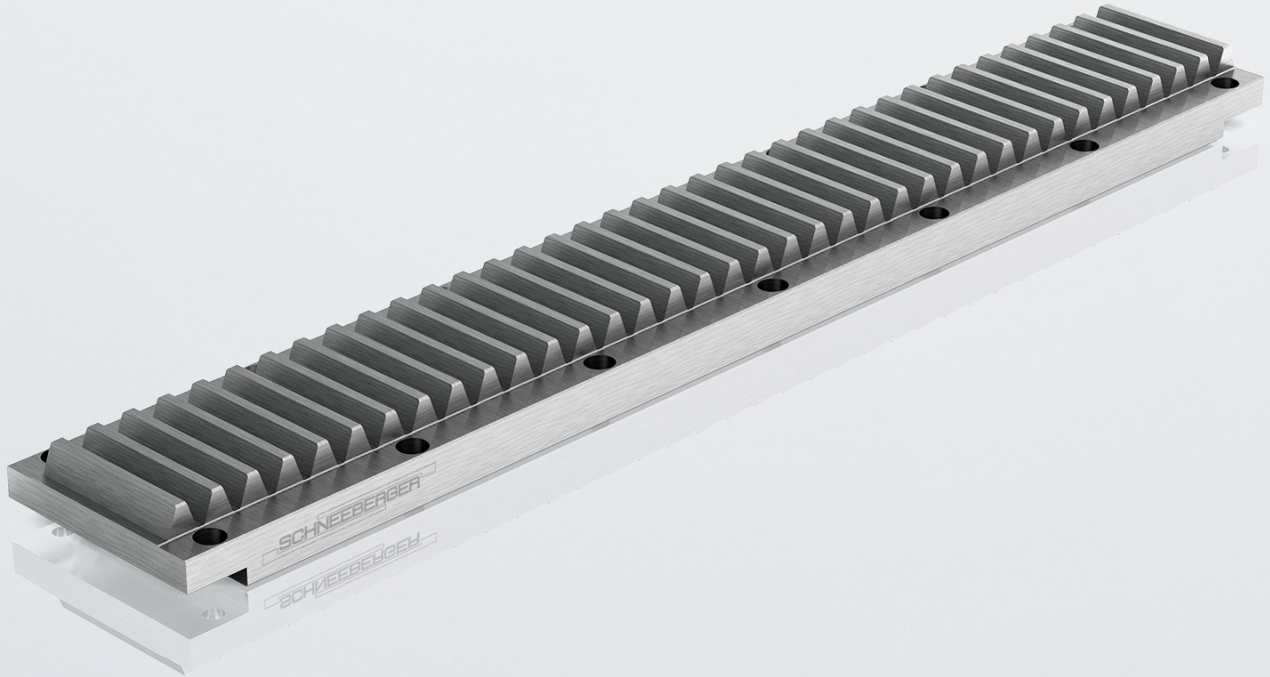


# SCHNEEBERGER



## Gear racks

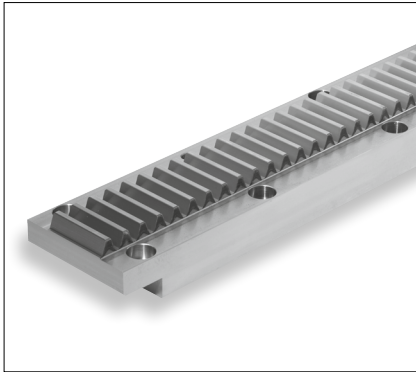
Standard and customized

Product catalog



<b>1</b>	<b>Overview</b>	<b>4</b>
1.1	<b>Properties</b>	<b>5</b>
1.1.1	Properties of the gear racks / conversion	5
1.1.2	Conversion / hardness / strength	6
1.2	<b>Fields of application</b>	<b>7</b>
<b>2</b>	<b>Technical principles</b>	<b>8</b>
2.1	<b>Standard gear racks</b>	<b>9</b>
2.1.1	Module pitches Q4 helical toothed	9
2.1.2	Module pitches Q5 helical toothed	10
2.1.3	Module pitches Q6 helical toothed	11
2.1.4	Module pitches Q7 helical toothed	12
2.1.5	Module pitches Q8 helical toothed	13
2.1.6	Module pitches Q8 helical toothed	14
2.1.7	Module pitches Q11 helical toothed	15
2.1.8	Module pitches Q4 straight toothed	16
2.1.9	Module pitches Q5 straight toothed	17
2.1.10	Module pitches Q6 straight toothed	18
2.1.11	Module pitches Q7 straight toothed	19
2.1.12	Module pitches Q8 straight toothed	20
2.1.13	Module pitches Q9 straight toothed	21
2.1.14	Module pitches Q11 straight toothed	22
2.1.15	Q6 metric pitch, straight toothed	23
2.1.16	Q6 stainless steel, helical toothed, metric pitch	24
2.1.17	Q6 stainless steel, straight toothed, module pitch	25
2.1.18	Q6 stainless steel, straight toothed, metric pitch	26
2.2	<b>Customised gear racks</b>	<b>27</b>
2.2.1	Customised gear racks	28
<b>3</b>	<b>Installation</b>	<b>29</b>
3.1	<b>Gear racks fitting instructions / lubrication</b>	<b>29</b>
<b>4</b>	<b>Order description</b>	<b>30</b>
4.1	<b>Standard gear racks</b>	<b>30</b>
4.2	<b>Customised gear racks</b>	<b>31</b>
<b>5</b>	<b>Quality</b>	<b>32</b>
5.1	<b>Quality</b>	<b>32</b>
<b>6</b>	<b>SCHNEEBERGER Agencies</b>	<b>33</b>

**1** Overview



**Gear racks**

Gear rack drives main feature is their high level of efficiency. They are the best choice for high axial forces.

This drive rigidity is constant over the whole length.

They are also very cost effective for long strokes of more than 2 m.

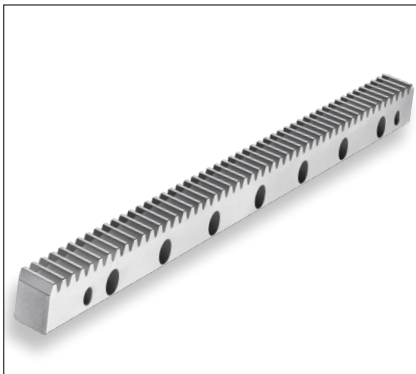
With a rack and pinion system a slideway is driven by the pinion running on a fixed gear rack.

There is a basic difference between straight and helical toothed gear racks.

Apart from typical dimensions, SCHNEEBERGER offers any cross sections with metric or module pitches. The max. one-piece length is 3000 mm. Joining with butt joints is possible for longer lengths.

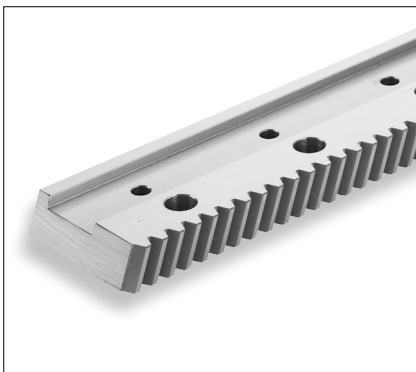
The tooth rack can be milled or ground depending on the customer's requirements. A particular feature is that different materials and hardening processes can be used. Depending on the load to be applied you have a choice of soft, induction or case hardened or nitride hardened gear racks.

**Skill and expertise are our strengths!**



**Standard gear racks**

Straight and helical toothed gear racks are available in typical industrial dimensions from module 2 to module 12. Different materials, hardnesses and accuracy are available depending on the load to be applied.



**Customised gear racks**

You need a gear rack but standardised dimensions do not fit your system?

No problem.

You can have any gear racks up to module 20. The maximum one-piece length is 3000 mm.

The customer can choose from different materials and therefore configure the gear rack just as required.

**Special is our standard.**

## 1.1 Properties

### 1.1.1 Properties of the gear racks / conversion

#### Modular tooth pitch (-M)

Tooth rack	Material condition	Material (-hardness-)	Modules	max. length for following qualities						
				Q4	Q5	Q6	Q7	Q8	Q9	Q11
helical (-S-)	soft	C45 (-W-)	2 .. 16	1000	2000	3000	3000	3000		
	tempered	42CrMo4+QT (-V-)	2 .. 16	1000	2000	3000	3000	3000		
	induction hardened	C45 (-I-), 42CrMo4+QT (-M-)	2 .. 16	1000	2000	2000	2000			
			2 .. 5						3000	
	case hardened	16MnCr5 (-C-)	2 .. 16	1000						
			2 .. 16		2000	2000	2000			
	nitrided	42CrMo4+QT (-N-), 16MnCr5 (-O-)	2 .. 16						2000	
through hardened	X90CrMo V18 (-H-)	2 .. 5	1000	1000	1000	1000				
straight (-G-)	soft	C45 (-W-)	2 .. 16	1018	2035	3000	3000	3000		
	tempered	42CrMo4+QT (-V-)	2 .. 16	1018	2035	3000	3000	3000		
	induction hardened	C45 (-I-), 42CrMo4+QT (-M-)	2 .. 16	1018	2035	2035				
			2 .. 4		2035	2035	2035			
	case hardened	16MnCr5 (-C-)	2 .. 16	1018						
			2 .. 16		2035	2035	2035			
	nitrided	42CrMo4+QT (-N-), 16MnCr5 (-O-)	2 .. 16						2035	
through hardened	X90CrMo V18 (-H-)	2 .. 5	1018	1018	1018	1018				

#### Metric tooth pitch (-T)

Tooth rack	Material condition	Material (-hardness-)	Pitch (mm)	max. length for following qualities						
				Q4	Q5	Q6	Q7	Q8	Q9	Q11
straight (-G-)	soft	C45 (-W-)	5 .. 20	1018	2035	3000	3000	3000		
	tempered	42CrMo4+QT (-V-)	5 .. 20	1018	2035	3000	3000	3000		
	induction hardened	C45 (-I-), 42CrMo4+QT (-M-)	5 .. 20	1018	1018	2035	2035			
			5 .. 10						3000	
	case hardened	16MnCr5 (-C-)	5 .. 20	1018						
			5 .. 20		2035	2035	2035			
	nitrided	42CrMo4+QT (-N-), 16MnCr5 (-O-)	5 .. 20						2035	
through hardened	X90CrMo V18 (-H-)	5 .. 15		1018	1018	1018				

#### Cross reference of material designations

Germany		Japan	USA	China	Special properties
W.-Nr.	DIN	JIS	AIS/SAE	GB	
10503	C45	-	1045	45	
17131	16MnCr5	-	5115	18CrMn	can be welded
17225	42CrMo4+QT	SCM 440 (H)	4140	42CrMo	
14112	X90CrMo V18	SUS 440B	440B	9Cr18 oV	Stainless steel

## 1.1 Properties

### 1.1.2 Conversion / hardness / strength

Converting a module  $m$  into a pitch  $p$  (straight toothed) and Transverse pitch  $p_s$  for helical tooth racks

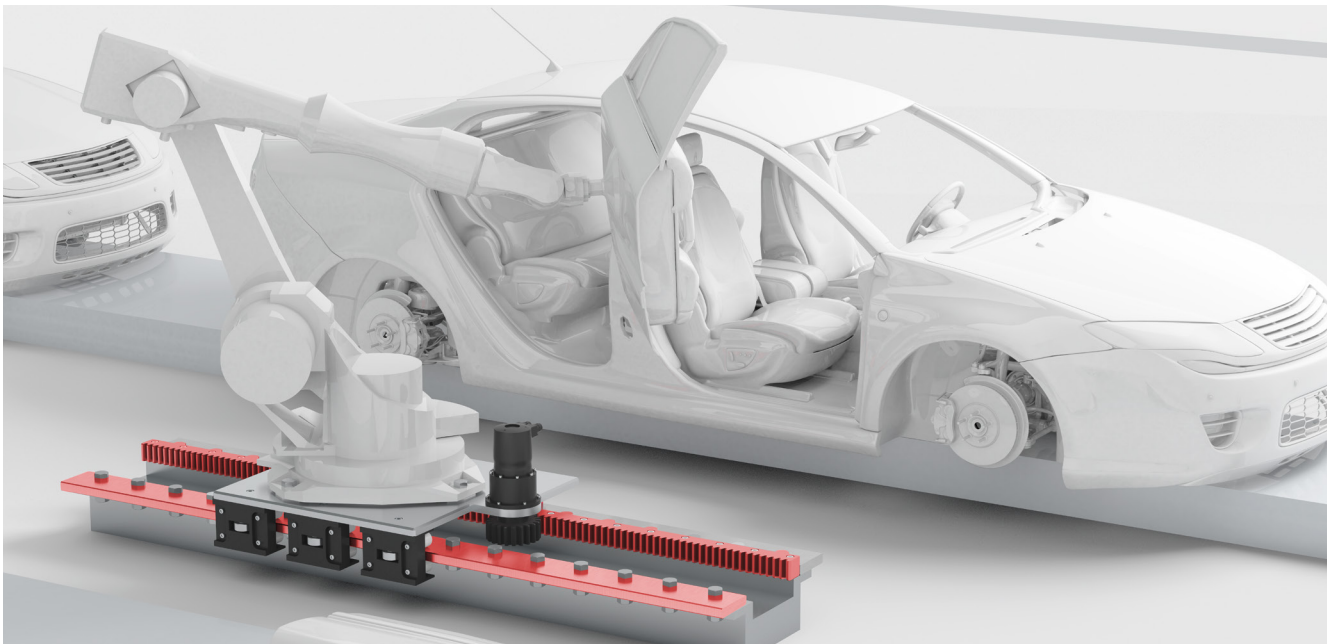
Module $m$	2	3	4	5	6	8	10	12	16	20
Pitch $p$ (mm)	6,28	9,42	12,57	15,71	18,85	25,13	31,42	37,70	50,27	62,83
Transverse pitch $p_s$ (mm)	6,67	10,00	13,33	16,67	20,00	26,67	33,33	40,00	53,33	66,67

<sup>1)</sup> where  $\beta=19,5283^\circ$

Converting pitch  $p$  (straight toothed) into a module  $m$

Pitch $p$ (mm)	5.00	7.50	10.00	12.50	15.00	20.00
Module $m$	1.59	2.39	3.18	3.98	4.77	6.37

$p$  Pitch in mm                       $\beta$  Helix angle  
 $p_s$  Transverse pitch in mm       $p = m \cdot \pi$   
 $m$  Module                               $p = m \cdot \pi / \cos \beta$



Traversing axis under robot, equipped with SCHNEEBERGER flat rails and racks

### Hardness/ strength of tooth rack

Condition of teeth	Material	Tensile strength $R_m$ N/mm <sup>2</sup>	Hardness	
			HRc	HV1
soft	C45	~650		
tempered	42CrMo4+QT	max 1000		
induction hardened	C45		55 .. 60	
	42CrMo4+QT		59±3	
case hardened	16MnCr5		58±3	
nitrided	42CrMo4+QT, 16MnCr5			550.700
through hardened	X90CrMoV18		56±2	

CUSTOMER-SPECIFIC BEARINGS AND GEAR RACKS

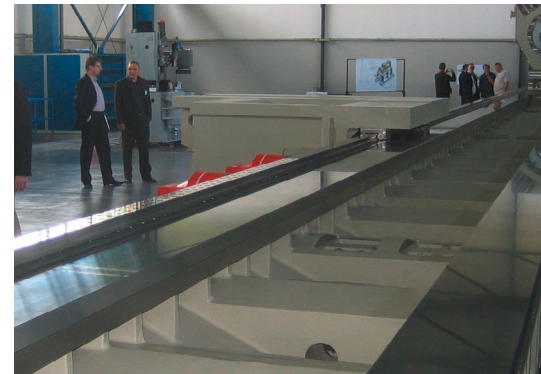
# On to new shores.

## SCHNEEBERGER involved in climate missions in Antarctica

Wherever large ships and, in particular, their drive systems, are built, our linear technologies are making a decisive contribution. Large multifunctional long bed lathes can be used to turn, mill, grind or even repair huge crankshafts or drive shafts, over a stroke of 40 meters and with minimal tolerance. For these and similar applications, such as when manufacturing rotor heads or wind turbines for power engineering, we provide custom guideways and gear racks. That is how we help to make new sources of energy possible. Our customized guideways and gear racks are used wherever standard guideways do not meet the specifications of the machine manufacturer either because the dimensions are incorrect or were not sufficiently precise.

In summary, we construct guideways that run perfectly smoothly, and guideways of particularly high rigidity or durability. There are no compromises with SCHNEEBERGER.

Thanks to our universal machinery and expert engineers, we are able to develop our products quickly and efficiently, even with complex customer specifications; initially in small batches as necessary for testing, and then in large-scale production, with high and constant quality and reliable and uninterrupted service.

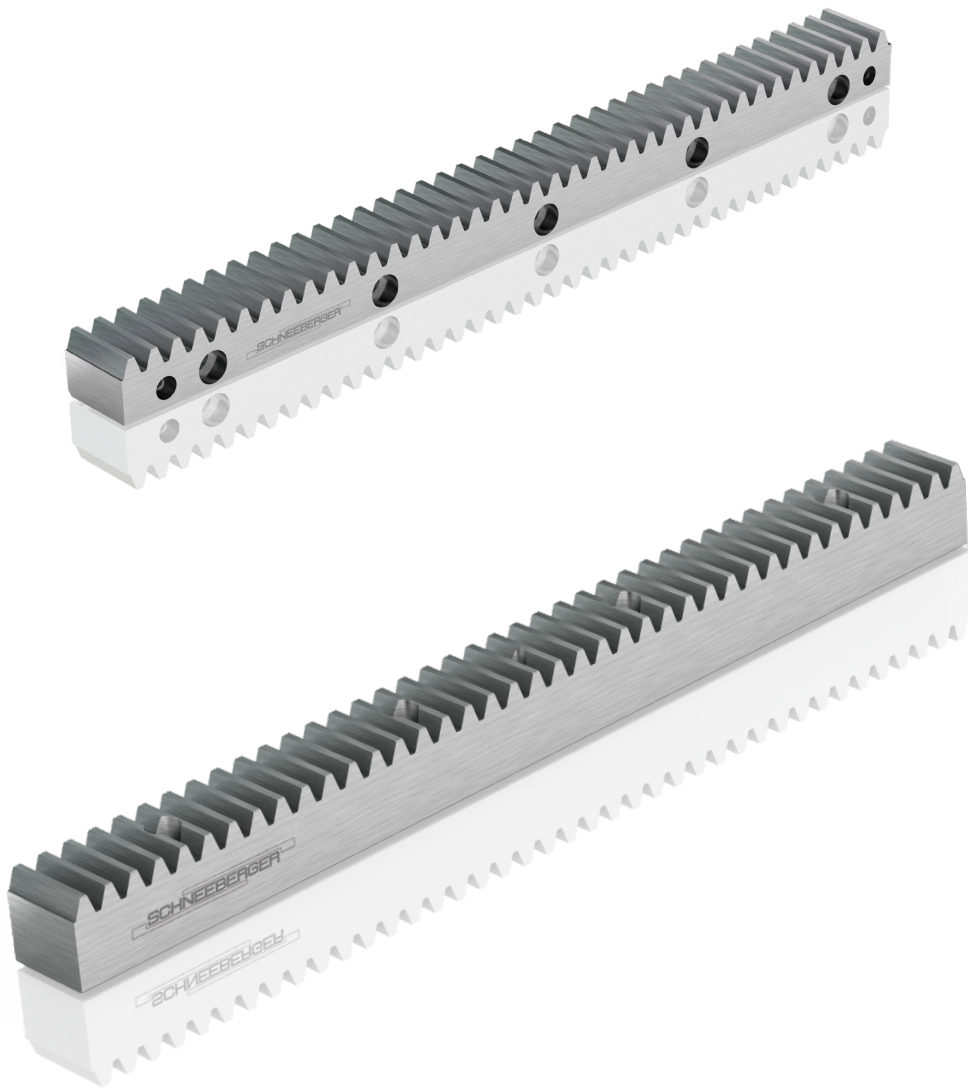


### Typical applications

Gear racks provides users with definite competitive advantages in the following industries:

- Machine tools
- Heavy machine construction
- Automation and robotics
- Material handling and material flow systems
- Machine and plant engineering
- Packaging machines
- Printing presses



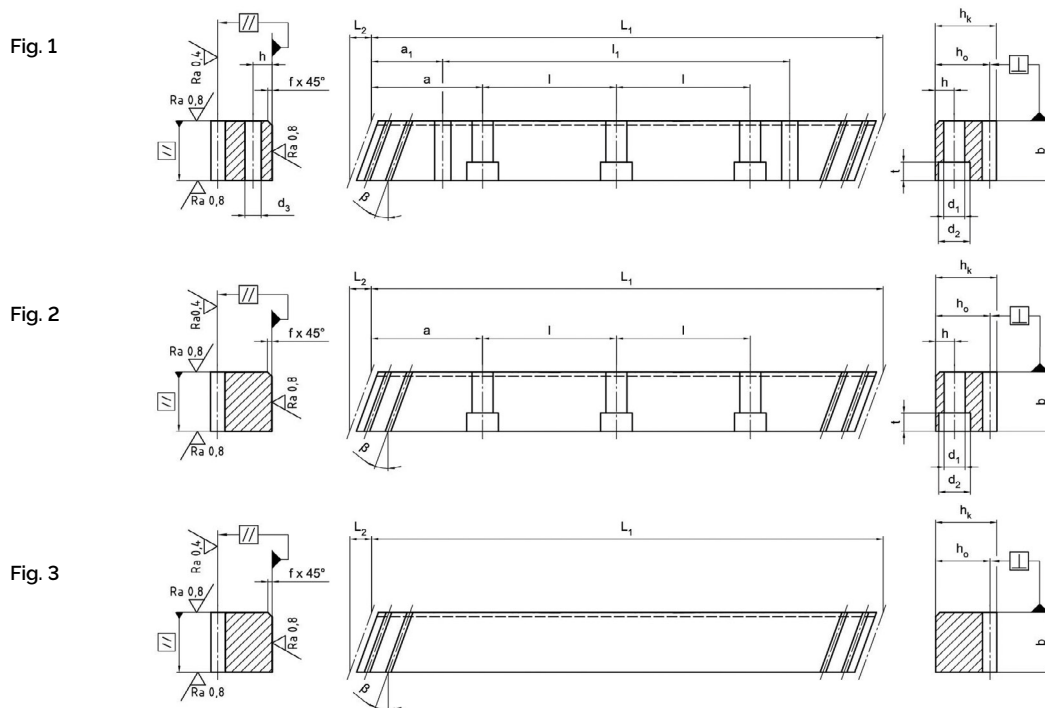




## 2.1 Standard gear racks

### 2.1.1 Module pitches Q4 helical toothed

<b>Tooth rack:</b>	Pressure angle $\alpha=20^\circ$ ground, soft or hardened	<b>Quality:</b> $f_p$ (mm)	4 in accordance with DIN 3962, 3963, 3967 Single pitch deviation Module $\leq 3$ : 0.003 Module $> 3$ : 0.004
<b>Outer surfaces:</b>	ground on all sides	$F_p$ (mm) $F_p/1000$ (mm)	Total pitch deviation 0,015 for a 1000 mm Length



Standard lengths	m <sup>1)</sup> - mm	ps <sup>4)</sup>	L1 mm	L2 mm	z <sup>2)</sup> -	b mm	hk mm	ho mm	f mm	a mm	l mm	n <sup>3)</sup> -	h mm	d1 mm	d2 mm	t mm	a1 mm	l1 mm	d3 mm	Dimen- sions kg
ZST M2 - 24 x 24 x 1000 - S	2	6.67	1000.0	8.5	150	24	24	22	2	62.5	125.00	8	8	7	11	7	31.7	936.6	5.7	4.1
ZST M2 - 24 x 24 x 2000 - S	2	6.67	2000.0	8.5	300	24	24	22	2	62.5	125.00	16	8	7	11	7	31.7	1936.6	5.7	8.2
MST M2 - 24 x 24 x 200 - SL	2	6.67	200.0	8.5	30	24	24	22												0.8
ZST M3 - 29 x 29 x 1000 - S	3	10.00	1000.0	10.3	100	29	29	26	2	62.5	125.00	8	9	10	15	9	35.0	930.0	7.7	5.9
ZST M3 - 29 x 29 x 2000 - S	3	10.00	2000.0	10.3	200	29	29	26	2	62.5	125.00	16	9	10	15	9	35.0	1930.0	7.7	11.8
MST M3 - 29 x 29 x 200 - SL	3	10.00	200.0	10.3	20	29	29	26												12
ZST M4 - 39 x 39 x 1000 - S	4	13.33	1000.0	13.8	75	39	39	35	3	62.5	125.00	8	12	10	15	9	33.3	933.4	7.7	10.7
ZST M4 - 39 x 39 x 2000 - S	4	13.33	2000.0	13.8	150	39	39	35	3	62.5	125.00	16	12	10	15	9	33.3	1933.4	7.7	21.4
MST M4 - 39 x 39 x 200 - SL	4	13.33	200.0	13.8	15	39	39	35												2.2
ZST M5 - 49 x 39 x 1000 - S	5	16.67	1000.0	17.4	60	49	39	34	3	62.5	125.00	8	12	14	20	13	37.5	925.0	11.7	13.0
ZST M5 - 49 x 39 x 2000 - S	5	16.67	2000.0	17.4	120	49	39	34	3	62.5	125.00	16	12	14	20	13	37.5	1925.0	11.7	26.0
MST M5 - 49 x 39 x 200 - SL	5	16.67	200.0	17.4	12	49	39	34												2.7
ZST M6 - 59 x 49 x 1000 - S	6	20.00	1000.0	20.9	50	59	49	43	3	62.5	125.00	8	16	18	26	17	37.5	925.0	15.7	18.1
ZST M6 - 59 x 49 x 2000 - S	6	20.00	2000.0	20.9	100	59	49	43	3	62.5	125.00	16	16	18	26	17	37.5	1925.0	15.7	36.2
MST M6 - 59 x 49 x 200 - SL	6	20.00	200.0	20.9	10	59	49	43												3.8
ZST M8 - 79 x 79 x 960 - S	8	26.67	960.0	28.0	36	79	79	71	3	60.0	120.00	8	25	22	33	21	120.0	720.0	19.7	42.5
ZST M8 - 79 x 79 x 1920 - S	8	26.67	1920.0	28.0	72	79	79	71	3	60.0	120.00	16	25	22	33	21	120.0	1680.0	19.7	85.0
MST M8 - 79 x 79 x 213 - SL	8	26.67	213.3	28.0	8	79	79	71												8.9
ZST M10 - 99 x 99 x 1000 - S	10	33.33	1000.0	35.1	30	99	99	89	3	62.5	125.00	8	32	33	48	32	125.0	750.0	19.7	68.7
ZST M10 - 99 x 99 x 2000 - S	10	33.33	2000.0	35.1	60	99	99	89	3	62.5	125.00	16	32	33	48	32	125.0	1750.0	19.7	137.4
MST M10 - 79 x 79 x 233 - SL	10	33.33	233.3	28.0	7	79	79	69												10.2
ZST M12 - 120 x 120 x 1000 - S	12	40.00	1000.0	42.6	25	120	120	108	3	40.0	125.00	8	40	39	58	38	102.5	750.0	19.7	111.0
MST M12 - 99 x 99 x 280 - SL	12	40.00	280.0	35.1	7	99	99	87												20.9

<sup>1)</sup> m Module

<sup>3)</sup> n Number of holes

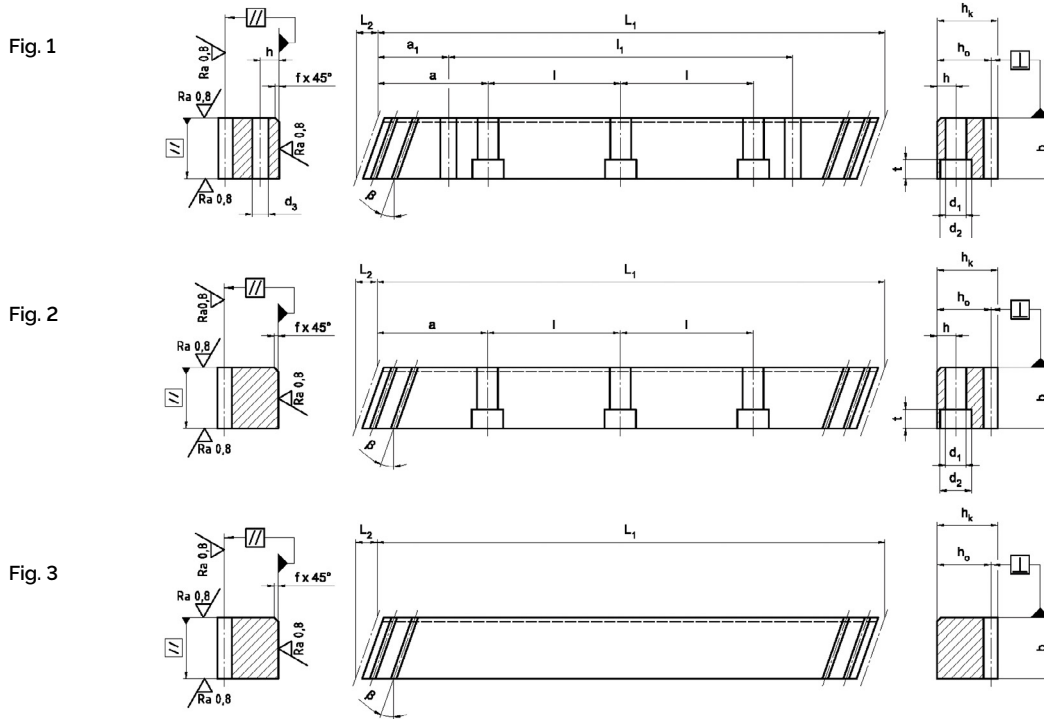
any other lengths on request

<sup>2)</sup> z Number of teeth <sup>4)</sup> ps Transverse pitch ( $p_s = m \cdot \pi / \cos \beta$ )  $\beta = 19.5283^\circ (19^\circ 31' 42'')$

## 2.1 Standard gear racks

### 2.1.2 Module pitches Q5 helical toothed

<b>Tooth rack:</b>	Pressure angle $\alpha=20^\circ$ ground, soft or hardened	<b>Quality:</b> $f_p$ (mm)	5 in accordance with DIN 3962, 3963, 3967 Single pitch deviation Module $\leq 3$ : 0.004 Module $> 3$ : 0.005
<b>Outer surfaces:</b>	ground on all sides	$F_p$ (mm)	Total pitch deviation
		$F_p/1000$ (mm)	0.024 for a 1000 mm Length
		$F_p/2000$ (mm)	0.032 for a 2000 mm length



Standard lengths	$m^{1)}$	$p_s^{4)}$	$L_1$	$L_2$	$z^{2)}$	$b$	$h_k$	$h_o$	$f$	$a$	$l$	$n^{3)}$	$h$	$d_1$	$d_2$	$t$	$a_1$	$l_1$	$d_3$	Dimensions kg
	-	mm	mm	mm	-	mm	mm	mm	mm	mm	mm	-	mm	mm	mm	mm	mm	mm	mm	
ZST M2 - 24 x 24 x 1000 - S	2	6.67	1000.0	8.5	150	24	24	22	2	62.5	125.00	8	8	7	11	7	31.7	936.6	5.7	4.1
ZST M2 - 24 x 24 x 2000 - S	2	6.67	2000.0	8.5	300	24	24	22	2	62.5	125.00	16	8	7	11	7	31.7	1936.6	5.7	8.2
MST M2 - 24 x 24 x 200 - SL	2	6.67	200.0	8.5	30	24	24	22												0.8
ZST M3 - 29 x 29 x 1000 - S	3	10.00	1000.0	10.3	100	29	29	26	2	62.5	125.00	8	9	10	15	9	35.0	930.0	7.7	5.9
ZST M3 - 29 x 29 x 2000 - S	3	10.00	2000.0	10.3	200	29	29	26	2	62.5	125.00	16	9	10	15	9	35.0	1930.0	7.7	11.8
MST M3 - 29 x 29 x 200 - SL	3	10.00	200.0	10.3	20	29	29	26												1.2
ZST M4 - 39 x 39 x 1000 - S	4	13.33	1000.0	13.8	75	39	39	35	3	62.5	125.00	8	12	10	15	9	33.3	933.4	7.7	10.7
ZST M4 - 39 x 39 x 2000 - S	4	13.33	2000.0	13.8	150	39	39	35	3	62.5	125.00	16	12	10	15	9	33.3	1933.4	7.7	21.4
MST M4 - 39 x 39 x 200 - SL	4	13.33	200.0	13.8	15	39	39	35												2.2
ZST M5 - 49 x 39 x 1000 - S	5	16.67	1000.0	17.4	60	49	39	34	3	62.5	125.00	8	12	14	20	13	37.5	925.0	11.7	13.0
ZST M5 - 49 x 39 x 2000 - S	5	16.67	2000.0	17.4	120	49	39	34	3	62.5	125.00	16	12	14	20	13	37.5	1925.0	11.7	26.0
MST M5 - 49 x 39 x 200 - SL	5	16.67	200.0	17.4	12	49	39	34												2.7
ZST M6 - 59 x 49 x 1000 - S	6	20.00	1000.0	20.9	50	59	49	43	3	62.5	125.00	8	16	18	26	17	37.5	925.0	15.7	18.1
ZST M6 - 59 x 49 x 2000 - S	6	20.00	2000.0	20.9	100	59	49	43	3	62.5	125.00	16	16	18	26	17	37.5	1925.0	15.7	36.2
MST M6 - 59 x 49 x 200 - SL	6	20.00	200.0	20.9	10	59	49	43												3.8
ZST M8 - 79 x 79 x 960 - S	8	26.67	960.0	28.0	36	79	79	71	3	60.0	120.00	8	25	22	33	21	120.0	720.0	19.7	42.5
ZST M8 - 79 x 79 x 1920 - S	8	26.67	1920.0	28.0	72	79	79	71	3	60.0	120.00	16	25	22	33	21	120.0	1680.0	19.7	85.0
MST M8 - 79 x 79 x 213 - SL	8	26.67	213.3	28.0	8	79	79	71												8.9
ZST M10 - 99 x 99 x 1000 - S	10	33.33	1000.0	35.1	30	99	99	89	3	62.5	125.00	8	32	33	48	32	125.0	750.0	19.7	68.7
ZST M10 - 99 x 99 x 2000 - S	10	33.33	2000.0	35.1	60	99	99	89	3	62.5	125.00	16	32	33	48	32	125.0	1750.0	19.7	137.4
MST M10 - 79 x 79 x 233 - SL	10	33.33	233.3	28.0	7	79	79	69												10.2
ZST M12 - 120 x 120 x 1000 - S	12	40.00	1000.0	42.6	25	120	120	108	3	40.0	125.00	8	40	39	58	38	102.5	750.0	19.7	111.0
MST M12 - 99 x 99 x 280 - SL	12	40.00	280.0	35.1	7	99	99	87												20.9

<sup>1)</sup> m Module

<sup>3)</sup> n Number of holes

any other lengths on request

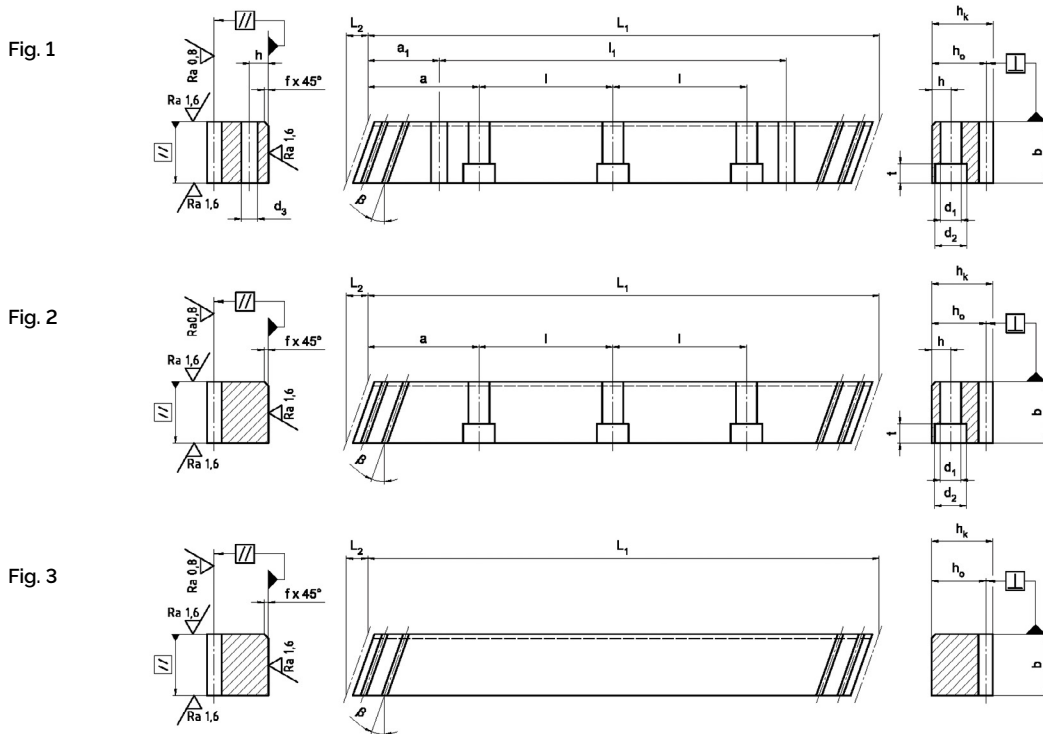
<sup>2)</sup> z Number of teeth <sup>4)</sup>  $p_s$  Transverse pitch ( $p_s = m \cdot \pi / \cos \beta$ )  $\beta = 19.5283^\circ (19^\circ 31' 42'')$

2.1 Standard gear racks

2.1.3 Module pitches Q6 helical toothed

**Tooth rack:** Pressure angle  $\alpha=20^\circ$  **Quality:** 6 in accordance with DIN 3962, 3963, 3967  
 ground, soft or hardened  **$f_p$  (mm)** Single pitch deviation  
 Module  $\leq 3$ : 0.006  
 Module  $> 3$ : 0.008

**Outer surfaces:** ground on all sides  **$F_p$  (mm)** Total pitch deviation  
 **$F_p/1000$  (mm)** 0,035 for a 1000 mm Length  
 **$F_p/2000$  (mm)** 0,045 for a 2000 mm Length



Standard lengths	$m^1$		$L_1$	$L_2$	$z^{2)}$	$b$	$h_k$	$h_0$	$f$	$a$	$l$	$n^{3)}$	$h$	$d_1$	$d_2$	$t$	$a_1$	$l_1$	$d_3$	Dimen- sions kg
	-	mm																		
ZST M2 - 24 x 24 x 1000 - S	2	6.67	1000.0	8.5	150	24	24	22	2	62.5	125.00	8	8	7	11	7	31.7	936.6	5.7	4.1
ZST M2 - 24 x 24 x 2000 - S	2	6.67	2000.0	8.5	300	24	24	22	2	62.5	125.00	16	8	7	11	7	31.7	1936.6	5.7	8.2
MST M2 - 24 x 24 x 200 - SL	2	6.67	200.0	8.5	30	24	24	22												0.8
ZST M3 - 29 x 29 x 1000 - S	3	10.00	1000.0	10.3	100	29	29	26	2	62.5	125.00	8	9	10	15	9	35.0	930.0	7.7	5.9
ZST M3 - 29 x 29 x 2000 - S	3	10.00	2000.0	10.3	200	29	29	26	2	62.5	125.00	16	9	10	15	9	35.0	1930.0	7.7	11.8
MST M3 - 29 x 29 x 200 - SL	3	10.00	200.0	10.3	20	29	29	26												1.2
ZST M4 - 39 x 39 x 1000 - S	4	13.33	1000.0	13.8	75	39	39	35	3	62.5	125.00	8	12	10	15	9	33.3	933.4	7.7	10.7
ZST M4 - 39 x 39 x 2000 - S	4	13.33	2000.0	13.8	150	39	39	35	3	62.5	125.00	16	12	10	15	9	33.3	1933.4	7.7	21.4
MST M4 - 39 x 39 x 200 - SL	4	13.33	200.0	13.8	15	39	39	35												2.2
ZST M5 - 49 x 39 x 1000 - S	5	16.67	1000.0	17.4	60	49	39	34	3	62.5	125.00	8	12	14	20	13	37.5	925.0	11.7	13.0
ZST M5 - 49 x 39 x 2000 - S	5	16.67	2000.0	17.4	120	49	39	34	3	62.5	125.00	16	12	14	20	13	37.5	1925.0	11.7	26.0
MST M5 - 49 x 39 x 200 - SL	5	16.67	200.0	17.4	12	49	39	34												2.7
ZST M6 - 59 x 49 x 1000 - S	6	20.00	1000.0	20.9	50	59	49	43	3	62.5	125.00	8	16	18	26	17	37.5	925.0	15.7	18.1
ZST M6 - 59 x 49 x 2000 - S	6	20.00	2000.0	20.9	100	59	49	43	3	62.5	125.00	16	16	18	26	17	37.5	1925.0	15.7	36.2
MST M6 - 59 x 49 x 200 - SL	6	20.00	200.0	20.9	10	59	49	43												3.8
ZST M8 - 79 x 79 x 960 - S	8	26.67	960.0	28.0	36	79	79	71	3	60.0	120.00	8	25	22	33	21	120.0	720.0	19.7	42.5
ZST M8 - 79 x 79 x 1920 - S	8	26.67	1920.0	28.0	72	79	79	71	3	60.0	120.00	16	25	22	33	21	120.0	1680.0	19.7	85.0
MST M8 - 79 x 79 x 213 - SL	8	26.67	213.3	28.0	8	79	79	71												8.9
ZST M10 - 99 x 99 x 1000 - S	10	33.33	1000.0	35.1	30	99	99	89	3	62.5	125.00	8	32	33	48	32	125.0	750.0	19.7	68.7
ZST M10 - 99 x 99 x 2000 - S	10	33.33	2000.0	35.1	60	99	99	89	3	62.5	125.00	16	32	33	48	32	125.0	1750.0	19.7	137.4
MST M10 - 79 x 79 x 233 - SL	10	33.33	233.3	28.0	7	79	79	69												10.2
ZST M12 - 120 x 120 x 1000 - S	12	40.00	1000.0	42.6	25	120	120	108	3	40.0	125.00	8	40	39	58	38	102.5	750.0	19.7	111.0
MST M12 - 99 x 99 x 280 - SL	12	40.00	280.0	35.1	7	99	99	87												20.9

<sup>1)</sup> m Module      <sup>3)</sup> n Number of holes      any other lengths on request  
<sup>2)</sup> z Number of teeth      <sup>4)</sup>  $p_s$  Transverse pitch ( $p_s = m \cdot \pi / \cos \beta$ )       $\beta = 19.5283^\circ (19^\circ 31' 42'')$

## 2.1 Standard gear racks

### 2.1.4 Module pitches Q7 helical toothed

<b>Tooth rack:</b>	Pressure angle $\alpha=20^\circ$ ground, soft or hardened	<b>Quality:</b> $f_p$ (mm)	7 in accordance with DIN 3962, 3963, 3967 Single pitch deviation Module $\leq 3$ : 0.007 Module $> 3$ : 0.009
<b>Outer surfaces:</b>	ground on all sides	$F_p$ (mm)	Total pitch deviation
		$F_p/1000$ (mm)	0.060 for a 1000 mm length
		$F_p/2000$ (mm)	0.075 for a 2000 mm length

Fig. 1

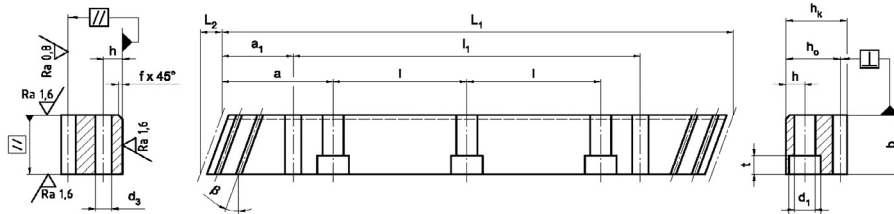


Fig. 2

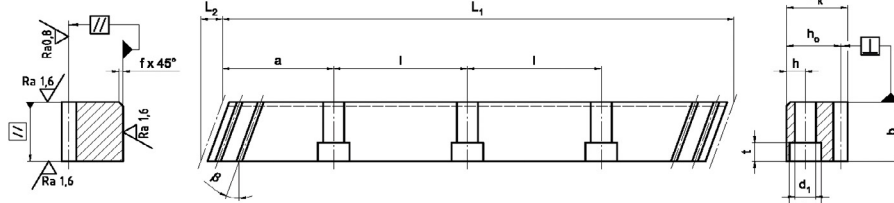
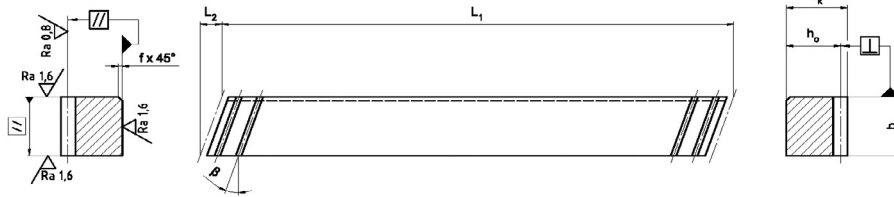


Fig. 3



Standard lengths	$m^1$ -	$p_s^{4)}$ mm	$L_1$ mm	$L_2$ mm	$z^{2)}$ -	$b$ mm	$h_k$ mm	$h_o$ mm	$f$ mm	$a$ mm	$l$ mm	$n^{3)}$ -	$h$ mm	$d_1$ mm	$d_2$ mm	$t$ mm	$a_1$ mm	$l_1$ mm	$d_3$ mm	Dimensions kg
ZST M2 - 24 x 24 x 1000 - S	2	6.67	1000.0	8.5	150	24	24	22	2	62.5	125.00	8	8	7	11	7	31.7	936.6	5.7	41
ZST M2 - 24 x 24 x 2000 - S	2	6.67	2000.0	8.5	300	24	24	22	2	62.5	125.00	16	8	7	11	7	31.7	1936.6	5.7	8.2
MST M2 - 24 x 24 x 200 - SL	2	6.67	200.0	8.5	30	24	24	22												0.8
ZST M3 - 29 x 29 x 1000 - S	3	10.00	1000.0	10.3	100	29	29	26	2	62.5	125.00	8	9	10	15	9	35.0	930.0	7.7	5.9
ZST M3 - 29 x 29 x 2000 - S	3	10.00	2000.0	10.3	200	29	29	26	2	62.5	125.00	16	9	10	15	9	35.0	1930.0	7.7	11.8
MST M3 - 29 x 29 x 200 - SL	3	10.00	200.0	10.3	20	29	29	26												1.2
ZST M4 - 39 x 39 x 1000 - S	4	13.33	1000.0	13.8	75	39	39	35	3	62.5	125.00	8	12	10	15	9	33.3	933.4	7.7	10.7
ZST M4 - 39 x 39 x 2000 - S	4	13.33	2000.0	13.8	150	39	39	35	3	62.5	125.00	16	12	10	15	9	33.3	1933.4	7.7	21.4
MST M4 - 39 x 39 x 200 - SL	4	13.33	200.0	13.8	15	39	39	35												2.2
ZST M5 - 49 x 39 x 1000 - S	5	16.67	1000.0	17.4	60	49	39	34	3	62.5	125.00	8	12	14	20	13	37.5	925.0	11.7	13.0
ZST M5 - 49 x 39 x 2000 - S	5	16.67	2000.0	17.4	120	49	39	34	3	62.5	125.00	16	12	14	20	13	37.5	1925.0	11.7	26.0
MST M5 - 49 x 39 x 200 - SL	5	16.67	200.0	17.4	12	49	39	34												2.7
ZST M6 - 59 x 49 x 1000 - S	6	20.00	1000.0	20.9	50	59	49	43	3	62.5	125.00	8	16	18	26	17	37.5	925.0	15.7	18.1
ZST M6 - 59 x 49 x 2000 - S	6	20.00	2000.0	20.9	100	59	49	43	3	62.5	125.00	16	16	18	26	17	37.5	1925.0	15.7	36.2
MST M6 - 59 x 49 x 200 - SL	6	20.00	200.0	20.9	10	59	49	43												3.8
ZST M8 - 79 x 79 x 960 - S	8	26.67	960.0	28.0	36	79	79	71	3	60.0	120.00	8	25	22	33	21	120.0	720.0	19.7	42.5
ZST M8 - 79 x 79 x 1920 - S	8	26.67	1920.0	28.0	72	79	79	71	3	60.0	120.00	16	25	22	33	21	120.0	1680.0	19.7	85.0
MST M8 - 79 x 79 x 213 - SL	8	26.67	213.3	28.0	8	79	79	71												8.9
ZST M10 - 99 x 99 x 1000 - S	10	33.33	1000.0	35.1	30	99	99	89	3	62.5	125.00	8	32	33	48	32	125.0	750.0	19.7	68.7
ZST M10 - 99 x 99 x 2000 - S	10	33.33	2000.0	35.1	60	99	99	89	3	62.5	125.00	16	32	33	48	32	125.0	1750.0	19.7	137.4
MST M10 - 79 x 79 x 233 - SL	10	33.33	233.3	28.0	7	79	79	69												10.2
ZST M12 - 120 x 120 x 1000 - S	12	40.00	1000.0	42.6	25	120	120	108	3	40.0	125.00	8	40	39	58	38	102.5	750.0	19.7	111.0
MST M12 - 99 x 99 x 280 - SL	12	40.00	280.0	35.1	7	99	99	87												20.9

<sup>1)</sup> m Module

<sup>3)</sup> n Number of holes

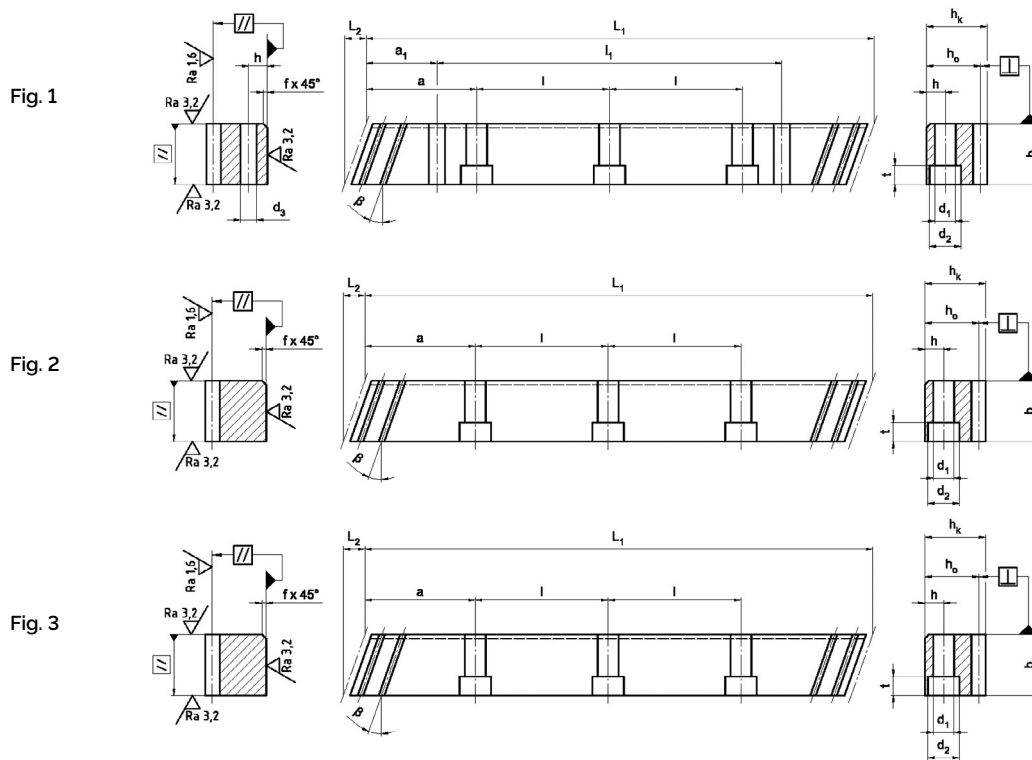
any other lengths on request

<sup>2)</sup> z Number of teeth <sup>4)</sup>  $p_s$  Transverse pitch ( $p_s = m \cdot \pi / \cos \beta$ )  $\beta = 19.5283^\circ (19^\circ 31' 42'')$

## 2.1 Standard gear racks

### 2.1.5 Module pitches Q8 helical toothed

<b>Tooth rack:</b>	Pressure angle $\alpha=20^\circ$ milled, soft	<b>Quality:</b> $F_p$ (mm)	8 in accordance with DIN 3962, 3963, 3967 Total pitch deviation
<b>Outer surfaces:</b>	ground on all sides	$F_p/1000$ (mm)	0.150 for a 1000 mm length
		$F_p/2000$ (mm)	0.225 for a 2000 mm length



Standard lengths	$m^{1)}$	$p_s^{4)}$	$L_1$	$L_2$	$z^{2)}$	$b$	$h_k$	$h_o$	$f$	$a$	$l$	$n^{3)}$	$h$	$d_1$	$d_2$	$t$	$a_1$	$L_1$	$d_3$	Dimensions kg
ZST M2 - 24 x 24 x 1000 - S	2	6.67	1000.0	8.5	150	24	24	22	2	62.5	125.00	8	8	7	11	7	31.7	936.6	5.7	4.1
ZST M2 - 24 x 24 x 2000 - S	2	6.67	2000.0	8.5	300	24	24	22	2	62.5	125.00	16	8	7	11	7	31.7	1936.6	5.7	8.2
MST M2 - 24 x 24 x 200 - SL	2	6.67	200.0	8.5	30	24	24	22												0.8
ZST M3 - 29 x 29 x 1000 - S	3	10.00	1000.0	10.3	100	29	29	26	2	62.5	125.00	8	9	10	15	9	35.0	930.0	7.7	5.9
ZST M3 - 29 x 29 x 2000 - S	3	10.00	2000.0	10.3	200	29	29	26	2	62.5	125.00	16	9	10	15	9	35.0	1930.0	7.7	11.8
MST M3 - 29 x 29 x 200 - SL	3	10.00	200.0	10.3	20	29	29	26												1.2
ZST M4 - 39 x 39 x 1000 - S	4	13.33	1000.0	13.8	75	39	39	35	3	62.5	125.00	8	12	10	15	9	33.3	933.4	7.7	10.7
ZST M4 - 39 x 39 x 2000 - S	4	13.33	2000.0	13.8	150	39	39	35	3	62.5	125.00	16	12	10	15	9	33.3	1933.4	7.7	21.4
MST M4 - 39 x 39 x 200 - SL	4	13.33	200.0	13.8	15	39	39	35												2.2
ZST M5 - 49 x 39 x 1000 - S	5	16.67	1000.0	17.4	60	49	39	34	3	62.5	125.00	8	12	14	20	13	37.5	925.0	11.7	13.0
ZST M5 - 49 x 39 x 2000 - S	5	16.67	2000.0	17.4	120	49	39	34	3	62.5	125.00	16	12	14	20	13	37.5	1925.0	11.7	26.0
MST M5 - 49 x 39 x 200 - SL	5	16.67	200.0	17.4	12	49	39	34												2.7
ZST M6 - 59 x 49 x 1000 - S	6	20.00	1000.0	20.9	50	59	49	43	3	62.5	125.00	8	16	18	26	17	37.5	925.0	15.7	18.1
ZST M6 - 59 x 49 x 2000 - S	6	20.00	2000.0	20.9	100	59	49	43	3	62.5	125.00	16	16	18	26	17	37.5	1925.0	15.7	36.2
MST M6 - 59 x 49 x 200 - SL	6	20.00	200.0	20.9	10	59	49	43												3.8
ZST M8 - 79 x 79 x 960 - S	8	26.67	960.0	28.0	36	79	79	71	3	60.0	120.00	8	25	22	33	21	120.0	720.0	19.7	42.5
ZST M8 - 79 x 79 x 1920 - S	8	26.67	1920.0	28.0	72	79	79	71	3	60.0	120.00	16	25	22	33	21	120.0	1680.0	19.7	85.0
MST M8 - 79 x 79 x 213 - SL	8	26.67	213.3	28.0	8	79	79	71												8.9
ZST M10 - 99 x 99 x 1000 - S	10	33.33	1000.0	35.1	30	99	99	89	3	62.5	125.00	8	32	33	48	32	125.0	750.0	19.7	68.7
ZST M10 - 99 x 99 x 2000 - S	10	33.33	2000.0	35.1	60	99	99	89	3	62.5	125.00	16	32	33	48	32	125.0	1750.0	19.7	137.4
MST M10 - 79 x 79 x 233 - SL	10	33.33	233.3	28.0	7	79	79	69												10.2
ZST M12 - 120 x 120 x 1000 - S	12	40.00	1000.0	42.6	25	120	120	108	3	40.0	125.00	8	40	39	58	38	102.5	750.0	19.7	111.0
MST M12 - 99 x 99 x 280 - SL	12	40.00	280.0	35.1	7	99	99	87												20.9

<sup>1)</sup> m Module

<sup>3)</sup> n Number of holes

any other lengths on request

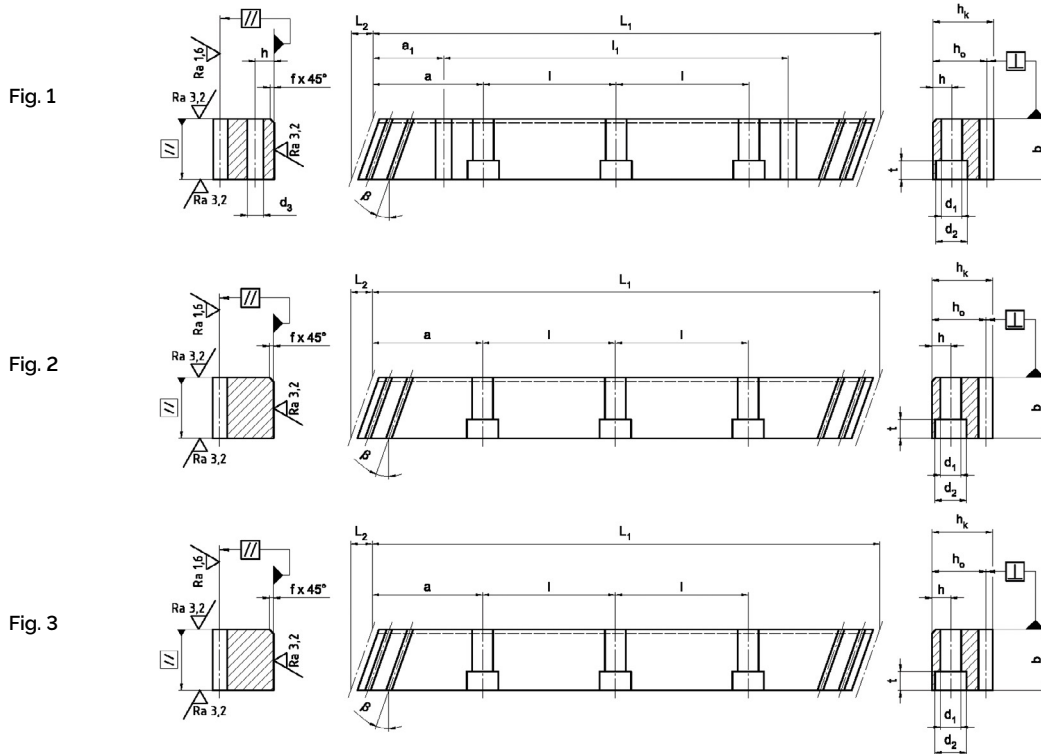
<sup>2)</sup> z Number of teeth

<sup>4)</sup>  $p_s$  Transverse pitch ( $p_s = m \cdot \pi / \cos \beta$ )  $\beta = 19.5283^\circ (19^\circ 31' 42'')$

## 2.1 Standard gear racks

### 2.1.6 Module pitches Q8 helical toothed

<b>Tooth rack:</b>	Pressure angle $\alpha=20^\circ$ ground, nitrided	<b>Quality:</b> $F_p$ (mm)	9 in accordance with DIN 3962, 3963, 3967 Total pitch deviation
<b>Outer surfaces:</b>	ground on all sides	$F_p/1000$ (mm)	0.180 for a 1000 mm length
		$F_p/2000$ (mm)	0.270 for a 2000 mm length



Standard lengths	$m^{1)}$	$p_s^{4)}$	$L_1$	$L_2$	$z^{2)}$	$b$	$h_k$	$h_o$	$f$	$a$	$l$	$n^{3)}$	$h$	$d_1$	$d_2$	$t$	$a_1$	$l_1$	$d_3$	Dimensions kg
	-	mm	mm	mm	-	mm	mm	mm	mm	mm	mm	-	mm	mm	mm	mm	mm	mm	mm	
ZST M2 - 24 x 24 x 1000 - S	2	6.67	1000.0	8.5	150	24	24	22	2	62.5	125.00	8	8	7	11	7	31.7	936.6	5.7	4.1
ZST M2 - 24 x 24 x 2000 - S	2	6.67	2000.0	8.5	300	24	24	22	2	62.5	125.00	16	8	7	11	7	31.7	1936.6	5.7	8.2
MST M2 - 24 x 24 x 200 - SL	2	6.67	200.0	8.5	30	24	24	22												0.8
ZST M3 - 29 x 29 x 1000 - S	3	10.00	1000.0	10.3	100	29	29	26	2	62.5	125.00	8	9	10	15	9	35.0	930.0	7.7	5.9
ZST M3 - 29 x 29 x 2000 - S	3	10.00	2000.0	10.3	200	29	29	26	2	62.5	125.00	16	9	10	15	9	35.0	1930.0	7.7	11.8
MST M3 - 29 x 29 x 200 - SL	3	10.00	200.0	10.3	20	29	29	26												1.2
ZST M4 - 39 x 39 x 1000 - S	4	13.33	1000.0	13.8	75	39	39	35	3	62.5	125.00	8	12	10	15	9	33.3	933.4	7.7	10.7
ZST M4 - 39 x 39 x 2000 - S	4	13.33	2000.0	13.8	150	39	39	35	3	62.5	125.00	16	12	10	15	9	33.3	1933.4	7.7	21.4
MST M4 - 39 x 39 x 200 - SL	4	13.33	200.0	13.8	15	39	39	35												2.2
ZST M5 - 49 x 39 x 1000 - S	5	16.67	1000.0	17.4	60	49	39	34	3	62.5	125.00	8	12	14	20	13	37.5	925.0	11.7	13.0
ZST M5 - 49 x 39 x 2000 - S	5	16.67	2000.0	17.4	120	49	39	34	3	62.5	125.00	16	12	14	20	13	37.5	1925.0	11.7	26.0
MST M5 - 49 x 39 x 200 - SL	5	16.67	200.0	17.4	12	49	39	34												2.7
ZST M6 - 59 x 49 x 1000 - S	6	20.00	1000.0	20.9	50	59	49	43	3	62.5	125.00	8	16	18	26	17	37.5	925.0	15.7	18.1
ZST M6 - 59 x 49 x 2000 - S	6	20.00	2000.0	20.9	100	59	49	43	3	62.5	125.00	16	16	18	26	17	37.5	1925.0	15.7	36.2
MST M6 - 59 x 49 x 200 - SL	6	20.00	200.0	20.9	10	59	49	43												3.8
ZST M8 - 79 x 79 x 960 - S	8	26.67	960.0	28.0	36	79	79	71	3	60.0	120.00	8	25	22	33	21	120.0	720.0	19.7	42.5
ZST M8 - 79 x 79 x 1920 - S	8	26.67	1920.0	28.0	72	79	79	71	3	60.0	120.00	16	25	22	33	21	120.0	1680.0	19.7	85.0
MST M8 - 79 x 79 x 213 - SL	8	26.67	213.3	28.0	8	79	79	71												8.9
ZST M10 - 99 x 99 x 1000 - S	10	33.33	1000.0	35.1	30	99	99	89	3	62.5	125.00	8	32	33	48	32	125.0	750.0	19.7	68.7
ZST M10 - 99 x 99 x 2000 - S	10	33.33	2000.0	35.1	60	99	99	89	3	62.5	125.00	16	32	33	48	32	125.0	1750.0	19.7	137.4
MST M10 - 79 x 79 x 233 - SL	10	33.33	233.3	28.0	7	79	79	69												10.2
ZST M12 - 120 x 120 x 1000 - S	12	40.00	1000.0	42.6	25	120	120	108	3	40.0	125.00	8	40	39	58	38	102.5	750.0	19.7	111.0
MST M12 - 99 x 99 x 280 - SL	12	40.00	280.0	35.1	7	99	99	87												20.9

<sup>1)</sup> m Module

<sup>3)</sup> n Number of holes

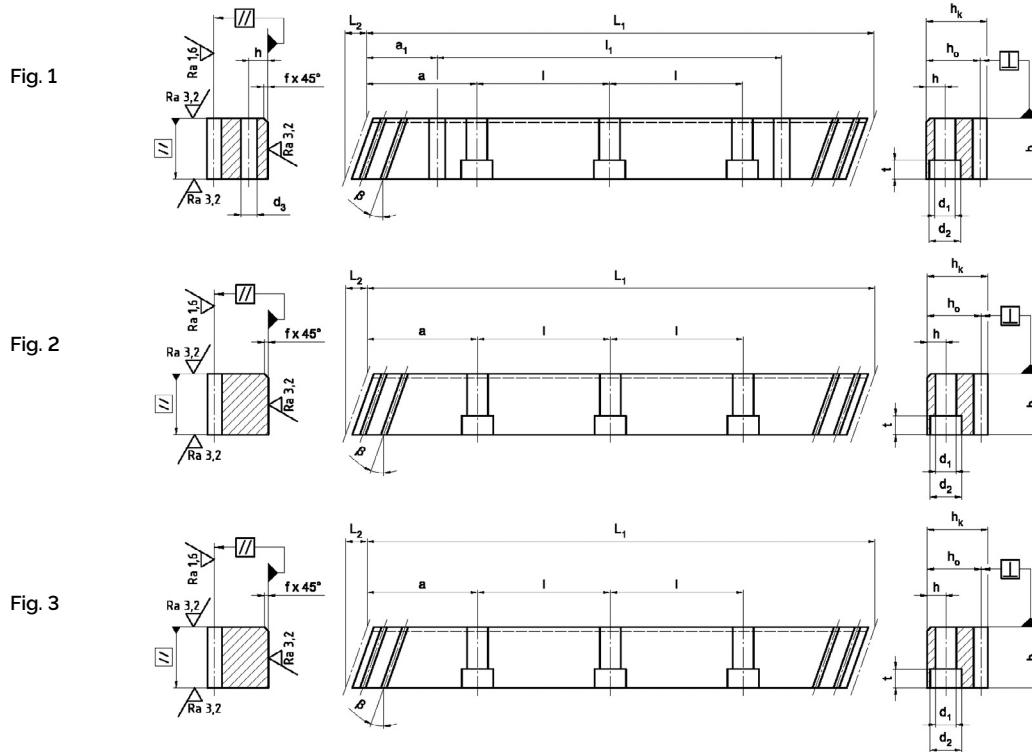
any other lengths on request

<sup>2)</sup> z Number of teeth <sup>4)</sup>  $p_s$  Transverse pitch ( $p_s = m \cdot \pi / \cos \beta$ )  $\beta = 19.5283^\circ (19^\circ 31' 42'')$

## 2.1 Standard gear racks

### 2.1.1.7 Module pitches Q11 helical toothed

<b>Tooth rack:</b>	Pressure angle $\alpha=20^\circ$ milled, induction, hardened	<b>Quality:</b> $F_p$ (mm)	11 in accordance with DIN 3962, 3963, 3967 Total pitch deviation
<b>Outer surfaces:</b>	ground on all sides	$F_p/1000$ (mm) $F_p/2000$ (mm)	0.220 for a 1000 mm length 0.330 for a 2000 mm length



Standard lengths	$m^{1)}$	$p_s^{4)}$ mm	$L_1$ mm	$L_2$ mm	$z^{2)}$	$b$ mm	$h_k$ mm	$h_o$ mm	$f$ mm	$a$ mm	$l$ mm	$n^{3)}$	$h$ mm	$d_1$ mm	$d_2$ mm	$t$ mm	$a_1$ mm	$l_1$ mm	$d_3$ mm	Dimensions kg
ZST M2 - 24 x 24 x 1000 - S	2	6.67	1000.0	85	150	24	24	22	2	62.5	125.00	8	8	7	11	7	31.7	936.6	5.7	4.1
ZST M2 - 24 x 24 x 2000 - S	2	6.67	2000.0	85	300	24	24	22	2	62.5	125.00	16	8	7	11	7	31.7	1936.6	5.7	8.2
MST M2 - 24 x 24 x 200 - SL	2	6.67	200.0	85	30	24	24	22												0.8
ZST M3 - 29 x 29 x 1000 - S	3	10.00	1000.0	10.3	100	29	29	26	2	62.5	125.00	8	9	10	15	9	35.0	930.0	7.7	5.9
ZST M3 - 29 x 29 x 2000 - S	3	10.00	2000.0	10.3	200	29	29	26	2	62.5	125.00	16	9	10	15	9	35.0	1930.0	7.7	11.8
MST M3 - 29 x 29 x 200 - SL	3	10.00	200.0	10.3	20	29	29	26												1.2
ZST M4 - 39 x 39 x 1000 - S	4	13.33	1000.0	13.8	75	39	39	35	3	62.5	125.00	8	12	10	15	9	33.3	933.4	7.7	10.7
ZST M4 - 39 x 39 x 2000 - S	4	13.33	2000.0	13.8	150	39	39	35	3	62.5	125.00	16	12	10	15	9	33.3	1933.4	7.7	21.4
MST M4 - 39 x 39 x 200 - SL	4	13.33	200.0	13.8	15	39	39	35												2.2
ZST M5 - 49 x 39 x 1000 - S	5	16.67	1000.0	17.4	60	49	39	34	3	62.5	125.00	8	12	14	20	13	37.5	925.0	11.7	13.0
ZST M5 - 49 x 39 x 2000 - S	5	16.67	2000.0	17.4	120	49	39	34	3	62.5	125.00	16	12	14	20	13	37.5	1925.0	11.7	26.0
MST M5 - 49 x 39 x 200 - SL	5	16.67	200.0	17.4	12	49	39	34												2.7
ZST M6 - 59 x 49 x 1000 - S	6	20.00	1000.0	20.9	50	59	49	43	3	62.5	125.00	8	16	18	26	17	37.5	925.0	15.7	18.1
ZST M6 - 59 x 49 x 2000 - S	6	20.00	2000.0	20.9	100	59	49	43	3	62.5	125.00	16	16	18	26	17	37.5	1925.0	15.7	36.2
MST M6 - 59 x 49 x 200 - SL	6	20.00	200.0	20.9	10	59	49	43												3.8
ZST M8 - 79 x 79 x 960 - S	8	26.67	960.0	28.0	36	79	79	71	3	60.0	120.00	8	25	22	33	21	120.0	720.0	19.7	42.5
ZST M8 - 79 x 79 x 1920 - S	8	26.67	1920.0	28.0	72	79	79	71	3	60.0	120.00	16	25	22	33	21	120.0	1680.0	19.7	85.0
MST M8 - 79 x 79 x 213 - SL	8	26.67	213.3	28.0	8	79	79	71												8.9
ZST M10 - 99 x 99 x 1000 - S	10	33.33	1000.0	35.1	30	99	99	89	3	62.5	125.00	8	32	33	48	32	125.0	750.0	19.7	68.7
ZST M10 - 99 x 99 x 2000 - S	10	33.33	2000.0	35.1	60	99	99	89	3	62.5	125.00	16	32	33	48	32	125.0	1750.0	19.7	137.4
MST M10 - 79 x 79 x 233 - SL	10	33.33	233.3	28.0	7	79	79	69												10.2
ZST M12 - 120 x 120 x 1000 - S	12	40.00	1000.0	42.6	25	120	120	108	3	40.0	125.00	8	40	39	58	38	102.5	750.0	19.7	111.0
MST M12 - 99 x 99 x 280 - SL	12	40.00	280.0	35.1	7	99	99	87												20.9

<sup>1)</sup> m Module

<sup>3)</sup> n Number of holes

any other lengths on request

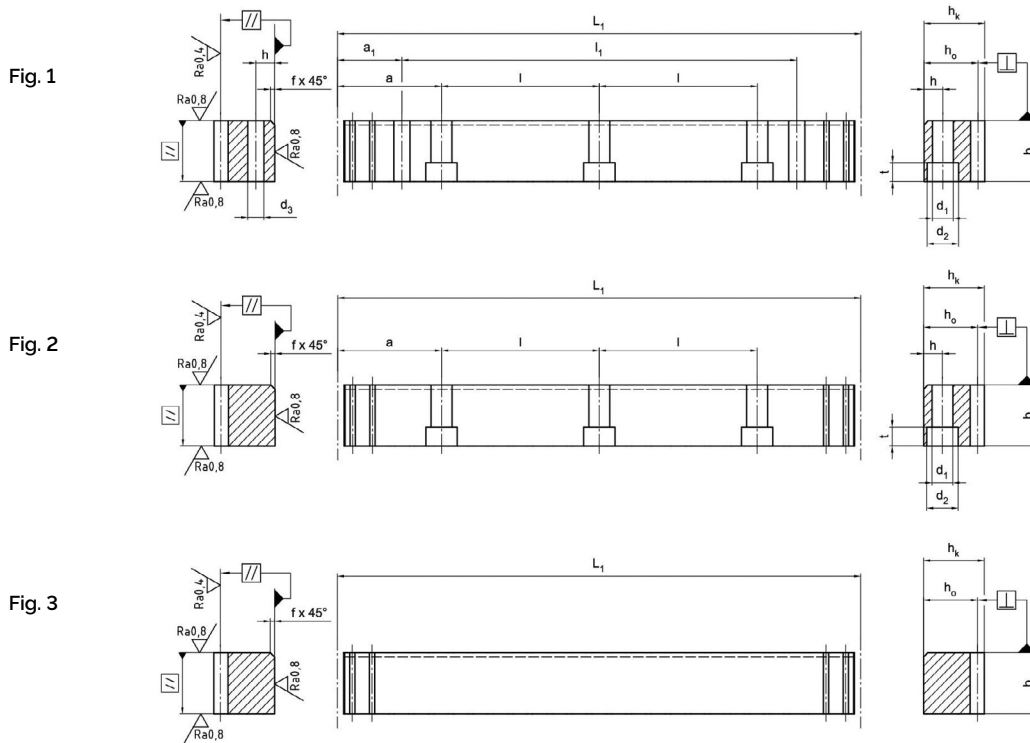
<sup>2)</sup> z Number of teeth

<sup>4)</sup>  $p_s$  Transverse pitch ( $p_s = m \cdot \pi / \cos \beta$ )  $\beta = 19.5283^\circ (19^\circ 31' 42'')$

## 2.1 Standard gear racks

### 2.1.8 Module pitches Q4 straight toothed

<b>Tooth rack:</b>	Pressure angle $\alpha=20^\circ$ ground, soft or hardened	<b>Quality:</b> $f_p$ (mm)	4 in accordance with DIN 3962, 3963, 3967 Single pitch deviation Module $\leq 3$ : 0.003 Module $> 3$ : 0.004
<b>Outer surfaces:</b>	ground on all sides	$F_p$ (mm) $F_p/1000$ (mm)	Total pitch deviation 0.015 for a 1000 mm length



Standard lengths	$m^{1)}$ mm	$p^{4)}$ mm	$L_1$ mm	$z^{2)}$	$b$ mm	$h_k$ mm	$h_o$ mm	$f$ mm	$a$ mm	$l$ mm	$n^{3)}$	$h$ mm	$d_1$ mm	$d_2$ mm	$t$ mm	$a_1$ mm	$l_1$ mm	$d_3$ mm	Dimensions kg
ZST M2 - 24 x 24 x 1005 - G	2	6.28	1005.3	160	24	24	22	2	62.8	125.66	8	8	7	11	7	31.3	942.7	5.7	4.2
ZST M2 - 24 x 24 x 2010 - G	2	6.28	2010.6	320	24	24	22	2	62.8	125.66	16	8	7	11	7	31.3	1948.0	5.7	8.4
MST M2 - 24 x 24 x 201 - G	2	6.28	2010	32	24	24	22												0.8
ZST M3 - 29 x 29 x 1017 - G	3	9.42	1017.9	108	29	29	26	2	63.6	127.23	8	9	10	15	9	34.4	949.1	7.7	6.0
ZST M3 - 29 x 29 x 2035 - G	3	9.42	2035.8	216	29	29	26	2	63.6	127.23	16	9	10	15	9	34.4	1967.0	7.7	12.0
MST M3 - 29 x 29 x 198 - G	3	9.42	198.0	21	29	29	26												12
ZST M4 - 39 x 39 x 1005 - G	4	12.57	1005.3	80	39	39	35	3	62.8	125.66	8	12	10	15	9	37.5	930.3	7.7	10.7
ZST M4 - 39 x 39 x 2010 - G	4	12.57	2010.6	160	39	39	35	3	62.8	125.66	16	12	10	15	9	37.5	1935.6	7.7	21.4
MST M4 - 39 x 39 x 201 - G	4	12.57	2010	16	39	39	35												2.2
ZST M5 - 49 x 39 x 1005 - G	5	15.71	1005.3	64	49	39	34	3	62.8	125.66	8	12	14	20	13	30.1	945.0	11.7	13.1
ZST M5 - 49 x 39 x 2010 - G	5	15.71	2010.6	128	49	39	34	3	62.8	125.66	16	12	14	20	13	30.1	1950.4	11.7	26.2
MST M5 - 49 x 39 x 204 - G	5	15.71	204.0	13	49	39	34												2.7
ZST M6 - 59 x 49 x 1017 - G	6	18.85	1017.9	54	59	49	43	3	63.6	127.23	8	16	18	26	17	31.4	955.0	15.7	20.2
ZST M6 - 59 x 49 x 2035 - G	6	18.85	2035.8	108	59	49	43	3	63.6	127.23	16	16	18	26	17	31.4	1973.0	15.7	40.4
MST M6 - 59 x 49 x 207 - G	6	18.85	207.0	11	59	49	43												4.1
ZST M8 - 79 x 79 x 1005 - G	8	25.13	1005.3	40	79	79	71	3	62.8	125.66	8	25	22	33	21	26.6	952.0	19.7	44.3
ZST M8 - 79 x 79 x 2010 - G	8	25.13	2010.6	80	79	79	71	3	62.8	125.66	16	25	22	33	21	26.6	1957.3	19.7	88.6
MST M8 - 79 x 79 x 201 - G	8	25.13	2010	8	79	79	71												8.9
ZST M10 - 99 x 99 x 1005 - G	10	31.42	1005.3	32	99	99	89	3	62.8	125.66	8	32	33	48	32	125.7	754.0	19.7	68.7
ZST M10 - 99 x 99 x 2010 - G	10	31.42	2010.6	64	99	99	89	3	62.8	125.66	16	32	33	48	32	125.7	1759.2	19.7	137.4
MST M10 - 79 x 79 x 219 - G	10	31.42	219.0	7	79	79	69												10.2
ZST M12 - 120 x 120 x 1017 - G	12	37.70	1017.9	27	120	120	108	3	63.6	127.23	8	40	39	58	38	127.2	763.4	19.7	109.0
MST M12 - 99 x 99 x 263 - G	12	37.70	263.0	7	99	99	87												19.0

<sup>1)</sup> m Module                      <sup>3)</sup> n Number of holes

<sup>2)</sup> z Number of teeth    <sup>4)</sup> p Pitch ( $p=m \cdot \pi$ )

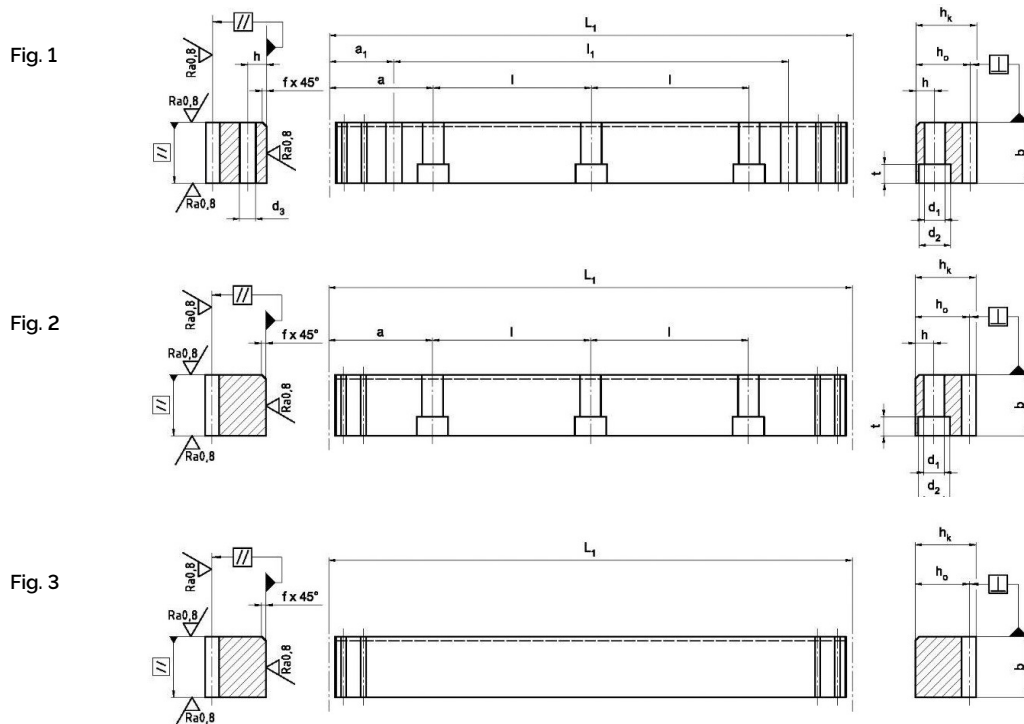
any other lengths on request



## 2.1 Standard gear racks

### 2.1.9 Module pitches Q5 straight toothed

<b>Tooth rack:</b>	Pressure angle $\alpha=20^\circ$ ground, soft or hardened	<b>Quality:</b> $f_p$ (mm)	5 in accordance with DIN 3962, 3963, 3967 Single pitch deviation Module $\leq 3$ : 0.004 Module $> 3$ : 0.005
<b>Outer surfaces:</b>	ground on all sides	$F_p$ (mm)	Total pitch deviation
		$F_p/1000$ (mm)	0.024 for a 1000 mm length
		$F_p/2000$ (mm)	0.032 for a 2000 mm length



Standard lengths	$m^{1)}$	$p^{4)}$	$L_1$	$z^{2)}$	$b$	$h_k$	$h_o$	$f$	$a$	$l$	$n^{3)}$	$h$	$d_1$	$d_2$	$t$	$a_1$	$l_1$	$d_3$	Dimensions
	-	mm	mm	-	mm	mm	mm	mm	mm	mm	-	mm	mm	mm	mm	mm	mm	mm	kg
ZST M2 - 24 x 24 x 1005 - G	2	6.28	1005.3	160	24	24	22	2	62.8	125.66	8	8	7	11	7	31.3	942.7	5.7	4.2
ZST M2 - 24 x 24 x 2010 - G	2	6.28	2010.6	320	24	24	22	2	62.8	125.66	16	8	7	11	7	31.3	1948.0	5.7	8.4
MST M2 - 24 x 24 x 201 - G	2	6.28	201.0	32	24	24	22												0.8
ZST M3 - 29 x 29 x 1017 - G	3	9.42	1017.9	108	29	29	26	2	63.6	127.23	8	9	10	15	9	34.4	949.1	7.7	6.0
ZST M3 - 29 x 29 x 2035 - G	3	9.42	2035.8	216	29	29	26	2	63.6	127.23	16	9	10	15	9	34.4	1967.0	7.7	12.0
MST M3 - 29 x 29 x 198 - G	3	9.42	198.0	21	29	29	26												1.2
ZST M4 - 39 x 39 x 1005 - G	4	12.57	1005.3	80	39	39	35	3	62.8	125.66	8	12	10	15	9	37.5	930.3	7.7	10.7
ZST M4 - 39 x 39 x 2010 - G	4	12.57	2010.6	160	39	39	35	3	62.8	125.66	16	12	10	15	9	37.5	1935.6	7.7	21.4
MST M4 - 39 x 39 x 201 - G	4	12.57	201.0	16	39	39	35												2.2
ZST M5 - 49 x 39 x 1005 - G	5	15.71	1005.3	64	49	39	34	3	62.8	125.66	8	12	14	20	13	30.1	945.0	11.7	13.1
ZST M5 - 49 x 39 x 2010 - G	5	15.71	2010.6	128	49	39	34	3	62.8	125.66	16	12	14	20	13	30.1	1950.4	11.7	26.2
MST M5 - 49 x 39 x 204 - G	5	15.71	204.0	13	49	39	34												2.7
ZST M6 - 59 x 49 x 1017 - G	6	18.85	1017.9	54	59	49	43	3	63.6	127.23	8	16	18	26	17	31.4	955.0	15.7	20.2
ZST M6 - 59 x 49 x 2035 - G	6	18.85	2035.8	108	59	49	43	3	63.6	127.23	16	16	18	26	17	31.4	1973.0	15.7	40.4
MST M6 - 59 x 49 x 207 - G	6	18.85	207.0	11	59	49	43												4.1
ZST M8 - 79 x 79 x 1005 - G	8	25.13	1005.3	40	79	79	71	3	62.8	125.66	8	25	22	33	21	26.6	952.0	19.7	44.3
ZST M8 - 79 x 79 x 2010 - G	8	25.13	2010.6	80	79	79	71	3	62.8	125.66	16	25	22	33	21	26.6	1957.3	19.7	88.6
MST M8 - 79 x 79 x 201 - G	8	25.13	201.0	8	79	79	71												8.9
ZST M10 - 99 x 99 x 1005 - G	10	31.42	1005.3	32	99	99	89	3	62.8	125.66	8	32	33	48	32	125.7	754.0	19.7	68.7
ZST M10 - 99 x 99 x 2010 - G	10	31.42	2010.6	64	99	99	89	3	62.8	125.66	16	32	33	48	32	125.7	1759.2	19.7	137.4
MST M10 - 79 x 79 x 219 - G	10	31.42	219.0	7	79	79	69												10.2
ZST M12 - 120 x 120 x 1017 - G	12	37.70	1017.9	27	120	120	108	3	63.6	127.23	8	40	39	58	38	127.2	763.4	19.7	109.0
MST M12 - 99 x 99 x 263 - G	12	37.70	263.0	7	99	99	87												19.0

<sup>1)</sup> m Module                      <sup>3)</sup> n Number of holes

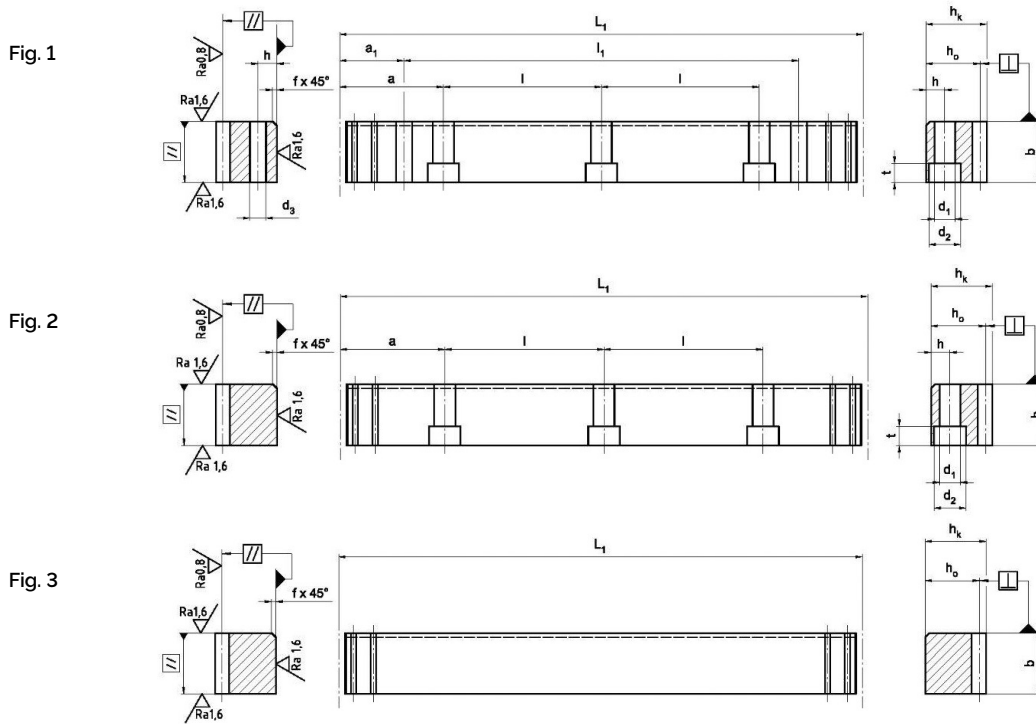
<sup>2)</sup> z Number of teeth    <sup>4)</sup> p Pitch ( $p=m \cdot \pi$ )

any other lengths on request

## 2.1 Standard gear racks

### 2.1.10 Module pitches Q6 straight toothed

<b>Tooth rack:</b>	Pressure angle $\alpha=20^\circ$ ground, soft or hardened	<b>Quality:</b> $f_p$ (mm)	6 in accordance with DIN 3962, 3963, 3967 Single pitch deviation Module $\leq 3$ : 0.006 Module $> 3$ : 0.008
<b>Outer surfaces:</b>	ground on all sides	$F_p$ (mm)	Total pitch deviation
		$F_p/1000$ (mm)	0.035 for a 1000 mm length
		$F_p/2000$ (mm)	0.045 for a 2000 mm length



Standard lengths	$m^{1)}$	$p^{4)}$	$L_1$	$z^{2)}$	$b$	$h_k$	$h_o$	$f$	$a$	$l$	$n^{3)}$	$h$	$d_1$	$d_2$	$t$	$a_1$	$L_1$	$d_3$	Dimensions kg
	-	mm	mm	-	mm	mm	mm	mm	mm	mm	-	mm	mm	mm	mm	mm	mm	mm	
ZST M2 - 24 x 24 x 1005 - G	2	6.28	1005.3	160	24	24	22	2	62.8	125.66	8	8	7	11	7	31.3	942.7	5.7	4.2
ZST M2 - 24 x 24 x 2010 - G	2	6.28	2010.6	320	24	24	22	2	62.8	125.66	16	8	7	11	7	31.3	1948.0	5.7	8.4
MST M2 - 24 x 24 x 201 - G	2	6.28	201.0	32	24	24	22												0.8
ZST M3 - 29 x 29 x 1017 - G	3	9.42	1017.9	108	29	29	26	2	63.6	127.23	8	9	10	15	9	34.4	949.1	7.7	6.0
ZST M3 - 29 x 29 x 2035 - G	3	9.42	2035.8	216	29	29	26	2	63.6	127.23	16	9	10	15	9	34.4	1967.0	7.7	12.0
MST M3 - 29 x 29 x 198 - G	3	9.42	198.0	21	29	29	26												12
ZST M4 - 39 x 39 x 1005 - G	4	12.57	1005.3	80	39	39	35	3	62.8	125.66	8	12	10	15	9	37.5	930.3	7.7	10.7
ZST M4 - 39 x 39 x 2010 - G	4	12.57	2010.6	160	39	39	35	3	62.8	125.66	16	12	10	15	9	37.5	1935.6	7.7	21.4
MST M4 - 39 x 39 x 201 - G	4	12.57	201.0	16	39	39	35												2.2
ZST M5 - 49 x 39 x 1005 - G	5	15.71	1005.3	64	49	39	34	3	62.8	125.66	8	12	14	20	13	30.1	945.0	11.7	13.1
ZST M5 - 49 x 39 x 2010 - G	5	15.71	2010.6	128	49	39	34	3	62.8	125.66	16	12	14	20	13	30.1	1950.4	11.7	26.2
MST M5 - 49 x 39 x 204 - G	5	15.71	204.0	13	49	39	34												2.7
ZST M6 - 59 x 49 x 1017 - G	6	18.85	1017.9	54	59	49	43	3	63.6	127.23	8	16	18	26	17	31.4	955.0	15.7	20.2
ZST M6 - 59 x 49 x 2035 - G	6	18.85	2035.8	108	59	49	43	3	63.6	127.23	16	16	18	26	17	31.4	1973.0	15.7	40.4
MST M6 - 59 x 49 x 207 - G	6	18.85	207.0	11	59	49	43												4.1
ZST M8 - 79 x 79 x 1005 - G	8	25.13	1005.3	40	79	79	71	3	62.8	125.66	8	25	22	33	21	26.6	952.0	19.7	44.3
ZST M8 - 79 x 79 x 2010 - G	8	25.13	2010.6	80	79	79	71	3	62.8	125.66	16	25	22	33	21	26.6	1957.3	19.7	88.6
MST M8 - 79 x 79 x 201 - G	8	25.13	201.0	8	79	79	71												8.9
ZST M10 - 99 x 99 x 1005 - G	10	31.42	1005.3	32	99	99	89	3	62.8	125.66	8	32	33	48	32	125.7	754.0	19.7	68.7
ZST M10 - 99 x 99 x 2010 - G	10	31.42	2010.6	64	99	99	89	3	62.8	125.66	16	32	33	48	32	125.7	1759.2	19.7	137.4
MST M10 - 79 x 79 x 219 - G	10	31.42	219.0	7	79	79	69												10.2
ZST M12 - 120 x 120 x 1017 - G	12	37.70	1017.9	27	120	120	108	3	63.6	127.23	8	40	39	58	38	127.2	763.4	19.7	109.0
MST M12 - 99 x 99 x 263 - G	12	37.70	263.0	7	99	99	87												19.0

<sup>1)</sup> m Module                      <sup>3)</sup> n Number of holes

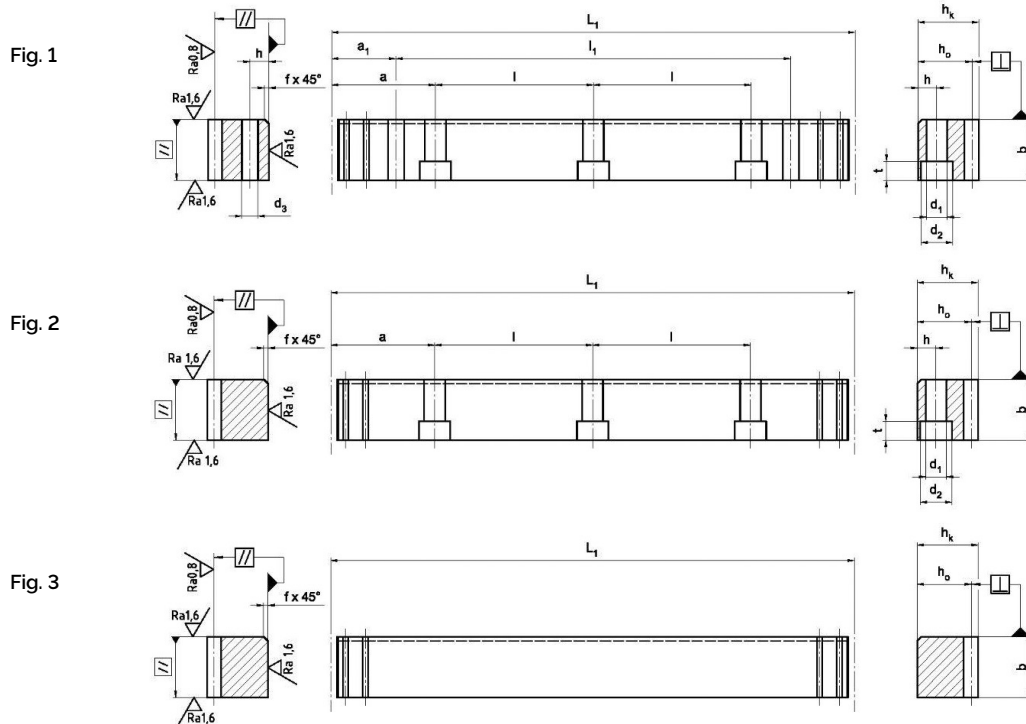
<sup>2)</sup> z Number of teeth    <sup>4)</sup> p Pitch ( $p=m \cdot \pi$ )

any other lengths on request

## 2.1 Standard gear racks

### 2.1.11 Module pitches Q7 straight toothed

<b>Tooth rack:</b>	Pressure angle $\alpha=20^\circ$ ground, soft or hardened	<b>Quality:</b> $f_p$ (mm)	7 in accordance with DIN 3962, 3963, 3967 Single pitch deviation Module $\leq 3$ : 0.007 Module $> 3$ : 0.009
<b>Outer surfaces:</b>	ground on all sides	$F_p$ (mm)	Total pitch deviation
		$F_p/1000$ (mm)	0.060 for a 1000 mm length
		$F_p/2000$ (mm)	0.075 for a 2000 mm length



Standard lengths	$m^{1)}$	$p^{4)}$	$L_1$	$z^{2)}$	$b$	$h_k$	$h_o$	$f$	$a$	$l$	$n^{3)}$	$h$	$d_1$	$d_2$	$t$	$a_1$	$L_1$	$d_3$	Dimensions
	-	mm	mm	-	mm	mm	mm	mm	mm	mm	-	mm	mm	mm	mm	mm	mm	mm	kg
ZST M2 - 24 x 24 x 1005 - G	2	6.28	1005.3	160	24	24	22	2	62.8	125.66	8	8	7	11	7	31.3	942.7	5.7	4.2
ZST M2 - 24 x 24 x 2010 - G	2	6.28	2010.6	320	24	24	22	2	62.8	125.66	16	8	7	11	7	31.3	1948.0	5.7	8.4
MST M2 - 24 x 24 x 201 - G	2	6.28	201.0	32	24	24	22												0.8
ZST M3 - 29 x 29 x 1017 - G	3	9.42	1017.9	108	29	29	26	2	63.6	127.23	8	9	10	15	9	34.4	949.1	7.7	6.0
ZST M3 - 29 x 29 x 2035 - G	3	9.42	2035.8	216	29	29	26	2	63.6	127.23	16	9	10	15	9	34.4	1967.0	7.7	12.0
MST M3 - 29 x 29 x 198 - G	3	9.42	198.0	21	29	29	26												1.2
ZST M4 - 39 x 39 x 1005 - G	4	12.57	1005.3	80	39	39	35	3	62.8	125.66	8	12	10	15	9	37.5	930.3	7.7	10.7
ZST M4 - 39 x 39 x 2010 - G	4	12.57	2010.6	160	39	39	35	3	62.8	125.66	16	12	10	15	9	37.5	1935.6	7.7	21.4
MST M4 - 39 x 39 x 201 - G	4	12.57	201.0	16	39	39	35												2.2
ZST M5 - 49 x 39 x 1005 - G	5	15.71	1005.3	64	49	39	34	3	62.8	125.66	8	12	14	20	13	30.1	945.0	11.7	13.1
ZST M5 - 49 x 39 x 2010 - G	5	15.71	2010.6	128	49	39	34	3	62.8	125.66	16	12	14	20	13	30.1	1950.4	11.7	26.2
MST M5 - 49 x 39 x 204 - G	5	15.71	204.0	13	49	39	34												2.7
ZST M6 - 59 x 49 x 1017 - G	6	18.85	1017.9	54	59	49	43	3	63.6	127.23	8	16	18	26	17	31.4	955.0	15.7	20.2
ZST M6 - 59 x 49 x 2035 - G	6	18.85	2035.8	108	59	49	43	3	63.6	127.23	16	16	18	26	17	31.4	1973.0	15.7	40.4
MST M6 - 59 x 49 x 207 - G	6	18.85	207.0	11	59	49	43												4.1
ZST M8 - 79 x 79 x 1005 - G	8	25.13	1005.3	40	79	79	71	3	62.8	125.66	8	25	22	33	21	26.6	952.0	19.7	44.3
ZST M8 - 79 x 79 x 2010 - G	8	25.13	2010.6	80	79	79	71	3	62.8	125.66	16	25	22	33	21	26.6	1957.3	19.7	88.6
MST M8 - 79 x 79 x 201 - G	8	25.13	201.0	8	79	79	71												8.9
ZST M10 - 99 x 99 x 1005 - G	10	31.42	1005.3	32	99	99	89	3	62.8	125.66	8	32	33	48	32	125.7	754.0	19.7	68.7
ZST M10 - 99 x 99 x 2010 - G	10	31.42	2010.6	64	99	99	89	3	62.8	125.66	16	32	33	48	32	125.7	1759.2	19.7	137.4
MST M10 - 79 x 79 x 219 - G	10	31.42	219.0	7	79	79	69												10.2
ZST M12 - 120 x 120 x 1017 - G	12	37.70	1017.9	27	120	120	108	3	63.6	127.23	8	40	39	58	38	127.2	763.4	19.7	109.0
MST M12 - 99 x 99 x 263 - G	12	37.70	263.0	7	99	99	87												19.0

<sup>1)</sup> m Module                      <sup>3)</sup> n Number of holes

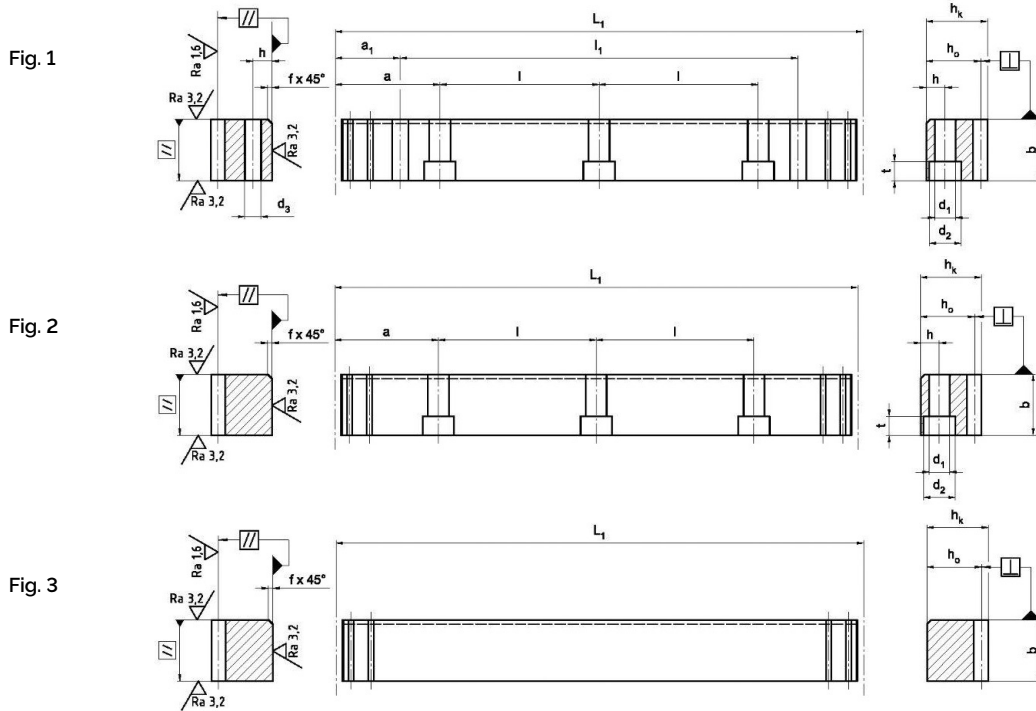
<sup>2)</sup> z Number of teeth    <sup>4)</sup> p Pitch ( $p=m \cdot \pi$ )

any other lengths on request

## 2.1 Standard gear racks

### 2.1.12 Module pitches Q8 straight toothed

<b>Tooth rack:</b>	Pressure angle $\alpha=20^\circ$ milled, soft	<b>Quality:</b>	8 in accordance with DIN 3962, 3963, 3967 Total pitch deviation
<b>Outer surfaces:</b>	ground on all sides	$F_p/1000$ (mm)	0.150 for a 1000 mm length
		$F_p/2000$ (mm)	0.225 for a 2000 mm length



Standard lengths	$m^{1)}$	$p^{4)}$	$L_1$	$z^{2)}$	$b$	$h_k$	$h_o$	$f$	$a$	$l$	$n^{3)}$	$h$	$d_1$	$d_2$	$t$	$a_1$	$L_1$	$d_3$	Dimensions
	-	mm	mm	-	mm	mm	mm	mm	mm	mm	-	mm	mm	mm	mm	mm	mm	mm	kg
ZST M2 - 24 x 24 x 1005 - G	2	6.28	1005.3	160	24	24	22	2	62.8	125.66	8	8	7	11	7	31.3	942.7	5.7	4.2
ZST M2 - 24 x 24 x 2010 - G	2	6.28	2010.6	320	24	24	22	2	62.8	125.66	16	8	7	11	7	31.3	1948.0	5.7	8.4
MST M2 - 24 x 24 x 201 - G	2	6.28	201.0	32	24	24	22												0.8
ZST M3 - 29 x 29 x 1017 - G	3	9.42	1017.9	108	29	29	26	2	63.6	127.23	8	9	10	15	9	34.4	949.1	7.7	6.0
ZST M3 - 29 x 29 x 2035 - G	3	9.42	2035.8	216	29	29	26	2	63.6	127.23	16	9	10	15	9	34.4	1967.0	7.7	12.0
MST M3 - 29 x 29 x 198 - G	3	9.42	198.0	21	29	29	26												1.2
ZST M4 - 39 x 39 x 1005 - G	4	12.57	1005.3	80	39	39	35	3	62.8	125.66	8	12	10	15	9	37.5	930.3	7.7	10.7
ZST M4 - 39 x 39 x 2010 - G	4	12.57	2010.6	160	39	39	35	3	62.8	125.66	16	12	10	15	9	37.5	1935.6	7.7	21.4
MST M4 - 39 x 39 x 201 - G	4	12.57	201.0	16	39	39	35												2.2
ZST M5 - 49 x 39 x 1005 - G	5	15.71	1005.3	64	49	39	34	3	62.8	125.66	8	12	14	20	13	30.1	945.0	11.7	13.1
ZST M5 - 49 x 39 x 2010 - G	5	15.71	2010.6	128	49	39	34	3	62.8	125.66	16	12	14	20	13	30.1	1950.4	11.7	26.2
MST M5 - 49 x 39 x 204 - G	5	15.71	204.0	13	49	39	34												2.7
ZST M6 - 59 x 49 x 1017 - G	6	18.85	1017.9	54	59	49	43	3	63.6	127.23	8	16	18	26	17	31.4	955.0	15.7	20.2
ZST M6 - 59 x 49 x 2035 - G	6	18.85	2035.8	108	59	49	43	3	63.6	127.23	16	16	18	26	17	31.4	1973.0	15.7	40.4
MST M6 - 59 x 49 x 207 - G	6	18.85	207.0	11	59	49	43												4.1
ZST M8 - 79 x 79 x 1005 - G	8	25.13	1005.3	40	79	79	71	3	62.8	125.66	8	25	22	33	21	26.6	952.0	19.7	44.3
ZST M8 - 79 x 79 x 2010 - G	8	25.13	2010.6	80	79	79	71	3	62.8	125.66	16	25	22	33	21	26.6	1957.3	19.7	88.6
MST M8 - 79 x 79 x 201 - G	8	25.13	201.0	8	79	79	71												8.9
ZST M10 - 99 x 99 x 1005 - G	10	31.42	1005.3	32	99	99	89	3	62.8	125.66	8	32	33	48	32	125.7	754.0	19.7	68.7
ZST M10 - 99 x 99 x 2010 - G	10	31.42	2010.6	64	99	99	89	3	62.8	125.66	16	32	33	48	32	125.7	1759.2	19.7	137.4
MST M10 - 79 x 79 x 219 - G	10	31.42	219.0	7	79	79	69												10.2
ZST M12 - 120 x 120 x 1017 - G	12	37.70	1017.9	27	120	120	108	3	63.6	127.23	8	40	39	58	38	127.2	763.4	19.7	109.0
MST M12 - 99 x 99 x 263 - G	12	37.70	263.0	7	99	99	87												19.0

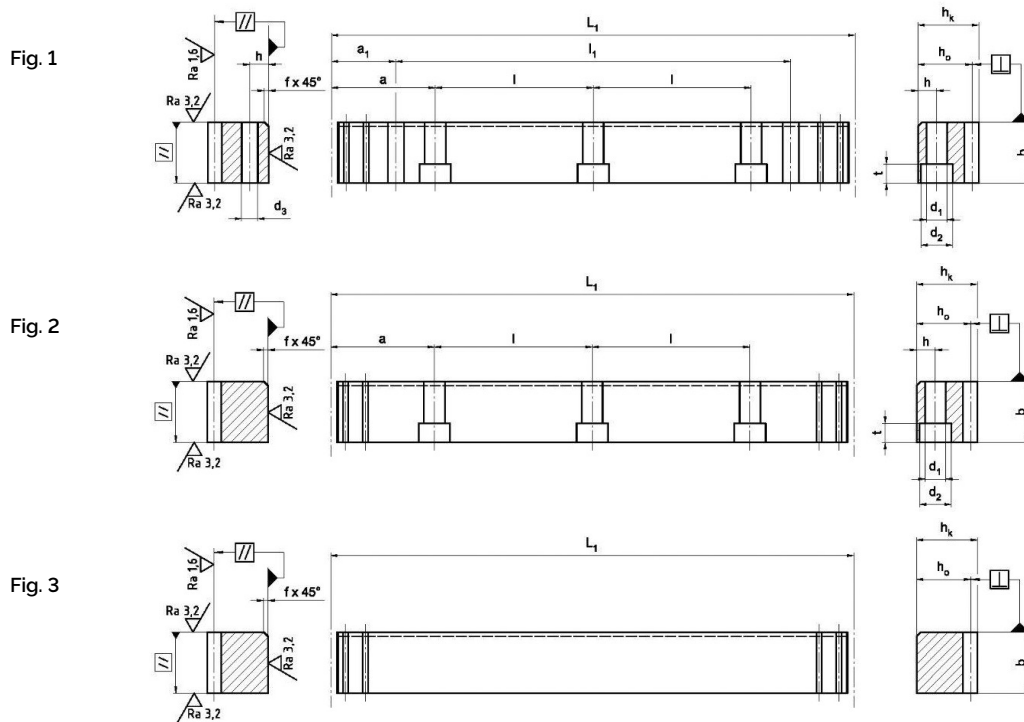
1) m Module                      3) n Number of holes  
2) z Number of teeth        4) p Pitch ( $p=m \cdot \pi$ )

any other lengths on request

## 2.1 Standard gear racks

### 2.1.13 Module pitches Q9 straight toothed

<b>Tooth rack:</b>	Pressure angle $\alpha=20^\circ$ ground, nitrided	<b>Quality:</b> $F_p$ (mm)	9 in accordance with DIN 3962, 3963, 3967 Total pitch deviation
<b>Outer surfaces:</b>	ground on all sides	$F_p/1000$ (mm)	0.180 for a 1000 mm length
		$F_p/2000$ (mm)	0.270 for a 2000 mm length



Standard lengths	$m^1$	$p^4$ mm	$L_1$ mm	$z^2$	$b$ mm	$h_k$ mm	$h_o$ mm	$f$ mm	$a$ mm	$l$ mm	$n^3$	$h$ mm	$d_1$ mm	$d_2$ mm	$t$ mm	$a_1$ mm	$l_1$ mm	$d_3$ mm	Dimensions kg
ZST M2 - 24 x 24 x 1005 - G	2	6.28	1005.3	160	24	24	22	2	62.8	125.66	8	8	7	11	7	31.3	942.7	5.7	4.2
ZST M2 - 24 x 24 x 2010 - G	2	6.28	2010.6	320	24	24	22	2	62.8	125.66	16	8	7	11	7	31.3	1948.0	5.7	8.4
MST M2 - 24 x 24 x 201 - G	2	6.28	2010	32	24	24	22												0.8
ZST M3 - 29 x 29 x 1017 - G	3	9.42	1017.9	108	29	29	26	2	63.6	127.23	8	9	10	15	9	34.4	949.1	7.7	6.0
ZST M3 - 29 x 29 x 2035 - G	3	9.42	2035.8	216	29	29	26	2	63.6	127.23	16	9	10	15	9	34.4	1967.0	7.7	12.0
MST M3 - 29 x 29 x 198 - G	3	9.42	198.0	21	29	29	26												12
ZST M4 - 39 x 39 x 1005 - G	4	12.57	1005.3	80	39	39	35	3	62.8	125.66	8	12	10	15	9	37.5	930.3	7.7	10.7
ZST M4 - 39 x 39 x 2010 - G	4	12.57	2010.6	160	39	39	35	3	62.8	125.66	16	12	10	15	9	37.5	1935.6	7.7	21.4
MST M4 - 39 x 39 x 201 - G	4	12.57	2010	16	39	39	35												2.2
ZST M5 - 49 x 39 x 1005 - G	5	15.71	1005.3	64	49	39	34	3	62.8	125.66	8	12	14	20	13	30.1	945.0	11.7	13.1
ZST M5 - 49 x 39 x 2010 - G	5	15.71	2010.6	128	49	39	34	3	62.8	125.66	16	12	14	20	13	30.1	1950.4	11.7	26.2
MST M5 - 49 x 39 x 204 - G	5	15.71	204.0	13	49	39	34												2.7
ZST M6 - 59 x 49 x 1017 - G	6	18.85	1017.9	54	59	49	43	3	63.6	127.23	8	16	18	26	17	31.4	955.0	15.7	20.2
ZST M6 - 59 x 49 x 2035 - G	6	18.85	2035.8	108	59	49	43	3	63.6	127.23	16	16	18	26	17	31.4	1973.0	15.7	40.4
MST M6 - 59 x 49 x 207 - G	6	18.85	207.0	11	59	49	43												4.1
ZST M8 - 79 x 79 x 1005 - G	8	25.13	1005.3	40	79	79	71	3	62.8	125.66	8	25	22	33	21	26.6	952.0	19.7	44.3
ZST M8 - 79 x 79 x 2010 - G	8	25.13	2010.6	80	79	79	71	3	62.8	125.66	16	25	22	33	21	26.6	1957.3	19.7	88.6
MST M8 - 79 x 79 x 201 - G	8	25.13	2010	8	79	79	71												8.9
ZST M10 - 99 x 99 x 1005 - G	10	31.42	1005.3	32	99	99	89	3	62.8	125.66	8	32	33	48	32	125.7	754.0	19.7	68.7
ZST M10 - 99 x 99 x 2010 - G	10	31.42	2010.6	64	99	99	89	3	62.8	125.66	16	32	33	48	32	125.7	1759.2	19.7	137.4
MST M10 - 79 x 79 x 219 - G	10	31.42	219.0	7	79	79	69												10.2
ZST M12 - 120 x 120 x 1017 - G	12	37.70	1017.9	27	120	120	108	3	63.6	127.23	8	40	39	58	38	127.2	763.4	19.7	109.0
MST M12 - 99 x 99 x 263 - G	12	37.70	263.0	7	99	99	87												19.0

<sup>1</sup> m Module                      <sup>3</sup> n Number of holes

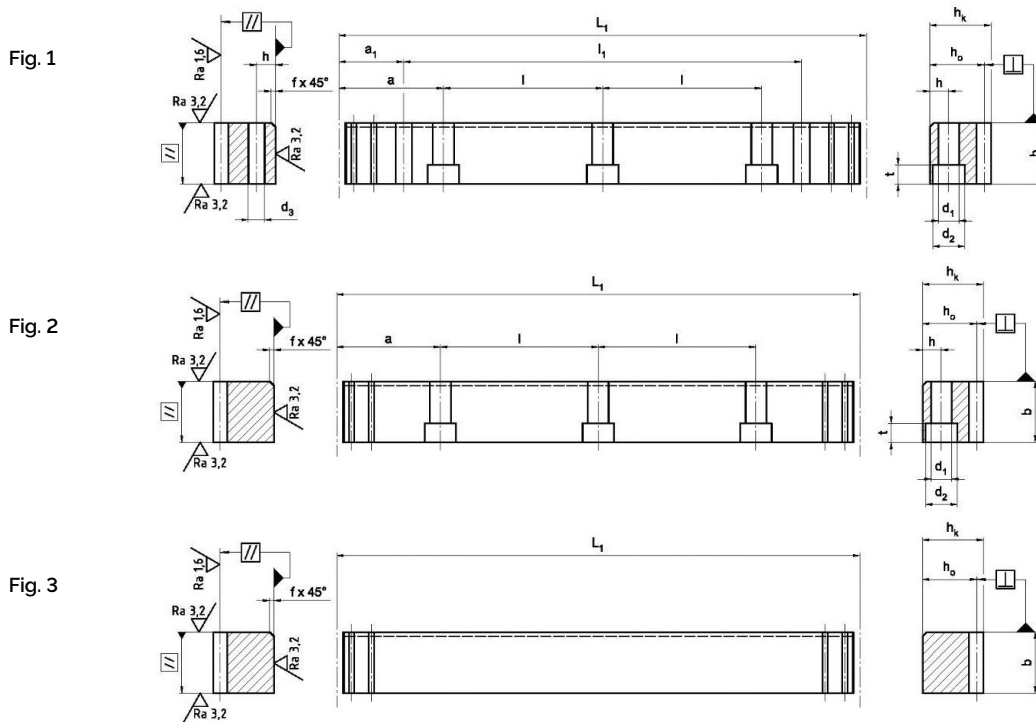
<sup>2</sup> z Number of teeth    <sup>4</sup> p Pitch ( $p=m \cdot \pi$ )

any other lengths on request

## 2.1 Standard gear racks

### 2.1.14 Module pitches Q11 straight toothed

<b>Tooth rack:</b>	Pressure angle $\alpha=20^\circ$ milled, induction hardened	<b>Quality:</b> $F_p$ (mm)	11 in accordance with DIN 3962, 3963, 3967 Total pitch deviation
<b>Outer surfaces:</b>	ground on all sides	$F_p/1000$ (mm)	0.220 for a 1000 mm length
		$F_p/2000$ (mm)	0.330 for a 2000 mm length



Standard lengths	$m^1$	$p^4$ mm	$L_1$ mm	$z^2$	$b$ mm	$h_k$ mm	$h_o$ mm	$f$ mm	$a$ mm	$l$ mm	$n^3$	$h$ mm	$d_1$ mm	$d_2$ mm	$t$ mm	$a_1$ mm	$l_1$ mm	$d_3$ mm	Dimensions kg
ZST M2 - 24 x 24 x 1005 - G	2	6.28	1005.3	160	24	24	22	2	62.8	125.66	8	8	7	11	7	31.3	942.7	5.7	4.2
ZST M2 - 24 x 24 x 2010 - G	2	6.28	2010.6	320	24	24	22	2	62.8	125.66	16	8	7	11	7	31.3	1948.0	5.7	8.4
MST M2 - 24 x 24 x 201 - G	2	6.28	201.0	32	24	24	22												0.8
ZST M3 - 29 x 29 x 1017 - G	3	9.42	1017.9	108	29	29	26	2	63.6	127.23	8	9	10	15	9	34.4	949.1	7.7	6.0
ZST M3 - 29 x 29 x 2035 - G	3	9.42	2035.8	216	29	29	26	2	63.6	127.23	16	9	10	15	9	34.4	1967.0	7.7	12.0
MST M3 - 29 x 29 x 198 - G	3	9.42	198.0	21	29	29	26												1.2
ZST M4 - 39 x 39 x 1005 - G	4	12.57	1005.3	80	39	39	35	3	62.8	125.66	8	12	10	15	9	37.5	930.3	7.7	10.7
ZST M4 - 39 x 39 x 2010 - G	4	12.57	2010.6	160	39	39	35	3	62.8	125.66	16	12	10	15	9	37.5	1935.6	7.7	21.4
MST M4 - 39 x 39 x 201 - G	4	12.57	201.0	16	39	39	35												2.2
ZST M5 - 49 x 39 x 1005 - G	5	15.71	1005.3	64	49	39	34	3	62.8	125.66	8	12	14	20	13	30.1	945.0	11.7	13.1
ZST M5 - 49 x 39 x 2010 - G	5	15.71	2010.6	128	49	39	34	3	62.8	125.66	16	12	14	20	13	30.1	1950.4	11.7	26.2
MST M5 - 49 x 39 x 204 - G	5	15.71	204.0	13	49	39	34												2.7
ZST M6 - 59 x 49 x 1017 - G	6	18.85	1017.9	54	59	49	43	3	63.6	127.23	8	16	18	26	17	31.4	955.0	15.7	20.2
ZST M6 - 59 x 49 x 2035 - G	6	18.85	2035.8	108	59	49	43	3	63.6	127.23	16	16	18	26	17	31.4	1973.0	15.7	40.4
MST M6 - 59 x 49 x 207 - G	6	18.85	207.0	11	59	49	43												4.1
ZST M8 - 79 x 79 x 1005 - G	8	25.13	1005.3	40	79	79	71	3	62.8	125.66	8	25	22	33	21	26.6	952.0	19.7	44.3
ZST M8 - 79 x 79 x 2010 - G	8	25.13	2010.6	80	79	79	71	3	62.8	125.66	16	25	22	33	21	26.6	1957.3	19.7	88.6
MST M8 - 79 x 79 x 201 - G	8	25.13	201.0	8	79	79	71												8.9
ZST M10 - 99 x 99 x 1005 - G	10	31.42	1005.3	32	99	99	89	3	62.8	125.66	8	32	33	48	32	125.7	754.0	19.7	68.7
ZST M10 - 99 x 99 x 2010 - G	10	31.42	2010.6	64	99	99	89	3	62.8	125.66	16	32	33	48	32	125.7	1759.2	19.7	137.4
MST M10 - 79 x 79 x 219 - G	10	31.42	219.0	7	79	79	69												10.2
ZST M12 - 120 x 120 x 1017 - G	12	37.70	1017.9	27	120	120	108	3	63.6	127.23	8	40	39	58	38	127.2	763.4	19.7	109.0
MST M12 - 99 x 99 x 263 - G	12	37.70	263.0	7	99	99	87												19.0

<sup>1)</sup> m Module                      <sup>3)</sup> n Number of holes

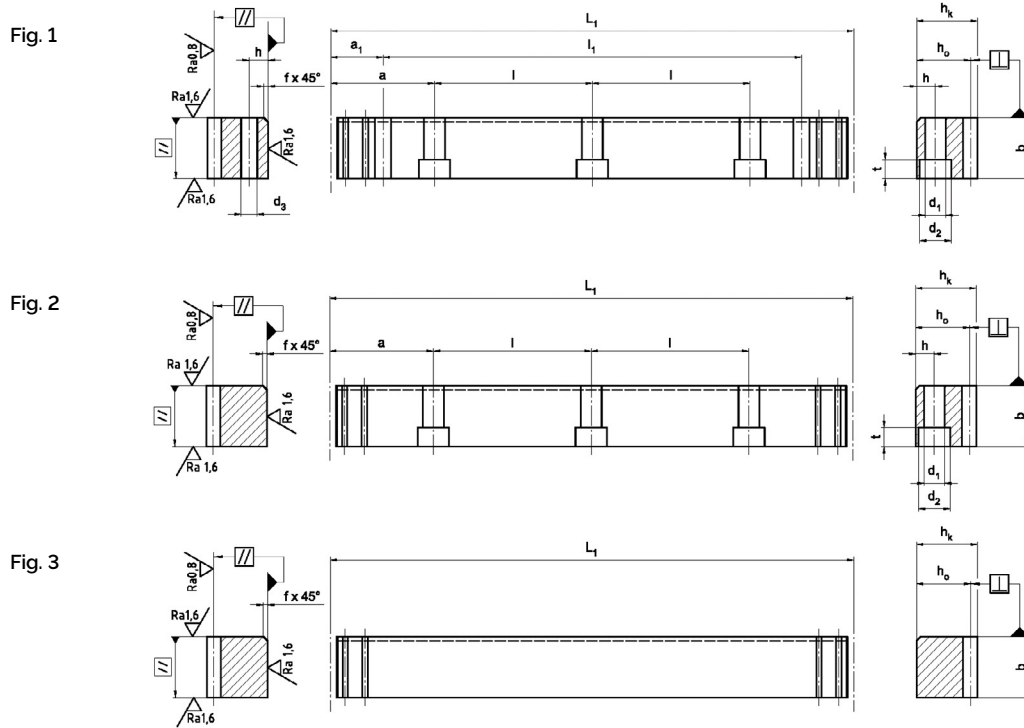
<sup>2)</sup> z Number of teeth    <sup>4)</sup> p Pitch ( $p=m \cdot \pi$ )

any other lengths on request

## 2.1 Standard gear racks

### 2.1.15 Q6 metric pitch, straight toothed

<b>Tooth rack:</b>	Pressure angle $\alpha=20^\circ$ ground	<b>Quality:</b> $f_p$ (mm)	6 in accordance with DIN 3962, 3963, 3967 Single pitch deviation Module $\leq 3$ : 0.006 Module $> 3$ : 0.008
<b>Outer surfaces:</b>	ground on all sides	$F_p$ (mm) $F_p/1000$ (mm)	Total pitch deviation 0.035 for a 1000 mm length



Standard lengths	$p^1$ mm	m	$L_1$ mm	$z^2$ -	b mm	$h_k$ mm	$h_o$ mm	f mm	a mm	l mm	$n^3$ -	h mm	$d_1$ mm	$d_2$ mm	t mm	$a_1$ mm	$l_1$ mm	$d_3$ mm	Dimensions kg
ZST T5 - 24 x 24 x 600 - G	5	1,592	600	120	24	24	22,41	2	60	120	5	8	7	11	7	25	550	5,7	2,5
ZST T5 - 24 x 24 x 1200 - G			1200	240													1150		5,0
MST T5 - 24 x 24 x 120 - G	5	1,592	120	24	24	24	22,41												0,8
ZST T10 - 29 x 29 x 600 - G	10	3,183	600	60	29	29	25,82	2	60	120	5	9	10	15	9	25	550	7,7	3,6
ZST T10 - 29 x 29 x 1200 - G			1200	120													1150		7,2
MST T10 - 29 x 29 x -200 - G	10	3,183	200	20	29	29	25,82												1,2

<sup>1)</sup> m Module                      <sup>3)</sup> n Number of holes

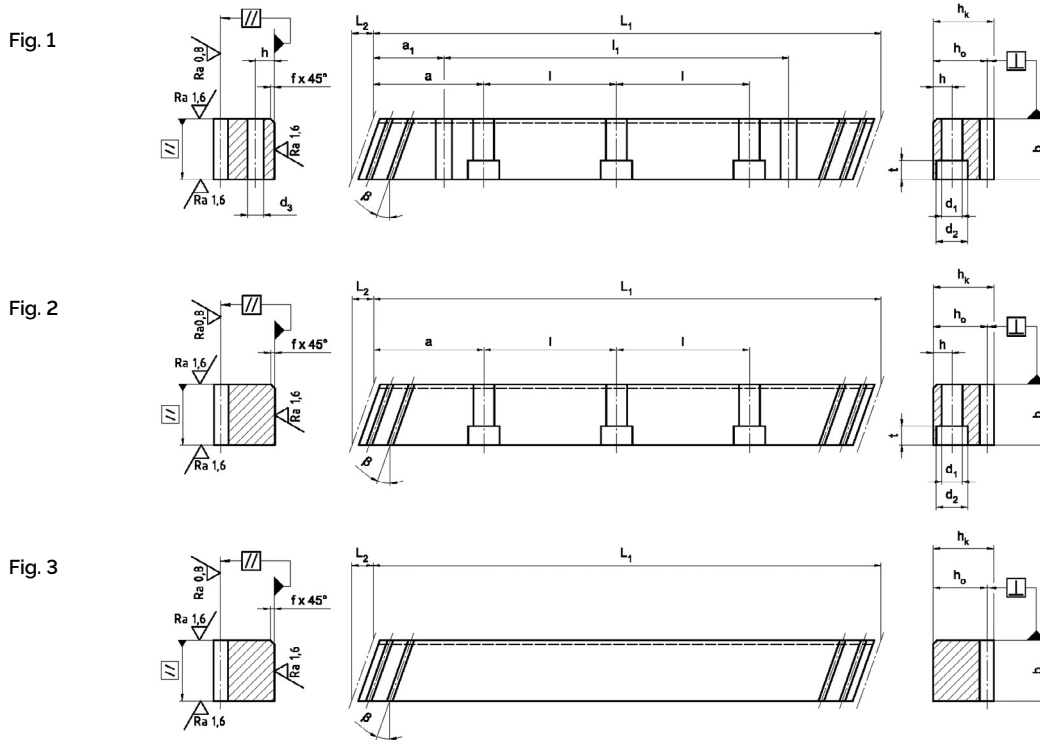
<sup>2)</sup> z Number of teeth      <sup>4)</sup> p Pitch ( $p=m \cdot \pi$ )

any other lengths on request

## 2.1 Standard gear racks

### 2.1.16 Q6 stainless steel, helical toothed, metric pitch

<b>Tooth rack:</b>	Pressure angle $\alpha=20^\circ$ ground	<b>Quality:</b> $f_p$ (mm)	6 in accordance with DIN 3962, 3963, 3967 Single pitch deviation Module $\leq 3$ : 0.006 Module $> 3$ : 0.008
<b>Outer surfaces:</b>	ground on all sides	$F_p$ (mm)	Total pitch deviation
<b>Material:</b>	X90CrMoV18	$F_p/1000$ (mm)	0.035 for a 1000 mm length



Standard lengths	$m^{1)}$	$p_s^{4)}$	$L_1$	$L_2$	$z^{2)}$	$b$	$h_k$	$h_o$	$f$	$a$	$l$	$n^{3)}$	$h$	$d_1$	$d_2$	$t$	$a_1$	$l_1$	$d_3$	Dimensions kg	
	-	mm	mm	mm	-	mm	mm	mm	mm	mm	mm	-	mm	mm	mm	mm	mm	mm	mm	mm	
ZST M2 - 24 x 24 x 1000 - S	2	6.67	1000.0	8.5	150	24	24	22	2	62.5	125.00	8	8	7	11	7	31.7	936.6	5.7	4.1	
MST M2 - 24 x 24 x 200 - SL	2	6.67	200.0	8.5	30	24	24	22													0.8
ZST M3 - 29 x 29 x 1000 - S	3	10.00	1000.0	10.3	100	29	29	26	2	62.5	125.00	8	9	10	15	9	35.0	930.0	7.7	5.9	
MST M3 - 29 x 29 x 200 - SL	3	10.00	200.0	10.3	20	29	29	26													1.2
ZST M4 - 39 x 39 x 1000 - S	4	13.33	1000.0	13.8	75	39	39	35	3	62.5	125.00	8	12	10	15	9	33.3	933.4	7.7	10.7	
MST M4 - 39 x 39 x 200 - SL	4	13.33	200.0	13.8	15	39	39	35													2.2
ZST M5 - 49 x 39 x 1000 - S	5	16.67	1000.0	17.4	60	49	39	34	3	62.5	125.00	8	12	14	20	13	37.5	925.0	11.7	13.0	
MST M5 - 49 x 39 x 200 - SL	5	16.67	200.0	17.4	12	49	39	34													2.7

<sup>1)</sup> m Module

<sup>3)</sup> n Number of holes

any other lengths on request

<sup>2)</sup> z Number of teeth <sup>4)</sup>  $p_s$  Transverse pitch ( $p_s = m \cdot \pi / \cos \beta$ )  $\beta = 19.5283^\circ (19^\circ 31' 42'')$



## 2.1 Standard gear racks

### 2.1.17 Q6 stainless steel, straight toothed, module pitch

<b>Tooth rack:</b>	Pressure angle $\alpha=20^\circ$ ground	<b>Quality:</b> $f_p$ (mm)	6 in accordance with DIN 3962, 3963, 3967 Single pitch deviation Module $\leq 3$ : 0.006 Module $> 3$ : 0.008
<b>Outer surfaces:</b>	ground on all sides	$F_p$ (mm)	Total pitch deviation
<b>Material:</b>	X90CrMoV18	$F_p/1000$ (mm)	0.035 for a 1000 mm length

Fig. 1

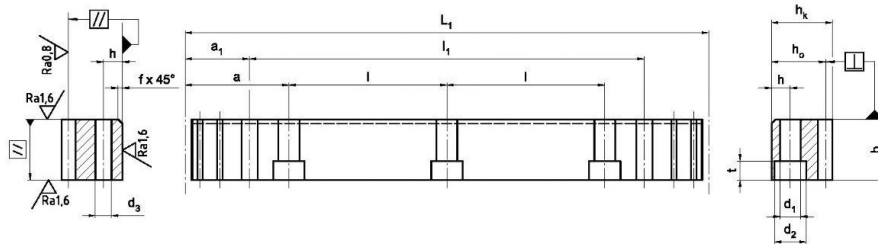


Fig. 2

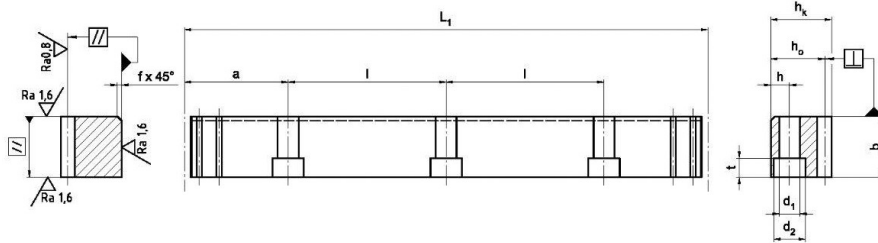
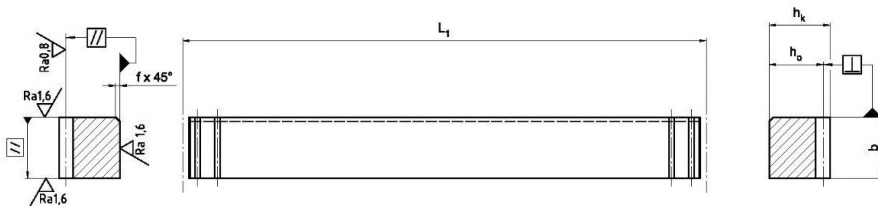


Fig. 3



Standard lengths	$m^1$	$p^4$	$L_1$	$z^2$	b	$h_k$	$h_o$	f	a	l	$n^3$	h	$d_1$	$d_2$	t	$a_1$	$l_1$	$d_3$	Dimensions kg
ZST M2 - 24 x 24 x 1005 - G	2	6.28	1005.3	160	24	24	22	2	62.8	125.66	8	8	7	11	7	31.3	942.7	5.7	4.2
MST M2 - 24 x 24 x 201 - G	2	6.28	201.0	32	24	24	22												0.8
ZST M3 - 29 x 29 x 1017 - G	3	9.42	1017.9	108	29	29	26	2	63.6	127.23	8	9	10	15	9	34.4	949.1	7.7	6.0
MST M3 - 29 x 29 x 198 - G	3	9.42	198.0	21	29	29	26												12
ZST M4 - 39 x 39 x 1005 - G	4	12.57	1005.3	80	39	39	35	3	62.8	125.66	8	12	10	15	9	37.5	930.3	7.7	10.7
MST M4 - 39 x 39 x 201 - G	4	12.57	201.0	16	39	39	35												2.2
ZST M5 - 49 x 39 x 1005 - G	5	15.71	1005.3	64	49	39	34	3	62.8	125.66	8	12	14	20	13	30.1	945.0	11.7	13.1
MST M5 - 49 x 39 x 204 - G	5	15.71	204.0	13	49	39	34												2.7

<sup>1)</sup> m Module                      <sup>3)</sup> n Number of holes

<sup>2)</sup> z Number of teeth    <sup>4)</sup> p Pitch ( $p=m \cdot \pi$ )

any other lengths on request

## 2.1 Standard gear racks

### 2.1.18 Q6 stainless steel, straight toothed, metric pitch

<b>Tooth rack:</b>	Pressure angle $\alpha=20^\circ$ ground	<b>Quality:</b> $f_p$ (mm)	6 in accordance with DIN 3962, 3963, 3967 Single pitch deviation Module $\leq 3$ : 0.006 Module $> 3$ : 0.008
<b>Outer surfaces:</b>	ground on all sides	$F_p$ (mm)	Total pitch deviation
<b>Material:</b>	X90CrMoV18	$F_p/1000$ (mm)	0.035 for a 1000 mm length

Fig. 1

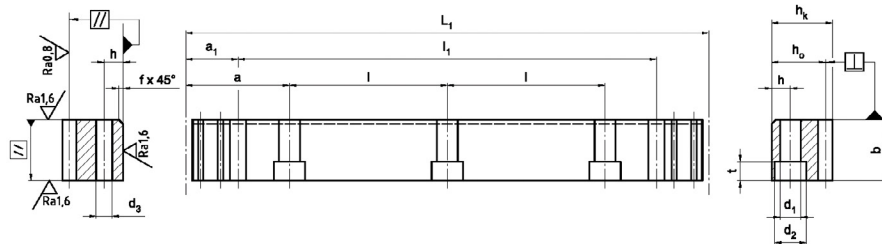


Fig. 2

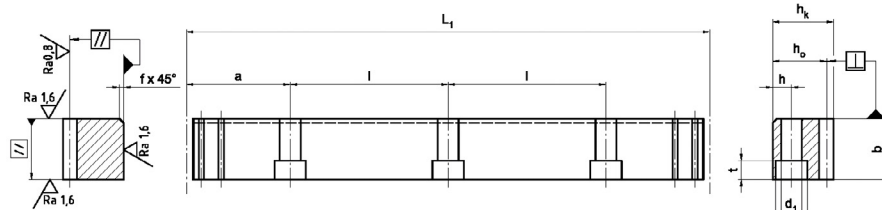
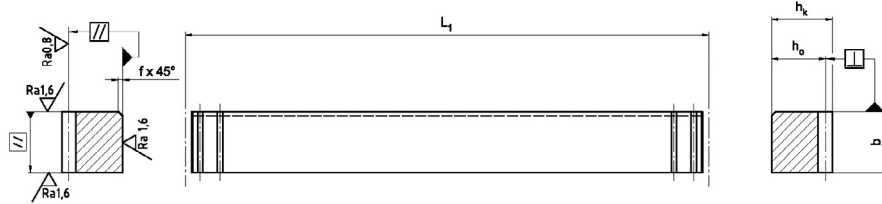


Fig. 3



Standard lengths	$p^{4)}$ mm	$m$ -	$L_1$ mm	$z^{2)}$ -	$b$ mm	$h_k$ mm	$h_o$ mm	$f$ mm	$a$ mm	$l$ mm	$n^{3)}$ -	$h$ mm	$d_1$ mm	$d_2$ mm	$t$ mm	$a_1$ mm	$l_1$ mm	$d_3$ mm	Dimensions kg
ZST T5 - 24 x 24 x 600 - G	5	1,592	600	120	24	24	22,41	2	60	120	5	8	7	11	7	25	550	5,7	2,5
ZST T5 - 24 x 24 x 1200 - G			1200	240													1150		5,0
MST T5 - 24 x 24 x 120 - G	5	1,592	120	24	24	24	22,41												0,8
ZST T10 - 29 x 29 x 600 - G	10	3,183	600	60	29	29	25,82	2	60	120	5	9	10	15	9	25	550	7,7	3,6
ZST T10 - 29 x 29 x 1200 - G			1200	120													1150		7,2
MST T10 - 29 x 29 x -200 - G	10	3,183	200	20	29	29	25,82												12

<sup>1)</sup> m Module                      <sup>3)</sup> n Number of holes

<sup>2)</sup> z Number of teeth    <sup>4)</sup> p Pitch ( $p=m \cdot \pi$ )

any other lengths on request

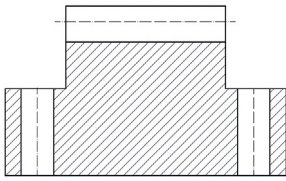
2.2 Customised gear racks



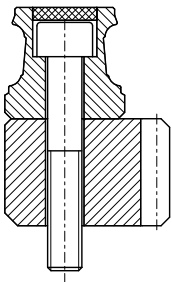
## 2.2 Customised gear racks

### 2.2.1 Customised gear racks

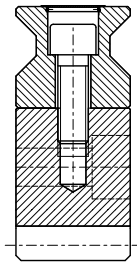
Any gear racks and guide racks can be made to a customer's drawing as long as they are within the specifications listed below.



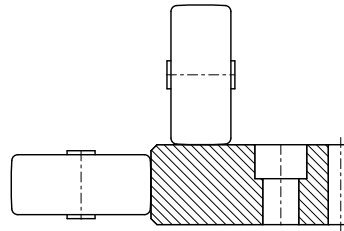
Unit weight:	max. 500 kg
Length:	max. 3000 mm
Tooth rack:	Modules 2 ... 20 Metric 5 mm ... 20 mm
Helix angle $\beta$ :	-30° ... +30° Left and right ascending
Material:	C45, 42CrMo4+QT, 16MnCr5 X90CrMoV18 (stainless steel)
Hardening process:	Induction hardening Case hardening Through hardening Nitriding
Best accuracy:	Q4



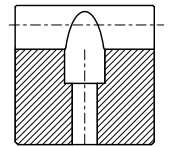
Combination with profiled linear guideway



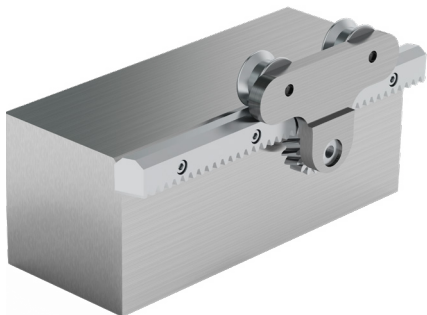
Screw connection from below



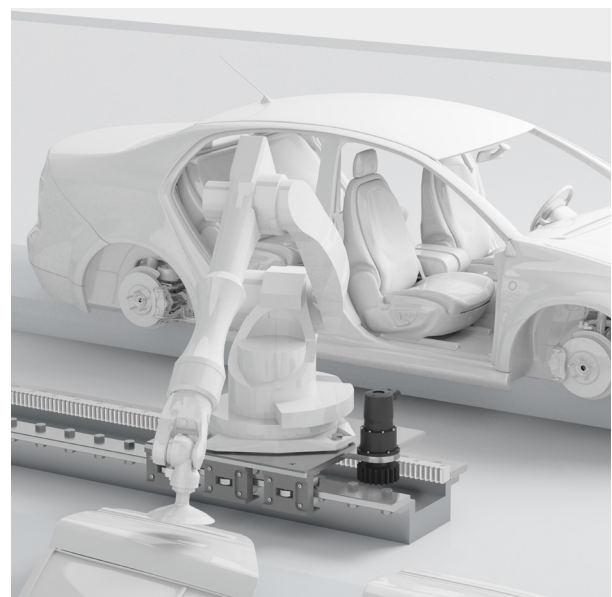
Box way with integrated tooth rack



Screw connection through the tooth rack



Gear rack integrated into linear bearing (guide rack)



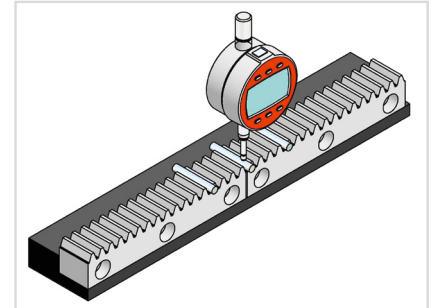
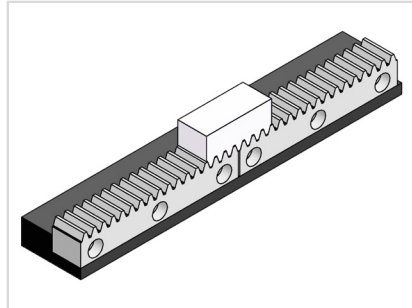
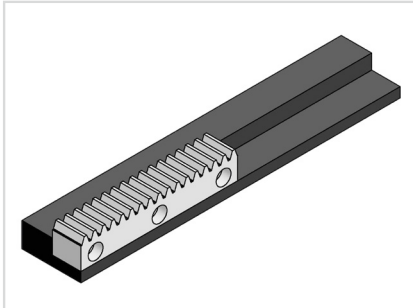
## 3 Installation

### 3.1 Gear racks fitting instructions / lubrication

Gear racks can be assembled in any lengths.

When assembling the spacing between two gear racks must be pitch precise.

Dowels may be needed for gear racks shorter than 1m.



- Aligning the first gear rack
- Tighten the screws with a torque wrench.
- The torque depends on the friction condition and strength class of the screws.
- For soft or induction hardened gear racks use screws with a strength class of 10.9. For case and through hardened gear racks use strength class 12.9.
- Align the next gear rack with a mounting plate.
- Screw the gear rack on.
- Using a measuring roller check the height deviation at the transition point and if necessary change the position of one gear rack.
- Check that the gear racks are parallel to each other.
- Finally, insert the pins if necessary.

#### Lubrication - instructions for use

Adequate lubrication using a lubricant adapted to the operating conditions is required to maintain the functionality of the rack drive. Lubrication protects from wear and corrosion and reduces friction.

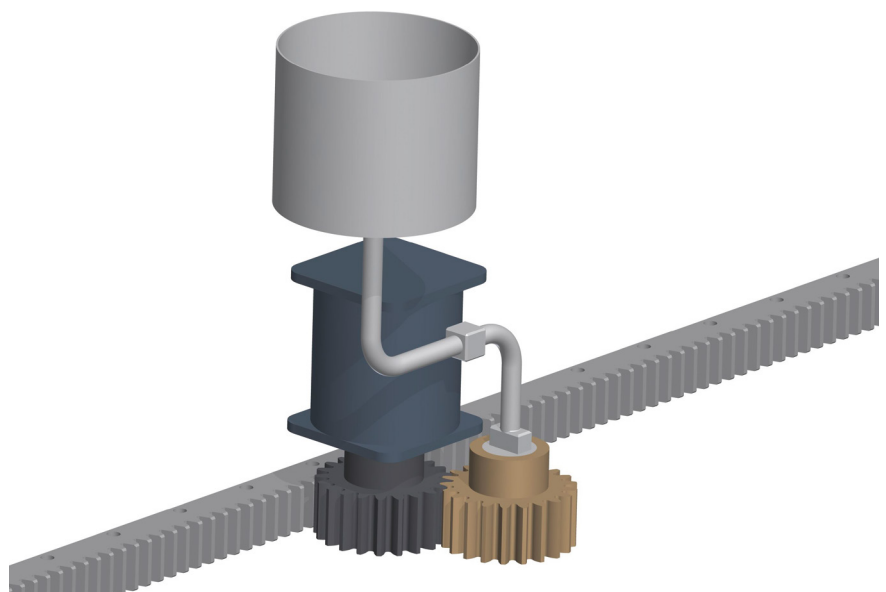
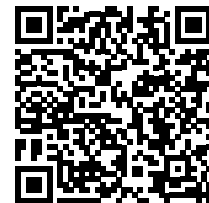
Apart from the initial lubrication during assembly, the machine must be lubricated regularly during operation.

Normally electrically-driven lubrication cartridges are used for lubrication. Lubrication greases NLGI 00 to NLGI 0 are applied to the drive pinion or the gear rack with a felt pinion.

A typical lubricant is Klüber Microlube GB 0.

Too little lubrication shortens the service life of the drive system. Therefore, always ensure that the machine is lubricated adequately.

The detailed version of our mounting instruction is available under [www.schneeberger.com/downloads](http://www.schneeberger.com/downloads).



**4** Order description

**4.1** Standard gear racks

Standard gear racks			--	ZST	M6	-59x49x1000	-S	-I	-6	-D
Quantity										
Model	ZST									
Tooth rack	M_---	modular								
	T_---	metric, in mm								
Size	b x hk x L1	in mm								
Tooth rack	S	inclined to the right, 19.5283°								
	G	straight								
Hardness	C	Material 16MnCr5, case hardened								
	I	Material C45, induction hardened								
	W	Material C45, soft								
	N	Material 42CrMo4+QT, nitrided								
	V	Material 42CrMo4+QT, tempered								
	H	Material X90CrMoV18 (stainless steel), through hardened								
Accuracy	4, 5, 6, 7	ground								
	8	milled, soft								
	9	ground, nitrided								
	11	milled, induction hardened								
Drilled holes	D	with pin and fixing holes				Fig. 1				
	OP	without pin holes				Fig. 2				
	OH	without holes				Fig. 3				

Standard assembly tool			--	MST	M6	-	-SL
Quantity							
Model	MST						
Tooth rack	M_---	modular					
	T_---	metric, in mm					
Grösse	b x hk x L1	in mm					
Tooth rack	SL	inclined to the left, 19.5283°					
	G	straight					

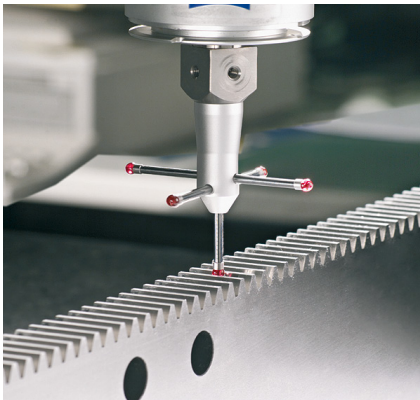
## 4. Order description

### 4.2 Customised gear racks

Customised gear racks			--	ZST	M4	-60x50x1820	-SL	-C	-5	-DX	-sp
Quantity											
Model	ZST										
Tooth rack	M_ _ _	modular									
	T_ _ _	metric, in mm									
Size	b x hk x L1	in mm									
Tooth rack	S	inclined to the right									
	SL	inclined to the left									
	G	straight									
Hardness	C	Material 16MnCr5, case hardened									
	O	Material 16 MnCr5, nitrided									
	I	Material C45, induction hardened									
	W	Material C45, soft									
	M	Material 42CrMo4+QT induction hardened									
	N	Material 42CrMo4+QT, nitrided									
	V	Material 42CrMo4+QT, tempered									
	H	Material X90CrMoV18 (stainless steel), through hardened									
Accuracy	4, 5, 6, 7	ground									
	8	milled, soft									
	9	ground, nitrided									
	10, 11	milled, induction hardened									
Drilled holes	D	with pin and fixing holes	Fig. 1								
	OP	without pin holes	Fig. 2								
	OH	without holes	Fig. 3								
	X	half hole pitch ( $l_x = \frac{1}{2} \cdot l$ )									
Special features	sp	with special features as in the drawing									

Customised assembly tool			--	MST	M4		-SR	-sp
Quantity								
Model	MST							
Tooth rack	M_ _ _	modular						
	T_ _ _	metric, in mm						
Size	b x hk x L1	in mm						
Tooth rack	SL	inclined to the left						
	SR	inclined to the right						
	G	straight						
Special features	sp	with special features as in the drawing						

### 5.1 Quality



All gear racks are manufactured on modern machine tools. The induction and through hardening is also done in-house.

It goes without saying that all SCHNEEBERGER production sites are ISO 9001 certified.

All process steps are self inspected by the machine operator. If required a measurement report is compiled on the quality of the gear rack.

The tooth rack profile complies with DIN 867, the tolerances for accuracy classes are based on DIN 3962, 3963 and 3967.

The tooth rack is measured on a CNC measuring machine.

The special feature of the SCHNEEBERGER standard tooth rack is the tip chamfer. This reduces the risk of injury to a minimum.

Our concern is to provide the best industrial companies with the best products and services because that is the key to our customers' success.





**6 SCHNEEBERGER Agencies**

**EUROPE**

**AUSTRIA**

Haberkorn GmbH  
6961 Wolfurt  
Phone: +43 5574 695-0  
Fax: +43 5574 695-99  
info.wolfurt@haberkorn.com

**BULGARIA / REPUBLIC OF NORTH MACEDONIA**

Atlas Technik EOOD  
Hippodroma, Bl. 139B, Eing. A, App. 6  
1612 Sofia, PB 51  
Bulgarien  
Phone +359 2 859 76 81  
Fax +359 2 859 76 81  
Mobile +359 8 852 32 595  
E-Mail: al\_popoff@atlas-technik.com

**CROATIA**

Haberkorn CRO d.o.o.  
10431 Sveta Nedelja  
Phone +385 1 333 5870  
Fax +385 1 337 3902  
E-Mail: info@haberkorn.hr

**CZECH REPUBLIC**

INOMECH s.r.o.  
Martina Koláře 2118  
390 02 Tábor  
Phone +420 381 252 223  
E-Mail: inomech@inomech.com

**DENMARK**

HERSTAD + PIPER A/S  
Jernholmen 48c  
2650 Hvidovre  
Phone +45 367 740 00  
Fax +45 367 777 40  
E-Mail: mail@herstad-piper.dk

**FINLAND**

EIE Maskin OY  
PL, 80 Asematie 1  
10601 Tammissaari  
Phone +358 192 239 100  
Fax +358 192 239 199  
E-Mail: info@eie.fi

**FRANCE**

**Region Rhône-Alpes**  
Groupe BARET  
6 avenue du 11 novembre 1918  
69200 Venissieux  
Phone +33 4 78 77 32 32  
Fax +33 4 78 00 90 00  
E-Mail: contact@baretf.fr

**Regions Ile de France,**

**Normandie, Bretagne**  
Groupe LECHEVALIER  
56 rue Jean Mermoz  
Parc d'activités de la Bretèque  
76230 Bois-Guillaume Cedex  
Phone +33 2 35 12 65 65  
Fax +33 2 35 59 89 97  
E-Mail: contact@lechevalier-sa.com

**Region Nord Pas de Calais**

LEFRANC LTL «Le Panetier»  
35, rue Pierre Martin  
Parc d'Activités de l'Inquétie  
62280 Saint Martin Boulogne  
Phone +33 3 21 99 51 51  
Fax +33 3 21 99 51 50  
E-Mail: lefranc.boulogne@lefranc-sa.fr

**GERMANY**

BGP-Blazevic Geradlinige Präzisionstechnik  
Stipo Blazevic  
Auerbacher Straße 8  
93057 Regensburg  
Phone +49 941 463 704 0  
Fax +49 941 463 704 50  
Mobile +49 151 401 126 25  
E-Mail: info@bpg-blazevic.de

**EUROPE**

**HUNGARY**

Haberkorn Kft.  
Asztalos Sándor u.12  
Budapest, 1087  
Phone +36 13030325  
Fax +36 1/3030262  
E-Mail: office@haberkorn.hu

**ITALY**

Gruppo Rinaldi  
Via Campana, 233G  
80078 Pozzuoli (NA)  
Phone +39 081 853 085 6  
Fax +39 081 303 049 8  
E-Mail: info@grupporinaldi.it

Nadella S.r.l.

Via Melette, 16  
20128 Milano  
Phone +39 022 709 329 7  
Fax +39 022 551 768  
E-Mail: customer.service@nadella.it

**NORWAY**

EIE Maskin AS  
Tvetenveien 164  
0671 Oslo  
Phone +47 675 722 70  
Fax +47 675 722 80  
E-Mail: elmeko@elmeko.no

**POLAND**

TECHNIKA LINIOWA  
Rollico Rolling Components  
Ul. Cegielniana 21  
42-700 Lubliniec  
Phone +48 343 510 430  
Fax +48 343 510 431  
E-Mail: rollico@rollico.com

**ROMANIA**

Meximpex SRL  
4, Burebista Blvd.,  
bl. D13 sc. A et 2 ap. 9-10  
031108 Bucharest  
Phone +40 213 166 843 / 44  
Fax +40 213 166 846  
E-Mail: office@meximpex.ro

**RUSSIA**

Bearing Alliance, TD  
121069 Moscow  
Phone +7495 987 32 92 add 114,  
8 800 100 42 92  
Fax +7495 987 32 92  
E-Mail: 114@9873292.ru

**SERBIA/MONTENEGRO**

Haberkorn d.o.o.  
Kralja Petra I, 59  
21203 Veternik,  
Phone +381 21 820 188  
Fax +381 21 820 071  
E-Mail: office@haberkorn.rs

**SLOVAKIA**

KBM, s.r.o.  
Juraj Hájovský  
Zitná 13  
010 04 Zilina  
Phone +421 417 070 324  
Fax +421 417 070 333  
Mobile +421 090 585 1465  
E-Mail: jhajovsky@kbm.sk

**SLOVENIA / BOSNIA HERZEGOVINA**

Haberkorn d.o.o.  
Vodovodna ul. 7  
2000 Maribor  
Phone +386 2 320 67 10  
Fax +386 2 320 67 30  
E-Mail: info@haberkorn.si

**EUROPE**

**SPAIN / PORTUGAL**

TECNOMECA-KIDELAN-DEXIS  
Pol Industrial Itziar  
20829 DEBA (Gipuzkoa)  
Phone +34 943 199 201  
Phone +34 943 199 273  
E-Mail: tecnomeca@tecnomeca.com

**SWEDEN**

EIE Maskin AB  
Box 7  
12421 Bandhagen  
Phone +46 87 278 800  
Fax +46 87 278 899  
E-Mail: eie@eie.se

**TURKEY**

Birlik Rulman (Paz) Ltd.sti.  
Mumhane Cad. No: 16  
80030 Karakoy-Istanbul  
Phone +90 212 249 54 95  
Fax +90 212 244 21 40  
E-Mail: birltik@birltikrulman.com

Mustafa Kozanlı Mühendislik Ltd. Şti.  
Çalı Kavşağı Alaaddinbey Cad. No: 7  
16130 Nilüfer / BURSA  
Phone +90 224 443 26 40  
Fax +90 224 443 26 39  
E-Mail: satis@kozanli.com.tr

**ASIA**

**TAIWAN / REPUBLIC OF CHINA**

Ever Bright Systems Co., Ltd.  
1F., No. 52, Lane 10, Chi-Hu Road  
11492, Taipei  
Phone +886 2 2659 7881  
Fax +886 2 2659 7831  
E-Mail: sales@everbright.com.tw

**INDIA**

Jagat Enterprise  
83, Narayan dhuru street, 3rd floor, Mazjid Bunder  
Mumbai - 400 003  
Phone +91 2223421941  
Fax +91 2223413405  
E-Mail: jagatent@gmail.com

M.R. Bearing Company  
MR Complex, 224 Linghi Chetty Street Parrys,  
Chennai - 600001  
Phone +91 4425232847  
Fax +91 4425264497  
E-Mail: info@mrbearing.in

**SOUTH AFRICA**

Fischli & Fuhrmann Ltd.  
P.O Box 253  
1600 Isando Gauteng  
Phone +27 119 745 571  
Fax +27 119 745 574  
E-Mail: info@fif.co.za

**SOUTH AMERICA**

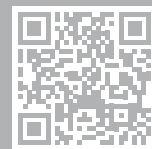
Ibatech Tecnologia Ltda.  
Estrada da Arrozeira, 90 – Residencial Eldorado  
92990-000 Eldorado do Sul  
Brazil  
Phone +55 51 3337 2870 (RS)  
Phone +55 19 3483 0007 (SP)  
E-Mail: vendas@ibatech.com.br

[www.schneeberger.com](http://www.schneeberger.com)  
[www.schneeberger.com/contact](http://www.schneeberger.com/contact)

#### PROSPECTUSES

- COMPANY BROCHURE
- CUSTOMIZED BEARINGS
- GEAR RACKS
- LINEAR BEARINGS AND RECIRCULATING UNITS
- MINERAL CASTING SCHNEEBERGER
- MINISLIDE MSQSCALE

- MINI-X MINIRAIL / MINISCALE PLUS / MINISLIDE
- MONORAIL AND AMS PROFILED LINEAR GUIDEWAYS WITH INTEGRATED MEASURING SYSTEM
- MONORAIL AND AMS APPLICATION CATALOG
- POSITIONING SYSTEMS
- SLIDES



[www.schneeberger.com](http://www.schneeberger.com)

[www.schneeberger.com](http://www.schneeberger.com)