ATB Automation
Mechanics | Motion Control

rack and pinion drives for automation and robotics

Rack for the STÖBER gear units:
P / PK / PKX
PE
KS
K / KL
ZTRS-ZTR-ZR

STÖBER

14.4 ATLANTA product catalog pages

The following pages include an excerpt from the product catalog of ATLANTA Antriebssysteme.

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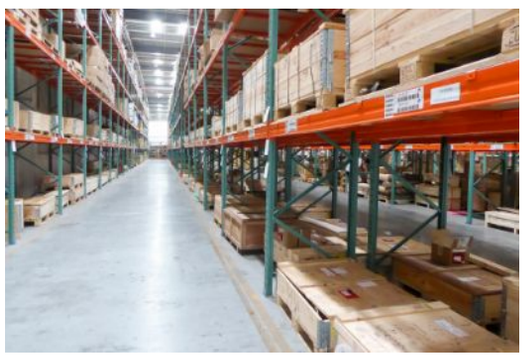


The values given in the load table are based upon uniform, smooth operation, $K_{H\beta}$=1,0 and reliable grease lubrication. Since, in practice, the applications are very diverse, it is important to consider the given conditions by using appropriate factors S_B, K_A, $L_{KH\beta}$ and f_n (see below).

Formulas for determining the tangential force

$$a = \frac{v}{t_b} \quad [m/s^2]$$

$$F_u = \frac{m \cdot g + m \cdot a}{1000} \text{ (for lifting axle)} \quad [kN]$$

$$F_u = \frac{m \cdot g \cdot \mu + m \cdot a}{1000} \text{ (for driving axle)} \quad [kN]$$

$$F_{u\,perm.} = \frac{F_{u\,tab}}{K_A \cdot S_B \cdot f_n \cdot L_{KH\beta}} \quad [kN]$$

Formula dimensions see page ZD-3

The condition $F_u < F_{u\,perm.}$ must be fulfilled.

Load factor K_A

Drive	Type of load from the machines to be driven		
	uniform	medium shocks	heavy shocks
uniform	1,00	1,25	1,75
light shocks	1,25	1,50	2,00
medium shocks	1,50	1,75	2,25

Safety coefficient S_B

The safety coefficient should be allowed for according to experience (S_B = 1.25 ÷ 1.50). This is valid for rack drives with one drive / rack line. For multiple drives on one rack line, as well as for preloaded drives, this safety coefficient have to be increased. In case of doubts please contact our technical service.

Life-time factor f_n

considering of the peripheral speed of the pinion and lubrication.

Lubrication		contin.	daily	monthly
Peripheral speed of gearing				
m/sec	m/min			
0,5	30	0,85	0,95	
1,0	60	0,95	1,10	from
1,5	90	1,00	1,20	3
2,0	120	1,05	1,30	to
3,0	180	1,10	1,50	10
5,0	300	1,25	1,90	

Linear load distribution factor $L_{KH\beta}$

The linear load distribution factor considers the contact stress, while it describes unintegrated load distribution over the tooth width ($L_{KH\beta} = \sqrt{K_{H\beta}}$).

$L_{KH\beta}$ = 1,1 for counter bearing, e.g. Torque Supporter
= 1,2 for preloaded bearings on the output shaft e.g. Atlanta Ht-, HP- and E-servo worm gear unit, BG-bevel gear unit
= 1,5 for unpreloaded bearings on the output shaft e.g. Atlanta B-servo worm gear unit

Calculation example

Values given

⊗ travelling operation

mass to be moved	m	=	820 kg
speed	v	=	2 m/s
acceleration time	t_b	=	1 s
acceleration due to gravity	g	=	9,81 m/s²
coefficient of friction	μ	=	0,1
load factor	K_A	=	1,5
life-time factor	f_n	=	1,05 (cont. lubrication)
safety coefficient	S_B	=	1,4
linear load distribution factor	$L_{KH\beta}$	=	1,5

Calculation process — Results

$$a = \frac{v}{t_b} \qquad a = \frac{2}{1} = 2 \text{ m/s}^2$$

$$F_u = \frac{m \cdot g \cdot \mu + m \cdot a}{1000}$$

$$F_u = \frac{820 \cdot 9{,}81 \cdot 0{,}1 + 820 \cdot 2}{1000} = 2{,}44 \text{ kN}$$

permissible feed force $F_{u\,Tab}$:
rack C45, ind. hardened, Q10, straight tooth, module 3,
pinion 16MnCr5, case hardened, 20 teeth
page ZB-40 with $F_{u\,Tab}$ = 11,5 kN

$$F_{u\,per.} = \frac{F_{uTab}}{K_A \cdot S_B \cdot f_n \cdot L_{KH\beta}};$$

$$F_{u\,per.} = \frac{11{,}5 \text{ kN}}{1{,}5 \cdot 1{,}4 \cdot 1{,}05 \cdot 1{,}5} = 3{,}47 \text{ kN}$$

Condition

$F_{u\,per.} > F_u$; 3,47 kN > 2,44 kN = > fulfilled

Result:			
	Rack	27 30 101	Page ZB-13
	Pinion	24 35 220	Page ZB-23 case hardened

Your calculation

Values given

⊗ travelling operation

mass to be moved	m	=	_____ kg
speed	v	=	_____ m/s
acceleration time	t_b	=	_____ s
acceleration due to gravity	g	=	9,81 m/s²
coefficient of friction	μ	=	_____
load factor	K_A	=	_____
life-time factor	f_n	=	_____
safety coefficient	S_B	=	_____
linear load distribution factor	$L_{KH\beta}$	=	_____

Calculation process — Results

$$a = \frac{v}{t_b} \qquad a = \_\_\_\_\_ = \_\_\_\_\_ \text{ m/s}^2$$

$$F_u = \frac{m \cdot g \cdot \mu + m \cdot a}{1000}; \quad F_u = \frac{\_\_\_\_\_}{1000} = \_\_\_\_\_ \text{ kN}$$

permissible feed force $F_{u\,Tab}$

$$F_{u\,per.} = \frac{F_{u\,Tab}}{K_A \cdot S_B \cdot f_n \cdot L_{KH\beta}};$$

$F_{u\,per.}$ = _____ = _____ kN

Condition

$F_{u\,per.} > F_u$; _____ kN > _____ kN = > fulfilled

Calculation example

Values given

⊗ travelling operation

mass to be moved	m	=	300 kg
speed	v	=	1,08 m/s
acceleration time	t_b	=	0,27 s
acceleration due to gravity	g	=	9,81 m/s²
load factor	K_A	=	1,2
life-time factor	f_n	=	1,1 (cont. lubrication)
safety coefficient	S_B	=	1,4
linear load distribution factor	$L_{KH\beta}$	=	1,2

Calculation process

$a = \frac{v}{t_b}$ $\quad a = \frac{1,08}{0,27}$ $\quad = 4$ m/s²

$F_u = \frac{m \cdot g + m \cdot a}{1000}$ $\quad F_u = \frac{300 \cdot 9,81 + 300 \cdot 4}{1000}$ $\quad = 4,1$ kN

permissible feed force $F_{u\,Tab}$:
rack C45, ind. hardened, Q6, helical tooth, module 2,
pinion 16MnCr5, case hardened, 20 teeth
page ZA-31 with $F_{u\,Tab} = 11,5$ kN

$F_{u\,per.} = \frac{F_{u\,Tab}}{K_A \cdot S_B \cdot f_n \cdot L_{KH\beta}}$; $F_{u\,per.} = \frac{11,5 \text{ kN}}{1,2 \cdot 1,4 \cdot 1,1 \cdot 1,2} = 5,18$ kN

Condition

$F_{u\,per.} > F_u$; 5,18 kN > 4,1 kN => fulfilled

Result: Rack 29 20 105 Page ZA-7
Pinion 24 29 520 Page ZA-24

Your calculation

Values given

⊗ travelling operation

mass to be moved	m	=	kg
speed	v	=	m/s
acceleration time	t_b	=	s
acceleration due to gravity	g	=	9,81 m/s²
load factor	K_A	=	
life-time factor	f_n	=	
safety coefficient	S_B	=	
linear load distribution factor	$L_{KH\beta}$	=	

Calculation process

$a = \frac{v}{t_b}$ $\quad a = \_\_\_\_ = \_\_\_\_$ m/s²

$F_u = \frac{m \cdot g + m \cdot a}{1000}$ $\quad F_{u\,req.} = \frac{\_\_\_\_}{1000} = \_\_\_\_$ kN

permissible feed force $F_{u\,Tab}$

$F_{u\,per.} = \frac{F_{u\,Tab}}{K_A \cdot S_B \cdot f_n \cdot L_{KH\beta}}$; $F_{u\,per.} = \_\_\_\_ = \_\_\_\_$ kN

Condition

$F_{u\,per.} > F_u$; ____ kN > ____ kN => fulfilled

Module 1,0

Module 1,25

Module 1,5

Module 2,0

Module 2,5

Module 3,0

Module 4,0

Module 5,0

Module 6,0

Module 8,0

Module 10,0

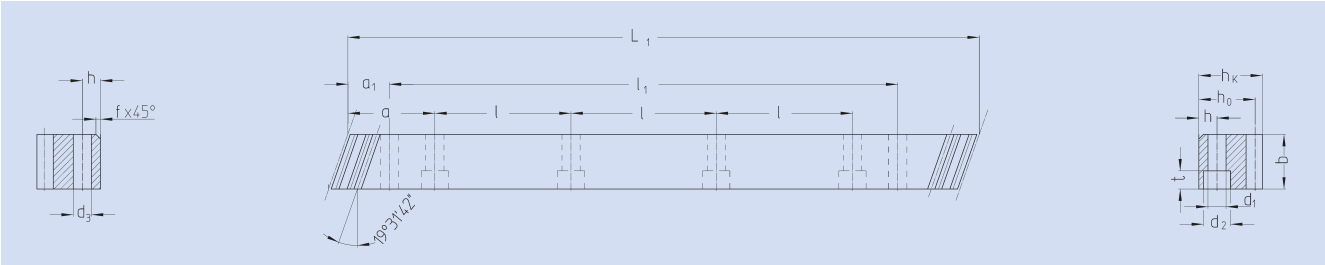
Module 12,0

Class	ATLANTA Quality	Module	Total pitch error [1] (± µm/m)	Tooth thickness tolerance (µm)	max. length (mm)	Max. feed force per pinion contact [2] kN	Applications (examples)
UHPR Ultra High Precision Rack	3	5	12	-13	1000	76,5	**High precision machine tools with electrical preload**
		6	12	-13	1000	109,0	
		8	12	-13	960	191,0	
		10	12	-13	1000	287,5	
		12	12	-13	1000	409,0	
	5	3	26	-15	1000	31,0	**Machine tools, lifting axes, multiple pinion contact**
		4	26	-15	1000	60,0	
		5	26	-15	1000	92,0	
		6	26	-15	1000	131,5	
HPR High Precision Rack	6	2	34	-20	2000	19,5	**Wood, plastic, composite, aluminium working machines**
		3	34	-20	2000	31,0	
		4	34	-20	2000	60,0	
	6	1,5	34	-20	1000	9,0	**Machine tools, integratable racks, water cutting machines, tube bending systems, plasma cutting machines**
		2	34	-20	2000	15,5	
		3	34	-20	2000	28,5	
		4	34	-20	2000	51,5	
		5	34	-20	2000	76,0	
		6	34	-20	2000	109,0	
		8	34	-20	1920	191,0	
		10	34	-20	1500	287,0	
		12	34	-20	1000	409,0	
	7	2	52	-36	2000	15,5	**Wood working machines, linear axes with high requirement for a smooth running**
		3	52	-36	2000	28,5	
		4	52	-36	2000	51,5	
		5	52	-36	2000	76,0	
		6	52	-36	2000	109,0	
		8	52	-36	1920	191,0	
		10	52	-36	1500	287,0	
PR Precision Rack	8	2	60	-59	2000	13,5	**Portals, handling linear axes**
		3	60	-59	2000	24,5	
		4	60	-59	2000	44,0	
		5	60	-59	2000	64,5	
	8	2	100	-110	2000	8,0	**Linear axes**
		3	100	-110	2000	14,0	
		4	100	-110	2000	27,0	

1) Values available for 1000 mm. Other total pitch errors for other length, see detailed description (ATLANTA Servo Drive catalogue).
2) Values are only valid for special steel according ATLANTA-Standard.

When using the maximum capacity of the teeth, or multiple pinions in contact, the mounting screw loads must be checked separately! Please ask ATLANTA for advice!

ATLANTA-Quality 3



Order code	Module	L_1	N° of teeth	b	h_k	h_0	f	a	l	N° of holes	h	d_1	d_2	t	a_1	l_1	d_3	kg
48 50 105	5	1000,00	60	49	39	34	2,5	62,5	125	8	12	13,5	20	13	37,5	925	11,7	12,15
48 60 105	6	1000,00	50	59	49	43	2,5	62,5	125	8	16	17,5	26	17	37,5	925	15,7	18,10
48 80 105	8	960,00	36	79	79	71	2,5	60,0	120	8	25	22,0	33	21	120,0	720	19,7	42,50
48 10 105	10	1000,00	30	99	99	89	2,5	62,5	125	8	32	33,0	48	32	125,0	750	19,7	68,70
48 12 105	12	1000,00	25	120	120	108	2,5	40,0	125	8	40	39,0	58	38	102,5	750	19,7	111,00

Total pitch error $\mathbf{GT_f/1000 \leq 0{,}012}$ **mm**

- Teeth hardened with the ATLANTA high performance hardening process and ground
- heat-treatable steel according ATLANTA-Standard
- ground on all sides after hardening
- signed with effective total pitch error (20 °C)

Inspection measurement data available as an option.

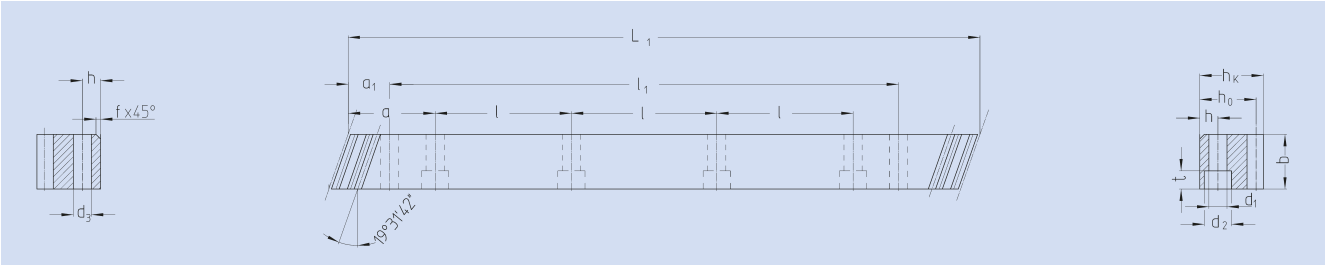
To achieve precision rack joints, we recommend our patented assembly kit, see Atlanta Servo Drive catalogue.

For lubrication of racks & pinions we recommend our automatic lubrication system, see Atlanta Servo Drive catalogue.

For the calculation and selection of the rack & pinion drive, see calculation sample in the Atlanta Servo Drive catalogue.

Srews for rack mounting, see Atlanta Servo Drive catalogue.

ATLANTA-Quality 5 StrongLine



Order code	Module	L_1	N° of teeth	b	h_k	h_0	f	a	l	N° of holes	h	d_1	d_2	t	a_1	l_1	d_3	kg
29 35 100	3	1000,00	100	29	29	26	2,0	62,5	125	8	10	12	17,5	11	27,5	945	11,7	5,9
29 45 100	4	1000,00	75	39	39	35	2,0	62,5	125	8	13	16	23,0	15	30,0	940	15,7	10,7
29 55 100	5	1000,00	60	49	49	44	2,5	62,5	125	8	15	18	26,0	17	34,5	931	15,7	16,3
29 65 100	6	1000,00	50	59	59	53	2,5	62,5	125	8	20	22	33,0	21	97,5	1805	19,7	24,5

Total pitch error $GT_f/1000 \leq 0{,}026$ mm,

- Teeth case hardened and ground
- case hardening steel according ATLANTA-Standard
- ground on all sides after hardening
- signed with effective total pitch error (20 °C)

Inspection measurement data available as an option.

Mounting racks, see Atlanta Servo Drive catalogue.

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For lubrication of racks & pinions we recommend our automatic lubrication system, see Atlanta Servo Drive catalogue.

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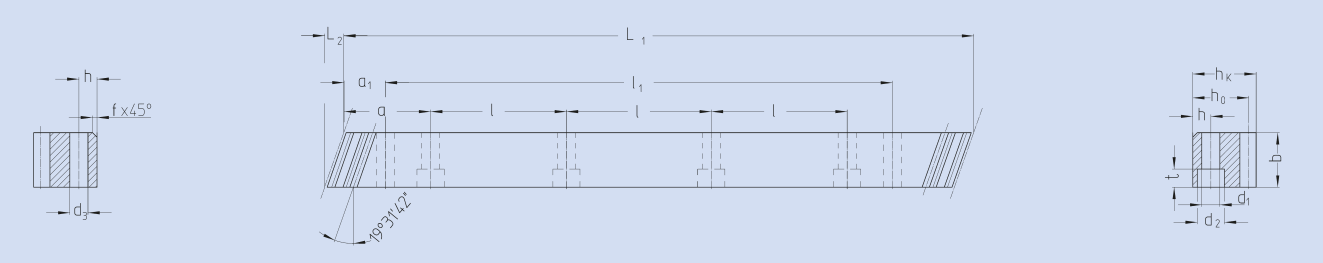
Srews for rack mounting, see Atlanta Servo Drive catalogue.

ATLANTA-Quality 6



Order code	Module	L_1	N° of teeth	b	h_k	h_0	f	a	l	N° of holes	h	d_1	d_2	t	a_1	l_1	d_3	kg
29 20 100	2	1000,00	150	24	24	22	2	62,5	125	8	8	7	11	7	31,7	936,6	5,7	4,10
29 20 150	2	1500,00	225	24	24	22	2	62,5	125	12	8	7	11	7	31,7	1436,6	5,7	6,15
29 20 200	2	2000,00	300	24	24	22	2	62,5	125	16	8	7	11	7	31,7	1936,6	5,7	8,20
29 30 100	3	1000,00	100	29	29	26	2	62,5	125	8	9	10	15	9	35,0	930,0	7,7	5,90
29 30 150	3	1500,00	150	29	29	26	2	62,5	125	12	9	10	15	9	35,0	1430,0	7,7	8,85
29 30 200	3	2000,00	200	29	29	26	2	62,5	125	16	9	10	15	9	35,0	1930,0	7,7	11,80
29 40 100[2]	4	1000,00	75	39	39	35	2	62,5	125	8	12	10	15	9	33,3	933,4	7,7	10,70
29 42 100	4	1000,00	75	39	39	35	2	62,5	125	8	12	14	20	13	33,3	933,4	11,7	10,70
29 42 150[1]	4	1506,67	113	39	39	35	2	62,5	125	12	12	14	20	13	33,3	1433,4	11,7	16,00
29 42 200	4	2000,00	150	39	39	35	2	62,5	125	16	12	14	20	13	33,3	1933,4	11,7	21,40

1) This racks could be used for continous linking only with the left side (see sketch).
2) The screw joint limits the feed force.

500 mm and other length on request.

Total pitch error **$GT_f/1000 \leq 0{,}034$ mm,**
$GT_f/1500 \leq 0{,}041$ mm (≙ 0,027 mm/1000),
$GT_f/2000 \leq 0{,}044$ mm (≙ 0,022 mm/1000).

- Teeth hardened with the ATLANTA high performance hardening process and ground
- heat-treatable steel acc. ATLANTA-Standard, carburized
- ground on all sides after hardening

Mounting racks, see Atlanta Servo Drive catalogue.

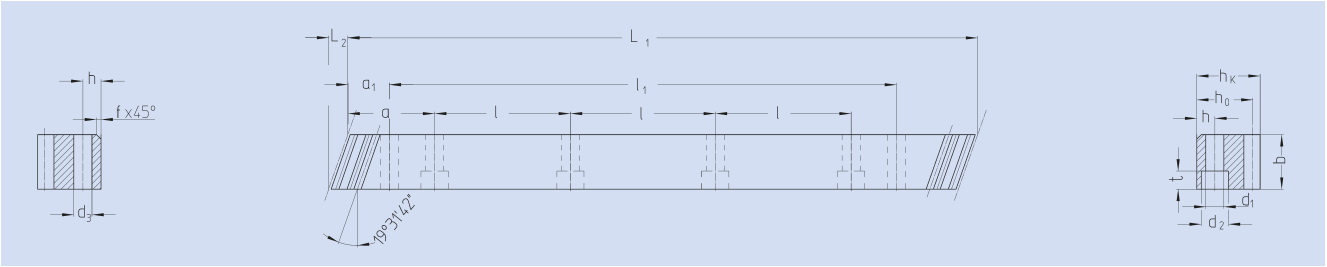
To achieve precision rack joints, we recommend our patented assembly kit, see Atlanta Servo Drive catalogue.

For lubrication of racks & pinions we recommend our automatic lubrication system, see Atlanta Servo Drive catalogue.

For the calculation and selection of the rack & pinion drive, see calculation sample in the Atlanta Servo Drive catalogue.

Srews for rack mounting, see Atlanta Servo Drive catalogue.

ATLANTA-Quality 6



Order code	Module	L_1	N° of teeth	b	h_k	h_0	f	a	l	N° of holes	h	d_1	d_2	t	a_1	l_1	d_3	kg
29 15 105	1,5	1000,00	200	19	19	17,5	2,0	62,5	125	8	8	7	11	7	31,7	936,6	5,7	2,60
29 20 105	2	1000,00	150	24	24	22	2,0	62,5	125	8	8	7	11	7	31,7	936,6	5,7	4,10
29 20 155	2	1500,00	225	24	24	22	2,0	62,5	125	12	8	7	11	7	31,7	1436,6	5,7	6,15
29 20 205	2	2000,00	300	24	24	22	2,0	62,5	125	16	8	7	11	7	31,7	1936,6	5,7	8,20
29 30 105	3	1000,00	100	29	29	26	2,0	62,5	125	8	9	10	15	9	35,0	930,0	7,7	5,90
29 30 155	3	1500,00	150	29	29	26	2,0	62,5	125	12	9	10	15	9	35,0	1430,0	7,7	8,85
29 30 205	3	2000,00	200	29	29	26	2,0	62,5	125	16	9	10	15	9	35,0	1930,0	7,7	11,80
29 40 105 [2]	4	1000,00	75	39	39	35	2,0	62,5	125	8	12	10	15	9	33,3	933,4	7,7	10,70
29 42 105	4	1000,00	75	39	39	35	2,0	62,5	125	8	12	14	20	13	33,3	933,4	11,7	10,70
29 42 155 [1]	4	1506,67	113	39	39	35	2,0	62,5	125	12	12	14	20	13	33,3	1433,4	11,7	16,05
29 40 205	4	2000,00	150	39	39	35	2,0	62,5	125	16	12	10	15	9	33,3	1933,4	7,7	21,40
29 42 205	4	2000,00	150	39	39	35	2,0	62,5	125	16	12	14	20	13	33,3	1933,4	11,7	21,40
29 50 105	5	1000,00	60	49	39	34	2,5	62,5	125	8	12	14	20	13	37,5	925,0	11,7	13,00
29 50 155	5	1500,00	90	49	39	34	2,5	62,5	125	12	12	14	20	13	37,5	1425,0	11,7	19,50
29 50 205	5	2000,00	120	49	39	34	2,5	62,5	125	16	12	14	20	13	37,5	1925,0	11,7	26,00
29 60 105	6	1000,00	50	59	49	43	2,5	62,5	125	8	16	18	26	17	37,5	925,0	15,7	18,10
29 60 155	6	1500,00	75	59	49	43	2,5	62,5	125	12	16	18	26	17	37,5	1425,0	15,7	27,10
29 60 205	6	2000,00	100	59	49	43	2,5	62,5	125	16	16	18	26	17	37,5	1925,0	15,7	36,20
29 80 105	8	960,00	36	79	79	71	2,5	60,0	120	8	25	22	33	21	120,0	720,0	19,7	42,50
29 80 155	8	1440,00	54	79	79	71	2,5	60,0	120	12	25	22	33	21	120,0	1200,0	19,7	63,80
29 80 205	8	1920,00	72	79	79	71	2,5	60,0	120	16	25	22	33	21	120,0	1680,0	19,7	85,00
29 10 105	10	1000,00	30	99	99	89	2,5	62,5	125	8	32	33	48	32	125,0	750,0	19,7	68,72
29 10 155	10	1500,00	45	99	99	89	2,5	62,5	125	12	32	33	48	32	125	1250,0	19,7	103,00
29 12 105	12	1000,00	25	120	120	108	2,5	40,0	125	8	40	39	58	38	125,0	750,0	19,7	111,00

1) This racks could be used for continous linking only with the left side (see sketch).
2) The screw joint limits the feed force.

500 mm and other length on request.

Total pitch error **$GT_f/1000 \leq 0{,}034$ mm,**
$GT_f/1500 \leq 0{,}041$ mm ($\triangleq 0{,}027$ mm/1000),
$GT_f/2000 \leq 0{,}044$ mm ($\triangleq 0{,}022$ mm/1000).

- Teeth hardened with the ATLANTA high performance hardening process and ground
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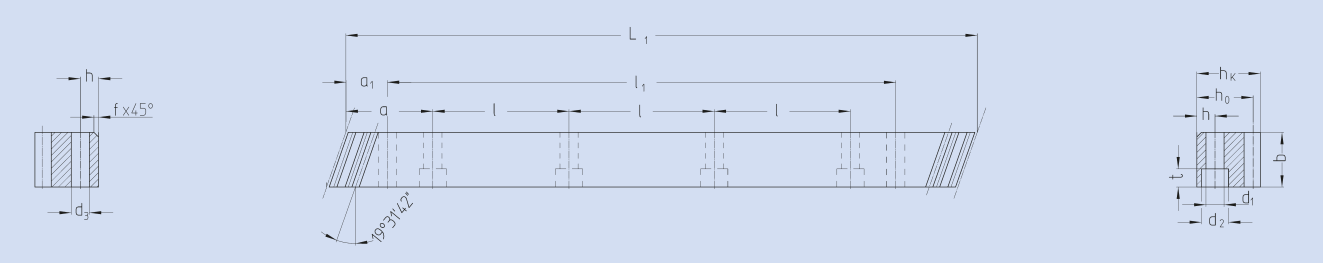
Srews for rack mounting, see Atlanta Servo Drive catalogue.

ATLANTA-Quality 7



Order code	Module	L_1	N° of teeth	$b^{+0,4}$	h_k	h_0	f	a	l	N° of holes	h	d_1	d_2	t	a_1	l_1	d_3	kg
29 20 107	2	1000,00	150	24	24	22	2	62,5	125	8	8	7	11	7	31,7	936,6	5,7	4,10
29 20 157	2	1500,00	225	24	24	22	2	62,5	125	12	8	7	11	7	31,7	1436,6	5,7	6,15
29 20 207	2	2000,00	300	24	24	22	2	62,5	125	16	8	7	11	7	31,7	1936,6	5,7	8,20
29 30 107	3	1000,00	100	29	29	26	2	62,5	125	8	9	10	15	9	35,0	930,0	7,7	5,90
29 30 157	3	1500,00	150	29	29	26	2	62,5	125	12	9	10	15	9	35,0	1430,0	7,7	8,85
29 30 207	3	2000,00	200	29	29	26	2	62,5	125	16	9	10	15	9	35,0	1930,0	7,7	11,80
29 40 107	4	1000,00	75	39	39	35	2	62,5	125	8	12	14	20	13	33,3	933,4	11,7	10,70
29 40 157 [1]	4	1506,67	113	39	39	35	2	62,5	125	12	12	14	20	13	33,3	1433,0	11,7	16,00
29 40 207	4	2000,00	150	39	39	35	2	62,5	125	16	12	14	20	13	33,3	1933,4	11,7	21,40
29 50 107	5	1000,00	60	49	39	34	2,5	62,5	125	8	12	14	20	13	37,5	925,0	11,7	13,00
29 50 157	5	1500,00	90	49	39	34	2,5	62,5	125	12	12	14	20	13	37,5	1425,0	11,7	19,50
29 50 207	5	2000,00	120	49	39	34	2,5	62,5	125	16	12	14	20	13	37,5	1925,0	11,7	26,00
29 60 107	6	1000,00	50	59	49	43	2,5	62,5	125	8	16	18	26	17	37,5	925,0	15,7	18,10
29 60 157	6	1500,00	75	59	49	43	2,5	62,5	125	12	16	18	26	17	37,5	1425,0	15,7	27,10
29 60 207	6	2000,00	100	59	49	43	2,5	62,5	125	16	16	18	26	17	37,5	1925,0	15,7	36,20
29 80 107	8	960,00	36	79	79	71	2,5	60,0	120	8	25	22	33	21	120,0	720,0	19,7	42,50
29 80 157	8	1440,00	54	79	79	71	2,5	60,0	120	12	25	22	33	21	120,0	1200,0	19,7	65,00
29 80 207	8	1920,00	72	79	79	71	2,5	60,0	120	16	25	22	33	21	120,0	1680,0	19,7	85,00
29 10 107	10	1000,00	30	99	99	89	2,5	62,5	125	8	32	33	48	32	125,0	750,0	19,7	68,72
29 10 157	10	1500,00	45	99	99	89	2,5	62,5	125	12	32	33	48	32	125,0	1250,0	19,7	104,00

1) This racks could be used for continous linking only with the left side (see sketch).

500 mm and other length on request.

Total pitch error **GT_f/1000 ≤ 0,052 mm,**
GT_f/1500 ≤ 0,062 mm (≙ 0,042 mm/1000),
GT_f/2000 ≤ 0,068 mm (≙ 0,034 mm/1000).

- Teeth hardened with the ATLANTA high performance hardening process and ground
- heat-treatable steel acc. ATLANTA-Standard, carburized
- ground on all sides after hardening

Mounting racks, see Atlanta Servo Drive catalogue.

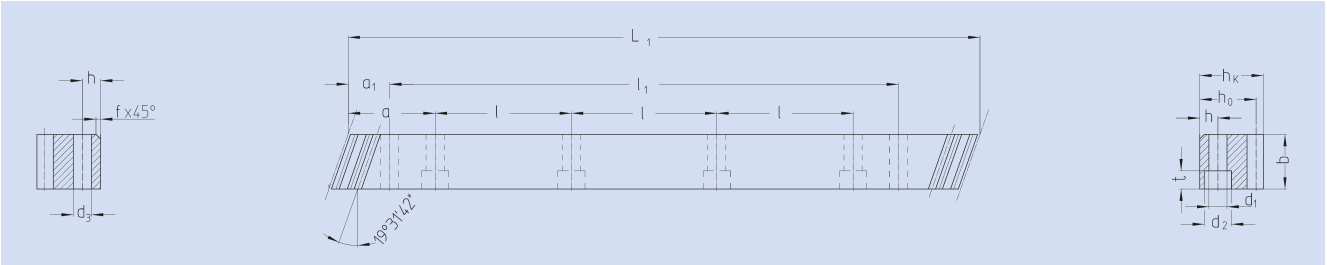
To achieve precision rack joints, we recommend our patented rack assembly kit, see Atlanta Servo Drive catalogue.

For lubrication of racks & pinions, we recommend our automatic lubrication systems, Atlanta Servo Drive catalogue.

For the calculation and selection of the rack & pinion drive, see Atlanta Servo Drive catalogue.

Screws for rack mounting, see Atlanta Servo Drive catalogue.

ATLANTA-Quality 8



Order code	Module	L_1	N° of teeth	$b^{+0,4}$	h_k	h_0	f	a	l	N° of holes	h	d_1	d_2	t	a_1	l_1	d_3	kg
39 20 108	2	1000,00	150	25	24	22	2	62,5	125	8	8	7	11	7	31,7	936,6	5,7	4,10
39 20 208	2	2000,00	300	25	24	22	2	62,5	125	16	8	7	11	7	31,7	1936,6	5,7	8,40
39 30 108	3	1000,00	100	30	29	26	2	62,5	125	8	9	10	15	9	35,0	930,0	7,7	5,90
39 30 208	3	2000,00	200	30	29	26	2	62,5	125	16	9	10	15	9	35,0	1930,0	7,7	12,00
39 40 108	4	1000,00	75	40	39	35	2	62,5	125	8	12	14	20	13	33,3	933,4	11,7	10,70
39 40 208	4	2000,00	150	40	39	35	2	62,5	125	16	12	14	20	13	33,3	1933,4	11,7	21,00
39 50 108	5	1000,00	60	50	39	34	2,5	62,5	125	8	12	14	20	13	37,5	925,0	11,7	13,00
39 50 208	5	2000,00	120	50	39	34	2,5	62,5	125	16	12	14	20	13	37,5	1925,0	11,7	26,00

500 mm and other length on request.
Without bores on request.

Total pitch error **$GT_f/1000 \leq 0{,}060$ mm,**
$GT_f/2000 \leq 0{,}078$ mm ($\hat{=}$ 0,039 mm/1000).

- Teeth hardened with the ATLANTA high performance hardening process and ground
- heat-treatable, bright steel according ATLANTA-Standard

Mounting racks, see Atlanta Servo Drive catalogue.

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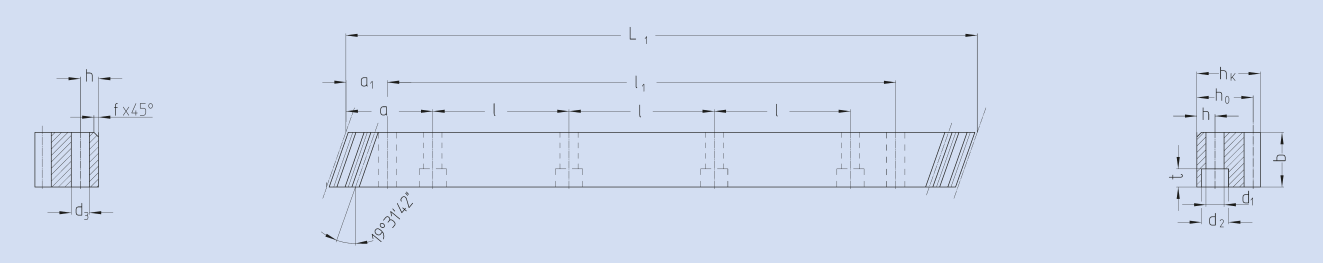
For lubrication of racks & pinions, we recommend our automatic lubrication systems, see Atlanta Servo Drive catalogue.

For the calculation and selection of the rack & pinion drive, see Atlanta Servo Drive catalogue.

Screws for rack mounting, see Atlanta Servo Drive catalogue.

ATLANTA-Quality 8



Order code	Module	L_1	N° of teeth	$b_{-0,5}$	h_k	h_0	f	a	l	N° of holes	h	d_1	d_2	t	a_1	l_1	d_3	kg
38 21 100	2	1000,00	150	25	24	22	2	62,5	125	8	8	7	11	7	31,7	936,6	5,7	4,30
38 20 100	2	1000,00	150	25	24	22	2			without mounting holes								4,30
38 21 200	2	2000,00	300	25	24	22	2	62,5	125	16	8	7	11	7	31,7	1936,6	5,7	8,60
38 20 200	2	2000,00	300	25	24	22	2			without mounting holes								8,60
38 31 100	3	1000,00	100	30	29	26	2	62,5	125	8	9	10	15	9	35,0	930,0	7,7	6,10
38 30 100	3	1000,00	100	30	29	26	2			without mounting holes								6,10
38 31 200	3	2000,00	200	30	29	26	2	62,5	125	16	9	10	15	9	35,0	1930,0	7,7	12,20
38 30 200	3	2000,00	200	30	29	26	2			without mounting holes								12,20
38 41 100	4	1000,00	75	40	39	35	2	62,5	125	8	12	10	15	9	33,3	933,4	7,7	10,90
38 40 100	4	1000,00	75	40	39	35	2			without mounting holes								10,90
38 41 200	4	2000,00	150	40	39	35	2	62,5	125	16	12	10	15	9	33,3	1933,4	7,7	21,80
38 40 200	4	2000,00	150	40	39	35	2			without mounting holes								21,80

500 mm and other length on request.

Total pitch error **GT_f /1000 ≤ 0,100 mm,**
GT_f /2000 ≤ 0,200 mm.

- Milled teeth, quenched and tempered
- heat-treatable steel according ATLANTA-Standard
- bright steel, backside machined

Mounting racks, see Atlanta Servo Drive catalogue.

To achieve precision rack joints, we recommend our patented rack assembly kit, Atlanta Servo Drive catalogue.

For lubrication of racks & pinions, we recommend our automatic lubrication systems, see Atlanta Servo Drive catalogue.

For the calculation and selection of the rack & pinion drive, see Atlanta Servo Drive catalogue.

Screws for rack mounting, see Atlanta Servo Drive catalogue.

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