OPM, WGM, WGMS

Технические характеристики

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Симферополь (3652)67-13-56
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Ставрополь (8652)20-65-13
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Томск (3822)98-41-53
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Киргизия (996)312-96-26-47
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Online particle monitor OPM II

Type OPM II

RE 51460

45197

- Nominal pressure up to 420 bar dynamic / 600 bar static
- Nominal flow 50 to 400 ml/min
- Operating temperature –20 to +80 °C

CE

Features

The OPM II is a visual online particle monitor that operates on the light-extinction principle.
The degree of contamination and the purity trend of fluids can be accurately monitored and documented. An alarm triggered when limit values are exceeded allows a fast reaction.

- Cleanliness class display according to ISO 4406:99 or SAE AS4059E
- Suitable for mineral and bio-oils; diesel fuel
- Easily configurable from the display; has an integrated data memory

Contents

Ordering code

Basic device

Material no.	Type key	Basic device
R928052298	OPM II – 1X – M	Online particle monitor OPM II (basic device with NBR seal)
R928052660	8874-19-01.03-BR	Software for PC evaluation

Accessories for hydraulic connections

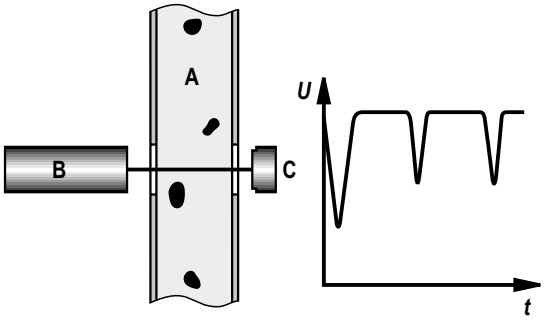
Material no.	Type key	Accessories for hydraulic connections
R928052661	2103-A0-02.00	Flow controller with screen 125 µm (pressure window at 30 cSt: 2 ... 300 bar)
R900025012	ANSCHLUESSSTUECK AB20-11/C G1/4"	Direct connection 1620 ISO228-G1/4 inside
R900981026	SCHLAUCH AB20-11/630-630BAR	Hose DN2, 2x screw connection m16x2, length 630 mm
R900083425	SCHLAUCH AB20-11/1000-630BAR	Hose DN2, 2x screw connection m16x2, length 1000 mm
R900054614	SCHLAUCH AB20-11/2000-630BAR	Hose DN2, 2x screw connection m16x2, length 2000 mm
R900033690	SCHLAUCH AB20-11/630-G1/4	Hose DN2, with hose connection M16x2 and pressure gauge connection G1/4, length 630 mm
R900033691	SCHLAUCH AB20-11/1000-G1/4	Hose DN2, with hose connection M16x2 and pressure gauge connection G1/4, length 1000 mm
R900033693	SCHLAUCH AB20-11/2000-G1/4	Hose DN2, with hose connection M16x2 and pressure gauge connection G1/4, length 2000 mm

Accessories for electrical connections

Material no.	Type key	Accessories for electrical connections
R928052662	8812-00-00.38	Power supply unit M12x1; socket 8-pole BU, with 4x country adapter
R913023441	VERTEILERSTUECK 8808-50-01.03	Y distributor, M12x1, 8-pole, socket to connector/socket
R928052663	8824-T4-02.00-BR	USB-CAN adapter with cable for connection to PC (connector M12x1, 8-pole - USB connector - cable length 2 m)
R913002642	LEITUNGSDOSE 8P 7000-17121-2911000	Connection (CAN) to existing system environment (measuring cable M12x1; straight socket, 8-pole/open end - cable length 10 m)
R901351431	LEITUNGSDOSE 7000-17141-2911000	Connection (CAN) to existing system environment (measuring cable M12x1; angled socket, 8-pole/open end - cable length 10 m)

Function, section

The **OPM II** is a visual particle monitor that operates on the light-extinction principle.
It consists of a flown-through measuring cell (A), a laser (B) and a photo diode (C). The laser radiates through the measuring cell and hits the photo diode. If a particle passes through the laser beam, the intensity reflected by the photo diode is reduced. The larger the particle, the less intensive the reflected light.
Using the **OPM II**, the level of contamination and the purity trend of non-aggressive fluids can be monitored. Potential variations in the absolute accuracy compared to particle counters calibrated according to ISO 11171:99 are below an ordinal number.
Due to the continuous purity monitoring, changes in a system are quickly identified and consequential damage can be avoided.
The cleanliness class is optionally displayed according to ISO 4406:99 or SAE AS4059E.
The device measures the temperature on the electronic circuit board and has an operating hours counter. After the current interruption, the counter re-starts counting at the last stored time value before the interruption.



Accessories

The OPM II can be integrated into external systems or operated alone. There is the possibility to transfer the data to a PC and analyze it there.

Integration of the OPM II into an external system:
- OPM II (basic device)
- Connection (CAN) to an external control system
- Hydraulic connections

Operation of the OPM II as stand-alone variant:
- OPM II (basic device)
- Plug-in power supply unit with country adapters
- Hydraulic connections

OPM II to PC for the read out of data:
- Y distributor (for simultaneous connection of plug-in power supply unit and USB-CAN adapter)
- USB-CAN adapter with cable for connection to PC
- PC software for evaluation

OPM II and accessories

1 OPM II (basic device)
2 Plug-in power supply unit
3 Flow controller
4 Y adapter
5 USB adapter

Technical data

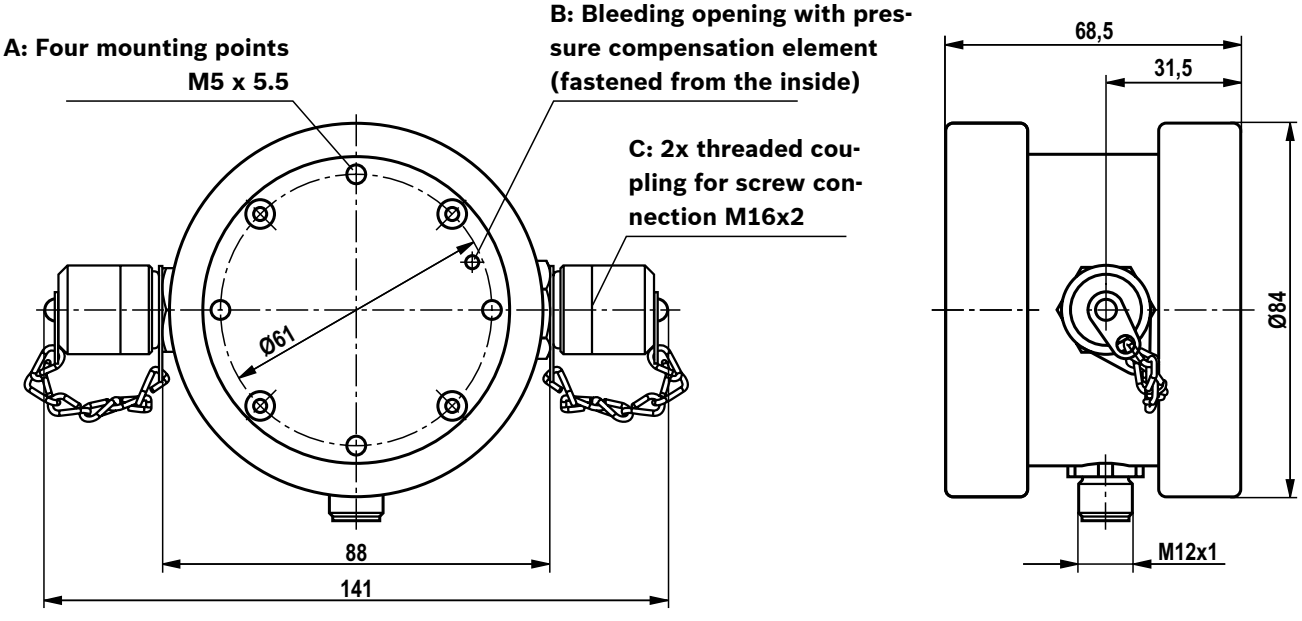
(For applications outside these parameters and high vibration loads, please consult us!)

Pin assignment	Designation	No.	Function
Connector	+UB (24 VDC)	1	Supply
	GND	2	Ground
	CANL; TxD	3	CAN bus; transmitting
	CANH; RxD	4	CAN bus; reading
	NC; digital input	5	–
	IOUT1	6	4 ... 20 mA
	Open collector, alarm out	7	Alarm output
M12x1 8-pole	SGND	8	Signal ground

Operating conditions	– Admissible operating pressure	bar *[psi]*	420 *[6091]* (dynamic)/600 *[8702]* (static)
	– Ambient temperature	°C *[°F]*	–20 ... 80 *[–4 ... 176]*
	– Humidity	%	0 ... 95
Fluids	– Admissible fluids		Mineral and ester fluids; poly-alpha-olefins
	– Temperature fluid	°C *[°F]*	–20 ... 80 *[–4 ... 176]*
	– Fluid connections		2x threaded coupling AB20-11/K1 G1/4
	– Admissible flow	ml/min	50 ... 400
Wetted materials			Stainless steel, sapphire, NBR
Sealing material			NBR
Voltage supply		V DC	9 ... 36
Current consumption		mA	Max. 300
Current outputs		mA	4 ... 20
Interfaces			RS 232, CANopen
Alarm contact			Open collector output
Electrical connection			8-pole connector M12x1
Measurement range according to ISO 4406:99			0 ... 24 (ordinal number)
Calibrated measurement range			10 ... 22 (ordinal number)
Measurement accuracy			±1.0 (ordinal number)

Dimensions

(dimensions in mm)



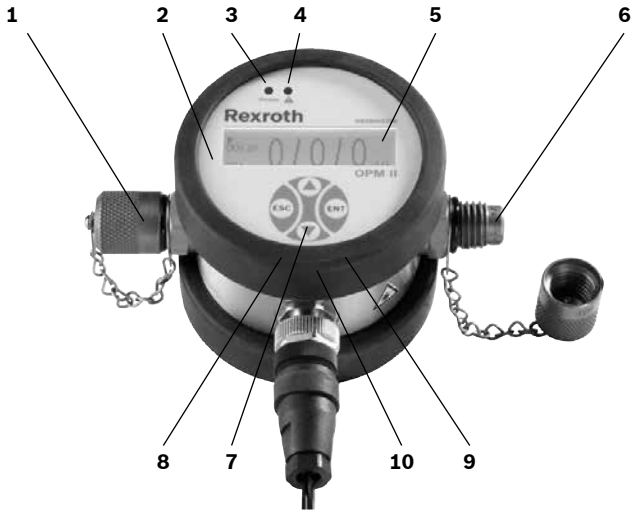
Components

Supply/discharge fluid (1) (6)
The device is equipped with two threaded couplings for screw connection M16x2. Hoses with measuring ports are usually connected here by means of which the particle counter is connected to the fluid-containing system. Adapters also allow for the conversion to G1/4 inside.

Display (2) (5)
The front side of the device can be rotated by approx. 190° so that irrespective of the assembly, the display can always be positioned horizontally. The SW display shows the last determined cleanliness classes as well as the time until the next measurement and/or the remaining time of the measurement.

"Power" indicator (3)
This indicator shows in green whether operating voltage is available.

"Alarm" indicator (4)
This indicator shows in red that an alarm is pending. In the device, two alarms can be programmed.



1	Fluid supply	**6**	Fluid discharge
2	Rotatable device front	**7**	"Up" key
3	"Power" indicator	**8**	"Escape" key
4	"Alarm" indicator	**9**	"Enter" key
5	Display	**10**	"Down" key

Assembly, commissioning, maintenance

☞ **Please observe this information when determining the site of installation:**

- Connect the OPM II to a pressure line using the T branch in the bypass.
- The flow direction is irrelevant.
- At the connection point, the pressure conditions should be as constant as possible. The pressure may vary, there must, however not be any pressure peaks or strong fluctuations.
- Connection to the control line is recommendable; alternatively, you can use the filter or cooling circuit.
- The flow should be constant and lie between 50 ... 400 ml/min.
- Flow control or pressure reduction units should always be installed downstream the particle counter as such equipment may create particles or air bubbles leading to measuring errors.
- If a pump is necessary to create the required flow, it should be of low-pulsation design and be installed upstream the particle counter. Otherwise, bubbles might be created in case of arrangement on the suction side leading to measuring errors.

☞ **Please also observe the following information before the installation:**

- Ensure during installation that afterwards, the display will be easily readable. For simplification, the display can be rotated by approx. 190°.
- The following is true for connection lines: The shorter the better. With the length of the line, the risk of settlement of larger particles increases.
- Ensure particularly with higher viscosities and when using lines that the pressure is high enough in order to set a flow between 50 ... 400 ml/min.
- Make sure that the measured fluid is free from bubbles and drops. Bubbles and droplets in the oil can mostly be identified from very high ordinal numbers and/or identical ordinal numbers in different size channels. Such bubbles and droplets are hardly visible to the naked eye.
- Warranty becomes void if the delivered item is changed by the ordering party or third parties or improperly mounted, installed, maintained, repaired, used or exposed to environmental condition that do not comply with the installation conditions.

Directives and standardization

Product validation

Rexroth products are developed, manufactured and assembled as part of a certified quality management system in accordance with ISO 9001:2000. The relevant standards and directives can be found in the CE Declaration of Conformity.

Online water content measurement device

Type WGM07

- Nominal pressure 40 bar [580 psi]
- Analog output 4...20 mA
- Water activity a_w: ± 0.02 (0...0.9)
  ± 0.03 (0.9...1.0)

Features

The online water content measurement devices allow the water activity in hydraulic and lubricating oils to be monitored online quickly and reliably.

They distinguish themselves by the following:

- Permanent measurement of the humidity and temperature
- Fast display of changes
- High measurement accuracy and measurement stability
- Simple connection to an external control system
- With ball valve installation, switching off the process or draining the oil is not necessary

Content

Ordering information for online water content measurement device

01		02		03
WGM07	-		-	

Series

01	Online water content measurement device	**WGM07**

Version

02	Standard version consisting of: - Sensor for determining water activity and temperature - Integrated LC display - Sensor cable, length 2 m - Sensor protection (stainless steel grid) - Serial interface RS 232 C - Analog output signal: 4...20 mA Channel 1: 0...1 Channel 2: 0...+100°°C - Measurement for analog output Channel 1: water activity a_w Channel 2: oil temperature T in °C	**1**
	Like version 1, but with sensor cable, length 5 m	**2**
	Like version 1, but with sensor cable, length 10 m	**3**
	Like version 1, but without display	**4**
	Like version 2, but without display	**5**
	Like version 3, but without display	**6**

Supply voltage

03	220 V	**1**
	24 V	**2**

Order example:
WGM07-1-1

Material no.: R928027995

Preferred types

Material no.	Online water content measurement device
R928027995	WGM07-1-1
R928028814	WGM07-3-2

Ordering information for accessories

Ball valve installation kit

01	02		03
Z	**WGM**	**-**	**KHI**

01	Accessories	**Z**
02	Water content measurement device	**WGM**
03	Ball valve installation kit	**KHI**

Material number

Material no.	Ball valve installation kit
R928028819	ZWGM - KHI

Function

The WGM07 oil humidity and temperature measurement encoder allows fast and reliable measurement of the humidity content in oils.
The devices are used to monitor humidity in real time and to control dryers and oil conditioners so that they are only activated as needed. Efficient monitoring helps to save oil and is good for the environment. With the WGM07, the humidity content in oil can be monitored simply and cost-effectively.

Measurement of the water activity
The WGM07 measures the oil humidity in the form of water activity (a_w) and also the oil temperature (T). The water activity is a direct indicator of whether there is a risk of water separation as a phase. The measurement is carried out independently of the type, age and temperature of the oil.

Calculation of the water content
The WGM07 indicates the water activity (a_w) and oil temperature (T). It is possible to calculate the average mass concentration of water in oil in ppm using this information. For this purpose, only the oil-specific conversion coefficients have to be determined.

Technical data

(For applications outside these parameters, please consult us.)

General		
Ambient temperature range	°C *[°F]*	0 ... +60 *[+32 ...+140]*
Storage conditions	°C *[°F]*	–40 ... +65 *[–40 ... +149]*; max. relative air humidity 65%
Mass	kg *[lbs]*	approx. 2 kg *[4.4]*

Measurements		
Measuring point		Piping with flows up to 40 bar *[580 psi]* or turbulent tank installation location
Response time	min.	10
Water activity		
Measurement range	a_w	0...1
Accuracy	a_w	0...0.9 +/-0.02
		0.9...1 +/-0.03
Sensor		Capacitive thin-film polymer sensor
Temperature		
Measurement range	°C *[°F]*	0...+100 *[+32...+212]*
Accuracy	°C *[°F]*	+/- 0.2 *[0.36]*
Sensor		Pt100
Electrical connections		
Analog output	mA	4...20
Supply voltage	V	10 ... 35 VDC, 24 VAC ± 20%
Current consumption at +20°C *[68°F]* (U_{in} 24 VDC) I_{out} 2 x 0...20 mA	mA	max. 60
Display with lighting	mA	+20
Housing protection class	IP	65
Sensor protection		Stainless steel grid filter
EMC		as per EN61326-1, industr. requirements

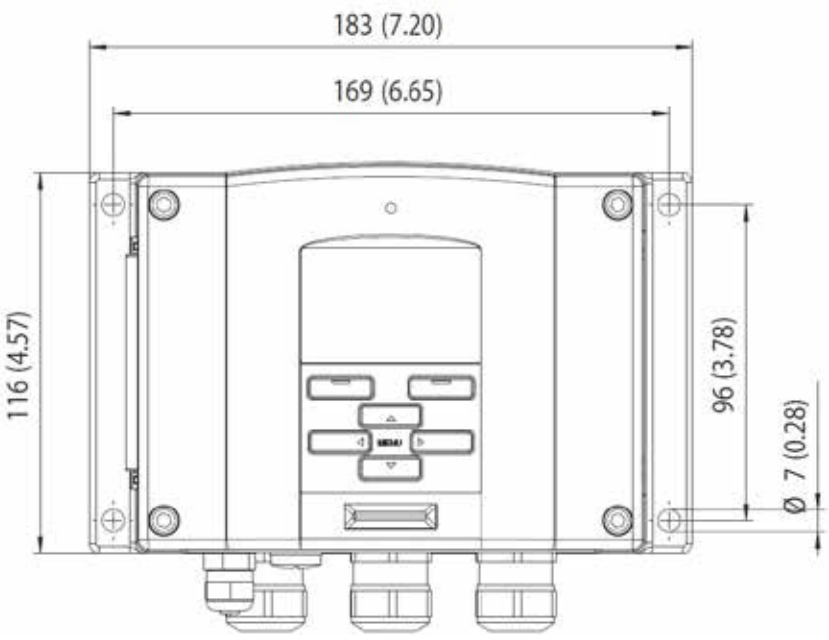
Compatibility with permitted hydraulic fluids

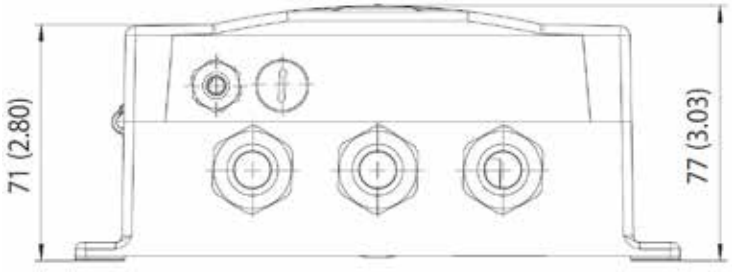
Hydraulic fluid	Classification	Standards
Mineral oils	HLP	DIN 51524

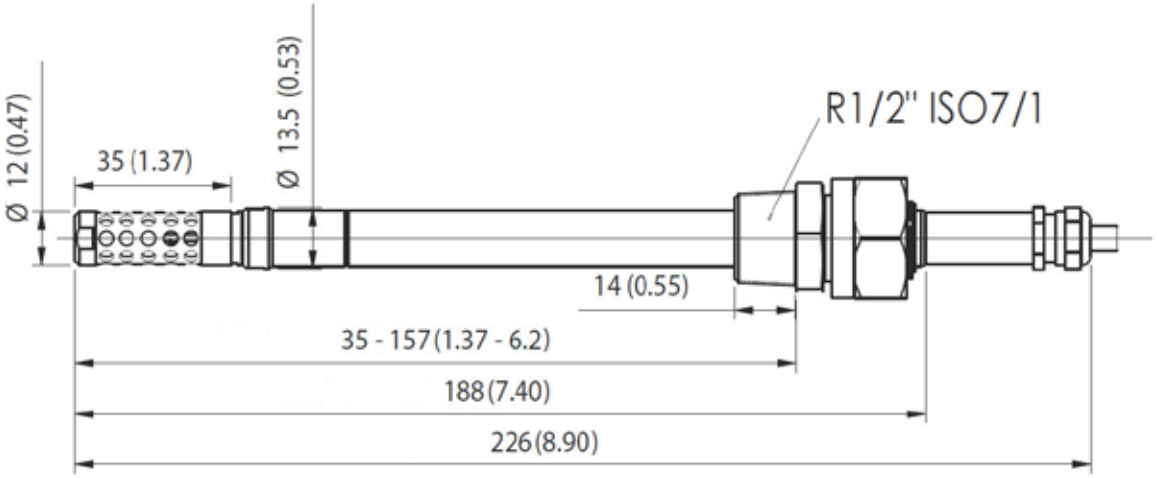
☞ **Important information about hydraulic fluids:**

▶ For more information and data on the use of other hydraulic fluids, please refer to data sheet 90220 or contact us.

Dimensions
(in mm *[inch]*)







Assembly, commissioning, maintenance

Assembly
The maximum operating pressure at the selected place of installation must not exceed the permissible operating pressure of the sensor.
When installing the sensor, ensure that the flow velocity does not exceed 1 m/s *[3.3 ft/s]*.
With the optional ball valve installation kit, it is possible to remove or install the sensor during system operation without having to drain the oil.

Commissioning
Electrically connect the sensor.

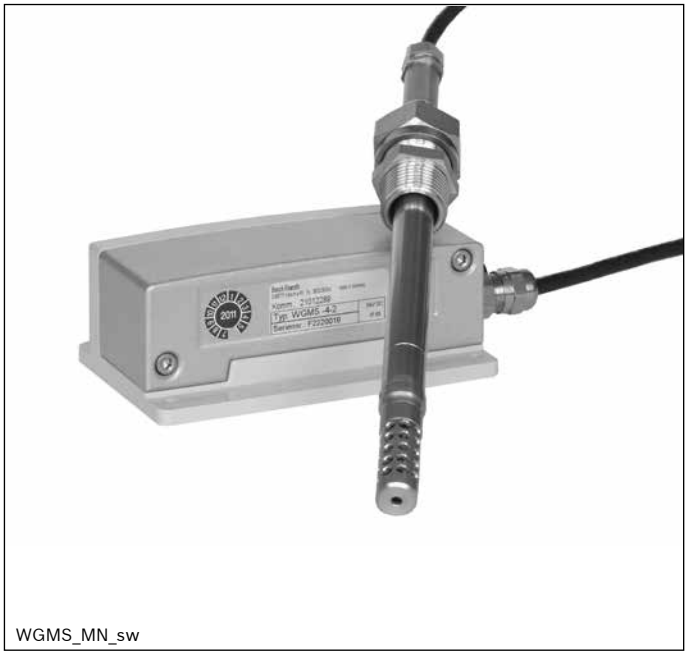
Important: when using the ball valve installation kit, leaks will occur when removing or sliding in the sensor.

Warning
Hot oil can cause burns when removing or sliding in the sensor.

☞ **Important:**
- ▶ All work on the device must be performed by trained specialists only.
- ▶ Warranty becomes void if the delivered item is changed by the ordering party or third parties or improperly mounted, installed, maintained, repaired, used or exposed to environmental conditions that do not comply with the installation conditions.

Online water content measurement device

Type WGMS



WGMS_MN_sw

- Nominal pressure 40 bar
- Analog output 4...20 mA
- Water activity a_w: ± 0.02 (0...0.9)
  ± 0.03 (0.9...1.0)

Features

Online water content measurement devices allow the water activity in hydraulic and lubricating oils to be monitored online quickly and reliably.

They distinguish themselves by the following:

- Permanent measurement of the humidity and temperature
- Fast display of changes
- High measurement accuracy and measurement stability
- Simple connection to an external control system
- With ball valve installation, switching off the process or draining the oil is not necessary

Contents

Ordering information for online water content measurement device

01		02		03		04
WGMS	**-**		**-**	**2**	**-**	

Series

01	Online water content measurement device (without display)	**WGMS**

Version

02	Standard version consisting of: - Sensor for determining water activity and temperature - Sensor cable, length 2 m - Sensor protection (stainless steel grid) - Serial interface RS 232 C - Analog output signal: 4...20 mA Channel 1: 0...1 Channel 2: 0...+100 °C - Measurement for analog output Channel 1: Water activity a_w Channel 2: oil temperature T in °C	**4**
	Like version 4, but with sensor cable, length 5 m	**5**
	Like version 4, but with sensor cable, length 10 m	**6**

Supply voltage

03	24 V	**2**

Amending information

04	Ball valve installation kit	**K**

Order example:
WGMS-4-2

Material no.: R928022617

Preferred types

Material no.	Online water content measurement device
R928022617	WGMS-4-2
R928022618	WGMS-5-2
R928022619	WGMS-6-2

Ordering code accessories

Ball valve installation kit

01	02		03
Z	**WGM**	**-**	**KHI**

01	Accessories	**Z**
02	Water content measurement device	**WGM**
03	Ball valve installation kit	**KHI**

Material number

Material no.	Ball valve installation kit
R928028819	ZWGM - KHI

Function

The WGMS oil humidity and temperature measurement encoder allows fast and reliable measurement of the humidity content in oils.
The devices are used to monitor humidity in real time and to control dryers and oil conditioners so that they are only activated as needed. Efficient monitoring helps to save oil and is good for the environment. With the WGMS, the humidity content in oil can be monitored simply and cost-effectively.

Measurement of the water activity
The WGMS measures the oil humidity in the form of water activity (a_w) and also the oil temperature (T). The water activity is a direct indicator of whether there is a risk of water separation as a phase. The measurement is carried out independently of the type, age and temperature of the oil.

Calculation of the water content
The WGMS indicates the water activity (a_w) and oil temperature (T). It is possible to calculate the average mass concentration of water in oil in ppm using this information. For this purpose, only the oil-specific conversion coefficients have to be determined.

Technical data
(For applications outside these values, please consult us!)

General		
Operating temperature range	°C *[°F]*	0... +60 *[+32...+140]*
Storage conditions	°C *[°F]*	–40 ... +65 *[–40 ... +149]*; max. relative air humidity 65%
Weight	kg *[lbs]*	approx. 1.5 kg *[3.3]*

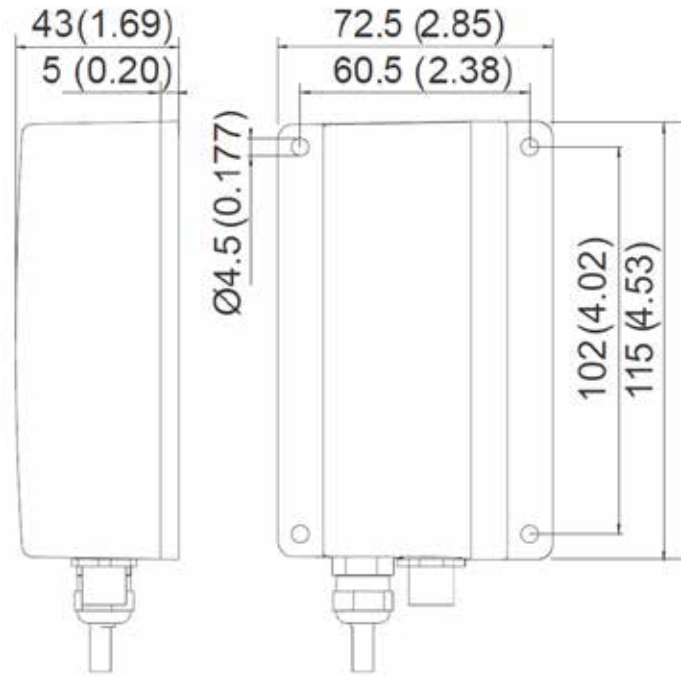
Measurements		
Measuring point		Piping with flows up to 40 bar *[580 psi]* or turbulent tank installation location
Response time	min.	10
Water activity		
Measurement range	a_w	0...1
Accuracy	a_w	0...0.9 +/-0.02
		0.9...1 +/-0.03
Sensor		Capacitive thin-film polymer sensor
Temperature		
Measurement range	°C *[°F]*	0...+100 *[+32...+212]*
Accuracy	°C *[°F]*	+/- 0.2 *[0.36]*
Sensor		Pt100
Electrical connections		
Analog output	mA	4...20
Supply voltage	V	10 ... 35 VDC, 24 VAC ± 20%
Current consumption at +20 °C *[68 °F]* (U_{in} 24 VDC) I_{out} 2 x 0...20 mA	mA	max. 40
Housing protection class	IP	65
Sensor protection		Stainless steel grid filter
EMC		as per EN61326-1, industr. requirements

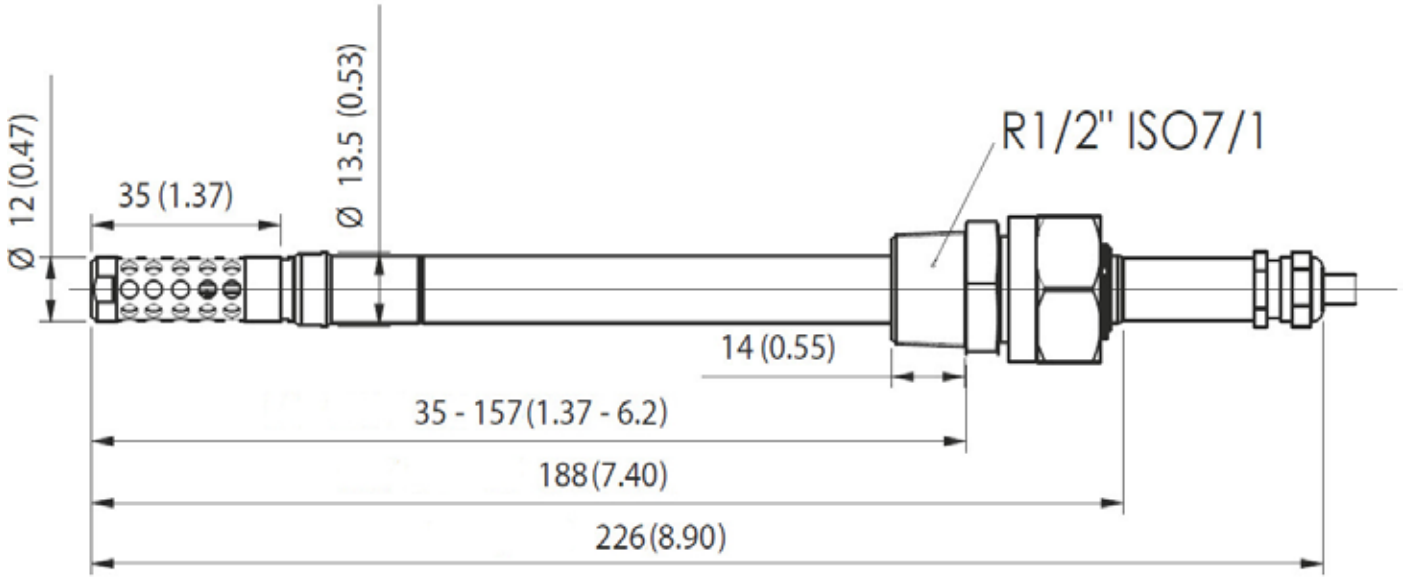
Compatibility with permitted hydraulic fluids

Hydraulic fluid	Classification	Standards
Mineral oils	HLP	DIN 51524

☞ **Important information on hydraulic fluids:**
- ▶ For more information and data on the use of other hydraulic fluids, please refer to data sheet 90220 or contact us!

Dimensions
(in mm *[inch]*)





Assembly, commissioning, maintenance

Assembly
The maximum operating pressure at the selected place of installation must not exceed the permissible operating pressure of the sensor.
When installing the sensor, ensure that the flow velocity does not exceed 1 m/s.
With the optional ball valve installation kit, it is possible to remove or install the sensor during system operation without having to drain the oil.

Commissioning
Electrically connect the sensor.

Important: when using the ball valve installation kit, leaks will occur when removing or inserting the sensor.

Warning
Hot oil can cause burns when removing or inserting the sensor.

☞ **Note:**
- All work on the device must be performed by trained specialists only.
- Warranty becomes void if the delivered item is changed by the ordering party or third parties or improperly mounted, installed, maintained, repaired, used or exposed to environmental condition that do not comply with the installation conditions.

Humidity Sensor WGM

Type WGM

- Measurement of relative humidity and temperature
- Output signal 4 ... 20 mA or IO-Link
- Operating Pressure up to 50 bar

Features

Humidity sensors enable quick and reliable online monitoring of the water activity in hydraulic and lubricating oils.
They have the following characteristics:

- Permanent measurement of relative humidity and temperature
- Require no calibration on the respective oil
- Quick indication of changes
- High measurement accuracy and stability
- Easy connection to external control systems

Contents

Ordering codes

01	02	03	04	05	06
WGM –		– **1X** /		–	–

Type

01	Humidity sensor	**WGM**

Variant

02	Basic option - Sensor only Display option - Sensor with display Remote display for basic option (connection only possible to basic option WGM-B-1X/2A1S-G34-V)	**B** **D** **R**
03	Component series	**1X**

Data transmission

04	**Option B** **Option B**	Sensor only 4 ... 20 mA; 2x analog output / 1x switching output 80% RH Digital sensor; IO-Link	**2A1S** **1D0S**
	Option D **Option D**	Sensor with display 4 ... ... 20 mA; 2x analog output / 2x switching output Sensor with digital display; IO-Link / 1x switching output	**2A2S** **1D1S**
	Remote display (option R) can only be combined with basic sensor WGM-B-1X/2A1S-G34-V		
	Option R **Option R**	Remote display 4 ... 20 mA; 2x analog output / 2x switching output Digital remote display; IO-Link / 1x switching output	**2A2S** **1D1S**

Connection

05	Thread G3/4"	**G34**
	Option R - Remote display without connection	**0**

Sealing material

06	FKM	**V**
	Option R - Remote display without seal	**0**

Accessories

Description		Art. no.
Connection cable for remote display M12x1, 8-pin, length 3.0 m angled coupling and straight connector	ZWGM connecting cable for remote	R928058029
Connection cable IO-Link M12x1, 4-pin, length 5.0 m angled coupling and braided wires	ZWGM connecting cable for IO-Link (4-pin)	R928058030
Connection cable 4...20 mA M12x1, 8-pin, length 5.0 m angled coupling and braided wires	ZWGM connecting cable for 4...20 mA (8-pin)	R928058031

Order example:

		Sensor	Connecting cable	Connecting cable for remote
Sensor without display				
Sensor 4 ... 20 mA; 2x analog output / 1x switching output	WGM-B-1X/2A1S-G34-V	**R928057041**	**R928058031**	–
Digital sensor; IO-Link	WGM-B-1X/1D1S-G34-V	**R928057042**	**R928058030**	–
Sensor with display (directly integrated with sensor)				
Sensor with display 4 ... 20 mA; 2x analog output / 2x switching output	WGM-D-1X/2A2S-G34-V	**R928057045**	**R928058031**	–
Sensor with digital display; IO-Link / 1x switching output	WGM-D-1X/1D1S-G34-V	**R928057046**	**R928058030**	–
Remote display for basic sensor WGM-B-1X/2A1S-G34-V (display for remote installation)				
Remote display 4 ... 20 mA; 2x analog output / 2x switching output	WGM-R-1X/2A2S-0-0	**R928057043**	**R928058031**	**R928058029**
Digital remote display; IO-Link / 1x switching output	WGM-R-1X/1D1S-0-0	**R928057044**	**R928058030**	**R928058029**

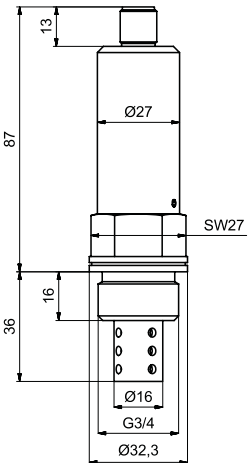
Product description

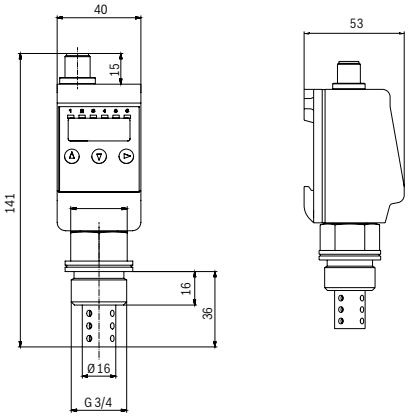
Just like solid particulate and air, moisture is also regarded as an undesired contaminant in hydraulic and lubrication systems, and may similarly cause considerable damage to both components and fluid.
The Rexroth Humidity Sensor (WGM) was specifically designed for the continuous monitoring of the relative humidity in oil and simultaneously measure the temperature of the oil.
The capacitive principle of operation ensures that a reliable information about the relative humidity of the oil is guaranteed.
The WGM product family offers a wide variety of functional possibilities. Starting with a standard sensor with switching as well as 4 ... 20 mA output, right up to digital communication in the form of IO-Link, all parameters are covered.
The option with display offers the possibility of the display being mounted directly on the sensor or remotely from the sensor. The remote display enables flexibility in mounting positions and can only be used with the basic sensor WGM-B-1X/2A1S-G34-V.
The WGM measures the relative humidity of the oil and the degree of saturation with water directly:

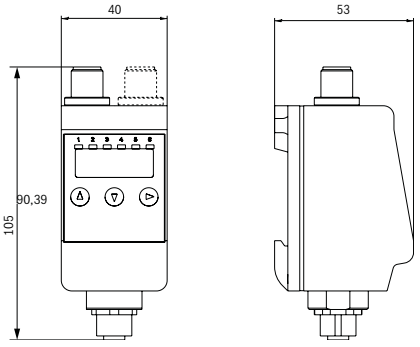
- 0%: Absolutley dry oil
- 100 %: Oil is completely saturated with water. Further water is no longer dissolved and therefore lies as free water.

In contrast to moisture analysis (titration) in the laboratory, the water content is not indicated in absolute ppm (parts per million) but the saturation of the oil is indicated by the measured relative humidity.

Mineral oils (e.g. HLP) have a comparatively low water absorption capacity. With 500 ppm generally indicating oversaturation of the oil and the presence of free water.
For ester oils (e.g. HEES), which can contain relatively large quantities of water, the oil saturation at 500 ppm would be approximatley 15 %.
Warm oil can dissolve more water than cold oil. It is therefore possible that when oil is cooled down from its operating temperature, that the seemingly dry oil may contain free water.
Irrespective of the oil type and temperature, the WGM indicates the current saturation level of the oil with water and provides additional safety warnings during the normal operation of systems.





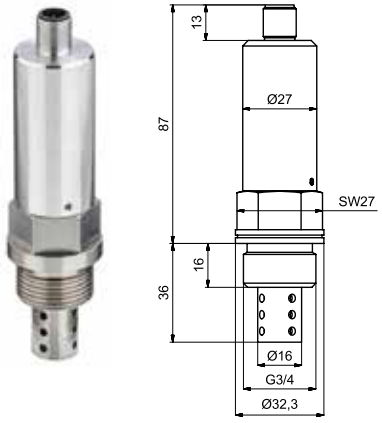


Technical data

General	
Operating pressure max.	50 bar
Medium	-20 °C ... +80 °C
Threaded connection	G3/4" pipe thread, Eolastic seal
Max. tightening torque	20 Nm
Sensor length from sealing surface	36 mm
Max. flow velocity at sensor	5 m/s
Media resistance	Fluids based on mineral oil (other fluids on request)

Technical data WGM-B

Sensor variant WGM-B	
Ambient temperature	-20 °C ... +70 °C
Supply voltage (U_B)	18 ... 30 V (nominal voltage 24 V DC)



Material/version	
Housing	Stainless steel/aluminum
Material in contact with media	1.4301, 1.4571, 2.4478, FR4, glass
Weight	approx. 205 kg
Protection class	IP67*

*with fitted plug-in connector

IO-Link	
IO-Link	Revision 1.1
Baud rate	COM2 (38.4 k)
SIO mode	Yes
Min. cycle time	20 ms

Humidity measurement	
Measurement range	0 ... 100 % rel. humidity
Accuracy	± 3 % FS
Analog output	4 ... 20 mA (0 ... 100 % relative humidity)
Tolerance	± 0.5 % FS
Load Ω	= (U_B – 8 V) / 0.02 A

Technical data WGM-B

Switching output for humidity	
PNP switching output [1)]	Fixed setting at 80 % relative humidity
Switching current	max. 0.2 A

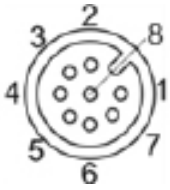
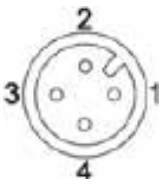
[1)] Others on request

Temperature measurement	
Measurement range	-20 °C ... +120 °C
Accuracy	± 1.5 % FS
Analog output	4 ... 20 mA (-20 ... +120 °C)
Tolerance	± 0.5 % FS
Load Ω	= (U_B – 8V) / 0.02 A

Outputs WGM-B

Version	**2A1S**	**1D0S**
Connector (base)	1 x M12 – 8-pole	1 x M12 – 4-pole
Switching output (fixed setting)	X	
IO-Link		X
Analog output for humidity	X	
Analog output for temperature	X	

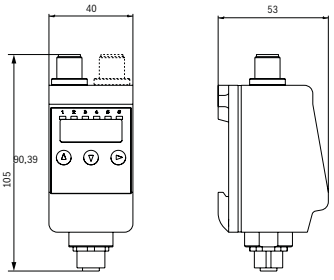
Pin assignment WGM-B

Version	**2A1S**	**1D0S**
		
Male/female connector	8-pole	4-pole
	Standard	IO-Link
Pin		
1	L+	L+
2	L-	
3	S1 humidity	L-
4		C/Q
5		
6	I1 humidity	
7	I2 temp.	
8		

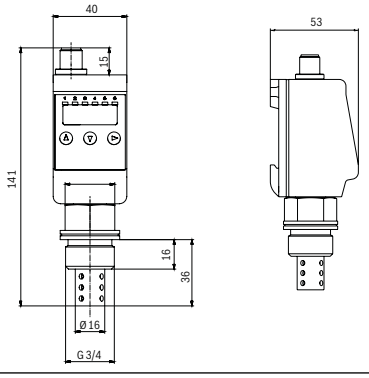
Technical data WGM-D/ WGM-R

Sensor with display and control unit

Evaluation and indication electronics	
Display	4-digit, 7-segment LED
Indicator unit	0 ... 100 % relative humidity
Operation	using 3 keys
Memory	Storage of min./max. values
Current consumption upon switch-on	approx. 100 mA for 100 ms
Current consumption in operation	approx. 50 mA (no current nor switching outputs)
Supply voltage (U_B)	18 ... 30 V DC (nominal voltage 24 V DC)
Ambient temperature	-20 °C ... +70 °C
Display resolution	0.5 %, 0.5 °C, °F

Version	**WGM-R remote display**		**Dimensions**
Fastening	35 mm top hat rail mounting		
Weight	approx. 130 g		
Display housing	PA		
Protection class	IP65* (display)		

* with fitted plug-in connector

Version	**WGM-D sensor with display**		**Dimensions**
Fastening	G3/4		
Weight	approx. 270 kg		
Display housing	PA		
Protection class	IP65* (display)		

*with fitted plug-in connector

IO-Link	
IO-Link	Revision 1.1
Baud rate	COM3 (230.4 k)
SIO mode	Yes
Min. cycle time	10 ms

Humidity measurement	
Measurement range	0 ... 100 % rel. humidity
Accuracy	± 3 % FS
Analog output	Selectable current or voltage output (4 ... 20 mA, 2 ... 10 V, 0 ... 10 V or 0 ... 5 V)
Tolerance	± 0.5 % FS
Load Ω (current output)	= (U_B – 8 V) / 0.02 A

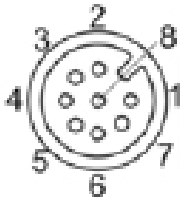
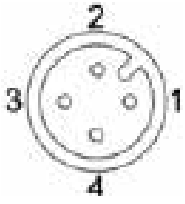
Switching outputs	
PNP switching output	Selectable switching function and switching output
Switching current	max. 0.2 A per output

Temperature measurement	
Measurement range	-20 °C ... +120 °C
Accuracy	± 1.5 % FS
Analog output	Selectable current or voltage output (4 ... 20 mA, 2 ... 10 V, 0 ... 10 V or 0 ... 5 V)
Tolerance	± 0.5 % FS
Load Ω (current output)	= (U_B – 8 V) / 0.02 A

Outputs WGM-D/WGM-R

Version	**2A2S**	**1D1S**
Connector (base) Display & remote	1 x M12 – 8-pole	1 x M12 – 4-pole
Sensor connection socket (bottom) Remote	1 x M12 – 8 pole	1 x M12 – 8 pole
Switching outputs	2 x	1 x
IO-Link		X
Analog output for humidity	X	
Analog output for temperature	X	

Pin assignment WGM-D/ WGM-R

	Connector A		Sensor connection socket
	WGM-D/ WGM-R 2A2S	WGM-D/ WGM-R 1D1S	WGM-R
			
Male/female connector	8-pole	4-pole	8-pole
	Standard	IO-Link	IO-Link
Pin			
1	L+	L+	L+
2	L-	DO/S2	L-
3	S1 humidity	L-	
4		C/Q	
5	I2 temp.		
6	I1 humidity		I1 humidity
7	I2 temp.		I2 temp.
8			

Installation recommendations
For the humidity sensor to function properely, ensure that the sensor element is fully and permanently immersed in the oil. The sensor is suitable for lateral tank installation if installed below the minimum filling level. In the event of return line installation ensure that the maximum flow velocity is not exceeded. With the WGM-R option, the remote display is mounted onto a profile rail.

Guidelines and standards

The development, manufacture and assembly of Rexroth products is carried out within the framework of a certified quality management system in accordance with ISO9001:2000.
For relevant standards and directives, please refer to the CE Declaration of Conformity.

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