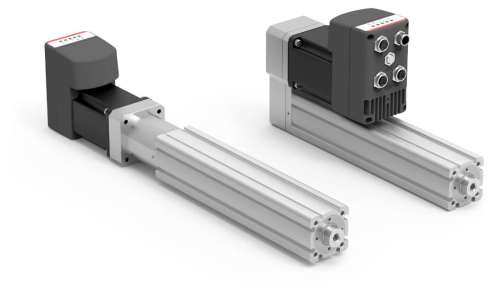
COMPACT ELECTROMECHANICAL CYLINDERS
SERIES 3E

News

Sizes 20, 32



- Flexibility
- Ease of use
- Reduced commissioning times
- Increased machine efficiency and productivity

Series 3E cylinders are electric rod actuators that combine a screw and motor to generate accurate linear motion. These are an alternative to pneumatic cylinders but possessing all the benefits of electric actuators in terms of speed, ease of parameter setting and flexibility in handling different load sizes and formats. Their compact design ensures easy integration with the machine, without affecting performance. Robust and quick, these actuators are ideal for multi-position applications and can be used with external proximity switches for homing operations or allowing extra-stroke readings to be performed.

Moreover, Series 3E can be supplied with the motor already assembled, to further reduce commissioning and wiring time. Series 3E electromechanical cylinders are the ideal solution for industrial applications that require rapid format changeovers or numerous production cycles. Their precision, reliability and flexibility, make these cylinders ideal for use in assembly lines, packaging systems or for material handling.

General Data

Construction	Electromechanical cylinder with recirculating ball screw
Design	Profile with thread rolling screws based on the ISO 15552 standard
Operation	Multi-position actuator with high precision linear movement
Sizes	20, 32
Strokes min - max	10 ÷ 500 mm
Anti-rotation function	With anti-friction pads in technopolymer
Mounting	Front flange, foot mounts, clamps or front / rear / swivel trunnion
Mounting motor	in line and parallel
Working temperature	0°C ÷ 50°C
Storage temperature	-20°C ÷ 80°C
Protection class	IP40
Lubrication	Not necessary. A pre-lubrication is performed on the cylinder
Repeatability	<± 0,02
Duty cycle	100% (if supplied with motor already assembled, the duty cycle depends on the motor selected)
Max rotation play	± 0,4°
Use with external sensors	Slots on four sides for sensors model CSD

COMPACT ELECTROMECHANICAL CYLINDERS
SERIES 3E - CODING EXAMPLES

Coding Example

3E	020	BS	0100	P10	M

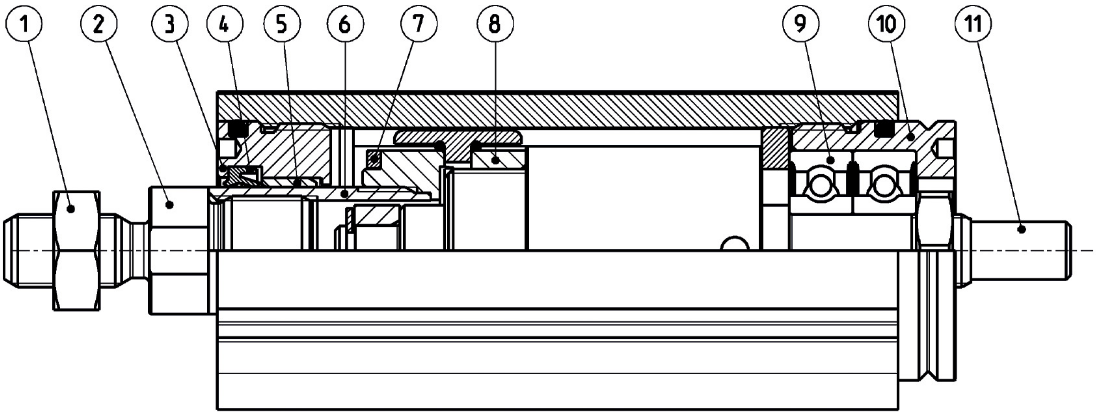
3E	SERIES
020	SIZE 020 = 20 032 = 32
BS	TRANSMISSION BS = Recirculating ball screw
0100	STROKE See table of mechanical characteristics
P10	SCREW PITCH P03 = 3 mm P10 = 10 mm
M	CONSTRUCTION M = Male F = Female
	EXTENDED ROD (___) = Rod extended with ___ mm

Mechanical characteristics

		Size 20	Size 20	Size 32	Size 32
Pitch "P"	[mm]	3	10	3	10
Dynamic load coefficient "C"	[N]	2100	1875	2800	2500
Average load[A]	[N]	177	236	236	315
Max torque applicable to screw's shaft	[Nm]	0,42	1,41	0,53	1,77
Max force applicable[B]	[N]	800	800	1000	1000
Max linear speed cylinder[B]	[m/s]	0,4	1,3	0,4	1,3
Maximum rotation speed of the cylinder shaft	[rpm]	8000	8000	8000	8000
Max accelleration of cylinder	[m/s^2]	25	25	25	25
Min Stroke	[mm]	10	25	10	25
Max Stroke	[mm]	300	300	500	500

[A]Value refers to a covered distance of 5000 Km (see the diagrams "Life of the cylinder according to the average axial force applied").
[B]This parameter varies as the stroke varies (see the diagrams "Maximum speed of the cylinder according to its stroke").

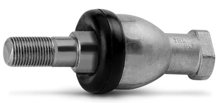
Series 3E materials



PARTS	MATERIALS
1. Rod nut	Zinc-plated steel
2. Front coupling piece	Stainless steel
3. Front cap	Anodized aluminium alloy
4. Rod seal	PU
5. Bushing	Technopolymer
6. Rod	Stainless steel
7. Magnet	Plastoferrite
8. Guiding element BS screw	Aluminium alloy
9. Bearing	Steel
10. Rear cap	Anodized aluminium alloy
11. BS ball screw	Steel

Accessories for Series 3E cylinders

Piston rod socket joint Mod. GY

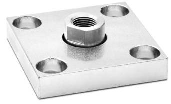


Piston rod lock nut Mod. U

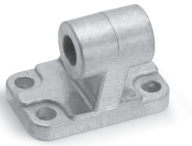
Clevis pin Mod. S

Rear trunnion ball-joint Mod. R

Coupling piece Mod. GKF

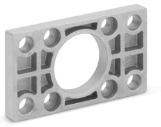


90° male trunnion Mod. ZC



Swivel Combination Mod. C+L+S

Front flange Mod. D-E

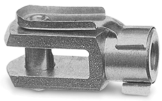


Self aligning rod Mod. GK

Foot mount Mod. B-3E

Rear female trunnion Mod. C and C-H

Rod fork end Mod. G

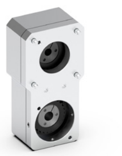


Rear trunnion male Mod. L

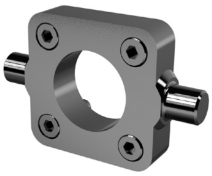
Side clamping bracket Mod. BG

Kit for axial connection Mod. AM

Kit for parallel connection Mod. PM



Front/rear spot faced trunnion Mod. FN



Counter bracket for trunnion Mod. BF

How to calculate the life of the cylinder

To perform a correct dimensioning of the Series 3E cylinder, you need to consider some facts.

Among these, the most important are:
- Dynamics of the system
- Operation and pause cyclicity
- Work environment
- General performance requirements: repeatability, accuracy, precision, etc.

CALCULATE THE LIFE IN ROTATIONS where:

L_r = Life of the cylinder in number of rotations of the BS ball screw
C = Dynamic load coefficient of the cylinder [N]
F_m = Average axial force applied [N]
f_w = Safety coefficient according to the working conditions (see table below)

$$L_r = \left(\frac{C}{F_m \cdot f_w}\right)^3 \cdot 10^6$$

CALCULATION OF LIFE IN km where:

L_{km} = Life of the cyllinder in km [km]
p = Pitch of the BS ball screw [mm]

$$L_{km} = \frac{L_r \cdot p}{10^6}$$

CALCULATION OF THE LIFE IN HOURS where:

L_h = Life of the cylinder in hours
n_m = Average number of revolutions of the RDS ball screw [rpm]

$$L_h = \frac{L_r}{n_m \cdot 60}$$

APPLICATION	ACCELERATION [m/s²]	SPEED [m/s]	DUTY CYCLE	f_w COEFFICIENT
Light	< 5,0	< 0,5	< 35%	1,0 ÷ 1,25
Normal	5,0 ÷ 15,0	0,5 ÷ 1,0	35% ÷ 65%	1,25 ÷ 1,5
Heavy	> 15,0	> 1,0	> 65%	1,5 ÷ 3,0

Analysis of the duty cycle and of system pauses

The analysis of the duty cycle and of the pauses of the system is essential to calculate the average F_m axial loads and the number of average revolutions nm that act on the cylinder. Normally, the duty cycle is composed by phases and for each single phase, we can have an acceleration, constant speed or deceleration.

F_m = CALCULATION OF THE AVERAGE AXIAL FORCE
n_m = CALCULATION OF THE AVERAGE NUMBER OF REVOLUTIONS

The table shown below reports the values of acceleration, speed and deceleration for each phase.

$$F_m = \sqrt[3]{\frac{({F_{a1}}^3 \cdot n_{a1} \cdot t_{a1}) + ({F_{vc1}}^3 \cdot n_{vc1} \cdot t_{vc1}) + ({F_{d1}}^3 \cdot n_{d1} \cdot t_{d1}) + \dots + ({F_{an}}^3 \cdot n_{an} \cdot t_{an}) + ({F_{vcn}}^3 \cdot n_{vcn} \cdot t_{vcn}) + ({F_{dn}}^3 \cdot n_{dn} \cdot t_{dn})}{(n_{a1} \cdot t_{a1}) + (n_{vc1} \cdot t_{vc1}) + (n_{d1} \cdot t_{d1}) + \dots + (n_{an} \cdot t_{an}) + (n_{vcn} \cdot t_{vcn}) + (n_{dn} \cdot t_{dn})}}$$

$$n_m = \left\{\frac{(n_{a1} \cdot t_{a1}) + (n_{vc1} \cdot t_{vc1}) + (n_{d1} \cdot t_{d1}) + \dots + (n_{an} \cdot t_{an}) + (n_{vcn} \cdot t_{vcn}) + (n_{dn} \cdot t_{dn})}{t_{a1} + t_{vc1} + t_{d1} + \dots + t_{an} + t_{vcn} + t_{dn}}\right\}$$

		F [N]	n [rpm]	Time %
PHASE 1	Acceleration Constant speed Deceleration	Fa1 Fvc1 Fd1	na1 nvc1 nd1	ta1 tvc1 td1
PHASE 2	Acceleration Constant speed Deceleration	Fa2 Fvc2 Fd2	na2 nvc2 nd2	ta2 tvc2 td2
PHASE "n -1"	Acceleration Constant speed Deceleration	Fan-1 Fvcn-1 Fdn-1	nan-1 nvcn-1 ndn-1	tan-1 tvcn-1 tdn-1
PHASE "n"	Acceleration Constant speed Deceleration	Fan Fvcn Fdn	nan-1 nvcn-1 ndn-1	tan-1 tvcn-1 tdn-1
	TOTAL			100%

Application example

$F_{a1} = 142\,N;$ $\quad F_{vc1} = 98\,N;$ $\quad F_{d1} = 54\,N;$
$n_{a1} = 630\,rpm;$ $\quad n_{vc1} = 1260\,rpm;$ $\quad n_{d1} = 630\,rpm;$
$t_{a1} = 0{,}7\,\%;$ $\quad t_{vc1} = 12{,}9\,\%;$ $\quad t_{d1} = 0{,}7\,\%;$

$F_{a2} = 616\,N;$ $\quad F_{vc2} = 589\,N;$ $\quad F_{d2} = 562\,N;$
$n_{a2} = 450\,rpm;$ $\quad n_{vc2} = 900\,rpm;$ $\quad n_{d2} = 450\,rpm;$
$t_{a2} = 4{,}8\,\%;$ $\quad t_{vc2} = 33{,}3\,\%;$ $\quad t_{d2} = 4{,}8\,\%;$

$F_{a3} = 997\,N;$ $\quad F_{vc3} = 981\,N;$ $\quad F_{d3} = 965\,N;$
$n_{a3} = 240\,rpm;$ $\quad n_{vc3} = 480\,rpm;$ $\quad n_{d3} = 240\,rpm;$
$t_{a3} = 7{,}1\,\%;$ $\quad t_{vc3} = 28{,}6\,\%;$ $\quad t_{d3} = 7{,}1\,\%;$

$$K_1 = (F_{a1}^3 \cdot n_{a1} \cdot t_{a1}) + (F_{vc1}^3 \cdot n_{vc1} \cdot t_{vc1}) + (F_{d1}^3 \cdot n_{d1} \cdot t_{d1}) \qquad n_1 = (n_{a1} \cdot t_{a1}) + (n_{vc1} \cdot t_{vc1}) + (n_{d1} \cdot t_{d1}) \qquad T_1 = t_{a1} + t_{vc1} + t_{d1}$$
$$K_2 = (F_{a2}^3 \cdot n_{a2} \cdot t_{a2}) + (F_{vc2}^3 \cdot n_{vc2} \cdot t_{vc2}) + (F_{d2}^3 \cdot n_{d2} \cdot t_{d2}) \qquad n_2 = (n_{a2} \cdot t_{a2}) + (n_{vc2} \cdot t_{vc2}) + (n_{d3} \cdot t_{d3}) \qquad T_2 = t_{a2} + t_{vc2} + t_{d2}$$
$$K_3 = (F_{a3}^3 \cdot n_{a3} \cdot t_{a3}) + (F_{vc3}^3 \cdot n_{vc3} \cdot t_{vc3}) + (F_{d3}^3 \cdot n_{d3} \cdot t_{d3}) \qquad n_3 = (n_{a3} \cdot t_{a3}) + (n_{vc3} \cdot t_{vc3}) + (n_{d3} \cdot t_{d3}) \qquad T_3 = t_{a3} + t_{vc3} + t_{d3}$$

$$F_m = \sqrt[3]{\frac{(K_1 + K_2 + K_3)}{(n_1 + n_2 + n_3)}} = 596{,}64\,N$$

$$n_m = \frac{n_1 + n_2 + n_3}{T_1 + T_2 + T_3} = 685{,}7\,rpm$$

		F [N]	n [rpm]	Time %
PHASE 1	Acceleration Constant speed Deceleration	142 98 54	630 1260 630	0,7 12,9 0,7
PHASE 2	Acceleration Constant speed Deceleration	616 589 562	450 900 450	4,8 33,3 4,8
PHASE 3	Acceleration Constant speed Deceleration	997 981 965	240 480 240	7,1 28,6 7,1
	TOTAL			100,0

How to calculate the driving torque [nm]

F_A = Total force acting from outside [N]
p = Pitch of the ball screw [mm]
η = Performance
C_{M1} = Driving torque due to external agents [Nm]

$$C_{TOT} = C_{M1} + C_{M2} + C_{M3}$$

$$C_{M1} = \frac{F_A \cdot p}{2\pi \cdot 1000} \cdot \frac{1}{\eta}$$

J_{TOT} = Moment of inertia of rotating components [kg·m²]
J_F = Moment of inertia of fixed-length rotating components [kg·m²]
J_V = Moment of inertia of variable-length rotating components [kg·m²]
K_V = Coefficient of inertia of variable-length rotating components [kg·mm²/mm]
C = Rod stroke [mm]
$\dot{\omega}$ = Angular acceleration [rad/s²]
a = Linear acceleration of the ball screw [m/s²]
C_{M2} = Driving torque due to rotating components [Nm]

$$J_{TOT} = (J_F + J_V) \cdot 10^{-6}$$

$$J_V = K_V \cdot C$$

$$\dot{\omega} = \frac{a \cdot 2\pi \cdot 1000}{p}$$

$$C_{M2} = J_{TOT} \cdot \dot{\omega} \cdot \frac{1}{\eta}$$

F_{TT} = Force needed to move sliding components [N]
F_{TF} = Force needed to move fixed-length sliding components [N]
F_{TV} = Force needed to move variable-length sliding components [N]
m_{C1} = Mass of the fixed-length sliding components [kg]
K_{TV} = Mass coefficient of variable-length sliding components [kg/mm]
C_{M3} = Driving torque due to sliding components [Nm]

$$F_{TT} = F_{TF} + F_{TV}$$

$$F_{TF} = m_{C1} \cdot a$$

$$F_{TV} = K_{TV} \cdot C \cdot a$$

$$C_{M3} = \frac{F_{TT} \cdot p}{2\pi \cdot 1000} \cdot \frac{1}{\eta}$$

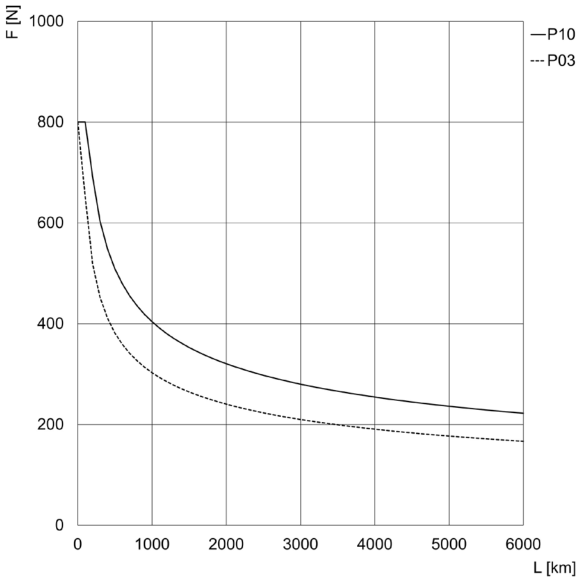
Values of masses and fixed and rotating inertia moments of 3E components

Size	J_F [kg·mm²]	K_V [kg·mm²/mm]	m_{C1} [kg]	K_{TV} [Kg·m]
20	2,1	6,13	0,12	0,46
32	2,1	6,13	0,13	0,46

COMPACT ELECTROMECHANICAL CYLINDERS

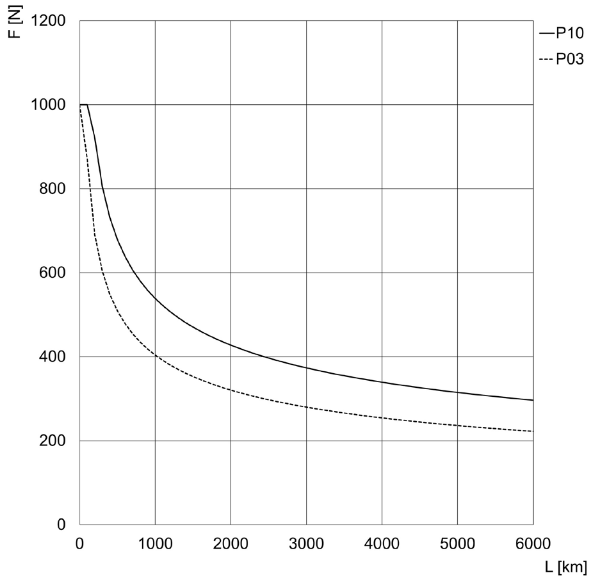
SERIES 3E - DIAGRAMS

Life of the cylinder according to the average axial force applied (environmental T and standard conditions of use)



Size 20

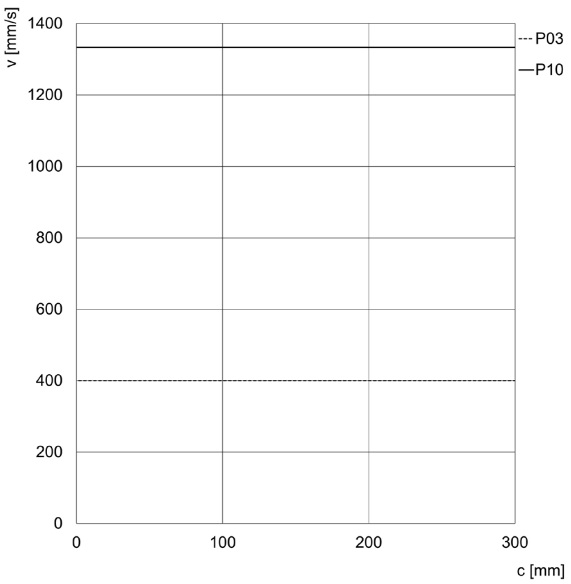
F = Axial Force [N]
L = Life [km]
Curves calculated with fw = 1



Size 32

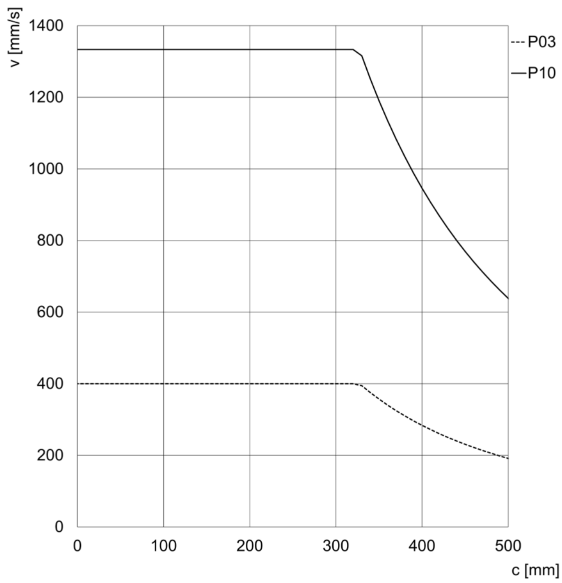
F = Axial Force [N]
L = life [km]
Curves calculated with fw = 1

Maximum speed of the cylinder according to its stroke



Size 20

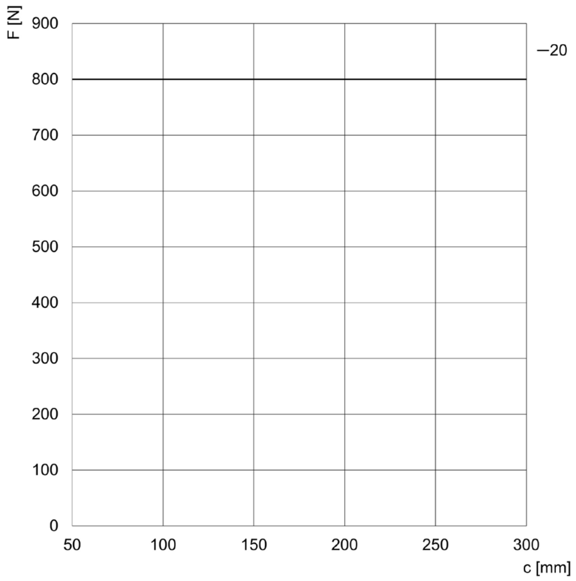
v = Speed [m/s]
c = Stroke [mm]



Size 32

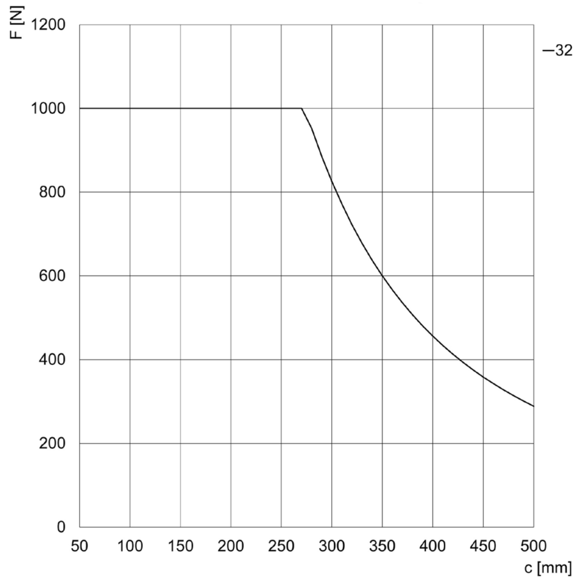
v = Speed [m/s]
c = Stroke [mm]

Maximum force of the cylinder according to its stroke



Size 20

F = Static axial Force [N]
c = Stroke [mm]



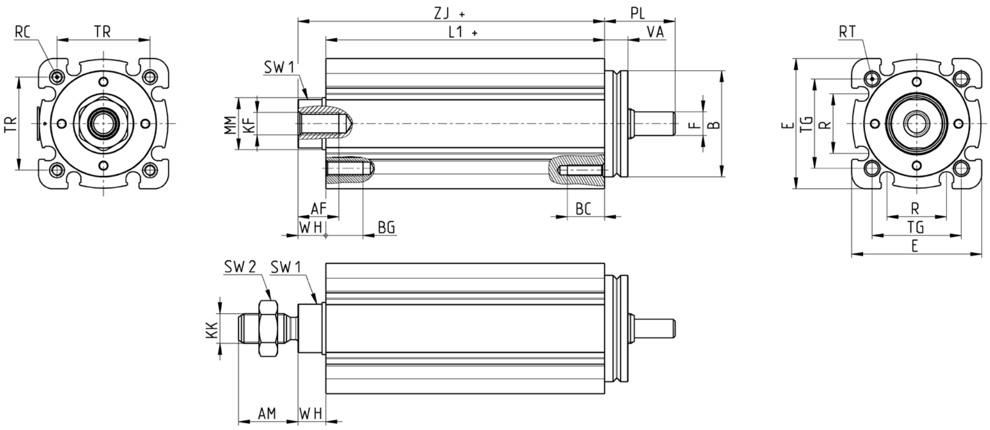
Size 32

F = Static axial Force [N]
c = Stroke [mm]

For longer strokes than the standard ones or for extended rods, please contact Camozzi.

COMPACT ELECTROMECHANICAL CYLINDERS
SERIES 3E - DIMENSIONS

Series 3E cylinders

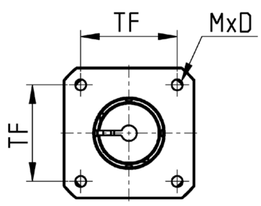


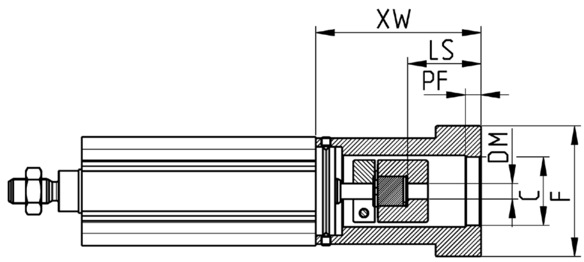
+ = add the stroke
***Dimension not in compliance with ISO 15552 standard**

Size	AM	AF	øB(h8)	BG	E	øF(h8)	KF	KK	L1 +	øMM	R	RT	PL	SW1	SW2	TG	VA	TR	RC	BC	WH	ZJ +	Weight stroke 0 [g]	Weight stroke [kg/m]
20	16	11	28,5	10	35	5	M6	M8x1,25	75	14	16	M4	19	13	13	24	6,5	25	M3	10	7,5	82,5	326	2,57
32	19	13	34	10	42	5	M8	M10x1,25	75	14	19	M5	19	13	17	32,5	5,5	32,5	M5	10	7,5	82,5	430	3,64

Kit for axial connection Mod. AM

Supplied with:
1x housing
1x flexible coupling
4x nuts
4x motor connection screws

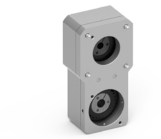




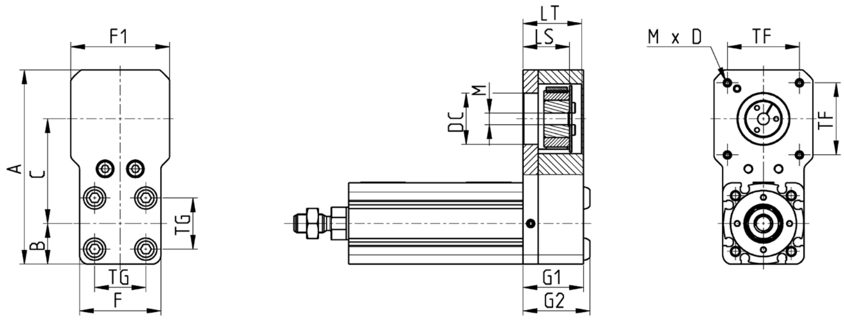
Mod.	Size	Protection	øC	øDM	TF	MxD	PF	F	LS	XW	Nominal torque [Nm](A)	Max torque [Nm](A)	J[kgmm²]	Weight [g]	η
AM-3E-20-0017	20	IP40	22	5	31	Ø3,5x14,5	5	42	24	53	5	10	0,85	127	0,78
AM-3E-32-0023	32	IP40	38,1	6,35	47,14	M4x15	9	56,4	20	49	5	10	0,85	152	0,78
AM-3E-32-0024	32	IP40	38,1	8	47,14	M4x15	9	56,4	20	49	5	10	0,85	152	0,78
AM-3E-32-0100	32	IP40	30	8	31,8	M3x9	5	41,5	25	54	5	10	0,85	144	0,78

(A)Continuously applicable torque, under ideal mounting and operating conditions. For further details, please contact service@camozzi. com
(B)Torque applicable for short intervals, under ideal mounting and operating conditions. For further details, please contact service@ camozzi.com

Kit for parallel connection Mod. PM

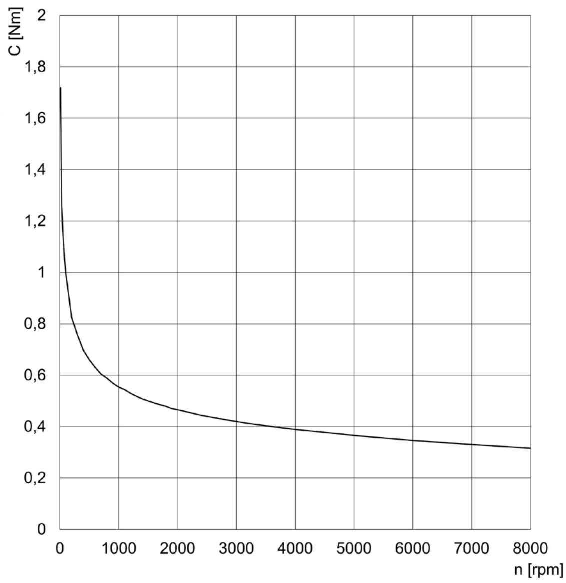


Supplied with:
1x front cover
1x rear cover
2x pulleys
2x locking sets
1x plate for pulley
1x toothed belt
3x nuts
4x rear cover screws
2-4x cover fixing screws
4x cylinder fixing screws
4x motor fixing screws

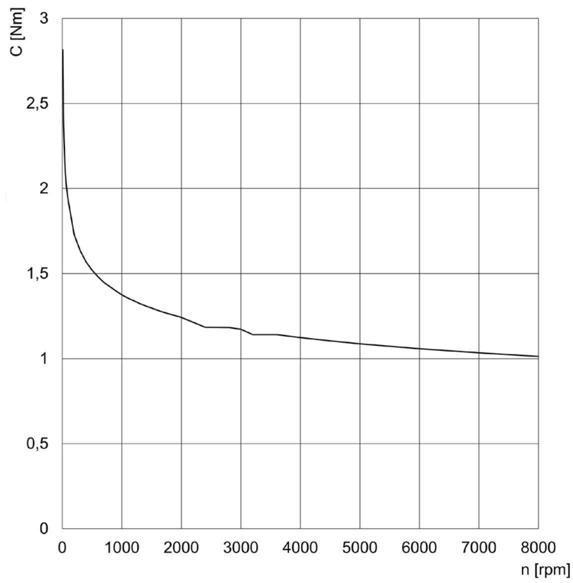


Mod.	Size	Protection	A	B	C	F	F1	TG	G1	G2	øDC	øM	LS	LT	TF	MxD	J[kgmm²]	Weight [g]	η
PM-3E-20-0017	20	IP40	83,5	17,5	45	35	42,5	22	26	29	22	5	20	25	32	M3x4,5	3,96	218	0,62
PM-3E-32-0023	32	IP40	116,5	21	67,5	42	56,5	32,5	28	31	38,1	6,35	19	26,5	47,14	M4x6	5,84	390	0,62
PM-3E-32-0024	32	IP40	116,5	21	67,5	42	56,5	32,5	28	31	38,1	8	19	26,5	47,14	M4x6	5,84	390	0,62
PM-3E-32-0100	32	IP40	87	21	45	42	42	32,5	28	31	30	8	19	26,5	31,82	M3x6	5,82	245	0,62

Transmissible power kit PM



PM-3E 20...
C = Torque [Nm]
n = Number of revolutions per minute



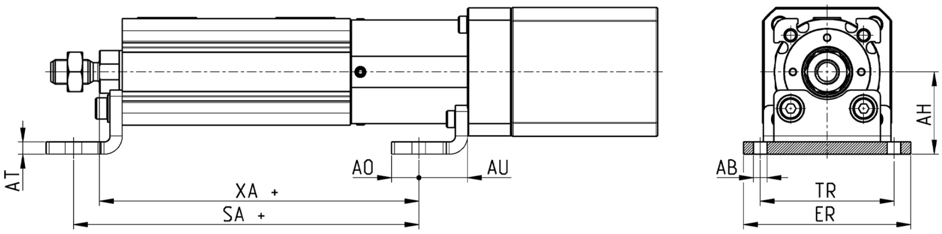
PM-3E 32...
C = Torque [Nm]
n = Number of revolutions per minute

The curves refer to a duty cycle of 70%.

Foot bracket Mod. B-3E-AM

Material:
zinc-plated steel

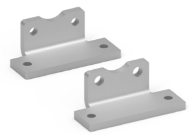
Supplied with:
2x foot brackets
4x screws



+ = add the stroke

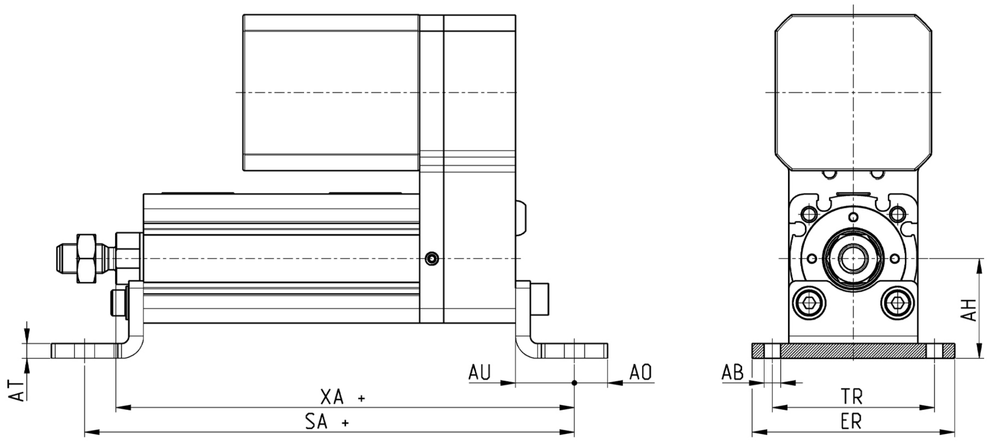
Mod.	Size	Compatible with	SA +	XA	AH	TR	AT	AU	AO	⌀AB	ER
B-3E-20-AM	20	AM-3E-20-0017	113,5	105	27	44	4	16	9	4,5	55
B-3E-32-AM-1	32	AM-3E-32-0023 / AM-3E-32-0024	109	100,5	36	52	4	16	9	4,5	62
B-3E-32-AM-2	32	AM-3E-32-0100	99	90,5	36	52	4	16	9	4,5	62

Foot bracket Mod. B-3E-PM



Material:
zinc-plated steel

Supplied with:
2x foot brackets
4x screws



+ = add the stroke

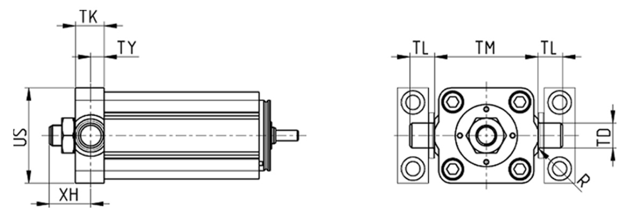
Mod.	Size	Compatible with	SA +	XA	AH	TR	AT	AU	AO	øAB	ER
B-3E-20-PM	20	PM-3E-20-0017	133	124,5	27	44	4	16	9	4,5	55
B-3E-32-PM	32	PM-3E-32-0023 / PM-3E-32-0024 / PM-3E-32-0100	135	126,5	36	52	4	16	9	4,5	62

COMPACT ELECTROMECHANICAL CYLINDERS
SERIES 3E - ACCESSORIES

Front spot faced trunnion Mod. FN

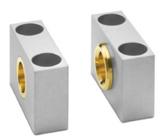
Material:
zinc-plated steel

Supplied with:
1x spot faced trunnion
4x screws



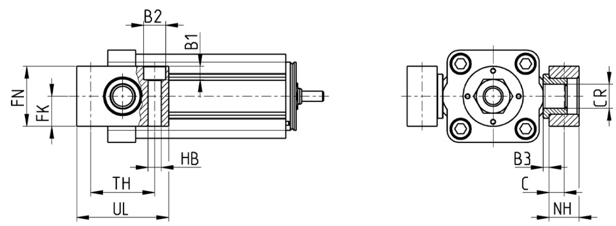
Mod.	Ø	TK	TY	XH	US	TL	TM	øTD	R
FN-3E-32	32	14	6,5	20	46	12	50	12	1

Counter bracket for front trunnion Mod. BF



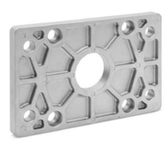
Material:
aluminium

Supplied with:
2x supports



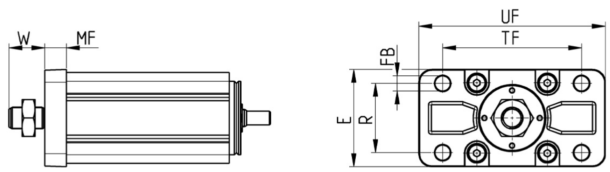
Mod.	Ø	øCR	NH	C	B3	TH	UL	FK	FN	B1	øB2	øHB
BF-32	32	12	15	7,5	3	32	46	15	30	6,8	11	6,6

Front flange Mod. D-E



Material:
aluminium for Ø 32

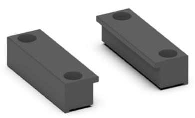
Supplied with:
1x flange
4x screws



+ = add the stroke

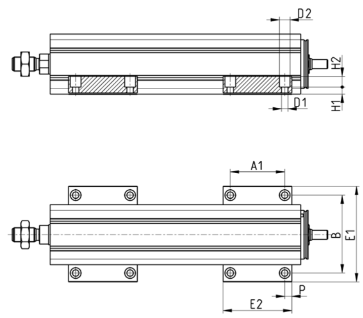
Mod.	Ø	W	MF	TF	R	UF	E	øFB
D-E-3E-32	32	16,5	10	64	32	80	45	7

Side clamping bracket Mod. BG



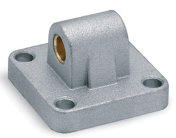
Material:
aluminium

Supplied with:
2x clamps



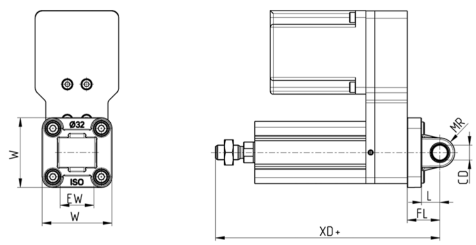
Mod.	Ø	E1	E2	P	A1	B	Screw	øD1	øD2	H1	H2	Weight [g]
BG-3E-20	20	60	48	5	38	47,5	M4	4,5	7,5	5	5,5	31
BG-3E-32	32	67	48	5	38	54,5	M4	4,5	7,5	5	7,5	35

Rear male trunnion Mod. L



Material:
aluminium

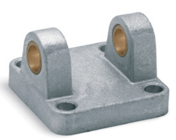
Supplied with:
1x male trunnion
4x screws



+ = add the stroke

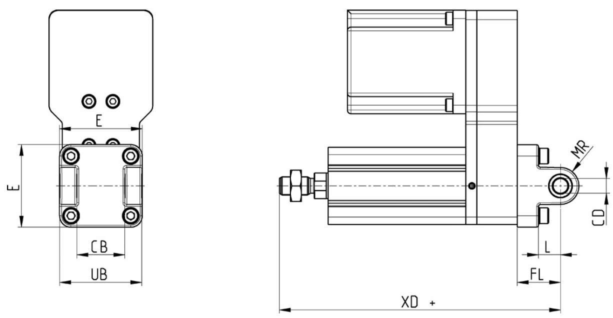
Mod.	Ø	øCD	L	FL	XD +	MR	E	EW
L-3E-20	20	8	14	20	151,5	8	34	16
L-3E-32	32	10	13	22	151,5	10	46	16

Rear female trunnion Mod. C



Material:
aluminium

Supplied with:
1x female trunnion
4x screws



+ = add the stroke

Mod.	Ø	øCD	L	FL	XD +	MR	E	CB	UB
C-3E-32	32	10	13	22	212	10	46	26	45

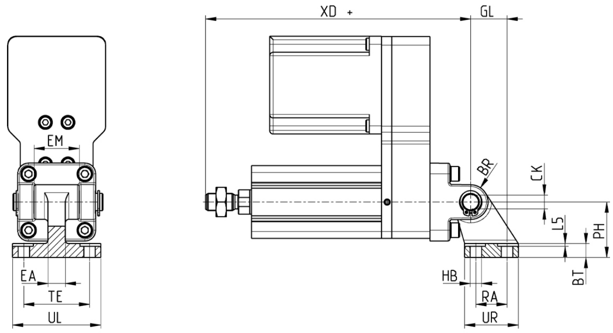
COMPACT ELECTROMECHANICAL CYLINDERS
SERIES 3E - ACCESSORIES

90° male trunnion Mod. ZC

CETOP RP 107P

Material:
aluminium

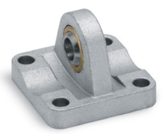
Supplied with:
1x male support



+ = add the stroke

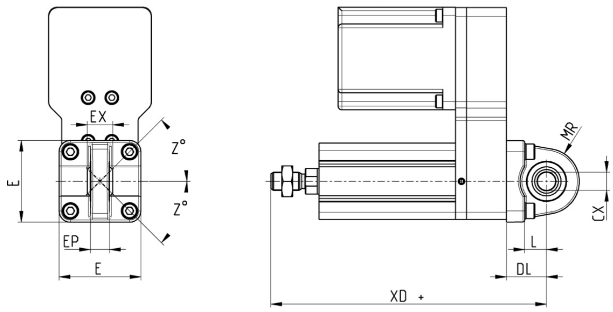
Mod.	Ø	øEB	øCK	øHB	XD +	TE	UL	EA	GL	L5	RA	EM	UR	PH	BT	BR
ZC-32	32	11	10	6,6	212	38	51	10	21	1,6	18	26	31	32	8	10

Trunnion ball-joint Mod. R



Material:
aluminium

Supplied with:
1x trunnion ball joint
4x screws



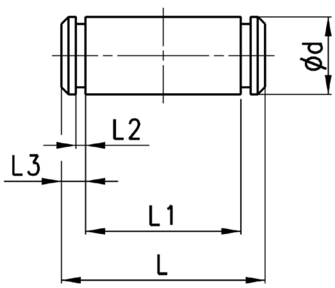
+ = add the stroke

Mod.	Ø	øCX	L	DL	XN+	MS	E	EX	EP	Z
R-3E-32	32	10	12	22	212	18	45	14	10,5	4°

Clevis pin Mod. S

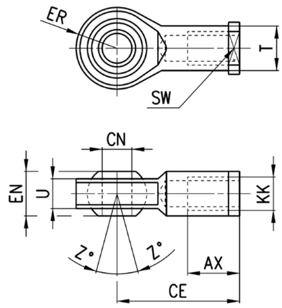
Materials:
Stainless steel Clevis pin,
Steel Seeger

Supplied with:
1x clevis pin
2x seeger in steel



Mod.	Ø	øD	L	L1	L2	L3
S-32	32	10	52	46	1,1	3

Swivel ball joint Mod. GA

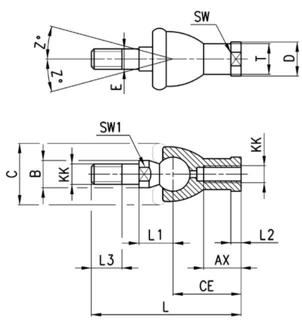


ISO 8139

Material:
zinc-plated steel

Mod.	Ø	øCN	U	EN	ER	AX	CE	KK	øT	Z	SW
GA-20	20	8	9	12	12	16	36	M8x1,25	12,5	6,5	14
GA-32	32	10	10,5	14	14	20	43	M10x1,25	15	6,5	17

Piston rod socket joint Mod. GY

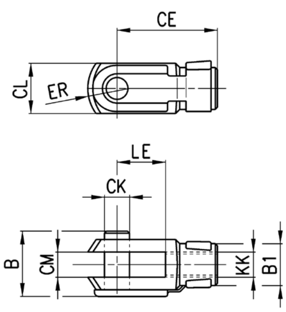


ISO 8139

Material:
zama and zinc-plated steel

Mod.	Ø	KK	L	CE	L2	AX	SW	SW1	L1	L3	øT	øD	E	øB	øC	Z
GY-20	20	M8x1,25	65	32	5	16	14	10	16	12	12,5	13	6	10	20	15
GY-32	32	M10x1,25	74	35	6,5	18	17	11	19,5	15	15	19	10	14	28	15

Rod fork end Mod. G



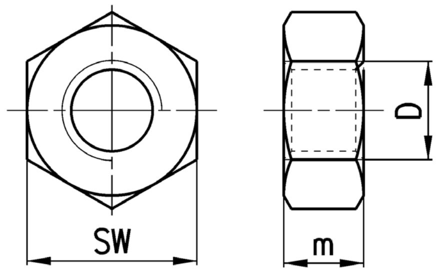
ISO 8140

Material:
zinc-plated steel

Mod.	Ø	øCK	LE	CM	CL	ER	CE	KK	B	øB1
G-20	20	8	16	8	16	10	32	M8x1,25	22	14
G-25-32	32	10	20	10	20	12	40	M10x1,25	26	18

COMPACT ELECTROMECHANICAL CYLINDERS
SERIES 3E - ACCESSORIES

Piston rod lock nut Mod. U

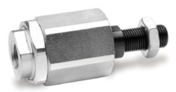


UNI EN ISO 4035

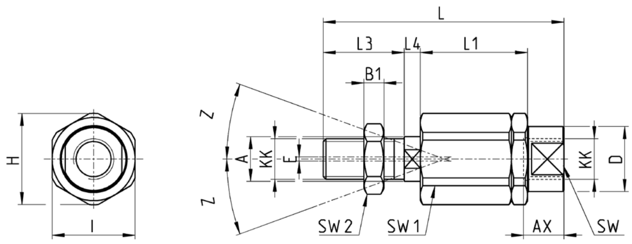
Material:
zinc-plated steel

Mod.	Ø	D	m	SW
U-20	20	M8x1,25	5	13
U-25-32	32	M10x1,25	6	17

Self aligning rod Mod. GK



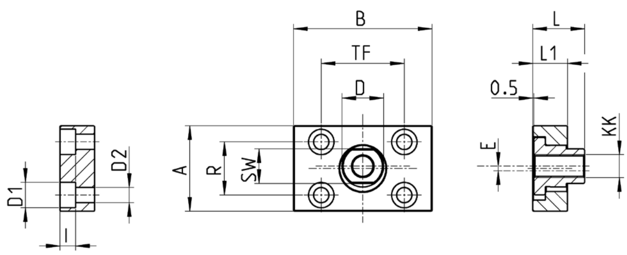
Material:
zinc-plated steel



Mod.	Ø	KK	L	L1	L3	L4	øA	øD	H	I	SW	SW1	SW2	B1	AX	Z	E
GK-20	20	M8x1,25	57	26	21	5	8	12,5	19	17	11	7	13	4	16	4	2
GK-25-32	32	M10x1,25	71,5	35	20	7,4	14	22	32	30	19	12	17	5	22	4	2

Coupling piece Mod. GKF

Material:
zinc-plated steel

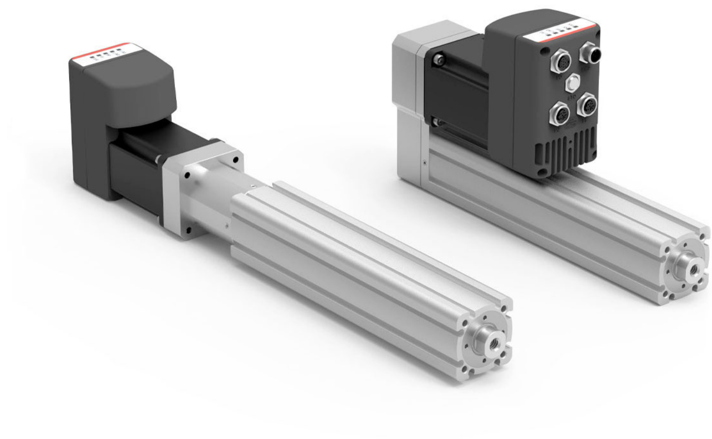


Mod.	Ø	KK	A	B	R	TF	L	L1	I	øD	øD1	øD2	SW	E
GKF-20	20	M8x1,25	30	35	20	25	22,5	10	-	14	5.5	-	13	1,5
GKF-25-32	32	M10x1,25	37	60	23	36	22,5	15	6,8	18	11	6,6	15	2

CYLINDER CONFIGURATION WITH ASSEMBLED MOTOR

SERIES 3E

Cylinder supplied with assembled motor and standard accessories AM and PM.

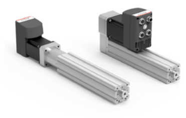


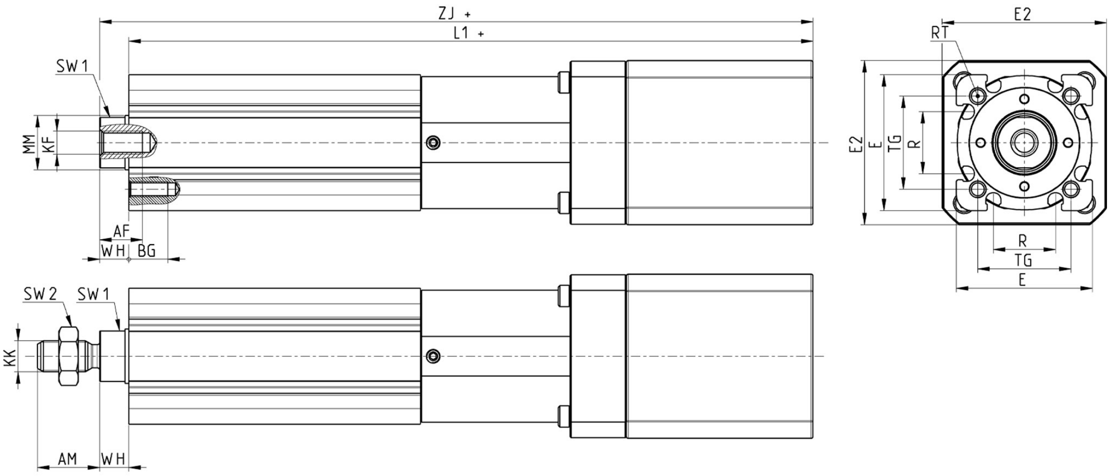
Coding Example

3E	020	BS	0100	P10	M	/	AM	E	0	E	-	EC	SF

3E	SERIES
020	SIZE 020 = 20 032 = 32
BS	TRANSMISSION BS = Recirculating ball screw
0100	STROKE See table of mechanical characteristics
P10	SCREW PITCH P03 = 3 mm P10 = 10 mm
M	CONSTRUCTION M = Male F = Female
	EXTENDED ROD (___) = Rod extended with ___ mm
AM	MOTOR CONNECTION AM = Kit Mod. AM PM = Kit Mod. PM
E	MOTOR A = MTS 17 B = MTS 23 C = MTS 24 E = DRVI-23ST (for size 32 only) F = DRVI-24ST (for size 32 only) G = DRVI-24EC (for size 32 only)
0	BRAKE 0 = Without brake B = With brake
E	ENCODER VARIANTS 0 = Without encoder (for motor A, B, C only) E = With encoder (for size 32 only)
EC	TYPE OF COMMUNICATION (for motor E, F, G only) PN = Profinet CO = CanOpen EC = Ethercat EI = Ethernet IP
SF	ADDITIONAL FUNCTIONS (for motor E, F, G only) = No additional function SF = STO (not certified)

Configuration of cylinder with in line motor AM

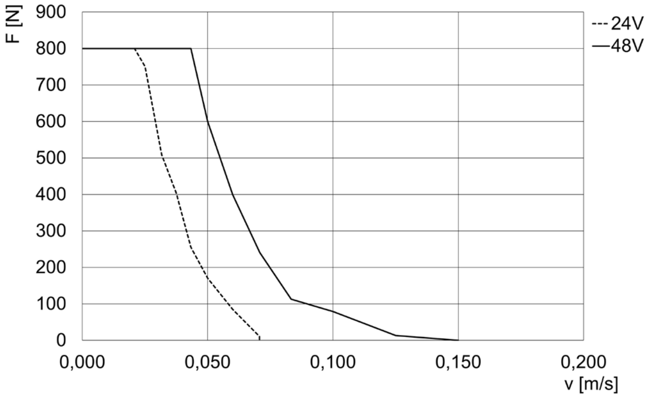




Mod.	Size	Motor	AM	AF	BG	E	E2	KF	KK	L1 +	øMM	R	RT	SW1	SW2	TG	WH	ZJ +	Weight stroke 0 [g]	Weight stroke [kg/m]
.../AMA00	20	MTS-17-18-050-0-0-S-C	16	11	10	35	42,5	M6	M8x1,25	176	14	16	M4	13	13	24	7,5	184	800	2,57
.../AMAB0	20	MTS-17-18-050-0-F-S-C	16	11	10	35	42,5	M6	M8x1,25	206	14	16	M4	13	13	24	7,5	214	910	2,57
.../AMB00	32	MTS-23-18-060-0-0-S-C	19	13	10	42	56,4	M8	M10x1,25	163	14	19	M5	13	17	32,5	7,5	171	1000	3,64
.../AMB0E	32	MTS-23-18-060-0-0-E-C	19	13	10	42	73,5	M8	M10x1,25	189	14	19	M5	13	17	32,5	7,5	196	1100	3,64
.../AMBBE	32	MTS-23-18-060-0-F-E-C	19	13	10	42	73,5	M8	M10x1,25	230	14	19	M5	13	17	32,5	7,5	237	1200	3,64
.../AMC00	32	MTS-24-18-250-0-0-S-C	19	13	10	42	60	M8	M10x1,25	211	14	19	M5	13	17	32,5	7,5	218	1980	3,64
.../AMC0E	32	MTS-24-18-250-0-0-E-C	19	13	10	42	77,5	M8	M10x1,25	235	14	19	M5	13	17	32,5	7,5	243	2080	3,64
.../AMCBE	32	MTS-24-18-250-0-F-E-C	19	13	10	42	77,5	M8	M10x1,25	276	14	19	M5	13	17	32,5	7,5	284	2180	3,64

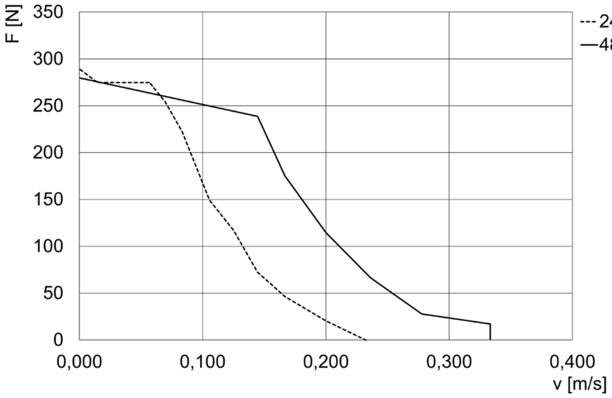
Force-speed curves of cylinder motor in line AM

With DRCS series drive



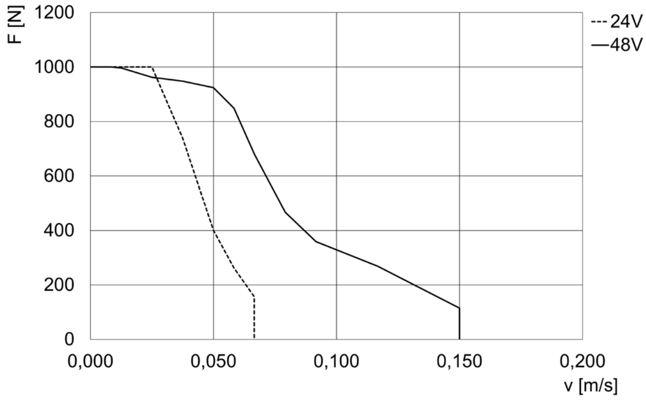
3E020BS...P03.../AMA... (MTS 17)

F = Force [N]
v = Speed [m/s]



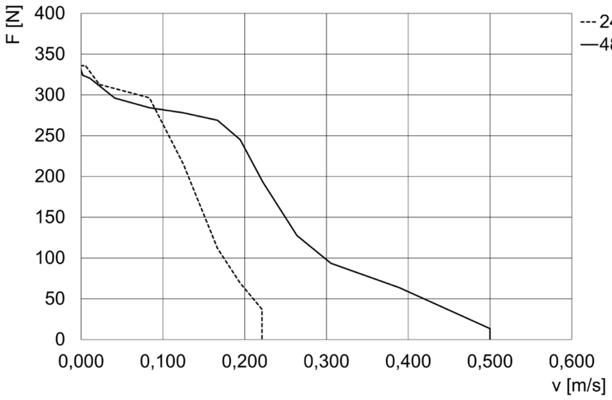
3E020BS...P10.../AMA... (MTS 17)

F = Force [N]
v = Speed [m/s]



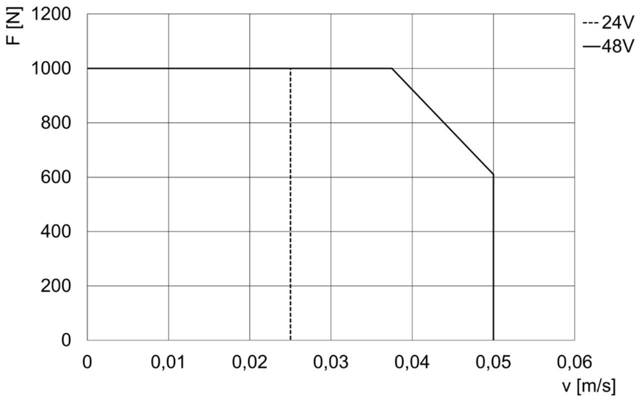
3E032BS...P03.../AMB... (MTS 23)

F = Force [N]
v = Speed [m/s]



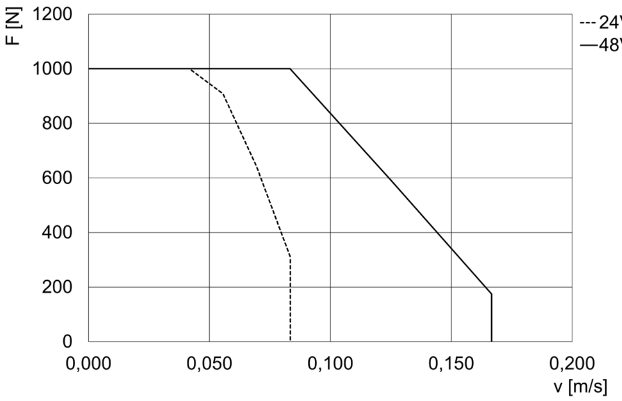
3E032BS...P10.../AMB... (MTS 23)

F = Force [N]
v = Speed [m/s]



3E032BS...P03.../AMC... (MTS 24)

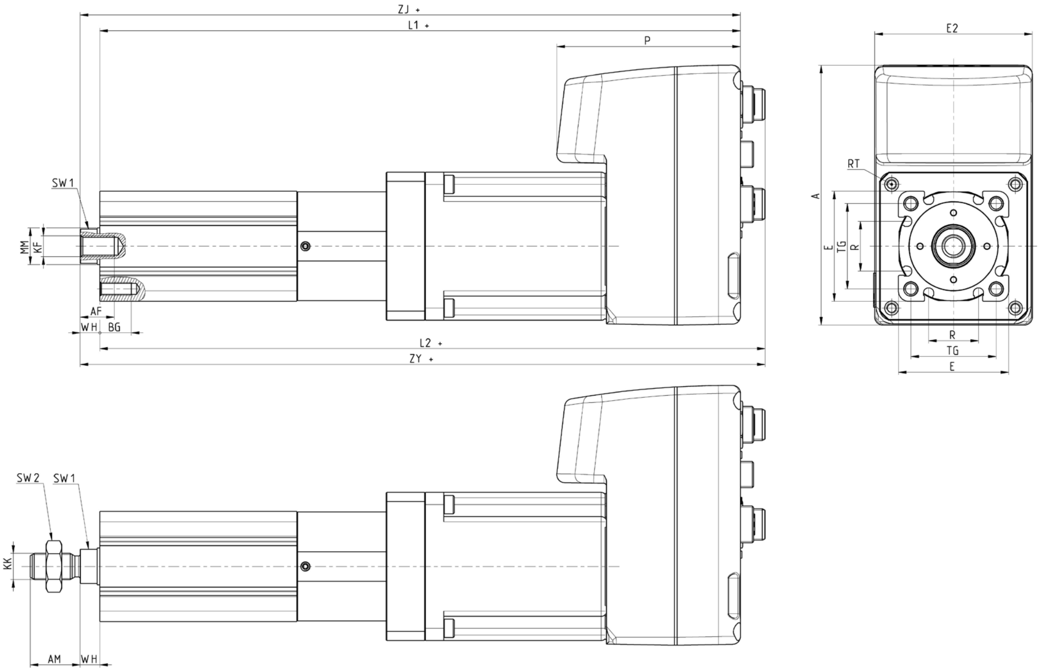
F = Force [N]
v = Speed [m/s]



3E032BS...P10.../AMC... (MTS 24)

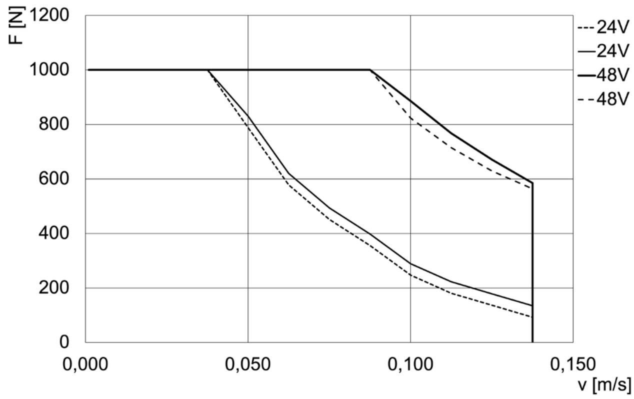
F = Force [N]
v = Speed [m/s]

Configuration of cylinder with in line motor AM + DRVI

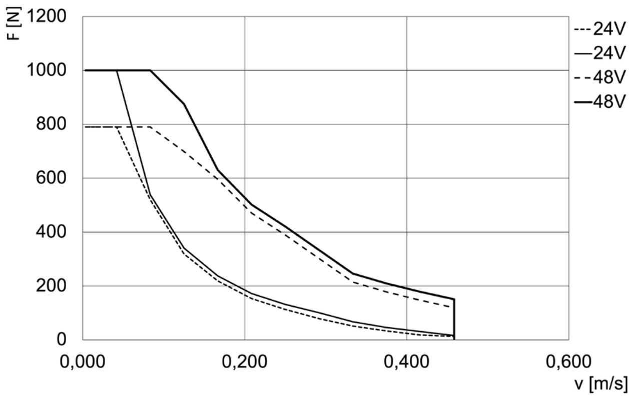


Mod.	Size	Motor	AM	AF	BG	A	E	E2	KF	KK	L1 +	øMM	R	P	RT	SW1	SW2	TG	WH	ZJ +	L2+	ZY+	Weight stroke 0 [g]	Weight stroke [kg/m]
.../AME0...	32	DRVI-23ST	19	13	10	99	42	60	M8	M10x1,25	249	14	19	70	M5	13	17	32,5	7,5	256,5	259	266	1660	3,64
.../AMEB...	32	DRVI-23ST	19	13	10	99	42	60	M8	M10x1,25	290	14	19	70	M5	13	17	32,5	7,5	298	300	307	2390	3,64
.../AMF0...	32	DRVI-24ST	19	13	10	99	42	60	M8	M10x1,25	275	14	19	70	M5	13	17	32,5	7,5	282,5	285	292	2240	3,64
.../AMFB...	32	DRVI-24ST	19	13	10	99	42	60	M8	M10x1,25	316	14	19	70	M5	13	17	32,5	7,5	324	326	333	2970	3,64
.../AMG0...	32	DRVI-24EC	19	13	10	99	42	60	M8	M10x1,25	254	14	19	70	M5	13	17	32,5	7,5	261,5	264	271	1700	3,64
.../AMGB...	32	DRVI-24EC	19	13	10	99	42	60	M8	M10x1,25	295	14	19	70	M5	13	17	32,5	7,5	303	305	312	2430	3,64

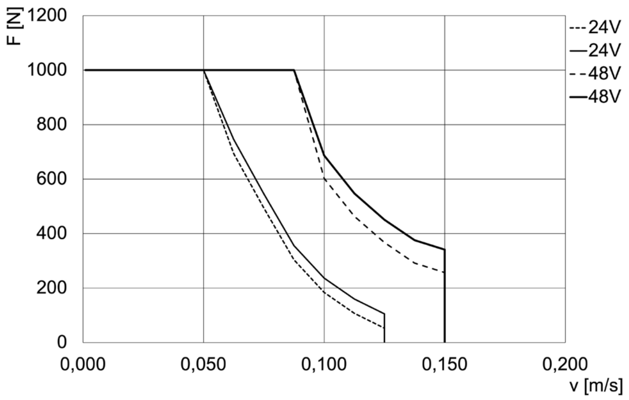
Force-speed curves motor cylinder in line AM + DRVI



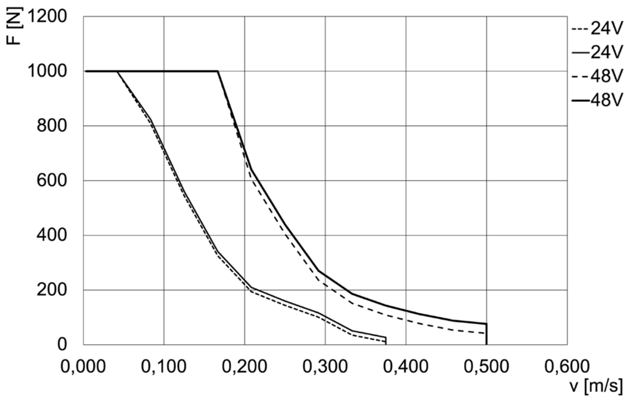
3E032BS...P03.../AME (DRVI-23ST)
F = Force [N]
v = Speed [m/s]
Continuous lines = Peak force of the actuator
Dashed lines = Nominal force of the actuator



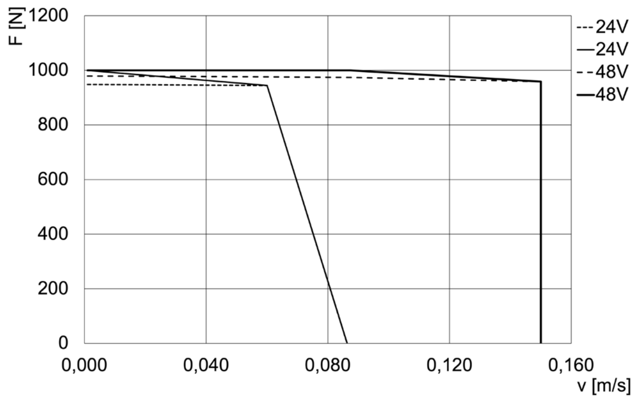
3E032BS...P10.../AME (DRVI-23ST)
F = Force [N]
v = Speed [m/s]
Continuous lines = Peak force of the actuator
Dashed lines = Nominal force of the actuator



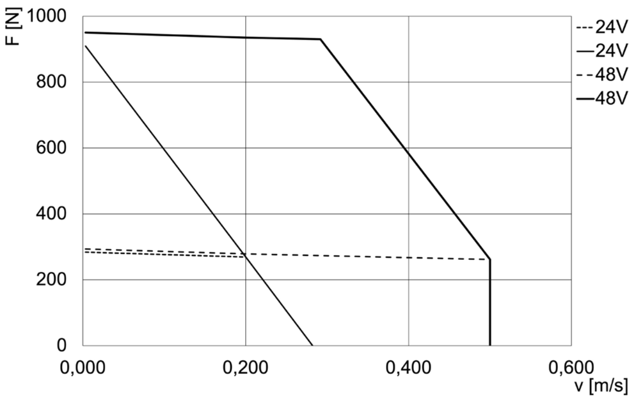
3E032BS...P03.../AMF (DRVI-24ST)
F = Force [N]
v = Speed [m/s]
Continuous lines = Peak force of the actuator
Dashed lines = Nominal force of the actuator



3E032BS...P10.../AMF (DRVI-24ST)
F = Force [N]
v = Speed [m/s]
Continuous lines = Peak force of the actuator
Dashed lines = Nominal force of the actuator



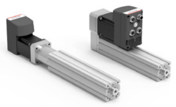
3E032BS...P03.../AMG (DRVI-24EC)
F = Force [N]
v = Speed [m/s]
Continuous lines = Peak force of the actuator
Dashed lines = Nominal force of the actuator

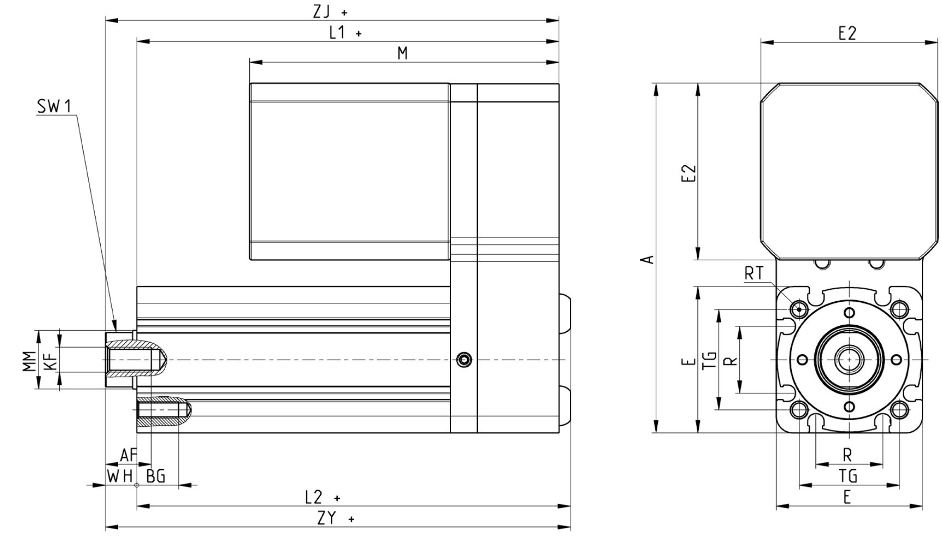


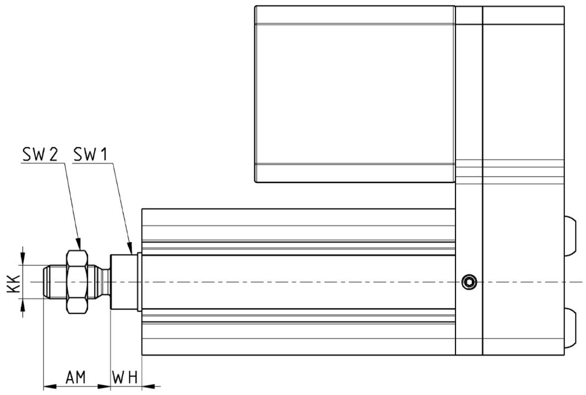
3E032BS...P10.../AMG (DRVI-24EC)
F = Force [N]
v = Speed [m/s]
Continuous lines = Peak force of the actuator
Dashed lines = Nominal force of the actuator

COMPACT ELECTROMECHANICAL CYLINDERS
SERIES 3E - DIMENSIONS

Configuration of cylinder with parallel motor PM



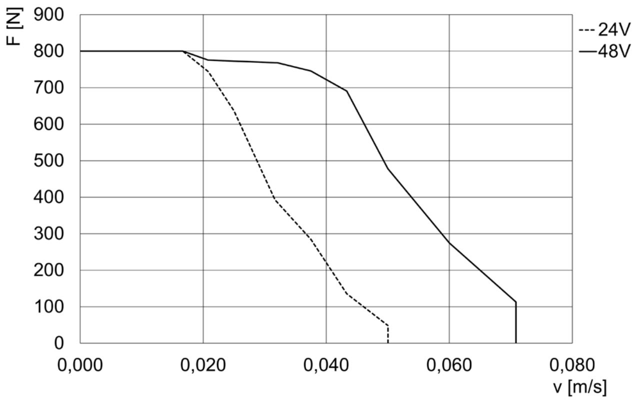




Mod.	Size	Motor	AM	AF	BG	E	E2	KF	M	A	KK	L1 +	L2+	ØMM	R	RT	SW1	SW2	TG	WH	ZJ +	ZY+	Minimum stroke suggested[A]	Weight stroke 0 [g]	Weight stroke [kg/m]
.../PMA00	20	MTS-17-18-050-0-0-S-C	16	11	10	35	42,5	M6	74	83,5	M8x1,25	101	104	14	16	M4	13	13	24	7,5	109	112	10	890	2,57
.../PMAB0	20	MTS-17-18-050-0-F-S-C	16	11	10	35	42,5	M6	104	83,5	M8x1,25	101	104	14	16	M4	13	13	24	7,5	109	112	10	1000	2,57
.../PMB00	32	MTS-23-18-060-0-0-S-C	19	13	10	42	56,4	M8	67	116,5	M10x1,25	103	106	14	19	M5	13	17	32,5	7,5	111	114	10	1240	3,64
.../PMB0E	32	MTS-23-18-060-0-0-E-C	19	13	10	42	56,4	M8	92,5	134	M10x1,25	103	106	14	19	M5	13	17	32,5	7,5	111	114	10	1340	3,64
.../PMBBE	32	MTS-23-18-060-0-F-E-C	19	13	10	42	56,4	M8	133,5	134	M10x1,25	103	106	14	19	M5	M5	17	32,5	7,5	111	114	40	1440	3,64
.../PMC00	32	MTS-24-18-250-0-0-S-C	19	13	10	42	60	M8	114,5	118,5	M10x1,25	103	106	14	19	M5	13	17	32,5	7,5	111	114	20	2200	3,64
.../PMC0E	32	MTS-24-18-250-0-0-E-C	19	13	10	42	60	M8	139	136	M10x1,25	103	106	14	19	M5	13	17	32,5	7,5	111	114	45	2320	3,64
.../PMCBE	32	MTS-24-18-250-0-F-E-C	19	13	10	42	60	M8	180	136	M10x1,25	103	106	14	19	M5	13	17	32,5	7,5	111	114	85	2420	3,64

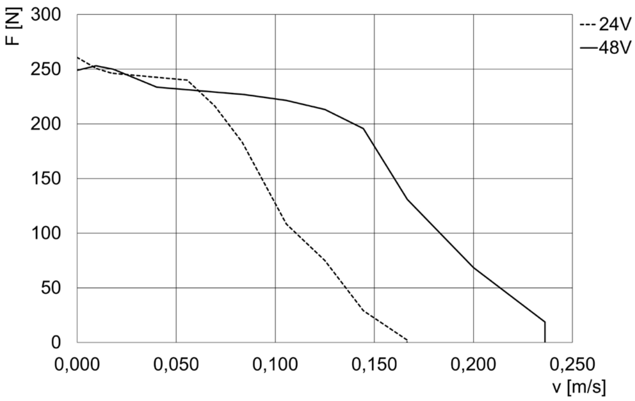
[A] Minimum stroke for L1 to be greater than M, see "mechanical characteristics" for minimum cylinder stroke.

Force-speed curves motor cylinder in parallel PM



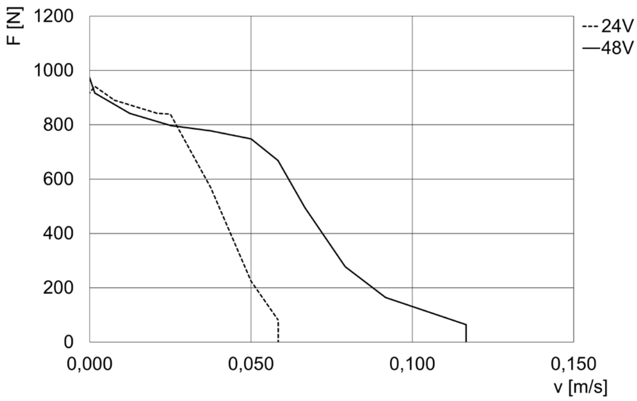
3E020BS...P03.../PMA... (MTS 17)

F = Force [N]
v = Speed [m/s]



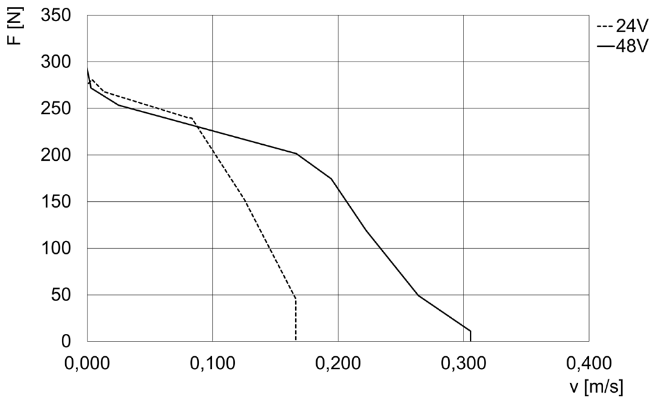
3E020BS...P10.../PMA... (MTS 17)

F = Force [N]
v = Speed [m/s]



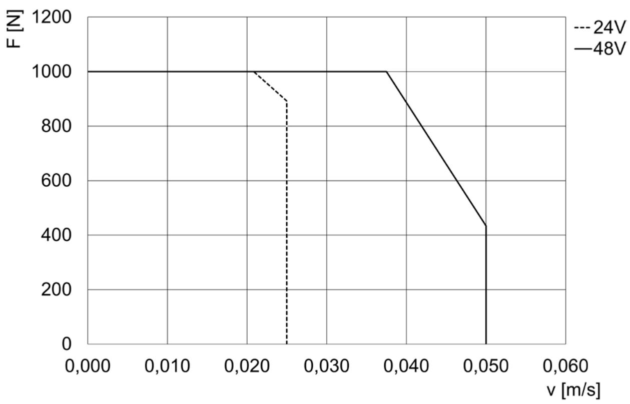
3E032BS...P03.../PMB... (MTS 23)

F = Force [N]
v = Speed [m/s]



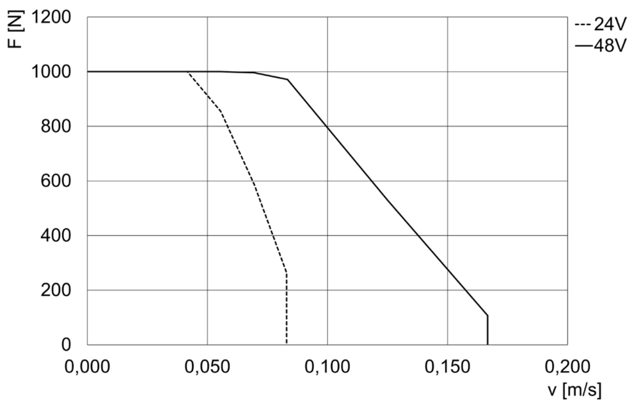
3E032BS...P10.../PMB... (MTS 23)

F = Force [N]
v = Speed [m/s]



3E032BS...P03.../PMC... (MTS 24)

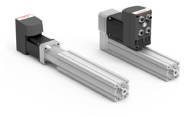
F = Force [N]
v = Speed [m/s]

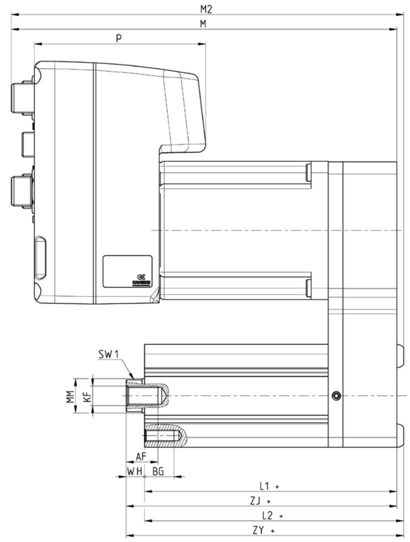


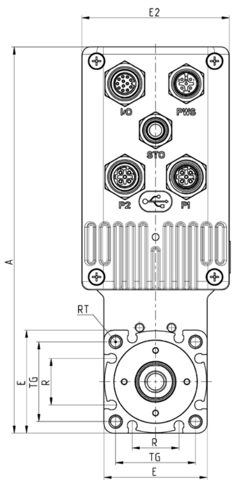
3E032BS...P10.../PMC... (MTS 24)

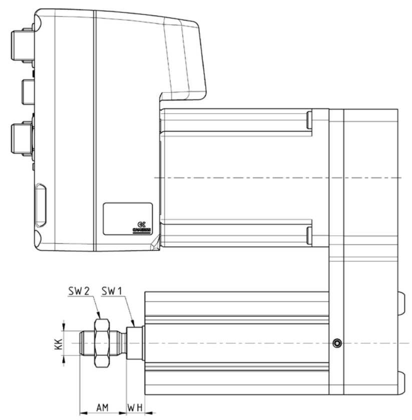
F = Force [N]
v = Speed [m/s]

Configuration of cylinder with in parallel motor PM + DRVI





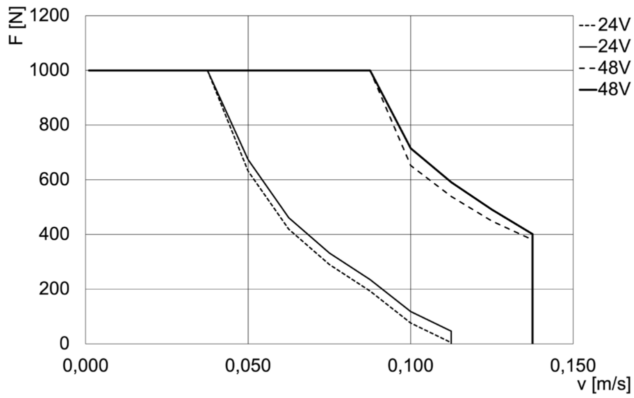




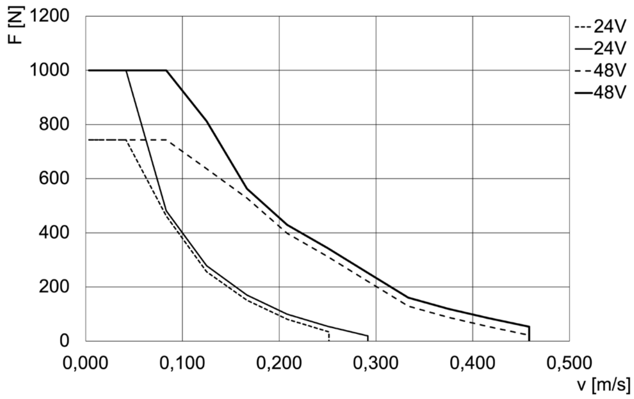
Mod.	Size	Motor	AM	AF	BG	E	E2	KF	M	P	A	KK	L1 +	L2+	ØMM	R	RT	SW1	SW2	TG	WH	ZJ +	ZY+	Minimum stroke suggested[(A)]	Weight stroke 0 [g]	Weight stroke [kg/m]
.../PME0...	32	DRVI-23ST	19	13	10	42	60	M8	153	70	157,5	M10x1,25	103	106	14	19	M5	13	17	32,5	7,5	110,5	113,5	60	1900	3,64
.../PMEB...	32	DRVI-23ST	19	13	10	42	60	M8	194	70	157,5	M10x1,25	103	106	14	19	M5	13	17	32,5	7,5	110,5	113,5	100	2630	3,64
.../PMF0...	32	DRVI-24ST	19	13	10	42	60	M8	179	70	157,5	M10x1,25	103	106	14	19	M5	13	17	32,5	7,5	110,5	113,5	80	2480	3,64
.../PMFB...	32	DRVI-24ST	19	13	10	42	60	M8	220	70	157,5	M10x1,25	103	106	14	19	M5	13	17	32,5	7,5	110,5	113,5	120	3210	3,64
.../PMG0...	32	DRVI-24EC	19	13	10	42	60	M8	158	70	157,5	M10x1,25	103	106	14	19	M5	13	17	32,5	7,5	110,5	113,5	60	1940	3,64
.../PMGB...	32	DRVI-24EC	19	13	10	42	60	M8	199	70	157,5	M10x1,25	103	106	14	19	M5	13	17	32,5	7,5	110,5	113,5	100	2670	3,64

(A) Minimum stroke for L1 to be greater than M, see “mechanical characteristics” for minimum cylinder stroke.

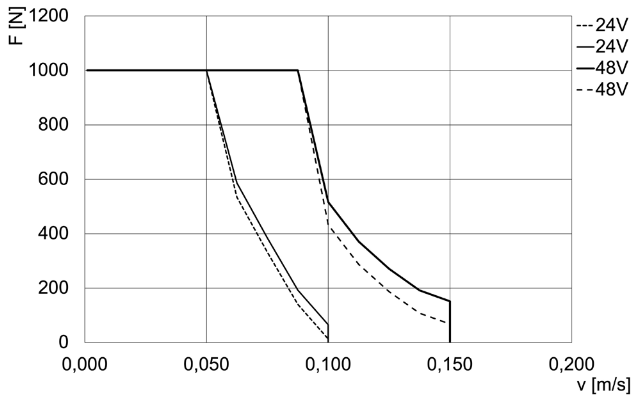
Force-speed curves motor cylinder in parallel PM + DRVI



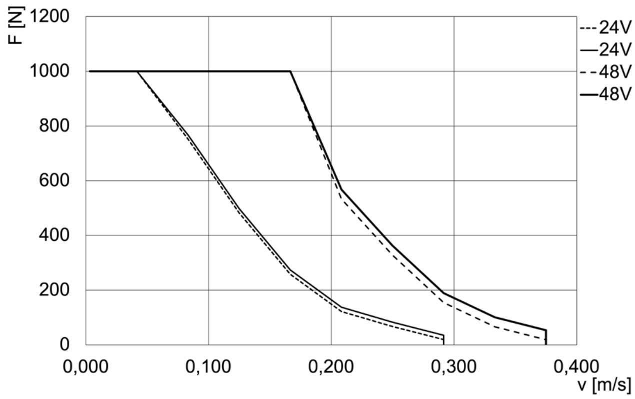
3E032BS...P03.../PME (DRVI-23ST)
F = Force [N]
v = Speed [m/s]
Continuous lines = Peak force of the actuator
Dashed lines = Nominal force of the actuator



3E032BS...P10.../PME (DRVI-23ST)
F = Force [N]
v = Speed [m/s]
Continuous lines = Peak force of the actuator
Dashed lines = Nominal force of the actuator



3E032BS...P03.../PMF (DRVI-24ST)
F = Force [N]
v = Speed [m/s]
Continuous lines = Peak force of the actuator
Dashed lines = Nominal force of the actuator



3E032BS...P10.../PMF (DRVI-24ST)
F = Force [N]
v = Speed [m/s]
Continuous lines = Peak force of the actuator
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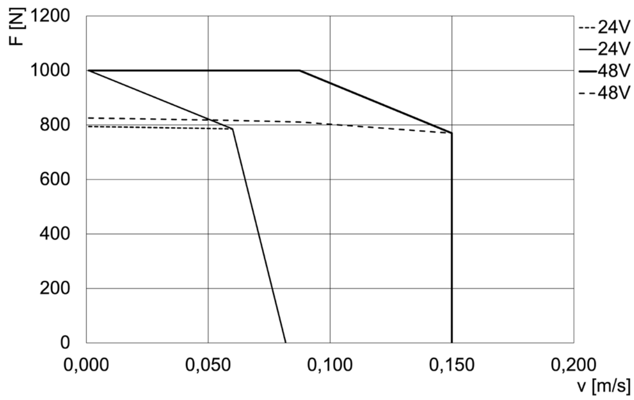
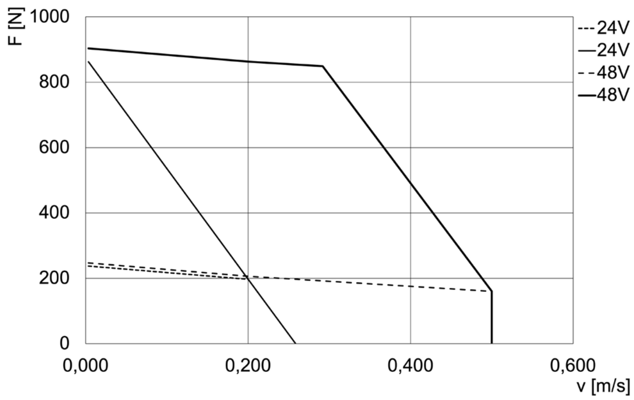


3E032BS...P03.../PMG (DRVI-24EC)
F = Force [N]
v = Speed [m/s]
Continuous lines = Peak force of the actuator
Dashed lines = Nominal force of the actuator



3E032BS...P10.../PMG (DRVI-24EC)
F = Force [N]
v = Speed [m/s]
Continuous lines = Peak force of the actuator
Dashed lines = Nominal force of the actuator