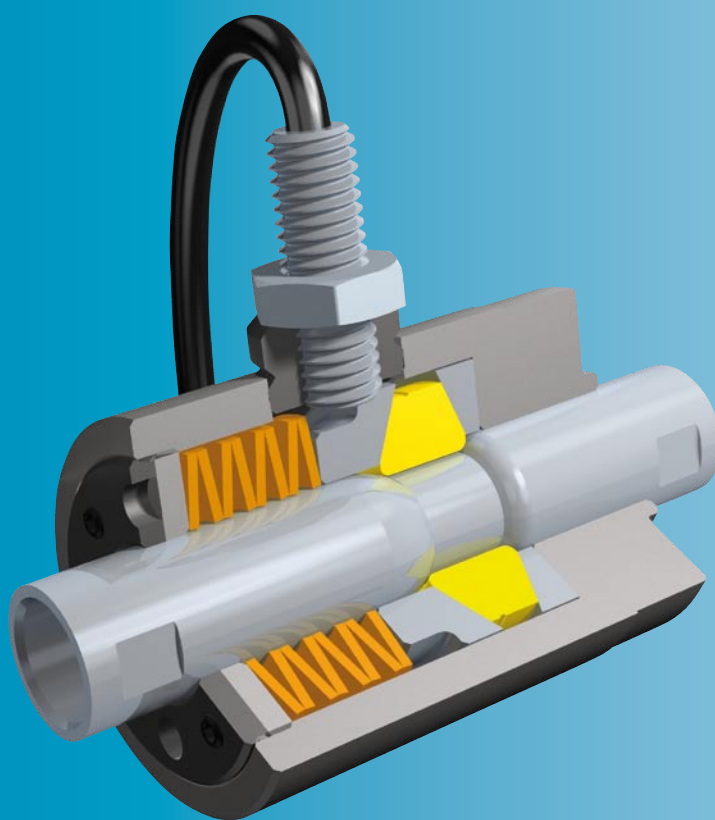


EAS[®]-axial

Force limiter for linear movements



- *Reliable force limitation*
- *High axial rigidity*
- *Automatic engagement*
- *Electrical drive disconnection via integrated sensor*

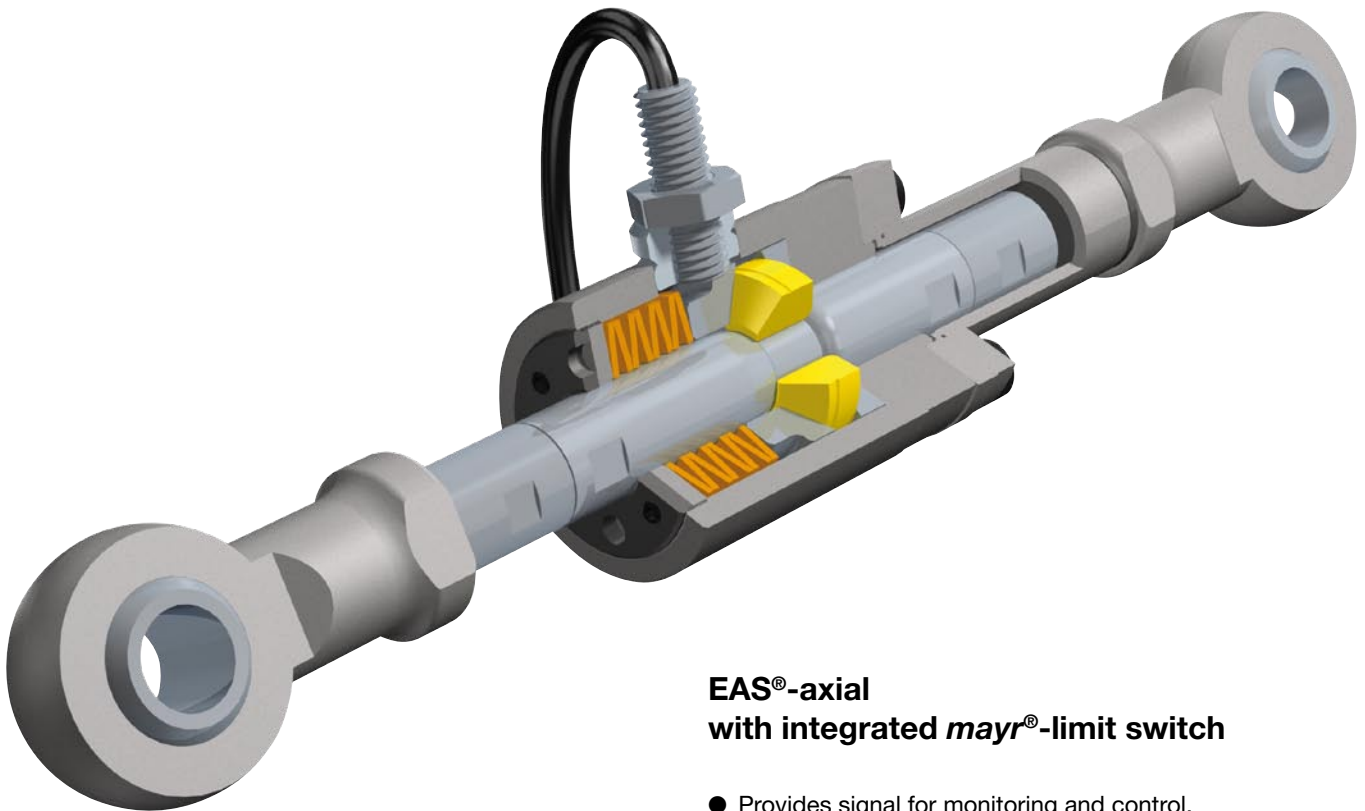
www.mayr.com

K.403.C.V08.GB

mayr[®]
your reliable partner

EAS®-axial – Two-directional overload protection

- Limits tensile and compressive forces.
- High quality materials, hardened functional components and superior manufacturing precision guarantee excellent repetitive accuracy of the set force and increase the service lifetime.
- Backlash-free force transmission with high axial rigidity.
- Immediate force interruption in the event of overload.
- Stepless adjustment of the release force.
- Free stroke in both tensile and compressive direction can be defined by the user.
- EAS®-axial with integrated limit switch emits a signal in case of overload occurrence, which can be used to shut down the drive.
- By using an EAS®-axial and a cycle monitor, cycle frequencies can be monitored and controlled.
- **Force limitation for linear movements, e.g. crank mechanisms.**
- **As torque support, e.g. in shaft-mounted gearboxes.**
- **In cam-controlled feed drives.**



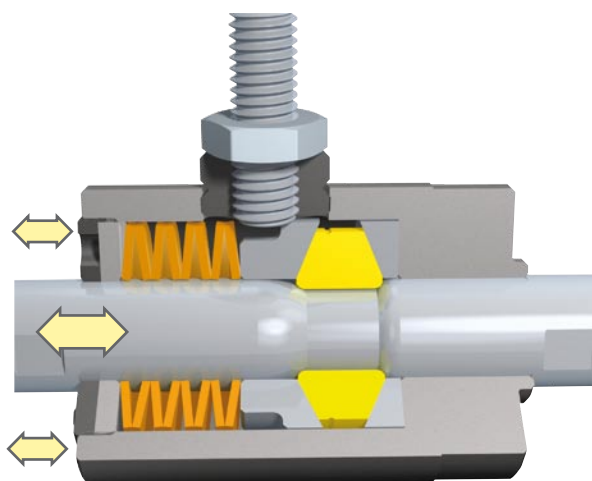
EAS®-axial with integrated mayr®-limit switch

EAS®-axial with cycle monitoring system

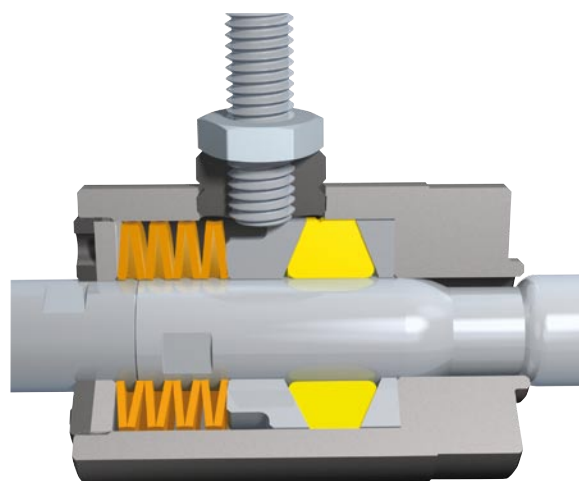
- Provides signal for monitoring and control.
- In case of overload occurrence, the limit switch switches off the drive or initiates further control functions.
- Contactless monitoring system.
- Flexible installation of the EAS®-axial.
- Direct signal evaluation.
- Secured against cable breakage via PNP NC contact (fail safe).
- Short constructional design, therefore compact overall dimensions.
- Provides signal for monitoring and control.
- In case of overload occurrence, the signal can also be used to switch off the drive.

Operating principle of the EAS®-axial

- If the pre-set tensile or compressive forces are exceeded, the EAS®-axial disengages in the respective direction.
- The release force is individually adjustable via an adjusting ring and *mayr*®-cup springs.
- In case of overload occurrence, the bolt carries out an axial stroke and moves the switching segments radially outward. The force transmission is then interrupted.
- Re-engagement takes place manually or automatically.



engaged



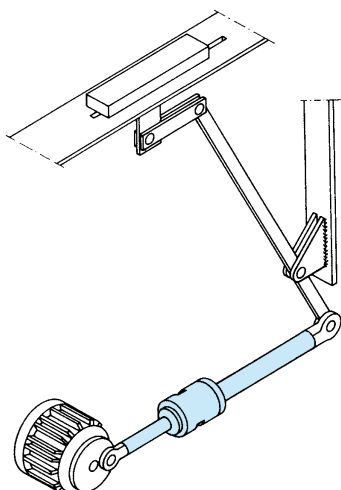
disengaged

Installation Example

In a crank mechanism, various forces have an effect on the connecting rod.

Extremely high forces can occur at the top or bottom dead center of the crank, in spite of torque limitation, and can therefore cause damage without a torque limiting clutch reacting.

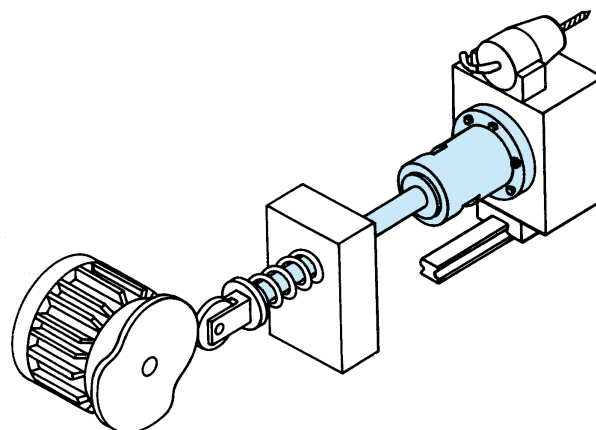
By using an EAS®-axial, it is guaranteed that the axial force acting on the connecting rod – independent of the position of the crank – does not exceed a certain set value.



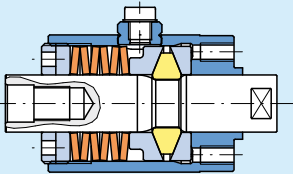
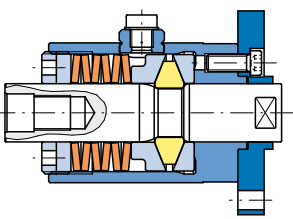
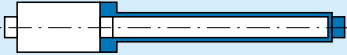
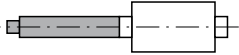
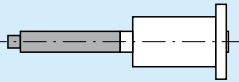
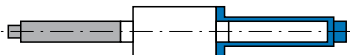
EAS®-axial in a cam-controlled feed drive, for example a transfer line.

In case of overload occurrence, the EAS®-axial disengages and limits the force to the set value.

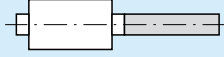
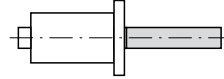
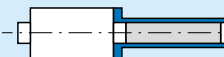
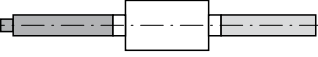
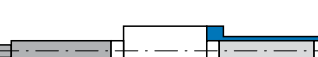
The connecting rod telescopes into the EAS®-axial. During reversal, the spring pulls the connecting rod back. The EAS®-axial engages and is ready for operation again automatically.



Summary of constructional designs EAS®-axial

Basic element 	Release force: 75 to 300 000 N Sizes 1 to 8 Type 300.___0	• Overload protection for linear movement of masses. • High axial rigidity. • Backlash-free design. • Rapid force drop. • Overload can be signalled via a contactless limit switch.
Exterior flange design 	Release force: 75 to 300 000 N Sizes 1 to 8 Type 320.___0	• Force transmitted via bolts and exterior flange. • Free strokes in tensile and / or compressive directions can be varied via customer-supplied attachment parts. • Application example: feed carriages.
Basic element with sleeve 	Release force: 75 to 300 000 N Sizes 1 to 8 Type 310.___0	• Force transmitted via bolt and threaded end of sleeve. • Free strokes in compressive directions can be varied via customer-supplied attachment parts up to a maximum limited by the sleeve length. • Sleeve length according to customer's request, dependent on the reduced length.
Basic element with connecting rod 	Release force: 75 to 300 000 N Sizes 1 to 8 Type 301.___0	• Force transmitted via connecting rod and bolt pattern on housing. • Connecting rod length is suitable for accommodating the free stroke in compressive direction based on the customer's application.
Exterior flange design with connecting rod 	Release force: 75 to 300 000 N Sizes 1 to 8 Type 321.___0	• Force transmitted via connecting rod and exterior flange. • Connecting rod length is suitable for accommodating the free stroke in compressive direction based on the customer's application.
Basic element with connecting rod and sleeve 	Release force: 75 to 300 000 N Sizes 1 to 8 Type 311.___0	• Force transmitted via connecting rod and threaded end of sleeve. • Both connecting rod and sleeve length are suitable for accommodating the free stroke in compressive direction based on the customer's application.

Summary of constructional designs EAS®-axial

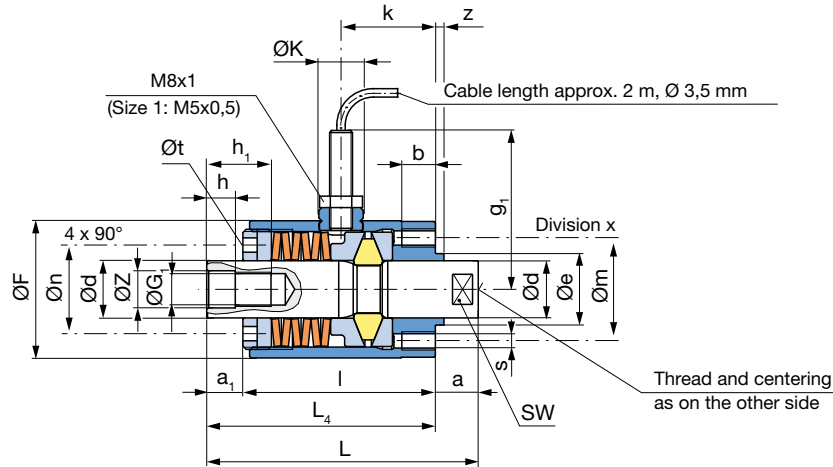
Basic element with guide rod 	Release force: 75 to 300 000 N Sizes 1 to 8 Type 302._ _0	• Force transmitted via bolt and housing. • Guide rod length is suitable for accommodating stroke in tensile direction based on the customer's application.
Page 12		
Exterior flange design with guide rod 	Release force: 75 to 300 000 N Sizes 1 to 8 Type 322._ _0	• Force transmitted via bolts and exterior flange. • Guide rod length is suitable for accommodating stroke in tensile direction based on the customer's application.
Page 13		
Basic element with guide rod and sleeve 	Release force: 75 to 300 000 N Sizes 1 to 8 Type 312._ _0	• Force transmitted via bolt and threaded end of sleeve. • Both guide rod and sleeve length are suitable for accommodating the free stroke in tensile direction based on the customer's application.
Page 14		
Basic element with connecting rod and guide rod 	Release force: 75 to 300 000 N Sizes 1 to 8 Type 303._ _0	• Force transmitted via connecting rod and bolt pattern on housing. • Both connecting rod and guide rod length are suitable for accommodating the free stroke in tensile and compressive direction based on the customer's application.
Page 15		
Exterior flange design with connecting rod and guide rod 	Release force: 75 to 300 000 N Sizes 1 to 8 Type 323._ _0	• Force transmitted via connecting rod and exterior flange. • Both connecting rod and guide rod length are suitable for accommodating the free stroke in tensile and compressive direction based on the customer's application.
Page 16		
Basic element with connecting rod, guide rod and sleeve 	Release force: 75 to 300 000 N Sizes 1 to 8 Type 313._ _0	• Force transmitted via connecting rod and threaded end of sleeve. • Connecting rod, guide rod and sleeve length are suitable for accommodating the free stroke in tensile and compressive direction based on the customer's application.
Page 17		
Length Dimensioning		
Page 18		
Technical Explanations		
Page 20		



According to German notation, decimal points in this catalogue are represented with a comma (e.g. 0,5 instead of 0.5).

Basic element

Type 300._ _0
Sizes 1 to 8



We reserve the right to make dimensional and constructional alterations.

Technical Data			Size							
			1	2	3	4	5	6	7	8
Release forces ¹⁾	Type 300.4_0	F _A [kN]	0,075 - 0,2	0,2 - 0,5	0,3 - 0,6	0,6 - 2	3 - 7,5	6 - 12	12 - 30	30 - 70
	Type 300.5_0	F _A [kN]	0,2 - 0,5	0,5 - 0,8	0,6 - 2	2 - 6	6 - 12	12 - 30	30 - 70	70 - 150
	Type 300.6_0	F _A [kN]	0,3 - 0,8	0,8 - 2	2 - 5	6 - 12	12 - 30	30 - 70	70 - 150	150 - 300
Free stroke ²⁾	H _{1 max} , H _{2 max}	[mm]	200	300	400	500	600	700	800	1000
Weight		[kg]	0,175	0,377	0,877	2,45	7,14	12,9	35,6	105,4

Dimensions [mm]	Size							
	1	2	3	4	5	6	7	8
a	8	12	15	20	32,5	35	50	65
a ₁	6	10	10	15	15	15	25	30
b	7	10	12	15	20	22	35	50
d _{h9}	10	14	20	30	40	50	70	100
e ₁₇	14	18	25	35	50	60	85	120
F	30	37	48	68	95	120	160	240
G ₁	M6 x 0,75	M10 x 0,75	M12 x 1,0	M20 x 1,0	M24 x 1,5	M30 x 1,5	M48 x 2,0	M75 x 2,0
g ₁	41,5	49,5	55,5	65,5	75,5	85,5	98	136
h	5	9	10	15	20	25	35	50
h ₁	12	18	22	32	42	53	73	103
K	15,5	15,5	15,5	15,5	-	-	-	-
k	18	30	33	44	59	74	114	163
L	52	75	95	130	190	230	350	460
L ₄	44	63	80	110	157,5	195	300	395
l	38	53	70	95	142,5	180	275	365
m	22	28	37	52	72	90	130	180
n	17	22	31	48	69	90	115	170
s	M3	M5	M6	M8	M10	M12	M16	M24
t	3	4	5	6	8	8	8	10
x	6 x 60°	6 x 60°	6 x 60°	6 x 60°	6 x 60°	6 x 60°	6 x 60°	6 x 60°
z ^{H7}	7	11	13	22	28	36	52	78
z	2	2	3	4	6	8	10	15
SW	9	13	17	27	36	46	65	90

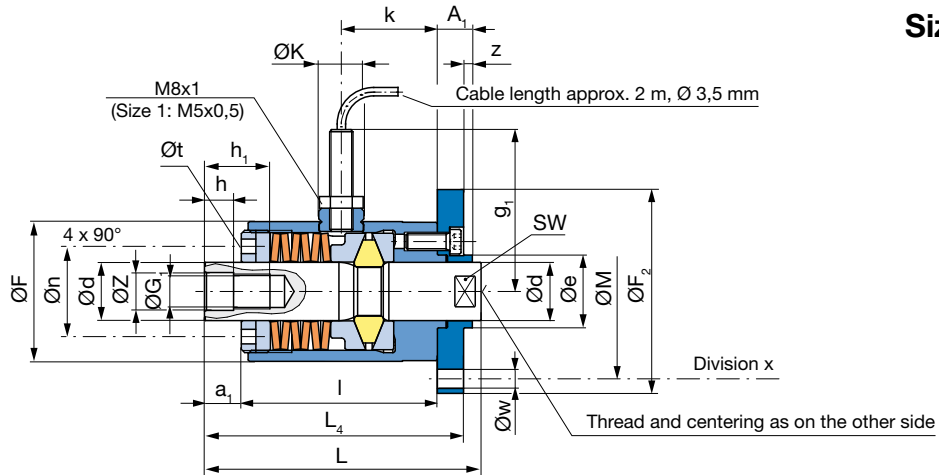
Order Number

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▲	▲	▲
Sizes	Release force ⁴⁾	Limit switch
1	Low	4 Without limit switch ³⁾
to	Medium	1 With integrated
8	High	limit switch

Example: Order number 2 / 300.600

- 1) Lower or higher release forces on request.
Re-engagement force = 20 – 25 % of the release force.
- 2) H_{1 max}: free stroke in tensile direction;
H_{2 max}: free stroke in compressive direction
(larger free strokes on request)
- 3) EAS®-axial without limit switch
– delivery with bushing (M8 or M5)
- 4) See Technical Data, release forces F_A

Exterior flange design

Type 320._ _0
Sizes 1 to 8

We reserve the right to make dimensional and constructional alterations.

Technical Data			Size							
			1	2	3	4	5	6	7	8
Release forces ¹⁾	Type 320.4_0	F _A [kN]	0,075 - 0,2	0,2 - 0,5	0,3 - 0,6	0,6 - 2	3 - 7,5	6 - 12	12 - 30	30 - 70
	Type 320.5_0	F _A [kN]	0,2 - 0,5	0,5 - 0,8	0,6 - 2	2 - 6	6 - 12	12 - 30	30 - 70	70 - 150
	Type 320.6_0	F _A [kN]	0,3 - 0,8	0,8 - 2	2 - 5	6 - 12	12 - 30	30 - 70	70 - 150	150 - 300
Free stroke ²⁾	H _{1 max} , H _{2 max}	[mm]	200	300	400	500	600	700	800	1000
Weight		[kg]	0,225	0,487	1,087	2,9	8,31	15,8	42,0	124,9

Dimensions [mm]	Size							
	1	2	3	4	5	6	7	8
A ₁	8	10	12	15	21	30	40	55
a ₁	6	10	10	15	15	15	25	30
d _{h9}	10	14	20	30	40	50	70	100
e ₁₇	14	18	25	35	50	60	85	120
F	30	37	48	68	95	120	160	240
F ₂	42	55	70	95	128	158	210	316
G ₁	M6 x 0,75	M10 x 0,75	M12 x 1,0	M20 x 1,0	M24 x 1,5	M30 x 1,5	M48 x 2,0	M75 x 2,0
g ₁	41,5	49,5	55,5	65,5	75,5	85,5	98	136
h	5	9	10	15	20	25	35	50
h ₁	12	18	22	32	42	53	73	103
K	15,5	15,5	15,5	15,5	-	-	-	-
k	18	30	33	44	59	74	114	163
L	52	75	95	130	190	230	350	460
L ₄	50	71	89	121	172,5	217	330	435
l	38	53	70	95	142,5	180	275	365
M	36	46	60	82	112	140	186	280
n	17	22	31	48	69	90	115	170
t	3	4	5	6	8	8	8	10
w	3,4	5,5	6,6	9	11	13,5	17,5	26
x	6 x 60°	6 x 60°	6 x 60°	6 x 60°	6 x 60°	6 x 60°	6 x 60°	6 x 60°
Z ^{H7/h7}	7	11	13	22	28	36	52	78
z	2	2	3	4	6	8	10	15
SW	9	13	17	27	36	46	65	90

Order Number

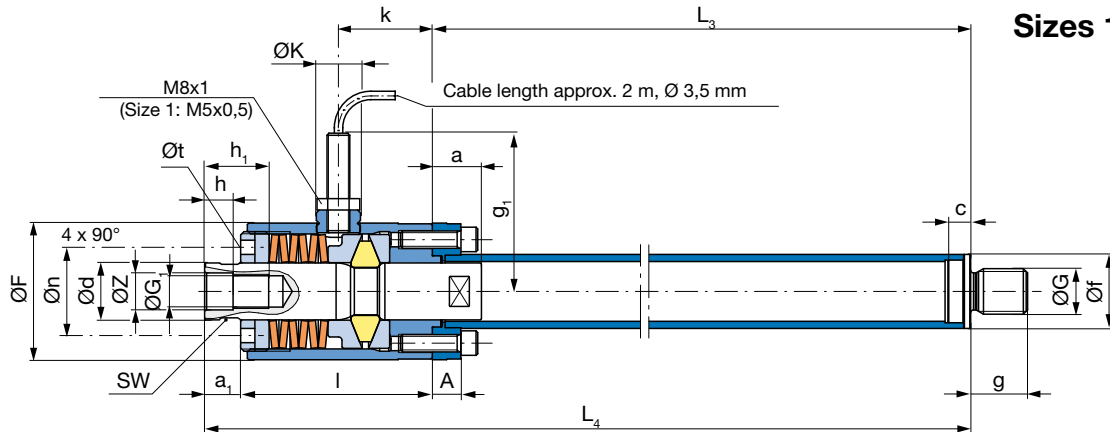
_ / 3 2 0 . _ _ 0					
▲			▲	▲	
Sizes	Release force ⁴⁾		Limit switch		
1	Low	4	0	Without limit switch ³⁾	
to	Medium	5	1	With integrated	
8	High	6		limit switch	

Example: Order number 1 / 320.510

- 1) Lower or higher release forces on request.
Re-engagement force = 20 – 25 % of the release force.
- 2) H_{1 max}: free stroke in tensile direction;
H_{2 max}: free stroke in compressive direction
(larger free strokes on request)
- 3) EAS®-axial without limit switch
– delivery with bushing (M8 or M5)
- 4) See Technical Data, release forces F_A

Basic element with sleeve

Type 310._ _0
Sizes 1 to 8



We reserve the right to make dimensional and constructional alterations.

Technical Data				Size							
				1	2	3	4	5	6	7	8
Release forces ¹⁾	Type 310.4_0	F _A	[kN]	0,075 - 0,2	0,2 - 0,5	0,3 - 0,6	0,6 - 2	3 - 7,5	6 - 12	12 - 30	30 - 70
	Type 310.5_0	F _A	[kN]	0,2 - 0,5	0,5 - 0,8	0,6 - 2	2 - 6	6 - 12	12 - 30	30 - 70	70 - 150
	Type 310.6_0	F _A	[kN]	0,3 - 0,8	0,8 - 2	2 - 5	6 - 12	12 - 30	30 - 70	70 - 150	150 - 300
Free stroke ²⁾	H _{1 max} , H _{2 max}		[mm]	200	300	400	500	600	700	800	1000

Dimensions [mm]	Size							
	1	2	3	4	5	6	7	8
A	7	8	10	12	15	22	32	44
a	8	12	15	20	32,5	35	50	65
a ₁	6	10	10	15	15	15	25	30
c	5	6	8	10	12,5	16	20	26
d _{h9}	10	14	20	30	40	50	70	100
F	30	37	48	68	95	120	160	240
f	14	19	26	38	55	70	95	130
G	M8	M12	M16	M24 x 2,0	M30 x 2,0	M36 x 3,0	M52 x 3,0	M64 x 4,0
G ₁	M6 x 0,75	M10 x 0,75	M12 x 1,0	M20 x 1,0	M24 x 1,5	M30 x 1,5	M48 x 2,0	M75 x 2,0
g	10	15	20	30	35	42	50	60
g ₁	41,5	49,5	55,5	65,5	75,5	85,5	98	136
h	5	9	10	15	20	25	35	50
h ₁	12	18	22	32	42	53	73	103
K	15,5	15,5	15,5	15,5	-	-	-	-
k	18	30	33	44	59	74	114	163
L ₃	Length depends on free stroke in tensile and							
L ₄	compressive directions, for calculation please see pages 18/19							
I	38	53	70	95	142,5	180	275	365
n	17	22	31	48	69	90	115	170
t	3	4	5	6	8	8	8	10
Z ^{H7/h7}	7	11	13	22	28	36	52	78
SW	9	13	17	27	36	46	65	90

Order Number

—	/	3	1	0	.	—	—	0	/	—
▲				▲		▲				▲
Sizes				Release force ⁴⁾		Limit switch				L ₃
1				Low	4	Without limit switch ³⁾				Length of the sleeve
to				Medium	5	With integrated				Calculations according to "Length Dimensioning",
8				High	6	limit switch				see Technical Data, pages 18/19

Example: Order number 2 / 310.400 / L₃ = 210

1) Lower or higher release forces on request.

Re-engagement force = 20 – 25 % of the release force.

2) H_{1 max}: free stroke in tensile direction;

H_{2 max}: free stroke in compressive direction (larger free strokes on request)

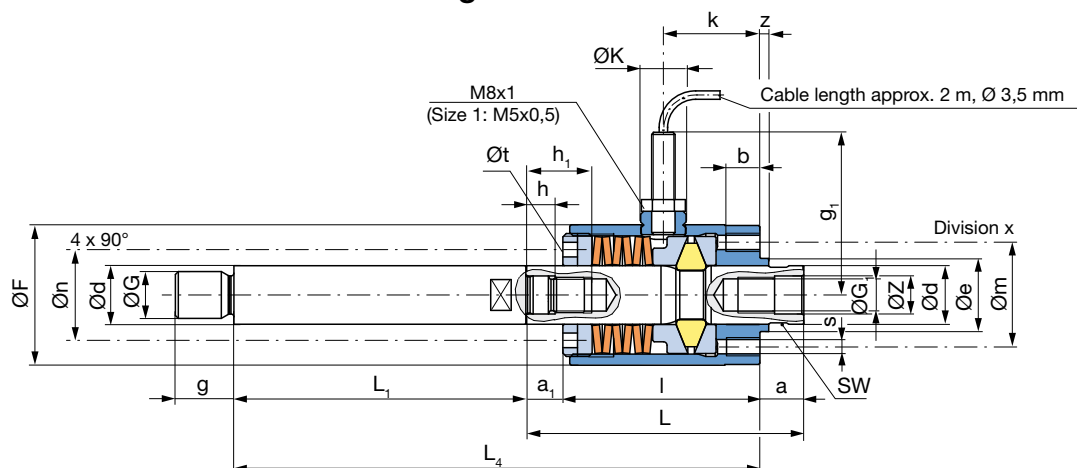
3) EAS®-axial without limit switch

– delivery with bushing (M8 or M5)

4) See Technical Data, release forces F_A

Basic element with connecting rod

Type 301._ _0
Sizes 1 to 8



We reserve the right to make dimensional and constructional alterations.

Technical Data				Size							
				1	2	3	4	5	6	7	8
Release forces ¹⁾	Type 301.4_0	F _A	[kN]	0,075 - 0,2	0,2 - 0,5	0,3 - 0,6	0,6 - 2	3 - 7,5	6 - 12	12 - 30	30 - 70
	Type 301.5_0	F _A	[kN]	0,2 - 0,5	0,5 - 0,8	0,6 - 2	2 - 6	6 - 12	12 - 30	30 - 70	70 - 150
	Type 301.6_0	F _A	[kN]	0,3 - 0,8	0,8 - 2	2 - 5	6 - 12	12 - 30	30 - 70	70 - 150	150 - 300
Free stroke ²⁾	H _{2 max}		[mm]	200	300	400	500	600	700	800	1000

Dimensions [mm]	Size							
	1	2	3	4	5	6	7	8
a	8	12	15	20	32,5	35	50	65
a ₁	6	10	10	15	15	15	25	30
b	7	10	12	15	20	22	35	50
d _{h9}	10	14	20	30	40	50	70	100
e _{f7}	14	18	25	35	50	60	85	120
F	30	37	48	68	95	120	160	240
G	M8	M12	M16	M24 x 2	M30 x 2	M36 x 3	M52 x 3	M64 x 4
G ₁	M6 x 0,75	M10 x 0,75	M12 x 1,0	M20 x 1,0	M24 x 1,5	M30 x 1,5	M48 x 2,0	M75 x 2,0
g	10	15	20	30	35	42	50	60
g ₁	41,5	49,5	55,5	65,5	75,5	85,5	98	136
h	5	9	10	15	20	25	35	50
h ₁	12	18	22	32	42	53	73	103
K	15,5	15,5	15,5	15,5	-	-	-	-
k	18	30	33	44	59	74	114	163
L	52	75	95	130	190	230	350	460
L ₁	Length depends on free stroke in tensile and							
L ₄	compressive directions, for calculation please see pages 18/19							
l	38	53	70	95	142,5	180	275	365
m	22	28	37	52	72	90	130	180
n	17	22	31	48	69	90	115	170
s	M3	M5	M6	M8	M10	M12	M16	M24
t	3	4	5	6	8	8	8	10
x	6 x 60°	6 x 60°	6 x 60°	6 x 60°	6 x 60°	6 x 60°	6 x 60°	6 x 60°
Z _{H7} h7	7	11	13	22	28	36	52	78
z	2	2	3	4	6	8	10	15
SW	9	13	17	27	36	46	65	90

Order Number

— / 3 0 1 . —		— 0 / —	
			
Sizes	Release force ⁴⁾	Limit switch	L₁
1	Low	0	Length of the connecting rod
to	Medium	1	Calculations according to "Length Dimensioning",
8	High	limit switch	see Technical Data, pages 18/19

Example: Order number 1 / 301.400 / $L_1 = 150$

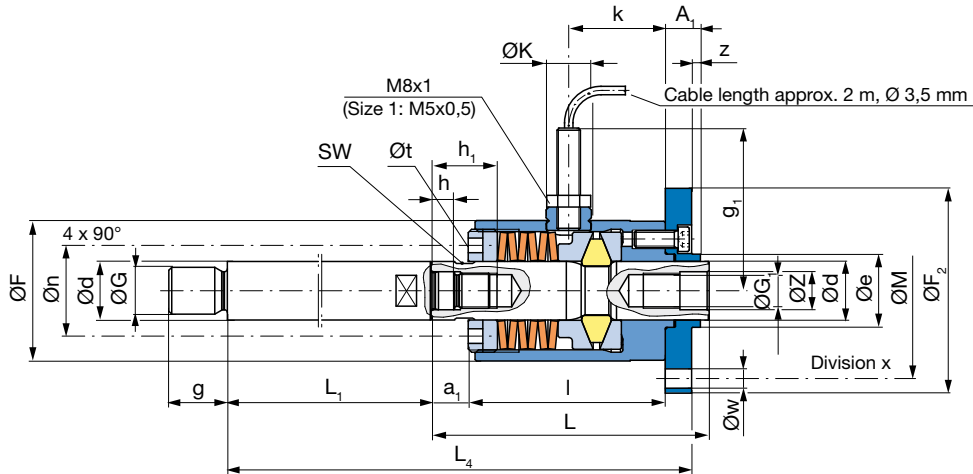
1) Lower or higher release forces on request.
Re-engagement force = 20 – 25 % of the release force.

2) $H_{2 \max}$: free stroke in compressive direction
(larger free strokes on request)

- 3) EAS®-axial without limit switch
– delivery with bushing (M8 or M5)
- 4) See Technical Data, release forces

Exterior flange design with connecting rod

Type 321._ _0 Sizes 1 to 8



We reserve the right to make dimensional and constructional alterations.

Technical Data				Size							
Release forces ¹⁾	Type 321.4_0	F _A [kN]		1	2	3	4	5	6	7	8
	Type 321.5_0	F _A [kN]		0,075 - 0,2	0,2 - 0,5	0,3 - 0,6	0,6 - 2	3 - 7,5	6 - 12	12 - 30	30 - 70
	Type 321.6_0	F _A [kN]		0,2 - 0,5	0,5 - 0,8	0,6 - 2	2 - 6	6 - 12	12 - 30	30 - 70	70 - 150
Free stroke ²⁾ H _{2 max}											
				[mm]	200	300	400	500	600	700	1000

Dimensions [mm]	Size							
	1	2	3	4	5	6	7	8
A ₁	8	10	12	15	21	30	40	55
a ₁	6	10	10	15	15	15	25	30
d _{h9}	10	14	20	30	40	50	70	100
e ₁₇	14	18	25	35	50	60	85	120
F	30	37	48	68	95	120	160	240
F ₂	42	55	70	95	128	158	210	316
G	M8	M12	M16	M24 x 2	M30 x 2	M36 x 3	M52 x 3	M64 x 4
G ₁	M6 x 0,75	M10 x 0,75	M12 x 1,0	M20 x 1,0	M24 x 1,5	M30 x 1,5	M48 x 2,0	M75 x 2,0
g	10	15	20	30	35	42	50	60
g ₁	41,5	49,5	55,5	65,5	75,5	85,5	98	136
h	5	9	10	15	20	25	35	50
h ₁	12	18	22	32	42	53	73	103
K	15,5	15,5	15,5	15,5	-	-	-	-
k	18	30	33	44	59	74	114	163
L	52	75	95	130	190	230	350	460
L ₁	Length depends on free stroke in tensile and compressive directions,							
L ₄	for calculation please see pages 18/19							
l	38	53	70	95	142,5	180	275	365
M	36	46	60	82	112	140	186	280
n	17	22	31	48	69	90	115	170
t	3	4	5	6	8	8	8	10
w	3,4	5,5	6,6	9	11	13,5	17,5	26
x	6 x 60°	6 x 60°	6 x 60°	6 x 60°	6 x 60°	6 x 60°	6 x 60°	6 x 60°
Z _{h7}	7	11	13	22	28	36	52	78
z	2	2	3	4	6	8	10	15
SW	9	13	17	27	36	46	65	90

Order Number

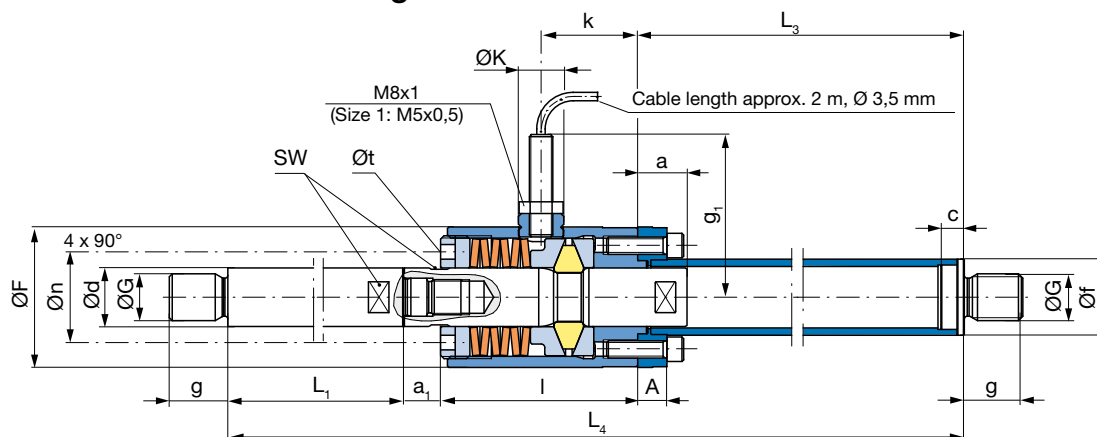
_ / 3 2 1 . _ _ 0 / _							
▲				▲			
Sizes				Limit switch			
1				Without limit switch ³⁾			
to				With integrated limit switch			
8				Length of the connecting rod			
				Calculations according to "Length Dimensioning", see Technical Data, pages 18/19			

Example: Order number 4 / 321.600 / L₁ = 320

- 1) Lower or higher release forces on request.
Re-engagement force = 20 - 25 % of the release force.
- 2) H_{2 max}: free stroke in compressive direction (larger free strokes on request)

- 3) EAS®-axial without limit switch
- delivery with bushing (M8 or M5)
- 4) See Technical Data, release forces F_A

Basic element with connecting rod and sleeve

Type 311._ _0
Sizes 1 to 8

We reserve the right to make dimensional and constructional alterations.

Technical Data				Size							
				1	2	3	4	5	6	7	8
Release forces ¹⁾	Type 311.4_0	F _A	[kN]	0,075 - 0,2	0,2 - 0,5	0,3 - 0,6	0,6 - 2	3 - 7,5	6 - 12	12 - 30	30 - 70
	Type 311.5_0	F _A	[kN]	0,2 - 0,5	0,5 - 0,8	0,6 - 2	2 - 6	6 - 12	12 - 30	30 - 70	70 - 150
	Type 311.6_0	F _A	[kN]	0,3 - 0,8	0,8 - 2	2 - 5	6 - 12	12 - 30	30 - 70	70 - 150	150 - 300
Free stroke ²⁾	H _{2 max}		[mm]	200	300	400	500	600	700	800	1000

Dimensions [mm]	Size							
	1	2	3	4	5	6	7	8
A	7	8	10	12	15	22	32	44
a	8	12	15	20	32,5	35	50	65
a ₁	6	10	10	15	15	15	25	30
c	5	6	8	10	12,5	16	20	26
d _{h9}	10	14	20	30	40	50	70	100
F	30	37	48	68	95	120	160	240
f	14	19	26	38	55	70	95	130
G	M8	M12	M16	M24 x 2	M30 x 2	M36 x 3	M52 x 3	M64 x 4
g	10	15	20	30	35	42	50	60
g ₁	41,5	49,5	55,5	65,5	75,5	85,5	98	136
K	15,5	15,5	15,5	15,5	-	-	-	-
k	18	30	33	44	59	74	114	163
L ₁	Length depends on free stroke							
L ₃	in tensile and compressive directions,							
L ₄	for calculation please see pages 18/19							
l	38	53	70	95	142,5	180	275	365
n	17	22	31	48	69	90	115	170
t	3	4	5	6	8	8	8	10
SW	9	13	17	27	36	46	65	90

Order Number

—	/	3	1	1	.	—	—	0	/	/	
▲						▲	▲			▲	▲
Sizes						Release force ⁴⁾	Limit switch			L ₁	L ₃
1						Low	Without limit switch ³⁾			Length of the	Length of the
to						Medium	With integrated			connecting rod	sleeve
8						High	limit switch			Calculations according to "Length Dimensioning",	see Technical Data, pages 18/19

Example: Order number 3 / 311.510 / L₁= 230 / L₃= 320

1) Lower or higher release forces on request.

Re-engagement force = 20 – 25 % of the release force.

2) H_{2 max}: free stroke in compressive direction (larger free strokes on request)

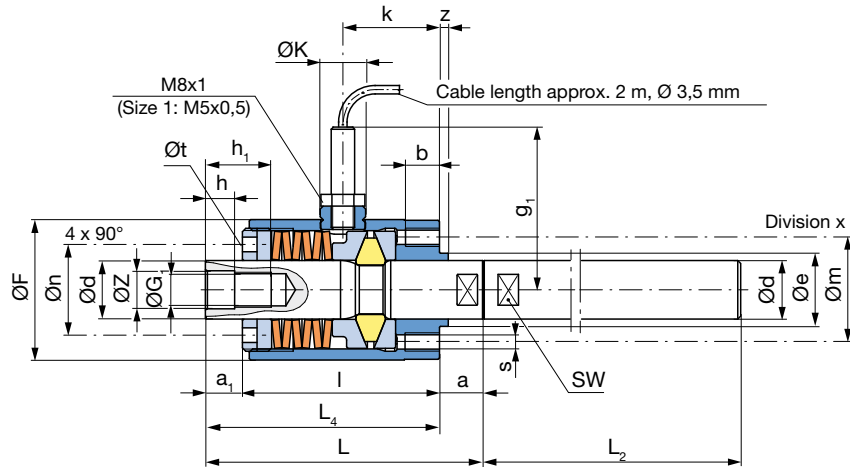
3) EAS®-axial without limit switch

– delivery with bushing (M8 or M5)

4) See Technical Data, release forces F_A

Basic element with guide rod

Type 302._ _0
Sizes 1 to 8



We reserve the right to make dimensional and constructional alterations.

Technical Data			Size							
			1	2	3	4	5	6	7	8
Release forces ¹⁾	Type 302.4_0	F _A [kN]	0,075 - 0,2	0,2 - 0,5	0,3 - 0,6	0,6 - 2	3 - 7,5	6 - 12	12 - 30	30 - 70
	Type 302.5_0	F _A [kN]	0,2 - 0,5	0,5 - 0,8	0,6 - 2	2 - 6	6 - 12	12 - 30	30 - 70	70 - 150
	Type 302.6_0	F _A [kN]	0,3 - 0,8	0,8 - 2	2 - 5	6 - 12	12 - 30	30 - 70	70 - 150	150 - 300
Free stroke ²⁾	H _{1 max}	[mm]	200	300	400	500	600	700	800	1000

Dimensions [mm]	Size							
	1	2	3	4	5	6	7	8
a	8	12	15	20	32,5	35	50	65
a ₁	6	10	10	15	15	15	25	30
b	7	10	12	15	20	22	35	50
d _{h9}	10	14	20	30	40	50	70	100
e _{f7}	14	18	25	35	50	60	85	120
F	30	37	48	68	95	120	160	240
G ₁	M6 x 0,75	M10 x 0,75	M12 x 1,0	M20 x 1,0	M24 x 1,5	M30 x 1,5	M48 x 2,0	M75 x 2,0
g ₁	41,5	49,5	55,5	65,5	75,5	85,5	98	136
h	5	9	10	15	20	25	35	50
h ₁	12	18	22	32	42	53	73	103
K	15,5	15,5	15,5	15,5	-	-	-	-
k	18	30	33	44	59	74	114	163
L	52	75	95	130	190	230	350	460
L ₂	Length depends on free stroke in tensile and compressive directions,							
L ₄	for calculation please see pages 18/19							
l	38	53	70	95	142,5	180	275	365
m	22	28	37	52	72	90	130	180
n	17	22	31	48	69	90	115	170
s	M3	M5	M6	M8	M10	M12	M16	M24
t	3	4	5	6	8	8	8	10
x	6 x 60°	6 x 60°	6 x 60°	6 x 60°	6 x 60°	6 x 60°	6 x 60°	6 x 60°
Z _{h7}	7	11	13	22	28	36	52	78
z	2	2	3	4	6	8	10	15
SW	9	13	17	27	36	46	65	90

Order Number

—	/	3	0	2	.	—	—	0	/	—
▲				▲		▲				▲
Sizes				Release force ⁴⁾		Limit switch				L ₂
1				Low	4	Without limit switch ³⁾				Length of the guide rod
to				Medium	5	With integrated				Calculations according to "Length Dimensioning",
8				High	6	limit switch				see Technical Data, pages 18/19

Example: Order number 1 / 302.500 / L₂ = 135

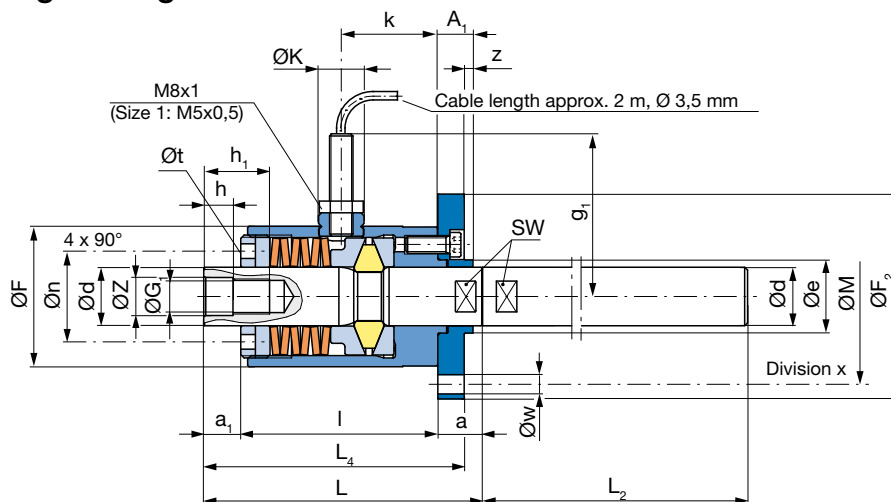
- 1) Lower or higher release forces on request.
Re-engagement force = 20 – 25 % of the release force.
- 2) H_{1 max}: free stroke in tensile direction (larger free strokes on request)

- 3) EAS®-axial without limit switch
– delivery with bushing (M8 or M5)
- 4) See Technical Data, release forces F_A

Exterior flange design with guide rod

Type 322._ _0

Sizes 1 to 8



We reserve the right to make dimensional and constructional alterations.

Technical Data				Size							
				1	2	3	4	5	6	7	8
Release forces ¹⁾	Type 322.4_0	F _A	[kN]	0,075 - 0,2	0,2 - 0,5	0,3 - 0,6	0,6 - 2	3 - 7,5	6 - 12	12 - 30	30 - 70
	Type 322.5_0	F _A	[kN]	0,2 - 0,5	0,5 - 0,8	0,6 - 2	2 - 6	6 - 12	12 - 30	30 - 70	70 - 150
	Type 322.6_0	F _A	[kN]	0,3 - 0,8	0,8 - 2	2 - 5	6 - 12	12 - 30	30 - 70	70 - 150	150 - 300
Free stroke ²⁾	H _{1 max}		[mm]	200	300	400	500	600	700	800	1000

Dimensions [mm]	Size							
	1	2	3	4	5	6	7	8
A ₁	8	10	12	15	21	30	40	55
a	8	12	15	20	32,5	35	50	65
a ₁	6	10	10	15	15	15	25	30
d _{h9}	10	14	20	30	40	50	70	100
e _{f7}	14	18	25	35	50	60	85	120
F	30	37	48	68	95	120	160	240
F ₂	42	55	70	95	128	158	210	316
G ₁	M6 x 0,75	M10 x 0,75	M12 x 1,0	M20 x 1,0	M24 x 1,5	M30 x 1,5	M48 x 2,0	M75 x 2,0
g ₁	41,5	49,5	55,5	65,5	75,5	85,5	98	136
h	5	9	10	15	20	25	35	50
h ₁	12	18	22	32	42	53	73	103
K	15,5	15,5	15,5	15,5	-	-	-	-
k	18	30	33	44	59	74	114	163
L	52	75	95	130	190	230	350	460
L ₂	Length depends on free stroke in tensile and compressive directions,							
L ₄	for calculation please see pages 18/19							
l	38	53	70	95	142,5	180	275	365
M	36	46	60	82	112	140	186	280
n	17	22	31	48	69	90	115	170
t	3	4	5	6	8	8	8	10
w	3,4	5,5	6,6	9	11	13,5	17,5	26
x	6 x 60°	6 x 60°	6 x 60°	6 x 60°	6 x 60°	6 x 60°	6 x 60°	6 x 60°
z ^{H7} _{h7}	7	11	13	22	28	36	52	78
z	2	2	3	4	6	8	10	15
SW	9	13	17	27	36	46	65	90

Order Number

—	/	3	2	2	.	—	—	0	/	—
▲						▲	▲			▲
Sizes						Release force ⁴⁾	Limit switch			L ₂
1						Low	Without limit switch ³⁾			Length of the guide rod
to						Medium	With integrated			Calculations according to "Length Dimensioning",
8						High	limit switch			see Technical Data, pages 18/19

Example: Order number 2 / 322.410 / L₂ = 185

1) Lower or higher release forces on request.

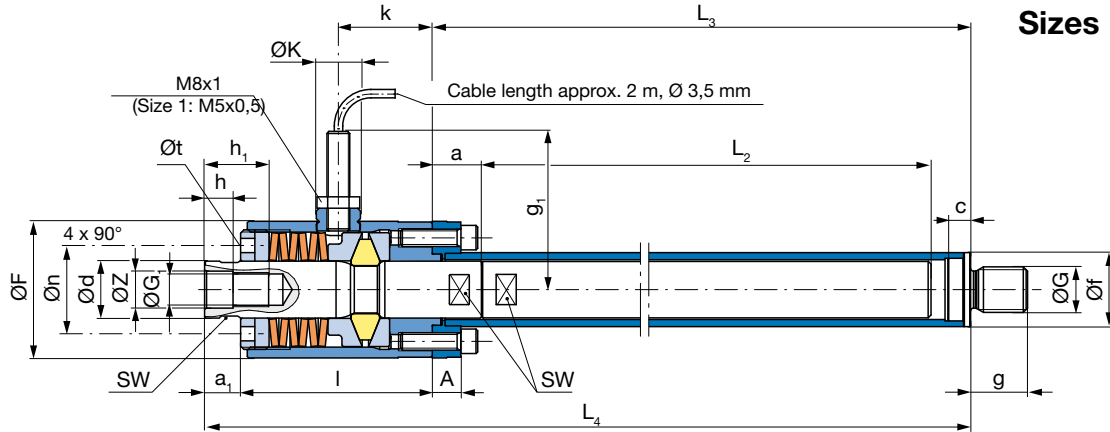
2) H_{1 max}: free stroke in tensile direction (larger free strokes on request)

3) EAS®-axial without limit switch – delivery with bushing (M8 or M5)

4) See Technical Data, release forces F_A

Basic element with guide rod and sleeve

Type 312._ _0
Sizes 1 to 8



We reserve the right to make dimensional and constructional alterations.

Technical Data			Size							
			1	2	3	4	5	6	7	8
Release forces ¹⁾	Type 312.4_0	F _A [kN]	0,075 - 0,2	0,2 - 0,5	0,3 - 0,6	0,6 - 2	3 - 7,5	6 - 12	12 - 30	30 - 70
	Type 312.5_0	F _A [kN]	0,2 - 0,5	0,5 - 0,8	0,6 - 2	2 - 6	6 - 12	12 - 30	30 - 70	70 - 150
	Type 312.6_0	F _A [kN]	0,3 - 0,8	0,8 - 2	2 - 5	6 - 12	12 - 30	30 - 70	70 - 150	150 - 300
Free stroke ²⁾ H _{1 max}		[mm]	200	300	400	500	600	700	800	1000

Dimensions [mm]	Size							
	1	2	3	4	5	6	7	8
A	7	8	10	12	15	22	32	44
a	8	12	15	20	32,5	35	50	65
a ₁	6	10	10	15	15	15	25	30
c	5	6	8	10	12,5	16	20	26
d _{h9}	10	14	20	30	40	50	70	100
F	30	37	48	68	95	120	160	240
f	14	19	26	38	55	70	95	130
G	M8	M12	M16	M24 x 2	M30 x 2	M36 x 3	M52 x 3	M64 x 4
G ₁	M6 x 0,75	M10 x 0,75	M12 x 1,0	M20 x 1,0	M24 x 1,5	M30 x 1,5	M48 x 2,0	M75 x 2,0
g	10	15	20	30	35	42	50	60
g ₁	41,5	49,5	55,5	65,5	75,5	85,5	98	136
h	5	9	10	15	20	25	35	50
h ₁	12	18	22	32	42	53	73	103
K	15,5	15,5	15,5	15,5	-	-	-	-
k	18	30	33	44	59	74	114	163
L ₂	Length depends on free stroke in tensile and compressive directions, for calculation please see pages 18/19							
L ₃								
L ₄								
l	38	53	70	95	142,5	180	275	365
n	17	22	31	48	69	90	115	170
t	3	4	5	6	8	8	8	10
Z ^{H7} _{h7}	7	11	13	22	28	36	52	78
SW	9	13	17	27	36	46	65	90

Order Number

_ / 3 1 2 . _ 0 / /									
▲		▲		▲		▲		▲	
Sizes 1 to 8		Release force ⁴⁾ Low Medium High		Limit switch Without limit switch ³⁾ With integrated limit switch		L ₂ Length of the guide rod Calculations according to "Length Dimensioning", see Technical Data, pages 18/19		L ₃ Length of the sleeve	
		4 5 6		0 1					

Example: Order number 1 / 312.600 / L₂ = 210 / L₃ = 300

1) Lower or higher release forces on request.
Re-engagement force = 20 - 25 % of the release force.

2) H_{1 max}: free stroke in tensile direction
(larger free strokes on request)

3) EAS®-axial without limit switch

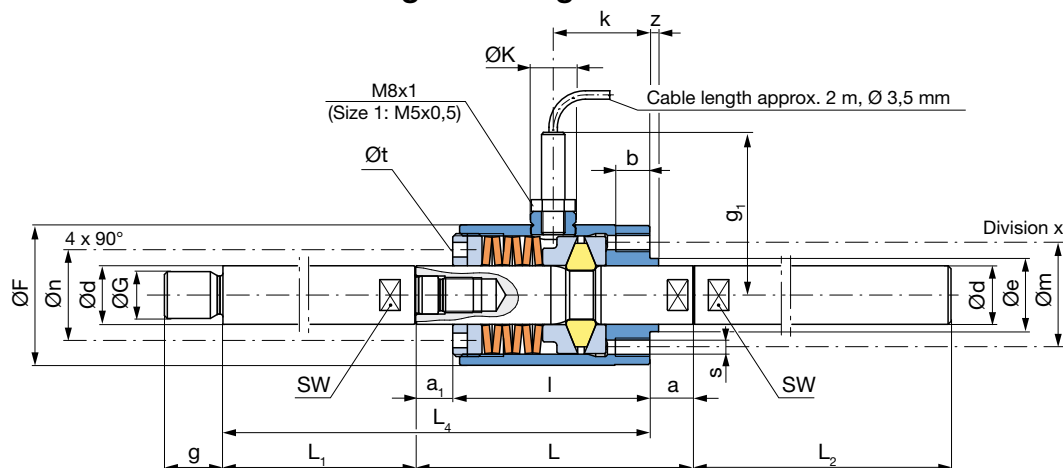
- delivery with bushing (M8 or M5)

4) See Technical Data, release forces F_A

Basic element with connecting rod and guide rod

Type 303._ _0

Sizes 1 to 8



We reserve the right to make dimensional and constructional alterations.

Technical Data				Size							
Release forces ¹⁾	Type 303.4_0	F _A	[kN]	1	2	3	4	5	6	7	8
	Type 303.5_0	F _A	[kN]	0,075 - 0,2	0,2 - 0,5	0,3 - 0,6	0,6 - 2	3 - 7,5	6 - 12	12 - 30	30 - 70
	Type 303.6_0	F _A	[kN]	0,2 - 0,5	0,5 - 0,8	0,6 - 2	2 - 6	6 - 12	12 - 30	30 - 70	70 - 150
Free stroke ²⁾	H _{1 max}	H _{2 max}	[mm]	0,3 - 0,8	0,8 - 2	2 - 5	6 - 12	12 - 30	30 - 70	70 - 150	150 - 300
				200	300	400	500	600	700	800	1000

Dimensions [mm]	Size							
	1	2	3	4	5	6	7	8
a	8	12	15	20	32,5	35	50	65
a ₁	6	10	10	15	15	15	25	30
b	7	10	12	15	20	22	35	50
d _{h9}	10	14	20	30	40	50	70	100
e ₇₇	14	18	25	35	50	60	85	120
F	30	37	48	68	95	120	160	240
G	M8	M12	M16	M24 x 2	M30 x 2	M36 x 3	M52 x 3	M64 x 4
g	10	15	20	30	35	42	50	60
g ₁	41,5	49,5	55,5	65,5	75,5	85,5	98	136
K	15,5	15,5	15,5	15,5	-	-	-	-
k	18	30	33	44	59	74	114	163
L	52	75	95	130	190	230	350	460
L ₁	Length depends on free stroke in tensile and compressive directions, for calculation please see pages 18/19							
L ₂								
L ₄								
l	38	53	70	95	142,5	180	275	365
m	22	28	37	52	72	90	130	180
n	17	22	31	48	69	90	115	170
s	M3	M5	M6	M8	M10	M12	M16	M24
t	3	4	5	6	8	8	8	10
x	6 x 60°	6 x 60°	6 x 60°	6 x 60°	6 x 60°	6 x 60°	6 x 60°	6 x 60°
z	2	2	3	4	6	8	10	15
SW	9	13	17	27	36	46	65	90

Order Number

_ / 3 0 3 . _				_ 0 / /			
▲				▲			
Sizes		Release force ⁴⁾		Limit switch		L ₁	
1		Low		0		Length of the connecting rod	
to		Medium		1		Length of the guide rod	
8		High		With integrated limit switch		Calculations according to "Length Dimensioning", see Technical Data, pages 18/19	

Example: Order number 2 / 303.610 / L₁= 320 / L₂= 320

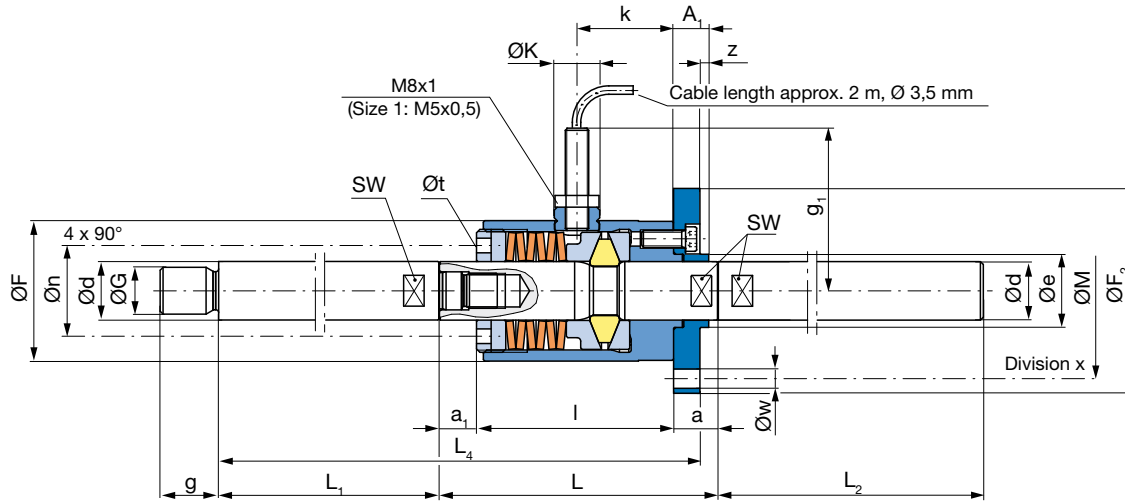
1) Lower or higher release forces on request.
Re-engagement force = 20 – 25 % of the release force.

2) H_{1 max}: free stroke in tensile direction;
H_{2 max}: free stroke in compressive direction
(larger free strokes on request)

3) EAS®-axial without limit switch
– delivery with bushing (M8 or M5)
4) See Technical Data, release forces F_A

Exterior flange design with connecting rod and guide rod

Type 323._ _0
Sizes 1 to 8



We reserve the right to make dimensional and constructional alterations.

Technical Data				Size							
				1	2	3	4	5	6	7	8
Release forces ¹⁾	Type 323.4_0	F _A	[kN]	0,075 - 0,2	0,2 - 0,5	0,3 - 0,6	0,6 - 2	3 - 7,5	6 - 12	12 - 30	30 - 70
	Type 323.5_0	F _A	[kN]	0,2 - 0,5	0,5 - 0,8	0,6 - 2	2 - 6	6 - 12	12 - 30	30 - 70	70 - 150
	Type 323.6_0	F _A	[kN]	0,3 - 0,8	0,8 - 2	2 - 5	6 - 12	12 - 30	30 - 70	70 - 150	150 - 300
Free stroke ²⁾	H _{1 max} ‡ H _{2 max}		[mm]	200	300	400	500	600	700	800	1000

Dimensions [mm]	Size							
	1	2	3	4	5	6	7	8
A ₁	8	10	12	15	21	30	40	55
a	8	12	15	20	32,5	35	50	65
a ₁	6	10	10	15	15	15	25	30
d _{h9}	10	14	20	30	40	50	70	100
e ₁₇	14	18	25	35	50	60	85	120
F	30	37	48	68	95	120	160	240
F ₂	42	55	70	95	128	158	210	316
G	M8	M12	M16	M24 x 2	M30 x 2	M36 x 3	M52 x 3	M64 x 4
g	10	15	20	30	35	42	50	60
g ₁	41,5	49,5	55,5	65,5	75,5	85,5	98	136
K	15,5	15,5	15,5	15,5	-	-	-	-
k	18	30	33	44	59	74	114	163
L	52	75	95	130	190	230	350	460
L ₁	Length depends on free stroke							
L ₂	in tensile and compressive directions,							
L ₄	for calculation please see pages 18/19							
l	38	53	70	95	142,5	180	275	365
M	36	46	60	82	112	140	186	280
n	17	22	31	48	69	90	115	170
t	3	4	5	6	8	8	8	10
w	3,4	5,5	6,6	9	11	13,5	17,5	26
x	6 x 60°	6 x 60°	6 x 60°	6 x 60°	6 x 60°	6 x 60°	6 x 60°	6 x 60°
z	2	2	3	4	6	8	10	15
SW	9	13	17	27	36	46	65	90

Order Number

_ / 3 2 3 . _ _ 0 / _ /							
▲ Sizes 1 to 8				▲ Release force ⁴⁾ Low Medium High			
				▲ Limit switch 0 Without limit switch ³⁾ 1 With integrated limit switch			
				▲ L₁ Length of the connecting rod Calculations according to "Length Dimensioning", see Technical Data, pages 18/19			
				▲ L₂ Length of the guide rod			

Example: Order number 2 / 323.400 / L₁ = 140 / L₂ = 155

1) Lower or higher release forces on request.
Re-engagement force = 20 - 25 % of the release force.

2) H_{1 max}: free stroke in tensile direction;
H_{2 max}: free stroke in compressive direction
(larger free strokes on request)

3) EAS®-axial without limit switch

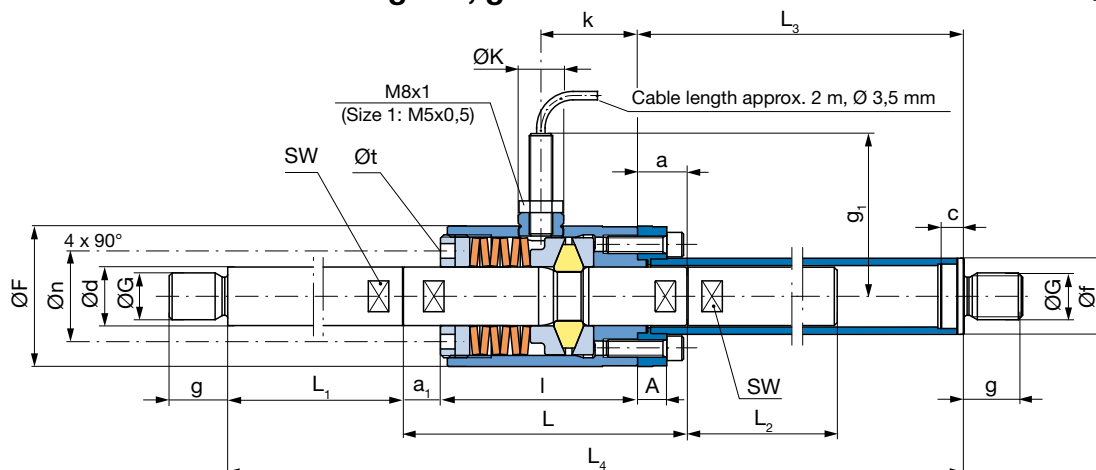
- delivery with bushing (M8 or M5)

4) See Technical Data, release forces F_A

Basic element with connecting rod, guide rod and sleeve

Type 313._ _0

Sizes 1 to 8



We reserve the right to make dimensional and constructional alterations.

Technical Data				Size							
				1	2	3	4	5	6	7	8
Release forces ¹⁾	Type 313.4_0	F _A	[kN]	0,075 - 0,2	0,2 - 0,5	0,3 - 0,6	0,6 - 2	3 - 7,5	6 - 12	12 - 30	30 - 70
	Type 313.5_0	F _A	[kN]	0,2 - 0,5	0,5 - 0,8	0,6 - 2	2 - 6	6 - 12	12 - 30	30 - 70	70 - 150
	Type 313.6_0	F _A	[kN]	0,3 - 0,8	0,8 - 2	2 - 5	6 - 12	12 - 30	30 - 70	70 - 150	150 - 300
Free stroke ²⁾		H _{1 max} H _{2 max}	[mm]	200	300	400	500	600	700	800	1000

Dimensions [mm]	Size							
	1	2	3	4	5	6	7	8
A	7	8	10	12	15	22	32	44
a	8	12	15	20	32,5	35	50	65
a ₁	6	10	10	15	15	15	25	30
c	5	6	8	10	12,5	16	20	26
d _{h9}	10	14	20	30	40	50	70	100
F	30	37	48	68	95	120	160	240
f	14	19	26	38	55	70	95	130
G	M8	M12	M16	M24 x 2	M30 x 2	M36 x 3	M52 x 3	M64 x 4
g	10	15	20	30	35	42	50	60
g ₁	41,5	49,5	55,5	65,5	75,5	85,5	98	136
K	15,5	15,5	15,5	15,5	-	-	-	-
k	18	30	33	44	59	74	114	163
L	52	75	95	130	190	230	350	460
L ₁	Length depends on free stroke in tensile and compressive directions, for calculation please see pages 18/19							
L ₂								
L ₃								
L ₄								
I	38	53	70	95	142,5	180	275	365
n	17	22	31	48	69	90	115	170
t	3	4	5	6	8	8	8	10
SW	9	13	17	27	36	46	65	90

Order Number

/ 3 1 3 . 0 / / /														
▲					▲	▲				▲	▲	▲		
Sizes	Release force ⁴⁾					Limit switch				L ₁	L ₂	L ₃		
1	Low				4	0	Without limit switch ³⁾			Length of the	Length of the	Length of		
to	Medium				5	1	With integrated			connecting rod	guide rod	the sleeve		
8	High				6		limit switch			Calculations according to "Length Dimensioning", see Technical Data, pages 18/19				

Example: Order number 2 / 313.400 / L₁ = 140 / L₂ = 136 / L₃ = 310

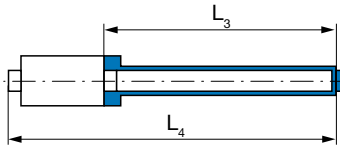
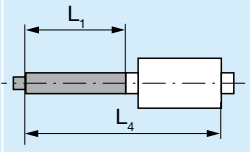
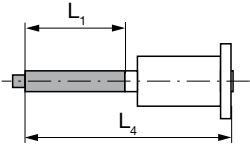
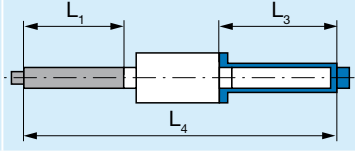
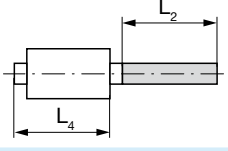
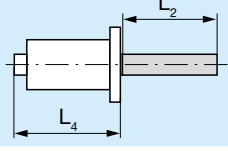
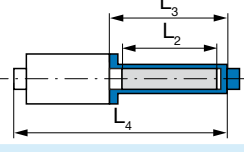
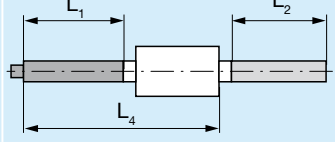
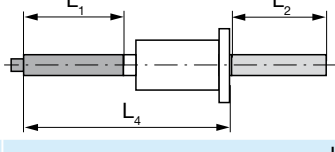
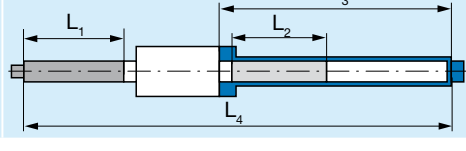
1) Lower or higher release forces on request.
Re-engagement force = 20 – 25 % of the release force.

2) H_{1 max}: free stroke in tensile direction;
H_{2 max}: free stroke in compressive direction
(larger free strokes on request)

3) EAS®-axial without limit switch
– delivery with bushing (M8 or M5)
4) See Technical Data, release forces F_A

Length Dimensioning

with given free stroke: in tensile direction H_1 / in compressive direction H_2

Disengagement direction free stroke		Design			Type	Minimum length of			Minimum installation length	Page
Tensile H_1	Com- pressive H_2	Connecting rod	Element	Guide rod / sleeve		connecting rod L_1 [mm]	guide rod L_2 [mm]	sleeve L_3 [mm]	L_4 [mm]	
					310._.0			$L_3 = H_2 + a + c + 2$	$L_4 = L_3 + a_1 + l$	8
→					301._.0	$L_1 = H_2 - a_1$			$L_4 = L_1 + a_1 + l$	9
→					321._.0	$L_1 = H_2 - a_1$			$L_4 = L_1 + a_1 + l + A_1 - z$	10
→					311._.0	$L_1 = H_2 - a_1$		$L_3 = H_2 + a + c + 2$	$L_4 = L_1 + L_3 + a_1 + l$	11
←					302._.0		$L_2 = H_1 - a - 2$		$L_4 = a_1 + l$	12
←					322._.0		$L_2 = H_1 - a - 2$		$L_4 = a_1 + l + A_1 - z$	13
←					312._.0		$L_2 = H_1 - a - 2$	$L_3 = H_1 + c$	$L_4 = L_3 + a_1 + l$	14
↔					303._.0	$L_1 = H_2 - a_1$	$L_2 = H_1 - a - 2$		$L_4 = L_1 + a_1 + l$	15
↔					323._.0	$L_1 = H_2 - a_1$	$L_2 = H_1 - a - 2$		$L_4 = L_1 + a_1 + l + A_1 - z$	16
↔					313._.0	$L_1 = H_2 - a_1$	$L_2 = H_1 - a - 2$	$L_3 = H_1 + H_2 + c$	$L_4 = L_1 + L_3 + a_1 + l$	17

Classifications

H_1	[mm]	Free stroke in tensile direction The max. defined free stroke in tensile direction must not be exceeded, otherwise the element will be pulled apart.
H_2	[mm]	Free stroke in compressive direction
L_1	[mm]	Minimum length of the connecting rod in order to carry out the free stroke in compressive direction H_2 .
L_2	[mm]	Minimum length of the guide rod in order to carry out the free stroke in tensile direction H_1 .
L_3	[mm]	Minimum sleeve length
L_4	[mm]	Minimum installation length If a larger installation length is required, the sleeve or the connecting rod must be chosen in an appropriate longer length
A_1	[mm]	see Tables Dimensions
a	[mm]	see Tables Dimensions
a_1	[mm]	see Tables Dimensions
c	[mm]	see Tables Dimensions
l	[mm]	see Tables Dimensions
z	[mm]	see Tables Dimensions

Calculation example for length dimensioning

Crank drive for linear movement of a carriage.

Technical Data:

Mass:	$m = 40 \text{ kg}$
Drive speed:	$n = 150 \text{ rpm}$
Angular speed:	$\omega = \frac{n \cdot \pi}{30} = 15,71 \text{ s}^{-1}$
Connecting rod ratio:	$\lambda = \frac{r}{D} = 0,05$
Transmission:	$i = \frac{C}{B} = 3$

Dimensions:

$B = 150 \text{ mm}$	$E = 94 \text{ mm}$
$C = 450 \text{ mm}$	$L_E = 762 \text{ mm}$
$D = 950 \text{ mm}$	$r = 50 \text{ mm}$

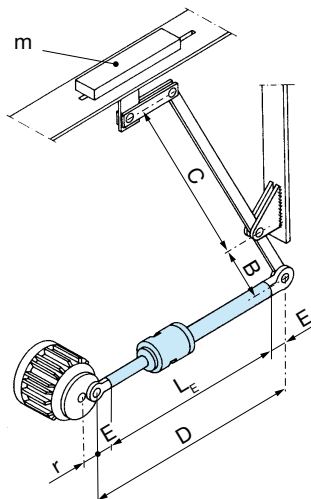


Fig.1

1. Forces on the carriage and on the EAS®-axial

1.1 Maximum acceleration of the crank drive

$$a_{\max} = \omega^2 \cdot r (1 + \lambda) = 12,96 \text{ m/s}^2$$

1.2 Acceleration on carriage

$$a_{\text{Sch}} = a_K \cdot i = 12,96 \text{ m/s}^2 \cdot 3 = 38,88 \text{ m/s}^2$$

1.3 Force on carriage

$$F_{\text{Sch}} = m \cdot a_{\text{Sch}} = 40 \text{ kg} \cdot 38,88 \text{ m/s}^2 = 1555 \text{ N}$$

1.4 Force on the EAS®-axial

$$F_{\text{EAS}} = F_{\text{Sch}} \cdot i = 1555 \text{ N} \cdot 3 = 4665 \text{ N}$$

2. Type and Size selection for the EAS®-axial

2.1 Level of release force F_A

$$F_A = F_{\text{EAS}} \cdot 1,5 = 4665 \cdot 1,5 = 6998 \text{ N}$$

(Factor 1,5 taking the friction conditions into account)

2.2 Size and Type

(connecting rod, guide rod and sleeve design page 17)

Size 4, Type 313.600 (release force 6000 – 12000 N)

3. Length dimensioning (see page 18)

3.1 Minimum length of the connecting rod L_1

$$L_1 = H_2 - a_1 = 100 \text{ mm} - 15 \text{ mm} = 85 \text{ mm}$$

with: $H_2 = 2 \cdot r$; a_1 see Dimensions, page 17

3.2 Minimum length of the guide rod L_2

$$L_2 = H_1 - a - 2 = (100 - 20 - 2) \text{ mm} = 78 \text{ mm}$$

with: $H_1 = 2 \cdot r$; a see Dimensions, page 17

3.3 Minimum sleeve length L_3

$$L_3 = H_1 + H_2 + c = (100 + 100 + 10) \text{ mm} = 210 \text{ mm}$$

with: $H_1 = H_2 = 2 \cdot r$; c see Dimensions, page 17

3.4 Minimum installation length L_4

$$L_4 = L_1 + L_3 + a_1 + l = (85 + 210 + 15 + 95) \text{ mm} = 405 \text{ mm}$$

with: L_1 and L_3 from 3.1 and 3.3;

a_1 and l see Dimensions, page 17

3.5 The difference ΔL from the required installation length L_E to minimum installation length L_4 is balanced by lengthening the connecting rod and the sleeve.

$$\Delta L = L_E - L_4 = 762 - 405 = 357 \text{ mm}$$

$$\text{Connecting rod length: } L_1 + 178 = 263 \text{ mm}$$

$$\text{Sleeve length: } L_3 + 179 = 389 \text{ mm}$$

3.6 Maximum permitted length of the connecting rod and the sleeve

$$\text{Connecting rod: } L_1 = H_2 - a_1 = 500 - 15 = 485 \text{ mm}$$

$$\text{Sleeve: } L_3 = H_1 + H_2 + c = 500 + 500 + 10 = 1010 \text{ mm}$$

The connecting rod and the sleeve must not be longer than the calculatory length with maximum free stroke H_1 and H_2 , see Dimensions (for Size 4: $H_1 = H_2 = 500 \text{ mm}$).

Adjustment of the release force

The force at which the EAS®-axial should disengage (release force) can be adjusted by altering the cup spring pre-tensioning.

Adjusting Sizes 1 – 4 (Fig. 3)

After having released the set screws (1), the adjusting nut (2) is set to Dimension "a" as shown in the Adjustment Diagram (see Fig. 2) using a face wrench. By turning the adjusting nut clockwise, the release force is increased. Turning the adjusting nut counter-clockwise leads to a decrease in release force (viewing direction: facing the front of the adjusting nut (2)). Afterwards, the adjusting nut (2) must be secured again using the set screws (1).

Adjusting Sizes 5 – 8 (Fig. 4):

There are 4 or 6 set screws (3) in the adjusting nut (2), which can be set to Dimension "a" (see Fig. 4). Countering the set screws (3) with hexagon nuts (4) prevents inadvertent changes to the adjustment. The Adjustment Diagram shows the relationship between Dimension "a", Fig. 4 and the release force. On request, we can deliver the EAS®-axial pre-set to the required release force.

Example:

- Size and Type:

Size 4, Type 313.600 (connecting rod, guide rod and sleeve design page 17)

- Release force F_A :

$F_A = 10\,000\text{ N}$ (disengaging force 6000 - 12 000 N)

- Dimension "a":

$a = 2\text{ mm}$ (Fig. 2)

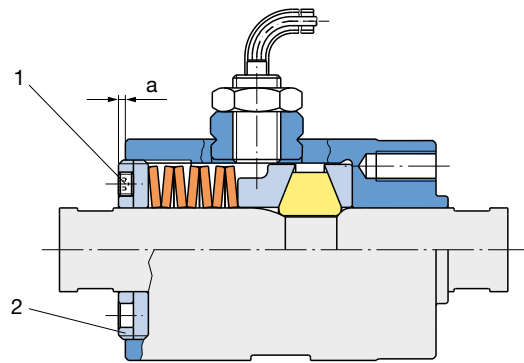


Fig. 3

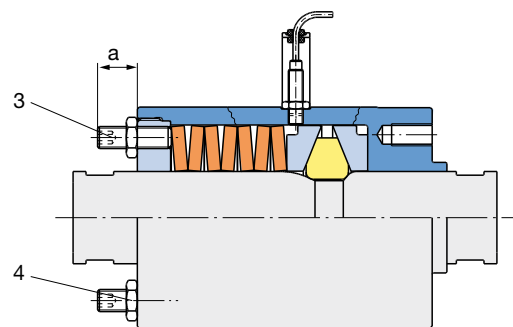


Fig. 4

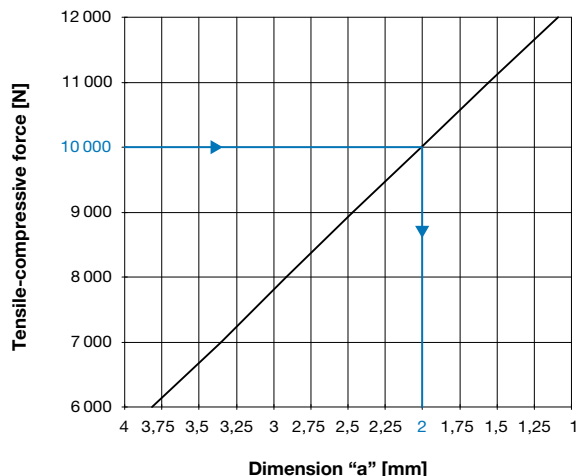


Fig. 2 (This Adjustment Diagram for Size 4, Type 3_ _6_0 only serves as an example!)

Installation

The EAS®-axial is delivered completely manufacturer-assembled. Special areas for the wrenches have been milled onto the individual components so that the connecting rod, the guide rod and the bolt can be screwed together. The screw connections are secured using Loctite 243. The connecting thread on the connecting rod and the sleeve are designed for mounting spherical joint ends acc. DIN 648, which mayr® can deliver on request.

On the designs with integrated limit switch, the sensor cable must be secured so that it cannot be damaged by movement of the EAS®-axial during operation or on disengagement.

Adjustment of the limit switch (PNP NC contact)

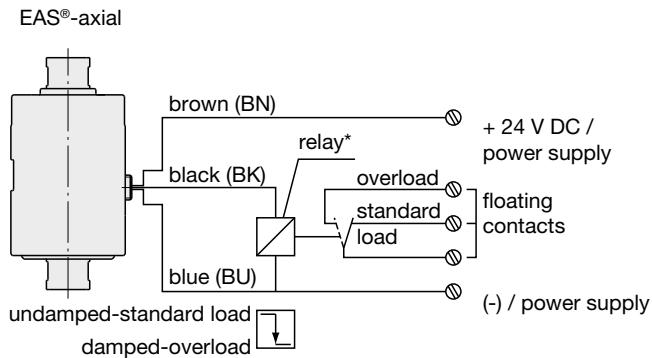
The EAS®-axial with integrated limit switch emits a signal on disengagement (overload), which can be used to switch off the drive. The limit switch is mounted and set at the site of manufacture.

Installation procedure and adjustment:

- Screw the sensor into the housing until it is damped.
- Slowly turn it back again until the switching condition changes again (undamped).
- Turn back by a further 45° (for Size 1, 90°) and mark this adjustment point.
- Carefully counter the sensor using a hexagon nut M8 x 1 (Size 1: M5 x 0,5) (tightening torque M5 = 1 Nm; M8 = 6 Nm). When countering, take out the thread backlash. The sensor thread must not be damaged.

After adjustment, the sensor cable must be secured to the EAS®-axial so that no damage can occur during operation (please attach a strain relief).

Wiring example



* Relay (+24 V DC / 200 mA) does not belong to the delivery range

Fig. 5

Maintenance

The EAS®-axial is mainly sealed, provided with a first grease-packing and therefore requires no particular maintenance work. Special maintenance work may only be necessary should the device be subject to very dirty or dusty ambient conditions.

The EAS®-axial maintenance work basically only means re-lubrication of the contact geometries.

A grease of the NLGI class 2 with a viscosity of 220 mm²/s at 40 °C, e.g. Mobilgrease HP222, is suitable for lubrication.

Please check the disengagement mechanism of the EAS®-axial annually.

We recommend carrying out maintenance work at the place of manufacture.

Why is it worth using EAS®-safety clutches?

Advantages for the Machine Manufacturer

Safety clutches ensure that the load on the components does not exceed the permitted values due to exact torque limitation.

This means that the modern demands on the machine construction can be fulfilled without risk.

- ☐ Reduction of constructional safety factors
- ☐ Optimum machine dimensions
- ☐ Low mass moment of inertia
- ☐ Smaller drive motors and gearbox
- ☐ Material and price reductions
- ☐ High rigidity and vibration-free transmission

Advantages for Productional Operation

No machine is safe from collisions. They occur due to incorrect operation, control software and hardware malfunctions or ambient influences such as foreign objects.

Safety clutches provide reliable protection and ensure:

- ☐ Low operational costs
- ☐ Minimum repair time expenditure
- ☐ High system availability
- ☐ High productivity
- ☐ Punctual production
- ☐ Good delivery image for customers

Classification of mayr®-safety clutches

	Torque limiting	Force limiting	Frictionally-locking	Positive-locking	Magnetic	Ratchetting	Disengaging	Pneum. switchable + controllable	Electr. switchable + controllable	Rustproof	Rustproof and sealed	Catalogue
Load holding safety clutches												
ROBA®-slip hubs	x		x									K.123.V_..GB
ROBA®-Co-Pro®	x		x									P.1000.V_..GB
EAS®-torque sensor	x			x								K.407.01.GB
ROBA®-contitorque	x				x					x	x	K.150.V_..GB
ROBA®-capping head	x				x					x	x	P.151000.V_..GB
Load separating safety clutches												
EAS®-Compact® / EAS®-NC	x			x		x				x	x	K.490.V_..GB
EAS®-smartic®	x			x		x						K.481.V_..GB
EAS®-400	x			x		x						K.407.01.GB
EAS®-Compact®-overload clutch	x			x			x					K.490.V_..GB
EAS®-element clutch	x			x			x					K.440.V_..GB
EAS®-elements	x			x			x					K.440.V_..GB
EAS®-dutytorque	x			x			x					K.4043.V_..GB
EAS®-Sp	x			x			x	x				K.406.V_..GB
EAS®-Sm / EAS®-Zr	x			x			x		x			K.406.V_..GB
EAS®-axial		x		x			x					K.403.C.V_..GB



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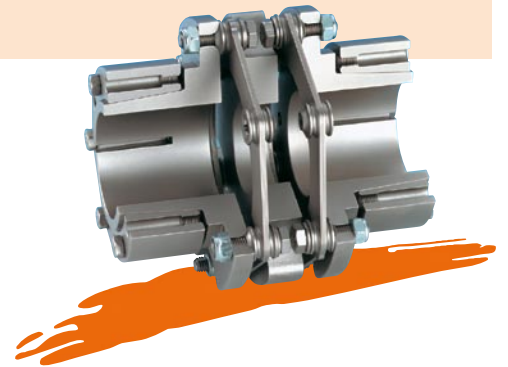
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Positive locking and completely backlash-free torque limiting clutches
- ❑ **EAS®-smartic®**
Cost-effective torque limiting clutches, quick installation
- ❑ **EAS®-element clutch/EAS®-elements**
Load-disconnecting protection against high torques
- ❑ **EAS®-axial**
Exact limitation of tensile and compressive forces
- ❑ **EAS®-Sp/EAS®-Sm/EAS®-Zr**
Load-disconnecting torque limiting clutches with switching function
- ❑ **ROBA®-slip hub**
Load-holding, frictionally locked torque limiting clutches
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Magnetic continuous slip clutches



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- ❑ **ROBA®-DS/ROBA®-D**
Backlash-free, torsionally rigid all-steel couplings
- ❑ **EAS®-control-DS**
Cost-effective torque-measuring couplings



Electromagnetic Brakes/Clutches

- ❑ **ROBA-stop® standard**
Multifunctional all-round safety brakes
- ❑ **ROBA-stop®-M motor brakes**
Robust, cost-effective motor brakes
- ❑ **ROBA-stop®-S**
Water-proof, robust monoblock brakes
- ❑ **ROBA-stop®-Z/ROBA-stop®-silenzio®**
Doubly safe elevator brakes
- ❑ **ROBA®-diskstop®**
Compact, very quiet disk brakes
- ❑ **ROBA®-topstop®**
Brake systems for gravity loaded axes
- ❑ **ROBA®-linearstop**
Backlash-free brake systems for linear motor axes
- ❑ **ROBATIC®/ROBA®-quick/ROBA®-takt**
Electromagnetic clutches and brakes, clutch brake units



DC Drives

- ❑ **tendo®-PM**
Permanent magnet-excited DC motors
- ❑ **tendo®-SC**
1 quadrant and 4 quadrant transistor controllers

