



TL6 on 192mm magnet plate

TL series

Water cooling

All TL motors feature integrated cooling channels that allow for the easy setup of a liquid cooled system, at no additional cost.

Magnet plate dimensions

Le (mm)	192	288
M5 bolts	8	12
Mass (kg/m)	3.8	

Magnet plates can be butted together.

Approvals



	Parameter	Remarks	Sym	Unit	TL6	TL9	TL12	TL15	TL18	TL24	TL48						
Performance	Winding type				N	S	N	S	N	S	N	S	N	S	Q		
	Motor type, max voltage ph-ph	3-phase synchronous	U _{max}	V _{ac,rms} (V _{dc})	400 (565)												
	Ultimate force @ 10 K/s increase	magnets @ 25°C	F _u	N	450	675	900	1125	1350	1800	3600						
	Peak force @ 6 K/s increase	magnets @ 25°C	F _p	N	400	600	800	1000	1200	1600	3200						
	Continuous force water cooled ¹	coils @ 100°C	F _{cw}	N	210	315	420	525	630	840	1680						
	Continuous force ¹	coils @ 100°C	F _c	N	200	300	400	500	600	800	1600						
	Maximum speed ²	@ U _{max} @ F _c	v _{max}	m/s	4.8	9.4	3.1	9.4	4.8	9.4	3.9	9.4	4.8	9.4	2.4		
	Motor force constant	I ≤ I _c	K _f	N/A _{rms}	93	46.5	140	46.5	93	46.5	112	46.5	93	44.9	93	46.5	180
	Motor constant	coils @ 25°C	S	N ² /W	400	400	605	596	801	801	972	1001	1196	1139	1593	1567	3130
Electrical	Ultimate current	magnets @ 25°C	I _u	A _{rms}	6.5	13.1	6.5	19.6	13.1	26.2	13.5	32.7	19.6	40.6	26.2	52.3	27.1
	Peak current	magnets @ 25°C	I _p	A _{rms}	5.0	10.0	5.0	15.0	10.0	20.0	10.4	25.0	15.0	31.0	20.0	40.0	20.7
	Continuous current water cooled ¹	coils @ 100°C	I _{cw}	A _{rms}	2.26	4.5	2.26	6.8	4.5	9.0	4.7	11.3	6.8	14.0	9.0	18.1	9.4
	Back EMF ph-ph _{peak}		K _e	V _{dc} /m/s	76	38	114	38	76	38	92	38	76	38	76	38	147
	Resistance per phase	coils @ 25°C ex. cable	R _{ph}	Ω	7.2	1.80	10.8	1.21	3.6	0.90	4.3	0.72	2.41	0.59	1.81	0.46	3.45
	Induction per phase	I < 0.6 I _p	L _{ph}	mH	54	14	81	9.0	27	7.0	32	5.4	18	4.4	14	3.4	26
	Electrical time constant		τ _e	ms	7.5												
Thermal	Continuous power loss ¹	coils @ 100°C	P _c	W	150	225	300	375	450	600	1200						
	Thermal resistance	coils to mount. sfc.	R _{th}	K/W	0.48	0.32	0.24	0.19	0.16	0.12	0.06						
	Thermal time constant		τ _{th}	s	77												
	Water cooling flow	for ΔT=3K	Φ _w	l/min	0.7	1.1	1.4	1.8	2.2	2.9	5.7						
	Water cooling pressure drop		ΔP _w	bar	1	2	3	7									
	Temperature sensor				PTC 1kΩ / KTY 83-122												
Mechanical	Coil unit mass	ex. cables	m	kg	1.5	2.0	2.6	3.2	3.8	5.2	9.8						
	Coil unit length	ex. cables	L	mm	146	194	244	290	336	468	855						
	Motor attraction force	rms @ 0 A	F _a	N	950	1325	1700	2075	2450	3400	6400						
	Magnet pitch NN		τ	mm	24												
	Cable mass	all cables		kg/m	0.18								0.3				
	Cable type (power)	length 1 m	d	mm (AWG)	9.6 (18)								11.4 (14)				
	Cable type (sensor)	length 1 m	d	mm (AWG)	4.7 (26)												

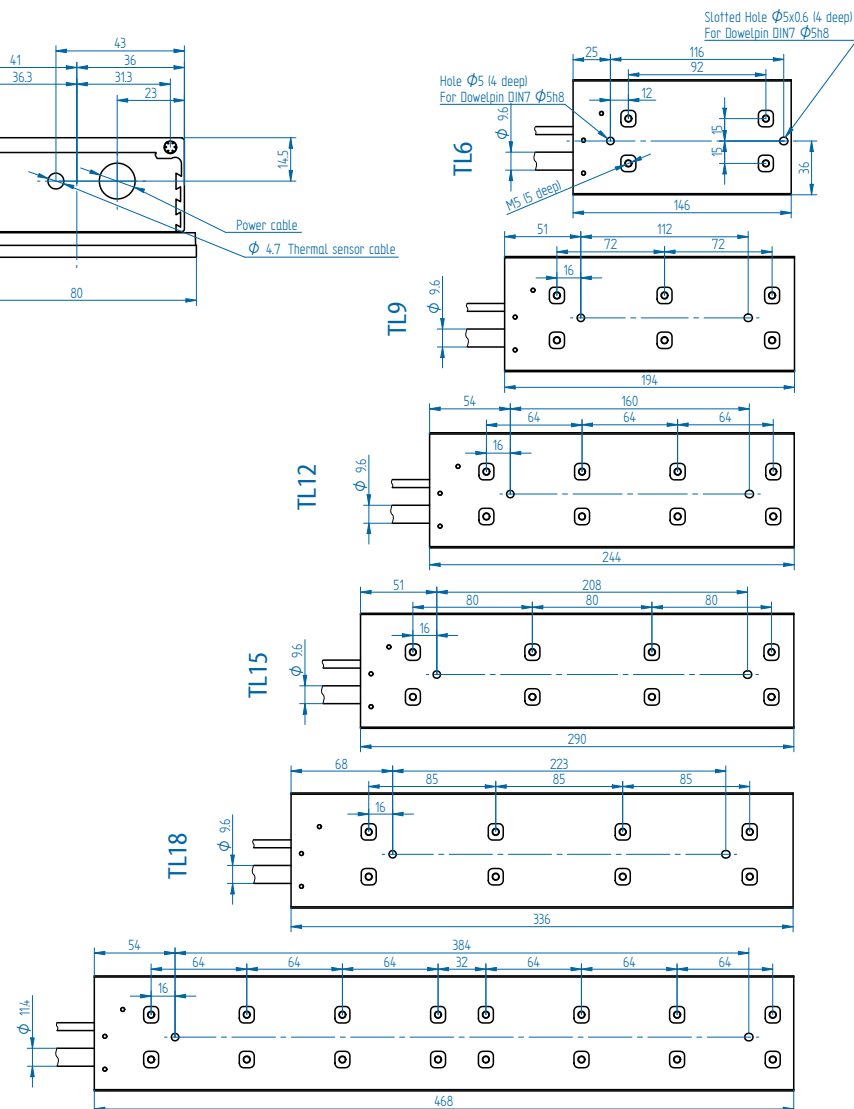
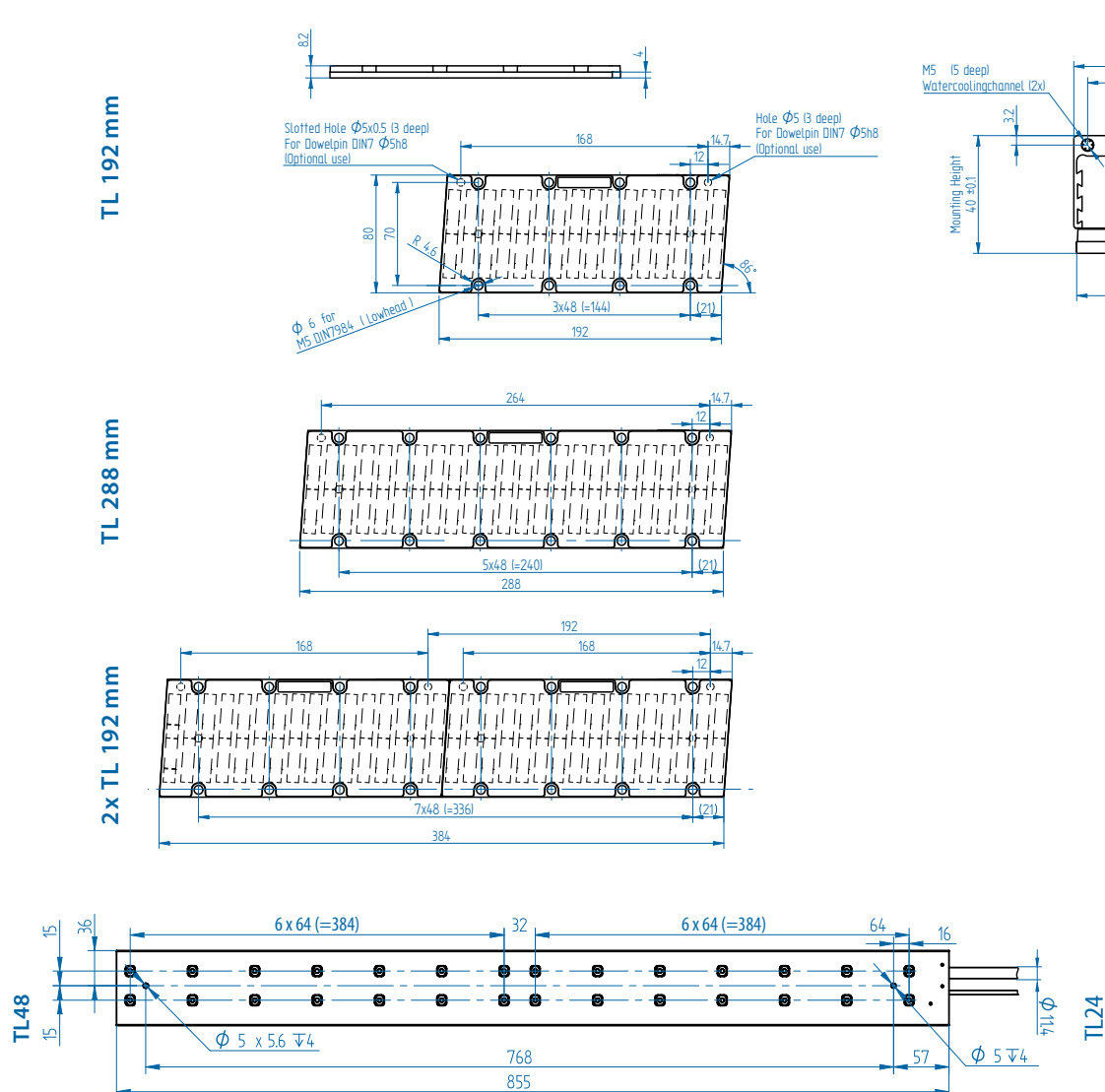
¹ These values are only applicable when the mounting surface is at 20°C and the motor is driven at continuous current. If these values differ in your application, please check our simulation tool.

² Actual values depend on bus voltage. Please check the F/v diagram in our simulation tool.

All specifications ±10%

Magnet plates

Coil units



Mounting instructions and flatness or parallelism requirements can be found in the iron core installation manual. CAD files and the manual can be downloaded from our website.

* All sizes are in mm