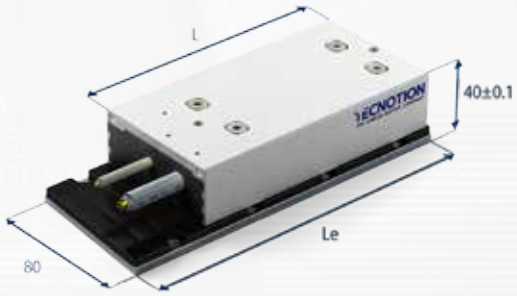
TL Series Iron Core

	Parameter	Remarks	Sym	Unit	TL6		TL9		TL12		TL15		TL18		TL24	
Performance	Winding type				N	S	N	S	N	S	N	S	N	S	N	S
	Motortype, max voltage ph-ph				3-phase synchronous Iron core, $400V_{ac\ rms}$ ($600V_{dc}$)											
	Ultimate Force @ 10°C/s increase	magnet @ 25°C	F_u	N	450		675		900		1125		1350		1800	
	Peak Force @ 6°C/s increase	magnet @ 25°C	F_p	N	400		600		800		1000		1200		1600	
	Continuous Force Watercooled*	coils @ 100°C	F_{cw}	N	210		315		420		525		630		840	
	Continuous Force Aircooled*	coils @ 100°C	F_c	N	200		300		400		500		600		800	
	Maximum Speed**	@ 560 V	v_{max}	m/s	3.5	7	2,5	7	3.5	7	3.5	7	3.5	7	3.5	7
	Motor Force Constant	mount. sfc. @ 20°C	K	N/A_{rms}	93	46.5	140	46.5	93	46.5	112	46.5	93	44.9	93	46.5
	Motor Constant		S	N^2/W	380		570		760		950		1140		1520	
Electrical	Ultimate Current	magnet @ 25°C	I_u	A_{rms}	6.5	13.1	6.5	19.6	13.1	26.2	13.5	32.7	19.6	41	26.2	52
	Peak Current	magnet @ 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
	Continuous Current Watercooled*	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
	Back EMF Phase-$Phase_{peak}$		B_{emf}	V/m/s	76	38	114	38	76	38	92	38	76	38	76	38
	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
	Induction per Phase	I < 0.6 Ip	L_{ph}	mH	54	14	81	9.0	27	7.0	32	5.4	18	4.4	14	3.4
	Electrical Time Constant*	coils @ 25°C	τ_e	ms	7.5		7.5		7.5		7.5		7.5		7.5	
Thermal	Maximum Continuous Power Loss	all coils	P_c	W	150		225		300		375		450		600	
	Thermal Resistance	coils to mount. sfc.	R_{th}	°C/W	0.48		0.32		0.24		0.19		0.16		0.12	
	Thermal Time Constant*	up to 63% max. coiltemp.	τ_{th}	s	77		77		77		77		77		77	
	Watercooling Flow	for ΔT=3K	Φw	l/min	0.7		1.1		1.4		1.8		2.2		2.9	
	Watercooling Pressure-drop	order of magnitude	ΔP_w	bar	1		1		2		2		2		3	
	Temperature Cut-off / Sensor				PTC 1kΩ / KTY 83-122											
Mechanical	Coil Unit Weight	ex. cables	W	kg	1.5		2.0		2.6		3.2		3.8		5.2	
	Coil Unit Length	ex. cables	L	mm	146		194		244		290		336		468	
	Motor Attraction Force	rms @ 0 A	F_a	N	950		1325		1700		2075		2450		3400	
	Magnet Pitch NN		τ	mm	24		24		24		24		24		24	
	Cable Mass		m	kg/m	0.18		0.18		0.18		0.18		0.18		0.30	
	Cable Type (Power)	length 1 m	d	mm (AWG)	9.6 (18)										11.9 (14)	
	Cable Type (Sensor)	length 1 m	d	mm (AWG)	4.3 (26)										4.3 (26)	

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.*

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



TL6 on 192mm magnet plate shown

Approvals

See page 28 for Analog hall

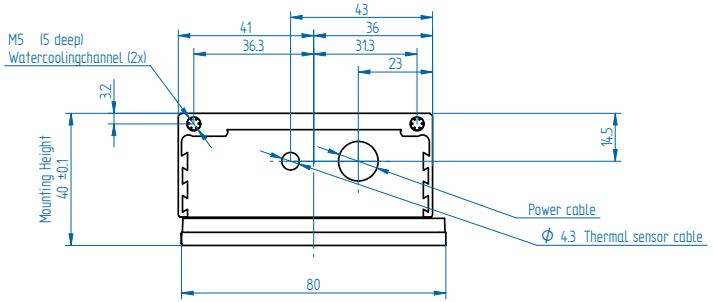
Water cooling

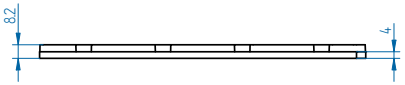
All TL motors feature integrated cooling channels that allow for the easy setup of a liquid cooled system, at no additional cost.

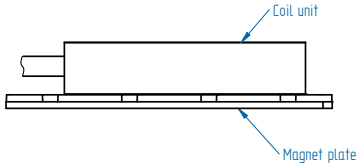
Magnet plate dimensions		
Le (mm)	192	288
M5 bolts	8	12
Mass (kg/m)	3.8	
Magnet plates can be butted together.		

Mounting instructions and flatness or parallelism requirements can be found in the Iron Core installation manual. CAD files, 3D models and the manual can be downloaded from our website.

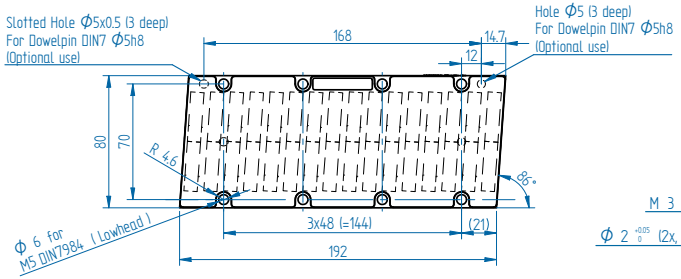
MAGNET PLATES

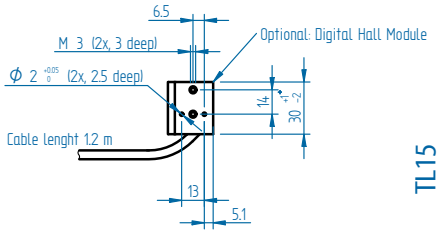




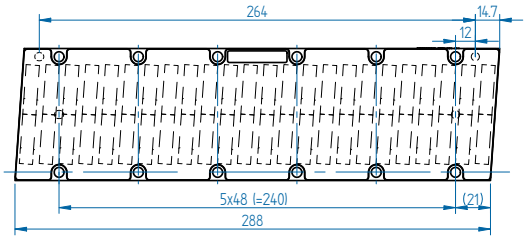


TL 192mm

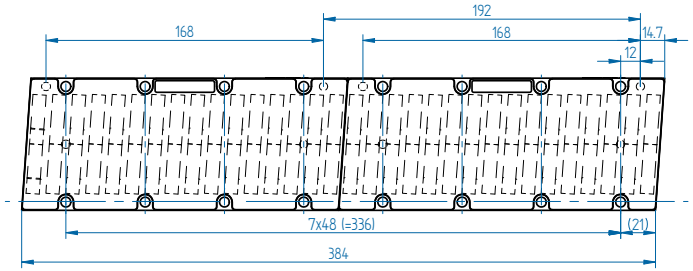




TL 288mm

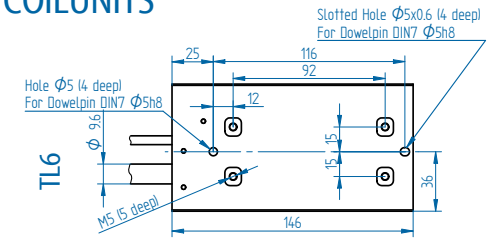


2x TL 192mm

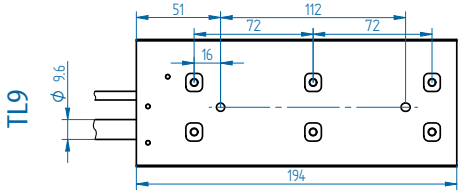


COILUNITS

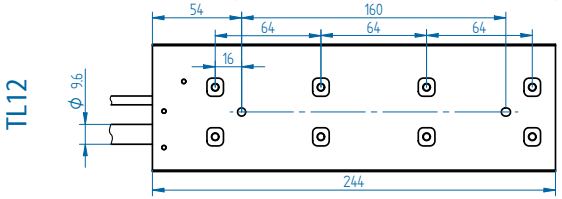
TL6



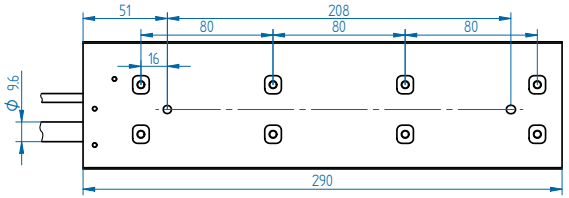
TL9



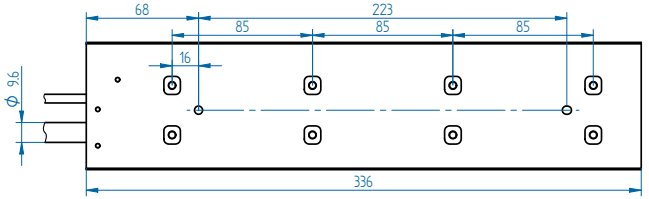
TL12



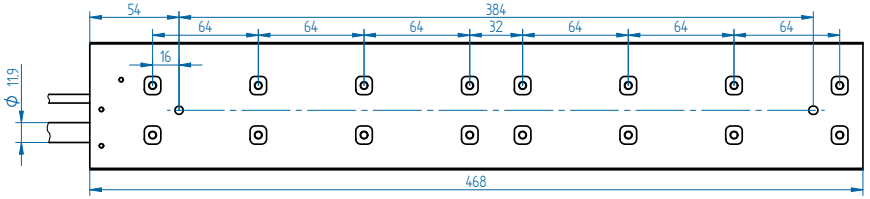
TL15



TL18



TL24



Features

Tecnotion's linear motor performances advantages

[DIRECT DRIVE ADVANTAGES]

The direct drive technology of linear motors is a perfect way to enhance productivity, accuracy, and dynamic performance. Linear motors eliminate the need for mechanical transmissions like rack and pinion, belts and speed reducers. Between coil unit and magnets there is no contact, this means no mechanical wear. The technology makes designs slimmer, modular and reduces costs.

Modular system. All motors can be used in various configurations:

1. single moving coil *2. moving magnet* *3. parallel coupled coil* *4. in-line on a single track* *5. crosstable or gantry*

High force density

More force in a smaller packing means lowering footprint and fits better in smal(ler) spaces.

Low cogging

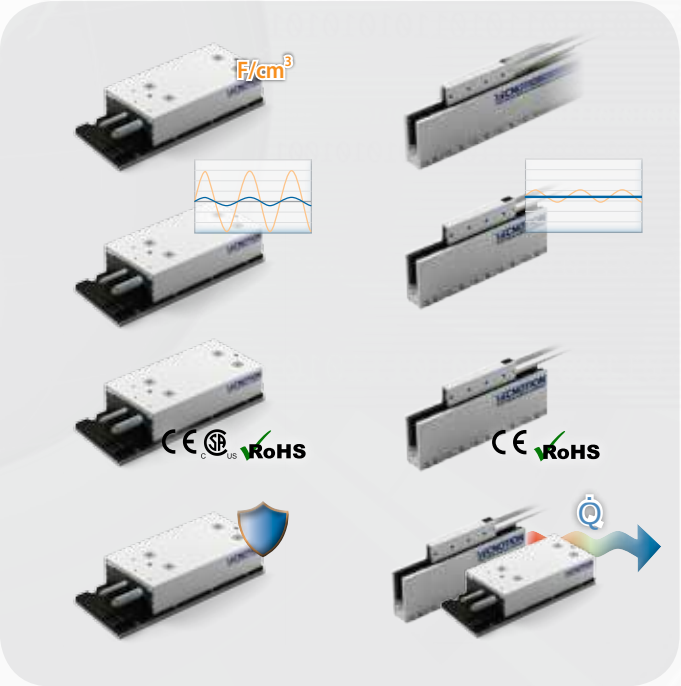
Optimized iron core motor design, for smooth motion and position accuracy in your application.

Approved for CSA and CE, ROHS

Iron core motors are approved for CE, CSA and ROHS.

Aluminium housed design

Housed design with integrated water cooling for TBW- and TL series.



High acceleration and dynamics

The outstanding force to mass ratio of the ironless coils enables unmatched system dynamics.

No cogging, extremely low force ripple

Ironless motors have no cogging effects. Offering smooth motion and position accuracy in your application.

Approved for CE and ROHS

Ironless motors are CE and RoHS approved.

Low thermal resistance

Allowing good heat transfer, achieving an extremely high continuous force for all motors when using a descent size heatsink or active cooling.