

SKF Flowline Monitor

Flow rate control and monitoring for oil circulation lubrication systems



Reliable flow rate control and monitoring

Oil circulation systems are used for lubrication, cooling and particle removal in pulp and paper, mining and many other heavy industry applications. The SKF Flowline Monitor was developed to measure and control the oil flow rates in these lubrication systems.

The SKF Flowline Monitor is simple to use and allows operators to see the flow rate status of each individual lubrication point. The three different FL types enable control and monitoring of oil flows from 0,1 to 100 l/min with operating oil viscosities from 32 to 1 000 mm²/s.

Utilizing Windows-based software, Flowline's RS232 interface makes computer configuration possible. Its Controller Area Network (CAN bus) interface enables remote monitoring and configuration of the system.

Regardless of oil temperature and viscosity changes, the SKF Flowline Monitor provides accurate monitoring results. The flow rate is calculated by measuring the turbine rotation time, compensating the result by considering the viscosity grade entered by the user, and the oil temperature measured by the on-board temperature sensor.

Flowline Monitor versions

SKF Flowline Monitor versions FL15, FL50 and FL100 are suitable for oil flows ranging from 0,1 l/min to 100 l/min. All three versions can be ordered either with BSP (R) or NPT (U) threads.

Typical applications:

Flow control and monitoring in oil circulation systems are utilized in:

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

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

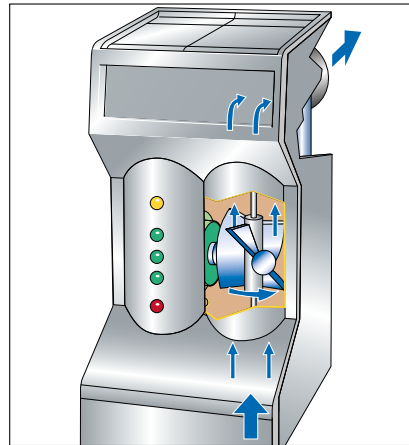


Energy efficient and accurate operation



User-friendly keypad

The SKF Flowline Monitor's keypad is easy to operate. Flow rates and settings can be viewed on the digital display. All settings can be adjusted using the keypad.



Traffic light feature

The LED indicators in the flow meters show a visual indication of oil flow volume. Any deviation from set point can be detected by the different LED indicator colours.

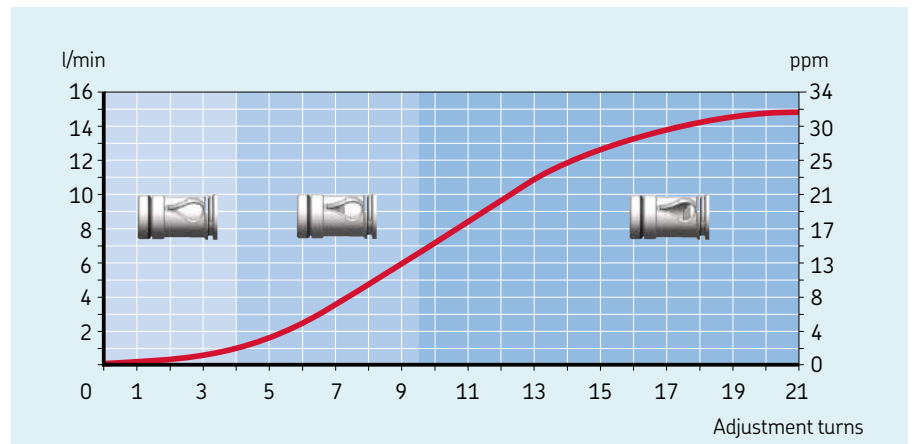
Red indicates that the flow rate is below the low alarm-limit value and yellow indicates that the flow rate is above the high alarm-limit value. When the green LED indicators are on, the flow rate is within tolerance. This makes it possible to control the system visually in the production facility during routine control checks without the necessity of using the keypad.

Control valve and adjustment range

The special design of the control valve, together with a sensitive turbine, provides an excellent adjustability over the entire flow range.



Flow control valve



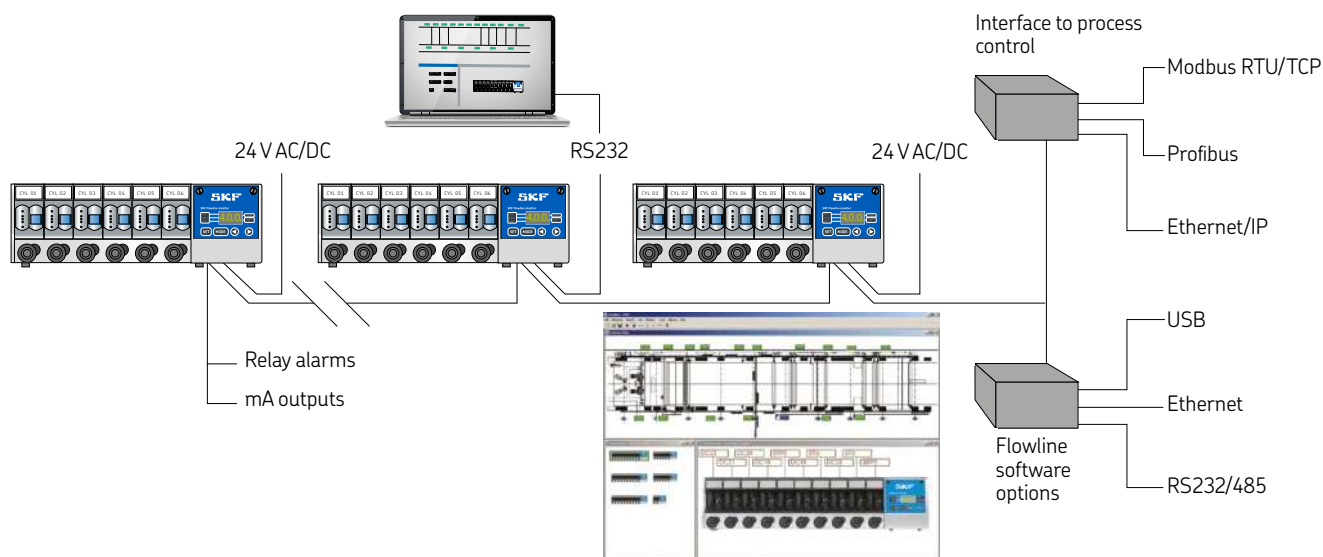
Flow curve

Modular system to meet customer's monitoring requirements

A standard SKF Flowline Monitor includes one common alarm, which is included in basic FL group electronics. In addition to the standard version, optional modular interfaces make it easy to choose the right monitoring options for your solution:

- CAN module with CAN bus connections
- Analogue module with 4-20 mA output for each lubrication point
- RC module with combined relay and CAN bus connections (RCM)

There is a reserved slot for this optional module in all SKF Flowline Monitor models: FL15, FL50 and FL100.

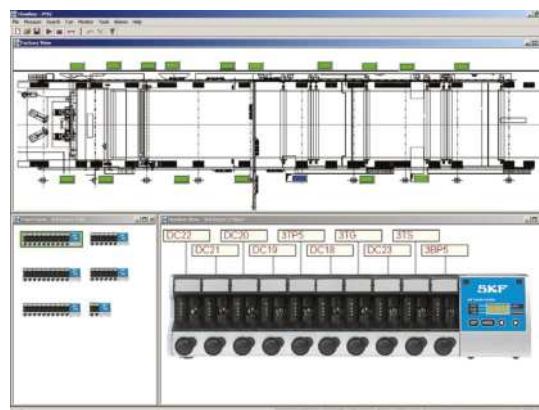


Software

The Windows-based SKF Flowline Software is the user interface for the centralized control system. With SKF Flowline Software, the user can monitor and control the operation of the measuring system, display flow rates and alarms, and modify settings such as flow rate alarm limits of flow meters. SKF Flowline Software collects continuous flow rate data, oil temperature and alarm trends.

SKF Flowline software also can be used for servicing and configuration of a single SKF Flowline Monitor. To accomplish this, a laptop with serial port is then needed.

Flow rate data and flow meter status information can be transmitted to the user's local control system through a built-in DCS-interface.



CAN module

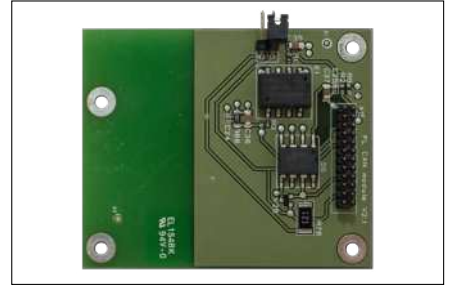
The CAN bus interface is used for connecting the monitors to remote control and monitoring systems. Various fieldbus alternatives are available for connecting to customer's DCS systems by using standard CAN/Fieldbus gateways:

- Modbus RTU
- Modbus TCP
- Profibus
- Ethernet/IP

SKF Flowline Hub and Flowline Software can be used with CAN bus interface to build a stand-alone, PC-based control and monitoring system.

Applications:

- Systems where one or several lubrication points must be monitored individually or are located in a wide area
- Paper machine dryer sections, etc.



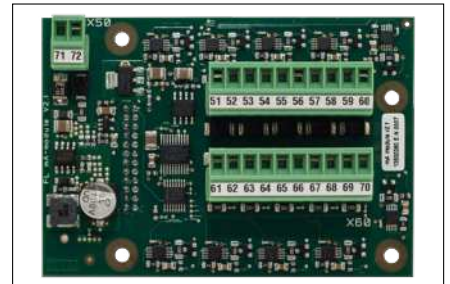
Analogue module with 4–20 mA

A FL mA module is a plug-in interface board for the SKF Flowline Monitor. It features 10 independent channels for low-rate-dependent, scalable analogue output of each flow meter.

The power supply and current loops have galvanic isolation from the supply voltage of the Flowline Monitor.

Applications:

- Systems where only a few lubrication points must be monitored
- Analogue output is required
- Fans, pumps, etc.



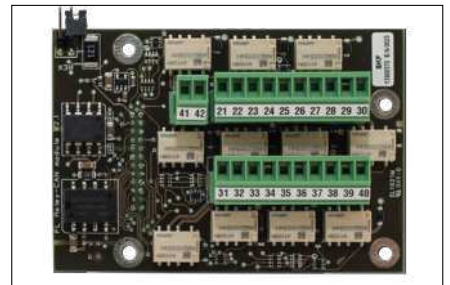
RC module

The relay and CAN module (RCM) provides CAN bus communication, individual flow meter alarms or specified common alarms, depending on the operational mode selected by the user:

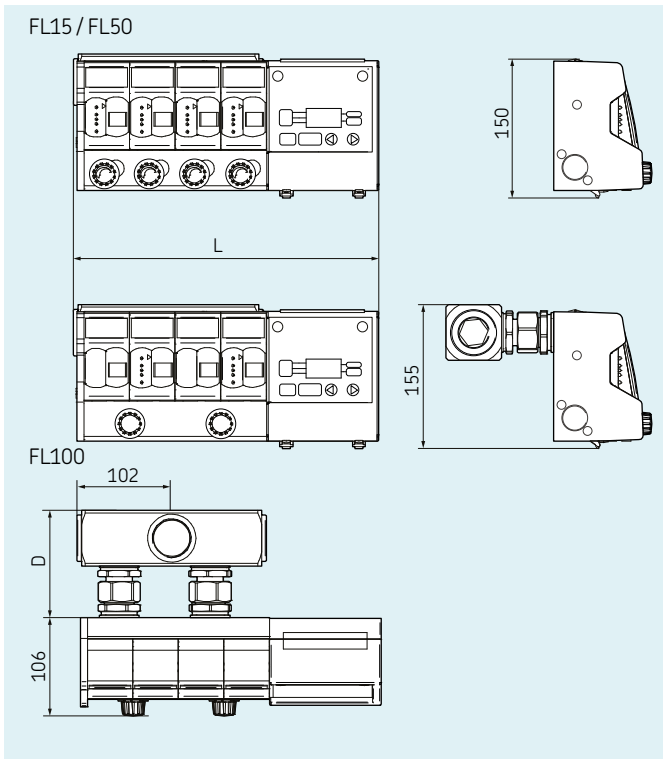
- Individual alarm relay for a maximum of 10 flow meters
- Two individual alarm relays for a maximum of 5 flow meters
- Common alarm relays for all flow meters with 7 different relay operations, including no-flow information

Applications:

- Systems where one or several lubrication points must be monitored individually or are located in a wide area
- Relay and fieldbus communication is required
- Paper machine dryer sections, etc.



Technical data	Flow meter type		
	FL15	FL50	FL100
Flow rate	0,1–15,0 l/min (0.2–30.0 pt/min)	15–50 l/min (30–100 pt/min)	50–100 l/min (100–200 pt/min)
Group size	2, 4, 6, 8, 10 flow meters	1, 2	1
Viscosity range	32–1 000 mm ² /s		
Operating pressure (max.)	10 bar (145 psi)		
Operating temperature	0 to + 65 °C (+32 to 150 °F)		
Protection class	IP 65		
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 connections	BSPP G 1 or NPT 1		BSPP 2× G 1 or 2× NPT 1
Outlet connections	BSPP G 1/2 or NPT 1/2	BSPP G 1 or NPT 1	BSPP 1× G 1 1/4 or 1× NPT 1 1/4



Dimensions

Flow meter type	L		D	
	mm	inch	mm	inch
FL15-02	226	8.89		
FL15-04	324	12.76		
FL15-06	422	16.61		
FL15-08	520	20.47		
FL15-10	618	24.33		
FL50-01	226	8.89		
FL100-01-R	324	12.76	116	4.57
FL100-01-U	324	12.76	124	4.88

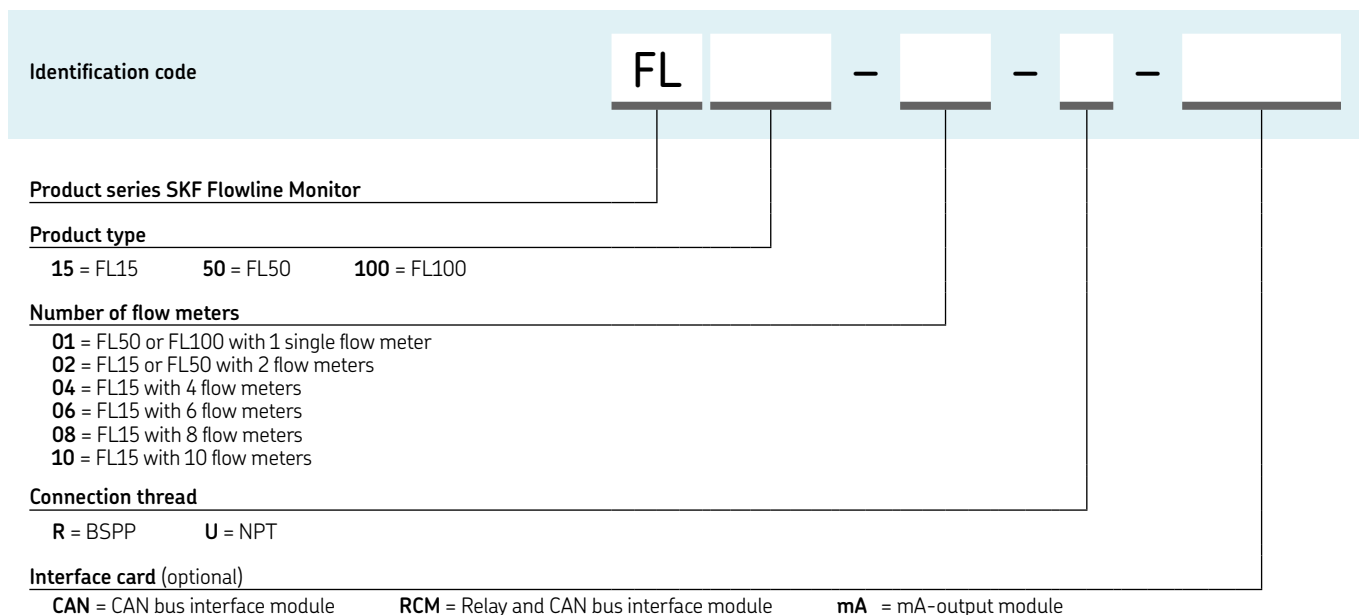
Supply piping assembly



Mounting options

- Easy and flexible panel installation with optional legs, wall brackets or hood mounting frame
- Many standard panel sizes for up to 60 lubrication points
- Plexiglass cover protects flow meters
- Panel material is stainless steel AISI316
- Options: Supply piping assembly, hinges to plexiglass cover, lock and light

How to configure and order



Flow meters with BSPP connection thread

Order number	Designation	Number of flow meters	Interface card
13120202	FL15-02-R	2	alarm relay output
13120204	FL15-04-R	4	alarm relay output
13120206	FL15-06-R	6	alarm relay output
13120208	FL15-08-R	8	alarm relay output
13120210	FL15-10-R	10	alarm relay output
13120300	FL50-R	1	alarm relay output
13120316	FL50-02-R	2	alarm relay output
13127800	FL100-01-R	1	alarm relay output
13120212	FL15-02-R-CAN	2	CAN bus module
13120214	FL15-04-R-CAN	4	CAN bus module
13120216	FL15-06-R-CAN	6	CAN bus module
13120218	FL15-08-R-CAN	8	CAN bus module
13120220	FL15-10-R-CAN	10	CAN bus module
13120310	FL50-R-CAN	1	CAN bus module
13120317	FL50-02-R-CAN	2	CAN bus module
13127808	FL100-01-R-CAN	1	CAN bus module
13120342	FL15-02-R-RCM	2	Relay & CAN bus module
13120344	FL15-04-R-RCM	4	Relay & CAN bus module
13120346	FL15-06-R-RCM	6	Relay & CAN bus module
13120348	FL15-08-R-RCM	8	Relay & CAN bus module
13120350	FL15-10-R-RCM	10	Relay & CAN bus module
13120312	FL50-R-RCM	1	Relay & CAN bus module
13120318	FL50-02-R-RCM	2	Relay & CAN bus module
13127802	FL100-01-R-RCM	1	Relay & CAN bus module
13120362	FL15-02-R-mA	2	analogue module
13120364	FL15-04-R-mA	4	analogue module
13120366	FL15-06-R-mA	6	analogue module
13120368	FL15-08-R-mA	8	analogue module
13120370	FL15-10-R-mA	10	analogue module
13120314	FL50-R-mA	1	analogue module
13120319	FL50-02-R-mA	2	analogue module
13127804	FL100-01-R-mA	1	analogue module
13120180	FL-100 OUTLET BLOCK G1 1/4	-	-

Flow meters with NPT connection thread

Order number	Designation	Number of flow meters	Interface card
13120222	FL15-02-U	2	alarm relay output
13120224	FL15-04-U	4	alarm relay output
13120226	FL15-06-U	6	alarm relay output
13120228	FL15-08-U	8	alarm relay output
13120230	FL15-10-U	10	alarm relay output
13120320	FL50-U	1	alarm relay output
13120336	FL50-02-U	2	alarm relay output
13127810	FL100-01-U	1	alarm relay output
13120232	FL15-02-U-CAN	2	CAN bus module
13120234	FL15-04-U-CAN	4	CAN bus module
13120236	FL15-06-U-CAN	6	CAN bus module
13120238	FL15-08-U-CAN	8	CAN bus module
13120240	FL15-10-U-CAN	10	CAN bus module
13120330	FL50-U-CAN	1	CAN bus module
13120337	FL50-02-U-CAN	2	CAN bus module
13127810	FL100-01-U-CAN	1	CAN bus module
13120352	FL15-02-U-RCM	2	Relay & CAN bus module
13120354	FL15-04-U-RCM	4	Relay & CAN bus module
13120356	FL15-06-U-RCM	6	Relay & CAN bus module
13120358	FL15-08-U-RCM	8	Relay & CAN bus module
13120360	FL15-10-U-RCM	10	Relay & CAN bus module
13120331	FL50-U-RCM	1	Relay & CAN bus module
13120338	FL50-02-U-RCM	2	Relay & CAN bus module
13127812	FL100-01-U-RCM	1	Relay & CAN bus module
13120372	FL15-02-U-mA	2	analogue module
13120374	FL15-04-U-mA	4	analogue module
13120376	FL15-06-U-mA	6	analogue module
13120378	FL15-08-U-mA	8	analogue module
13120380	FL15-10-U-mA	10	analogue module
13120334	FL50-U-mA	1	analogue module
13120339	FL50-02-U-mA	2	analogue module
13127816	FL100-01-U-mA	1	analogue module
13120182	FL-100 OUTLET BLOCK NPT1 1/4	-	-