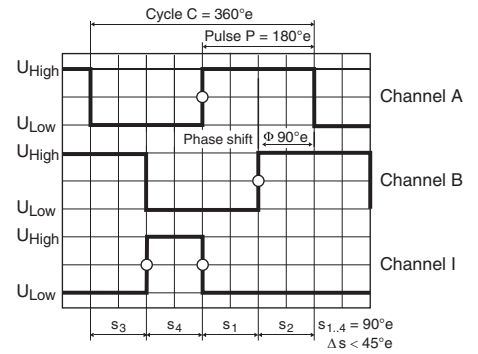
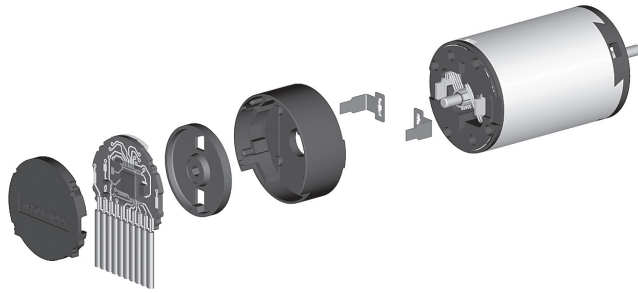


Encoder MR Type M, 128–512 CPT, 2/3 Channels, with Line Driver



Direction of rotation cw (definition cw p. 150)

- Stock program
- Standard program
- Special program (on request)

Part Numbers

228179	228177	228181	228182	201937	201940
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Type						
Counts per turn	128	128	256	256	512	512
Number of channels	2	3	2	3	2	3
Max. operating frequency (kHz)	80	80	160	160	320	320
Max. speed (rpm)	37500	37500	37500	37500	37500	37500



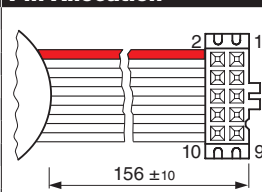
maxon Modular System

+ Motor	Page	+ Gearhead	Page	+ Brake	Page	Overall length [mm] / • see Gearhead					
RE 16, 2 W	174					28.0	28.0	28.0	28.0	28.0	28.0
RE 16, 2 W	174	GP 16, 0.1 - 0.6 Nm	323/324			•	•	•	•	•	•
RE 16, 2 W	174	GP 16 S	365/366			•	•	•	•	•	•
RE 16, 3.2 W	176					45.4	45.4	45.4	45.4	45.4	45.4
RE 16, 3.2 W	176	GP 16, 0.1 - 0.6 Nm	323/324			•	•	•	•	•	•
RE 16, 3.2 W	176	GP 16 S	365/366			•	•	•	•	•	•
RE 16, 4.5 W	178					48.4	48.4	48.4	48.4	48.4	48.4
RE 16, 4.5 W	178	GP 16, 0.1 - 0.6 Nm	323/324			•	•	•	•	•	•
RE 16, 4.5 W	178	GP 16 S	365/366			•	•	•	•	•	•
A-max 16	194/196					30.4	30.4	30.4	30.4	30.4	30.4
A-max 16	194/196	GS 16, 0.01 - 0.1 Nm	319-322			•	•	•	•	•	•
A-max 16	194/196	GP 16, 0.1 - 0.6 Nm	323/324			•	•	•	•	•	•
A-max 16	194/196	GP 16 S	365/366			•	•	•	•	•	•
A-max 19, 1.5 W	198					34.0	34.0	34.0	34.0	34.0	34.0
A-max 19, 1.5 W	198	GP 19, 0.1 - 0.3 Nm	325			•	•	•	•	•	•
A-max 19, 1.5 W	198	GP 22, 0.5 - 2.0 Nm	329/331			•	•	•	•	•	•
A-max 19, 1.5 W	198	GS 24, 0.1 Nm	335			•	•	•	•	•	•
A-max 19, 1.5 W	198	GP 22 S	368/369			•	•	•	•	•	•
A-max 19, 2.5 W	200					35.8	35.8	35.8	35.8	35.8	35.8
A-max 19, 2.5 W	200	GP 19, 0.1 - 0.3 Nm	325			•	•	•	•	•	•
A-max 19, 2.5 W	200	GS 20 0.06 - 0.25 Nm	326			•	•	•	•	•	•
A-max 19, 2.5 W	200	GP 22, 0.5 - 2.0 Nm	329/331			•	•	•	•	•	•
A-max 19, 2.5 W	200	GS 24, 0.1 Nm	335			•	•	•	•	•	•
A-max 19, 2.5 W	200	GP 22 S	368/369			•	•	•	•	•	•
A-max 22	202/204					36.9	36.9	36.9	36.9	36.9	36.9
A-max 22	202/204	GP 22, 0.1 - 0.6 Nm	327/328			•	•	•	•	•	•
A-max 22	202/204	GP 22, 0.5 - 2.0 Nm	329/331			•	•	•	•	•	•
A-max 22	202/204	GS 24, 0.1 Nm	335			•	•	•	•	•	•
A-max 22	202/204	GP 22 S	368/369			•	•	•	•	•	•

Technical Data

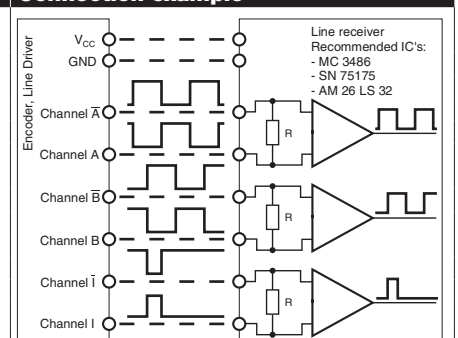
Supply voltage V _{CC}	5 V ± 5%
Output signal	TTL compatible
Phase shift Φ	90°e ± 45°e
Index pulse width	90°e ± 45°e
Operating temperature range	-25...+85 °C
Moment of inertia of code wheel	≤ 0.09 gcm ²
Output current per channel	max. 5 mA

Pin Allocation



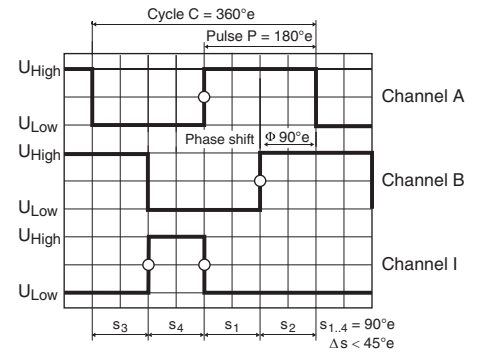
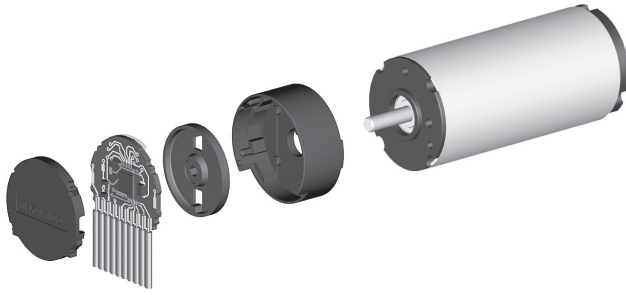
- 1 Motor +
 - 2 V_{CC}
 - 3 GND
 - 4 Motor -
 - 5 Channel Ā
 - 6 Channel A
 - 7 Channel B
 - 8 Channel B̄
 - 9* Channel I (Index)
 - 10* Channel I (Index)
- DIN Connector 41651/
EN 60603-13
flat band cable AWG 28
*version with 3 channels

Connection example



Opt. terminal resistance R > 1 kΩ

Encoder MR Type M, 128–512 CPT, 2/3 Channels, with Line Driver



Direction of rotation cw (definition cw p. 150)

- Stock program
- Standard program
- Special program (on request)

Part Numbers

228179	228177	228181	228182	201937	201940
--------	--------	--------	--------	--------	--------

Type							
Counts per turn		128	128	256	256	512	512
Number of channels		2	3	2	3	2	3
Max. operating frequency (kHz)		80	80	160	160	320	320
Max. speed (rpm)		37500	37500	37500	37500	37500	37500

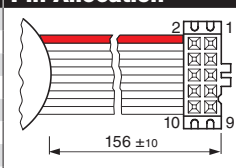
maxon Modular System

+ Motor	Page	+ Gearhead	Page	+ Brake	Page	Overall length [mm] / ● see Gearhead					
RE-max 21, 3.5 W	224					34.0	34.0	34.0	34.0	34.0	34.0
RE-max 21, 3.5 W	224	GP 22, 0.5 - 2.0 Nm	329/331			●	●	●	●	●	●
RE-max 21, 3.5 W	224	GS 38, 0.1 - 0.6 Nm	348			●	●	●	●	●	●
RE-max 21, 3.5 W	224	GP 22 S	368/369			●	●	●	●	●	●
RE-max 21, 6 W	226					35.8	35.8	35.8	35.8	35.8	35.8
RE-max 21, 6 W	226	GP 22, 0.5 - 2.0 Nm	329/331			●	●	●	●	●	●
RE-max 21, 6 W	226	GS 38, 0.1 - 0.6 Nm	348			●	●	●	●	●	●
RE-max 21, 6 W	226	GP 22 S	368/369			●	●	●	●	●	●
EC 16, 30 W	244					50.7	50.7	50.7	50.7	50.7	50.7
EC 16, 30 W	244	GP 16, 0.1 - 0.6 Nm	323/324			●	●	●	●	●	●
EC 16, 30 W	244	GP 22, 0.5 - 1.0 Nm	329			●	●	●	●	●	●
EC 16, 30 W	244	GP 16 S	365/366			●	●	●	●	●	●
EC 16, 60 W	245					66.7	66.7	66.7	66.7	66.7	66.7
EC 16, 60 W	245	GP 16, 0.2 - 0.6 Nm	324			●	●	●	●	●	●
EC 16, 60 W	245	GP 22, 0.5 - 2.0 Nm	329/332			●	●	●	●	●	●
EC 16, 60 W	245	GP 16 S/GP 22 S	365/369			●	●	●	●	●	●
EC 22, 40 W	246					50.5	50.5	50.5	50.5	50.5	50.5
EC 22, 40 W	246	GP 22, 0.5 - 3.4 Nm	332/333			●	●	●	●	●	●
EC 22, 40 W	246	GP 22 S	368/369			●	●	●	●	●	●
EC 22, 100 W	247					68.7	68.7	68.7	68.7	68.7	68.7
EC 22, 100 W	247	GP 22, 0.5 - 3.4 Nm	332/333			●	●	●	●	●	●
EC 22, 100 W	247	GP 22 S	368/369			●	●	●	●	●	●
EC-max 16, 5 W	259					31.3	31.3	31.3	31.3	31.3	31.3
EC-max 16, 5 W	259	GP 16, 0.1 - 0.6 Nm	323/324			●	●	●	●	●	●
EC-max 16, 5 W	259	GP 16 S	365/366			●	●	●	●	●	●
EC-max 16, 8 W	261					43.3	43.3	43.3	43.3	43.3	43.3
EC-max 16, 8 W	261	GP 16, 0.2 - 0.6 Nm	324			●	●	●	●	●	●
EC-max 16, 8 W	261	GP 22, 0.5 - 2.0 Nm	332			●	●	●	●	●	●
EC-max 16, 8 W	261	GP 16 S/GP 22 S	365/369			●	●	●	●	●	●
EC-max 22, 12 W	262					41.7	41.7	41.7	41.7	41.7	41.7
EC-max 22, 12 W	262	GP 22, 0.5 - 2.0 Nm	332/333			●	●	●	●	●	●
EC-max 22, 12 W	262	KD 32, 1.0 - 4.5 Nm	347			●	●	●	●	●	●
EC-max 22, 12 W	262	GP 22 S	368/369			●	●	●	●	●	●
EC-max 22, 25 W	263					58.2	58.2	58.2	58.2	58.2	58.2
EC-max 22, 25 W	263	GP 22/GP 32	333/343			●	●	●	●	●	●
EC-max 22, 25 W	263	GP 32 S	370-372			●	●	●	●	●	●

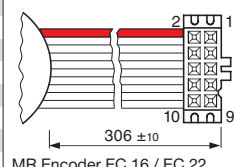
Technical Data

Supply voltage V_{CC}	5 V \pm 5%
Output signal	TTL compatible
Phase shift Φ	90°e \pm 45°e
Index pulse width	90°e \pm 45°e
Operating temperature range	-25...+85 °C
Moment of inertia of code wheel	\leq 0.09 gcm ²
Output current per channel	max. 5 mA

Pin Allocation



MR Encoder EC-max 16 / EC-max 22



MR Encoder EC 16 / EC 22

- 1 N.C.
- 2 V_{CC}
- 3 GND
- 4 N.C.
- 5 Channel A
- 6 Channel A
- 7 Channel B
- 8 Channel B
- 9* Channel I (Index)
- 10* Channel I (Index)

DIN Connector 41651/
EN 60603-13
flat band cable AWG 28
*version with 3 channels

Pin assignment for RE-max
see Page 390

Connection example

