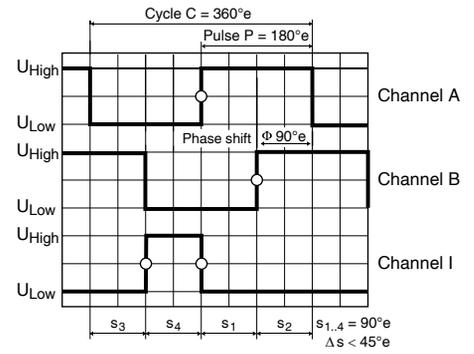


# Encoder MR Type M, 128–512 CPT, 2/3 channels, with line driver

sensor



Direction of rotation cw (definition cw p. 78)

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

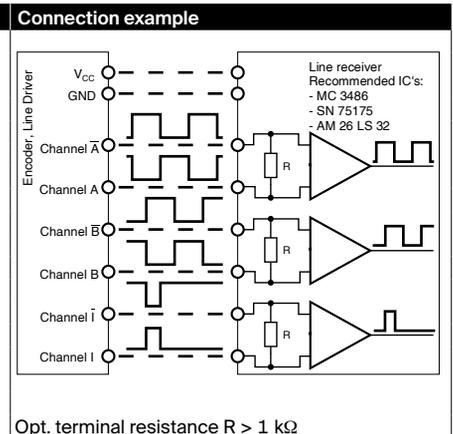
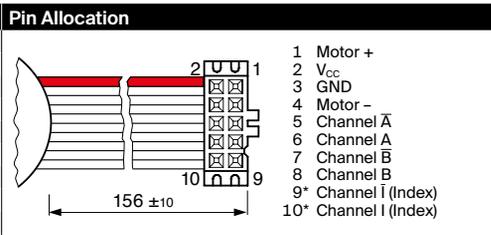
Part Numbers						
228179	228177	228181	228182	201937	<b>201940</b>	

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



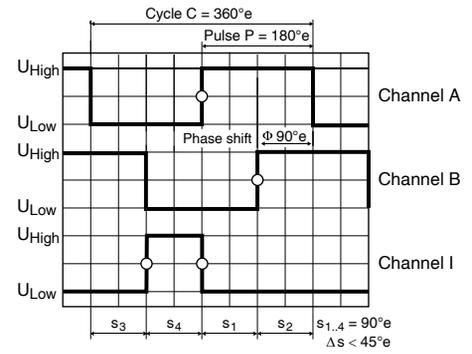
maxon Modular System										
+ Motor	Page	+ Gearhead	Page	∅ Enc [mm]	Overall length [mm] / • see Gearhead					
RE 16, 2 W	139			16	28.0	28.0	28.0	28.0	28.0	28.0
RE 16, 2 W	139	GP 16, 0.1 - 0.6 Nm	379/380	16	•	•	•	•	•	•
RE 16, 2 W	139	GP 16 S	421/422	16	•	•	•	•	•	•
RE 16, 3.2 W	141			16	45.4	45.4	45.4	45.4	45.4	45.4
RE 16, 3.2 W	141	GP 16, 0.1 - 0.6 Nm	379/380	16	•	•	•	•	•	•
RE 16, 3.2 W	141	GP 16 S	421/422	16	•	•	•	•	•	•
RE 16, 4.5 W	143			16	48.4	48.4	48.4	48.4	48.4	48.4
RE 16, 4.5 W	143	GP 16, 0.1 - 0.6 Nm	379/380	16	•	•	•	•	•	•
RE 16, 4.5 W	143	GP 16 S	421/422	16	•	•	•	•	•	•
A-max 16	160/162			16	30.4	30.4	30.4	30.4	30.4	30.4
A-max 16	160/162	GS 16, 0.01 - 0.1 Nm	375-378	16	•	•	•	•	•	•
A-max 16	160/162	GP 16, 0.1 - 0.6 Nm	379/380	16	•	•	•	•	•	•
A-max 16	160/162	GP 16 S	421/422	16	•	•	•	•	•	•
A-max 19, 1.5 W	164			19	34.0	34.0	34.0	34.0	34.0	34.0
A-max 19, 1.5 W	164	GP 19, 0.1 - 0.3 Nm	381	19	•	•	•	•	•	•
A-max 19, 1.5 W	164	GP 22, 0.5 - 2.0 Nm	383/385	19	•	•	•	•	•	•
A-max 19, 1.5 W	164	GS 24, 0.1 Nm	389	19	•	•	•	•	•	•
A-max 19, 1.5 W	164	GP 22 S	424/425	19	•	•	•	•	•	•
A-max 19, 2.5 W	166			19	35.8	35.8	35.8	35.8	35.8	35.8
A-max 19, 2.5 W	166	GP 19, 0.1 - 0.3 Nm	381	19	•	•	•	•	•	•
A-max 19, 2.5 W	166	GP 22, 0.5 - 2.0 Nm	383/385	19	•	•	•	•	•	•
A-max 19, 2.5 W	166	GS 24, 0.1 Nm	389	19	•	•	•	•	•	•
A-max 19, 2.5 W	166	GP 22 S	424/425	19	•	•	•	•	•	•
A-max 22	168/170			22	36.9	36.9	36.9	36.9	36.9	36.9
A-max 22	168/170	GP 22, 0.1 - 0.3 Nm	382	22	•	•	•	•	•	•
A-max 22	168/170	GP 22, 0.5 - 2.0 Nm	383/385	22	•	•	•	•	•	•
A-max 22	168/170	GS 24, 0.1 Nm	389	22	•	•	•	•	•	•
A-max 22	168/170	GP 22 S	424/425	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 $\phi$	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 <sup>2</sup>
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. 78)

sensor

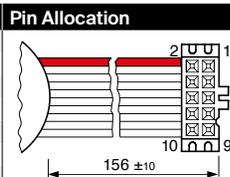
- Stock program
- Standard program
- Special program (on request)

Part Numbers						
228179	228177	228181	228182	201937	<b>201940</b>	

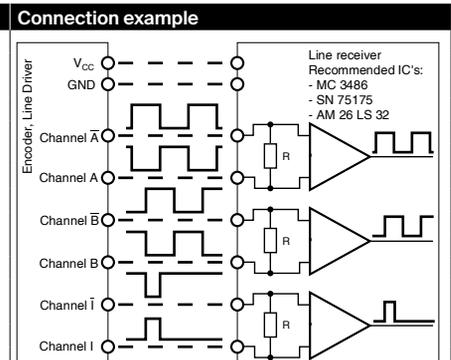
Type						
Counts per turn	128	128	256	256	512	512
Number of channels	2	3	2	3	2	3
Max. operating frequency (kHz)	80	80	160	160	320	320
Max. speed (rpm)	37500	37500	37500	37500	37500	37500

maxon Modular System										
+ Motor	Page	+ Gearhead	Page	Ø Enc [mm]	Overall length [mm] / • see Gearhead					
EC-max 16, 5 W	245			16	31.3	31.3	31.3	31.3	31.3	31.3
EC-max 16, 5 W	245	GP 16, 0.1 - 0.6 Nm	379/380	16	•	•	•	•	•	•
EC-max 16, 5 W	245	GP 16 S	421-423	16	•	•	•	•	•	•
EC-max 16, 8 W	247			16	43.3	43.3	43.3	43.3	43.3	43.3
EC-max 16, 8 W	247	GP 16, 0.1 - 0.6 Nm	379/380	16	•	•	•	•	•	•
EC-max 16, 8 W	247	GP 22, 0.5 - 2.0 Nm	386	16	•	•	•	•	•	•
EC-max 16, 8 W	247	GP 16 S/GP 22 S	421/425	16	•	•	•	•	•	•
EC-max 22, 12 W	248			16	41.6	41.6	41.6	41.6	41.6	41.6
EC-max 22, 12 W	248	GP 22, 0.5 - 2.0 Nm	383/386	16	•	•	•	•	•	•
EC-max 22, 12 W	248	KD 32, 1.0 - 4.5 Nm	403	16	•	•	•	•	•	•
EC-max 22, 12 W	248	GP 22 S	424/425	16	•	•	•	•	•	•
EC-max 22, 25 W	249			16	58.1	58.1	58.1	58.1	58.1	58.1
EC-max 22, 25 W	249	GP 22, 0.5 - 2.0 Nm	383/386	16	•	•	•	•	•	•
EC-max 22, 25 W	249	GP 22/GP 32	387/398	16	•	•	•	•	•	•
EC-max 22, 25 W	249	GP 22 S	424	16	•	•	•	•	•	•
EC-max 22, 25 W	249	GP 32 S	426-433	16	•	•	•	•	•	•

Technical Data	
Supply voltage $V_{CC}$	$5 V \pm 5\%$
Typical current draw 2 channel	11 mA
Typical current draw 3 channel	14 mA
Output signal	TTL compatible
Phase shift $\Phi$	$90^\circ e \pm 45^\circ e$
Index pulse width	$90^\circ e \pm 45^\circ e$
Operating temperature range	$-25 \dots +85^\circ C$
Moment of inertia of code wheel	$\leq 0.09 \text{ gcm}^2$
Output current per channel	max. 5 mA



- 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



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

Opt. terminal resistance  $R > 1 \text{ k}\Omega$