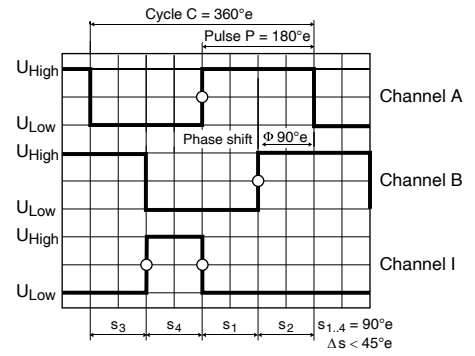


Encoder MR Type M, 128–512 CPT, 2/3 Channels, with Line Driver



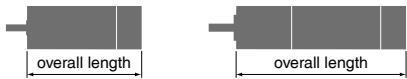
sensor

Direction of rotation cw (definition cw p. 68)

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

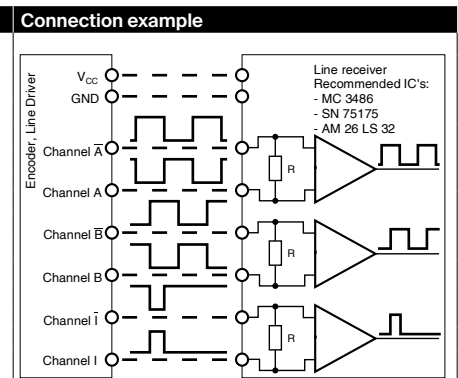
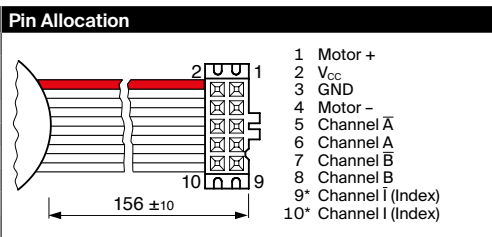
Part Numbers						
228179	228177	228181	228182	201937	201940	

Type	228179	228177	228181	228182	201937	201940
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



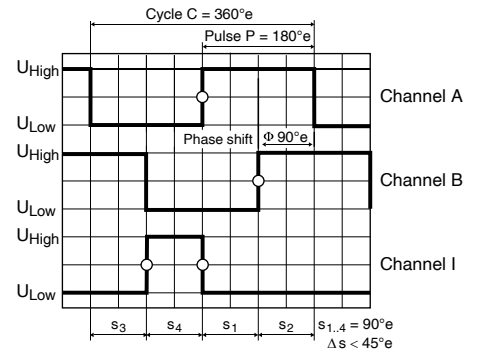
maxon Modular System										
+ Motor	Page	+ Gearhead	Page	∅ Enc [mm]	Overall length [mm] / • see Gearhead					
RE 16, 2 W	129			16	28.0	28.0	28.0	28.0	28.0	28.0
RE 16, 2 W	129	GP 16, 0.1 - 0.6 Nm	369/370	16	•	•	•	•	•	•
RE 16, 2 W	129	GP 16 S	411/412	16	•	•	•	•	•	•
RE 16, 3.2 W	131			16	45.4	45.4	45.4	45.4	45.4	45.4
RE 16, 3.2 W	131	GP 16, 0.1 - 0.6 Nm	369/370	16	•	•	•	•	•	•
RE 16, 3.2 W	131	GP 16 S	411/412	16	•	•	•	•	•	•
RE 16, 4.5 W	133			16	48.4	48.4	48.4	48.4	48.4	48.4
RE 16, 4.5 W	133	GP 16, 0.1 - 0.6 Nm	369/370	16	•	•	•	•	•	•
RE 16, 4.5 W	133	GP 16 S	411/412	16	•	•	•	•	•	•
A-max 16	150/152			16	30.4	30.4	30.4	30.4	30.4	30.4
A-max 16	150/152	GS 16, 0.01 - 0.1 Nm	365-368	16	•	•	•	•	•	•
A-max 16	150/152	GP 16, 0.1 - 0.6 Nm	369/370	16	•	•	•	•	•	•
A-max 16	150/152	GP 16 S	411/412	16	•	•	•	•	•	•
A-max 19, 1.5 W	154			19	34.0	34.0	34.0	34.0	34.0	34.0
A-max 19, 1.5 W	154	GP 19, 0.1 - 0.3 Nm	371	19	•	•	•	•	•	•
A-max 19, 1.5 W	154	GP 22, 0.5 - 2.0 Nm	374/376	19	•	•	•	•	•	•
A-max 19, 1.5 W	154	GS 24, 0.1 Nm	380	19	•	•	•	•	•	•
A-max 19, 1.5 W	154	GP 22 S	414/415	19	•	•	•	•	•	•
A-max 19, 2.5 W	156			19	35.8	35.8	35.8	35.8	35.8	35.8
A-max 19, 2.5 W	156	GP 19, 0.1 - 0.3 Nm	371	19	•	•	•	•	•	•
A-max 19, 2.5 W	156	GP 22, 0.5 - 2.0 Nm	374/376	19	•	•	•	•	•	•
A-max 19, 2.5 W	156	GS 24, 0.1 Nm	380	19	•	•	•	•	•	•
A-max 19, 2.5 W	156	GP 22 S	414/415	19	•	•	•	•	•	•
A-max 22	158/160			22	36.9	36.9	36.9	36.9	36.9	36.9
A-max 22	158/160	GP 22, 0.1 - 0.6 Nm	372/373	22	•	•	•	•	•	•
A-max 22	158/160	GP 22, 0.5 - 2.0 Nm	374/376	22	•	•	•	•	•	•
A-max 22	158/160	GS 24, 0.1 Nm	380	22	•	•	•	•	•	•
A-max 22	158/160	GP 22 S	414/415	22	•	•	•	•	•	•

Technical Data	
Supply voltage V_{CC}	5 V ± 5%
Typical current draw 2 channel	11 mA
Typical current draw 3 channel	14 mA
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



The index signal I is synchronized with channel A or B.

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



Direction of rotation cw (definition cw p. 68)

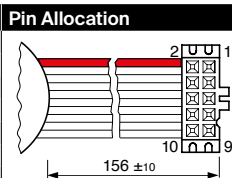
- Stock program
- Standard program
- Special program (on request)

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

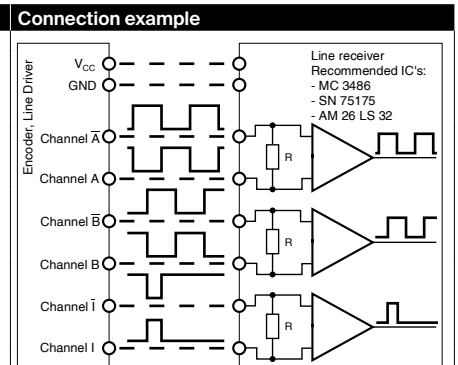
maxon Modular System										
+ Motor	Page	+ Gearhead	Page	∅ Enc [mm]	Overall length [mm] / • see Gearhead					
EC-max 16, 5 W	235			16	31.3	31.3	31.3	31.3	31.3	31.3
EC-max 16, 5 W	235	GP 16, 0.1 - 0.6 Nm	369/370	16	•	•	•	•	•	•
EC-max 16, 5 W	235	GP 16 S	411-413	16	•	•	•	•	•	•
EC-max 16, 8 W	237			16	43.3	43.3	43.3	43.3	43.3	43.3
EC-max 16, 8 W	237	GP 16, 0.2 - 0.6 Nm	370	16	•	•	•	•	•	•
EC-max 16, 8 W	237	GP 22, 0.5 - 2.0 Nm	377	16	•	•	•	•	•	•
EC-max 16, 8 W	237	GP 16 S/GP 22 S	411/415	16	•	•	•	•	•	•
EC-max 22, 12 W	238			16	41.7	41.7	41.7	41.7	41.7	41.7
EC-max 22, 12 W	238	GP 22, 0.5 - 2.0 Nm	377	16	•	•	•	•	•	•
EC-max 22, 12 W	238	KD 32, 1.0 - 4.5 Nm	394	16	•	•	•	•	•	•
EC-max 22, 12 W	238	GP 22 S	414/415	16	•	•	•	•	•	•
EC-max 22, 25 W	239			16	58.2	58.2	58.2	58.2	58.2	58.2
EC-max 22, 25 W	239	GP 22/GP 32	378/388	16	•	•	•	•	•	•
EC-max 22, 25 W	239	GP 32 S	416-421	16	•	•	•	•	•	•

Technical Data	
Supply voltage V_{CC}	5 V ± 5%
Typical current draw 2 channel	11 mA
Typical current draw 3 channel	14 mA
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



- 1 N.C.
- 2 V_{CC}
- 3 GND
- 4 N.C.
- 5 Channel \bar{A}
- 6 Channel A
- 7 Channel \bar{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



Opt. terminal resistance R > 1 kΩ

The index signal I is synchronized with channel A or B.