Oil circulation lubrication systems

Product catalogue

LINCOLN

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Two leading brands

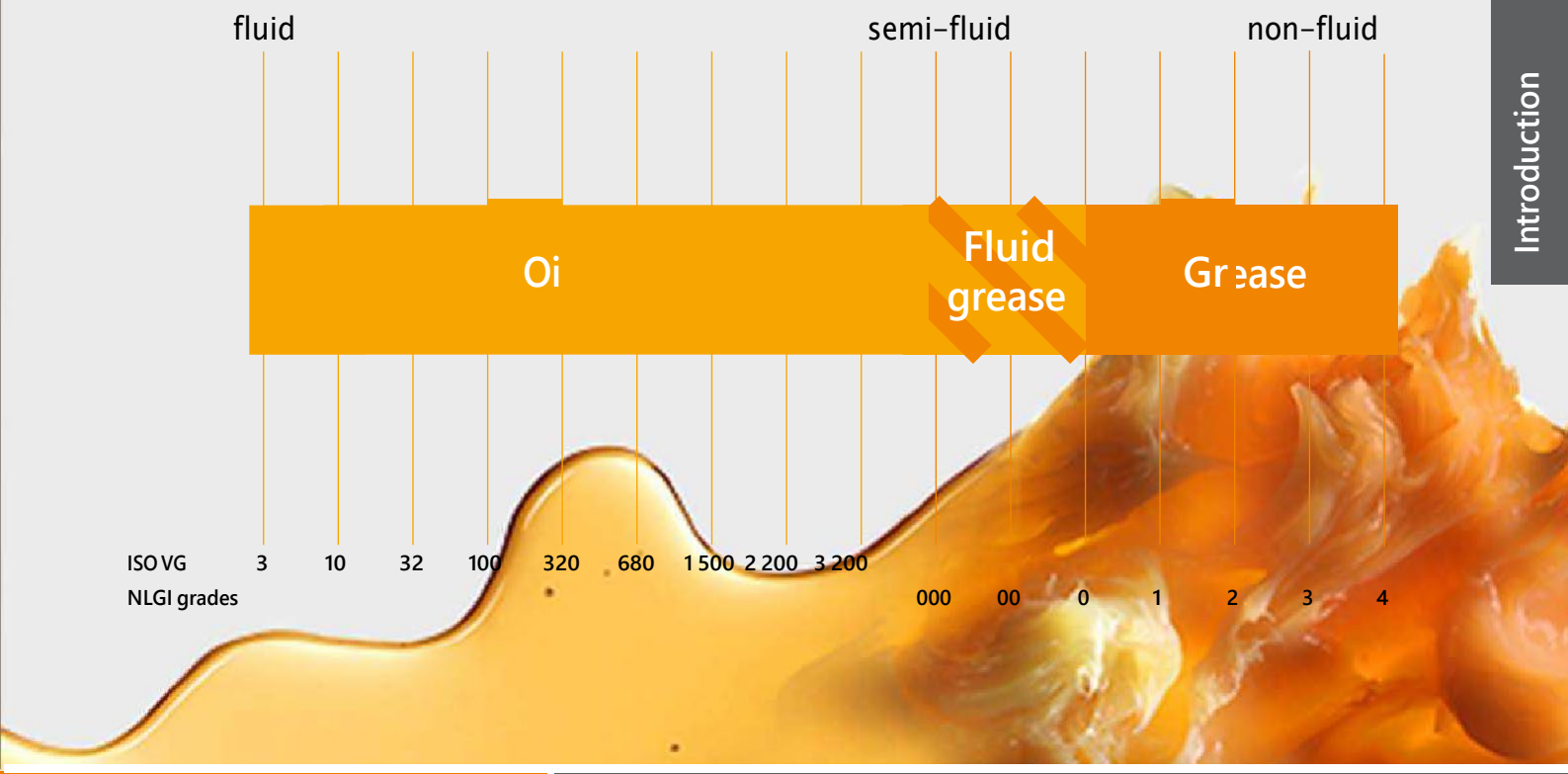
One global leader

SKF and Lincoln have joined forces to provide you with the world's most complete portfolio of innovative lubrication solutions – from manual lubricators and tools, to the most advanced centralized and automatic lubrication systems available

In addition to traditional lubrication products and systems, we offer customized solutions for many industries such as pulp and paper, steel, mining, agriculture, marine, rail, wind, construction, machine tool and automotive SKF engineering and technical specialists partner with OEMs and end-users to develop system solutions based on customer requirements We also offer a variety of control and monitoring equipment for ease of use and to help ensure proper lubrication

Both SKF and Lincoln systems are available through our global network of lubrication experts, offering you world-class installation and ongoing support on a local level – today and into the future With the power of this network, and more than 200 years of combined friction management experience, we can help you improve machine reliability, reduce maintenance, increase productivity, enhance safety and optimise manpower resources

Lubricants suitable for lubrication systems



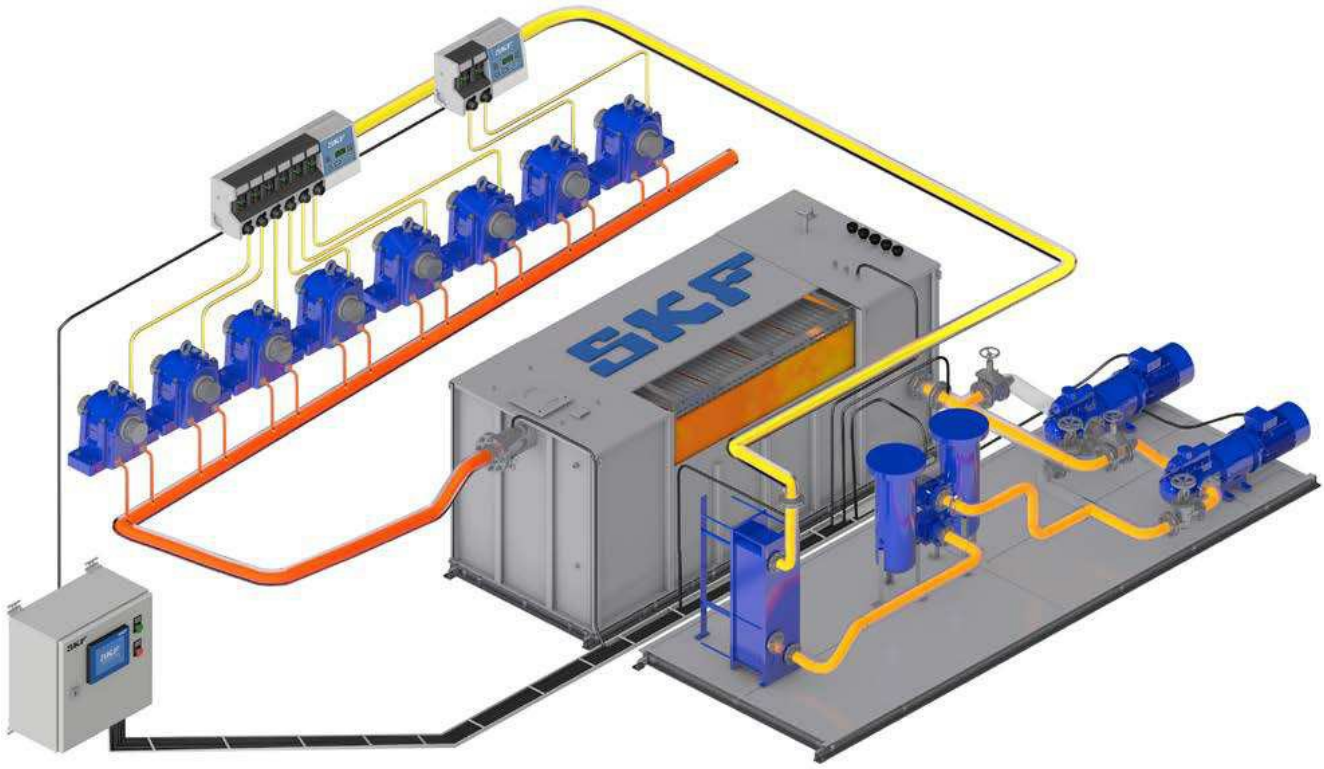
Oil and luid grease

The viscosity is an expression of a luid's internal friction Oils are classiied in ISO VG viscosity classes from 2 to 3 200 NLGI grade 000, 00 and 0 greases are called luid greases Different types of oils are available, including mineral oils, organic oils and synthetic oils A compatibility check is recommended prior to using any oil with SKF lubrication systems

Grease

Greases are consistent lubricants (NLGI grade 1-6) They are soft to hard, triple-component mixtures of a base oil as the lubricating luid, a thickening agent and additives In most instances, greases of NLGI grade 1 up to 3 are suitable for use in a lubrication system A compatibility check should be made prior to using any grease with SKF lubrication systems

Oil circulation lubrication systems



System description

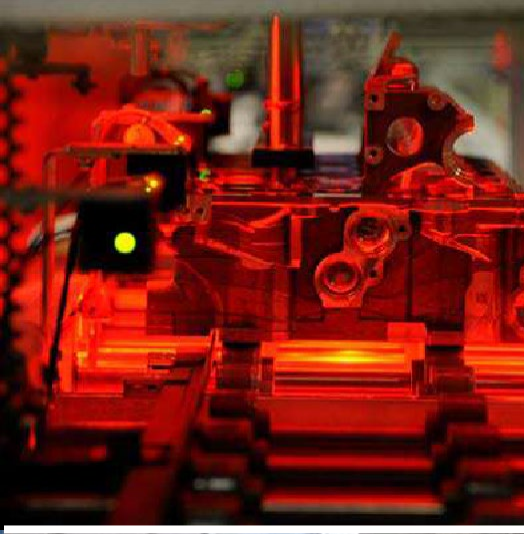
SKF CircOil systems are designed primarily for oil circulation lubrication to lubricate as well as cool highly stressed bearings in nearly every size of machine Additionally, the returning oil removes and ilters out wear particles from friction points and prevents corrosion damage by removing air and water from bearings Thus, a continuous oil low is necessary SKF CircOil systems include a wide range of customized and turnkey solutions for low rates from 0,1–3 000 l/min They are simple to service and feature a modular design that can be expanded easily Our patented tank design with the SKF plate separator technology increases operating eficiency to up to 90% An oil supply system delivers the lubricant to the adjustment valves with individual settings Flow rates can be controlled visually or electronically Monitoring systems with a low rate read-out function and individual warning levels are available for a more predictive maintenance approach

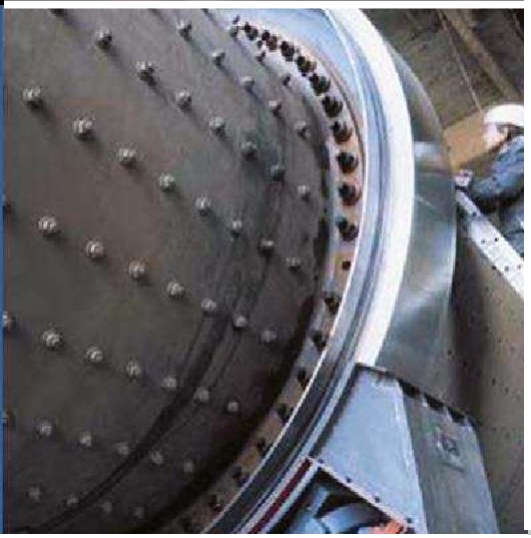
Oil circulation lubrication systems are used in pulp and paper and printing industry, as well as in many other industries They also are used in heavy industries like marine or tunnel boring In addition, SKF offers a range of oil circulation EEX components and systems specially designed for operations in harsh conditions and explosive atmospheres like mining or cement mills

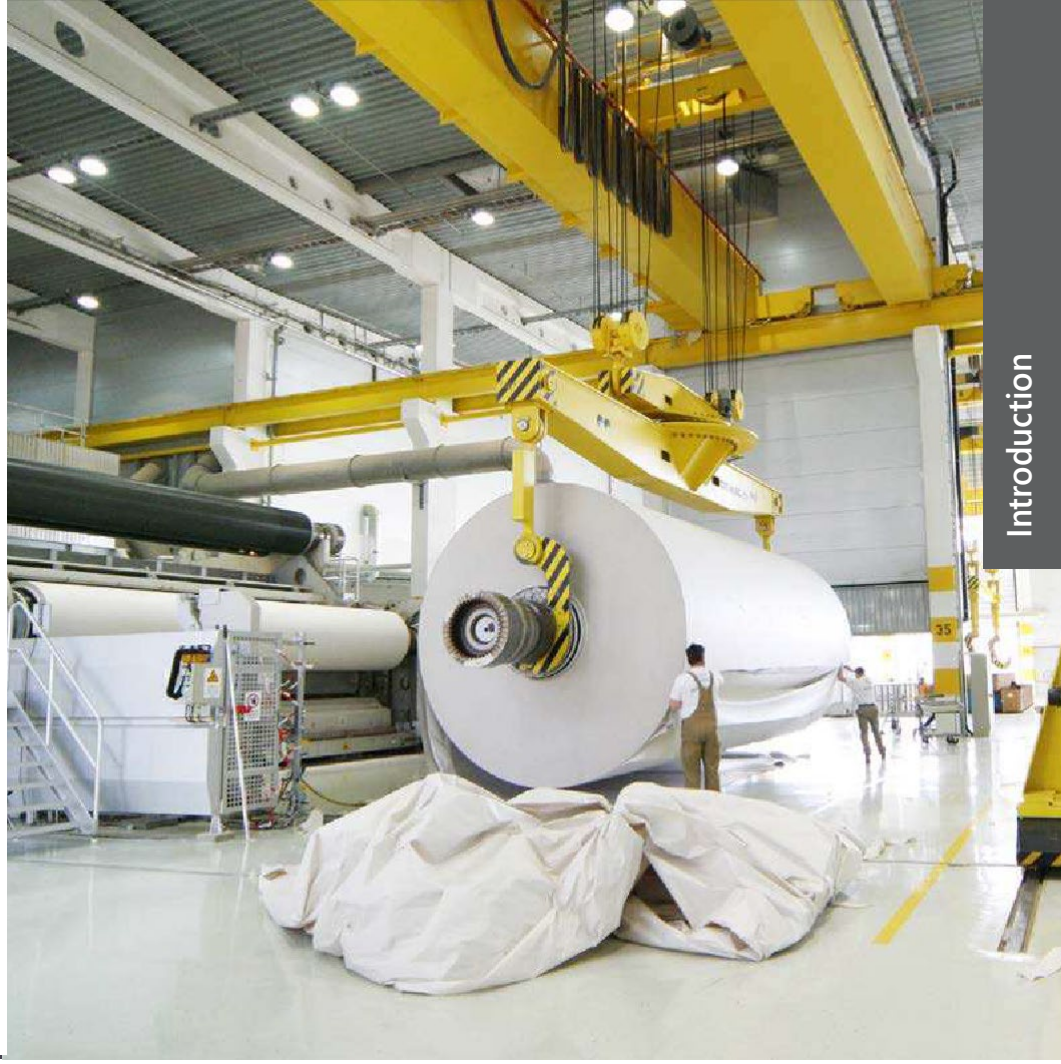
SKF oil circulation system consist of the following components:

- An oil supply unit with oil reservoir and pump unit/station (optionally equipeed with ilters and oil coditioning units)
- A control device
- One or several monitoring devices
- One or several low metering devices
- One or several sump units
- Fittings and pipes

When planning a lubrication system, ambient conditions must be determined irst The number of lubrication points, back pressures at the lubrication points, operating temperature range, the feed pump's drive energy, control and monitoring etc must be deined correctly Attention also must be given to bearing or lubrication point information The sum of all the quantities metered out by the system's metering devices needs to be completed by safety margin and expansion and compressibility loss SKF application engineers as well as SKF sales partners and distributors, are experts in designing lubrication systems according to these speciications A lubrication system laid out by SKF and partners ensures the supply of the correct amount of lubricant at the best time to lubricate This reduces wear and minimizes pollution caused by over-lubrication







System advantages

- Cools highly stressed bearings
- Removes particles from bearings
- Durable pump series designed for 24/7 operation
- Oil reservoir sizes from 3 to 40 000 liters; *(0.79 to 10 567 gal)*
- High operating eficiency
- Easy expansion of the lubrication system
- Able to pump long distances and within a wide temperature range

Applications

SKF CircOil lubrication systems are suitable for various industries that operate 24/7 While cooling is the predominant task of these systems, they equally supply bearings and gearboxes with clean oil at the correct temperature and viscosity Small, highly eficient oil reservoirs provide a high level of machine availability and save money at the same time

A large variety of low meters allows for it-for-purpose solutions and offers state-of-the-art monitoring and digitalization of low information Tailor-made controllers support stand-alone operation of SKF oil circulation lubrication systems

- Pulp and paper industry
- Metals
- Automobile presses
- Automation
- Printing
- Food and Beverage
- ATEX
- API

Recommended product combinations

Product combination matrix

	Oil supply units						Pumps								
	MF	FLMF	SM-100	OCU	Flowline	Streamline	M/MF	FLM/ FLMF	ZP	ZM [1]	ZM [2]	143 [3]	143 [4]	143 EEX	ZPU 09/ ZPU 09A
Metering devices															
VD	•	•	–	–	–	–	•	•	•	•	–	–	–	–	–
SMT	–	–	–	–	–	•	–	•	•	•	–	•	•	•	–
242	•	•	–	–	–	–	•	•	•	•	–	–	–	–	–
Variolub	–	–	–	–	–	•	–	–	–	–	–	•	•	–	–
Safelow	–	–	•	–	•	–	–	–	–	–	–	•	•	–	–
Flowline monitor	–	–	•	–	•	–	–	–	–	–	–	•	•	–	–
SMB 3	–	–	–	–	–	•	–	–	–	–	–	•	•	•	–
SMB 6	–	–	–	–	–	•	–	–	–	–	–	•	•	•	–
SMB 8	–	–	–	–	–	•	–	–	–	–	–	•	•	•	–
SMB 9	–	–	–	–	–	•	–	–	–	–	–	•	•	•	–
SMB 10	–	–	–	–	–	•	–	–	–	–	–	•	•	•	–
SMB 13	–	–	–	–	–	•	–	–	–	–	–	•	•	•	–
SMB 14	–	–	–	–	–	•	–	–	–	–	–	•	•	•	–
PSG 1	–	–	–	–	–	•	–	–	–	–	–	•	•	•	–
PSG 2	–	–	–	–	–	•	–	–	–	–	–	•	•	•	–
PSG 3	–	–	–	–	–	•	–	–	–	–	–	•	•	•	–
VP	–	–	–	–	–	–	–	–	–	–	–	•	•	•	–
Control units															
ST-2240-Circ	–	–	•	–	•	•	–	–	–	–	–	–	–	–	–
PGA 3	–	–	–	–	–	•	–	–	–	–	–	–	–	–	–
Flowline Software	–	–	–	–	•	–	–	–	–	–	–	–	–	–	–
Variolub Software	–	–	–	–	–	•	–	–	–	–	–	–	–	–	–
Monitoring devices															
WS 32/33/35	•	–	–	–	–	–	–	–	–	–	–	–	–	–	–
WS63-2/68	•	–	–	–	–	–	–	–	–	–	–	–	–	–	–
171-210	•	–	–	–	–	–	•	•	•	•	•	–	–	–	–
IPM 12	–	–	–	–	–	•	–	–	–	–	–	–	–	–	–
SFZ	•	•	–	•	•	•	•	•	•	•	–	•	•	•	–
Accessories															
169-460-...	•	•	–	–	–	–	•	•	•	•	•	•	•	•	•

[1] ZM (single-circuit)
[2] ZM (multi-circuit)
[3] 143 without motor
[4] 143 with motor

Examples for oil circulation system conigurations

System	Oil supply unit	Metering device	Monitoring device	Control unit
Flow limiter system	Streamline	SMB low limiter, PSG metering device, SMT low divider	IPM-12	ST-2240-Circ
Variolub system	Streamline, Flowline	SMD Variolub	IPM-12	ST-2240-Circ
Safelow system	Flowline, Streamline, SM-100	SF Safelow	included	ST-2240-Circ
Flowline monitor system	Flowline, Streamline, SM-100	FL Flowline monitor	included	ST-2240-Circ
242 series system	SM-100	242 restrictor	–	ST-2240-Circ

System component highlights

Streamline

SKF's customized solution when it comes to oil circulation lubrication systems They come with reservoir sizes of up to 40 000 liters in both carbon steel and stainless steel † Page 22

FLowline

They provide superior water and air separation properties Their cylindrical stainless steel reservoirs typically require only one-third of the tank volumes of traditional oil tanks † Page 20

SM-100

SM-100 is a compact, small oil circulation system The unit can provide oil for one or two small machines with a total low rate of 7 l/min
* Page 16

SMB low limiter

They divide main line low into parallel, individual lows The low is generated independently of system pressure changes virtually guaranteeing a constant low † Page 68

SMD low meter

They meter and monitor the low in oil circulation lubrication systems They are offered in three different versions covering a low rate of 0,05 to 40 l/min
* Page 54

Safelow low meter

They control and indicate the low rate in oil circulation lubrication systems Each low meter can be calibrated individually and cover a low rate of 0,04 to 56 l/min † Page 56

FL lowline monitor

Thy divide, measure and control the low rate in a systems Monitors 0,1 to 100 l/min lows with operating viscosities from 32 to 1 000 mm²/s
* Page 58

PSG metering valve

Progressive metering devices consisting of a baseplate and different metering sections that can be individually combined for speciic outlet ratios and cross portings † Page 80

ST-2240-Circ controller

A stand-alone controller for oil circulation lubrication systems It comes with a touch screen and remote smart phone options
* Page 90

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Overview of oil circulation supply units

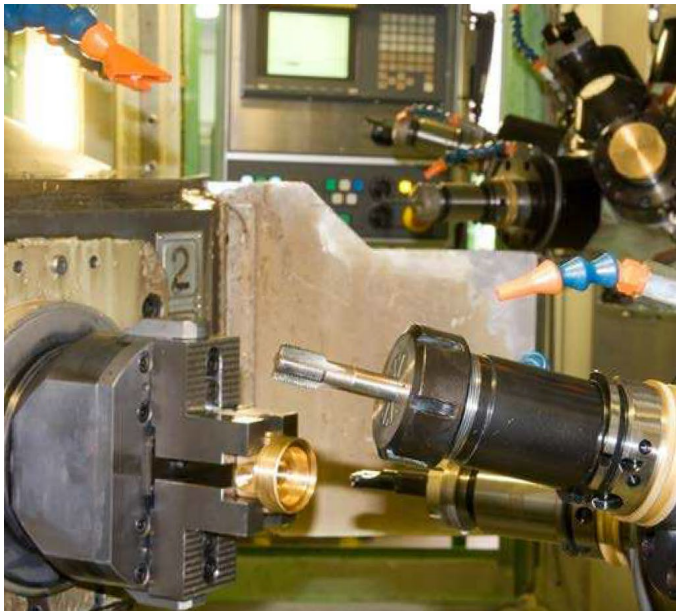
Oil supply units

Product	Lubricant mineral and synthetic oil	Flow rate [1]		Ambient temperature		Reservoir size		Reservoir material	Page
	viscosity ISO VG	l/min	*pts/min*	°C	*°F*	l	*pts*		
MF	5–2 000	0,12–0,5	*0.23–1.06*	10 to 40	*50 to 104*	2,7–50	*5.7–105*	plastic/metal	12
FLMF	20–850	1,2–2,4	*2.5–5.0*	10 to 40	*50 to 104*	2,7–50	*5.7–105*	metal	14
SM-100	30–1 000	2–7	*4.2–14.8*	0 to +70	*+32 to 158*	100	*211*	steel	16
OCU	15–800	5–30	*10.5–63.4*	–10 to 40	*14 to 104*	–	–	–	18
	viscosity ISO VG	l/min	*gal/min*	°C	*°F*	l	*gal*		
Flowline	20–1 000	30–1 200	*8–317*	10 to 40	*50 to 104*	300–2 × 6 000	*80–2 × 1 585*	stainless steel AISI 304, 316	20
Streamline	20–1 000	30–4 000	*8–1 056*	10 to 40	*50 to 104*	1 000–40 000	*264–10 566*	carbon steel or stainless steel AISI 304, 316	22

[1] Valid for operating viscosity of 140 mm^2/s

Gear pump unit

MF



Description

MF single-circuit gear pump units are used in small oil circulation lubrication systems with pressure ranges up to 65 bar *(940 psi)* and high viscosities up to 2 000 mm²/s The pump is vertically mounted on the reservoir

MF gear pumps come with integrated pressure relief and venting valves that feed into the internal return oil connection in the adapter lange In case of trapped air, the venting valve opens In case of excess pressure, oil is relieved to the return oil connection via the pressure relief valve

Features and beneits

- Designed for 24/7 operation
- Inexpensive solution
- High viscosity range
- Compact, rugged and reliable design
- Low noise level
- Integrated pressure relief valve and venting valve

Applications

- Machine tools
- Automotive
- Automation
- Textile machinery
- Metal and plastic forming machinery
- Printing

Technical data

Function	electrically operated gear pump unit; single circuit
Lubricant	environmentally friendly mineral and synthetic oils; viscosity 5–2 000 mm²/s
Flow rate	0,12–0,5 l/min; *0.25–1.06 pts/min*
Number of outlets	1
Ambient temperature	+10 to 40 °C; *+50 to 104 °F*
Oil temperature	+10 to 65 °C; *+50 to 149 °F*
Operating back pressure	max 65 bar; *max. 940 psi*
Suction height	500 mm; *19.68 in*
Drive speed	2 600–2 700 min⁻¹
Motor [1]	3-phase motor
Voltage	220–240/380–420 V AC at 50 Hz
Rated power	0,075–0,18 kW
Pressure connection	M 14 × 1,5 for ∅ 8 mm
Seal material	NBR, FPM
Reservoir	2,7l; 6l; 15 l; 50l; *5.7pts; 12.7 pts, 31.7 pts; 105 pts*
Reservoir material	plastic, metal
Protection class	IP 54
Dimensions	min 131 × 88 × 209 mm max 131 × 88 × 220 mm *min. 5.16 × 3.54 × 8.23 in* *max. 5.16 × 3.54 × 8.66 in*
Mounting position	horizontal [2] or vertical
Approvals (dep on model)	CE, UL, CSA

[1] Further motor designs available on request
[2] with special seal design

NOTE

Further technical information, technical drawings, accessories, spare parts or product function descriptions available on SKF com/lubrication:
1-1204-2-EN, 951-170-001 EN, 951-170-002 EN

Gear pump unit

MF

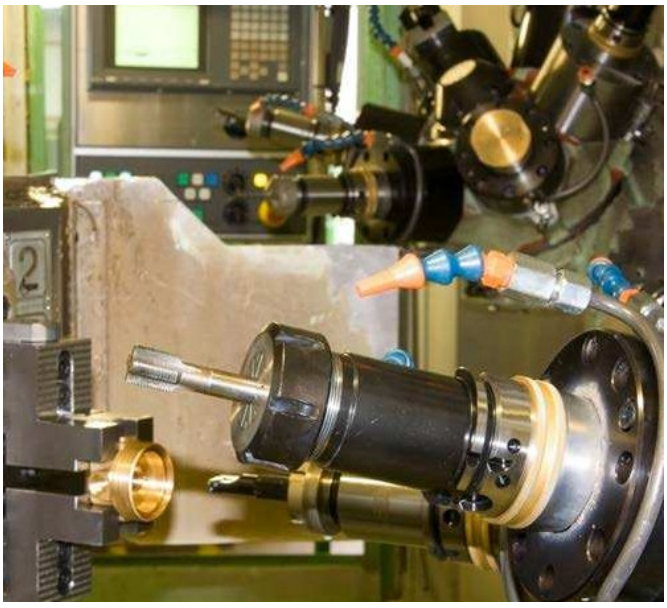
MF pump unit with reservoir

Order number [1]	Viscosity	Flow rate [2]		Reservoir size		material	design	level sensor	ilter	gauge
	mm²/s	l/min	*pts/min*	l	*pts*					
MF1-BW3-S20+1FV	20–2 000	0,12	0 25	2,7	5,7	metal	wall mounting	min ill level warning	–	–
MF1-KW3-S15+1FX	20–1 000	0,12	0 25	2,7	5,7	plastic	wall mounting	min ill level warning	–	yes
MF2-BW7+299	20–1 000	0,20	0 42	6	12 7	metal	wall mounting	min ill level warning	–	–
MF2-KW6-S8+299	20–2 000	0,20	0 42	6	12 7	plastic	wall mounting	–	pressure ilter	–
MF5-BW7+140	20–1 000	0,50	1 0	6	12 7	metal	wall mounting	min ill level warning	–	–
MF5-KW6+299	20–1 000	0,50	1 0	6	12 7	plastic	foot design	min ill level warning	–	–
MF5-BW16-S223+299	20–1 000	0,50	1 0	15	31 7	metal	foot design	min and max ill level warning	–	–
MF5-BW51-S22+29G	20–1 000	0,50	1 0	50	105	metal	foot design	min and max ill level warning	pressure ilter	yes

[1] Recommended oil iltration for MF pumps: According to ISO 440620/17/14, NAS code (1638) class 8, SAW AS 4059 class 8
[2] On an operating viscosity of 140 mm²/s and 5 bar back pressure

Vane pump unit

FLMF



Description

The SKF FLM vane pump unit is a simple and reliable solution suitable for usage in small oil circulation systems with low pressure and low viscosity range Because of its high suction capacity of up to 3 m (the SKF FLM pump unit is often used as a sump pump SKF vane pumps can deliver both oil and oil/air mixtures and provide a higher suction capability than gear pump units Two different pump designs of the pump unit are available: one allows the pump to be mounted separately from the reservoir (FLM) and the other allows the pump to be lange-mounted on the reservoir (FLMF) both vertically and horizontally When installed on the side (horizontally), ensure that the unit is mounted above the maximum lubricant level Special designs with a sealed lange for mounting below the lubricant level are available on request

Features and beneits

- Simple, reliable and cost-effective solution
- Low-wear and low-maintenance
- High suction capacity (3 m)
- Designed for 24/7 operation
- Delivers oil and air mixtures
- Fail safe running functions

Applications

- General Industry
- Machine Tools
- Automotive
- Automation

Technical data

Function	electrically operated vane pump unit
Lubricant	oil, viscosity 20-850 mm²/s
Flow rate	1,2-2,4 l/min; *2.5–5.0 pts/min*
Number of outlets	1
Ambient temperature	+10 to 40 °C; *+50 to 104°F*
Oil temperature	+10 to 65 °C; *+50 to 149 °F*
Operating back pressure	max 6 bar, *max. 87 psi*
Suction height [1]	max 3 000 mm; *118.1 in*
Drive speed	2 700 min⁻¹
Motor [2]	3-phase motor
Voltage	220-240/380-420 V AC at 50 Hz
Rated power	0,075 kW
Suction connection	M16×1,5
Pressure connection	M14×1,5
Reservoir	2,7-50 l; *5.7-105 pts*
Reservoir material	plastic, metal
Protection class	IP 54
Dimensions	max 216×88×134,5 mm *max. 8.5×3.46×5.29 in*
Mounting position	horizontal

[1] Based on operating viscosity of 140 mm²/s at a back pressure of p = 5 bar
[2] Further motor designs available on request

NOTE

Further technical information, technical drawings, accessories, spare parts or product function descriptions available on SKF com/lubrication:

1-1204-2-EN, 951-170-001 –EN, 951-170-002 –EN

3D

skf-lubrication partcommunity com/3d-cad-models

Vane pump unit

FLMF

FLMF with reservoir

Order number [1]	Viscosity	Flow rate [2]		Back pressure		Reservoir size		Suction height		design	level sensor
	mm²/s	l/min	*pts/min*	bar	*psi*	l	*pts*	mm	*in*		
FLMF12-BW3-2+299	20–850	1,2	*2.5*	6	*87*	2,7	*5.7*	3 000	*118*	wall mounting	min and ill level
FLMF12-BW7+299	20–850	1,2	*2.5*	6	*87*	6	*12.6*	3 000	*118*	wall mounting	min and ill level
FLMF12-BW16+299	20–850	1,2	*2.5*	6	*87*	15	*31.7*	3 000	*118*	foot design	min and ill level
FLMF24-BW51-S2+MWZ	20–500	2,4	*5.0*	3	*44*	50	*105*	1 000	*40*	foot design	min and max ill level

[1] Recommended oil iltration for MF pumps: According to ISO 440620/17/14, NAS code (1638) class 8, SAW AS 4059 class 8
[2] On an operating viscosity of 140 mm²/s and 5 bar back pressure

Gerotor pump unit

SM-100

Description

SM-100 is a complete small oil circulation system The unit can provide oil for one or two small machines with a total low rate of 7 l/min The system pressure level is adjusted by variable speed drives (VFD) Other typical systems utilize an overlow valve leading to energy losses, component wear and oil degradation The reservoir is equipped with a heater to control oil viscosity at start up An optional cooler is furnished to reduce the iltered oil temperature supplied to the bearings The ilter cartridge can be changed during operation, using a by-pass valve For even larger fans, SKF has Flowline, a full oil circulation system family with necessary customized designs to fulill customer requirements

Features and beneits

- Energy saving compact oil supply unit for one or two pumps
- Easy to use, to locate and to install
- Eficient air cooler, special application without cooler
- Compact power supply unit with frequency converters (VFD), available also without power supply
- Compact electronic control system, available also without control

Applications

- Fans, gears, reiners, washers, gear boxes, motors
- Presses, rolls, pumps, chippers
- Etc

Technical data

Function	electrically operated gerotor pump unit
Lubricant	lubrication and hydraulic oils; 30 to 1 000 mm^2/s
Flow rate	2 to 7 l/min (6 8 l/min at 950 min^{-1}); *4,2 to 14.8 pts/min*
Number of outlets [1]	1 -10
Ambient temperature	+10 to 40 °C; *+50 to 104 °F*
Oil temperature	+10 to 70 °C; *+50 to 158 °F*
Operating pressure	max 10 bar; max *145 psi*
Reservoir	100 l; *211 pts*
Reservoir material	carbon steel (painted)
Thermostat controlled heater for oil tank	20 to 50 °C in 6 h; *68 to 122 °F in 6 h*
Oil iltering rate	5 micron
Voltage	400 V AC/50 Hz
Pressure connection	G / NPT 1/2; G / NPT 1; G / NPT 1 1/4
Protection class	IP 54
Dimensions	1 200 × 550 × 840 mm; *47.25 × 21.65 × 33 in*
Mounting position	vertical

[1] Number of outlets is depending on the design of the selected SKF Flowline Monitor

NOTE
Further technical information, technical drawings, accessories, spare parts or product function descriptions available on SKF com/lubrication:
6633EN

Gerotor pump unit

SM-100

Supply units

Order number	Designation	Number of pumps	Number of ilters	Reservoir material	Cooler type	Control unit
13141098	SM-30-1P-1F-PNTST-XX	1	1	Painted	No	Relay control with power supply
13141099	SM-30-1P-1F-PNTST-WAC	1	1	Painted	Water	Relay control with power supply
13141100	SM-30-1P-1F-PNTST-AIC	1	1	Painted	Air	Relay control with power supply
13143400	SM-100-1P-1F-PNTST-XX	1	1	Painted	No	ST-2240
13143410	SM-100-2P-1F-PNTST-XX	2	1	Painted	No	ST-2240
13143450	SM-100-1P-1F-PNTST-WAC	1	1	Painted	Water	ST-2240
13143420	SM-100-1P-1F-PNTST-AIC	1	1	Painted	Air	ST-2240
13143460	SM-100-2P-1F-PNTST-WAC	2	1	Painted	Water	ST-2240
13143430	SM-100-2P-1F-PNTST-AIC	2	1	AISI 304	Air	ST-2240
13143461	SM-100-1P-2F-SS-XX	1	2 (Duplex)	AISI 304	No	ST-2240
13143462	SM-100-2P-2F-SS-XX	2	2 (Duplex)	AISI 304	No	ST-2240
13143463	SM-100-1P-2F-SS-WAC	1	2 (Duplex)	AISI 304	Water	ST-2240
13143464	SM-100-1P-2F-SS-AIC	1	2 (Duplex)	AISI 304	Air	ST-2240
13143465	SM-100-2P-2F-SS-WAC	2	2 (Duplex)	AISI 304	Water	ST-2240
13143466	SM-100-2P-2F-SS-AIC	2	2 (Duplex)	AISI 304	Air	ST-2240
13143470	SM-200-1P-2F-SS-xx	1	2 (Duplex)	AISI 304	No	ST-2240
13143471	SM-200-2P-2F-SS-xx	2	2 (Duplex)	AISI 304	No	ST-2240
13143472	SM-200-1P-2F-SS-WAC	1	2 (Duplex)	AISI 304	Water	ST-2240
13143473	SM-200-1P-2F-SS-AIC	1	2 (Duplex)	AISI 304	Air	ST-2240
13143474	SM-200-2P-2F-SS-WAC	2	2 (Duplex)	AISI 304	Water	ST-2240
13143475	SM-200-2P-2F-SS-AIC	2	2 (Duplex)	AISI 304	Air	ST-2240

Gear pump unit

OCU

Description

OCU (Oil Conditioning Unit) is an electrically operated oil pumping, cooling and iltration system It removes contamination and allows to condition oil temperature and contributes greatly to optimum lubrication with correct oil viscosity There are three diffent OCU models available: without cooler, with air cooler or with water cooler All models work in a side stream (kidney loop) coniguration The units are installed directly on the machine Access ports should be located on opposing sides of the oil sump, so that suitable oil circulation is possible Once installed the system is ready for continuous operation

Features and beneits

- Continuous lubricant cooling and iltration to extend machine life
- Eliminats wear and premature failures eficiently
- Optional available with frequency converter, electrical clogging indicator, temperature transmitter, pressure transmitter, gauge, shut-off valve, lowmeter, moisture transmitter or thermostat
- Dust proof cabinet with cooling or heating design on request
- Virtually maintenance free
- Easy to use and install

Applications

- Large bearing houses
- Compressors
- Turbine systems
- Vacuum pumps
- Gearboxes

Technical data

Function	electrically operated gear pump unit
Lubricant	lubrication and hydraulic oils; 15 to 800 mm^2/s
Flow rate	5 to 30 l/min, *10.5 to 63 pts/min*
Number of outlets	1–2
Ambient temperature	–10 to +40 °C; *14 to 104 °F*
Oil temperature	–10 to +80 °C; *14 to 176 °F*
Operating pressure	10 bar; *145 psi*
Lubricant viscosity at start-up	2 000 mm^2/s
Oil iltering rate	20 micron
Voltage	400/690 V AC/50 Hz 460 VAC/60 Hz
Inlet connection	
SKF-OCU-5	G 3/4
SKF-OCU-10, 30	G 1 1/2
Pressure connection	G 1
Protection class	IP55
Dimensions	min 570 × 345 × 378 mm max 570 × 800 × 920 mm *min. 22.4 × 13.6 × 14.9 in* *max. 22.4 × 31.5 × 36.2 in*
Mounting position	horizontal

NOTE

Further technical information, technical drawings, accessories, spare parts or product function descriptions available on SKF com/lubrication:

10160/2 EN

Gear pump unit

OCU

OCU models

Order number	Designation	Cooler	Flow rate		Rated power	Drive speed	Dimensions	Weight
			l/min	*pts/min*	kW	min^{-1}	mm	kg
13140907	**SKF-OCU-5-P-400-XX**	–	5	*10.5*	0,55	935	360 × 600 × 470	35
13140908	**SKF-OCU-10-P-400-XX**	–	10	*21*	0,75	1 450	360 × 600 × 470	33
13140909	**SKF-OCU-30-P-400-XX**	–	30	*63*	1,1	1 450	360 × 600 × 470	45
13140911	**SKF-OCU-5-P-400-AIC**	Air cooler	5	*10.5*	0,55	935	1 000 × 620 × 620	46
13140912	**SKF-OCU-10-P-400-AIC**	Air cooler	10	*21*	0,75	1 450	1 000 × 620 × 621	44
13140913	**SKF-OCU-30-P-400-AIC**	Air cooler	30	*63*	1,1	1 450	1 030 × 620 × 622	83
13140901	**SKF-OCU-5-P-400-WAC**	Water cooler	5	*10.5*	0,55	935	360 × 600 × 590	38
13140904	**SKF-OCU-10-P-400-WAC**	Water cooler	10	*21*	0,75	1 450	360 × 600 × 591	38
13140906	**SKF-OCU-30-P-400-WAC**	Water cooler	30	*63*	1,1	1 450	360 × 600 × 592	50

[1] Other low rates or motor voltages available on request

Screw pump unit

Flowline

Description

SKF Flowline oil supply units provide superior water and air separation properties Their cylindrical stainless steel reservoirs typically require only one-third of the tank volumes of traditional oil tanks Advanced technology and the unique SKF tank design guarantee the highest possible oil quality and condition The compact and modular SKF Flowline oil circulation lubrication system product family consists of the following components: Flowline pumping unit, ST-2240 control centre, Flowline monitor low meters and sump units

Features and beneits

- Increased machine availability due to optimal oil treatment
- Cost savings on oil purchasing, handling and disposal
- Energy savings
- Less environmental impact
- 50% reduction in reservoir size compared to traditional oil tanks
- 80% more air and water removal than traditional oil tanks
- 90% tank eficiency
- Short lead times

Applications

- Pulp and paper industry
- Metals
- Mining
- Industrial gearboxes
- Industrial fans

Technical data

Function	electrically operated screw pump unit
Lubricant	lubrication and hydraulic oils; viscosity 20 to 1 000 mm^2/s
Flow rate	30 to 1 200 l/min; *8 to 317 gal/min*
Ambient temperature	+10 to 40 °C; *+50 to 104 °F*
Oil temperature	+10 to 70 °C; *+50 to 158 °F*
Operating back pressure	max 10 bar *max. 145 psi*
Motor	3-phase, according to DIN IEC 60038
Rated power	1,1 to 30 kW
Reservoir	300 up to 2 × 6 000 l *80 up to 2 × 1 585 gal*
Material reservoir	stainless steel AISI 304 or AISI 316
Dimensions	depending on unit size
Mounting position:	
FL 300C to FL 2 000C	pump skid attached to the reservoir
FL 1 000 to FL 9000	pump skid on separate base frame

NOTE

Further technical information, technical drawings, accessories, spare parts or product function descriptions are available on SKF com/lubrication:
17150 EN

Oil supply units

Screw pump unit

Streamline

Description

SKF Streamline oil supply units are SKF's customized solution when it comes to oil circulation lubrication systems They come with reservoir sizes of up to 40 000 liters in both carbon steel and stainless steel and provide equally superior water and air separation properties compared with the SKF Flowline product series These reservoirs have a rectangular shape and typically require only one-third of the tank volumes of traditional oil tanks Advanced technology and the unique SKF tank design guarantee the highest possible oil quality and condition

Features and beneits

- Increased machine availability due to optimal oil treatment
- Cost savings on oil purchasing, handling and disposal
- Energy savings
- Less environmental impact
- 50% reduction in reservoir size compared to traditional oil tanks
- 80% more air and water removal than traditional oil tanks
- 90% tank eficiency
- Dimensions can be adapted to machine footprint

Applications

- Pulp and paper industry
- Metals
- Mining
- Industrial gearboxes

Technical data

Function	electrically operated screw pump unit
Lubricant	hydraulic and lubricating oils; viscosity 20 to 1 000 mm^2/s
Flow rate	30 to 4 000 l/min; *8 to 1 057 gal/min*
Ambient temperature	0 to +70 °C; *+32 to 158 °F*
Oil temperature	+10 to 70 °C; *+50 to 158 °F*
Operating back pressure	max 25 bar *max. 363 psi*
Rated power	1 1 to 75 kW
Reservoir	1 000–40 000 l *264–10 566 gal*
Material reservoir	carbon steel or stainless steel AISI 304 or AISI 316
Dimensions	depending on unit size
Mounting position	pump skid mounting on separate base frame

NOTE

For further technical information, technical drawings, accessories, spare parts or product function descriptions, please contact your local SKF sales representative

LINCOLN

SKF

Oil supply units


SKF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Overview of oil circulation pumps

Single-circuit oil pumps

Product	Function type	Outlets	Flow rate [1] max		Operating back pressure max		Suction height max		Page
			l/min	*pts/min*	bar	*psi*	mm	*inch*	
M/MF	gear pump	1	0,5	*1.06*	65	*942*	500	*19.7*	22
FLM / FLMF	vane pump	1	2,4	*5.0*	6	*87*	3 000	*118.1*	28
ZP	gear pump	1	2,5	*5.3*	25	*363*	1 000	*39,4*	30
ZM (single-circuit)	gear pump	1	2,5	*5.3*	30	*435*	1 000	*39.4*	32
143	gerotor pump	1	50	*105.7*	50	*725*	1 000	*39.4*	36
143 EEX	gerotor pump	1	50	*105.7*	50	*725*	1 000	*39.4*	38

[1] Valid for operating viscosity of 140 mm²/s

Product	Function type	Outlets	Flow rate [1] max		Operating back pressure max		Suction height max		Page
			l/min	*pts/min*	bar	*psi*	mm	*inch*	
ZM (multi-circuit)	gear pump	2–20	0,45	*0.951*	20	*290*	500	*19.7*	40

[1] Valid for operating viscosity of 140 mm²/s

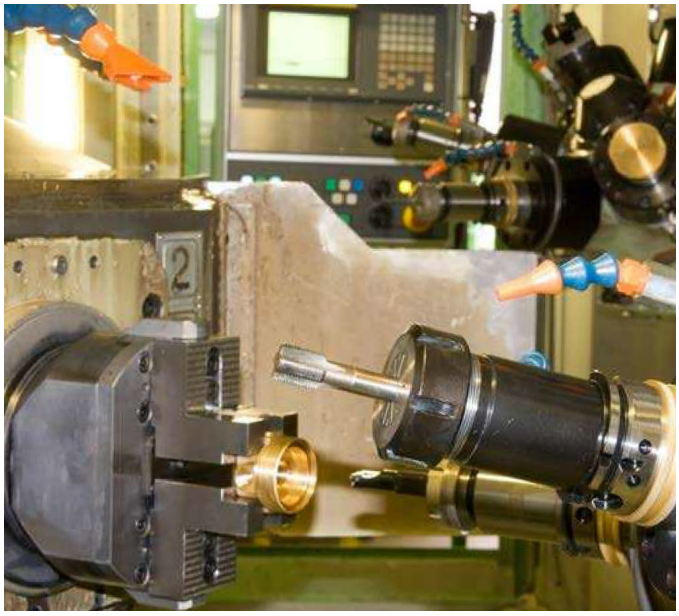
Hydrostatic oil pumps

Product	Function type	Outlets	Flow rate [1] max		Operating back pressure max		Page
			l/min	*pts/min*	bar	*psi*	
ZPU 09/09A	piston pump	1–2	0,13	*0.27*	400	*5 800*	42

[1] Valid for operating viscosity of 140 mm²/s

Gear pump

M / MF



Description

MF single-circuit gear pump units are used in small oil circulation lubrication systems with pressure ranges up to 65 bar *(940 psi)* and high viscosities up to 2 000 mm²/s The pump is vertically mounted on the reservoir

MF gear pumps come with integrated pressure relief and venting valves that feed into the internal return oil connection in the adapter lange In case of trapped air, the venting valve opens In case of excess pressure, oil is relieved to the return oil connection via the pressure relief valve

Features and beneits

- Designed for 24/7 operation
- Inexpensive solution
- High viscosity range
- Compact, rugged and reliable design
- Low noise level
- Integrated pressure relief valve and venting valve

Applications

- Machine tools
- Automotive
- Automation
- Textile machinery
- Metal and plastic forming machinery
- Printing

Technical data

Function	electrically operated gear pump; single circuit
Lubricant	environmentally friendly mineral and synthetic oils; viscosity 5-2 000 mm²/s
Flow rate	0,12-0,5 l/min; *0.25–1.06 pts/min*
Outlet	1
Operating temperature	+10 to 40 °C; *+50 to 104 °F*
Operating back pressure	max 65 bar; *max. 940 psi*
Suction height	500 mm; *19.68 in*
Drive speed	2 600-2 700 min^{-1}
Motor [1]	3-phase motor
Voltage	220-240/380-420 V AC at 50 Hz
Rated power	0,075-0,18 kW
Pressure connection	M 14 × 1,5 for ∅ 8 mm
Suction connection	M 14 × 1,5 or M 16 × 1,5
Seal material	NBR, FPM
Protection class	IP 54
Dimensions	min 131 × 88 × 209 mm max 131 × 88 × 220 mm *min. 5.16 × 3.54 × 8.23 in* *max. 5.16 × 3.54 × 8.66 in*
Mounting position	horizontal [2] or vertical
Approvals (dep on model)	CE, UL, CSA

[1] Further motor designs available on request
[2] with special seal design

NOTE

Further technical information, technical drawings, accessories, spare parts or product function descriptions available on SKF com/lubrication:
1-1204-2-EN, 951-170-001 EN, 951-170-002 EN

Gear pump

M / MF

M pumps for mounting separate from reservoir

Order number [1]	Viscosity	Flow rate [2]		Operating back pressure max		Drive speed	Rated power	Suction port thread	Weight	
	mm^2/s	l/min	*pts/min*	bar	*psi*	min^{-1}	kW	mm	kg	*lbs*
M1-2000+299	20–2 000	0,12	*0.253*	28	*406*	2 700	0,075	M14×1,5	3,15	*6.94*
M2-2004+299	20–2 000	0,2	*0.423*	12	*174*	2 700	0,075	M14×1,5	3,18	*7.01*
M2-2000+299	20–2 000	0,2	*0.423*	28	*406*	2 700	0,075	M14×1,5	3,16	*6.96*
M2-S14+299	20–1 000	0,2	*0.423*	65	*940*	2 700	0,075	M14×1,5	3,16	*6.96*
M2-2127+299	20–2 000	0,2	*0.423*	70	*1 015*	2 700	0,075	M14×1,5	3,16	*6.96*
M5-2000+299	20–1 000	0,5	*1.06*	28	*406*	2 700	0,075	M14×1,5	3,40	*7.49*
M5-2024+299	20–2 000	0,5	*1.06*	25	*362*	2 700	0,075	M14×1,5	3,37	*7.43*
M5-2013+299	5–500	0,5	*1.06*	16	*230*	2 700	0,075	M14×1,5	3,20	*7.05*
M5-S12+299	35–500	0,5	*1.06*	60	*870*	2 700	0,120	M14×1,5	3,40	*7.49*
M10-2002+299	10–500	1,0	*2.12*	15	*217*	2 700	0,075	M16×1,5	3,57	*7.87*

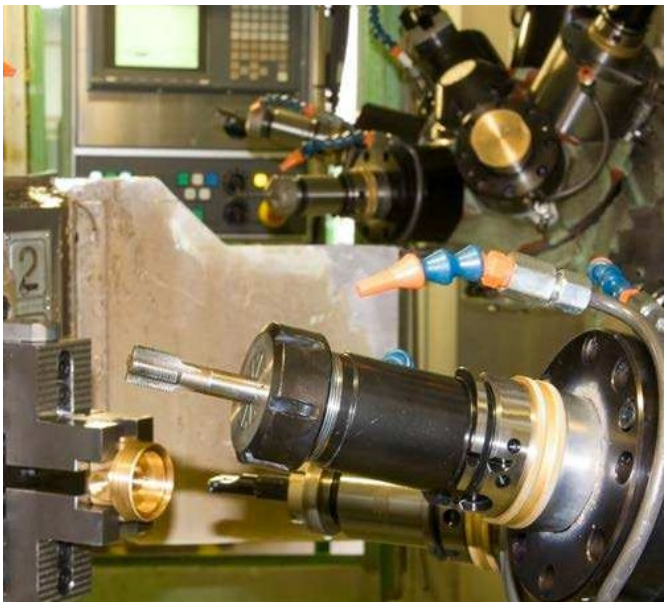
MF pumps for lange-mounting on reservoir

MF1-2000+299	20–2 000	0,12	0 253	28	*406*	2 700	0,075	M14×1,5	3,13	*6.90*
MF1-2006+299	20–2 000	0,12	*0.253*	6	*87*	2 700	0,075	M14×1,5	3,15	*6.94*
MF2-2000+299	20–2 000	0,2	*0.423*	28	*406*	2 700	0,075	M14×1,5	3,17	*6.98*
MF2-S12+299	20–1 000	0,2	*0.423*	65	*940*	2 800	0,120	M14×1,5	3,17	*6.98*
MF2-2127+299	140–1 000	0,2	*0.423*	60	*870*	2 700	0,075	M14×1,5	3,20	*7.05*
MF5-2000+299	20–1 000	0,5	*1.06*	28	*406*	2 700	0,075	M14×1,5	3,19	*7.03*
MF5-2014+299	5–500	0,5	*1.06*	12	*174*	2 700	0,075	M14×1,5	3,23	*7.12*
MF5-S12+299	140–1 000	0,5	*1.06*	60	*870*	2 800	0,075	M14×1,5	3,06	*6.75*
MF10-2001+299	20–1 000	1,0	2,11	12	*174*	2 700	0,075	M14×1,5	3,23	*7.12*
MF10-S12+299	20–1 000	1,0	2,11	28	*406*	2 800	0,120	M16×1,5	3,57	*7.87*
MF210-2001+299	20–150	2,0	4 22	15	217	2 700	0,075	M16×1,5	3,57	*7.87*

[1] Recommended oil iltration for MF pumps: According to ISO 440620/17/14, NAS code (1638) class 8, SAW AS 4059 class 8
[2] On an operating viscosity of 140 mm^2/s and 5 bar back pressure

Vane pump

FLM / FLMF



Description

The SKF FLM vane pump unit is a simple and very reliable solution suitable for usage in small oil circulation systems with low pressure and low viscosity range Because of its high suction capacity of up to 3 m (the SKF FLM pump unit is often used as a sump pump SKF Vane pumps can deliver both oil and oil/air mixtures and provide a higher suction capability than gear pump units Two different pump designs of the pump unit are available, one allows the pump to be mounted separately from the reservoir (FLM) or the other allows the pump to be lange-mounted on the reservoir (FLMF) both vertically and horizontally When installed on the side (horizontally), ensure that the unit is mounted above the maximum lubricant level Special designs with a sealed lange for mounting below the lubricant level are available on request

Features and beneits

- Simple, reliable and cost-eficient solution
- Low-wear and low-maintenance
- High suction capacity (3 m)
- Designed for 24/7 operation
- Delivers oil and air mixtures
- Fail safe running functions

Applications

- General industry
- Machine tools
- Automotive
- Automation

Technical data

Function	electrically operated vane pump
Lubricant	mineral and synthetic oils; viscosity 20–850 mm^2/s
Flow rate	1,2–2,4 l/min; *2.5–5.0 pts/min*
Operating temperature	+10 to 40 °C; *+50 to 104°F*
Operating back pressure	max 3–6,6 bar; *44–87 psi*
Suction height [1]	1 000–3 000 mm; *39.4– 118.1 in*
E-motor drive	3 phase motor
Drive speed	2 700 min^{-1}
Motor [2]	3-phase motor
Voltage	220–240/380–420 V AC at 50 Hz
Rated output	0,075 kW
Suction connection	M16×1,5
Pressure connection	M14×1,5
Protection class	IP 54
Dimensions	max 216 × 88 × 134,5 mm *max. 8.5 × 3.46 × 5.29 in*
Mounting position	separate or langed to reservoir
Options	with shaft butt, with slotted coupling, left or right rotating pumps

[1] Based on operating viscosity of 140 mm^2/s at a back pressure of p = 5 bar
[2] Further motor designs available on request

NOTE

Further technical information, technical drawings, accessories, spare parts or product function descriptions available on SKF com/lubrication:

1-1204-2-EN, 951-170-001 –EN, 951-170-002 –EN

3D

skf-lubrication partcommunity com/3d-cad-models

Vane pump

FLM / FLMF

FLM / FLMF without reservoir

Order number	Order number	Flow rate [1]		Suction height		Operating back pressure max		Viscosity
lange-mounting	separate mounting	l/min	*pts/min*	mm	*inch*	bar	*psi*	mm^2/s
FLMF12-2000+299	**FLM12-2000+299**	1,2	*2.5*	3 000	*118.1*	6,6	*95*	2-850
FLMF24-2000+299	**FLM24-2000+299**	2,4	*5.0*	3 000	*118.1*	3	*44*	2-500
FLMF24-S10+299	**FLM24-S10+299**	2,4	*5.0*	1 000	*39.4*	3	*44*	2-500

[1] Recommended oil iltration for FLM/FLMF pumps: According to ISO 4406 20/17/14, NAS code (1638) class 8, SAW AS 4059 class 8
[2] On an operating viscosity of 140 mm^2/s and 5 bar back pressure

Gear pump

ZP

Description

ZP gear pumps are manufactured for clockwise (ZP12-2; ZP1) or counterclockwise (ZP1-S1) rotation, with constant direction of delivery The indicated delivery rates apply to an operating viscosity of 140 mm²/s and a back pressure of 5 bars *(72 psi)* They allow direct drive ZP operated by electrical motors are ZM pumps

Features and beneits

- Designed for 24/7 operation
- Wide viscosity range
- Compact, rugged and reliable design
- Low noise level
- Integrated pressure relief valve and venting valve

Applications

- Machine tools
- General industry
- Printing
- Metal forming

Technical data

Function	gear pump
Lubricant	mineral and synthetic oils; viscosity 20-1 000 mm²/s
Flow rate:	
ZP12-2	1,2 l/min; *2.5 ptsl/min*
ZP1; ZP1-S1	2,5 l/min; *5.3 pts/min*
Operating temperature	+10 to +80 °C; *+50 to 175 °F*
Operating back pressure:	
ZP12-2	max 25 bar; *max. 363 psi*
ZP1; ZP1-S1	max 20 bar; *max. 290 psi*
Suction height: [1]	
ZP12-2	500 mm; *19.7 in*
ZP1; ZP1-S1	1 000 mm; *39.4 in*
Drive direction: [2]	
ZP12-2; ZP1	clockwise
ZP1-S1	counterclockwise
Connection suction	M12×1
Pressure connection	M12×1
Dimensions	min 60 × 60 × 85 mm max 70 × 70 × 82 mm *min. 2.36 × 2.36 × 3.35 in* *max. 2.76 × 2.76 × 3.23 in*
Designs	with shaft butt, with slotted coupling, clockwise or counterclockwise rotating pumps

[1] At 1 400 min⁻¹
[2] Viewing on drive shaft

NOTE

Further technical information, technical drawings, accessories, spare parts or product function descriptions available on SKF com/lubrication:

1-1200-EN

3D

skf-lubrication partcommunity com/3d-cad-models

Gear pump

ZP

ZP

Order number	Flow rate [1] at 1 400 min^{-1}		Back pressure max		Suction head [1]		Direction of rotation [2]
	l/min	*pts/min*	bar	*psi*	mm	*in*	
ZP12-2 [3]	1,2	*2.5*	25	*363*	500	*19.7*	right
ZP1 [3]	2,5	*5.3*	20	*290*	1 000	*39.4*	right
ZP1-S1 [3]	2,5	*5.3*	20	*290*	1 000	*39.4*	left

[1] with open main line at 1 400 min^{-1} and oil viscoisty of 140 mm^2/min
[2] viewing on the drive shaft
[3] order adapter with ports tapped for solderless tube connection separately

Gear pump

ZM (single-circuit)

Description

ZM single-circuit gear pump units are used in small oil circulation lubrication systems with pressure ranges up to 30 bar *(435 psi)* and high viscosities up to 2 000 mm²/s They consist of a gear pump, a lange, a coupling and an electric motor The pump design suits mounting separatley from the reservoir or vertically on top of the reservoir Horizontal lange mounting below lubricant level is not allowed ZM gear pump units come without integrated pressure relief and venting valves

Features and beneits

- High viscosity range
- Low noise operation
- High operating back pressure
- Easy system planning

Applications

- Machine tools
- Metal and plastic forming machinery
- General industry

Technical data

Function	electrically operated gear pump
Lubricant	mineral and synthetic oils; viscosity: 20–2 000 mm²/s
Flow rate	
ZM12:	1,2 l/min; *2.5 pts/min*
ZM25:	2,5 l/min; *5.3 pts/min*
Outlets	1
Operating temperature	+10 to 40 °C; *+50 to 104 °F*
Operating back pressure:	
ZM12	max 30 bar; *max. 435 psi*
ZM25	max 20 bar; *max. 290 psi*
Suction height:	
ZM12	500 mm; *19.7 in*
ZM25	1 000 mm; *39.4 in*
Drive speed	1 350 min⁻¹
Motor [1]	3-phase motor
Voltage	220–240/380–420 V AC at 50 Hz
Rated power	0,18 kW
Pressure connection	G 1/4; M14×1,5
Suction connection	G 1/4; M16×1,5
Protection class	IP 54
Dimensions:	
ZM12	299 × 164 × 125 mm; *11.77 × 6.45 × 4.92 in*
ZM25	*283 × 123 × 162 mm; 11.14 × 4.84 × 6.37 in*
Mounting position	horizontal or vertical

[1] Further motor designs available on request

NOTE

Further technical information, technical drawings, accessories, spare parts or product function descriptions available on SKF com/lubrication:
1-1204-2-EN; 951-170-002 EN

Gear pump

ZM (single-circuit)

ZM single-circuit [1]

Order number	Design	Mounting position	Flow rate [2]		Operating back pressure max	
			l/min	*pts/min*	bar	*psi*
ZM12-21+1FV	foot design, CE Europe	horizontal, separate	1 2	*2.5*	30	*435*
ZM12-31+1FV	lange design, CE Europe	vertical, langed	1 2	*2.5*	30	*435*
ZM12-21-S11+1HM	foot design, UL/CSA (USA, Canada)	horizontal, separate	1 2	*2.5*	30	*435*
ZM25-2+1FV	foot design, CE Europe	horizontal, separate	2 5	*5.3*	20	*290*

[1] Recommended iltration for ZM single-circuit pumps according to: ISO 4406 20/17/14; NAS code (1638); class 8 SAW AS 4059 class 8
[2] On an operating viscosity of 140 mm²/s and 5 bar back pressure

Gerotor pump

143 without motor

Description

Gerotor pump series 143 are self-priming positive-displacement pumps with ixed displacement and high eficiency They are suitable for a variety of applications, such as hydraulic, hydrostatic, cooling as well as circulating-oil and total-loss lubrication systems SKF gerotor pump units of product series 143 are highly eficient and operate in a low range between 0,85 to 50 l/min at pressure up to 50 bar They are characterized by very smooth running, low noise generation and good suction capability

Features and beneits

- Flexible pump delivery range
- Wide viscosity range
- Smooth running
- Low-noise operation
- Good suction characteristics
- Simpliied ordering

Applications

- Marine and offshore industry
- Pulp and paper and printing industries
- Commercial vehicles
- Heavy industry

Technical data

Function	gerotor pump
Lubricant	lubrication and hydraulic oils; viscosity 20 to 1 000 mm^2/s
Flow rate	*0,85–50 l/min; 1.8-105.7 pts/min*
Operating temperature	0 to +40 °C; *+32 to 104 °F*
Operating back pressure	max 50 bar; max *725 psi*
Outlet	1
Suction height	max 1 000 mm; *39.4 in*
Drive speed	1 400–2 800 min^{-1}
Connecting thread pressure	G 1/4 to G 1 BSPP
Connecting thread suction	G 1/4 to G 1 1/4 BSPP
Material	hydraulic cast, steel, sintered material, low-deformation case-hardened steels, NBR or FPM
Dimensions	depending on the model: min 289 × 184 × 126 mm max 656 × 264 × 280 mm *min. 11.37 × 7.3 × 4.96 in* *max. 25.82 × 10.4 × 11 in*
Mounting position	horizontal or vertical; foot or lange mounting

NOTE

Further technical information, technical drawings, accessories, spare parts or product function descriptions available on SKF com/lubrication:

1-1204-3-EN, 951-170-222-EN

3D

skf-lubrication partcommunity com/3d-cad-models

Gerotor pump

143 without motor

Identiication code

1 4 3 –

Product series

A Model design

B Seal design

C Code Pump design

Model design

A	3	gerotor pump+pump lange+ shaft coupling
	4	gerotor pump only

Seal design

B	N	NBR
	F	FKM

Pump design

C

Code	Flow rate [1] l/min	*pts/min*	Operating back pressure max bar	*psi*	Code	Flow rate [1] l/min	*pts/min*	Operating back pressure max bar	psi
D03	1 7	*3.6*	30	*435*	**M05**	12,5	*26.4*	50	*725*
F02	2 5	*5.3*	20	*290*	**P02**	19	*40.1*	20	*290*
F05	2 5	*5.3*	50	*725*	**R02**	30	*63.4*	20	*290*
H02	5 25	*11.1*	20	*290*	**R03**	30	*63.4*	30	*435*
H05	5 25	*11.1*	50	*725*	**T02**	40	*84.5*	20	*290*
K02	9	*19*	20	*290*	**T03**	40	*84.5*	30	*435*
K05	9	*19*	50	*725*	**V02**	50	*105.7*	20	*290*
M02	12 5	*26.4*	20	*290*	**V03**	50	*105.7*	30	*435*

[1] Valid for operating viscosity of 140 mm²/s

Accessories

Pressure relief valves

Order number	Flow rate	
	l/min	*pts/min*
WVN200-10	1,7; 2,5; 5,25	*3.6; 5.3; 11.1*
161-218-000	9; 12,5	*19; 26.4*
161-228-051	19; 30; 40; 50	*40.2; 63.4; 84.5; 105.7*

Gerotor pump

143 with motor

Description

Gerotor pump series 143 are self-priming positive-displacement pumps with ixed displacement and high eficiency They are suitable for a variety of tasks and applications, such as circulating-oil and total-loss lubrication systems SKF gerotor pumps operate in a low range between 0,85 to 50 l/min at pressure up to 50 bar They are characterized by very smooth running, low noise generation and good suction capability

Features and beneits

- Flexible pump delivery range
- Wide viscosity range
- Smooth running
- Low-noise operation
- Good suction characteristics
- Simpliied ordering

Applications

- Marine and offshore industry
- Pulp and paper and printing industries
- Heavy industry

Technical data

Function	electrically operated gerotor pump
Lubricant	lubrication and hydraulic oils; viscosity 20 to 1 000 mm^2/s
Flow rate	*0,85–50 l/min; 1.8-105 pts/min*
Operating temperature	0 to +40 °C; *+32 to 104 °F*
Operating back pressure	max 50 bar; max *725 psi*
Outlet	1
Suction height	max 1 000 mm; *39.4 in*
Operating voltage	3-phase, acc to DIN IEC 60038
Drive speed	1 400-2 800 min^{-1}
Connecting thread pressure	G 1/4 to G 1 BSPP
Connecting thread suction	G 1/4 to G 1 1/4 BSPP
Rated power	0,18 to 5,5 kW
Protection class	IP 54 (motor)
Material	hydraulic cast, steel, sintered material, low-deformation case-hardened steels, NBR or FPM
Dimensions	depending on the model: min 289 × 184 × 126 mm max 656 × 264 × 280 mm *min. 11.37 × 7.3 × 4.96 in max. 25.82 × 10.4 × 11 in*
Mounting position	horizontal or vertical; foot or lange mounting

NOTE

Further technical information, technical drawings, accessories, spare parts or product function descriptions available on SKF com/lubrication:

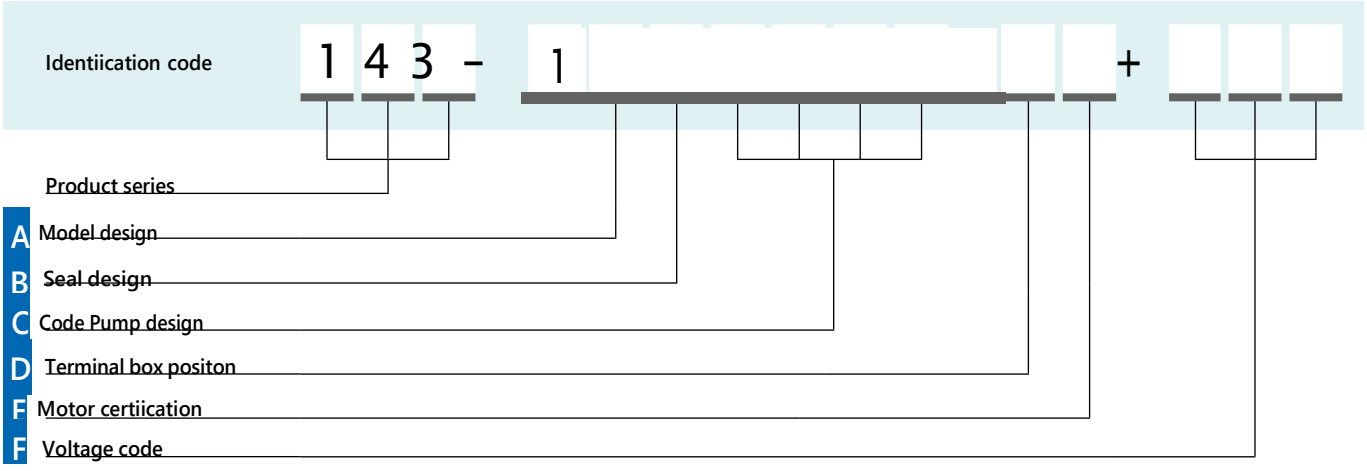
1-1204-3-EN

3D

skf-lubrication partcommunity com/3d-cad-models

Gerotor pump

143 with motor



Model design

A	1	Motor foot (IBM34)
	2	Motor lange (IBM14)
	3	Gerotor pump+pump lange+ shaft coupling (without motor)
	4	only gerotor pump (without motor)

Seal design

B	N	NBR
	F	FKM

Terminal box position

as seen from shaft extension of drive side (not applicable on design without motor)

D	R	right, (standard, not on motor 1 1; 1 5, and 4 kW)
	O	top (standard, on motor 1 1, 1 5, and 4 kW)
	X	on motor lange design (IMB14), terminal box position on suction port side of pump

(others available on request)

Motor certiication

E	A	CE (Europe)
	B	UL/CSA (USA/Canada)

(others available on request)

Pump design

C Code	Metering quantity [1]	Operating pressure	Motor drive	Operating viscosity	Size	Poles
	l/min	max bar	kW	mm²/s		
B03C	0,85	30	0,18	20-1 000	63	4
D03E	1,7	30	0,37	20-1 000	71	2
F02D	2,5	20	0,25	20-1 000	71	4
F05F	2,5	20	0,55	20-1 000	80	4
H02F	5,25	20	0,55	20-1 000	80	4
H05J	5,25	50	1,1	20-1 000	90	4
K02H	9	20	0,75	20-1 000	80	4
K05J	9	50	1,1	20-1 000	90	4
M02H	12,5	20	0,75	20-1 000	80	4
M05K	12,5	50	1,5	20-1 000	90	4
P02K	19	20	1,5	20-1 000	90	4
R02M	30	20	3	20-1 000	100	2
R03M	30	30	3	20-750	100	2
R03N	30	30	4	20-1 000	112	2
T02M	40	20	3	20-750	100	2
T03N	40	30	4	20-1 000	112	2
V02N	50	20	4	20-1 000	112	2
V03N	50	30	4	20-750	112	2
V03P	50	30	5,5	20-1 000	132	2

[1] Nominal low rate at motor speed 1 400/2 800 min^{-1} according to number of motor pins

Voltage Code V AC

F		
	+1GP	220/380 [1], 255/440 [2] [3]
	+1GD	230/400 [1]; 265/460 [2] [3]
	+1GQ	240/415 [1]; 280/480 [2] [3]
	+1HQ	290/500 [1]; 330/575 [2] [3]
	+1GH	380/660 [1]; 440 [2] [3]
	+1GK	400/690 [1]; 460 [2] [3]
	+1GL	415/720 [1]; 480 [2] [3]
	+1KG	400 [1]; 460 [2] [3]
	+1KS	240/415 [2]
	+1LL	500/575 [1] [2]
	+1GF	200/345 [1] [3]
	+1GG	200/345 [2] [3]
	+MDP	220/380 [2] [3]
	+MFN	255/440 [1]
	+1GR	230/400 [2] [3]
	+MMP	305/525 [1] [3]
	+1FX	220-240/380-420 [1] [4] 254-240/440-480 [2] [4]
	+1HM	220-240/380-420 [1] [4] 254-280/440-480 [2] [4]

[1] 50 Hz
[2] 60 Hz
[3] ± 10 %
[4] ±5 %

Gerotor pump

143 EEX

Description

The SKF 143 EEX product series was designed for centralized lubrication systems in explosive environments It offers a high degree of protection in explosive atmospheres Pump, motor, coupling and seals comply with ATEX requirements SKF Gerotor pumps of the 143 series are self-priming positive displacement pumps with a ixed displacement and high eficiency They are suitable for lubrication, hydraulic, hydrostatic and cooling applications as well as for oil circulation lubrication systems

Features and beneits

- Safe operation in explosive enviroments (Zone 1, 2, 21, 22)
- Work with standard mineral and synthetic lubrication and hydraulic oils
- Smooth running
- Good suction characteristic
- Low noise

Applications

- Marine and offshore industry
- Pulp and paper and printing industries
- Wood industry
- Heavy industry
- Agriculture

Technical data

Function	electrically operated gerotor pump
Lubricant	lubrication and hydraulic oils; viscosity 20 to 1 000 mm^2/s
Flow rate	*0,85–50 l/min; 1.8–105 pts/min*
Operating temperature	0 to 40 °C; *32 to 104 °F*
Operating back pressure	depending on model; max 50 bar; max *725 psi*
Outlet	1
Suction height	max 1 000 mm; *39.4 in*
Motor	3-phase, acc to DIN IEC 60038
Output rated	0,18–5,5 kW
Drive speed	1 400–2 800 min^{-1}
Connecting thread pressure	G 1/4 to G 1 BSPP
Connecting thread suction	G 1/4 to G 1 1/4 BSPP
Rated power	0,25 to 5,5 kW
Protection class	IP 54
Material	hydraulic cast, steel, sintered material, low-deformation case-hardened steels, NBR or FPM
Dimensions	depending on the model: min 289 × 184 × 126 mm max 656 × 264 × 280 mm *min. 11.37 × 7.3 × 4.96 in* *max. 25.82 × 10.4 × 11 in*
Mounting position	horizontal or vertical; foot or lange mounting
ATEX gas	II 2G c IIC T4 Gb
ATEX dust	II 2D c IIIC T120° C Db

NOTE

Further technical information, technical drawings, accessories, spare parts or product function descriptions available on SKF com/lubrication:

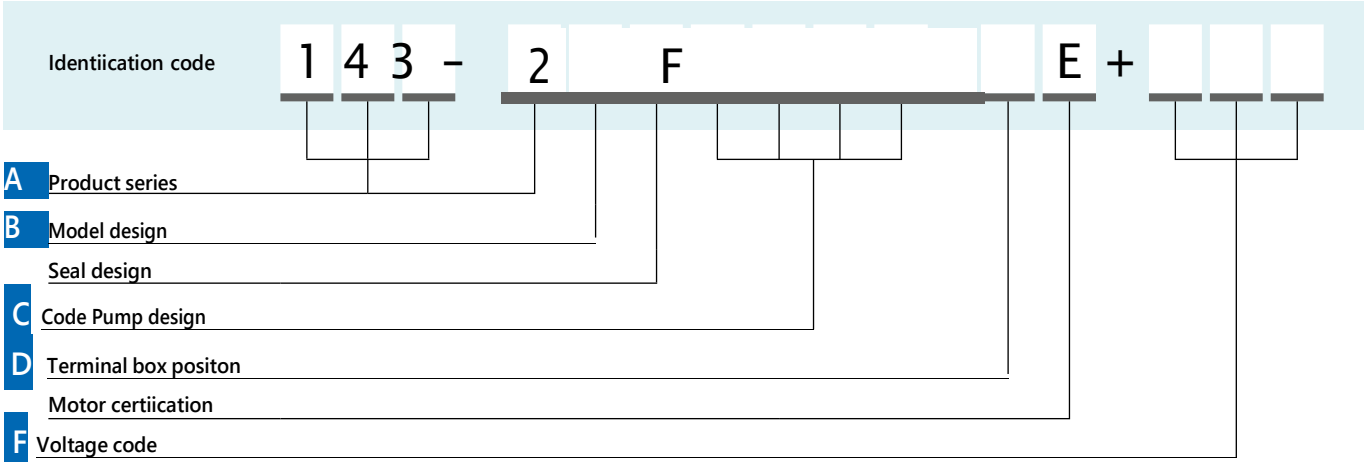
17345 EN; 915-170-002

3D

skf-lubrication partcommunity com/3d-cad-models

Gerotor pump

143 EEX



Model design

A	1	motor foot (IBM34)
	2	motor lange (IBM14)
	Seal design	
B	F	FKM

Terminal box position
as seen from shaft extension of drive side

D	R	right, (standard, not on motor 1 1; 1 5, and 4 kW)
	O	top (standard, on motor 1 1, 1 5, and 4 kW)
	X	on motor lange design (IMB14), terminal box position on suction port side of pump

(others available on request)

Motor certiication

E	E	ATEX; IECEx

Pump design

C Code	Flow rate [1]	Operating pressure	Motor drive	Operating viscosity	Size	Poles
	l/min	max bar	kW	mm²/s		
B03C	0,85	30	0,18	20-1 000	63	4
D03E	1,7	30	0,37	20-1 000	71	2
F02D	2,5	20	0,25	20-1 000	71	4
F05F	2,5	20	0,55	20-1 000	80	4
H02F	5,25	20	0,55	20-1 000	80	4
H05J	5,25	50	1,1	20-1 000	90	4
K02H	9	20	0,75	20-1 000	80	4
K05J	9	50	1,1	20-1 000	90	4
M02H	12,5	20	0,75	20-1 000	80	4
M05K	12,5	50	1,5	20-1 000	90	4
P02K	19	20	1,5	20-1 000	90	4
R02M	30	20	3	20-1 000	100	2
R03M	30	30	3	20-750	100	2
R03N	30	30	4	20-1 000	112	2
T02M	40	20	3	20-750	100	2
T03N	40	30	4	20-1 000	112	2
V02N	50	20	4	20-1 000	112	2
V03N	50	30	4	20-750	112	2
V03P	50	30	5,5	20-1 000	132	2

[1] Nominal delivery rate at motor speed 1 400 / 2 800 min-1 according to number of motor pins

Voltage Code V AC

F		
	+1GP	220/380 [1], 255/440 [2] [3]
	+1GD	230/400 [1]; 265/460 [2] [3]
	+1GQ	240/415 [1]; 280/480 [2] [3]
	+1HQ	290/500 [1]; 330/575 [2] [3]
	+1GH	380/660 [1]; 440 [2] [3]
	+1GK	400/690 [1]; 460 [2] [3]
	+1GL	415/720 [1]; 480 [2] [3]
	+1KG	400 [1]; 460 [2] [3]
	+1GF	200/345 [1] [3]
	+1GG	200/345 [2] [3]
	+MDP	220/380 [2] [3]
	+1GR	230/400 [2] [3]
	+MMP	305/525 [1] [3]
	+1FX	220-240/380-420 [1] [4]
		254-240/440-480 [2] [4]
	+1HM	220-240/380-420 [1] [4]
		254-280/440-480 [2] [4]

[1] at 50 Hz
[2] at 60 Hz
[3] ± 10 %
[4] ±5 %

Gear pump

ZM (multi-circuit)

Description

ZM multi-circuit gear pump units are self-priming and valveless pumps They are used in oil circulation lubrication systems with 2 to 20 separate delivery circuits Unused outlets must be returned to the reservoir The pumps consists of an electric motor, adapter lange, coupling and a gear pump The pump can be mounted separately from the reservoir or as a langed pump on the reservoir A special design with seals for horizontal mounting below lubricant level is available The luids to be pumped must have enough lubricity for the pump to lubricate itself

Some of these distribution pumps require an attached, single-circuit priming pump that operates separately The priming pump restricts differential pressure within the multicircuit pumps and helps to provide uniform delivery rates It is advisable to ilter the oil upstream of the distribution pump inlet

Features and beneits

- High viscosity range
- Flexible due to up to 20 circuits per pump
- Suitable for hydrostatic operation
- Easy system planning
- Space-saving pump design

Applications

- Machine tools
- Metal and plastic forming machinery
- General industry

Technical data

Function	electrically operated, self-priming gear pump
Lubricant	mineral and synthetic oils; viscosity depending on model: 20–2 000 mm²/s
Flow rate	depending on model: min 0,015 l/min; *0.032 pts/min* max 0,45 l/min; *0.951 pts/min*
Outlets	2–20
Operating temperature	+10 to 40 °C; *+50 to 104 °F*
Operating back pressure	max 20 bar; *max. 290 psi*
Suction height	500 mm; *max. 19.7 in*
Drive speed	670 to 1 400 min^{-1}
Motor	3-phase motor
Voltage	220-240/380-420 V AC at 50 Hz
Rated power	0,18-0,37 kW
Pressure connection	G 1/8 or M10×1
Suction connection	G 1/2 or M14×1,5
ZM21 , ZM50 :	M14×1,5 for ∅ 12 mm
ZM10 :	G 1/2
Material sealing	NBR, FPM
Protection class	IP 54
Dimensions	min 325 × 152 × 125 mm max 460 × 208 × 160,5 mm *min. 12.79 × 5.98 × 4.92 in* *max. 18.11 × 8.18 × 6.32 in*
Mounting position	horizontal, or langed to reservoir [1]

[1] Only lange design version with separate seal

NOTE

Further technical information, technical drawings, accessories, spare parts or product function descriptions available on SKF com/lubrication:
1-1204-2-EN, 951-170-002 EN

Gear pump

ZM (multi-circuit)

ZM multi-circuit pump, self-priming [1]

Order number	Circuits [4] (Outlets)	Flow rate [6] V_a		V_b		Back pressure		Drive speed	Operating viscosity
		l/min	*pts/min*	l/min	*pts/min*	bar	*psi*	min^{-1}	mm^2/s
ZM212-21+1FV [2]	2	1 × 0,12	*1 × 0.253*	1 × 0,12	*1 × 0.253*	12	*174*	1 300	20–2 000
ZM212-31+1FV [3]	2	1 × 0,12	*1 × 0.253*	1 × 0,12	*1 × 0.253*	12	*174*	1 300	20–2 000
ZM502+1FV [2]	5	5 × 0,2	*5 × 0.423*	–	–	20	*290*	670	20–2 000
ZM502-3+1FV [3]	5	5 × 0,2	*5 × 0.423*	–	–	20	*290*	670	20–2 000
ZM505+1FV [2]	5	5 × 0,45	*5 × 0.951*	–	–	10	*145*	670	20–500
ZM505-3+1FV [3]	5	5 × 0,45	*5 × 0.951*	–	–	10	*145*	670	20–500
ZM1002+1FV [2]	10	5 × 0,2	*5 × 0.423*	5 × 0,2	*5 × 0.423*	20	*290*	690	20–1 000
ZM1002-3+1FV [3]	10	5 × 0,2	*5 × 0.423*	5 × 0,2	*5 × 0.423*	20	*290*	690	20–1 000
ZM1005+1FV [2]	10	5 × 0,45	*5 × 0.951*	5 × 0,45	*5 × 0.951*	10	*145*	690	20–250
ZM1005-3+1FV [3]	10	5 × 0,45	*5 × 0.951*	5 × 0,45	*5 × 0.951*	10	*145*	690	20–250
ZM1025+1FV [2]	10	5 × 0,2	*5 × 0.423*	5 × 0,45	*5 × 0.951*	15	*218*	690	20–500
ZM1025-3+1FV [3]	10	5 × 0,2	*5 × 0.423*	5 × 0,45	*5 × 0.951*	15	*218*	690	20–500

ZM multi-circuit pump for operation with a separate priming pump [1]

Order number	Circuits [4] (Outlets)	Flow rate [6] V_a		V_b		Pump inlet P_1 [5]		Drive speed	Operating visosity
		l/min	*pts/min*	l/min	*pts/min*	bar	*psi*	min^{-1}	mm^2/s
ZM402-2-S2+1FV [2]	4	4 × 0,2	*4 × 0.423*	–	–	50	*725*	690	20–500
ZM405-2-S2+1FV [2]	4	4 × 0,45	*4 × 0.951*	–	–	50	*725*	690	20–500
ZM502-S2+1FV [2]	5	5 × 0,2	*5 × 0.423*	–	–	30	435	690	20–500
ZM505-S2+1FV [2]	5	5 × 0,45	*5 × 0.951*	–	–	30	435	690	20–500
ZM802-2-S2+1FV [2]	8	4 × 0,2	*4 × 0.423*	4 × 0,2	*4 × 0.423*	50	*725*	690	20–500
ZM805-2-S2+1FV [2]	8	4 × 0,45	*4 × 0.951*	4 × 0,45	*4 × 0.951*	50	*725*	690	20–500
ZM1002-S2+1FV [2]	10	5 × 0,2	*5 × 0.423*	5 × 0,2	*5 × 0.423*	30	435	690	20–500
ZM1005-S2+1FV [2]	10	5 × 0,45	*5 × 0.951*	5 × 0,45	*5 × 0.951*	30	435	690	20–500
ZM2101-1+1FV [2]	20	20 × 0,015	*20 × 0.032*	–	–	30	435	1 400	20–1 000
ZM2102-1+1FV [2]	20	20 × 0,03	*20 × 0.063*	–	–	30	435	1 400	20–1 000
ZM2103-1+1FV [2]	20	20 × 0,05	*20 × 0.105*	–	–	30	435	1 400	20–1 000
ZM2104-1+1FV [2]	20	20 × 0,1	*20 × 0.211*	–	–	30	435	1 400	20–1 000

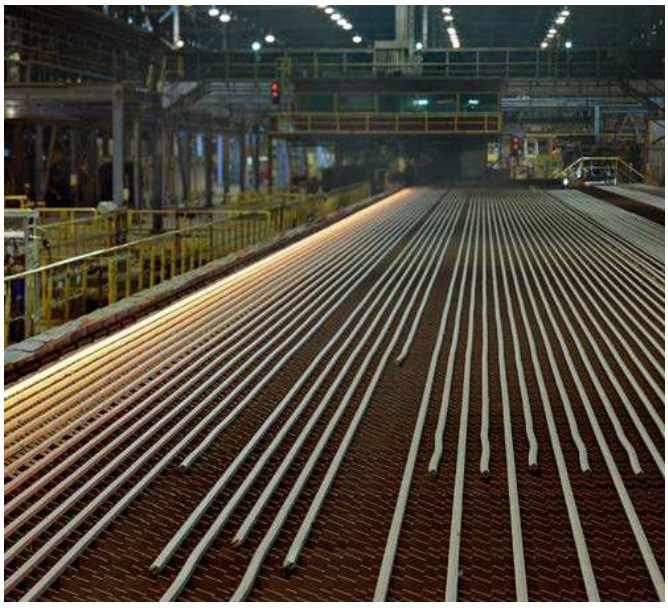
ZM pump with built-in priming pump and adjustable pressure restriction valve [1]

Order number	Circuits [4] (Outlets)	Flow rate [6]		Pump inlet P_1		Pump inlet P_2		Drive speed
		l/min	*pts/min*	bar	*psi*	bar	*psi*	min^{-1}
ZM1035+1FV [2]	10	10 × 0,45	*10 × 0.951*	16	*232*	*20*	*290*	1 400
ZM2201+1FV [2]	20	20 × 0,025	*20 × 0.052*	18	*260*	*20*	*290*	680
ZM2202+1FV [2]	20	20 × 0,035	*20 × 0.074*	18	*260*	*20*	*290*	915
ZM2103+1FV [2]	20	20 × 0,05	*20 × 0.105*	18	*260*	*20*	*290*	1 360

[1] Recommended iltration between multicircuit pump and priming pump According to: ISO 4406 20/17/14, NAS code (1638) class 8, SAW AS 4059 class 8
[2] Foot-mounted pumps for separate mounting from reservoir
[3] Flange-mounted pumps with special seal design
[4] Non used pump delivery ports must be returned to the oil reservoir and must not be blanked off
[5] P2 outlet pressure corresponds P1 ± 5 bar; *72.5 psi*
[6] Valid for an operation viscoisty of 140 mm^2/min and a drive speed of 1 400 min^{-1}

Piston pump

ZPU 09/09A



Description

The ZPU 09/09A high-pressure pumps are designed for use in hydrostatic and hydrodynamic (start-up phase) lubrication systems They also may be used in oil supply systems, blocking oil systems and regulation and control oil systems The pump is suitable for oils with viscosity of 20 to 460 mm²/s The pump shows a housing, of 8 l *(16.9 pts)* capacity, with a pump element and a lange with outlets and return lines, all connected to a 3-phase, multi-range or 500 V motor The pump can be delivered with one or two outlets

Features and beneits

- Reliable
- With one or two outlets
- Simple to service
- Built-in check-valve for ZPU 09
- Return line from pressure relief valve
- Housing integrated oil level indicator

Applications

- Turbines
- Steel mills
- Gears
- Paper machines
- Power stations

Technical data

Function	electrically operated piston pump
Operating temperature	-20 to +80 °C; *-4 to +176 °F*
Operating back pressure	max 400 bar; *max. 5 800 psi*
Lubricant	mineral and synthetic oils; viscosity 20-460 mm²/s
Number of outlets	
ZPU09	1
ZPU09A	2
Flow rate	
ZPU09	0,13 l/min, *0.27 pts*/min
ZPU09A	2 × 0,06 l/min, *2 × 0.13 pts*/min
Voltage	380-415, 420-480 V AC / 50 Hz, ±5% to ±10% 500 V AC / 50 Hz, ±10%
Outlet connection illing line	G 3/8 BSPP
Direction of rotation drive	optional
Protection class	IP 54
Dimensions	650 × 410 × 465 mm *25.59 × 16.14 × 16.31 in*
Mounting position	vertical

Piston pump

ZPU 09/09A

ZPU 09/09A

Order number	Designation	Number of outlets	Flow rate per outlet		Motor
			l/min	*pts/min*	
605-27545-1	ZPU 09 / 08 GT-380-415, 420-480	1	0,13	*0.27*	3-phase gear motor, 380-415 / 420-480 V AC
605-27546-1	ZPU09 / 08GT-500	1	0,13	*0.27*	3-phase gear motor, 500 V AC
605-27547-1	ZPU09A / 08GT-380-415,420-480	2	0,6	*0.13*	3-phase gear motor, 380-415 / 420-480 V AC
605-27548-1	ZPU09A / 08GT-500	2	0,6	*0.13*	3-phase gear motor, 500 V AC
605-28166-1	ZPU09 / 08GT-000	1	0,13	*0.27*	without motor


SKF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MODE

Overview of oil circulation metering devices

Flow restrictor

Product	Lubricant viscosity	Flow rate		Outlets	Operating pressure max		Operating temperature		Page
	mm²/s	l/min	*pts/min*		bar	*psi*	°C	*°F*	
VD	10–1 000	0,001–0,23	*0.002–0.49*	1	max 10	*max. 145*	0 to 60	*32 to 140*	48

Flow divider

Product	Lubricant viscosity	Flow rate		Outlets	Operating pressure max		Operating temperature		Page
	mm²/s	l/min	*pts/min*		bar	*psi*	°C	*°F*	
SMT	50–1 300	0,5–6,0	*1.1–12.7*	2	100	*1 450*	0 to +100	*32 to 212*	50

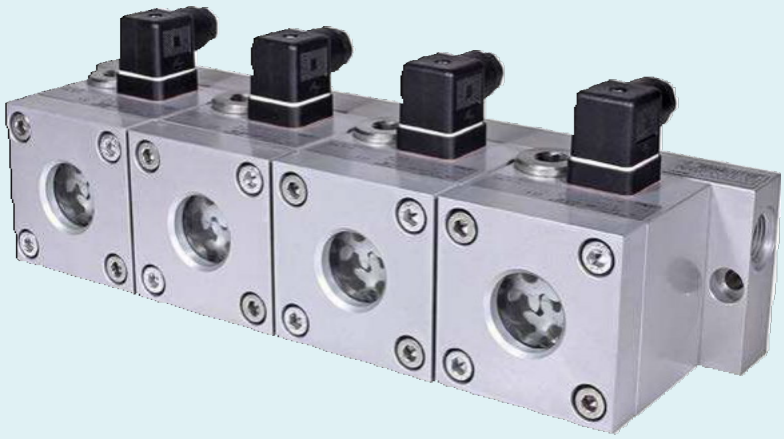
Adjustable metering valve with visual low indication

Product	Lubricant viscosity	Flow rate		Outlets	Operating pressure max		Operating temperature		Page
	mm²/s	l/min;	*pts/min*		bar	*psi*	°C	*°F*	
242 type A	10–1 000	0–0,01	*0–0.02*	1, 2, 5, 14	10	*145*	0 to 60	*32 to 140*	52
242 type B	10–1 000	0,01–1,0	*0.02–2.1*	2–6, 10, 12	10	*145*	0 to 60	*32 to 140*	52
242 type C	10–1 000	0,01–2,0	*0.02–4.2*	2–6	10	*145*	0 to 60	*32 to 140*	52

Adjustable metering valve with low meter

Product	Lubricant viscosity	Flow rate		Outlets	Operating pressure max		Operating temperature		Page
	mm²/s	l/min	*pts/min*		bar	*psi*	°C	*°F*	
SMD 1B (SKF VarioLub)	50–650	0,05–1,0	*0.1–2.1*	2	16	*230*	0 to 70	*32 to 158*	54
SMD 2 (SKF VarioLub)	50–650	0,1–8,0	*0.2–16.9*	2	16	*230*	0 to 70	*32 to 158*	54
SMD 3 (SKF VarioLub)	50–650	4,0–40	*8.5–85*	1	16	*230*	0 to 70	*32 to 158*	54
SF05A (SKF SafeFlow) [1]	30–1 000	0,04–0,7 [1]	*0.08–1.5* [1]	1, 2, 4, 6, 8, 10	15	*215*	max 70	*max. 158*	56
SF10A (SKF SafeFlow) [1]	30–1 000	0,1–3,0 [1]	*0.2–6.3* [1]	1, 2, 4, 6, 8, 10	15	*215*	max 70	*max. 158*	56
SF15A (SKF SafeFlow) [1]	30–1 000	0,2–7,2 [1]	*0.4–15.2* [1]	1, 2, 4, 6, 8, 10	15	*215*	max 70	*max. 158*	56
SF20A (SKF SafeFlow) [1]	30–1 000	0,6–17 [1]	*1.3–35.9* [1]	1, 2, 4, 6	15	*215*	max 70	*max. 158*	56
SF30A (SKF SafeFlow) [1]	30–1 000	2,5–56 [1]	*5.3–118.3* [1]	1	15	*215*	max 70	*max. 158*	56
FL15 (SKF Flowline Monitor)	32–1 000	0,1–15	*0.2–32*	2, 4, 6, 8, 10	10	*145*	0 to +65	*32 to 150*	58
FL50 (SKF Flowline Monitor)	32–1 000	15–50	*32.0–106*	1	10	*145*	0 to +65	*32 to 150*	58
FL100 (SKF Flowline Monitor)	32–1 000	50–100	*106–211*	1	10	*145*	0 to +65	*32 to 150*	58

[1] depending on the operating viscosity



Overview of oil circulation metering devices

Pressure-compensated low limiter with optional monitoring

Product	Lubricant viscosity	Flow rate		Outlets	Operating pressure		Operating temperature		Page
	mm²/s	l/min	*pts/min*		bar	*psi*	°C	*°F*	
SMB 3	20–600	6,0–38	*12.7–80*	1	5–200	*73–2 900*	0 to 100	*32 to 212*	60
SMB 6	20–600	25–132	*53–279*	1	5–200	*73–2 900*	0 to 100	*32 to 212*	62
SMB 8	20–600	0,08–8	*0.17–17*	1–6	5–200	*73–2 900*	0 to 100	*32 to 212*	64
SMB 9	20–600	0,08–8	*0.17–17*	1–6	6–50	*87–725*	0 to 70	*32 to 158*	68
SMB 10	20–600	0 21-8 15	*0.44–17.2*	1–6	7–50	*100–725*	0 to 70	*32 to 158*	72
SMB 13	20–600	6,0–30	*12.7–63.4*	1	6–50	*87–725*	0 to 70	*32 to 158*	76
SMB 14	20–600	25–132	*52.8–278.9*	1	6–50	*87–725*	0 to 70	*32 to 158*	78

Product	Lubricant viscosity	Flow rate		Outlets	Operating pressure max		Operating temperature		Page
	mm²/s	l/min	*pts/min*		bar	*psi*	°C	*°F*	
PSG1	> 12	0–0,8	0–*1.7*	6–20	200	*2 900*	–15 to +110	*5 to 230*	80
PSG2	> 12	0–2,5	0–*5.3*	6–20	200	*2 900*	–15 to +110	*5 to 230*	82
PSG3	> 12	0–6	0–*12.7*	6–20	200	*2 900*	–15 to +110	*5 to 230*	84
VP	> 12	0–1	0–*2.1*	6–20	200	*2 900*	–25 to +90	*-13 to +194*	86

Screw-in restrictor

VD

Description

SKF screw-in low restrictors VD are used to deliver relatively small amounts of oil to lubrication points Four types of SKF VD are available, differing in tube diameter, low rate and functionality VD1 and VD4 restrictors can be combined and it to manifolds, while VD2 and VD3 can be screwed directly into the ports of individual lubrication points Screw-in restrictors VD3 and VD4 also come with a check valve to prevent leaks These inexpensive low restrictors are sensitive to dirt Therefore, it is recommended to use a ilter size of 10 µm

Features and beneits

- Easy planning and low rate regulation
- Flow rate dependent on pressure and viscosity
- Check valve to prevent leaks (VD3, VD4)
- Fitting to manifolds and combination of screw-in restrictors possible (VD1, VD4)
- Direct threading into ports of individual lubrication points possible (VD2, VD3)

Applications

- Machine tools
- Metal industry
- Presses
- Automation
- Industrial transmissions
- Automotive industry
- Heavy industry

Technical data

Function	screw-in restrictor
Outlets	1
Lubricant	mineral and PAO oils; viscosity 10–1 000 mm²/s
Flow rate	0,001–0,23 l/min *0.002–0.49 pts/min*
Operating temperature	0 to +60 °C; *+32 to 140 °F*
Operating pressure	10 bar; *145 psi*
Filter	< 10 µm
Material	steel, brass
Main line connections:	
VD 1	M10×1
VD 2	M10×1 for tube ∅6 mm
VD 3	DIN 3862 fitting for tube ∅4 mm
VD 4	M8×1
Outlet connections:	
VD 1	M8×1 for tube ∅ 4 mm
VD 2	M10×1 (direct lub point mounting)
VD 3	M10×1 tap (direct lub point mounting)
VD 4	DIN 3862 fitting for tube ∅4 mm M8 or M10
Length:	
VD 1	30 mm; *1.18 in*
VD 2	32 mm; *1.26 in*
VD 3	32 mm; *1.26 in*
VD 4	34 mm; *1.34 in*
Mounting position	any

NOTE

Further technical information, technical drawings, accessories, spare parts or product function descriptions available on SKF com/lubrication:

1-5006-EN

3D

skf-lubrication partcommunity com/3d-cad-models

Screw-in restrictor

VD

VD

Order number	Tube	Flow rate [1] at 2 bar		at 4 bar		at 6 bar		Description [2]	Code
	∅ mm	ml/min	*pts/min*	ml/min	*pts/min*	ml/min	*pts/min*		
VD1-102	4	1	*0.0021*	2,8	*0.0059*	4	*0.0085*	M10×1 for manifold mounting, washer **504-019**	2
VD1-103	4	2,8	*0.0059*	5,5	*0.0116*	8	*0.0169*	M10×1 for manifold mounting, washer **504-019**	3
VD1-104	4	5	*0.0106*	10	*0.0211*	15	*0.0317*	M10×1 for manifold mounting, washer **504-019**	4
VD1-105	4	7,5	*0.0158*	15	*0.0317*	23	*0.0486*	M10×1 for manifold mounting, washer **504-019**	5
VD1-106	4	15	*0.0317*	28	*0.0592*	40	*0.0845*	M10×1 for manifold mounting, washer **504-019**	6
VD1-107	4	35	*0.0739*	68	*0.1437*	100	*0.2113*	M10×1 for manifold mounting, washer **504-019**	7
VD1-108	4	58	*0.1226*	112	*0.2367*	170	*0.3592*	M10×1 for manifold mounting, washer **504-019**	8
VD1-109	4	77	*0.1627*	155	*0.3276*	230	*0.4860*	M10×1 for manifold mounting, washer **504-019**	9
VD2-102	6	1	*0.0021*	2,8	*0.0059*	4	*0.0085*	M10×1 for mounting direct into lubrication point	2
VD2-103	6	2,8	*0.0059*	5,5	*0.0116*	8	*0.0169*	M10×1 for mounting direct into lubrication point	3
VD2-104	6	5	*0.0105*	10	*0.0211*	15	*0.0317*	M10×1 for mounting direct into lubrication point	4
VD2-105	6	7,5	*0.0159*	15	*0.0317*	23	*0.0486*	M10×1 for mounting direct into lubrication point	5
VD2-109	6	77	*0.1627*	155	*0.3276*	230	*0.4860*	M10×1 for mounting direct into lubrication point	9
VD3-099	4	0,15	*0.0003*	0,28	*0.0006*	0,4	*0.0008*	M10×1 tab for mounting direct into lubrication point	00
VD3-100	4	0,3	*0.0006*	0,68	*0.0014*	1	*0.0021*	M10×1 tab for mounting direct into lubrication point	0
VD3-101	4	0,5	*0.0011*	1	*0.0021*	1,5	*0.0032*	M10×1 tab for mounting direct into lubrication point	1
VD3-102	4	1	*0.0021*	2	*0.0042*	3	*0.0063*	M10×1 tab for mounting direct into lubrication point	2
VD4-099	4	0,15	*0.0003*	0,28	*0.0006*	0,4	*0.0008*	M8×1 for manifold mounting, washer **DIN 7603-A8x11,5-CU**	00
VD4-100	4	0,3	*0.0006*	0,68	*0.0014*	1	*0.0021*	M8×1 for manifold mounting, washer **DIN 7603-A8x11,5-CU**	0

[1] The shown low rates are valid for an operating viscosity of 140 mm²/s Flow rates change at the same time system pressure or lubricant vistcosity change Further details on request
[2] Washer not included, but can be ordered separately

Accessories - manifold

Order code **V L –** ☐ ☐ ☐ ☐ ☐ ☐

Product series

Number of ports

01 = 1 port **03** = 3 ports **05** = 5 ports **08** = 8 ports
02 = 2 ports **04** = 4 ports **06** = 6 ports **10** = 10 ports

Design of outlet thread

D = Small proile, M8×1 with counterbore for lat washer (can only be selected for main line connection M3)
F = Normal proile, M8×1 with counterbore for lat washer
G = Normal proile, M10×1 with counterbore for lat washer

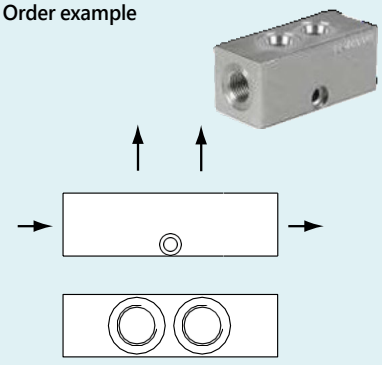
Material

A = Aluminum;
E = Stainless steel (only for outlet threads A, B, E, G)

Design of main line connection

G1 = G 1/8 to DIN 3852-2, Form X, small
G2 = G 1/4 to DIN 3852-2, Form X, small
M1 = M10×1 to DIN 3852-1, Form X, small
M2 = M14×1 5 to DIN 3852-1, Form X, small
M3 = M10×1 with counterbore for solderless pipe connection per DIN 3862
M4 = M14×1 5 with counterbore for solderless pipe connection per DIN 3862

Order example



VL-02FAM3

- Product series VL
- 2 ports
- Normal proile made of aluminum
- M8×1 internal thread with counterbore for lat washer
- M10×1 main line connection with counterbore for solderless pipe connection per DIN 3862

Flow divider

SMT

Description

The SKF low divider SMT 1 splits the low rate into two equal lows or into two individual lows at a speciic ratio Different deined dividing ratios are available from 1:1 to 1:4 Because the SMT 1 low divider regulates itself, varying back pressures have negligible impact on the dividing accuracy The SMT 1 is distinguished by its simple and compact design for installation near the lubrication point Due to its corrosion-resistant material, it also can be utilized in aggressive environments Additionally, this low divider can be used with a wide range of viscosities from 50-1 300 mm²/s

Features and beneits

- Compact design for installation near lubrication point
- High accuracy due to self-regulating feature
- Corrosion resistant
- Easy low adjustment (nozzle exchange)
- Inexpensive monitoring through upstream pressure switch or low controller possible

Applications

- Automotive
- Pulp and paper industry
- On-off road
- Machine tools
- Metal fabrication
- Power plants

Technical data

Function	low divider
Outlets	2
Operating temperature	0 to +100 °C; *+32 to 212 °F*
Operating pressure	100 bar; *1 450 psi*
Lubricant	mineral and synthetic oils; viscosity 50-1 300 mm²/s
Flow rate	0,5-6,0 l/min *1.05–12.7 pts/min*
Dividing ratios	1:1; 1:1,5; 1:2; 1:2,5; 1:3; 1:3,5; 1:4
Dividing accuracy	≥ 95 %
Material	aluminium, anodized
Dimensions	30 × 69 × 58 mm *1.18 × 2.72 × 2.28 in*
with inline strainer	87 × 69 × 108 mm *3.43 × 2.72 × 4.25 in*
Mounting position	any

NOTE

Further technical information, technical drawings, accessories, spare parts or product function descriptions available on SKF com/lubrication:
1-5017-EN; 1-5006-EN

Flow divider

SMT

Identiication code

SP / SMT 1 / _ / _ A _ / B _

Product series

Product type

SMT 1

Version

1 = standard design

2 = with inline strainer

Flow dividing ratio

10 = 1:1
15 = 1:1 5
20 = 1:2
25 = 1:2 5
30 = 1:3
35 = 1:3 5
40 = 1:4

Nozzle ∅ d_1 [1)]

0,6 = 0,6 mm	1,4 = 1,4 mm	2,1 = 2,1 mm
0,8 = 0,8 mm	1,5 = 1,5 mm	2,2 = 2,2 mm
0,9 = 0,9 mm	1,6 = 1,6 mm	2,3 = 2,3 mm
1,0 = 1,0 mm	1,7 = 1,7 mm	2,4 = 2,4 mm
1,1 = 1,1 mm	1,8 = 1,8 mm	2,5 = 2,5 mm
1,2 = 1,2 mm	1,9 = 1,9 mm	2,6 = 2,6 mm
1,3 = 1,3 mm	2,0 = 2,0 mm	

Nozzle ∅ d_2 [1)]

0,6 = 0,6 mm	1,4 = 1,4 mm	2,1 = 2,1 mm
0,8 = 0,8 mm	1,5 = 1,5 mm	2,2 = 2,2 mm
0,9 = 0,9 mm	1,6 = 1,6 mm	2,3 = 2,3 mm
1,0 = 1,0 mm	1,7 = 1,7 mm	2,4 = 2,4 mm
1,1 = 1,1 mm	1,8 = 1,8 mm	2,5 = 2,5 mm
1,2 = 1,2 mm	1,9 = 1,9 mm	2,6 = 2,6 mm
1,3 = 1,3 mm	2,0 = 2,0 mm	

[1)] Nozzle diameters d1 and d2 need to be determined using a diagram, see brochure 1-5017 Identiication code positions A and B are three-digit numbers representing the nozzle sizes
The code for the example would be: d1 0 9 mm) = 090 and for d2 1 4 mm) = 140

Adjustable restrictor

242

Description

The SKF adjustable restrictors 242 are used if a subsequent adjustment of the low rate is required The restrictors come in three versions, differing in metering quantity, visual low indication and number of outlets Type A low rates are within the drop-feed range of 0 to 0,01 l/min *(0 to 0.02 pts)* The adjustable restrictor 242 offers 1 to 14 outlets and a sight-glass for low rate monitoring Type B offers continuous metering quantity from 0,01 to 1,0 l/min *(0.02 to 2.11 pts)* and comes with 2 to 12 outlets Type C metering quantity ranges from 0,01 to 2,0 l/min *(0.02 to 4.23 pts)* Depending on the distributor, 2 to 6 outlets are available Types B and C offer a spring-loaded metal pin in the sight-glass for visual oil low monitoring

Features and beneits

- Easy adjustable
- Easy planning and quantity regulation
- Cost-effective visual oil low monitoring
- Individual regulation of low range for each lubrication point
- Wide viscosity range

Applications

- Oil and Gas
- Machine tools
- Metal fabrication
- Metal forming
- Textiles

Technical data

Function	adjustable restrictor
Lubricant	mineral and synthetic oils; viscosity 10–1 000 mm²/s
Outlets:	
A	1, 2, 5, 14
B	2, 3, 4, 5, 6, 10, 12
C	2 to 6
Metering quantity:	
A	0 to 0 01 l/min; *0 to 0.02 pts/min*
B	0 01to 1 0 l/min; *0.02 to 2.11 pts/min*
C	0 01 to 2 0 l/min; *0.02 to 4.23 pts/min*
Operating temperature	0 to +60 °C; *+32 to 140 °F*
Operating pressure	max 10 bar *max. 145 psi*
Filter	< 10 µm
Material	steel
Connection:	
A + B	M10×1 for tube 6 mm
C	M16×1,5 for tube 10 mm
Dimension:	
depending on model	min 93 × 16 × 32 mm max 97 × 25 × 253 mm *min. 3.66 × 0.63 × 1.29 in* *max. 3.82 × 0.98 × 9.96 in*
Mounting position:	any

NOTE

Further technical information, technical drawings, accessories, spare parts or product function descriptions available on SKF com/lubrication:

1-5006-EN

3D

skf-lubrication partcommunity com/3d-cad-models

Adjustable restrictor

242

242-026.00

242 Type A

Metering quantity: 0–10 cm³; *0–0.6 in³*

Order number	Outlets
242-016 00	1
242-026 00	2
242-056 00	5
242-146 00	14

242-124.00

242 Type B

Metering quantity: 10–1 000 cm³; *0.6–61 in³*

Order number	Outlets
242-024 00	2
242-034 00	3
242-044 00	4
242-054 00	5
242-064 00	6
242-104 00	10
242-124 00	12

Indicating at 110 mm²/s; start at 10, end at 1 000 or 2 000 cm³/min

242-044.004

242 Type C

Metering quantity: 10–2 000 cm³; *0.6–122 in³*

Order number	Outlets
242-025 00	2
242-035 00	3
242-045 00	4
242-055 00	5
242-065 00	6

Indicating at 110 mm²/s; star at 10, end at 1 000 or 2 000 cm³/min

Accessories

242 Type A and B, main tube connector and accessories

Order number	Designation	Tube
		∅ mm
406-162	main tube connector	6
408-162	main tube connector	8
410-162	main tube connector	10
408-211	screw plug	–
508-215-CU	washer	–

242 Type C, main tube connector and accessories

Order number	Designation	Tube
		∅ mm
410-018	main tube connector	10
412-018	main tube connector	12
412-011	screw plug	–
DIN7603-A18×22-CU	washer	–

Flow meter

SKF VarioLub

Description

SKF Variolub SMD low meters are designed to meter and monitor the low in oil circulation lubrication systems They are offered in three different versions covering a low rate of 0,05 to 40 l/min The low meters can be adjusted by a built-in adjustment valve The meters provide visual and electronic monitoring, and the by-pass system allows adjustment and service, even while the system is running Due to their modular design, SMD low meters can be easily replaced, adapted and expanded They are suitable for machines with several hundred lubrication points and provide reliability and lexibility

Features and beneits

- High accuracy and robust design
- Easy maintenance and reduced downtime due to bypass system
- Modular system enables low rate changes and system extension
- Many industry interfaces available
- Monitoring by SKF IPM12 pulse meter
- Programming and set up by SKF PGA3 or SKF Variolub software

Applications

- Pulp and paper industry
- Machine tools
- Metal industry
- Heavy industry

Technical data

Function	gear wheel low meter	
Outlets	SMD 1B, SMD 2: 2	
	SMD 3: 1	
Lubricant	mineral and synthetic oils; viscosity 50-650 mm^2/s	
Flow rate		
SMD 1B:	0,05-1,0 l/min;	*0.1–2.1 pts/min*
SMD 2:	0,1-8,0 l/min;	*0.2–16.9 pts/min*
SMD 3:	4,0-40,0 l/min;	*8.5–84.5 pts/min*
Operating temperature	0 to +70 °C	*+32 to 158 °F*
Operating pressure	16 bar	*232 psi*
Material	housing:	anodized aluminium
	lid:	PMMA
	gear wheels:	GPR
		SMD3 :GPR / aluminum
Inlet connection	G 3/4 BSPP; G 1 1/16-12 UN	
Outlet connection		
SMD 1B, SMD2:	G 3/8 BSPP; G 9/16-18 UN	
SMD3:	G 3/4 BSPP; G 1 1/16-12 UN	
Protection class	IP 65	
Dimensions		
SMD 1B/SMD 2	90 × 70 × 150 mm *3.54 × 2.7 × 5.91 in*	
SMD 3	110 × 130 × 150 mm *4.33 × 5.1 × 5.91 in*	
Mounting position	any	
Options	connection block, shut-off block, lushing port	

NOTE

Further technical information, technical drawings, accessories, spare parts or product function descriptions available on SKF com/lubrication:

1-3021-EN

Flow meter

SKF VarioLub

Variolub SMD

Type	Designation	Outlets	Flow rate		Order number	
			l/min	*pts/min*	Connection thread BSPP	UN / UNF
SMD 1B	2 very ine adjustment valves	2	2 × 0,05-1,0	*2 × 0.1–2.1*	24-2581-2650	24-2581-2651
SMD 2	2 ine adjustment valves	2	2 × 0,1-4,4	*2 × 0.2–9.3*	24-2581-2656	24-2581-2615
SMD 2	2 coarse adjustment valves	2	2 × 4,0-8,0	*2 × 8.5–16.9*	24-2581-2657	24-2581-2617
SMD 2	1 ine adjustment valve (top) 1 coarse adjustment valve (down)	2	1 × 0,1-4,4 1 × 4,0-8,0	*1 × 0.2–9.3* *1 × 8.5–16.9*	24-2581-2658	24-2581-2616
SMD 3	1 very coarse adjustment valve	1	1 × 4,0-40	*1 × 8.5–84.5*	24-2581-2652	24-2581-2693

Variolub SMD bank mounting components

Type	Designation	Order number	
		Connection thread BSPP	UN / UNF
SMD 1B/SMD 2	connection block complete	24-1503-2103	24-1503-2104
SMD 1B/SMD 2	shut-off block complete	24-1503-2102	on request
SMD 1B/2/3	plug screws G 3/4 BSPP; DIN 908 1 1/16-12 UN	95-0034-0908	–
SMD 1B/2/3	seal A27 × 32 DIN 7603 Cu	95-2721-7603	–

Variolub SMD Accessories

Type	Designation	Order number	
		Connection thread BSPP	UN / UNF
SMD 1B	spare part kit	24-9909-0184	24-9909-0184
SMD 2	spare part kit	24-9909-0178	24-9909-0178
SMD 3	spare part kit	24-9909-0179	24-9909-0179
SMD 1B/SMD 2	seal kit	24-0404-2520	24-0404-2520
SMD 3	seal kit	24-0404-2521	24-0404-2521
SMD 1B/SMD 2	mounting screw 4× [1]	DIN912-M6×60-8 8D2R	DIN912-M6×60-8 8D2R
SMD 3	mounting screw 4× [1]	DIN912-M6×45-8 8D2R	DIN912-M6×45-8 8D2R

[1] Mounting screw is included in delivery of SMD 1B and SMD 2

Flow meter

SKF Safelow

Description

SKF Safelow low meters control and indicate the low rate in oil circulation lubrication systems Each low meter can be calibrated individually according to oil viscosity and desired low SKF Safelow covers a low rate of 0,04 to 56 l/min *(0.08-118 pts/min)* per lubrication point and can be banked (up to 10 units wide) to reduce piping and simplify installation These low meters offer excellent readability and visual monitoring due to their operating principle of straight glass low tubes with internal calibration cones

Features and beneits

- Easy and individual calibration of low meters with adjustable low rate
- SF05A, SF10A and SF15A can be combined in same module
- Common or individual electronic alarms available

Applications

- Pulp and paper industry
- Metal industry
- Power plants
- Mining

Technical data

Function	variable area low meter
Lubricant	mineral and synthetic oils; viscosity 30–1 000 mm²/s
Flow rate	0,04–56 l/min; *0.08–118 pts/min*
Operating temperature	0 to +70 °C; *+32 to 158 °F*
Operating pressure	15 bar; *217 psi*
Outlets	1–10
Material	aluminum, glass
Electrical alarm:	
Power supply	24V DC (22–36 V DC) or 24V AC (18–27 V AC RMS)
Power consumption	max 150 mA
Alarm output	dry contact relay output max load 50 VAC/DC, 1 A
Protection class	IP65
Dimensions:	
SF05A/10A/15A	min 170 × 97 × 170 mm max 170 × 97 × 566 mm *min. 6.69 × 3.82 × 6.69 in* *max. 6.69 × 3.82 × 22.28 in*
SF20	min 250 × 94 × 74 mm max 250 × 94 × 324 mm *min. 9.84 × 3.70 × 2.91 in* *max. 9.84 × 3.70 × 13.46 in*
SF30	275 × 100 × 129 mm *10.83 × 3.94 × 5.08 in*
Mounting position	horizontal

NOTE

Further technical information, technical drawings, accessories, spare parts or product function descriptions available on SKF com/lubrication: **6409/2**

3D

skf-lubrication partcommunity com/3d-cad-models

Flow meter

SKF Safelow

Identiication code SF ___ A ___ ___ ___ ___

Product types

SF = Safelow

Flow rate per low meter

05 = 100 mm²/s: 0,1–0,7 l/min; 0 2–1 5 pts/min
220 mm²/s: 0,04–0,35 l/min; 0 08–0 74 pts/min
10 = 100 mm²/s: 0,1–3,0 l/min; 0 2–6 3 pts/min
220 mm²/s: 0,1–1,7 l/min; 0 08–0 74 pts/min
15 = 100 mm²/s: 0,3–7,2 l/min; 0 6–15 2 pts/min
220 mm²/s: 0,2–4,4 l/min; 0 4–9 3 pts/min
20 = 100 mm²/s: 1,3–17,0 l/min; 2 7–35 9 pts/min
220 mm²/s: 0,6–10,6 l/min; 5 3–93 0 pts/min
30 = 100 mm²/s: 5,0–56,0 l/min; 10 6–118 3 pts/min
220 mm²/s: 2,5–44,0 l/min; 5 3–93 0 pts/min

Calibration cone

A = adjustable cone

Outlets

1 = 1; SF05A–SF30A
2 = 2, SF05A–SF20A
4 = 4, SF05A–SF20A
6 = 6, SF05A–SF20A
8 = 8, SF05A–SF15A
10 = 10, SF05A–SF15A

Connection ports

R = BSPP
U = NPT

Alarm electrical (Alarm units for SF20A and SF30A must be ordered separately)

X = no alarm
A = with electrical alarm

Alarm type

BSC = common alarm
BSS = individual alarm

Alarm units for Safelow SF20A and SF30A [1)]

Order number	Designation
BSC-12030	common alarm
BSS-12030	individual alarm

[1)] Must be ordered seperately

BSC–12030

Safelow connections

Products	Outlets	Connection inlet group size 1	group size 2-10	Outlet connection
		BSPP / NPT	BSPP / NPT	BSPP / NPT
SF05A	1, 2, 4, 6, 8, 10	1/2	1	1/2
SF10A	1, 2, 4, 6, 8, 10	1/2	1	1/2
SF15A	1, 2, 4, 6, 8, 10	1/2	1	1/2
SF20A	1, 2, 4, 6	1/2	1	3/4
SF30A	1	1 1/4		1 1/4

Flow meter

SKF Flowline Monitor

Description

The SKF Flowline Monitor is used to divide, measure and control the low rate in oil circulation lubrication systems Three different low meter sizes enable control and monitoring of 0,1 to 100 l/min lows with operating viscosities from 32 to 1 000 mm²/s The low meters operate individually and can be programmed and adjusted separately Regardless of oil temperature and viscosity changes, the SKF Flowline Monitor provides accurate results Computer coniguration and remote monitoring are possible Monitoring modules are available offering common alarms, individual alarms for each lubrication point and interfaces to process controls

Features and beneits

- Minimal pressure loss due to turbine-based monitoring and adjusting-valve technology
- Easy-to-use interface
- Indication of low accuracy of each lubrication point
- Modular monitoring capabilities
- Panel mounting possible

Applications

- Pulp and paper industry
- Metal industry
- Mining
- Power plants
- Other industries and applications

Technical data

Function	turbine low meter
Lubricant	mineral, synthetic or environmentally friendly oils with a viscosity of 32–1 000 mm²/s
Flow meters:	
FL15	2, 4, 6, 8, 10
FL50, FL100	1
Flow rate:	
FL15	0,1–15 l/min; *0,2–32 pts/min*
FL50	15–50 l/min; *32–105 pts/min*
FL100	50–100 l/min; *105–210 pts/min*
Operating temperature	0 to + 65 °C; *+32 to 150 °F*
Operating pressure	max 10 bar; *145 psi*
Power supply	20–36 V DC 24 V AC (–20 to + 5%)
Power consumption	5 W
Alarm relay	potential free contact; max load 30 V DC / 1 A, 120 V AC / 1 A, resistive load
Inlet connection depending on model	G / NPT 1; G / NPT 2×1
Outlet connection	G / NPT 1/2; G / NPT 1 1/4
Protection class	IP 65
Dimensions	min 150 × 106 × 226 mm max 150 × 230 × 618 mm *min. 5.9 × 4.17 × 8.9 in* *max. 5.9 × 9.05 × 24.33 in*

NOTE

Further technical information, technical drawings, accessories, spare parts or product function descriptions available on SKF com/lubrication:

17075 EN

3D

skf-lubrication partcommunity com/3d-cad-models

Flow meter

SKF Flowline Monitor

Identiication code

FL ____ – ____ – ____ – ____

Product series SKF Flowline Monitor

Product type
- 15 = FL15
- 50 = FL50
- 100 = FL100

Number of low meters
- 01 = FL50 or FL100 with 1 single low meter
- 02 = FL15 with 2 low meters
- 04 = FL15 with 4 low meters
- 06 = FL15 with 6 low meters
- 08 = FL15 with 8 low meters
- 10 = FL15 with 10 low meters

Connection thread
- R = BSPP
- U = NPT

Interface card (optional)
- CAN = CAN bus interface module
- RCM = Relay and CAN bus interface module
- mA = mA-output module

Order numbers

Order number	Flow meter type
FL with BSPP connection thread (R)	
13120202	FL15-02-R
13120204	FL15-04-R
13120206	FL15-06-R
13120208	FL15-08-R
13120210	FL15-10-R
13120300	FL50-R
13127800	FL100-01-R
13120180	connection block G 1 1/4
FL with CAN module	
13120212	FL15-02-R-CAN
13120214	FL15-04-R-CAN
13120216	FL15-06-R-CAN
13120218	FL15-08-R-CAN
13120220	FL15-10-R-CAN
13120232	FL15-02-U-CAN
13120234	FL15-04-U-CAN
13120236	FL15-06-U-CAN
13120238	FL15-08-U-CAN
13120240	FL15-10-U-CAN
13120310	FL50-R-CAN
13120330	FL50-U-CAN
13127808	FL100-01-R-CAN
13127818	FL100-01-U-CAN

Order number	Flow meter type
FL with NPT connection thread (U)	
13120222	FL15-02-U
13120224	FL15-04-U
13120226	FL15-06-U
13120228	FL15-08-U
13120230	FL15-10-U
13120320	FL50-U
13127810	FL100-01-U
13120182	connection block NTP 1 1/4
FL with relay and CAN module	
13120342	FL15-02-R-RCM
13120344	FL15-04-R-RCM
13120346	FL15-06-R-RCM
13120348	FL15-08-R-RCM
13120350	FL15-10-R-RCM
13120352	FL15-02-U-RCM
13120354	FL15-04-U-RCM
13120356	FL15-06-U-RCM
13120358	FL15-08-U-RCM
13120360	FL15-10-U-RCM
13120312	FL50-R-RCM
13120331	FL50-U-RCM
13127802	FL100-01-R-RCM
13127812	FL100-01-U-RCM

Order number	Flow meter type
FL with mA module	
13120362	FL15-02-R-mA
13120364	FL15-04-R-mA
13120366	FL15-06-R-mA
13120368	FL15-08-R-mA
13120370	FL15-10-R-mA
13120372	FL15-02-U-mA
13120374	FL15-04-U-mA
13120376	FL15-06-U-mA
13120378	FL15-08-U-mA
13120380	FL15-10-U-mA
13120314	FL50-R-mA
13120334	FL50-U-mA
13127804	FL100-01-R-mA
13127816	FL100-01-U-mA

Flow limiter

SMB 3

Description

The SKF SMB 3 low limiter is designed to divide the main line low into parallel, individual lows The low is generated independently of system pressure changes and virtually independently of viscos-ity, guaranteeing a constant low The SMB 3 provides a low rate from 6 to 38 l/min *(12.6–80.3 pts/min)* and a pressure range of up to 200 bar The low limiter offers oil low monitoring with a signal transmitter or piston detector These indicators create a fault signal when the low rate drops to approximately 85%

Features and beneits

- Stable system regardless of pressure, temperature or viscosity changes
- Easy start-up with ixed low rate via pre-selected nozzle sizes
- Adaptation of low rate possible (nozzle exchange)
- High operating temperature up to +100 °C
- Optional ATEX version Ex II 3 cII CT6

Applications

- Oil and Gas
- Machine tools
- Metal forming
- Industrial transmissions

Technical data

Function	low limiter
Outlets	1
Lubricant	environmentally friendly mineral and synthetic oils; viscosity 20–600 mm²/s
Flow rate [1]	6–38 l/min; *12.6–80.3 pts/min*
Operating temperature	0 to +100 °C; *+32 to 212 °F*
Operating pressure [2]	5–200 bar *72–2 900 psi*
Differential pressure	>5 bar *>72 psi*
Material	gray cast iron, zinc coated
Connection	M12×1; 4-poles coupler socket
Protection class	IP 65
Signal sensors E4/E5	24 V to 230 V AC/DC
Proximity switch E6	12 to 36 VDC; IP 67
Dimensions	min 40 × 90 × 138 mm max 40 × 90 × 245 mm min *1.57 × 3.54 × 5.43 in* *max. 1.57 × 3.54 × 9.63 in*
Mounting position	any, preferably vertical

[1] For technical reasons oil output of the system's feeding pump must be > 10-15% of all low limiters low rates mounted in the system
[2] See further details under monitoring SMB3/6/8

NOTE

Further technical information, technical drawings, accessories, spare parts or product function descriptions available on SKF com/lubrication:

1-3001-EN

Flow limiter

SMB 3

Identiication code

24 – 27 03 – [ ] [ ] – [ ]

Product series

SMB

Product type

03 = SMB 3

Type of monitoring

0 = without monitoring
6 = with piston detector E6
7 = with signal transmitter E4
8 = with signal transmitter E5

Flow rate

Plug-in nozzle size = see table below

ATEX

ATEX = on request, only for ATEX (EX II 3cII CT6), without monitoring or with signal transmitter E5

SMB 3 plug-in nozzle

Order number	Flow rate [1]		Nozzle
	l/min	*pts/min*	∅ mm
250	6,00	*12.6*	2,50
260	6,50	*13.7*	2,60
270	6,75	*14.2*	2,70
280	7,00	*14.8*	2,80
290	7,50	*15.9*	2,90
300	8,00	*16.9*	3,00
310	8,75	*18.5*	3,10
320	9,25	*19.5*	3,20
330	9,75	*20.6*	3,30
340	10,50	*22.1*	3,40
350	11,00	*23.2*	3,50
360	11,50	*24.3*	3,60
370	12,00	*25.3*	3,70
380	12,75	*26.9*	3,80
390	13,50	*28.5*	3,90
400	14,00	*29.5*	4,00
410	14,75	*31.1*	4,10
420	15,50	*32.7*	4,20

Order number	Flow rate [1]		Nozzle
	l/min	*pts/min*	∅ mm
430	16,00	*33.8*	4,30
440	16,75	*35.4*	4,40
450	17,50	*36.9*	4,50
460	18,00	*38.0*	4,60
470	18,75	*39.6*	4,70
480	19,50	*41.2*	4,80
490	20,25	*42.8*	4,90
500	21,00	*44.3*	5,00
510	21,75	*45.9*	5,10
520	22,50	*47.5*	5,20
530	23,25	*49.1*	5,30
540	24,00	*50.7*	5,40
550	25,00	*52.8*	5,50
570	26,50	*56.0*	5,70
580	28,00	*59.1*	5,80
600	30,00	*63.4*	6,00
650	34,00	*71.8*	6,50
690	38,00	*80.3*	6,90

[1] at an operating viscosity of 300 mm²/s

SMB 3 accessories

Order number	Designation
24-0404-2119	**Seal kit**
	E4 signal transmitter
24-1072-2113	signal transmitter without coupler socket
24-1072-2115	signal transmitter with coupler socket with LED 24 V DC
24-1882-2151	coupler socket with LED 24 V DC
	E5 signal transmitter
24-1072-2113	signal transmitter without coupler socket
24-1072-2114	signal transmitter with coupler socket without LED 230 V AC/DC
24-1882-2121	coupler socket without LEDs

Order number	Designation
	E6 piston detector
24-1884-2282	piston detector
179-990-371	socket straight, 4-pole, M12×1
179-990-372	socket angled, 4-pole, M12×1
179-990-600	socket straight, 4-pole, M12×1 with orange cable, 5 m
179-990-601	socket angled, 4-pole, M12×1 with orange cable, 5 m
	Monitoring
84-8011-0369	group monitoring unit
24-1883-2081	**Flow limiter** without nozzle, without signal transmitter

For further information on monitoring extensions, see IPM 12

Flow limiter

SMB 6

Description

The SMB 6 low limiter is designed to divide the main line low into parallel, individual, lows The low is generated independently of system pressure changes and virtually independently of viscosity, guaranteeing a constant low The SMB 6 provides a low rate from 25 to 132 l/min *(52.8–279 pts/min)* and a pressure range of up to 200 bar *(2 900 psi)* The low limiter offers oil low monitoring with a signal transmitter or piston detector These indicators create a fault signal when the low rate drops to approximately 85%

Features and beneits

- Stable system regardless of pressure, temperature or viscosity changes
- Easy start-up with ixed low rate via pre-selected nozzle sizes
- Adaptation of low rate possible (nozzle exchange)
- High operating temperature up to +100 °C
- Optional ATEX version Ex II 3 cII CT6

Applications

- Metal forming
- Pulp and paper industry
- Automotive
- Presses
- Heavy industry

Technical data

Function	low limiter
Outlets	1
Lubricant	enviromentally friendly, mineral and synthetic oils; viscosity 20–600 mm²/s
Flow rate [1]	25–132 l/min *52.8–279 pts/min*
Operating temperature	0 to +100 °C; *+32 to 212 °F*
Operating pressure [2]	5–200 bar *72–2 900 psi*
Differential pressure	>5 bar *>72 psi*
Material	gray cast iron, zinc coated
Connection	M12×1; 4-poles coupler socket
Protection class	IP 65
Signal sensors E4/E5	24 V to 230 V AC/DC; IP 65
Proximity switch E6	12 to 36 VDC; IP 67
Dimensions	min 40 × 90 × 138 mm max 40 × 90 × 245 mm *min. 1.57 × 3.54 × 5.43 in* *max. 1.57 × 3.54 × 9.63 in*
Mounting position	any, preferably vertical

[1] For technical reasons oil output of the system's feeding pump must be > 10-15% of all low limiters low rates mounted in the system Higher metering quantities available on request
[2] See further details under monitoring SMB3/6/8

NOTE

Further technical information, technical drawings, accessories, spare parts or product function descriptions available on SKF com/lubrication:

1-3001-EN

Flow limiter

SMB 6

Identiication code **24 – 27 06 – [ ] [ ] – [ ]**

Product series
SP/SMB

Product type
06 = SP/SMB 6

Type of monitoring
0 = without monitoring
6 = with piston detector E6
7 = with signal transmitter E4
8 = with signal transmitter E5

Flow rate
Plug-in nozzle size = see table below

ATEX
ATEX = on request, only for ATEX (EX II 3cII CT6), without monitoring or with signal transmitter E5

SMB 6 plug-in nozzle

Order number	Flow rate [1]		Nozzle
	l/min	*pts/min*	∅ mm
570	25	*52.8*	5,70
630	30	*63.4*	6,30
680	35	*73.9*	6,80
730	40	*84.5*	7,30
780	45	*95.1*	7,80
820	50	*105.7*	8,20
870	55	*116.2*	8,70
910	60	*126.8*	9,10
960	65	*137.4*	9,60

Order number	Flow rate [1]		Nozzle
	l/min	*pts/min*	∅ mm
000	70	*147.9*	10,00
040	75	*158.5*	10,40
080	80	*169.0*	10,80
170	90	*190.2*	11,70
270	100	*211.3*	12,70
310	105	*221.9*	13,10
350	110	*232.5*	13,50
400	116	*245.1*	14,00
440	120	*253.6*	14,40
530	132	*278.9*	15,30

[1] at an operating visc osity of 300 mm²/s

Accessories

SMB 6 accessories

Order number	Designation
24-0712-6050	**Flow limiter** without nozzle, without signal transmitter
24-0404-2155	**Seal kit**
	Monitoring
84-8011-0369	group monitoring unit
	E4 signal transmitter
24-1072-2113	signal transmitter without coupler socket
24-1072-2115	signal transmitter with coupler socket with LED 24 V DC
24-1882-2151	coupler socket with LED 24 V DC

Order number	Designation
	E5 signal transmitter
24-1072-2113	signal transmitter without coupler socket
24-1072-2114	signal transmitter with coupler socket without LED 230 V AC/DC
24-1882-2121	coupler socket without LEDs
	E6 piston detector
24-1884-2282	piston detector
179-990-371	socket straight, 4-pole, M12×1
179-990-372	socket angled, 4-pole, M12×1
179-990-600	socket straight, 4-pole, M12×1 with orange cable, 5 m
179-990-601	socket angled, 4-pole, M12×1 with orange cable, 5 m

For further information for monitoring extensions IPM 12

Flow limiter

SMB 8

Description

The SMB 8 low limiter is designed to divide the main line low into parallel, individual lows The low is generated independently of system pressure changes and virtually independently of viscosity, guaranteeing a constant low The SMB 8 provides a low rate from 0,08 to 8 l/min *(0.16–16.9 pts/min)* and a pressure range of up to 200 bar *(2 900 psi)* The low limiter offers oil low monitoring with a signal transmitter or piston detector These indicators create a fault signal when the low rate drops to approximately 70% Up to six SMB 8 can be combined on a mounting plate, providing a simple, space-saving installation and compact construction with only one inlet

Features and beneits

- Stable system regardless of pressure, temperature or viscosity changes
- Easy start-up with ixed low rate via pre-selected nozzle sizes
- Adaptation of low rate possible (nozzle exchange)
- Optional ATEX version Ex II 3 cII CT6
- Available as attachment to PSG2, PSG3 and VP on the same mounting plate

Applications

- Metal forming and presses
- Heavy industry
- Pulp and paper industry
- Industrial transmissions
- Automation

Technical data

Function	2-way low limiter	
Outlets	1-6 on mounting plate	
Lubricant	environmentally friendly mineral and synthetic oils; viscosity 20-600 mm²/s	
Flow rate [1]	0,08-8 l/min;	*0.16–16.9 pts/min*
Operating temperature	0 to +100 °C	*+32 to 212 °F*
Operating pressure [2]	5-200 bar	*72–2 900 psi*
Differential pressure	>5 bar	*>72 psi*
Material	AlCuPb F38, neutrally anodized	
Connection	M12×1; 4-poles coupler socket	
Protection class	IP 65	
Signal sensors E4/E5	24 V to 230 V AC/DC; IP 65	
Proximity switch E6	12 to 36 VDC; IP 67	
Dimensions	min 40 × 45 × 78,5 mm max 40 × 45 × 185 mm *min. 1.57 × 1.77 × 3.09 in* *max. 1.57 × 1.77 × 7.28 in*	
Mounting position	any, ilter always in upright position	

[1] For technical reasons oil output of the system's feeding pump must be > 10-15% of all low limiters low rates mounted in the system
[2] See further details under monitoring SMB3/6/8

NOTE

Further technical information, technical drawings, accessories, spare parts or product function descriptions available on SKF com/lubrication:
1-3028-EN

Flow limiter

SMB 8

Identiication code

24 – 27 08 – ___ ___ – ___

Product series

SMB

Product type

08 = SMB 8

Type of monitoring

0 = without monitoring
6 = with piston detector E6
7 = with signal transmitter E4
8 = with signal transmitter E5

Flow rate

Plug-in nozzle size = see table below

ATEX

ATEX = on request, only for ATEX, only with signal transmitter E5

SMB 8 plug-in nozzle

Order number	Flow rate [1]		Nozzle
	l/min	*pts/min*	∅ mm
050	0,08	*0.16*	0,50
055	0,12	*0.25*	0,55
060	0,15	*0.31*	0,60
065	0,21	*0.44*	0,65
070	0,25	*0.52*	0,70
075	0,29	*0.61*	0,75
080	0,35	*0.74*	0,80
085	0,41	*0.87*	0,85
090	0,47	*0.99*	0,90
095	0,56	*1.18*	0,95
100	0,65	*1.37*	1,00
105	0,73	*1.54*	1,05
110	0,79	*1.67*	1,10
115	0,88	*1.86*	1,15
120	0,98	*1.88*	1,20
125	1,09	*2.30*	1,25
130	1,18	*2.49*	1,30
135	1,30	*2.74*	1,35
140	1,43	*3.02*	1,40
145	1,56	*3.29*	1,45
150	1,67	*3.53*	1,50
155	1,79	*3.78*	1,55
160	1,92	*4.06*	1,60
165	2,07	*4.37*	1,65
170	2,21	*4.67*	1,70
175	2,36	*4.98*	1,75
180	2,52	*5.32*	1,80
185	2,67	*5.64*	1,85

Order number	Flow rate [1]		Nozzle
	l/min	*pts/min*	∅ mm
190	2,80	*5.91*	1,90
195	2,98	*6.29*	1,95
200	3,16	*6.68*	2,00
205	3,30	*6.97*	2,05
210	3,43	*7.24*	2,10
215	3,58	*7.57*	2,15
220	3,79	*8.00*	2,20
225	3,98	*8.41*	2,25
230	4,18	*8.83*	2,30
235	4,37	*9.24*	2,35
240	4,57	*9.66*	2,40
245	4,80	*10.1*	2,45
250	5,00	*10.5*	2,50
255	5,19	*10.9*	2,55
260	5,37	*11.3*	2,60
265	5,55	*11.7*	2,65
270	5,77	*12.1*	2,70
275	5,99	*12.7*	2,75
280	6,22	*13.1*	2,80
285	6,49	*13.7*	2,85
290	6,74	*14.2*	2,90
295	6,95	*14.7*	2,95
300	7,15	*15.1*	3,00
305	7,31	*15.4*	3,05
310	7,48	*15.8*	3,10
315	7,72	*16.3*	3,15
320	7,98	*16.9*	3,20

[1] Up to a nozzle diameter of 1 45 are based at an operational viscosity of 300 mm²/s and 20 bar differential pressure, for nozzle diameters of 1 5 and above are valid without correction over the entire viscosity range from 150 to 600 mm²/s and differential pressures of 20 to 150 bar

Accessories

SMB 8

24-0714-3480

SMB 8 mounting plate

Order number	Designation	Flow limiter(s)
24-0714-3477	SMB 8 mounting plate	1
24-0714-3478	SMB 8 mounting plate	2
24-0714-3479	SMB 8 mounting plate	3
24-0714-3480	SMB 8 mounting plate	4
24-0714-3481	SMB 8 mounting plate	5
24-0714-3482	SMB 8 mounting plate	6
24-0711-2403	blind element, to blank off unused mounting	

24-0714-3474

SMB 8 mounting plates with extension for oil ilter mounting [1)]

Order number	Designation	Flow limiter(s)
24-0714-3471	SMB 8 mounting plate	1
24-0714-3472	SMB 8 mounting plate	2
24-0714-3473	SMB 8 mounting plate	3
24-0714-3474	SMB 8 mounting plate	4
24-0714-3475	SMB 8 mounting plate	5
24-0714-3476	SMB 8 mounting plate	6
24-0711-2403	blind element, to blank off unused mounting	

[1)] please order oil ilter seperat ely

24-0714-3470

SMB 8 interchangeable strainer
for single base plates only

Order number	Designation
24-1874-2106	interchangeable strainer; 300 µm
24-0404-2117	seal kit for interchangeable strainer
24-0714-3470	mounting plate with interchangeable strainer

SMB 8 low limiter

Order number	Designation
24-1883-3005	flow limiter SMB 8, without nozzle, without signal transmitter
24-0404-2339	seal kit

Oil ilter

Order number	Designation
24-0651-3041	oil filter with shut-off valve
24-2104-2009	valve insert with hand wheel
24-0651-2200	filter insert, 100 µm
24-0404-2293	seal kit for filter

Accessories

SMB 3 / 6 / 8

Technical data monitoring extension E4 / E5 / E6

	E4 signal transmitter	E5 signal transmitter	E6 piston detector
Function	magnetic switch	magnetic switch	inductive PNP
Operating temperature	0 to +90 °C; *32 to 194 °F*	0 to +90 °C; *32 to 194 °F*	0 to +80 °C; *32 to 176 °F*
Operating pressure	5–85 bar, *72–1 233 psi*	5–85 bar; *72–1 233 psi*	5–200 bar; *72–2 900 psi*
Material	AlCuMgPb F38, neutrally anodized, connector polyamide	AlCuMgPb F38, neutrally anodized, connector polyamide	AlCuMgPb F37, PBTP, AISI 316Ti connector polyamide
Switching voltage	24 V DC	24–230 V DC	12–36 V DC
Switching voltage ATEX	–	30 V DC	–
ATEX	–	II 3 cII CT6	–
Visual monitoring (LED)	green–yellow	–	–
Dimension length	105 mm; *4.13 in*	105 mm; *4.13 in*	53 mm; *2.09 in*

SMB 3 / 6 / 8 monitoring

Order number	Designation
	E4 signal transmitter
24-1072-2113	signal transmitter without coupler socket
24-1072-2115	signal transmitter with coupler socket with LED 24 V DC
24-1882-2151	coupler socket with LED 24 V DC
	E5 signal transmitter
24-1072-2113	signal transmitter without coupler socket
24-1072-2114	signal transmitter with coupler socket without LED 230 V AC/DC
24-1882-2121	coupler socket without LEDs
	E6 piston detector
24-1884-2282	piston detector
179-990-371	socket straight, 4-pole, M12×1
179-990-372	socket angled, 4-pole, M12×1
179-990-600	socket straight, 4-pole, M12×1 with orange cable, 5 m
179-990-601	socket angled, 4-pole, M12×1 with orange cable, 5 m

SMB 3 / 6 / 8 group monitoring unit

Order number	Designation
84-8011-0369	group monitoring unit for SMB 3, 6 and 8

Flow limiter

SMB 9

Description

The SMB 9 low limiter is designed to divide the main line low into parallel, individual lows The low is generated independently of system pressure changes and virtually independently of viscosity, guaranteeing a constant low The SMB 9 provides a low rate from 0,08 to 8 l/min *(0.16–16.9 pts/min)* and a pressure range of up to 50 bar *(725 psi)* The product has a built-in, gear-wheel-type low indicator for electronic and visual monitoring of oil low Every rotation creates a signal offering information about the low rate The SMB 9 can be used in combination with the SKF IPM 12 Also, up to six SMB 9s can be combined on a mounting plate, providing a simple, space-saving installation and compact construction with only one inlet Various extension options are available

Features and beneits

- Stable system regardless of pressure, temperature or viscosity changes
- Reliable product with self-adjusting metering
- Visual and electronic monitoring with real low indication
- Easy start-up with ixed low rate via pre-selected nozzle sizes
- Adaptation of low rate possible (nozzle exchange)

Applications

- Mining and mineral processing
- Cement
- Pulp and paper industry
- Metal forming; metal fabrication

Technical data

Function	low limiter, gear wheel monitoring
Outlets	1-6 on mounting plate
Lubricant	environmentally friendly mineral and synthetic oils; viscosity 20-600 mm^2/s
Flow rate [1]	0,08-8 l/min; *0.16–16.9 pts/min*
Operating temperature	0 to +70 °C; *+32 to 158 °F*
Operating pressure	6-50 bar; *87–725 psi*
Differential pressure	>6 bar; *>87 psi*
Electrical connection	hall sensor;
Voltage	24 VDC ±10%; 20mA
Material	AlCuPb F38, neutrally anodized
Connection	plug, DIN 43 650
Protection class	IP 65
Dimensions	80 × 80 × 120 mm *3.15 × 3.15 × 4.72 in*
Mounting position	any, ilter in upright position
Options	ATEX version for Ex II 2G c TX Gb, Ex II 2D c TX Db

[1] For technical reasons oil output of the system's feeding pump must be > 10-15% of all low limiters low rates mounted in the system

NOTE

Further technical information, technical drawings, accessories, spare parts or product function descriptions available on SKF com/lubrication:
1-3002 EN; 951-180-072 EN

Flow limiter

SMB 9

Identiication code **24 – 27 09 – [ ] [ ] – [ ]**

Product series
SMB

Product type
09 = SMB 9

Type of monitoring
0 = without monitoring
6 = with piston detector E6
7 = with signal transmitter E4
8 = with signal transmitter E5

Flow rate
Plug-in nozzle size = see table below

ATEX
ATEX = on request, only for ATEX design (EX II 2G c TX Gb, EX II 2D c TX Db), without monitoring or with piston detector

SMB 9 plug-in nozzle

Order number	Flow rate [1]		Nozzle
	l/min	*pts/min*	∅ mm
050	0,08	*0.16*	0,50
055	0,12	*0.25*	0,55
060	0,15	*0.31*	0,60
065	0,21	*0.44*	0,65
070	0,25	*0.52*	0,70
075	0,29	*0.61*	0,75
080	0,35	*0.74*	0,80
085	0,41	*0.87*	0,85
090	0,47	*0.99*	0,90
095	0,56	*1.18*	0,95
100	0,65	*1.37*	1,00
105	0,73	*1.54*	1,05
110	0,79	*1.67*	1,10
115	0,88	*1.86*	1,15
120	0,98	*1.88*	1,20
125	1,09	*2.30*	1,25
130	1,12	*2.49*	1,30
135	1,30	*2.74*	1,35
140	1,43	*3.02*	1,40
145	1,56	*3.29*	1,45
150	1,67	*3.53*	1,50
155	1,79	*3.78*	1,55
160	1,92	*4.06*	1,60
165	2,07	*4.37*	1,65
170	2,21	*4.67*	1,70
175	2,36	*4.98*	1,75
180	2,52	*5.32*	1,80
185	2,67	*5.64*	1,85

Order number	Flow rate [1]		Nozzle
	l/min	*pts/min*	∅ mm
190	2,80	*5.91*	1,90
195	2,98	*6.29*	1,95
200	3,16	*6.68*	2,00
205	3,30	*6.97*	2,05
210	3,43	*7.24*	2,10
215	3,58	*7.57*	2,15
220	3,79	*8.00*	2,20
225	3,98	*8.41*	2,25
230	4,18	*8.83*	2,30
235	4,37	*9.24*	2,35
240	4,57	*9.66*	2,40
245	4,80	*10.1*	2,45
250	5,00	*10.5*	2,50
255	5,19	*10.9*	2,55
260	5,37	*11.3*	2,60
265	5,55	*11.7*	2,65
270	5,77	*12.1*	2,70
275	5,99	*12.7*	2,75
280	6,22	*13.1*	2,80
285	6,49	*13.7*	2,85
290	6,74	*14.2*	2,90
295	6,95	*14.7*	2,95
300	7,15	*15.1*	3,00
305	7,31	*15.4*	3,05
310	7,48	*15.8*	3,10
315	7,72	*16.3*	3,15
320	7,98	*16.9*	3,20

[1] Up to a nozzle diameter of 1 45 are based at an operational viscosity of 300 mm²/s and 20 bar differential pressure, for nozzle diameters of 1 5 and above are valid without correction over the entire viscosity range from 150 to 600 mm²/s and differential pressures of 20 to 150 bar

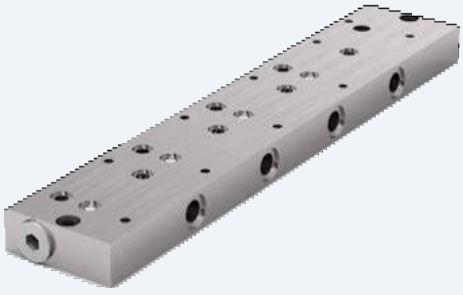
Accessories

SMB 9

24-0714-3174

SMB 9 mounting plates

Order number	Designation	Flow limiter(s)
24-0714-3171	SMB 9 mounting plate	1
24-0714-3172	SMB 9 mounting plate	2
24-0714-3173	SMB 9 mounting plate	3
24-0714-3174	SMB 9 mounting plate	4
24-0714-3175	SMB 9 mounting plate	5
24-0714-3176	SMB 9 mounting plate	6



24-0714-3184

SMB 9 mounting plates with extension for oil ilter mounting [1)]

Order number	Designation	Flow limiter(s)
24-0714-3181	SMB 9 mounting plate	1
24-0714-3182	SMB 9 mounting plate	2
24-0714-3183	SMB 9 mounting plate	3
24-0714-3184	SMB 9 mounting plate	4
24-0714-3185	SMB 9 mounting plate	5
24-0714-3186	SMB 9 mounting plate	6

[1)] please order oil ilter seperately

Oil ilter

Order number	Designation
24-0651-3041	oil filter with shut-off valve
24-2104-2009	valve insert with hand wheel
24-0651-2200	filter insert, filter fineness 100 µm
24-0404-2293	seal kit set for filter

Accessories

SMB 9

SMB 9 interchangeable strainer

Order number	Designation
24-1874-2104	interchangeable strainer SMB 9
24-0404-2117	seal kit set for interchangeable strainer
24-0714-3180	mounting plate for a low limiter with interchangeable strainer

SMB 9 blind element
to blank off unused positions

Order number	Designation
24-0711-2405	blind element, SMB 9
95-0038-0908	screw plug G $^{3}/_{8}$ for SMB 9 [1]

[1] One screw plug for dummy element has to be ordered

SMB 9 spare parts

Order number	Designation
24-1883-3012	SMB 9 without nozzle, without electrical monitoring
24-1883-3010	SMB 9 without nozzle, with electrical monitoring
24-0404-2340	seal kit for SMB 9
179-990-033	Socket

SMB 9 group monitoring

Order number	Designation
84-8011-0380	IPM 12 pulse meter for SMB 9, 10, 13 and 14
84-8011-0390	IPM 12 pulse meter with connection socket for PGA 3

IPM 12

Flow limiter

SMB 10

Description

The SMB 10 low limiter is designed to divide the main line low into parallel, individual lows The low is generated independently of system pressure changes and virtually independently of viscosity, guaranteeing a constant low The SMB 10 provides a low rate from 0,21 to 8 l/min *(0.44–17.2 pts)* and a pressure range of up to 50 bar *(725 psi)* The SMB 10 can reduce the starting low to 25% to prevent cold bearings from overlowing The change-over can be done with a hydraulic or electric change-over valve Up to six SMB 10s can be combined on a mounting plate, providing a simple, space-saving installation and compact construction with only one inlet Various extension options are available For visual and electronic monitoring of oil low, the SMB 10 has a built-in, gear-wheel-type low indicator Every rotation creates a signal offering information about the low rate The SMB 10 can be used in combination with the SKF IPM 12 pulse meter

Features and beneits

- Stable system regardless of pressure, temperature or viscosity changes
- Reliable product with self-adjusting metering
- Visual and electronic monitoring with real low indication
- Adaptation of low rate possible (nozzle exchange)
- Optional ATEX version for Ex II 2G c T4 Gb

Applications

- Pulp and paper industry
- Metal industry
- Heavy industry

Technical data

Function	changeover 2-way low limiter with volumetric low control 1-
Outlets	6 on mounting plate
Lubricant	environmentally friendly mineral and synthetic oils; viscosity 20-600 mm²/s
Flow rate [1]	0,21-8,15 l/min; *0.44–17.2 pts/min*
Operating temperature	0 to +70 °C; *+32 to 158 °F*
Operating pressure	*7-50 bar; 102-725 psi*
Differential pressure	>7 bar; *>101 psi*
Electrical connection	Hall sensor
Voltage	24 V DC ±10%; 20mA
Material	AlCuPb F38, neutrally anodized
Connection	plug, DIN 43 650
Protection class	IP 65
Dimensions	80 × 80 × 120 mm *3.15 × 3.15 × 4.72 in*
Mounting position	any, ilter in vertical position

[1] For technical reasons oil output of the system's feeding pump must be > 10-15% of all low limiters low rates mounted in the system

NOTE

Further technical information, technical drawings, accessories, spare parts or product function descriptions available on SKF com/lubrication:
1-3003-EN; 951-180-072 EN

Flow limiter

SMB 10

Identiication code **24 – 27 10 – – –**

Product series
SMB

Product size
10 = SMB 10

Type of monitoring
0 = without monitoring
1 = with electrical monitoring
2 = with monitoring for ATEX
3 = without monitoring for ATEX

Flow rate
Plug-in nozzle size = see table below

ATEX
ATEX = on request, only for ATEX design (II 2G EX e IIC T4 Gb), without monitoring or with piston detector

SMB 10 with a starting operating volumetric low ratio 1:4

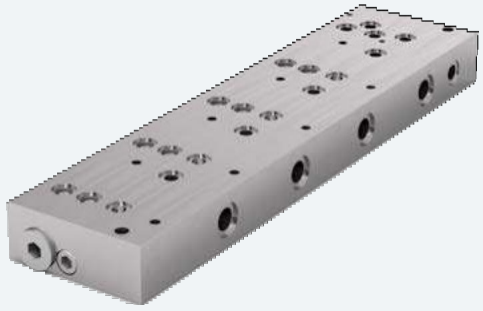
Order number	Flow rate [1]		Nozzle
	l/min	*pts/min*	∅ mm
003	0,21 : 0,85	*0.44 : 1.79*	0,55–1,10
004	0,26 : 1,02	*0.55 : 2.16*	0,55–1,10
005	0,30 : 1,22	*0.63 : 2.58*	0,60–1,20
006	0,36 : 1,43	*0.76 : 3.02*	0,65–1,30
007	0,41 : 1,66	*0.87 : 3.50*	0,70–1,40
008	0,48 : 1,91	*1.01 : 4.04*	0,75–1,50
009	0,54 : 2,17	*1.14 : 4.59*	0,80–1,60
010	0,61 : 2,45	*1.29 : 5.18*	0,85–1,70
011	0,69 : 2,75	*1.46 : 5.81*	0,90–1,80
012	0,76 : 3,06	*1.60 : 6.47*	0,95–1,90
013	0,85 : 3,39	*1.79 : 7.16*	1,00–2,00
014	0,93 : 3,74	*1.97 : 7.90*	1,05–2,10
015	1,02 : 4,10	*2.16 : 8.66*	1,10–2,20
016	1,12 : 4,49	*2.37 : 9.49*	1,15–2,30
017	1,22 : 4,88	*2.58 : 10.3*	1,20–2,40
018	1,32 : 5,30	*2.79 : 11.2*	1,25–2,50
019	1,43 : 5,73	*3.02 : 12.1*	1,30–2,60
020	1,55 : 6,18	*3.27 : 13.0*	1,35–2,70
021	1,66 : 6,65	*3.50 : 14.0*	1,40–2,80
022	1,78 : 7,13	*3.76 : 15.0*	1,45–2,90
023	1,91 : 7,63	*4.03 : 16.1*	1,50–3,00
024	2,04 : 8,14	*4.31 : 17.2*	1,55–3,10
SMB 10 without starting reduction – ratio 1:1			
050	0,08	*0.17*	5,5–0,50
055	0,12	*0.25*	5,5–0,55
060	0,15	*0.32*	5,5–0,60
065	0,20	*0.42*	5,5–0,65
070	0,25	*0.55*	5,5–0,70
075	0,29	*0.61*	5,5–0,75
080	0,35	*0.74*	5,5–0,80
085	0,41	*0.87*	5,5–0,85
090	0,47	*0.99*	5,5–0,90
095	0,56	*1.18*	5,5–0,95
100	0,65	*1.37*	5,5–1,00
105	0,73	*1.54*	5,5–1,05
110	0,79	*1.67*	5,5–1,10
115	0,88	*1.86*	5,5–1,15

Order number	Flow rate [1]		Nozzle
	l/min	*pts/min*	∅ mm
120	0,98	*2.07*	5,5–1,20
125	1,09	*2.30*	5,5–1,25
130	1,18	*2.49*	5,5–1,30
135	1,30	*2.75*	5,5–1,35
140	1,43	*3.02*	5,5–1,40
145	1,56	*3.30*	5,5–1,45
150	1,67	*3.53*	5,5–1,50
155	1,79	*3.78*	5,5–1,55
160	1,92	*4.06*	5,5–1,60
165	2,07	*4.37*	5,5–1,65
170	2,21	*4.67*	5,5–1,70
175	2,36	*4.99*	5,5–1,75
180	2,52	*5.33*	5,5–1,80
185	2,67	*5.33*	5,5–1,85
190	2,80	*5.64*	5,5–1,90
195	2,985	*5.92*	5,5–1,95
200	3,16	*6.30*	5,5–2,00
205	3,306	*6.68*	5,5–2,05
210	3,43	*6.97*	5,5–2,10
215	3,58	*7.25*	5,5–2,15
220	3,79	*7.57*	5,5–2,20
225	3,988	*8.01*	5,5–2,25
230	4,18	*8.41*	5,5–2,30
235	4,37	*8.83*	5,5–2,35
245	4,80	*9.66*	5,5–2,45
250	5,00	*10.14*	5,5–2,50
255	5,19	*10.57*	5,5–2,55
260	5,37	*10.97*	5,5–2,60
265	5,55	*11.35*	5,5–2,65
270	5,77	*11.73*	5,5–2,70
275	5,99	*12.19*	5,5–2,75
280	6,22	*12.66*	5,5–2,80
285	6,49	*13.15*	5,5–2,85
290	6,74	*13.72*	5,5–2,90
295	6,95	*14.24*	5,5–2,95
300	7,15	*14.69*	5,5–3,00
305	7,31	*15.11*	5,5–3,05
310	7,48	*15.45*	5,5–3,10

[1] at an operating viscosity of 300 mm²/s

Accessories

SMB 10



24-0714-3234

SMB 10 mounting plates with extension for hydraulic changeover valve mounting [1)]

Order number	Designation	Flow limiter(s)
24-0714-3231	SMB 10 mounting plate	1
24-0714-3232	SMB 10 mounting plate	2
24-0714-3234	SMB 10 mounting plate	4
24-0714-3236	SMB 10 mounting plate	6

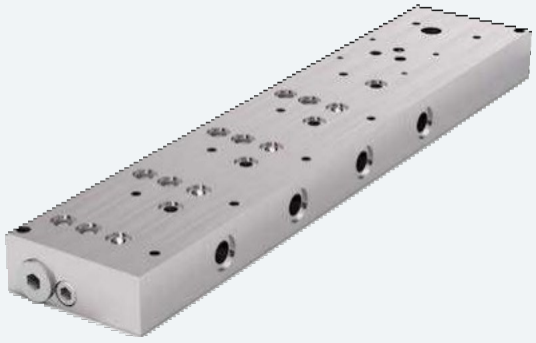
1) please order changeover valve seperately

24-0714-3244

SMB 10 mounting plates with extension for hydraulic changeover valve and oil ilter mounting [1)]

Order number	Designation	Flow limiter(s)
24-0714-3241	SMB 10 mounting plate	1
24-0714-3242	SMB 10 mounting plate	2
24-0714-3244	SMB 10 mounting plate	4
24-0714-3246	SMB 10 mounting plate	6
24-0714-3164	blind plate to close ilter ports	

1) please order changeover valve and oil ilter seperately



24-0714-3264

SMB 10 mounting plates with extension for electrical changeover valve and oil ilter mounting [1)]

Order number	Designation	Flow limiter(s)
24-0714-3261	SMB 10 mounting plate	1
24-0714-3262	SMB 10 mounting plate	2
24-0714-3263	SMB 10 mounting plate	3
24-0714-3264	SMB 10 mounting plate	4
24-0714-3265	SMB 10 mounting plate	5
24-0714-3266	SMB 10 mounting plate	6
24-0714-3164	blind plate to close ilter ports	

1) please order changeover valve and oil ilter seperately

SMB 10

SMB 10 oil ilter

Order number	Designation
24-0651-3041	oil filter with shut-off valve
24-2104-2009	valve insert with hand wheel
24-0651-2200	filter insert, filter fineness 100 µm
24-0404-2293	seal kit filter

SMB 10 change-over valve

Order number	Designation
24-1883-2093	hydraulic change-over valve
24-1254-2486	electrical change-over valve 24 V DC
24-1254-2487	electrical change-over valve 230 V AC
24-0404-2281	seal kit hydraulic change-over valve

SMB 10 group monitoring

Order number	Designation
84-8011-0380	IPM 12 pulse meter for SMB 9, 10, 13 and 14
84-8011-0390	IPM 12 pulse meter with connection socket for PGA 3

SMB 10 spare parts

Order number	Designation
24-1883-3020	SMB 10 without nozzle, without electrical monitoring
24-0404-2341	Seal kit for SMB 10
24-0758-2113	Sight glass (with lange, seals and shims)

SMB 10 blind element
to blank off unused positions

Order number	Designation
24-0711-2406	blind element SMB 10

Flow limiter

SMB 13

Description

The SMB 13 low limiter is designed to divide the main line low into parallel, individual, volumetric low quantities and to “limit” these according to requirements The low is generated independently of system pressure and virtually independently of viscosity, guaranteeing a constant low The SMB 13 provides a low rate from 6 to 30 l/min *(12.6–63.4 pts/min)* and a pressure range up to 50 bar *(725 psi)* The low limiter has a built-in, gear-wheel-type low indicator for electronic and visual monitoring of oil low Every rotation creates a signal offering information about the low rate The SMB 13 can be used in combination with the IPM 12

Features and beneits

- Stable system regardless of pressure, temperature or viscosity changes
- Visual and electronic monitoring with real low indication
- Easy start-up with ixed low rate via pre-selected nozzle sizes
- Adaptation of low rate possible (nozzle exchange)
- Optional ATEX version for Ex II 2G c TX Gb, Ex II 2D c TX Db

Applications

- Mining
- Presses
- Cement
- Heavy industry

Technical data

Function	low limiter 2-way with volumetric low control
Outlets	1
Lubricant	enviromentally friendly, mineral and synthetic oils; viscosity 20-600 mm²/s
Flow rate [1]	6,0-30 l/min; *12.7–63.4 pts/min*
Operating temperature	0 to +70 °C;*+32 to 158 °F*
Operating pressure	6-50 bar *87–725 psi*
Differential pressure	>6 bar *>87 psi*
Material	AlCuPb F38, neutrally anodized
Electrical sensor	Hall sensor
Voltage	24 V DC ± 10%
Current switch	max 20 mA
Connection	plug, DIN 43 650
Protection class	IP 65
Dimension	115 × 120 × 128,5 mm *4.53 × 4.72 × 5.06 in*
Mounting position	any

[1] For technical reasons oil output of the system’s feeding pump must be > 10-15% of all low limiters low rates mounted in the system

NOTE

Further technical information, technical drawings, accessories, spare parts or product function descriptions available on SKF com/lubrication:
1-3004-EN; 951-180-072 EN

Flow limiter

SMB 13

Identiication code 24 – 27 13 – ___ ___ – ___

Product series
SMB

Product design
13 = SMB 13

Type of monitoring
0 = without monitoring
1 = with electrical monitoring
2 = with monitoring for ATEX
3 = without monitoring for ATEX

Flow rate
Plug-in nozzle size = see table below

ATEX
ATEX = on request, only for ATEX (EX II 2G c TX Gb, EX II 2D c TX Db), without monitoring or with piston detector

SMB 13 plug-in nozzle

Order number	Flow rate [1]		Nozzle
	l/min	*pts/min*	∅ mm
250	6,00	*12.6*	2,50
260	6,50	*13.7*	2,60
270	6,75	*14.2*	2,70
280	7,00	*14.8*	2,80
290	7,50	*15.6*	2,90
300	8,00	*16.9*	3,00
310	8,75	*18.5*	3,10
320	9,25	*19.5*	3,20
330	9,75	*20.6*	3,30
340	10,50	*22.1*	3,40
350	11,00	*23.2*	3,50
370	12,00	*25.4*	3,70
380	12,75	*26.9*	3,80
390	13,50	*28.5*	3,90
400	14,00	*29.6*	4,00
410	14,75	*31.1*	4,10
420	15,50	*32.8*	4,20
430	16,00	*33.8*	4,30
440	16,75	*35.4*	4,40
450	17,50	*36.9*	4,50
460	18,00	*38.0*	4,60
470	18,75	*39.6*	4,70
480	19,50	*41.2*	4,80
490	20,25	*42.8*	4,90
500	21,00	*44.4*	5,00
510	21,75	*45.9*	5,10
520	22,50	*47.6*	5,20
530	23,25	*49.1*	5,30
540	24,00	*50.7*	5,40
550	25,00	*52.8*	5,50
560	26,00	*54.9*	5,60
570	27,00	*57.0*	5,70
580	28,00	*59.1*	5,80
600	30,00	*63.4*	6,00

[1] at an operating viscosity of 300 mm2/s

SMB 13 group monitoring

Order number	Designation
84-8011-0380	IPM 12 pulse meter
84-8011-0390	IPM 12 pulse meter with connection socket for PGA 3

SMB 13 low limiter

Order number	Designation
24-1883-3016	SMB 13 without nozzle, with electrical monitoring

SMB 13 accessories

Order number	Designation
44-0758-2049	sight glass D45×12
24-0404-2310	gasket set: gasket D32/45×05 O-ring 44×3 O-ring 90×3
24-1882-2029	socket

Flow limiter

SMB 14

Description

The SMB 14 low limiter is designed to divide the main line low into parallel, individual, volumetric low quantities and to “limit” these according to requirements The low is generated independently of system pressure and virtually independently of viscosity, guaranteeing a constant low The SMB 14 provides a low rate from 25 to 100 l/min *(52.8–211.3 pts/min)* and a pressure range up to 50 bar *(725 psi)* It has a built-in, gear-wheel-type low indicator for electronic and visual monitoring of oil low Every rotation creates a signal offering information about the low rate SMB 14 low limiter can be used in combination with the SKF IPM 12

Features and beneits

- Stable system regardless of pressure, temperature or viscosity changes
- Visual and electronic monitoring with real low indication
- Easy start-up with ixed low rate via pre-selected nozzle sizes
- Adaptation of low rate possible (nozzle exchange)
- Optional ATEX version for Ex II 2G c TX Gb, Ex II 2D c TX Db

Applications

- Metal industry
- Automation
- Heavy industry

Technical data

Function	2-way low limiter valve with volumetric low check
Outlets	1
Lubricant	enviromentally friendly, mineral and synthetic oils; viscosity 20-600 mm²/s
Flow rate [1]	25-132 l/min *52.8 - 278.9 pts/min*
Operating temperature	0 to +70 °C *+32 to 158 °F*
Operating pressure	6-50 bar *87–725 psi*
Differential pressure	>6 bar *>87 psi*
Material	AlCuPb F38, neutrally anodized
Electrical connection	hall sensor
Voltage	24 VDC ±10%
Current switch	max 20 mA
Connection	plug, DIN 43 650
Protection class	IP 65
Dimensions	150 × 180 × 190 mm *5.91 × 7.09 × 7.48 in*
Mounting position	any

[1] For technical reasons oil output of the system’s feeding pump must be > 10-15% of all low limiters low rates mounted in the system Higher metering quantities available on request

NOTE

Further technical information, technical drawings, accessories, spare parts or product function descriptions available on SKF com/lubrication:

1-3005-EN; 951-180-072 EN

Flow limiter

SMB 14

Identiication code 24 – 27 14 – ____ ____ – ____

Product series

SMB

Product size

14 = SMB 14

Type of monitoring

0 = without monitoring, for nozzle, 570–960 l/min
1 = without monitoring, for nozzle, 1 000–1 270 l/min
2 = with monitoring for ATEX
3 = without monitoring for ATEX
4 = with electrical monitoring [1], for nozzle, 570–960 l/min
5 = with electrical monitoring [1], for nozzle, 1 000–1 270 l/min

Flow rate

Plug-in nozzle size = see table below

ATEX

ATEX = on request, only for ATEX design (EX II 2G c TX Gb, EX II 2D c TX Db), without monitoring or with piston detector

[1] with electrical monitoring, (PNP technology, 24 V DC) continuous pulse sequence, proportional to volumetric low

SMB 14 plug-in nozzle

Order number	Flow rate [1]		Nozzle
	l/min	*pts/min*	∅ mm
44-0455-2357	25	*52.8*	5,70
44-0455-2360	30	*63.4*	6,30
44-0455-2363	35	*73.9*	6,80
44-0455-2365	40	*84.5*	7,30
44-0455-2367	45	*95.1*	7,80
44-0455-2369	50	*105.7*	8,20
44-0455-2371	55	*116.2*	8,70
44-0455-2373	60	*126.8*	9,10
44-0455-2374	65	*137.4*	9,60
44-0455-2375	70	*147.9*	10,00
44-0455-2376	75	*158.5*	10,40
44-0455-2377	80	*169.0*	10,80
44-0455-2378	90	*190.2*	11,70
44-0455-2379	100	*211.3*	12,70
44-0455-2385	105	*221.9*	13 10
44-0455-2380	110	*232.4*	13 50
44-0455-2381	116	*245.1*	14 00
44-0455-2386	120	*253.6*	14 40
44-0455-2382	132	*278.9*	15 30

[1] at an operating viscosity of 300 mm2/s

SMB 14 group monitoring

Order number	Designation
84-8011-0380	IPM 12 pulse meter
84-8011-0390	IPM 12 pulse meter with connection socket for PGA 3

SMB 14 low limiter

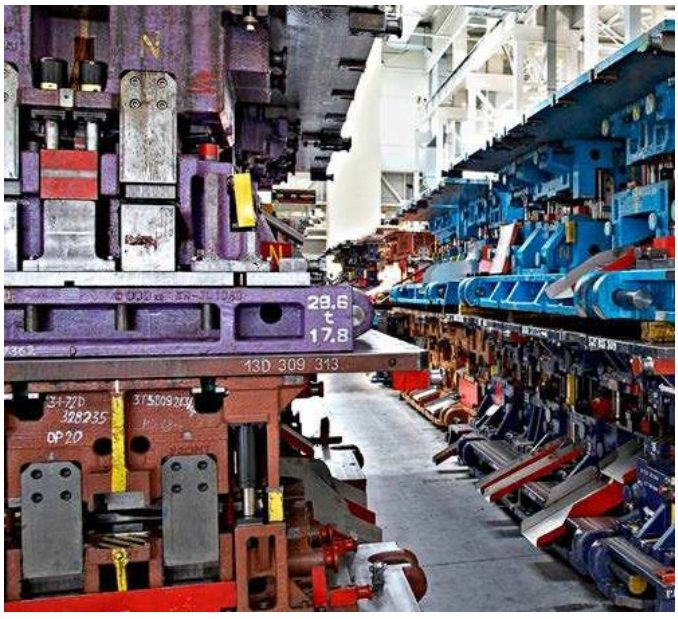
Order number	Designation
24-1883-3017	SMB 14 without nozzle, with electrical monitoring

SMB 14 accessories

Order number	Designation
44-0758-2049	sight glass, D45×12
24-0404-2311	gasket set: gasket D32/45×05 O-ring 44×3 O-ring 90×3
24-1882-2029	socket

Progressive metering device

PSG1



Description

The PSG1 is a progressive metering device consisting of a baseplate and different metering sections that can be individually combined for speciic outlet ratios and cross portings The ports are part of the baseplate, so that connectors and tubes remain in place when segments need to be changed

Features and beneits

- Easy servicing as outlets are located on baseplate
- Flexible due to exchangeable metering segments
- Visual or electrical monitoring possible
- Dummy segments with no output available
- Adjustable by consolidating outlets internally or externally

Applications

- Automobile presses
- Paper machines
- Tunnel boring machines

Technical data

Function	segmented progressive metering device
Outlets	6 to 20
Lubricant	grease: up to NLGI 2 mineral and synthetic oils; min viscosity 12 mm²/s
Metering quantity	per cycle and outlet:
min	0,05 cm ; *0.003 in*
max	0,25 cm ; *0.015 in*
Flow rate	*max. 0,8 l/min; 0.17 pts/min*
Operating temperature	*–15 to +110 °C; 5 to 230 °F*
Operating pressure [1]	200 bar; *2 900 psi*
Material	
baseplate:	aluminum alloy
sections:	steel galvanized
Inlet connection	G 1/8
Outlet connection	G 1/8
Protection class	IP 67
Dimensions	min 90 × 55 × 41 mm max 244 × 55 × 41 mm *min. 3.54 × 2.17 × 1.61 in* *max. 9.61 × 2.17 × 1.61 in*
Mounting position:	
on machines without vibration	any
on machines with vibration	piston position should be 90° to machine's movement direction

[1] Operating pressure may be lower depending on design with monitoring or attachments

PSG1 accessories

Order number	Designation
466-419-001	Closure plug for baseplate outlet incl washer
24-2151-3760	Crossporting bridge, 2 outlets [1]
24-2151-3762	Crossporting bridge, 2 outlets, with outlet port [1]
24-2151-3764	Crossporting bridge, 2 outlets, with outlet port and check valve [1]

[1] bridges are approved for a maximum operating pressure of 100 bar; crossporting bridge also available for 3 outlets; see brochure

NOTE

Further technical information, technical drawings, accessories, spare parts or product function descriptions available on SKF com/lubrication:

14389EN; 951-230-013

3D

skf-lubrication partcommunity com/3d-cad-models

Progressive metering device

PSG1

Identiication code PSG1 X X X

Product series

Monitoring
X = none
3 = 3-pin piston detector, M12×1 plug
Y = cycle indicator, visual plunger rod [1) 2)]
S = cycle indicator with bracket and proximity switch [1) 2)]
G = cycle indicator with bracket for proximity switch (without proximity switch) [1) 2)]

Position of monitoring device [2)]
X = none

A = left, section 1	B = right, section 1
C = left, section 2	D = right, section 2
E = left, section 3	F = right, section 3
G = left, section 4	H = right, section 4
J = left, section 5	K = right, section 5
L = left, section 6	M = right, section 6
N = left, section 7	P = right, section 7
Q = left, section 8	R = right, section 8
S = left, section 9	T = right, section 9
U = left, section 10	V = right, section 10

Connector baseplate inlet [3)]
X = none
A = tube ∅6 mm
B = tube ∅8 mm
C = tube ∅10 mm

Sections
= to be conigured in the section conigurator below

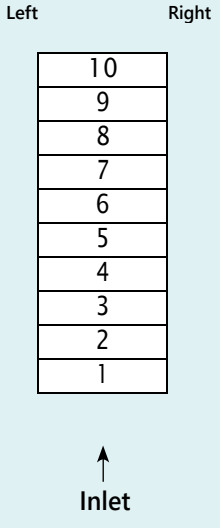
Identiication code – –

Section (minimum 3 sections) [4)]
X = dummy section

A = 0,05 cm³/cycle [5)]	B = 0,10 cm³/cycle
E = 0,25 cm³/cycle	D = 0,20 cm³/cycle

Outlet connector left
S = outlet closed by screw plug [6)]
X = outlet without itting

Outlet connector right
S = outlet closed by screw plug [6)]
X = outlet without itting



1) Only on 200 and 250 mm³ section sizes
2) Installation on irst or last section is not recommended
3) Solderless pipe union with cutting sleeve per DIN 2353
4) The volume per section is equal on both sides
5) If possible, do not place in irst position when designing metering device
6) Metering device only operates with one side (left or right) outlet closed per section

Progressive metering device

PSG2

Description

The PSG2 is a progressive metering device consisting of a baseplate and different metering sections that can be individually combined for speciic outlet ratios and cross portings The ports are part of the baseplate, so that connectors and tubes remain in place when segments need to be changed

Features and beneits

- Easy servicing due to outlet location
- Flexible with exchangeable metering segments
- Visual or electrical monitoring available
- Increased corrosion-resistant material
- Adjustable output by consolidating outlets internally or externally

Applications

- Automobile presses
- Tunnel boring machines
- Paper machines

Technical data

Function	segmented progressive metering device
Outlets	6 to 20
Lubricant	grease: up to NLGI 2 mineral and synthetic oils; min viscosity of 12 mm²/s
Metering quantity	per cycle and outlet:
min	0,06 cm ; *0.0037 in*
max	0,84 cm ; *0.051in*
Flow rate	*max. 2,5 l/min; 5.3 pts/min*
Operating temperature	*–15 to +110 °C; +5 to +230 °F*
Operating pressure [1]	200 bar; *2 900 psi*
Material	
baseplate:	aluminium alloy or anodized
sections:	steel or nickel plated
Inlet connection	G 1/4
Outlet connection	G 1/4
Protection class	IP67
Dimensions	min 131 × 86 × 71 mm max 327 × 86 × 71 mm *min. 5.16 × 3.39 × 2.80 in* *max. 12.87 × 3.39 × 2.80 in*
Mounting position:	
on machines without vibration	any
on machines with vibration	piston position should be 90° to machine movement direction
Options	low limiter

[1] Operating pressure may be lower depending on design with monitoring or attachments

PSG2 accessories

Order number	Designation
466-419-001	Closure plug for baseplate outlet incl washer
24-2151-3760	Crossporting bridge, 2 outlets [1]
24-2151-3762	Crossporting bridge, 2 outlets, with outlet port [1]
24-2151-3764	Crossporting bridge, 2 outlets, with outlet port and check valve [1]

[1] Bridges are approved for a maximum operating pressure of 100 bar; crossporting bridge also available for 3 outlets, see brochure

NOTE

Further technical information, technical drawings, accessories, spare parts or product function descriptions available on SKF com/lubrication:

14389 EN; 951-230-01

3D

skf-lubrication partcommunity com/3d-cad-models

Progressive metering device

PSG2

Identiication code PSG2 X

Product series

Monitoring
X = none
3 = 3-pin piston detector, M12×1 plug
Y = cycle indicator, visual plunger rod [1]
S = cycle indicator with bracket and proximity switch [1]
G = cycle indicator with bracket for proximity switch (without proximity switch) [1]

Position of monitoring device [2]
X = none

A = left, section 1	B = right, section 1
C = left, section 2	D = right, section 2
E = left, section 3	F = right, section 3
G = left, section 4	H = right, section 4
J = left, section 5	K = right, section 5
L = left, section 6	M = right, section 6
N = left, section 7	P = right, section 7
Q = left, section 8	R = right, section 8
S = left, section 9	T = right, section 9
U = left, section 10	V = right, section 10

Attachments
F = SMB 8 low limiter with nominal volume up to 1 56 l/min
G = SMB 8 low limiter with nominal volume from 1 67 l/min
K = gear-type low indicator

Plug-in nozzle for low limiter

see PUB 14389 EN; p 15

Connector baseplate inlet[3]
X = none

A = tube ∅6 mm	C = tube ∅10 mm
B = tube ∅8 mm	D = tube ∅12 mm

Sections

= to be conigured in the section conigurator below

Section conigurator [4] – –

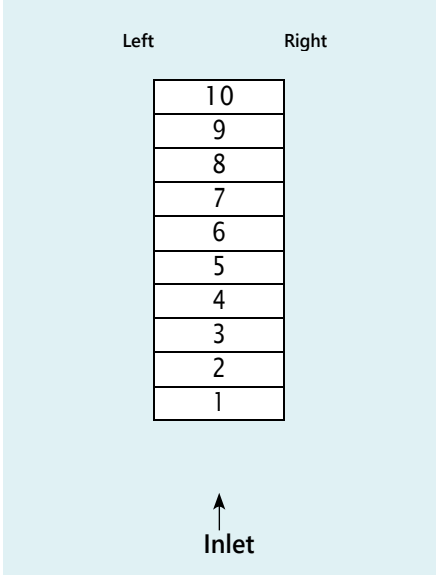
Section (minimum 3 sections) [4]
x = dummy section

F = 0,06 cm³/cycle [5]	K = 0,48 cm³/cycle
G = 0,12 cm³/cycle	L = 0,60 cm³/cycle
H = 0,24 cm³/cycle	M = 0,72 cm³/cycle
J = 0,36 cm³/cycle	N = 0,84 cm³/cycle

Outlet connector left
S = outlet closed by screw plug [6]
X = outlet without connector

Outlet connector right
S = outlet closed by screw plug [6]
X = outlet without connector

1) Only on section sizes L (0,60 cm³)
2) Installation on irst or last section is not recommended
3) Solderless pipe union with cutting sleeve per DIN 2353
4) The volume per section is equal on both sides
5) If possible, do not place in irst position when designing metering device
6) Metering device only operates with one side (left or right) outlet closed per section



Progressive metering device

PSG3

Description

The PSG3 is a progressive metering device consisting of a baseplate and different metering sections that can be individually combined for speciic outlet ratios and cross portings The ports are part of the baseplate, so that connectors and tubes remain in place when segments need to be changed

Features and beneits

- Easy servicing as outlets are located on baseplate
- Flexible with exchangeable metering segments
- Visual or electrical monitoring available
- Increased corrosion-resistant material available
- Dummy segments without output available
- Adjustable output by consolidating outlets internally or externally
- Main metering device in oil circulation systems

Applications

- Automobile presses
- Paper machines
- Tunnel boring machines

Technical data

Function	segmented progressive metering device
Outlets	6 to 20
Lubricant	grease up to NLGI 2 mineral and synthetic oils; min viscosity 12 mm²/s
Metering quantity	per cycle and outlet:
min	0,80 cm³ *0.049 in³*
max	3,20 cm³ *0.195in³*
Flow rate	*max. 6 l/min; 12.7 pts/min*
Operating temperature	*–15 to +110 °C;+5 to +230 °F*
Operating pressure [1]	200 bar *2 900 psi*
Material	
baseplate:	aluminium alloy or anodized
sections:	steel galvanized or nickel plated
Inlet connection	G 3/8
Outlet connection	G 1/4
Protection class	IP 67
Dimensions	min 165 × 108 × 88 mm max 466 × 108 × 88 mm *min. 6.50 × 4.25 × 3.46 in* *max. 18.35 × 4.25 × 3.46 in*
Mounting position:	
on machines without vibration	any
on machines with vibration	piston position must be in 90° angle to machine's movement direction
Options	low limiter

[1] Operating pressure may be lower depending on design with monitoring or attachments

PSG3 accessories

Order number	Designation
DIN908-R1-4-5 8	Closure plug for baseplate outlet
508-108	Washer for closure plug
24-2151-3734	Crossporting bridge, 2 outlets [1]
24-2151-3736	Crossporting bridge, 2 outlets with outlet ports [1]

[1] Crossporting bridges are approved for a maximum operating pressure of 100 bar; crossporting bridge also available for 3 outlets, see brochure

NOTE

Further technical information, technical drawings, accessories, spare parts or product function descriptions available on SKF com/lubrication:

14389 EN; 951-230-013

3D

skf-lubrication partcommunity com/3d-cad-models

Progressive metering device

PSG3

Identiication code PSG3 X

Product series

Monitoring
X = none
3 = 3-pin piston detector, M12×1 plug
Y = cycle indicator, visual plunger rod [1]
S = cycle indicator with bracket and proximity switch [1]
G = cycle indicator with bracket for proximity switch (without proximity switch) [1]

Position of monitoring device [2]
X = none

A = left, section 1	B = right, section 1
C = left, section 2	D = right, section 2
E = left, section 3	F = right, section 3
G = left, section 4	H = right, section 4
J = left, section 5	K = right, section 5
L = left, section 6	M = right, section 6
N = left, section 7	P = right, section 7
Q = left, section 8	R = right, section 8
S = left, section 9	T = right, section 9
U = left, section 10	V = right, section 10

Attachments
F = SP/SMB 8 low limiter with nominal volume up to 1 56 l/min
G = SP/SMB 8 low limiter with nominal volume from 1 67 l/min
K = gear-type low indicator

Plug-in nozzle for low limiter

see PUB 14389 EN; p 22

Connector baseplate inlet [2]

X = none	D = tube ∅12 mm
B = tube ∅8 mm	F = tube ∅16 mm
C = tube ∅10 mm	E = tube ∅15 mm

Sections

= to be conigured in the section conigurator below

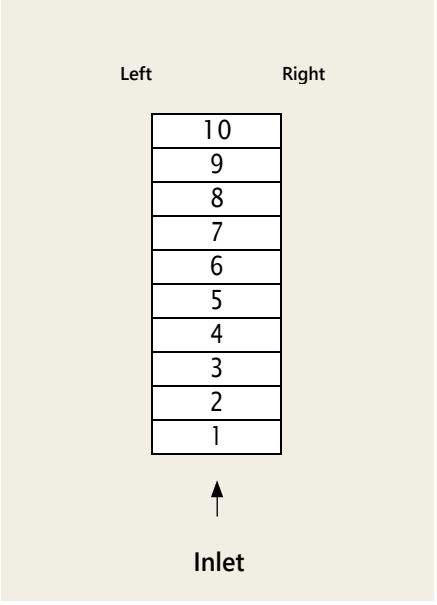
Section conigurator – –

Section (minimum 3 sections) [3]

X = dummy section	R = 1,60 cm³/cycle
P = 0,80 cm³/cycle [4]	S = 2,40 cm³/cycle
Q = 1,20 cm³/cycle	T = 3,20 cm³/cycle

Outlet itting left
S = outlet closed by screw plug [5]
X = outlet without itting

Outlet itting right
S = outlet closed by screw plug [5]
X = outlet without itting



[1] Installation on irst or last section is not recommended
[2] Solderless pipe union with cutting sleeve per DIN 2353
[3] The volume per section is equal on both sides
[4] If possible, do not place in irst position when designing metering device
[5] Metering device only operates with one side (left or right) outlet closed per section

Progressive metering device

VP

Description

The VP type metering device is a sectional metering device Its metering sections cover a metering volume per outlet and cycle of 0,1 cm³ (T-section = 2 outlets) to 1,2 cm³ (S-section = 1 outlet) All sections (inlet, intermediate, end) are tightened via tie rods The delivery ducts are sealed by porting plates in between the segments A minimum of three intermediate sections is necessary

Features and beneits

- Volumetric low of up to 1,0 l/min; *2.1 pts/min*
- Universal use in continuous or intermittent operation
- Metering sections with variable metering amount
- Internal and external consolidation of outlets
- Visual or electrical monitoring optional
- Ideal as main metering device
- All outlets with built-in, non-return valves

Applications

- Preferred master metering device
- Metal forming machines
- Vehicles, trucks
- Construction and mining
- Packaging machines
- General industry
- Farm machinery

Technical data

Function	sectional metering device
Outlets	6 to 20
Lubricant	grease up to NLGI 2; environmentally friendly mineral and synthetic oils; viscosity min 12 mm²/s
Metering quantity	per cycle and outlet: 0,1–1,2 cm³; *0.006–0.073 in³*
Flow rate	1 l/min; *2.1 pts/min*
Operating temperature	–25 to +90 °C; *-13 to 194 °F*
Operating pressure	oil: 200 bar: *2 900 psi* grease: 200 bar; *2 900 psi*
Material:	
inlet, separator and end plate	steel, galvanized/NBR
sections/piston plate	steel, galvanized
Inlet connection:	
VPM / VPG	M14 × 1,5 / G 1/4
Outlet connection:	
VPM / VPG	M10 × 1 / G 1/8
Protection class	IP 67
Dimensions	min 98 × 82,5 × 41 mm max 238 × 82,5 × 41 mm *min. 3.86 × 3.25 × 161 in* *max. 9.37 × 3.25 × 161 in*
Mounting position:	
on machines without vibration	any
on machines with vibration	piston position must be in 90° angle to machine's movement direction

NOTE

Further technical information, technical drawings, accessories, spare parts or product function descriptions available on SKF com/lubrication:

15400EN, 951-230-008 EN

3D

skf-lubrication partcommunity com/3d-cad-models

Progressive metering device

VP

Identiication code VP _ _ A _ _ _ X _

Product series

Connections
M = M14×1,5 inlet thread; M10×1 outlet thread
G = G $^1/_4$ inlet thread; G $^1/_8$ outlet thread

Monitoring
X = none
2 = 2-pin piston detector, M12×1 plug
3 = 3-pin piston detector, M12×1 plug (wire breaking detection)
Y = cycle indicator, visual (plunger rod) [1]

Plug-on
A = low limiter SMB 8 with nominal volume up to 1,09 l/min; *2.3 pts/min*

Plug-in nozzle for low limiter
see PUB 1-3016 EN, p 12

Position of monitoring device [2]
X = none
A = left, section 1
C = left, section 2
E = left, section 3
G = left, section 4
J = left, section 5
L = left, section 6
N = left, section 7
D = right, section 2
F = right, section 3
H = right, section 4
K = right, section 5
M = right, section 6
P = right, section 7
Q = left, section 8
S = left, section 9
U = left, section 10
R = right, section 8
T = right, section 9
V = right, section 10

Inlet connector [2] [3]
X = none
A = VPM straight connector, tube ∅6 mm (L)
D = VPM straight connector, tube ∅8 mm (S)
E = VPM straight connector, tube ∅10 mm (L)
F = VPM straight connector, tube ∅12 mm (L)
B = VPG straight connector, tube ∅6 mm (S)
C = VPG straight connector, tube ∅8 mm (L)
E = VPG straight connector, tube ∅10 mm (L)
F = VPG straight connector, tube ∅12 mm (L)

Sections
= to be conigured in the section conigurator below

Section conigurator [4] – –

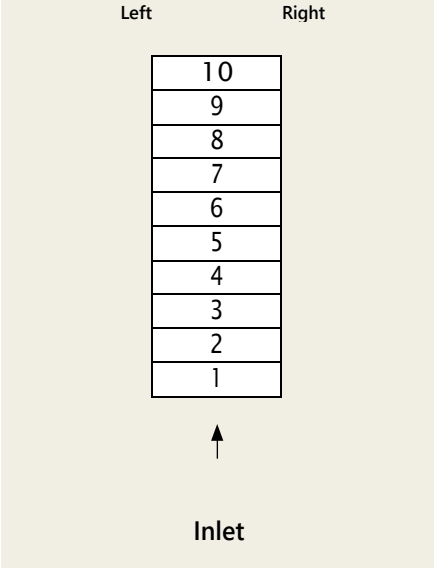
Section (minimum 3 sections)

Single
D = 0,20 cm³/cycle
F = 0,40 cm³/cycle
H = 0,60 cm³/cycle
K = 0,80 cm³/cycle
M = 1,00 cm³/cycle
Q = 1,20 cm³/cycle

Twin
C = 0,10 cm³/cycle
E = 0,20 cm³/cycle
G = 0,30 cm³/cycle
J = 0,40 cm³/cycle
L = 0,50 cm³/cycle
N = 0,60 cm³/cycle

Outlet connector left
S = outlet closed by screw plug [5]
X = outlet without itting

Outlet connector right
S = outlet closed by screw plug [5]
X = outlet without itting



[1] The installation of the cycle indicator is only possible from metering device section 2T and 2S, respectively!
[2] Solderless pipe unions with cutting sleeve acc to DIN 2353
[3] LL-series = extra light version, L-series = light version, S-series = heavy-duty version
[4] Repeat this entry according to number of selected sections (1 to 10)
[5] Metering device only operates with one side (left or right) outlet closed per section

LINCOLN

Overview of oil circulation control units and software

Control units

Product	Function type	Operating temperature max		Electrical connection		Page
		°C	°F	V DC	V AC	
ST-2240-CIRC	Control unit	–20 to +70	-4 to +158	–	93–132 / 5 4 A 186–264 / 2 2 A	90
PGA 3	Programming and display unit	–20 to +70	-4 to +158	24 / 170 mA	–	91

Control and monitoring software

Product	Function type	Metering device to be used with	Connection interface	Page
SKF Flowline Software	Software	SKF Flowline Monitor low meters	USB or SKF Flowline HUB (LAN)	92
SKF Variolub Software	Software	IPM 12 pulse meter	USB	93

Control unit

ST-2240 CIRC

Description

The SKF Control Centre ST-2240-CIRC is a stand-alone controller for oil circulation lubrication systems It comes with a touch screen and remote smart phone option It is a lexible and cost-effective solution for controlling and monitoring oil circulation lubrication systems It comes with an easy-to-use touch screen interface, machine interlocking and various communication protocol

Features and beneits

- Automatic and manual pump change
- Control of output pressure, output oil temperature and oil reservoir heating and ilter pressures
- Automatic cold start-up mode
- By-pass valve control

Applications

- Pulp and Paper, metals industry
- Mining, mineral processing and cement
- Power plants

Technical data

Function	control unit
Operating temperature [1)]	-20 to +70 °C;*-4 to +158 °F*
Power supply	93-132 V AC / 5 4 A 186-264 V AC / 2 2 A 47-63 Hz
Instrument power supply	Internal power supply 24 V DC / 10A
Display	5 7 TFT touch screen, 64k color
Ports	Ethernet for remote control via web browser or mobile app for Android and iPhone/iPad USB for log and trend memory Modbus TCP for DCS (data control system) interface
Control unit	SKF ST-105
Communication	2 Modbus ports for VFD and display communication RS232/CAN interface for Flowline monitor communication
Input	4 analog/digital 4 20 A 6 digital 10 mA
Output	8 digital 24V / 2A 2 relay outputs for alarm and interlocking
Protection class	IP 65
Dimensions	380 × 380 × 210 mm *14.96 × 14.96 × 8.27 in*
Mounting position	vertical

ST-2240

Order number	Designation
12380707	ST-2240-CIRC
on request	ST-2240-SUMP
on request	power stack for ST-2240-CIRC

NOTE

Further technical information, technical drawings, accessories, spare parts or product function descriptions available on SKF com/lubrication:
14257 EN

Programming and display unit

PGA 3

Description

The PGA 3 programming and display unit is an input device for the IPM 12 pulse meter It is used to parameterize the IPM 12 and display current low rates of the IPM 12 connected to it It can be used to transfer data to a customer data control system or a condition monitoring system via an OPC interface (Ethernet) The PGA 3 mobile version is used for maintenance purposes
Its function and design is identical

Features and beneits

- Portable version available
- Easy handling
- Easy-to-read display
- Interface to condition monitoring system
- Interface to customer data control system (DCS)

Applications

- Pulp and paper industry
- Metals industry
- Automobile body presses
- Machine tools

Technical data

Function	programming and display unit
Operating temperature [1)]	–20 to +70 °C; *–4 to +158 °F*
Operating voltage	24 V DC
Power consumption	170 mA
Interfaces	ethernet LAN interface RS 232 / 422 / 485, serial interface
Indicating range	1 – 9999 pulse/min or 0,01 – 99 l/min; *0.00 – 26.15 gal/min*
Display	approx 62 × 44 mm; *2.44 × 1.73 in*
Display precision	± 2%
Protection class	IP 65
Dimensions	with housing: 191 × 161 × 57 mm; *75.3 × 6.34 × 2.24 in*
Mounting position	any

PGA 3

Order number	Designation
84-8011-0402	PGA 3 mobile including connection cable
84-8011-0401	PGA 3 mobile
84-8011-0400	PGA 3 stationary
24-6882-5010	Connection cable for PGA 3 mobile

NOTE
Further technical information, technical drawings, accessories, spare parts or product function descriptions available on SKF com/lubrication:
1-3022-EN; 951-180-003 EN

Software

SKF Flowline Software

Description

The SKF Flowline Software is designed as a stand alone monitoring software for SKF Flowline Monitor low meters It collects and processes information on current states of all connected low meters and records trends A detailed visualization enables the operator to track down each alarm signal from the factory view to the individual panel and low meter The software provides detailed information on each lubrication point

Features and beneits

- Full overview of all connected low meters
- Traceability down to the lubrication point
- Compatibility with Canbus, Modbus, Proibus, Proinet

Applications

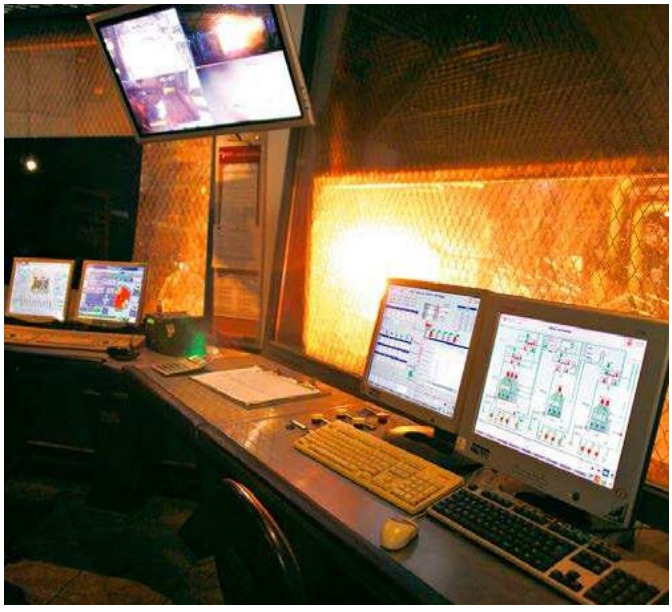
- Pulp and paper industry
- Metals industry
- Mining, mineral processing and cement

SKF Flowline Software

Order number	Designation
13399500	Flowline Software Version 2 with Flowline Hub
13399510	Flowline Software Version 2 with Flowline Hub and Bus Gateway
13399520	Flowline Software Version 2 with USB interface
13399540	Flowline Software Version 2 with Ethernet interface
13399560	Flowline Software Version 2 with RS232 interface

Software

SKF Variolub Software



Description

The SKF Variolub Software offers an inexpensive solution for the set-up of the IPM 12 pulse meter It can be downloaded to a laptop computer for maintenance purposes in the ield and directly communicates with the IPM 12 connected to it Set points can be deined for each individual lube point whereas the alarm limits are set as a common parameter for each IPM 12 Inputs currently not in use can be switched off

Features and beneits

- Human Machine Interface for parameter setting
- Connector cable to connect a laptop computer (Sub-D9) to the IPM 12 pulse meter (M12)
- Adaptor Sub-D9 – USB optional

Applications

- Pulp and paper industry
- Metals industry
- Automobile body presses

SKF Variolub Software

Order number	Designation
84-8013-0001	Software IPM 12V1 01
24-6882-5003	Connection cable laptop RS 232
44-2392-2694	USB RS 232 adapter

Overview of oil circulation monitoring devices

Level switches

Product	Function type	Operating temperature max		Electrical connection		Page
		°C	°F	V DC	V AC	
WS 32 / 33 / 35	level switch	–10 to +80	*+14 to 175*	230	230	96
WS-63-2	level switch	–10 to +80	*+14 to 175*	200	240	98
WS 68	level switch	–10 to +80	*+14 to 175*	48	48	98

Monitoring and indication devices

Product	Function type	Operating temperature max		Electrical connection		Page
		°C	°F	V DC	V AC	
171-210	low monitor	+5 to 80	*+41 to 176*	–	250 / 0,5 A	100
IPM 12	pulse meter	0 to +70	*+32 to 158*	24 ±15%; 0,15 A	–	102
SFZ	gear wheel indicator hall sensor	0 to +70	*+32 to 158*	24 ±10%; 20 mA	–	104

Level switch

WS 32 / 33 / 35

Description

Fill level switches monitor the ill level in non-pressurized luid reservoirs To meet different requirement, ill level switches either have one or two switching points If ill level switches have one switching point (WS32), the minimum ill level in the reservoir is monitored Fill level switches with two switching points either monitor the minimum and maximum ill levels in the reservoir so the illing stops automatically when the maximum level is reached (WS33), or they monitor the minimum ill level and have an early warning function (WS35) The latter version gives a signal before a critical oil level in the reservoir is reached so oil can be topped off before the machine stops working Other ill level switches are available on request, e g with three switching points

Features and beneits

- Easy mounting
- Different plug sizes
- Various switching points

Applications

- Machine tools
- Printing
- Automation

Technical data

Function	level switch
Lubricant	mineral and synthetic oils; viscosity max 1 500 mm²/s
Operating temperature	−10 to +80 °C; *+14 to 175 °F*
Material	Aluminium, CuZn, NBR, PP
Switching points :	
WS 32	1
WS 33, WS35	2
Switching element	reed contact
Switching voltage	230 V AC, 230 V DC
Switching capacity max	60 VA / 40 W
Switching current max	1 A
Switching point settings	100–1 600 mm; *3.94–63 in*
Protection class	IP 65
Dimensions	
WS32	min 100–1 600 × 52 × 52 mm *min. 3.94-63 × 2 × 2 in*
WS33	max 120–600 × 52 × 52 mm max *4.72-23.6 × 2 × 2 in*
WS 35	max 120–1 600 × 52 × 52 mm max *4.72–63 × 2 × 2 in*
Mounting position	vertical

NOTE

Further technical information, technical drawings, accessories, spare parts or product function descriptions available on SKF com/lubrication:
1-1702-EN

Level switch

WS 32 / 33 / 35

Identiication code

Product series

Switching points [1]

Code	Designation
32	Minimum ill level
33	Minimum and maximum ill levels
35	Early warning and minimum ill level

[1] gasket included

Plug connector and visual monitoring

Code	Designation
S10	Circular connector with cable socket and LED
2	Square connector with cable socket, without LED
S30	Circular connector M12×1 with LED
2-V57-A	Circular connector ×1 without LED

Lengths keys for ill level switch

Lenght	Designation					
	WS32	WS33	WS33	WS33	WS33	WS35
mm	–	50	100	150	65	–
110	C25	–	–	–	–	–
120	C17	V69	V69	–	–	C17
130	B27	Y72	Y72	–	–	B27
140	B97	X16	X16	–	–	B97
150	C08	X41	X41	Z06	–	C08
160	E08	X24	X24	–	–	E08
170	D84	X07	X07	–	–	D84
180	B53	X22	X22	–	–	B53
190	E77	Y91	Y91	–	–	E77
200	B31	V85	V85	Y87	–	B31
210	D42	ZE7	ZE7	–	–	D42
220	C52	V86	V86	–	–	C52
230	C81	V27	V27	–	–	C81
240	C79	Z49	Z49	–	–	C79
250	B44	X46	X46	V23	ZG4	B44
260	F01	Y69	Y69	–	–	F01
270	D54	ZL8	ZL8	–	–	D54
280	C04	X98	X98	–	–	C04
290	D65	X84	X84	–	–	D65
300	B37	X76	X76	V75	–	B37
325	E28	–	–	–	–	E28
350	B46	X86	X86	V21	–	B46
375	D13	–	–	–	–	D13
400	B95	V74	V74	V43	–	B95
425	D56	–	–	–	–	D56
450	L69	Y85	Y85	–	–	L69
475	E30	–	–	–	–	E30
500	B28	V49	V49	V17	Y77	B28
550	B48	–	–	–	–	B48
600	B51	–	–	X93	–	B51
650	C65	–	–	–	–	C65
700	F94	–	–	–	–	F94
750	E54	–	–	–	–	E54
800	F29	–	–	–	–	F29
850	F53	–	–	–	–	F53
900	L24	–	–	–	–	L24
1 000	B70	–	–	–	–	B70
1 100	B84	–	–	–	–	B84
1 200	F49	–	–	–	–	F49
1 300	F77	–	–	–	–	F77
1 400	L06	–	–	–	–	L06
1 500	F83	–	–	–	–	F83
1 600	L34	–	–	–	–	L34

Level switch

WS63-2

Description

Fill level switches monitor the ill level in non-pressurized luid reservoirs To suit different requirement, the ill level switches either have one or two switching points WS63-2 series has only one switching point and electric contact opens with dropping oil level The switch can be turned by 180° to make the electric contacts close with rising oil level

Features and beneits

- Compact design
- Dropping and rising oil level monitoring

Applications

- Machine tools
- Printing
- Automation

Technical data

Order number	**WS63-2**
Function	level switch
Lubricant	mineral and synthetic oils; viscosity max 1 500 mm²/s
Operating temperature	−10 to +80 °C; *+14 to 175 °F*
Material	PP, Aluminium, NBR
Switching voltage	240 V AC, 200 V DC
Switching capacity max	100 VA / 50 W
Switching current max	0,5 A
Switching points	1
Protection class	IP 65
Dimensions	55 × 55 × 131 mm *2.17 × 2.17 × 5.16 in*
Mounting position	horizontal

NOTE

Further technical information, technical drawings, accessories, spare parts or product function descriptions available on SKF com/lubrication:

1-1702-EN

Level switch

WS68

Description

Fill level switches monitor the ill level in non-pressurized luid reservoirs To suit different requirement, the ill level switches either have one or two switching points WS 68 series has only one switching point, and electric contact opens with dropping oil level

Features and beneits

- Compact design
- Dropping and rising oil level monitoring

Applications

- Machine tools
- Printing
- Automation

Technical data

Order number	**WS68**
Function	level switch
Lubricant	mineral and synthetic oils; viscosity max 1 500 mm²/s
Operating temperature	−10 to +80 °C; *+14 to 175 °F*
Material	NBR, Aluminium, PA
Switching voltage	48 V AC/DC
Switching capacity max	10 VA / 10 W
Switching current max	0,25 A
Switching points	1
Protection class	IP 65
Dimensions	53 × 53 × 62 mm *2.09 × 2.09 × 2.44 in*
Mounting position	horizontal

NOTE

Further technical information, technical drawings, accessories, spare parts or product function descriptions available on SKF com/lubrication:

1-1702-EN

Flow monitor

171-210

Description

Flow monitors are minimum low detector switches They represent an inexpensive solution for the monitoring of smaller oil circulation lubrication systems or critical lubrication points in systems that generally are not equipped with individual low monitoring

Features and beneits

- Effective monitoring of minimum oil low
- Wide low range
- Available in ive ranges but with identical outer dimensions
- High operating temperature

Applications

- Automotive industry
- Metal forming
- Machine tools
- Heavy industry

Technical data

Function	Flow switch
Lubricant	mineral oils; viscosity 20–1 000 mm²/s [1]
Flow rate	0,05–14 l/min; *0.013–3.70 gal/min*
Operating temperature	+5 to 80 °C; *+41 to 176 °F*
Operating pressure [1]	4–25 bar; 5*8–363 psi*
Electrical connection	change-over 250 V AC / 0,5 A
Inlet connection	depending on model: M10×1, M18×1,5
Outlet connection	M18×1,5
Material:	
Housing	die-cast zinc, polyamide
Seals	NBR (FKM on request)
Protection class	IP 65
Dimensions	min 90 × 47 × 34 mm max 101 × 47 × 34 mm *min. 3.54 × 1.85 × 1.33 in* *max. 3.98 × 1.85 × 1.33 in*
Mounting position	any

[1] If the low monitors are equipped with metering restrictors, at least 6 bars are required in the feed line

NOTE

Further technical information, technical drawings, accessories, spare parts or product function descriptions available on SKF com/lubrication:

1-1704-EN, 951-170-232

3D

skf-lubrication partcommunity com/3d-cad-models

Flow monitor

171-210

Flow monitor 171-210-05

Order number	Flow rate		Connection inlet	outlet
	l/min	*gal/min*		
171-210-051	0,05–0,1	*0.01–0.03*	M10×1	M18×1,5
171-210-052	0,1–0,2	*0.03–0.05*	M10×1	M18×1,5
171-210-053	0,2–0,5	*0.05–0.13*	M10×1	M18×1,5
171-210-054	0,5–0,8	*0.13–0.21*	M10×1	M18×1,5
171-210-055	0,8–1,8	*0.21–0.48*	M10×1	M18×1,5

Flow monitor 171-210-06

Order number	Flow rate		Connection inlet	outlet
	l/min	*gal/min*		
171-210-061	1,6–2,5	*0.42–0.67*	M18×1,5	M18×1,5
171-210-062	2,3–4,0	*0.61–1.06*	M18×1,5	M18×1,5
171-210-063	3,6–6,0	*0.95–1.59*	M18×1,5	M18×1,5
171-210-064	5,5–10,0	*1.45–2.64*	M18×1,5	M18×1,5
171-210-065	8,0–14,0	*2.11–3.70*	M18×1,5	M18×1,5

Connection ittings for 171-210-05 [1]

Inlet connection	Tube ∅	Union nut	Cutting ring	Adapter	Washer
	mm				
M10×1	6	**406-302**	**406-301**	**GD60 02**	**504-019**
M10×1	8	**408-302**	**408-301**	**GD80 02**	-
M10×1	10	**410-302**	**410-301**	**GD100 02**	-

Connection ittings for 171-210-06 [1]

Inlet connection	Tube ∅	Functional nut
	mm	
M18×1,5	12	**460-212-001**

Connection ittings [1]

Outlet connection	Tube Ø	Adapter
	mm	
M18×1,5	6	**473-806-391**
M18×1,5	8	**473-808-392**
M18×1,5	10	**473-810-391**

[1] Port tapped for solderless cutting-sleeve screw union to DIN 2353, connection piece without restrictor, straight screw-in connector

Pulse meter

IPM 12

Description

The IPM 12 pulse meter is used to monitor the functionality of oil circulation metering devices like restrictor valve metering devices, low limiters or progressive metering devices It allows for the monitoring of as many as 12 lubrication points per pulse meter, each point being assigned to one input of the IPM 12 Thanks to its modular design, the IPM 12 easily can be adapted to machines and systems at any time Based on speciied values entered via a programming unit or programming software, each lubrication point is monitored individually with LEDs indicating in the event of malfunctions or alarms Also, relay contacts signal alarms to the process control level

Features and beneits

- Easy wiring and installation
- Modular design for simple system extension
- RS 232 interface
- Easy parameter set-up

Applications

- Pulp and paper industry
- Metals industry
- Automobile body presses

Technical data

Function	pulse meter
Operating temperature	0 to +70 °C; *+32 to 158 °F*
Connection type	screw terminal 1,5 mm²
Electrical data	
Operating voltage	24 V DC ±15%
Power consumption	0,15 A
Interface	RS 232
Transmission rate	9 600 baud
Signal amplitude	± 9 V
Signal inputs	12 [1] pulse generator inputs, min pulse width 20 ms
Signal outputs	2 change-over switches (isolated)
Switching voltage	max 250 V AC
Switching current	max 2 A
Switching capacity	250 VA
Protection class	IP 64
Dimensions	200 × 120 × 93 mm *7.87 × 4.72 × 3.66 in*
Mounting position	any
Options	PNP initiators, three-wire technology as per Namur, two-wire technology 24 V DC contactor, max 15 mA

[1] The start-up mode and the external reset signals require free inputs In case these signals are used, the number of pulse inputs is reduced accordingly

NOTE

Further technical information, technical drawings, accessories, spare parts or product function descriptions available on SKF com/lubrication:
1-3022-EN; 951-180-003 EN

Pulse meter

IPM 12

IPM 12
for the use with Variolub, SMB 9, 10, 13, 14

Order number	Designation
84-8011-0380	IPM 12 pulse meter without connection socket for PGA 3 mobile
84-8011-0390	IPM 12 pulse meter with connection socket for PGA 3 mobile

IPM 12
for the use with SMB 3, 6, 8

Order number	Designation
84-8011-0369	group monitoring unit

IPM 12 accessories

Order number	Designation
24-6882-5002	connection socket for PGA 3
24-6882-5010	connection cable for PGA 3

Gear wheel indicator

SFZ

Description

The SFZ product series offers robust low monitoring even under harsh environmental conditions Its gear-wheel measuring principle is based on the low limiter technology

Features and beneits

- Three designs with metering ranges from 0 to 180 l/min *(0 to 380 pts/min)*
- Robust aluminium body
- Sight glass for visual monitoring
- Gear-wheel-type measuring principle

Applications

- Pulp and paper industry
- Metals industry
- Mining
- Mineral processing
- Cement
- Automobile body presses

Technical data

Function	gear wheel indicator
Lubricant	mineral and synthetic oils; viscosity 20-600 mm^2/s
Operating temperature [1)]	0 to +70 °C; *+32 to 158 °F*
Operating pressure	6-50 bar *87–725 psi*
Flow rate	
SFZ 9/6/1; SFZ 9E/6/1:	0,09-8,2 l/min*; 0.19-17.3 pts/min*
SFZ 9E30/1:	6-30 l/min; *12.7–63.4 pts/min*
SFZ 9E100/1:	25-132 l/min; *52.8–279 pts/min*
SFZ 9E180/3:	max 180 l/min; *max. 380 pts/min*
Electrical connection	hall sensor
Voltage	24 VDC ±10%; 20mA
Material	Al, Cu, Mg, Pb
Protection class	IP 65
Dimensions	min 80 × 80 × 75 mm max 190 × 180 × 150 mm *min. 3.1 × 3.1 × 3.0 in* *max. 190 × 180 × 150 in*
Mounting position	any

Gear wheel indicator

SFZ

SFZ

Order number	Designation	Monitoring	Connection	Flow rate	
				l/min	*pts/min*
24-2581-2150	SFZ 9/6/1	visual	G 3/8	0,09–8,2	*0.19–17.3*
24-2581-2151	SFZ 9E/6/1	electrical	G 3/8	0,09–8,2	*0.19–17.3*
24-2581-2155	SFZ 9E30/1	electrical	G 3/4	6–30	*12.7–63.4*
24-2581-2156	SFZ 9E100/1	electrical	G 1 1/4	25–132	*52.8–279*
24-2581-2550	SFZ 9E180/3	electrical	G 1 1/4	max 180	*max. 380*


169-460-255

Overview of oil circulation system accessories

Filters

Product	Function type	Operating temperature max		Filter rating	Operating pressure max		Page
		°C	°F	µm	bar	psi	
169-460-	oil ilter	–30 to +100	-22 to 212	3–50	100	1450	108
169-400-	ilter elements	–30 to +100	-22 to 212	3–50	30	435	108
176-200-	dirt indicators	–30 to +100	-22 to 212	3–50	–	–	108

Filter

169-460-...

Description

SKF pressure ilter series 169-460 are standard oil ilters according to DIN 24550 They are modular in design with a ilter housing (ilter head/ ilter body), a ilter element and a screw plug Optionally a dirt indicator can be selected instead of the screw plug The pressure ilters are used as line ilters in the pipes of the CircOil lubrication system for separating solids from the luids Two kinds of ilter elements are available Fiberglass leece – disposable elements based on inorganic ibers (absolute iltration) or wire fabric (nominal iltration) The dirt indicator monitors the ilter element and signals when it needs to be replaced

Features and beneits

- Prevents system or component failures and extends system live due to signiicant reduction of solids
- Economical, reliable and maintenance-friendly operation
- Compact and modular design mountable directly into pipes
- Wide range of volumetric low up levels and grades of iltration
- Optimized service handling by replacing of ilter elements only
- Dirt monitoring of ilter elements as an option

Applications

- General mechanical and plant engineering
- Shipbuilding and offshore industry
- Pulp and paper industry
- Heavy industry

Technical data

Function	oil ilter
Lubricant	mineral and synthetic oils; viscosity 20-1 000 mm²/s
Operating temperature	-30 to +100 °C; *-22 to 212 °F*
Operating pressure	max 100 bar *max. 1450 psi*
Pressure difference:	
Fiberglass leece	Δp 30 bar; *435 psi*
Dirt indicators	Δp 5 bar; *72.5 psi*
Collapse pressure resistance:	
Fiberglass leece	20 bar; *290 psi*
Wire fabric	30 bar; *435 psi*
Volumetric low up	40 l, 63 l, 100 l; *10.6, 16.6, 26.4 gal*
Filter ratings	3 to 50 µm
Material:	
Housing	Aluminum
Sealing material	FKM
Filter	Fiberglass leece-inorganic-absolute iltration, wire fabric-stainless steel-nominal iltration
Connecting thread (ISO 228)	G 1/2
Dimensions	min 92 × 82 × 186 mm max 92 × 82 × 426 mm *min. 3.62 × 3.3 × 7.32 in max. 3.62 × 3.3 × 16.77 in*
Mounting position	vertical

NOTE

Further technical information, technical drawings, accessories, spare parts or product function descriptions available on SKF com/lubrication:
1-0116-EN; 1-0103-EN; 995-901-056 EN

Filter

169-460-...

Filter

Filter complete	Volumetric low		Filter element	Filter rating	Dirt renetation		Filter material	Dirt indicator, display	Housing
	l	*gal*		µm	g	cm^2			
169-460-261	40	*10.6*	**169-400-260-V57**	3	5,2	–	Fiberglass leece	**176-200-012**	**853-880-011**
169-460-269	40	*10.6*	**169-400-260-V57**	3	5,2	–	Fiberglass leece	**833-030-014**	**853-880-011**
169-460-273	40	*10.6*	**169-400-260-V57**	3	5,2	–	Fiberglass leece	**176-200-013**	**853-880-011**
169-460-279	40	*10.6*	**169-400-260-V57**	3	5,2	–	Fiberglass leece	**176-200-014**	**853-880-011**
169-460-280	40	*10.6*	**169-400-260-V57**	3	5,2	–	Fiberglass leece	**176-200-011**	**853-880-011**
169-460-262	40	*10.6*	**169-400-250**	10	6,3	–	Fiberglass leece	**176-200-012**	**853-880-011**
169-460-264	63	*16.6*	**169-400-252**	10	11,3	–	Fiberglass leece	**176-200-012**	**853-880-012**
169-460-266	100	*26.4*	**169-400-254**	10	18,6	–	Fiberglass leece	**176-200-012**	**853-880-013**
169-460-270	40	*10.6*	**169-400-250**	10	6,3	–	Fiberglass leece	**176-200-014**	**853-880-011**
169-460-274	40	*10.6*	**169-400-250**	10	6,3	–	Fiberglass leece	**176-200-013**	**853-880-011**
169-460-287	40	*10.6*	**169-400-252**	10	11,1	–	Fiberglass leece	**176-200-014**	**853-880-012**
169-460-286	63	*16.6*	**169-400-286**	20	–	–	Fiberglass leece	**176-200-013**	**853-880-012**
169-460-263	40	*10.6*	**169-400-255**	25	7	–	Fiberglass leece	**176-200-012**	**853-880-011**
169-460-265	63	*16.6*	**169-400-253**	25	12,8	–	Fiberglass leece	**176-200-012**	**853-880-012**
169-460-267	100	*26.4*	**169-400-256**	25	20,6	–	Fiberglass leece	**176-200-012**	**853-880-012**
169-460-271	40	*10.6*	**169-400-255**	25	7	–	Fiberglass leece	**833-030-014**	**853-880-011**
169-460-276	40	*10.6*	**169-400-255**	25	7	–	Fiberglass leece	**176-200-010**	**853-880-011**
169-460-278	40	*10.6*	**169-400-255**	25	7	–	Fiberglass leece	**176-200-013**	**853-880-011**
169-460-288	63	*16.6*	**169-400-253**	25	12,8	–	Fiberglass leece	**176-200-010**	**853-880-012**
169-460-284	40	*10.6*	**169-400-185-V57**	25	–	440	Wire fabric	**176-200-014**	**853-880-011**
169-460-259	40	*10.6*	**169-400-251**	50	–	440	Wire fabric	**833-030-014**	**853-880-011**
169-460-272	40	*10.6*	**169-400-251**	50	–	440	Wire fabric	**176-200-013**	**853-880-011**
169-460-282	40	*10.6*	**169-400-251**	50	–	440	Wire fabric	**176-200-009**	**853-880-011**

Dirt indicators

Order number	Indication	Switching type	Electrical connections	Switching points
176-200-009	Electrical/Optical	1× NO-contact / 1× NC-contact	M12×1 / 4-pin	75% / 100%
176-200-010	Electrical/Optical	1× NO-contact / 1× NC-contact	M12×1 / 4-pin / LED, Cold start suppression 30°C	75% / 100%
176-200-011	Electrical/Optical	2× NC-contact	–	75% / 100%
176-200-012	Electrical/Optical	1× NO-contact / 1× NC-contact	–	75% / 100%
176-200-013	Optical	–	–	–
176-200-014	Electrical	Change-over contact	DIN EN 175301-803-A	–

Filter elements

Order number	Designation
169-400-260-V57	3 µm; NG 40
169-400-257	3 µm; NG 63
169-400-250	10 µm; NG 40
169-400-252	10 µm; NG 63
169-400-254	10 µm; NG 100
169-400-286	20 µm; NG 63
169-400-185-V57	25 µm; NG 40
169-400-253	25 µm; NG 63
169-400-255	25 µm; NG 40
169-400-256	25 µm; NG 100
169-400-251	50 µm; NG 40

Filter accessories

Order number	Designation
833-030-014	Closure plug
853-880-011	Filter housing, without reverse low rate NG 40
853-880-012	Filter housing, without reverse low rate NG 63
853-880-013	Filter housing, without reverse low rate NG 100
881-280-050	Mounting bracket for 3-liter plastic and metal reservoir
881-280-044	Retaining plate for 6-liter plastic reservoir
881-290-270	Filter plate for 6-liter metal reservoir
881-290-271	Filter plate for 15-liter metal reservoir
881-290-272	Filter plate for 30-liter metal reservoir
881-290-273	Filter plate for 50-liter metal reservoir

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Notes

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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