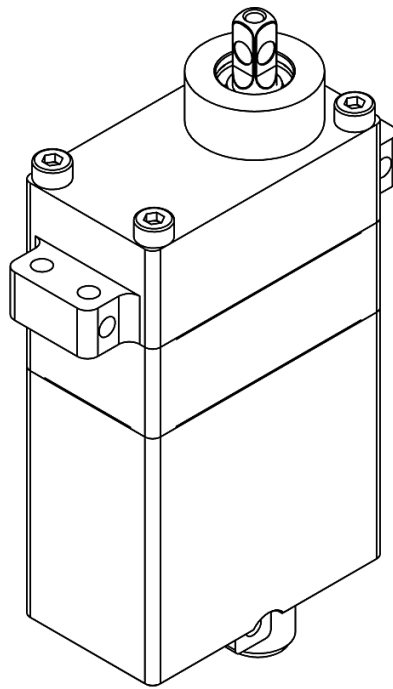


DA 22-SUB Technical Specification



DA 22-SUB-30-4128



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1. General Description

We developed the submersible DA 22-SUB, which based on the DA 22 actuator. The DA 22-SUB is pressure proof down to a depth of 100 meters (300ft / 10 bar / 145 psi).

The housing is CNC machined from marine bronze (DIN 1705 R65/MIL B24480). The integrated overload clutch (ISS system) protects the solid-steel gear train from every kind of radial shock loads.

The standard version (PWM) of the DA 22-SUB comes equipped with analog position feedback and an integrated moisture or temperature sensor. Every actuator is tested in our test lab for six hours in a pressure tank under various atmospheric pressures (0 to 15 bar).

2. Operating Data

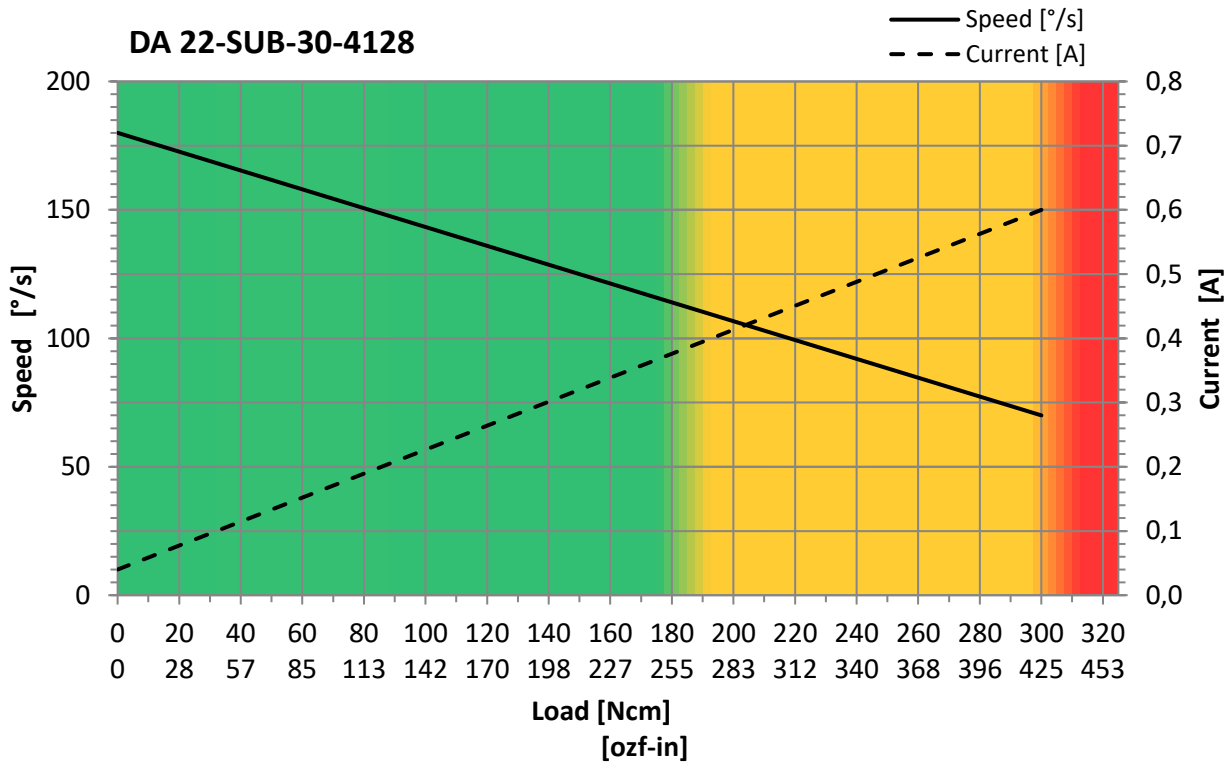
		DA 22-SUB-30-4128...
Supply Voltage (rated)		28 V DC
Supply Voltage Range		20 ... 30 V DC
Standby Current ¹	at rated voltage	< 0.04 A
Rated Current ¹	at rated voltage	0.3 A
Peak Current ¹	at rated voltage	0.6 A
Rated Torque ¹	at rated speed	180 Ncm (255 ozf-in)
Peak Torque ¹	at rated voltage	300 Ncm (424 ozf-in)
No Load Speed ¹	at rated voltage	180 °/s
Rated Speed ¹	at rated torque	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		-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)

3. Performance



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-SUB-30-4128._.P._.X.ST_
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

Valid for all Versions with RS 485 Command Signal

RS 485	DA 22-SUB-30-4128._.X._.R.ST_
Baud-Rate	115200 ±1.5% bits/s
Protocol (Documentation available)	6 Byte (incl. 2 byte CRC)

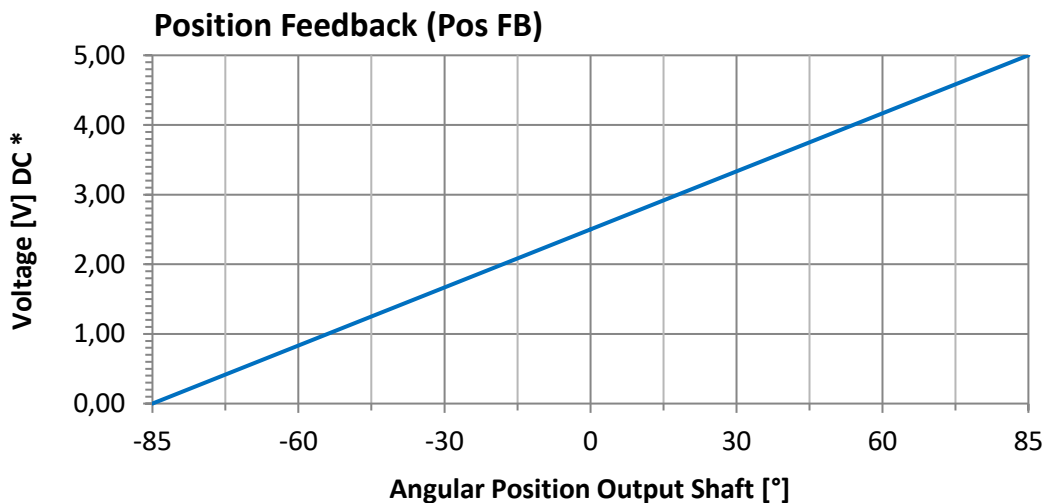
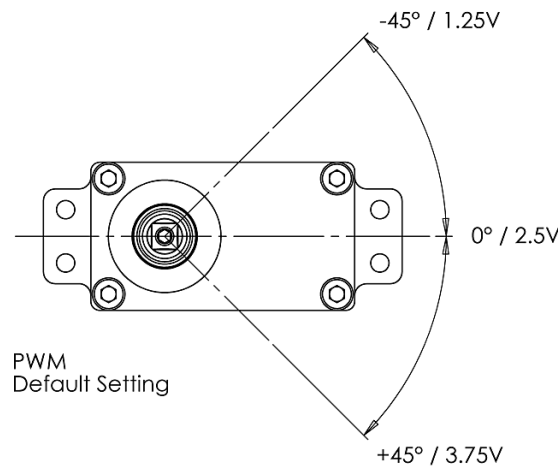
4.3. Position Feedback Signal

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).

Available Versions:

PWM Command Signal , Pos FB and Humidity Sensor (DA 22-SUB-30-4128._.P._.H.X.ST_)

PWM Command Signal , Pos FB and Temperature Sensor (DA 22-SUB-30-4128._.P._.T.X.ST_)



* Tolerance $\pm 5\%$

4.4. Position Feedback Value

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 Marine Bronze
Splash Water Resistance	Pressure-Resistance 100m (300ft) Water 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
Humidity- or Temperature Sensor ⁴	Standard
RS 485 Communication Interface	Optional

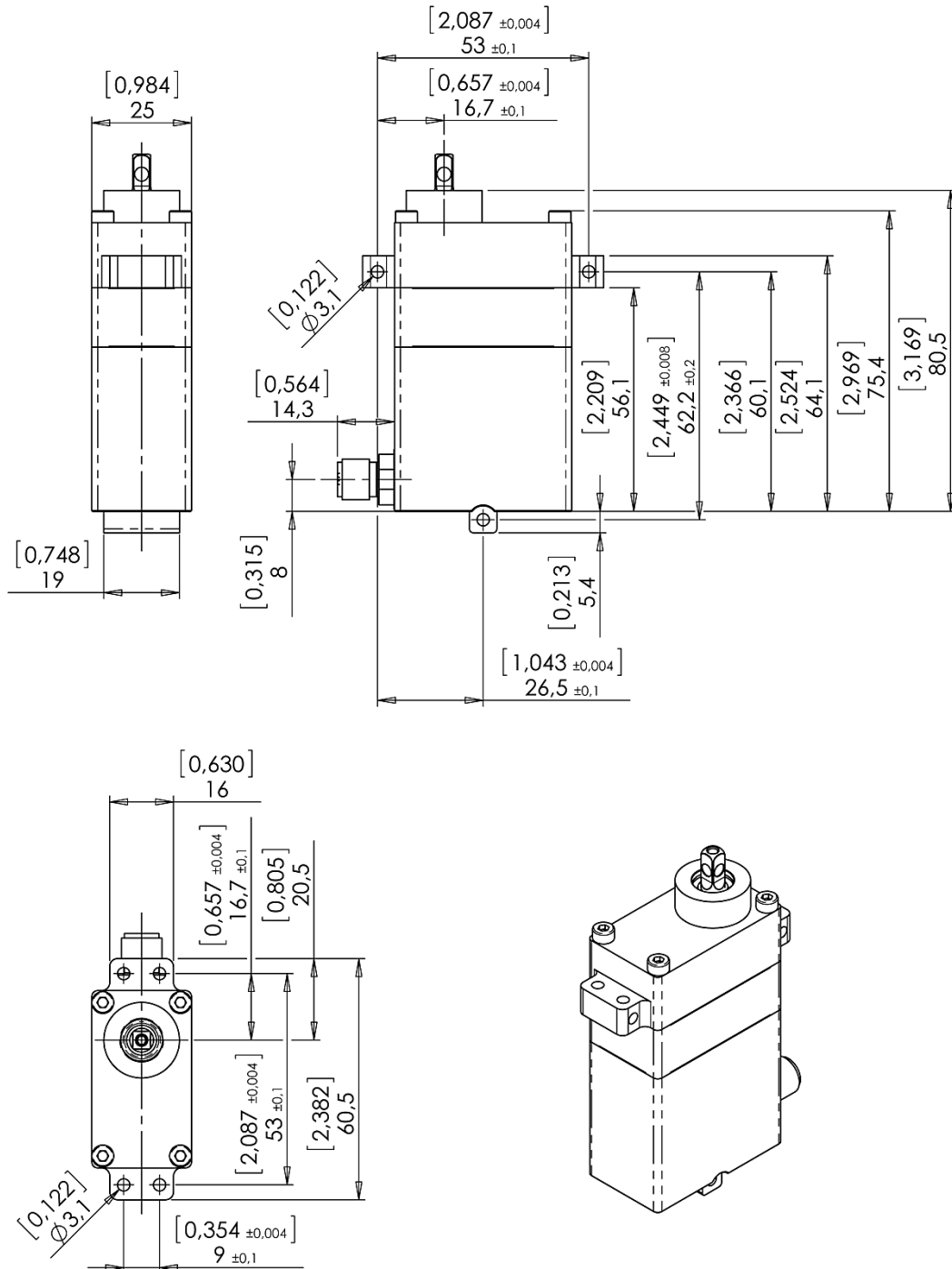
- 4) Either Humidity or Temperature Sensor in PWM-Version available
No Humidity or Temperature Sensor in RS 485-Version available

6. Dimensions

	DA 22-SUB-30-4128...
Case Dimensions	44.5 mm x 80.5 mm x 25.0 mm ±0.2 mm (1.752 in x 3.169 in x 0.984 in ±0.008 in)
Weight	372g (13.1 oz) ±10%

6.1. Installation Dimensions

Connector Side Entry
 DA 22.SUB.30.4128._.P._._.STS



Not to scale

Dimensions [in] , mm

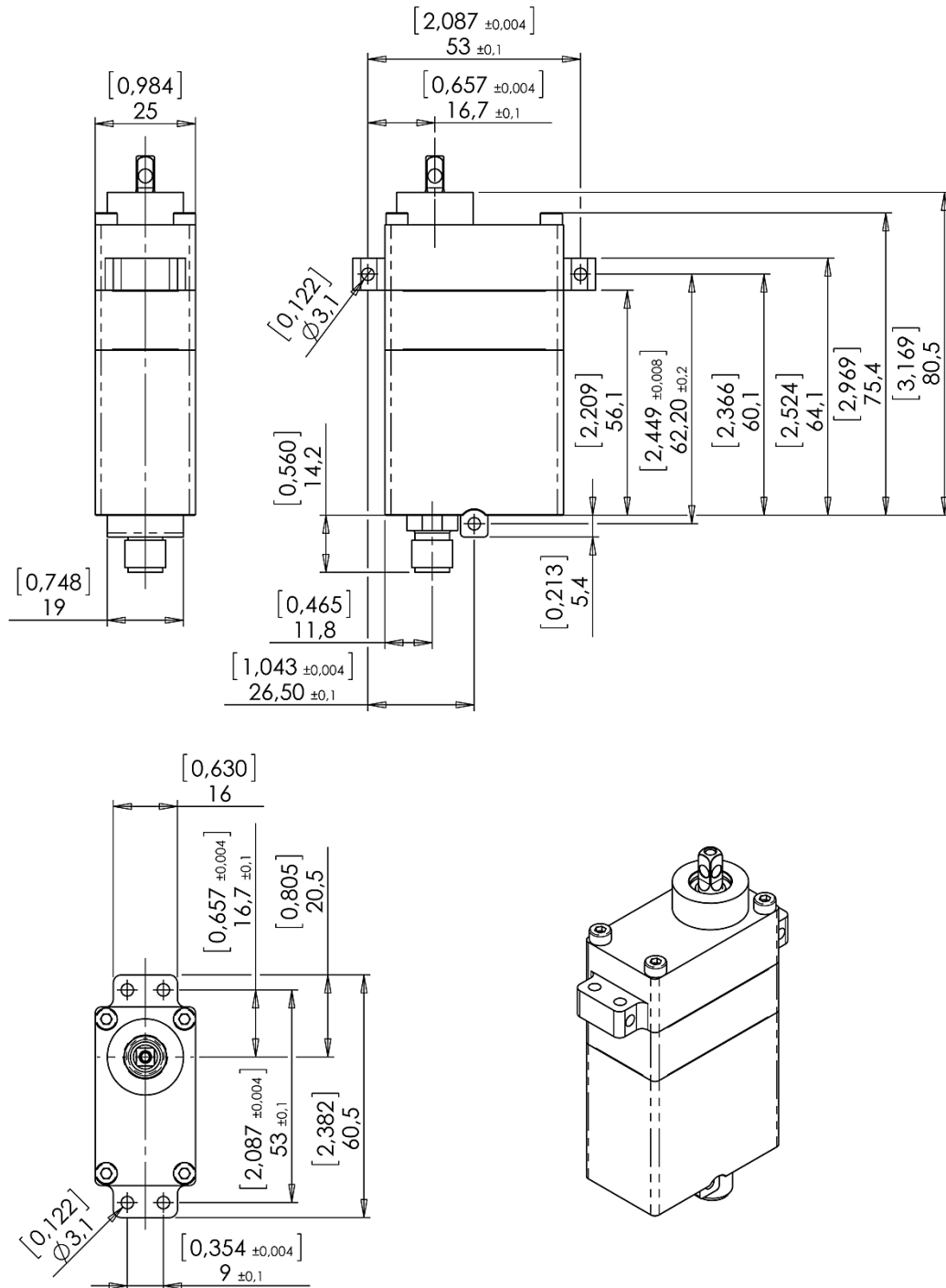
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Revision: D

6.2. Installation Dimensions

Connector Bottom Entry

DA 22.SUB.30.4128._P._._._.STB



Not to scale

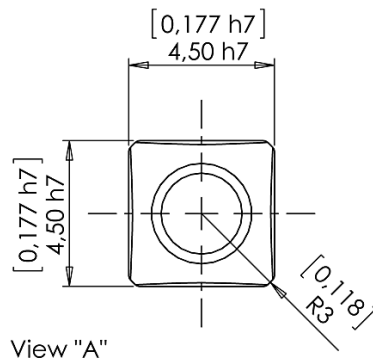
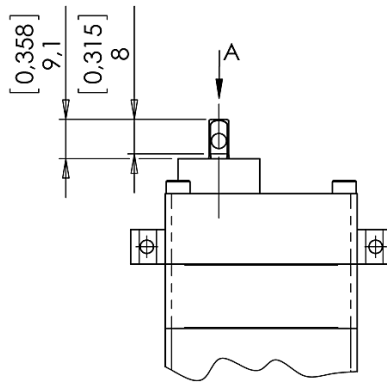
Dimensions [in] , mm

Content is subject to change without notice

Revision: D

6.3. Output Shaft Dimensions

Valid for all Versions
 DA 22.SUB.30.4128...



Not to scale

Dimensions [in] , mm

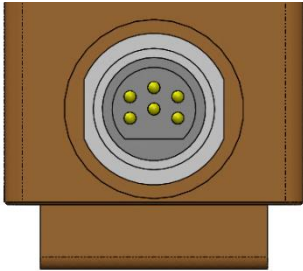
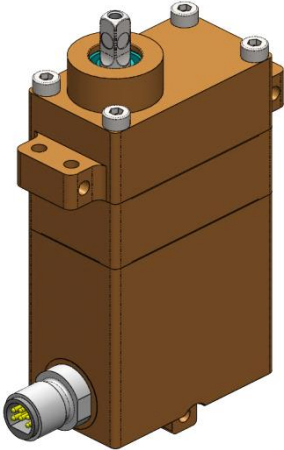
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Revision: D

7. Electrical Connection Options

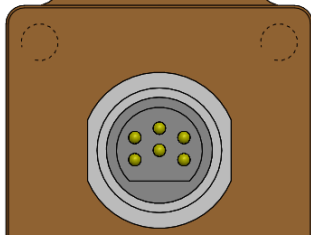
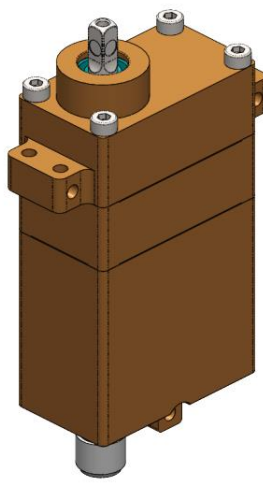
Integrated Connector
Side Entry

Item # DA 22.SUB.30.4128._.P._._.STS

 <p>4 6 5</p> <p>1 3 2</p>	Side Entry Connector	
	Manufacturer	Impulse Enterprise Inc.
Type	IE55-1206-BCR	
Mating	IE55-1206-CCP/UT , IE55-1206-CCP R/A	
PWM Pin Assignment		
1	+V DC	Supply Voltage
2	Pos FB	Position Feedback Signal
3	SIG	Command Signal
4	GND	Supply Ground, Signal Ground
5	Temp.	Temperture Sensor
6	H	Humidity Sensor
RS 485 Pin Assignment		
1	+V DC	Supply Voltage
2	RS 485 B	Inverting RS 485 Input / Output (B)
3	RS 485 A	Non-Inverting RS 485 Input / Output (A)
4	GND	Supply Ground, Interface Ground
5	NC	Do not connect
6	NC	Do not connect
		

Integrated Connector
Bottom Entry

Item # DA 22.SUB.30.4128._.P._._.STB

	Bottom Entry Connector	
	Manufacturer	Impulse Enterprise Inc.
Type	IE55-1206-BCR	
Mating	IE55-1206-CCP/UT , IE55-1206-CCP R/A	
PWM Pin Assignment		
1	+V DC	Supply Voltage
2	Pos FB	Position Feedback Signal
3	SIG	Command Signal
4	GND	Supply Ground, Signal Ground
5	Temp.	Temperture Sensor
6	H	Humidity Sensor
RS 485 Pin Assignment		
1	+V DC	Supply Voltage
2	RS 485 B	Inverting RS 485 Input / Output (B)
3	RS 485 A	Non-Inverting RS 485 Input / Output (A)
4	GND	Supply Ground, Interface Ground
5	NC	Do not connect
6	NC	Do not connect
		

8. Accessories

Item	Item-No.
Programming Tool PWM	985.3
Programming Tool RS-485	985.8

9. Item Number System

DA	22	SUB	30	41	28	I	P	E	H	R	STS
Servo Class 22mm Class		Submersible SUB		Supply Voltage 30 V DC 30		Servo Type 4128		Electrical Connection STS Standard Connector, Side Entry STB Standard Connector, Bottom Entry			
								Command Interface R RS 485 X PWM			
								Sensor H Humidity (PWM-Version) T Temperature (PWM) X without (RS 485-Version)			
								Extended Travel Angle E integrated X without			
								Position Feedback P integrated			
								ISS Gear Protection System I integrated X without			



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