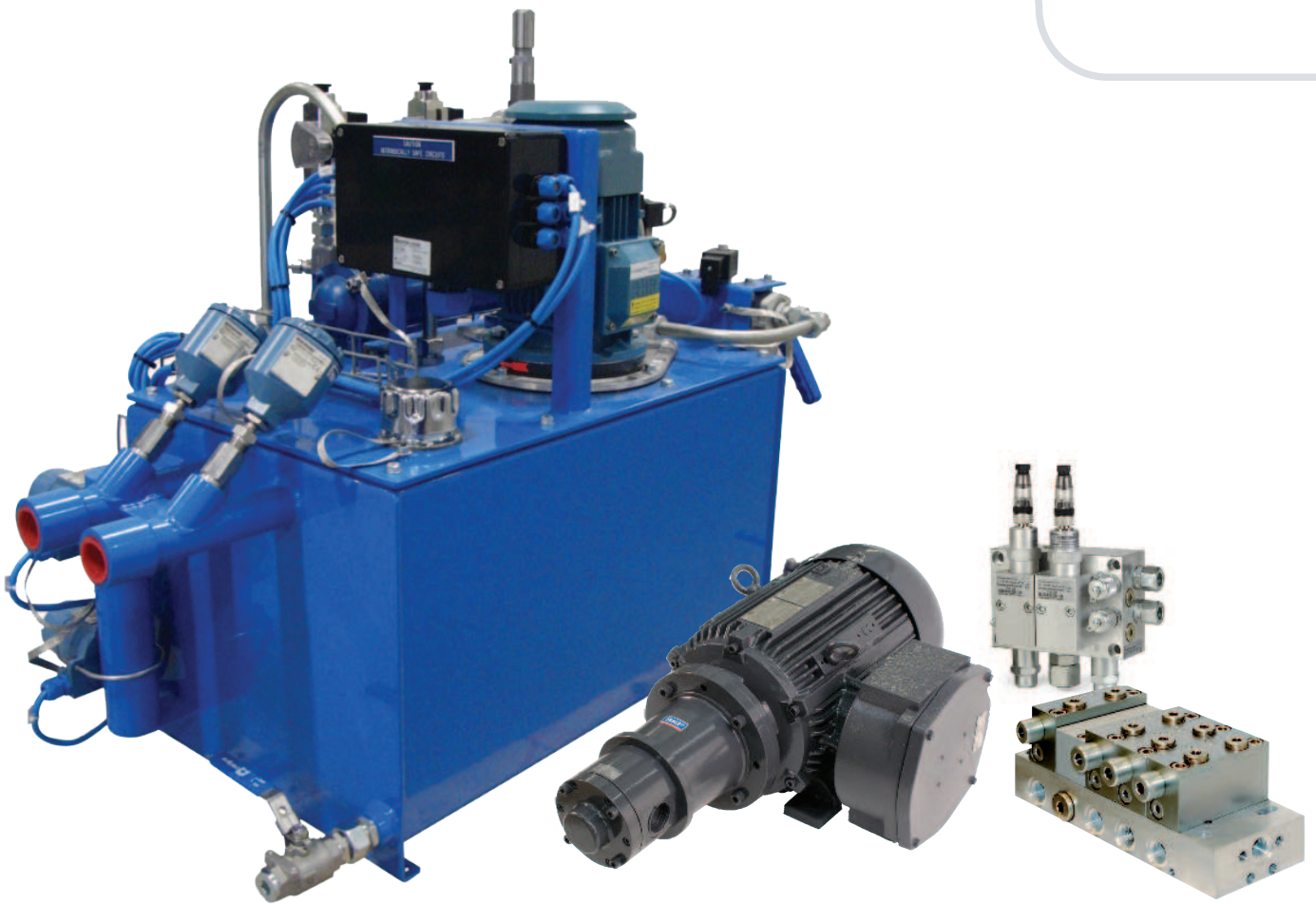


Reliable safety in explosive environments

SKF CircOil EEX Portfolio for use in gas- and dust-Ex-atmospheres



Cooling, lubricating and particle removal with one system

SKF CircOil systems circulate oil to lubricate and cool bearings in many industrial applications. They also efficiently remove dirt, water and air particles. This cooling effect becomes especially important in explosive atmospheres.

Friction, wear and contamination can lead to overheating and bearing failures. This creates a potential ignition source and risk zone.

This is why SKF offers a range of CircOil EEX components and systems that help to ensure reliable safety in your operations. All products were designed to provide a high degrees of safety in gas- and dust-Explosive atmospheres.

Reliable operation in challenging environments

Combustible gases, mists, vapours or dusts in the air can create explosive atmospheres. Combined with an ignition source such as an overheated bearing can lead to disastrous explosions with significant damages, injuries or even loss of life.

The European ATEX Directive 2014/34/EU specifies product requirements and intended use to assure safe operations in potentially explosive atmospheres. To comply entirely with the European Directive SKF products are specifically designed, analysed for potential ignition sources and undergo extensive testing.

Application areas with explosive gas or dust:

- Oil and gas industry
- Energy generation
- Chemical and pharmaceutical industries
- Food and beverage
- Agriculture
- Wastewater
- Marine
- Heavy industry
- Machine tool industry
- Wood industry

Modular lubrication system to meet customer requirements

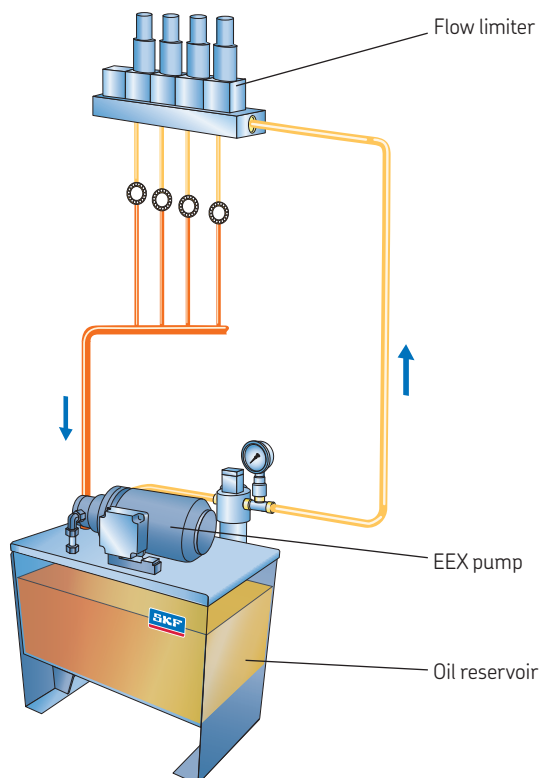
The SKF CircOil lubrication solutions provide new opportunities to increase profitability by reducing costs to operate machinery, improving reliability and safety, extending service intervals and optimizing manpower resources.

SKF CircOil EEX systems include a wide range of customized and turnkey solutions for flow rates from 0,1–3 000 l/min. They are simple to service and feature a modular design that can be easily expanded. Our patented tank design with the SKF plate separator technology increases operating efficiency to up to 90%. Flow rates can be controlled visually or electronically. Monitoring systems are available for a predictive maintenance approach.

Benefits:

- Safe operation in explosive environments
- Efficient cooling and lubrication
- Increased machine reliability and reduced downtime
- Many customizable solutions available
- Demand-based distribution of lubricant
- Effective visual and electronic monitoring options
- Prolonged oil life thanks to patented air-removal design
- Reduced oil purchasing, handling and disposal costs

Typical layout of an oil-circulation system



Proofed for use in explosive atmospheres

Global engineering support

SKF CircOil EEX systems provide lubrication and cooling capabilities. They can be tailor-made and comply with local safety regulations and environmental constraints.

The design is done by our SKF Application Engineers, providing you with the knowledge of a market leader. Decades of experience in oil circulation systems and ATEX solutions assure you safe operation of your machinery. Our engineers design products that solve real, every-day customer problems. As a result, we understand the challenges of your industry and advice you on the right lubrication solution. With this we help you to make processes safer and increase operating efficiency.

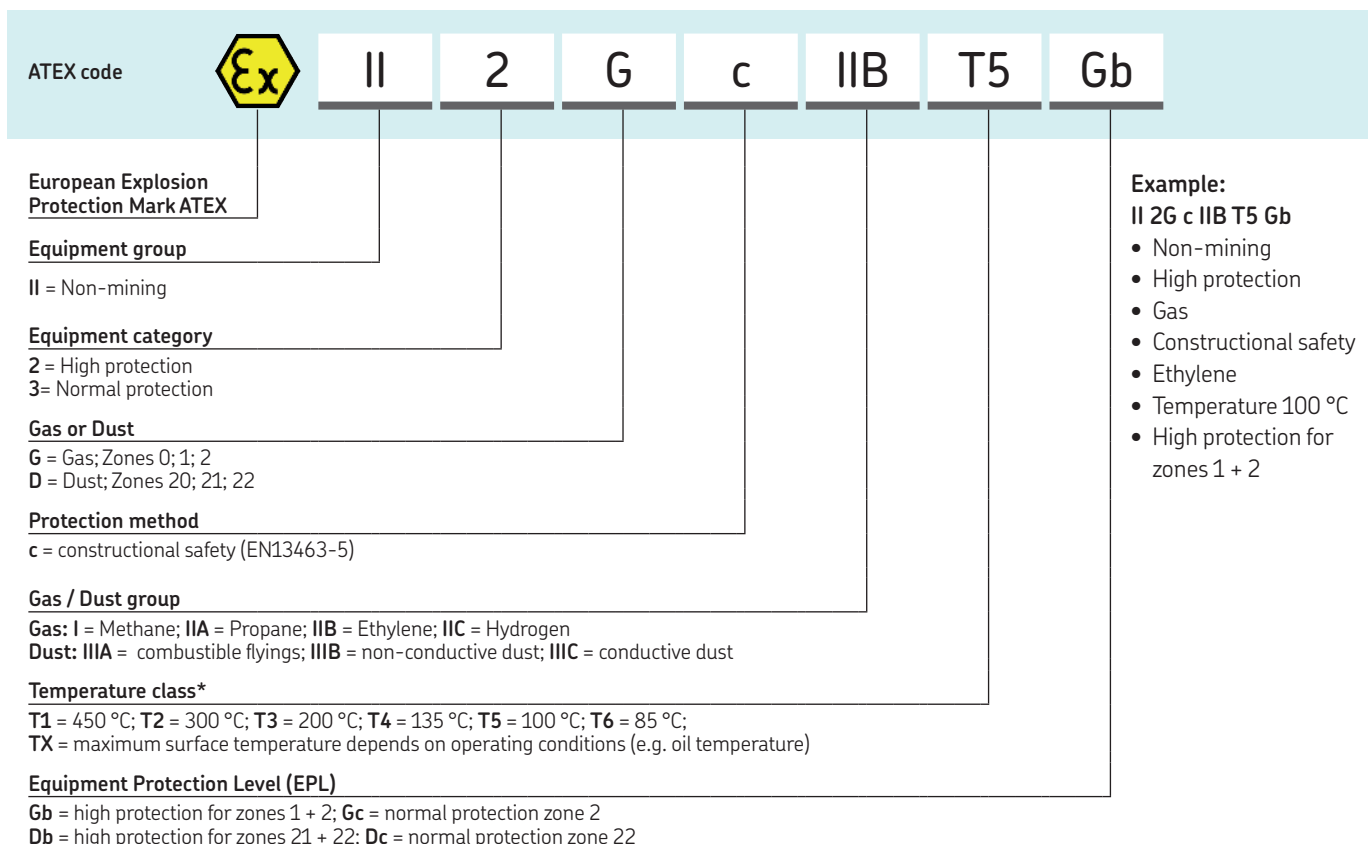
Full range of lubrication services

- SKF Lubrication Management
- Audits and lubrication consulting
- Lubricant analysis and testing
- Return-on-investment (ROI) calculations
- Application and system engineering
- System installation, supervision and start-up
- Service of existing SKF automatic lubrication systems
- Training



SKF has developed many of our products specifically for use in potentially explosive atmospheres. We meet requirements including the European Union Directive 2014/34/EU. To comply with this so-called "ATEX"-Directive, we follow both the requirements for electrical and non-electrical equipment according to the related EN standards. Furthermore, we can provide some products in which all electrical parts have IECEx certification.

Most products are available for explosion group IIC/IIIC (flammable vapors and gases) and equipment protection level (EPL) Gb/Db (see IEC / EN 60079-0).



* maximum surface temperature

Gerotor pump series 143 EEX

The 143 EEX product series has been specifically designed for centralized lubrication systems in explosive environments. It offers a high degree of protection in a gas or dust explosive atmosphere.

The 143 EEX series is a complete pumping unit solution including pump, motor, coupling and sealing all according to ATEX requirements. It is based on the well-proven and established SKF 143 gerotor pump series.

The 143 EEX is a self-priming positive-displacement pump with high efficiency. It feeds the lubricating oil from a reservoir into the pipe system of an oil lubrication system.

Features and benefits:

- Reliable and safe operation in explosive environments (Zone 1, 2, 21, 22)
- Low volumetric flow pulsation allows very smooth running
- Gerotor with a cycloid contour provides optimum suction characteristics
- Low noise during operation
- Large viscosity range for standard mineral and synthetic lubricating and hydraulic oils
- Compact design with pump, motor, coupling and seal
- Customizable solution
- Durable and rugged gerotor pump unit designed and manufactured in Germany



Explosion protection:

ATEX

- **ATEX II 2G c IICT4 Gb**
- **ATEX II 2D c IIIC T120°C Db**

IECEX (motor only)

- **Ex de IICT4 Gb**
- **Ex tb IIIC T120°C Db**

Table 1

Technical data

Lubricant	standard mineral, synthetic lubricating and hydraulic oils	
Viscosity	20–1000 mm ² /s	
Flow range	0,85–50 l/min	0.22–13 gal/min
Operating pressure	up to 50 bar	up to 725 psi
Operating temperature	0 to +40 °C	+32 to 104 °F
Lubricant temperature	0 to +60 °C	+32 to 140 °F
ATEX classification for gas	II 2G c IICT4 Gb	
ATEX classification for dust	II 2D c IIIC T120°C Db	

Further information

Brochure	17345 EN
Assembly instructions	951-180-074

You can download the publications as PDF file from the SKF website skf.com/143

Online configurable under skf-lubrication.partcommunity.com

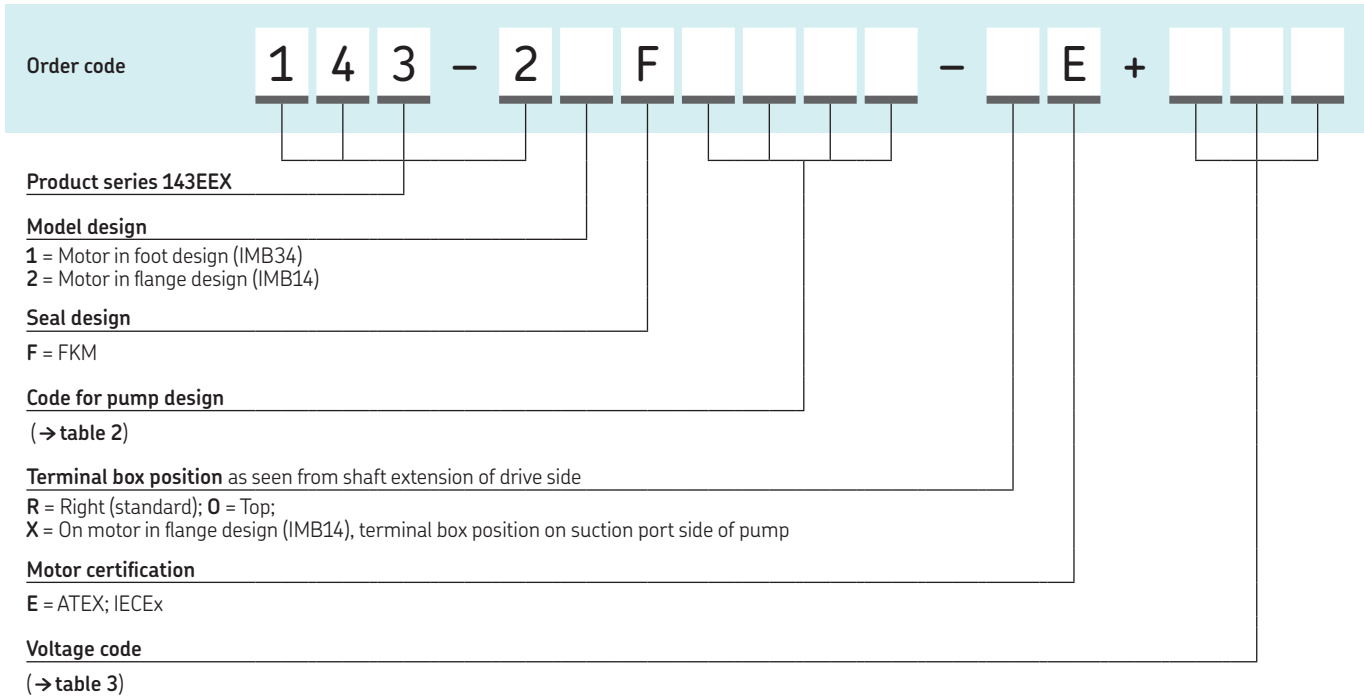


Table 2

Code for pump design

Code	Nominal delivery rate		Back pressure max.		Motor drive power kW	Permissible operating viscosity mm ² /s	Frame size	Number of poles
	l/min	gal/min	bar	psi				
-								
B03D	0,85	0.22	30	435	0,25	20-1000	71	4
D03E	1,70	0.45	30	435	0,37	20-1000	71	2
F02D	2,50	0.66	20	290	0,25	20-1000	71	4
F05F	2,50	0.66	50	725	0,55	20-1000	80	4
H02F	5,25	1.39	20	290	0,55	20-1000	80	4
H05J	5,25	1.39	50	725	1,10	20-1000	90	4
K02H	9,00	2.38	20	290	0,75	20-1000	80	4
K05K	9,00	2.38	50	725	1,50	20-1000	90	4
M02H	12,50	3.30	20	290	0,75	20-1000	80	4
M05L	12,50	3.30	50	725	2,20	20-1000	100	4
P02L	19,00	5.02	20	290	2,20	20-1000	100	4
R02M	30,00	7.93	20	290	3,00	20-1000	100	2
R03M	30,00	7.93	30	435	3,00	20-750	100	2
R03N	30,00	7.93	30	435	4,00	20-1000	112	2
T02M	40,00	10.57	20	290	3,00	20-750	100	2
T03N	40,00	10.57	30	435	4,00	20-1000	112	2
V02N	50,00	13.21	20	290	4,00	20-1000	112	2
V03N	50,00	13.21	30	435	4,00	20-750	112	2
V03P	50,00	13.21	30	435	5,50	20-1000	132	2

Table 3

Voltage code

Code	Motor power
+1GP	220 / 380 V, 50 Hz ; 255 / 440 V, 60 Hz
+1GD	230 / 400 V, 50 Hz ; 265 / 460 V, 60 Hz
+1GQ	240 / 415 V, 50 Hz ; 280 / 480 V, 60 Hz
+1HQ	290 / 500 V, 50 Hz ; 330 / 575 V, 60 Hz
+1GH ¹⁾	380 / 660 V, 50 Hz ; 440 V, 60 Hz
+1GK ¹⁾	400 / 690 V, 50 Hz ; 460 V, 60 Hz
+1GL ¹⁾	415 V, 50 Hz, Δ; 480 V, 60 Hz, Δ
+1KG ¹⁾	400 V, 50 Hz, Δ; 460 V, 60 Hz, Δ
+1GF	200 / 345 V, 50 Hz
+1GG	200 / 345 V, 60 Hz
+MDP	220 / 380 V, 60 Hz
+1GR	230 / 400 V, 60 Hz

¹⁾ Motor power P ≧ 5,5 kW

SKF CircOil EEX – Metering devices

Flow limiters, product series SP/SMB

Flow limiters EEX are designed for use in oil circulation lubrication systems in explosive atmospheres. The task of a flow limiter is to divide the volumetric flow of the main line into parallel individual quantities, to “limit” these according to the required volumes and to keep the flow constant.

The volumetric flow generated is independent of the system pressure and nearly independent of viscosity. Temperature or pressure changes therefore do not effect the cooling capabilities of the system. The required volumes are always delivered to the lubrication points.

SKF flow limiters feature a simple and compact construction using interchangeable plug-in nozzles to change the volumes. This also makes subsequent adjustments possible. The volumetric flow in explosive environments can be monitored with a static signal transmitter or visually and electrically with a rotary gear indicator.

Features and benefits:

- Reliable and high degree of safety
- For gas and dust Ex atmospheres
- Self-adjusting metering, stable flows
- Effective monitoring of flow
- Wide range of operation up to 100 l/min
- System pressures 5–200 bar
- Visual and electronic monitoring options
- Mounting plate and filter options
- Wide viscosity range
- Virtually independent of temperature and viscosity
- Pressure compensated
- Easy system design and start-up
- Space-saving layout
- Many customization options

Explosion protection:

- ATEX II 3c II CT6
- ATEX II 2G c T4 Gb
- ATEX II 2G c TX Gb
- ATEX II 2D c TX Db



Further information

Assembly instructions **951-180-072**

You can download the publications as PDF file from the SKF website skf.com/flowlimiters

Table 4

Overview flow limiters

Product	Flow rate		Pressure range		ATEX class	Monitoring options		
	l/min	gal/min	bar	psi		Signal transmitter	Rotary gear indicator	Base plate option
SP/SMB 3	6–38	1.58–10.04	5–200	72.5–2 900	II 3 c II CT6	•		
SP/SMB 6	25–100	6.6–26.42	5–200	72.5–2 900	II 3 c II CT6	•		
SP/SMB 8	0,1–8	0.02–2.11	5–200	72.5–2 900	II 3 c II CT6	•		•
SP/SMB 10	0,1–8	0.02–2.11	7–50	101–725	II 2 G c T4 Gb		•	•
SP/SMB 9	0,1–8	0.02–2.11	6–50	87–725	II 2 D c TX Db II 2 G c TX Gb		•	•
SP/SMB 13	6–38	1.58–10.04	6–50	87–725	II 2 D c TX Db II 2 G c TX Gb		•	
SP/SMB 14	25–100	6.6–26.42	6–50	87–725	II 2 D c TX Db II 2 G c TX Gb		•	

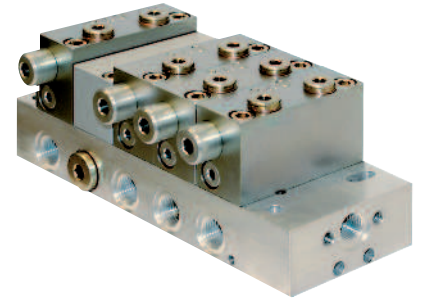
Progressive metering devices

SKF progressive metering devices can be used individually or in combination with SKF flow limiters. They are used to meter the correct amount of oil in oil-circulation systems. In combination with SKF flow limiters, progressive metering devices dispense a precise, metered amount of oil to up to 150 lubrication points over distances of over 100 m (109 yd).

SKF has adapted the well-proven designs of VPB, VPK, VP and PSG product series for use in explosive atmospheres.

Features and benefits:

- Block or modular divider options
- Up to 20 outlets per metering block
- Internal and external crossporting of outlets possible
- Visual or electric monitoring options
- Expandable by attaching flow limiters, gear type flow indicators, inductive proximity switches
- Reliable and safe operation in explosive atmospheres
- Easy system design
- Large product offering from robust, cost-effective to many customizable options



Explosion protection:

- ATEX II 2G c IICT4 Gb
- ATEX II 2D c IIIC T135°C Db

Further information

Catalogue **16964**

You can download this and other publications as PDF file from the SKF website skf.com/progressive-metering

Table 5

Overview progressive metering devices

Product	Design	Metering quantity		Number of outlets	Max. operating pressure		ATEX class ¹	Monitoring options			
		cm ³ /stroke	in ³ /stroke		bar	psi		Indicator pin	Proximity switch	Signal transmitter	Rotary gear indicator
VPB	block	0,2	0.01	6–20	300	4 350	II 2G c IICT4 Gb ¹ II 2D c IIIC T135°C Db ¹	•	•		
VPK	modular	0,05–0,6	0.003–0.037	6–20	300	4 350		•	•		
VP	modular	0,10–1,2	0.006–0.073	6–20	300	4 350		•	•		
PSG1	modular	0,05–0,25	0.003–0.015	6–20	200	2 900		•	•	•	•
PSG2	modular	0,06–0,84	0.003–0.051	6–20	200	2 900		•	•	•	•
PSG3	modular	0,80–3,20	0.049–0.195	6–20	200	2 900		•	•	•	•

¹) applicable for all progressive metering devices



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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PUB LS/P2 17160 EN · February 2017

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