

ENG

PHASE



MOTION
CONTROL



UL-T/Tw

Compact Servomotors



UL-T and Tw Motors

Compact Servomotors



Servomotors UL-T and Tw a New Technology for 'Short' Torque Motors.

UL-T AND TW drives consist of a new type of permanent magnet, rare earth PM motors, in which an **exceptional torque density** is achieved by means of a new winding configuration and novel non laminated soft magnetic materials. The motors are mass produced on an innovative stratified winding system, unlike all conventional PM motors.

This novel arrangement is ideally suited to the realisation of **very short torque or pancake motors**, very useful for all the direct drive applications.

The combination motor + drive is shielded and insulated from the motor frame so that the RFI noise typical of PWM drives, which is coupled to the driven system by the capacity of interconnection cables and motor windings, is stemmed at its source point. The motors are thus **noise free**.

All equipped with **new multiturn absolute encoder**, based on inductive sensing with 16 bits/turn resolution, 1arcmin accuracy and serial interface endat (for low cost and performances the motors are supplied with resolvers).

Autoconfiguration with all the phase's drives with 'electronic label'.

In the TW drive, however, such a "short motor" geometry is used to couple the motor with its own multiturn, absolute encoder and DSP based sinusoidal drive in a single, IP 65 protected package in a "cube" geometry. The interconnection with the machine master is provided exclusively by an optically isolated Can interface, **full Canopen compatible**. TW drives are fed from a 310 Vdc bus.



UL-T Motors

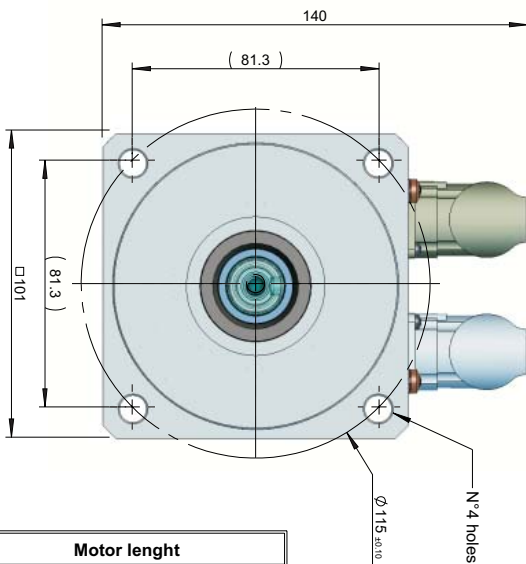
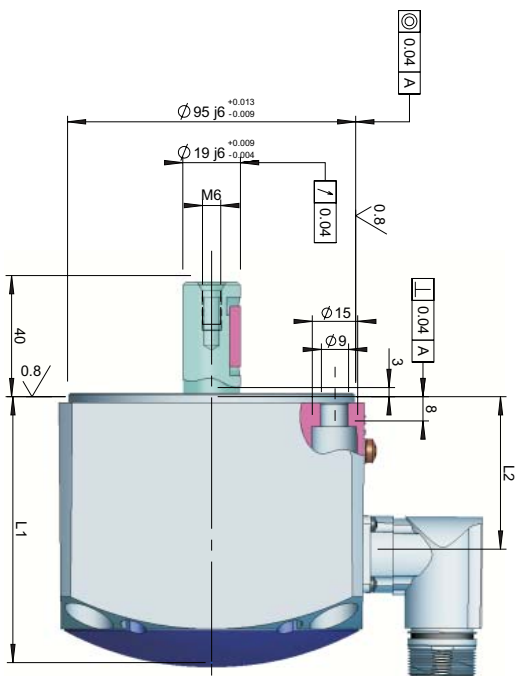
	Symbol	UL-T 503403	UL-T 506303	Units
REFERENCE DATA (WINDING INDEPENDENT)				
Nominal torque, S1,0 speed, suspended in free air 1)	Tnc	2,28	4,30	Nmrms
Nominal torque, S1, 0 speed, flange mount 2)	Tnw	2,85	5,90	Nmrms
Peak torque, S6 10% 1)	Tpk	6,49	12,24	Nmrms
Maximum structural speed	Pn	600	600	rad/sec
PHYSICAL DATA (WINDING INDEPENDENT)				
Rotor inertia	Jm	0,27	0,46	mkgm2
Acceleration at max torque	apk	24033	26604	rad/s2
Mass	Msta	1,65	3,05	kg
Insulation		Class H - F	Class H - F	
Protection		IP 65	IP 65	
THERMAL DATA (WINDING INDEPENDENT)				
Thermal time constant susp. in air 1)	Tc	1337	1608	sec
Thermal time constant, flanged 2)	Tw	762	692	sec
Loss at Tnc	LOc	41	72	W
Loss at Tnw	LOW	73	150	W
Threshold of built-in PTC	PTCt	130	130	°C
ELECTRICAL DATA (WINDING DEPENDENT)				
Nominal speed flanged 3)	wn	419	314	rad/sec
Nominal power, flanged, 3)	Pnw	1,08	1,77	kW
Back E.M.F. between phases	Ke	0,70	1,00	Vs
Torque constant	Kt	1,21	1,73	Nm/Arms
Nominal current, zero speed 1)	In0c	1,88	2,48	Arms
Nominal current, zero speed, 2)	In0f	2,47	3,59	Arms
BRAKE DATA (OPTIONAL)				
Supply voltage (+/- 10%)	Un	24	24	V
Input power	P20	13	13	W
Stall braking torque	Tbk	7,00	7,00	Nm
Additional inertia	Jbk	0,041	0,041	mkgm2

1) Motor susp. in free air (worse case), horizontal position, ambient 40 °C, copper 130 °C, frame 105 °C

2) Flange mount on solid steel flange, flange temperature <=80 C

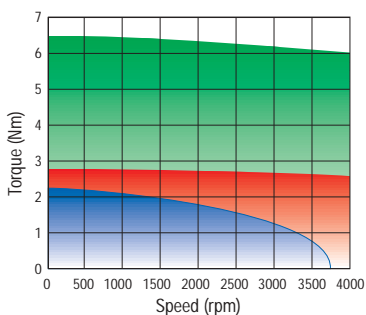
3) Speed sustained only with flange mount



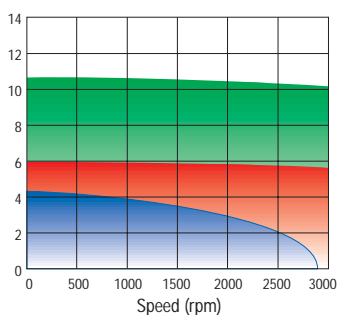


Motor length				
T	503.40.3	503.40.3B	506.30.3	506.30.3B
L1(mm)	87.5	127	117.5	158
L2(mm)	50		80	

UL-T 503.40.3



UL-T 506.30.3



■ Torque cont. S1 (flanged*) ■ Torque cont. S1 (free air) ■ Torque max S6-10% (flanged*)

Torque curves (Nm) of motor versus speed (rad/sec)
 *Flanged, temperature flang $\leq 60^{\circ}\text{C}$, $T_{amb} = 40^{\circ}\text{C}$

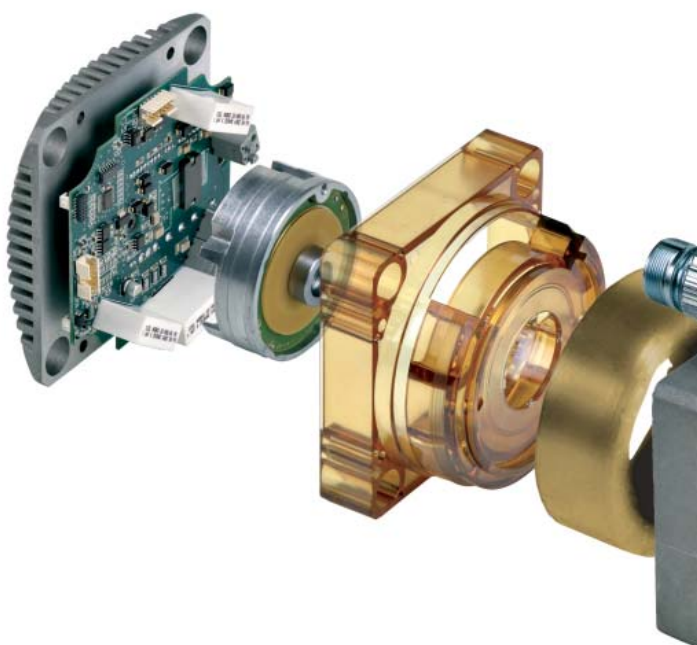


Tw Motors

With Integrated Servodrive

Integrated drive with high torque density, built-in absolute multiturn encoder, Canopen interface.

- *Power supply 310 Vdc*
- *Torque continuous up 5Nm; max speed 3000rpm*
- *Multiaxis systems*
- *Direct drive applications*
- *Single and multiturn absolute encoder built in
(16bits/turn, 4096 turns, 1arcmin accuracy)*
- *Don't need zero search sequence*
- *Fully canopen compatible ds301, dsp402*
- *Double insulation*
- *Integrated emi filters class b*
- *IP65 protection*





In the TW drive, however, such a "short motor" geometry is used to couple the motor with its own multiturn, absolute encoder and DSP based sinusoidal drive in a single, IP 65 protected package in a "cube" geometry.

The interconnection with the machine master is provided exclusively by an optically isolated Can interface, full Canopen compatible.

The protocol implemented is in full compliance with the standards ds301 and device profile drives dsp402 v2.0. TW drives are controlled in space, speed or torque.

In the interpolated mode to follow a profile synchronized with other axis the max throughput speed will be 500 sample/sec. A separate hardwire enable input is also available for safety.

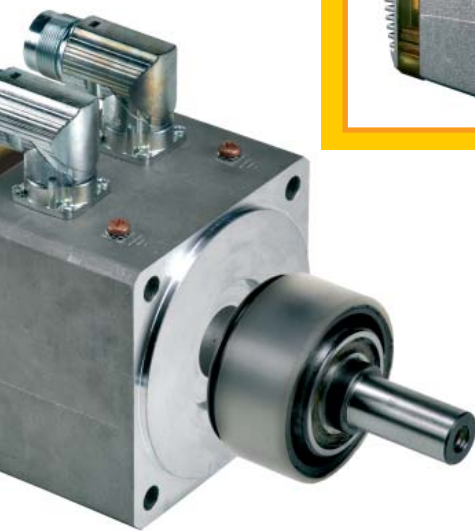
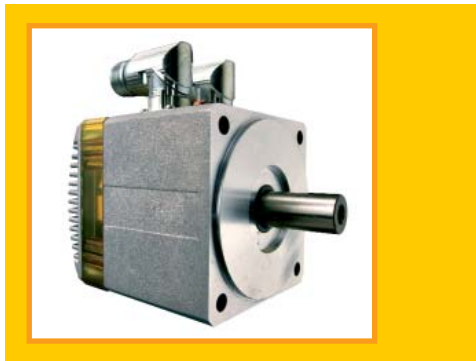
The 2 wire digital interface grants reliability and ease of installation especially in multi axis systems. The motor can be programmed or monitored via the CAN-Cockpit Windows interface (available on request).

The TW motors embody a flash memory to store permanent data irrespective of power supply availability.

TW drives are fed from a 310 Vdc bus. On request is available a braking and precharge unit to supply up to 1KW of continuous power.

They are ideally suited for multi-axes applications, such as packaging, and all the automation needs.

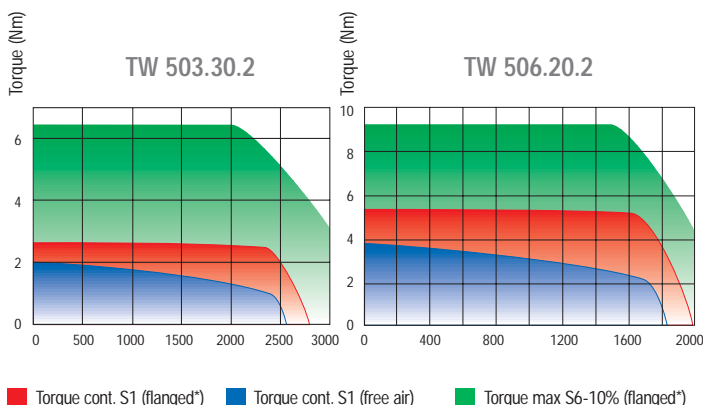
For remote control there are some optional boards for multi-axes control and industrial PC programmable.



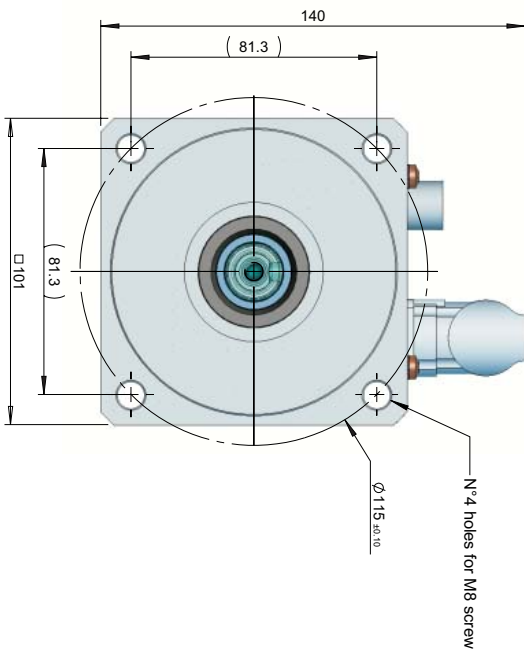
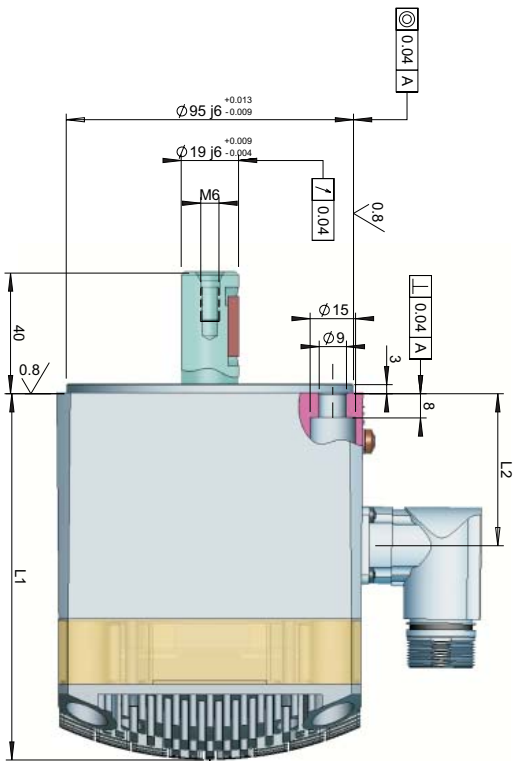


	Symbol	TW 503.20.3	TW 506.20.2	Units
REFERENCE DATA (WINDING INDEPENDENT)				
Nominal torque, S1, 0 speed, suspended in free air 1)	Tnc	2,00	3,77	Nmrms
Nominal torque, S1, 0 speed, flange mount 2)	Tnw	2,63	5,36	Nmrms
Peak torque, S6 10% 1)	Tpk	6,40	9,22	Nmrms
Maximum structural speed	Pn	600	600	rad/sec
PHYSICAL DATA (WINDING INDEPENDENT)				
Rotor inertia	Jm	0,27	0,46	mkgm ²
Acceleration at maximum torque	apk	23704	20043	rad/s ²
Mass	Msta	2,70	4,10	kg
Insulation		Class H - F	Class H - F	
Protection		IP 65	IP 65	
THERMAL DATA (WINDING INDEPENDENT)				
Thermal time constant susp. in air 1)	Tc	2189	2161	sec
Thermal time constant, flanged 2)	Tw	1247	930	sec
Loss at Tnc	LOc	41	72	W
Loss at Tnw	LOW	73	150	W
Treshold of built-in PTC	PTCt	110	110	°C
ELECTRICAL DATA (WINDING DEPENDENT)				
Nominal speed flanged 3)	wn	250	170	rad/sec
Nominal power, flanged, 3)	Pnw	0,60	0,88	kW
BRAKE DATA (OPTIONAL)				
Supply voltage (+/- 10%)	Un	24	24	V
Input power	P20	13	13	W
Stall braking torque	Tbk	7,00	7,00	Nm
Additional inertia	Jbk	0,041	0,041	mkgm ²

- 1) Motor susp. in free air (worse case), horizontal position, ambient 40 °C, copper 130 °C, frame 105 °C
 2) Flange mount on solid steel flange, flange temperature <=60 °C
 3) Speed sustained only with flange mount



Torque curves (Nm) of motor versus speed (rad/sec)
 *Flanged, temperature flang <=60°C, Tamb = 40°C

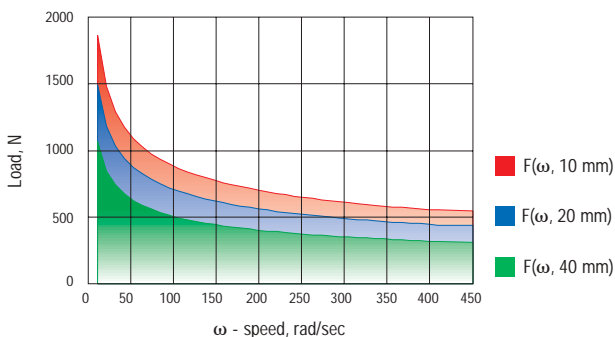


Motor lenght				
TW	503.40.3	503.40.3B	506.30.3	506.30.3B
L1 (mm)	121	161	151.5	191.5
L2 (mm)	50		80	



UL-T and Tw Motors Load Capability.

UL-T and TW Motors are equipped with double row angular contact ball bearings (like TYPE3204A, yoke CLASS C2 from 2 to 14 μm) lubricated for life and maintenance-free; these correspond in design to two single row angular contact ball bearings but take up less axial space. The bearing is fixed by interference and axially onto the shaft and the bearing slot so it can accommodate radial loads as well as axial loads acting in both directions. In order to guarantee satisfactory operation, double row angular contact ball bearings, like all ball and roller bearings, must always be subjected to a given minimum load. The basic load ratings for dynamic case is about 19000N. Because ball bearing slot and the flange are worked together in a single shot, the flange concentricity and perpendicularity are granted with very tight tolerances. In the graph we show the bearing axial load (life expected 30000H):



Maximum axial load on the motor shaft versus speed (10,20,40 mm from flange; 30000h life expected). Axial load must never exceed the 30% of the radial load allowed.



Tw Accessories

Power Supply precharge with brake unit.

SMD Technologies, Single phase supply operation Single phase supply 220 +/- 20% Vac, Dynamic braking (external resistor required), Precharge capabilities, Integrated EMC filter, Nominal Output Voltage 310 Vdc, continuous Output Power up to 1kW, Nominal Braking Power up to 1kW, DIN rail mounted, Free air cooling.



CanPC interface board.

Rs232-can interface, Modbus-canopen protocol conversion, Programmable filters and monitoring of can lines, Transmission of can messages programmable, Can bus baud rate selectable from 50kbps up to 1Mbps.

Can Open remote control panel

Can Open axis control boards

CanIO modules



In order to provide our Customers with a continuously improved product, all technical data, drawings and product informations contained hereof are subject to change. For up to date information, software and drawings please refer to our web site: www.phase.it.

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COME ARRIVARE A PHASE MOTION CONTROL:

In automobile: direzione Genova; A12 direzione Livorno; uscita Genova Est; seguire la mappa (5Km), salire le rampe interne e parcheggiare al 3° piano negli spazi designati.

In aereo: il taxi dall'aeroporto impiega circa 20 minuti.

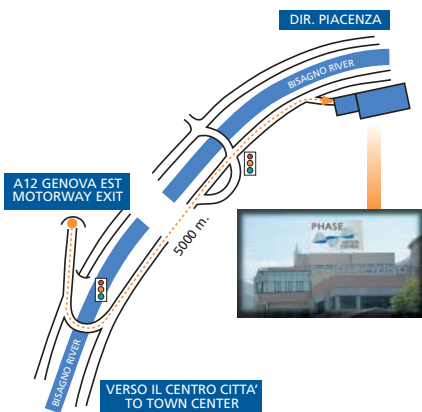
In treno: scendere a Genova P. Brignole, il percorso taxi dura circa 10 minuti.

HOW TO REACH PHASE MOTION CONTROL:

By car: drive to Genoa, take A12 to Livorno, exit Genova Est, drive according to the road map (5Km from motorway exit), drive inside Phase Motion Control building, park on 3rd floor.

By air: taxi from airport takes approximately 20 minutes.

By train: use Genova Brignole station, taxi ride approximately 10 minutes.



WORLD WIDE SUPPORT AND DISTRIBUTION NETWORK

- R&D, Company headquarters
- Manufacturing and support
- Authorized distribution



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