



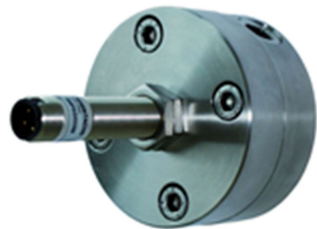
Oval Wheel Meter

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 case 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.
7. Symbols used



Warning!

Failure to observe this warning can lead to injury of persons or a security risk.



Attention!

Non-compliance can lead to faulty operation or damage to the device.

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 Plus / OF |
| Version number | A-EN-01280-00 Rev.G |
| 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.

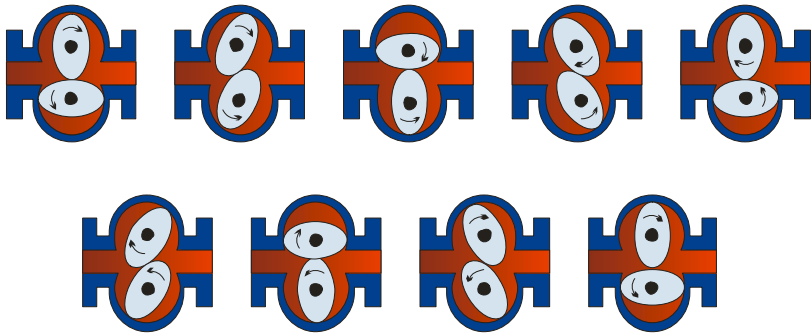
3. Measuring Principle and System Design

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.



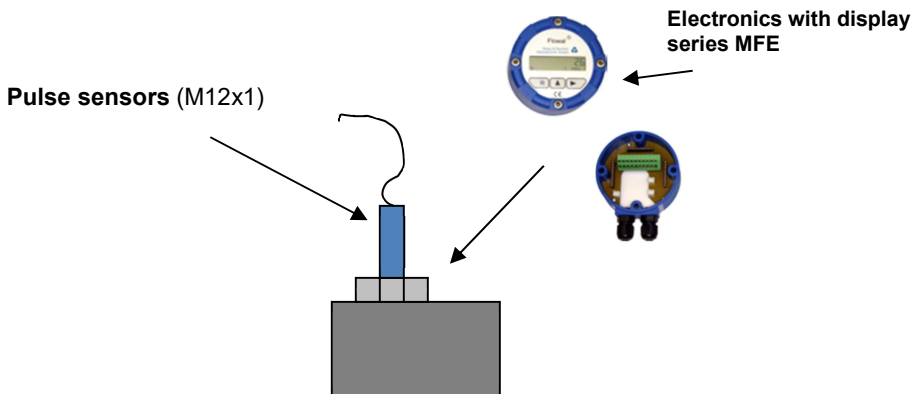
Each revolution the oval wheels displace a discrete volume of liquid (defined by the space between the oval wheel and measurement chamber) through the chamber.

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 |
|----------------------------|---|--------------------------------|--|--|--|----|-------------|
| Pulse pick-up | | | | | | | |
| Reed RM | passive reed sensor for connection to PLC / PLS | via PLC / PLS | max 170V, max 0,5A, max 10W | cable 2m | -25 to 80° | Ex | IP67 |
| NAMUR A1 | 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 | Ex | |
| Magnetic field sensor | | | | | | | |
| N1 | open collector sensor NPN | NPN 10 - 30VDC | max 200mA | plug-in connector opt. cable 3m | -25 to 85° | - | IP67 |
| P1 | open collector sensor PNP | PNP 10 - 30VDC | max 200mA | plug-in connector opt. cable 3m | -25 to 85° | - | |
| NT | open collector sensor NPN | NPN 5 - 24VDC | max 25mA | cable 1m, iintegrated on the sensor | -40 to 125°C | - | |
| PT | open collector sensor PNP | PNP 18 - 30VDC | max 100mA | cable 2m, integrated on the sensor | -25 to 130°C | - | |
| Multifunctional electronic | | | | | | | |
| M1 | on-site indicator flow / volume | internal battery | without output | no connection | -20 to 80° -20 to 125° high temperature | - | IP65 |
| MFE1 | | | | | | Ex | |
| M2 | 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 | - | |
| MFE2 | | | | | | Ex | |
| M3 | 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 | - | |
| MFE3 | | | | | | Ex | |

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 | Pulses | | |
|-------------------------------|--------------------|--------|-------|-------|
| | | l/min | Imp/n | Imp/l |
| 015 | 0.03 - 1 | 2 | ~3100 | 52 |
| 06 | 0.2 - 5 | 2 | ~333 | 28 |
| 1 | 0.4 - 10 | 2 | ~166 | 28 |
| 2 | 1 - 30 | 2 | ~100 | 50 |
| 5 | 2 - 50 | 2 | ~40 | 33 |
| 10 | 4 - 100 | 2 | ~20 | 33 |
| 50 | 15 - 300 | 2 | ~4 | 20 |
| 115 | 35 - 660 | 2 | ~1.7 | 19 |

Oval wheels: PEEK – max. 150 mPa·s

| Type OR Plus / OF | Measuring range | Pulses | | |
|-----------------------------|--------------------|--------|-------|-------|
| | | l/min | Imp/n | Imp/l |
| 015 | 0.03 - 1 | 2 | ~3100 | 52 |
| 06 | 0.2 - 7 | 2 | ~333 | 39 |
| 1 | 0.4 - 14 | 2 | ~166 | 39 |
| 2 | 1 - 30 | 2 | ~100 | 50 |
| 5 | 2 - 60 | 2 | ~40 | 40 |
| 10 | 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



Warning!

Before mounting and operating the device, carefully read and observe the installation instructions.

Before mounting or disassembling the device, **depressurize** and **cool down the system**.

7.1.1.1 General information

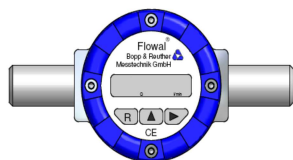
- Only trained personnel who have been authorized by the system operator are allowed to perform assembly, electrical installations, commissioning, maintenance and operation. You must have read and understood the instructions and follow their instructions strictly.
- Bopp & Reuther Oval Wheel Meters are 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!**

D

**Oval Wheel Meter
correct installed**

7.1.2 Start-Up Conditions



Attention!

Start up the Oval Wheel Meter with slowly increasing flow.

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)

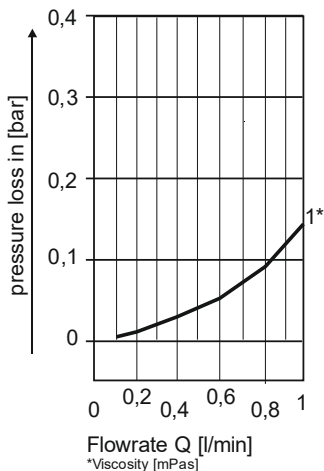
7.3.6 Table pressure / temperature range

| Series OR Plus | Material Housing / Oval wheel | | | | | | | |
|-------------------|-------------------------------|------------|-------------|----------|----------|------------|--|--|
| | AL1PK | SS1PK | SS1SS | PV1PK | PP1PK | PK1PK | | |
| OR015 | PN40 | PN68 | PN 68 | PN16 | - | - | | |
| OR06 | | | | | | PN16 | | |
| OR1 | | | | | | | | |
| 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 | | |

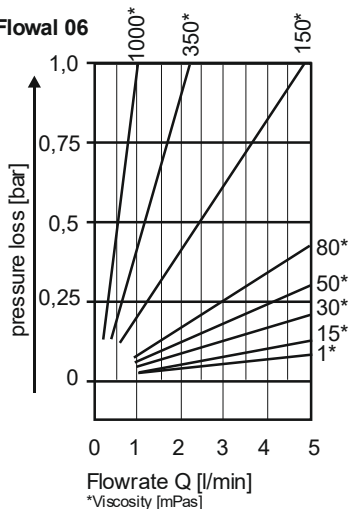
| Series OF | Material Housing / Oval wheel | | | | | |
|----------------|-------------------------------|------------|-------------|----------|-------|-------|
| | AL1PK | SS1PK | SS1SS | PV1PK | PP1PK | PK1PK |
| OF1 | Class300 (50,6 bar) | | | - | - | |
| OF2 | | | | PN16 | | |
| OF10 | | | | PN10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

7.3.7 Pressure loss

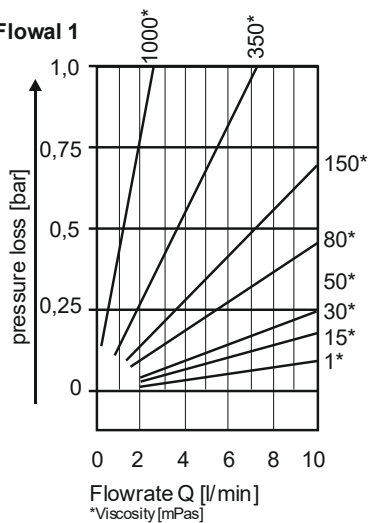
Flowal 015



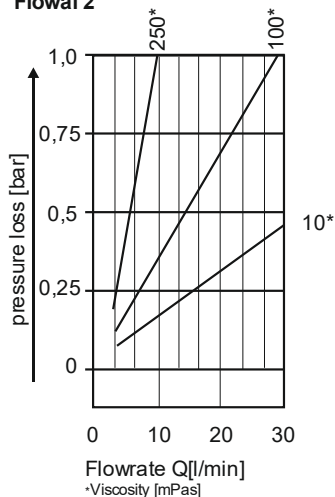
Flowal 06

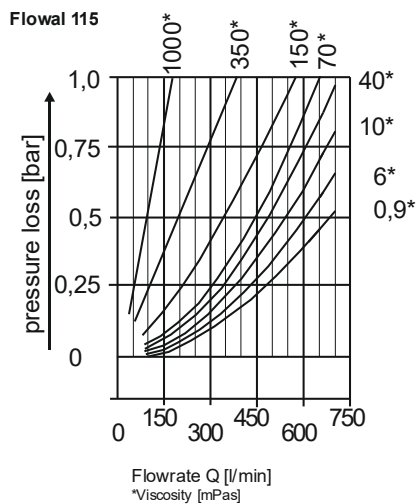
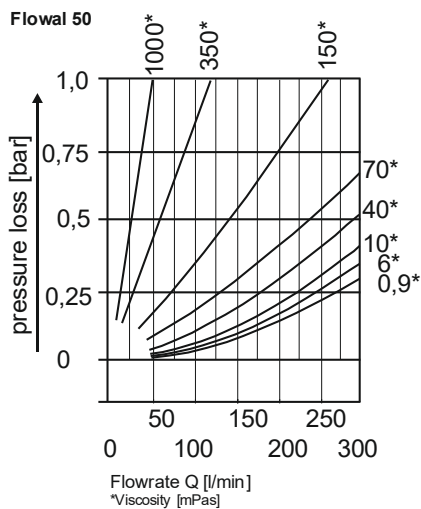
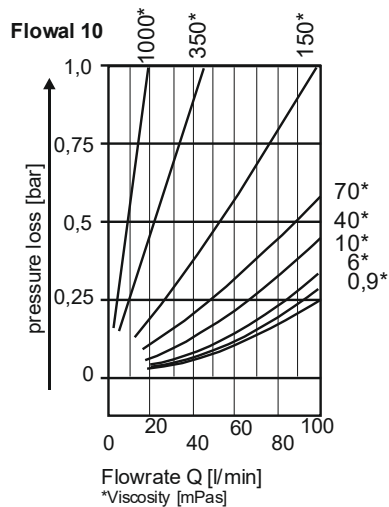
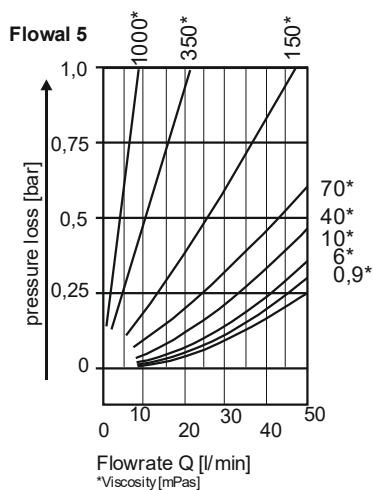


Flowal 1



Flowal 2





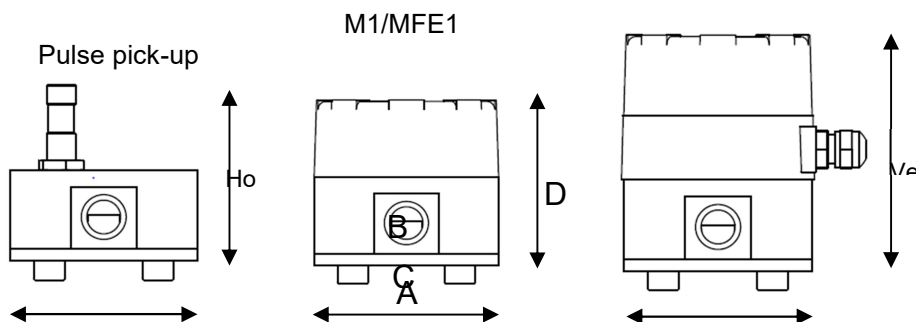
8. Constructive Design

8.1 Model/Dimensions/Weights

8.1.1 Flowal®Plus, OR Plus

Multifunctional electronics

M2/M3/MFE2/MFE3

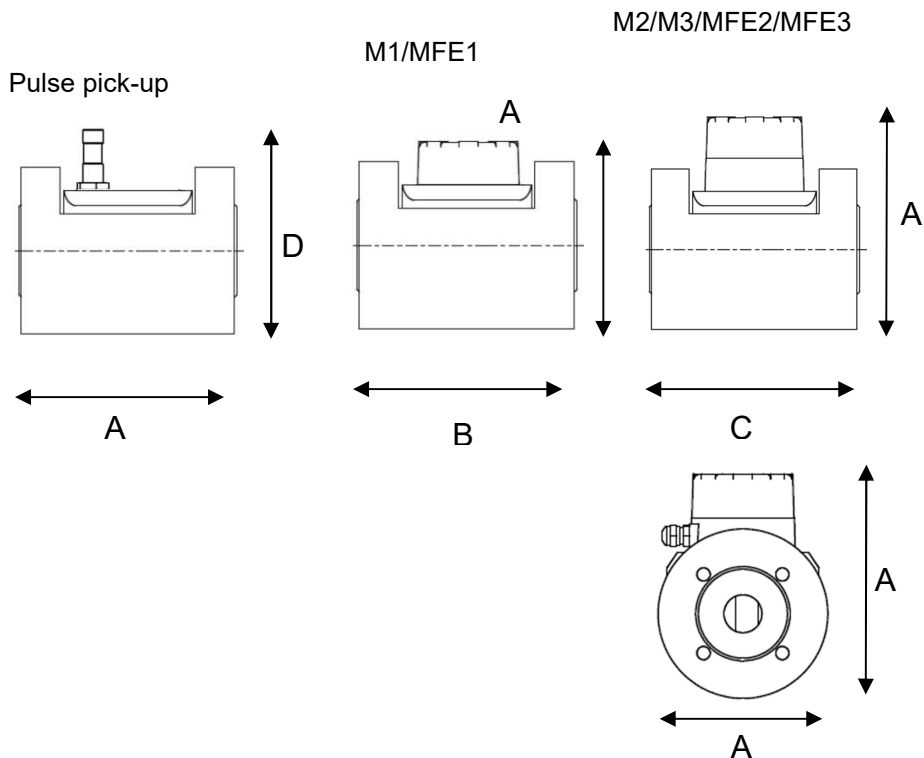


| Type OR Plus | A (mm) | C (mm) | B _{max} *, D (mm) | Installation dimension (mm) | PP1PK (kg) | AL1PK (kg) | SS1PK (kg) | SS1SS (kg) | PV1PK (kg) |
|-----------------|-----------|-----------|----------------------------------|-----------------------------------|---------------|---------------|---------------|---------------|---------------|
| 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_{max} depending on sensor

8.1.2 Flowal®Plus, OF

Multifunctional electronics



| Type OF | A (mm) Installation dimension | C (mm) | B_{max}^* , 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_{max} depending on sensor

8.2 Materials

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

PK: Polyetheretherketone (PEEK)

PP: Polypropylene

PV: Polyvinylidenefluoride (PVDF)

SS: stainless steel

AL: Aluminium

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

8.3 Process connection

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

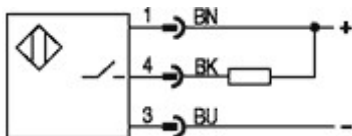
Flangse $\frac{1}{2}$ " ANSI 300 lbs

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

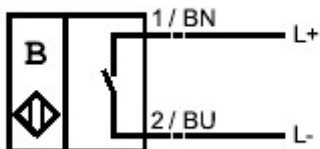


Attention!

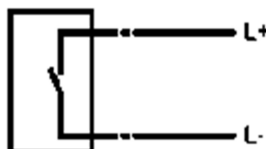
When installing in hazardous areas, each national installation regulations must be observed (for Germany: EN 60079-14 and VDE 0165).

Namur-Sensor A1
RM

1N



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 nd signal input for forward and return flow detection (with 2 nd 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 the 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 work to Bopp & Reuther Messtechnik GmbH (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:

| |
|--|
| <p>Bopp & Reuther Messtechnik GmbH Service Am Neuen Rheinhafen 4 67346 Speyer Phone : +49 6232 657-420 Fax: +49 6232 657-561</p> |
|--|

C. Form

C.1 Declaration on contamination of products and components

Bopp Reuther Messtechnik GmbH
Am Neuen Rheinhafen 4

D - 67346 Speyer

Germany / Deutschland

BOPP & REUTHER
MESSTECHNIK 

Telefon: +49 (0) 6232 657 420
Fax: +49 (0) 6232 657 561
Mail: service@bopp-reuther.de
Web: www.bopp-reuther.de

DECLARATION ON CONTAMINATION OF PRODUCTS AND COMPONENTS

Please complete this form and return in advance by Fax to +49 (0) 6232 / 657 561 in order to receive an equipment return authorisation (ERA) number. No action to repair or examine the product will be done, until a valid declaration of contamination has been received.

ERA number: _____

Contact information

Company name + address

Contact person

Name: _____

Phone: _____

E-Mail: _____

Product information

Type: _____









Id. no.: _____

Serial no.: _____

Reason for return (e.g. calibration, repair). Please describe in detail.

Contamination information

The product was contaminated with: _____

| | | |
|--|--|---|
| <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, health hazard  |
| <input type="checkbox"/> explosive  | <input type="checkbox"/> environmental hazardous  | <input type="checkbox"/> other: _____ |

The product was cleaned with: _____

Packaging and shipping Instructions

- remove any cables, connectors, separate filters and mounting materials
- double bag each item in suitable protective foil (sealed)
- transport in suitable shipping container (e.g. original B & R shipping container) and include a copy of this declaration form at
- the shipping documents to the outside

By signing this form you are accepting full responsibility for its contents and confirming that any decontamination has taken place in accordance with legal regulations.

Print name: _____

Date: _____

Legally valid signature: _____

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 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

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

| | | |
|---|---|---------|
| Richtlinie Directive Directive | 2014/30/EU /UE Elektromagnetische Verträglichkeit Electromagnetic interference Compatibilité électromagnétique | L 96/79 |
| Normen und normative Dokumente Standards and normative documents Normes et documents normatifs | EN 61000-6-2:2005 EN 61000-6-3:2011 | |

| | | |
|---|---|--|
| Richtlinie Directive Directive | 2014/34/EU /UE Explosionsschutz Explosion protection Protection contre les explosions | L 96/309 |
| Baumusterprüfbescheinigung Type examination certificate Certificat d'approbation de type | KEMA 02ATEX1090 X BVS 09 ATEX E 031 X DMT 99 ATEX E 014 X BVS 04 ATEX E 022 X DMT 00 ATEX E 063 X | A1 (BIM-M12) MFE1-3 UST1 USTX AG41 (PV11) |
| Notifizierte Stelle Notified Body Organisme Notifié | KEMA: DEKRA Certification B.V. BVS, DMT: DEKRA EXAM | 0344 0158 |
| Normen und normative Dokumente Standards and normative documents Normes et documents normatifs | EN 60079-0:2012/A11:2013 EN 60079-1:2014 EN 60079-11:2012 | BIM-M12, MFE1-3, UST1, USTX, PV11 USTX BIM-M12, MFE1-3, UST1, USTX, PV11 |

Bopp & Reuther Messtechnik GmbH, Am Neuen Rheinhafen 4, D-67346 Speyer
Telefon: +49(0)6232 657-0, Telefax: +49(0)6232 657-505, Email: info@bopp-reuther.de, Internet: www.bopp-reuther.de

Z-ML-KE Flowal-V5 2020-03-17

| | | |
|--|---|-----------|
| Richtlinie <i>Directive</i> Directive | 2014/68/EU /UE Druckgeräte <i>Pressure equipment</i> Équipements sous pression | L 189/164 |
| Baumusterprüfbescheinigung <i>Type approval certificate</i> Certificat d'approbation de type | Modul B Z-IS-AN1-MAN-19-07-2681356-23083220 Modul C1 Z-IS-DDB-MAN-15-05-100067376-007 | |
| Notifizierte Stelle <i>Notified Body</i> Organisme Notifié | 0036 TUV SÜD Industrie Service GmbH Dudenstraße 28, D-68167 Mannheim | |
| Normen und normative Dokumente <i>Standards and normative documents</i> Normes et documents normatifs | AD 2000 Regelwerk AD 2000 Code Code AD 2000 | |
| Klassifizierung <i>Classification</i> Classification | Rohrleitungsteil <i>Pipe</i> Tuyauterie | |
| Fluid Kategorie ; Diagramm <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 | |
| Angewandtes Konformitätsbewertungsverfahren <i>Conformity assesment procedure beeing used</i> Procédure d'évaluation de la conformité appliquée | 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.

| | | |
|--|--|----------|
| Richtlinie <i>Directive</i> Directive | 2011/65/EU /UE Beschränkung gefährlicher Stoffe <i>Restriction of hazardous substances</i> Limitation de substances dangereuses | L 174/88 |
| Normen und normative Dokumente <i>Standards and normative documents</i> Normes et documents normatifs | EN 50581:2012 | |

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

Speyer, 2020-03-17



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



i. A. B. Bähr
QS Leiter / QA Manager / Responsable qualité