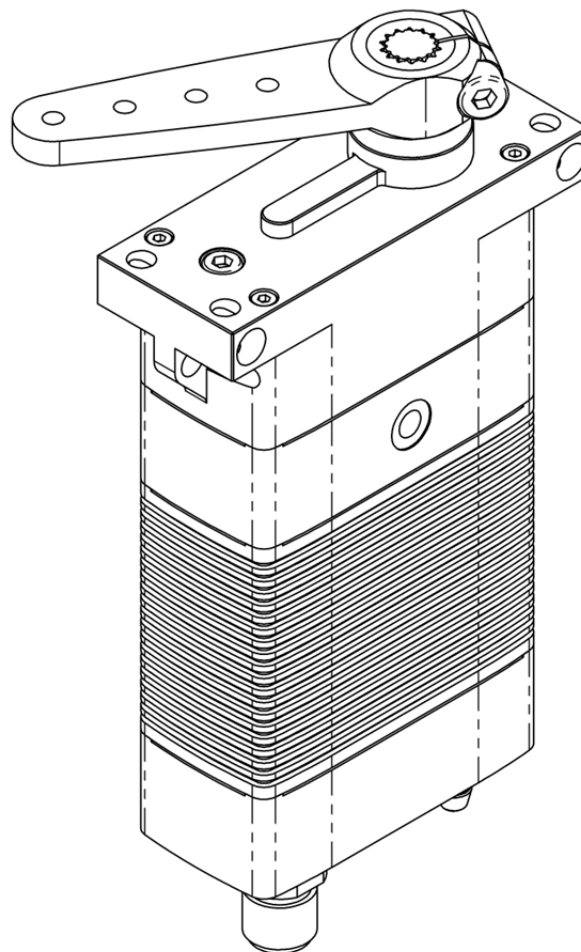


## DA 26-SUB Technical Specification



DA 26-SUB-30-5024

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## 1. General Description

Based on our DA 26 actuator, we have developed a special underwater actuator for great depths.

The oil-filled actuators can be exposed to extreme pressure conditions. Customers have already deployed our DA 26-SUB-30-5024 at depths down to 2000 m / 6600 feet.

To guarantee maximum safety and reliability, our DA 26-SUB-30-5024 includes a brushless motor drive and a contactless, wear free rotary encoder. This ensures maximum service life with the greatest possible power delivery. The housing is CNC machined from saltwater-resistant aluminum with HART®-coat treatment that can even be effectively used above water without oil filling.

There is a hose adapter on the bottom of the housing for filling the actuator with oil after opening the venting screw situated in the housing's top case part.

The DA 26-SUB series can be provided with a standard TTL-PWM input (Pulse Width Modulation) which includes analog position feedback to detect the drive shaft position.

The DA 26-SUB with digital serial command interface (RS-485) receives its commands via a CRC secured protocol. It can return not only the shaft position in digital format, but also several diagnostic data such as the level of the supply voltage, current consumption and the temperature of the motor and electronics in digital form (optionally also the humidity within actuator case). These kind of diagnostic capabilities help to determine the health state of the actuators before, during and after deployment.

DA 26-SUB actuators have been subjected to endurance tests of more than 3 million cycles (> 2,000 hours). Furthermore, successful tests based on MIL-STD 810F (vibration) and 810G (acceleration/shock) have been performed.

Interface Options:

### **TTL-PWM**

PWM-Level Compatible, TTL PWM Interface

### **RS 485 (2-wire)**

RS-485 Compatible, Asynchronous Serial Command Interface

For RS 485-Versions Only:

Customized commands can be implemented on request.

## 2. Operating Data

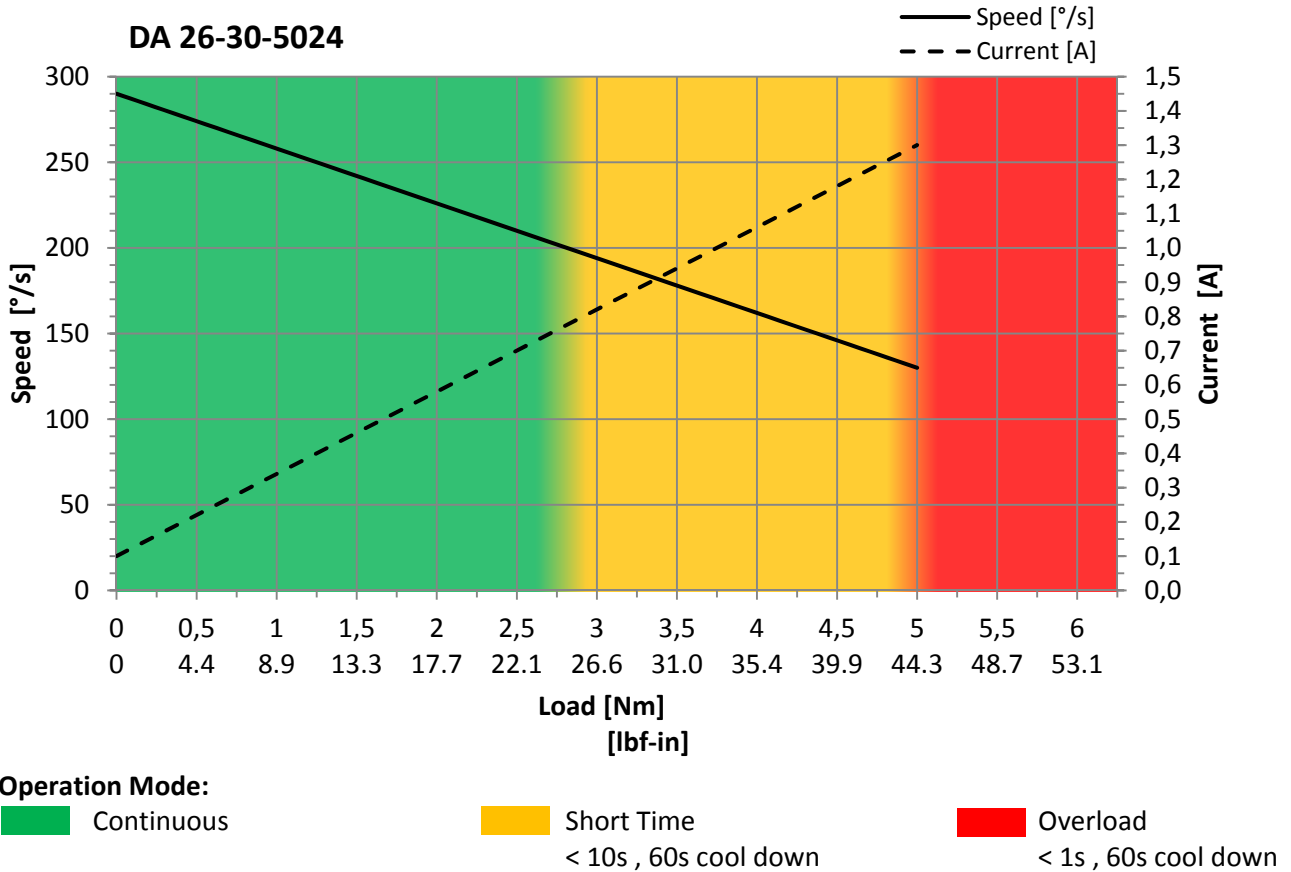
		DA 26-SUB-30-5024. . . . .
Supply Voltage (rated)		28 V DC
Supply Voltage Range		12 ... 32 V DC
Standby Current <sup>1</sup>	at rated voltage	< 0.04 A
Rated Current <sup>1</sup>	at rated voltage	0.8 A
Peak Current <sup>1</sup>	at rated voltage	1.3 A
Rated Torque <sup>1</sup>	at rated speed	2.7 Nm (23.9 lbf-in)
Peak Torque <sup>1</sup>	at rated voltage	5.0 Nm (44.3 lbf-in)
No Load Speed <sup>1</sup>	at rated voltage	290 °/s
Rated Speed <sup>1</sup>	at rated torque	200 °/s
Default Travel Angle		±45° = 90° total travel
Max. Standard Travel Angle <sup>2</sup>		±50° = 100° total travel
Extended Travel Angle (optional)		±85° = 170° total travel
Backlash (mechanical)		≤ 0.5°
Position Error under Temperature <sup>3</sup>		≤ ±1.0°
Operating Temperature Range		-30°C ... +70°C (-22°F ... +158°F)
Storage Temperature Range		-55°C ... +85°C (-67°F ... +185°F)

1) Tolerance ±10%

2) Programming Tool # 985.4 for PWM-Versions required

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

### 3. Performance



## 4. Command Signal

### 4.1. PWM Command Interface

TTL-PWM	DA 26-SUB-30-5024.1. _._
Signal Voltage	TTL-Level HIGH: min. 3.5V , max. 5.5V TTL-Level LOW: min. 0.0V , max. 1.5V
Frame Rate	2.6 ... 2000 ms
Valid Pulse Lengths	0.9 ... 2.1 ms
Pulse Lengths for Position Left / Center / Right	1.0 / 1.5 / 2.0 ms
Resolution	≤ 1.0 μs

### 4.2. RS 485 Command Signal

RS 485	DA 26-SUB-30-5024.3. _._
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 26-SUB-30-5024.3._._
Number of Data Bits	8
Number of Stop Bits	1 or 2
Parity	None

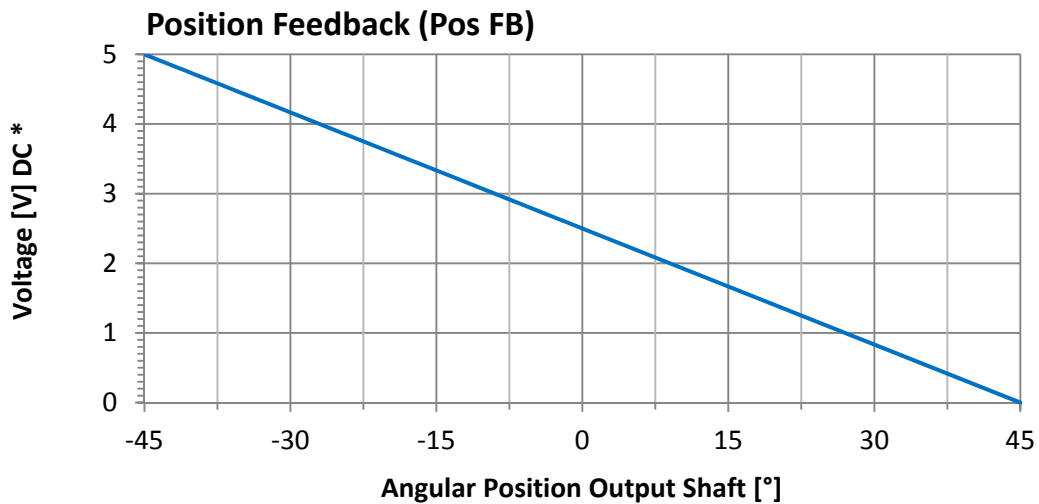
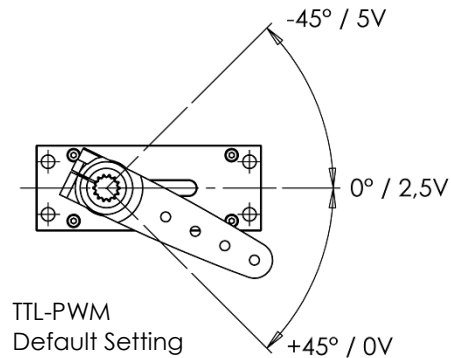
#### Command / Response Frame

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

Further interface options (RS 485-Redundant and RS 485 4-wire) on request.

## 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 / Signal 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
Case Surface Treatment	HART®-Coat
Salt Water Resistance	> 1000 hrs. Salt Water Spray
Salt Water Resistance	Standard, Case Material
EMI / RFI Shielding	Case Shielding
Motor Type	Brushless DC Motor
Gear Set Material	Hardened Steel
Position Sensor	Contactless
Position Feedback	Standard
RS 485 Communication Interface	Optional
Temperature Sensor <sup>1</sup>	Standard , Motor and PCB

1) RS 485-Versions only

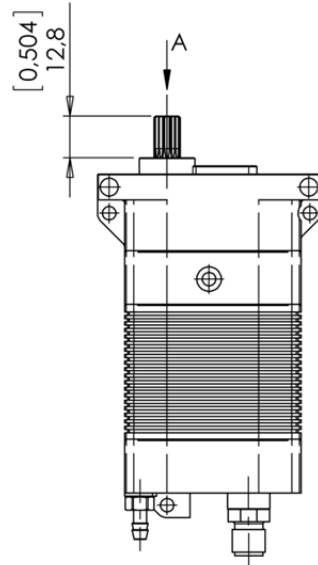
## 6. Dimensions

	<b>DA 26-SUB-30-5024.1.1.1</b>
Case Dimensions	54 mm x 102.8 mm x 26.0 mm ±0.2 mm (2.123 in x 4.047 in x 1.024 in ±0.008 in)
Weight (without oil filling)	290g (10.23oz) ±10%

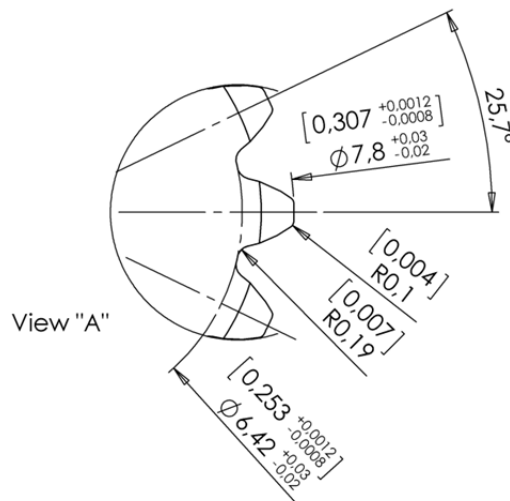


## 6.2. Output Shaft Spline

Valid for all Interface Versions  
 DA 26-SUB-30-5024. \_.\_.\_



Output Shaft Spline:  
 ANSI B92.1-1996 fillet root side fit



Not to scale

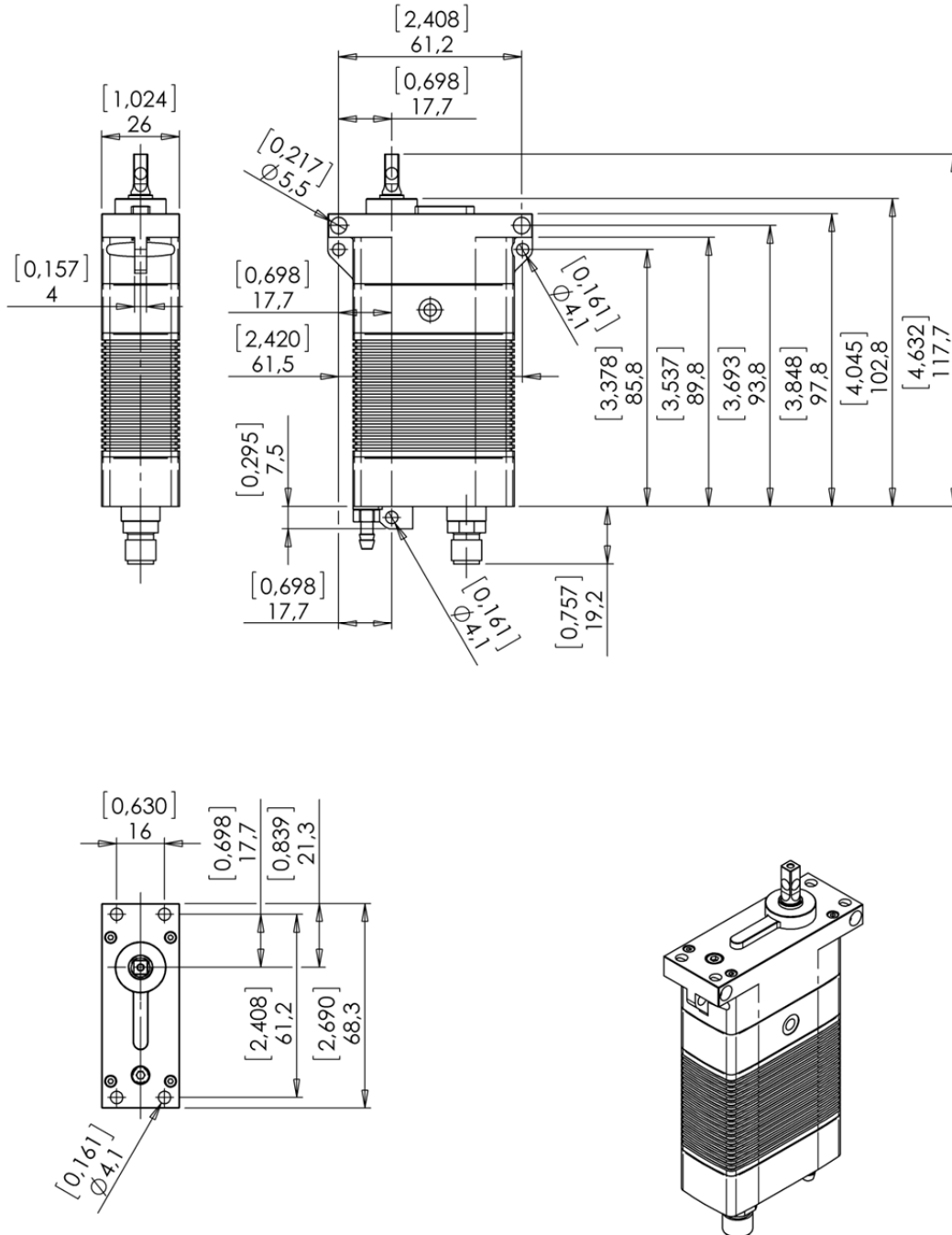
Dimensions [in] , mm

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Revision: A

### 6.3. Installation Dimensions, Square Shaft

Valid for all Versions with Output Shaft Square  
DA 26-SUB-30-5024.\_.\_.SQ



Not to scale

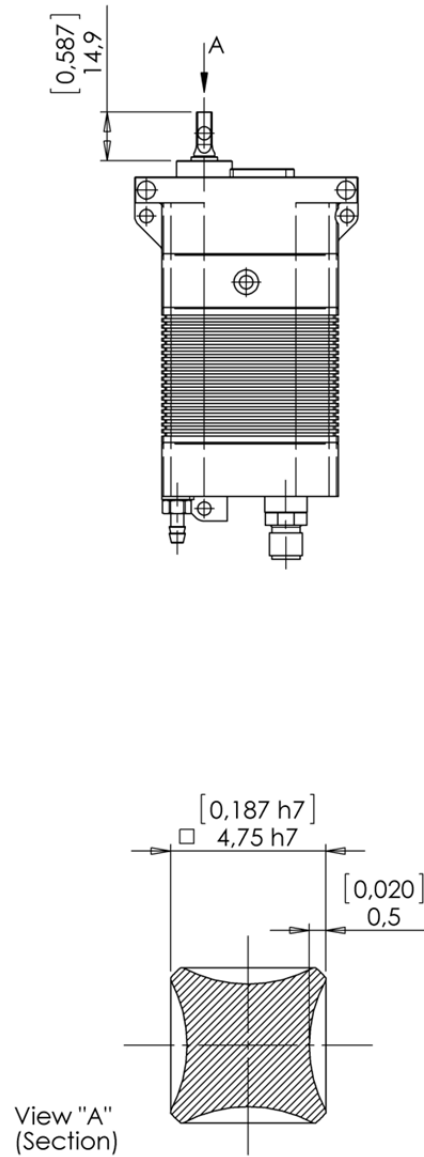
Dimensions [in] , mm

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Revision: A

## 6.4. Output Shaft Square

Valid for all Interface Versions  
DA 26-SUB-30-5024.\_.\_.SQ



Not to scale

Dimensions [in] , mm

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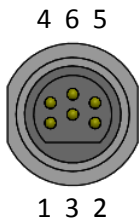
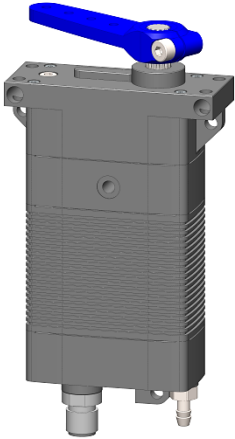
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## 7. Electrical Connection Options

### TTL-PWM Interface

Integrated Connector

Item # DA 26.SUB.30.5024.1.\_.\_

	Standard Connector		
	Manufacturer	Impulse Enterprise Inc.	
	Type	IE55-1206-BCR	
	Mating	IE55-1206-CCP	
	PWM-TTL Pin Assignment		
	1	+V DC	Supply Voltage
	2	Pos FB	Position Feedback Signal
	3	GND	Ground
	4	SIG	Command Signal
	5	NC	Do not connect
	6	NC	Do not connect


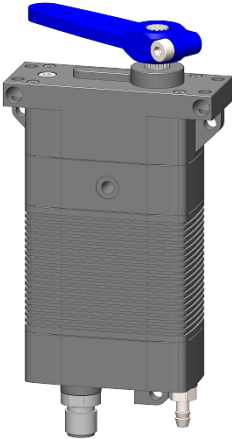
**NOTE:**

Access to the actuator parameters is possible via the TTL-PWM-Interface only.  
 Programming Tool # 985.4 required.

## RS 485 Interface (2-wire)

Integrated Connector

Item # DA 26.SUB.30.5024.3.\_.\_

	<b>Standard Connector</b>		
	Manufacturer	Impulse Enterprise Inc.	
	Type	IE55-1206-BCR	
	Mating	IE55-1206-CCP	
	<b>RS 485 (2-wire) Pin Assignment</b>		
	1	+V DC	Supply Voltage
	2	RS 485 A	Non-Inverting RS 485 Input / Output (A)
	3	RS 485 B	Inverting RS 485 Input / Output (B)
	4	GND	Case Ground
	5	NC	Do not connect
	6	NC	Do not connect

**NOTE:**

Access to the actuator parameters is possible via the RS 485-Interface only.  
Programming Tool # 985.5 required.

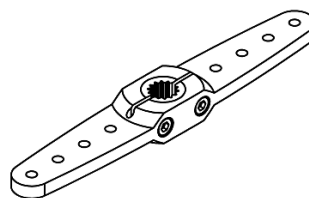
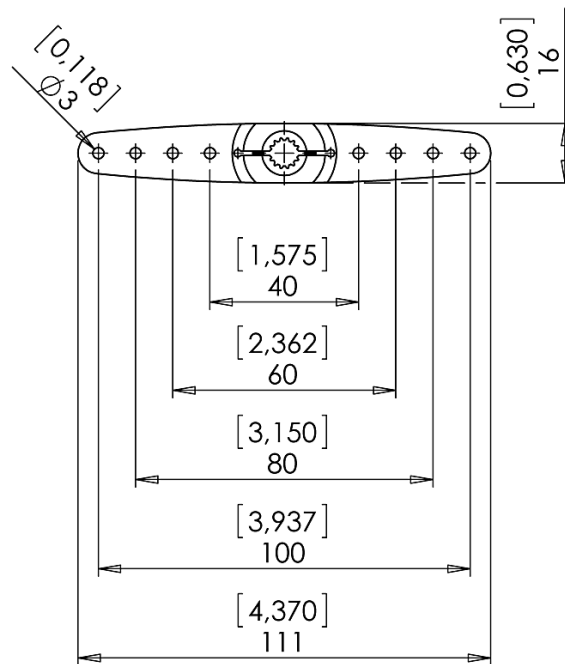
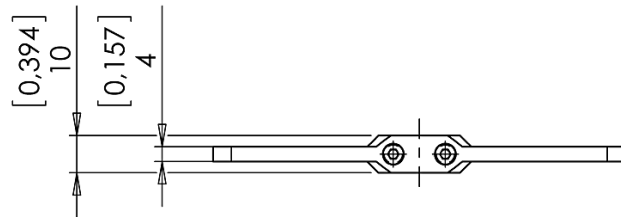


## 8. Accessories

Item	Item-No.
Aluminum Servo Arm, Double Sided	1841.20
Aluminum Servo Arm, Single Sided	1841.21
Aluminum Servo Disc	1841.23
Aluminum Mounting Frame, Left Hand Side	1821.30 incl. Hardware
Aluminum Mounting Frame, Right Hand Side	1821.31 incl. Hardware
Programming Tool PWM	985.4
Programming Tool RS-485	985.5

## 8.1. Aluminum Servo Arm, Double Sided

Servo Arm, Double Sided with Spline  
1841.20



Not to scale

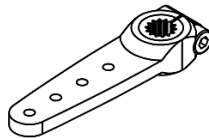
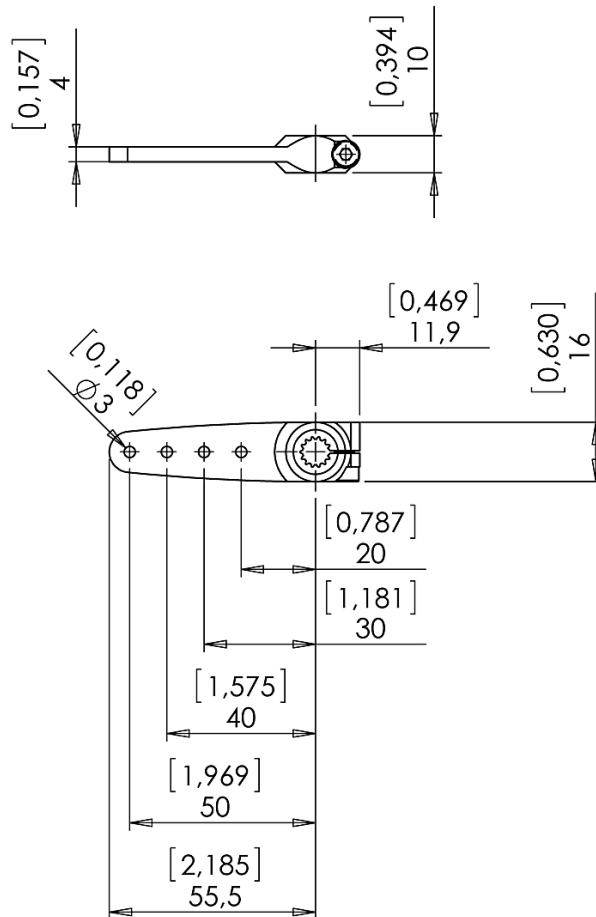
Dimensions [in] , mm

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Revision: A

## 8.2. Aluminum Servo Arm, Single Sided

Servo Arm, Single Sided with Spline  
 1841.21



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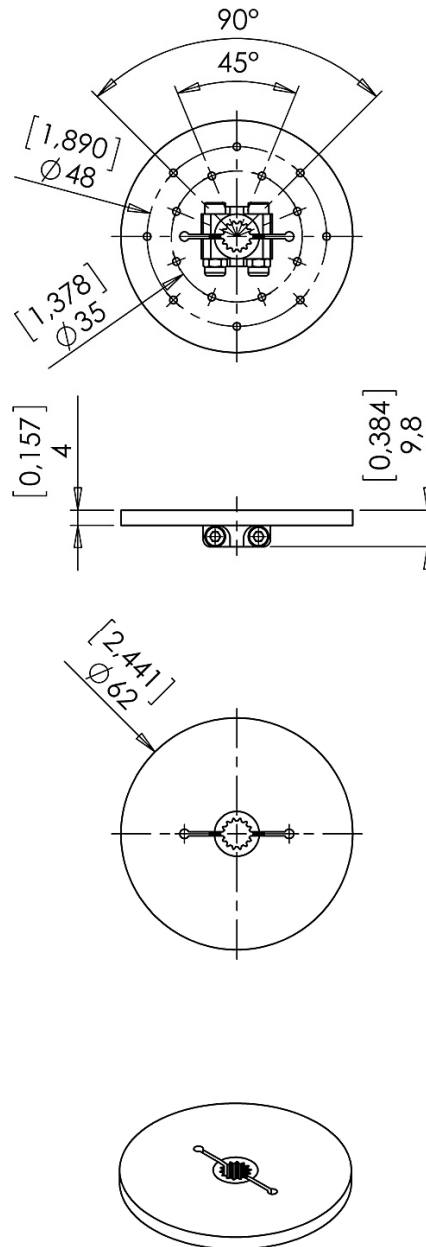
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Revision: A

### 8.3. Aluminum Servo Disc

Servo Disc with Spline  
1841.23



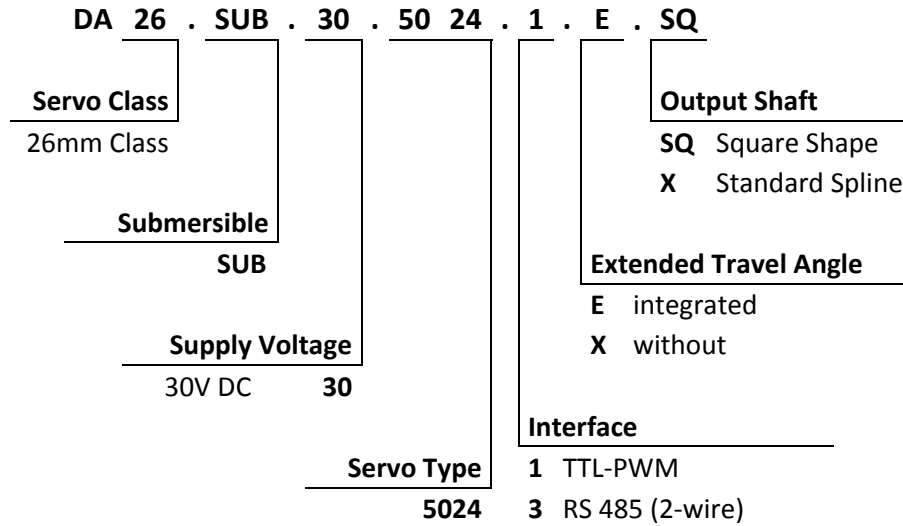
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Dimensions [in] , mm

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Revision: A

## 9. Item Number System



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