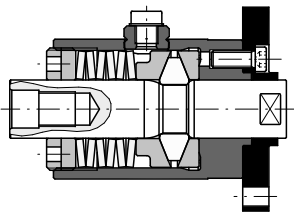


your reliable partner

tection for
ments



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 manufacturing gearbox.
- In cam-controlled feed drives.

EAS[®]-axial with cycle monitoring system

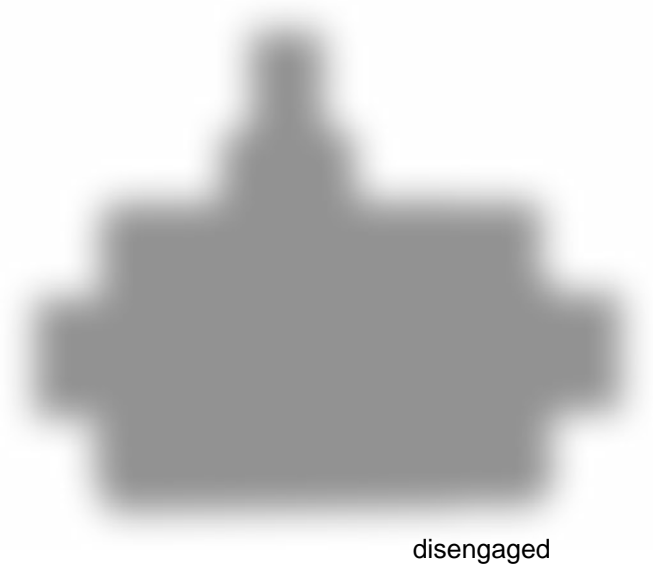
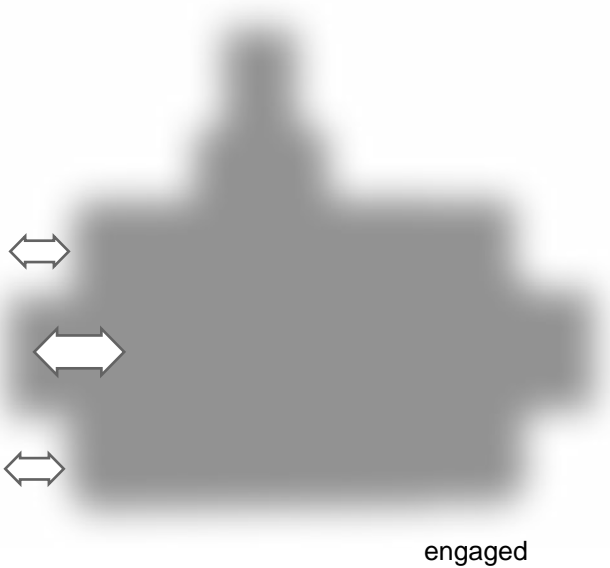
- Provides signal for monitoring and control.
- In case of overload occurrence, the signal can also be used to switch off the drive.

EAS[®]-axial with integrated mayr[®]-limit switch

- 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.
- Short constructional design, therefore compact overall dimensions.

Operating principle of the EAS[®]-axial

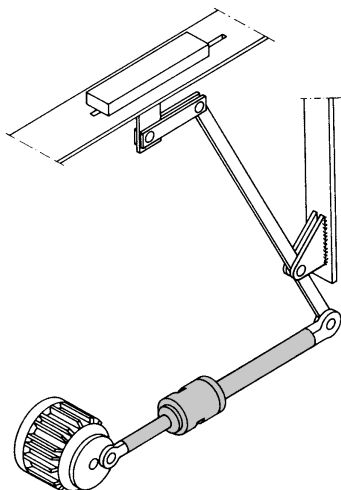
- If the pre-set tensile or compressive forces are exceeded, the EAS[®]-axial disengages in the respective direction.
- The release force is individually adjustable via an adjusting ring and mayr[®]-cup springs.
- In case of overload occurrence, the bolt carries out an axial stroke and moves the switching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



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.

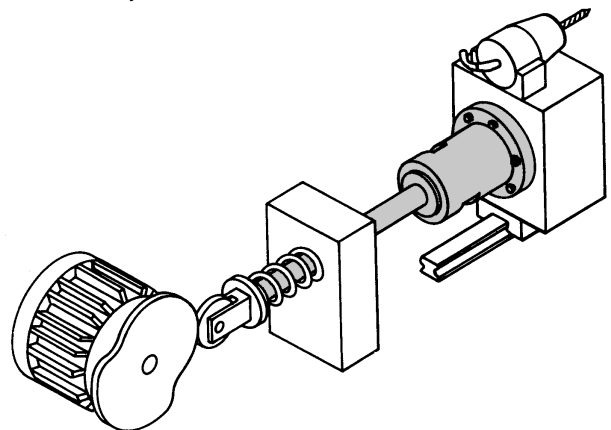
By using an EAS[®]-axial, it is guaranteed that the force acting on the connecting rod – independent of the position of the crank – does not exceed a certain set value.



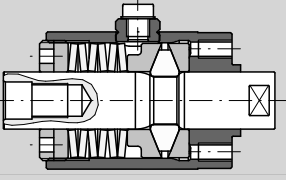
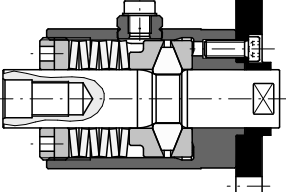

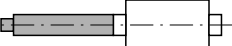
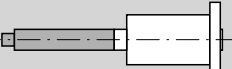
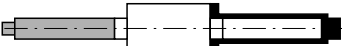
EAS[®]-axial in a cam-controlled feed drive, for example a transfer line.

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

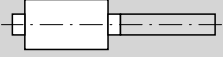
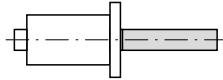
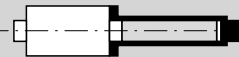
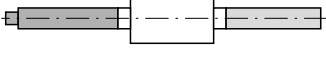
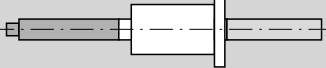
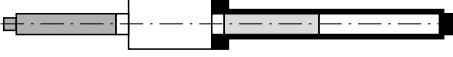
The connecting rod telescopes into the EAS[®]-axial. During reversal, the spring pulls the connecting rod back. The EAS[®]-axial engages and is ready for operation again automatically.



Summary of constructional designs EAS[®]-axial

<p>Basic element</p> 	<p>Release force: 75 to 300 000 N</p> <p>Sizes 1 to 8 Type 300.___0</p>	<ul style="list-style-type: none"> • Overload protection for linear movements. • High axial rigidity. • Backlash-free design. • Rapid force drop. • Overload can be signalled via a contactless limit switch.
Page 6		
<p>Mounting ange design</p> 	<p>Release force: 75 to 300 000 N</p> <p>Sizes 1 to 8 Type 320.___0</p>	<ul style="list-style-type: none"> • Force transmitted via bolts and mounting flange. • Free strokes in tensile and / or compressive directions can be varied via customer-supplied attachment parts. • Application example: feed carriages.
Page 7		
<p>Basic element with sleeve</p> 	<p>Release force: 75 to 300 000 N</p> <p>Sizes 1 to 8 Type 310.___0</p>	<ul style="list-style-type: none"> • 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.
Page 8		
<p>Basic element with connecting rod</p> 	<p>Release force: 75 to 300 000 N</p> <p>Sizes 1 to 8 Type 301.___0</p>	<ul style="list-style-type: none"> • Force transmitted via connecting rod and tapped hole on the housing. • Connecting rod length is suitable for accommodating the free stroke in compressive direction based on the customer's application.
Page 9		
<p>Mounting ange design with connecting rod</p> 	<p>Release force: 75 to 300 000 N</p> <p>Sizes 1 to 8 Type 321.___0</p>	<ul style="list-style-type: none"> • Force transmitted via connecting rod and mounting ange. • Connecting rod length is suitable for accommodating the free stroke in compressive direction based on the customer's application.
Page 10		
<p>Basic element with connecting rod and sleeve</p> 	<p>Release force: 75 to 300 000 N</p> <p>Sizes 1 to 8 Type 311.___0</p>	<ul style="list-style-type: none"> • Force transmitted via connecting rod and sleeve-side threaded pin. • Both connecting rod and sleeve length are suitable for accommodating the free stroke in compressive direction based on the customer's application.
Page 11		

Summary of constructional designs EAS[®]-axial

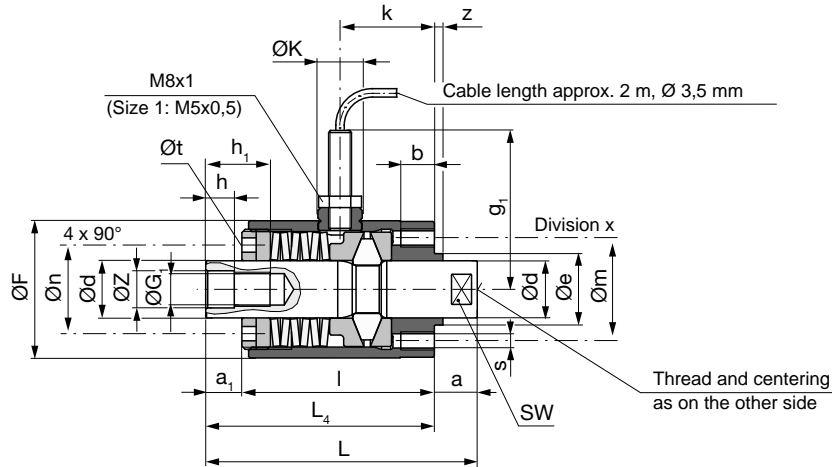
<p>Basic element with guide rod</p> 	<p>Release force: 75 to 300 000 N</p> <p>Sizes 1 to 8 Type 302._ _0</p>	<ul style="list-style-type: none"> • Force transmitted via bolt and tapped hole on the housing. • Guide rod length is suitable for accommodating the free stroke in tensile direction based on the customer's application. 	<p>Page 12</p>
<p>Mounting flange design with guide rod</p> 	<p>Release force: 75 to 300 000 N</p> <p>Sizes 1 to 8 Type 322._ _0</p>	<ul style="list-style-type: none"> • Force transmitted via bolts and mounting flange. • Guide rod length is suitable for accommodating the free stroke in tensile direction based on the customer's application. 	<p>Page 13</p>
<p>Basic element with guide rod and sleeve</p> 	<p>Release force: 75 to 300 000 N</p> <p>Sizes 1 to 8 Type 312._ _0</p>	<ul style="list-style-type: none"> • Force transmitted via bolt and sleeve-side threaded pin. • Both guide rod and sleeve length are suitable for accommodating the free stroke in tensile direction based on the customer's application. 	<p>Page 14</p>
<p>Basic element with connecting rod and guide rod</p> 	<p>Release force: 75 to 300 000 N</p> <p>Sizes 1 to 8 Type 303._ _0</p>	<ul style="list-style-type: none"> • Force transmitted via connecting rod and tapped hole on the 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. 	<p>Page 15</p>
<p>Mounting flange design with connecting rod and guide rod</p> 	<p>Release force: 75 to 300 000 N</p> <p>Sizes 1 to 8 Type 323._ _0</p>	<ul style="list-style-type: none"> • Force transmitted via connecting rod and mounting 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. 	<p>Page 16</p>
<p>Basic element with connecting rod, guide rod and sleeve</p> 	<p>Release force: 75 to 300 000 N</p> <p>Sizes 1 to 8 Type 313._ _0</p>	<ul style="list-style-type: none"> • Force transmitted via connecting rod and sleeve-side threaded pin. • 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. • Application example: crank mechanisms. 	<p>Page 17</p>
<p>Length Dimensioning</p>			<p>Page 18</p>
<p>Technical Explanations</p>			<p>Page 20</p>



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} _{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

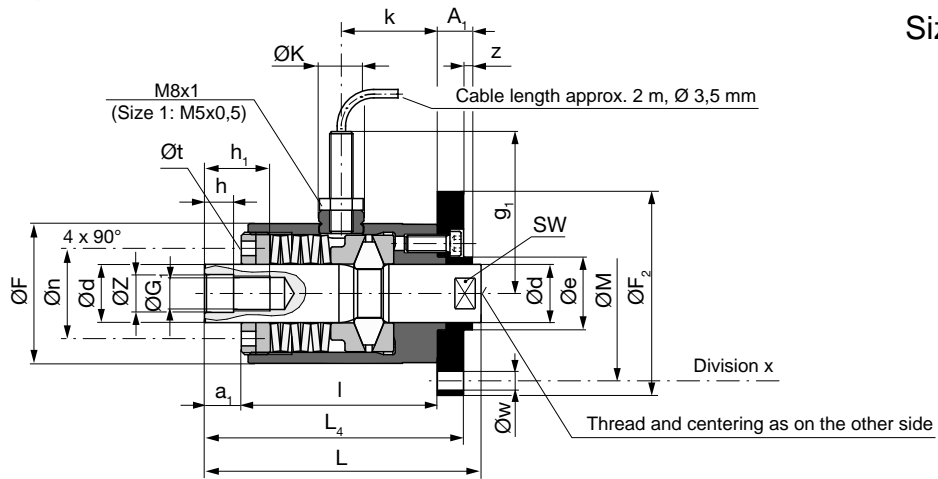
_ / 3 0 0 . _ _ 0			
▲		▲	▲
Sizes	Release force ⁴⁾		Limit switch
1	Low	4	0 Without limit switch ³⁾
to	Medium	5	1 With integrated
8	High	6	limit switch

Example: Order number 2 / 300.600

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

Mounting angle 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 _{T7}	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

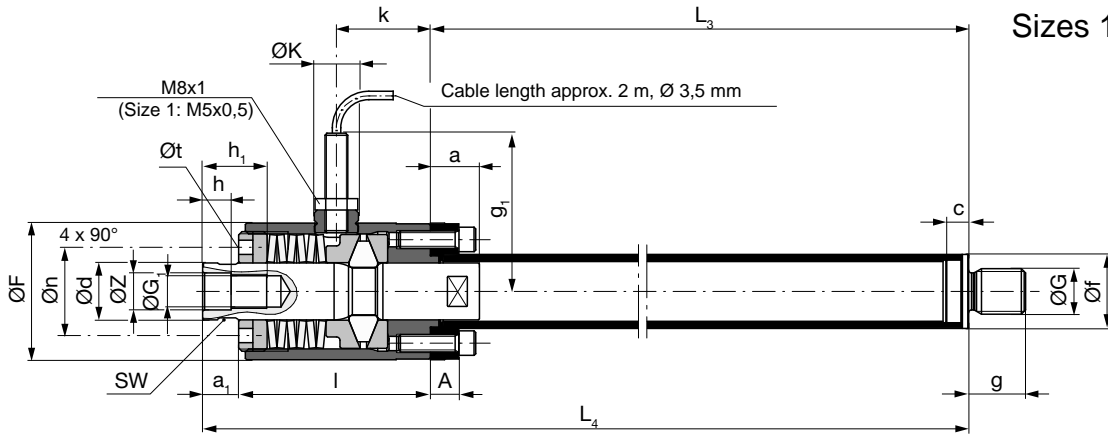
_ / 3 2 0 . _ _ 0			
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Sizes 1 to 8	Release force ⁴⁾ Low Medium High	4 5 6	Limit switch Without limit switch ³⁾ With integrated limit switch

Example: Order number 1 / 320.510

- Additional sizes for lower or higher release forces on request.
Re-engagement force = 20 – 25 % of the release force.
- H_{1 max}: free stroke in tensile direction;
H_{2 max}: free stroke in compressive direction
(larger free strokes on request)
- EAS®-axial without limit switch – delivery with bushing (M8 or M5)
- 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							
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	0	.	___	___	0	/	___
▲						▲	▲			▲
Sizes 1 to 8		Release force ⁴⁾ Low Medium High				4 5 6	0 1	Limit switch Without limit switch ³⁾ With integrated limit switch		L ₃ Length of the sleeve Calculations according to "Length Dimensioning", see Technical Data, pages 18/19

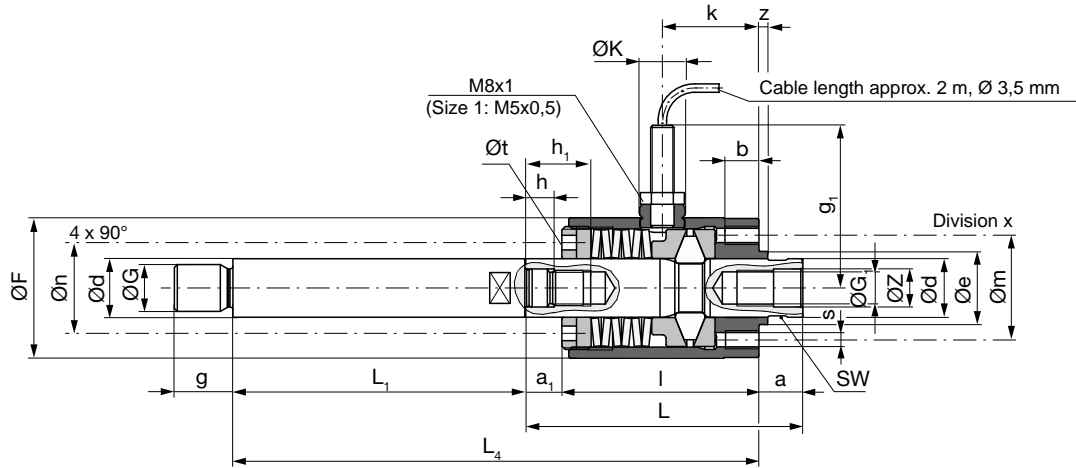
Example: Order number 2 / 310.400 / L₃ = 210

1) Additional sizes for 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 ₁₇	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}	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 1 to 8		Release force ⁴⁾ Low Medium High		4 5 6		0 1	Limit switch Without limit switch ³⁾ With integrated limit switch			L ₁ Length of the connecting rod Calculations according to "Length Dimensioning", see Technical Data, pages 18/19

Example: Order number 1 / 301.400 / L₁ = 150

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

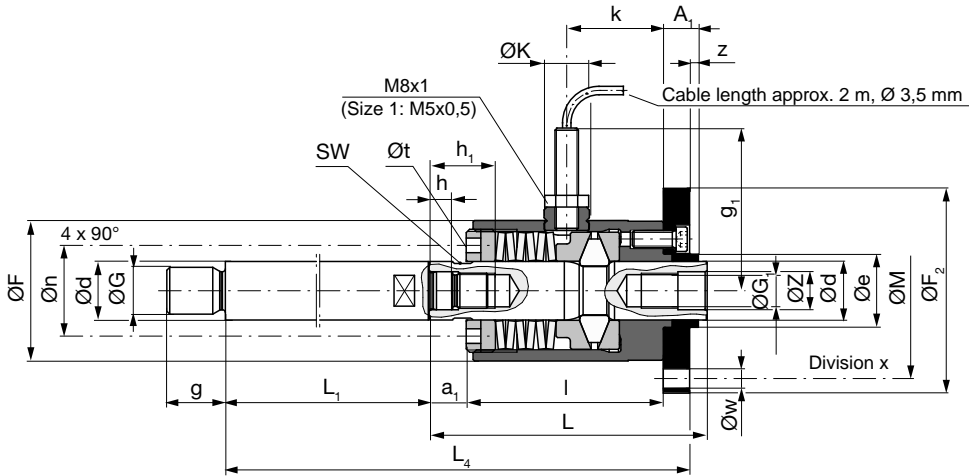
2) H_{2 max}: free stroke in compressive direction (larger free strokes on request)

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

4) See Technical Data, release forces F_A

Mounting angle design with connecting rod

Type 321._._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 321.4_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 321.5_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 321.6_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 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 _{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	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 1 to 8		Release force ⁴⁾ Low Medium High			4 5 6		Limit switch 0 Without limit switch ³⁾ 1 With integrated limit switch			Length of the connecting rod L ₁ Calculations according to "Length Dimensioning", see Technical Data, pages 18/19

Example: Order number 4 / 321.600 / L₁ = 320

1) Additional sizes for 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)

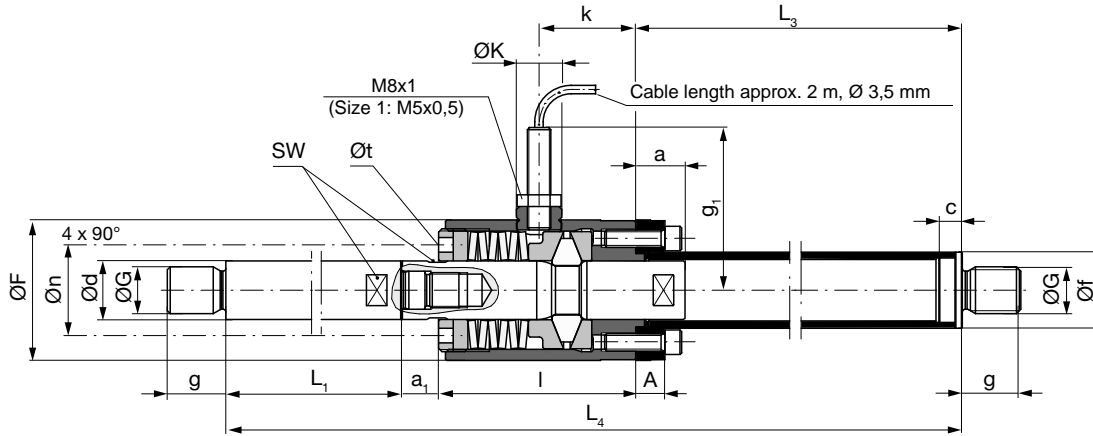
3) EAS®-axial without limit switch

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

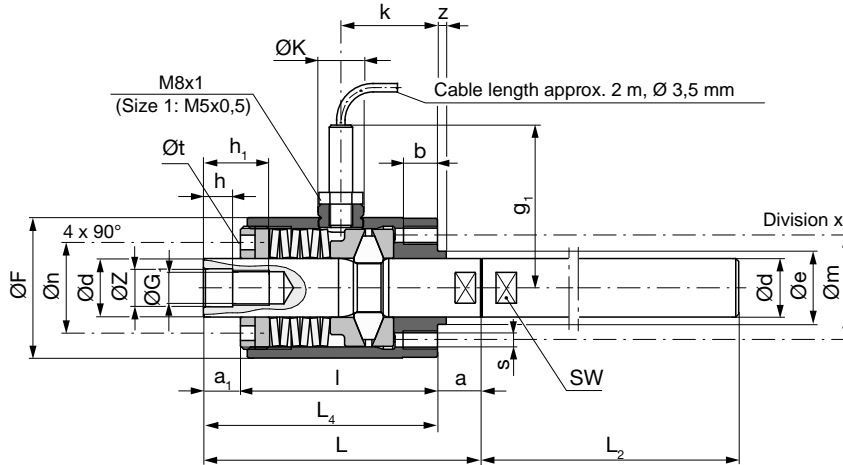
Example: Order number 3 / 311.510 / L₁ = 230 / L₃ = 320

1) Additional sizes for 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}^{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 1 to 8		Release force ⁴⁾ Low Medium High			4 5 6		Limit switch 0 Without limit switch ³⁾ 1 With integrated limit switch			Length of the guide rod L_2 Calculations according to "Length Dimensioning", see Technical Data, pages 18/19

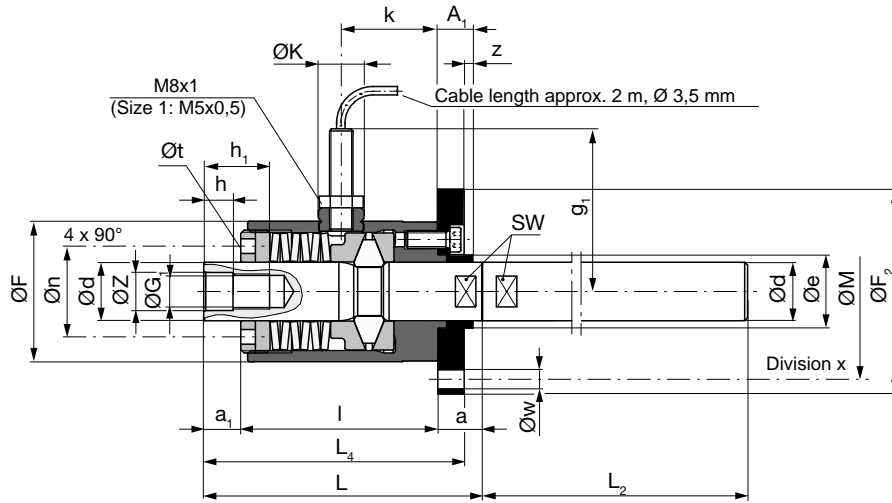
Example: Order number 1 / 302.500 / $L_2 = 135$

1) Additional sizes for 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

Mounting angle 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 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 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 1 to 8			Release force ⁴⁾ Low Medium High			4 5 6			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		

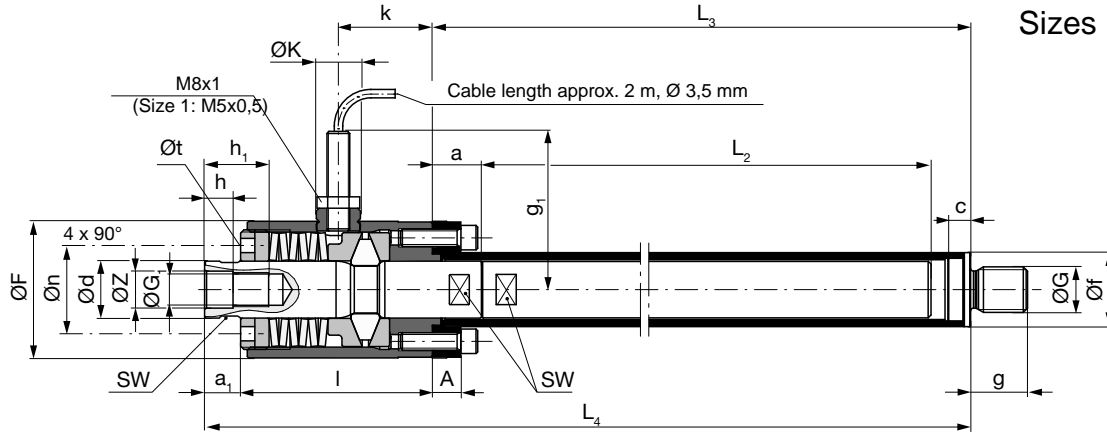
Example: Order number 2 / 322.410 / L₂ = 185

1) Additional sizes for 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 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							
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
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 / /

<p>▲</p> <p>Sizes 1 to 8</p>	<p>▲</p> <p>Release force ⁴⁾ Low Medium High</p>	<p>▲</p> <p>4 5 6</p>	<p>▲</p> <p>0 1</p> <p>Limit switch Without limit switch ³⁾ With integrated limit switch</p>	<p>▲</p> <p>L₂ Length of the guide rod</p>	<p>▲</p> <p>L₃ Length of the sleeve</p>
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Calculations according to "Length Dimensioning", see Technical Data, pages 18/19

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

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

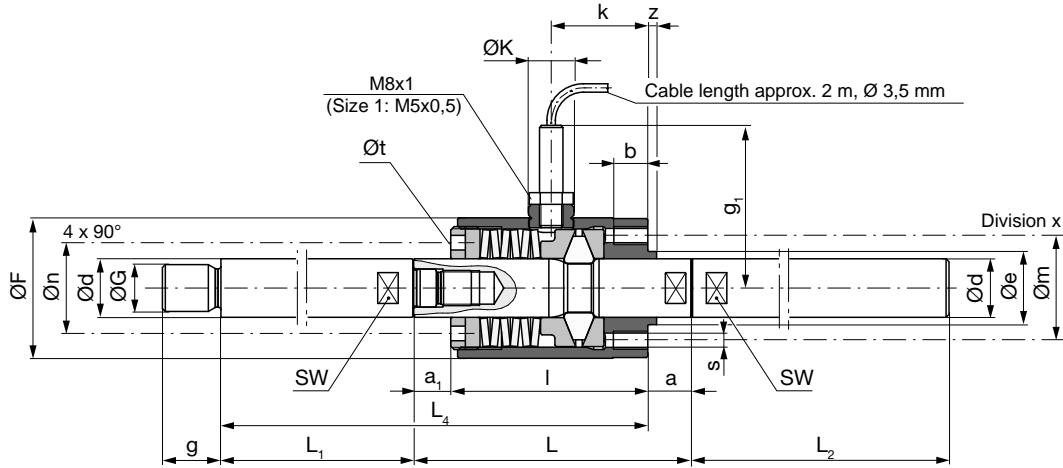
2) H_{1 max}: free stroke in tensile direction (larger free strokes on request)

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							
			1	2	3	4	5	6	7	8
Release forces ¹⁾	Type 303.4_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 303.5_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 303.6_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	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 _{T7}	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							
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	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 1 to 8	Release force ⁴⁾ Low Medium High	4 5 6	Limit switch Without limit switch ³⁾ With integrated limit switch	0 1	L ₁ Length of the connecting rod	L ₂ Length of the guide rod	Calculations according to "Length Dimensioning", see Technical Data, pages 18/19

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

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

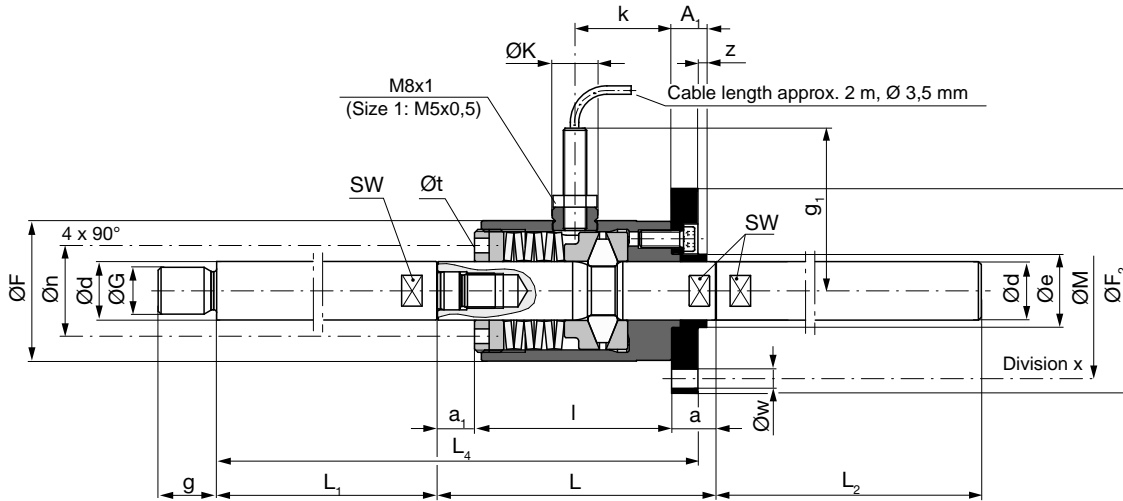
2) H_{1 max}: free stroke in tensile direction;
 H_{2 max}: free stroke in compressive direction
 (larger free strokes on request)

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

4) See Technical Data, release forces F_A

Mounting angle 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 ₁₉	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		4 5 6		Limit switch Without limit switch ³⁾ With integrated limit switch		L ₁ Length of the connecting rod	L ₂ Length of the guide rod
								Calculations according to "Length Dimensioning", see Technical Data, pages 18/19	

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

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

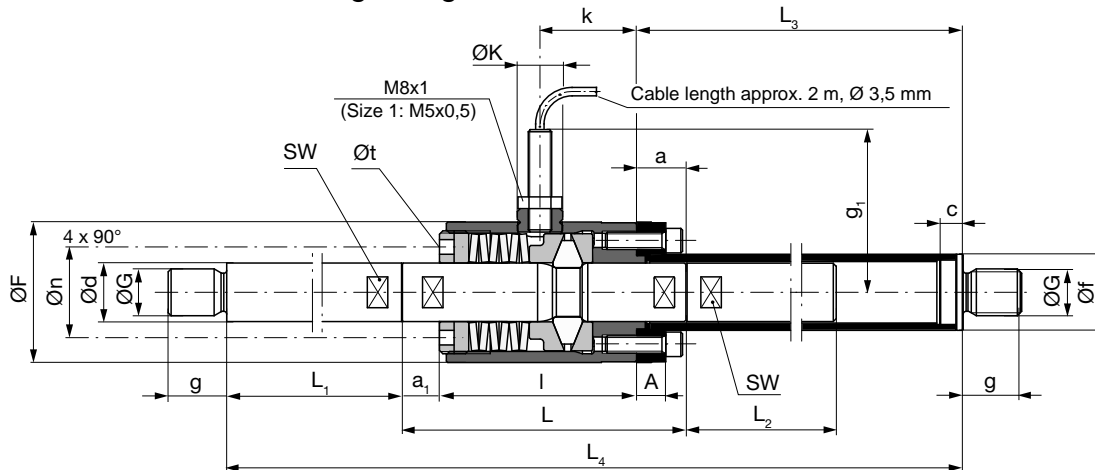
2) H_{1 max}: free stroke in tensile direction;
 H_{2 max}: free stroke in compressive direction
 (larger free strokes on request)

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							
L ₂	in tensile and							
L ₃	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										
<div style="display: flex; justify-content: space-around; font-size: 24px; font-weight: bold;"> ___ / 3 1 3 . ___ 0 / / / </div>										
▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	
Sizes 1 to 8	Release force ⁴⁾ Low Medium High	4 5 6	0 1	Limit switch Without limit switch ³⁾ With integrated limit switch	L ₁ Length of the connecting rod	L ₂ Length of the guide rod	L ₃ Length of the sleeve	Calculations according to "Length Dimensioning", see Technical Data, pages 18/19		

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

1) Additional sizes for 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

Technical Explanations – 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	Compressive 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				$L_3 = H_2 + a + c + 2$	$L_4 = L_3 + a_1 + 1$	8
→					301.__0	$L_1 = H_2 - a_1$				$L_4 = L_1 + a_1 + 1$	9
→					321.__0	$L_1 = H_2 - a_1$				$L_4 = L_1 + a_1 + 1 + A_1 - z$	10
→					311.__0	$L_1 = H_2 - a_1$		$L_3 = H_2 + a + c + 2$		$L_4 = L_1 + L_3 + a_1 + 1$	11
←					302.__0		$L_2 = H_1 - a - 2$			$L_4 = a_1 + 1$	12
←					322.__0		$L_2 = H_1 - a - 2$			$L_4 = a_1 + 1 + A_1 - z$	13
←					312.__0		$L_2 = H_1 - a - 2$	$L_3 = H_1 + c$		$L_4 = L_3 + a_1 + 1$	14
↔					303.__0	$L_1 = H_2 - a_1$	$L_2 = H_1 - a - 2$			$L_4 = L_1 + a_1 + 1$	15
↔					323.__0	$L_1 = H_2 - a_1$	$L_2 = H_1 - a - 2$			$L_4 = L_1 + a_1 + 1 + A_1 - z$	16
↔					313.__0	$L_1 = H_2 - a_1$	$L_2 = H_1 - a - 2$	$L_3 = H_1 + H_2 + c$		$L_4 = L_1 + L_3 + a_1 + 1$	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 Technical Data
a	[mm]	see Technical Data
a_1	[mm]	see Technical Data
c	[mm]	see Technical Data
l	[mm]	see Technical Data
z	[mm]	see Technical Data

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:

$B = 150 \text{ mm}$ $E = 94 \text{ mm}$

$C = 450 \text{ mm}$ $L_E = 762 \text{ mm}$

$D = 950 \text{ mm}$ $r = 50 \text{ mm}$

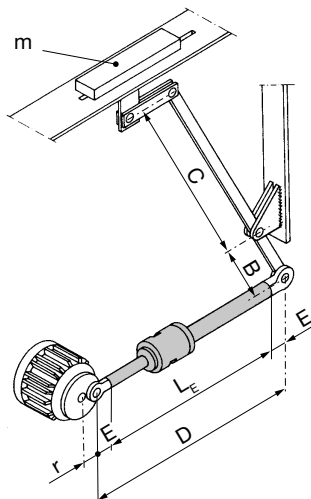


Fig.1

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

(design with connecting rod, guide rod and sleeve, 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 L from the required installation length L_E to minimum installation length L_4 is balanced by lengthening the connecting rod and the sleeve.

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

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

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

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: $H_1 = H_2 = 500 \text{ mm}$).

Technical Explanations

Adjustment of the release force

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

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 (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).

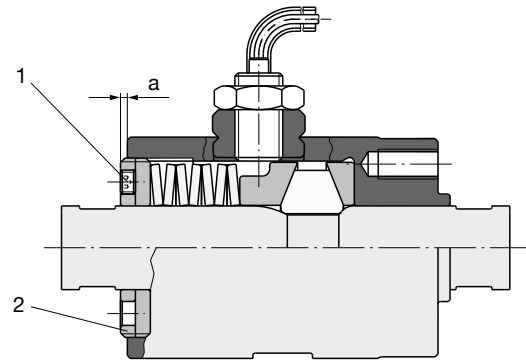


Fig. 3

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". 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 (basic element with connecting rod, guide rod and sleeve)

- Release force F_A :

$F_A = 10\,000\text{ N}$ (release force range 6000 – 12000 N)

- Dimension "a":

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

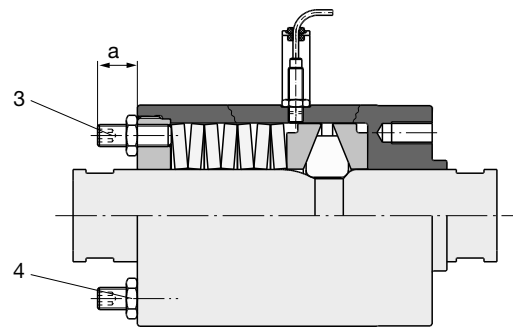


Fig. 4

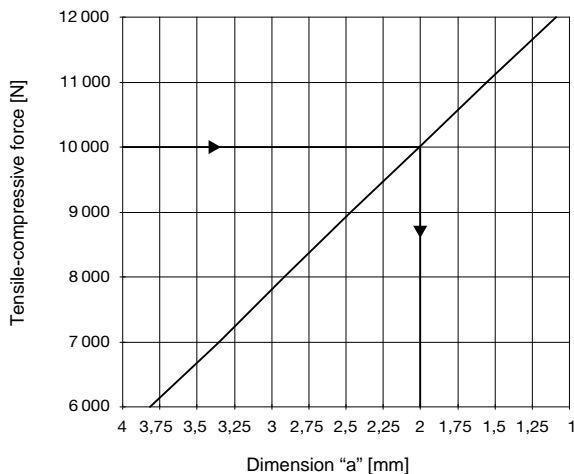


Fig. 2 (This Adjustment Diagram for Size 4, Type 3_ _6_0 only serves as an example!)

Technical Explanations

Installation

The EAS®-axial is delivered manufacturer-assembled ready for installation. 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 against automatic loosening using Loctite 243 (medium hard). The connection threads 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 proximity switch 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 proximity switch 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 proximity switch 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 proximity switch thread must not be damaged.

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

Maintenance

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

The EAS®-axial maintenance work basically only means re-lubrication of the contact geometries. For greasing, please use NLGI Class 2 grease with a basic oil viscosity of 220 mm²/s at 40 °C, e.g. Mobilgrease HP222.

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

We recommend that maintenance work is carried out at the site of manufacture.

Wiring example

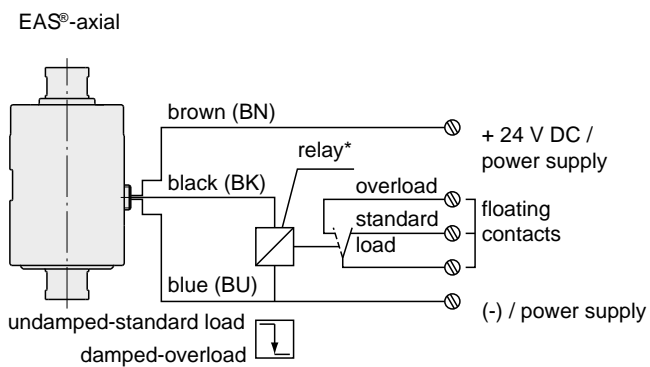


Fig. 5

* Relay (+24 V DC / 200 mA) is not part of the scope of delivery

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 in uences 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_ _ _ _
EAS [®] -torque sensor	x			x								K.407.V_ _ _ _
ROBA [®] -contitorque	x				x					x	x	K.150.V_ _ _ _
ROBA [®] -capping head	x				x					x	x	P.151000.V_ _ _ _
Load separating safety clutches												
EAS [®] -Compact [®] / EAS [®] -NC	x			x		x				x	x	K.490.V_ _ _ _
EAS [®] -smartic [®]	x			x		x						K.481.V_ _ _ _
EAS [®] -400	x			x		x						K.407.V_ _ _ _
EAS [®] -Compact [®] -overload clutch	x			x			x					K.490.V_ _ _ _
EAS [®] -HSC	x			x			x					P.4090.V_ _ _ _
EAS [®] -element clutch	x			x			x					K.440.V_ _ _ _
EAS [®] -elements	x			x			x					K.440.V_ _ _ _
EAS [®] -HSE	x			x			x					P.4090.V_ _ _ _
EAS [®] -dutytorque	x			x			x					K.4043.V_ _ _ _
EAS [®] -Sp	x			x			x	x				K.406.V_ _ _ _
EAS [®] -Sm / EAS [®] -Zr	x			x			x		x			K.406.V_ _ _ _
EAS [®] -axial		x		x			x					K.403.C.V_ _ _ _

Product Summary

- EAS[®]-Compact [®]/EAS[®]-NC
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
- ROBA[®]-contitorque
Magnetic continuous slip clutches

- smartflex [®]/primeflex [®]
Perfect precision couplings for servo and stepping motors
- ROBA[®]-ES
Backlash-free and damping for vibration-sensitive drives
- ROBA[®]-DS/ROBA [®]-D
Backlash-free, torsionally rigid all-steel couplings
- ROBA[®]-DSM
Cost-effective torque-measuring couplings

- 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
- ROBA[®]-guidestop
Backlash-free holding brake for profield rail guides
- ROBATIC[®]/ROBA[®]-quick/ROBA [®]-takt
Electromagnetic clutches and brakes, clutch brake units

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

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