ET

Electro Thrust Cylinder

ET系列
电动缸

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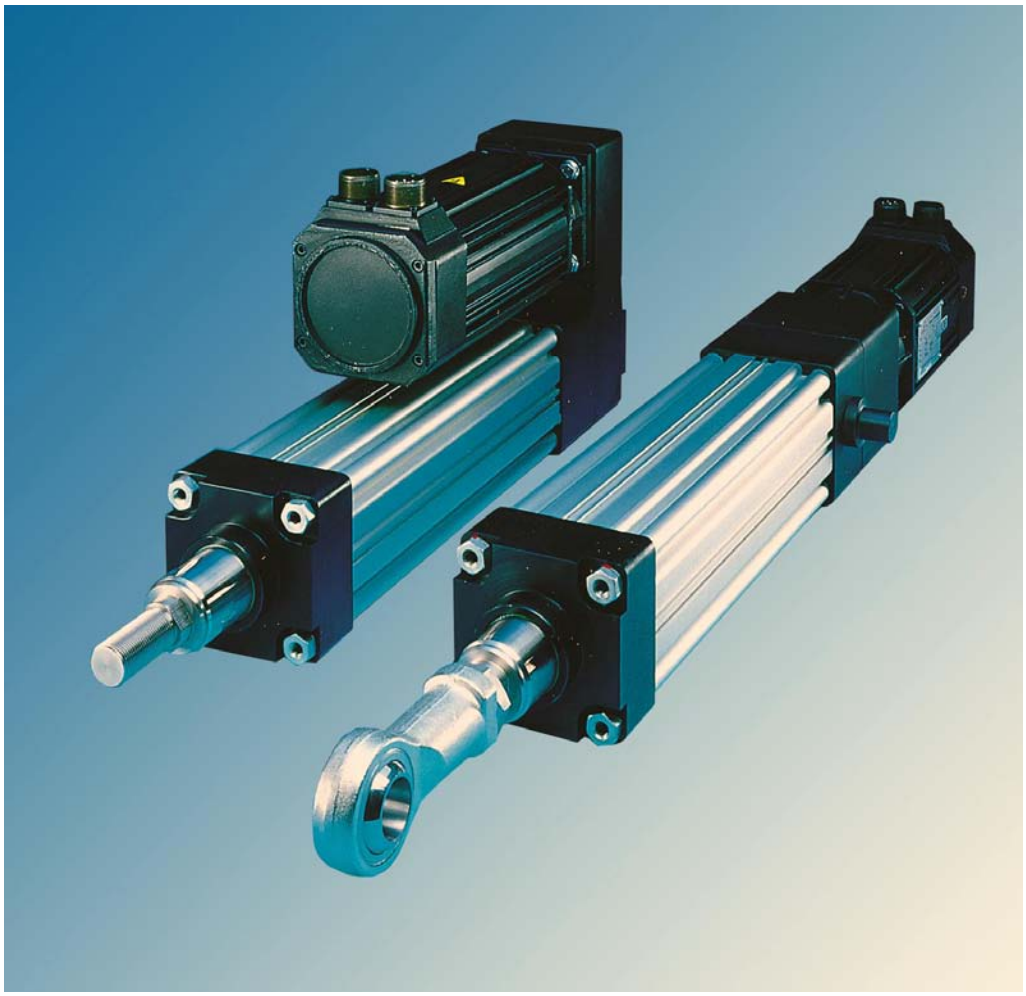

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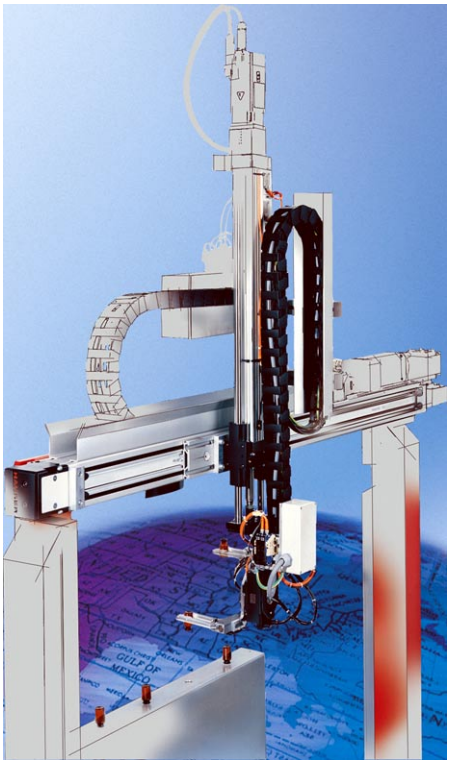
The ET Electro Thrust Cylinder

Contents

The ET Electro Thrust Cylinder:
Motion, positioning, material feed and setting



Product description

Typical fields of application:

The electro thrust cylinder closes the gap between pneumatic and hydraulic drives. Together with the wide choice of accessories, it offers many possibilities in the field of:

⇨ Material handling and feed systems,
- wood and plastic working industry
- vertical actuators for loading machine tools
- in the textile industry for tensioning / gripping textile fabrics
- in the automotive industry for transporting and feeding components

⇨ Testing equipment and laboratory applications

⇨ Valve and flap actuation

Performance / Technical data:

For precise motion, positioning, setting and actuating, the ET offers:

- High mechanical efficiency up to 90%
- Stroke up to 2400mm
- High traction/thrust force up to 44500N
- Repeatability ± 0.07mm (up to ± 0.01mm)
- Speeds up to 1.3m/s
- Timing belt drive (with parallel motor mounting) also available with transmission ratios
- Screw pitch from 5 to 50mm/rev
- 5 different sizes + ETV100 (V=longer service life)
- Available with servo or stepper motor drive

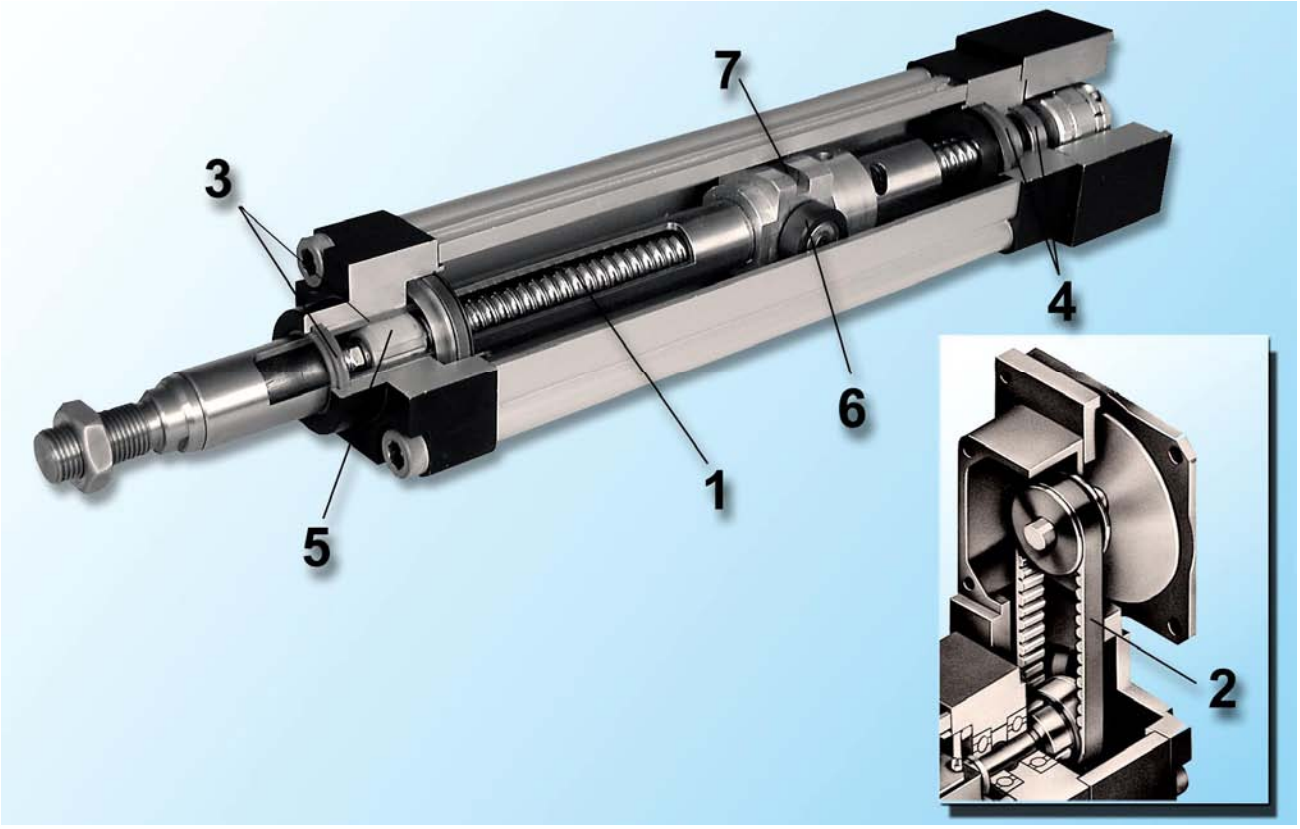
The technology:

⇨ Advantages of the ballscrew drive
- Smooth operation
- Low wear
- Low maintenance
- High efficiency
- long life
- High precision even at low speed, as hardly any stick-slip effect occurs
- High speeds are possible due to high efficiency and low heat generation

Direct drive

Parallel drive

Product design



(1) Ballscrew:

⇨ As a feed unit, a high-quality precision class C7 ballscrew is used.

⇨ The balls between spindle and nut ensure a low frictional resistance. This ensures an especially smooth operation over the entire speed range, high lifetime and an excellent efficiency. Smallest travels are possible due to a low stick-slip effect.

(2) Timing belt transmission:

⇨ The slip- and maintenance free timing belt transmission (only with parallel drive) has an excellent efficiency.

⇨ The transmission ratios 1:1, 1:1.5, 1.5:1 and 2:1 are available.

(3) Linear sliding bearing:

⇨ The extra long cylinder rod bearing allows high side load forces. A wiper ring prevents the ingress of external contamination under normal conditions. In the event of fine dust, a high amount of dirt as well as muds and liquids, special sealing is required, which is available on request.

(4) rear screw bearing:

⇨ The screw bearing on the drive side accepts high axial and radial forces. It consists of two interlinked tapered roller bearings which accept the thrust and traction forces of the cylinder.

(5) Front screw bearing:

⇨ The front screw support bearing is supported by a polymer sliding bearing. This eliminates vibrations and run-out. This increases the precision, dynamic behaviour and lifetime of the screw.

(6) Anti-rotation device

⇨ The integrated anti-rotate mechanism, with three Nylatron NS wheels prevents the rod-rotation and can absorb minor torsional movements.

(7) Permanent magnet

⇨ All electro thrust cylinders are equipped with a permanent magnet integrated into the screw nut. The permanent magnet actuates the sensors, which can be mounted in the longitudinal grooves of the cylinder body.

IP65 rating

The IP65 version is intended for the use under difficult environmental conditions, if the drives must be cleaned with liquids or for use in dusty or wet environments. Depending on the medium, the sealing system might need adaption. It is therefore necessary, to contact us to discuss the application.

- ⇨ Available for the sizes ET_32, 50, 80 and 100.
- ⇨ Polyester/polyurethane coated cylinder body
- ⇨ Special dual piston rod seal
- ⇨ All external fixings in corrosion resistant materials
- ⇨ Accessories are available in corrosion resistant steel as an option.
- ⇨ Use of the standard position sensors

Special designs

The following special features are available on request:

- ⇨ Class C5 precision screws
- ⇨ Customer-specific screw pitches
- ⇨ blow valve
- ⇨ Splash lubrication of the screw for high-duty applications
- ⇨ Customized mountings and rod ends
- ⇨ Mounting of customer motors
- ⇨ Preparation of the cylinder for use under aggressive environmental conditions

Technical data

In this chapter you can read about:

Technical data with safety factor S=1 taken into consideration. Temperature range from 0°C to +60°C. Max. permissible air humidity: 90% - the dew point may not be reaced at the cylinder! The technical data apply under normal conditions and only for the individual operating and load mode. In the case of compound loads, it is necessary to verify in accordance with normal physical laws and technical standards whether individual ratings should to be reduced. In case of doubt please contact Parker Hannifin.

Technical data ET_32, ET_50, ET_80

Cylinder size	Units	ET_32		ET_50			ET_80		
Type		**M05**	**M10**	**M05**	**M10**	**M16**	**M05**	**M10**	**M25**
Screw									
Screw pitch	mm	5	10	5	10	16	5	10	25
Screw diameter	mm	12		16			25		
Screw Length with zero stroke									
Parallel drive	mm	174.7	174.7	200.3	203.1	207.1	227.0	245.5	252.4
Direct drive	mm	160.7	160.7	190.7	193.7	197.7	211.2	229.8	236.6
Travels, speeds and accelerations [1]									
Available strokes	mm	continuous, from 50-750		continuous, from 50-1000			continuous, from 100-1500		
Max. permissible speeds at a stroke =									
50-300mm	mm/s	420	840	320	730	1170	270	540	1340
450mm	mm/s	420	840	320	630	1000	270	540	1340
600mm	mm/s	270	540	320	630	1000	270	540	1340
750mm	mm/s	190	380	230	450	720	270	540	1340
1,000mm	mm/s	-	-	150	300	470	210	420	1040
1,250mm	mm/s	-	-	-	-	-	150	290	720
1,500mm	mm/s	-	-	-	-	-	110	210	530
Max. acceleration	m/s^2	3	6	3	6	10	3	6	10
Forces [2]									
Max. traction/thrust force	N	600		3300			8300		
Weight and mass moments of inertia									
Weight of basic unit without stroke	kg	1.3		2.3			6.8		
Weight of additional length	kg/m	3		6			10		
Mass moment of inertia J_0 refers to the drive shaft without stroke for i=1, for i ≠ 1 applies: $J_{total}=[J_0(i=1)+J_H(i=1)] / i^2$									
Parallel drive	$kgm^2 10^{-4}$	0.042	0.044	0.554	0.576	0.605	1.289	1.353	1.428
Direct drive	$kgm^2 10^{-4}$	0.025	0.027	0.129	0.158	0.187	0.748	0.811	0.887
Mass moment of inertia J_H refers to the drive shaft per meter of additional length for i=1;									
Drive parallel/direct	$kgm^2 10^{-4}$ /m	0.166	0.185	0.516	0.540	0.568	3.020	3.060	3.320

1 Please contact us if you wish to work at higher speeds or at operation times >80%!
2 Values refer to the maximum permissible cylinder load. Please do also respect the "life time curve"! With parallel drive, the maximum thrust/traction force is limited by the timing belt, see "transmissible torques at parallel drive"

ET_32, ET_50, ET_80 available for servo motor or stepper motor mounting

Technical Data general

Precision and backlash

Repeatability	mm	±0.07 (up to ± 0.01)
Reversing play	mm	0.02 with inline drive/0.025 with parallel and reverse drive

Efficiency

Direct drive	%	90
Parallel drive	%	81

Ratios

Ratios		1:1 (inline or parallel drive); 1.5:1 (parallel drive-transmission to slow); 2:1 (parallel drive-transmission to slow); 1:1.5 (parallel drive – transmission to fast only with ET_32)

Technical data ETB100, ETV100 (increased service life), ETB125

Cylinder size	**Units**	**ETB100**				**ETV100**		**ETB125**			
Type		**M05**	**M10**	**M20**	**M40**	**M05**	**M10**	**M05**	**M10**	**M20**	**M50**

Screw

Screw pitch	mm	5	10	20	40	05	10	5	10	20	50
Screw diameter	mm	40				40		50			
Screw Length with zero stroke											
Parallel drive	mm	332.2	352.0	370.0	380.0	362.7	403.5	359.0	389.0	389.0	412.0
Direct drive	mm	309.4	329.2	347.2	357.2	339.9	380.7	400.5	430.5	430.5	453.5

Travels, speeds and accelerations [1]

Available strokes	mm	continuous,from 100-1500						continuous,from 100-2400			
Max. permissible speed at stroke =											
50-300mm	mm/s	170	340	670	1340	170	340	140	270	540	1340
450mm	mm/s	170	340	670	1340	170	340	140	270	540	1340
600mm	mm/s	170	340	670	1340	170	340	140	270	540	1340
750mm	mm/s	170	340	670	1340	170	340	140	270	540	1340
1,000mm	mm/s	170	340	670	1340	170	340	140	270	540	1340
1,250mm	mm/s	170	340	670	1340	170	340	140	270	540	1340
1,500mm	mm/s	160	310	610	1220	160	310	140	270	540	1340
1,600mm	mm/s	-	-	-	-	-	-	140	270	540	1340
1,800mm	mm/s	-	-	-	-	-	-	140	270	530	1330
2,000mm	mm/s	-	-	-	-	-	-	120	230	450	1100
2,200mm	mm/s	-	-	-	-	-	-	100	190	380	950
2,400mm	mm/s	-	-	-	-	-	-	90	170	330	820
Max. acceleration	m/s^2	3	6	6	10	-	-	3	6	6	10

Forces [2]

Max. traction/thrust force	N	21200	21200	44500

Weight and mass moments of inertia

Weight of base unit with zero stroke	kg	14.8				16.6		30			
Weight of additional length	kg/m	20				20		37			
Mass moment of inertia J_0 refers to the drive shaft without stroke for i=1, for i ≠ 1 applies: $J_{total}=[J_0(i=1)+J_H(i=1)] / i^2$											
Parallel drive	$kgm^2 10^{-4}$	7.083	7.492	8.183	9.189	8.669	9.479	34.701	34.847	35.432	39.527
Direct drive	$kgm^2 10^{-4}$	4.018	4.427	5.177	6.124	4.421	5.231	33.644	33.790	34.375	38.471
Mass moment of inertia J_H refers to the drive shaft per meter of additional length for i=1;											
Drive parallel/direct	$kgm^2 10^{-4}$ /m	19.780	19.860	20.164	21.380	19.780	19.860	48.216	48.364	48.957	53.120

[1] Please contact us if you wish to work at higher speeds or at operation times >80%!

[2] Values refer to the maximum permissible cylinder load. Please do also respect the "life time curve"! With parallel drive, the maximum thrust/traction force is limited by the timing belt, see "transmissible torques at parallel drive"

ET_100, ETV100, ET_125 available for operation with servo motor drive

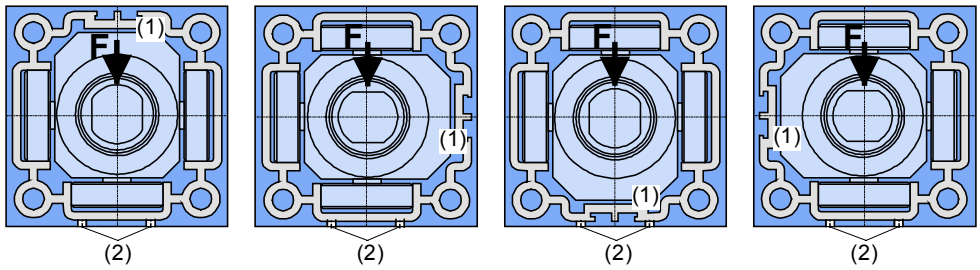
Permissible side loads

The electro thrust cylinder disposes of a generously dimensioned cylinder rod bearing together with 3 Nylatron NS wheels which prevent the rod rotation. Thanks to this system, the cylinder is able to accept a certain side load. Please note that the load bearing capacity increases with a longer stroke, as the distance between the bearings becomes longer. In order to reach the required load values in a given application, it can be useful to select a cylinder with a longer stroke than necessary for the application.

Example: An ET_50 with 200mm stroke can accept a lateral force of 72N in fully extended state.
An ET_50 with 300mm stroke can however, if only 200mm are extended, accept a lateral force of 166N.
If your application equires an even higher load bearing capacity, you can fortify the cylinder with the rod guiding system available as an option (not for ETB125).

Lateral load – profile orientation

Profile orientations – view on the thrust rod			
Standard	**A**	**B**	**C**
12 hrs	3 hrs	6 hrs	9 hrs



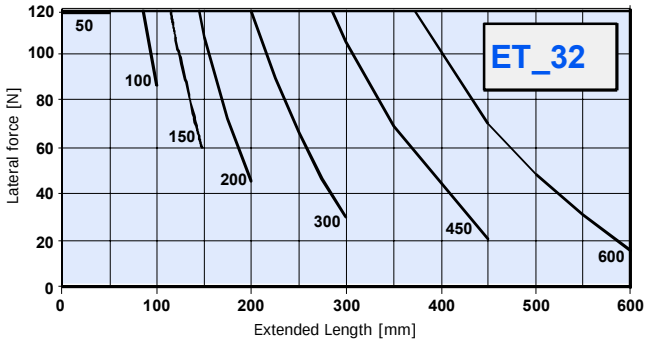
(1:) Sensor mounting grooves: on ET_32, 50 and 80 only on one side, on ET_100 and ETB125 on all sides.
(2): Thread for foot mounting
F: Lateral force

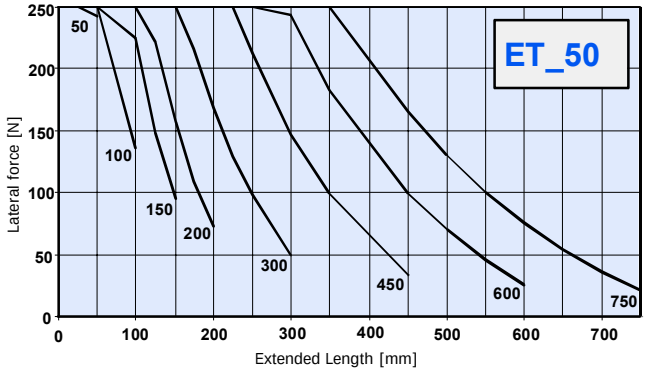
- with standard and B profile orientation the lateral force is accepted by two rollers, with A and C profile orientation, only by a single roller.
- If the lateral force F does not apply, as in the drawing, from above or below but from the right or the left, the opposite of the above description applies!

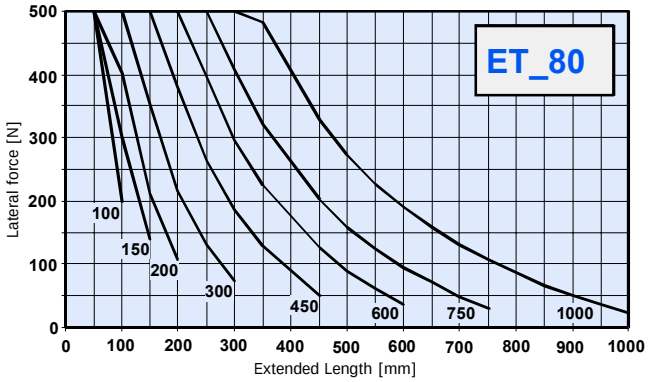
The profile orientation of ET_32, 50 and 80 does also determine the mounting position of the sensors and does therefore also influence the mounting position of the motor. At the same time, the profile orientation defines the position of the lubrication bore.

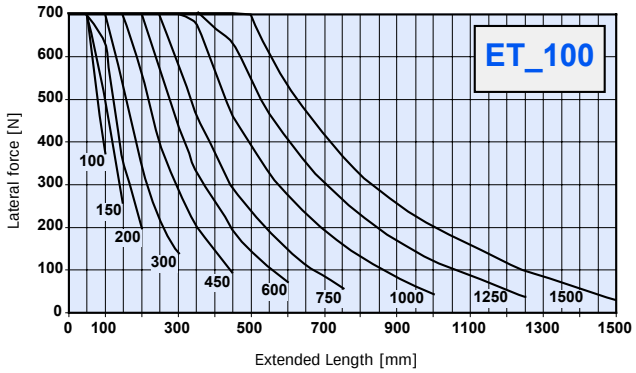
Lateral forces may reduce the lifetime of the cylinder. If you want to exploit the maximum possible lateral force at 100%, you will have to reduce the duty cycle to 40% or you can only exploit 40% of the max. possible lateral force if you want to operate at a 100% duty cycle.

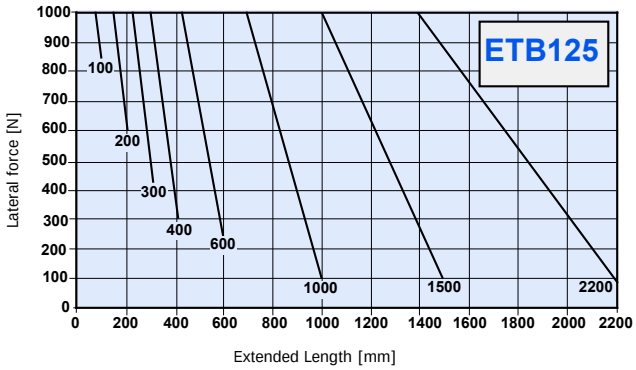
The curves given here are only valid for a profile orientation of 12 hrs (standard) and 6 hrs (B), if the lateral force applies from above or from below. With profile orientation 3 hrs and 9 hrs (A and C), the permissible lateral load is halved!











Thrust force factor and breakaway torque

The following table shows the resulting thrust or traction per 1Nm of torque at the screw, taking the efficiency, belt transmission ratio and screw pitch into consideration. The table can be used for a rough calculation of the drive dimensioning. The exact dimensioning of the drive must take the screw mass moment of inertia into consideration!

The "L" or **"P"** stands for the motor mounting **L** = direct (in-line), **P** = all parallel or reverse motor positions
"A" stands for a ratio of i = 1:1, **"B"** for i =1.5:1, **"D"** for i = 2:1, **"Z"** for i = 1:1.5.

Example: ET_32 (size) M04 (screw pitch) L (motor mounting) A (ratio)

ET_32	Thrust force factor [N/Nm]	Breakaway torque for the drive [Nm]
ET_32-M05LA	1130	0.2
ET_32-M05PA	1015	0.2
ET_32-M05PZ	675	0.4
ET_32-M10LA	565	0.3
ET_32-M10PA	510	0.3
ET_32-M10PZ	335	0.4
ET_50		
ET_50-M05LA	1130	0.4
ET_50-M05PA	1015	0.4
ET_50-M05PB	1525	0.3
ET_50-M05PD	2035	0.2
ET_50-M10LA	565	0.5
ET_50-M10PA	510	0.6
ET_50-M10PB	765	0.4
ET_50-M10PD	1015	0.3
ET_50-M16LA	353	0.5
ET_50-M16PA	317	0.6
ET_50-M16PB	476	0.4
ET_50-M16PD	635	0.3
ET_80		
ET_80-M05LA	1130	0.5
ET_80-M05PA	1015	0.6
ET_80-M05PB	1525	0.4
ET_80-M05PD	2035	0.3
ET_80-M10LA	565	0.6
ET_80-M10PA	510	0.7
ET_80-M10PB	765	0.4
ET_80-M10PD	1015	0.3
ET_80-M25LA	225	0.9
ET_80-M25PA	205	1.0
ET_80-M25PB	305	0.7
ET_80-M25PD	405	0.5
ET_100		
ET_100-M05LA	1130	0.5
ET_100-M05PA	1015	0.6
ET_100-M10LA	565	0.6
ET_100-M10PA	510	0.7
ETB100-M20LA	283	0.7
ETB100-M20PA	255	0.8
ETB100-M40LA	140	0.9
ETB100-M40PA	125	1.0
ETB125		
ETB125-M05LA	1130	2.6
ETB125-M05PA	1107	2.9
ETB125-M10LA	565	3.0
ETB125-M10PA	508	3.3
ETB125-M20LA	283	3.4
ETB125-M20PA	255	3.8
ETB125-M50LA	113	3.8
ETB125-M50PA	102	4.2

Transmissible torques in parallel drive mounting

The table shows the torques that can be transmitted by the timing belt.

Please do also respect the maximum permissible thrust/traction force:
ET_32, 50, 80 (see on page 6), **ET_100, ETB125** (see on page 7).

For the conversion you can use the **thrust force factor table** (see on page 10)

The "L" or **"P"** stands for the motor mounting **L** = direct (in-line), **P** = all parallel or reverse motor positions
"A" stands for a ratio of i = 1:1, **"B"** for i =1.5:1, **"D"** for i = 2:1, **"Z"** for i = 1:1.5.

Motor / gear type																			Transmissible motor torque [Nm]							
		Stepper motor motor code			Servo motor motor code									Gear code						Speed at the drive shaft [rpm]							
		20	30	40	37	47	57	67	77	87	J4	J5	J6	J7	P3	P4	P5	P7	N6	N8	100	500	1000	1500	2000	2500	3000	3300
ET_32	PA	X				X															1.68	1.35	1.09	0.92	0.84	0.75	0.68	0.65
	PZ	X				X															1.22	0.99	0.82	0.72	0.63	0.57	0.53	0.50
ET_50	PA	X			X																2.80	2.19	1.73	1.42	1.27	1.12	1.01	0.99
	PB	X						X													1.93	1.55	1.25	1.04	0.94	0.84	0.76	0.73
	PD	X																			1.43	1.16	0.94	0.80	0.73	0.66	0.60	0.57
	PA		X				X	X											x		3.64	2.93	2.39	2.10	1.85	1.67	1.53	1.38
	PB		X				X														2.40	1.96	1.62	1.44	1.28	1.17	1.08	0.99
ET_80	PA		X																		7.07	5.55	4.39	3.77	3.22	2.84	2.52	2.20
	PB		X																		5.08	4.04	3.25	2.83	2.46	2.21	2.00	1.78
	PD		X																		3.64	2.93	2.39	2.10	1.85	1.67	1.53	1.38
	PA			X	X			X	X		X				x				x	x	13.4	10.6	8.43	7.16	6.11	5.40	4.79	4.18
	PB			X	X			X	X						x				x		9.66	7.69	6.18	5.38	4.68	4.19	3.79	3.38
	PD				X			X											x		6.91	5.57	4.54	4.01	3.51	3.18	2.91	2.65
ET_100	PA								X	X		X	X			x	x			x	61.2	37.1	32.6	30.4	28.5	27.6	25.9	24.8
ETB125	PA									X			X	X			x	x			91.0	81.0	77.0	72.0	71.0	--	--	--

Motor / gear codes: **Order code** (see on page 26)

Nominal lifetime and lubrication cycles

Nominal lifetime of ballscrew and rear screw bearing

The lifetime depends strongly on the degree of power exploitation and on impermissible operating states occurring – even if only for a short time -. The lifetime of the stripper depends strongly on the frequency and speed of motion, especially in connection with lateral forces (danger of heating) as well as the amount of contamination.

Prerequisite:

- ⇨ Bearing and screw temperature between 20°C and 40°C
- ⇨ no affectation of the lubricant, for example by external particles
- ⇨ lubrication conform to the specifications
- ⇨ the given values for thrust force, speed and acceleration must be adhered to at any rate.
- ⇨ no contact to mechanical end stops (external or internal) and no other abrupt loads
- ⇨ no lateral forces are being applied to the cylinder rod
- ⇨ no short stroke (stroke smaller than 2.5 x screw ptich)
- ⇨ no vibration at standstill or at very low speed
- ⇨ no high exploitation of several power features at a time (for example maximum speed or thrust force)

only under these circumstances, the service life corresponds to the nominal lifetime

Determination of the medium dynamic axial load:

If the load on the ballscrew is varying, the lifetime must be determined with the aid of the medium dynamic axial load. The medium dynamic axial load is determined as follows in the event of cascaded load changes:

$$F_m = \sqrt[3]{\frac{1}{L} \cdot (Fa_1^3 \, l_1 + Fa_2^3 \, l_2 + \ldots + Fa_n^3 \, l_n)}$$

F_m = medium dynamic axial load [N]
F_{an} = varying load [N]
l_n = travel under a defined load F_n [mm]
L = total travel [mm]

If you need the lifetime as the number of possible cycles, just divide the lifetime in kilometers by twice the stroke traveled.

The application factor fw

The application factor has a strong influence on the lifetime of a screw.

The application factor can be roughtly determinedd with the aid of the following table:

Load from vibration, shock, temperature, dirt	Screw speed	fw
light	n < 500 rpm	1.0 - 1.5
Medium	500 < n < 2000 rpm	1.5 - 2.0
high	2000 < n < 3300 rpm	2.0 - 3.5

Lifetime calculation:

$$Ln\,(fw) = \frac{Ln(fw=1.0)}{fw^3}$$

Ln: Nominal lifetime

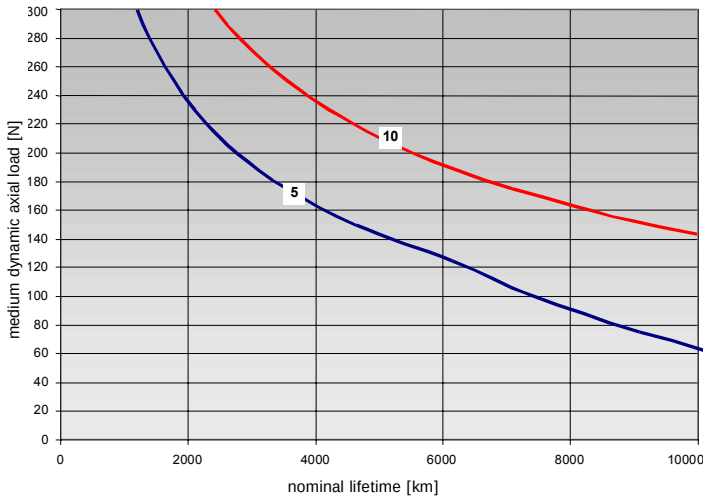
Ln (fw=1.0): see lifetime diagrams

fw: application factor

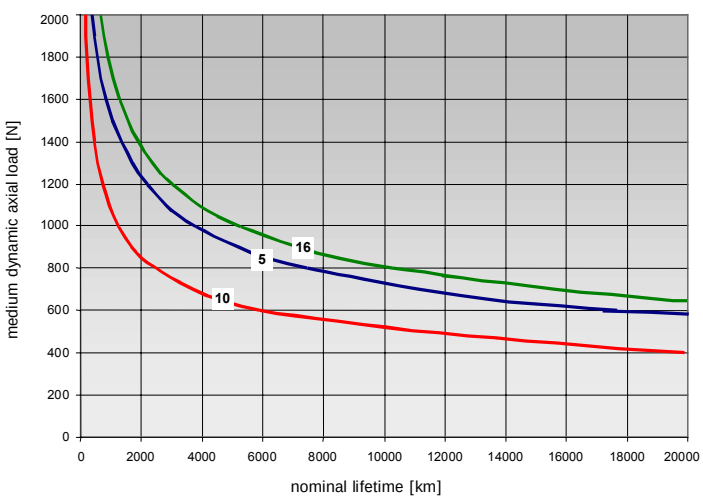
Lifetime diagrams

The screw lifetime is calculated with the factor fw=1.0.

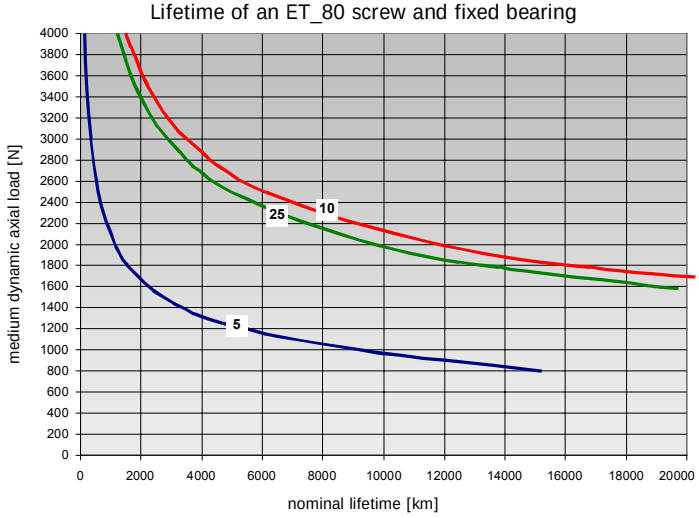
Lifetime of an ET_32 screw and fixed bearing



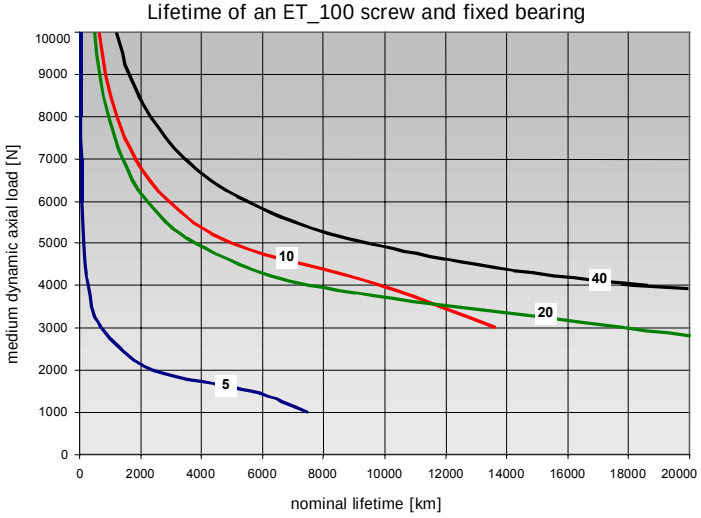
Lifetime of an ET_50 screw and fixed bearing



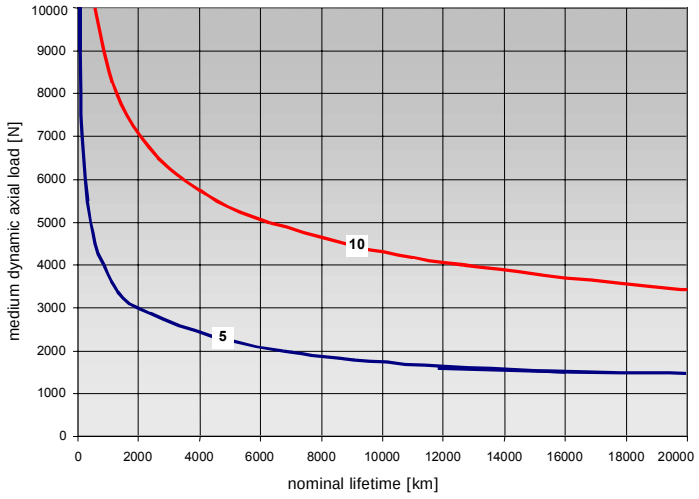
Lifetime of an ET_80 screw and fixed bearing



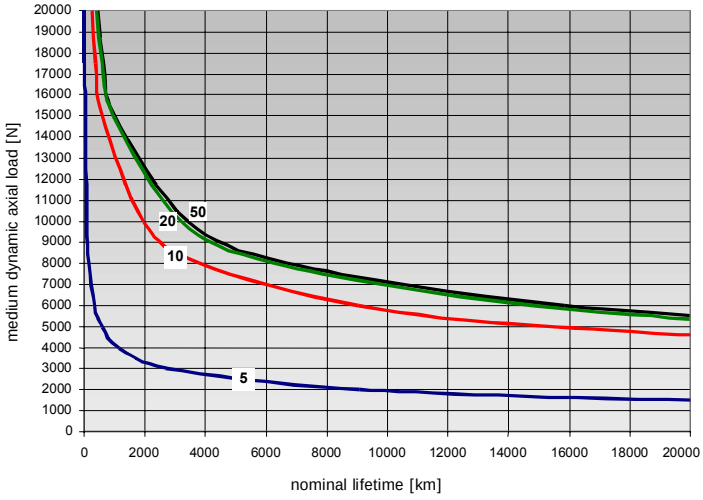
Lifetime of an ET_100 screw and fixed bearing



Lifetime of an ETV100 screw and fixed bearing



Lifetime of an ETB125 screw and fixed bearing



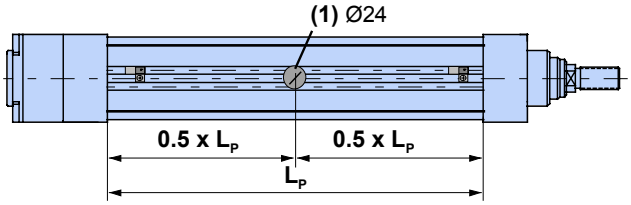
Designation: 5 = 5mm, 10 = 10mm screw pitch etc.

Lubrication interval for the ballscrew drive

All sizes have a lubrication bore in the cylinder body (in the middle of the aluminium profile), which permits to lubricte the screw nut.

On the ET_32, 50 and 80 cylinders, this bore can be found at the same side as the sensor mounting grooves. Free access to this bore – even after integration of the cylinder into a system – can be ensured by choosing the corresponding **profile orientation** (see on page 8).

The necessary lubrication intervals depend on the application.

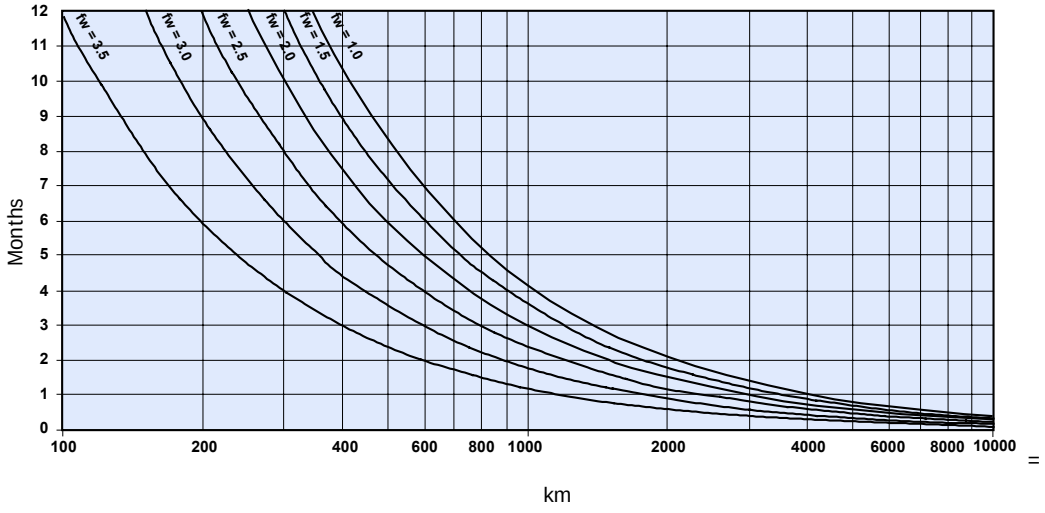


(1): Lubrication bore

LP: Length of profile

Greatest interval with an application factor of fw = 1.0:

⇨ 12 months or 350km, depending on which value is first reached.



Lubrication intervals for the screw bearing

The lubrication interval ist half the grease service life:

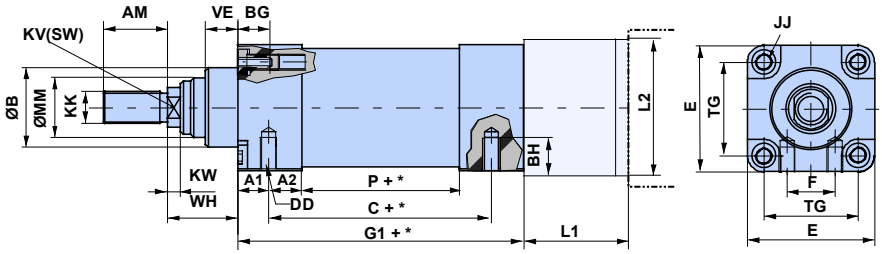
ETV100 - M05 (increased service life)	- Lubrication after approx. 4,000km
ETV100 - M10 (increased service life)	- Lubrication after approx. 7,000km
ETB125 - M05	- Lubrication after approx. 2,000km
ETB125 - M10	- Lubrication after approx. 3,000km
ETB125 - M20	- Lubrication after approx. 6,000km
ETB125 - M50	- no lubrication necessary up to 20,000km

ET_32 to ETB100 are not lubricated at the **screw support bearing**.

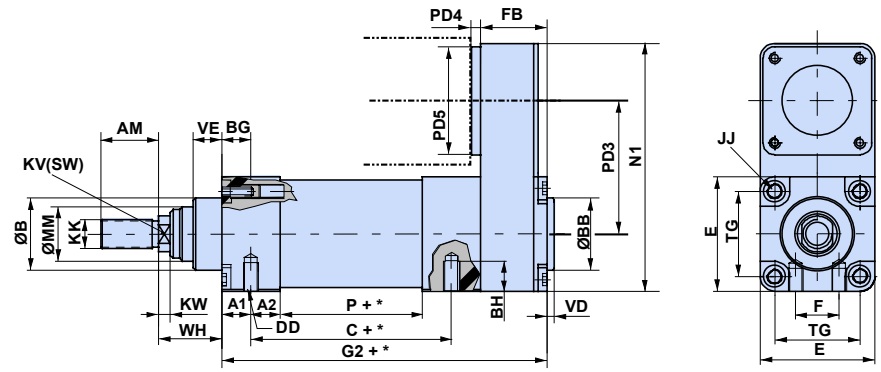
Dimensions

Stated in mm

Electro thrust cylinder – direct (in-line) motor mounting



Electro thrust cylinder – parallel motor mounting



ET (inline/parallel)

	A1	A2	AM	BG	BH	DD	E	F	JJ**	KK	KV	ØMM	TG	KW	N1	FB	VD	ØBB
ET_32	14	14	22	14.5	9	M6x1.0 (1)	46.5	16	M6x1.0	M10x1.25	10	18	32.5	5	106.4	37	4	30
ET_50	16	16	32	16	12.7	M8x1.25	63.5	24	M8x1.25	M16x1.5	17	25	46.5	6.5	139.4	39	4	40
ET_80	21	21	40	16	17.5	M10x1.5	95.3	30	M10x1.5	M20x1.5	22	35	72	10	191.3	57	5	45
ET_100	27.5	27.5	54	16	24	M12x1.75	114	50	M10x1.5	M27x2.0	27	50	89	13	254	79	4	55
ETB125	42.4	33	72	16	24	M16x2.0	139.7	64	M12x1.75	M36x2.0	41	70	110	13	334.5	127.1	7	60

** Thread "JJ" is not available in IP65 version for ET_32 and ET_50!
(1) If you wish to mount a component at the front screws (with thread II = M6x1), please provide for through holes with a diameter of at least 7mm at this component, even though this is not the common norm.

	Standard cylinder			IP65 rating		
	VE	WH	ØB	VE	WH	ØB
ET_32	13	26	30	40	50	46
ET_50	16	37	40	43	64	62
ET_80	20	46	50	55	81	68
ET_100	20	51	65	60	91	89
ETB125	20	68	90	On request		

Stroke dependent dimensions

		Standard cylinder				IP65 rating			
		C+*	G1+*	G2+*	P+*	C+*	G1+*	G2+*	P+*
ET_32	M05	112.5	140.5	176.7	84.5	115.7	143.7	179.9	84.5
	M10	112.5	140.5	176.7	84.5	115.7	143.7	179.9	84.5
ET_50	M05	128.4	160.4	199.5	96.4	131.6	163.6	202.7	96.4
	M10	131.4	163.4	202.5	99.4	134.6	166.6	205.7	99.4
	M16	135.4	167.4	206.5	103.4	138.6	170.6	209.7	103.4
ET_80	M05	129.5	173.0	228.3	86	132.7	176.2	231.5	86
	M10	148.1	191.6	246.9	104.6	151.3	194.8	250.1	104.6
	M25	154.9	198.4	253.7	111.4	158.1	201.6	256.9	111.4
ETB100	M05	201.5	259.7	335.5	132.1	204.7	262.9	338.7	132.1
	M10	221.3	279.5	355.3	151.9	224.5	282.7	358.5	151.9
	M20	239.3	297.5	373.3	169.9	242.5	300.7	376.5	169.9
	M40	249.4	307.6	383.4	179.9	252.6	310.8	386.6	179.9
ETV100	M05	222.3	290.2	366	143.1	225.5	293.4	369.2	143.1
	M10	263.1	331	406.8	183.9	266.3	334.2	410.0	183.9
ET125	M05	207.0	283.9	411.0	140.0	On request			
	M10	237.0	313.9	441.0	170.0				
	M20	237.0	313.9	441.0	170.0				
	M50	260.0	336.9	464.0	193.0				

+* =given Dimension + length of desired stroke **Definition of stroke** (see on page 16)

*Definition of stroke, travel and safety travel

Stroke: The stroke to be indicated in the order code is the maximum possible stroke between the internal end stops.

Working stroke: The travel is the distance which you need to move in your application. It is always shorter than the stroke.

Safety travels S1, S2: The safety travels are required to slow down the cylinder after it has passed a limit switch (Emergency stop, in order to avoid contact with the mechanical limit stops).

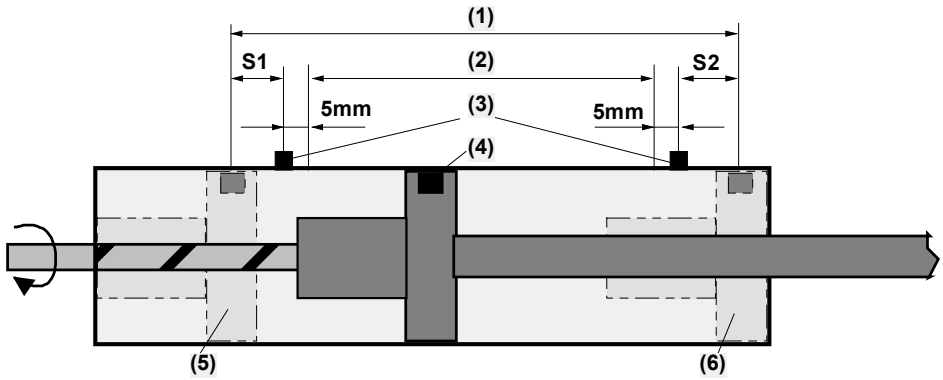
For vertical mounting, S1 and S2 must in general be different. The minimum safety travels given in the table are, according to experience, sufficient for most applications. With demanding applications (great masses and high dynamic), the safety travel has to be calculated and enlarged accordingly (dimensioning on demand).

Minimum safety travels

Cylinder	ET_32		ET_50			ET_80			ET_100				ETB125			
Type	M05	M10	M05	M10	M16	M05	M10	M25	M05	M10	M20	M40	M05	M10	M20	M50
S1 = S2	10	20	10	20	30	10	20	30	10	20	25	30	10	20	25	40

Recommended minimum safety travels with horizontal mounting position: Calculated for a load of up to 50% of the maximum permissible thrust/traction force and for a speed of up to 50% of the maximum permissible speed and under the condition that the drive is able to generate a corresponding braking torque.

Recommended safety travel = S1+S2+10mm



(1): Stroke
(2): Working stroke
(3): Initiators
(4): Magnet
(5): Retracted cylinder position
(6): Extended cylinder position

Help for the order statement: Stroke ≥ working stroke + 10mm + S1 + S2

This formula takes a distance between the software end limit and a limit switch of 5mm per side into consideration. The length of this distance depends on the controller used.

Possible motor mounting options

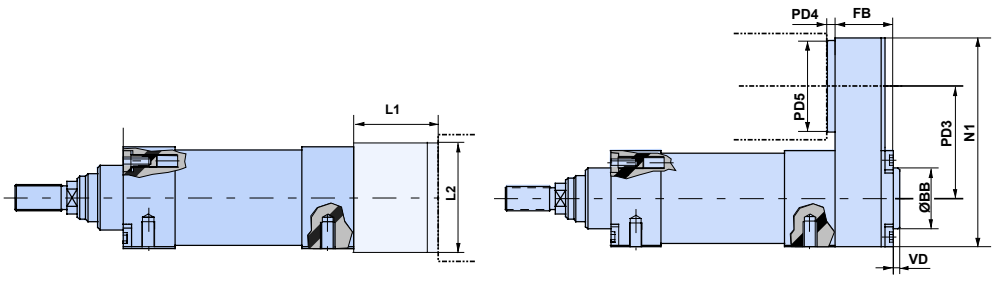
Motor / gear mounting, transmission ratios, dimensions

The "L" or **"P"** stands for the motor mounting **L** = direct (in-line), **P** = all parallel or reverse motor positions
"A" stands for a ratio of i = 1:1, **"B"** for i =1.5:1, **"D"** for i = 2:1, **"Z"** for i = 1:1.5.

	Prepared for motor / gear mounting	Mounting option transmission ratio						Dimensions in [mm]				
		LA	PA	PB	PD	PZ	Order code	direct L1	direct L2	parallel PD3(1)	parallel PD4	parallel PD5
ET...	for stepper motor mounting											
S32	**NEMA 23 (SY56)**	x	x			x	20	44.25	57.15	54.00	5.75	57.15
S50	**NEMA 23 (SY56)**	x	x	x	x		20	53.50	63.50	75.00	5.75	57.15
	NEMA 34 (SY83)	x	x	x			30	68.25	82.55	52.50	7.75	82.55
S80	**NEMA 34 (SY83)**	x	x	x	x		30	79.50	95.25	95.00	7.75	86.36
	NEMA 42 (SY107)	x	x	x			40	89.26	107.95	105.00	7.75	107.95
ET...	for servo motor / gear mounting											
B32	**NEMA 23 with 9.525mm shaft (i.e. SM23 with long shaft)**	x	x			x	20	61.10	57.15	54.00	5.75	57.15
	MH56-B5/9 or SMH60-B8/9	x	x			x	47*	49.80	57.15	54.00	5.75	57.15
B50	**NEMA 23 with 9.525mm shaft (i.e. SM23 with long shaft)**	x	x	x	x		20	66.50	63.50	75.00	5.75	57.15
	NEMA 34 with 1/2 inch shaft	x	x				30	68.25	82.55	82.50	7.75	82.55
	NEMA 34 with 14mm shaft		x				37	68.25	82.55	82.50	7.75	82.55
	MH70-B05/11 or SMH60-B05/11	x	x	x			57	59.00	69.80	82.50	8.74	76.20
	SMH82-B08/14	x	x				67	65.60	95.25	82.50	8.56	95.25
	P3 (planetary gear)	x					P3	83.00	72.00	--	--	--
	PE3 (planetary gear)	x	x				N6	69.50	90.00	82.5	2.00	72.15
B80	**NEMA 34 with 1/2 inch shaft (BE34)**	x	x	x	x		30	87.50	95.00	95.00	7.75	86.36
	NEMA 34 with 14mm shaft (MD3450/3475)	x	x	x	x		37	87.50	95.00	95.00	7.75	86.36
	SMH82-B8/14	x	x	x	x		67	85.75	95.25	95.00	10.75	95.25
	SMH82-B5/19 / SMH100-B5/19 / MH105-B5/19	x	x	x			77	99.00	107.95	107.50	10.00	107.95
	MH105-B9/19	x	x	x			J4	95.75	96.00	97.50	10.75	95.25
	P3 (planetary gear)	x	x	x			P3	105.25	95.00	95.00	19.00	82.00
	P4 (planetary gear)	x	x				P4	111.50	95.00	104.00	31.00	80.00
	PE3 (planetary gear)	x	x	x	x		N6	89.50	80.00	95.00	10.00	80.00
	PE4 (planetary gear)	x	x				N8	94.50	80.00	95.00	10.00	80.00
B100 V100	**SMH82-B5/19 / SMH100-B5/19 / MH105-B5/19**	x	x				77	107.50	107.95	140.00	11.50	107.95
	MH145-B5/24 or SMH142-B5/24	x	x				87	115.34	142.87	140.00	20.00	142.88
	MH105-B6/24 or SMH115-B7/24	x	x				J5	112.50	114.30	140.00	17.00	114.30
	HJ155	x	x				J6	128.25	152.40	140.00	20.00	142.88
	P4 (planetary gear)	x	x				P4	125.00	107.95	140.00	18.00	98.00
	P5 (planetary gear)	x	x				P5	158.00	120.65	140.00	40.00	114.00
B125	**MH145-B5/24 or SMH142-B5/24**	x	x				87	155.00	139.70	184.00	22.50	150.00
	HJ155	x	x				J6	155.00	140.00	184.00	28.50	155.00
	MH205-B5/38	x	x				J7	188.00	205.00	184.00	27.50	205.00
	P5 (planetary gear)	x	x				P5	195.00	139.70	184.00	32.50	150.00
	P7 (planetary gear)	x	x				P7	220.00	145.00	184.00	55.00	150.00

(1): PD3 = distance between spindle and motor shaft. Tolerance: ± 3mm, as the timing belt is tensioned over this distance!

*: SMH60 with encoder option (A6/7) cannot be connected to the ETB32 with parallel mounting!



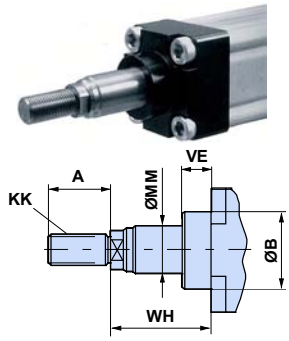
Accessories

In this chapter you can read about:

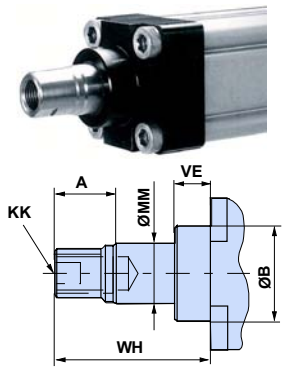
Stated in mm

Configuration of the thrust rod

External / internal thread

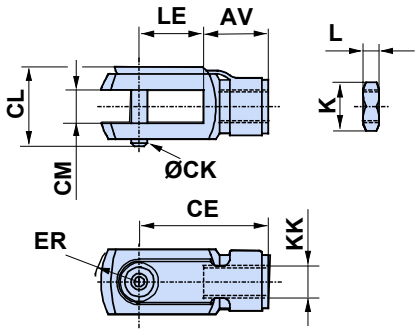


	External thread (delivery standard)								
				Standard cylinder			IP65 rating		
	A	KK	ØMM	VE	WH	ØB	VE	WH	ØB
ET_32	22	M10x1.25	18	13	26	30	40	50	46
ET_50	32	M16x1.5	25	16	37	40	43	64	62
ET_80	40	M20x1.5	35	20	46	50	55	81	68
ET_100	54	M27x2.0	50	20	51	65	60	91	89
ETB125	71.5	M36x2.0	70	20	68	90	-	-	-



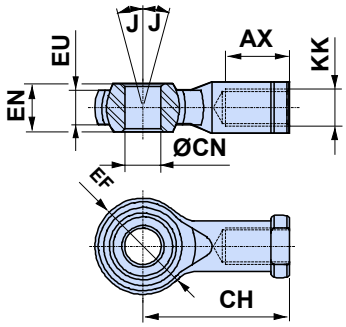
	Internal thread								
				Standard cylinder			IP65 rating		
	A	KK	ØMM	VE	WH	ØB	VE	WH	ØB
ET_32	14	M10x1.25	18	13	32	30	40	56	46
ET_50	24	M16x1.5	25	16	50	40	43	77	62
ET_80	29	M20x1.5	35	20	59	50	55	94	68
ET_100	40	M27x2.0	50	20	73	65	60	113	89
ETB125	50	M36x2.0	70	20	99.5	90	-	-	-

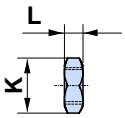
Rod clevis



	KK	CL	CM		LE	CE	AV	ER	ØCK (h11/E9)	K	L
ET_32	M10x1.25	26.0	10.2	+0.13 -0.05	20	40	20	14	10	17	5
ET_50	M16x1.5	39.0	16.2	+0.13 -0.05	32	64	32	22	16	24	8
ET_80	M20x1.5	52.5	20.1	+0.02 -0.0	40	80	40	30	20	30	10
ET_100	M27x2.0	72.0	30.0	+0.6 -0.2	54	110	56	35	30	41	10
ETB125	M36x2.0	83.0	35		72	144	72	50	35	55	14

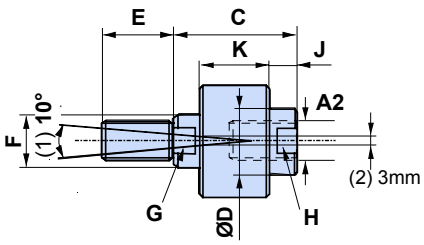
Spherical rod eye

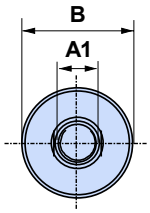




	ØCN (H9)	EN (h12)	EU	AX	CH	ØEF	KK	J°	K	L
ET_32	10	14	10.5	20	43	28	M10x1.25	13	17	5
ET_50	16	21	15.0	28	64	42	M16x1.5	15	24	8
ET_80	20	25	18.0	33	77	50	M20x1.5	14	30	10
ET_100	30	37	25.0	51	110	70	M27x2.0	15	41	10
ETB125	35	43	28.0	56	125	80	M36x2.0	15	55	14

Flexible coupling





For mounting at the extremity of the thrust rod

- Balances misalignments
- Enlarges the mounting tolerance
- Simplifies the cylinder mounting
- Increases the service life of the cylinder guidings
- Compensates the offset between components and relieves the guiding from lateral force influences
- The traction/thrust force bearing capacity is maintained

(1): Angle offset
(2): Axial offset
O2: Thread depth=E

	Type	A1	A2	B	C	ØD	E	F	G	H	J	K
ET_32	**LC32-1010**	M10x1.25	M10x1.25	40	51	19	19	16	13	16	13	26
ET_50	**LC50-1616**	M16x1.5	M16x1.5	54	59	32	29	25	22	29	14	33
ET_80	**LC80-2020**	M20x1.5	M20x1.5	54	59	32	29	25	22	29	14	33
ET_100	**LC100-2727**	M27x2.0	M27x2.0	89	102	51	51	38	32	43	19	64
ETB125	**LC125-3636**	M36x2.0	M36x2.0	102	112	57	57	44.5	38	49.3	22	70

Not listed in the cylinder order code, please order separately.

Mounting options

Rod guiding

The outrigger bearing unit performs the following tasks:

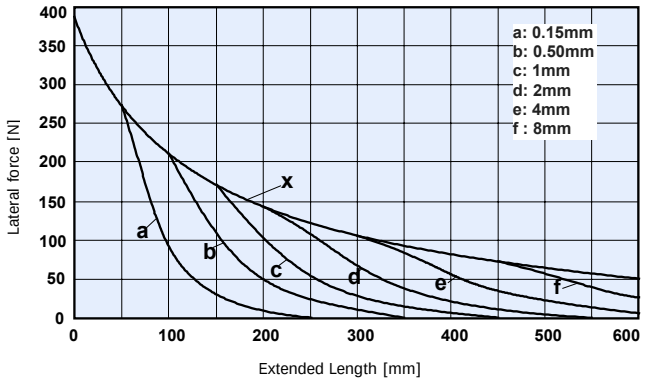
- ⇨ rotation protection for higher torques
- ⇨ Absorption of lateral forces
- ⇨ Relieves the cylinder of lateral forces

The additional stability and precision is ensured by 2 hardened steel guiding rods in connection with 4 linear ball bearings.

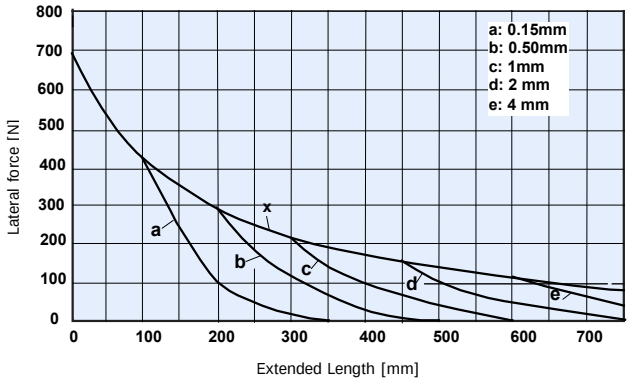
Not available for ETB125, not possible with IP65 rating

Rigidity of the cylinder with outrigger bearing

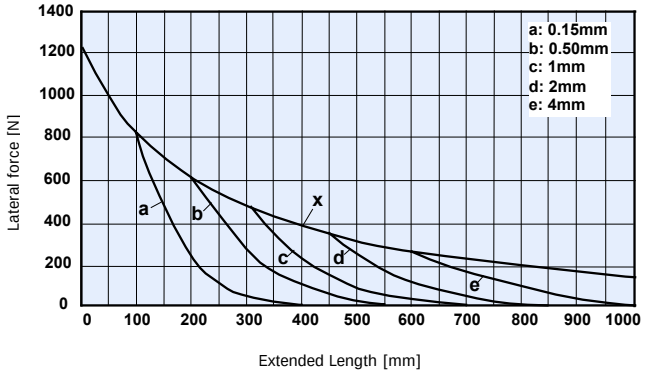
ET_32 with outrigger bearing



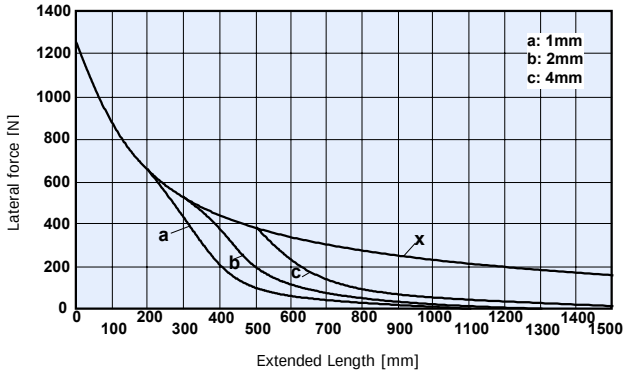
ET_50 with outrigger bearing



ET_80 with outrigger bearing

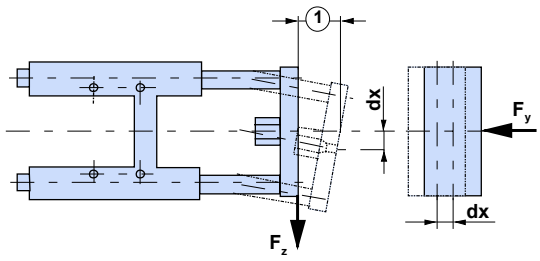


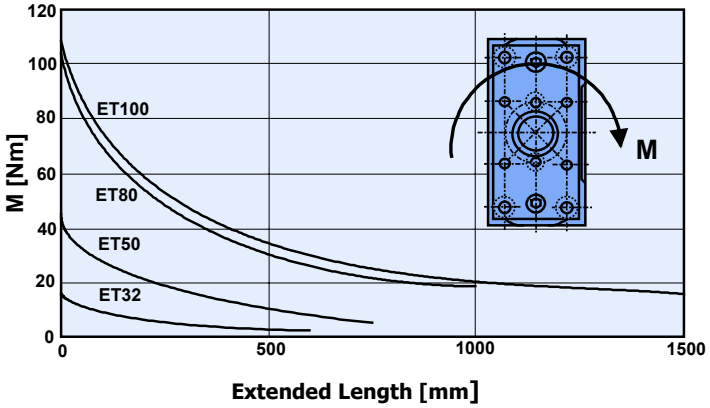
ET_100 with outrigger bearing



a, b, ...: deflection
x: Deflecion with maximum load

Deflection





(1): Stroke
dx: deflection
valid for F_z or F_y

M: Torsional load

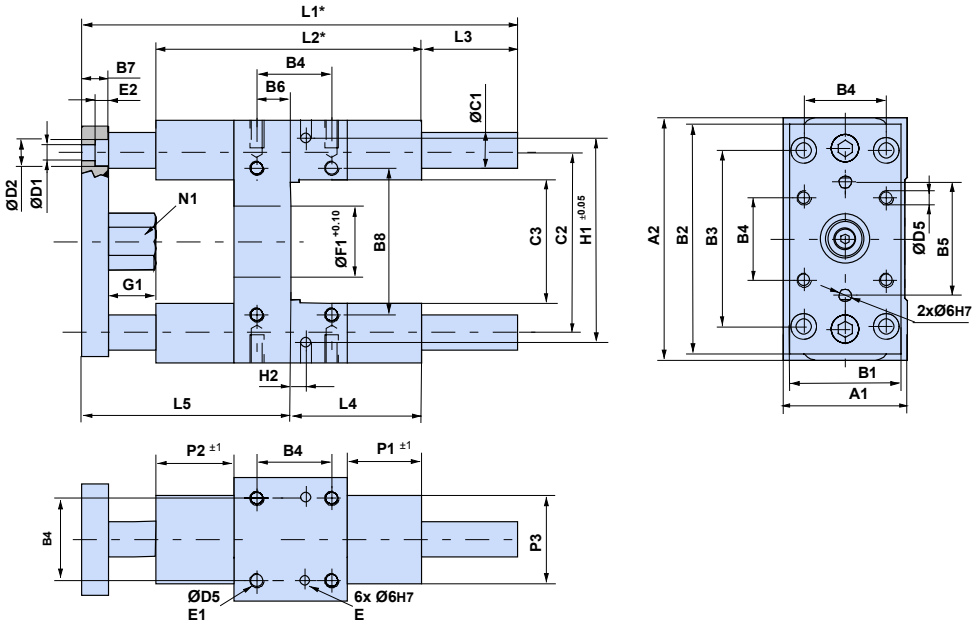
Dimensions of ET outrigger bearing

	ET_32	ET_50	ET_80	ET_100
Model	**32-2800R**	**50-2800R**	**80-2800R**	**100-2800R**
A1	50	70	105	130
A2	97	137	189	213
B1	45	63	100	120
B2	90	130	180	200
B3	78	100	130	150
B4	32.5	46.5	72	89
B5	50	72	106	131
B6	4	19	21	24.5
B7	12	15	20	20
B8	61	85	130	150
ØC1	12	20	25	25
C2	73.5	103.5	147	171.5
C3	50	70	105	130
ØD1	6.6	9	11	11
ØD2	11	14	17	17
ØD5	M6	M8	M10	M10
E (Depth)	10	10	10	10
E1 (Depth)	12	16	20	20
E2 (Depth)	7	9	11	11
ØF1	30	40	50	65
G1	17	27	32	55
H1	81	119	166	190
H2	11.7	4.2	15	20.5
L1+*	150	192	247	290
L2	120	150	200	220
L3+*	15	24	24	24
L4	71	79	113	128
L5	64	89	110	138
N1	17	24	30	38
P1	36	42	50	49
P2	31	44	52	51
P3	40	50	70	70
Mass	970g	2,560g	6,530g	8,760g
Additional mass / 100mm stroke	175g	495g	770g	770g

+* =given Dimension + length of desired stroke **Definition of stroke** (see on page 16)

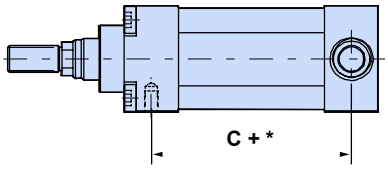
N1: Hexagon head, outrigger bearing not possible with IP65 rating! For the ET_100, a larger coupling piece is used (concerns G1 and N1)

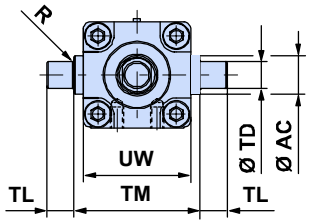
For the ET_80 and the ET_100, the standard pneumatic outrigger bearing modules cannot be used, ØF1 must be bored up to 50 mm for **ET_**80 (from 45mm) and to 65mm for ET_100 (from 55mm).



The hole pattern is suitable for Parker pneumatic modules, e.g. grippers and pivoting units

Centre trunnion mounting





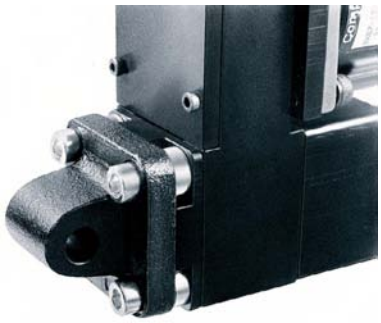
	C+*	UW	ØTD**	R	TL***	TM	ØAC
ET_32	**depending on the stroke** (see on page 15)	46.5	12	0.8	12	50	18
ET_50	**depending on the stroke** (see on page 15)	63.5	16	0.8	16	75	25
ET_80	**depending on the stroke** (see on page 15)	95.3	20	0.8	20	110	30
ET_100	**depending on the stroke** (see on page 15)	114.3	25	1.6	25	132.5	40
ETB125	**depending on the stroke** (see on page 15)	139.7	32	2.0	32	149.7	45

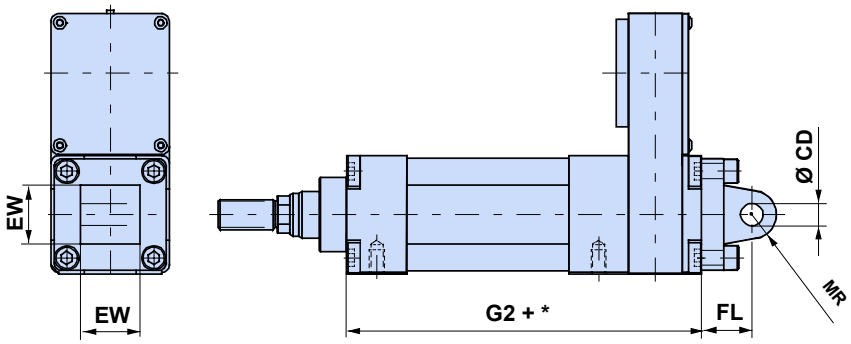
+* = given Dimension + length of desired stroke **Definition of stroke** (see on page 16)

**: ØTD according to ISO tolerance field h7

***: TL according to ISO tolerance field e9

Rear eye mounting



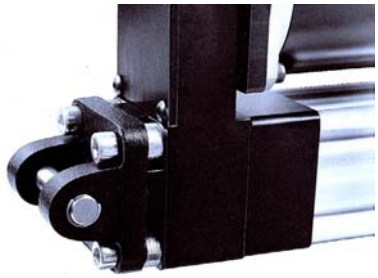


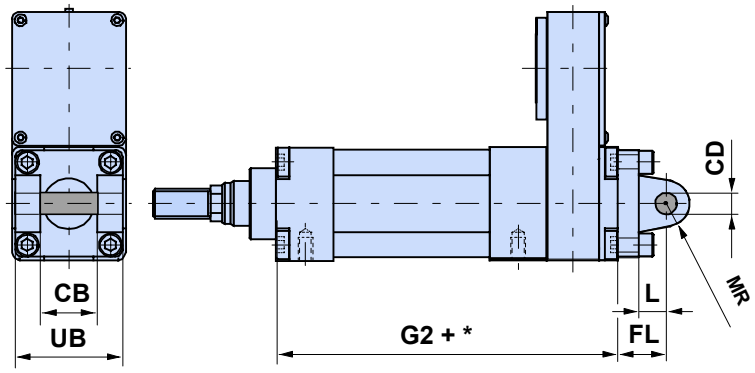
Only for parallel / reverse drive

	G2+*	EW	ØCD	MR (H9)	FL ±0,2
ET_32	**depending on the stroke** (see on page 15)	26	10	10	22
ET_50	**depending on the stroke** (see on page 15)	32	12	12	27
ET_80	**depending on the stroke** (see on page 15)	50	16	16	36
ET_100	**depending on the stroke** (see on page 15)	60	20	20	41
ETB125	**depending on the stroke** (see on page 15)	70	25	25	50

+* = given Dimension + length of desired stroke **Definition of stroke** (see on page 16)

Rear clevis





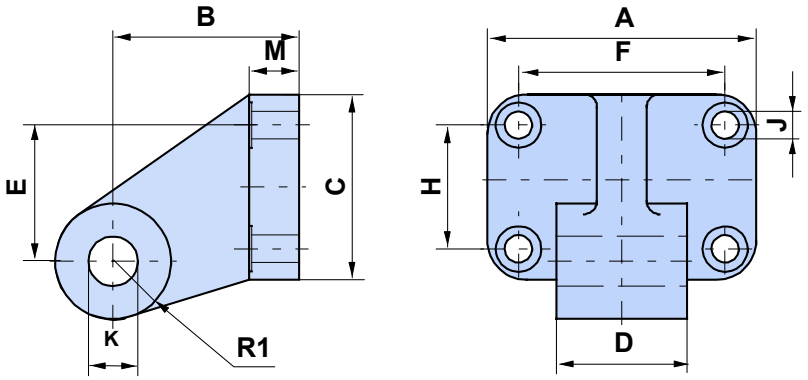
Only for parallel / reverse drive

	G2+*	UB (h14)	CB (H14)	ØCD (H9)	MR	L	FL ±0.2
ET_32	**depending on the stroke** (see on page 15)	45	26	10	10	13	22
ET_50	**depending on the stroke** (see on page 15)	60	32	12	12	16	27
ET_80	**depending on the stroke** (see on page 15)	90	50	16	16	22	36
ET_100	**depending on the stroke** (see on page 15)	110	60	20	20	27	41
ETB125	**depending on the stroke** (see on page 15)	130	70	25	25	30	50

+* = given Dimension + length of desired stroke **Definition of stroke** (see on page 16)

Bearing block

Counterpiece of the rear clevis



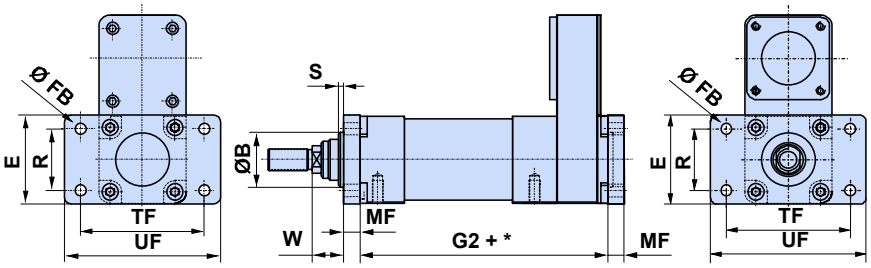
	Type	A	B (JS15)	C	D	E (JS14)	F (JS14)	H	ØJ (H13)	ØK (H9)	M	R1
ET_32	32-2800T	51	32	31	25.5	21	38	18	6.6	10	8	10
ET_50	50-2800T	65	45	45	31.0	33	50	30	9.0	12	12	13
ET_80	80-2800T	86	63	60	49.0	47	66	40	11.0	16	14	15
ET_100	100-2800T	96	71	70	59.0	55	76	50	11.0	20	15	21
ETB125	125-2800T	124	90	90	69.0	70	94	60	14.0	25	20	25

Not listed in the cylinder order code, please order separately.

Installation flanges

Front plate not possible with IP65 rating

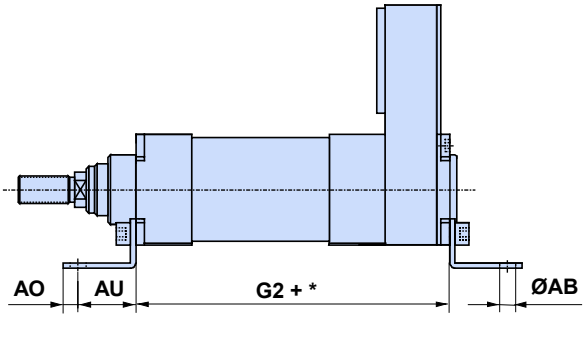
Rear plate only for parallel / reverse drive



	G2+*	UF	E	TF	ØFB	R	W	MF	ØB	S
ET_32	**depending on the stroke** (see on page 15)	80	48	64	7	32	16	10	30	3
ET_50	**depending on the stroke** (see on page 15)	110	65	90	9	45	25	12	40	4
ET_80	**depending on the stroke** (see on page 15)	150	95	126	12	63	30	16	50	4
ET_100	**depending on the stroke** (see on page 15)	180	110	150	14	75	35	16	65	4
ETB125	**depending on the stroke** (see on page 15)	205	140	180	17	90	53	20	90	0

+* = given Dimension + length of desired stroke **Definition of stroke** (see on page 16)

Foot mounting



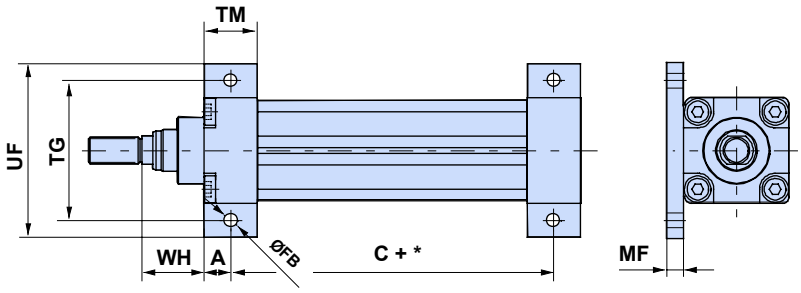
Only for parallel / reverse drive

Front foot mounting plate not possible with IP65 rating.

	G2+*	AH	AT	TR	ØAB (H14)	AO	AU	TW
ET_32	**depending on the stroke** (see on page 15)	32	3	32	7	8	24	48
ET_50	**depending on the stroke** (see on page 15)	45	3	45	9	12	32	65
ET_80	**depending on the stroke** (see on page 15)	63	4	63	12	15	41	95
ET_100	**depending on the stroke** (see on page 15)	71	6.5	75	14	17	41	115
ETB125	**depending on the stroke** (see on page 15)	90	8.3	90	17	25	45	140

+* = given Dimension + length of desired stroke **Definition of stroke** (see on page 16)

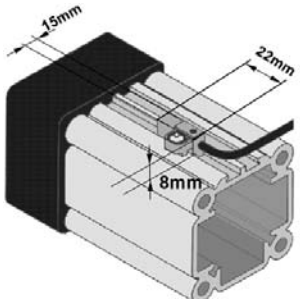
Mounting flanges



	C+*	WH	TG	UF	ØFB	TM	MF	A
ET_32	**depending on the stroke** (see on page 15)	**Dimensions** (see on page 15)	62	78	6.6	25	8	14
ET_50	**depending on the stroke** (see on page 15)	**Dimensions** (see on page 15)	84	104	9	30	10	16
ET_80	**depending on the stroke** (see on page 15)	**Dimensions** (see on page 15)	120	144	11	40	12	21
ET_100	**depending on the stroke** (see on page 15)	**Dimensions** (see on page 15)	150	185	13	50	12	27.5
ETB125	**depending on the stroke** (see on page 15)	**Dimensions** (see on page 15)	175	210	17	70	20	35

+* = given Dimension + length of desired stroke **Definition of stroke** (see on page 16)

Initiators / limit switches



The cylinder profile has two t-grooves for the mounting of initiators.

The initiators can be freely positioned along the profile (access to the lubricating hole must be granted).

ET_100 and ETB125 have these longitudinal grooves on all sides,
ET_32, ET_50 and ET_80 only on one side of the profile.

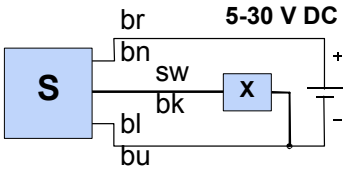
The permanent magnet integrated into the spindle nut, actuates the initiators.

Two different initiator types are available for the ET cylinder series:

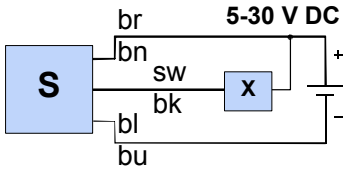
⇨ Hall effect sensor

- Normally closed contact or normally open contact
- electronic
- LED display
- medium costs
- long life

PNP sensor



NPN sensor



S: Switch / X: Load

Hall effect sensors								
Type	**Function**	**LED**	**Logic**	**Cables**	**Switching current**	**Electric current drain**	**Utilities**	**Max. switching frequency**
SMH-1P*	Normally open contact	Green	PNP	1.5m	max.150mA	7mA at 12VDC 14mA at 24VDC	5 - 30VDC	max.500Hz
SMH-1N*	Normally open contact	Red	NPN					
SMC-1P*	Normally closed contact	Yellow	PNP					
SMC-1N*	Normally closed contact	White/Red	NPN					

*If you require only 150mm of cable length instead of 1.5m, please add a "C" to you order code. Example: SMH-1PC.
Use only SMC-1P with COMPAX.

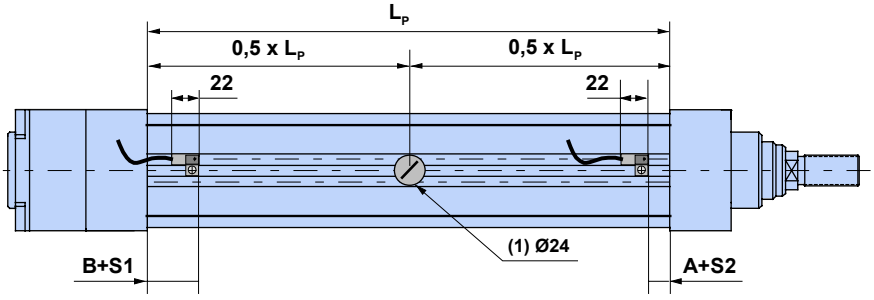
⇨ Reed contact

- Normally closed contact
- mechanical
- LED display
- low costs
- medium life

Reed contact								
Type	**Function**	**LED**	**Cables**	**Switching current [mA]**		**rated power [W]**		**Utilities**	**Max. switchingfrequency**
				resistive Load	**ind. Last**	**resistive Load**	**ind. Last**		
SMR-1	Normally open contact	Green	1.5m	30 - 300	30 - 100	AC/DC10	AC/DC5	5 - 30VDC	300Hz
SMR-1L	Normally open contact	Red	1.5m	5 - 40	5 - 25	AC/DC10	AC/DC5		300Hz
SMD-1L	Normally closed contact	Yellow	1.5m	5 - 25	5 - 25	AC/DC3	AC/DC3		200Hz

Mounting of initiators / limit switches

No initiator is to be mounted in the area of the lubrication hole. If you should need an initiator at this position due to your application, please contact us.



(1): Lubrication bore
S1, S2: **Safety travel** (see on page 16)
Stated in mm

Cylinder →		ET_32		ET_50			ET_80			ET_100				ETB125			
Limit switch ↓		M05	M10	M05	M10	M16	M05	M10	M25	M05	M10	M20	M40	M05	M10	M20	M50
SMH-1P / SMH-1N	A ± 1	1	1	1	1	1	6	6	6	1	1	1	1	4	4	4	4
SMC-1P / SMC-1N	B ± 1	88	88	84	87	91	70	89	96	111	131	149	159	127	157	157	180

Order code

Order example: ETB50M05PA67FMA600A			ET	B	50	M	05	P	A	67	F	M	A	600	A
ET series															
Design	for standard NEMA motors (ET32 to 80)			S											
	for metric motors and gears as well as special NEMA motors (ET32 to 125)			B											
	like version B, but with increased lifetime (only ET100)			V											
Model /size	32, 50, 80, 100, 125														
[1]Screw pitch Mxx in mm	05, 10, 16, 20, 25, 40, 50														
[2]Motor mounting position	direct: L parallel: P, M, N, Q reverse: R, S, T, V														
[3]Transmission ratio	1:1 direct, parallel, reverse								A						
	1.5:1 parallel, reverse								B						
	2:1 parallel, reverse								D						
	1:1.5 parallel, reverse								Z						
[4]prepared for NEMA standard motors	NEMA 23									20					
	NEMA 34									30					
	NEMA 42									40					
[4]prepared for metric motors and special NEMA motors	NEMA 23 with 9.525mm shaft									20					
	NEMA 34 with ½inch shaft									30					
	NEMA 34 with 14mm shaft									37					
	MH56-B5/9, SMH60-B8/9	*40/63/9/20/bore M5								47					
	MH70-B5/11, SMH60-B5/11	*60/75/11/23								57					
	SMH82-B08/14	*80/100/14/30								67					
	SMH82-, SMH100- or, MH105-B5/19	*95/115/19/40								77					
	MH145-B5/24, SMH142-B5/24	*130/165/24/50								87					
	MH105-B9/19	*80/100/19/40								J4					
	MH105-B6/24 ,SMH115-B7/24	*110/130/24/50								J5					
	HJ155	*130/165/32/58								J6					
	MH205-B5/38	*180/215/38/80								J7					
[4]prepared for planetary gear	P3	*60/75/16/48								P3					
	P4	*70/85/22/56								P4					
	P5	*90/120/32/88								P5					
	P7	*130/165/40/112								P7					
	PE3	*40/52/14/35/internal thread M5								N6					
	PE4	*80/100/20/40								N8					
[4]prepared for	non-standard motors / gears**									90					
[5]Mounting option	Foot mounting										B				
	Rear clevis mounting										C				
	Centre trunnion mounting										D				
	Rear eye mounting										E				
	Standard (Thread at cylinder profile)										F				
	Mounting flanges										G				
	Rear plate										H				
	Front plate										J				
	Front- and rear plate										N				
	Customer specific										X				
[6]Thrust rod with	External thread (Standard metrical)											M			
	Internal thread											F			
	Rod clevis											C			
	Spherical rod eye											S			
	Outrigger bearing											R			
[7]Profile orientation	3 hrs (not with motor position M)												A		
	6 hrs (not with motor position N)												B		
	9 hrs (not with motor position Q)												C		
	12 hrs/standard (not with motor position P)														
[8]Stroke in mm for	ET_32: 50 - 0750 ET_50: 50 - 1000 ET_80, ET_100: 100 - 1500 ETB125: 100 - 2400														
[9]Protection class	company internal designation														A
	IP65 rating (not for ETB125)														IP

[1] Screw pitch **Mxx** (see on page 6)

[2] Motor mounting position

- with parallel motor mounting, the motor could, depending on the profile orientation, interfere with the initiators (ET_32, 50, 80) and block the lubrication hole (**motor position** (see on page 27), **profile orientation** (see on page 8)).

[3] Transmission ratios

- 1:1.5 only with ET_32,
- 1.5:1 and 2:1 mounting of drives with a shaft diameter of >9mm is not possible with ET_50.
- possible **motor / cylinder combinations** (see on page 17)

[4] stepper and servo motors, gears

- possible **motor / cylinder combinations** (see on page 17)
- 47: SMH60 with encoder A6 / A7cannot be mounted parallelly on ET_32.

* Pilot/Hole circle/Shaft diameter/Shaft length/Note on the fixing

**only motors / garboxes with keyway can be mounted.

[5] Monting

- Foot mounting, rear eye/clevis options, rear plate only possible with pralallel/reverse motor mounting position.
- Front plate not possible with IP65 rating.
- Stainless version of the mounting options on request.

[6] rod end

- Outrigger bearing not available for ETB125 and with IP65 rating.

[7] Profile orientation

- The **profile orientation** (see on page 8) does also define the position of the lubrication hole.

[8] Stroke

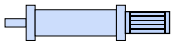
- **Definition of Stroke** (see on page 16)

[9] Protection class IP65

- Contact the supplier in order to discuss conditions of use and environment.

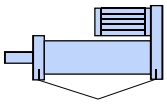
Definition of motor mounting positions

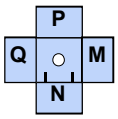
Motor directly at the cylinder (inline)



direct (inline) — order code = L

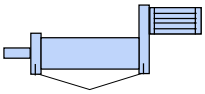
Drive parallel / reverse via timing belt

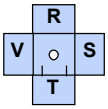




Parallel drive — Order code = P, M, N, Q

Thread View to thrust rod





Reverse drive — Order code = R, S, T, V

Thread View to thrust rod

- Your partner for automation

Would you like more information?
We would be happy to send you our brochures and catalogs!
Or call us and set up a meeting.

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