

## Gerotor Pumps

# Product series 143

For oil, for use in SKF CircOil centralized lubrication systems



# Gerotor pumps, product series 143

SKF gerotor pump units of product series 143 are self-priming positive-displacement pumps with fixed displacement and high efficiency. They are used in SKF CircOil centralized lubrication systems for a variety of tasks and applications, especially in circulating-oil and total-loss lubrication systems.

## Fields of application:

- General mechanical and plant engineering
- Shipbuilding and offshore industry
- Paper, printing, and pulp industries
- Heavy industry

## Advantages:

- Flexible delivery range from 0.85 to 50 l/min at system pressures up to 50 bar
- Large viscosity range for standard mineral and synthetic lubricating and hydraulic oils from 20 to 1000 mm<sup>2</sup>/s

- Ambient temperature of 0 to +40 °C
- Low volumetric flow pulsation and thus very smooth running
- Gerotor with a cycloid contour and thus good suction characteristics
- Low-noise
- Gerotor pumps are available in NBR and FKM designs.
- Squirrel cage motors are available in different voltage designs for 50 and 60 Hz
- Compact design
- Modular ordering system (order as a complete pump unit, single pump, or pump with flange and shaft coupling)

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### Note

The technical data in this publication provide for general information. Follow the assembly instructions and any instructions on and accompanying the products when performing assembly, operating, and maintenance.

Technical data and selection and ordering data, including availability, for accessories are subject to change.

### Further information

Assembly instructions **951-170-251**

You can download the publications as PDF file from the SKF website: [skf.com/143](http://skf.com/143)

Online configurable and CAD models under [skf-lubrication.partcommunity.com](http://skf-lubrication.partcommunity.com)

# Gerotor pumps, product series 143

## Illustration of designs and accessories

Gerotor pump unit in foot design



Gerotor pump unit in flange design



Gerotor



Gerotor pump



Pump flange



Shaft coupling



ICE squirrel cage motor



Gerotor pump+pump flange+ shaft coupling



# Gerotor pumps, product series 143

## Fundamentals

### General use

SKF gerotor pump units of product series 143 are used in circulating-oil and total-loss lubrication systems in a flow rate range of 0.85 to 50 l/min. The standard permissible ambient temperature is between 0 and +40 °C. Higher ambient temperatures are possible, though they lead to a reduction in motor performance and thus the delivery rate. The permissible temperature of the pumped medium is between 0 and +80°C. The gerotor pumps are available in NBR and FKM designs.

SKF gerotor pump units feed lubricating and hydraulic oils from a reservoir and into the pipe system of a centralized lubrication system. In doing so, they increase the energy of the pumped medium (pressure increase) to overcome flow resistance in the pipelines (pressure loss), the components (filters, valves, distributors) and the bearings and friction points. SKF gerotor pump units of different types and performance ratings are used depending on the type and size of the centralized lubrication system and the lubricant.

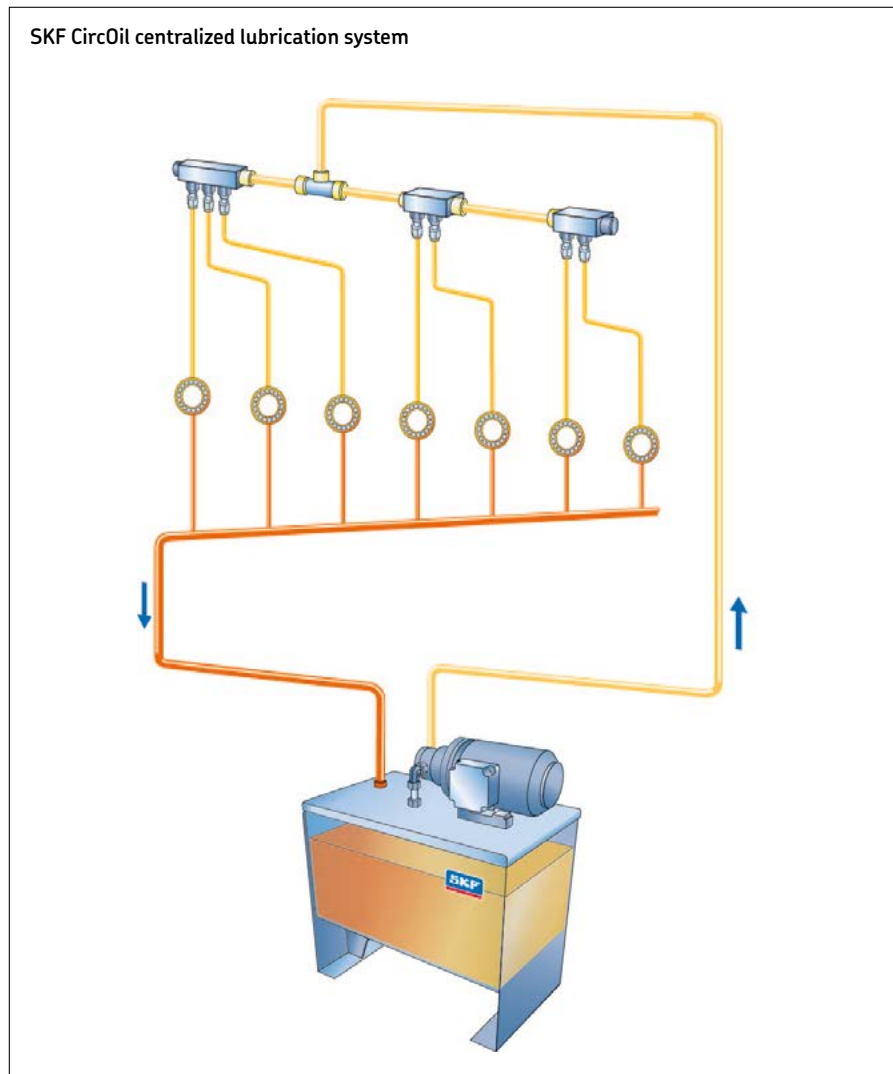
### Applications

The main area of application is the broad field of circulating-oil and total-loss lubrication systems for general mechanical engineering and plant engineering applications. Here, the focus is on lubricating and cooling heavily loaded bearings and friction points for a wide range of uses. SKF gerotor pump units are used primarily as lubricating, hydraulic, hydrostatic, and cooling oil pumps. They can be set up either as single pumps or integrated into a reservoir unit. Other areas include the shipbuilding and offshore industry as well as the paper, printing, pulp, and heavy industries.

### Delivery rates and characteristic curves

The nominal delivery rates indicated in the catalog refer to the nominal output multiplied by the speed of the motor. The actual delivery rate changes with operating viscosity and back pressure and can be found in the characteristic curve diagrams in the catalog (→ page 12–13). These diagrams are based on the range between 20 and 1000 mm<sup>2</sup>/s in increments of 20, 140, 750, and 1000 mm<sup>2</sup>/s. Each gerotor pump has a characteristic curve represented as a function of the delivery rate above the delivery pressure (back pressure).

It is important to note that temperature influences can render lubricating and hydraulic oils extremely thin or viscous. Please consult with us in advance if you will use lubricating and hydraulic oils with an operating viscosity outside the specified range.



# Gerotor pumps, product series 143

## Fundamentals

### Design (→ Figure 1)

SKF gerotor pump units of product series 143 have a constant displacement volume and one delivery circuit. The annular-toothed feeding element, also referred to as the gerotor, is equipped with a cycloid contour, which creates a large tooth meshing length. This yields a low volumetric flow pulsation and thus very smooth running, low noise production, and good suction characteristics.

SKF gerotor pumps consist primarily of pump housing (1), the shaft (2), the displacement elements toothed rotor (3) and annular gear (4), and the lid (5).

### Suction and displacement process (→ Fig. 1)

The shaft drives the centrally mounted toothed rotor in the indicated direction of rotation via a feather key. The toothed rotor meshes with the outer, eccentrically mounted annular gear and rotates with it. The openings between teeth arising in the suction area (S) draw the pumped medium in. The suction and pressure area is separated from the tooth meshing area (Z) by a radial gap (R) formed by the tooth profiles of the annular gear and the toothed rotor as they slide onto one another. In the pressurized area (P), the fluid is fed to the pressure port through increasingly small chambers.

### Drive

SKF gerotor pump units of product series 143 are driven by IEC squirrel cage motors sized 63 to 132 in the standard design. The motors are designed for a rated motor voltage of 230/400 V or 400/690 V for 50 networks according to DIN IEC 60038. The normal coils used here in motors with performance  $\leq 0.75$  kW are designed for the wide voltage range. The normal coils in motors with performance  $\geq 0.75$  kW are tailor-made and meet the IE3 efficiency level according to EU Directive 2009/125/EC. Special voltage versions with special coils for 50 Hz and 60 Hz networks are available for order.

The standard design of the motors comes with a terminal box. Motors with UL/CSA certification are available. Further certifications are available on request.

### Shaft coupling

The shaft couplings are designed as curved-tooth couplings. Curved-tooth couplings are flexible shaft connections for positive torque transmission. The material combination of steel hub and polyamide sleeve used for the curved-tooth couplings permits maintenance-free continuous duty with very low friction on the teeth. They, therefore, do not require any lubrication or maintenance and are nearly wear-free in operation.

### Installation

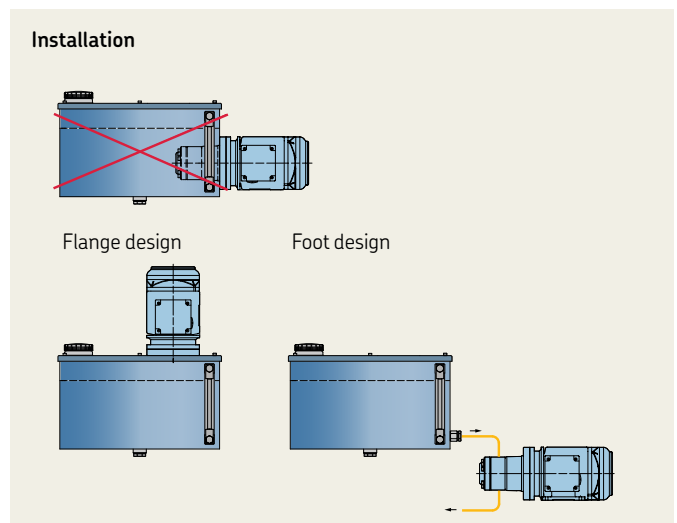
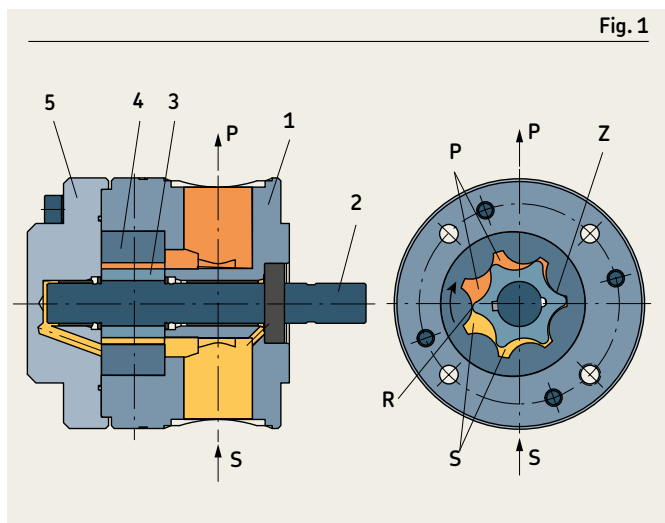
SKF gerotor pump units of product series 143 can be installed both horizontally and vertically. Foot or flange versions are available for each gerotor pump unit design.

When the gerotor pump unit is set up separately from the reservoir, the suction port on the pump can be connected to a reservoir at a higher position (max. 2000 mm).

To flange the gerotor pump unit to a reservoir horizontally below the oil level, use a sealed pump in a special design. Please consult our Engineering department in advance.

In its design as a pump with flange and coupling, various technical designs of customer-specific electrical motors can be used. The flange allows for the installation of all IEC standard motors with a flange according to DIN EN 50347, design FT (with threaded holes). See the drawings in this publication for the geometric dimensions of the flange.

If only gerotor pumps without a motor are used, for example as an integrated/attached pump on a machine housing, ensure that no radial or axial load is applied to the drive shaft. The pumps can be installed in any position.



# Gerotor pumps, product series 143

## Technical data

Gerotor pump unit in foot design



Gerotor pump unit in flange design



Gerotor pump



Table 1

### Technical data

Lubricant	standard mineral, synthetic lubricating and hydraulic oils
Operating viscosity	20–1000 mm <sup>2</sup> /s
Flow range	0,85–50 l/min
Operating pressure	up to 50 bar
Ambient temperature range	0 to +40 °C
Medium temperature range	0 to +80 °C
Protection class acc. to DIN EN 60529	IP 54
Operating noise level	60 dBA
Drive speed depending on design	1400 and 2800 min <sup>-1</sup>
Suction head, max.	1000 mm
Varnishing	RAL 7024 graphite grey, special painting optional
Duty type per VDE 0530	S1
Sealing material	NBR, FKM
Mounting position	horizontal, vertical

### Materials

Pump housing	hydraulic cast (pressure-proof) with good wear and antifriction properties
Gerotor insert	sintered material
Shafts	low-deformation steels, case-hardened
Bearing	SKF plain bearing

### ! General notes on usage

During commissioning, pay attention to the pump's direction of rotation. See the rating plate and motor rotation arrow on the pump.

If using the pumps in systems without any open pressure lines, provide pressure-regulating valves to limit the maximum pressure of the system.

The selected cross-section of the intake tube must be equal to or greater than the cross-section of the pump's suction port.

SKF Lubrication Systems Germany GmbH recommends the use of filters for trouble-free operation of the pumps or pump units. Effective filtration prevents malfunctions while also increasing the service life of the pumps. A pumped medium of at least the purity class 20/17/14 according to ISO 4406(c) is recommended. This corresponds to the U.S. standard NAS code (1638) class 8 and SAWAS 4059 class 8. A filter rating of approx. 5 - 10 µm meets this requirement. The filter rating used is always based on the most sensitive component in the entire system. This is not necessarily the pump.

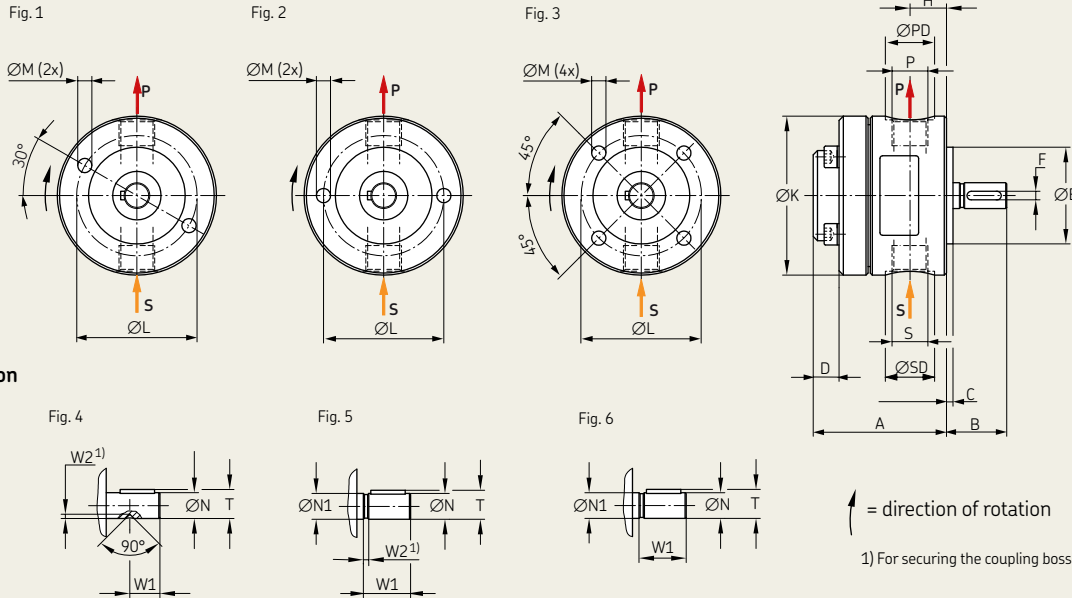


# Gerotor pumps, product series 143

## Gerotor pump design, technical data and dimensions

Figure 2

### Gerotor pump



### Gerotor pump (→ Figure 2)

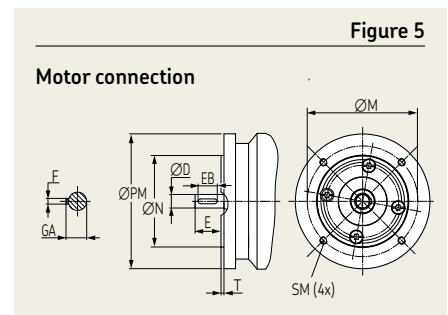
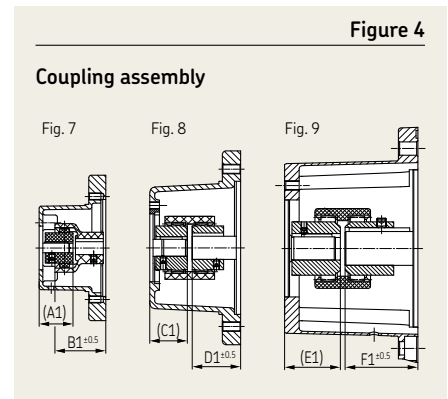
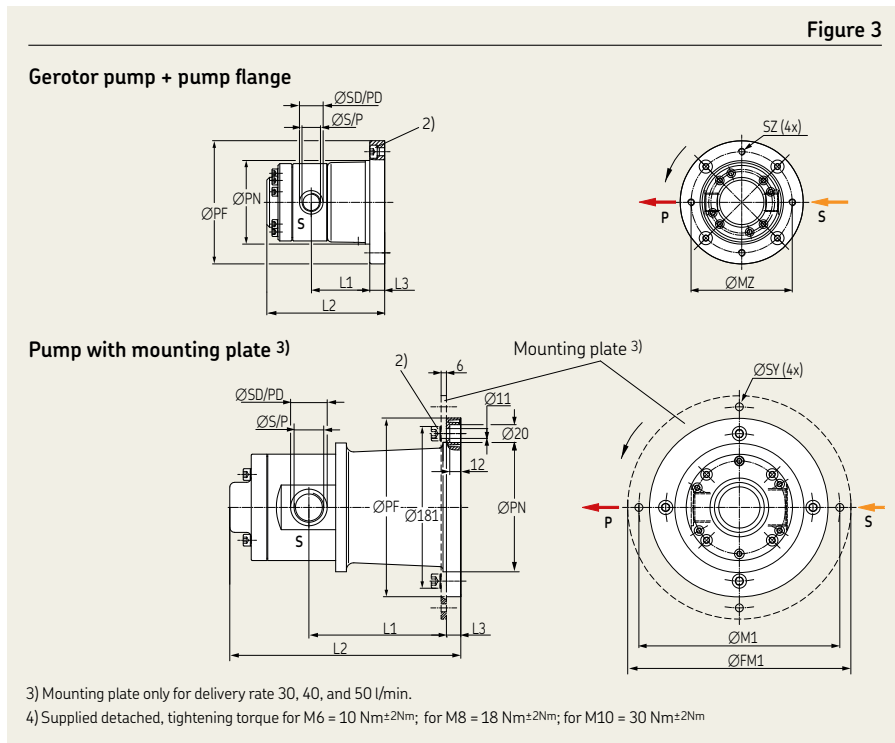
Nimnal delivery rate [l/min]	Back pressure max. [bar]	Perm. viscosity range [mm <sup>2</sup> /s]	Char. curve No. 1)	Nominal output [cm <sup>3</sup> /rev.]	Required drive Speed [min <sup>-1</sup> ]	Required power [kW]	Suction port S	Pressure port P	Design N (NBR) / F (FKM) Order No. 4)	Dimensions [mm]																
										ØPD/ØSD	A	B	C	D	ØE	F	H	ØK	ØL	ØM	ØN	ØN1	T	W1	W2	Fig.
0.85	30	20-1000	1	0.61	1400	0.18	G1/4 <sub>12 deep</sub>	G1/4 <sub>12 deep</sub>	19	143-14...B03	49	25	3	9	36 <sub>h7</sub>	2	12.5	60	48	6.6	8 <sub>h5</sub>	-	8.8	14	2	1/4
1.7	30	20-1000	2	0.61	2800	0.37	G1/4 <sub>12 deep</sub>	G1/4 <sub>12 deep</sub>	19	143-14...D03	49	25	3	9	36 <sub>h7</sub>	2	12.5	60	48	6.6	8 <sub>h5</sub>	-	8.8	14	2	1/4
2.5	20	20-1000	3	1.79	1400	0.25	G3/8 <sub>12 deep</sub>	G3/8 <sub>12 deep</sub>	23	143-14...F02	62	28	3	12	45 <sub>h7</sub>	4	17	74	56	6.6	12 <sub>g5</sub>	12 <sub>g5</sub>	13.5	18.5	2.5	2/5
2.5	50	20-1000	3	1.79	1400	0.55	G3/8 <sub>12 deep</sub>	G3/8 <sub>12 deep</sub>	23	143-14...F05	62	28	3	12	45 <sub>h7</sub>	4	17	74	56	6.6	12 <sub>g5</sub>	12 <sub>g5</sub>	13.5	18.5	2.5	2/5
5.25	20	20-1000	4	3.75	1400	0.55	G1/2 <sub>14.5 deep</sub>	G1/2 <sub>14.5 deep</sub>	27	143-14...H02	69	30	3	12.7	56 <sub>h7</sub>	5	18.5	88	70	6.6	14 <sub>g5</sub>	14 <sub>g5</sub>	16	20.5	2.5	3/5
5.25	50	20-1000	4	3.75	1400	1.1	G1/2 <sub>14.5 deep</sub>	G1/2 <sub>14.5 deep</sub>	27	143-14...H05	69	30	3	12.7	56 <sub>h7</sub>	5	18.5	88	70	6.6	14 <sub>g5</sub>	14 <sub>g5</sub>	16	20.5	2.5	3/5
9	20	20-1000	5	6.44	1400	0.75	G1/2 <sub>14.5 deep</sub>	G1/2 <sub>14.5 deep</sub>	27	143-14...K02	77	30	3	12.7	56 <sub>h7</sub>	5	20	88	70	6.6	14 <sub>g5</sub>	14 <sub>g5</sub>	16	20.5	2.5	3/5
9	50	20-1000	5	6.44	1400	1.1	G1/2 <sub>14.5 deep</sub>	G1/2 <sub>14.5 deep</sub>	27	143-14...K05	77	30	3	12.7	56 <sub>h7</sub>	5	20	88	70	6.6	14 <sub>g5</sub>	14 <sub>g5</sub>	16	20.5	2.5	3/5
12.5	20	20-1000	6	8.93	1400	0.75	G3/4 <sub>16 deep</sub>	G3/4 <sub>16 deep</sub>	33	143-14...M02	89	30	3	12.7	56 <sub>h7</sub>	5	22	88	70	6.6	14 <sub>g5</sub>	14 <sub>g5</sub>	16	20.5	2.5	3/5
12.5	50	20-1000	6	8.93	1400	1.5	G3/4 <sub>16 deep</sub>	G3/4 <sub>16 deep</sub>	33	143-14...M05	89	30	3	12.7	56 <sub>h7</sub>	5	22	88	70	6.6	14 <sub>g5</sub>	14 <sub>g5</sub>	16	20.5	2.5	3/5
19	20	20-1000	7	13.6	1400	1.5	G1 <sub>18 deep</sub>	G1 <sub>18 deep</sub>	40	143-14...P02	100	30	3	21.5	56 <sub>h7</sub>	5	25	98	80	8.5	16 <sub>g5</sub>	16 <sub>g5</sub>	18	21.5	2.5	3/5
30	20	20-1000	8	10.74	2800	3	G1 <sub>18.5 deep</sub>	G1 <sub>18.5 deep</sub>	41	143-14...R02	108	42	4	23.5	80 <sub>h7</sub>	6	30	119	104	8.5	19 <sub>g6</sub>	22	21.5	36.5	-	3/6
30	30	20-750	8	10.74	2800	3	G1 <sub>18.5 deep</sub>	G1 <sub>18.5 deep</sub>	41	143-14...R03	108	42	4	23.5	80 <sub>h7</sub>	6	30	119	104	8.5	19 <sub>g6</sub>	22	21.5	36.5	-	3/6
30	30	20-1000	8	10.74	2800	4	G1 <sub>18.5 deep</sub>	G1 <sub>18.5 deep</sub>	41	143-14...R03	108	42	4	23.5	80 <sub>h7</sub>	6	30	119	104	8.5	19 <sub>g6</sub>	22	21.5	36.5	-	3/6
40	20	20-750	9	14.36	2800	3	G1 <sub>18.5 deep</sub>	G1 <sub>18.5 deep</sub>	41	143-14...T02	108	42	4	23.5	80 <sub>h7</sub>	6	30	119	104	8.5	19 <sub>g6</sub>	22	21.5	36.5	-	3/6
40	30	20-1000	9	14.36	2800	4	G1 <sub>18.5 deep</sub>	G1 <sub>18.5 deep</sub>	41	143-14...T03	108	42	4	23.5	80 <sub>h7</sub>	6	30	119	104	8.5	19 <sub>g6</sub>	22	21.5	36.5	-	3/6
50	20	20-1000	10	17.87	2800	4	G1 <sub>1/4</sub> <sub>20.5 deep</sub>	G1 <sub>1/4</sub> <sub>20.5 deep</sub>	41/51	143-14...V02	111	42	4	23.5	80 <sub>h7</sub>	6	30	119	104	8.5	19 <sub>g6</sub>	22	21.5	36.5	-	3/6
50	30	20-750	10	17.87	2800	4	G1 <sub>1/4</sub> <sub>20.5 deep</sub>	G1 <sub>1/4</sub> <sub>20.5 deep</sub>	41/51	143-14...V03	111	42	4	23.5	80 <sub>h7</sub>	6	30	119	104	8.5	19 <sub>g6</sub>	22	21.5	36.5	-	3/6
50	30	20-1000	10	17.87	2800	5.5	G1 <sub>1/4</sub> <sub>20.5 deep</sub>	G1 <sub>1/4</sub> <sub>20.5 deep</sub>	41/51	143-14...V03	111	42	4	23.5	80 <sub>h7</sub>	6	30	119	104	8.5	19 <sub>g6</sub>	22	21.5	36.5	-	3/6

1) → see page 12



# Gerotor pumps, product series 143

## Gerotor pump+pump flange+shaft coupling design, technical data and dimensions



**Table 3**

Gerotor pump + pump flange (→ Figure 3)										Coupling assembly (→ Figure 4)					Motor connection (→ Figure 5)										
Design N (NBR) / F (FKM) Order No. 5)	Maße [mm]			L1	L2	L3	ØFM1	ØM1	ØSY	ØMZ	SZ	Fig. 7	Fig. 8	Fig. 9	Frame size	ØN	T	ØM	SM	ØD	E	EB	GA	F	
ØPM	ØPN	ØPF	(A1)									B1	(C1)	D1											(E1)
143-13...B03C	120	72	53.5	104	14	-	-	-	85	M6	28	42	-	-	63	80	3	100	M8 <sub>12</sub> tief	11 <sub>6</sub>	23	18	12.5	4	
143-13...D03E	140	95	55.5	109	12	-	-	-	115	M8	28	42	-	-	71	95	3	115	M8 <sub>12</sub> tief	14 <sub>6</sub>	30	25	16	5	
143-13...F02D	140	95	65	127	17	-	-	-	115	M8	31	51	-	-	71	95	3	115	M8 <sub>12</sub> tief	14 <sub>6</sub>	30	25	16	5	
143-13...F05F	160	110	77	137	15	-	-	-	130	M8	-	-	31	40	80	110	3.5	130	M8 <sub>12</sub> tief	19 <sub>6</sub>	40	32	21.5	6	
143-13...H02F	160	110	78.5	144	15	-	-	-	130	M8	-	-	31	40	80	110	3.5	130	M8 <sub>12</sub> tief	19 <sub>6</sub>	40	32	21.5	6	
143-13...H05J	160	110	85.5	153	17	-	-	-	130	M8	-	-	31	49	90	110	3.5	130	M8 <sub>13</sub> tief	24 <sub>6</sub>	50	40	27	8	
143-13...K02H	160	110	80	152	15	-	-	-	130	M8	-	-	31	40	80	110	3.5	130	M8 <sub>12</sub> tief	19 <sub>6</sub>	40	32	21.5	6	
143-13...K05J	160	110	87	161	17	-	-	-	130	M8	-	-	31	49	90	110	3.5	130	M8 <sub>13</sub> tief	24 <sub>6</sub>	50	40	27	8	
143-13...M02H	160	110	82	164	15	-	-	-	130	M8	-	-	31	40	80	110	3.5	130	M8 <sub>12</sub> tief	19 <sub>6</sub>	40	32	21.5	6	
143-13...M05K	160	110	89	173	17	-	-	-	130	M8	-	-	31	49	90	110	3.5	130	M8 <sub>13</sub> tief	24 <sub>6</sub>	50	40	27	8	
143-13...P02K	160	110	92	184	17	-	-	-	130	M8	-	-	30	50	90	110	3.5	130	M8 <sub>13</sub> tief	24 <sub>6</sub>	50	40	27	8	
143-13...R02M	200	144.6	124	218	16	250	225	9	165	-	-	-	-	46	60	100	130	3.5	165	M10 <sub>12</sub> tief	28 <sub>6</sub>	60	50	31	8
143-13...R03M	200	144.6	124	218	16	250	225	9	165	-	-	-	-	46	60	100	130	3.5	165	M10 <sub>12</sub> tief	28 <sub>6</sub>	60	50	31	8
143-13...R03N	200	144.6	124	218	16	250	225	9	165	-	-	-	-	46	60	100	130	3.5	165	M10 <sub>12</sub> tief	28 <sub>6</sub>	60	50	31	8
143-13...T02M	200	144.6	124	218	16	250	225	9	165	-	-	-	-	46	60	100	130	3.5	165	M10 <sub>12</sub> tief	28 <sub>6</sub>	60	50	31	8
143-13...T03N	200	144.6	124	218	16	250	225	9	165	-	-	-	-	46	60	100	130	3.5	165	M10 <sub>12</sub> tief	28 <sub>6</sub>	60	50	31	8
143-13...V02N	200	144.6	124	221	16	250	225	9	165	-	-	-	-	46	60	112	130	3.5	165	M10 <sub>12</sub> tief	28 <sub>6</sub>	60	50	31	8
143-13...V03N	200	144.6	124	221	16	250	225	9	165	-	-	-	-	46	60	112	130	3.5	165	M10 <sub>12</sub> tief	28 <sub>6</sub>	60	50	31	8
143-13...V03P	200	145	154	251	16	250	225	9	165	-	-	-	-	48	88	132	130	3.5	165	M10 <sub>12</sub> tief	38 <sub>6</sub>	80	70	41	10

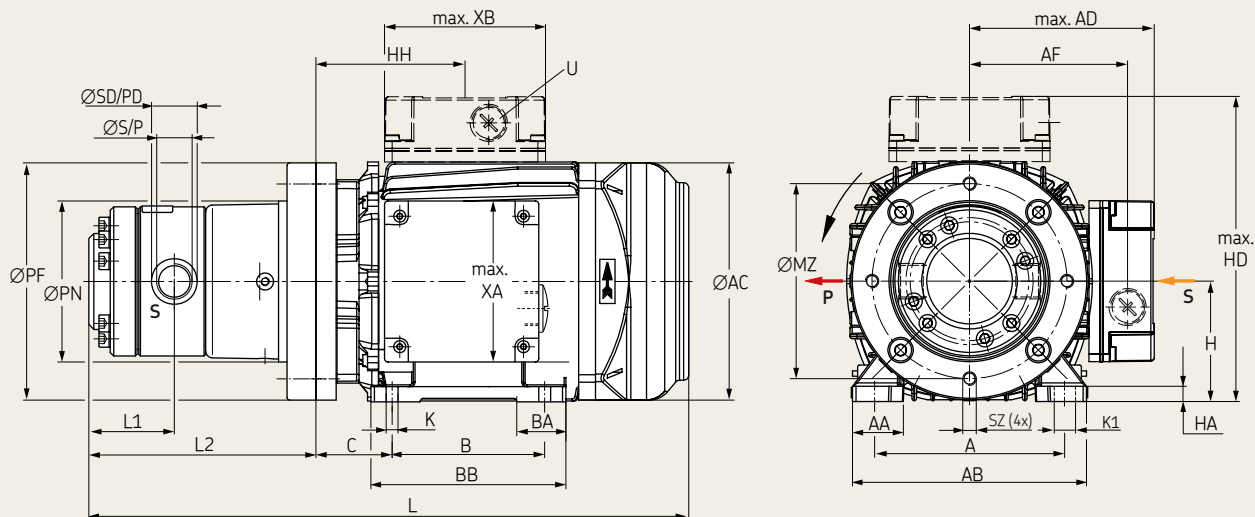
5) Supplement the order No. with the code letter for the desired seal design. Seal design NBR (N) or FKM (F).

# Gerotor pumps, product series 143

## Foot and flange designs, technical data and dimensions

Figure 6

### Foot design (type IMB34)



Delivery rate	Back pressure max.	Viscosity range	Char. curve No. 1)	Food design N (NBR) / F (FKM) Order No. 2)3)	Flange design N (NBR) / F (FKM) Order No. 2)3)	Nominal Suction-output port	Pressure port	Dimensions [mm] (→ Drawing 6+7)							
[l/min]	[bar]	[mm <sup>2</sup> /s]				[cm <sup>3</sup> /U] S	P	ØPD	ØSD	ØPN	ØPF	ØFM1	ØMZ	ØM1	
0,85	30	20–1000	1	143-11...B03C-R...	143-12...B03C-X...	0,61	G1/4 12 deep	G1/4 12 deep	19	19	72	120	-	100	-
1,7	30	20–1000	2	143-11...D03E-R...	143-12...D03E-X...	0,61	G1/4 12 deep	G1/4 12 deep	19	19	95	140	-	115	-
2,5	20	20–1000	3	143-11...F02D-R...	143-12...F02D-X...	1,79	G3/8 12 deep	G3/8 12 deep	23	23	95	140	-	115	-
2,5	50	20–1000	3	143-11...F05F-R...	143-12...F05F-X...	1,79	G3/8 12 deep	G3/8 12 deep	23	23	110	160	-	130	-
5,25	20	20–1000	4	143-11...H02F-R...	143-12...H02F-X...	3,75	G1/2 14,5 deep	G1/2 14,5 deep	27	27	110	160	-	130	-
5,25	50	20–1000	4	143-11...H05J-R...	143-12...H05J-X...	3,75	G1/2 14,5 deep	G1/2 14,5 deep	27	27	110	160	-	130	-
9	20	20–1000	5	143-11...K02H-R...	143-12...K02H-X...	6,44	G1/2 14,5 deep	G1/2 14,5 deep	27	27	110	160	-	130	-
9	50	20–1000	5	143-11...K05J-R...	143-12...K05J-X...	6,44	G1/2 14,5 deep	G1/2 14,5 deep	27	27	110	160	-	130	-
12,5	20	20–1000	6	143-11...M02H-R...	143-12...M02H-X...	8,93	G3/4 16 deep	G3/4 16 deep	33	33	110	160	-	130	-
12,5	50	20–1000	6	143-11...M05K-R...	143-12...M05K-X...	8,93	G3/4 16 deep	G3/4 16 deep	33	33	110	160	-	130	-
19	20	20–1000	7	143-11...P02K-R...	143-12...P02K-X...	13,6	G1 18 deep	G1 18 deep	40	40	110	160	-	130	-
30	20	20–1000	8	143-11...R02M-R...	143-12...R02M-X...	10,74	G1 18,5 deep	G1 18,5 deep	41	41	144,6	200	250	165	225
30	30	20–750	8	143-11...R03M-R...	143-12...R03M-X...	10,74	G1 18,5 deep	G1 18,5 deep	41	41	144,6	200	250	165	225
30	30	20–1000	8	143-11...R03N-O...	143-12...R03N-X...	10,74	G1 18,5 deep	G1 18,5 deep	41	41	144,6	200	250	165	225
40	20	20–750	9	143-11...T02M-R...	143-12...T02M-X...	14,36	G1 18,5 deep	G1 18,5 deep	41	41	144,6	200	250	165	225
40	30	20–1000	9	143-11...T03N-O...	143-12...T03N-X...	14,36	G1 18,5 deep	G1 18,5 deep	41	41	144,6	200	250	165	225
50	20	20–1000	10	143-11...V02N-O...	143-12...V02N-X...	17,87	G1 1/4 20,5 tief	G1 18,5 tief	41	51	144,6	200	250	165	225
50	30	20–750	10	143-11...V03N-O...	143-12...V03N-X...	17,87	G1 1/4 20,5 tief	G1 18,5 tief	41	51	144,6	200	250	165	225
50	30	20–1000	10	143-11...V03P-R...	143-12...V03P-X...	17,87	G1 1/4 20,5 tief	G1 18,5 tief	41	51	145	200	250	165	225

1) → see page 12

2) Supplement the order No. with the code letter for the desired seal design. Seal design NBR (N) or FKM (F).

3) Supplement the order No. with the code letter for the desired motor certification (→ page 7) and the voltage code (→ page 16).

For associated motor data → page 17.

# Gerotor pumps, product series 143

## Foot and flange designs, technical data and dimensions

Figure 7

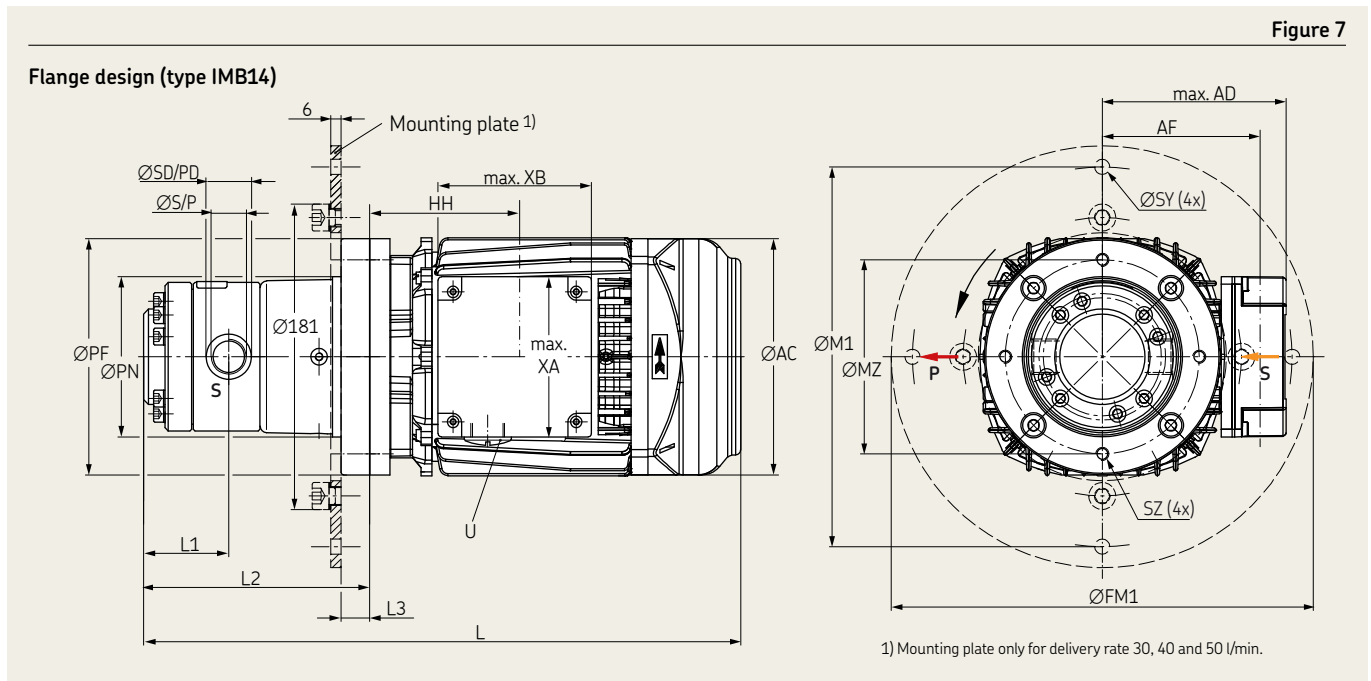


Table 4

Dimensions [mm] (→ Drawing 6+7)

SZ	ØSY	L1	L2	L3	A	AA	AB	ØAC	AD	AF	B	BA	BB	C	H	HA	HD	HH	K	K1	U	XA	XB	L
M6	-	36,5	104	14	100	22	120	124	107	84,5	80	-	95	40	63	7,5	-	61	Ø7	-	1xM25x1,5	92	92	309,5
M8	-	36,5	109	12	112	32	138	124	107	84,5	90	-	116	45	71	11	-	61	Ø8	-	1xM25x1,5	90	90	319
M8	-	45	127	17	112	24	135	139	115	92	90	-	114	45	71	8	-	67	Ø7	-	1xM25x1,5	90	90	337
M8	-	45	137	15	125	30,5	150	159	149,5	112,5	100	32	118	50	80	8	229,5	73	9,5	13,5	1xM25x1,5	123	119,5	389
M8	-	50,5	144	15	125	30,5	150	159	149,5	112,5	100	32	125	50	80	8	229,5	73	9,5	13,5	1xM25x1,5	123	119,5	396
M8	-	50,5	153	17	140	30,5	165	178	154,5	117,5	100	33	143	56	90	10	244,5	78,5	10	14	1xM25x1,5	123	119,5	450
M8	-	57	152	15	125	30,5	150	159	149,5	112,5	100	32	118	50	80	8	229,5	73	9,5	13,5	1xM25x1,5	123	119,5	439
M8	-	57	161	17	140	30,5	165	178	154,5	117,5	100	33	143	56	90	10	244,5	78,5	10	14	1xM25x1,5	123	119,5	458
M8	-	67	164	15	125	30,5	150	159	149,5	112,5	100	32	118	50	80	8	229,5	73	9,5	13,5	1xM25x1,5	123	119,5	451
M8	-	67	173	17	140	30,5	165	178	154,5	117,5	100	33	143	56	90	10	244,5	78,5	10	14	1xM25x1,5	123	119,5	510
M8	-	75	184	17	140	30,5	165	178	154,5	117,5	100	33	143	56	90	10	244,5	78,5	10	14	1xM25x1,5	123	119,5	521
Ø11 9	78	218	16	160	42	196	198	166	166	125,5	140	37,5	176	63	100	12	266	96,5	12	16	2xM32x1,5	112	135	588,5
Ø11 9	78	218	16	160	42	196	198	166	166	125,5	140	37,5	176	63	100	12	266	96,5	12	16	2xM32x1,5	112	135	588,5
Ø11 9	78	218	16	190	46,0	226	222	177	177	136,5	140	37,5	176	70	112	12	289	96	12	16	2xM32x1,5	112	135	572
Ø11 9	78	218	16	160	42	196	198	166	166	125,5	140	37,5	176	63	100	12	266	96,5	12	16	2xM32x1,5	112	135	588,5
Ø11 9	78	218	16	190	46	226	222	177	177	136,5	140	37,5	176	70	112	12	289	96	12	16	2xM32x1,5	112	135	572
Ø11 9	81	221	16	190	46	226	222	177	177	136,5	140	37,5	176	70	112	12	289	96	12	16	2xM32x1,5	112	135	575
Ø11 9	81	221	16	190	46	226	222	177	177	136,5	140	37,5	176	70	112	12	289	96	12	16	2xM32x1,5	112	135	575
Ø11 9	81	251	16	216	53	256	262	202	202	159,5	140	38	180	89	132	15	-	115,5	12	16	2xM32x1,5	130	155	636

# Gerotor pumps, product series 143

## Characteristic curves

Chart 1

Operating viscosity 20 mm<sup>2</sup>/s, 50 Hz

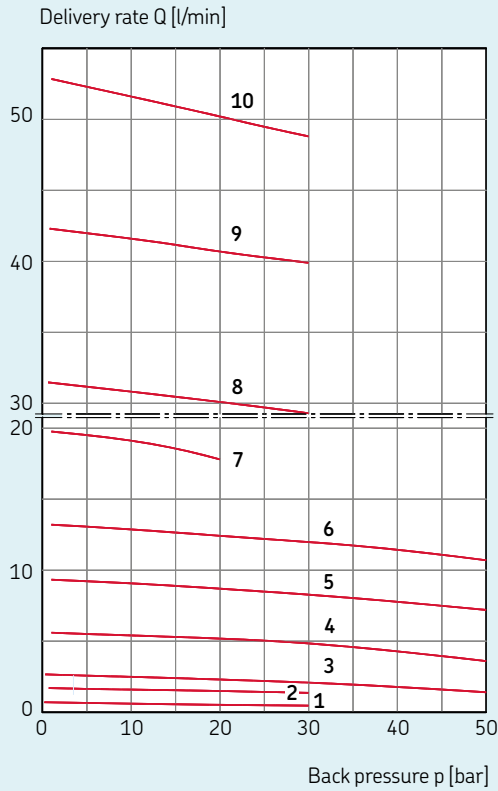
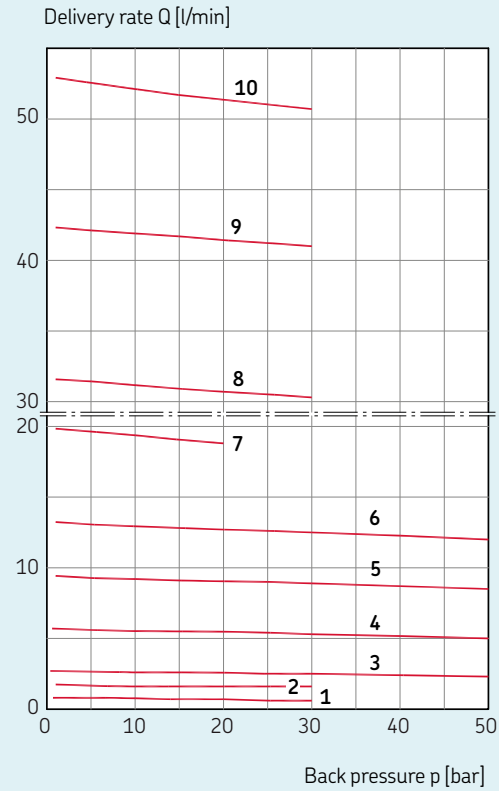


Chart 2

Operating viscosity 140 mm<sup>2</sup>/s, 50 Hz



### Legend to diagrams 1–4:

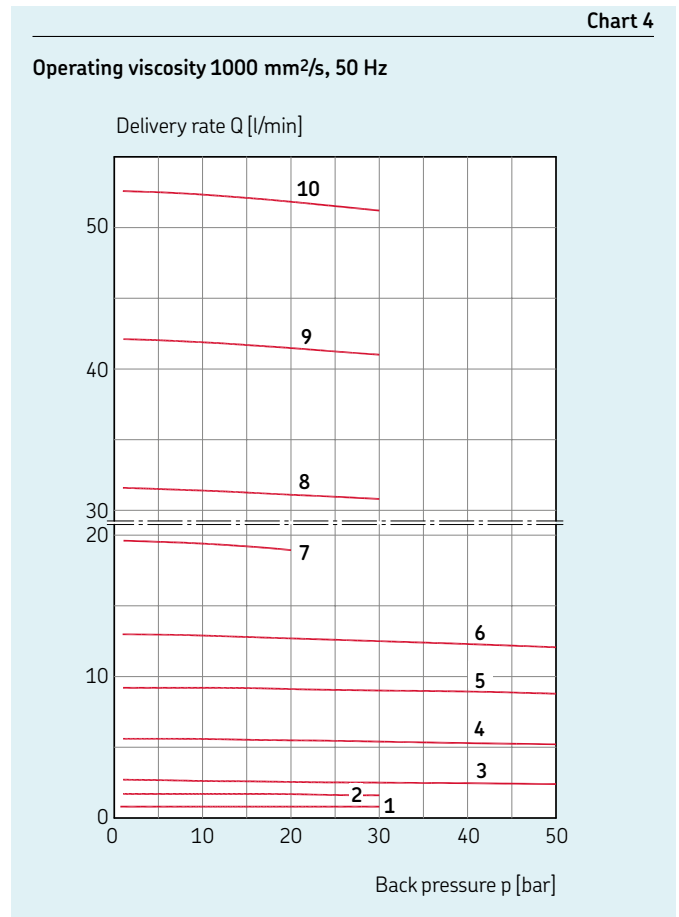
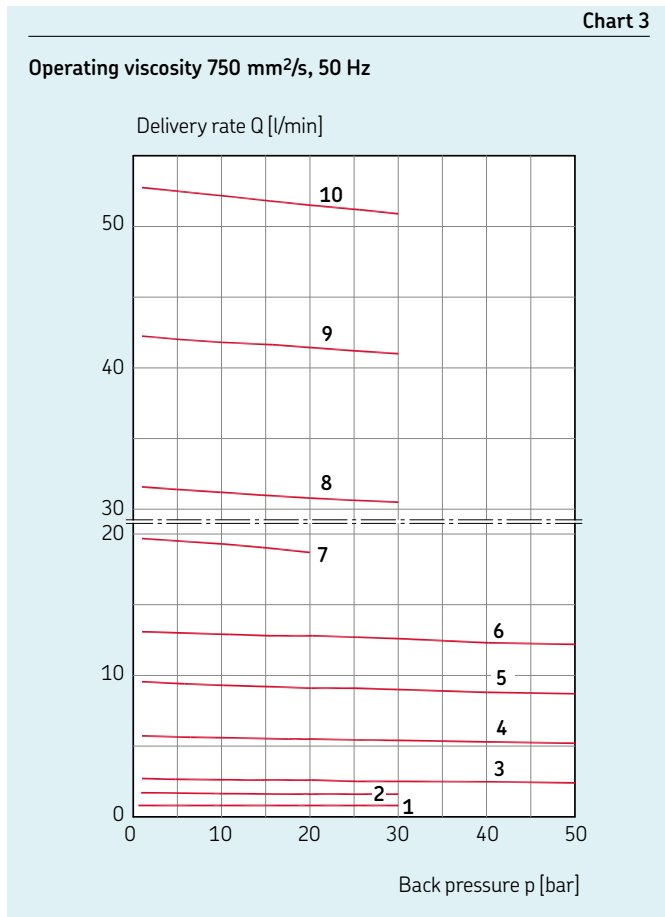
- Characteristic curve 1: 0.85 l/min
- Characteristic curve 2: 1.7 l/min
- Characteristic curve 3: 2.5 l/min
- Characteristic curve 4: 5.25 l/min
- Characteristic curve 5: 9 l/min
- Characteristic curve 6: 12.5 l/min
- Characteristic curve 7: 19 l/min
- Characteristic curve 8: 30 l/min
- Characteristic curve 9: 40 l/min
- Characteristic curve 10: 50 l/min

Tolerances: VDMA 24284-II

For connection with a frequency of 60 Hz, the speed and the volumetric flow are increased by 20% (compared to the table specifications, basis 50 Hz).

# Gerotor pumps, product series 143

## Characteristic curves



### Legend to diagrams 1–4:

- Characteristic curve 1: 0.85 l/min
- Characteristic curve 2: 1.7 l/min
- Characteristic curve 3: 2.5 l/min
- Characteristic curve 4: 5.25 l/min
- Characteristic curve 5: 9 l/min
- Characteristic curve 6: 12.5 l/min
- Characteristic curve 7: 19 l/min
- Characteristic curve 8: 30 l/min
- Characteristic curve 9: 40 l/min
- Characteristic curve 10: 50 l/min

Tolerances: VDMA 24284-II

For connection with a frequency of 60 Hz, the speed and the volumetric flow are increased by 20% (compared to the table specifications, basis 50 Hz).

# IEC squirrel cage motors

## Fundamentals

### General information

The standard design of SKF gerotor pump units of product series 143 is driven by IEC asynchronous motor. The motors are used in sizes 63 to 132, in 2-pole and 4-pole designs. They meet the relevant IEC/EN standards both mechanically and electrically. The standard design of the motors comes with a terminal box. The motors bear a CE marking in accordance with Low Voltage Directive 2014/35/EC. There is no CE marking with respect to Machinery Directive 2006/42/EC and EMC Directive 2014/30/EC because asynchronous motors do not fall under the scope of these Directives.

### Special provisions

The motors can be ordered in UL and CSA-compliant versions and are approved by UL (Underwriter Laboratories). These motors have an electrical design according to NEMA MG1-12 and meet the required NEMA efficiency classes. The UL approval is stored on the rating plate of the motor.

Other approvals on request.

### Types

The motors are used exclusively in the types IM B34 and IM B14. The type is indicated according to Code I, DIN EN 60034-7 on the rating plate.

IM B34: Shaft horizontal, feet on floor

IM B14: Shaft horizontal, no feet

### Rated voltage, frequency and power output

The motors are configured as standard for a rated motor voltage in accordance with IEC 38 of 230 V, 400 V or 690 V for 50 Hz networks (standard winding). Motors for other voltages and frequencies (non-standard winding) are available at additional cost.

The voltage deviation permitted in operation for the aforementioned rated motor voltages and for special voltages is  $\pm 5\%$  for range A (continuous duty operation) and  $\pm 10\%$  for range B (short-time duty operation), as specified in EN 60034-1. The permitted frequency deviation is  $\pm 2\%$  for range A and  $-5/+3\%$  for range B. For supply voltages that are 95% or 105% of the rated motor voltage, the tolerances described in EN 60034-1 are met. Furthermore, motor temperature is allowed to exceed the permitted temperature rise limit by 10 K. The percentile specifications for the permitted voltage and frequency deviations are not stamped onto the rating plate of the motor. The presence of the CE mark on the motor rating plate, accompanied by a reference to standard EN 60034, guarantees that these requirements have been incorporated by the motor manufacturer during configuration of the motor.

The motors are designed for a rated motor voltage of 230/400 V or 400/690 V for 50 Hz networks according to DIN IEC 60038. The standard windings used for this are point-wound. Motors with power  $\leq 0.75$  kW correspond to efficiency class IE2, motors with power  $\geq 0.75$  kW correspond to efficiency class IE3 according to EU Directive 2009/125/EG, Regulation (EU) 2019/1781. Special voltages with abnormal windings for 50 Hz and 60 Hz networks are available to order.

The stated rated outputs and operating values apply to duty type S1 in accordance with EN 60034-1 at the stated rated frequency, rated voltage, a coolant temperature of 40°C maximum and a site installation altitude up to 1 000 metres above sea level. Enquiries for motors for operating conditions other than those mentioned are welcome, on the understanding that these will incur additional costs.

### Circuit

The phase belts of the motor that are laid on the terminal board can be interconnected in two different connection systems:

#### Star connection

In the star connection, the coil ends U2, V2, and W2 are interconnected on the terminal board, creating the neutral point. Mains power is connected on the free connection ports of the coil ends U1, V1, and W1 on the terminal board.

#### Delta connection

In the delta connection, the end of the phase belt is interconnected with the beginning of the next phase belt. (U2 to V1, V2 to W1, W2 to U1). Mains power is connected at the connection points on the terminal board.

# IEC squirrel cage motors

## Fundamentals

### Cooling method

The motors are designed for cooling method IC 411 (surface cooling).

### Temperature class

The insulation on the motor coils is designed for temperature class 155 (F). When utilized at their performance rating, the motors meet temperature class 130 (B). Given a coolant temperature of 40°C, the power reserve is thus approx. +10%; when operated at their performance rating, the temperature reserve is approx. +20 K.

### Protection class

The motors are designed for protection class IP55 according to DIN EN 60034-5.

Touch and foreign object protection:

Provides complete protection against contacting or getting close to such parts, as well as against touching moving parts within the housing. Provides protection against the ingress of damaging amounts of dust deposits.

Water protection: A jet of water from a nozzle and aimed at the motor from all directions has no adverse effect.

### Terminal box

The degree of protection of the terminal boxes is IP55. The terminal box location the standard engines is on the right at Blick on the drive side. The exception is the 2-pole motor size 112 (4.0 kW), at which the terminal box from. For design reasons, the standard is mounted at the top. Special motors with different terminal box positions than standard motors are available on request. The position of the openings for the cable entry can be adjusted to the existing connection options by rotating the terminal box by 90°. The thread of the cable entry has 1x metric thread M25x1.5 for sizes 63 to 90. Sizes 100 to 132 have 2x M32x1.5. The clipboard is fundamental 6-pole design.

### Rating plates

1	3-Mot. 1AV3164A	1E10231DA434AA0-Z	E 1701/1410842 001 001
14	IEC/EN 60034 160L IMB3	IP55	Brake:
15	94kg	Th.Cl. 155(F)	-20°C <= TAMB <= 45°C
20	2000M	2LM8040-5NA10	
31	RINA	Bearing	UNIREX-N3
32	230V AC 50/60Hz 1.25A	TH.Cl. 155(F) 40Nm	
16	DE 6209/2ZC3	20g	INTERVAL: 2000h
19	NE 6209/2ZC3	20g	
18	Vibration B	60Hz: SF 1.1 CONT	NEMA MG1 12-12 TEFC DES A 25.0 HP
24	V	Hz	A
26	400 Δ	50	32.0
27	690 Y	50	18.6
28	460 Δ	60	32.0
29	460 Δ	60	28.0
			kW
			18.5
			21.3
			18.5
			0.90
			0.91
			0.90
			0.90
			PF
			92.4
			91.7
			91.7
			NOM.EFF
			rpm
			2955
			3550
			3560
			IE-CL
			IE3
			IE3
			CL
			M
			M
			M
			N
	KUNo. 12345678999111		MATNo. 12345678
			Space Heater 230V
	G_D081_DE_00891		

- |   |  |
|---|--|
| 1 Type of machine:<br>three-phase low-voltage motor       | 21 Customer data (optional)  |
| 2 Article no.   | 22 Date of manufacture YYYYMM  |
| 3 factory number<br>(ID no., serial number)               | 23 half-key balancing  |
| 4 Design  | 24 Code Letter „CL“  |
| 5 Degree of protection                                    | 25 Engine Type Number (MT)   |
| 6 Rated voltage [V] and winding circuit                   | 26 IEC standard series<br>Power 50Hz<br>(P50/50Hz) 400A                          |
| 7 Frequency [Hz]  | 27 IEC standard series<br>Power 50Hz 690A  |
| 8 Rated current [A]                                       | 28 Equivalent power 60 Hz with the same utilization as IEC standard series 50 Hz |
| 9 Rated power [kW]  | 29 IEC standard series performance<br>60Hz (P50/60Hz)                            |
| 10 Power factor (cos φ)                                   | 30 manufacturer address  |
| 11 efficiency   | 31 Ship Certificates   |
| 12 Rated speed [min <sup>-1</sup> ]                       | 32 Information optional  |
| 13 IE efficiency class                                    | 33 stock size  |
| 14 Standards and regulations                              | 34 Relubrication data optional   |
| 15 Machine weight [kg]                                    |  |
| 16 heat class   |  |
| 17 size   |  |
| 18 Additional information (optional)                      |  |
| 19 operating temperature range                            |  |
| 20 installation altitude<br>(only if greater than 1000 m) |  |

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# IEC squirrel cage motors

## Voltage code

Table 5

### Voltagages and frequencies of different countries

	Voltage V	Voltage tolerance (DIN EN 60034-1)		Voltage key and approval		Country code
		Range A %	Range B %	CE	UL/CSA	
50 Hz	200 / 345	±5	±10	+1GF	+1GF	JP, HK
	220 / 380	±5	±10	+1GP	+1GP	CN, RU, TR, IQ, IR, ID, IN, TH, VN, AR, CL, EG, DZ, LY, AF
	230 / 400	±5	±10	+1GD	+1GD	EU, IL, PK, ZA, AE, BD, MM
	240 / 415	±5	±10	+1GQ	+1GQ	UK, IN, IQ, MY, AU, NZ, SG, KW, QA
	255 / 440	±5	±10	+MFN	+MFN	
	500	±5	±10	+1HQ	+1HQ	
	305 / 525	±5	±10	+MMP	–	ZA
	380 / 660	±5	±10	+1GH	–	CN, RU, TR, IQ, IR, ID, IN, TH, VN, AR, CL
	400 / 690	±5	±10	+1GK	–	
	415 Δ (P ≥ 5,5 kW)	±5	±10	+1GL <sup>1)</sup>	–	UK, IN, IQ, MY, AU, NZ, SG
500 Δ (P ≥ 5,5 kW)	±5	±10	+1LL <sup>3)</sup>	+1LL <sup>3)</sup>		
60 Hz	200 / 345	±5	±10	+1GG	+1GG	JP
	220 / 380	±5	±10	+MDP	+MDP	BR, KP, KR, PE, MX, SA, TW, VE, BO
	230 / 400	±5	±10	+1GR	+1GR	
	240 / 415	±5	±10	+1KS	+1KS	
	400 / 690	±5	±10	+585	+585	
	440 Y	±5	±10	+1GP)	+1GP	MX, PA, PH
	460 Y	±5	±10	+1GP	+1GD	US, CA, MX
	480 Y	±5	±10	+GQ	+1GQ	CA
	575 Y	±5	±10	+1HQ	+1HQ	
	440 Δ	±5	±10	+1GH	–	MX, PA, PH
	460 Δ	±5	±10	+1GK	–	US, CA, MX
	460 Δ (P ≥ 5,5 kW)	±5	±10	–	+1KG <sup>2)</sup>	
	480 Δ (P ≥ 5,5 kW)	±5	±10	+1GL <sup>1)</sup>	–	CA
	575 Δ (P ≥ 5,5 kW)	±5	±10	+1LL <sup>3)</sup>	+1LL <sup>3)</sup>	

AE = United Arab Emirates  
AF = Afghanistan  
AR = Argentina  
AU = Australia  
BO = Bolivia  
BR = Brazil  
CA = Canada  
CL = Chile  
CN = China

DZ = Algeria  
EG = Egypt  
EU = Europe  
HK = Hong Kong  
ID = Indonesia  
IL = Israel  
IN = India  
IQ = Iraq  
IR = Iran

JP = Japan  
KR = Korea  
KW = Kuwait  
LY = Libya  
MX = Mexico  
MY = Malaysia  
NZ = New Zealand  
PA = Panama  
PE = Peru

PH = Philippines  
PK = Pakistan  
QA = Qatar  
RU = Russia  
SA = Saudi Arabia  
SG = Singapore  
TH = Thailand  
TR = Turkey  
TW = Taiwan

UK = United Kingdom  
US = USA  
VE = Venezuela  
VN = Vietnam  
ZA = South Africa

**Note:** Motors with a performance rating of ≥0.75 kW must be designed for efficiency class IE3.

(others available on request)

1) P ≥5.5 kW not for UL/CSA  
2) P ≥5.5 kW not for UL/CSA  
3) P ≥5.5 kW

### Voltage code texts

**+1GD** 230 / 400 V, 50 Hz; 460 V, 60 Hz  
**+1GF** 200 / 345 V, 50 Hz  
**+1GG** 200 / 345 V, 60 Hz  
**+1GH** 380 / 660 V, 50 Hz; 440 V, 60 Hz  
**+1GK** 400 / 690 V, 50 Hz; 460 V, 60 Hz  
**+1GL** 415 V, 50 Hz, Δ; 480 V, 60 Hz, Δ<sup>1)</sup>  
**+1GP** 220 / 380 V, 50 Hz; 440 V, 60 Hz

**+1GQ** 240 / 415 V, 50 Hz; 480 V, 60 Hz  
**+1GR** 230 / 400 V, 60 Hz  
**+1HQ** 290 / 500 V, 50 Hz; 330 / 575 V, 60 Hz  
**+1KG** 400 V, 50 Hz, Δ; 460 V, 60 Hz, Δ<sup>2)</sup>  
**+1KS** 240 / 415 V, 60 Hz  
**+1LL** 500 V, 50 Hz, Δ; 575 V, 60 Hz, Δ<sup>3)</sup>  
**+MDP** 220 / 380 V, 60 Hz

**+MFN** 255 / 440 V, 50 Hz  
**+MMP** 305 / 525 V, 50 Hz  
**+585** 400 / 690 V, 60 Hz



# IEC squirrel cage motors

## Technical data

Squirrel cage motor in foot design



Table 6

### Technical data

Type	Foot design IM B34, Flange design IM B14
Protection class	IP55
Temperature class	
Duty type	
Temperature range	-20 to +40 °C
Max. site altitude	1000 m above sea level
Cooling method	IC 411 (surface cooling with fan))
Temperature monitoring	none
Terminal box material	Metal

Table 7

### Code for pump design

Frame size	Number of poles	Flange-design (with threaded hole) <sup>1)</sup>	Weight	50 Hz						60 Hz					
				Rated voltage		Rated power <sup>2)</sup>	Speed	Rated current		Rated voltage <sup>3)</sup>		Rated power <sup>2)</sup>	Speed	Rated current	
				Δ	Y			Δ	Y	Δ	Y			Δ	Y
kg	V	V	kW	min <sup>-1</sup>	A	A	V	V	kW	min <sup>-1</sup>	A	A			
63	4	FT100 (C120)	7,1	230	400	0,18	1415	0,96	0,55	-	460	0,21	1725	-	0,56
			5	230	400	0,18	1385	1,07	0,62	-	460	0,21	1685	-	0,60
71	2	FT115 (C140)	7,6	230	400	0,37	2840	1,44	0,83	-	460	0,44	3430	-	0,83
71	2	FT115 (C140)	6	230	400	0,37	2770	1,65	0,95	-	460	0,43	3370	-	0,93
71	4	FT115 (C140)	9,9	230	400	0,25	1430	1,15	0,66	-	460	0,30	1725	-	0,66
71	4	FT115 (C140)	6	230	400	0,25	1395	1,33	0,76	-	460	0,28	1695	-	0,75
71	4	FT115 (C140)	9,9	230	400	0,37	1425	1,74	1,00	-	460	0,44	1720	-	0,98
71	4	FT115 (C140)	7	230	400	0,37	1380	1,77	1,02	-	460	0,43	1680	-	1,04
80	4	FT130 (C160)	10	230	400	0,55	1440	2,40	1,39	-	460	0,63	1735	-	1,42
80	4	FT130 (C160)	11	230	400	0,55	1440	2,20	1,26	-	460	0,55	1740	-	1,25
80	4	FT130 (C160)	14	230	400	0,75	1450	3,05	1,75	-	460	0,86	1750	-	1,72
90	4	FT130 (C160)	16	230	400	1,10	1440	4,20	2,40	-	460	1,27	1740	-	2,40
90	4	FT130 (C160)	19	230	400	1,50	1445	5,50	3,15	-	460	1,75	1740	-	3,15
100	2	FT165 (C200)	25	230	400	3,00	2910	9,90	5,70	-	460	3,45	3505	-	5,60
100	2	FT165 (C200)	26	230	400	3,00	2920	9,80	5,60	-	460	3,45	3520	-	5,50
112	2	FT165 (C200)	32	230	400	4,00	2945	12,80	7,40	-	460	4,55	3545	-	7,30
132	2	FT165 (C200)	48	400	690	5,50	2945	10,10	5,90	460	-	6,30	3540	10,00	-
132	2	FT165 (C200)	43	400	-	5,50	2950	9,90	-	460	-	6,30	3545	9,70	-

1) Flange with threaded hole acc. to DIN EN 50347 (FT).

3) Beyond a performance rating of 0.75 kW, the motors are designed for efficiency class IE3.

# IEC squirrel cage motors

## Installation drawing and dimensions

Figure 8

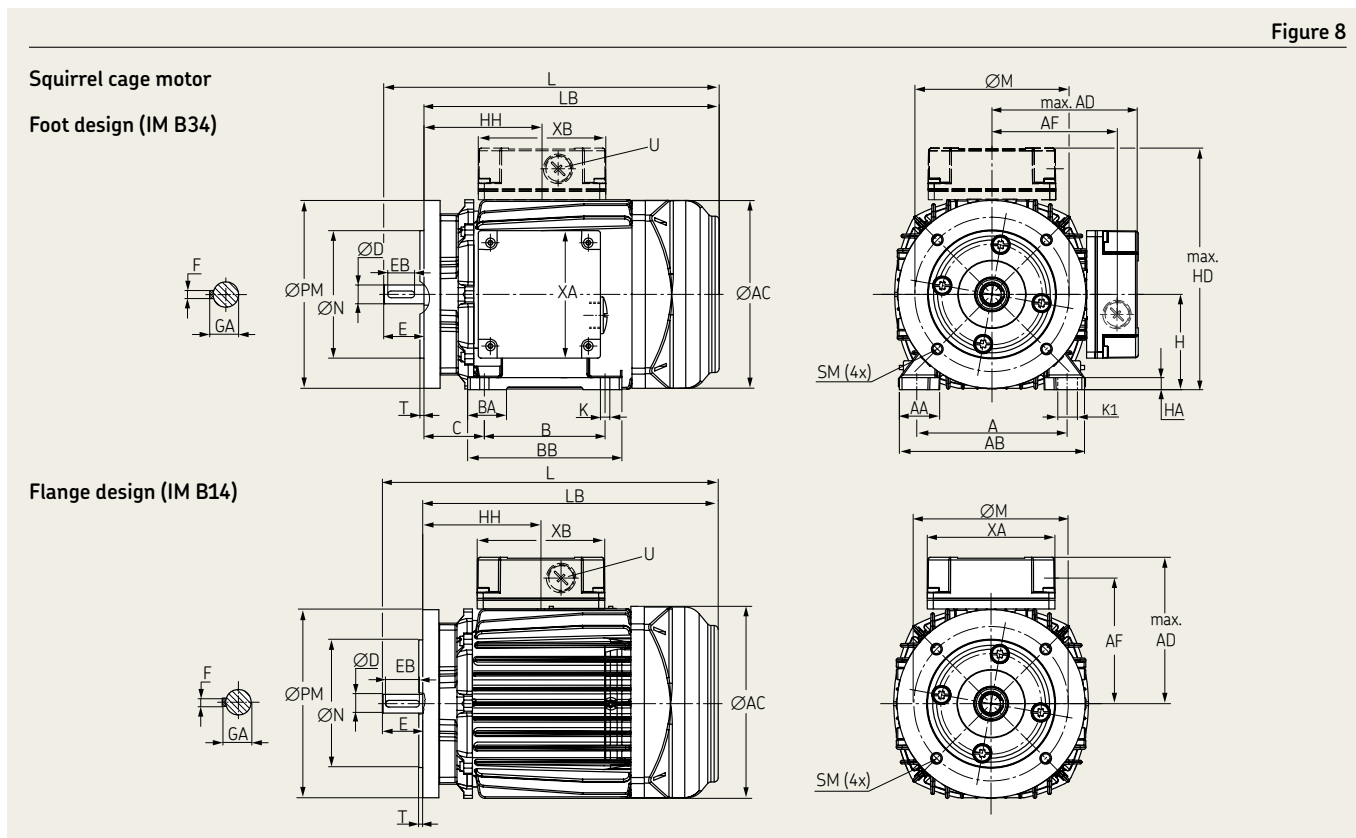


Table 8

### Dimensions [mm]

Ser.No.	Motor	Frame size	Poles	ØM	ØN	ØPM <sup>1)</sup>	SM	T	A	AA	AB	ØAC	AD <sub>max</sub>	AF <sub>max</sub>	B	B1	BA	BB
1	178-V12CC-M1...	63	4	100	80	120	M6	3	100	22	120	124	107	85	80	-	-	95
2	178-S22CC-M1...	63	4	100	80	120	M6	3	-	-	-	124	101	77,5	-	-	-	-
3	178-V11ED-M1...	71	2	115	95	140	M8	3	112	32	138	124	107	85	90	-	-	116
4	178-S21ED-M1...	71	2	115	95	140	M8	3	-	-	-	145	111	87,5	-	-	-	-
5	178-V12DD-M1...	71	4	115	95	140	M8	3	112	24	135	139	115	93	90	-	-	114
6	178-S22DD-M1...	71	2	115	95	140	M8	3	-	-	-	145	111	87,5	-	-	-	-
7	178-V12ED-M1...	71	4	115	95	140	M8	3	112	24	135	139	115	93	90	-	-	114
8	178-S22ED-M1...	71	2	115	95	140	M8	3	-	-	-	145	111	87,5	-	-	-	-
9	178-S...	80	4	130	110	160	M8	3	125	30,5	150	159	149,5	112,5	100	-	32	118
10	178-S...	90	4	130	110	160	M8	3,5	140	30,5	165	178	154,5	117,5	100	125	33	143
11	178-S...	100	2	165	130	200	M10	3,5	160	42	196	198	166	125,5	140	-	37,5	176
12	178-S...	112 <sup>2)</sup>	2	165	130	200	M10	3,5	190	46	226	222	177	136,5	140	-	37,5	176
13	178-S...	132	2	165	130	200	M10	3,5	216	53	256	262	202	159,5	140	-	38	180
Ser.No.	C	H	HA	HD <sub>max</sub>	K	K1	U	XA <sub>max</sub>	XB <sub>max</sub>	HH	LB	L	ØD	E	EB	F	GA	
1	40	63	7,5	170	Ø7	-	1xM20x1,5	92	92	63	176	199	11	23	16	4	12,5	
2	-	-	-	-	-	-	1xM25x1,5	75	75	69,5	205,5	228,5	11	23	16	4	12,5	
3	45	71	11	178	Ø8	-	1xM20x1,5	90	90	61	176	206	14	30	22	5	16	
4	-	-	-	-	-	-	1xM25x1,5	75	75	63,5	210	240	14	30	22	5	16	
5	45	71	8	186	Ø7	-	1xM20x1,5	90	90	67	209	239	14	30	22	5	16	
6	-	-	-	-	-	-	1xM25x1,5	75	75	63,5	210	240	14	30	22	5	16	
7	45	71	8	186	Ø7	-	1xM20x1,5	90	90	67	209	239	14	30	22	5	16	
8	-	-	-	-	-	-	1xM25x1,5	75	75	63,5	210	240	14	30	22	5	16	
9	50	80	8	229,5	9,5	13,5	1xM25x1,5	93	63	73	252	292	19	40	32	6	21,5	
10	56	90	10	244,5	10	14	1xM25x1,5	123	123	78,5	297	347	24	50	40	8	27	
11	63	100	12	266	12	16	2xM32x1,5	135	135	96,5	370,5	430,5	28	60	50	8	31	
12	70	112	12	289	12	16	2xM32x1,5	135	135	96	354	414	28	60	50	8	31	
13	89	132	15	334	12	16	2xM32x1,5	155	155	115,5	385	465	38	80	70	10	41	

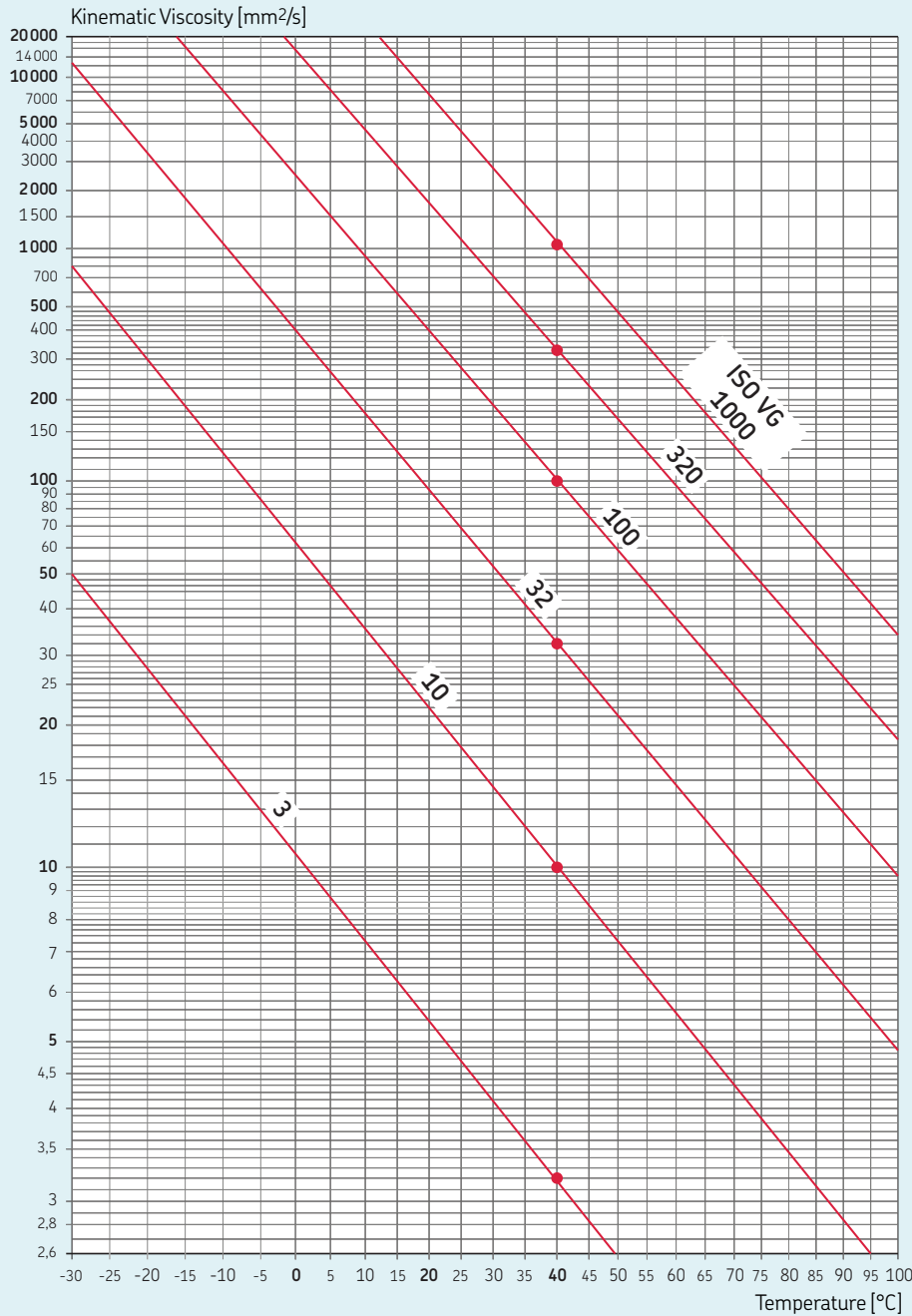
1) Mounting flange acc. to DIN EN 50347.

2) Only standard terminal box position on top is supported, right is not possible.

3) Dimension for 2nd mounting hole

# Viscosity-temperature relationship of oils with different rated viscosity

Viscosity-temperature relationship of oils



The curves are based on a viscosity index of VI ~ 95, approximately corresponding to standard mineral oil. The viscosity index describes the slope of the curve and thus the viscosity-temperature relationship at temperatures other than +40 °C.

The lines appear straight because a logarithmic scale was selected for the ordinates so that the slope of the curves can be determined easily based on 2 measuring points.

**Viscosity class \***

ISO VG	is approx.
3, 10	Spindle oils
32, 100	Normal machine oils
320	Medium-heavy machine oils
1000	Gear oil or similar

\* The values correspond to the midpoint viscosity at 40 °C in mm<sup>2</sup>/s

**Note**  
 The change in the viscosity of oils is disproportionately greater in lower temperature ranges than in higher temperature ranges. For example, an oil with a rated viscosity of 100 undergoes the following viscosity change in different temperature ranges at the same temperature difference:

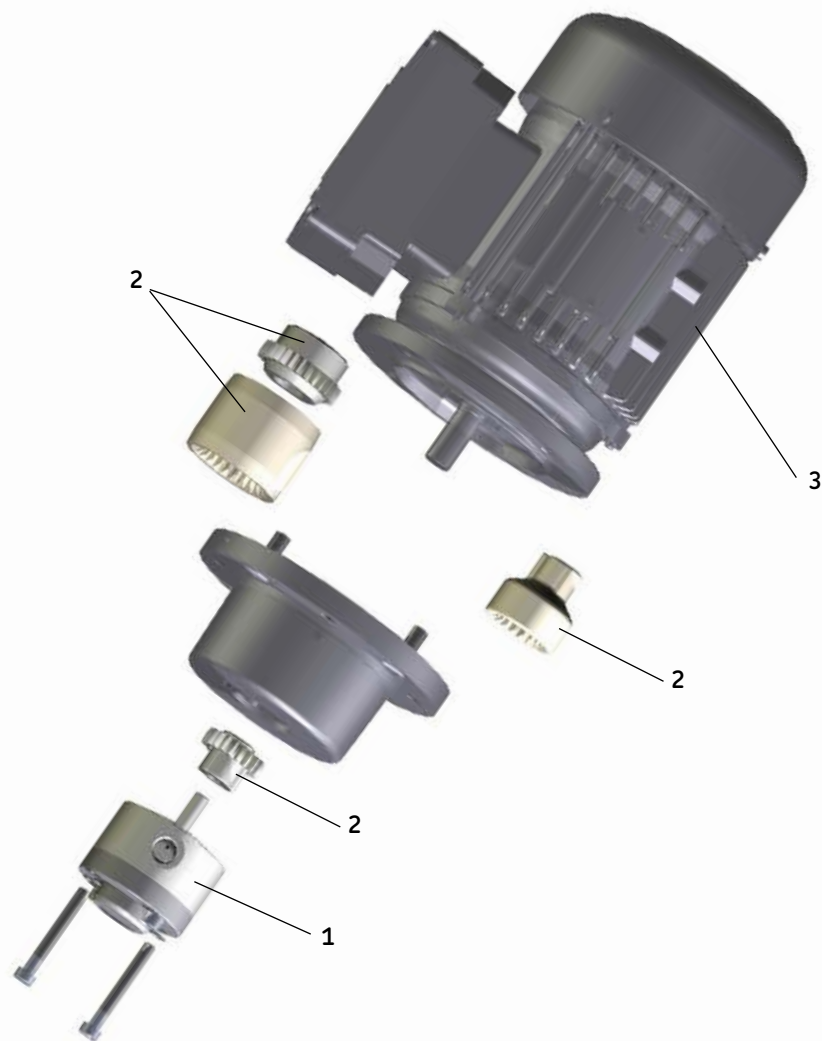
at +80 °C = 18 mm<sup>2</sup>/s  
 at +75 °C = 21 mm<sup>2</sup>/s  
 change of 3 mm<sup>2</sup>/s

at +10 °C = 875 mm<sup>2</sup>/s  
 at + 5 °C = 1450 mm<sup>2</sup>/s  
 change of 575 mm<sup>2</sup>/s

# Spare parts

## Exploded view

Figure 9



Position description → page 21, table 9.

**!** Dismantling of the product or individual parts thereof within the statutory warranty period is not permitted and voids any warranty claims..

# Spare parts

Table 9

Position description (→ Figure 9)

Gerotor pump unit <sup>1)</sup>	Pos. 1 Pump <sup>1)</sup>	Pos. 2 Coupling, complete <sup>2)</sup>	Pos. 3 Motor	Description	Order No.
143-11...B03C-RA+1GD	143-14...B03	995-000-350	178-V12CC-M1RA+1GD	Docu. package	951-170-251-01
143-12...B03C-XA+1GD	143-14...B03	995-000-350	178-S22CC-M1XA+1GD		
143-11...D03E-RA+1GD	143-14...D03	995-000-351	178-V12DD-M1RA+1GD	Rotation arrow	760-072
143-12...D03E-XA+1GD	143-14...D03	995-000-351	178-S21ED-M1XA+1GD		
143-11...F02D-RA+1GD	143-14...F02	995-000-353	178-V12DD-M1RA+1GD		
143-12...F02D-XA+1GD	143-14...F02	995-000-353	178-S22DD-M1XA+1GD		
143-11...F05F-RA+1GD	143-14...F05	995-000-354	178-S12FE-M1RA+1GD		
143-12...F05F-XA+1GD	143-14...F05	995-000-354	178-S22FE-M1XA+1GD		
143-11...H02F-RA+1GD	143-14...H02	995-000-356	178-S12FE-M1RA+1GD		
143-12...H02F-XA+1GD	143-14...H02	995-000-356	178-S22FE-M1XA+1GD		
143-11...H05J-RA+1GD	143-14...H05	995-000-357	178-S12JE-M1RA+1GD		
143-12...H05J-XA+1GD	143-14...H05	995-000-357	178-S22JE-M1XA+1GD		
143-11...K02H-RA+1GD	143-14...K02	995-000-356	178-S12HE-M1RA+1GD		
143-12...K02H-XA+1GD	143-14...K02	995-000-356	178-S22HE-M1XA+1GD		
143-11...K05J-RA+1GD	143-14...K05	995-000-357	178-S12JE-M1RA+1GD		
143-12...K05J-XA+1GD	143-14...K05	995-000-357	178-S22JE-M1XA+1GD		
143-11...M02H-RA+1GD	143-14...M02	995-000-356	178-S12HE-M1RA+1GD		
143-12...M02H-XA+1GD	143-14...M02	995-000-356	178-S22HE-M1XA+1GD		
143-11...M05K-RA+1GD	143-14...M05	995-000-357	178-S12KE-M1RA+1GD		
143-12...M05K-XA+1GD	143-14...M05	995-000-357	178-S22KE-M1XA+1GD		
143-11...P02K-RA+1GD	143-14...P02	995-000-358	178-S12KE-M1RA+1GD		
143-12...P02K-XA+1GD	143-14...P02	995-000-358	178-S22KE-M1XA+1GD		
143-11...R02M-RA+1GD	143-14...R02	995-000-359	178-S11MF-M1RA+1GD		
143-12...R02M-XA+1GD	143-14...R02	995-000-359	178-S21MF-M1XA+1GD		
143-11...R03M-RA+1GD	143-14...R03	995-000-359	178-S11MF-M1RA+1GD		
143-12...R03M-XA+1GD	143-14...R03	995-000-359	178-S21MF-M1XA+1GD		
143-11...R03N-OA+1GD	143-14...R03	995-000-359	178-S11NF-M10A+1GD		
143-12...R03N-XA+1GD	143-14...R03	995-000-359	178-S21NF-M1XA+1GD		
143-11...T02M-RA+1GD	143-14...T02	995-000-359	178-S11MF-M1RA+1GD		
143-12...T02M-XA+1GD	143-14...T02	995-000-359	178-S21MF-M1XA+1GD		
143-11...T03N-OA+1GD	143-14...T03	995-000-359	178-S11NF-M10A+1GD		
143-12...T03N-XA+1GD	143-14...T03	995-000-359	178-S21NF-M1XA+1GD		
143-11...V02N-OA+1GD	143-14...V02	995-000-359	178-S11NF-M10A+1GD		
143-12...V02N-XA+1GD	143-14...V02	995-000-359	178-S21NF-M1XA+1GD		
143-11...V03N-OA+1GD	143-14...V03	995-000-359	178-S11NF-M10A+1GD		
143-12...V03N-XA+1GD	143-14...V03	995-000-359	178-S21NF-M1XA+1GD		
143-11...V03P-RA+1GD	143-14...V03	995-000-360	178-S11PF-M1RA+1GD		
143-12...V03P-XA+1GK	143-14...V03	995-000-360	178-S21PF-M1XA+1GK		

1) Supplement the order No. with the code letter for the desired seal. Design NBR (N) or FKM (F).

2) It is recommended that coupling parts always be replaced completely.

# Gerotor pump, product series 143

## Comparison of order numbers

Table 10

Comparison of old and new order Nos. for gerotor pump, product series 143

Nominal delivery rate	Back pressure max.	Permiss. viscosity range	Sealing design NBR		Sealing design FKM	
			Old	New	Old	New
			order No.	order No.	order No.	order No.
0.85	30	20–1000	143-011-131	143-14NB03	143-011-132	143-14FB03
1.70	30	20–1000	143-011-131	143-14ND03	143-011-132	143-14FD03
2.50	20	20–1000	143-011-151 <sup>1)</sup> /-152 <sup>2)</sup>	143-14NF02 <sup>2)</sup>	143-011-159 <sup>1)</sup>	143-14FF02 <sup>2)</sup>
2.50	50	20–1000	143-011-151 <sup>1)</sup> /-152 <sup>2)</sup>	143-14NF05 <sup>2)</sup>	143-011-159 <sup>1)</sup>	143-14FF05 <sup>2)</sup>
5.25	20	20–1000	143-011-161	143-14NH02	143-011-169	143-14FH02
5.25	50	20–1000	143-011-161	143-14NH05	143-011-169	143-14FH05
9.00	20	20–1000	143-011-171	143-14NK02	143-011-173	143-14FK02
9.00	50	20–1000	143-011-171	143-14NK05	143-011-173	143-14FK05
12.50	20	20–1000	143-011-181-2	143-14NM02	143-011-187	143-14FM02
12.50	50	20–1000	143-011-181-2	143-14NM05	143-011-187	143-14FM05
19.00	20	20–1000	143-011-500	143-14NP02	143-011-508	143-14FP02
30.00	20	20–1000	–	143-14NR02	–	143-14FR02
30.00	30	20–750	–	143-14NR03	–	143-14FR03
30.00	30	20–1000	–	143-14NR03	–	143-14FR03
40.00	20	20–750	–	143-14NT02	–	143-14FT02
40.00	30	20–1000	–	143-14NT03	–	143-14FT03
50.00	20	20–1000	–	143-14NV02	–	143-14FV02
50.00	30	20–750	–	143-14NV03	–	143-14FV03
50.00	30	20–1000	–	143-14NV03	–	143-14FV03

1) counterclockwise

2) clockwise

# Gerotor pump, product series 143

## Comparison of order numbers

Table 11

Comparison of old and new order Nos. for gerotor pump unit in foot design, product series 143

Nominal delivery rate	Back pressure max.	Permiss. viscosity range	Sealing design N (NBR)		Sealing design F (FKM)	
			Old	New	Old	New
l/min	bar	mm <sup>2</sup> /s	order No.	order No.	order No.	order No.
0.85	30	20–1000	143-012-131+...	143-11NB03C-RA+1GD	–	143-11FB03C-RA+1GD
1.70	30	20–1000	143-012-141+...	143-11ND03E-RA+1GD	143-012-142+...	143-11FD03E-RA+1GD
2.50	20	20–1000	–	143-11NF02D-RA+1GD	–	143-11FF02D-RA+1GD
2.50	50	20–1000	–	143-11NF05F-RA+1GD	–	143-11FF05F-RA+1GD
5.25	20	20–1000	–	143-11NH02F-RA+1GD	–	143-11FH02F-RA+1GD
5.25	50	20–1000	–	143-11NH05J-OA+1GD	–	143-11FH05J-OA+1GD
9.00	20	20–1000	–	143-11NK02H-RA+1GD	–	143-11FK02H-RA+1GD
9.00	50	20–1000	143-012-171+...	143-11NK05J-OA+1GD	–	143-11FK05J-OA+1GD
12.50	20	20–1000	143-012-180+...	143-11NM02H-RA+1GD	–	143-11FM02H-RA+1GD
12.50	50	20–1000	143-012-181+...	143-11NM05K-OA+1GD	–	143-11FM05K-OA+1GD
19.00	20	20–1000	143-012-501+...	143-11NP02K-OA+1GD	143-012-509+...	143-11FP02K-OA+1GD
30.00	20	20–1000	–	143-11NR02M-RA+1GD	–	143-11FR02M-RA+1GD
30.00	30	20–750	–	143-11NR03M-RA+1GD	–	143-11FR03M-RA+1GD
30.00	30	20–1000	–	143-11NR03N-OA+1GD	–	143-11FR03N-OA+1GD
40.00	20	20–750	–	143-11NT02N-OA+1GD	–	143-11FT02N-OA+1GD
40.00	30	20–1000	–	143-11NT03N-OA+1GD	–	143-11FT03N-OA+1GD
50.00	20	20–1000	–	143-11NV02N-OA+1GD	–	143-11FV02N-OA+1GD
50.00	30	20–750	–	143-11NV03N-OA+1GD	–	143-11FV03N-OA+1GD
50.00	30	20–1000	–	143-11NV03P-RA+1GK	–	143-11FV03P-RA+1GK

Table 12

Comparison of old and new order Nos. for gerotor pump unit in flange design, product series 143

Nominal delivery rate	Back pressure max.	Permiss. viscosity range	Sealing design N (NBR)		Sealing design F (FKM)	
			Old	New	Old	New
l/min	bar	mm <sup>2</sup> /s	order No.	order No.	order No.	order No.
0.85	30	20–1000	143-012-231+...	143-12NB03C-XA+1GD	–	143-12FB03C-XA+1GD
1.70	30	20–1000	143-012-241+...	143-12ND03E-XA+1GD	143-012-242+...	143-12FD03E-XA+1GD
2.50	20	20–1000	–	143-12NF02D-XA+1GD	–	143-12FF02D-XA+1GD
2.50	50	20–1000	–	143-12NF05F-XA+1GD	–	143-12FF05F-XA+1GD
5.25	20	20–1000	–	143-12NH02F-XA+1GD	–	143-12FH02F-XA+1GD
5.25	50	20–1000	–	143-12NH05J-XA+1GD	–	143-12FH05J-XA+1GD
9.00	20	20–1000	–	143-12NK02H-XA+1GD	–	143-12FK02H-XA+1GD
9.00	50	20–1000	143-012-271+...	143-12NK05J-XA+1GD	–	143-12FK05J-XA+1GD
12.50	20	20–1000	143-012-280+...	143-12NM02H-XA+1GD	–	143-12FM02H-XA+1GD
12.50	50	20–1000	143-012-281+...	143-12NM05K-XA+1GD	–	143-12FM05K-XA+1GD
19.00	20	20–1000	143-012-601+...	143-12NP02K-XA+1GD	–	143-12FP02K-XA+1GD
30.00	20	20–1000	–	143-12NR02M-XA+1GD	–	143-12FR02M-XA+1GD
30.00	30	20–750	–	143-12NR03M-XA+1GD	–	143-12FR03M-XA+1GD
30.00	30	20–1000	–	143-12NR03N-XA+1GD	–	143-12FR03N-XA+1GD
40.00	20	20–750	–	143-12NT02M-XA+1GD	–	143-12FT02M-XA+1GD
40.00	30	20–1000	–	143-12NT03N-XA+1GD	–	143-12FT03N-XA+1GD
50.00	20	20–1000	–	143-12NV02N-XA+1GD	–	143-12FV02N-XA+1GD
50.00	30	20–750	–	143-12NV03N-XA+1GD	–	143-12FV03N-XA+1GD
50.00	30	20–1000	–	143-12NV03P-XA+1GK	–	143-12FV03P-XA+1GK



#### **Important information on product usage**

SKF and Lincoln lubrication systems or their components are not approved for use with gases, liquefied gases, pressurized gases in solution and fluids with a vapor pressure exceeding normal atmospheric pressure (1 013 mbar) by more than 0,5 bar at their maximum permissible temperature.



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