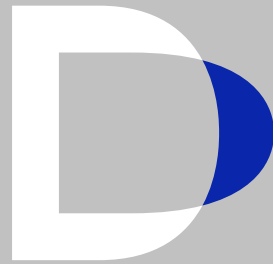


2021/2022  
Product  
Catalogue



**Delta Line**

Moving together

# Stepper



Permanent Magnet Stepper

p.265



Flat Hybrid Stepper

p.353



Hybrid Stepper S series

p.277



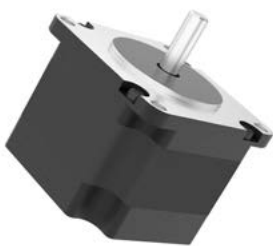
Hybrid Stepper SH series

p.287



Hybrid Stepper STC series

p.327



3-Phase Hybrid Stepper

p.337



Hollow Shaft Stepper

p.345 - NEW



Hybrid Stepper with Encoder

p.357



IP65 Hybrid Stepper

p.373

# Stepper Motors

Technical introduction		262
<b>Permanent Magnet Stepper motors</b>	<b>Torque* (Nm)</b>	<b>265</b>
15PM12	0,003...0,004	266
20PM18	0,005	267
25PM15	0,01...0,016	268
35PM16...22	0,04...0,055	269
42PM17...22	0,05...0,06	271
57PM25	0,12...0,15	273
<b>Hybrid Stepper motors - S series</b>	<b>Torque* (Nm)</b>	<b>277</b>
57S41...76	0,288...1,25	278
86S67...125	2,3...7,6	282
<b>Hybrid Stepper motors - SH series High Torque</b>	<b>Torque* (Nm)</b>	<b>287</b>
20SH33...42	0,018...0,03	288
25SH23	0,033	290
28SH32...51	0,043...0,12	291
35SH26...36	0,07...0,14	294
39SH20...38	0,065...0,29	297
42SH33...60	0,158...0,8	300
42SH33...47M - step 0,9°	0,158...0,44	304
57SH41...76	0,39...1,89	307
57SH41...76M - step 0,9°	0,39...1,8	311
60SH45...86	0,78...3,1	314
86SH65...156	2,6...12,1	318
110SH99...201	11,2...28	323
<b>Hybrid Stepper motors - STC series Hyper Torque</b>	<b>Torque* (Nm)</b>	<b>327</b>
20STC33...40	0,022...0,036	328
28STC32...51	0,08...0,18	330
57STC41...76	0,6...2,3	333
<b>3-Phase Hybrid Stepper motors</b>	<b>Torque* (Nm)</b>	<b>337</b>
42 3P24...39	0,08...0,2	338
57 3P42...79	0,45...1,5	340
60 3P53	0,9	343
<b>Hollow Shaft Stepper motors - NEW</b>	<b>Torque* (Nm)</b>	<b>345</b>
20STC40 H	0,036	346
28STC51 H	0,12	347
35STC38 H	0,23	348
42STC47 H	0,44	349
57STC76 H	2,3	350
86SH118 H	6	351
<b>Flat Hybrid Stepper motors</b>	<b>Torque* (Nm)</b>	<b>353</b>
28S10	0,01	354
63S10	0,064	355
<b>Stepper motors with Encoder</b>	<b>Torque* (Nm)</b>	<b>357</b>
SM42 054...080 -E	0,22...0,75	358
SM60 066...107 -E	1...3	362
SM86 084...172 -E	3,5...12	366
<b>IP65 Hybrid Stepper motors</b>	<b>Torque* (Nm)</b>	<b>373</b>
SM28 051...070 - IP65	0,071...0,127	374
SM42 097...127 - IP65	0,16...0,72	376
SM42 097...127 -E - IP65 with Encoder	0,16...0,72	379
SM57 070...093 - IP65	1,2...2,2	382
SM57 101...136 -E - IP65 with Encoder	0,7...1,95	384

\* Holding Torque

Term	
<b>Rated voltage</b>	Voltage necessary to reach the nominal current per phase.
<b>Current/Phase</b>	The current supplied to the motor phases that will not exceed, at an ambient temperature of 20°C, the thermal limits of the motor.
<b>Resistance/Phase</b>	Winding resistance per phase. Tolerance +/- 12%, steady state.
<b>Inductance/Phase</b>	Winding inductance per phase measured at 1kHz.
<b>Holding Torque</b>	The torque generated by the motor at nominal current.
<b>Rotor Inertia</b>	Is the mass moment of inertia of the rotor, based on the axis of rotation.
<b>Detent Torque</b>	The torque required to rotate a non-energized step motor.
<b>Number of leads</b>	Number of lead wires available to connect the motor.
<b>Length</b>	Total motor length.
<b>Weight</b>	Total motor mass.
<b>Step angle</b>	Number of angular degrees the motor moves per full-step
<b>Step angle accuracy</b>	The percentage position error per full step, at no load and nominal current. This error is not cumulative between steps.
<b>Insulation class</b>	The electrical insulation system for wires and other wire-wound electrical components is divided into different classes by temperature and temperature rise. The electrical insulation system is sometimes referred to as insulation class or thermal classification.
<b>Ambient temperature</b>	Temperatures at which the motor can operate.
<b>Max. Temp. Rise (rated current 2 phase on)</b>	Maximum temperature rise for the motor at rated voltage and two phases
<b>Max. shaft radial play</b>	The shaft displacement perpendicular to the shaft due to a side force applied perpendicular to the shaft axis.
<b>Max. shaft axial play</b>	Axial shaft displacement occurring during a reversal of an axial force on the shaft.
<b>Max. Radial force</b>	Maximum force that can be applied to the shaft in the radial direction (any direction perpendicular to the motor shaft axis).
<b>Max. Axial force</b>	Maximum force that can be applied to the shaft in the axial direction (in the same axis as or parallel to the motor shaft axis).
<b>Dielectric strength</b>	A dielectric test (also known as hipot or high potential test) is performed on all motors under 500V phases to the housing and during 5 seconds after voltage ramp up. Maximum allowed leakage is 1mA
<b>Insulation resistance</b>	The measurement of insulation resistance is carried out by means of a megohmmeter - high resistance range ohmmeter. DC voltage is applied between the windings and the ground of the motor.

# Glossary

## Product families

Permanent Magnet Stepper motors  
Hybrid Stepper motors  
3-Phase Hybrid Stepper motors  
Hollow Shaft Stepper motors  
Flat Hybrid Stepper motors  
Stepper motors with Encoder  
IP65 Hybrid Stepper motors

A stepper motor is an electromechanical device which converts electrical pulses into discrete mechanical movements. The shaft or spindle of a stepper motor rotates in discrete step increments when electrical command pulses are applied to it in the proper sequence. The motors rotation has several direct relationships to these applied input pulses. The sequence of the applied pulses is directly related to the direction of motor shafts rotation. A stepper motor can be a good choice whenever controlled movement is required. They can be used to advantage in applications where you need to control rotation angle, speed, position and synchronism.

## Main advantages

- 1 The rotation angle of the motor is proportional to the input pulse.
- 2 Precise positioning and repeatability of movement since good stepper motors have an accuracy of 3 - 5% of a step and this error is non cumulative from one step to the next.
- 3 Excellent response to starting/stopping/reversing.
- 4 Very reliable since there are no contact brushes in the motor. Therefore the life of the motor is simply dependent on the life of the bearing.
- 5 A wide range of rotational speeds can be realized as the speed is proportional to the frequency of the input pulses.

Often referred to as "tin can" or "can stack" motor the permanent magnet step motor is a low cost and low resolution type motor. PM motors have permanent magnets added to the motor structure. The rotor no longer has teeth, instead the rotor is magnetized with alternating north and south poles situated in a straight line parallel to the rotor shaft. These motors offer good torque at lower speed.

## Permanent Magnets stepper motors

The hybrid stepper motor is more expensive than the PM stepper motor but provides better performance with respect to step resolution, torque and speed. This motor combines the best features of both the PM and Variable Reluctance stepper motors. The rotor is multi-toothed and contains an axially magnetized concentric magnet around its shaft. The teeth on the rotor provide an even better path which helps guide the magnetic flux to preferred locations in the air gap. This further increases the detent, holding and dynamic torque characteristics of the motor when compared with both the VR and PM types.

## Hybrid Stepper motors (2-Phase)

3-Phase technology in hybrid stepper motor is used mainly where ultra-low vibration and very low noise levels are required. The drive circuit of these motors is simplified because it is driven with a star wiring connection. The use of three phases inherently helps to reduce torque ripple and smooth motor performance. An example of an ideal application is in performance lighting, where quick movement and quiet operation are required.

## 3-Phase Hybrid Stepper motors

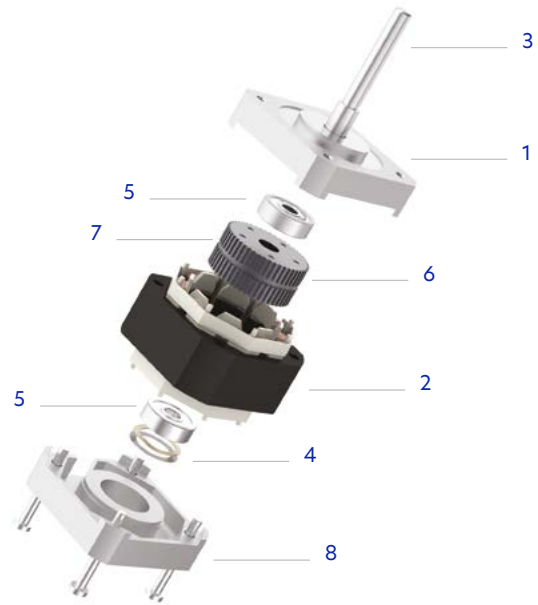
Our Hybrid stepper motors are also available equipped with an optical incremental encoder to increase the motion precision. Thanks to the encoder, the drive knows the position (or the speed) of the motor in real time and can perform adjustments to align the real condition with the condition requested by the system. The presence of an encoder is highly recommended when is critical to know the status of the motor (both position and speed) in every instant.

## Stepper motors with integrated Encoder

# Technical introduction

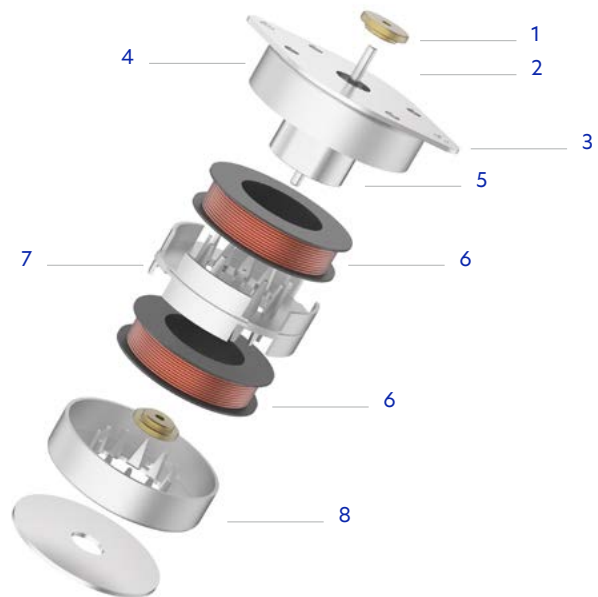
### Composition Hybrid Stepper

- 1 Front Endbell
- 2 Stator & Coils
- 3 Shaft
- 4 Washer
- 5 Ball bearings
- 6 Rotor cup
- 7 Magnet
- 8 Rear Endbell



### Composition PM Stepper

- 1 Sleeve bearing
- 2 Shaft
- 3 Front flange
- 4 Front cover/stator
- 5 Rotor
- 6 Windings
- 7 Inner stator
- 8 Rear cover/stator





Stepper motors  
**IP65 Hybrid**



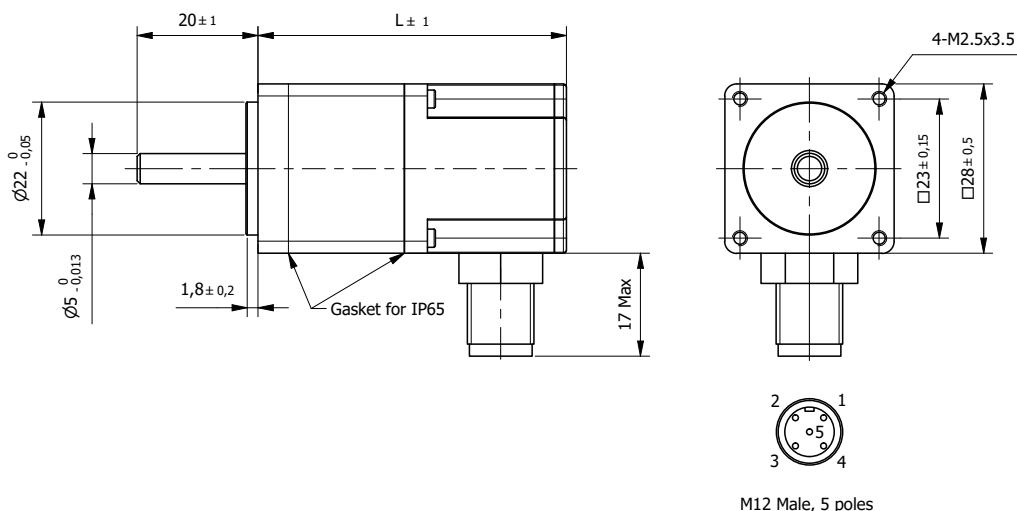
**Advantages at a glance**

- High protection
- High torque
- High speed

Our Hybrid stepper motors with protection class IP65 are designed for harsh operating environments. These IP65-rated stepper motors are completely dustproof. Dust cannot enter the device and therefore cannot damage it internally under any circumstances. IP65 rating also guarantees the protection of the device against water projections, and can withstand low-pressure jets of water.

IP65 Hybrid Stepper motors	Torque* (Nm)	
SM28 051 - IP65	0,071	374
SM28 070 - IP65	0,127	375
SM42 097 - IP65	0,160	376
SM42 115 - IP65	0,480	377
SM42 127 - IP65	0,720	378
SM42 097 - E - IP65	0,160	379
SM42 115 - E - IP65	0,480	380
SM42 127 - E - IP65	0,720	381
SM57 070 - IP65	1,200	382
SM57 093 - IP65	2,200	383
SM57 101 - E - IP65	0,700	384
SM57 112 - E - IP65	1,240	385
SM57 136 - E - IP65	1,950	386

\* Holding Torque



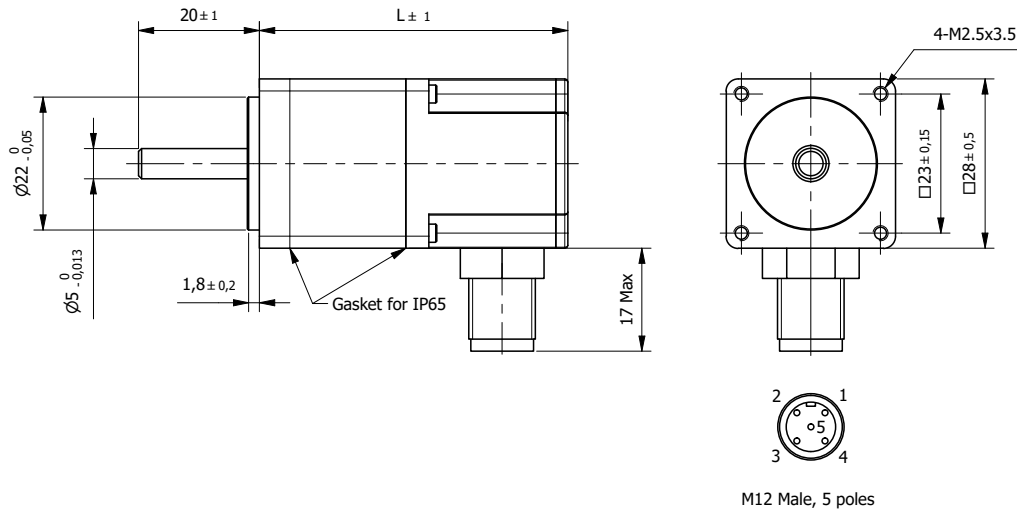
Specification			
Model	...07S4-IP		
1	Rated Voltage	V	3,75
2	Current/Phase	A	0,67
3	Resistance/Phase	Ω	5,6
4	Inductance/Phase	mH	4
5	Holding Torque	Nm	0,071
6	Rotor Inertia	gcm <sup>2</sup>	9
7	n° of Leads		4
8	Length (L)	mm	51
9	Weight	Kg	0,13

Characteristics		
Item		
Step angle		1,8°
Step angle Accuracy		±5%
Insulation Class		B
Protection Class		IP65
Ambient Temperature		-20°C to +50°C
Max. Temp. Rise (rated current, 2-phase on)		80°C
Max. Shaft Radial play (450g load)		0,02mm
Max. Shaft Axial play (450g load)		0,08mm
Max. Radial Force (on shaft end)		21N
Max Axial Force		10N
Dielectric Strength (for 1 min.)		500 VAC
Insulation Resistance (min. 500 VDC)		100 Mohm

Standard Combination	
Gearbox	Drive
28JMS	Aries
22JMS	Libra
	Orion
	Aquarius

\* other options on request

Connection	
Pole n°	Function
1	Phase A-
2	Phase A
3	Phase B
4	Phase B-



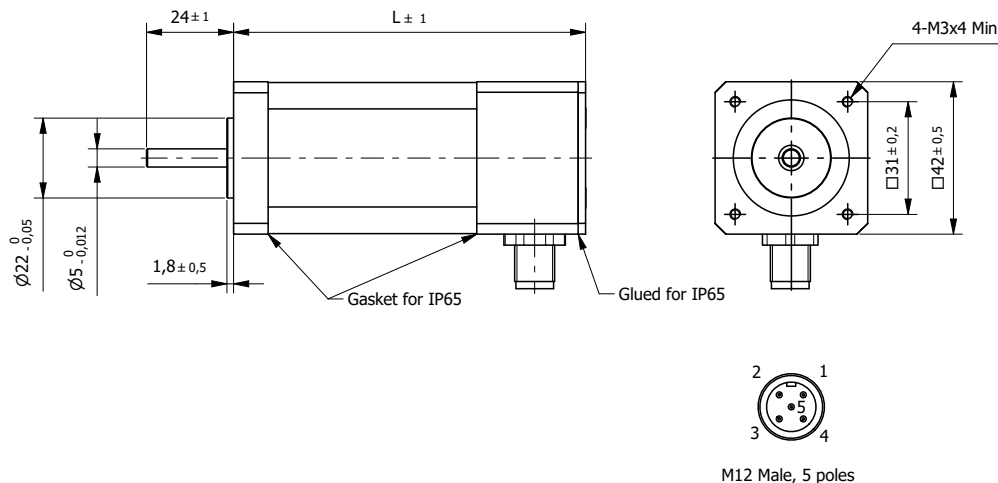
Specification		
Model	...07S4-IP	
1	Rated Voltage	V 9,2
2	Current/Phase	A 0,67
3	Resistance/Phase	Ω 9,2
4	Inductance/Phase	mH 7,2
5	Holding Torque	Nm 0,127
6	Rotor Inertia	gcm <sup>2</sup> 18
7	n° of Leads	4
8	Length (L)	mm 70
9	Weight	Kg 0,22

Characteristics	
Item	
Step angle	1,8°
Step angle Accuracy	±5%
Insulation Class	B
Protection Class	IP65
Ambient Temperature	-20°C to +50°C
Max. Temp. Rise (rated current, 2-phase on)	80°C
Max. Shaft Radial play (450g load)	0,02mm
Max. Shaft Axial play (450g load)	0,08mm
Max. Radial Force (on shaft end)	21N
Max Axial Force	10N
Dielectric Strength (for 1 min.)	500 VAC
Insulation Resistance (min. 500 VDC)	100 Mohm

Connection	
Pole n°	Function
1	Phase A-
2	Phase A
3	Phase B
4	Phase B-

Standard Combination	
Gearbox	Drive
28JMS	Aries
22JMS	Libra
	Orion
	Aquarius

\* other options on request



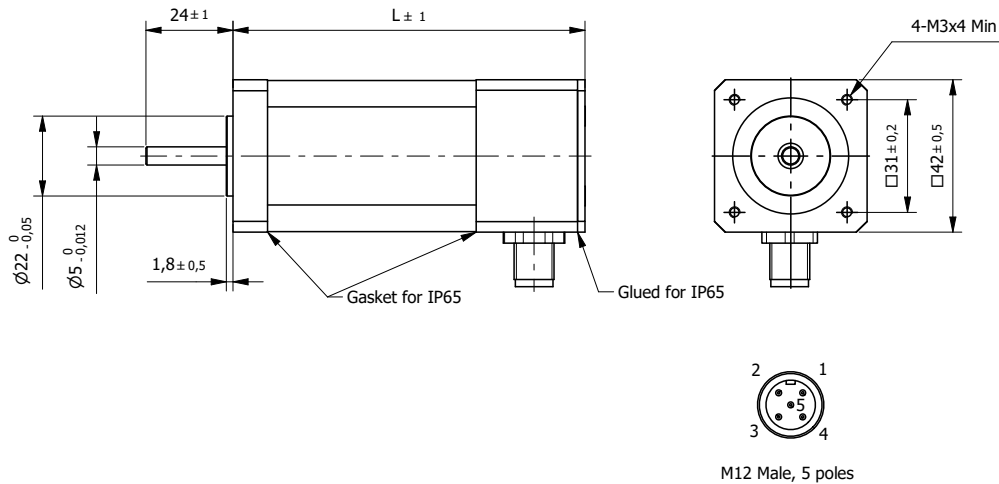
Specification			
Model	...18S4-IP		
1	Rated Voltage	V	1,5
2	Current/Phase	A	1,8
3	Resistance/Phase	Ω	0,86
4	Inductance/Phase	mH	1,1
5	Holding Torque	Nm	0,16
6	Rotor Inertia	gcm <sup>2</sup>	25
7	Detent torque	Nm	0,012
8	n° of Leads		4
9	Length (L)	mm	97
10	Weight	Kg	0,22

Characteristics	
Item	
Step angle	1,8°
Step angle Accuracy	±5%
Insulation Class	B
Protection Class	IP65
Ambient Temperature	-20°C to +50°C
Max. Temp. Rise (rated current, 2-phase on)	80°C
Max. Shaft Radial play (450g load)	0,02mm
Max. Shaft Axial play (450g load)	0,08mm
Max. Radial Force (on shaft end)	21N
Max Axial Force	10N
Dielectric Strength (for 1 min.)	500 VAC
Insulation Resistance (min. 500 VDC)	100 Mohm

Standard Combination	
Gearbox	Drive
GYP42	Aries
42JMS	Libra
	Orion
	Aquarius

\* other options on request

Connection	
Pole n°	Function
1	Phase A-
2	Phase A
3	Phase B
4	Phase B-



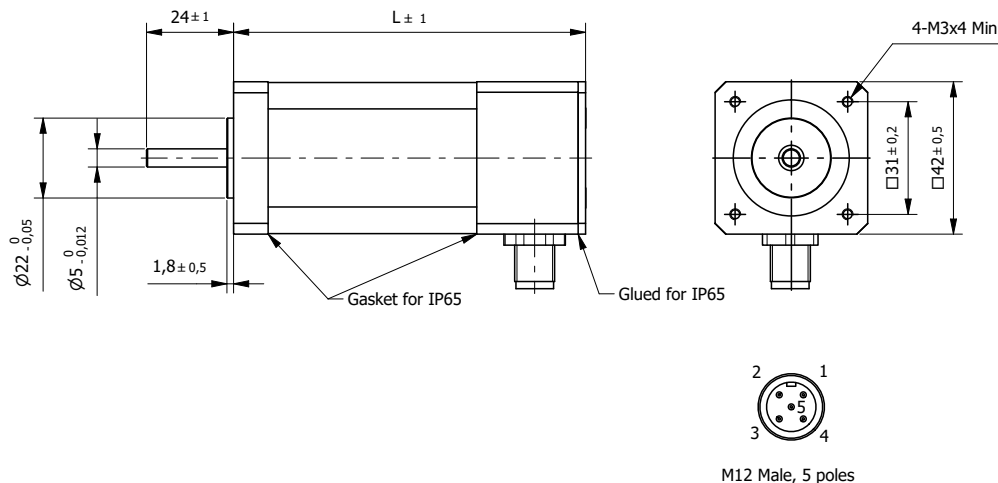
Specification			
Model	...18S4-IP		
1	Rated Voltage	V	2,7
2	Current/Phase	A	1,8
3	Resistance/Phase	Ω	1,52
4	Inductance/Phase	mH	3,7
5	Holding Torque	Nm	0,48
6	Rotor Inertia	gcm <sup>2</sup>	80
7	Detent torque	Nm	0,012
8	n° of Leads		4
9	Length (L)	mm	115
10	Weight	Kg	0,56

Characteristics	
Item	
Step angle	1,8°
Step angle Accuracy	±5%
Insulation Class	B
Protection Class	IP65
Ambient Temperature	-20°C to +50°C
Max. Temp. Rise (rated current, 2-phase on)	80°C
Max. Shaft Radial play (450g load)	0,02mm
Max. Shaft Axial play (450g load)	0,08mm
Max. Radial Force (on shaft end)	21N
Max Axial Force	10N
Dielectric Strength (for 1 min.)	500 VAC
Insulation Resistance (min. 500 VDC)	100 Mohm

Connection	
Pole n°	Function
1	Phase A-
2	Phase A
3	Phase B
4	Phase B-

Standard Combination	
Gearbox	Drive
GYP42	Aries
42JMS	Libra
	Orion
	Aquarius

\* other options on request



Specification			
Model	...18S4-IP		
1	Rated Voltage	V	3,6
2	Current/Phase	A	1,8
3	Resistance/Phase	Ω	2
4	Inductance/Phase	mH	5
5	Holding Torque	Nm	0,72
6	Rotor Inertia	gcm <sup>2</sup>	115
7	Detent torque	Nm	0,012
8	n° of Leads		4
9	Length (L)	mm	127
10	Weight	Kg	0,7

Characteristics	
Item	
Step angle	1,8°
Step angle Accuracy	±5%
Insulation Class	B
Protection Class	IP65
Ambient Temperature	-20°C to +50°C
Max. Temp. Rise (rated current, 2-phase on)	80°C
Max. Shaft Radial play (450g load)	0,02mm
Max. Shaft Axial play (450g load)	0,08mm
Max. Radial Force (on shaft end)	21N
Max Axial Force	10N
Dielectric Strength (for 1 min.)	500 VAC
Insulation Resistance (min. 500 VDC)	100 Mohm

Standard Combination	
Gearbox	Drive
GYP42	Aries
42JMS	Libra
	Orion
	Aquarius

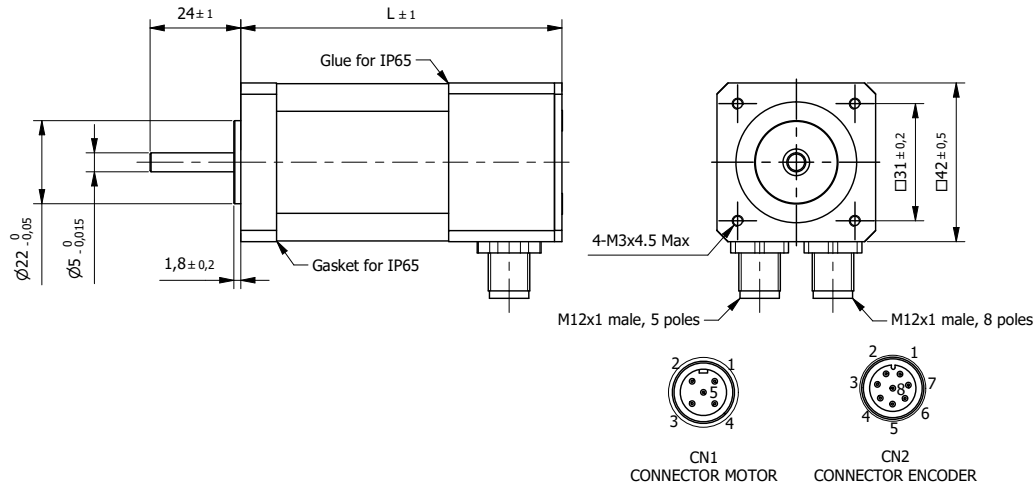
\* other options on request

Connection	
Pole n°	Function
1	Phase A-
2	Phase A
3	Phase B
4	Phase B-

# Hybrid Stepper Motor SM42 097

with Encoder - IP65

□ 42mm



Specification			
Model	...18E4-IP		
1	Rated Voltage	V	1,6
2	Current/Phase	A	1,8
3	Resistance/Phase	Ω	0,86
4	Inductance/Phase	mH	1,1
5	Holding Torque	Nm	0,16
6	Rotor Inertia	gcm <sup>2</sup>	25
7	Detent Torque	Nm	0,012
8	n° of Leads		4
9	Length (L)	mm	97
10	Weight	Kg	0,2

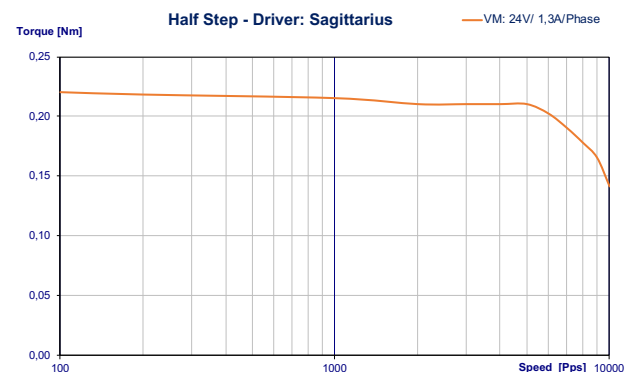
Characteristics	
Item	
Encoder Type*	Optical - Incremental 1000 CPR / 2 channels
Step angle	1,8°
Step angle Accuracy	±5%
Insulation Class	B
Protection Class	IP65
Ambient Temperature	-20°C to +50°C
Max. Temp. Rise (rated current, 2-phase on)	80°C
Max. Shaft Radial play (450g load)	0,02mm
Max. Shaft Axial play (450g load)	0,08mm
Max. Radial force (at shaft end)	21N
Max. Axial force	10N
Dielectric Strength (for 1 min.)	500 VAC
Insulation Resistance (min. 500 VDC)	100 Mohm

\* 3-channel encoder or other types on request

Connection	
Poles n°	Function
<b>Motor</b>	
1	Phase A
2	Phase A-
3	Phase B
4	Phase B-
<b>Feedback</b>	
1	EA+
2	EA-
3	EB+
4	EB-
5	GND
6	EZ+
7	EZ-
8	VDC 5V

Standard Combination	
Gearbox	Drive
GYP42	Aries
42JMS	Libra
	Orion
	Sagittarius

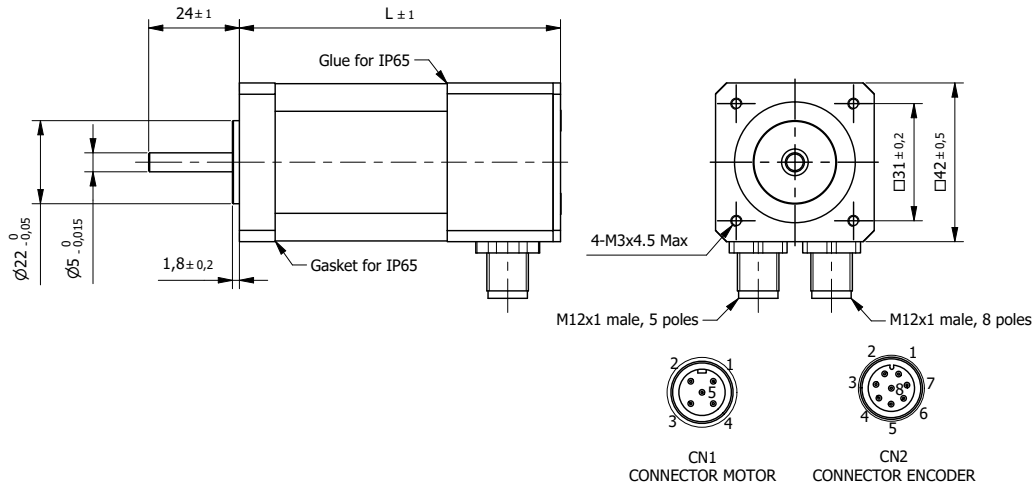
\* other options on request



# Hybrid Stepper Motor SM42 115

with Encoder - IP65

□ 42mm



Specification		
Model	...18E4-IP	
1	Rated Voltage	V 2,7
2	Current/Phase	A 1,8
3	Resistance/Phase	Ω 1,52
4	Inductance/Phase	mH 3,7
5	Holding Torque	Nm 0,48
6	Rotor Inertia	gcm <sup>2</sup> 80
7	Detent Torque	Nm 0,012
8	n°of Leads	4
9	Length (L)	mm 115
10	Weight	Kg 0,56

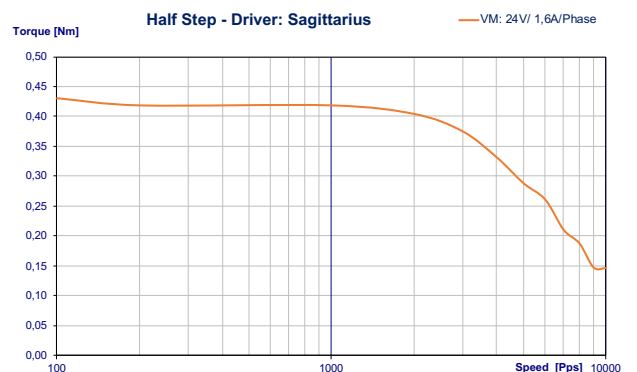
Characteristics	
Item	
Encoder Type*	Optical - Incremental 1000 CPR / 2 channels
Step angle	1,8°
Step angle Accuracy	±5%
Insulation Class	B
Protection Class	IP65
Ambient Temperature	-20°C to +50°C
Max. Temp. Rise (rated current, 2-phase on)	80°C
Max. Shaft Radial play (450g load)	0,02mm
Max. Shaft Axial play (450g load)	0,08mm
Max. Radial force (at shaft end)	21N
Max. Axial force	10N
Dielectric Strength (for 1 min.)	500 VAC
Insulation Resistance (min. 500 VDC)	100 Mohm

\* 3-channel encoder or other types on request

Standard Combination	
Gearbox	Drive
GYP42	Aries
42JMS	Libra
	Orion
	Sagittarius

\* other options on request

Connection	
Poles n°	Function
<b>Motor</b>	
1	Phase A
2	Phase A-
3	Phase B
4	Phase B-
<b>Feedback</b>	
1	EA+
2	EA-
3	EB+
4	EB-
5	GND
6	EZ+
7	EZ-
8	VDC 5V

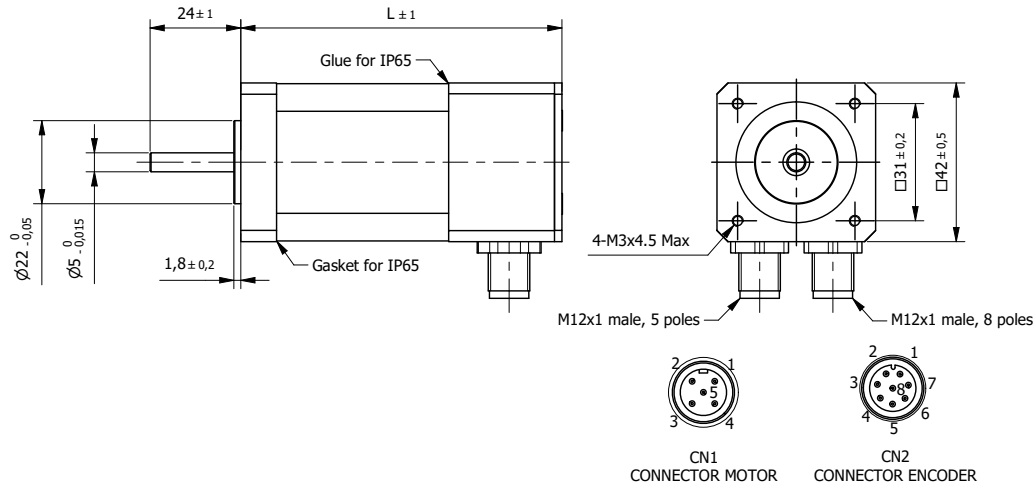




# Hybrid Stepper Motor SM42 127

with Encoder - IP65

□ 42mm



Specification		
Model	...18E4-IP	
1	Rated Voltage	V 3,6
2	Current/Phase	A 1,8
3	Resistance/Phase	Ω 2
4	Inductance/Phase	mH 5
5	Holding Torque	Nm 0,72
6	Rotor Inertia	gcm <sup>2</sup> 115
7	Detent Torque	Nm 0,012
8	n° of Leads	4
9	Length (L)	mm 127
10	Weight	Kg 0,7

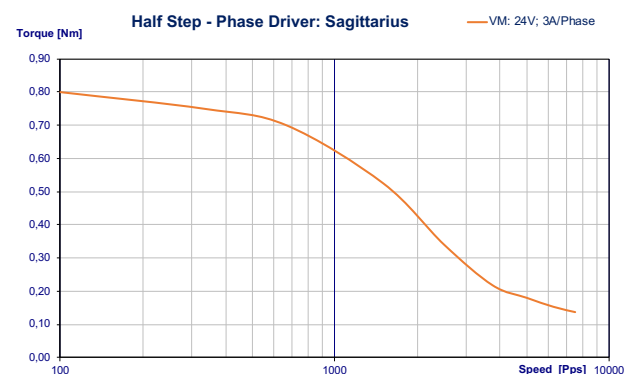
Characteristics	
Item	
Encoder Type*	Optical - Incremental 1000 CPR / 2 channels
Step angle	1,8°
Step angle Accuracy	±5%
Insulation Class	B
Protection Class	IP65
Ambient Temperature	-20°C to +50°C
Max. Temp. Rise (rated current, 2-phase on)	80°C
Max. Shaft Radial play (450g load)	0,02mm
Max. Shaft Axial play (450g load)	0,08mm
Max. Radial force (at shaft end)	21N
Max. Axial force	10N
Dielectric Strength (for 1 min.)	500 VAC
Insulation Resistance (min. 500 VDC)	100 Mohm

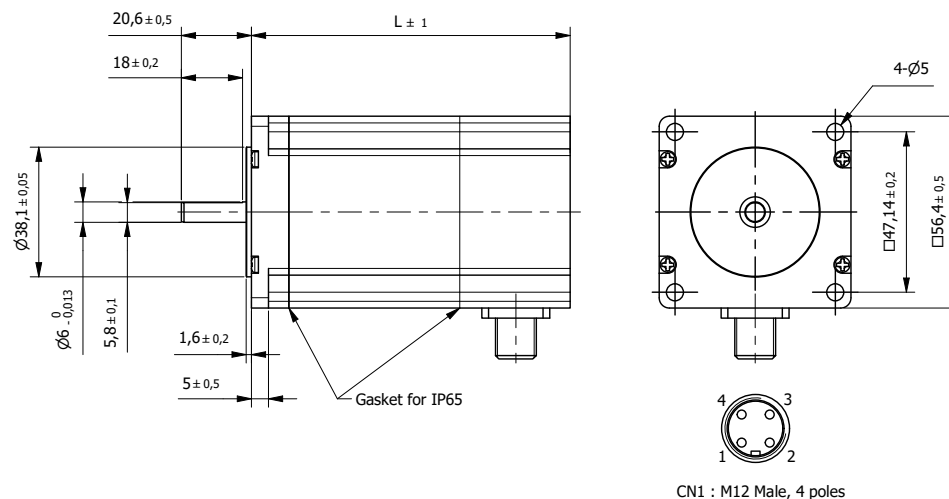
\* 3-channel encoder or other types on request

Connection	
Poles n°	Function
<b>Motor</b>	
1	Phase A
2	Phase A-
3	Phase B
4	Phase B-
<b>Feedback</b>	
1	EA+
2	EA-
3	EB+
4	EB-
5	GND
6	EZ+
7	EZ-
8	VDC 5V

Standard Combination	
Gearbox	Drive
GYP42	Aries
42JMS	Libra
	Orion
	Sagittarius

\* other options on request





CN1 : M12 Male, 4 poles

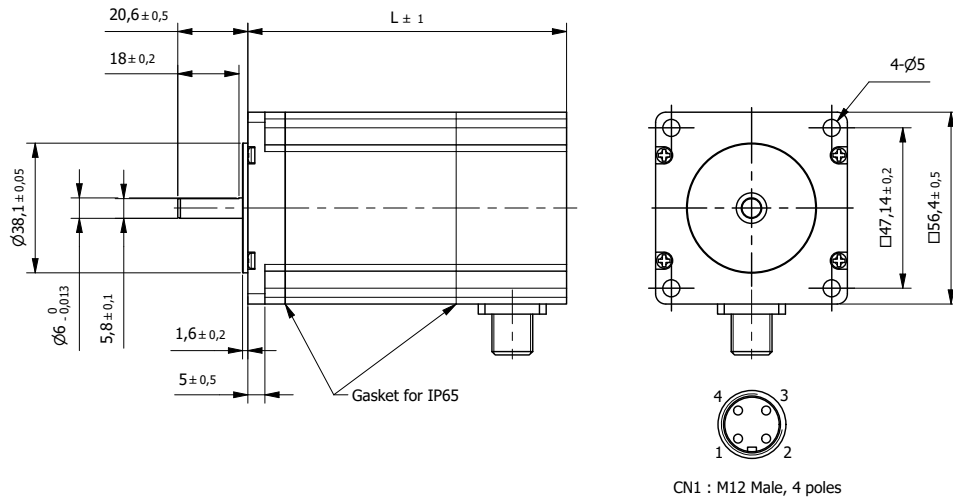
Specification			
Model	...42S4-IP		
1	Rated Voltage	V	1,7
2	Current/Phase	A	4,2
3	Resistance/Phase	Ω	0,4
4	Inductance/Phase	mH	1,2
5	Holding Torque	Nm	1,2
6	Rotor Inertia	gcm <sup>2</sup>	300
7	n° of Leads		4
8	Length (L)	mm	70
9	Weight	Kg	0,7

Characteristics		
Item		
Step angle	1,8°	
Step angle Accuracy	±5%	
Insulation Class	B	
Protection Class	IP65	
Ambient Temperature	-20°C to +50°C	
Max. Temp. Rise (rated current, 2-phase on)	80°C	
Max. Shaft Radial play (450g load)	0,02mm	
Max. Shaft Axial play (450g load)	0,08mm	
Max. Radial Force (on shaft end)	75N	
Max Axial Force	15N	
Dielectric Strength (for 1 min.)	500 VAC	
Insulation Resistance (min. 500 VDC)	100 Mohm	

Standard Combination	
Gearbox	Drive
GYP56	Aries
56JMS	Libra
	Sagittarius
	Aquarius

\* other options on request

Connection	
Pole n°	Function
1	Phase A-
2	Phase A
3	Phase B
4	Phase B-



Specification			
Model	...42S4-IP		
1	Rated Voltage	V	2,1
2	Current/Phase	A	4,2
3	Resistance/Phase	Ω	0,5
4	Inductance/Phase	mH	1,77
5	Holding Torque	Nm	2,2
6	Rotor Inertia	gcm <sup>2</sup>	520
7	n° of Leads		4
8	Length (L)	mm	93,7
9	Weight	Kg	1

Characteristics	
Item	
Step angle	1,8°
Step angle Accuracy	±5%
Insulation Class	B
Protection Class	IP65
Ambient Temperature	-20°C to +50°C
Max. Temp. Rise (rated current, 2-phase on)	80°C
Max. Shaft Radial play (450g load)	0,02mm
Max. Shaft Axial play (450g load)	0,08mm
Max. Radial Force (on shaft end)	75N
Max Axial Force	15N
Dielectric Strength (for 1 min.)	500 VAC
Insulation Resistance (min. 500 VDC)	100 Mohm

Connection	
Pole n°	Function
1	Phase A
2	Phase A-
3	Phase B
4	Phase B-

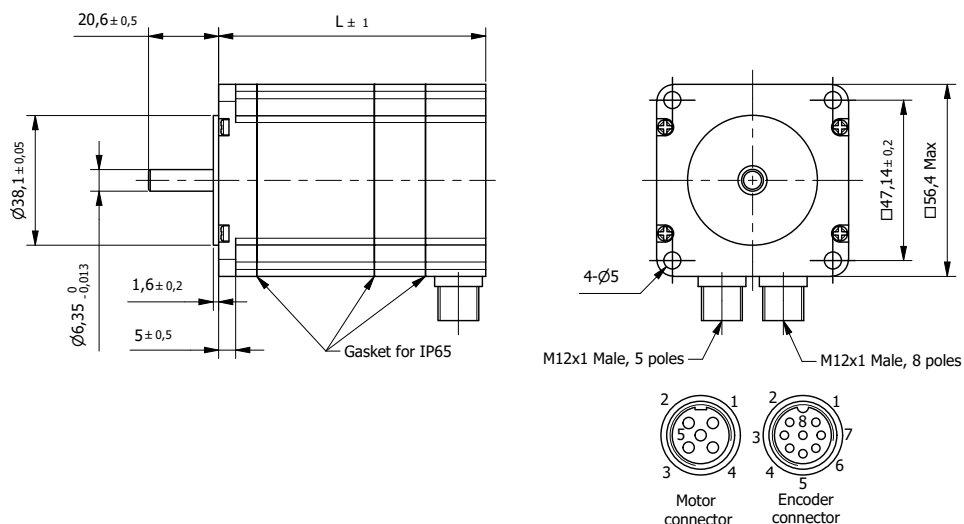
Standard Combination	
Gearbox	Drive
GYP56	Aries
56JMS	Libra
	Sagittarius
	Aquarius

\* other options on request

# Hybrid Stepper Motor SM57 101

## with Encoder - IP65

□ 57mm



Specification		
Model	...28E4-IP	
1	Rated Voltage	V 1,6
2	Current/Phase	A 2,8
3	Resistance/Phase	Ω 0,57
4	Inductance/Phase	mH 1,6
5	Holding Torque	Nm 0,7
6	Rotor Inertia	gcm <sup>2</sup> 170
7	Detent Torque	Nm 0,036
8	n°of Leads	4
9	Length (L)	mm 101
10	Weight	Kg 0,5

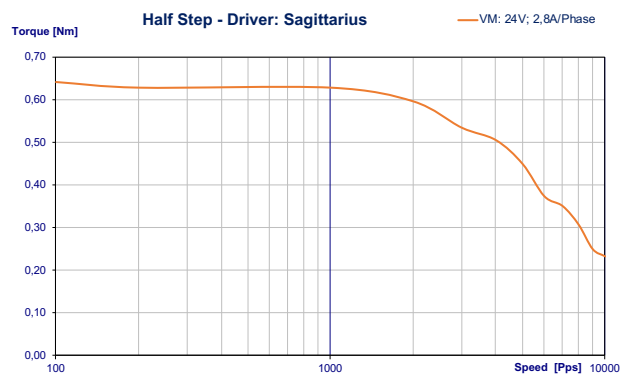
Characteristics	
Item	
Encoder Type*	Optical - Incremental 1000 CPR / 2 channels
Step angle	1,8°
Step angle Accuracy	±5%
Insulation Class	B
Protection Class	IP65
Ambient Temperature	-20°C to +50°C
Max. Temp. Rise (rated current, 2-phase on)	80°C
Max. Shaft Radial play (450g load)	0,02mm
Max. Shaft Axial play (450g load)	0,08mm
Max. Radial force (at shaft end)	75N
Max. Axial force	15N
Dielectric Strength (for 1 min.)	500 VAC
Insulation Resistance (min. 500 VDC)	100 Mohm

\* 3-channel encoder or other types on request

Connection	
Poles n°	Function
<b>Motor</b>	
1	Phase A
2	Phase A-
3	Phase B
4	Phase B-
<b>Feedback</b>	
1	EA+
2	EA-
3	EB+
4	EB-
5	GND
6	EZ+
7	EZ-
8	VDC 5V

Standard Combination	
Gearbox	Drive
GYP56	Aries
56JMS	Libra
	Orion
	Sagittarius

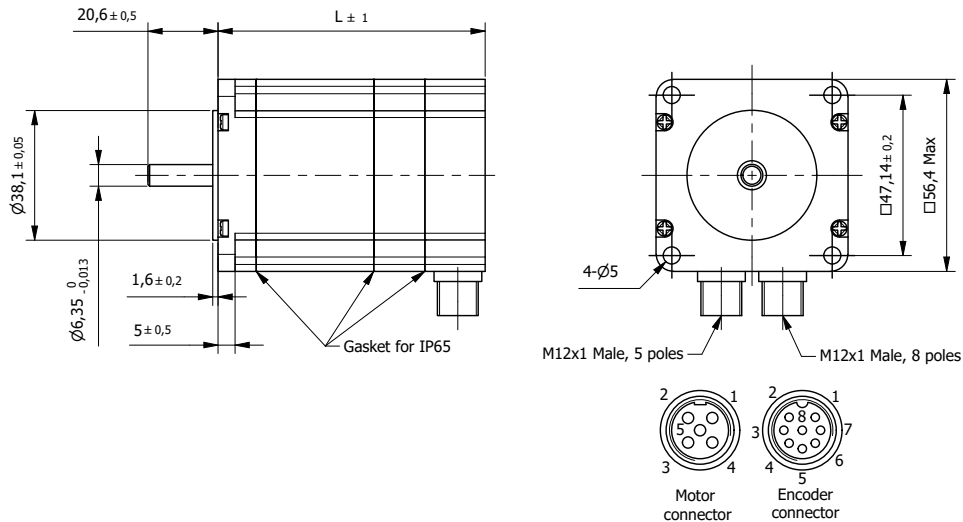
\* other options on request



# Hybrid Stepper Motor SM57 112

with Encoder - IP65

□ 57mm



Specification			
Model	...28E4-IP		
1	Rated Voltage	V	2,5
2	Current/Phase	A	2,8
3	Resistance/Phase	Ω	0,9
4	Inductance/Phase	mH	2,9
5	Holding Torque	Nm	1,24
6	Rotor Inertia	gcm <sup>2</sup>	280
7	Detent Torque	Nm	0,04
8	n° of Leads		4
9	Length (L)	mm	112
10	Weight	Kg	0,7

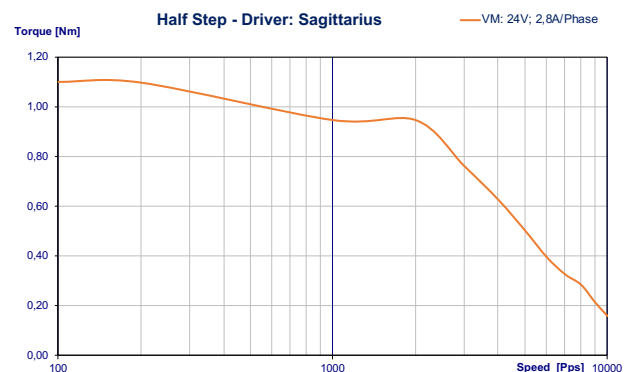
Characteristics	
Item	
Encoder Type*	Optical - Incremental 1000 CPR / 2 channels
Step angle	1,8°
Step angle Accuracy	±5%
Insulation Class	B
Protection Class	IP65
Ambient Temperature	-20°C to +50°C
Max. Temp. Rise (rated current, 2-phase on)	80°C
Max. Shaft Radial play (450g load)	0,02mm
Max. Shaft Axial play (450g load)	0,08mm
Max. Radial force (at shaft end)	75N
Max. Axial force	15N
Dielectric Strength (for 1 min.)	500 VAC
Insulation Resistance (min. 500 VDC)	100 Mohm

\* 3-channel encoder or other types on request

Connection	
Poles n°	Function
<b>Motor</b>	
1	Phase A
2	Phase A-
3	Phase B
4	Phase B-
<b>Feedback</b>	
1	EA+
2	EA-
3	EB+
4	EB-
5	GND
6	EZ+
7	EZ-
8	VDC 5V

Standard Combination	
Gearbox	Drive
GYP56	Aries
56JMS	Libra
	Orion
	Sagittarius

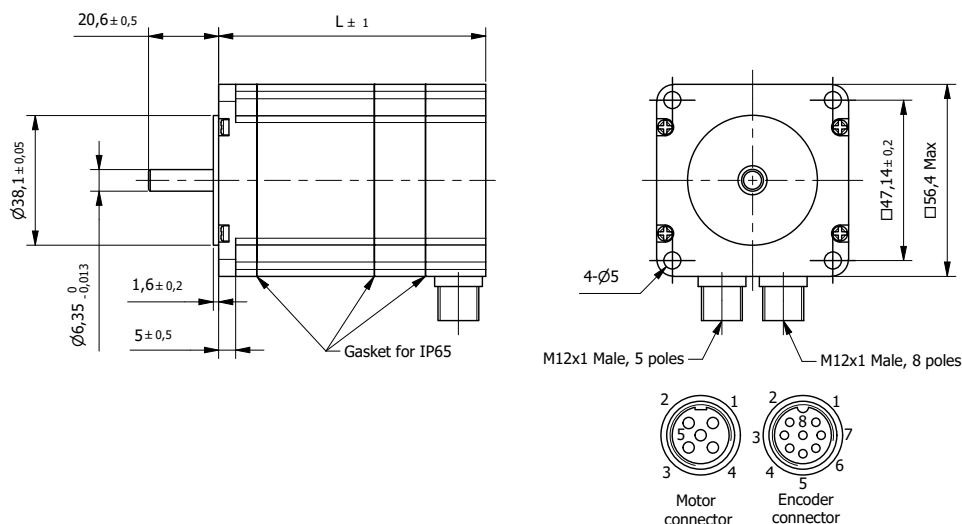
\* other options on request



# Hybrid Stepper Motor SM57 136

## with Encoder - IP65

□ 57mm



Specification		
Model	...28E4-IP	
1	Rated Voltage	V 3,1
2	Current/Phase	A 2,8
3	Resistance/Phase	Ω 1,1
4	Inductance/Phase	mH 3,8
5	Holding Torque	Nm 1,95
6	Rotor Inertia	gcm <sup>2</sup> 520
7	Detent Torque	Nm 0,068
8	n°of Leads	4
9	Length (L)	mm 136
10	Weight	Kg 1

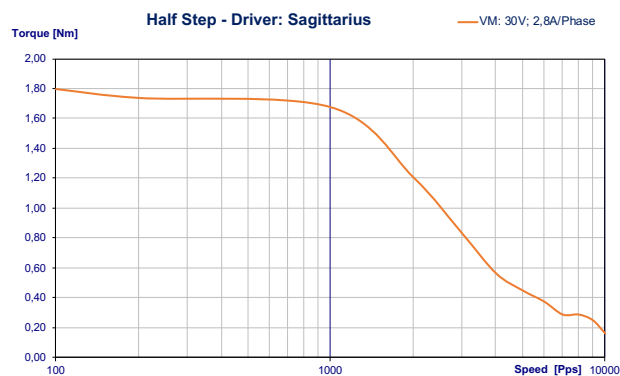
Characteristics	
Item	
Encoder Type*	Optical - Incremental 1000 CPR / 2 channels
Step angle	1,8°
Step angle Accuracy	±5%
Insulation Class	B
Protection Class	IP65
Ambient Temperature	-20°C to +50°C
Max. Temp. Rise (rated current, 2-phase on)	80°C
Max. Shaft Radial play (450g load)	0,02mm
Max. Shaft Axial play (450g load)	0,08mm
Max. Radial force (at shaft end)	75N
Max. Axial force	15N
Dielectric Strength (for 1 min.)	500 VAC
Insulation Resistance (min. 500 VDC)	100 Mohm

\* 3-channel encoder or other types on request

Connection	
Poles n°	Function
<b>Motor</b>	
1	Phase A
2	Phase A-
3	Phase B
4	Phase B-
<b>Feedback</b>	
1	EA+
2	EA-
3	EB+
4	EB-
5	GND
6	EZ+
7	EZ-
8	VDC 5V

Standard Combination	
Gearbox	Drive
GYP56	Aries
56JMS	Libra
	Orion
	Sagittarius

\* other options on request



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