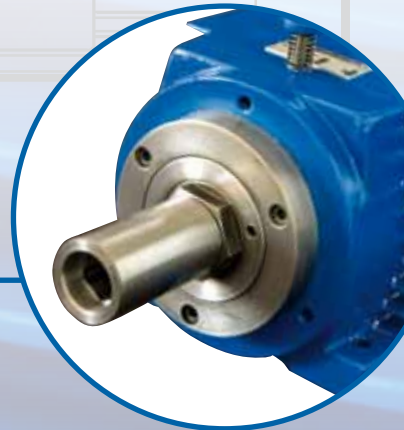




# SPECIAL ELECTRIC MOTORS



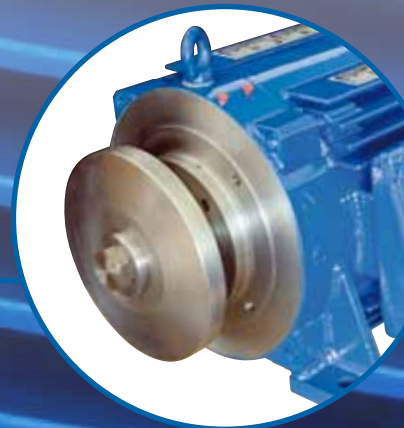
High-Speed  
Machining Motors



Special Drives /  
High-Speed Direct Drives



Flat Motors /  
Circular Saw Motors





# We keep you running.

## PRECISION AND HIGH SPEED

As a financially independent, medium-sized, family-owned company, we manufacture specialty electric motors and induction motor elements, especially for high-speed operations.

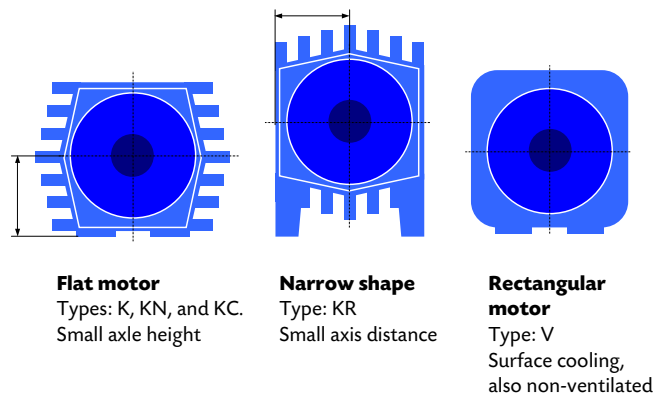
With our own R&D department and the latest technical equipment, we are able to manufacture motors according to customized specifications and designs for our customers. Our quality products manufactured in Germany have proven themselves for decades, even under the toughest conditions. It's no wonder that with our performance, we have become the leading supplier and partner for well-known original equipment manufacturers (OEM).



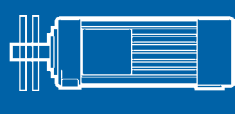
As a result, many customers from the industrial and trade sectors count on us and our technical support – and we're proud of it. However, we don't stop there. We work hard to earn our customers' trust in our knowledge and consulting skills – every single day. Ultimately, we want to continue improving, too.

We keep you running!

## PERSKE ADVANTAGES AT A GLANCE

- Precision and high speed for cost-effective production
- Flexible design based on a modular system can adapt to different shaft ends and mounting dimensions
- Customer-specific, application-oriented development results in optimized solutions
- Best balance quality and smoothness with maximum precision ensure a long service life
- Space-saving, installation-ready, compact design.



<b>Design criteria</b>		<b>4</b>
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<b>High-speed machining motors</b> <b>A</b> 	<b>1</b> Basic design <b>2</b> Milling motors for cylindrical shaft tools <b>3</b> High-precision motors for hydro-clamp chuck systems <b>4</b> Motor spindles with HSK (hollow taper shank) tool holders	<b>9</b> 20 30 33
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<b>General Information</b>	Technical information Permissible shaft loads Protection class and operating modes Designs/calculation formulas Instructions for ordering replacement parts Motor checklist (for inquiries and orders)	<b>56</b>
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## A) Rules:

<b>Electrical design</b>	DIN EN 60034-1 (VDE 0530-1)
<b>Performance rating</b>	Thermal class F
<b>Site altitude</b>	≤ 1000 m above sea level
<b>Ambient temperature</b>	40°C max.
<b>Converter-fed induction motors</b>	DIN VDE 0530-17 (VDE 0530-17)
<b>Mechanical design</b>	DIN EN 60034-7 (DE 0530-7)
<b>Protection class</b>	DIN EN 60034-5 (VDE 0530-5) IP 54 totally enclosed, fan cooled terminal box, IP 55-rated
<b>Vibration level</b>	DIN EN 60034-14 (VDE 0530-14) $V_{eff} \leq 1.8$ mm/s in the delivered state
<b>Balancing</b>	Vibration level R or S in accordance with DIN ISO 2373 upon request

## B) General:

<b>Low-Voltage Directive</b>	2006/95/EC Motors are intended for installation in machines according to Machine Directive 2006/42/EC, but are subject to the Low-Voltage Directive.
<b>Energy efficiency</b>	IEC 600 34 – 30 : 2008; EuP Directive 640/2009 Scope: low-voltage motors connected directly to 50 or 60 Hz and continuous duty. Not included are motors exclusively built for converter operations as well as brake motors.

## C) The following are possible upon request:

<b>Country-specific regulations</b>	<i>USA</i> NEMA MG1 <i>Canada</i> CSA C22.2 No. 100, file L.R 16865 for selected Types, upon request
<b>Dust protection</b>	DIN EN 61241-1 (Zone 20-22) Increased dust protection in accordance with ATEX protection zone 22 for non-conductive dust

## Breakdown of Type designation

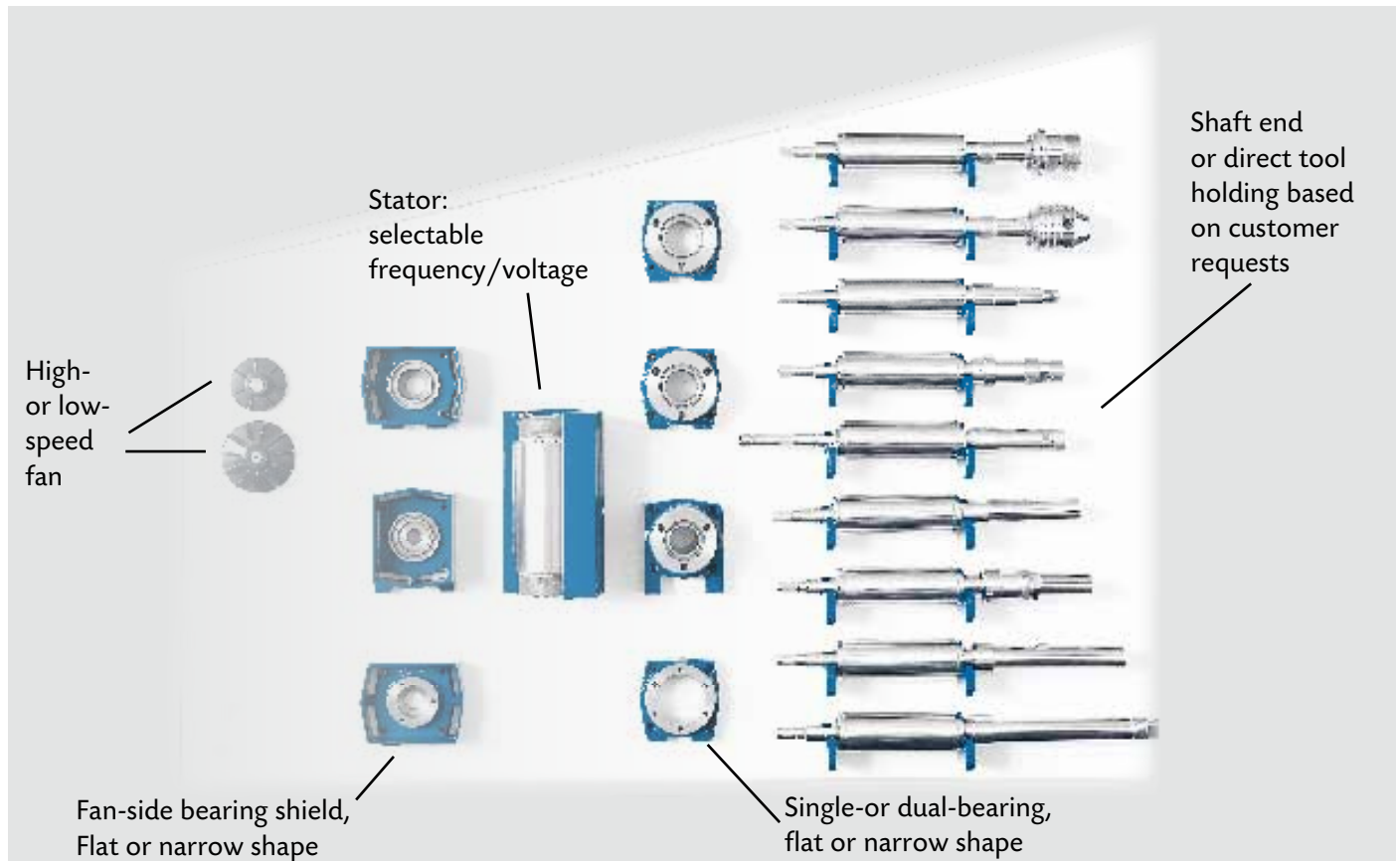
### Example

Note: performance data, rated voltage and frequency are not coded in the type - designation. These are indicated in plain text. The shaft design is provided in the drawings. The type designation does not provide complete order information!

	K	...	61.	13	-	2	D	Br
Model series K, KN, KC, KR, V								
S – Special motor based on customer specifications								
Frame Size								
Code for housing length								
Code for electrical design								
Pole number								
Supplemental letter e.g. D – Double bearing Br – electromechanical brake								



## Special electric motors based on a modular design



## Precision and high speed

- Customer-specific drive solutions
- High-speed, speed-adjustable drives
- High overload capacity and high stalling torque
- Direct tool-holding
- High radial and axial run-out precision in micron-level quality
- Best balance quality and running smoothness
- All motors developed and manufactured in-house

**Features that  
no standard  
motor offers.**

## Quality made in Germany

### Machining motors for

- Wood
- Plastics
- Metal
- Composite materials
- Stone

### Direct drives for

- Atomizers
- Pumps
- Fans
- Compressors
- Grinders
- Test benches

**... over 60 years of experience attest to our quality.**

Type	Weight [kg]	Rated output [kW]						
		S6-60%	S 1					
		50 Hz 3,000 rpm	100 Hz 6,000 rpm	150 Hz 9,000 rpm	200 Hz 12,000 rpm	300 Hz 18,000 rpm	400 Hz 24,000 rpm	500 Hz 30,000 rpm
KN 21.05-2	1.8	-	-	0.15	0.2	0.32	0.4	0.4
KN 22.08-2	2.1	-	-	0.24	0.32	0.5	0.6	0.6
KN 23.10-2	2.9	-	-	0.3	0.4	0.6	0.7	-
V 30.06-2	2.7	-	0.2	0.3	0.42	0.6	0.65	0.65
V 31.09-2	3.4	-	0.3	0.45	0.65	0.9	1.0	1.0
KR 35.1-2 (D)	4.0	-	0.3	0.5	0.7	0.9	1.0	-
KR 35.3-2 (D)	4.8	-	0.45	0.7	1.0	1.3	1.4	-
KR 35.5-2 (D)	5.8	0.28	0.6	1.0	1.4	1.9	2.0	-
KR 35.7-2 (D)	6.2	0.34	0.75	1.1	1.6	2.2	-	-
KR 35.9-2 (D)	7.2	0.4	0.9	1.4	2.0	-	-	-
V 50.09-2	8.5	0.6	1.2	1.5	1.85	2.5	3.0	3.0
KN/KR 50.11-2 (D)	11.0	0.9	1.8	2.5	3.0	4.0	-	-
KN/KR 51.14-2 (D)	12.5	1.3	2.4	3.5	4.0	5.0	-	-
KN/KR 52.16-2 (D)	13.5	1.5	2.7	4.0	4.5	-	-	-
V 60.11-2	16.0	1.7	2.2	3.0	4.0	5.0	5.0	5.0
V 61.15-2	18.5	2.3	3.0	4.0	5.0	-	-	-
KN/KR 60.09-2 (D)	14.5	2.0	2.7	3.0	3.5	-	-	-
KN/KR 61.13-2 (D)	19.5	3.0	4.0	5.0	6.0	7.0	-	-
KN/KR 62.18-2 (D)	22.0	4.0	5.5	6.0	7.0	-	-	-
KC 70.12-2 (D)	26.0	3.7	5.2	5.5	-	-	-	-
KC 71.16-2 (D)	33.0	5.0	6.6	7.0	8.0*	10.0*	-	-
KC 71.20-2 (D)	38.0	6.5	8.0	9.0	10.0*	12.0*	-	-
KC 72.28-2 (D)	51.0	9.0	12.5	13.0	-	-	-	-
K 81.23-2 (D)	69.0	11.0	16.0	18.0	-	-	-	-
K 82.27-2 (D)	79.0	13.0	18.0	22.0	-	-	-	-
K 83.37-2 (D)	91.0	18.0	25.0	-	-	-	-	-
K 91.31-2 (D)	106.0	20.0	25.0	30.0	-	-	-	-
K 93.38-2 (D)	128.0	25.0	30.0	35.0	-	-	-	-

### Legend:

Rated output based on thermal Class F

Weights are approximate value for single- bearing units

Output figures in the columns are assigned to various electrical models of the corresponding frequency

(D) Motor can be equipped with a single- or double bearing on the drive (tool) side

D = double-bearing only

\* Special KNO model – see milling motors, p. 29

KR model, narrow design, see milling motors, p. 25-28

S6 - 60% rating for conventional use in sawing operations

**4-pole motors available upon request**

Type	Weight [kg]	Rated output [kW]					
		S6-60%	S 1				
		50 Hz 3,000 rpm	75 Hz 4,500 rpm	100 Hz 6,000 rpm	150 Hz 9,000 rpm	200 Hz 12,000 rpm	300 Hz 18,000 rpm
K 110.24-2 (D)	160.0	25.0	25.0	30.0	35.0	42.0	55.0
K 111.31-2 (D)	177.0	37.0	37.0	45.0	-	-	-
K 112.38-2 (D)	195.0	45.0	45.0	55.0	-	-	-
K 113.50-2 (D)	240.0	55.0	55.0	65.0	-	-	-
K 140.38-2 (D)	360.0	65.0	65.0	80.0	-	-	-
K 141.50-2 (D)	450.0	75.0	80.0	100.0	-	-	-
K 160.50-2 D	625.0	90.0	100.0	-	-	-	-
K 162.60-2 D	750.0	120.0	125.0	-	-	-	-
K 200.50-2 D	840.0	140.0	150.0	-	-	-	-
K 202.60-2 D	900.0	170.0	175.0	-	-	-	-

### Main features of specialty motors

- Greater radial and axial run-out precision
- Reinforced bearings compared to standard motors
- Self-cooling by means of integrated fan
- Labyrinth seal
- Balancing at rated speed
- Voltage freely selectable
- Converter operating mode
- Variable speed

### Options at a glance

#### Special shaft, tool mounting

- Cylindrical with / without key with tight rotational tolerance
- Front or exterior threads
- Interior taper (e.g., for holding collets) or exterior taper
- High-precision for radial and axial runout in micron-level quality
- HSK-C for manual tool changes
- HSK-F63 for automatic tool changes
- Saw blade flange
- Hollow shaft for lubricants or purge air

#### Bearings

- Spindle or hybrid bearing based on speed and precision requirements
- Single or dual bearing on drive/tool side

#### Shock loads (e.g., by flying saw)

- Housing and bearing shield are welded steel

#### Balancing

- Balancing at rated speed also for various operating speeds
- Vibration level R or S

#### Electrical connection

- Choice of terminal box position (looking at shaft end): front, rear, right, left, axial
- Plug instead of terminal box up to rated current  $I_N \leq 5 \text{ A}$  possible

#### Motor protection, thermal

- Winding: PTC, PT 100, bimetal switch, KTY sensor
- Bearing: PTC, PT 100

#### Winding

- Tropical insulation
- Thermal Class H with thermal utilization based on class F

#### Protection against environmental influences

- Labyrinth seal in special models
- Sealing air for bearings
- Overpressure in the interior in the event of increased humidity
- Dust protection in accordance with ATEX Zone 22
- Anti-condensation heating
- Increased spray water protection

#### Add-on parts

- Brake, electromechanical
- Rpm indicator
- Mounting flange according to customer specifications

# Motor Selection with Examples

## A) Electrical requirements

The performance charts are type-specific and show the motor's maximum output for the associated frequency (speed). This always requires a particular winding configuration. The motors are then selected based on the operating requirements.

### 1) Fixed speed

Example: 4 kW desired at 18,000 rpm

Results in Type KN 50.11-2 on p. 6, column 300 Hz

### 2) Variable-speed operation

Here, the required output is assigned to a given frequency.

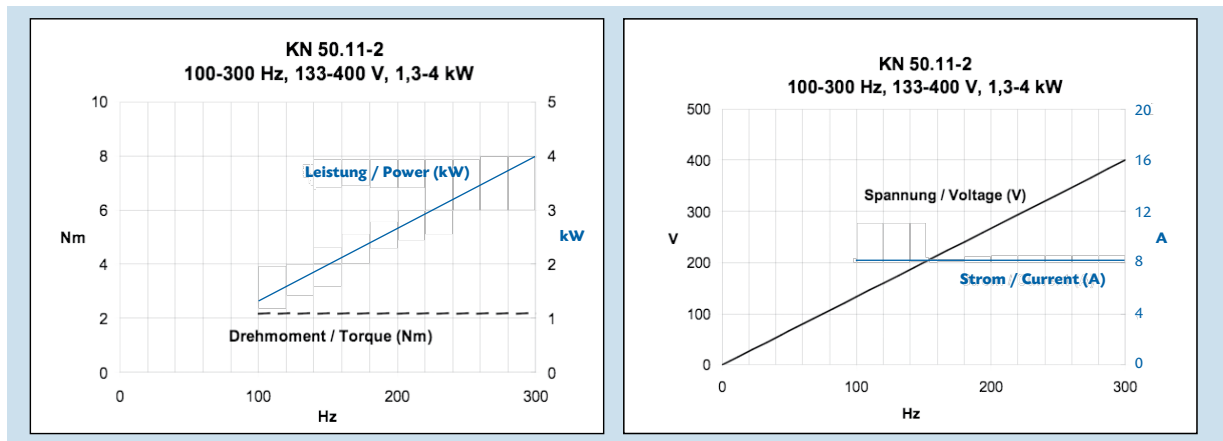
Example: 4 kW desired for a speed range of 6,000 to 18,000 rpm

This request may require various motor configurations, e.g.,

#### 2.1) Maximum output is required at 18,000 rpm and output may fall off below that.

**"Constant torque"** operating mode

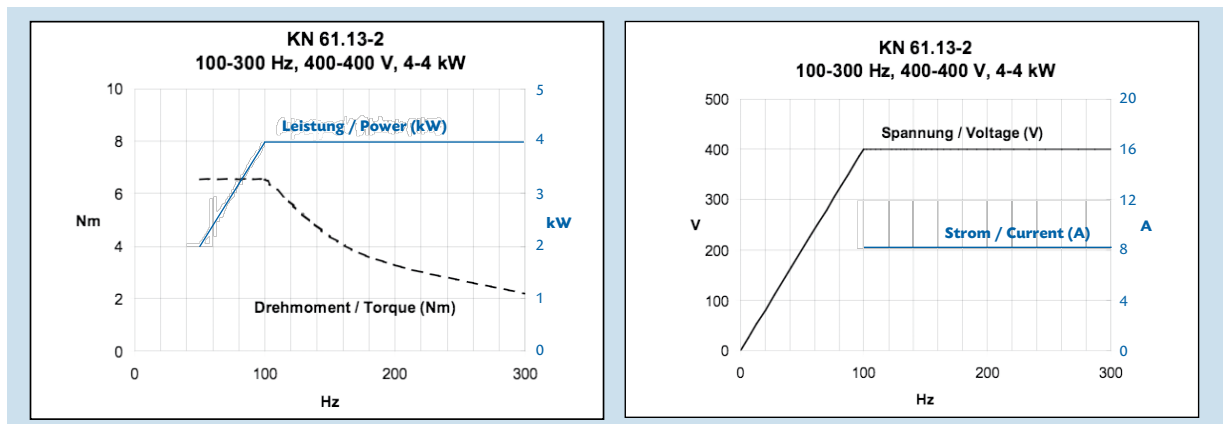
results in type KN 50.11-2 on p. 6, column 300 Hz with the following characteristics:



#### 2.2) Max. output is already required at 6,000 rpm, without output increase up to 18,000 rpm.

**"Constant output"** operating mode now

results in a bigger motor, Type KN 61.13-2 on p. 6, column 100 Hz with the following characteristics:



## B) Mechanical requirements

For a given motor-size, the bearing limits the maximum possible shaft diameter. If the required shaft end is bigger, then a bigger motor must be selected than needed in terms of output. This shall be verified on a case-by-case basis. The indicated maximum shaft diameters do not correspond to the basic models. The associated maximum speed depends on the bearing and application. Further inquiry is necessary. The drawings depicted here are non-binding; all dimensions are in mm. The valid drawings are provided with the order confirmation.





## Basic Model

**Housing:** Aluminum  
**Bearing shield:** Aluminum  
**Impregnation:** Vacuum technology  
**Protection class:** IP 54

## Model KN 20 V 30

Type	Weight [kg]	Rated output [kW]					
		S 1					
		100 Hz 6,000 rpm	150 Hz 9,000 rpm	200 Hz 12,000 rpm	300 Hz 18,000 rpm	400 Hz 24,000 rpm	500 Hz 30,000 rpm
KN 21.05-2	1.8	-	0.15	0.2	0.32	0.4	0.4
KN 22.08-2	2.1	-	0.24	0.32	0.5	0.6	0.6
KN 23.10-2	2.9	-	0.3	0.4	0.6	0.7	-
V 30.06-2	2.7	0.2	0.3	0.42	0.6	0.65	0.65
V 31.09-2	3.4	0.3	0.45	0.65	0.9	1.0	1.0

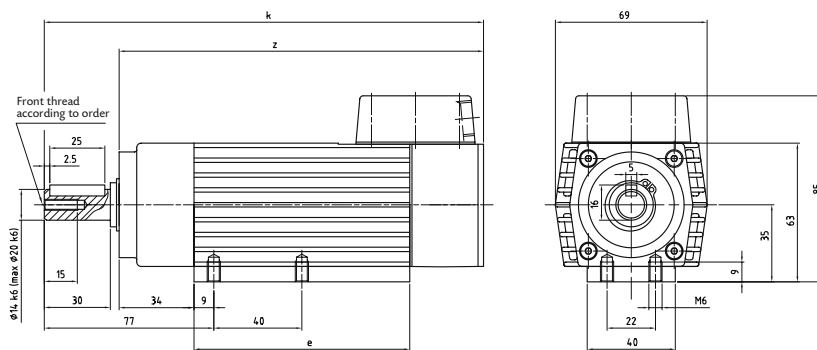
Only available with single-bearing

Values in table pertain to the drawings depicted below.

The maximum shaft diameter or customer-specific designs can influence the values.

### KN 20 Single-bearing

#### Drawing MS 151

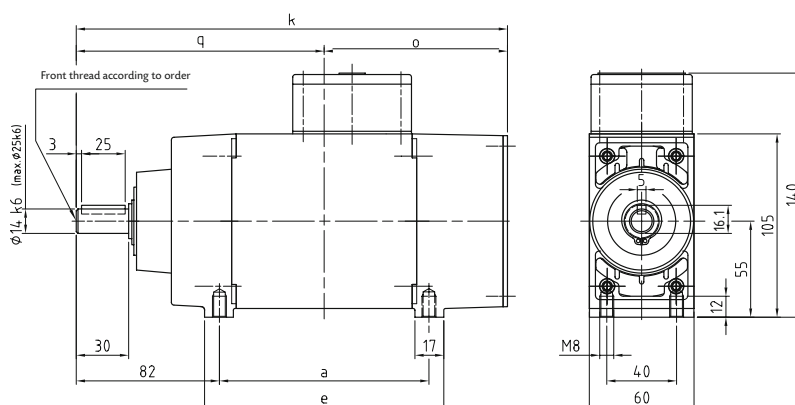


Type	e	k	z
KN 21.05	98	200	166
KN 22.08	133	235	201
KN 23.10	153	255	221

Max. shaft diameter 20 mm

### V 30 Single-bearing

#### Drawing MS 132



Type	a	e	k	o	q
V 30	90	108	217	90	127
V 31	120	138	247	105	142

Max. shaft diameter 25 mm



## Basic Model

**Housing:** Aluminum  
**Bearing shield:** Aluminum, cast iron for double bearing models  
**Impregnation:** Vacuum technology  
**Protection class:** IP 54

### Model KR 35

Type	Weight [kg]	Rated output [kW]				
		S 1				
		100 Hz 6,000 rpm	150 Hz 9,000 rpm	200 Hz 12,000 rpm	300 Hz 18,000 rpm	400 Hz 24,000 rpm
KR 35.1-2 (D)	4.0	0.3	0.5	0.7	0.9	1.0
KR 35.3-2 (D)	4.8	0.45	0.7	1.0	1.3	1.4
KR 35.5-2 (D)	5.8	0.6	1.0	1.4	1.9	2.0
KR 35.7-2 (D)	6.2	0.75	1.1	1.6	2.2	-
KR 35.9-2 (D)	7.2	0.9	1.4	2.0	-	-

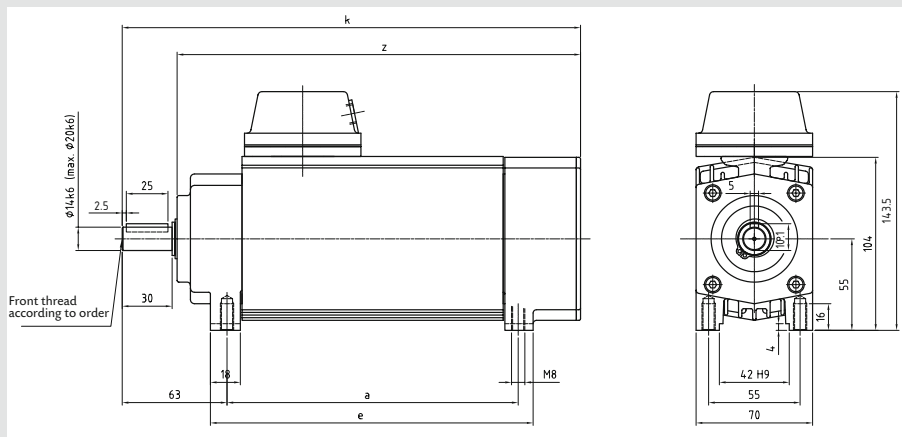
(D) Motor available with single or double bearings on drive (tool) side

Values in table pertain to the drawings depicted below.

The maximum shaft diameter or customer-specific designs can influence the values.

### KR 35 Single bearing

#### Drawing MS 3746

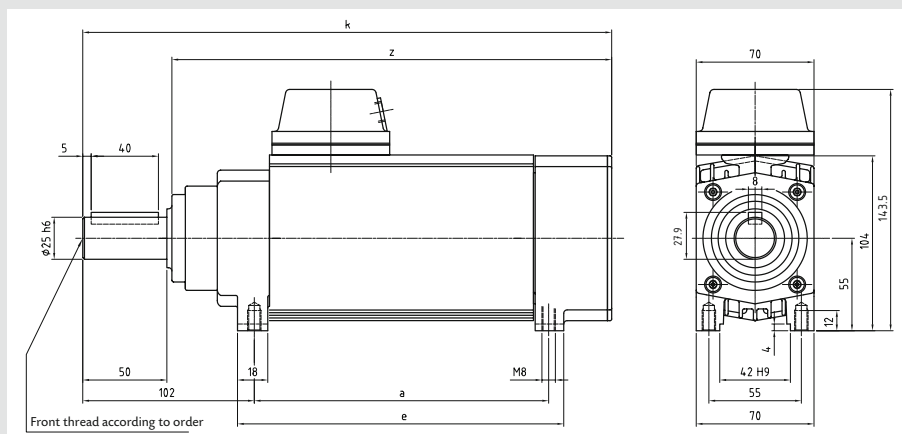


Type	a	e	k	z
KR 35.1	145	165	245	212
KR 35.3	175	195	275	242
KR 35.5	215	235	315	282
KR 35.7	235	255	335	302
KR 35.9	275	295	375	342

Max. shaft diameter 25 mm

### KR 35 D Double bearing

#### Drawing MS 3772



Type	a	e	k	z
KR 35.1 D	145	165	284	231
KR 35.3 D	175	195	314	261
KR 35.5 D	215	235	354	301
KR 35.7 D	235	255	374	321
KR 35.9 D	275	295	414	361

Max. shaft diameter 25 mm



## Basic Model

**Housing:** Aluminum  
**Bearing shield:** Cast iron  
**Impregnation:** Vacuum technology  
**Protection class:** IP 54

## Model KN 50

Type	Weight [kg]	Rated output [kW]			
		S 1			
		100 Hz 6,000 rpm	150 Hz 9,000 rpm	200 Hz 12,000 rpm	300 Hz 18,000 rpm
KN* 50.11-2 (D)	11.0	1.8	2.5	3.0	4.0
KN* 51.14-2 (D)	12.5	2.4	3.5	4.0	5.0
KN* 52.16-2 (D)	13.5	2.7	4.0	4.5	-

(D) Motor available with single or double bearings on drive (tool) side

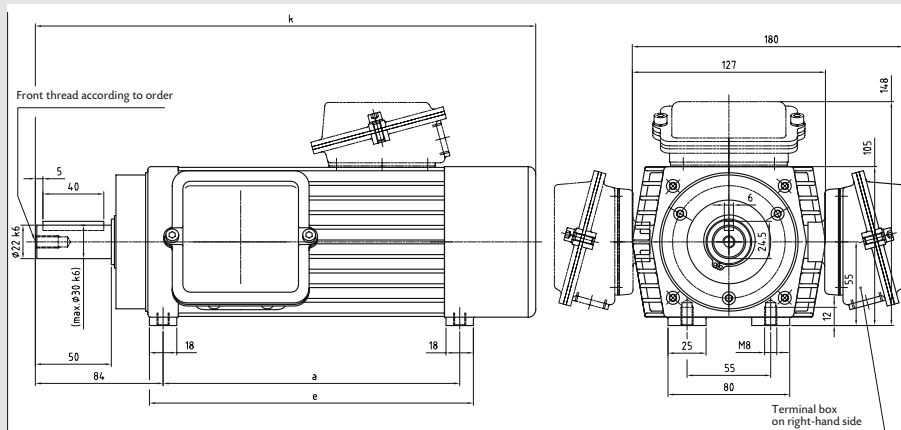
\* KR model possible, see p. 26

Values in table pertain to the drawings depicted below.

The maximum shaft diameter or customer-specific designs can influence the values.

## KN 50 Single-bearing

### Drawing MS 170 A

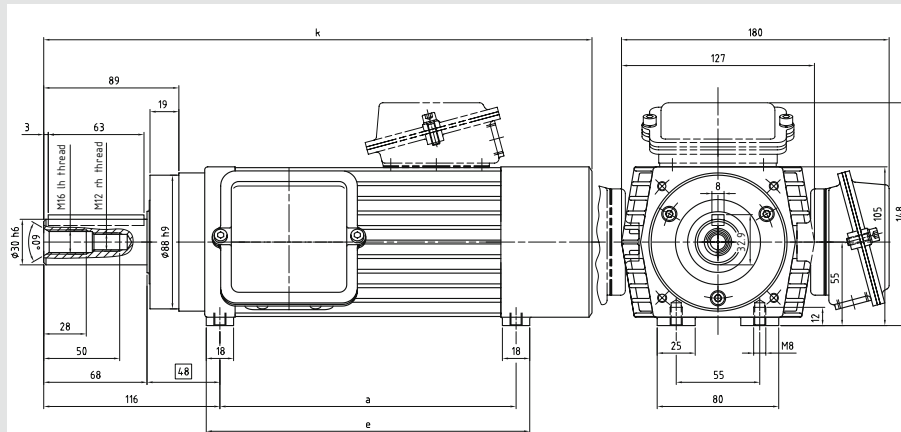


Type	a	e	k
KN 50	195	213	330
KN 51	225	243	360
KN 52	245	263	380

Max. shaft diameter 30 mm

## KN 50 D Double-bearing

### Drawing MS 4046



Type	a	e	k
KN 50 D	195	213	361
KN 51 D	225	243	391
KN 52 D	245	263	411

Max. shaft diameter 30 mm



## Basic Model

**Housing:** Aluminum  
**Bearing shield:** Aluminum for V50/cast iron for V60  
**Impregnation:** Vacuum technology  
**Protection class:** IP 54

### Model V 50 V 60

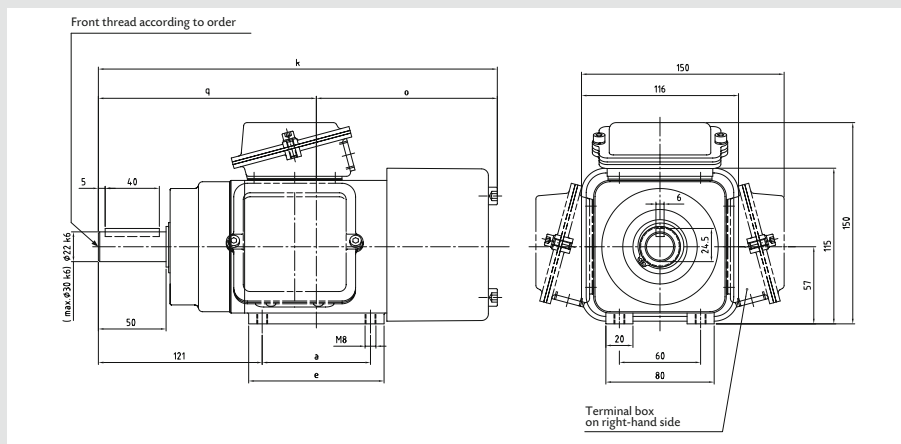
Type	Weight [kg]	Rated output [kW]					
		S 1					
		100 Hz 6,000 rpm	150 Hz 9,000 rpm	200 Hz 12,000 rpm	300 Hz 18,000 rpm	400 Hz 24,000 rpm	500 Hz 30,000 rpm
V 50.09-2	8.5	1.2	1.5	1.85	2.5	3.0	3.0
V 60.11-2	16.0	2.2	3.0	4.0	5.0	5.0	5.0
V 61.15-2	18.5	3.0	4.0	5.0	-	-	-

Only available with single bearing

Values in table pertain to the drawings depicted below.  
 The maximum shaft diameter or customer-specific designs can influence the values.

### V 50

#### Drawing MS 113 A

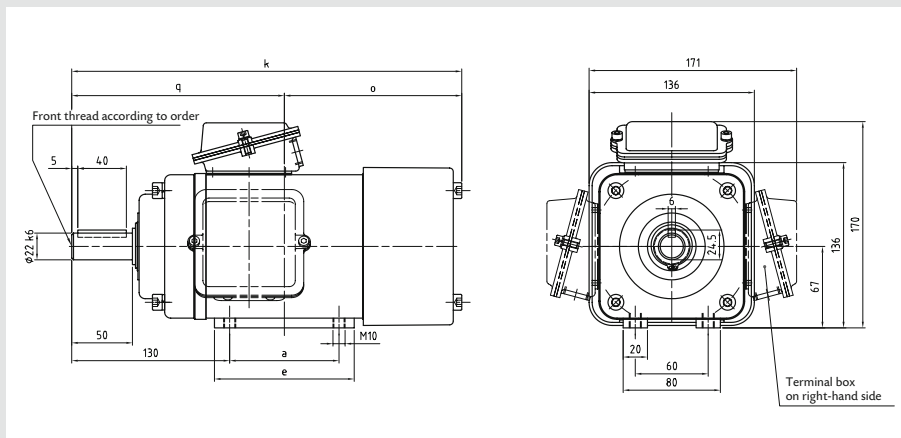


Type	a	e	k	o	q
V 50	80	100	297	136	161

Max. shaft diameter 30 mm

### V 60

#### Drawing MS 113 B



Type	a	e	k	o	q
V 60	90	115	320	145	175
V 61	130	155	360	165	195

Max. shaft diameter 30 mm

## Model KN 60

## Basic Model

<b>Housing:</b>	<b>Aluminum</b>
<b>Bearing shield:</b>	<b>Cast iron</b>
<b>Impregnation:</b>	<b>Vacuum technology</b>
<b>Protection class:</b>	<b>IP 54</b>

Type	Weight [kg]	Rated output [kW]			
		S 1			
		100 Hz	150 Hz	200 Hz	300 Hz
		6,000 rpm	9,000 rpm	12,000 rpm	18,000 rpm
KN* 60.09-2 (D)	14.5	2.7	3.0	3.5	-
KN* 61.13-2 (D)	19.5	4.0	5.0	6.0	7.0
KN* 62.18-2 (D)	22.0	5.5	6.0	7.0	-

(D) Motor available with single or double bearings on drive (tool) side

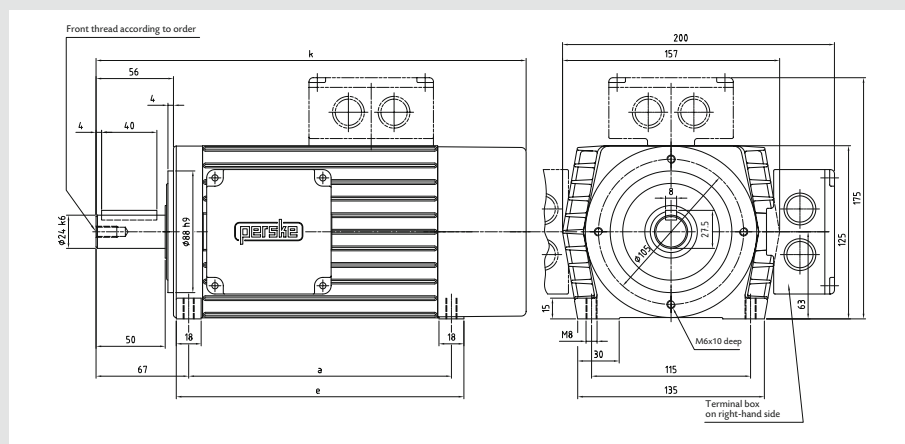
\* KR model possible, see p. 28

Values in table pertain to the drawings depicted below.

The maximum shaft diameter or customer-specific designs can influence the values.

## KN 60 Single bearing

## Drawing MS 170 B

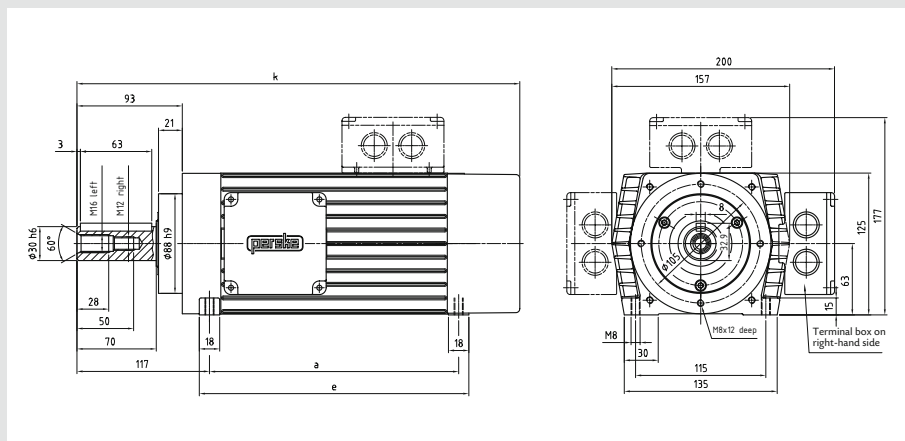


Type	a	e	k
KN 60	190	210	311
KN 61	220	240	341
KN 62	270	290	391

Max. shaft diameter 35 mm

**KN 60 D Double bearing**

### Drawing MS 171



Type	a	e	k
KN 60 D	190	210	361
KN 61 D	220	240	391
KN 62 D	270	290	441

Max. shaft diameter 40 mm





## Basic Model

<b>Housing:</b>	<b>Aluminum</b>
<b>Bearing shield:</b>	<b>Cast iron</b>
<b>Impregnation:</b>	<b>Vacuum technology</b>
<b>Protection class:</b>	<b>IP 54</b>

## Model KC 70

Type	Weight [kg]	Rated output [kW]			
		S 1			
		100 Hz 6,000 rpm	150 Hz 9,000 rpm	200 Hz 12,000 rpm	300 Hz 18,000 rpm
KC 70.12-2 (D)	26.0	5.2	5.5	-	-
KC 71.16-2 (D)	33.0	6.6	7.0	8.0*	10.0*
KC 71.20-2 (D)	38.0	8.0	9.0	10.0*	12.0*
KC 72.28-2 (D)	51.0	12.5	13.0	-	-

\* For KNO model, see milling motors pages 21 and 29

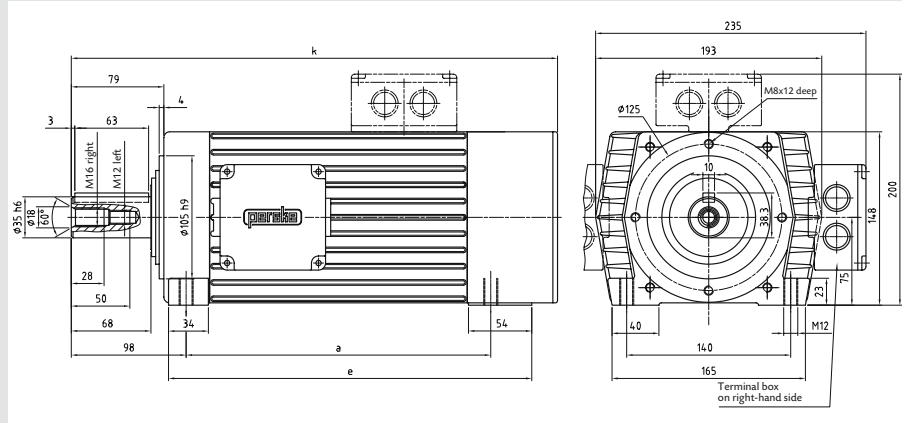
(D) Motor available with single or double bearings on drive (tool) side

Values in table pertain to the drawings depicted below.

The maximum shaft diameter or customer-specific designs can influence the values.

## KC 70 Single bearing

**Drawing MS 652 - 44**

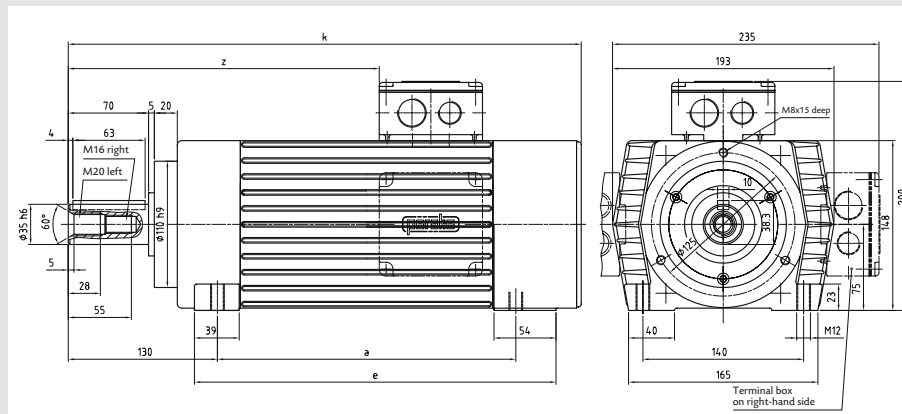


Type	a	e	k
KC 70	260	310	415
KC 71	340	390	495
KC 72	420	470	575

Max. shaft diameter 40 mm

## KC 70 D Double bearing

**Drawing MS 182 - 5**



Type	a	e	k	z
KC 70 D	260	315	447	271
KC 71 D	340	395	527	351
KC 72 D	420	475	607	431

Max. shaft diameter 50 mm

## Model K 80

## Basic Model

<b>Housing:</b>	<b>Cast iron</b>
<b>Bearing shield:</b>	<b>Cast iron</b>
<b>Impregnation:</b>	<b>Vacuum technology</b>
<b>Protection class:</b>	<b>IP 54</b>

Type	Weight [kg]	Rated output [kW]	
		S 1	
		100 Hz 6,000 rpm	150 Hz 9,000 rpm
K 81.23-2 (D)	69.0	16.0	18.0
K 82.27-2 (D)	79.0	18.0	22.0
K 83.37-2 (D)	91.0	25.0	-

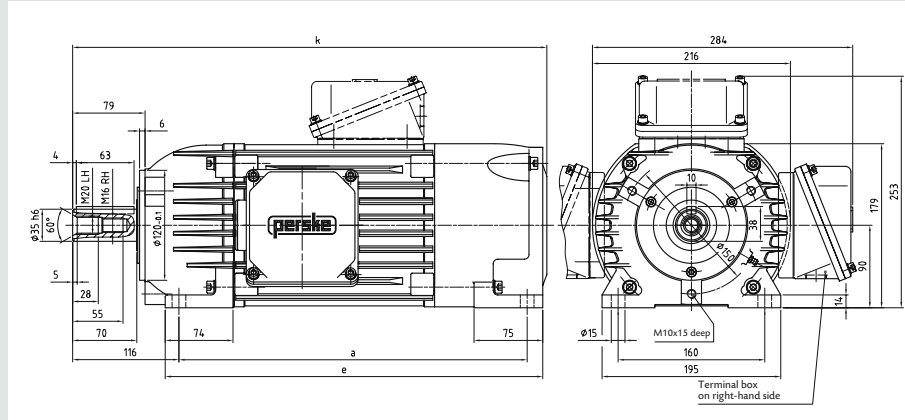
(D) Motor available with single or double bearings on drive (tool) side

Values in table pertain to the drawings depicted below.

The maximum shaft diameter or customer-specific designs can influence the values.

## K 80 Single bearing

### Drawing MS 630 A453

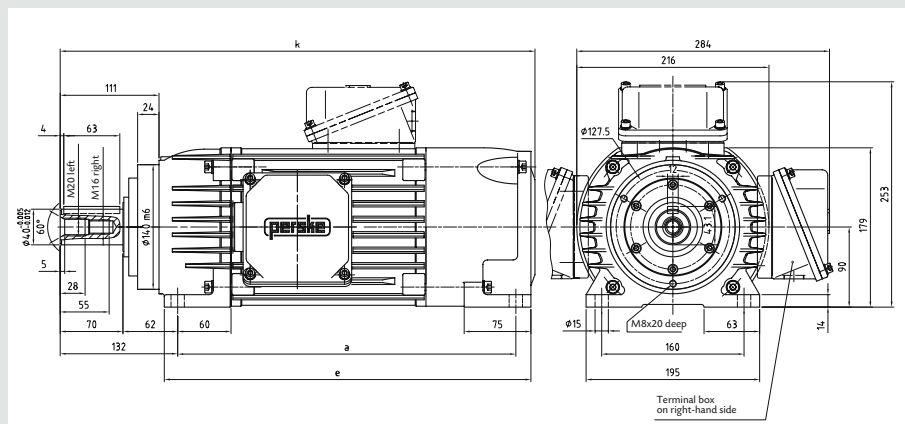


Type	a	e	k
K 81	460	492	600
K 82	510	542	650
K 83	570	602	710

Max. shaft diameter 40 mm

**K 80 D Double bearing**

## Drawing MS 630 A196



Type	a	e	k
K 81 D	460	492	615
K 82 D	510	542	665
K 83 D	570	602	725

Max. shaft diameter 60 mm



## Basic Model

**Housing:** Cast iron for K 91, steel for K 93  
**Bearing shield:** Cast iron or steel  
**Impregnation:** Vacuum technology  
**Protection class:** IP 54

## Model K 90

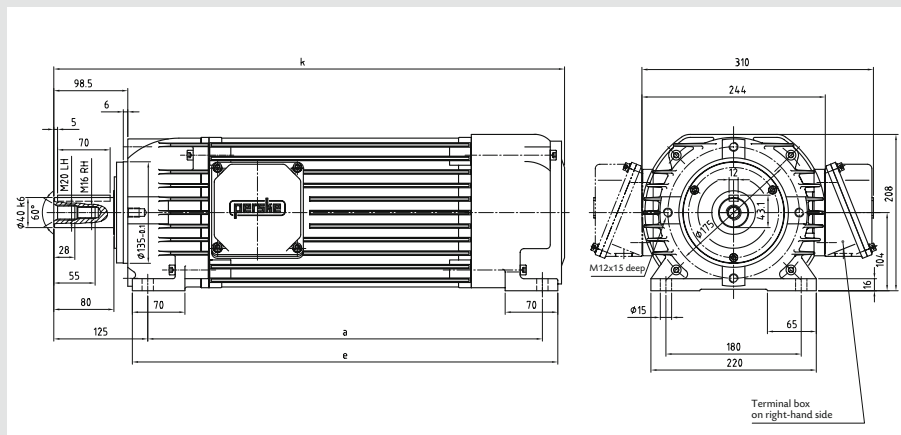
Type	Weight [kg]	Rated output [kW]	
		S 1	
		100 Hz 6,000 rpm	150 Hz 9,000 rpm
K 91.31-2 (D)	106.0	25.0	30.0
K 93.38-2 (D)	128.0	30.0	35.0

(D) Motor available with single or double bearings on drive (tool) side

Values in table pertain to the drawings depicted below.  
 The maximum shaft diameter or customer-specific designs can influence the values.

### K 90 Single bearing

#### Drawing MS 630 B182

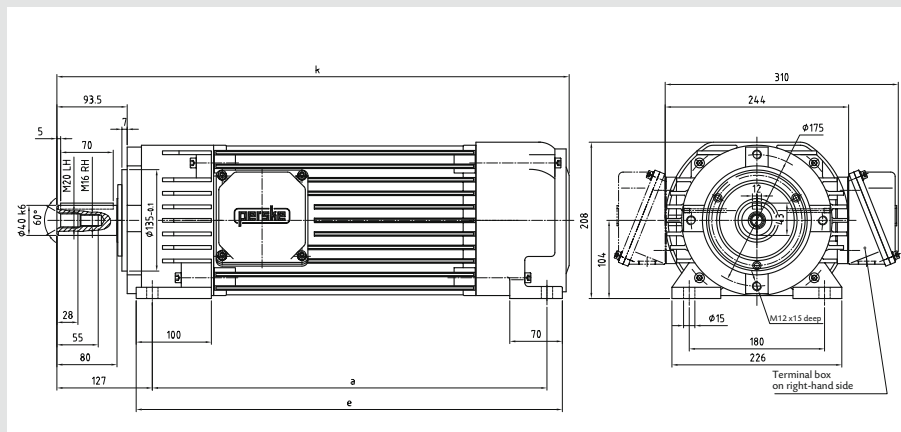


Type	a	e	k
K 91.31	525	566	680
K 93.38	615	656	770

Max. shaft diameter 50 mm

### K 90 D Double bearing

#### Drawing MS 630 B183



Type	a	e	k
K 91.31 D	525	567	682
K 93.38 D	615	657	772

Max. shaft diameter 50 mm



## Model K 110

## Basic Model

## Housing:

**Cast iron for up to K 111, steel for K 112 & K 113**

### Bearing shield:

**Cast iron or steel**

### Impregnation:

## Vacuum technology

**Protection class:**

**IP 54**

Type	Weight [kg]	Rated output [kW]	
		S 1	
		75 Hz 4,500 rpm	100 Hz 6,000 rpm
K 110.24-2 (D)	160.0	25.0	30.0
K 111.31-2 (D)	177.0	37.0	45.0
K 112.38-2 (D)	195.0	45.0	55.0
K 113.50-2 (D)	240.0	55.0	65.0

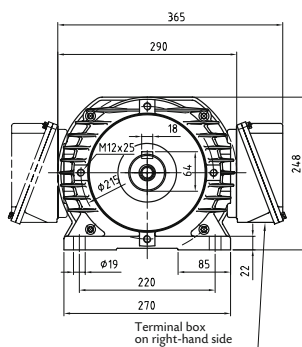
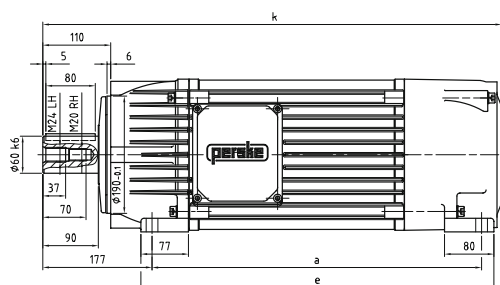
(D) Motor available with single or double bearings on drive (tool) side

Values in table pertain to the drawings depicted below.

The maximum shaft diameter or customer-specific designs can influence the values.

## K 110 Single bearing

**Drawing MS 630 C153**

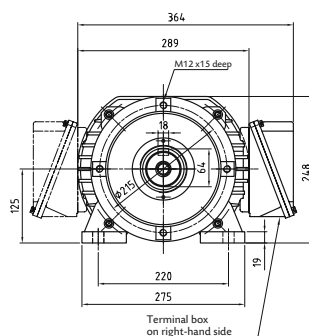
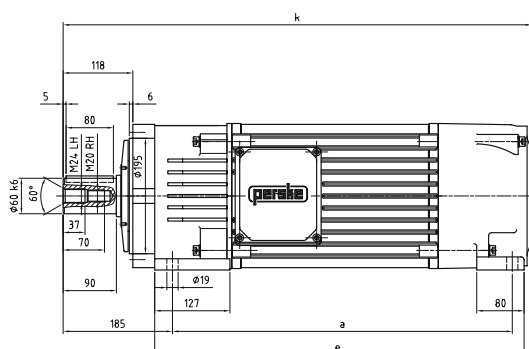


Type	a	e	k
K 110	464	504	674
K 111	534	574	743
K 112	614	654	823
K 113	734	774	943

Max. shaft diameter 70 mm

**K 110 D** Double bearing

**Drawing MS 630 C154**



Type	a	e	k
K 110 D	504	554	721
K 111 D	574	624	791
K 112 D	654	704	871
K 113 D	774	824	991

Max. shaft diameter 80 mm

<b>Housing:</b>	<b>Cast iron up to K 140, steel for K 141</b>
<b>Bearing shield:</b>	<b>Cast iron or steel</b>
<b>Impregnation:</b>	<b>Vacuum technology</b>
<b>Protection class:</b>	<b>IP 54</b>

Type	Weight [kg]	Rated output [kW]	
		S 1	
		75 Hz 4,500 rpm	100 Hz 6,000 rpm
K 140.38-2 (D)	360.0	65.0	80.0
K 141.50-2 (D)	450.0	80.0	100.0





**Model K 160**  
**K 200**

## Basic Model

<b>Housing:</b>	<b>Steel</b>
<b>Bearing shield:</b>	<b>Steel</b>
<b>Impregnation:</b>	<b>Vacuum technology</b>
<b>Protection class:</b>	<b>IP 54</b>

Type	Weight [kg]	Rated output [kW]
		S 1
		75 Hz 4,500 rpm
K 160.50-2 D	625.0	100.0
K 162.60-2 D	750.0	125.0
K 200.50-2 D	840.0	150.0
K 202.60-2 D	900.0	175.0

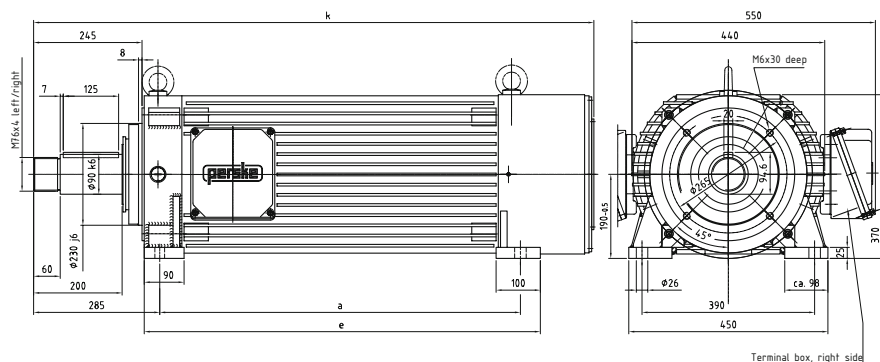
Only available with double bearing

Values in table pertain to the drawings depicted below.

The maximum shaft diameter or customer-specific designs can influence the values.

**K 160 D** Double bearing

## Drawing MS 3503

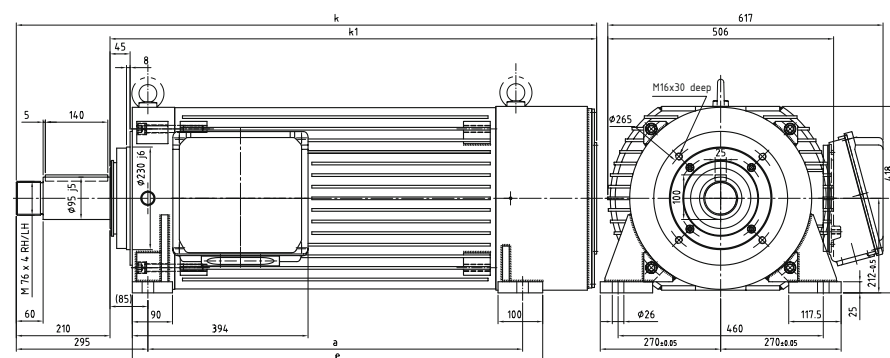


Type	a	e	k
K 160 D	815	895	1266
K 162 D	895	975	1346

Max. shaft diameter 115 mm

**K 200 D** Double bearing

## Drawing MS 4452



Type	a	e	k	k1
K 200 D	840	920	1301	1091
K 202 D	900	980	1361	1151

Max. shaft diameter 115 mm



# Milling Motors

**for cylindrical shaft tools with no-play double bearing**

Protection class IP 54

## General

Years of experience in the area of high-speed milling have resulted in the development of these compact milling motors. Robust milling spindles can accommodate collets up to 25 mm maximum. The stable bearing shields have an adjustment groove between the feet for proper mounting on the machine support. The dust extraction shroud can be easily attached thanks to holes and a centering diameter on the tool side.

## Output

In the selection tables, the performance is indicated for continuous duty (operating mode S1). For intermittent operations (operating mode S6 – 60%) commonly seen in milling, one can assume an approx. 20% higher output. Please inquire to obtain a binding statement.

## Bearings

By using lifetime-lubricated bearings, the motors are maintenance-free and thereby easy to operate. The shaft end is free of play both radially and axially thanks to a precision spindle bearing. This robust yet precise bearing makes the motor less sensitive to minor residual unbalancing of the tools used. If necessary, hybrid bearings are used, which are especially suited for high speeds.

## Cooling

The motors are self-cooled with a built-in fan. It operates as a function of the motor's operating speed and makes it independent of other units. Noise generation is reduced to a large extent by the design of the air inlet and the fan. In special cases, separate ventilation is possible.

## Toolholding

The motors are designed for commercially available collets (2 – 25 mm).

**Safety notice: only one turning direction is permitted.**

The motors with hydraulic chucks stand out thanks to the greatest run-out precision possible, secure tightening of the tool, and ease of operation. In addition, these spindles can be operated in left- or right-hand rotation.



## Milling Motors

For cylindrical shaft tools and small axle center distances.  
Standard right-hand thread, also available with left-hand thread.

### Single bearing

Type	Weight [kg]	Rated output [kW]					
		S 1					
		150 Hz 9,000 rpm	200 Hz 12,000 rpm	300 Hz 18,000 rpm	400 Hz 24,000 rpm	500 Hz 30,000 rpm	Max. clamping capacity, in mm <sup>2</sup>
KNS 21.05-2	1.8	0.15	0.2	0.32	0.4	0.4	13 <sup>2)</sup>
KNS 22.08-2	2.1	0.24	0.32	0.5	0.6	0.6	13 <sup>2)</sup>
KNS 23.10-2	2.9	0.3	0.4	0.6	0.7	-	13 <sup>2)</sup>
VS 30.06-2	2.7	0.3	0.42	0.6	0.65	0.65	13 <sup>2)</sup>
VS 31.09-2	3.4	0.45	0.65	0.9	1.0	1.0	13 <sup>2)</sup>
VS 50.09-2	8.5	1.5	1.85	2.5	3.0	3.0	16
VS 60.11-2	16.0	3.0	4.0	5.0	5.0	5.0	16
VS 61.15-2	19.0	4.0	5.0	-	-	-	16
VUS 50.09-2 <sup>3)</sup>	8.0	0.55	0.8	1.0	1.0		16
VUS 60.11-2 <sup>3)</sup>	15.5	1.9	2.1	2.6	2.6		16
VUS 61.15-2 <sup>3)</sup>	18.0	2.6	2.8	-	-		16

### Double bearing

KRS 35.1-2 D	4.5	0.5	0.7	0.9	1.0		13
KRS 35.3-2 D	5.3	0.7	1.0	1.3	1.4		13
KRS 35.5-2 D	6.3	1.0	1.4	1.9	2.0		13
KRS 35.7-2 D	6.7	1.1	1.6	2.2	-		13
KRS 35.9-2 D	7.7	1.4	2.0	-	-		13
KRS 50.11-2 D	11.5	2.5	3.0	4.0			16
KRS 51.14-2 D	13.0	3.5	4.0	5.0			16
KRS 52.16-2 D	14.0	4.0	4.5	-			16
KRSV 51.14-2 D	13.5	3.5	4.0	5.0			25
KRSV 51.14-2 D <sup>1)</sup>	14.5	3.5	4.0	5.0			25
KRS 60.09-2 D	16.0	3.0	3.5	-			20
KRS 61.13-2 D	20.0	5.0	6.0	7.0			20
KRS 62.18-2 D	22.0	6.0	7.0	-			20
KRS 60.09-2 D	16.5	3.0	3.5	-			25
KRS 61.13-2 D	20.5	5.0	6.0	7.0			25
KRS 62.18-2 D	23.0	6.0	7.0	-			25
KRSV 61.13-2 D <sup>1)</sup>	24.0	5.0	6.0	7.0			25
KNOCS 71.16-2 D	35.0	7.0	8.0	10.0			20
KNOS 71.16-2 D	37.0	7.0	8.0	10.0			25
KNOCS 71.20-2 D	37.0	9.0	10.0	12.0			20
KNOS 71.20-2 D	39.0	9.0	10.0	12.0			25

<sup>2)</sup> clamping capacity dependent on collet system

<sup>1)</sup> with hydraulic chuck

<sup>2)</sup> max. clamping capacity only up to 24,000 rpm

<sup>3)</sup> non-ventilated, low noise



## Milling Motors

For cylindrical shaft tools and small axle center distances.  
Standard right-hand thread, also available with left-hand thread.

### Model KN 20 V 30

#### Single bearing

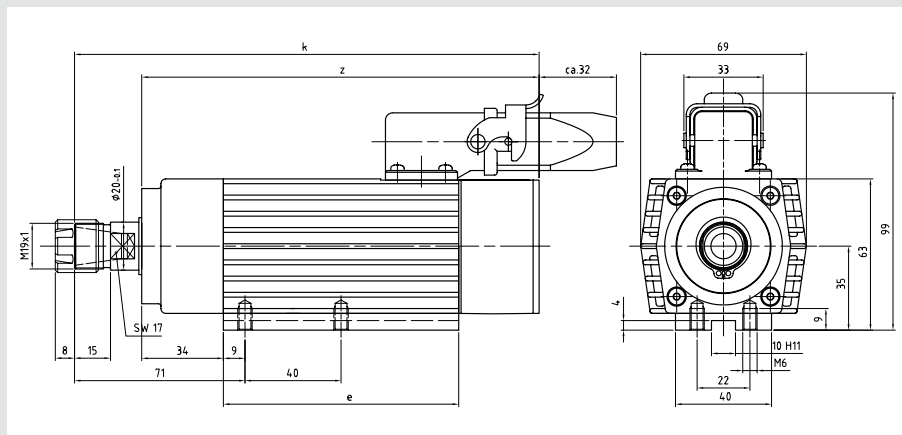
Type	Weight [kg]	Rated output [kW]					
		S 1					
		150 Hz 9,000 rpm	200 Hz 12,000 rpm	300 Hz 18,000 rpm	400 Hz 24,000 rpm	500 Hz 30,000 rpm	Max. clamping capacity, in mm*
KNS 21.05-2	1.8	0.15	0.2	0.32	0.4	0.4	13 <sup>2)</sup>
KNS 22.08-2	2.1	0.24	0.32	0.5	0.6	0.6	13 <sup>2)</sup>
KNS 23.10-2	2.9	0.3	0.4	0.6	0.7	-	13 <sup>2)</sup>
VS 30.06-2	2.7	0.3	0.42	0.6	0.65	0.65	13 <sup>2)</sup>
VS 31.09-2	3.4	0.45	0.65	0.9	1.0	1.0	13 <sup>2)</sup>

<sup>1)</sup> Clamping capacity dependent on collet system

<sup>2)</sup> Max. clamping capacity only up to 24,000 rpm

#### KNS 20 Single bearing

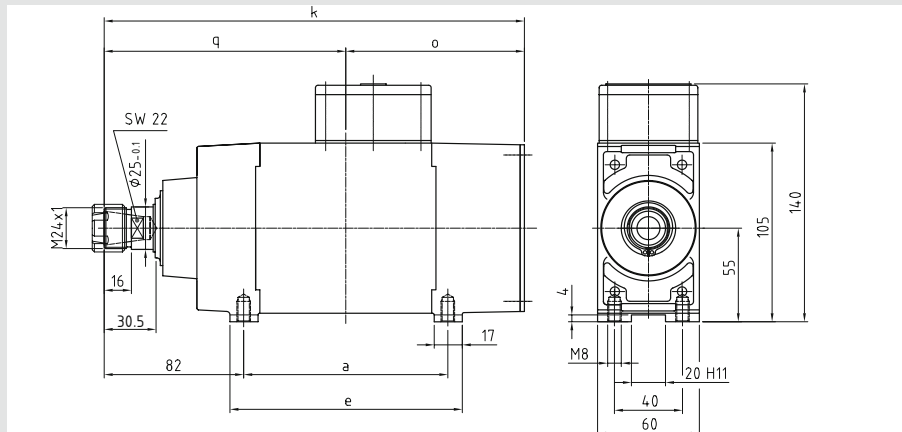
##### Drawing MS 151-64-7



Type	e	k	z
KNS 21.05	98	194	166
KNS 22.08	133	229	201
KNS 23.10	153	249	221

#### VS 30 Single bearing

##### Drawing MS 132-300



Type	a	e	k	o	q
VS 30	90	108	217	90	127
VS 31	120	138	247	105	142



## Milling Motors

**For cylindrical shaft tools and small axle center distances.  
Standard right-hand thread, also available with left-hand thread.**

**Model V 50**  
**V 60**

## Single bearing

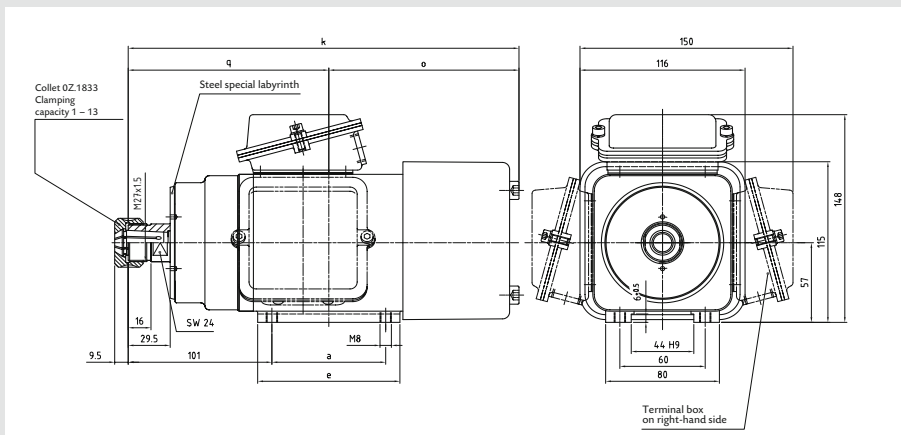
Type	Weight [kg]	Rated output [kW]					
		S 1					
		150 Hz 9,000 rpm	200 Hz 12,000 rpm	300 Hz 18,000 rpm	400 Hz 24,000 rpm	500 Hz 30,000 rpm	Max. clamping capacity, in mm*
VS 50.09-2	8.5	1.5	1.85	2.5	3.0	3.0	16**
VS 60.11-2	16.0	3.0	4.0	5.0	5.0	5.0	16**
VS 61.15-2	19.0	4.0	5.0	-	-	-	16

\*) Clamping capacity dependent on collet system

**\*\*\*) Max. clamping capacity up to 24,000 rpm**

**VS 50** **Single bearing**

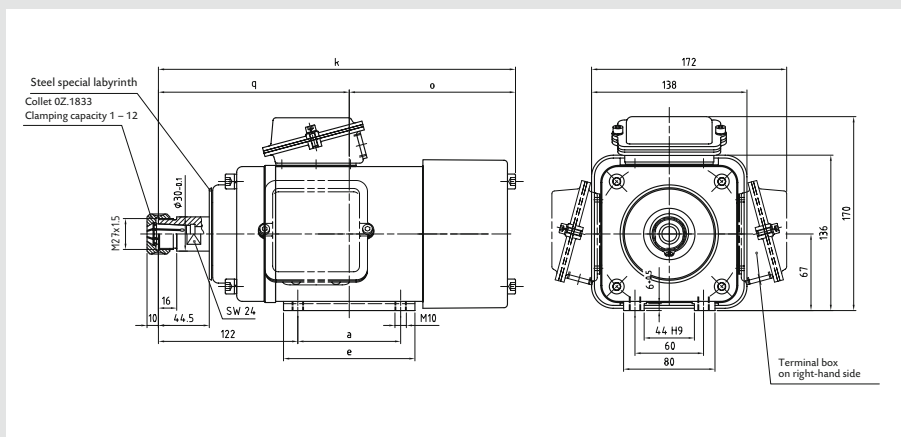
**Drawing MS 3675-5**



Type	a	e	k	o	q
VS 50	80	100	277	136	141

## VS 60 Single bearing

### Drawing MS 3110-7



Type	a	e	k	o	q
VS 60	90	115	312	145	167
VS 61	130	155	352	165	187





## Milling Motors

For cylindrical shaft tools and small axle center distances.  
Standard right-hand thread, also available with left-hand thread.

### Model VU 50 VU 60

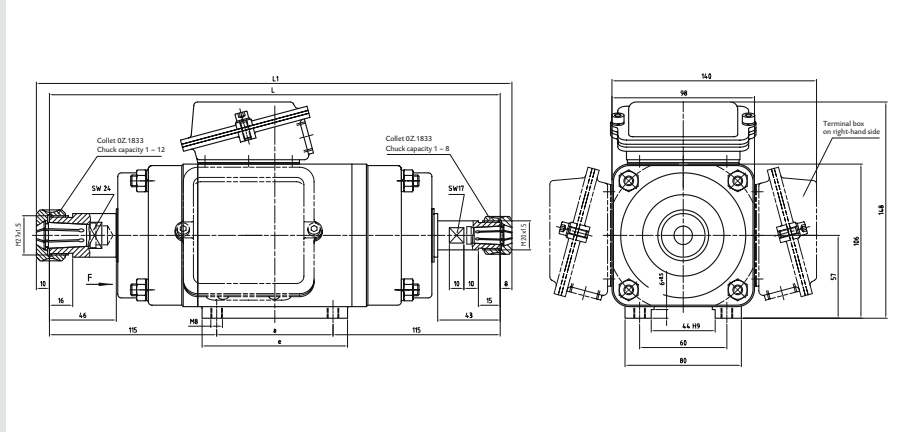
#### Single bearing

Type	Weight [kg]	Rated output [kW]				
		S 1				
		150 Hz 9,000 rpm	200 Hz 12,000 rpm	300 Hz 18,000 rpm	400 Hz 24,000 rpm	Max. clamping capacity, in mm*
VUS 50.09-2	8.0	0.55	0.8	1.0	1.0	16
VUS 60.11-2	15.5	1.9	2.1	2.6	2.6	16
VUS 61.15-2	18.0	2.6	2.8	-	-	16

\*) Clamping capacity dependent on collet system  
Non-ventilated, low noise

### VUS 50 Single bearing

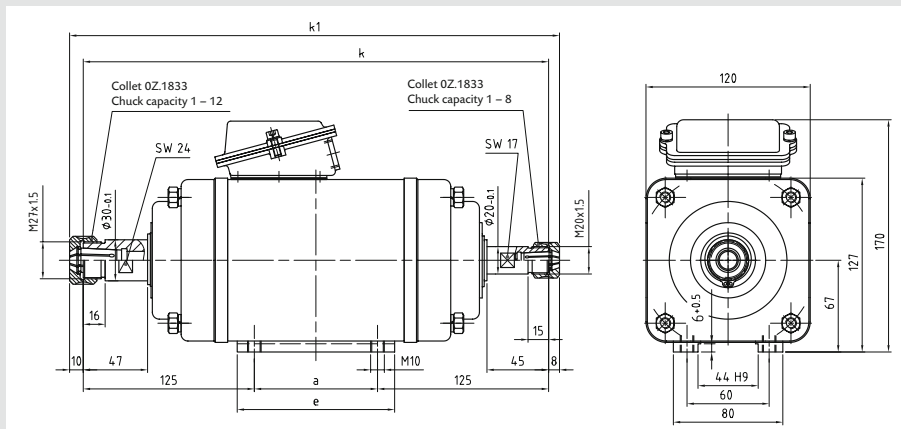
#### Drawing U 05/2436-1



Type	a	e	L	L1
VUS 50	80	100	310	328

### VUS 60 Single bearing

#### Drawing U 06/2439-1



Type	a	e	k	k1
VUS 60	90	115	340	358
VUS 61	130	155	380	398



## Milling Motors

For cylindrical shaft tools and small axle center distances.  
Standard right-hand thread, also available with left-hand thread.

### Model KRS 35

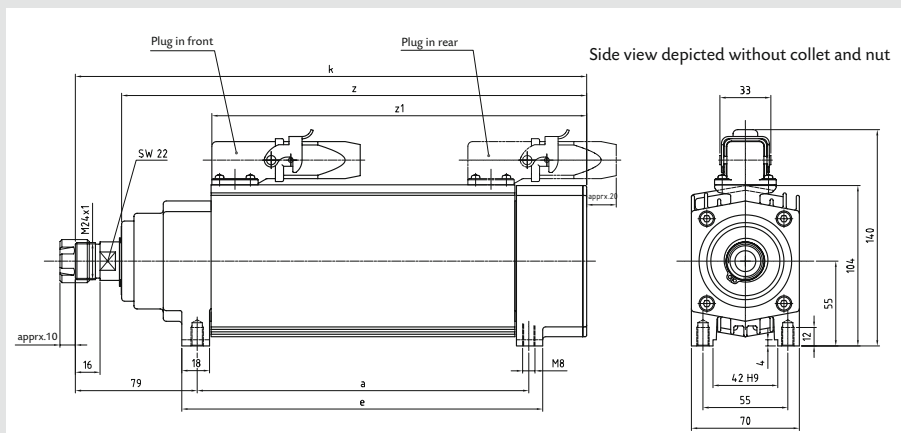
#### Double bearing

Type	Weight [kg]	Rated output [kW]				
		S 1				
		150 Hz 9,000 rpm	200 Hz 12,000 rpm	300 Hz 18,000 rpm	400 Hz 24,000 rpm	Max. clamping capacity, in mm*
KRS 35.1-2 D	4.5	0.5	0.7	0.9	1.0	13
KRS 35.3-2 D	5.3	0.7	1.0	1.3	1.4	13
KRS 35.5-2 D	6.3	1.0	1.4	1.9	2.0	13
KRS 35.7-2 D	6.7	1.1	1.6	2.2	-	13
KRS 35.9-2 D	7.7	1.4	2.0	-	-	13

\* Clamping capacity dependent on collet system

### KRS 35 D Double bearing

#### Drawing MS 3870



Type	a	e	k	z	z1
KRS 35.1 D	145	165	261	231	173
KRS 35.3 D	175	195	291	261	203
KRS 35.5 D	215	235	331	301	243
KRS 35.7 D	235	255	351	321	263
KRS 35.9 D	275	295	391	361	303

**For cylindrical shaft tools and small axle center distances.  
Standard right-hand thread, also available with left-hand thread.**



**Model KR 50**  
**KR 60**

## Milling Motors

**For cylindrical shaft tools and small axle center distances.**

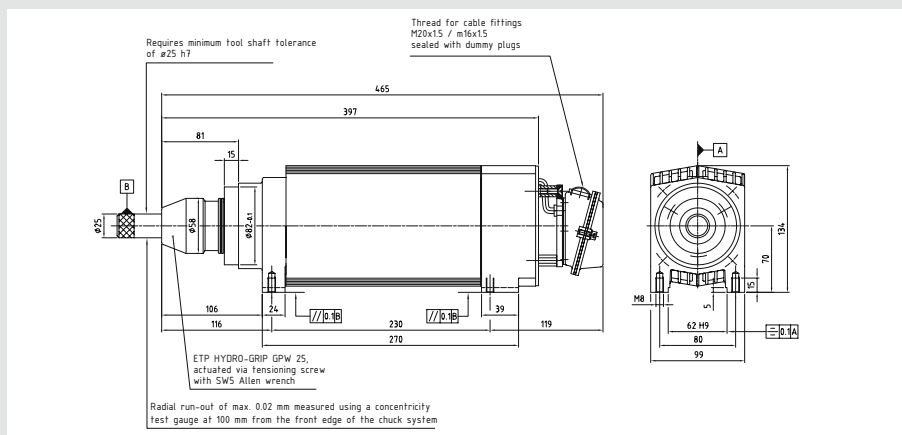
**With hydraulic chucks, simple operation, and suitable for left-/right-hand rotation**

## Double bearing

Type	Weight [kg]	Rated output [kW]			
		S 1			
		150 Hz 9,000 rpm	200 Hz 12,000 rpm	300 Hz 18,000 rpm	Max. clamping capacity, in mm*
KRSV 51.14-2 D	14.5	3.5	4.0	5.0	25
KRSV 61.13-2 D	24.0	5.0	6.0	7.0	25

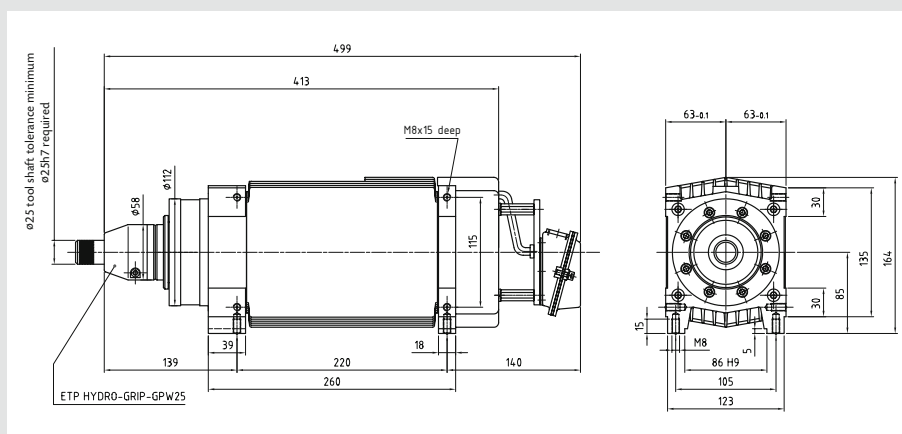
**KRSV 51.14-2 D Double bearing**

## Drawing MS 164-7



**KRSV 61.13-2 D Double bearing**

**Drawing MS 3757**





## Milling Motors

**For cylindrical shaft tools and small axle center distances.  
Standard right-hand thread, also available with left-hand thread.**

### Model KR 60

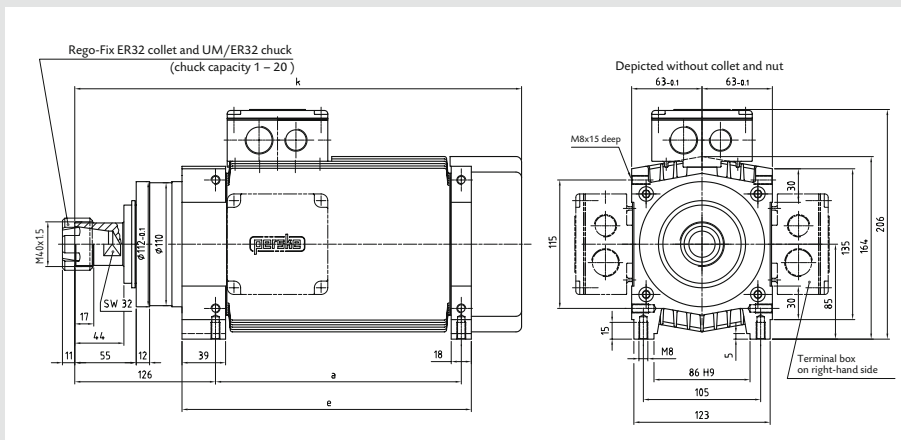
#### Double bearing

Type	Weight [kg]	Rated output [kW]			
		S 1			
		150 Hz 9,000 rpm	200 Hz 12,000 rpm	300 Hz 18,000 rpm	Max. clamping capacity, in mm*
KRS 60.09-2 D	16.0	3.0	3.5	-	20
KRS 61.13-2 D	20.0	5.0	6.0	7.0	20
KRS 62.18-2 D	22.0	6.0	7.0	-	20
KRS 60.09-2 D	16.5	3.0	3.5	-	25
KRS 61.13-2 D	20.5	5.0	6.0	7.0	25
KRS 62.18-2 D	23.0	6.0	7.0	-	25

\*) Clamping capacity dependent on collet system

### KRS 60 D Double bearing

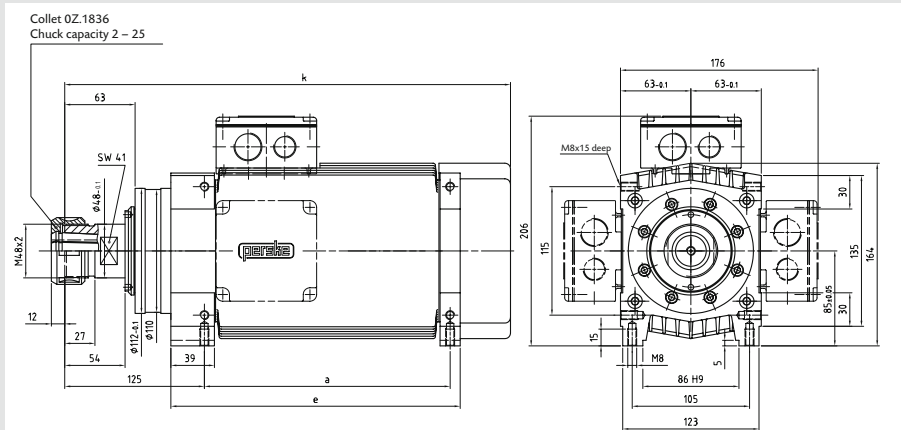
#### Drawing MS 3903



Type	a	e	k
KRS 60 D	190	230	370
KRS 61 D	220	260	400
KRS 62 D	270	310	450

### KRS 60 D Double bearing

#### Drawing MS 4445



Type	a	e	k
KRS 60 D	190	230	369
KRS 61 D	220	260	399
KRS 62 D	270	310	449

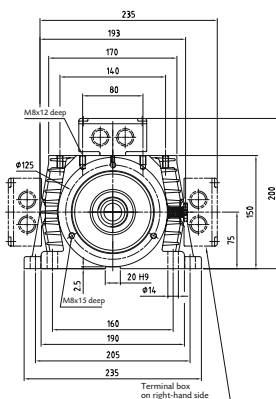
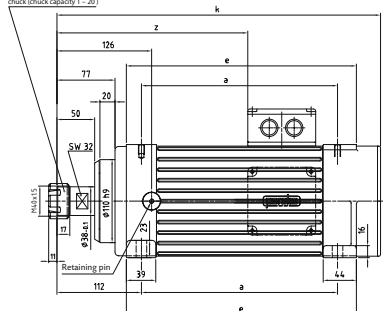


**Standard right-hand thread, also available with left-hand thread.**

## Double bearing

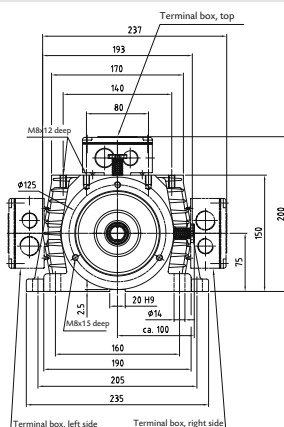
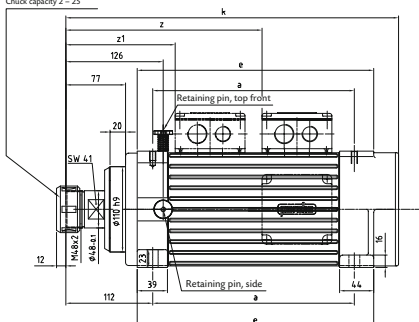
Type	Weight [kg]	Rated output [kW]			
		S 1			
		150 Hz 9,000 rpm	200 Hz 12,000 rpm	300 Hz 18,000 rpm	Max. clamping capacity, in mm*
KNOCS 71.16-2 D	35.0	7.0	8.0	10.0	20
KNOS 71.16-2 D	37.0	7.0	8.0	10.0	25
KNOCS 71.20-2 D	37.0	9.0	10.0	12.0	20
KNOS 71.20-2 D	39.0	9.0	10.0	12.0	25

**Drawing MS 181 A8**



Type	a	e	k	z
KNOCS 71 D	340	385	509	333

## Drawing MS 181 A2



Type	a	e	k	z	z1
KNOS 71 D	340	385	509	333	221

## High-Precision Motors

for hydraulic chucks

A3

Type	Weight [kg]	Rated output [kW]		
		S 1		
		100 Hz 6,000 rpm	150 Hz 9,000 rpm	200 Hz 12,000 rpm
KNS 51.14-2 D	13.5	2.4	3.5	4.0
KNS 61.13-2 D	20.0	4.0	5.0	6.0
KCS 71.16-2 D	35.0	6.6	7.0	-
KCS 71.20-2 D	40.0	8.0	9.0	-
KS 81.23-2 D	71.0	16.0	18.0	-
KS 82.27-2 D	82.0	18.0	22.0	-

## High-Precision Motors

Perske high-precision motors are developed especially for **hydraulic chucks**. By using a reinforced bearing with high-precision ball bearings and a stiffer spindle, outstanding axial and radial run-out can be achieved in micron-level quality.

In combination with our precision balancing, we offer smooth-running, maximum-precision drives that are especially well-suited for use with PKD tools and can substantially increase their service lives. The result is improved cost-effectiveness and availability.

### Perske high-precision motors are characterized by

- Stiff motor spindles and precision bearings with double spindle bearings
- Ground and hardened shafts
- Radial and axial run-out precision  $\leq 8$  microns
- Uniform interface for milling and cutting tools
- Significantly longer tool service life
- No-play tool clamping



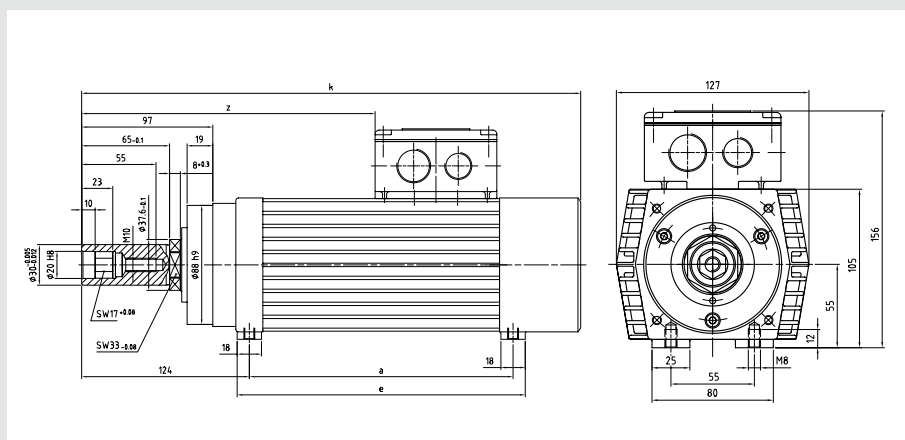
**Model KNS 50**  
**KNS 60**

## High-Precision Motors for hydraulic tool holders

Type	Weight [kg]	Rated output [kW]		
		S 1		
		100 Hz 6,000 rpm	150 Hz 9,000 rpm	200 Hz 12,000 rpm
KNS 51.14-2 D	13.5	2.4	3.5	4.0
KNS 61.13-2 D	20.0	4.0	5.0	6.0

**KNS 50 D Double bearing**

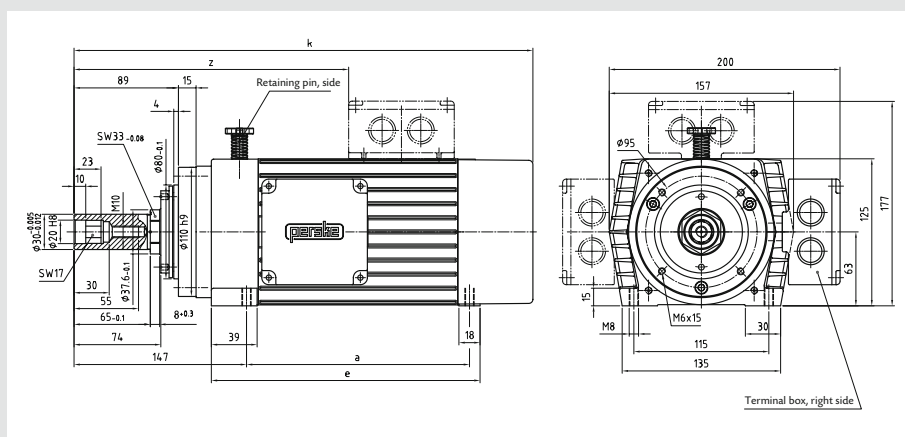
## Drawing MS 3833-1



Type	a	e	k	z
KNS 51 D	225	243	400	247

**KNS 60 D Double bearing**

## Drawing MS 3946

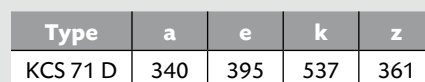


Type	a	e	k	z
KNS 61 D	220	260	421	264

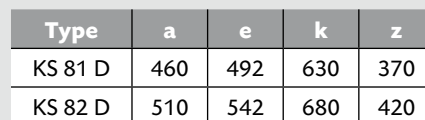
# Model KCS 70 KS 80

Type	Weight [kg]	Rated output [kW]	
		S 1	
		100 Hz 6,000 rpm	150 Hz 9,000 rpm
KCS 71.16-2 D	35.0	6.6	7.0
KCS 71.20-2 D	40.0	8.0	9.0
KS 81.23-2 D	71.0	16.0	18.0
KS 82.27-2 D	82.0	18.0	22.0

**Drawing MS 182A-191**



**Drawing MS 630 A422-1**





# Motor spindles

## Standardized tool holding systems for:

Manual quick tool changes according to DIN 69893-1 HSK-C

Automatic tool changes according to DIN 69893-6 HSK-F63

## Special flat motors: proven milling and cutting drives further enhanced

- **High-performance asynchronous motor with high overload capacity**
- **Performance measured for S1 – continuous duty**
- **Robust mechanical design, thereby making it suitable for heavy tools**
- **Maintenance-free, no-play, lifetime-lubricated bearing**
- **Protection class IP 54, surface-cooled**
- **Self-cooling through integrated fan**
- **High-quality vacuum impregnation of the winding**
- **Centering diameter for protective shroud**

## Advantages

- Standardized tool holding
- Existing shaft tools can be used by means of adapters
- High degree of radial and axial stiffness
- Optimal radial and axial run-out precision
- Precisely defined and reproducible cutting edge position
- Short mounting/removal path for tool changes
- Easy to use



## HSK Motors

for manual tool changes according to DIN 69893-1 HSK-C

for automated tool changes according to DIN 69893-6 HSK-F63

### HSK-C

Type	Weight [kg]	Tool Interface	Rated output [kW]			
			S 1			
			100 Hz 6,000 rpm	150 Hz 9,000 rpm	200 Hz 12,000 rpm	300 Hz 18,000 rpm
KNS 51.14-2 D	13.5	HSK-C40	2.4	3.5	4.0	5.0
KNS 61.13-2 D	19.5	HSK-C50	4.0	5.0	6.0	7.0
KCS 71.20-2 D	40.0	HSK-C63	8.0	9.0	-	-
KS 81.23-2 D	71.0	HSK-C63	16.0	18.0	-	-
			33 Hz 1,000 rpm		100 Hz 3,000 rpm	
KS 111.32-4 D	185.0	HSK-C100	13.0		30.0	

### HSK-F63

			100 Hz 6,000 rpm	150 Hz 9,000 rpm	200 Hz 12,000 rpm
KNWS 61.13-2 D	28.0	HSK-F63	4.0	5.0	6.0
KCWS 71.16- 2 D	50.0	HSK-F63	6.6	7.0	8.0
			200 Hz 6,000 rpm	300 Hz 9,000 rpm	400 Hz 12,000 rpm
KRWS 80.14-4 D	70.0	HSK-F63	10.0	12.0	14.0

## Manual

### HSK-C interface

- Simple tool change with Allen wrench
- Insertion force between 2-4 times standardized requirements
- Insertion force increases with rpm
- Short mounting/removal path for tool changes

## Automatic

### HSK-F63 interface

- Pneumatic release device for 6 bar
- Insertion force >150% of standardized requirement
- Hollow shaft for cleaning air
- Clamping system easy to maintain
- Tool clamping with spring assembly
- Three-position sensor technology to monitor clamping system

For additional details, please contact our technical sales department



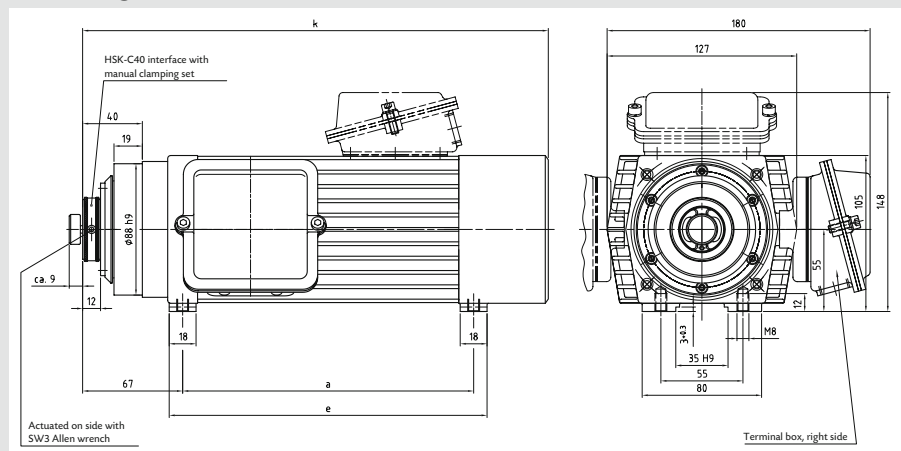
## HSK Motors

**for manual tool changes according to DIN 69893-1 HSK – C**

Type	Weight [kg]	Tool Interface	Rated output [kW]			
			S 1			
			100 Hz 6,000 rpm	150 Hz 9,000 rpm	200 Hz 12,000 rpm	300 Hz 18,000 rpm
KNS 51.14-2 D	13.5	HSK-C40	2.4	3.5	4.0	5.0
KNS 61.13-2 D	19.5	HSK-C50	4.0	5.0	6.0	7.0
KCS 71.20-2 D	40.0	HSK-C63	8.0	9.0	-	-
KS 81.23-2 D	71.0	HSK-C63	16.0	18.0	-	-
			33 Hz 1,000 rpm		100 Hz 3,000 rpm	
KS 111.32-4 D	185.0	HSK-C100	13.0		30.0	

**KNS 51 D Double bearing**

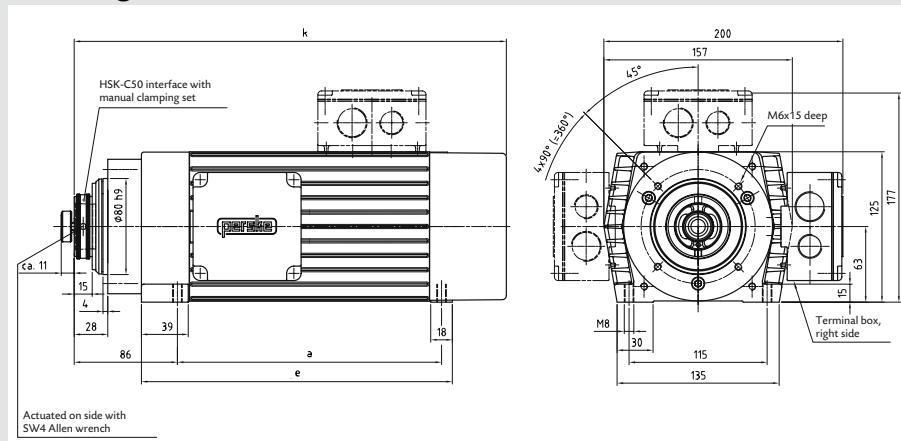
**Drawing MS 4232, shaft end: HSK-C40**



Type	a	e	k
KNS 51 D	225	243	342

**KNS 61 D Double bearing**

**Drawing MS 4266, shaft end: HSK-C50**



Type	a	e	k
KNS 61 D	220	260	360







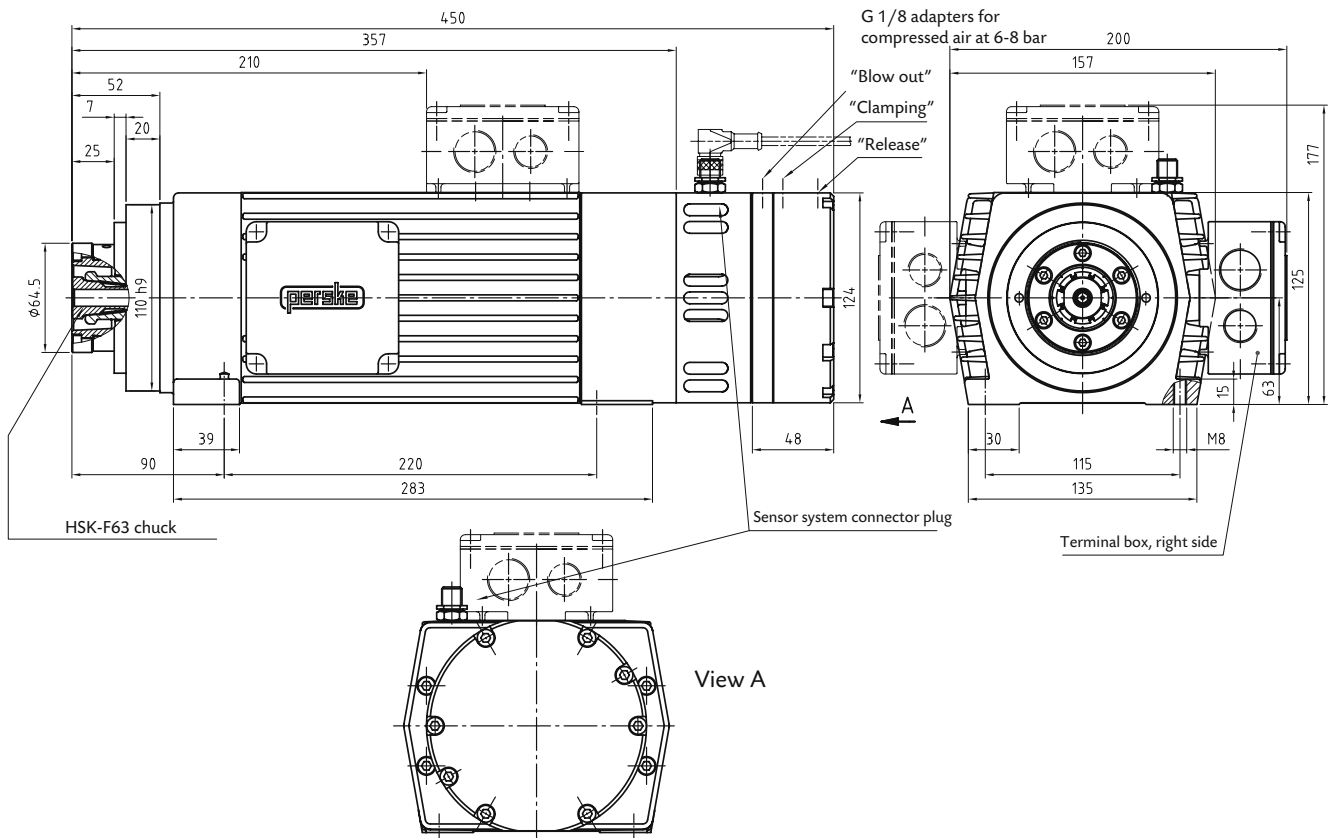
## HSK Motors

for automatic tool changes according to DIN 69893-6 HSK-F63

Type	Weight [kg]	Tool Interface	Rated output [kW]		
			S1		
			100 Hz 6,000 rpm	150 Hz 9,000 rpm	200 Hz 12,000 rpm
KNWS 61.13-2 D	28.0	HSK-F63	4.0	5.0	6.0
KCWS 71.16- 2 D	50.0	HSK-F63	6.6	7.0	8.0
			200 Hz 6,000 rpm	300 Hz 9,000 rpm	400 Hz 12,000 rpm
KRWS 80.14-4 D	70.0	HSK-F63	10.0	12.0	14.0

### KNWS 61.13-2 D Double bearing

#### Drawing MS 4464

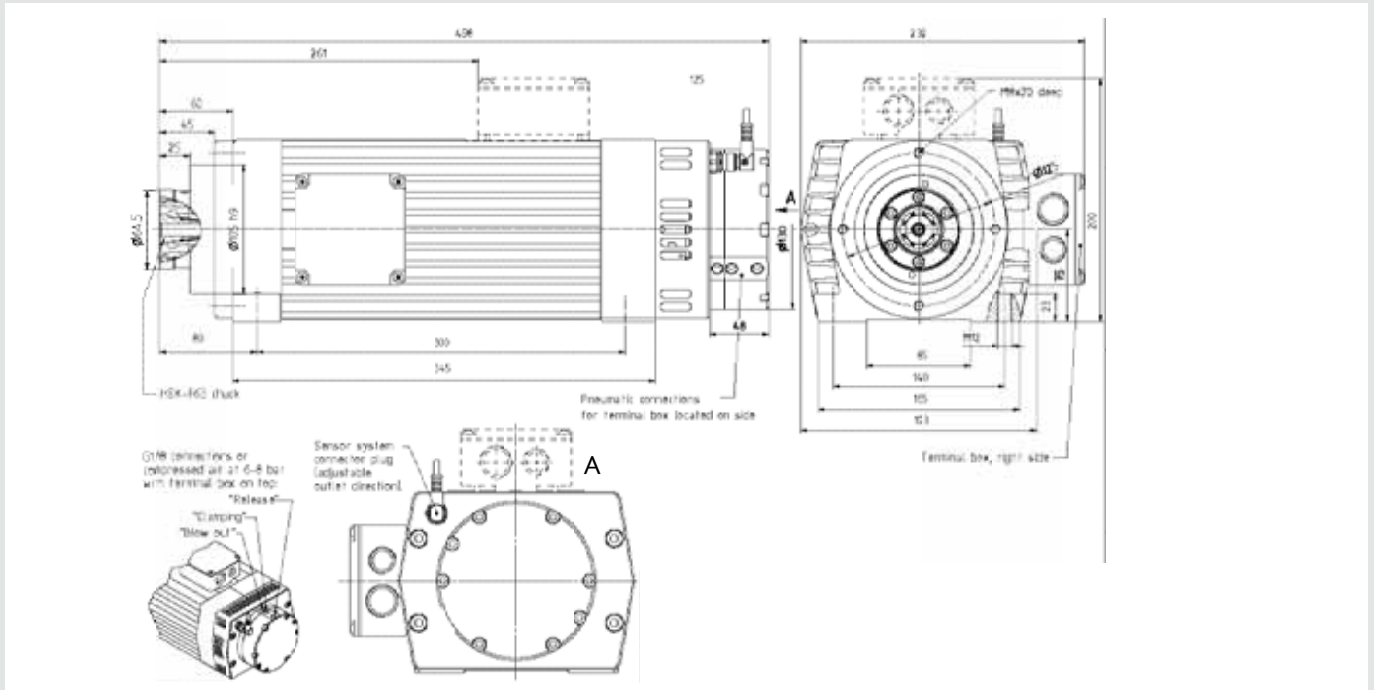


## HSK Motors

for automatic tool changes according to DIN 69893-6 HSK-F63

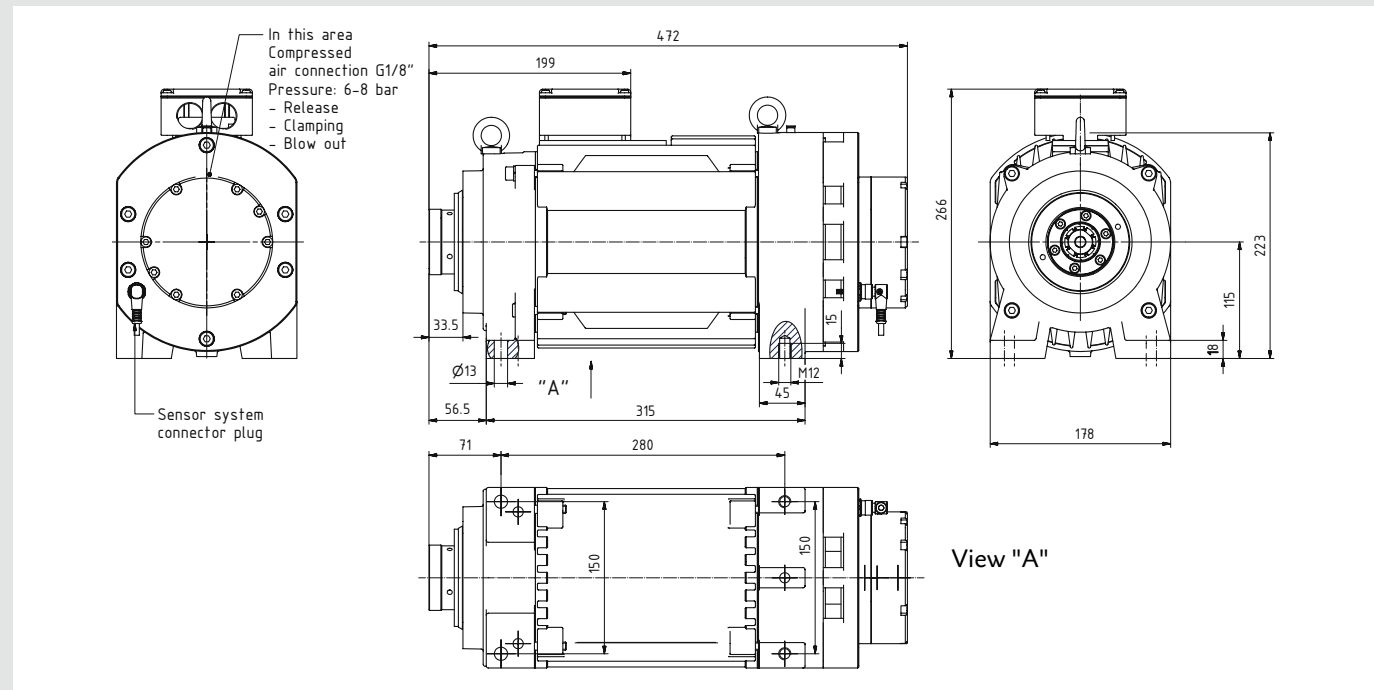
### KCWS 71.16-2 D Double bearing

#### Drawing MS 182-493-1



### KRWS 80.14-4 D Double bearing

#### Drawing MS 4475



# Special drives/ High-speed direct drives

For many years, Perske has specialized in developing and designing special electric motors. As a result, we have been able to gather valuable experience in many application areas that are very beneficial in regard to innovations.

Our partners are machine manufacturers domestically and abroad with whom we collaborate closely to develop demand-oriented, specially adapted drive solutions. The result is a diverse range of variants. They include mechanical features such as

- **shafts, bearing shields, and mounting flanges**

as well as electrical configurations pertaining to

- **voltage, frequencies, speed response characteristics, etc.**

The full range of possibilities cannot be depicted in this brochure.

To offer you an optimized, technical and cost-effective drive solution for you and your requirements, we ask that you please call us with your questions.

## **We offer from our range:**

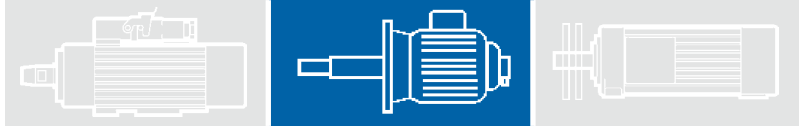
At 3,000 rpm up to 170 kW

At 18,000 rpm up to 55 kW

At 30,000 rpm up to 5 kW

We know that we can assist you with our expertise.

For the sake of offering some preliminary information, we would like to provide you with a few examples of drive solutions.



## **Synchronous Motors (permanent magnet excited)**

In comparison to asynchronous motors, they offer a substantially higher power density. They are thus lighter and smaller than an asynchronous motor with comparable performance. As a result, this drive is especially well suited for highly dynamic or space-limited applications.

The high power density is achieved by high-quality, low-loss electroplates in the stators and rotors with rare earth magnets.

Perske offers a series of synchronous, no-feedback motors, which are also suitable as direct tool supports. By combining synchronous technology with our expertise in precision bearings, we can find special solutions for your needs.

### **Advantages/Properties**

- **Small, lightweight construction thanks to a very high power density**  
**Weight reduction by over 40%**  
**Performance increase by over 100%**
- **Energy-saving due to high efficiency**  
**Efficiency increase by up to 20%**
- **High overload capacity up to > 3 x rated torque**
- **Constant speed up to approx. three times the rated output**
- **Robust, lifetime-lubricated, maintenance-free bearing**
- **Easy to install since there is no speed feedback**

Synchronous motors are powered by electronic frequency converters. The motor and converter must be carefully matched to each other to operate optimally.

Overload behavior and speed constancy are primarily dependent on the converter. We are able to provide assistance in tuning them at any time.



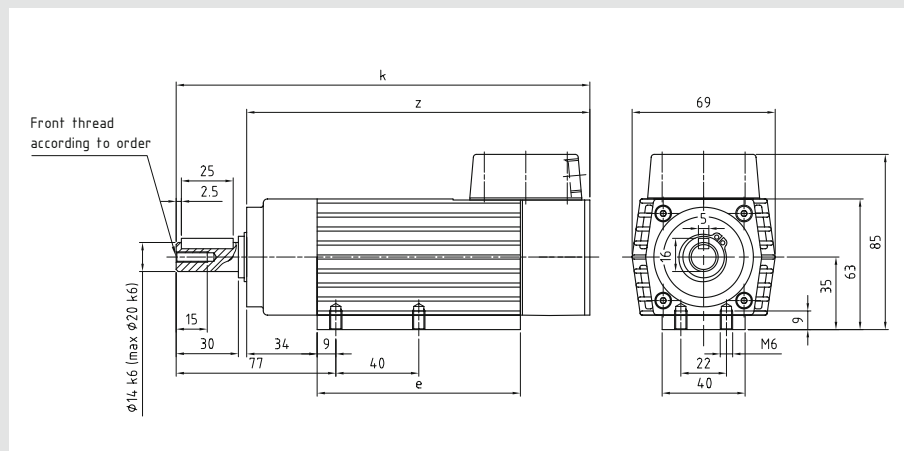
## Synchronous Motors

Type	Weight [kg]	Rated output [kW]	
		S 1	
		400 Hz 12,000 rpm	600 Hz 18,000 rpm
KN 21.04-4S	1.8	0.5	0.65
KN 22.08-4S	2.5	1.0	1.3
KN 24.12-4S	3.2	1.5	2.0
KR 35.1-4S	3.8	1.5	2.0
KR 35.5-4S	4.7	2.0	3.0
KR 35.7-4S	5.5	3.0	4.0

We can provide you with additional performance specifications and speeds upon request.  
Available as direct drive or with direct tool holding system.

### KN 20 S

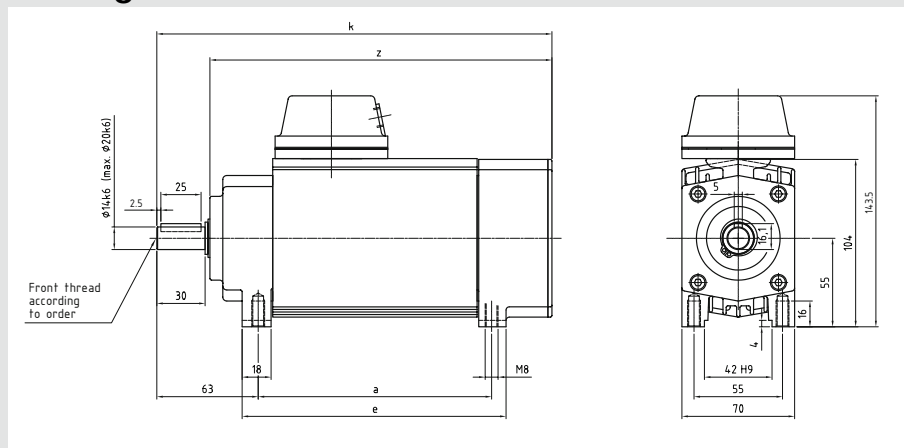
#### Drawing MS 151-188



Type	e	k	z
KN 21.04 S	93	200	166
KN 22.08 S	133	235	201
KN 24.12 S	173	275	241

### KR 35 S

#### Drawing MS 4490



Type	a	e	k	z
KR 35.1 S	145	165	245	212
KR 35.5 S	215	235	315	282
KR 35.7 S	235	255	335	302



## **Direct Drives**

### **for foot- or flange-mounting**

The treatment of various materials in the **processing industry/process engineering** realm requires drives that precisely meet the requirements. Speed-regulated drives, designed especially for converter operations, offer the right solution for these applications.

The converter helps to precisely adjust to the speed. The asynchronous motor combined with the converter also results in an extremely useful "side effect," namely substantial energy savings, i.e., providing the most cost-effective solution.

PERSKE motors are designed together with the user according to the need profile, while also taking into account electrical data and ambient conditions.

More than 60 years of experience building machining motors made for high speeds and adverse operating conditions flow into each unit, and ensure a high degree of reliability and availability.

One should also note that the converters and motors must be tuned to each other.

From its comprehensive portfolio, Perske can offer you a wide selection of suitable direct drives and provide support in configuring them.

We would be pleased to show you examples of implemented and tested drive solutions.

### **How you benefit**

- **Direct drive with low maintenance since there is no mechanical transmission**
- **Motors designed especially for converter operations**
- **Customer-specific performance/speed adjustment capability**
- **High degree of energy efficiency with low-loss materials**
- **A variety of models, all available from our portfolio**
- **Robust bearing**
- **Compact design**
- **Variable mounting flange upon request**
- **Speeds of up to 30,000 rpm**

## Increased dust protection for ATEX 22 type protection zone with non-conductive dust

The Perske modular system has motors that comply with increased dust protection requirements. A detailed inquiry is necessary so that the design can be adapted to special specifications.

The design takes into account the following criteria:

- Incidence of dust occurs only briefly if at all.
- The material-specific temperature class sets a maximum permissible temperature that is lower than the ignition temperature of the corresponding dust cloud or layer. The motor's surface temperature may not exceed this temperature and generally requires a lower output of the corresponding motor size.
- Voltage fluctuations of  $\pm 10\%$  may not result in an unacceptable temperature increase.
- The motors must be equipped with a temperature monitoring system, e.g., thermistors.
- The motor housing must be grounded directly.

When inquiring, it is necessary to describe the dust material.

## Increased water protection

Especially when working with stone, the motors must be protected from water penetration. Perske delivers motors that meet this requirement and incorporate the following features:

- Hollow shaft for supplying spray to the tool's center
- Specially sealed housing section interfaces
- Sealed cable inlet in the terminal box
- Shaft Labyrinth seals partially equipped with additional V- or O-rings.



# Induction Motor, Stator Rotor Packages

## General

Perske integrated motors are used to build high- and ultra-high-speed spindle and special drives. The integrated motor elements are brushless and thereby wear- and maintenance-free.

Additional advantages include:

- High efficiency and performance factor through the use of modern, low-loss materials
- Optimally balanceable thanks to a precisely designed die cast cage

The output depends on the size, speed, and type of cooling (water, air, or oil). To achieve high speeds, the integrated motors must have the frequency converter supply correspondingly high frequencies.

## Design

Perske integrated motor elements consist of

- A stator package with a high-quality, vacuum-impregnated winding (thermal class F), 400-mm-long winding connections made of Teflon-insulated braided wire, oil-resistant, stator-hole machined, winding with 3 thermistors upon request
- A rotor package with a squirrel cage winding made of die cast aluminum, non-machined to allow an exact fit to the shaft

For production reasons, generally only complete packages, i.e., stator and rotor, are available.

## Option

Perske rotor packages can also be supplied with a shaft.

## Performance

The performance data is based on empirical values obtained for bearing friction and sufficient cooling to dissipate heat loss. Increased cooling makes higher outputs possible. The transient peak power possible is substantially higher. Please contact us to obtain further details.

## Type-designation

### Example

	DKE 045 075.5/40/20-2
Core length	_____
Stator's exterior diameter	_____
Stator's interior diameter	_____
Diameter of rotor hole	_____
Pole number	_____





## Flat Motors / Circular Saw Motors

- Perske circular saw motors have proven themselves in many years of use and under the most adverse operating conditions as being extremely reliable.
- Due to their high overload capacity and high stalling torque (approx. 2-3 times the rated torque which is significantly higher than on standard motors), our motors can also overcome the increased high demands encountered in very non-homogenous material.
- A direct drive, without a separate saw blade shaft, may be the right design for an economical, cost-effective solution (also speed-adjustable).
- Available for right- or left-hand operation, with or without brakes, and variable terminal box position.
- Special shafts with large diameters, reinforced bearings, or extreme lengths are also possible.
- Special configurations with increased water protection may be available upon request.



# Circular saw motors with saw blade flange

## for sawing, drilling, and milling wood, plastics, and metal

### Protection class IP 54

#### Mechanical design

Three-phase motor with squirrel cage rotor

The stable and aesthetically designed flat motors have an especially low loss of cutting depth thanks to their low center heights.

#### Type KN 50, KN 60, KC 70:

Especially flat housing made of die cast aluminum, bearing shields made of cast iron, and motors designed with labyrinth seals on both sides.

#### Type K 80, K 90, K 110, K 140:

Housing and bearing shields made of cast iron (welded steel for higher loads), and with borings to mount the protective shroud. The K 160 and K 200 models have their housings and bearing shields made of welded steel.

The shaft bearing consists of generously dimensioned grooved ball bearings. The drive-side bearing is designed as a fixed bearing, while the fan-side one is a self-aligning bearing. The bearings are dust-sealed for normal operating conditions. Permanent lubrication makes the motors of the KN 50, KN 60, KC 70 and K 80 maintenance-free and thus especially user-friendly.

When using the motors to cut plastics and metals, dust and chips are a major hazard for the bearings.

For such operating conditions, the bearings can also be equipped with special labyrinth seals on the bearing shield upon request.

Terminal boxes are normally located at the right front (when looking at the shaft end); however, they can be installed on the left side upon special request. The openings for the cable inlets can be turned 90 degrees with the terminal box if necessary. Flat motors for stonework are available upon request.

**Protection class IP 55** upon request.

#### Electrical design

The motors are designed according to DIN EN 60034-1 (VDE 0530, Part 1) guidelines. Based on normal use in sawing operations, the output for intermittent operations S6-60% is provided.

Output measurement for thermal class F, high-quality vacuum impregnation, high stalling torque and high overload capacity, ambient temperature 40°C, and installation altitude < 1,000 m above sea level.

High-quality insulating materials are used for the insulation. Vacuum impregnation uses state-of-the-art technology. The motors are also available with tropical insulation upon request.

For installation in ambient temperatures above 40°C or at altitudes above 1,000 m above sea level, the motors will exhibit decreased performance.

All motors can be designed for alternative voltages and frequencies. Please inquire if such cases apply to you, especially if foreign electrical connection regulations must be complied with. Depending on the type, the motors develop stalling torques of approx. 250-350% of the rated torque. As a result, the motors have a high transient overload capacity and are thus especially designed for adverse sawing operations. For the transient use of peak output, it is recommended to measure the fuse and the lines based on the resulting higher currents. We ask that you please contact us for further details.



## Circular saw motors with saw blade flange

Type	Weight [kg]	Rated output [kW]		[HP]	Saw blade flange Ø mm	Drawing
		S6-60%				
		50 Hz 3,000 rpm	60 Hz 3,600 rpm	60 Hz 3,600 rpm		
KN 50.11-2	11.0	0.9	1.1	1.5	80	MS 170 A177
KN 51.14-2	12.5	1.3	1.5	2.0	80	MS 170 A177
KN 52.16-2	13.5	1.5	1.7	2.3	80	MS 170 A177
KN 60.09-2	14.5	2.0	2.4	3.2	100	MS 3614-1
KN 61.13-2	19.5	3.0	3.5	4.7	100	MS 3614-1
KN 62.18-2	22.0	4.0	4.8	6.5	100	MS 3614-1
KC 70.12-2	26.0	3.7	4.4	6.0	120	MS 3862
KC 71.16-2	33.0	5.0	6.0	8.0	120	MS 3862
KC 71.20-2	38.0	6.5	7.5	10.0	120	MS 3862
KC 72.28-2	51.0	9.0	11.0	15.0	120	MS 3862
K 81.23-2	69.0	11.0	13.0	17.0	160	MS 630 A 397
K 82.27-2	79.0	13.0	15.0	20.0	160	MS 630 A 397
K 83.37-2	91.0	18.0	21.0	28.0	160	MS 630 A 397
K 91.31-2	106.0	20.0	25.0	34.0	180	MS 630 B 130
K 93.38-2	128.0	25.0	30.0	40.0	180	MS 630 B 130
K 110.24-2	160.0	25.0	30.0	40.0	200	MS 3954
K 111.31-2	177.0	37.0	43.0	58.0	200	MS 3954
K 112.38-2	195.0	45.0	52.0	70.0	200	MS 3954
K 113.50-2	240.0	55.0	65.0	87.0	200	MS 3954
K 140.38-2	360.0	65.0	78.0	105.0	300	MS 630 D 62
K 141.50-2	450.0	75.0	95.0	128.0	300	MS 630 D 62
K 160.50-2 D	625.0	90.0	110.0	150.0	Upon Request	MS 3503
K 162.60-2 D	750.0	120.0	140.0	190.0	Upon Request	MS 3503
K 200.50-2 D	840.0	140.0	170.0	230.0	Upon Request	MS 4452
K 202.60-2 D	900.0	170.0	200.0	270.0	Upon Request	MS 4452

**Configuration for 1,500/1,800 rpm with 4-pole motor available upon request**

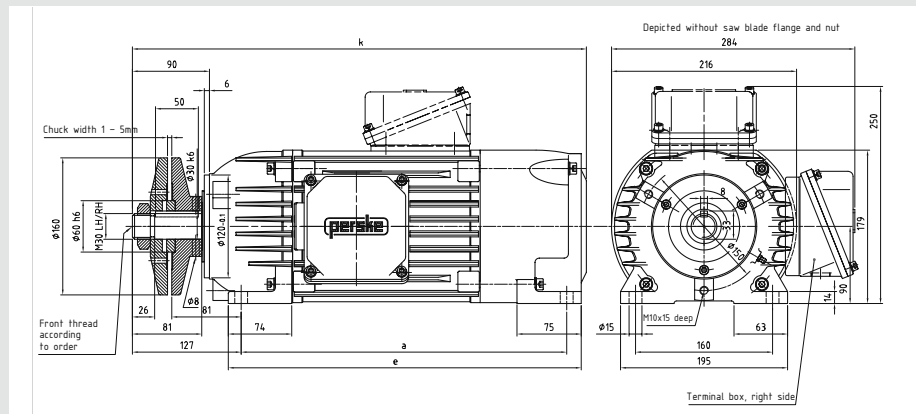




## Circular saw motors with saw blade flange

### K 80

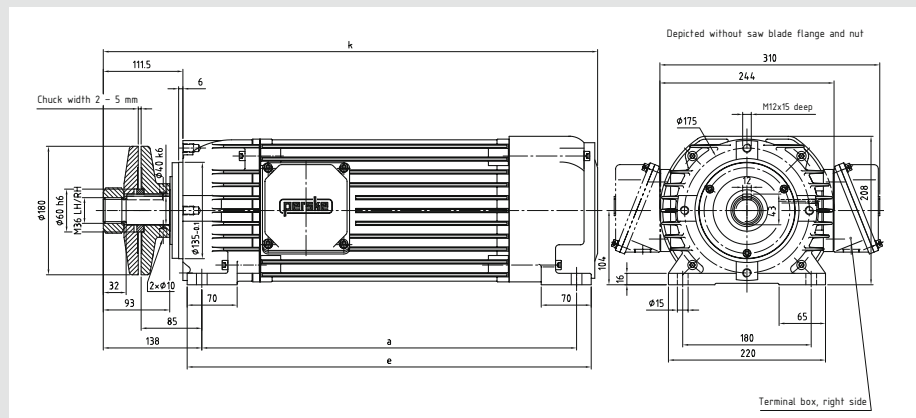
#### Drawing MS 630 A397



Type	a	e	k
KS 81	460	492	610
KS 82	510	542	660
KS 83	570	602	720

### K 90

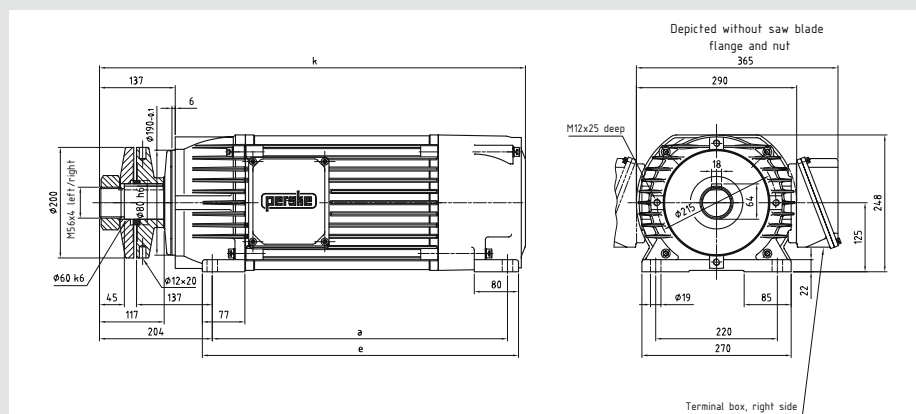
#### Drawing MS 630 B130



Type	a	e	k
KS 91.31	525	566	693
KS 93.38	615	656	783

### K 110

#### Drawing MS 3954



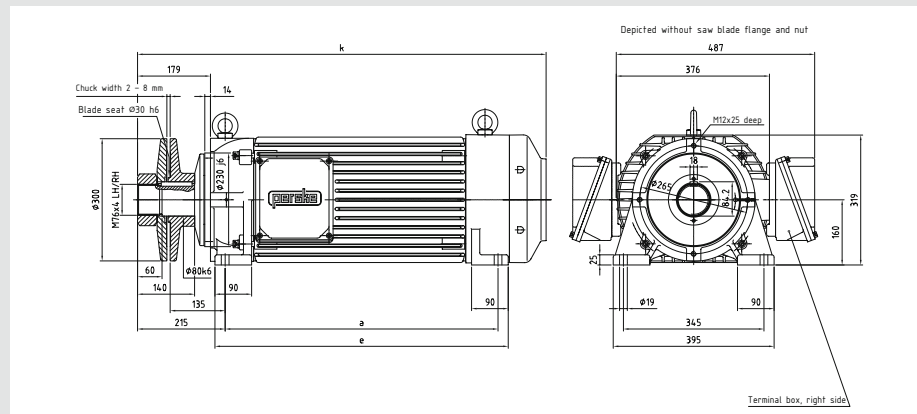
Type	a	e	k
KS 110	464	504	705
KS 111	534	574	775
KS 112	614	654	855
KS 113	734	774	975



## Circular saw motors with saw blade flange

### K 140

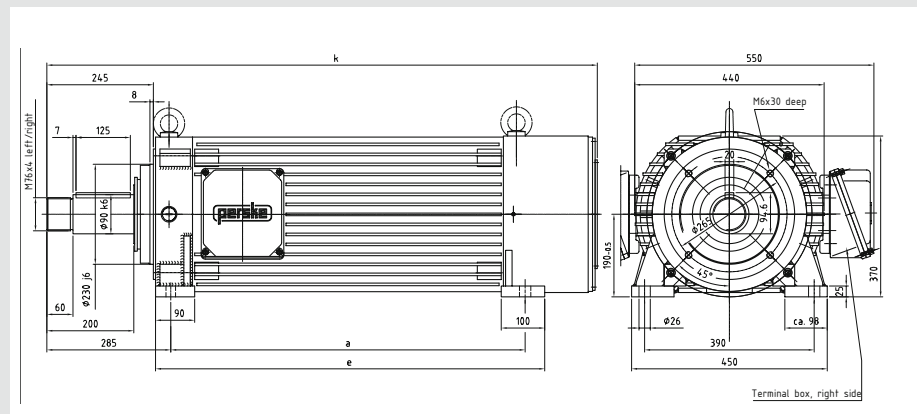
#### Drawing MS 630 D62



Type	a	e	k
K 140	670	720	1003
K 141	855	905	1188

### K 160 D

#### Drawing MS 3503

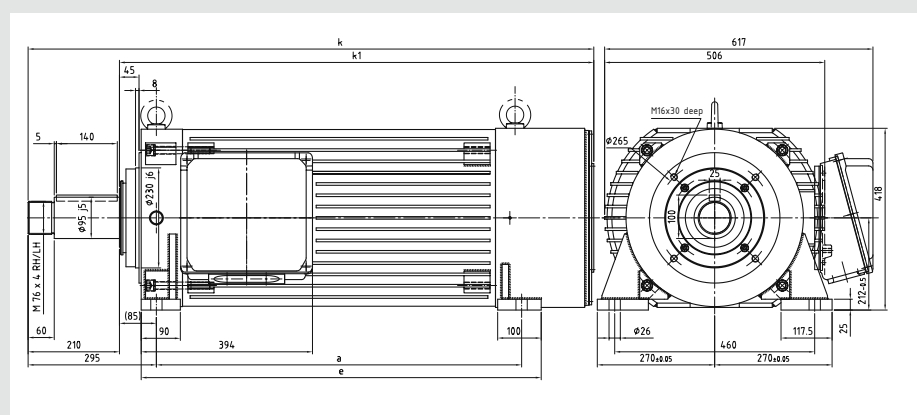


Type	a	e	k
K 160 D	815	895	1266
K 162 D	895	975	1346

also for milling tool  
Saw flange upon request

### K 200 D

#### Drawing MS 4452



Type	a	e	k	k1
KS 200 D	840	920	1301	1091
KS 202 D	900	980	1361	1151

also for milling tool  
Saw flange upon request



# Circular saw motors with saw blade flange and brake

## Mechanical design

Three-phase motor with squirrel cage rotor. Integrated electromechanical spring-pressure brake cooled by the motor's fan. When turning the motor ON, the brake is powered also. Its powerful electromagnet lifts the brake disk and lets the motor run. When turning the power OFF, the strong springs located in the brake exert a high braking force on the friction disks and bring the motor to a standstill. This naturally also applies in the event of a power outage, since the motors have a fail-safe brake.

## Electrical design of the motor

As on p. 46

## Electrical design of the brake

Supply voltage: 230- or 400-V, single-phase alternating current. The electromagnet is configured for DC current and is fed via a rectifier that is located, along with the connection terminals of the motor and brake, in the motor terminal box. For the power supply, single-phase alternating current is required. Normally, this is drawn parallel from the motor terminal board and thereby has the same switching states for motor and brake, and thus also automatic interaction. For star/delta startups, the brake's power supply must also be ensured in the event of a protective failover to prevent a transient, no-voltage state. However, if this is not possible because the motor voltage is deviating excessively from the brake's rated voltage or because the speed regulation is fed in variably, then a separate power supply is necessary for the brake. In this case, the user should ensure that synchronous switching states (motor/brake) are provided. Please request a wiring diagram.

## Safety Note

If the brake motor is used as a circular saw motor, then in the event of braking, the saw blade would continue turning along with the outside flange and nut due to the rotational inertia and the nut would loosen on the thread with the corresponding results. Therefore, the nut is secured from loosening by a full-length fitted key that also applies to the external saw blade flange. The saw blade must then have a greater bore hole diameter than the shaft diameter, and rest on a spacer ring or corresponding flange bevel. It is especially pointed out that the brake is not suited to function as a holding device for tool changes (saw blade change).

## Design of the brake

The integrated standard brakes provide the following braking torque:

Model KN 5... Br Braking torque 4 Nm  
Model KN 6... Br Braking torque 3 Nm  
Model KC 7... Br Braking torque 16 Nm  
Model K 8... Br Braking torque 36 Nm  
Model K 9... Br Braking torque 50 Nm  
Model K 10... Br Braking torque 80 Nm  
Model K 14... Br Braking torque 150 Nm  
Model K 16... Br Braking torque 150 Nm

### General validity

The electromechanical spring-activated brake shall be checked for the intended use. The strength, i.e., the service life, of the brake lining is dependent on the speed, switching frequency, and the mass moment of inertia.

To perform a quick check, please provide:

- Speed [rpm] at which the brake will be actuated
- Switching frequency [switches per hour]
- Mass moment of inertia of external load [kgm<sup>2</sup>]



## Circular saw motors with saw blade flange and brake

Type	Weight [kg]	Rated output [kW]		[HP]		
		S6-60%			Saw blade flange	Drawing
		50 Hz 3,000 rpm	60 Hz 3,600 rpm	60 Hz 3,600 rpm	Ø mm	
KN 50.11-2 Br	12.5	0.9	1.1	1.5	80	MS 645
KN 51.14-2 Br	14.0	1.3	1.5	2.0	80	MS 645
KN 52.16-2 Br	15.0	1.5	1.7	2.3	80	MS 645
KN 60.09-2 Br	15.5	1.8	2.2	2.9	100	MS 646
KN 61.13-2 Br	20.5	2.6	3.1	4.2	100	MS 646
KN 62.18-2 Br	23.0	3.5	4.2	5.6	100	MS 646
KC 70.12-2 Br	32.0	3.7	4.4	6.0	120	MS 654-2
KC 71.16-2 Br	39.0	5.0	6.0	8.0	120	MS 654-2
KC 71.20-2 Br	44.0	6.5	7.5	10.0	120	MS 654-2
KC 72.28-2 Br	57.0	9.0	11.0	15.0	120	MS 654-2
K 81.23-2 Br	77.0	11.0	13.0	17.0	160	MS 635
K 82.27-2 Br	87.0	13.0	15.0	20.0	160	MS 635
K 83.37-2 Br	99.0	18.0	21.0	28.0	160	MS 635
K 91.31-2 Br	120.0	20.0	25.0	34.0	180	MS 636
K 93.38-2 Br	145.0	25.0	30.0	40.0	180	MS 636
K 110.24-2 Br	175.0	25.0	30.0	40.0	200	MS 633 C
K 111.31-2 Br	190.0	37.0	43.0	58.0	200	MS 633 C
K 112.38-2 Br	205.0	45.0	52.0	70.0	200	MS 633 C
K 113.50-2 Br	255.0	55.0	65.0	87.0	200	MS 633 C
K 140.38-2 Br	400.0	65.0	78.0	105.0	300	MS 631-3
K 141.50-2 Br	460.0	75.0	95.0	128.0	300	MS 631-3
K 160.50-2 D Br	655.0	90.0	110.0	150.0	Upon request	MS 639
K 162.60-2 D Br	780.0	120.0	140.0	190.0	Upon request	MS 639

**Configuration for 1,500/1,800 rpm with 4-pole motor available upon request**











# **General Information**

**Technical information**

**Permissible shaft loads**

**Types of protection and operating modes**

**Models/Calculation formulas**

**Notes about ordering parts**

**Motor checklist (for inquiries and orders)**

# **Terms and Conditions of Sale and Delivery**

**Contact person**

# Technical information

## Impregnation

The motors are impregnated in a vacuum impregnation process based on state-of-the-art technology. This method prevents air pockets in the winding and serves to increase the electrical strength of the winding against increased loads.

## Performance

Perske motors are built for industrial use and designed to operate with a converter. The motor output is indicated for thermal class F and continuous duty (S1) or intermittent operation (S6-60%) and is valid for ambient temperatures up to 40°C and an installation altitude up to 1,000 m above sea level. When the motors are installed in ambient temperatures above 40°C or at altitudes above 1,000 m above sea level, the motor may exhibit decreased performance.

## Operating with a static converter

Note: If a static frequency converter is used to operate high-speed motors, then one must plan on thermal class F. The converter is to be tailored to the motor. The EMC guidelines shall be complied with. When operating static converters, one shall preferably seek a sine-shaped outlet voltage. Under certain conditions, smoothing reactors or filters may be necessary. DIN VDE 0530-17, (dated January 2007) shall be complied with. When operating converters at the motor's rated frequency, the available torque is usually less than on sine-shaped voltages. This results from the heat increase stemming from the additional losses. For the rated frequency, the reduction coefficient fluctuates between 0 and 20% (DIN VDE 0530-17, Section 6).

## Bearings

The motors have high-quality ball bearings whose specifications have been coordinated with the manufacturer. For high speeds, bearings with increased speed capability and special running smoothness are built into the motors. Normally, lifetime-lubricated bearings are used. This makes them user-friendly and almost maintenance-free. The drive-side bearing is a fixed bearing, while the fan-side bearing is a self-aligning bearing. The shafts are supported largely free of play by means of built-in corrugated springs, which enables close machining tolerances. Dual bearings on the tool-side are play-free and have proven themselves especially in milling and cutting. These bearings enable the absorption of high forces resulting from heavy tools or rapid feed rates.

## Bearing and shaft loads

In regard to the sizing of the drive shaft and bearing, radial and axial forces are generously compensated for. When the technical features are used as intended, a high degree of operational safety can be provided. The permissible values in accordance with the table on page 59 shall be complied with in configuring a given machine.

## Balancing

Despite the high speeds, meticulous dynamic balancing of the motors ensures smooth operation. In the delivered state, the vibration velocity  $V_{\text{eff}}$  is  $< 1.8 \text{ mm/s}$ . For the bearing's service life, balancing of the entire motor-and-tool system is essential. For that reason, only balanced tools with a balance quality of at least G 6.3 shall be used. For heavier tools or higher speeds, a balance quality of G 2.5 may be necessary. Normally, full-key balancing is agreed upon, i.e., the entire inserted key and "F" shafts. Half-key balancing must be arranged separately. If a system is insufficiently balanced, one can expect the bearing to fail prematurely.

## Safety and startup instructions

Ensure that the motors are installed, maintained, and repaired only by qualified personnel and that the safety provisions as well as local regulations are complied with. Startup and maintenance instructions shall be adhered to. If these startup instructions are not on hand, please request them by indicating the model type and the serial number. Low-voltage machines are components to be installed in machines in accordance with the Machine Directive 2006/42/EC. Startup is prohibited until the end product's conformity with these guidelines has been ascertained.

# Permissible shaft loads

To preclude mechanical overloading of the shaft and bearing, the overload capacity of the shaft end shall be limited to permissible values.

To quickly select a motor and estimate loads, a simplified load model shall be established (see Fig. 1). Here, the radial load, the axial load, and the distance of the load application point from the front side of the motor are the parameters that the user shall verify when selecting a motor.

For every motor size, a fixed axial load limit shall be pre-defined and the associated radial load limits as a function of the effective distance "a" shall be indicated. The catalog provides the values for the loads on the shaft end ( $a=L$ ) or on half the mounting length ( $a=L/2$ ). The information provided applies only for the indicated lengths. If loads engage beyond the shaft end, we recommend that our engineering department perform a separate test.

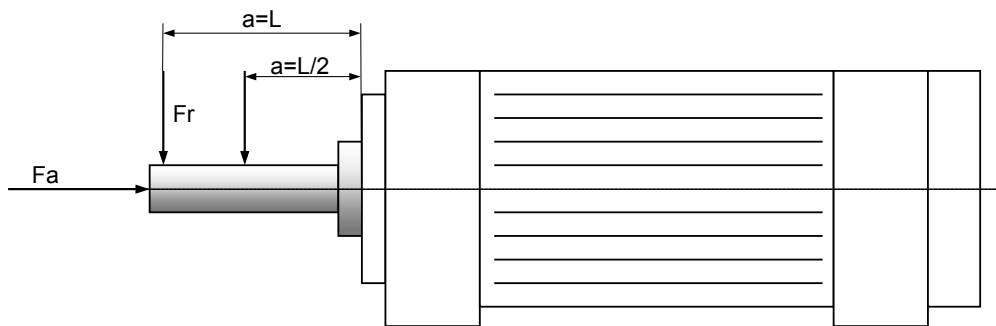


Fig. 1: Simplified load model.  $F_a$  = axial load,  $F_r$  = radial load.

## Scope

- The radial loads provided in the table are permissible during continuous duty and incorporate at least twice the safety factor against the shaft's fatigue fracture.
- All figures apply only for the shaft ends indicated in the table or motor spec sheets.
- The load application point must be within the mounting range on the shaft.
- Permissible loads are calculated for an extended service life of 15,000 operating hours of the bearing according to DIN ISO 281.
- The weight of the parts that the customer mounts on the shaft are not taken into consideration. For heavier weights, a separate test is advisable to avoid problems with the critical bending frequencies.
- The figures are calculated values and not a binding statement in the sense of guaranteed characteristics.
- The calculation is based on the installation position on Model B3.

## Basic recommendations

Tools or other customer components to be installed on the shaft must, at a minimum, meet a balance quality of G6.3 according to DIN ISO 1940-1. In special situations (large tool weight, high speeds), a balance quality of G2.5 or better may be necessary.

The load application point on the shaft should lie as close as possible to the motor since the load carrying capability is highest here. In practice, this means that tools or other components to be mounted by the customer should be clamped on the shaft as close as possible to the motor. In the design phase, this should be considered as early as possible.

## Permissible shaft load

Type	Drawing	Shaft end	Permissible radial load		Axial load Fa	Valid up to n n =
			F_per_(a=L)	F_per_(a=0,5L)		
KN 21,05	MS 151	ø14x30 PF	450 N	500 N	200 N	18,000 rpm
KN 22.08	MS 151	ø14x30 PF	350 N	550 N	200 N	18,000 rpm
KN 23.10	MS 151	ø14x30 PF	300 N	400 N	200 N	18,000 rpm
V 30.06	MS 132	ø14x30 PF	500 N	550 N	200 N	18,000 rpm
V 31.09	MS 132	ø14x30 PF	500 N	550 N	200 N	18,000 rpm
KR 35.1	MS 3746	ø14x30 PF	550 N	850 N	300 N	18,000 rpm
KR 35.3	MS 3746	ø14x30 PF	550 N	850 N	300 N	18,000 rpm
KR 35.5	MS 3746	ø14x30 PF	550 N	900 N	300 N	18,000 rpm
KR 35.7	MS 3746	ø14x30 PF	550 N	900 N	300 N	18,000 rpm
KR 35.9	MS 3746	ø14x30 PF	600 N	900 N	300 N	12,000 rpm
KR 35.1 D	MS 3772	ø25x50 PF	1100 N	1200 N	300 N	18,000 rpm
KR 35.3 D	MS 3772	ø25x50 PF	1000 N	1200 N	300 N	18,000 rpm
KR 35.5 D	MS 3772	ø25x50 PF	750 N	1200 N	300 N	18,000 rpm
KR 35.7 D	MS 3772	ø25x50 PF	650 N	1000 N	300 N	18,000 rpm
KR 35.9 D	MS 3772	ø25x50 PF	500 N	800 N	300 N	12,000 rpm
V 50.09	MS 113 A	ø22x50 PF	900 N	1000 N	300 N	18,000 rpm
KN 50.11	MS 170A	ø22x50 PF	1100 N	1500 N	300 N	12,000 rpm
KN 51.14	MS 170A	ø22x50 PF	850 N	1400 N	300 N	12,000 rpm
KN 52.16	MS 170A	ø22x50 PF	750 N	1200 N	300 N	12,000 rpm
KN 50.11 D	MS 4046	ø30x68 PF	1100 N	1700 N	300 N	12,000 rpm
KN 51.14 D	MS 4046	ø30x68 PF	950 N	1600 N	300 N	12,000 rpm
KN 52.16 D	MS 4046	ø30x68 PF	850 N	1400 N	300 N	12,000 rpm
V 60.11	MS 113 B	ø22x50 PF	750 N	800 N	400 N	18,000 rpm
V 61.15	MS 113 B	ø22x50 PF	750 N	850 N	400 N	18,000 rpm
KN 60.09	MS 170B	ø24x50 PF	1100 N	1200 N	400 N	12,000 rpm
KN 61.13	MS 170B	ø24x50 PF	1100 N	1200 N	400 N	12,000 rpm
KN 62.18	MS 170B	ø24x50 PF	1200 N	1300 N	400 N	12,000 rpm
KN 60.09 D	MS 171	ø30x70 PF	1300 N	1900 N	400 N	12,000 rpm
KN 61.13 D	MS 171	ø30x70 PF	1300 N	2000 N	400 N	12,000 rpm
KN 62.18 D	MS 171	ø30x70 PF	1300 N	2000 N	400 N	12,000 rpm
KC 70.12	MS 652-44	ø35x68 PF	2300 N	2500 N	600 N	9,000 rpm
KC 71.16	MS 652-44	ø35x68 PF	2400 N	2600 N	600 N	9,000 rpm
KC 71.20	MS 652-44	ø35x68 PF	2400 N	2600 N	600 N	9,000 rpm
KC 72.28	MS 652-44	ø35x68 PF	2500 N	2700 N	600 N	9,000 rpm
KC 70.12 D	MS 182-5	ø35x70 PF	2400 N	2600 N	600 N	9,000 rpm
KC 71.16 D	MS 182-5	ø35x70 PF	2500 N	2800 N	600 N	9,000 rpm
KC 71.20 D	MS 182-5	ø35x70 PF	2500 N	2800 N	600 N	9,000 rpm
KC 72.28 D	MS 182-5	ø35x70 PF	2500 N	2800 N	600 N	9,000 rpm
K 81.23	MS 630 A397	ø30x81 Flange	2000 N	2900 N	800 N	6,000 rpm
K 82.27	MS 630 A397	ø30x81 Flange	1900 N	2700 N	800 N	6,000 rpm
K 83.37	MS 630 A397	ø30x81 Flange	1800 N	2400 N	800 N	6,000 rpm
K 81.23 D	MS 630 A196	ø40x70 PF	2400 N	2600 N	800 N	6,000 rpm
K 82.27 D	MS 630 A196	ø40x70 PF	2500 N	2600 N	800 N	6,000 rpm
K 83.37 D	MS 630 A196	ø40x70 PF	2500 N	2700 N	800 N	6,000 rpm
K 91.31	MS 630 B130	ø40x93 Flange	4100 N	5000 N	1000 N	6,000 rpm
K 93.38	MS 630 B130	ø40x93 Flange	4000 N	5100 N	1000 N	6,000 rpm
K 110.24	MS 3954	ø60x117 Flange	6400 N	7700 N	1500 N	6,000 rpm
K 111.31	MS 3954	ø60x117 Flange	6000 N	7900 N	1500 N	6,000 rpm
K 112.38	MS 3954	ø60x117 Flange	4500 N	8000 N	1500 N	6,000 rpm
K 113.50	MS 3954	ø60x117 Flange	4200 N	8300 N	1500 N	6,000 rpm
K 140.38	MS 630 D62	ø80x140 Flange	11600 N	12200 N	2500 N	5,000 rpm
K 141.50	MS 630 D62	ø80x140 Flange	12000 N	12500 N	2500 N	5,000 rpm
K 160.50 D	MS 3503	ø90x200 PF	13200 N	14200 N	4000 N	4,500 rpm
K 162.60 D	MS 3503	ø90x200 PF	13500 N	14400 N	4000 N	4,500 rpm
K 200.50 D	MS 4452	ø95x210 PF	13200 N	14200 N	4000 N	4,500 rpm
K 202.60 D	MS 4452	ø95x210 PF	13400 N	14400 N	4000 N	4,500 rpm

# Protection Class and Operating Modes

The protection classes of electrical machines are indicated in letter symbols consisting of two letters and two digits. The following protection classes are generally used:

## Protection classes according to DIN EN 60034-5 / VDE 0530, Part 5

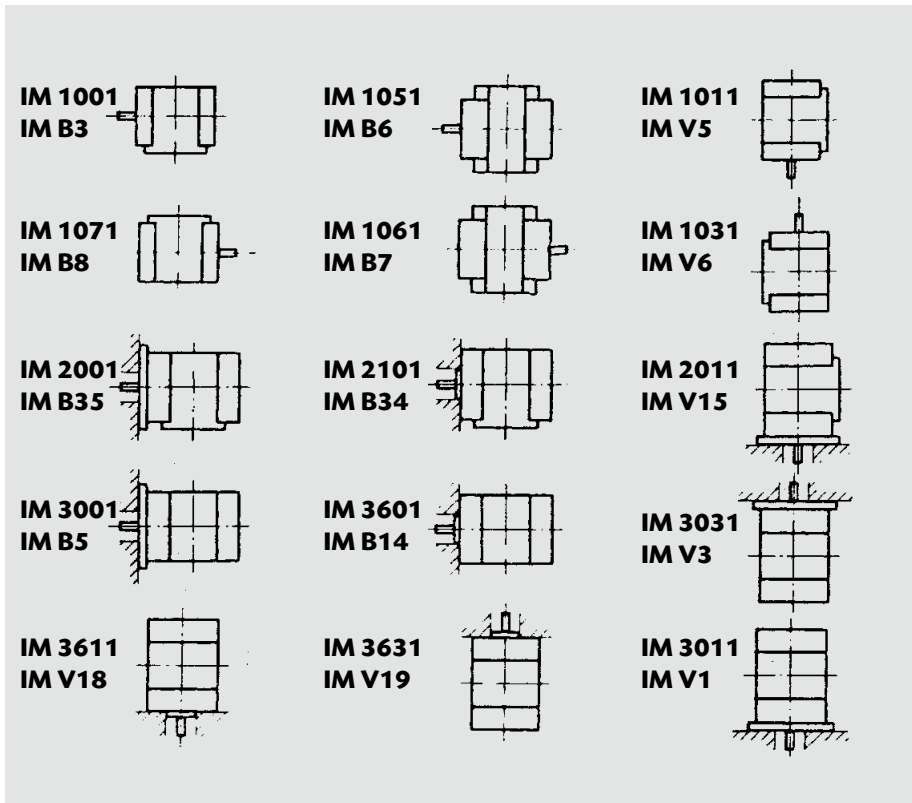
Protection Class	1 <sup>st</sup> number: contact protection	Protection against foreign objects	2 <sup>nd</sup> number: water protection
IP 00	No protection	No protection	No protection
IP 11	Against inadvertent large-surface area contact of interior components that are moving or under voltage	Against foreign objects having a diameter greater than 50 mm	Against water dripping vertically down from above
IP 23	Against contact with fingers	Against medium-sized, solid foreign objects having a diameter greater than 12 mm	Against water spray from a vertical direction to 60°
IP 44	Against contact with tools, wires thicker than 1 mm	Against small, solid foreign objects having a diameter greater than 1 mm	Against water spray from all directions
IP 54	Complete protection against contact	Against harmful dust deposits	Against water spray from all directions
IP 55	Complete protection against contact	Against harmful dust deposits	Against water jets from all directions

## Operating modes according to DIN EN 60034-1/VDE 0530, Part 1

Code	Operating mode	Additional explanation	Additional information	For example
S 1	Continuous duty	Constant rated output possible		
S 2	Short-term operation	Constant rated output possible with no-voltage pause and full cool-down	Activation time ED in minutes	S 2 – 10 min
S 3	Intermittent operation	Result of similar short-term loads with no-voltage pauses and full cool-down	Load duration ED in % of cycle period	S 3 – 40%
S 4	Intermittent operation influenced by startup	Result of startup, constant rated output, and no-voltage, recurring pauses	Load duration ED in % of cycle period	S 4 – 30% – 10 cycles
S 5	Intermittent operation influenced by startup and electrical braking	Result of startup, constant rated output, electrical braking, and no-voltage, recurring pauses	Load duration ED in % of cycle period	S 5 – 20% – 24 cycles
S 6	Continuous duty with intermittent loads	Result of constant rated output and idle mode, continuously repeated	Load duration in % of cycle period	S 6 – 60%
S 7	Uninterrupted operation with startup and braking	Result of startup, constant rated output, electrical braking. No stoppage, machine continuously under voltage.		
S 8	Uninterrupted operation with pole-changing	Periods of various loads and speeds, continuously changing, without stoppage	For every speed, load and duration indicated separately	
S 9	Intermittent operation influenced by startup and electrical braking and load changes	Non-periodic result of startup, various loads, speeds, and direction of rotation, electrical braking, and no-voltage stoppage of various lengths of time	Given this operating mode, a corresponding duration value is to be determined to specify the motor-type	



## Construction type



**Codes for models  
and mounting of  
rotating electrical  
machines**

**DIN EN 60034-7  
VDE 0530, Part 7**

## Calculation formula

Torque:  $M = 9,55 \cdot \frac{P}{n}$

Mechanical power:  $P = \frac{1}{9,55} \cdot M \cdot n$

Power input:  $P_1 = \sqrt{3} \cdot U \cdot I \cdot \cos \phi$

Power output:  $P_2 = \sqrt{3} \cdot U \cdot I \cdot \cos \phi \cdot \eta$

Apparent power:  $S = \sqrt{3} \cdot U \cdot I$

Rated current:  $I = \frac{S}{\sqrt{3} \cdot U}$

$M$  = Torque [Nm]

$P$  = Power [W]

$n$  = Speed [rpm]

$\eta$  = Efficiency

$\cos \phi$  = Power factor

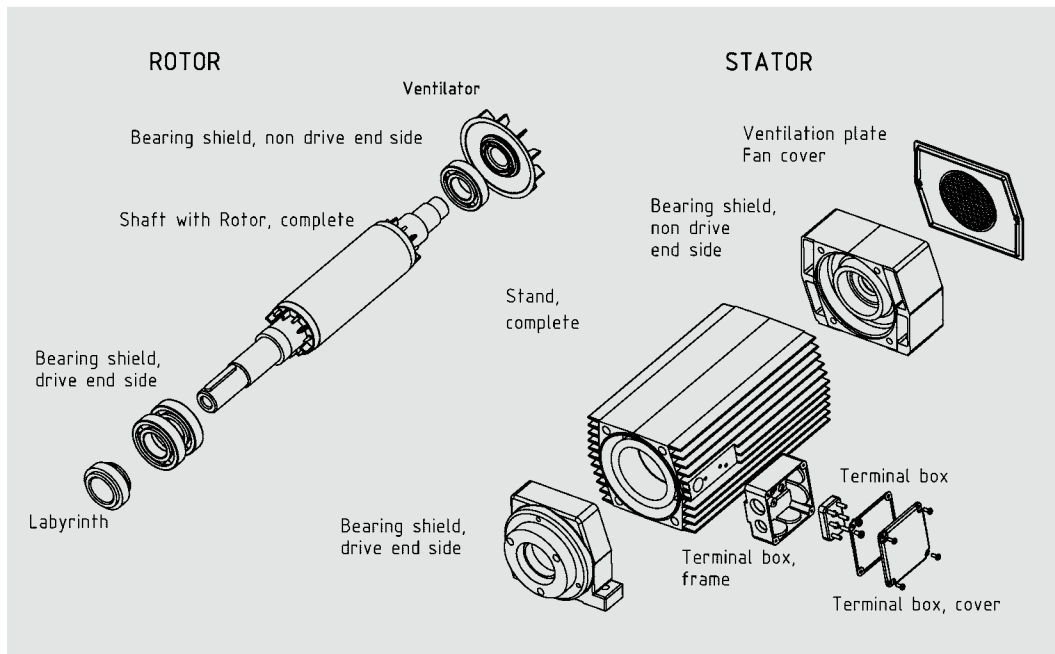
$U$  = Voltage [V]

$I$  = Current [A]

$S$  = Apparent power [VA]

# Instructions for ordering parts

## Principle schematic of motor's main components

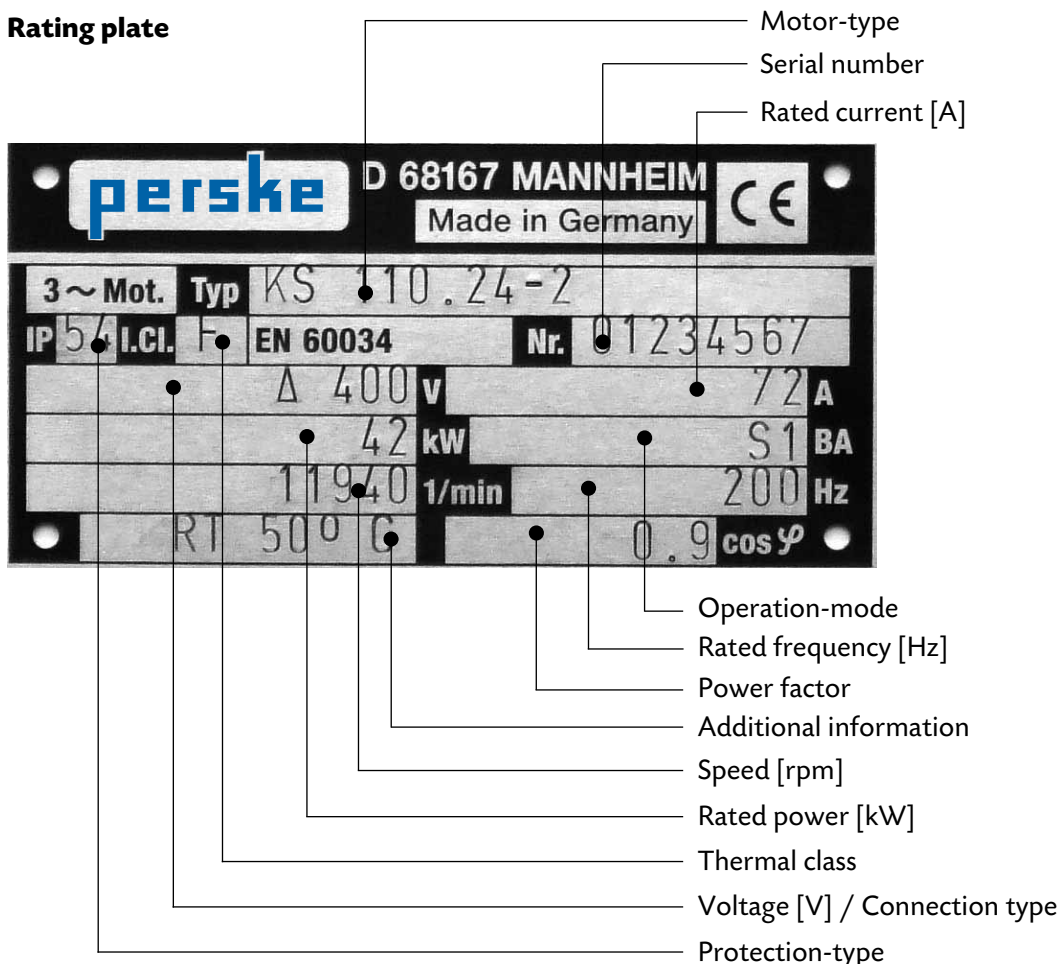


### Note:

**When ordering parts, always provide the model-type and serial number.**

**This information is indicated on the rating plate (see below):**

## Rating plate





# Motor checklist

☐ **Inquiries**      ☐ **Enclosure to Purchase order**

To  
Walter Perske GmbH  
Sales Department  
Friedrich-Ebert-Strasse 80-84  
68167 Mannheim  
Tel. 0621/33090-0  
Fax 0621/33090-33  
E-mail permo@perske.de

Company \_\_\_\_\_  
Processed by \_\_\_\_\_  
Tel.: \_\_\_\_\_ Fax: \_\_\_\_\_  
Street \_\_\_\_\_  
Postal code / city \_\_\_\_\_  
E-mail \_\_\_\_\_

## ☐ **New motor**

### **Application**

☐ Sawing      ☐ Drilling      ☐ Stonework      ☐ Direct drive  
☐ Milling      ☐ Grinding

### **Ambient conditions**

☐ Dry      ☐ Wet

Quantity	Type	According to catalogue page	Drawing no.:
<b>Regulation, rule</b>	<input type="checkbox"/> DIN EN 60034-1 (VDE 0530-1)	<input type="checkbox"/> NEMA	<input type="checkbox"/> CSA
<b>Output</b>	<input type="checkbox"/> _____ kW S1/S6-60%	<input type="checkbox"/> Special speed-output characteristics (attached)	
<b>Voltage</b>	_____ V	<b>Frequency</b>	_____ Hz <b>Speed</b> _____ rpm
<b>Model</b>	_____	<b>Position of terminal box</b> _____	
<b>Bearing arrangement</b>	<input type="checkbox"/> Single bearing <input type="checkbox"/> Double bearing		

## **A. 1. Shaft design**

☐ According to diagram (attached)      ☐ Collet design Max. clamping diameter Ø \_\_\_\_\_ mm  
☐ With saw flange Ø \_\_\_\_\_ mm  
☐ cylindrical      ☐ With key      ☐ Without key  
Diameter \_\_\_\_\_ mm length \_\_\_\_\_ mm without thread  
Collet \_\_\_\_\_ Size \_\_\_\_\_  
Key \_\_\_\_\_ Nut \_\_\_\_\_  
☐ Exterior thread size M \_\_\_\_\_ ☐ left      ☐ right      ☐ Electromagnetic brake  
☐ Interior thread size M \_\_\_\_\_ ☐ left      ☐ right      ☐ Wrench flat

## **A. 2. Motor protection**

☐ With thermistors      ☐ With thermal contacts (bimetal break contact)  
☐ PT 100      ☐ KTY

## ☐ **Spare motor/Repeat order**

Quantity	Type
----------	------

Same as serial no. \_\_\_\_\_

Comments \_\_\_\_\_

Enclosures \_\_\_\_\_

Date \_\_\_\_\_

Company stamp \_\_\_\_\_

# Terms and Conditions for Sales and Deliveries

## General Information

The models depicted in the spec sheets of the preceding lists are the basic models of the respective motor. The illustrations are non-binding. Designs deviating from these are special configurations and are subject to surcharges. In the absence of any other agreement, we will charge the customary fee for all agreed upon modifications after signing of the contract.

## Prices

The prices are considered to include delivery without installation or assembly, ex works, and not including packaging. Prices do not include the applicable statutory value-added tax.

## Material Surcharge

### Copper

Bid prices are based on a quotation for electrolyte copper (Cu-DEL-Notiz) of € 230.00 per 100 kg. For quotations above € 230.00 per 100 kg, the following surcharges will be assessed:

DEL quotation in € per 100 kg	Copper surcharge in %
225 to below 275	1.2
275 to below 325	2.5
325 to below 375	3.5
375 to below 425	4.5
425 to below 475	5.5
475 to below 525	6.5
525 to below 575	7.5
575 to below 625	8.5
625 to below 675	9.5
675 to below 725	10.5
725 to below 775	11.5

When calculating the copper surcharges, the DEL quotation of the order reception date is authoritative.

### Other material

We reserve the right to impose additional material surcharges.

## Complying with instructions

During operations, our operating instructions and lubricating guidelines shall be complied with. In particular, we wish to point out that all accident prevention and installation guidelines shall be strictly complied with at the location of the ordering/using party. We assume no liability for improper use. Special requirements pertaining to noise emissions shall be taken into account in designing the machine or system.

## Terms and conditions for sales and deliveries

The following shall apply: the “Electrical Industry’s General Delivery Terms for Goods and Services” (ZVEI), including the “retention of title” addendum as well as “Walter Perske GmbH’s General Terms for Sales of Goods and Services.” We reserve the right to modify the technical data. The sole place of fulfillment for all contractual or ex-contractual obligations stemming from the service contract is Mannheim. Upon publication of this list, all earlier editions shall no longer be valid.

The terms and conditions for sales and deliveries can be viewed on the Internet or be mailed upon request.

### Motor-collet correlation

motor type	OZ-type collet DIN 6388 taper ratio 1:10				ER-type collet DIN 6449 taper angle 8°				max. speed (rpm)
	OZ-type	size	max. collet capacity		ER-type	size	max. collet capacity		
			mm	inch			mm	inch	
KN 21.05	OZ 1832	10	10 <sup>(1)</sup>	3/8"	ER 20	20	13 <sup>(1)</sup>	1/2"	30,000
KN 22.08	OZ 1832	10	10 <sup>(1)</sup>	3/8"	ER 20	20	13 <sup>(1)</sup>	1/2"	30,000
KN 23.10	OZ 1832	10	10	3/8"	ER 20	20	13	1/2"	24,000
V 30.06	OZ 1832	10	10 <sup>(1)</sup>	3/8"	ER 20	20	13 <sup>(1)</sup>	1/2"	30,000
V 31.09	OZ 1832	10	10 <sup>(1)</sup>	3/8"	ER 20	20	13 <sup>(1)</sup>	1/2"	30,000
KR 35.1 D	OZ 1832	10	10	3/8"	ER 20	20	13	1/2"	24,000
KR 35.3 D	OZ 1832	10	10	3/8"	ER 20	20	13	1/2"	24,000
KR 35.5 D	OZ 1832	10	10	3/8"	ER 20	20	13	1/2"	24,000
KR 35.7 D	OZ 1832	10	10	3/8"	ER 20	20	13	1/2"	18,000
KR 35.9 D	OZ 1832	10	10	3/8"	ER 20	20	13	1/2"	12,000
V/VU 50.09	OZ 1833	12	12	1/2"	ER 25	25	16	5/8"	30,000
V/VU 60.11	OZ 1833	12	12	1/2"	ER 25	25	16	5/8"	30,000
V/VU 61.15	OZ 1833	12	12	1/2"	ER 25	25	16	5/8"	12,000
KR 50.11 D	OZ 1833	12	12	1/2"	ER 25	25	16	5/8"	18,000
KR 51.14 D	OZ 1833	12	12	1/2"	ER 25	25	16	5/8"	18,000
KR 52.16 D	OZ 1833	12	12	1/2"	ER 25	25	16	5/8"	12,000
KRSV 51.14 D	OZ 1836	25	25	1"	-		-		18,000
KR 60.09 D	OZ 1834	16	16	5/8"	ER 32	32	20	3/4"	18,000
KR 61.13 D	OZ 1834	16	16	5/8"	ER 32	32	20	3/4"	18,000
KR 62.18 D	OZ 1834	16	16	5/8"	ER 32	32	20	3/4"	12,000
KRS 61.13-2 D	OZ 1836	25	25	1"	-	-	-		18,000
KC 70/71/72	OZ 1836	25	25	1"	ER 32	32	20	3/4"	9,000
KC 70/71/72 D	OZ 1836	25	25	1"	-	-	-	-	9,000
KNOC 71 D		-	-		ER 32	32	20	3/4"	18,000
KNO 71 D	OZ 1836	25	25	1"	-	-	-	-	18,000

(1) = the maximum collet capacity can only be used up to 24,000 rpm at the maximum.

D = double bearing arrangement on tool side

The maximum collet capacities and maximum speeds stated in the above list do not conform with all standard motor versions but sometimes need special bearing arrangements.

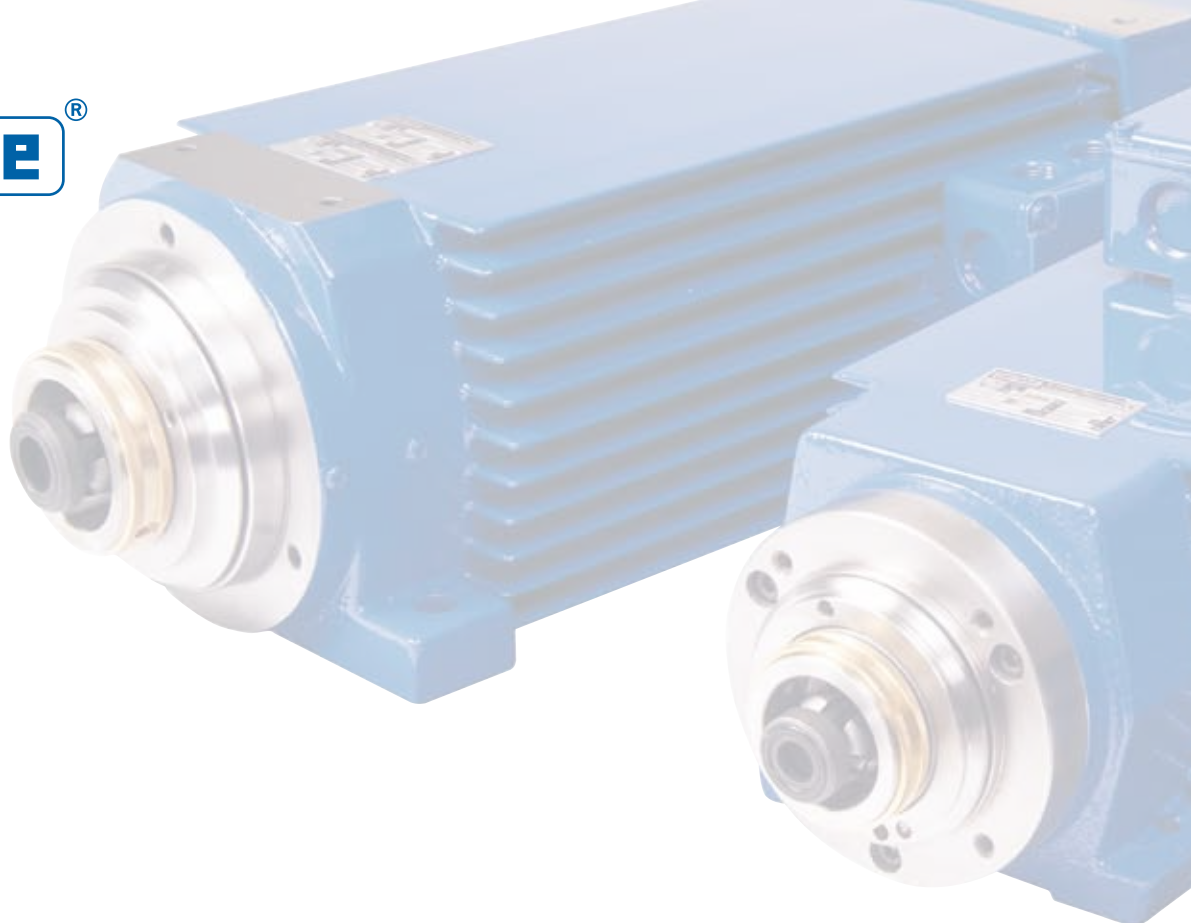
Only balanced tools are to be used. Depending on the weight of tool, restrictions may be necessary.

### Measurements conversion table

power 1 HP	= 0.7457 kW	1 kW = 1.341 Hp					
length 1 inch	= 25.4 mm	1 mm = 0.039 inch					
length 1 ft	= 304.8 mm	1 m = 3.28 ft					
weight 1 lb	= 0.454 kg	1 kg = 2.20 lbs					
temperature °F	= 9/5°C + 32	°C = (°F - 32) x 5/9					
pressure 1 psi	= 68.95 mbar	1 mbar = 0.0145 psi					
speed 1 ft/s	= 0.305 m/s	1 m/s = 3.28 ft/s					



## Notes



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# Precision and high speed



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