Electric Cylinder CTC-060 - IO-Link Servo-Actuator

03.07.2025 Datasheet

General Description

The CTC electric cylinder is the solution for a compact and powerful electric cylinder to fulfill precise linear movements in your machine.
The CTC electric cylinder is an IO-Link spindle drive. Thanks to its innovative all-in-one technology, it integrates a servo motor, a servo controller and a ball screw in a compact design.
Real-time setpoints are exchanged via the IO-Link communication interface and pave the way for Industry 4.0. Its compatibility enables easy integration into existing systems and requires no space in the control cabinet. Simple 2-point movements can be controlled via a digital signal, while potentiometers enable individual adjustment of force and speed directly on the drive.

Control

Control over IO-Link

- Singleturn Encoder
- Target position setting in real time
- Adjustable speed, force and acceleration settings in real time
- Real-time feedback of position, speed and force (cycle time of 1.5 ms)
- Pre-programmable travel sets
- Press-in mode
- Extensive diagnostic options
- Many more features

Control over digital I/O

- Simple 2-point movements
- Automatic teaching of the stroke distance
- Speed and Force adjustable via potentiometer

Ratings

Spindle pitch	[mm/rev]	5	10	20 *
Stroke	[mm]	100, 150, 200, 250, 300, 400, 500, 600, 800		
Max. Feed force (peak)	[N]	800	400	200
Max. Feed force (continuous operation)	[N]	400	200	100
Max. Speed **In 24V operation** **In 48V operation**	[mm/s]	 150 300	 300 600	 600 1200
Max. Acceleration	[m/s^2]	10	20	20
Positioning accuracy	[mm]	+/- 0.1	+/- 0.1	+/- 0.2
Positioning precision (repeatability)	[mm]	+/- 0.02	+/- 0.02	+/- 0.04
Spindle type		Ball screw		
Mounting position		any		
Piston rod thread		-A: M10 x 1.25 male / -F: M6 female / -V&-F: end plate		
Ambient temperature	[°C]	0…+40 (-20…+60 on request)		
Storage temperature	[°C]	-20…+60		
Protection class		IP65 according to EN 60529		
Relative humidity	[%]	0…90 (non-condensing)		
Motor type		Synchronous-Servomotor		
Rotor position encoder		Absolute, single turn, 12bit		
Anti-torsion mechanism of the push rod		Sliding guide (no external torque)		
CE mark (see Declaration of Conformity)		According to **EU-RoHS-RL**		
		According to **EU-EMC-Directive**		

* Spindle pitch of 20 mm/rev available on request, see core program (page 4)

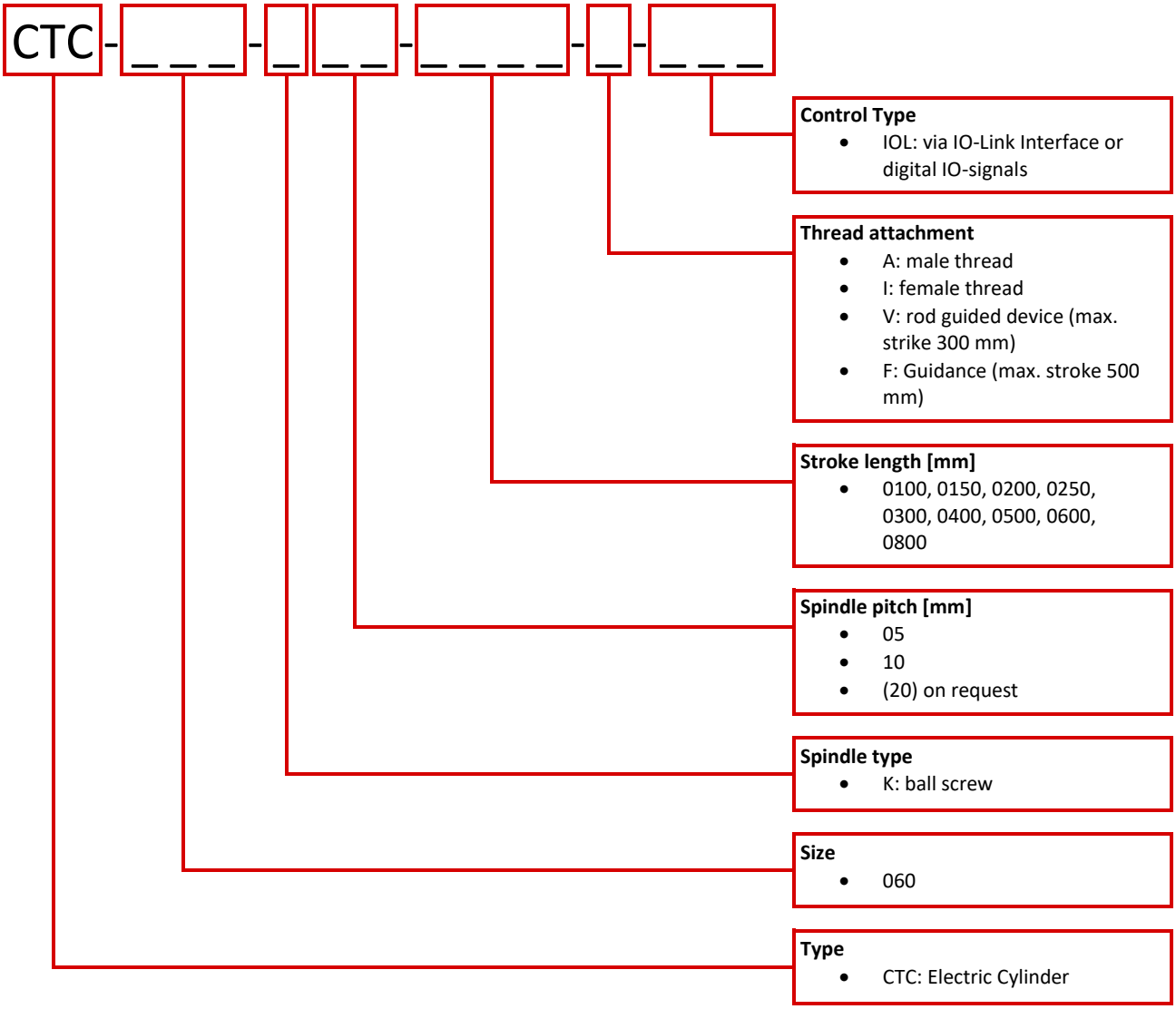
Connectors, Signals, Control		
Status display		3x LED
Rated voltage power circuit	[V DC]	24 – 48 *
Max. current consumption	[A]	3.5 (continuous load operation)
	[A]	5 (consumption peak load operation)
Operating range signal input	[V DC]	24
Permissible voltage variations	%	+/- 15
Max. current consumption logic	[mA]	50
Max. current digital signal outputs	[mA]	100 / output
Number of digital signal inputs	3	extend, retract, teach
Number of digital signal outputs	3	extended, retracted, ready
Features signal input		galvanically isolated from power circuit not galvanically isolated between signals
Max. cable length	[m]	20
Switching logic outputs		push-pull
Switching logic inputs		positive switching
Reference		External fixed stop / manually by IO-Link

Weight (+/- 10%)		
For 100 mm stroke	[g]	1600
Per 10mm stroke additionally	[g]	45
moving mass / 10 mm stroke	[g]	5.85

Materials	
Housing, cover	Aluminium colorless anodized
Thrust tube	Aluminium, hard anodized
Seals	NBR / PUR / EPDM
Thread attachment	Stainless steel
Screws	Steel Galvanized
Spindle	heat-treated steel
Spindle nut	Roller bearing steel
Covers knobs	Stainless steel
Grease nipple	Steel Galvanized
Connector fittings	Zinc nickel plated
RoHS Information	Conform according to declaration
REACH Information	All Variants: contains > 0,1% of 7439-92-1

* *With a 48 V supply, the need for a brake chopper must be checked for each application.*
Overvoltage can occur during generator operation (quadrants 2 and 4), which must be limited with a brake chopper. We will be happy to assist you with the design.

Configuration Key



Example: CTC-060-K10-0150-I-IOL

Core Program ★

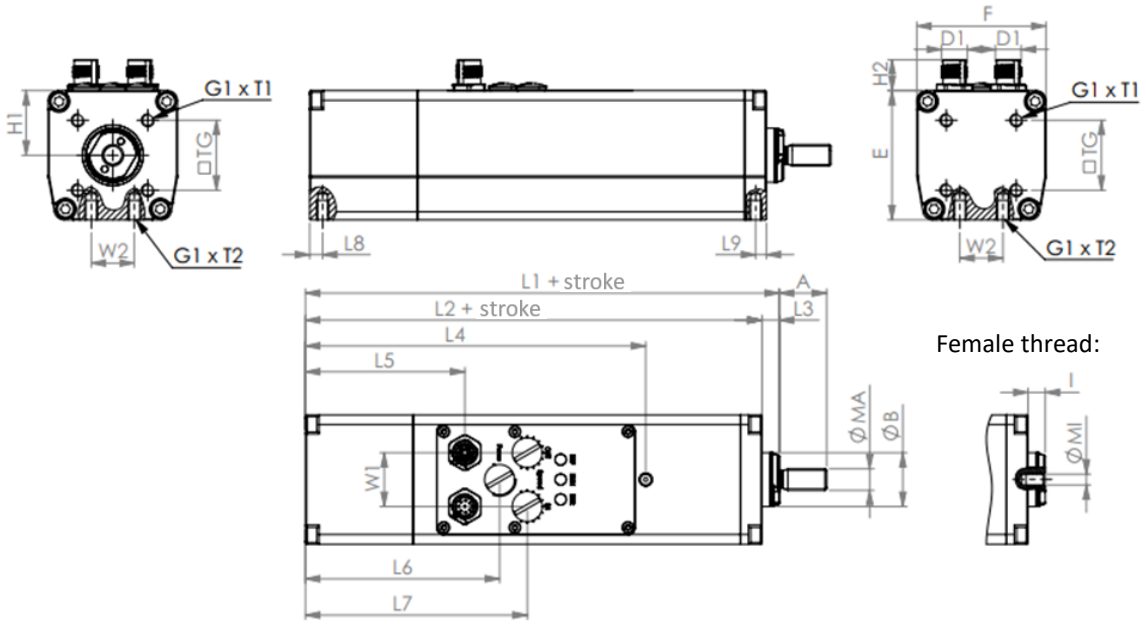
Our core program is assembled just in time according to your order and offers high availability. Variants not included in the core program are assembled to order. To cover your application appropriately, an increased delivery time is to be expected. If you require better availability for your series, please contact our sales team. We are happy to take on your challenges.

Stroke [mm]	0100	0150	0200	0250	0300	0400	0500	0600	0800
K05	★	★	★		★				★
K10	★	★	★		★				★
K20									

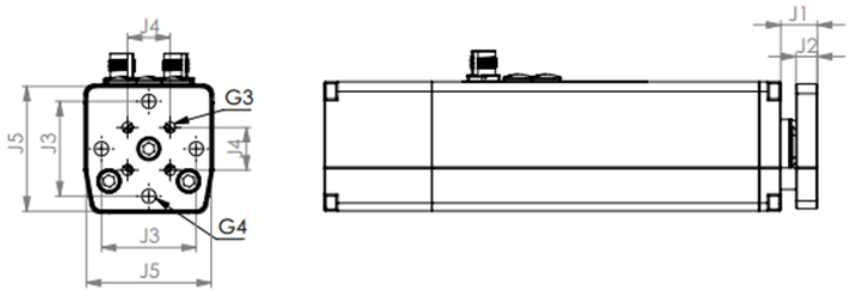
Dimensions

The basic dimensions are based on ISO 15552.

The connection and accessory dimensions comply with ISO 15552.



With anti-twist device:



	L1*	L2*	L3	L4	L5	L6	L7	L8	L9	H1	H2	D1
CTC-060-K05 **CTC-060-K10**	120	112	8	158	74	90	103	6	5	30	14.3	M12
CTC-060-K20* **	123	112	11	158	74	90	103	6	5	30	14.3	M12

	TG**	G1**	T1**	T2	A	B	E	F	I	MA	MI	W1	W2
CTC-060	32.5	M6	12	9	22	25	60	60	9	M10x1.25	M6	25	20

	J1	J2	J3	J4	J5	G3	G4
CTC-060-___-____-V	17	10	44	19.8	58	M6	6.6

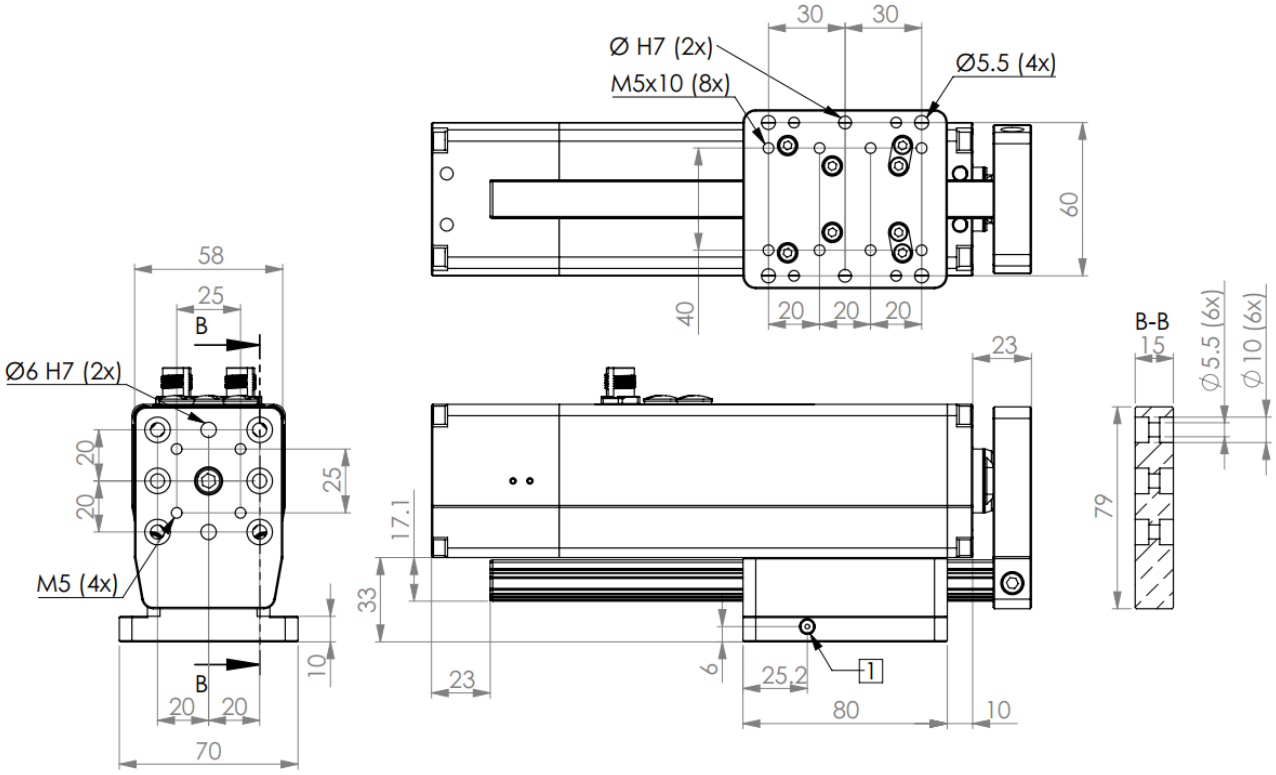
All dimensions in mm.

* *Stroke-dependent dimensions*

** *Thread on version with anti-rotation lock only on the rear of the housing*

*** *With the "K20" version, the usable stroke is reduced by 3 mm compared to the configuration key. The extended position is identical to "K05" and "K10", the retracted position is 3 mm further out.*

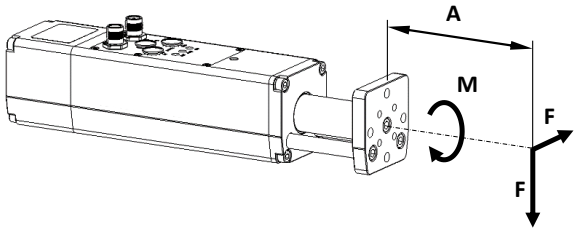
Supplementary dimensions for CTC-060-___-____-F



[1] Conical grease nipple for lubricating the guide (both sides)

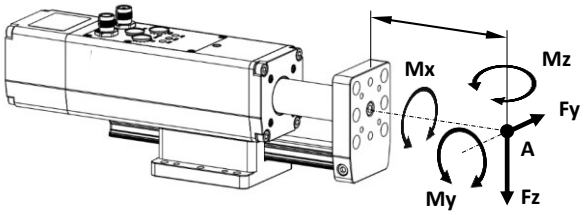
Permissible moment load M and transversal load F for CTC-060-___-____-V

Hub	F [N]	M [Nm]
100	29.96	1.26
150	12.45	0.75
200	6.31	0.54
250	3.63	0.45
300	2.28	0.40



Permissible moment load M and transversal load F for CTC-060-___-____-F

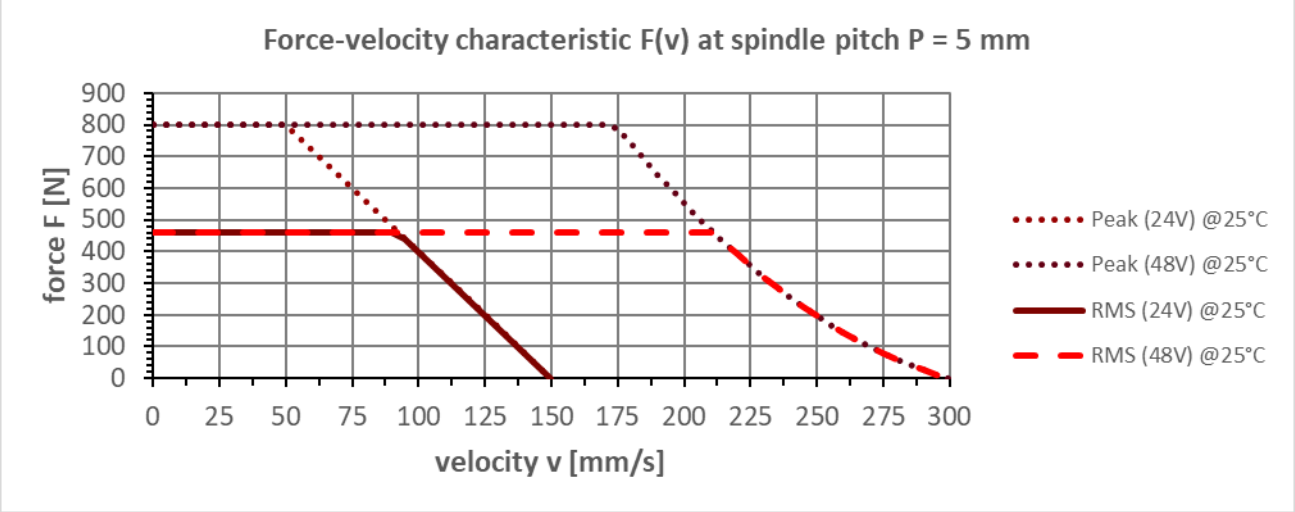
stroke	Fy [N]*	Fz [N]*	Mx [Nm]*	My [Nm]*	Mz [Nm]*
100	84.6	182.7	11.3	8.2	3.8
150	77.8	168.1	10.4	7.5	3.5
200	74.1	160.1	9.9	7.2	3.3
250	71.8	155.0	9.6	6.9	3.2
300	70.2	151.5	9.4	6.8	3.1

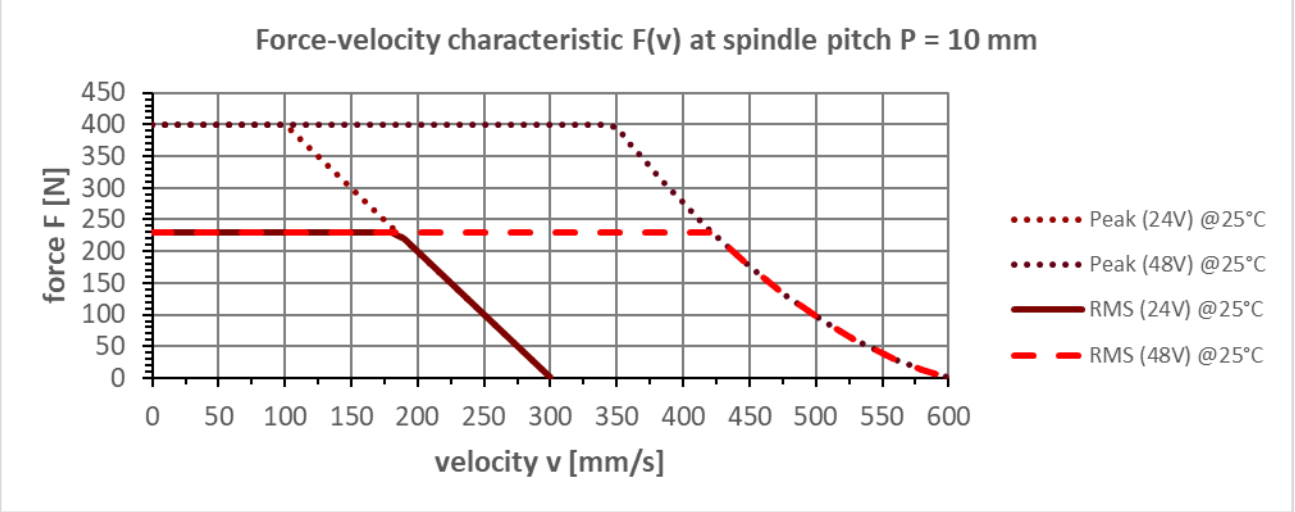


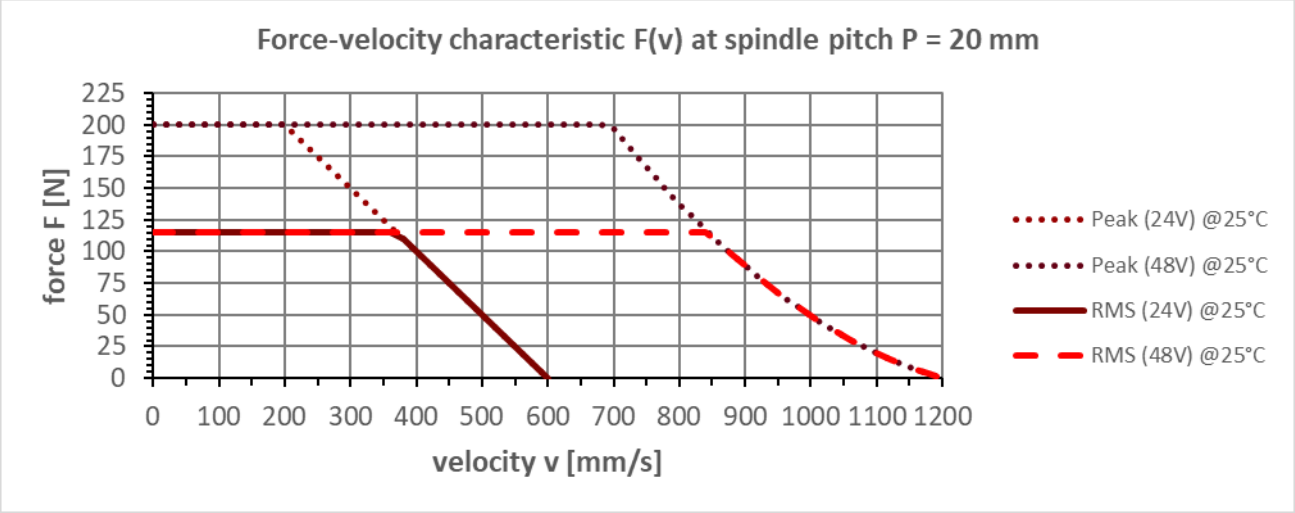
* *The maximum permissible load applies in the retracted state and decreases with extended length. Detailed design according to diagrams in the operating instructions.*

Characteristics

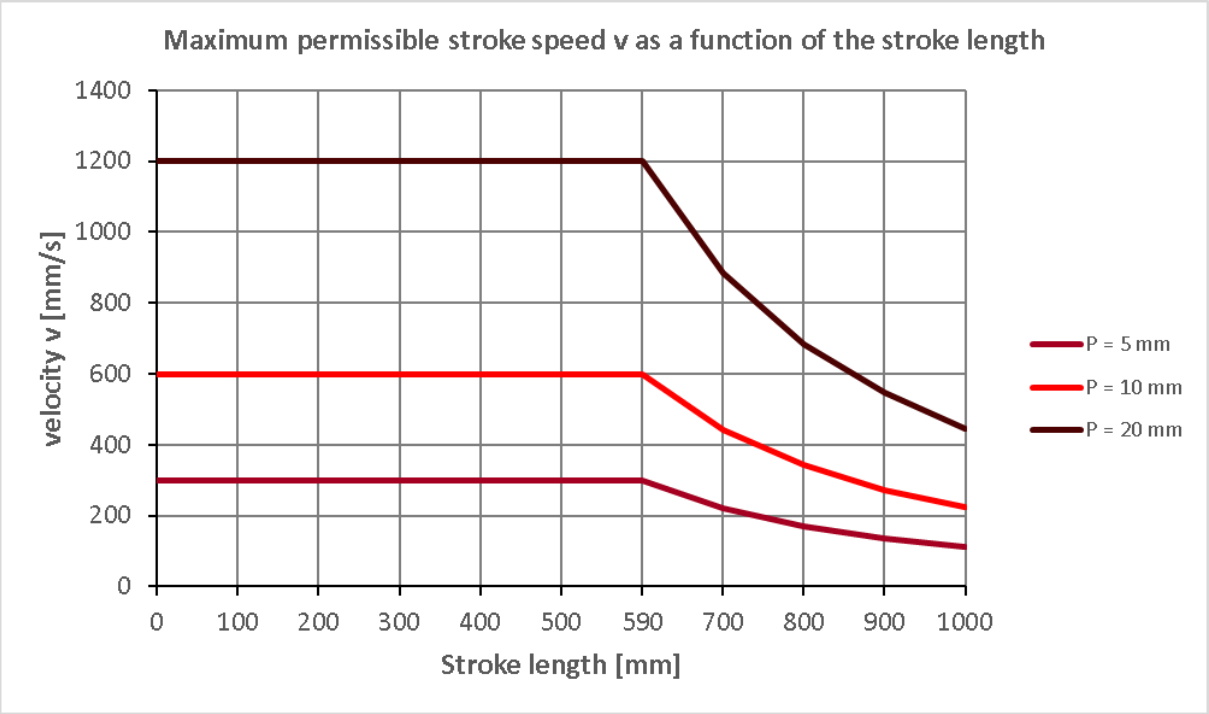
Force-Velocity Characteristics



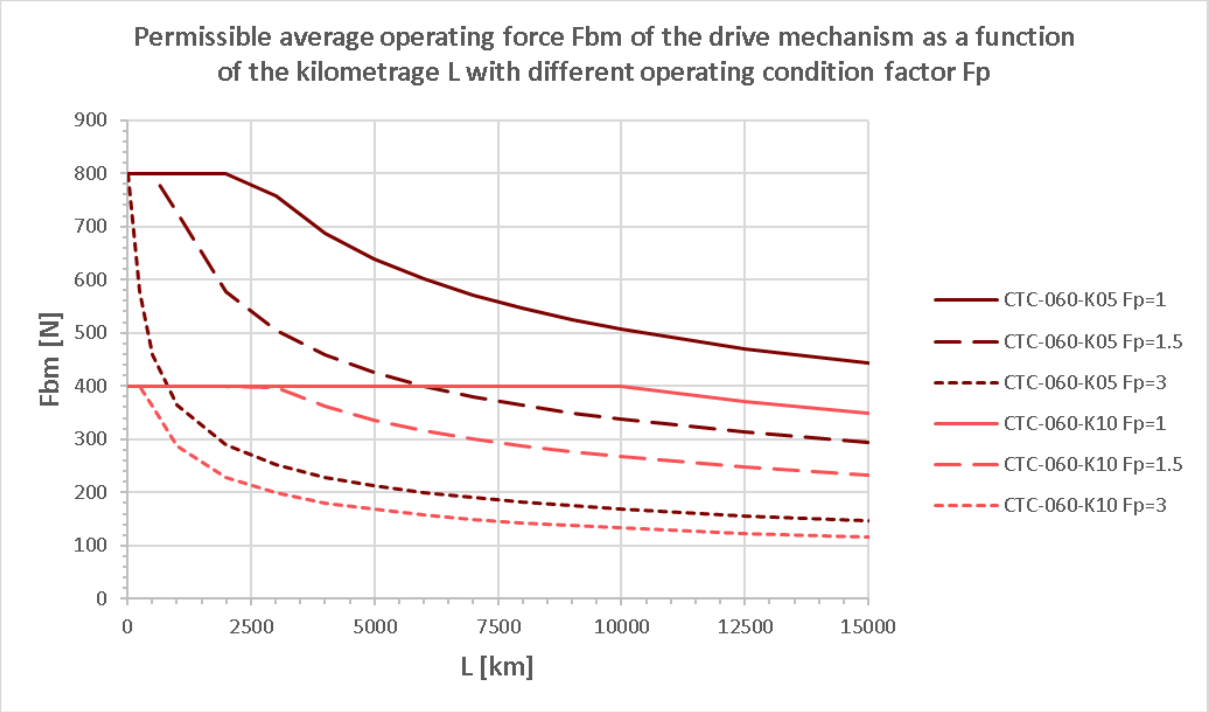




Stroke Speed



Lifetime Characteristic * of the drive mechanism **



Operating condition factor Fp:

Fp = 1	*Operation under ideal conditions*
Fp = 1.5	*Operation under normal conditions*
Fp = 3	*Operation with high impact and vibration or short stroke application (stroke < 100 mm)*

* *Failure probability 10%*

** *Ball screw and its bearing*

Relubrication interval

The relubrication interval depends on the mileage of the cylinder. This is divided into the following gradations:

1: Continuous operation: Relubrication interval by number of kilometers
2: Medium mileage: Relubrication interval by number of months
3: Low Mileage: Relubrication interval per year

		1	2	3			
Stroke	**Spindle Type and pitch**	**Continuous operation > 3600 strokes / h**	**Medium mileage 10 – 3600 strokes / h**	**Low Mileage < 10 strokes / h**	**quantity per lubrication**	**Number of strokes per quantity**	**number of repetitions**
[mm]	**K[mm/Rev]**	**[km]**	**[every N Months]**	**[1/Year]**	**[cm3]**	**[1]**	**[1]**
100 - 300	K05	250	3	1	0.6	6	2
	K10	500					
	K20	1000					
400 – 600	K05	250	3	1	1.2	6	2
	K10	500					
	K20	1000					
600 - 1000	K05	250	3	1	1.2	6	3
	K10	500					
	K20	1000					

Relubrication of short stroke applications

Please note: For short-stroke applications, less than 100 mm travel, lubrication runs must be made in addition to the regular relubrication intervals listed in the table.
At least four trips must be made every two months over the entire stroke distance to distribute the lubricant regularly.

Tightening torques of screws

Thread	Tightening torque for mounting holes	Minimal screwing depth
M5	4.8 Nm (+/- 10%)	7.5 mm
M6	8.0 Nm (+/- 10%)	9.0 mm

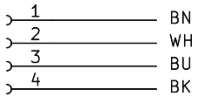
Version	Tightening torque for piston rod thread	Minimal screwing depth
-A	20.0 Nm (+/- 10%)	5.0 mm
-I	8.0 Nm (+/-10%)	6.0 mm

Electrical Connection of the Drive

Power

Plug M12x1, 4-pole
T-coded according to EN 61076-2-11

On the device

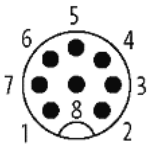


Connecting cable

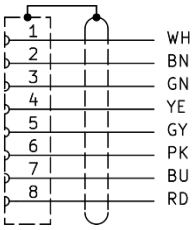
Pin	Color	Function
1	BN	Power voltage 24 V - 48 V ± 15% (max. 10 A) **
2	WH	Functional Earth (FE)
3	BU	GND (0 V)
4	BK	Reserved, do not connect

Signal

Plug M12x1, 8-pole
A-coded according to EN 61076-2-101 *



On the device



Connecting cable

Pin	Color	IO-Link	Digital
1	WH	IO-Link CQ	DO Ready
2	BN	Logic voltage 24 V ± 15% (max. 500 mA)	Logic voltage 24 V ± 15% (max. 500 mA)
3	GN		DO is extended
4	YE		DO is retracted
5	GY		DI Retract *
6	PK		DI Extend *
7	BU	GND (0 V)	GND (0 V)
8	RD		DI Teach / Reset / Powerless

* *Shielded cables are recommended*

** *The use of a brake chopper is recommended for 48 V*

IO-Link interface

Parameter	
Transfer rate	COM3
Cycle time	1.5 ms
IO-Link Specification	V1.1.3
Process data input (Slave -> Master)	Status Actual Position (in mm) Actual Speed (in mm/s) Actual Force (in N) - Total 14 Bytes -
Process data output (Master -> Slave)	Motion Mode Target Position (in mm) Override 1-3 (in %) - Total 8 Bytes -
Service data	Konfiguration, Diagnose, Statistik, Identifikation
IO-Link profile	Common Profile BLOB Transfer & Firmware Update