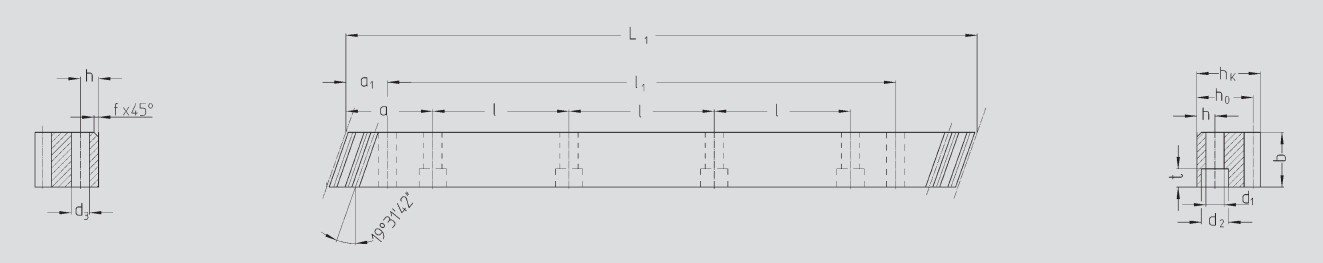
Class	Series	Module	ATLANTA-Quality	Page
UHPR	48	5, 6, 8, 10, 12	3	ZA-4
	29	3, 4, 5, 6	5	ZA-5
HPR	29	2, 3, 4	6	ZA-6
	29	1.5, 2, 3, 4, 5, 6, 8, 10, 12	6	ZA-7
	29	2, 3, 4, 5, 6, 8, 10	7	ZA-8
PR	39	2, 3, 4, 5	8	ZA-9
	38	2, 3, 4	8	ZA-10
BR	47	1.5, 2, 3, 4, 5, 6, 8, 10	9	ZA-11
	39	1.5, 2, 3, 4, 5, 6, 8, 10, 12	10	ZA-12–13
	Selection and Load Tables			ZA-30–38
	Electronically Controlled Lubricators, Sliding-Type Lubricating Brushes and Hose-Connection Sets			ZE-2 – 6
	Felt Gear and Mounting Shaft			ZE-7 – 8
	Mounting			ZF-9

[1)] All our helical racks are right hand, except the companion racks, which are left hand!

	Series	Module	Heat-Treatment of Teeth	Tolerance of Teeth	Page
	78	2, 3, 4, 5, 6	Case-Hardened	≤ 5	ZA-14 – 18
	78 .. 5..	2, 3, 4, 5	Case-Hardened	5 e 24	ZA-19 – 22
	79	1.5, 2, 3, 4	Case-Hardened	5 e 24	ZA-23
	24	1.5, 2, 3, 4, 5, 6, 8, 10	Case-Hardened	7 e 25	ZA-24 – 26
	24	2, 3, 4, 5, 6, 8	Induction Hardened	6 e 25	ZA-27
	21 .. 5..	1.5, 2, 3, 4, 5, 6, 8, 10, 12	Soft	8 e 25	ZA-28 – 29
	Short Description TR-Pinion, Mounting Instructions				ZF-11 – 13
	Selection and Load Tables for Rack Drives				ZH-2 – 6
	Electronically Controlled Lubricators, Sliding-Type Lubricating Brushes and Hose-Connection Sets				ZE-2 – 6

[1] All our helical pinions are left hand!

ATLANTA-Quality 3



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
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 **$GT_f/1000 \leq 0.012$ mm**

- Teeth hardened with the ATLANTA high performance hardening process and ground
- Heat-treatable steel according to 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 rack assembly kit, see page ZF-4.

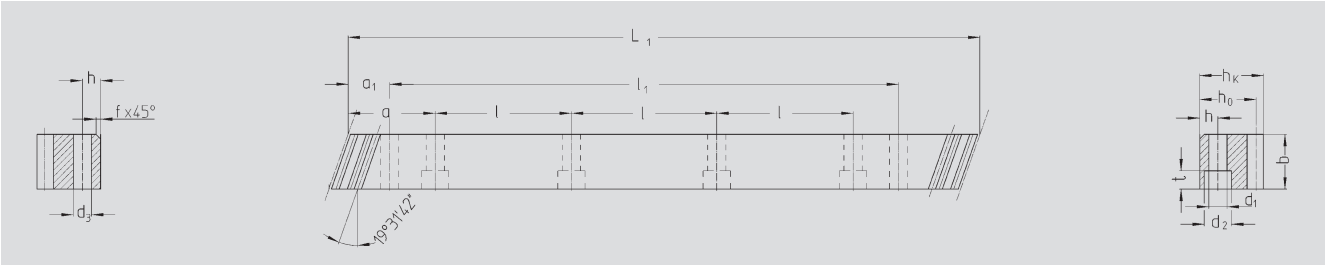
For lubrication of racks & pinions, we recommend our automatic lubrication systems, see page ZE-1.

For the calculation and selection of the rack & pinion drive, see page ZD-1.

Screws for rack mounting, see page ZF-3.

ATLANTA-Quality 5

StrongLine



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 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	805	19.7	24.5

Total pitch error **$GT_f/1000 \leq 0.026$ mm**

- Teeth case hardened and ground
- Case hardening steel according to 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 page ZF-2.

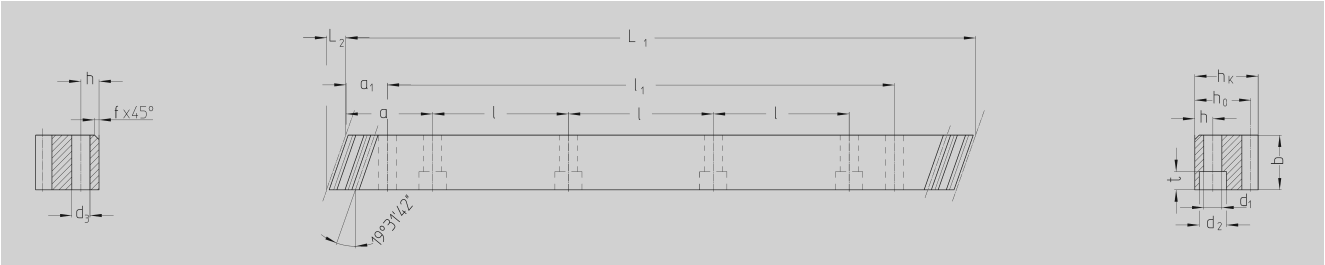
To achieve precision rack joints, we recommend our patented rack assembly kit, see page ZF-4.

For lubrication of racks & pinions, we recommend our automatic lubrication systems, see page ZE-1.

For the calculation and selection of the rack & pinion drive, see page ZD-1.

Screws for rack mounting, see page ZF-3.

ATLANTA-Quality 6



Order Code	Module	L_1	L_2	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 20 050[2]	2	500.00	8.5	75	24	24	22	2	62.5	125	4	8	7	11	7	31.7	436.6	5.7	2.10
29 21 050	2	500.00	8.5	75	24	24	22	2				without Mounting Holes							2.10
29 20 100	2	1000.00	8.5	150	24	24	22	2	62.5	125	8	8	7	11	7	31.7	936.6	5.7	4.10
29 21 100	2	1000.00	8.5	150	24	24	22	2				without Mounting Holes							4.10
29 20 150	2	1500.00	8.5	225	24	24	22	2	62.5	125	12	8	7	11	7	31.7	1436.6	5.7	6.15
29 21 150	2	1500.00	8.5	225	24	24	22	2				without Mounting Holes							6.15
29 20 200	2	2000.00	8.5	300	24	24	22	2	62.5	125	16	8	7	11	7	31.7	1936.6	5.7	8.20
29 21 200	2	2000.00	8.5	300	24	24	22	2				without Mounting Holes							8.20
29 30 050[2]	3	500.00	10.3	50	29	29	26	2	62.5	125	4	9	10	15	9	35.0	430.0	7.7	2.90
29 31 050	3	500.00	10.3	50	29	29	26	2				without Mounting Holes							2.90
29 30 100	3	1000.00	10.3	100	29	29	26	2	62.5	125	8	9	10	15	9	35.0	930.0	7.7	5.90
29 31 100	3	1000.00	10.3	100	29	29	26	2				without Mounting Holes							5.90
29 30 150	3	1500.00	10.3	150	29	29	26	2	62.5	125	12	9	10	15	9	35.0	1430.0	7.7	8.85
29 31 150	3	1500.00	10.3	150	29	29	26	2				without Mounting Holes							8.85
29 30 200	3	2000.00	10.3	200	29	29	26	2	62.5	125	16	9	10	15	9	35.0	1930.0	7.7	11.80
29 31 200	3	2000.00	10.3	200	29	29	26	2				without Mounting Holes							11.80
29 40 050[1][2]	4	506.67	13.8	38	39	39	35	2	62.5	125	4	12	10	15	9	33.3	433.0	7.7	5.40
29 41 050	4	506.67	13.8	38	39	39	35	2				without Mounting Holes							5.40
29 40 100[2]	4	1000.00	13.8	75	39	39	35	2	62.5	125	8	12	10	15	9	33.3	933.4	7.7	10.70
29 41 100	4	1000.00	13.8	75	39	39	35	2				without Mounting Holes							10.70
29 42 100	4	1000.00	13.8	75	39	39	35	2	62.5	125	8	12	14	20	13	33.3	933.4	11.7	10.70
29 41 150	4	1506.67	13.8	113	39	39	35	2				without Mounting Holes							16.00
29 42 150[1]	4	1506.67	13.8	113	39	39	35	2	62.5	125	12	12	14	20	13	33.3	1433.4	11.7	16.00
29 41 200	4	2000.00	13.8	150	39	39	35	2				without Mounting Holes							21.40
29 42 200	4	2000.00	13.8	150	39	39	35	2	62.5	125	16	12	14	20	13	33.3	1933.4	11.7	21.40

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

Total pitch error:

GT_f /500 ≤ 0.026 mm
GT_f /1000 ≤ 0.034 mm
GT_f /1500 ≤ 0.041 mm (≤ 0.027/1000 mm)
GT_f /2000 ≤ 0.044 mm (≤ 0.022/1000 mm)

- Teeth induction-hardened and ground
- Material 16MnCr5, carburized
- Ground on all sides after hardening

Highlighted items will become obsolete in the future. Please check with the factory for delivery information.

Mounting racks, see page ZF-2.

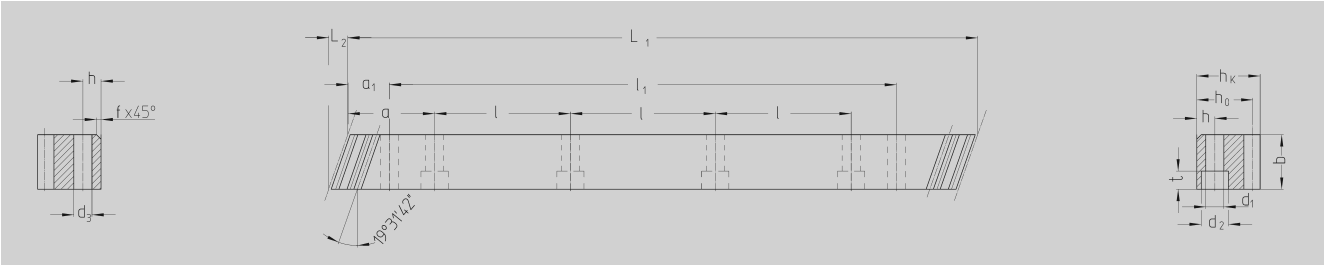
To achieve precision rack joints, we recommend our patented rack assembly kit, see page ZF-4.

For lubrication of racks & pinions, we recommend our automatic lubrication systems, see page ZE-1.

For the calculation and selection of the rack & pinion drive, see page ZD-1.

Screws for rack mounting, see page ZF-3.

ATLANTA-Quality 6



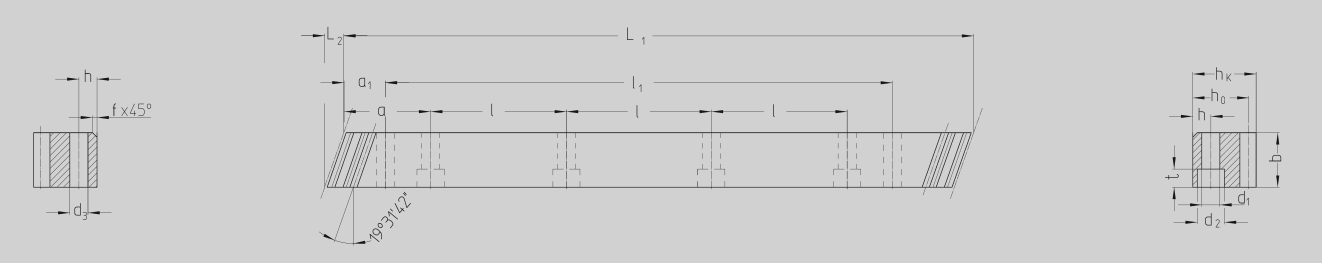
Order Code	Module	L_1	L_2	N° of Teeth	b	h_k	h_0	f	a	l	N° of Holes	h	d_1	d_2	t	a_1	l_1	d_3	kg
29 15 055 [2]	1.5	500.00	6.74	100	19	19	17.5	2	62.5	125	4	8	7	11	7	31.7	436.6	5.7	1.30
29 16 055	1.5	500.00	6.74	100	19	19	17.5	2				without Mounting Holes							1.30
29 15 105	1.5	1000.00	6.74	200	19	19	17.5	2	62.5	125	8	8	7	11	7	31.7	936.6	5.7	2.60
29 16 105	1.5	1000.00	6.74	200	19	19	17.5	2				without Mounting Holes							2.60
29 20 105	2	1000.00	8.50	150	24	24	22	2	62.5	125	8	8	7	11	7	31.7	936.6	5.7	4.10
29 21 105	2	1000.00	8.50	150	24	24	22	2				without Mounting Holes							4.10
29 20 155	2	1500.00	8.50	225	24	24	22	2	62.5	125	12	8	7	11	7	31.7	1436.6	5.7	6.15
29 21 155	2	1500.00	8.50	225	24	24	22	2				without Mounting Holes							6.15
29 20 205	2	2000.00	8.50	300	24	24	22	2	62.5	125	16	8	7	11	7	31.7	1936.6	5.7	8.20
29 21 205	2	2000.00	8.50	300	24	24	22	2				without Mounting Holes							8.20
29 30 105	3	1000.00	10.30	100	29	29	26	2	62.5	125	8	9	10	15	9	35.0	930.0	7.7	5.90
29 31 105	3	1000.00	10.30	100	29	29	26	2				without Mounting Holes							5.90
29 30 155	3	1500.00	10.30	150	29	29	26	2	62.5	125	12	9	10	15	9	35.0	1430.0	7.7	8.85
29 31 155	3	1500.00	10.30	150	29	29	26	2				without Mounting Holes							8.85
29 30 205	3	2000.00	10.30	200	29	29	26	2	62.5	125	16	9	10	15	9	35.0	1930.0	7.7	11.80
29 31 205	3	2000.00	10.30	200	29	29	26	2				without Mounting Holes							11.80
29 40 105 [2]	4	1000.00	13.80	75	39	39	35	2	62.5	125	8	12	10	15	9	33.3	933.4	7.7	10.70
29 41 105	4	1000.00	13.80	75	39	39	35	2				without Mounting Holes							10.70
29 42 105	4	1000.00	13.80	75	39	39	35	2	62.5	125	8	12	14	20	13	33.3	939.4	11.7	13.00
29 42 155 [1]	4	1506.67	13.80	113	39	39	35	2	62.5	125	12	12	14	20	13	33.3	1433.4	11.7	19.50
29 40 205	4	2000.00	13.80	150	39	39	35	2	62.5	125	16	12	10	15	9	33.3	1933.4	7.7	21.40
29 41 205	4	2000.00	13.80	150	39	39	35	2				without Mounting Holes							21.40
29 42 205	4	2000.00	13.80	150	39	39	35	2	62.5	125	16	12	14	20	13	33.3	1933.4	11.7	21.40
29 50 055 [2]	5	500.00	17.40	30	49	39	34	2.5	62.5	125	4	12	14	20	13	37.5	425.0	11.7	6.50
29 51 055	5	500.00	17.40	30	49	39	34	2.5				without Mounting Holes							6.50
29 50 105	5	1000.00	17.40	60	49	39	34	2.5	62.5	125	8	12	14	20	13	37.5	925.0	11.7	13.00
29 51 105	5	1000.00	17.40	60	49	39	34	2.5				without Mounting Holes							13.00
29 50 155	5	1500.00	17.40	90	49	39	34	2.5	62.5	125	12	12	14	20	13	37.5	1425.0	11.7	19.50
29 51 155	5	1500.00	17.40	90	49	39	34	2.5				without Mounting Holes							19.50
29 50 205	5	2000.00	17.40	120	49	39	34	2.5	62.5	125	16	12	14	20	13	37.5	1925.0	11.7	26.00
29 51 205	5	2000.00	17.40	120	49	39	34	2.5				without Mounting Holes							26.00
29 60 055 [2]	6	500.00	20.90	25	59	49	43	2.5	62.5	125	4	16	18	26	17	37.5	425.0	15.7	9.90
29 61 055	6	500.00	20.90	25	59	49	43	2.5				without Mounting Holes							9.90
29 60 105	6	1000.00	20.90	50	59	49	43	2.5	62.5	125	8	16	18	26	17	37.5	925.0	15.7	18.10
29 61 105	6	1000.00	20.90	50	59	49	43	2.5				without Mounting Holes							18.10
29 60 155	6	1500.00	20.90	75	59	49	43	2.5	62.5	125	12	16	18	26	17	37.5	1425.0	15.7	27.10
29 61 155	6	1500.00	20.90	75	59	49	43	2.5				without Mounting Holes							27.10
29 60 205	6	2000.00	20.90	100	59	49	43	2.5	62.5	125	16	16	18	26	17	37.5	1925.0	15.7	36.20
29 61 205	6	2000.00	20.90	100	59	49	43	2.5				without Mounting Holes							36.20
29 80 055 [2]	8	480.00	28.00	18	79	79	71	2.5	60.0	120	4	25	22	33	21	120.0	240.0	19.7	21.00
29 81 055	8	480.00	28.00	18	79	79	71	2.5				without Mounting Holes							21.00
29 80 105	8	960.00	28.00	36	79	79	71	2.5	60.0	120	8	25	22	33	21	120.0	720.0	19.7	42.50
29 81 105	8	960.00	28.00	36	79	79	71	2.5				without Mounting Holes							42.50
29 80 205	8	1920.00	28.00	72	79	79	71	2.5	60.0	120	16	25	22	33	21	120.0	1680.0	19.7	85.00
29 81 205	8	1920.00	28.00	72	79	79	71	2.5				without Mounting Holes							85.00
29 10 105	10	1000.00	35.11	30	99	99	89	2.5	62.5	125	8	32	33	48	32	125.0	750.0	19.7	68.72
29 11 105	10	1000.00	35.11	30	99	99	89	2.5				without Mounting Holes							68.72
29 10 155	10	1500.00	35.11	45	99	99	89	2.5	62.5	125	12	32	33	48	32	125	1250.0	19.7	103.00
29 11 155	10	1500.00	35.11	45	99	99	89	2.5				without Mounting Holes							103.00
29 12 105	12	1000.00	42.56	25	120	120	108	2.5	40.0	125	8	40	39	58	38	125.0	750.0	19.7	111.00
29 13 105	12	1000.00	42.56	25	120	120	108	2.5				without Mounting Holes							111.00

1) These racks should be used for continuous linking only with the left side (see sketch).
2) The screw joint limits the feed force.

Total pitch error: GT_f /500 ≤ 0.026 mm, GT_f /1000 ≤ 0.034 mm
GT_f /1500 ≤ 0.041 mm (≤ 0.027/1000 mm), GT_f /2000 ≤ 0.044 mm (≤ 0.022/1000 mm)

- Further information see next page.

ATLANTA-Quality 7



Order Code	Module	L_1	L_2	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 20 107	2	1000.00	8.5	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	8.5	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	8.5	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	10.3	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	10.3	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	10.3	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	13.8	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	13.8	113	39	39	35	2	62.5	125	12	12	14	20	13	33.3	1433.4	11.7	16.00
29 40 207	4	2000.00	13.8	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	17.4	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	17.4	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	17.4	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	20.9	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	20.9	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	20.9	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	28.0	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	28.0	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	28.0	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	35.11	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	35.11	45	99	99	89	2.5	62.5	125	12	32	33	48	32	125.0	1425.0	19.7	104.00

1) These racks should be used for continuous linking only with the left side (see sketch).

Total pitch error:

GT_f /1000 ≤ 0.052 mm
GT_f /1500 ≤ 0.062 mm (≤ 0.041/1000 mm)
GT_f /2000 ≤ 0.068 mm (≤ 0.034/1000 mm)

- Teeth induction-hardened and ground
- Material C45
- Ground on all sides after hardening

Mounting racks, see page ZF-2.

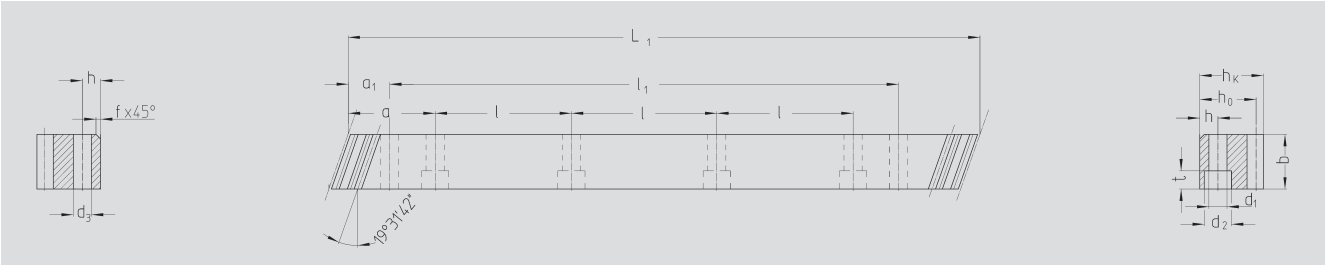
To achieve precision rack joints, we recommend our patented rack assembly kit, see page ZF-4.

For lubrication of racks & pinions, we recommend our automatic lubrication systems, see page ZE-1.

For the calculation and selection of the rack & pinion drive, see page ZD-1.

Screws for rack mounting, see page ZF-3.

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 (≤ 0.039 mm/1000)

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

Mounting racks, see page ZF-2.

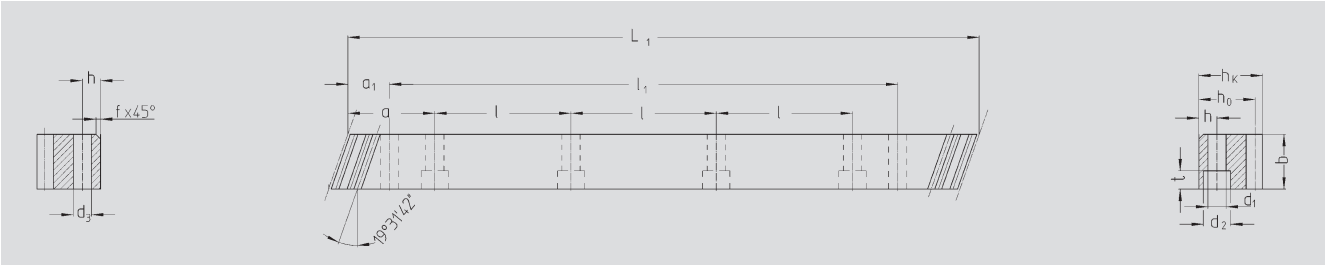
To achieve precision rack joints, we recommend our patented rack assembly kit, see page ZF-4.

For lubrication of racks & pinions, we recommend our automatic lubrication systems, see page ZE-1.

For the calculation and selection of the rack & pinion drive, see page ZD-1.

Screws for rack mounting, see page ZF-3.

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 **$GT_f/1000 \leq 0.100$ mm**
$GT_f/2000 \leq 0.200$ mm

- Milled teeth, quenched and tempered
- Heat-treatable steel according to ATLANTA-Standard
- Bright steel, backside machined

Mounting racks, see page ZF-2.

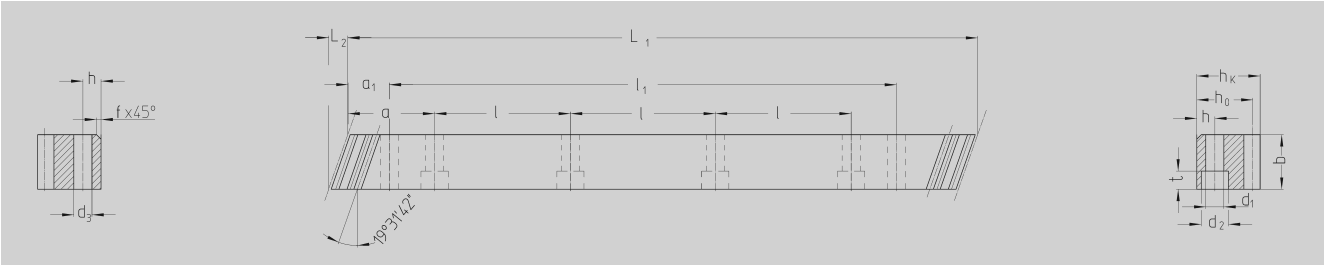
To achieve precision rack joints, we recommend our patented rack assembly kit, see page ZF-4.

For lubrication of racks & pinions, we recommend our automatic lubrication systems, see page ZE-1.

For the calculation and selection of the rack & pinion drive, see page ZD-1.

Screws for rack mounting, see page ZF-3.

ATLANTA-Quality 9



Order Code	Module	L_1	L_2	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
47 15 100	1.5	1000.00	6.0	200	17	17	15.5		62.5	125	8	6	6	10	6	31.7	936.6	5.7	1.30
47 16 100	1.5	1000.00	6.0	200	17	17	15.5					without Mounting Holes							1.30
47 15 150	1.5	1500.00	6.0	300	17	17	15.5		62.5	125	12	6	6	10	6	31.7	1436.6	5.7	1.95
47 16 150	1.5	1500.00	6.0	300	17	17	15.5					without Mounting Holes							1.95
47 15 200	1.5	2000.00	6.0	400	17	17	15.5		62.5	125	16	6	6	10	6	31.7	1936.6	5.7	2.60
47 16 200	1.5	2000.00	6.0	400	17	17	15.5					without Mounting Holes							2.60
47 20 050	2	500.00	9.2	75	26	24	22		62.5	125	4	8	7	11	7	31.7	436.6	5.7	2.20
47 21 050	2	500.00	9.2	75	26	24	22					without Mounting Holes							2.20
47 20 100	2	1000.00	9.2	150	26	24	22		62.5	125	8	8	7	11	7	31.7	936.6	5.7	4.40
47 21 100	2	1000.00	9.2	150	26	24	22					without Mounting Holes							4.40
47 20 200	2	2000.00	9.2	300	26	24	22		62.5	125	16	8	7	11	7	31.7	1936.6	5.7	8.80
47 21 200	2	2000.00	9.2	300	26	24	22					without Mounting Holes							8.80
47 30 050	3	500.00	11.0	50	31	29	26		62.5	125	4	9	10	15	9	35.0	430.0	7.7	3.10
47 31 050	3	500.00	11.0	50	31	29	26					without Mounting Holes							3.10
47 30 100	3	1000.00	11.0	100	31	29	26		62.5	125	8	9	10	15	9	35.0	930.0	7.7	6.20
47 31 100	3	1000.00	11.0	100	31	29	26					without Mounting Holes							6.20
47 30 200	3	2000.00	11.0	200	31	29	26		62.5	125	16	9	10	15	9	35.0	1930.0	7.7	12.50
47 31 200	3	2000.00	11.0	200	31	29	26					without Mounting Holes							12.50
47 30 300	3	3000.00	11.0	300	31	29	26		62.5	125	24	9	10	15	9	35.0	2930.0	7.7	18.60
47 31 300	3	3000.00	11.0	300	31	29	26					without Mounting Holes							18.60
47 40 050 [1]	4	506.67	14.5	38	41	39	35		62.5	125	4	12	10	15	9	33.3	433.0	7.7	5.60
47 41 050	4	506.67	14.5	38	41	39	35					without Mounting Holes							5.60
47 40 100	4	1000.00	14.5	75	41	39	35		62.5	125	8	12	10	15	9	33.3	933.4	7.7	11.10
47 41 100	4	1000.00	14.5	75	41	39	35					without Mounting Holes							11.10
47 40 200	4	2000.00	14.5	150	41	39	35		62.5	125	16	12	10	15	9	33.3	1933.4	7.7	22.20
47 41 200	4	2000.00	14.5	150	41	39	35					without Mounting Holes							22.20
47 50 100	5	1000.00	17.7	60	50	39	34		62.5	125	8	12	14	20	13	37.5	925.0	11.7	13.26
47 51 100	5	1000.00	17.7	60	50	39	34					without Mounting Holes							13.26
47 50 200	5	2000.00	17.7	120	50	39	34		62.5	125	16	12	14	20	13	37.5	1925.0	11.7	26.52
47 51 200	5	2000.00	17.7	120	50	39	34					without Mounting Holes							26.52
47 60 100	6	1000.00	21.3	50	60	49	43		62.5	125	8	16	18	26	17	37.5	925.0	15.7	20.12
47 61 100	6	1000.00	21.3	50	60	49	43					without Mounting Holes							20.12
47 60 200	6	2000.00	21.3	100	60	49	43		62.5	125	16	16	18	26	17	37.5	1925.0	15.7	40.24
47 61 200	6	2000.00	21.3	100	60	49	43					without Mounting Holes							40.24
47 80 100	8	960.00	28.7	36	81	79	71		60.0	120	8	25	22	33	21	120.0	720.0	19.7	44.85
47 81 100	8	960.00	28.7	36	81	79	71					without Mounting Holes							44.85
47 80 200	8	1920.00	28.7	72	81	79	71		60.0	120	16	25	22	33	21	120.0	1680.0	19.7	89.71
47 81 200	8	1920.00	28.7	72	81	79	71					without Mounting Holes							89.71
47 10 100	10	1000.00	35.5	30	100	99	89		62.5	125	8	32	33	48	32	125	750	19.7	69.80
47 11 100	10	1000.00	35.5	30	100	99	89					without Mounting Holes							69.80

1) These racks should be used for continuous linking only with the left side (see sketch).

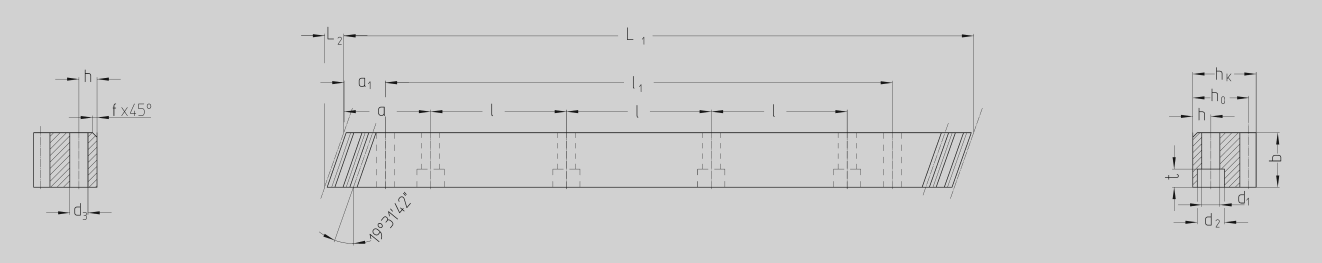
Total pitch error $GT_f/1000 \leq 0.150$ mm.

- Milled teeth
- Material C45
- Bright Steel

Mounting racks, see page ZF-2.

Further information see page ZA – 10.

ATLANTA-Quality 10



Order Code	Module	L_1	L_2	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
39 15 050 [2]	1.5	500.00	6.02	100	17	17	15.5	2	62.5	125	4	6	6	10	6	31.7	436.6	5.7	1.30
39 16 050	1.5	500.00	6.02	100	17	17	15.5	2				without Mounting Holes							1.30
39 15 100	1.5	1000.00	6.02	200	17	17	15.5	2	62.5	125	8	6	6	10	6	31.7	936.6	5.7	2.60
39 16 100	1.5	1000.00	6.02	200	17	17	15.5	2				without Mounting Holes							2.60
39 20 050 [2]	2	500.00	8.87	75	25	24	22	2	62.5	125	4	8	7	11	7	31.7	436.6	5.7	2.10
39 21 050	2	500.00	8.87	75	25	24	22	2				without Mounting Holes							2.10
39 20 100	2	1000.00	8.87	150	25	24	22	2	62.5	125	8	8	7	11	7	31.7	936.6	5.7	4.20
39 21 100	2	1000.00	8.87	150	25	24	22	2				without Mounting Holes							4.20
39 20 200	2	2000.00	8.87	300	25	24	22	2	62.5	125	16	8	7	11	7	31.7	1936.6	5.7	8.40
39 21 200	2	2000.00	8.87	300	25	24	22	2				without Mounting Holes							8.40
39 30 050 [2]	3	500.00	10.64	50	30	29	26	2	62.5	125	4	9	10	15	9	35.0	430.0	7.7	3.00
39 31 050	3	500.00	10.64	50	30	29	26	2				without Mounting Holes							3.00
39 30 100	3	1000.00	10.64	100	30	29	26	2	62.5	125	8	9	10	15	9	35.0	930.0	7.7	6.00
39 31 100	3	1000.00	10.64	100	30	29	26	2				without Mounting Holes							6.00
39 30 200	3	2000.00	10.64	200	30	29	26	2	62.5	125	16	9	10	15	9	35.0	1930.0	7.7	12.00
39 31 200	3	2000.00	10.64	200	30	29	26	2				without Mounting Holes							12.00
39 40 050 [1] [2]	4	506.67	14.2	38	40	39	35	2	62.5	125	4	12	10	15	9	33.3	433.0	7.7	5.30
39 41 050	4	506.67	14.2	38	40	39	35	2				without Mounting Holes							5.30
39 40 100 [2]	4	1000.00	14.2	75	40	39	35	2	62.5	125	8	12	10	15	9	33.3	933.4	7.7	10.50
39 41 100	4	1000.00	14.2	75	40	39	35	2				without Mounting Holes							10.50
39 42 100	4	1000.00	14.2	75	40	39	35	2	62.5	125	8	12	14	20	13	33.3	933.4	11.7	10.50
39 42 150 [1]	4	1506.67	14.2	113	40	39	35	2	62.5	125	12	12	14	20	13	33.3	1433.4	11.7	15.75
39 40 200	4	2000.00	14.2	150	40	39	35	2	62.5	125	16	12	10	15	9	33.3	1933.4	7.7	21.00
39 41 200	4	2000.00	14.2	150	40	39	35	2				without Mounting Holes							21.00
39 42 200	4	2000.00	14.2	150	40	39	35	2	62.5	125	16	12	14	20	13	33.3	1933.4	11.7	21.00
39 50 050 [2]	5	500.00	17.7	30	50	39	34	2.5	62.5	125	4	12	14	20	13	37.5	425.0	11.7	6.50
39 51 050	5	500.00	17.7	30	50	39	34	2.5				without Mounting Holes							6.50
39 50 100	5	1000.00	17.7	60	50	39	34	2.5	62.5	125	8	12	14	20	13	37.5	925.0	11.7	13.00
39 51 100	5	1000.00	17.7	60	50	39	34	2.5				without Mounting Holes							13.00
39 50 200	5	2000.00	17.7	120	50	39	34	2.5	62.5	125	16	12	14	20	13	37.5	1925.0	11.7	26.00
39 51 200	5	2000.00	17.7	120	50	39	34	2.5				without Mounting Holes							26.00
39 60 050 [2]	6	500.00	21.4	25	60	49	43	2.5	62.5	125	4	16	18	26	17	37.5	425.0	15.7	9.90
39 61 050	6	500.00	21.4	25	60	49	43	2.5				without Mounting Holes							9.90
39 60 100	6	1000.00	21.4	50	60	49	43	2.5	62.5	125	8	16	18	26	17	37.5	925.0	15.7	19.80
39 61 100	6	1000.00	21.4	50	60	49	43	2.5				without Mounting Holes							19.80
39 60 200	6	2000.00	21.4	100	60	49	43	2.5	62.5	125	16	16	18	26	17	37.5	1925.0	15.7	39.60
39 61 200	6	2000.00	21.4	100	60	49	43	2.5				without Mounting Holes							39.60

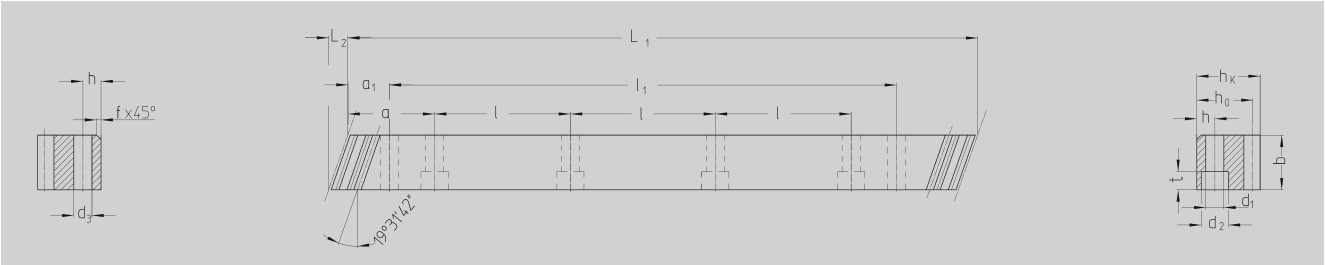
1) These racks should be used for continuous linking only with the left side (see sketch).
2) The screw joint limits the feed force.

Total pitch error $GT_f/1000 \leq 0.200$ mm.

- Milled teeth and induction hardened
- Material C45
- Backside machined, profile blasted

Further information see page ZA–13.

ATLANTA-Quality 10



Order Code	Module	L_1	L_2	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
39 80 050 [2]	8	480.00	28.4	18	80	79	71	2.5	60.0	120	4	25	22	33	21	120.0	240	19.7	21.00
39 81 050	8	480.00	28.4	18	80	79	71	2.5			without Mounting Holes								21.00
39 80 100	8	960.00	28.4	36	80	79	71	2.5	60.0	120	8	25	22	33	21	120.0	720	19.7	42.50
39 81 100	8	960.00	28.4	36	80	79	71	2.5			without Mounting Holes								42.50
39 80 200	8	1920.00	28.4	72	80	79	71	2.5	60.0	120	16	25	22	33	21	120.0	1680	19.7	85.00
39 81 200	8	1920.00	28.4	72	80	79	71	2.5			without Mounting Holes								85.00
39 10 100	10	1000.00	35.46	30	100	99	89	2.5	62.5	125	8	32	33	48	32	125.0	750	19.7	68.72
39 11 100	10	1000.00	35.46	30	100	99	89	2.5			without Mounting Holes								68.72
39 12 100	12	1000.00	42.56	25	120	120	108	2.5	40.0	125	8	40	39	58	38	102.5	750	19.7	120.00
39 13 100	12	1000.00	42.56	25	120	120	108	2.5			without Mounting Holes								120.00

1) These racks should be used for continuous linking only with the left side (see sketch).
2) The screw joint limits the feed force.

Total pitch error $GT_f/1000 \leq 0.200$ mm.

- Milled teeth and induction hardened
- Material C45
- Backside machined, profile blasted

Mounting racks, see page ZF-2.

To achieve precision rack joints, we recommend our patented rack assembly kit, see page ZF-4.

For lubrication of racks & pinions, we recommend our automatic lubrication systems, see page ZE-1.

For the calculation and selection of the rack & pinion drive, see page ZD-1.

Screws for rack mounting, see page ZF-3.

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 **U**ltra **H**igh **P**recision **R**ack	3	5	12	-13	1005	62.0	**High Precision Machine Tools with Electrical Preload**
		6	12	-13	1018	89.0	
		8	12	-13	1005	156.0	
		10	12	-13	1005	234.0	
		12	12	-13	1018	333.5	
	5	3	26	-15	1018	25.5	**Backlash Free Drives with Electrical Preload Machine Tools, Lifting Axis, Multiple Pinion Contact**
		4	26	-15	1005	49.0	
		5	26	-15	1005	75.0	
		6	26	-15	1018	107.0	
HPR **H**igh **P**recision **R**ack	6	2	34	-20	1005	15.5	**Wood, Plastic, Composite, Aluminium Working Machines**
		3	34	-20	1018	25.5	
		4	34	-20	1005	49.0	
	6	2	34	-20	2011	12.5	**Machine Tools, Integratable Racks, Water Cutting Machines, Tube Bending Systems, Plasma Cutting Machines**
		3	34	-20	2036	23.5	
		4	34	-20	2011	42.0	
		5	34	-20	2011	62.0	
		6	34	-20	2036	89.0	
		8	34	-20	2011	155.5	
		10	34	-20	1005	234.0	
		12	34	-20	1018	333.0	
	7	2	52	-36	1005	12.5	**Woodworking Machines, Linear Axis with High Requirement for a Smooth Running**
		3	52	-36	1018	23.0	
		4	52	-36	1005	42.0	
		5	52	-36	1005	62.0	
		6	52	-36	1018	89.0	
		8	52	-36	1005	155.5	
PR **P**recision **R**ack	8	2	60	-59	1005	12.0	**Portals, Handling Linear Axis**
		3	60	-59	1018	22.0	
		4	60	-59	1005	39.0	
		5	60	-59	1005	57.5	
	8	2	100	-110	2011	7.0	**Linear Axis**
		3	100	-110	2036	12.0	
		4	100	-110	2011	23.0	
BR **B**asic **R**ack	9	1	150	-110	999	0.7	**Linear Axis with Low Load Feed Units for Adjustment**
		1.5	150	-110	1998	1.0	
		2	150	-110	3016	3.0	
		2.5	150	-110	2003	3.0	
		3	150	-110	3054	6.5	
		4	150	-110	3016	12.5	
		5	150	-110	2011	14.5	
		6	150	-110	2036	21.5	
		8	150	-110	2011	38.5	
		10	150	-110	1005	49.5	
	10	1	200	-110	999	2.0	**Driving and Lifting Axes for Higher Loads but Without Special Accuracy**
		1.5	200	-110	1998	3.5	
		2	200	-110	3016	7.0	
		3	200	-110	3054	16.5	
		4	200	-110	3016	29.5	
		5	200	-110	2011	45.5	
		6	200	-110	2036	63.0	
		8	200	-110	2011	110.0	
		10	200	-110	1005	166.0	

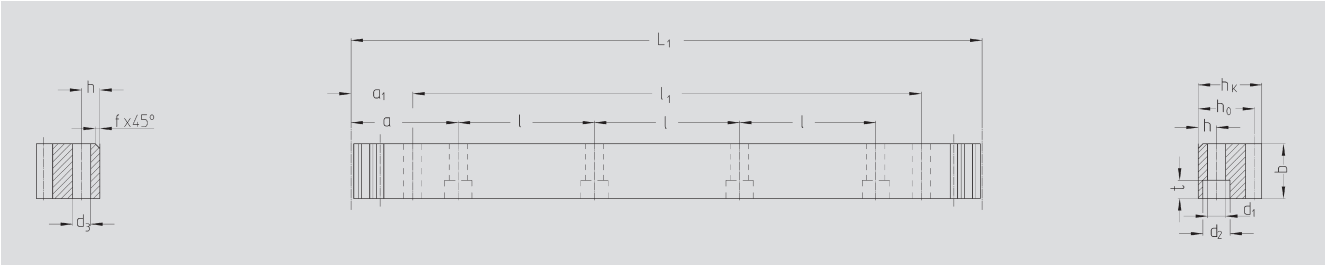
[1] Values available for 1000 mm. Other total pitch errors for other length, see detailed description (Kap. ZB).
[2] Values are only valid for special steel according ATLANTA-Standard.

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!

Class	Series	Module	ATLANTA-Quality	Page
UHPR	46	5, 6, 8, 10, 12	3	ZB-4
	28	3, 4, 5, 6	5	ZB-5
HPR	28	2, 3, 4	6	ZB-6
	28	2, 3, 4, 5, 6, 8, 10, 12	6	ZB-7
	28	2, 3, 4, 5, 6, 8	7	ZB-8
PR	34	2, 3, 4, 5	8	ZB-9
	33	2, 3, 4	8	ZB-10
BR	25	1, 1.5, 2, 2.5, 3, 4, 5, 6, 8, 10	9	ZB-11–12
	34	1, 1.5, 2, 3, 4, 5, 6, 8, 10	10	ZB-15

	Series	Module	Heat-Treatment of Teeth	Tolerance of Teeth	Page
	78	2, 3, 4, 5, 6, 8	Case-Hardened	≤ 5	ZB-16 – 20
	24	2, 3, 4, 5, 6, 8, 10	Case-Hardened	6 e 25	ZB-21 – 26
	24	2, 3, 4, 5	Induction-Hardened	6 e 25	ZB-27
	21/23.. ...	1, 1.5, 2, 2.5, 3, 4, 5, 6, 8, 10, 12	Soft	8 e 25	ZB-28 – 35
	Short Description TR-Pinion, Mounting Instructions				ZF-11 – 13
	Selection and Load Tables for Rack Drives				ZD-2 – 4
	Electronically Controlled Lubricators, Sliding-Type Lubricating Brushes and Hose-Connection Sets				ZE-2 – 6

ATLANTA-Quality 3



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
46 50 105	5	1005.3	64	49	39	34	2.5	62.8	125.66	8	12	13.5	20	13	30.10	945.0	11.7	12.2
46 60 105	6	1017.9	54	59	49	43	2.5	63.6	127.23	8	16	17.5	26	17	31.40	955.0	15.7	18.5
46 80 105	8	1005.3	40	79	79	71	2.5	62.8	125.66	8	25	22.0	33	21	26.60	952.0	19.7	22.0
46 10 105	10	1005.3	32	99	99	89	2.5	62.8	125.66	8	32	33.0	48	32	125.66	753.9	19.7	68.0
46 12 105	12	1017.9	27	120	120	108	2.5	63.6	127.23	8	40	39.0	58	38	127.23	763.4	19.7	111.0

Total pitch error **$GT_f/1000 \leq 0.012$ mm**

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

Inspection measurement data available as an option.

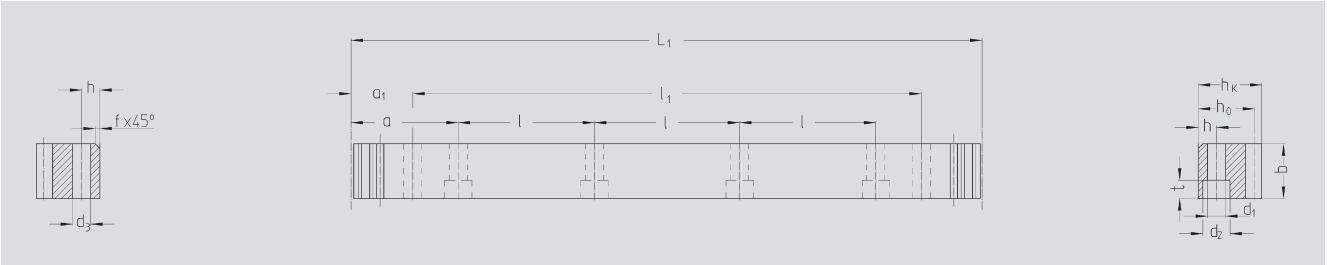
To achieve precision rack joints, we recommend our patented rack assembly kit, see page ZF-4.

For lubrication of rack & pinions we recommend our automatic lubrication systems, see page ZE-1.

For the calculation and selection of the rack & pinion drive, see page ZD-1.

Screws for rack mounting, see page ZF-3.

ATLANTA-Quality 5 StrongLine



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
28 35 100	3	1017.88	108	29	29	26	2.0	63.61	127.23	8	10	12	17.5	11	28.6	960.6	11.7	5.9
28 45 100	4	1005.31	80	39	39	35	2.0	62.83	125.66	8	13	16	23.0	15	30.3	944.7	15.7	10.7
28 55 100	5	1005.31	64	49	49	44	2.5	62.83	125.66	8	15	18	26.0	17	34.8	935.7	15.7	16.3
28 65 100	6	1017.88	54	59	59	53	2.5	63.62	127.23	8	20	22	33.0	21	98.6	820.6	19.7	24.5

Total pitch error **$GT_f/1000 \leq 0.026$ mm**

- Teeth case hardened and ground
- Case hardening steel according to 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 page ZF-2.

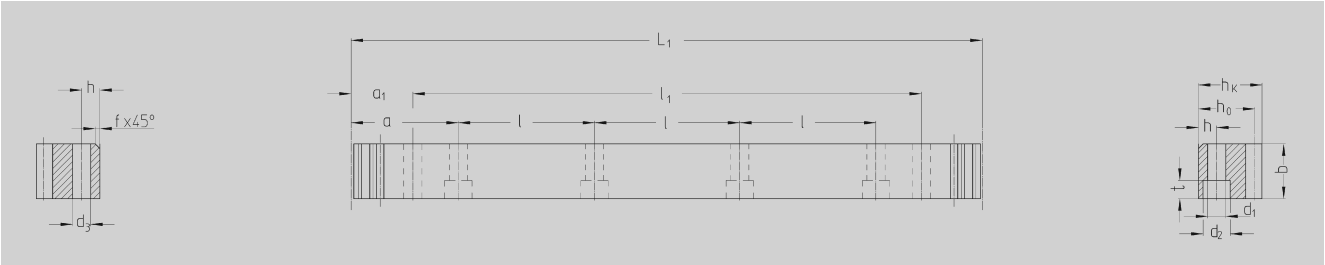
To achieve precision rack joints, we recommend our patented rack assembly kit, see page ZF-4.

For lubrication of rack & pinions we recommend our automatic lubrication systems, see page ZE-1.

For the calculation and selection of the rack & pinion drive, see page ZD-1.

Screws for rack mounting, see page ZF-3.

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
28 20 025 [1]	2	251.3	40	24	24	22.0	2	62.8	125.66	2	8	7	11	7	31.3	188.7	5.7	1.00
28 21 025	2	251.3	40	24	24	22.0	2	without Mounting Holes										1.00
28 20 050 [1]	2	502.7	80	24	24	22.0	2	62.8	125.66	4	8	7	11	7	31.3	440.1	5.7	2.10
28 21 050	2	502.7	80	24	24	22.0	2	without Mounting Holes										2.10
28 20 100	2	1005.3	160	24	24	22.0	2	62.8	125.66	8	8	7	11	7	31.3	942.7	5.7	4.20
28 21 100	2	1005.3	160	24	24	22.0	2	without Mounting Holes										4.20
28 30 025 [1]	3	254.5	27	29	29	26.0	2	63.6	127.23	2	9	10	15	9	34.4	185.7	7.7	1.50
28 31 025	3	254.5	27	29	29	26.0	2	without Mounting Holes										1.50
28 30 050 [1]	3	508.9	54	29	29	26.0	2	63.6	127.23	4	9	10	15	9	34.4	440.1	7.7	3.00
28 31 050	3	508.9	54	29	29	26.0	2	without Mounting Holes										3.00
28 30 100	3	1017.9	108	29	29	26.0	2	63.6	127.23	8	9	10	15	9	34.4	949.1	7.7	6.00
28 31 100	3	1017.9	108	29	29	26.0	2	without Mounting Holes										6.00
28 40 025 [1]	4	251.3	20	39	39	35.0	2	62.8	125.66	2	12	10	15	9	37.5	176.3	7.7	2.60
28 41 025	4	251.3	20	39	39	35.0	2	without Mounting Holes										2.60
28 40 050 [1]	4	502.7	40	39	39	35.0	2	62.8	125.66	4	12	10	15	9	37.5	427.7	7.7	5.30
28 41 050	4	502.7	40	39	39	35.0	2	without Mounting Holes										5.30
28 40 100 [1]	4	1005.3	80	39	39	35.0	2	62.8	125.66	8	12	10	15	9	37.5	930.3	7.7	10.50
28 41 100	4	1005.3	80	39	39	35.0	2	without Mounting Holes										10.50
28 42 100	4	1005.3	80	39	39	35.0	2	62.8	125.66	8	12	14	20	13	37.5	930.3	11.7	10.50
28 42 150	4	1507.9	120	39	39	35.0	2	62.8	125.66	12	12	14	20	13	37.5	1432.9	11.7	16.00
28 42 200	4	2010.62	160	39	39	35.0	2	62.8	125.66	16	12	14	20	13	37.5	1935.6	11.7	21.00

1) The screw joint limits the feed force.

Total pitch error:

GT_f /500 ≤ 0.026 mm
GT_f /1000 ≤ 0.034 mm
GT_f /1500 ≤ 0.041 mm (≤ 0.027/1000 mm)
GT_f /2000 ≤ 0.044 mm (≤ 0.022/1000 mm)

- Teeth induction-hardened and ground
- Material 16MnCr5, carburized
- Ground on all sides after hardening

Mounting racks, see page ZF-2.

Highlighted items will become obsolete in the future. Please check with the factory for delivery information.

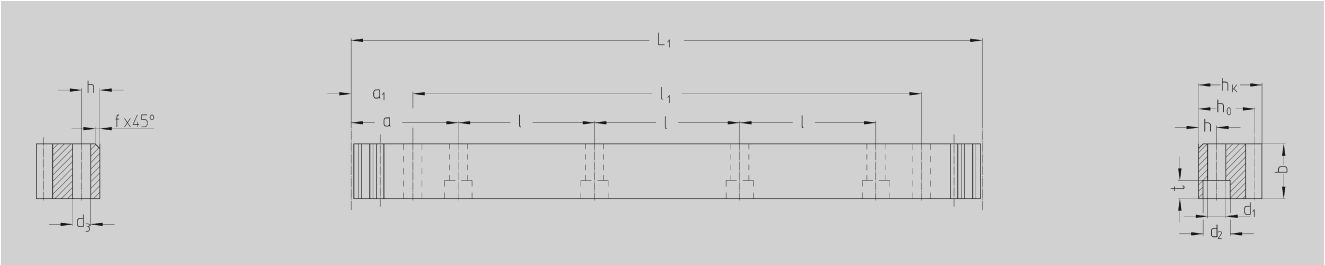
To achieve precision rack joints, we recommend our patented rack assembly kit, see page ZF-4.

For lubrication of rack & pinions we recommend our automatic lubrication systems, see page ZE-1.

For the calculation and selection of the rack & pinion drive, see page ZD-1.

Screws for rack mounting, see page ZF-3.

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
28 20 105	2	1005.30	160	24	24	22.0	2	62.8	125.66	8	8	7	11	7	31.3	942.70	5.7	4.20
28 21 105	2	1005.30	160	24	24	22.0	2			without Mounting Holes								4.20
28 20 205	2	2010.62	320	24	24	22.0	2	62.8	125.66	16	8	7	11	7	31.3	1948.00	5.7	8.40
28 21 205	2	2010.62	320	24	24	22.0	2			without Mounting Holes								8.40
28 30 105	3	1017.90	108	29	29	26.0	2	63.6	127.23	8	9	10	15	9	34.4	949.10	7.7	6.00
28 31 105	3	1017.90	108	29	29	26.0	2			without Mounting Holes								6.00
28 30 205	3	2035.75	216	29	29	26.0	2	63.6	127.23	16	9	10	15	9	34.4	1967.00	7.7	12.00
28 31 205	3	2035.75	216	29	29	26.0	2			without Mounting Holes								12.00
28 40 105[1]	4	1005.30	80	39	39	35.0	2	62.8	125.66	8	12	10	15	9	37.5	930.30	7.7	10.50
28 41 105	4	1005.30	80	39	39	35.0	2			without Mounting Holes								10.50
28 40 205	4	2010.62	160	39	39	35.0	2	62.8	125.66	16	12	10	15	9	37.5	1935.60	7.7	21.00
28 41 205	4	2010.62	160	39	39	35.0	2			without Mounting Holes								21.00
28 42 105	4	1005.30	80	39	39	35.0	2	62.8	125.66	8	12	14	20	13	37.5	930.3	11.7	10.50
28 42 155	4	1507.90	120	39	39	35.0	2	62.8	125.66	12	12	14	20	13	37.5	1432.9	11.7	16.00
28 42 205	4	2010.62	160	39	39	35.0	2	62.8	125.66	16	12	14	20	13	37.5	1935.6	11.7	21.00
28 50 055[1]	5	502.60	32	49	39	34	2.5	62.8	125.66	4	12	14	20	13	30.1	442.40	11.7	6.70
28 51 055	5	502.60	32	49	39	34	2.5			without Mounting Holes								6.70
28 50 105	5	1005.30	64	49	39	34	2.5	62.8	125.66	8	12	14	20	13	30.1	945.00	11.7	13.40
28 51 105	5	1005.30	64	49	39	34	2.5			without Mounting Holes								13.40
28 50 155	5	1507.96	96	49	39	34	2.5	62.8	125.66	12	12	14	20	13	30.1	1447.70	11.7	20.10
28 51 155	5	1507.96	96	49	39	34	2.5			without Mounting Holes								20.10
28 50 205	5	2010.62	128	49	39	34	2.5	62.8	125.66	16	12	14	20	13	30.1	1950.40	11.7	26.80
28 51 205	5	2010.62	128	49	39	34	2.5			without Mounting Holes								26.80
28 60 055[1]	6	508.90	27	59	49	43	2.5	63.6	127.23	4	16	18	26	17	31.4	446.10	15.7	10.40
28 61 055	6	508.90	27	59	49	43	2.5			without Mounting Holes								10.40
28 60 105	6	1017.88	54	59	49	43	2.5	63.6	127.23	8	16	18	26	17	31.4	955.00	15.7	20.20
28 61 105	6	1017.88	54	59	49	43	2.5			without Mounting Holes								20.20
28 60 155	6	1526.81	81	59	49	43	2.5	63.6	127.23	12	16	18	26	17	31.4	1464.00	15.7	30.30
28 61 155	6	1526.81	81	59	49	43	2.5			without Mounting Holes								30.30
28 60 205	6	2035.75	108	59	49	43	2.5	63.6	127.23	16	16	18	26	17	31.4	1973.00	15.7	40.40
28 61 205	6	2035.75	108	59	49	43	2.5			without Mounting Holes								40.40
28 80 055[1]	8	502.65	20	79	79	71	2.5	62.8	125.66	4	25	22	33	21	26.6	449.45	19.7	22.38
28 81 055	8	502.65	20	79	79	71	2.5			without Mounting Holes								22.38
28 80 105	8	1005.30	40	79	79	71	2.5	62.8	125.66	8	25	22	33	21	26.6	952.00	19.7	44.76
28 81 105	8	1005.30	40	79	79	71	2.5			without Mounting Holes								44.76
28 80 205	8	2010.61	80	79	79	71	2.5	62.8	125.66	16	25	22	33	21	26.6	1957.30	19.7	89.50
28 81 205	8	2010.61	80	79	79	71	2.5			without Mounting Holes								89.50
28 10 105	10	1005.30	32	99	99	89	2.5	62.83	125.66	8	32	33	48	32	125.66	753.96	19.7	68.72
28 11 105	10	1005.30	32	99	99	89	2.5			without Mounting Holes								68.72
28 12 105	12	1017.90	27	120	120	108	2.5	63.60	127.23	8	40	39	58	38	127.23	763.40	19.7	111.00
28 13 105	12	1017.90	27	120	120	108	2.5			without Mounting Holes								20.00

1) The screw joint limits the feed force.

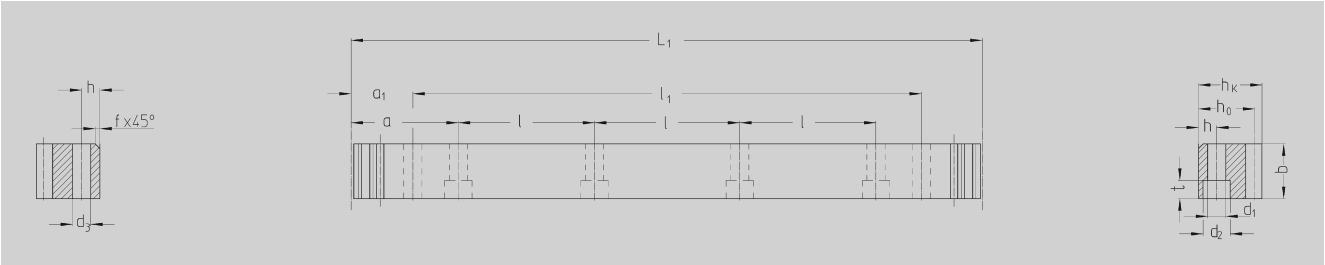
Total pitch error: GT_f /500 ≤ 0.026 mm, GT_f /1000 ≤ 0.034 mm
GT_f /1500 ≤ 0.041 mm (≤ 0.027/1000 mm)
GT_f /2000 ≤ 0.044 mm (≤ 0.022/1000 mm)

- Teeth induction-hardened and ground
- Material C45
- Ground on all sides after hardening

Mounting racks, see page ZF-2.

Further information see page ZB–4.

ATLANTA-Quality 7



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
28 20 107	2	1005.3	160	24	24	22	2	62.8	125.66	8	8	7	11	7	31.3	942.7	5.7	4.2
28 30 107	3	1017.9	108	29	29	26	2	63.6	127.23	8	9	10	15	9	34.4	949.1	7.7	6.0
28 40 107	4	1005.3	80	39	39	35	2	62.8	125.66	8	12	14	20	13	37.5	930.3	7.7	10.5
28 50 107	5	1005.3	64	49	39	34	2.5	62.8	125.66	8	12	14	20	13	30.1	945.0	11.7	13.4
28 60 107	6	1017.88	54	59	49	43	2.5	63.6	127.23	8	16	18	26	17	31.4	955.00	15.7	20.20
28 80 107	8	1005.30	40	79	79	71	2.5	62.8	125.66	8	25	22	33	21	26.6	952.00	19.7	44.76

Total pitch error: $GT_f/1000 \leq 0.052$ mm

- Teeth induction-hardened and ground
- Material C45
- Ground on all sides after hardening

Mounting racks see page ZF-2.

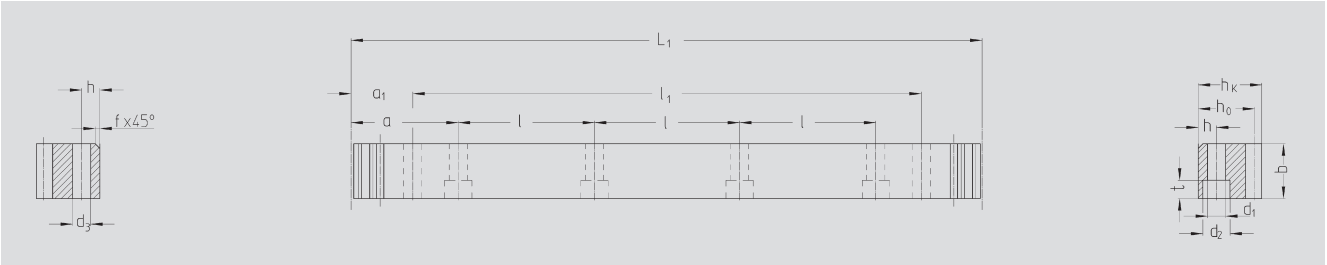
To achieve precision rack joints, we recommend our patented rack assembly kit, see page ZF-4.

For lubrication of rack & pinions we recommend our automatic lubrication systems, see page ZE-1.

For the calculation and selection of the rack & pinion drive, see page ZD-1.

Screws for rack mounting, see page ZF-3.

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
34 20 108	2	1005.30	160	25	24	22	2	62.80	125.66	8	8	7	11	7	31.4	942.7	5.7	4.2
34 20 208	2	2010.62	320	25	24	22	2	62.83	125.66	16	8	7	44	7	31.3	1948.0	5.7	8.4
34 30 108	3	1017.90	108	30	29	26	2	63.60	127.23	8	9	10	15	9	34.4	949.1	7.7	6.0
34 30 208	3	2035.75	216	30	29	26	2	63.62	127.23	16	9	10	15	9	34.4	1967.0	7.7	12.0
34 40 108	4	1005.30	80	40	39	35	2	62.80	125.66	8	12	14	20	13	37.5	930.3	11.7	10.5
34 40 208	4	2010.62	160	40	39	35	2	62.83	125.66	16	12	14	20	13	37.5	1935.6	11.7	20.4
34 50 108	5	1005.30	64	50	39	34	2.5	62.80	125.66	8	12	14	20	13	30.2	945.0	11.7	13.4
34 50 208	5	2010.62	128	50	39	34	2.5	62.83	125.66	16	12	14	20	13	30.2	1950.4	11.7	27.6

Without bores on request.

Total pitch error: **GT_f /1000 ≤ 0.060 mm**
GT_f /2000 ≤ 0.078 mm (≤ 0.039 mm/1000)

- Teeth hardened with the ATLANTA high performance hardening process and ground
- Heat-treatable steel according to ATLANTA-Standard
- Bright steel, profile blasted

Mounting racks see page ZF-2.

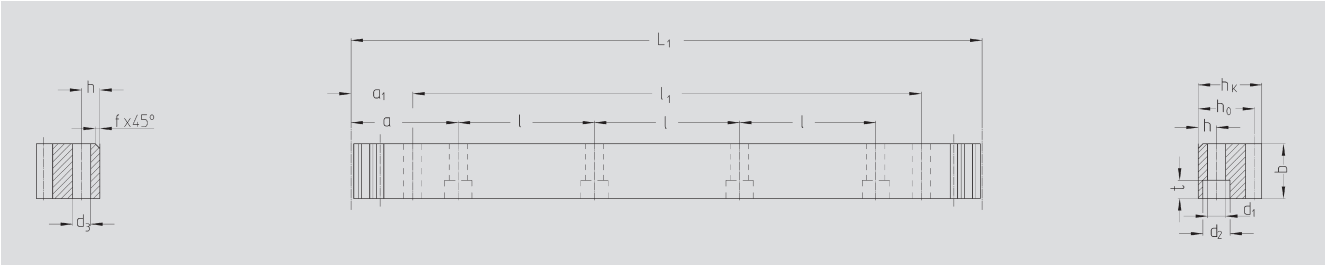
To achieve precision rack joints, we recommend our patented rack assembly kit, see page ZF-4.

For lubrication of rack & pinions we recommend our automatic lubrication systems, see page ZE-1.

For the calculation and selection of the rack & pinion drive, see page ZD-1.

Screws for rack mounting, see page ZF-3.

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
33 21 100	2	1005.31	160	25	24	22	2	62.83	125.66	8	8	7	11	7	31.3	942.7	5.7	4.30
33 20 100	2	1005.31	160	25	24	22	2	without mounting holes										4.30
33 21 200	2	2010.62	320	25	24	22	2	62.83	125.66	16	8	7	11	7	31.3	1948.0	5.7	8.60
33 20 200	2	2010.62	320	25	24	22	2	without mounting holes										8.60
33 31 100	3	1017.88	108	30	29	26	2	63.62	127.23	8	9	10	15	9	34.4	949.1	7.7	6.20
33 30 100	3	1017.88	108	30	29	26	2	without mounting holes										6.20
33 31 200	3	2035.75	216	30	29	26	2	63.62	127.23	16	9	10	15	9	34.4	1967.0	7.7	12.40
33 30 200	3	2035.75	216	30	29	26	2	without mounting holes										12.40
33 41 100	4	1005.31	80	40	39	35	2	62.83	125.66	8	12	10	15	9	37.5	930.3	7.7	11.00
33 40 100	4	1005.31	80	40	39	35	2	without mounting holes										11.00
33 41 200	4	2010.62	160	40	39	35	2	62.83	125.66	16	12	10	15	9	37.5	1935.6	7.7	22.00
33 40 200	4	2010.62	160	40	39	35	2	without mounting holes										22.00

500 mm and other length on request.

Total pitch error **$GT_f/1000 \leq 0.100$ mm,**
$GT_f/2000 \leq 0.200$ mm.

- Milled teeth, quenched and tempered
- Heat-treatable steel according to ATLANTA-Standard
- Bright steel, backside machined

Mounting racks see page ZF-2.

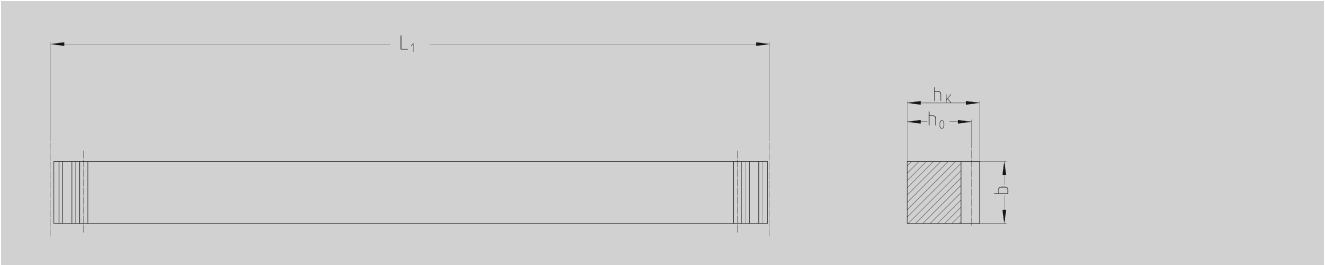
To achieve precision rack joints, we recommend our patented rack assembly kit, see page ZF-4.

For lubrication of rack & pinions we recommend our automatic lubrication systems, see page ZE-1.

For the calculation and selection of the rack & pinion drive, see page ZD-1.

Screws for rack mounting, see page ZF-3.

ATLANTA-Quality 9



Order Code	Module	L_1	N° of Teeth	b	h_k	h_0	Remarks	kg
25 10 025	1	251.33	80	15	15	14	Square Dimension	0.41
25 10 050	1	499.51	159	15	15	14	Square Dimension	0.82
25 10 100	1	999.03	318	15	15	14	Square Dimension	1.64
25 15 025	1.5	249.76	53	17	17	15.5	Square Dimension	0.51
25 15 050	1.5	499.51	106	17	17	15.5	Square Dimension	1.03
25 15 100	1.5	999.03	212	17	17	15.5	Square Dimension	2.06
25 15 200	1.5	1998.05	424	17	17	15.5	Square Dimension	4.11
25 20 025	2	251.33	40	20	20	18	Square Dimension	0.71
25 20 050	2	502.65	80	20	20	18	Square Dimension	1.41
25 20 100	2	999.03	159	20	20	18	Square Dimension	2.81
25 20 150	2	1507.96	240	20	20	18	Square Dimension	4.25
25 20 200	2	1998.05	318	20	20	18	Square Dimension	5.62
25 20 300	2	3015.93	480	20	20	18	Square Dimension	8.49
25 25 025	2.5	251.33	32	25	25	22.5	Square Dimension	1.10
25 25 050	2.5	502.65	64	25	25	22.5	Square Dimension	2.21
25 25 100	2.5	997.46	127	25	25	22.5	Square Dimension	4.38
25 25 200	2.5	2002.77	255	25	25	22.5	Square Dimension	8.80
25 30 025	3	254.47	27	30	30	27	Square Dimension	1.61
25 30 051	3	508.94	54	30	30	27	Square Dimension	3.22
25 30 101	3	1017.88	108	30	30	27	Square Dimension	6.44
25 30 150	3	1526.81	162	30	30	27	Square Dimension	9.66
25 30 201	3	2035.75	216	30	30	27	Square Dimension	12.88
25 30 300	3	3053.63	324	30	30	27	Square Dimension	19.32
25 40 025	4	251.33	20	40	40	36	Square Dimension	2.83
25 40 050	4	502.65	40	40	40	36	Square Dimension	5.65
25 40 100	4	1005.31	80	40	40	36	Square Dimension	11.31
25 40 150	4	1507.96	120	40	40	36	Square Dimension	19.97
25 40 201	4	2010.62	160	40	40	36	Square Dimension	22.61
25 40 300	4	3015.93	240	40	40	36	Square Dimension	33.93

Total pitch error $GT_f/1000 \leq 0.150$ mm.

- Milled teeth
- Material C45
- Bright steel

Mounting racks see page ZF-2.

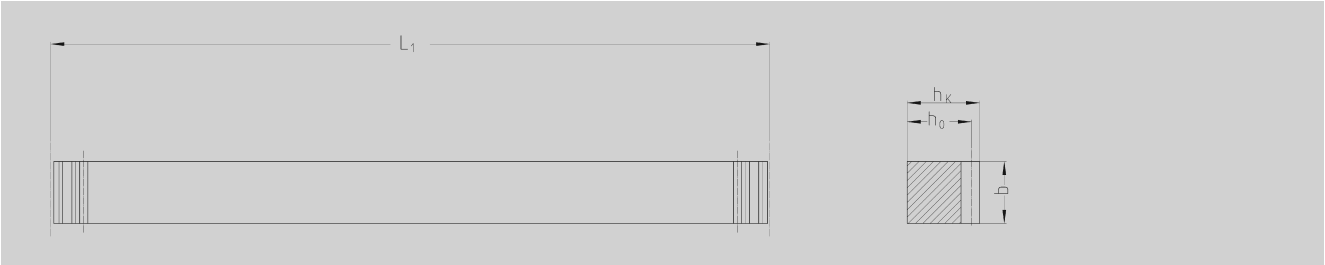
To achieve precision rack joints, we recommend our patented rack assembly kit, see page ZF-4.

For lubrication of rack & pinions we recommend our automatic lubrication systems, see page ZE-1.

For the calculation and selection of the rack & pinion drive, see page ZD-1.

Screws for rack mounting, see page ZF-3.

ATLANTA-Quality 9



Order Code	Module	L_1	N° of Teeth	b	h_k	h_0	Remarks	kg
25 50 025	5	251.33	16	50	40	35	Not square dimension	3.44
25 50 050	5	502.65	32	50	40	35	Not square dimension	6.87
25 50 100	5	1005.31	64	50	40	35	Not square dimension	13.74
25 50 150	5	1507.96	96	50	40	35	Not square dimension	20.40
25 50 200	5	2010.62	128	50	40	35	Not square dimension	27.48
25 52 100	5	1005.31	64	50	50	45	Square dimension	17.10
25 52 200	5	2010.62	128	50	50	45	Square dimension	34.20
25 60 051	6	508.94	27	60	50	44	Not square dimension	10.49
25 60 101	6	1017.88	54	60	50	44	Not square dimension	20.99
25 60 201	6	2035.75	108	60	50	44	Not square dimension	41.97
25 62 101	6	1017.88	54	60	60	54	Square dimension	25.00
25 62 201	6	2035.75	108	60	60	54	Square dimension	50.00
25 80 100	8	1005.31	40	80	79.5	71.5	Square dimension	44.63
25 80 200	8	2010.62	80	80	79.5	71.5	Square dimension	89.26
25 11 100	10	1005.30	32	100	100	90	Square dimension	70.60

Total pitch error $GT_f/1000 \leq 0.150$ mm.

- Milled teeth
- Material C45
- Bright steel

Mounting racks see page ZF-2.

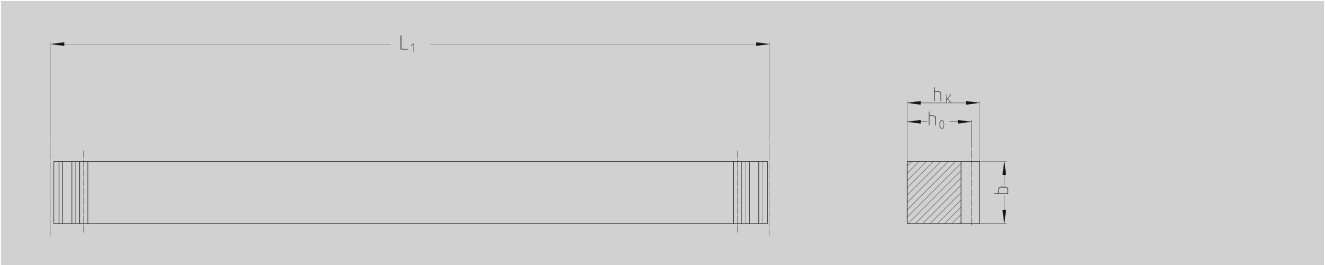
To achieve precision rack joints, we recommend our patented rack assembly kit, see page ZF-4.

For lubrication of rack & pinions we recommend our automatic lubrication systems, see page ZE-1.

For the calculation and selection of the rack & pinion drive, see page ZD-1.

Screws for rack mounting, see page ZF-3.

ATLANTA-Quality 10



Order Code	Module	L_1	N° of Teeth	b	h_k	h_0	Remarks	kg
27 10 025	1	251.33	80	15	15	14	Square dimension	0.41
27 10 050	1	499.51	159	15	15	14	Square dimension	0.82
27 10 100	1	999.03	318	15	15	14	Square dimension	1.64
27 15 025	1.5	249.76	53	17	17	15.5	Square dimension	0.51
27 15 050	1.5	499.51	106	17	17	15.5	Square dimension	1.03
27 15 100	1.5	999.03	212	17	17	15.5	Square dimension	2.06
27 15 200	1.5	1998.05	424	17	17	15.5	Square dimension	4.11
27 20 025	2	251.33	40	20	20	18	Square dimension	0.71
27 20 050	2	502.65	80	20	20	18	Square dimension	1.41
27 20 100	2	999.03	159	20	20	18	Square dimension	2.81
27 20 150	2	1507.96	240	20	20	18	Square dimension	4.25
27 20 200	2	1998.05	318	20	20	18	Square dimension	5.62
27 20 300	2	3015.93	480	20	20	18	Square dimension	8.49
27 25 025	2.5	251.33	32	25	25	22.5	Square dimension	1.10
27 25 050	2.5	502.65	64	25	25	22.5	Square dimension	2.21
27 25 100	2.5	997.46	127	25	25	22.5	Square dimension	4.38
27 25 200	2.5	2002.77	255	25	25	22.5	Square dimension	8.80
27 30 025	3	254.47	27	30	30	27	Square dimension	1.61
27 30 051	3	508.94	54	30	30	27	Square dimension	3.22
27 30 101	3	1017.88	108	30	30	27	Square dimension	6.44
27 30 150	3	1526.81	162	30	30	27	Square dimension	9.66
27 30 201	3	2035.75	216	30	30	27	Square dimension	12.88
27 30 300	3	3053.63	324	30	30	27	Square dimension	19.32
27 40 025	4	251.33	20	40	40	36	Square dimension	2.83
27 40 050	4	502.65	40	40	40	36	Square dimension	5.65
27 40 100	4	1005.31	80	40	40	36	Square dimension	11.31
27 40 150	4	1507.96	120	40	40	36	Square dimension	19.97
27 40 201	4	2010.62	160	40	40	36	Square dimension	22.61
27 40 300	4	3015.93	240	40	40	36	Square dimension	33.93

Total pitch error $GT_f/1000 \leq 0.200$ mm.

- Milled teeth and induction hardened
- Material C45
- Bright steel

Mounting racks see page ZF-2.

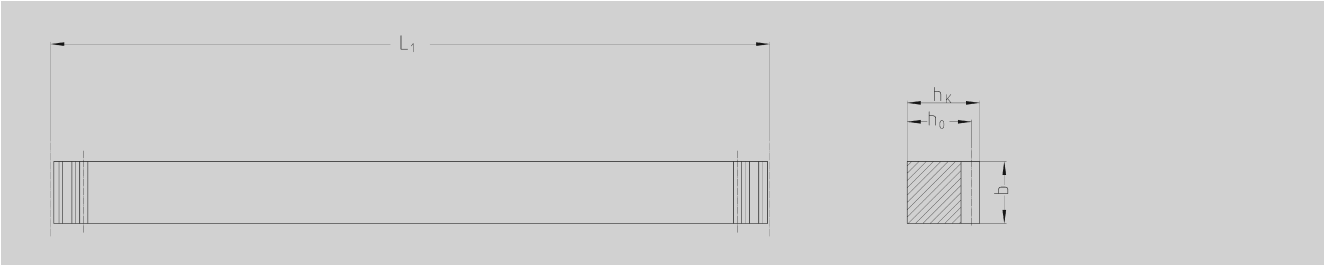
To achieve precision rack joints, we recommend our patented rack assembly kit, see page ZF-4.

For lubrication of rack & pinions we recommend our automatic lubrication systems, see page ZE-1.

For the calculation and selection of the rack & pinion drive, see page ZD-1.

Screws for rack mounting see page ZF-3.

ATLANTA-Quailty 10



Order Code	Module	L_1	N° of Teeth	b	h_k	h_0	Remarks	kg
27 50 025	5	251.33	16	50	40	35	Not square dimension	3.44
27 50 050	5	502.65	32	50	40	35	Not square dimension	6.87
27 50 100	5	1005.31	64	50	40	35	Not square dimension	13.74
27 50 150	5	1507.96	96	50	40	35	Not square dimension	20.40
27 50 200	5	2010.62	128	50	40	35	Not square dimension	27.48
27 52 100	5	1005.31	64	50	50	45	Square dimension	17.10
27 52 200	5	2010.62	128	50	50	45	Square dimension	34.20
27 60 051	6	508.94	27	60	50	44	Not square dimension	10.49
27 60 101	6	1017.88	54	60	50	44	Not square dimension	20.99
27 60 201	6	2035.75	108	60	50	44	Not square dimension	41.97
27 62 101	6	1017.88	54	60	60	54	Square dimension	25.00
27 62 201	6	2035.75	108	60	60	54	Square dimension	50.00
27 80 100	8	1005.31	40	80	79.5	71.5	Square dimension	44.63
27 80 200	8	2010.62	80	80	79.5	71.5	Square dimension	89.26
27 11 100	10	1005.30	32	100	100	90	Square dimension	70.60

Total pitch error $GT_f/1000 \leq 0.200$ mm.

- Milled teeth and induction hardened
- Material C45
- Bright steel

Mounting racks see page ZF-2.

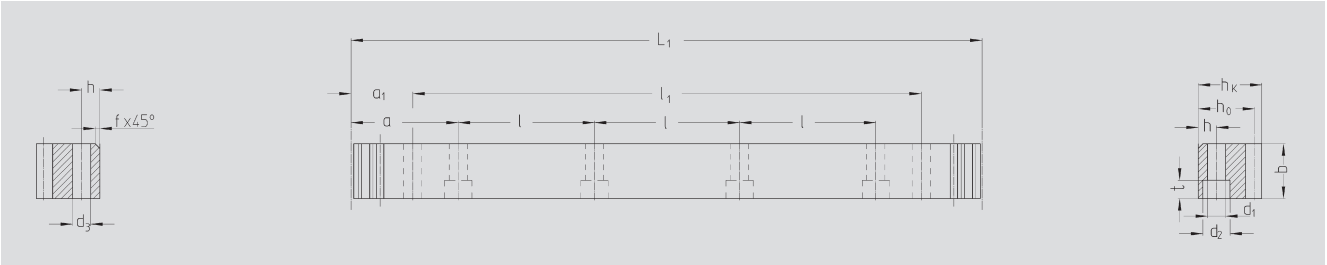
To achieve precision rack joints, we recommend our patented rack assembly kit, see page ZF-4.

For lubrication of rack & pinions we recommend our automatic lubrication systems, see page ZE-1.

For the calculation and selection of the rack & pinion drive, see page ZD-1.

Screws for rack mounting, see page ZF-3.

ATLANTA-Quality 10



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
34 93 100	1	999.06	318	15	15	14	2		without mounting holes									1.64
34 93 200	1	1998.05	636	15	15	14	2		without mounting holes									3.28
34 16 100	1.5	999.03	212	17	17	15.5	2		without mounting holes									2.06
34 16 200	1.5	1998.05	424	17	17	15.5	2		without mounting holes									4.12
34 20 100	2	1005.31	160	25	24	22	2	62.83	125.66	8	8	7	11	7	31.3	942.7	5.7	4.20
34 21 100	2	1005.31	160	25	24	22	2		without mounting holes									4.20
34 20 200	2	2010.62	320	25	24	22	2	62.83	125.66	16	8	7	11	7	31.3	1948.0	5.7	8.40
34 21 200	2	2010.62	320	25	24	22	2		without mounting holes									8.40
34 30 100	3	1017.88	108	30	29	26	2	63.62	127.23	8	9	10	15	9	34.4	949.1	7.7	6.00
34 31 100	3	1017.88	108	30	29	26	2		without mounting holes									6.00
34 30 200	3	2035.75	216	30	29	26	2	63.62	127.23	16	9	10	15	9	34.4	1967	7.7	12.00
34 31 200	3	2035.75	216	30	29	26	2		without mounting holes									12.00
34 40 100 [1]	4	1005.31	80	40	39	35	2	62.83	125.66	8	12	10	15	9	37.5	930.3	7.7	10.20
34 41 100	4	1005.31	80	40	39	35	2		without mounting holes									10.20
34 42 100	4	1005.31	80	40	39	35	2	62.83	125.66	8	12	14	20	13	37.5	930.3	11.7	10.20
34 40 200 [1]	4	2010.62	160	40	39	35	2	62.83	125.66	16	12	10	15	9	37.5	1935.6	7.7	20.50
34 41 200	4	2010.62	160	40	39	35	2		without mounting holes									20.50
34 42 200	4	2010.62	160	40	39	35	2	62.83	125.66	16	12	14	20	13	37.5	1935.6	11.7	20.50
34 50 100	5	1005.31	64	50	39	34	2.5	62.83	125.66	8	12	14	20	13	30.2	945.0	11.7	13.80
34 51 100	5	1005.31	64	50	39	34	2.5		without mounting holes									13.80
34 50 200	5	2010.62	128	50	39	t34	2.5	62.83	125.66	16	12	14	20	13	30.2	1950.3	11.7	27.50
34 51 200	5	2010.62	128	50	39	34	2.5		without mounting holes									27.50
34 60 100	6	1017.88	54	60	49	43	2.5	63.62	127.23	8	16	18	26	17	31.4	955.0	15.7	21.00
34 61 100	6	1017.88	54	60	49	43	2.5		without mounting holes									21.00
34 60 200	6	2035.75	108	60	49	43	2.5	63.62	127.23	16	16	18	26	17	31.4	1972.9	15.7	42.00
34 61 200	6	2035.75	108	60	49	43	2.5		without mounting holes									42.00
34 81 100	8	1005.31	40	80	79	71	2.5		without mounting holes									44.63
34 81 200	8	2010.61	80	80	79	71	2.5		without mounting holes									82.26
34 11 100	10	1005.30	32	100	99	89	2.5		without mounting holes									70.60

1) The screw joint limits the feed force.

500 mm and other length on request.

Total pitch error

$GT_f/1000 \leq 0.200$ mm,
$GT_f/1500 \leq 0.300$ mm,
$GT_f/2000 \leq 0.400$ mm.

- Teeth hardened with the ATLANTA high performance hardening process
- Heat-treatable steel according to ATLANTA-Standard
- Bright steel

Mounting racks see page ZF-2.

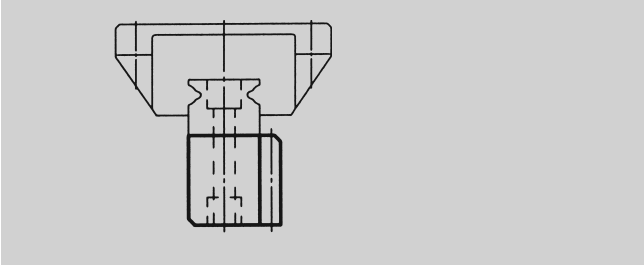
To achieve precision rack joints, we recommend our patented rack assembly kit, see page ZF-4.

For lubrication of rack & pinions we recommend our automatic lubrication systems, see page ZE-1.

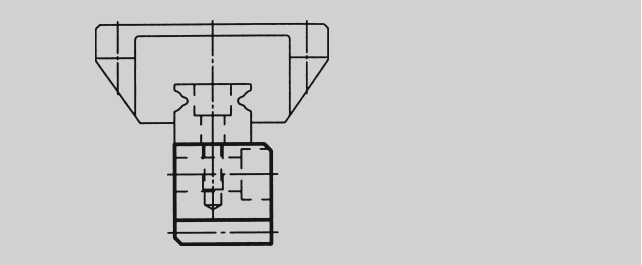
For the calculation and selection of the rack & pinion drive, see page ZD-1.

Screws for rack mounting, see page ZF-3.

90° Arrangement



180° Arrangement



- **Adjusting between rack and rail not necessary**
- **Space-saving and performance-optimized design can be realized**
- **Different types of integrated racks allows best price-performance-ratio**
- **Allows assembling of integrated rack and rail outside the machine**
- **On-site mounting of integrated rack and rail with corresponding device**
- **Continuous linking of the integrated rack with rails**
- **Additional requirement: threads in the rail for the 90° arrangement**

Helical Integrated Rack

Class	Quality	Module	Total Pitch Error (µm/m)	Tooth Thickness Tolerance (µm)	Max. Length (mm)	Feed Force per Pinion Contact/ Tooth Wide (kN/width)	Applications (Examples)
HPIR **H**igh **P**recision **I**ntegrated **R**ack	6	2	34	-20	960	6.8/24	**Machine Tools, Wood, Plastic Working Machines**
		3	34	-20	960	12.0/29	
		4	34	-20	960	23.5/39	
BIR **B**asic **I**ntegrated **R**ack	9	2	150	-110	1920	1.8/25	**Pick and Place Applicaions**
		3	150	-110	1920	3.0/30	
		4	150	-110	1920	5.0/40	

Straight Integrated Rack

Class	Quality	Module	Total Pitch Error (µm/m)	Tooth Thickness Tolerance (µm)	Max. Length (mm)	Feed Force per Pinion Contact/ Tooth Wide (kN/width)	Applications (Examples)
HPIR **H**igh **P**recision **I**ntegrated **R**ack	6	5	34	-20	960	5/24	**Machine Tools, Wood, Plastic Working Machines**
		10	34	-20	960	12/29	
		13.33	34	-20	960	23/39	
BIR **B**asic **I**ntegrated **R**ack	9	5	150	-110	1920	1.5/25	**Pick and Place Applicaions**
		10	150	-110	1920	5.5/30	
		13.33	150	-110	1920	6.5/40	

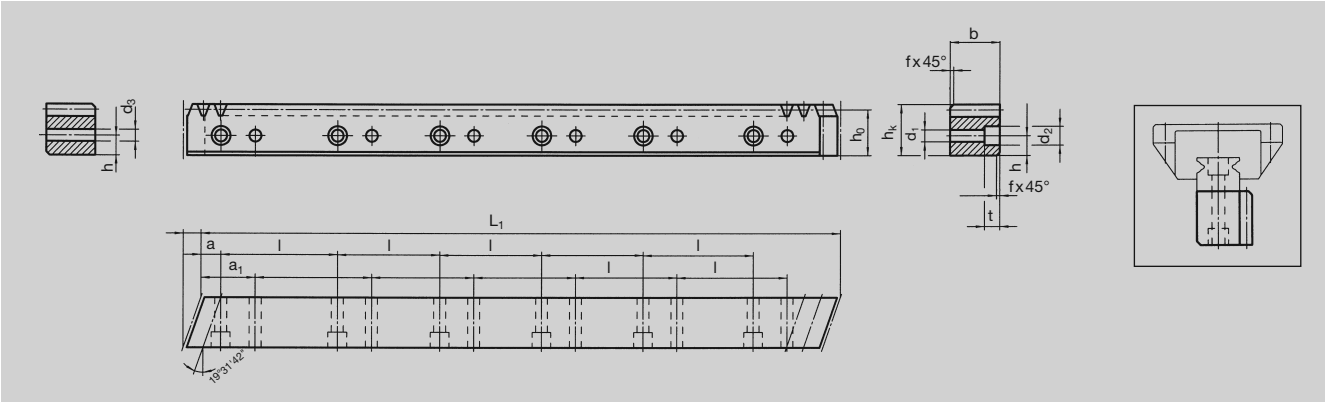
	Series	Straight/ Helical	Module	Heat-Treatment of Teeth		Page
HPIR	49	Helical [1)]	2, 3, 4	Induction-Hardened	6 h 25	ZC-4/5
	49	Straight	5, 10, 13.33 mm	Induction-Hardened	6 h 25	ZC-8/9
BIR	49	Helical [1)]	2, 3, 4	Soft	9 e 27	ZC-6/7
	49	Straight	5, 10, 13.33 mm	Soft	9 e 27	ZC-10/11
	Mounting Guide for 90° Version					ZC-12
	Mounting Guide for 180° Version					ZC-13
	Selection and Load Tables					ZC-15–20
	Electronically Controlled Lubricators, Sliding-Type Lubricating Brushes and Hose-Connection Sets					ZE-2–6
	Felt Gear and Mounting Shaft					ZE-7–8
	Mounting					ZF-9

[1)] All our helical racks are right hand, except the companion racks, which are left hand!

	Series	Pitch	Heat-Treatment of Teeth	Tolerance of Teeth	Page
	24	5, 10, 13.33	Case-Hardened	6 e 25	ZC-14
	07	5, 10	Soft	8 e 25	ZC-14
	Selection and Load Tables				ZC-15–20
	Electronically Controlled Lubricators, Sliding-Type Lubricating Brushes and Hose-Connection Sets				ZE-2–6
	Felt Gear and Mounting Shaft				ZE-7–8
	Mounting				ZF-9

Suitable helical pinions are shown at page ZA –14 and following pages.

Quality 6 – 90° Version



Order Code	Module	L_1	L_2	N° of Teeth	b	h_k	h_o	f	a	l	N° of Holes	h	d_1	d_2	t	a_1	d_3	kg
49 29 197	2	960	6.70	144	19	19.50	17.50	1	10	60	16	7.5	4.5	7.5	5.3	30	4.5	2.7
49 29 397	2	480	6.70	72	19	19.50	17.50	1	10	60	8	7.5	4.5	7.5	5.3	30	4.5	1.3
49 29 187	2	960	8.50	144	24	24.50	22.50	1	10	60	16	10.0	6.0	9.5	8.5	30	6.0	4.2
49 29 387	2	480	8.50	72	24	24.50	22.50	1	10	60	8	10.0	6.0	9.5	8.5	30	6.0	2.1
49 39 197	3	960	10.30	96	29	29.75	26.75	2	10	60	16	11.5	7.0	11.0	9.0	30	7.0	5.6
49 39 397	3	480	10.30	48	29	29.75	26.75	2	10	60	8	11.5	7.0	11.0	9.0	30	7.0	2.8
49 49 197	4	960	13.83	72	39	39.75	35.75	2	20	80	12	14.0	10.0	15.0	9.0	40	10.0	10.5
49 49 397	4	480	13.83	36	39	39.75	35.75	2	20	80	6	14.0	10.0	15.0	9.0	40	10.0	5.2
49 49 177	4	960	13.83	72	39	48.75	44.75	2	20	80	12	17.0	10.0	15.0	9.0	40	10.0	13.0
49 49 377	4	480	13.83	36	39	48.75	44.75	2	20	80	6	17.0	10.0	15.0	9.0	40	10.0	6.5
49 49 887	4	840	17.38	63	49	58.00	54.00	2	30	105	8	22.5	14.0	20.0	13.0	60	14.0	17.3

Total pitch error: $GT_f/1000 \leq 0.034$ mm

- Teeth induction-hardened and ground
- Material C45
- Ground on all sides after hardening

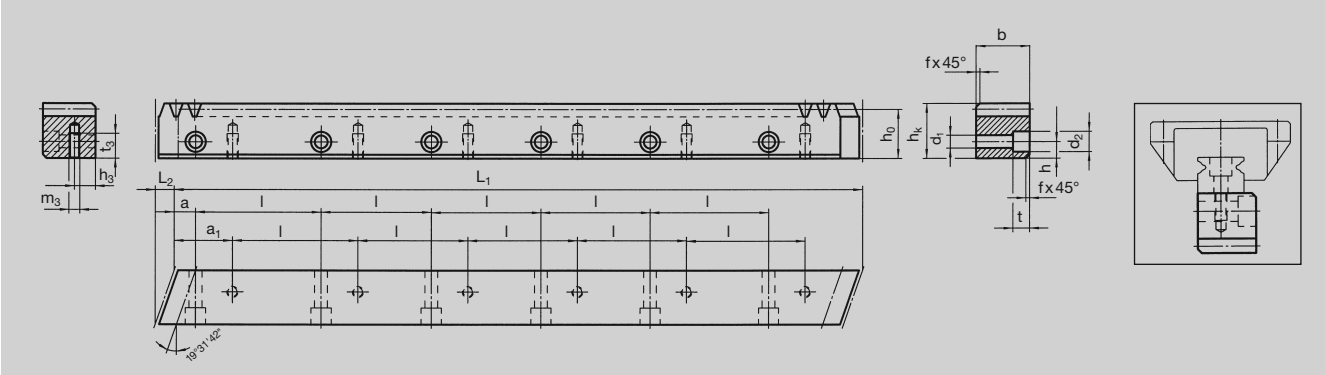
Mounting racks, see page ZF-2.

To achieve precision rack joints, we recommend our patented rack assembly kit, see page ZF-4.

For lubrication of racks & pinions, we recommend our automatic lubrication systems, see page ZE-1.

For the calculation and selection of the rack & pinion drive, see page ZD-1.

Quality 6 – 180° Version



Order Code	Module	L_1	L_2	N° of Teeth	b	h_k	h_o	f	a	l	N° of Holes	h	d_1	d_2	t	a_1	m_3	h_3	t_3	kg
49 29 107	2	960	6.70	144	19	19.50	17.50	1	10	60	16	7.5	5.8	10	6	30	M4	7.5	8.0	2.7
49 29 117	2	960	8.50	144	24	24.50	22.50	1	10	60	16	10.0	7.0	11	7	30	M5	10.0	11.0	4.2
49 39 107	3	960	10.30	96	29	29.75	26.75	2	10	60	16	11.5	10.0	15	9	30	M6	11.5	13.5	5.6
49 49 107	4	960	13.83	72	39	39.75	35.75	2	20	80	12	14.0	12.0	18	12	40	M8	14.0	16.0	10.5
49 49 127	4	960	13.83	72	39	48.75	44.75	2	20	80	12	17.0	12.0	18	12	40	M8	17.0	16.0	13.0
49 49 807	4	840	17.38	63	49	58.00	54.00	2	30	105	8	22.5	14.0	20	13	60	M12	22.5	25.0	17.3

Total pitch error: $GT_f/1000 \leq 0.034$ mm

- Teeth induction-hardened and ground
- Material C45
- Ground on all sides after hardening

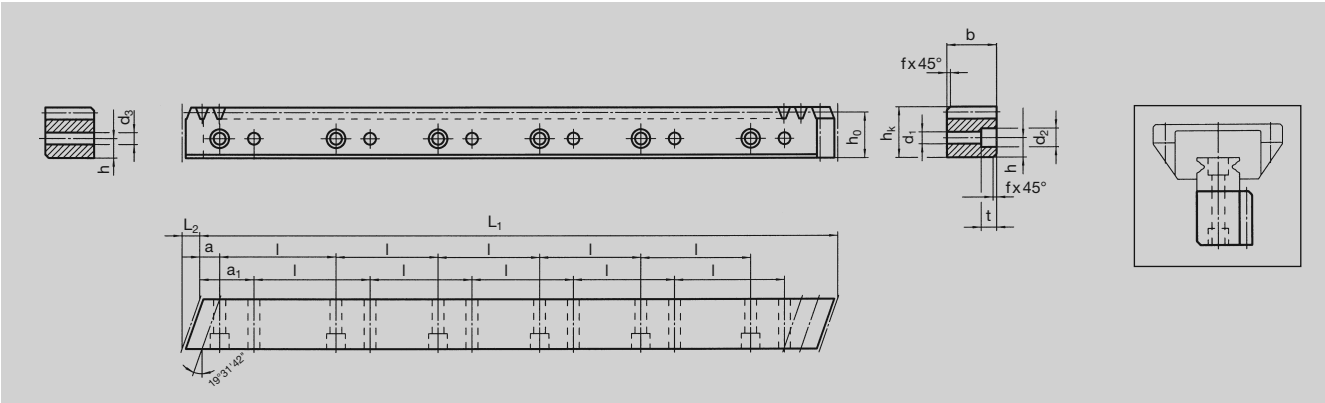
Mounting racks, see page ZF-2.

To achieve precision rack joints, we recommend our patented rack assembly kit, see page ZF-4.

For lubrication of racks & pinions, we recommend our automatic lubrication systems, see page ZE-1.

For the calculation and selection of the rack & pinion drive, see page ZD-1.

Quality 9 – 90° Version



Order Code	Module	L_1	L_2	N° of Teeth	b	h_k	h_o	f	a	l	N° of Holes	h	d_1	d_2	t	a_1	d_3	kg
49 29 292	2	1920	7.10	288	20	19.50	17.50	1	10	60	32	7.5	4.5	7.5	5.3	30	4.5	5.4
49 29 282	2	1920	8.90	288	25	24.50	22.50	1	10	60	32	10.0	6.0	9.5	8.5	30	6.0	8.4
49 39 292	3	1920	10.60	192	30	29.75	26.75	2	10	60	32	11.5	7.0	11.0	9.0	30	7.0	11.2
49 49 292	4	1920	14.20	144	40	39.75	35.75	2	20	80	24	14.0	10.0	15.0	9.0	40	10.0	21.5
49 49 272	4	1920	14.54	144	41	48.75	44.75	2	20	80	24	17.0	10.0	15.0	9.0	40	10.0	29.9

Total pitch error $GT_f/1000 \leq 0.150$ mm.

- Milled teeth
- Material C45
- Bright steel

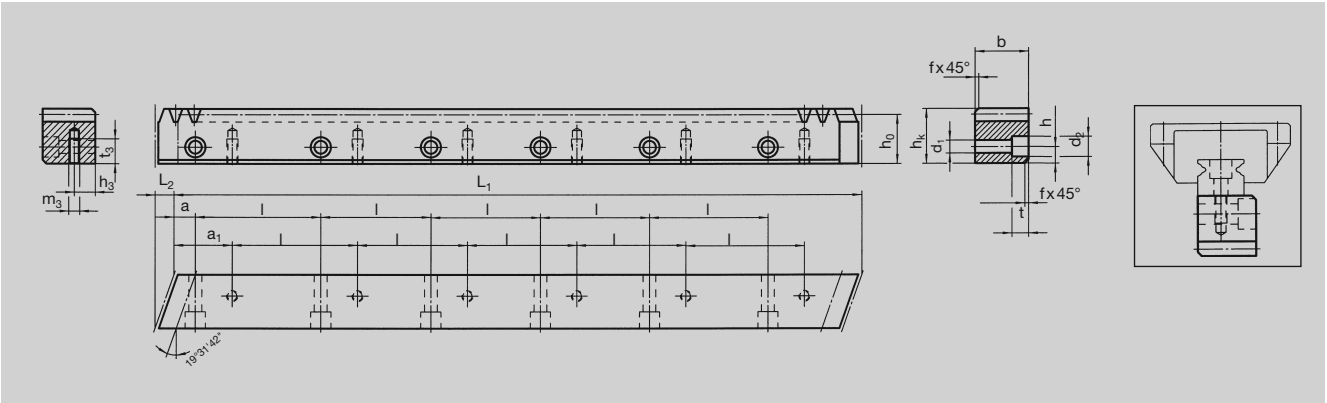
Mounting racks see page ZF-2.

To achieve precision rack joints, we recommend our patented rack assembly kit, see page ZF-4.

For lubrication of racks & pinions, we recommend our automatic lubrication systems, see page ZE-1.

For the calculation and selection of the rack & pinion drive, see page ZD-1.

Quality 9 – 180° Version



Order Code	Module	L_1	L_2	N° of Teeth	b	h_k	h_o	f	a	l	N° of Holes	h	d_1	d_2	t	a_1	m_3	h_3	t_3	kg
49 29 202	2	1920	7.1	288	20	19.50	17.50	1	10	60	32	7.5	5.8	10	6	30	M4	7.5	8.0	5.4
49 29 212	2	1920	8.9	288	25	24.50	22.50	1	10	60	32	10.0	7.0	11	7	30	M5	10.0	11.0	8.4
49 39 202	3	1920	10.6	192	30	29.75	26.75	2	10	60	32	11.5	10.0	15	9	30	M6	11.5	13.5	11.2
49 49 202	4	1920	14.2	144	40	39.75	35.75	2	20	80	24	14.0	12.0	18	12	40	M8	14.0	16.0	21.5

Total pitch error $GT_f/1000 \leq 0.150$ mm.

- Milled teeth
- Material C45
- Bright steel

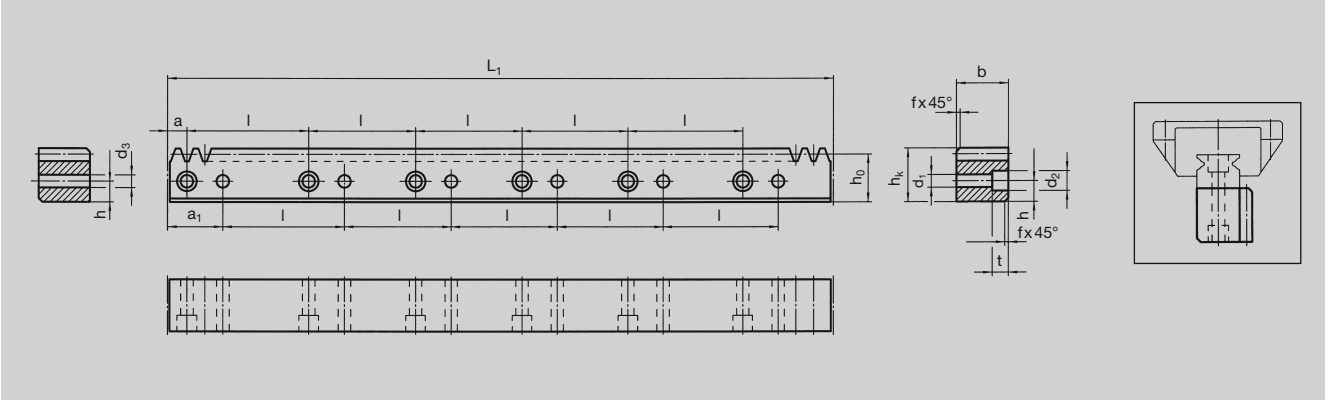
Mounting racks see page ZF-2.

To achieve precision rack joints, we recommend our patented rack assembly kit, see page ZF-4.

For lubrication of racks & pinions, we recommend our automatic lubrication systems, see page ZE-1.

For the calculation and selection of the rack & pinion drive, see page ZD-1.

Quality 6 – 90° Version



Order Code	Pitch	L_1	N° of Teeth	b	h_k	h_o	f	a	l	N° of Holes	h	d_1	d_2	t	a_1	d_3	kg
49 77 197	5	960	192	19	19.50	17.91	1	10	60	16	7.5	4.5	7.5	5.3	30	4.5	2.7
49 77 187	5	960	192	24	24.50	22.91	1	10	60	16	10.0	6.0	9.5	8.5	30	6.0	4.2
49 97 197	10	960	96	29	29.75	26.57	2	10	60	16	11.5	7.0	11.0	9.0	30	7.0	5.6
49 47 197	13.33	960	72	39	39.75	35.50	2	20	80	12	14.0	10.0	15.0	9.0	40	10.0	10.5

Total pitch error: $GT_f/1000 \leq 0.034$ mm

- Teeth induction-hardened and ground
- Material C45
- Ground on all sides after hardening

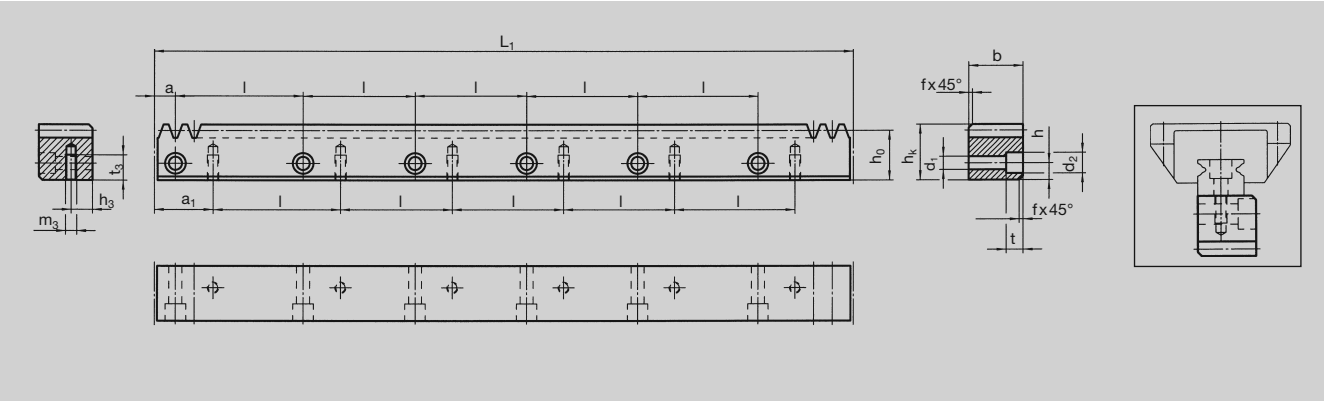
Mounting racks see page ZF-2 and ZF-4-5.

To achieve precision rack joints, we recommend our patented rack assembly kit, see page ZF-4.

For lubrication of racks & pinions, we recommend our automatic lubrication systems, see page ZE-1.

For the calculation and selection of the rack & pinion drive, see page ZD-1.

Quality 6 – 180° Version



Order Code	Pitch	L_1	N° of Teeth	b	h_k	h_o	f	a	l	N° of Holes	h	d_1	d_2	t	a_1	m_3	h_3	t_3	kg
49 77 107	5	960	192	19	19.50	17.91	1	10	60	16	7.5	5.8	10	6	30	M4	7.5	8.0	2.7
49 77 117	5	960	192	24	24.50	22.91	1	10	60	16	10.0	7.0	11	7	30	M5	10.0	11.0	4.2
49 97 107	10	960	96	29	29.75	26.57	2	10	60	16	11.5	10.0	15	9	30	M6	11.5	13.5	5.6
49 47 107	13.33	960	72	39	39.75	35.50	2	20	80	12	14.0	12.0	18	12	40	M8	14.0	16.0	10.5

Total Pitch Error: $GT_f/1000 \leq 0.034$ mm

- Teeth induction-hardened and ground
- Material C45
- Ground on all sides after hardening

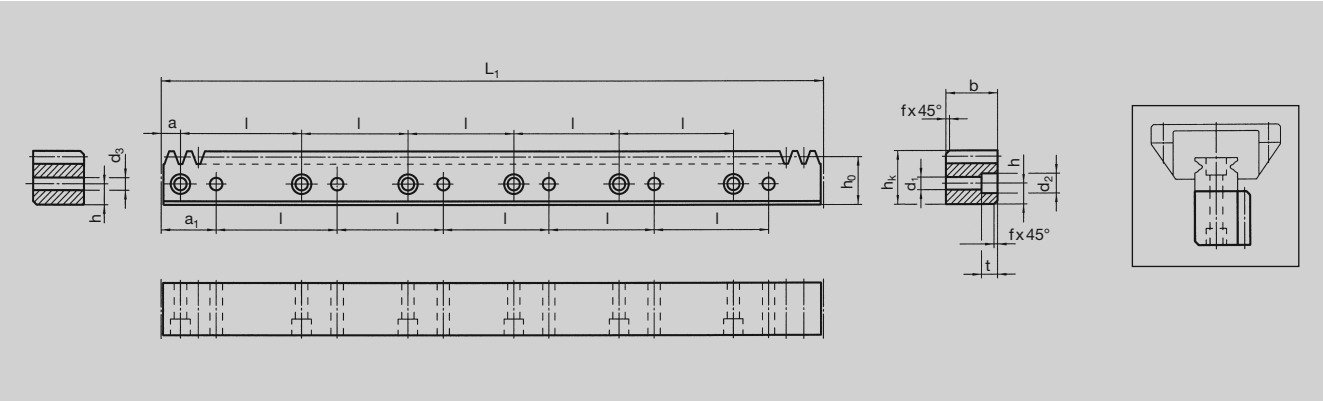
Mounting racks see page ZF-2 and ZF-4-5.

To achieve precision rack joints, we recommend our patented rack assembly kit, see page ZF-4.

For lubrication of racks & pinions, we recommend our automatic lubrication systems, see page ZE-1.

For the calculation and selection of the rack & pinion drive, see page ZD-1.

Quality 9 – 90° Version



Order Code	Pitch	L_1	N° of Teeth	b	h_k	h_o	f	a	l	N° of Holes	h	d_1	d_2	t	a_1	d_3	kg
49 77 292	5	1920	384	20	19.50	17.91	1	10	60	32	7.5	4.5	7.5	5.3	30	4.5	5.4
49 77 282	5	1920	384	25	24.50	22.91	1	10	60	32	10.0	6.0	9.5	8.5	30	6.0	8.4
49 97 292	10	1920	192	30	29.75	26.57	2	10	60	32	11.5	7.0	11.0	9.0	30	7.0	11.2
49 47 292	13.33	1920	144	40	39.75	35.50	2	20	80	24	14.0	10.0	15.0	9.0	40	10.0	21.5

Total pitch error $GT_f/1000 \leq 0.150$ mm.

- Milled teeth
- Material C45
- Bright steel

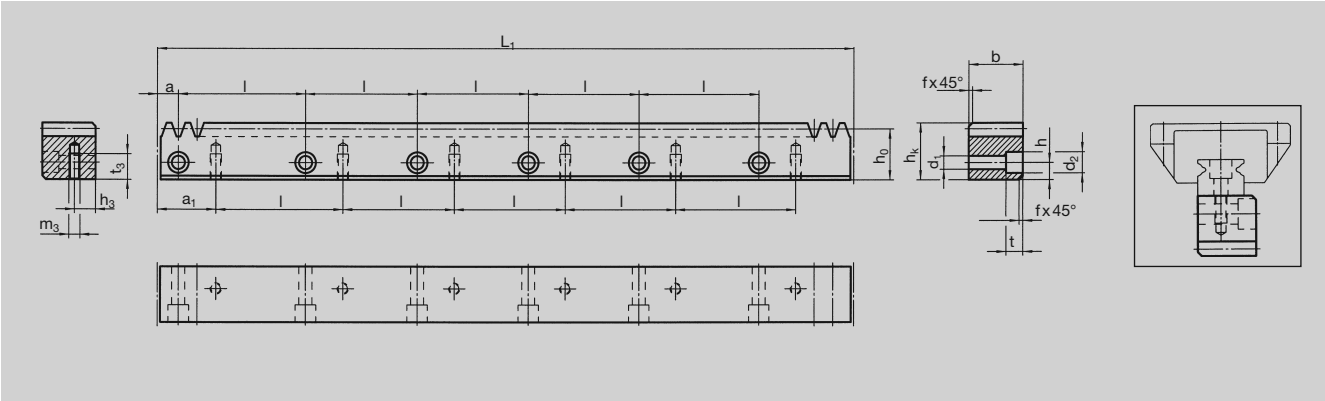
Mounting racks see page ZF-2 and ZF-4-5.

To achieve precision rack joints, we recommend our patented rack assembly kit, see page ZF-4.

For lubrication of racks & pinions, we recommend our automatic lubrication systems, see page ZE-1.

For the calculation and selection of the rack & pinion drive, see page ZD-1.

Quality 9 – 180° Version



Order Code	Pitch	L_1	N° of Teeth	b	h_k	h_o	f	a	l	N° of Holes	h	d_1	d_2	t	a_1	m_3	h_3	t_3	kg
49 77 202	5	1920	384	20	19.50	17.91	1	10	60	32	7.5	5.8	10	6	30	M4	7.5	8.0	5.4
49 77 212	5	1920	384	25	24.50	22.91	1	10	60	32	10.0	7.0	11	7	30	M5	10.0	11.0	8.4
49 97 202	10	1920	192	30	29.75	26.57	2	10	60	32	11.5	10.0	15	9	30	M6	11.5	13.5	11.2
49 47 202	13.33	1920	144	40	39.75	35.50	2	20	80	24	14.0	12.0	18	12	40	M8	14.0	16.0	21.5

Total Pitch error $GT_f/1000 \leq 0.150$ mm.

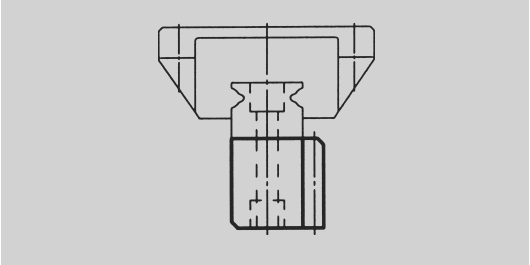
- Milled teeth
- Material C45
- Bright steel

Mounting racks see page ZF-2 and ZF-4-5.

To achieve precision rack joints, we recommend our patented rack assembly kit, see page ZF-4.

For lubrication of racks & pinions, we recommend our automatic lubrication systems, see page ZE-1.

For the calculation and selection of the rack & pinion drive, see page ZD-1.



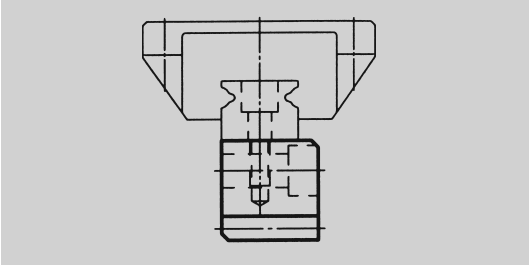
This table with the most usual rails enables (you) to select the rack suitable for the rail. the permissible feed force of the rack has to be checked, too. the rail has to be selected according to the supplier's specifications.

Racks from	**90° Assembly** (Additional threads required in the rail)					
ATLANTA	**49 29 197**	**49 29 187**	**49 39 197**	**49 49 197**	**49 49 177**	**49 49 887**
	49 29 292	**49 29 282**	**49 39 292**	**49 49 292**	**49 49 377**	
	49 77 197	**49 77 187**	**49 97 197**	**49 47 197**		
	49 77 292	**49 77 282**	**49 97 292**	**49 47 292**		
HIWIN	LGR 15R	LGR 20R	LGR 25R	LGR 30R	LGR 35R	LGR 45R
	AGR 15U	AGR 20R	AGR 25R	AGR 30U		
	HGR 15Z	HGR 20Z	HGR 25Z	HGR 30Z	HGR 35Z	HGR 45Z
IKO		LWL 20				
	LWH 15	LWH 20	LWH 25	LWH 30	LWH 35	LWH 45
	LRX 15	LRX 20	LRX 25	LRX 30	LRX 35	LRX 45
INA		KUSE 20	KUSE 25	KUSE 30	KUSE 35	KUSE 45
	KUVE 15	KUVE 20	KUVE 25	KUVE 30	KUVE 35	KUVE 45
	KUE 15	KUE 20	KUE 25	KUE 30	KUE 35	
NSK	L1H 15	L1H 20	L1H 25	L1H 30	L1H 35	L1H 45
	L1S 15T	L1S 20	L1S 25	L1S 30	L1S 35	
	LY 15	LY 20	LY 25	LY 30	LY 35	LY 45
			LA 25	LA 30	LA 35	LA 45
Schneeberger	BM 15	BM 20	BM 25	BM 30	BM 35	BM 45
SKF	LLBHS 15	LLBHS 20	LLBHS 25	LLBHS 30	LLBHS 35	LLBHS 45
		LLBUS 20	LLBUS 25		LLBUS 35	
Star	1605-G15	1605-G20	1605-G25	1605-G30	1605-G35	1605-G45
	1646-G15	1646-G20	1646-G25	1646-G30	1646-G35	1646-G45
	1645-G15	1645-G20	1645-G25	1645-G30	1645-G35	1645-G45
THK	SSR15	SSR20	SSR25	SSR30	SSR35	
	SHS15	SHS20	SHS25	SHS30	SHS35	SHS45
	SR15	SR20	SR25	SR30	SR35	SR45
	HSR15	HSR20	HSR25	HSR30	HSR35	HSR45
	CSR15	CSR20	CSR25	CSR30	CSR35	CSR45
	GSR15	GSR20	GSR25	GSR30		
			NSR20TBC			

Mounting Device

Order Code	**49 01 115**	**49 01 120**	**49 01 125**	**49 01 130**	**49 01 135**	**49 01 145**

The device for mounting racks on rails (patented), is available upon request.



This table with the most usual rails enables (you) to select the rack suitable for the rail. the permissible feed force of the rack has to be checked, too. the rail has to be selected according to the supplier's specifications.

Racks from	180° Assembly					
ATLANTA	**49 29 107**	**49 29 117**	**49 39 107**	**49 49 107**	**49 49 127**	**49 49 807**
	49 29 202	**49 29 212**	**49 39 202**	**49 49 202**		
	49 77 107	**49 77 117**	**49 97 107**	**49 47 107**		
	49 77 202	**49 77 212**	**49 97 202**	**49 47 202**		
HIWIN	LGR 15R	LGR 20R	LGR 25R	LGR 30R	LGR 35R	LGR 45R
	AGR 15U	AGR 20R	AGR 25R	AGR 30U		
	HGR 15R	HGR 20R	HGR 25R	HGR 30R	HGR 35R	HGR 45R
IKO		LWL 20				
	LWH 15	LWH 20	LWH 25	LWH 30	LWH 35	LWH 45
	LRX 15	LRX 20	LRX 25	LRX 30	LRX 35	LRX 45
INA		KUSE 20	KUSE 25	KUSE 30	KUSE 35	KUSE 45
	KUVE 15	KUVE 20	KUVE 25	KUVE 30	KUVE 35	KUVE 45
	KUE 15	KUE 20	KUE 25	KUE 30	KUE 35	
NSK	L1H 15	L1H 20	L1H 25	L1H 30	L1H 35	L1H 45
	L1S 15T	L1S 20	L1S 25		L1S 35	
	LY 15	LY 20	LY 25	LY 30	LY 35	LY 45
			LA 25	LA 30	LA 35	LA 45
Schneeberger	BM 15	BM 20	BM 25	BM 30	BM 35	BM 45
SKF	LLBHS 15	LLBHS 20	LLBHS 25	LLBHS 30	LLBHS 35	LLBHS 45
		LLBUS 20	LLBUS 25		LLBUS 35	
Star	1605-G15	1605-G20	1605-G25	1605-G30	1605-G35	1605-G45
	1646-G15	1646-G20	1646-G25	1646-G30	1646-G35	1646-G45
	1645-G15	1645-G20	1645-G25	1645-G30	1645-G35	1645-G45
THK	SSR15	SSR20	SSR25		SSR35	
	SHS15	SHS20	SHS25	SHS30	SHS35	SHS45
		SR20	SR25		SR35	SR45
	HSR15	HSR20	HSR25	HSR30	HSR35	HSR45
	CSR15	CSR20	CSR25	CSR30	CSR35	CSR45
	GSR15	GSR20	GSR25	GSR30		
		RSR20				

Mounting Device

Order Code	**49 01 215**	**49 01 220**	**49 01 225**	**49 01 230**	**49 01 235**	**49 01 245**

The device for mounting racks on rails (patented), is available upon request.