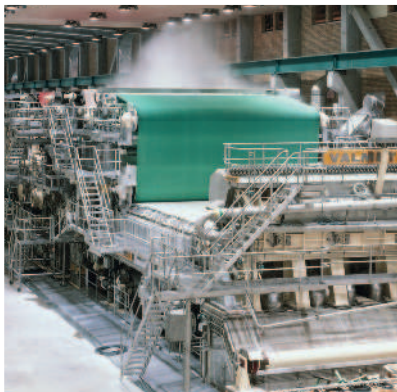
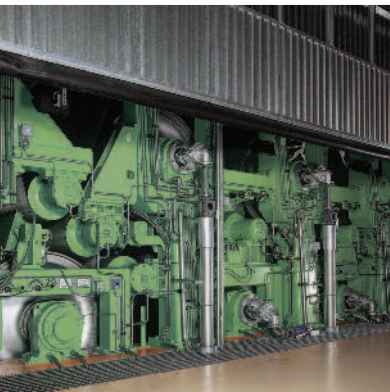
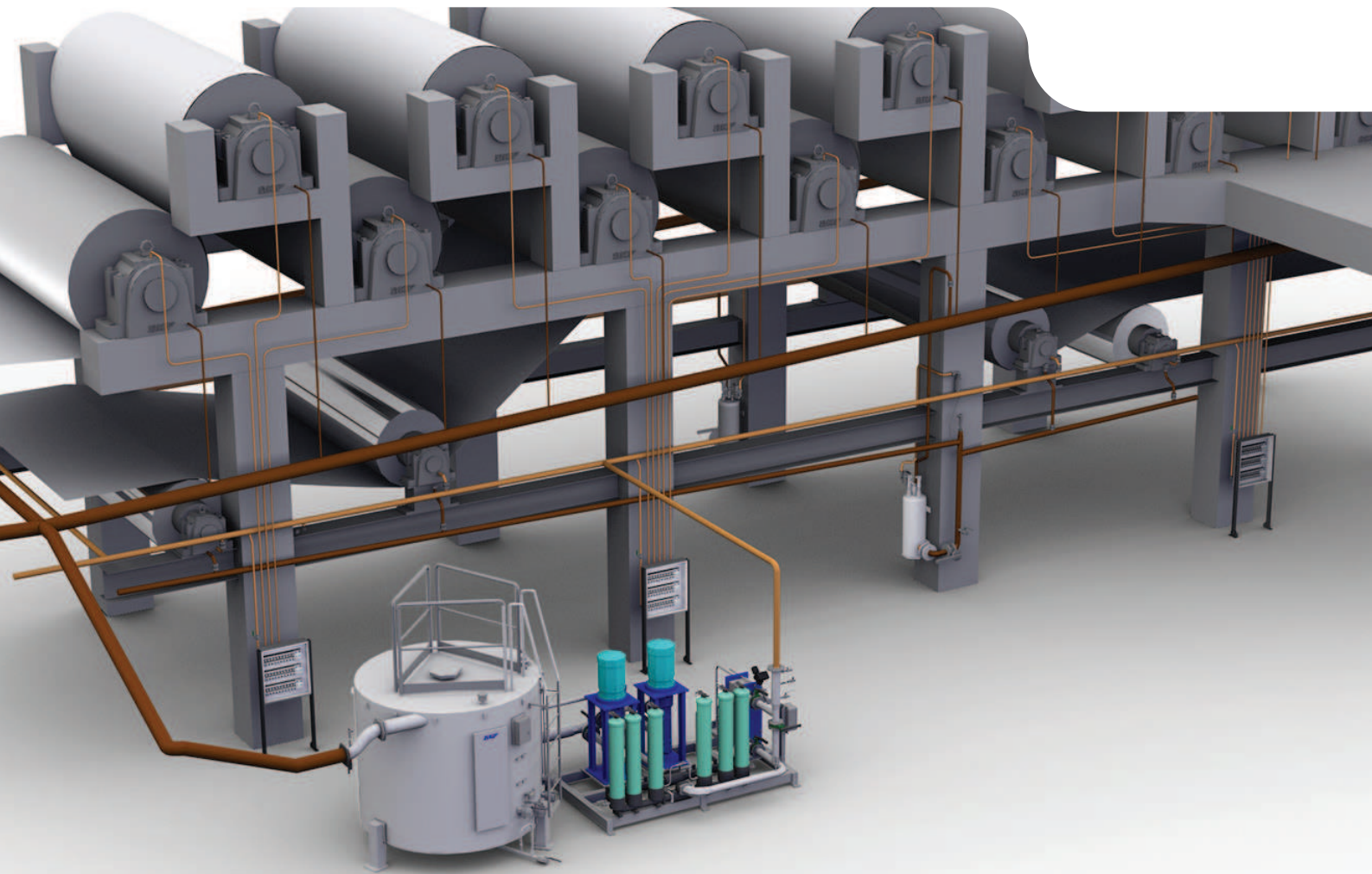


# SKF Flowline

for circulating oil lubrication systems



# SKF Flowline boosts your circulating oil system's efficiency

Circulating oil systems are used in heavy industry for lubrication, cooling and particle removal. SKF's high-quality Flowline system provides accurate lubrication and optimal operating conditions as a stand-alone solution for all circulating oil lubrication purposes.

With the SKF Flowline system, the right amount of oil is metered to each lubrication point while an integrated controller ensures that the operating parameters remain constant.

The unique Flowline pumping unit reconditions the lubricant by eliminating contaminants such as abrasive and oxidized particles, air bubbles and water. The high quality oil is then sent back to the lubrication points.



## Benefits:

- Increases machine reliability and reduced downtime
- Reduces oil purchasing, handling and disposal costs
- Energy and oil savings
- Increases efficiency
- Decreases the risk of damaging lubrication points
- Improves environmental safety
- Improves free water and air removal from lubrication oil
- Provides better oil conditioning and extended bearing life

## Applications:

Bearing, gearbox and fan lubrication in the following industries:

- Pulp and paper
- Mining, mineral processing and cement
- Steel
- Power plants
- Renewable energy

The compact and modular SKF Flowline circulating oil lubrication system product family consists of the following components:

- Flowline pumping unit
- ST-2240 control centre
- Flowline monitor
- Flowline sump



# SKF – a total solution provider

From system design to training, SKF provides a full range of lubrication services including:

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



## SKF Flowline environmental friendly solution

In traditional oil circulating systems, less than 50% of the oil is in effective circulation. SKF utilized its significant lubrication knowledge, genuine innovation and research and testing to address this situation, resulting in a unique solution.

Using SKF Flowline tank technology, more than 90% of the oil is in effective circulation. It also removes more free water and air from

the oil. This reconditioning efficiency, combined with high circulation efficiency, allows smaller oil tanks to be used.

In SKF Flowline pumping stations, the outgoing oil flow and pressure are controlled by electrical motors with variable frequency drives. This directly reduces the energy consumption by 10–20% compared to a traditional relief valve control. This solution elimi-

nates the need for oversized main pumping station components such as pumps, motors, heat exchanger and filters.

As a result of these two innovations, the consumption of oil, energy and cooling water can be more significantly reduced.

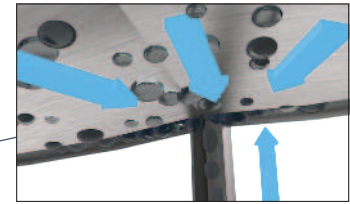
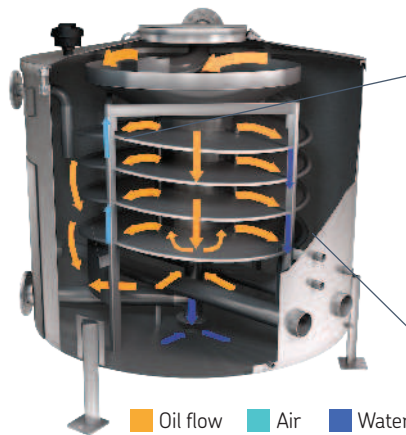


# SKF Flowline for efficient pumping

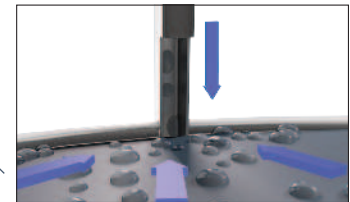
Compared to traditional circulation lubrication systems, SKF Flowline is an advanced solution, resulting in greater system efficiency and optimal lubrication.

## Features and benefits:

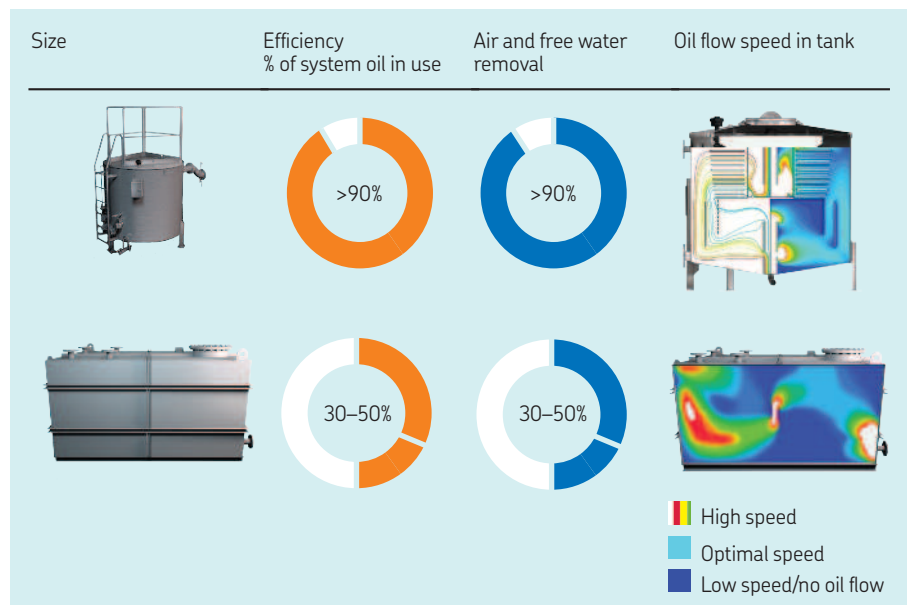
- Cylindrical, patented tank design with unique SKF plate separator technology: Operational efficiency is more than 90%, while a traditional tank has only 30–50% efficiency. This results in:
  - Advanced removal of air bubbles and free water; Flowline removes up to 80% more air and water than a traditional tank
  - Tank volume is only 30–50% of what it was earlier with traditional design and less installation space is needed (an advantage in rebuilds)
  - Reduces oil purchasing, handling and disposal costs
  - Minimizes amount of material with fire or environmental risk
- Saves energy and oil by using variable frequency drives for pressure control  
Compact unit structure with oil tank, pumps, filters, heaters, coolers and valves  
Normal operating pressure is 4 to 6 bar; maximum pressure is 10 bar  
Stainless steel materials



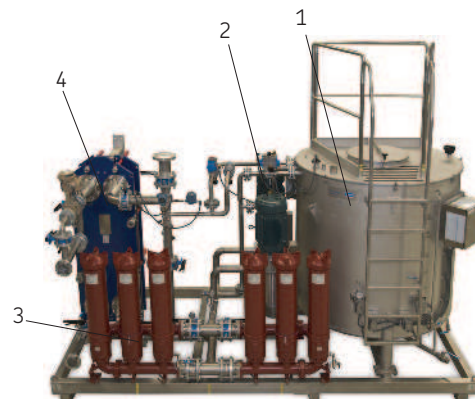
Air removal from the oil



Water removal from the oil



The figure reveals how effectively the SKF Flowline tank separates and eliminates free water and air bubbles from oil compared to the traditional design.



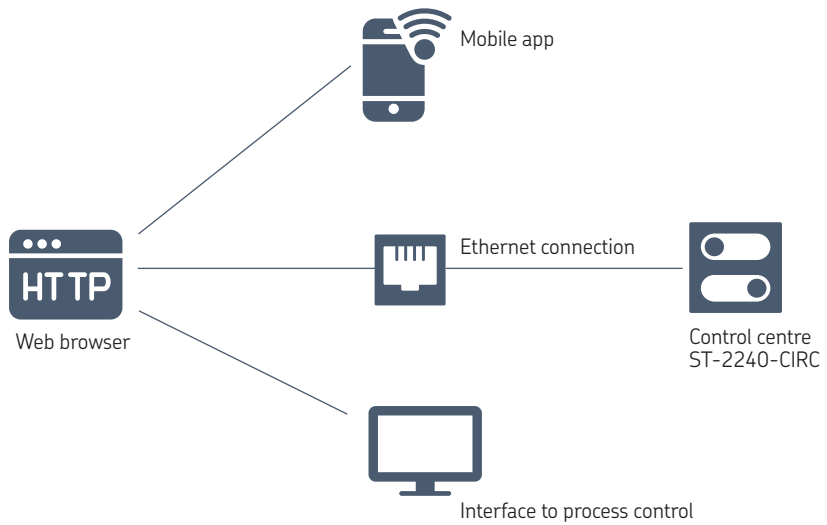
- 1 Oil tank
- 2 Pumps
- 3 Filters
- 4 Heat exchanger

# Control centre ST-2240-CIRC

The control centre has many state-of-the-art features such as cold system start-up logic, interface to the process control system and remote access with smartphones and web browsers. It offers a modern, flexible and cost-effective solution to control and monitor a large range of oil circulation lubrication systems.

## Features and benefits:

- Automatic and manual pump change
- Control
  - Output pressure, output oil temperature and oil reservoir heating
- Monitoring
  - Total oil flow with SKF Flowline monitors, filter pressure loss, return oil temperature and tank oil level
- Automatic cold start-up mode
  - Automatic cold start pressure control by return oil temperature
- By-pass valve control
- Machine interlocking
- Easy user interface with clear main operations, 5,7 inch touch screen and colour display
- Communication connections and data collection
  - Ethernet port for
    - Remote control via web browser
    - Remote control via mobile app
    - Modbus TCP for DCS interface
    - USB-port for log and trend memory
- Protection class IP65



The block contains several elements related to the control centre:

- 1 Main screen:** A pressure trend graph showing pressure over time (26/06/2013) with a setpoint of 4.0 bar.
- 2 Operation panel:** A parameter adjustment screen with fields for Pressure setpoint (4.0bar), Pressure alarm limit (2.0bar), Temperature setpoint (50.0C), Coldstart pressure (2.0bar), TS3 low coldstart temp. (25.0C), and TS3 high coldstart temp. (30.0C).
- 3 Alarm list:** A log of events including Filter alarm (PDS), Pumping is off, Pump changed, and Filter alarm (PDS) with timestamps and status (ACTIVE, RTN).
- 4 Parameter pages:** A control panel with buttons for MAIN PUMP (1, 2), PUMP HEATING (OFF, ON), and HEATING (ON, OFF). It also shows measured values for pressure (4.0bar), temperature (36.3C), and flow (5.0 l/min).
- 5 Trend pages:** A schematic diagram of the lubrication system showing components like PDS (4.8bar), LS1, LS2, TS3, TS2, and H-.

Physical control cabinet: A grey metal cabinet with a 5.7-inch color touch screen and several indicator lights and buttons.

- 1 Main screen
- 2 Operation panel
- 3 Alarm list
- 4 Parameter pages
- 5 Trend pages

### Further information

Brochure **PUB LS/P2 14257 EN**

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

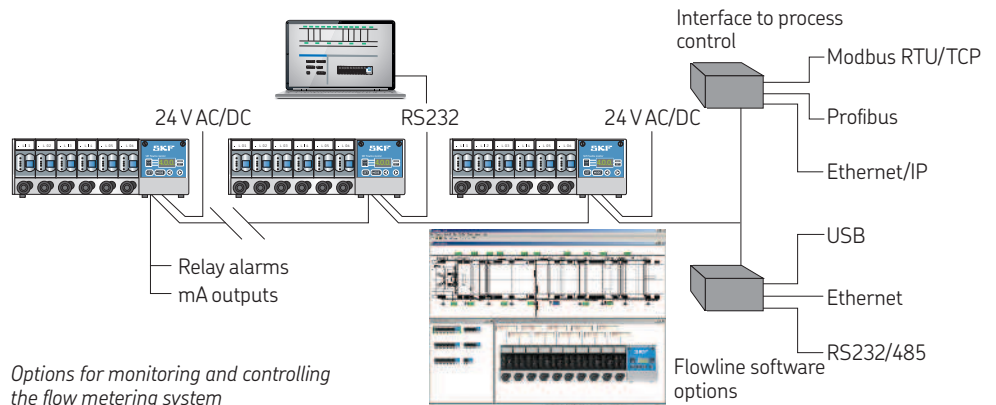
# SKF Flowline monitor – provides oil flow rate control and monitoring

With the Flowline monitor, SKF introduces a digital dimension for measuring and controlling flow rates of circulating oil lubrication systems. The monitor is available with up to 10 flow meters that can be adjusted and programmed individually. SKF Flowline's user friendly visual design allows operators to see the flow rate status of each individual lubrication point.



## Features and benefits:

- Control and monitoring system to meet customer requirements:
  - Adjustment range from 0,1 to 100 l/min
  - Modular monitoring capabilities with fieldbus and relay or analogue outputs
- Reliable operation:
  - Electronic temperature measurement and temperature-compensated measuring results
  - Minimal pressure loss due to turbine-based metering technology
- Easy-to-use interface:
  - LED indication with traffic light feature
  - User-friendly keypad
  - Special design in flow control valve



Options for monitoring and controlling the flow metering system

## SKF Flowline software

- Designed for Windows
- Computer configuration possible with RS232 interface
- CAN –bus interface allows remote monitoring and configuration of entire measuring system

## Interface to process control

- Common alarm relay output
- Flow meter-specific alarms or versatile common alarm outputs via the optional relay module

### Further information

Brochure **PUB LS/P2 17175 EN**

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

### SKF Flowline monitor oil flow metering at a viscosity of 220 mm<sup>2</sup>/s

Designation	Flow rate		Number of meters
	l/min	pt/min	
FL15	0,1–15,0	0,2–30,0	2, 4, 6, 8, 10
FL50	15–50	30–100	1
FL100	50–100	100–200	1

# SKF Flowline sump and telescopic pipe for return oil handling

## Flowline sump

Circulation lubrication systems can include lubrication points that are below the main return line, such as lower fabric rolls in a paper machine dryer section.

Oil from these lubrication points does not drain back to the tank by gravity. For these types of lubrication points, SKF has invented a cost-effective solution – the SKF Flowline sump unit.

This pneumatically operated sump unit enables splitting return piping located below the main return line into smaller and more cost-effective groups without trespassing machine lines and/or walkways.

### Features and benefits:

- Reliable operation; few mechanical moving parts
- Small space requirement
- Advantageous way to pump oil to the main return line
- Stand-alone operation due to simple oil-level control
- No pumps or motors
- Typical running time is every 5 minutes with pumping time of 30 seconds



### SKF Flowline sump

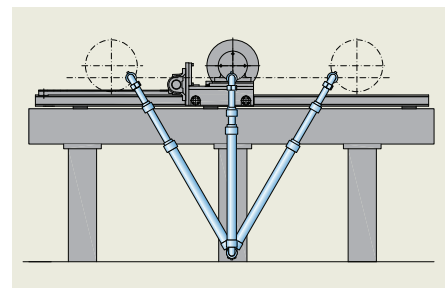
Operating volume	12 l	25 pt
Gross volume	20 l	42 pt
Pumping capacity	0–15 l/min	0–31 pt/min
Consumption of compressed air	0–100 l/min	0–22 gl/min
Maximum compressed air demand	350 l/min	79 gl/min
Required pressure for compressed air	5 bar, max 8 bar	72 psi, max. 116 psi
Power supply	24 V DC, 2 W	

## Telescopic pipe

SKF has developed a special telescopic pipe for return lines of moving lubrication points. The pipe was designed for a paper machine environment but could be used in all horizontally or vertically moving lubrication points.

### Features and benefits:

- Robust design and material selections resist wear and the environment
- Rigid pipe design secures oil flow to return line and minimizes leakage
- Does not require any guiding devices or extra space because of telescopic design
- Easy to install
- Telescopic pipe installation
- Long service life
- Available in different lengths and diameters



*Telescopic pipe installation*





#### **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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