ALIEN ROBOT

우)14057 경기도 안양시 동안구 엘에스로 116번길
25-32 SK V1센터 413호 (주)에일리언로봇
TEL:031-426-3907 FAX:031-426-3908 홈페이지:http://www.alienrobot.io

문서번호 : 200702101 **담 당 자 :** 이선우

수 신 : 한국수력원자력

참 조 :

발 신 : ㈜에일리언로봇

날 짜 : 2020년 07월 2일

제 목 : 해수배관로봇 원격점검로봇 정품 및 A/S 확인서

1. 귀 원의 무궁한 발전을 기원합니다.

2. 이번에 납품하는 “해수배관 원격점검로봇”은 당사에서 직접 제조한 물품입니다.
또한 A/S가 필요시에는 당사에서 직접 A/S 서비스를 제공 드리겠습니다.

- 다 음 -

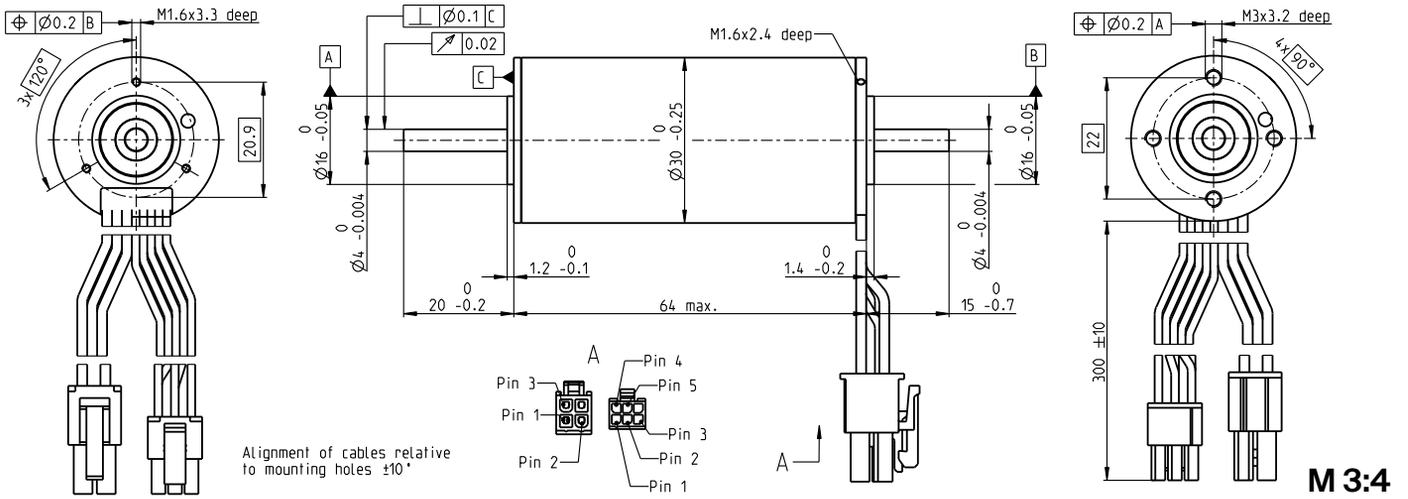
- 첨부파일: 맥슨모터 부품의 상세 사양 1부

2020년 07월 2일

(주)에일리언로봇 대표 이 선 우 (인감)

EC-i 30 ∅30 mm, brushless, 75 Watt

High Torque



Stock program
Standard program
Special program (on request)

Part Numbers

with Hall sensors	539485	539486	**539487**	539488	539489
Motor Data (provisional)					
Values at nominal voltage					
1 Nominal voltage V	12	18	24	36	48
2 No load speed rpm	7940	7950	7950	7950	8210
3 No load current mA	447	298	223	149	117
4 Nominal speed rpm	6760	6840	6870	6890	7150
5 Nominal torque (max. continuous torque) mNm	108	110	107	110	104
6 Nominal current (max. continuous current) A	7.32	4.97	3.64	2.48	1.83
7 Stall torque[1] mNm	1460	1770	1800	1970	1910
8 Stall current A	102	82.5	63.1	46	34.6
9 Max. efficiency %	87.3	88.5	88.6	89	88.8
Characteristics					
10 Terminal resistance phase to phase Ω	0.118	0.218	0.38	0.782	1.39
11 Terminal inductance phase to phase mH	0.0975	0.219	0.39	0.877	1.46
12 Torque constant mNm/A	14.3	21.4	28.6	42.9	55.4
13 Speed constant rpm/V	668	446	334	223	173
14 Speed/torque gradient rpm/mNm	5.5	4.54	4.45	4.07	4.33
15 Mechanical time constant ms	0.893	0.736	0.722	0.66	0.702
16 Rotor inertia gcm²	15.5	15.5	15.5	15.5	15.5

Specifications

Thermal data

17	Thermal resistance housing-ambient	9.01 K/W
18	Thermal resistance winding-housing	2.46 K/W
19	Thermal time constant winding	32.7 s
20	Thermal time constant motor	1090 s
21	Ambient temperature	-40...+100°C
22	Max. winding temperature	+155°C

Mechanical data (preloaded ball bearings)

23	Max. speed		10 000 rpm
24	Axial play at axial load	< 9.0 N	0 mm
		> 9.0 N	0.14 mm
25	Radial play		preloaded
26	Max. axial load (dynamic)		5 N
27	Max. force for press fits (static)		98 N
	(static, shaft supported)		1300 N
28	Max. radial load, 5 mm from flange		25 N

Other specifications

29	Number of pole pairs	4
30	Number of phases	3
31	Weight of motor	242 g

Values listed in the table are nominal.

Connection motor (Cable AWG 20)

red	Motor winding 1	Pin 1
black	Motor winding 2	Pin 2
white	Motor winding 3	Pin 3
	N.C.	Pin 4

Connector	**Article number**
Molex	39-01-2040

Connection sensors (Cable AWG 26)

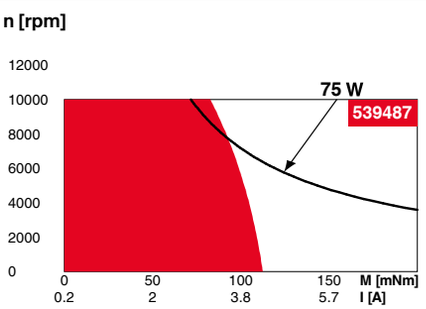
yellow	Hall sensor 1	Pin 1
brown	Hall sensor 2	Pin 2
grey	Hall sensor 3	Pin 3
blue	GND	Pin 4
green	V_{Hall} 4.5...24 VDC	Pin 5
	N.C.	Pin 6

Connector	**Article number**
Molex	430-25-0600

Wiring diagram for Hall sensors see p. 49

[1]Calculation does not include saturation effect (p. 61/168)

Operating Range



Comments

Continuous operation
In observation of above listed thermal resistance (lines 17 and 18) the maximum permissible winding temperature will be reached during continuous operation at 25°C ambient.
= Thermal limit.

Short term operation
The motor may be briefly overloaded (recurring).

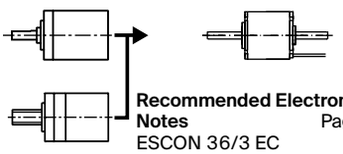
Assigned power rating

maxon Modular System

Details on catalog page 36

Planetary Gearhead
∅32 mm
1.0 - 6.0 Nm
Page 389

Screw Drive
∅32 mm
Page 416–421



Recommended Electronics:

Notes	Page **36**
ESCON 36/3 EC	487
ESCON Mod. 50/4 EC-S	487
ESCON Mod. 50/5	487
ESCON Mod. 50/8 (HE)	488
ESCON 50/5	489
DEC Module 50/5	491
EPOS4 Mod./Comp. 50/5	496
EPOS4 Mod./Comp. 50/8	497
EPOS4 50/5	501
EPOS4 70/15	501
EPOS2 P 24/5	504

Encoder 16 EASY/XT
128 - 1024 CPT, 3 channels
Page 450/452

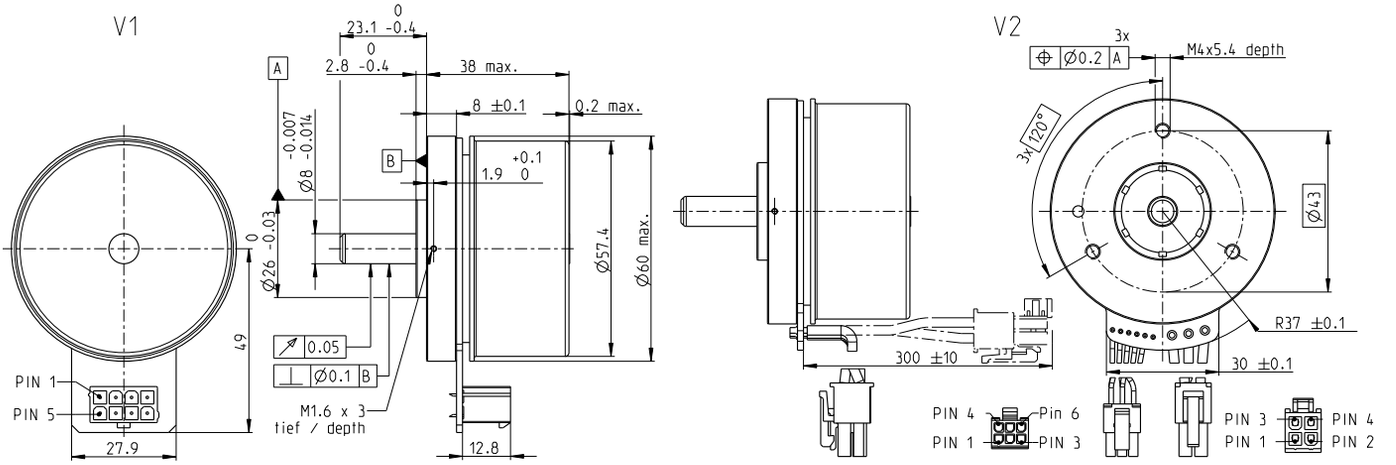
Encoder 16 EASY Absolute/XT
4096 steps
Page 454/456

Encoder 16 RIO
1024 - 32768 CPT, 3 channels
Page 467

Encoder HEDL 5540
500 CPT, 3 channels
Page 469

Encoder AEDL 5810
1024 - 5000 CPT, 3 channels
Page 476

EC 60 flat ∅60 mm, brushless, 100 Watt



M 1:2

Stock program
Standard program
Special program (on request)

Part Numbers

V1 with Hall sensors	625854	**625855**	625856
V2 with Hall sensors and cables	647691	645604	647692

Motor Data

	Values at nominal voltage									
1	Nominal voltage	V	12	24	48					
2	No load speed	rpm	3760	4300	4020					
3	No load current	mA	797	493	221					
4	Nominal speed	rpm	3210	3730	3460					
5	Nominal torque (max. continuous torque)	mNm	261	269	298					
6	Nominal current (max. continuous current)	A	8.72	5.14	2.61					
7	Stall torque[1]	mNm	3340	4300	4870					
8	Stall current	A	111	81.9	43.2					
9	Max. efficiency	%	84.1	85.3	86.4					
	Characteristics									
10	Terminal resistance phase to phase	Ω	0.108	0.293	1.11					
11	Terminal inductance phase to phase	mH	0.0911	0.279	1.28					
12	Torque constant	mNm/A	30	52.5	113					
13	Speed constant	rpm/V	318	182	84.8					
14	Speed/torque gradient	rpm/mNm	1.14	1.01	0.837					
15	Mechanical time constant	ms	9.99	8.86	7.32					
16	Rotor inertia	gcm²	835	835	835					

Specifications

Thermal data

17	Thermal resistance housing-ambient	2.5 K/W
18	Thermal resistance winding-housing	3.8 K/W
19	Thermal time constant winding	41.4 s
20	Thermal time constant motor	90 s
21	Ambient temperature	-40...+100°C
22	Max. winding temperature	+125°C

Mechanical data (preloaded ball bearings)

23	Max. speed		6000 rpm
24	Axial play at axial load	< 12.0 N	0 mm
		> 12.0 N	0.14 mm
25	Radial play		preloaded
26	Max. axial load (dynamic)		12 N
27	Max. force for press fits (static)		170 N
	(static, shaft supported)		8000 N
28	Max. radial load, 5 mm from flange		112 N

Other specifications

29	Number of pole pairs	7
30	Number of phases	3
31	Weight of motor	355 g

Values listed in the table are nominal.

Connection V1		**V2** (sensors, AWG 24)
Pin 1	Hall sensor1	Hall sensor1
Pin 2	Hall sensor 2	Hall sensor 2
Pin 3	V_{Hall} 4.5...24 VDC	Hall sensor 3
Pin 4	Motor winding 3	GND
Pin 5	Hall sensor 3	V_{Hall} 4.5...24 VDC
Pin 6	GND	N.C.
Pin 7	Motor winding 1	
Pin 8	Motor winding 2	
		V2 (Motor, AWG 16)
Pin 1		Motor winding 1
Pin 2		Motor winding 2
Pin 3		Motor winding 3
Pin 4		N.C.

Wiring diagram for Hall sensors see p. 49

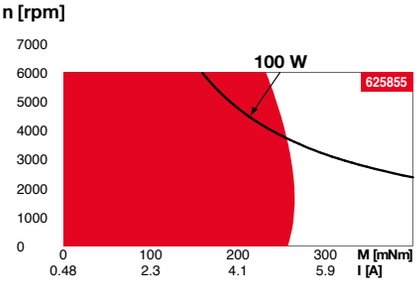
Connector	**Part number**	
Molex	46015-0806	43025-0600
Molex		39-01-2040

Connection cable for V1

Universal, L = 500 mm	**339380**
zu EPOS4, L = 500 mm	**354045**

[1]Calculation does not include saturation effect (p. 61/168)

Operating Range



Comments

Continuous operation
In observation of above listed thermal resistance (lines 17 and 18) the maximum permissible winding temperature will be reached during continuous operation at 25°C ambient.
= Thermal limit.

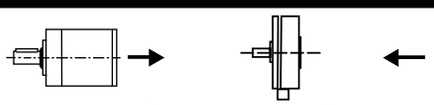
Short term operation
The motor may be briefly overloaded (recurring).

Assigned power rating

maxon Modular System

Details on catalog page 38

Planetary Gearhead
∅52 mm
4 - 30 Nm
Page 402



Encoder MILE
512 - 4096 CPT,
2 channels
Page 447

Recommended Electronics:

Notes	Page **38**
ESCON Module 50/5	487
ESCON Mod. 50/8 (HE)	488
ESCON 50/5	489
ESCON 70/10	489
DEC Module 50/5	491
EPOS4 Mod./Comp. 50/5	496
EPOS4 Mod./Comp. 50/8	497
EPOS4 Mod./Comp. 50/15	500
EPOS4 50/5	501
EPOS4 70/15	501
EPOS2 P 24/5	504