

# Oval Wheel Meter

# Flowal® Plus

Series

OR / OF

## Operating manual



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## Foreword

### I. Transport, Delivery, Storage

Always protect devices against humidity, soiling, impacts and damages

#### Delivery Inspection:

Check the delivery for completeness upon receipt. Compare the device data with the data on the delivery note and in the order records.

Report any in-transit damage immediately. Damage reported at a later date shall not be recognized.

### II. Warranty

Please refer the contractual terms and conditions relating to delivery for the scope and period of warranty.

Warranty claims shall be conditional to correct installation and commissioning in accordance with the operating instructions of the device. The necessary installation, commissioning and maintenance work should only be carried out by qualified and authorized personnel.


### III. General safety instructions


1. Oval Wheel Meters are reliable, high accurate volumetric measuring devices. They should only be used for their intended purpose. Always observe the pressure and temperature limits stated on the type plate, as well as all other technical data and safety information during device installation, start-up and operation.
2. Always observe national and international regulations concerning the operation of devices and systems under pressure.
3. Prior to installation, the operator has to ensure that the pressure bearing parts have not been damaged during transportation.
4. The devices have to be installed, operated and serviced by qualified personnel. The operator has the responsibility to ensure that the personnel have received sufficient and appropriate training. In cause of doubt, please contact the manufacturer.
5. The operator must ensure that the materials used (wetted parts) of the device compared with the measured liquid are chemically resistant.

6. The gaskets or sealing elements must be handled with care according to the operating instructions.

## IV. Basic Safety Information

Description of Symbols:

	<p><b>IMPORTANT NOTES!</b></p> <p>Please consider these notes carefully to achieve a reliable functional system. The accompanying text contains important information about the product, handling the product or about a section of the document that is of particular importance.</p>
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	<p><b>WARNING!</b></p> <p>Failure to take the prescribed precautions could result in death, severe bodily injury, or substantial material / product damage.</p>
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## V. Intended Use

Oval wheel meters Flowal® Plus are used for measuring liquid raw, intermediate and finished products such as liquefied gases, gasolines, heating oils, lubricating oils, transmission oils, solvents, bitumen, alkaline solutions, acids and other chemical liquids.

### Intended User

The intended user is not a general purpose user.

	<p>The intended user is not allowed to open, manipulate or dismantle the device.</p> <p>The device may be maintained, serviced or opened only by dedicated and qualified service personnel.</p>
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## 1. Identification

Manufacturer	Bopp & Reuther Messtechnik Am Neuen Rheinhafen 4 67346 Speyer Phone : +49 6232 657-0 Fax: +49 6232 657-505
Type of product	Direct volumetric meter (displacement flow meter)
Product name	Oval Wheel Meter Flowal® Plus, Series OR / OF
Version number	A-EN-01280-00 Rev.H
Associated documents:	Operating manual Multifunctional electronics MFE1, MFE2, MFE3 A-EN-17208-00 in the actual revision

## 2. Area of Application

The application area for Oval Wheel Meters Flowal® Plus encompasses the simple, reliable and cost-effective measurement of liquid volumes or volumetric flow rates. They have an extremely robust design and combine years of experience with state of the art technologies. They can be used in various industries, e.g. mechanical engineering, plant construction, food industry, semiconductor industry, environment industry, automotive industry, etc.

Due to the available material combinations, this series is also suitable for measuring aggressive or corrosive media.

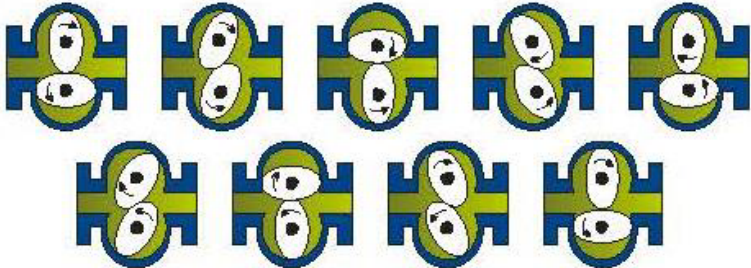
## 3. Measuring Principle and System Design

### 3.1 Measuring Principle

Oval Wheel Meter belongs to the group of direct volumetric meters for liquids with movable partition walls (displacement flow meters).

The Oval Wheel Meter consists of measurement chamber housing with two pivoted oval wheels which are toothed and roll off each other in counter-rotations.

The diagram displays oval wheel movement during the measurement process.



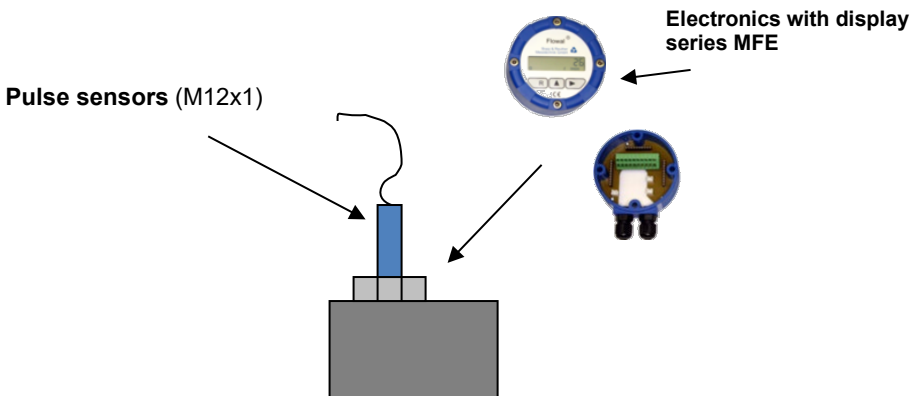
Each revolution the oval wheels displaces a discrete volume of liquid (defined by the space between the oval wheel and measurement chamber) through the chamber.

For measurement purposes, the rotation of the oval wheels is transmitted to a mechanical counter and/or a pulse pick-up via a magnet coupling and gear device.

### 3.2 System Design

Oval Wheel Meter Flowal® Plus consists of the following main components:

- measuring transducer (measuring chamber with oval wheels)
- pulse sensors/ electronic with display



### 3.2.1 Pulse Pick-up or multifunctional electronic

Type	Function	Power supply	Loading capacity Output	Connection (all M12x1)	Temperature	Ex	Pro-tection
<b>Pulse pick-up</b>							
Reed <b>RM</b>	passive reed sensor for connection to PLC / PLS	via PLC / PLS	max 170V, max 0,5A, max 10W	cable 2m	-25 to 80°	<b>Ex</b>	IP67
NAMUR <b>A1</b>	for connection to NAMUR power supply (approx. 8.2VDC)	via NAMUR supply unit	acc. NAMUR	cable 2m, integrated on the sensor	-25 to 70°C	<b>Ex</b>	
Magnetic field sensor							
<b>N1</b>	open collector sensor NPN	NPN 10 - 30VDC	max 200mA	plug-in connector opt. cable 3m	-25 to 85°	-	IP67
<b>P1</b>	open collector sensor PNP	PNP 10 - 30VDC	max 200mA	plug-in connector opt. cable 3m	-25 to 85°	-	
<b>NT</b>	open collector sensor NPN	NPN 5 - 24VDC	max 25mA	cable 1m, integrated on the sensor	-40 to 125°C	-	
<b>PT</b>	open collector sensor PNP	PNP 18 - 30VDC	max 100mA	cable 2m, integrated on the sensor	-25 to 130°C	-	
<b>Multifunctional electronic</b>							
<b>M1</b>	on-site indicator flow / volume	internal battery	without output	no connection	-20 to 80° -20 to 125° high temperature	-	IP65
<b>MFE1</b>						<b>Ex</b>	
<b>M2</b>	on-site indicator flow / volume with Pulse output	internal battery	pulse output open collector max 30mA	terminal block in the terminal compartment	-20 to 80° -20 to 125° high temperature	-	
<b>MFE2</b>						<b>Ex</b>	
<b>M3</b>	on-site indicator flow / volume with Pulse output and flow-proportional current output; optional return flow detection; memory for density+correction factor for mass conversion; optional PT1000	24VDC (4-20mA) two wire-device	pulse output open collector max 30mA and current output in two-wire technology	terminal block in the terminal compartment	-20 to 80° -20 to 125° high temperature	-	
<b>MFE3</b>						<b>Ex</b>	

#### Installation note:

Screw the sensor to stop and then turn back as far as can be detected up signals (eg, control of flashing LED on the connector).

see Operation manual Multifunctional electronics MFE1, 2 and 3 A-DE-17208-00 in the actual revision.



### 3.2.2 Measuring chamber

Overview: Dates of measuring chamber depending on the pick-up, and counter size

**Oval wheels: stainless steel – max. 3000 mPa·s\***

\* with Newtonian flow properties

Series OR Plus / OF	Measuring range  l/min	Pulses		
		Imp/n	Imp/l	Hz <sub>max</sub>
<b>015</b>	0.03 - 1	2	~3100	52
<b>06</b>	0.2 - 5	2	~333	28
<b>1</b>	0.4 - 10	2	~166	28
<b>2</b>	1 - 30	2	~100	50
<b>5</b>	2 - 50	2	~40	33
<b>10</b>	4 - 100	2	~20	33
<b>50</b>	15 - 300	2	~4	20
<b>115</b>	35 - 660	2	~1.7	19

**Oval wheels: PEEK – max. 150 mPa·s**

Type OR Plus / OF	Measuring range  l/min	Pulses		
		Imp/n	Imp/l	Hz <sub>max</sub>
<b>015</b>	0.03 - 1	2	~3100	52
<b>06</b>	0.2 - 7	2	~333	39
<b>1</b>	0.4 - 14	2	~166	39
<b>2</b>	1 - 30	2	~100	50
<b>5</b>	2 - 60	2	~40	40
<b>10</b>	3 - 120	2	~20	40

## 4. Input

### 4.1 Measured values

Volume and volume flow

## 5. Output

### 5.1 Pulse pick-up

Original pulses (e.g. see 3.2.1.)

### 5.2 Output signal

Output signals are dependent of the used evaluation system; see operating manual Multifunctional electronics MFE1, 2 and 3 A-EN-17208-00 in the actual revision.

M2 / MFE2:     scalable pulses

M3 / MFE3:     scalable pulses, current output 4-20mA

## 6. Characteristic Parameter

### 6.1 Reference conditions

All oval wheel counters are calibrated at test benches approved for fiscal metering with the following reference conditions:  
pressure: 2 to 7 bar, temperature: 20°C  
liquid: 3 mPa·s

### 6.2 Tolerated deviation

± 0.5% of measured value

± 0.25% of measured value (optional at restricted measuring range 1:10)

Plastic meters (PV1PK / PP1PK)

OR1 / OR2 / OF2     ± 0,6% of measured value

OR5 / OR10 / OF10   ± 0,8% of measured value

### 6.3 Repeatability

± 0.02%

## 6.4 Influence of ambient temperature

includes in the measuring deviation


## 6.5 Influence of media temperature

Depending on viscosity of measured media

# 7. Operating Conditions

## 7.1 Installation conditions

### 7.1.1 Installation instructions

	<p><b>WARNING!</b> Before mounting and operating the device, carefully read and observe the installation instructions. Before mounting or disassembling the device, <b>depressurize</b> and <b>cool down the system</b>.</p>
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#### 7.1.1.1 General information

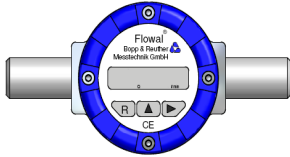
- Only trained personnel who have been authorized by the system operator are allowed to perform assembly, electrical installations, commissioning, maintenance and operation. You must have read and understood the instructions and follow their instructions strictly.
- Bopp & Reuther Oval Wheel Meters are precision flow meters. Inlet and outlet are covered with protective caps against foreign substances. Remove caps shortly before putting the device into operation.
- As indicated on the type plate parameters are maximum values and must not be exceeded. Operating parameters are specified in the contract documents. If you want to use the device under differing operating conditions, consult Bopp & Reuther Messtechnik GmbH indicating the factory number.
- Install the Oval Wheel Meter in the pressure pipe behind the pump (approximately 3 m liquid column pressure drop for nominal flow rate).

- Install the Oval Wheel Meter in such a way, that it remains filled with liquid also in non-operating condition.
- To avoid measuring inaccuracies due to gas bubbles or contamination, preventive measures must be taken (e.g. gas separator or type N strainer).
- Oval Wheel Meters intended for liquid food products must be cleaned thoroughly before putting them into operation (see Maintenance and Cleaning).

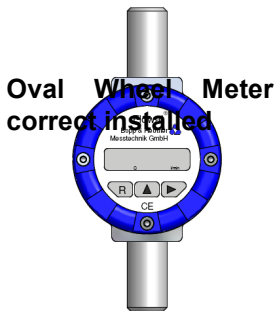
### **7.1.1.2 Installation**

- Remove any impurities from the pipework. When doing so, replace the Oval Wheel Meter with a suitable piece of piping.
- Do not remove the caps on the in- and outlet of the Oval Wheel Meter until the device is being installed to prevent the penetration of foreign substances.
- Any flow direction, if applicable note the arrow on the housing of the Oval wheel meter
- The housing cover of the Oval Wheel Meter is to be placed vertically so that the axes of the Oval Wheel are in a horizontal position independent of the position of the pipe.
- The Oval Wheel Meter must be installed free from strain.

Horizontal pipeline

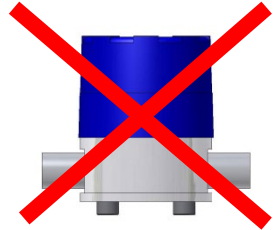


**Wrong!**



**Oval Wheel Meter  
correct installed**

D



### 7.1.2 Start-Up Conditions

	<p><b>ATTENTION!</b> Start up the Oval Wheel Meter with slowly increasing flow.</p>
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### 7.1.3 Exchange of sensors

The sensors (for the pulse pick, if applicable for temperature measurement) can be exchanged under operating conditions.

**WARNING!**

Depending on the temperature risk of burns.

## 7.2 Ambient Conditions

### 7.2.1 Ambient temperature

Depending on used electronics.

### 7.2.2 Storage temperature

+10 C to +55° C

### 7.2.3 Degree of protection

IP 67

According to IEC 529 / EN 60529

### 7.2.4 Electromagnetic compatibility

According to Guideline EMV 2014/30/EU (EMV-Guideline)

EN 61000-6-2 Immunity for industrial environments

EN 61000-6-3 Immunity residential area

## 7.3 Process conditions

### 7.3.1 State of aggregation

Suitable for liquids

### 7.3.2 Flow limit

Depending on the measuring chamber, see 3.2.3 Measuring Chamber

### 7.3.3 Viscosity

Oval wheels in stainless steel: OR 015: 350 mPa·s  
 OR 06 up to OR/OF 2: 1000 mPa·s  
 OR 5 up to OR/OF 115: 3000 mPa·s

Oval wheels in PEEK: up to 150 mPa·s

### 7.3.4 Liquid temperature limits

Depending on the sensor and on the material combination (see 7.3.6)

### 7.3.5 Liquid pressure limits

Depending on the material combination (see 7.3.6)

### 7.3.6 Table pressure / temperature range

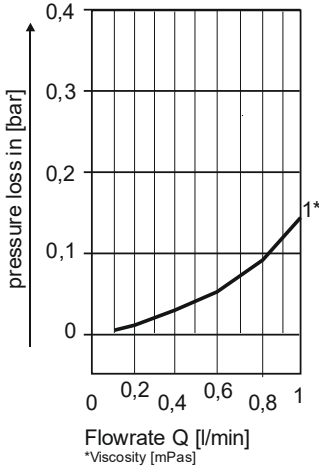
Series OR Plus	Material Housing / Oval wheel					
	AL1PK	SS1PK	SS1SS	PV1PK	PP1PK	PK1PK
OR015	PN40	PN68	PN 68	PN16	-	-
OR06						PN16
OR1						PN16
OR2				PN10	PN10	-
OR5						
OR10						
OR50				-		-
OR115	-		-			
Temp. range	-10...80°C	-20...70°C	-40...130°C	0...70°C	0...40°C	-20...80°C

Series OF	Material Housing / Oval wheel					
	AL1PK	SS1PK	SS1SS	PV1PK	PP1PK	PK1PK
OF1	Class300 (50,6 bar)			-	-	
OF2				PN16		
OF10				PN10		
OF50	-		PN40	-		
OF115	-		PN40	-		
Temp. range	-10...80°C	-20...70°C	-40...130°C	0...70°C	-	

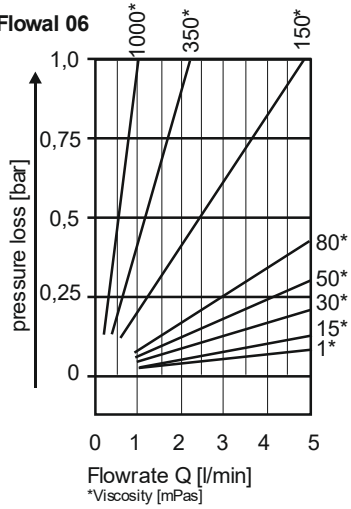


### 7.3.7 Pressure loss

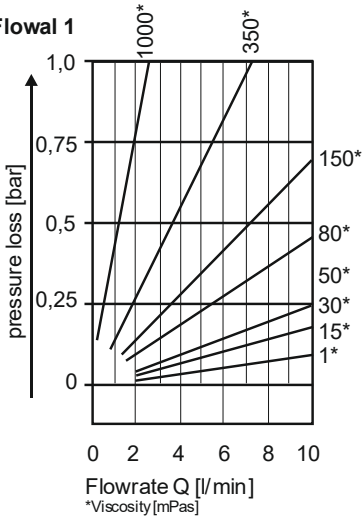
Flowal 015



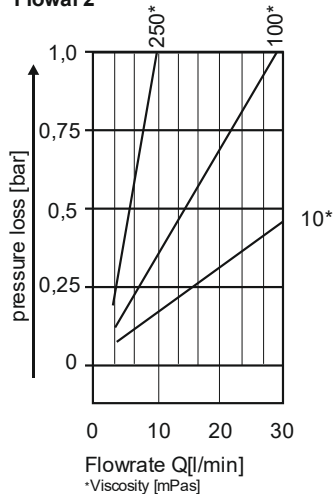
Flowal 06

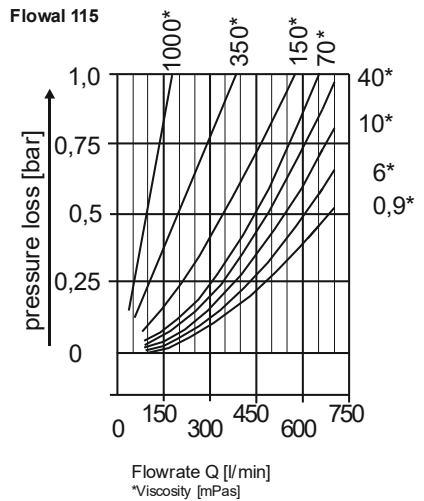
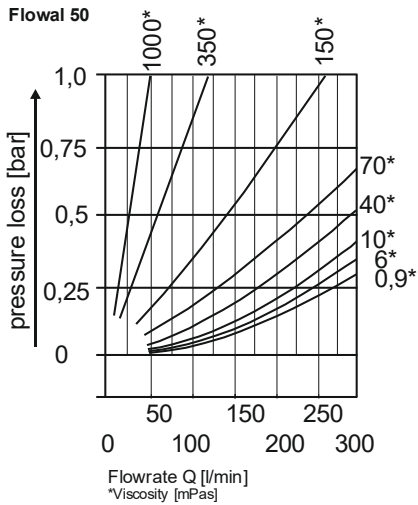
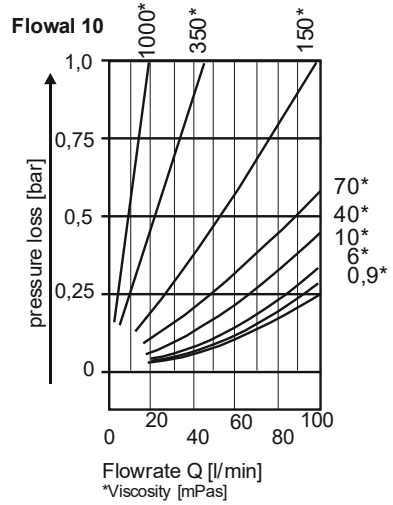
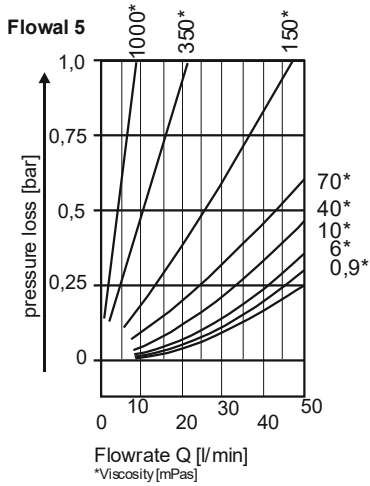


Flowal 1



Flowal 2





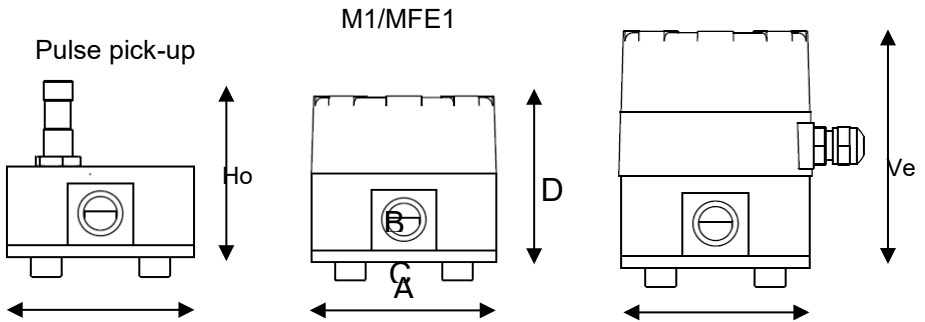
## 8. Constructive Design

### 8.1 Model/Dimensions/Weights

#### 8.1.1 Flowal® Plus, OR Plus

Multifunctional electronics

M2/M3/MFE2/MFE3



Type OR Plus	A (mm)	C (mm)	B <sub>max</sub> *, D (mm)	Installation dimension (mm)	PP1PK (kg)	AL1PK (kg)	SS1PK (kg)	SS1SS (kg)	PV1PK (kg)
OR015	78	70	96	73	-	0.6	1.3	1.3	0.6
OR06	78	75	101	73	-	0.6	1.3	1.4	0.6
OR1	78	85	111	73	-	0.7	1.6	1.8	0.6
OR2	99	93	120	90	-	1.5	3.1	3.4	1.1
OR5	112	98	125	102	0.9	1.9	3.8	4.2	1.2
OR10	112	125	152	102	1.4	2.4	4.9	5.6	2.1
OR50	220	187	213	184	-	-	-	31	-
OR115	260	245	271	196	-	-	-	55	-

\*B<sub>max</sub> depending on sensor

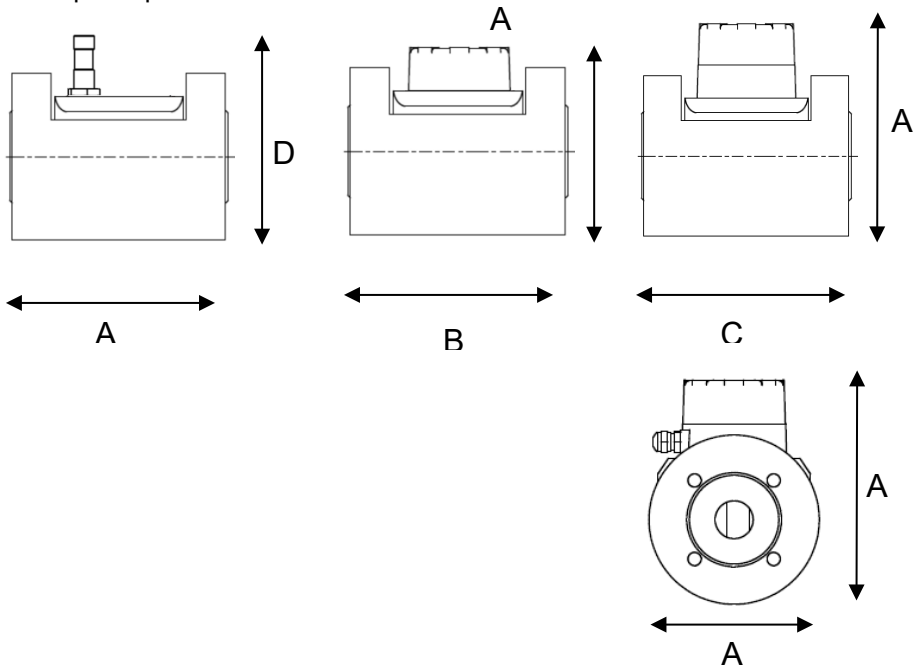
### 8.1.2 Flowal®Plus, OF

Multifunctional electronics

M2/M3/MFE2/MFE3

M1/MFE1

Pulse pick-up



Type OF	A (mm) Installation dimension	C (mm)	B <sub>max</sub> *, D (mm)	E (mm)	PP1PK (kg)	AL1PK (kg)	SS1PK (kg)	SS1SS (kg)	PV1PK (kg)
OF1	140	108	135	95	-	2.3	6.4	6.6	-
OF2	140	108	135	95	-	2.2	6.2	6.5	1.7
OF10	170	153	180	130	-	5.1	14.2	15	3.8
OF50	184	165	192	220	-	-	-	31	-
OF115	196	243	270	260	-	-	-	55	-

\*B<sub>max</sub> depending on sensor

## 8.2 Materials

Code	Housing	Oval wheel	Sleeve bearing	Axle	seals
PP1PK	PP	PEEK	PEEK	ceramics stainless steal	Viton
AL1PK	Alu	PEEK	PEEK	stainless steal	Viton
SS1PK	stainless steal	PEEK	PEEK	stainless steal	Viton
SS1SS	stainless steal	stainless steal	coal	stainless steal	Viton
PV1PK	PVDF	PEEK	PEEK	ceramics stainless steal	Viton
PK1PK	PEEK	PEEK	PEEK	ceramics stainless steal	Viton

PK: Polyetheretherketone (PEEK)

PP: Polypropylene

PV: Polyvinylidene fluoride (PVDF)

SS: stainless steel

AL: Aluminium

Seals: depending on the medium on request: EPDM, FEP (max.PN 25)

## 8.3 Process connection

Flowal® Plus	
<b>OR</b>	Female threads G $\frac{1}{4}$ , G $\frac{1}{2}$ , G $\frac{3}{4}$ , G1, G2
<b>OF</b>	Flanges DIN DN15/25/50; ANSI $\frac{1}{2}$ "/1" $\frac{1}{2}$ "

DN15, PN40 (DIN EN 1092-1 form B1)

DN25, PN40 (DIN EN 1092-1 form B1)

DN50, PN40 (DIN EN 1092-1 form B1)

Flanges  $\frac{1}{2}$ " ANSI 150 lbs

Flanges 1" ANSI 150 lbs

Flanges 2" ANSI 150 lbs

Flangse  $\frac{1}{2}$ " ANSI 300 lbs

Flanges 1" ANSI 300 lbs

## 8.4 Electrical connection

### 8.4.1 Electrical connection for pulse pick-up without MFE

Magnet field sensor NPN



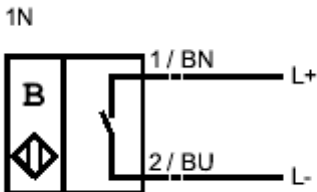
Magnetic field sensor PNP



#### ATTENTION!

When installing in hazardous areas, each national installation regulations must be observed (for Germany: EN 60079-14 and VDE 0165)

Namur-Sensor A1  
RM



Reedsensor R1,



### 8.4.2 Electrical for pulse pick-up with MFE

see operating manual Multifunctional electronics MFE 1, 2 and 3 A-DE-17208-00 in the actual revision.


## 9. Indicator

### 9.1 General

The Oval Wheel Meter series Flowal® Plus are set at the factory on request to the operating conditions specified in the order. The values which are set in the electronic display are shown in the attached data sheet configuration.

### 9.2 Electronic indicator

The electronic indicator Type MFE1, MFE2 or MFE3 (Code: M1, M2, M3) evaluates the original impulses of an Oval Wheel Meter in a quantity or flow indicator. The indicator is an LC Display.

Multifunctional electronic	Standard	
battery-powered display	M1	MFE1
battery-powered display, pulse output	M2	MFE2
pulse output, current output 4-20mA, PT 1000 input, 2 <sup>nd</sup> signal input for forward and return flow detection (with 2 <sup>nd</sup> sensor), memory for density and correction factor, powered directly by the current loop	M3	MFE3

(see operating manual Multifunctional electronics MFE1, 2 and 3 A-DE-17208-00 in the actual revision.)

### 9.3 Pulse value, K-Factor

The volume or the flow rate is calculated using a multiplication of the pulses generated with the device-specific K-factor.

For devices that are supplied with calibration, you receive a test certificate with your device, the device-specific pulse factor (K factor) in pulses per liter will be listed. This K factor is also specified on the device. If the device is supplied without calibration, the standard K factor should be used (see 3.2.2).

## Appendix

### A. Troubleshooting/Error Detection

The Oval Wheel Meter series Flowal® Plus operates maintenance-free. If a fault occurs or there is suspicion of an incorrect message, check the installation conditions as stated in section 7.

**WARNING!**

Always observe local regulations and all safety instructions in these operating instructions when working at the electrical connections.

**General:**

If the fault cannot be detected, please contact the service department of Bopp & Reuther Messtechnik GmbH or return the device for repair to the headquarter in Speyer / Germany (see Appendix B2).

### B Maintenance, Cleaning, Repairs, Hazardous Substances

#### B.1 Maintenance, Cleaning

If the Oval Wheel Meter will not be in operation for a longer period of time, it has to be dismantled, thoroughly cleaned and conserved with acid-free oil. Oval Wheel Meters used for liquid food may not be preserved in this way. In- and outlet are to be covered with caps. Make sure to store the Oval Wheel Meter in a dry room.

**Cleaning of the Oval Wheel Meters**

The oval wheels have to be dismantled if the pipes are flushed with hot water.

- Loosen the screws on housing cover, lift housing cover with pressure screws, pull off oval wheels from axle, handle with great care, do not place on stone floors, use support made of wood or rubber material.
- When mounting, put on the oval wheels toothed in, i.e. in a way that the M marks on the wheel face each other. Turn the oval wheel manually to



make sure they are properly inserted (once). When inserting the gaskets, make sure it fits precisely.

## B.2 Repair / Hazardous Media

Before sending the Oval Wheel Meter to Bopp & Reuther Messtechnik GmbH, make sure to observe the following:

- Attach a declaration of contamination describing the malfunction, state the application field and the chemical/physical properties of the media (please find the respective form in appendix)
- Remove all residues of the media and pay special attention to sealing grooves and slits. This is of extreme importance if the medium is hazardous to health, i.e. caustic, toxic, carcinogenic or radioactive etc.
- Please do not return the device if you are not perfectly sure that all media hazardous to health have been cleaned off.

Costs incurred due to inadequate cleaning of the device and possible costs for disposal and/or personal injuries (causticization etc.) will be billed to the operating company.

Please ask our customer service for help and advice if your Oval Wheel Meter does not work properly:

Bopp & Reuther Messtechnik GmbH  
Service  
Am Neuen Rheinhafen 4  
67346 Speyer, Deutschland  
Tel.: +49 6232 657-420  
Mobil-Nr.: +49 15115233023  
Fax: +49 6232 657-561  
Email: [service@bopp-reuther.com](mailto:service@bopp-reuther.com)

### C. Declaration on Decontamination

<p><b>Bopp &amp; Reuther Messtechnik GmbH</b>                  Am Neuen Rheinhafen 4                  67346 Speyer                  Germany</p>	<p><b>BOPP &amp; REUTHER                  MESSTECHNIK</b> </p> <p>Telephone: +49 (0) 6232 / 657 420                  Fax: +49 (0) 6232 / 657 561                  Mail: <a href="mailto:service@bopp-reuther.com">service@bopp-reuther.com</a>                  Web: <a href="http://www.bopp-reuther.com">www.bopp-reuther.com</a></p>	
ERA number: <input style="width: 200px;" type="text"/>		
<b>DECLARATION ON DECONTAMINATION OF METERS AND COMPONENTS</b>		
<p>Please complete this form and return in advance by email or by Fax to +49(0)6232 / 657 561 in order to receive an Equipment Return Authorisation (ERA) number (not necessarily required). No action to repair or examine the meter will be done, until a valid declaration of decontamination has been received.</p>		
<b>Contact information</b>		
Company Name: <input style="width: 150px;" type="text"/>	Contact Person: <input style="width: 150px;" type="text"/>	
Company Address: <input style="width: 150px;" type="text"/>	Name: <input style="width: 150px;" type="text"/>	
	Phone: <input style="width: 150px;" type="text"/>	
	Email: <input style="width: 150px;" type="text"/>	
<b>Meter information</b>		
Type: <input style="width: 150px;" type="text"/>	Serial no.: <input style="width: 150px;" type="text"/>	
Id. no.: <input style="width: 150px;" type="text"/>		
Reason for return (e.g. calibration, repair). Please describe in detail.		
<input style="width: 100%; height: 100%;" type="text"/>		
<b>Contamination information</b>		
The meter was contaminated with: <input style="width: 500px;" type="text"/>		
<input type="checkbox"/> poisonous	<input type="checkbox"/> corrosive, irritant	<input type="checkbox"/> flammable
<input type="checkbox"/> hazardous	<input type="checkbox"/> oxidizing	<input type="checkbox"/> cancer-causing, harmful
<input type="checkbox"/> explosive	<input type="checkbox"/> environmental hazardous	<input type="checkbox"/> other: <input style="width: 100px;" type="text"/>
The meter was cleaned with: <input style="width: 500px;" type="text"/>		
<b>Packaging and shipping Instructions</b>		
<ul style="list-style-type: none"> <li>• Remove all cables, connectors, separate filters and mounting materials</li> <li>• Please pack each item in two suitable sealed protective foil bags</li> <li>• Transport in suitable shipping package (e.g. original Bopp &amp; Reuther Messtechnik shipping package)</li> <li>• Include a copy of this declaration form along with the shipping documents on the outside</li> </ul>		
By signing this form, you are accepting the full responsibility for its contents and confirming that appropriate decontamination has taken place in accordance with legal regulations.		
Print name: <input style="width: 200px;" type="text"/>	Date: <input style="width: 100px;" type="text"/>	
Legally valid signature: <input style="width: 500px;" type="text"/>		

## D. Certificates

### D.1. EU-Declaration of conformity

BOPP & REUTHER  
MESSTECHNIK 

#### EU - Konformitätserklärung EU - Declaration of conformity UE - Déclaration de conformité

Hiermit erklärt der Hersteller in alleiniger Verantwortung, dass die nachfolgend bezeichnete Baueinheit den Anforderungen der zutreffenden EU-Richtlinien entspricht. Bei nicht mit uns abgestimmten Änderungen verliert diese Erklärung ihre Gültigkeit.

*The manufacturer herewith declares under sole responsibility that the unit mentioned below complies with the requirements of the relevant EU directives. This declaration is no longer valid if the unit is modified without our agreement.*

Par la présente, le fabricant déclare sous sa seule responsabilité que les appareils décrits ci-dessous, correspondent aux exigences de la réglementation UE qui les concerne. Toute modification des appareils sans notre accord entraîne la perte de validité de cette déclaration de conformité

<b>Hersteller</b> Manufacturer Fabricant	Bopp & Reuther Messtechnik GmbH Am Neuen Rheinhafen 4 D-67346 Speyer
<b>Bezeichnung</b> Description Description	Ovalradzähler Familie Flowal®Plus Oval wheel meter Family Flowal®Plus Compteur à roue ovales famille Flowal®Plus
<b>Typ, Modell</b> Type, model Type, modèle	OR / OF / OD mit with avec A1, MFE, UST, RM, RO, AG

<b>Richtlinie</b> Directive Directive	2014/30/EU /UE L 96/79 Elektromagnetische Verträglichkeit Electromagnetic interference Compatibilité électromagnétique
<b>Normen und normative Dokumente</b> Standards and normative documents Normes et documents normalifs	EN IEC 61000-6-2:2019 EN IEC 61000-6-3:2021

<b>Richtlinie</b> Directive Directive	2014/34/EU /UE L 96/309 Explosionsschutz Explosion protection Protection contre les explosions										
<b>Baumusterprüfbescheinigung</b> Type examination certificate Certificat d'approbation de type	<table border="1"> <tr> <td>KEMA 02ATEX1090 X</td> <td>A1 (BIM-M12)</td> </tr> <tr> <td>BVS 09 ATEX E 031 X</td> <td>MFE1-3</td> </tr> <tr> <td>DMT 99 ATEX E 014 X</td> <td>USTI</td> </tr> <tr> <td>BVS 04 ATEX E 022 X</td> <td>USTX</td> </tr> <tr> <td>DMT 00 ATEX E 063 X</td> <td>AG41 (PV11)</td> </tr> </table>	KEMA 02ATEX1090 X	A1 (BIM-M12)	BVS 09 ATEX E 031 X	MFE1-3	DMT 99 ATEX E 014 X	USTI	BVS 04 ATEX E 022 X	USTX	DMT 00 ATEX E 063 X	AG41 (PV11)
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DMT 00 ATEX E 063 X	AG41 (PV11)										
<b>Notifizierte Stelle</b> Notified Body Organisme Notifié	<table border="1"> <tr> <td>KEMA:</td> <td>0344</td> </tr> <tr> <td>DEKRA Certification B.V.</td> <td></td> </tr> <tr> <td>BVS, DMT: DEKRA EXAM</td> <td>0158</td> </tr> </table>	KEMA:	0344	DEKRA Certification B.V.		BVS, DMT: DEKRA EXAM	0158				
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EN 60079-11:2012	BIM-M12, MFE1-3, USTI, USTX, PV11										

Bopp & Reuther Messtechnik GmbH, Am Neuen Rheinhafen 4, 67346 Speyer / Germany  
Telefon: +49(0)6232 657-0, Telefax: +49(0)6232 657-505, Email: [info@bopp-reuther.com](mailto:info@bopp-reuther.com), Internet: [www.bopp-reuther.com](http://www.bopp-reuther.com)

Z-ML-KE Flowal-V6 2023-01-30

<b>Richtlinie</b> <i>Directive</i> Directive	2014/68/EU /UE Druckgeräte <i>Pressure equipment</i> Équipements sous pression	L 189/164
<b>Konformitätsbewertungsverfahren</b> <i>Conformity assessment procedure</i> Procédures d'évaluation de la conformité	Modul B + Modul C2	
<b>Notifizierte Stelle</b> <i>Notified Body</i> <i>Organisme Notifié</i>	0036 TUV SÜD Industrie Service GmbH Dudenstraße 28, D-68167 Mannheim	
<b>Normen und normative Dokumente</b> <i>Standards and normative documents</i> Normes et documents normatifs	AD 2000 Regelwerk AD 2000 Code Code AD 2000	
<b>Klassifizierung</b> <i>Classification</i> Classification	Rohrleitungsteil <i>Pipe</i> Tuyauterie	
<b>Fluid Kategorie ; Diagramm</b> <i>Fluid category ; Diagramm</i> Dangerosité du fluide ; Tableau	Gruppe 1 ; Anhang II / 6 <i>Group 1 ; Attachment II / 6</i> Groupe 1 ; Appendice II / 6	
<b>Einstufung Druckgerät</b> <i>Classification equipment sous pression</i> Classification pressure equipment	Kategorie III <i>Category III</i> Catégorie III	

**Die Angaben zur Richtlinie 2014/68/EU ist nur gültig für Druckgeräte die unter Artikel 4 Absatz 1 und 2 fallen, alle anderen unterliegen der guten Ingenieurspraxis nach Artikel 4 Absatz 3.**

*The information on Directive 2014/68 / EU is only valid for pressure equipment that falls under Article 4 Paragraph 1 and 2, all others are subject to good engineering practice according to Article 4 Paragraph 3.*

Les informations sur la directive 2014/68 / UE ne sont valables que pour les équipements sous pression relevant de l'article 4, paragraphes 1 et 2, tous les autres sont soumis aux bonnes pratiques d'ingénierie conformément à l'article 4, paragraphe 3.

<b>Richtlinie</b> <i>Directive</i> Directive	2011/65/EU /UE Beschränkung gefährlicher Stoffe <i>Restriction of hazardous substances</i> Limitation de substances dangereuses	L 174/88
<b>Delegierte Richtlinie</b> <i>Delegated Directive</i> Directive Déléguée	(EU /UE) 2015/863 Änderung Anhang II der Richtlinie 2011/65/EU <i>Amending Annex II to Directive 2011/65/EU</i> Modifiant l'annexe II de la directive 2011/65/UE	L 137/10
<b>Normen und normative Dokumente</b> <i>Standards and normative documents</i> Normes et documents normatifs	EN IEC 63000:2018	

**Ort, Datum / Place, Date / Lieu, Date:**

**Speyer, 2023-01-30**

  
**Dr. J. Ph. Herzog**  
**Geschäftsführer**  
*Managing director / Gérant*

**i. V. J. Riedl**  
**stv. QM Beauftragter**  
*Deputy QM Officer / Adjoint chargé de la qualité*

*J. Riedl*

**NOTES:**

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## **Our product portfolio:**

### **Volume flowmeter:**

- Oval wheel meter
- Turbine meter
- Electromagnetic flowmeter

### **Mass flowmeter:**

- Vortex meter
- Compact orifice
- Coriolis mass flowmeter

### **Density and concentration meter (Measuring and testing equipment)**

#### **Dosing measurement technology**

- Electromagnetic flowmeter
- Coriolis mass flowmeter
- Oval wheel meter
- Dosing control system

#### **Measurement Accessories**

- Processing electronics
- Mechanical indicator
- Pulse pick-ups
- Components

#### **Measuring and testing equipment**

#### **Conformity assessment according to MID Directive 2014/32/EU**

#### **After Sales Service**

Bopp & Reuther Messtechnik GmbH  
Am Neuen Rheinhafen 4  
67346 Speyer  
Germany  
Phone: +49 6232 657-0  
Fax: +49 6232 657- 505  
Email: [info@bopp-reuther.com](mailto:info@bopp-reuther.com)  
<https://www.bopp-reuther.com>

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**MESSTECHNIK**

