



MTS1 13
MTS1 14
Synchronous Drum Motor



Partner Company



Characteristics

Nominal Diameter (mm)	113	oil-free (no leakage)
Nominal Power (kW)	0.19 - 1.0	very high efficiency (IE4)
Nominal Force (N)	11 - 1,770	minimal heating
Nominal Torque (Nm)	0.6 - 100	maintenance free
Nominal Speed (m/min)	1,070 - 2	steel or stainless steel construction
Nominal Speed (m/s)	18 - 0.035	hardened steel planetary gear
Nominal Speed (U/min)	3,000 - 6	with cable gland
		UL certified

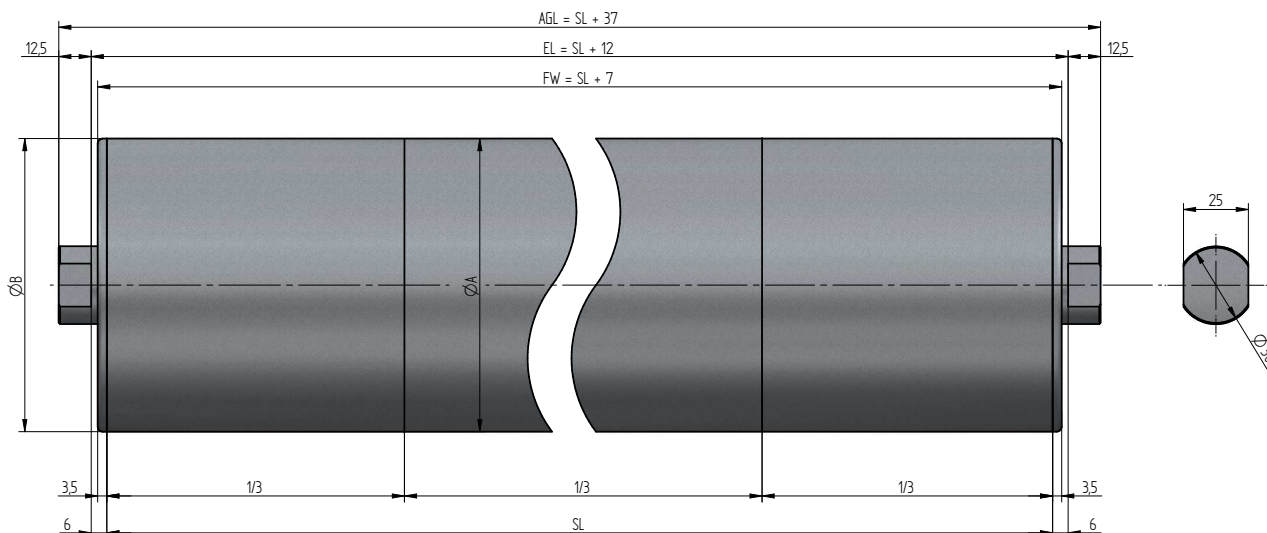
Drum motors listed on the following pages are available with short lead times.



Technical Data

Type of motor	Permanent magnet AC synchronous motor
Connection	Frequency converter or servo drive
Voltage	DC-Bus voltage 320 V or 560 V
Motor winding insulation class	F
Thermal protection	Temperature sensor KTY84-130 (standard) PTC (optional)
Temperature range	+ 5 °C to + 40 °C (standard) for operation with belt low temperature range to - 25 °C (optional)
Protection class	IP66 (standard), IP62 or IP69K optional
Electrical connection	Cable 4 x 0.5 qmm + 2 x 0.25 qmm shielded

Dimensions

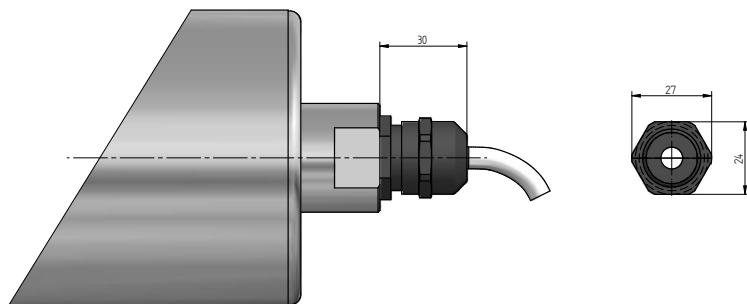


Dimensions Shell

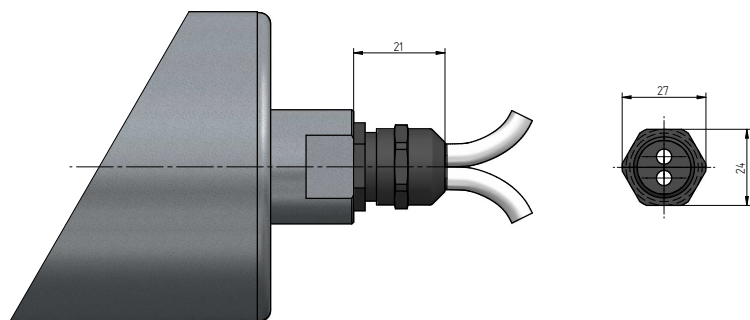
Type	ØA (mm)	ØB (mm)	shell length max.* (mm)
crowned	113.5	112.0	900
cylindrical	112.0	112.0	900
cylindrical with key	113.0	113.0	900

* longer motors available on request

Dimensions Cable Connection



EMC cable gland, straight, brass or stainless steel



Cable gland, straight, for 2 cables (option motor feedback)

Aufbau / Materialvarianten

Component	Variants	Standard	Option
Tube	crowned	Steel	Stainless steel
	cylindrical	Steel	Stainless steel
	cylindrical with key	Steel	Stainless steel
	flat rubber lagging	Steel	Stainless steel
	profiled rubber lagging	Steel	Stainless steel
	sprocket	Steel	Stainless steel
Shaft	D = 30 / SW = 25 / SFL = 12.5	Steel	Stainless steel
	alternative style	Steel	Stainless steel
Cover	laser engraved nameplate	Steel	Stainless steel
Labyrinth seal		Galvanised steel	Stainless steel A2
Electrical connection	straight cable gland	Brass	Stainless steel A2
	angled cable gland	Steel	Stainless steel A2
	terminal box	Stainless steel	
	connector		

Motor variants

MTS113-0.19

Rated values refer to the drum tube						
Power	Rotational Speed	Linear Speed		Torque	Belt pull	Min. tube length
kW	RPM	m/min	m/s	Nm	N	mm
0.19	375	133	2.22	4.6	82	270
	250	89	1.48	6.8	120	270
	188	67	1.11	9.0	160	270
	150	53	0.89	11.3	200	270
	94	33	0.56	18.0	319	270

MTS113-0.38

Rated values refer to the drum tube						
Power	Rotational Speed	Linear Speed		Torque	Belt pull	Min. tube length
kW	RPM	m/min	m/s	Nm	N	mm
0.38	375	133	2.22	9.2	163	300
	250	89	1.48	13.5	240	300
	188	67	1.11	18.0	319	300
	150	53	0.89	22.6	399	300
	94	33	0.56	36.1	636	300

MTS113-0.72

Rated values refer to the drum tube						
Power	Rotational Speed	Linear Speed		Torque	Belt pull	Min. tube length
kW	RPM	m/min	m/s	Nm	N	mm
0.72	375	133	2.22	17.7	313	300
	250	89	1.48	25.9	459	310
	188	67	1.11	34.6	612	310
	150	53	0.89	43.2	765	310
	94	33	0.56	44.0	779	310

MTS113-1.01

Rated values refer to the drum tube						
Power	Rotational Speed	Linear Speed		Torque	Belt pull	Min. tube length
kW	RPM	m/min	m/s	Nm	N	mm
1.01	375	133	2.22	18.0	319	330
	250	89	1.48	36.1	639	330
	188	67	1.11	44.0	779	330
	150	53	0.89	44.0	779	330
	94	33	0.56	44.0	779	330

MTS114-0.72

Rated values refer to the drum tube						
Power	Rotational Speed	Linear Speed		Torque	Belt pull	Min. tube length
kW	RPM	m/min	m/s	Nm	N	mm
0.72	120	43	0.71	52.9	936	350
	86	30	0.51	74.1	1,311	380
	75	27	0.44	84.6	1,498	380
	60	21	0.35	100.0	1,770	380
	43	15	0.25	100.0	1,770	380

MTS114-1.01

Rated values refer to the drum tube						
Power	Rotational Speed	Linear Speed		Torque	Belt pull	Min. tube length
kW	RPM	m/min	m/s	Nm	N	mm
1.01	120	43	0.71	73.6	1,303	380
	86	30	0.51	100.0	1,770	400
	75	27	0.44	100.0	1,770	400
	60	21	0.35	100.0	1,770	400
	43	15	0.25	100.0	1,770	400

Note regarding drum speed

Speed adjustments in the following ranges are possible:	
Sensorless operation with suitable frequency converter	10:1 (usual), 15:1 (potentially possible)
Servo drive and feedback	up to 1,000:1

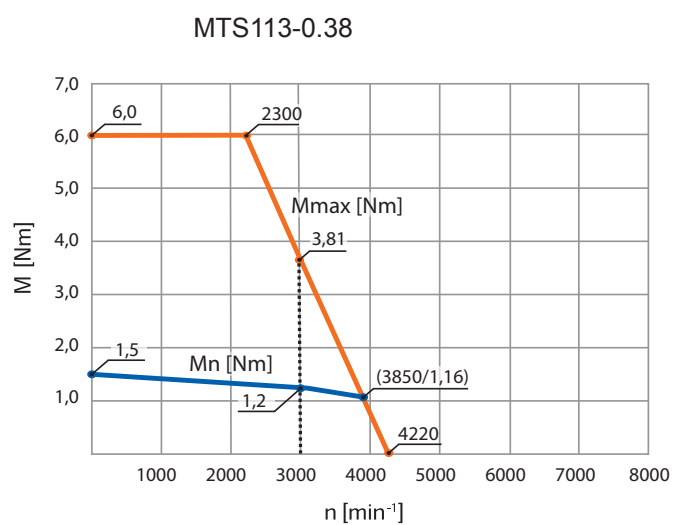
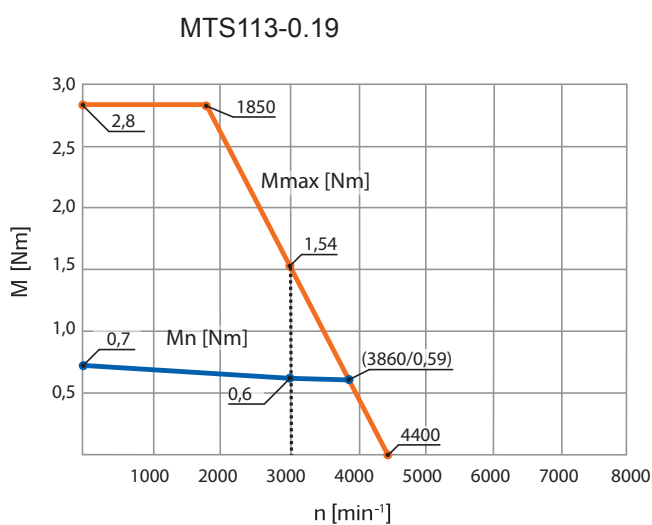
Note

Starting torque	
Sensorless	Rated torque x 1.5
With feedback	Peak torque

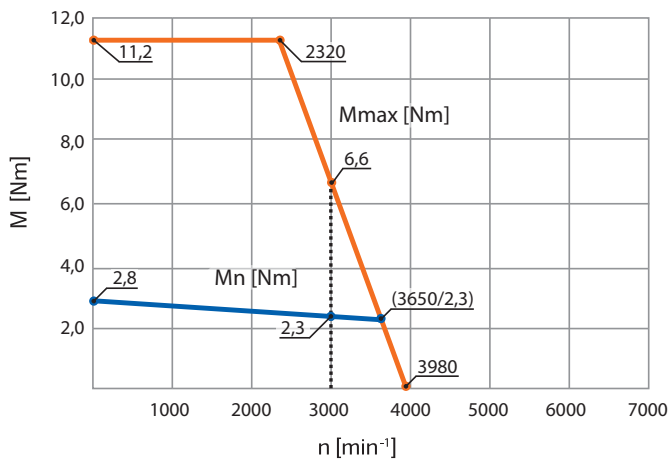
Motor data

Motor		MTS113-0.19	MTS113-0.38	MTS113-0.72 MTS114-0.72	MTS113-1.01 MTS114-1.01
Nominal rotational speed [RPM]	n_n	3,000	3,000	3,000	3,000
Pole pairs		3	3	3	3
Electrical connection		Y	Y	Y	Y
DC-Bus voltage [V _{dc}]	U_{ZK}	320/560	320/560	560	560
Rated torque [Nm]	M_n	0.6	1.2	2.3	3.2
Nominal current per phase [A _{rms}]	I_n	0.8	1.5	1.6	2.1
Stall torque [Nm]	M_0	0.7	1.5	2.8	3.5
Locked rotor current per phase [A _{rms}]	I_0	0.9	1.8	1.8	2.2
Peak torque [Nm]	M_{max}	2.8	6.0	11.2	14.0
Peak current [A _{rms}]	I_{max}	3.6	7.2	7.2	8.8
Voltage constant (per 1.000 RPM) [V _{rms}]	k_e	49.6	51.7	95.3	97.5
Torque constant [Nm/A _{rms}]	k_t	0.82	0.86	1.58	1.61
Winding resistance (phase to phase at 20 °C) [Ω]	R_{pp}	26.4	9.8	14.2	9.0
Winding inductance (phase to phase) [mH]	L_{pp}	37.6	18.6	36.2	26.0
Electrical time constant [ms]	T_{el}	1.4	1.9	2.5	2.9
Rotor inertia [kgcm ²]	J	0.22	0.41	1.40	1.93

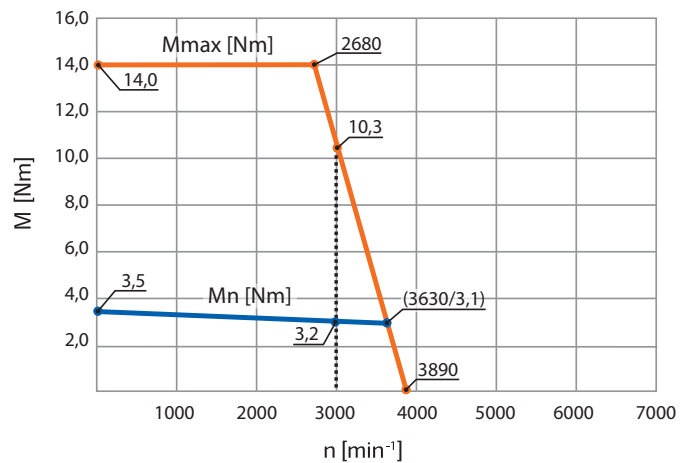
Characteristic curves



MTS113-0.72/MTS114-0.72



MTS113-1.01/MTS114-1.01



Option: Motor feedback

MTS drum motors can be supplied with resolver or SKS36 feedback:

Resolver

Number of poles	2
Input frequency	10 kHz
Input voltage	7 V _{rms}
Connection	signal cable 6 x 0.14 qmm, shielded

SKS36 (SICK Stegmann)

Number of Sin/Cos Periods per revolution	128
Number of absolute revolutions	1 (single turn)
Resolution	4096
Supply voltage	7 to 12 V DC
Connection	signal cable 8 x 0.15 qmm, shielded

Note:

SKS36 can be supplied with a data-plate programmed for the Schneider Electric PACDrive 3.

The optional components increase the minimum length of the drum motor as follows:

Option	SL _{min} (with option)
Resolver	Minimum length SL _{min} + 50 mm
SKS36	Minimum length SL _{min} + 50 mm

Cable specifications

Power cable

	Variant 1 only for motors without options	Variant 2 standard for motor with feedback option
Construction	4 x 0.50 mm ² + (2 x 0.25 mm ²)C shielded	4 x 0.50 mm ² + (2 x 0.25 mm ²)C shielded
Voltage	600 V (0.5 mm ²)	600 V (0.5 mm ²)
Sheath material	PUR	PUR (TPE-U)
Outer diameter	maximum 8.7 mm	7.6 mm (maximum 7.9 mm)
Sheath colour	orange (similar to RAL 2003)	orange (similar to RAL 2003)
Temperature range (fixed in place)	-50 °C to +90 °C	-50 °C to +105 °C
Minimum bending radius (fixed in place)	5 x D	7.5 x D
flame retardant	yes	yes
halogen free	yes	yes
oil resistant	yes	yes
UL	AWM STYLE 20235 80 °C	AWM STYLE 21928/11559 105 °C 600V

Connection cable/Motor feedback

Option	Resolver	SKS36
Construction	3 x 2 x 0.14 mm ² shielded	4 x 2 x 0.15 mm ² shielded
Sheath material	PVC	PUR (TPE-U)
Outer diameter	5.8 mm	5.3 mm
Sheath colour	grey (RAL 7032)	black
Temperature range (fixed in place)	-40 °C to +80 °C	-30 °C to +90 °C

Connector pin assignment

Power

Colour / code	Function
black / 1	U
black / 2	V
black / 3	W
green-yellow	PE
brown	KTY (+) or PTC
white	KTY (-) or PTC

Resolver

Colour	Signal / Function
white	REF +
brown	REF -
green	SIN +
yellow	SIN -
pink	COS +
grey	COS -

SKS36

Colour	Signal / Function
grey	DATA +
green	DATA -
white	SIN +
brown	REF SIN
pink	COS +
black	REF COS
red	US (8 V DC)
blue	GND (0 V DC)

Thermal protection

The MTS drum-motor is fitted, as standard, with a KTY84-130 thermal sensor. The temperature sensor must be monitored by an external circuit, such as a frequency convertor which switches off the power to the motor if the maximum temperature is exceeded.

KTY84-130, technical data

Measurement range	-40 °C to +300 °C
Reference resistance	1000 Ohm
Reference temperature	100 °C
Tolerance	+/- 3 %
Measurement current	2 mA

Optionally it is possible to fit a PTC sensor (not all frequency converters /servo drives support the KTY84).

Tested frequency converters/servo drives

MTS drum motors have been tested with the following frequency converters and servo drives.

Manufacturer	Servo drives		Frequency converter/sensorless
	Type	Feedback	Type
Allen Bradley			Powerflex 525
Beckhoff	AX5000	Resolver	
Bonfiglioli			AGILE
Danfoss	VLT FC 301/302	Resolver	VLT FC 280
Hitachi			WJ200
Invertek			Optidrive E3
			Optidrive P2
KEB	Combivert F5	Resolver	Combivert F5 SCL
	Combivert S6	Resolver	Combivert S6
Lenze	9400 High Line	Resolver	8400 State Line
			i500
Nord			SK 215E
Omron			MX2
Schneider Electric	PAC Drive 3	SKS36	Altivar 32
SEW			Movitrac LTP-B