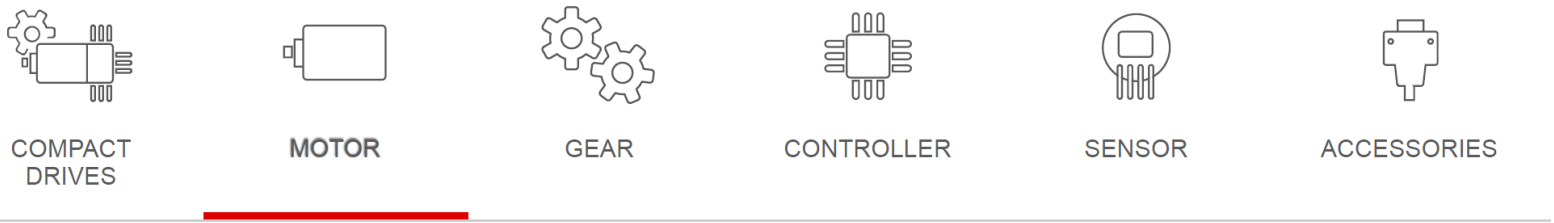
ENS 206 Project Assignment
Motor Selection Guide:

https://www.maxongroup.com/maxon/view/catalog?etcc_med=ID+Teaser&etcc_cmp=ID-Teaser-Rebrush-Homepage&etcc_cu=onsite&etcc_var=%5bcom%5d%23en%23_d_&etcc_plc=home

Go to the link above (maxon motors online shop) and check out the DC motors listed there.



Limit your search to the RE series!

For example, let's check out this one:
RE 35, 90 watt

You can choose any other one listed on the RE program.

PART NO.	ARTICLE	TECHNICAL DATA					PRICE
		Ø	P	U_N	N_0	M_N	
323890	RE 35 Ø35 mm, Graphite Brushes, 90 Watt	35 mm	90 W	24 V	7750 rpm	107 mNm	**€290.82**
323891	RE 35 Ø35 mm, Graphite Brushes, 90 Watt	35 mm	90 W	24 V	7750 rpm	107 mNm	**€290.82**
339149	RE 25 Ø25 mm, Graphite Brushes, 20 Watt	25 mm	20 W	9 V	9710 rpm	24.4 mNm	**€203.37**
339150	RE 25 Ø25 mm, Graphite Brushes, 20 Watt	25 mm	20 W	12 V	9620 rpm	27.5 mNm	**€203.37**
339151	RE 25 Ø25 mm, Graphite Brushes, 20 Watt	25 mm	20 W	18 V	10400 rpm	29.1 mNm	**€203.37**
339152	RE 25 Ø25 mm, Graphite Brushes, 20 Watt	25 mm	20 W	24 V	10900 rpm	30.4 mNm	**€203.37**
339153	RE 25 Ø25 mm, Graphite Brushes, 20 Watt	25 mm	20 W	30 V	9210 rpm	31.4 mNm	**€203.37**
339154	RE 25 Ø25 mm, Graphite Brushes, 20 Watt	25 mm	20 W	36 V	10100 rpm	30.7 mNm	**€203.37**
339155	RE 25 Ø25 mm, Graphite Brushes, 20 Watt	25 mm	20 W	48 V	9540 rpm	31.7 mNm	**€203.37**

	Watt	mm			rpm	mNm	
339155	RE 25 Ø25 mm, Graphite Brushes, 20 Watt	25 mm	20 W	48 V	9540 rpm	31.7 mNm	**€203.37**

1 ... 40 41 **42** 43 44 ... 48

☐ **Only recommended products** Available on short notice!

DETAILS

RE 35 Ø35 mm, Graphite Brushes, 90 Watt

Part number 323890

PRICE SCALES	Quantity	Price per unit
Prices excluding VAT and shipping costs	1-4	**€290.82**
	5-19	**€238.09**
	20-49	**€184.46**
	from 50	**On request**

Start combination

Order quantity 1 Add to cart

Once you select the item on the list, its information pops up!

Prices excluding VAT and shipping costs	1-4	**€290.82**
	5-19	**€238.09**
	20-49	**€184.46**
	from 50	**On request**

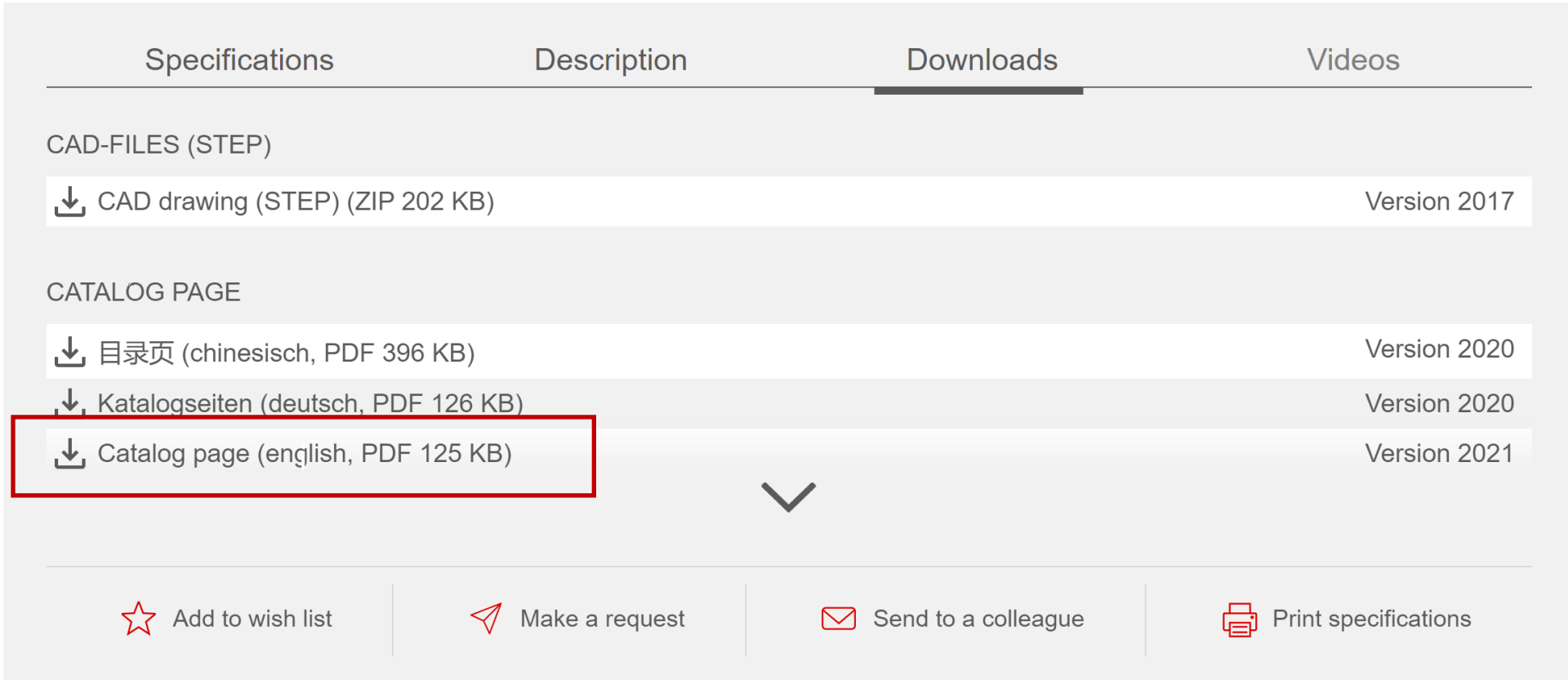
Start combination

Order quantity 1 **Add to cart**

Check out the documents under the tab: Downloads

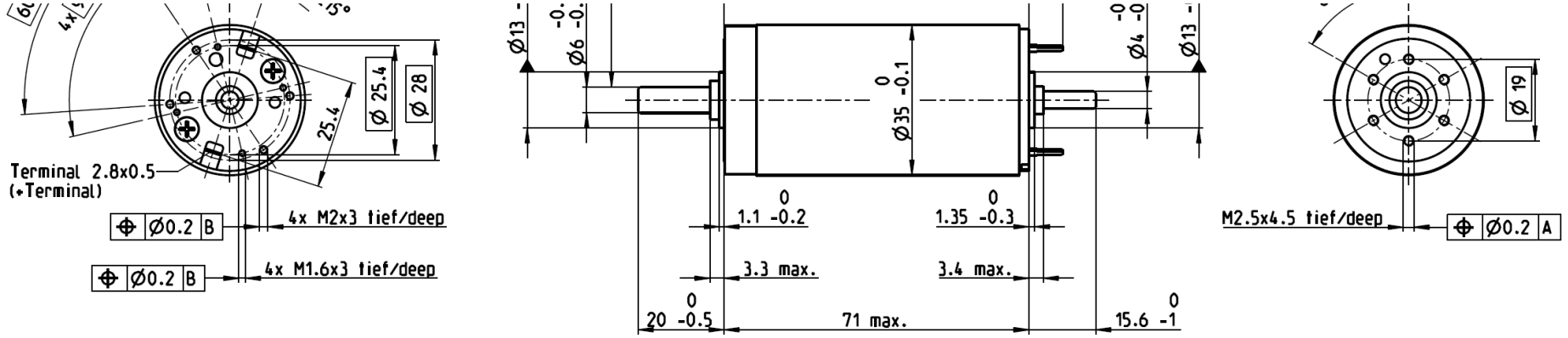
Specifications Description Downloads Videos

TECHNICAL ILLUSTRATIONS



Check out the catalog page of among the documents listed! That's the datasheet!

Catalog Page:



M 1:2

Stock program
Standard program
Special program (on request)

	Part Numbers												
according to dimensional drawing	273752	323890	273753	273754	273755	273756	273757	273758	273759	273760	273761	273762	273763
shaft length 15.6 shortened to 4 mm	285785	323891	285786	285787	285788	285789	285790	285791	285792	285793	285794	285795	285796
Motor Data													
Values at nominal voltage													
1 Nominal voltage	V	15	24	30	42	48	48	48	48	48	48	48	48	48
2 No load speed	rpm	7200	7750	7280	7580	7310	6680	5990	4770	3830	3150	2590	2110	1630
3 No load current	mA	188	128	94.1	70.5	58.9	52.6	46	34.9	27	21.6	17.3	13.9	10.5
4 Nominal speed	rpm	6500	6990	6470	6800	6510	5870	5170	3930	2990	2290	1720	1230	737
5 Nominal torque (max. continuous torque)	mNm	74.2	105	101	105	103	104	104	106	108	107	107	106	106
6 Nominal current (max. continuous current)	A	4	3.72	2.68	2.07	1.71	1.58	1.41	1.15	0.934	0.764	0.628	0.508	0.393
7 Stall torque	mNm	931	1200	976	1090	983	892	778	621	499	399	323	256	196
8 Stall current	A	47.9	41.2	25.1	20.7	15.8	13.1	10.3	6.52	4.21	2.77	1.85	1.2	0.71
9 Max. efficiency	%	85	87	87	88	88	87	86	85	84	83	81	79	77
Characteristics														
10 Terminal resistance	Ω	0.313	0.582	1.2	2.03	3.04	3.66	4.68	7.36	11.4	17.3	26	40.1	67.6
11 Terminal inductance	mH	0.085	0.191	0.34	0.62	0.87	1.04	1.29	2.04	3.16	4.65	6.89	10.3	17.1
12 Torque constant	mNm/A	19.4	29.2	38.9	52.5	62.2	68	75.8	95.2	119	144	175	214	276
13 Speed constant	rpm/V	491	328	246	182	154	140	126	100	80.5	66.4	54.6	44.7	34.6
14 Speed/torque gradient	rpm/mNm	7.91	6.54	7.55	7.03	7.5	7.55	7.77	7.75	7.74	7.99	8.1	8.38	8.47
15 Mechanical time constant	ms	5.62	5.41	5.37	5.32	5.32	5.32	5.33	5.33	5.33	5.34	5.35	5.36	5.38
16 Rotor inertia	gcm²	67.9	79	67.9	72.3	67.7	67.2	65.4	65.7	65.7	63.8	63	61	60.6

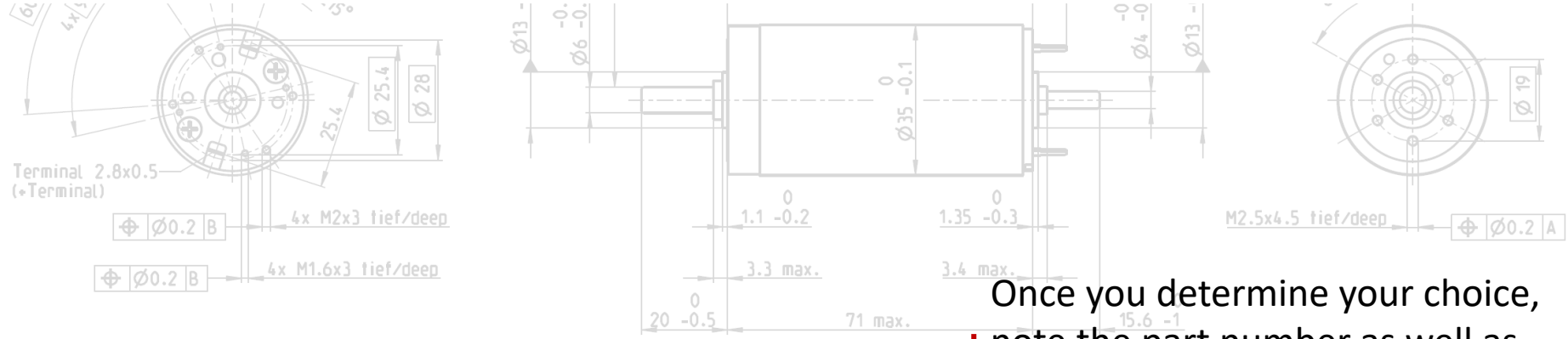
Compatible voltage options

This should match the voltage rating of your battery

Electrical resistance parameter

Electrical inductance parameter

Catalog Page continued:



Once you determine your choice, note the part number as well as the model

Stock program
Standard program
Special program (on request)

			Part Numbers												
		according to dimensional drawing	273752	323890	273753	273754	273755	273756	273757	273758	273759	273760	273761	273762	273763
		shaft length 15.6 shortened to 4 mm	285785	323891	285786	285787	285788	285789	285790	285791	285792	285793	285794	285795	285796
Motor Data															
	Values at nominal voltage														
1	Nominal voltage	V	15	24	30	42	48	48	48	48	48	48	48	48	48
2	No load speed	rpm	7200	7750	7280	7580	7310	6680	5990	4770	3830	3150	2590	2110	1630
3	No load current	mA	188	128	94.1	70.5	58.9	52.6	46	34.9	27	21.6	17.3	13.9	10.5
4	Nominal speed	rpm	6500	6990	6470	6800	6510	5870	5170	3930	2990	2290	1720	1230	737
5	Nominal torque (max. continuous torque)	mNm	74.2	105	101	105	103	104	104	106	108	107	107	106	106
6	Nominal current (max. continuous current)	A	4	3.72	2.68	2.07	1.71	1.58	1.41	1.15	0.934	0.764	0.628	0.508	0.393
7	Stall torque	mNm	931	1200	976	1090	983	892	778	621	499	399	323	256	196
8	Stall current	A	47.9	41.2	25.1	20.7	15.8	13.1	10.3	6.52	4.21	2.77	1.85	1.2	0.71
9	Max. efficiency	%	85	87	87	88	88	87	86	85	84	83	81	79	77
	Characteristics														
10	Terminal resistance	Ω	0.313	0.582	1.2	2.03	3.04	3.66	4.68	7.36	11.4	17.3	26	40.1	67.6
11	Terminal inductance	mH	0.085	0.191	0.34	0.62	0.87	1.04	1.29	2.04	3.16	4.65	6.89	10.3	17.1
12	Torque constant	mNm/A	19.4	29.2	38.9	52.5	62.2	68	75.8	95.2	119	144	175	214	276
13	Speed constant	rpm/V	491	328	246	182	154	140	126	100	80.5	66.4	54.6	44.7	34.6
14	Speed/torque gradient	rpm/mNm	7.91	6.54	7.55	7.03	7.5	7.55	7.77	7.75	7.74	7.99	8.1	8.38	8.47
15	Mechanical time constant	ms	5.62	5.41	5.37	5.32	5.32	5.32	5.33	5.33	5.33	5.34	5.35	5.36	5.38
16	Rotor inertia	gcm²	67.9	79	67.9	72.3	67.7	67.2	65.4	65.7	65.7	63.8	63	61	60.6

Note that your choice will have a max torque limit!

Torque constant

Velocity constant

Catalog Page continued:

12	Torque constant	mNm/A	19.4	29.2	38.9	52.5	62.2	68	75.8	95.2	119	144	175	214	276
13	Speed constant	rpm/V	491	328	246	182	154	140	126	100	80.5	66.4	54.6	44.7	34.6
14	Speed/torque gradient	rpm/mNm	7.91	6.54	7.55	7.03	7.5	7.55	7.77	7.75	7.74	7.99	8.1	8.38	8.47
15	Mechanical time constant	ms	5.62	5.41	5.37	5.32	5.32	5.32	5.33	5.33	5.33	5.34	5.35	5.36	5.38
16	Rotor inertia	gcm²	67.9	79	67.9	72.3	67.7	67.2	65.4	65.7	65.7	63.8	63	61	60.6

Specifications

Thermal data

17	Thermal resistance housing-ambient	6.2 K/W
18	Thermal resistance winding-housing	2 K/W
19	Thermal time constant winding	30.1 s
20	Thermal time constant motor	707 s
21	Ambient temperature	-30...+100°C
22	Max. winding temperature	+155°C

Mechanical data (ball bearings)

23	Max. speed	12000 rpm
24	Axial play	0.05 - 0.15 mm
25	Radial play	0.025 mm
26	Max. axial load (dynamic)	5.6 N
27	Max. force for press fits (static)	110 N
	(static, shaft supported)	1200 N
28	Max. radial load, 5 mm from flange	28 N

Other specifications

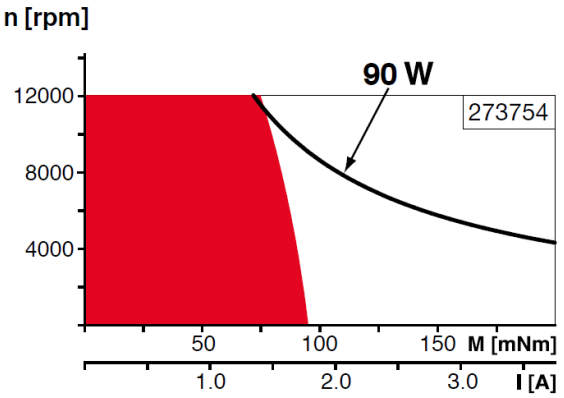
29	Number of pole pairs	1
30	Number of commutator segments	13
31	Weight of motor	340 g

Values listed in the table are nominal.
Explanation of the figures on page 72.

Option
Hollow shaft as special design
Preloaded ball bearings

Weight of the motor is given here!

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

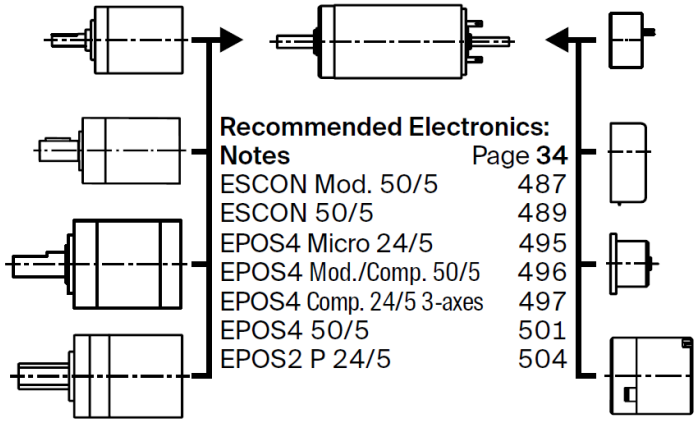
Details on catalog page 34

Planetary Gearhead
∅32 mm
0.75 - 6.0 Nm
Page 383–390

Planetary Gearhead
∅32 mm
4.0 - 8.0 Nm
Page 391

Planetary Gearhead
∅42 mm
3 - 15 Nm
Page 396

Screw Drive
∅32 mm
Page 416–421



Recommended Electronics:

Notes	Page 34
ESCON Mod. 50/5	487
ESCON 50/5	489
EPOS4 Micro 24/5	495
EPOS4 Mod./Comp. 50/5	496
EPOS4 Comp. 24/5 3-axes	497
EPOS4 50/5	501
EPOS2 P 24/5	504

Encoder MR
256 - 1024 CPT,
3 channels
Page 464

Encoder HED_5540
500 CPT,
3 channels
Page 471/473

DC-Tacho DCT
∅22 mm
0.52 V
Page 480

Brake AB 28
24 VDC
0.4 Nm
Page 519

End cap
Page 525