

# TECNOTION<sup>®</sup>

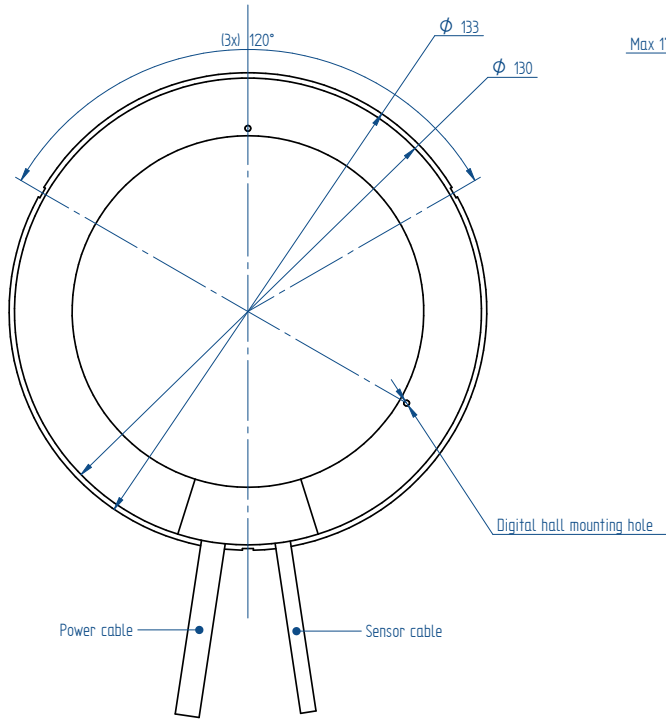
THE LINEAR MOTOR COMPANY

*Frameless torque motor series*

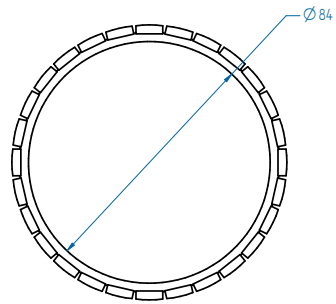


Mounting instructions and tolerances can be found in the torque installation manual. Manuals and 3D CAD files can be downloaded from our website.

## STATOR

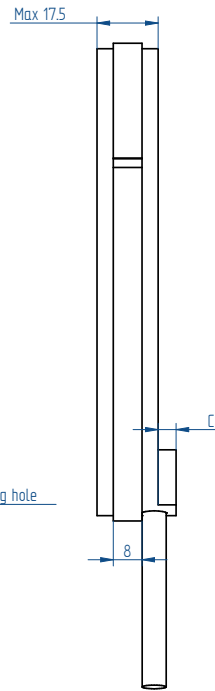


## ROTOR

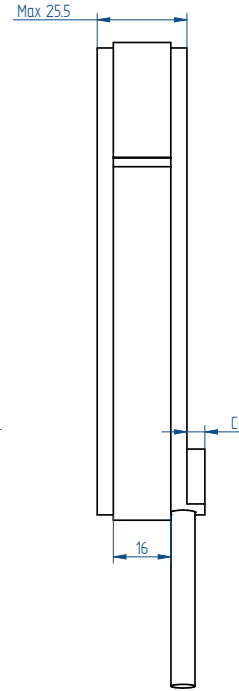


\* All sizes are in mm

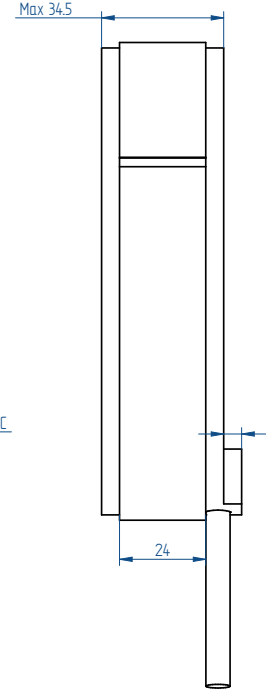
QTR-A 133-17



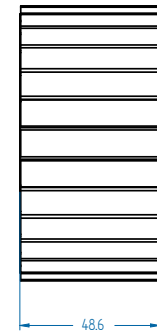
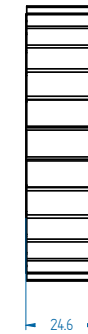
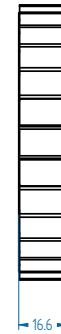
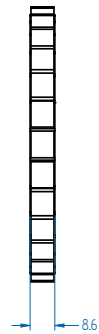
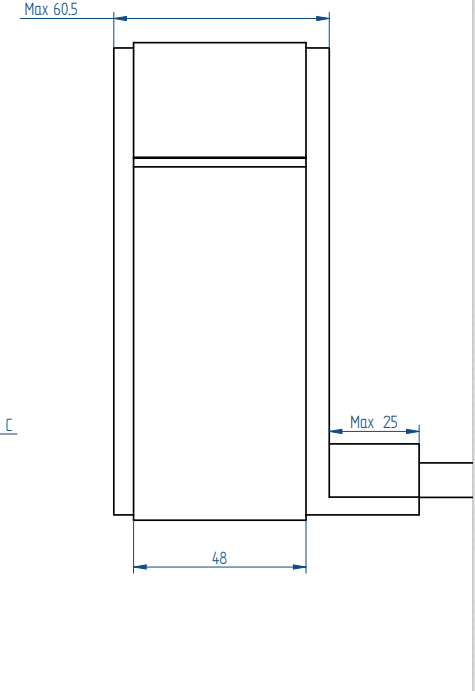
QTR-A 133-25



QTR-A 133-34



QTR-A 133-60



winding	C (mm)
N	3.5
Y+Z	5.5

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Parameter	Remarks	Symbol	Unit	QTR-A-133-17			QTR-A-133-25			QTR-A-133-34		QTR-A-133-60
Winding type				N	Y	Z	N	Y	Z	N	Z	N
Motor type max. voltage ph-ph	3-phase synchronous		$V_{acrms} (V_{dc})$	230 (300)								420 (600)
Ultimate torque @ 20°C/s increase	magnet @ 25°C	$T_u$	Nm	5.6	6.4	6.4	11.9	13.5	13.5	20.6	20.3	55.5
Peak torque @ 6°C/s increase	magnet @ 25°C	$T_p$	Nm	3.8	4.3	4.3	7.5	8.6	8.6	13.1	12.9	35.3
Continuous torque	coil @ 100°C	$T_c$	Nm	2.6	2.6	2.6	5.9	6.0	6.0	10.0	9.5	21.9
Maximum speed <sup>(3)</sup> @ 48 Volt	@ $T_c$	$n_{max}$	rpm	317	839	1641	33	345	788	0	478	0
Maximum speed @ max. voltage	@ $T_c$	$n_{max}$	rpm	3514	6340	10807	1825	3389	5930	946	4040	724
Motor torque constant	up to $I_c$	$K_t$	Nm/A <sub>rms</sub>	0.58	0.33	0.19	1.16	0.65	0.38	2.09	0.56	5.57
Motor constant	coils @ 25°C	$K_m$	(Nm) <sup>2</sup> /W	0.058	0.061	0.061	0.167	0.177	0.180	0.344	0.310	1.08
Ultimate current	magnet @ 25°C	$I_u$	A <sub>rms</sub>	13.8	28.2	48.8	13.8	28.2	48.8	13.3	48.8	13.5
Peak current	magnet @ 25°C	$I_p$	A <sub>rms</sub>	7.56	15.40	26.70	7.56	15.40	26.70	7.31	26.70	7.37
Maximum continuous current <sup>(1)</sup>	coils @ 100°C	$I_c$	A <sub>rms</sub>	4.43	8.10	14.00	5.05	9.30	16.10	4.77	16.90	3.93
Back EMF phase-phase <sub>peak</sub>		$K_e$	V/krpm	50	28	16	99	56	32	179	48	476
Back EMF phase-phase <sub>rms</sub>		$K_e$	V/krpm	35	20	11	70	39	23	126	34	337
Coil resistance per phase	coils @ 25°C ex. cable	R	Ω	1.93	0.58	0.20	2.70	0.80	0.27	4.23	0.34	9.58
Coil inductance per phase	$l < 0.6 I_p$	L	mH	3.74	1.20	0.40	5.87	1.87	0.62	11.50	0.85	36.6
Electrical time constant	coils @ 25°C	$\tau_e$	ms	1.9	2.1	2.0	2.2	2.4	2.3	2.7	2.5	3.8
Poles		$N_{mgn}$	nr	28	28	28	28	28	28	28	28	28
Continuous power loss	coils @ 100°C	$P_c$	W	147	147	147	268	268	268	375	375	577
Thermal resistance <sup>(2)</sup>	coils to mount. sfc.	$R_{th}$	°C/W	0.51	0.51	0.51	0.28	0.28	0.28	0.20	0.20	0.13
Thermal time constant	up to 63% max. coiltemp.	$\tau_{th}$	s	23	27	27	18	21	21	19	19	29
Temperature cut-off / sensor				PTC 1kΩ / KTY83-122								
Stator OD		OD <sub>s</sub>	mm	133								
Rotor ID		ID <sub>r</sub>	mm	84								
Motor height		H <sub>motor</sub>	mm	17			25			34		60
Lamination stack height		H <sub>arm</sub>	mm	8			16			24		48
Rotor inertia		J <sub>r</sub>	kg*m <sup>2</sup>	2.1E-04			4.2E-04			6.2E-04		1.2E-03
Stator mass	excluding cables	M <sub>s</sub>	g	414			717			1037		2090
Rotor mass		M <sub>r</sub>	g	106			208			309		613
Total mass	excluding cables	M <sub>t</sub>	g	520			925			1346		2703
Cable mass	all cables	m	g	63	90	90	63	90	90	63	90	95
Cable type (power)	length 0.5 m	d	mm (AWG)	6.5 (20)	6.7 (14)	6.7 (14)	6.5 (20)	6.7 (14)	6.7 (14)	6.5 (20)	6.7 (14)	9.6 (18)
Cable type (sensor)	length 0.5 m	d	mm (AWG)	4.3 (26)								



QTR-A-133 Stator and rotor shown with a height of 17 mm

- All specifications ±10%
- These values are only applicable when the mounting surface is at 20°C and the motor is driven at maximum continuous current. If these values differ in your application, please check our simulation tool or manual.
  - R<sub>th</sub> based on radial mounting of stator lamination stack.
  - MAXIMUM allowable speed for QTR-A 133 series motors is 14,000 rpm. If you plan a high speed application, please contact Tecnotion.

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