

HYDRUS 2.0 BULK

ULTRASONIC METER

DIEHL
Metering



APPLICATION

HYDRUS 2.0 BULK is a static water meter operating on ultrasonic measuring technology. This technology enables accurate calculation of water consumption with long-term stability and eliminates measuring deviations caused by sand, suspended particles, scale or air pockets. Moreover it does not require any earthing.

Developed within the framework of the MID, HYDRUS 2.0 BULK complies with the European regulations and holds sanitary conformity certificates (ACS, WRAS, BELGAQUA, DM174 and others). The meter is also designed for cold and hot water.

Its integrated radio enables remote reading of the meter's index and alarms both in mobile (walk-by, drive-by, passive drive-by) and fixed network mode.

HYDRUS 2.0 BULK offers a wide choice of connectivities compatible with the different IZAR reading modes.

A complete Diehl Metering solution is thus available to meet your needs.

FEATURES

- ▶ DN 50 to 200
- ▶ MID approval up to R=1,000
- ▶ IP 68
- ▶ Wireless M-Bus radio, Wired M-Bus/Pulse/Pulse, Wireless M-Bus radio/L-Bus/Pulse, Pulse (IZAR BE PULSE compatible)
- ▶ Display with symbols and error codes
- ▶ Self-monitoring function
- ▶ Battery lifetime up to 16 years

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TECHNICAL DATA

| HYDRUS 2.0 BULK | | | |
|-------------------------------------|------------|--|------|
| Water temperature | °C | +0.1 ... +50 (T30 / T50) +0.1 ... +90 (T90) | |
| Accuracy | | Class 2 according to ISO 4064:2014 / OIML R49:2013 | |
| Ambient operating temperature | °C | -10 ... +55 | |
| Ambient storage temperature | °C | -10 ... +70 (>35 °C max. 4 weeks) | |
| Environmental class | | O (Outdoors) | |
| Mechanical environmental class | | M2 | |
| Electromagnetic environmental class | | E2 | |
| Flow profile sensitivity class | | U0/D0 (no calming sections required) | |
| Installation position | | Horizontal, inclined 45°, inclined 90°, vertical | |
| Nominal pressure | PN | bar | 16 |
| Pressure loss class | Δp | bar | 0.16 |
| Power supply | | 3.6 V lithium battery (D-cell) | |
| Battery lifetime ¹ | | Up to 16 years (all communication interfaces) | |
| Communication interfaces | | Optical, OMS wireless M-Bus 434 or 868 MHz, M-Bus, L-Bus and Pulse | |
| Data storage | | For errors, alarms and measuring values, data logging capabilities to record up to 512 daily + 32 monthly values | |
| Protection class | | IP 68 | |

¹ Theoretical lifetime, depends on the sending interval of the radio telegram, the telegram length and the ambient temperature at the installation.

TECHNICAL DATA DISPLAY

| HYDRUS 2.0 BULK | |
|------------------------------|--|
| Display indication | LCD, 9-digit, additional symbols/display counter/unit |
| Units displayed DN 50 - 100 | Volume (m ³ + 2 digits after decimal point) and flow rate (m ³ /h + 3 digits after decimal point) |
| Units displayed DN 125 - 200 | Volume (m ³ + 1 digit after decimal point) and flow rate (m ³ /h + 3 digits after decimal point) |
| Values displayed | Display test - volume - battery lifetime - firmware version - software checksum - flow - current/continuous/historical error - alarm status - high resolution volume - due date - due date volume - reverse volume - flow direction - display counter - low battery indication - leakage indication - metrological log access - radio signal ON/OFF - alarm indication - billing value |

COMMUNICATION INTERFACES

| HYDRUS 2.0 BULK | |
|--------------------|--|
| Optical | For switching the display loop, reading and configuration with IZAR@MOBILE 2 |
| Radio | 434 or 868 MHz, Open Metering Standard (OMS) radio frame (short frame) for mobile reading sent every 14 seconds, long range radio frame for fixed network sent every 5 minutes, extra long range radio frame for fixed network sent every 15 minutes |
| M-Bus | 2,400 baud, cable length 1.5 m*, power supply only via built-in battery - is combined with 2 pulse outputs |
| L-Bus | In combination with radio, cable length 1.5 m* (only 1 interface communicating at the same time) |
| Pulse (Open drain) | 2 pulse outputs, or 1 pulse and 1 L-Bus output, pulse cable length 1.5 m* |

*May vary by up to $\pm 3.5\%$ due to manufacturing tolerances.

SECURITY

| HYDRUS 2.0 BULK | |
|-----------------|--|
| Versions | OMS Generation 3 - Profile A or OMS Generation 4 - Profile B |

PRIVACY

The HYDRUS 2.0 BULK saves 512 daily consumption values. This data can be read locally and accessed only by using the IZAR@MOBILE 2. As a second logging, a small amount of 32 monthly consumption values can be stored. Both the radio protocol and the optical interface are encrypted by default.

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VOLUME / PULSE OPEN DRAIN

| HYDRUS 2.0 BULK | |
|---|--|
| Max. input voltage | V 30 |
| Max. input current | mA 27 |
| Max. voltage drop at active output | V/mA 2 / 27 |
| Max. current through inactive output | µA/V 5 / 30 |
| Max. reverse voltage without destroying outputs | V 6 (in case current does not exceed 27 mA) |
| Pulse rates DN 50 | l/pulse 1 / 10 / 100 / 1,000 (depending on nominal size) |
| Pulse rates DN 65 - 150 | l/pulse 10 / 100 / 1,000 (depending on nominal size) |
| Pulse rates DN 200 | l/pulse 100 / 1,000 (depending on nominal size) |
| Configuration pulse output 1 | Total volume or forward volume |
| Configuration pulse output 2 | Flow direction or error, reverse volume, forward volume |
| Pulse frequency | Max. frequency 10 Hz |
| Pulse width | 50 ms |

AVAILABLE VERSIONS

| HYDRUS 2.0 BULK | |
|----------------------------------|---|
| Wireless M-Bus radio/Pulse/L-Bus | 3 wires - only forward volume for pulse output 2 (minimum 10L/pulse) |
| Wireless M-Bus radio only | without wire |
| Wired M-Bus/Pulse/Pulse | 5 wires - forward volume on pulse output 1 and reverse volume on pulse output 2 |
| Pulse (IZAR BE PULSE compatible) | 4 wires - total volume on pulse output 1 and direction on pulse output 2 with fraud |

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PERFORMANCE DATA - COLD WATER (T30 / T50) HORIZONTAL

| Nominal diameter | DN | mm | 50 | 65 | 80 | 100 | 125 | 150 | 200 |
|---|-------------------|-------------------|-------|------|-------|------|------|--------|------|
| Permanent flow rate | Q ₃ | m ³ /h | 25 | 40 | 63 | 100 | 160 | 250 | 400 |
| Dynamic (Q ₃ /Q ₁) | R | | 800 | 800 | 800 | 800 | 800 | 800 | 800 |
| Overload flow rate | Q ₄ | m ³ /h | 31.25 | 50 | 78.75 | 125 | 200 | 312.50 | 500 |
| Transitional flow rate | Q ₂ | l/h | 50 | 80 | 126 | 200 | 320 | 500 | 800 |
| Minimum flow rate | Q ₁ | l/h | 31.25 | 50 | 78.75 | 125 | 200 | 312.50 | 500 |
| Starting flow rate | | l/h | 15 | 27 | 35 | 45 | 70 | 250 | 400 |
| Pressure loss at Q ₃ | | bar | 0.16 | 0.15 | 0.16 | 0.13 | 0.15 | 0.11 | 0.12 |
| Pressure loss at Q ₄ | | bar | 0.25 | 0.23 | 0.25 | 0.2 | 0.23 | 0.18 | 0.19 |
| Maximum flow rate ² | Q _{high} | m ³ /h | 62.5 | 100 | 157.5 | 250 | 400 | 625 | 1000 |
| Flow rate at ΔP = 1 bar | | m ³ /h | 63 | 105 | 158 | 280 | 420 | 747 | 1140 |

² Outlet pressure minimum 3 bar, maximum 100 hours per year, closed pipeline network

PERFORMANCE DATA - HOT WATER (T90) HORIZONTAL

| Nominal diameter | DN | mm | 50 | 65 | 80 | 100 | 125 | 150 | 200 |
|---|----------------|-------------------|-------|------|-------|------|-----|-----|-----|
| Permanent flow rate | Q ₃ | m ³ /h | 25 | 40 | 63 | 100 | - | - | - |
| Dynamic (Q ₃ /Q ₁) | R | | 400 | 400 | 400 | 400 | - | - | - |
| Overload flow rate | Q ₄ | m ³ /h | 31.25 | 50 | 78.75 | 125 | - | - | - |
| Transitional flow rate | Q ₂ | l/h | 100 | 160 | 250 | 400 | - | - | - |
| Minimum flow rate | Q ₁ | l/h | 63 | 100 | 160 | 250 | - | - | - |
| Starting flow rate | | l/h | 15 | 27 | 35 | 45 | - | - | - |
| Pressure loss at Q ₃ | | bar | 0.16 | 0.15 | 0.16 | 0.13 | - | - | - |
| Pressure loss at Q ₄ | | bar | 0.25 | 0.23 | 0.25 | 0.2 | - | - | - |
| Flow rate at ΔP = 1 bar | | m ³ /h | 63 | 105 | 158 | 280 | - | - | - |

APPROVAL

| DN 50 - 200 | | |
|---|---|--------------------------------|
| Approval | | MID DE-19-MI001-PTB011 |
| Dynamic range (Q ₃ /Q ₁) | R | Up to R=1,000 |
| Standards | | ISO 4064 EN 14154 OIML R49 |
| Sanitary conformity | | ACS WRAS DM174 BELGAQUA |

DYNAMIC RANGE

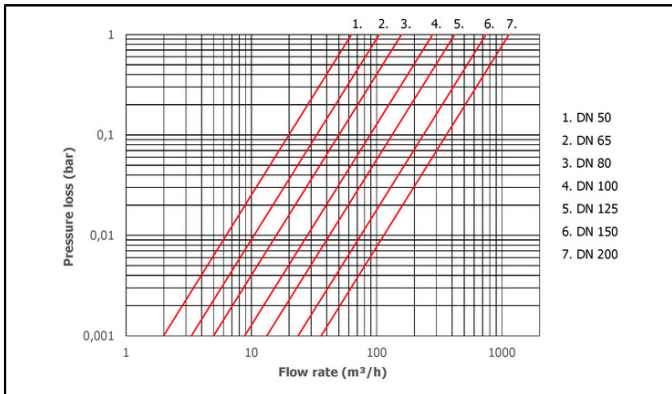
| DN 50 - 200 | | |
|---|---|-------------|
| Q ₃ 25 ... 400 m ³ /h - T30 | R | 800 |
| Q ₃ 25 ... 400 m ³ /h - T50 | R | 800H / 250V |
| Q ₃ 25 ... 100 m ³ /h - T90 | R | 400H / 160V |

H=horizontal installation position / V=vertical installation position

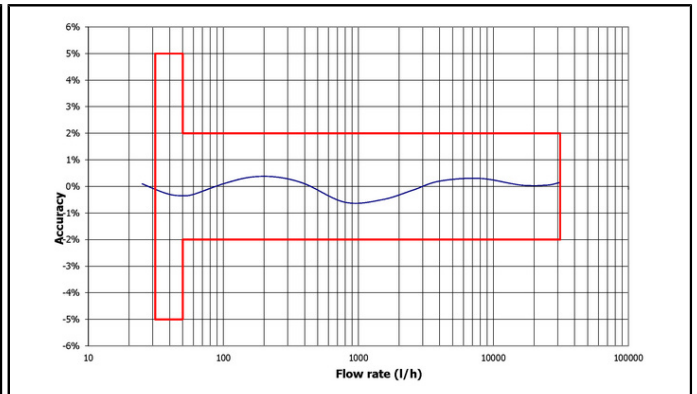
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PRESSURE LOSS GRAPH / TYPICAL ERROR GRAPH

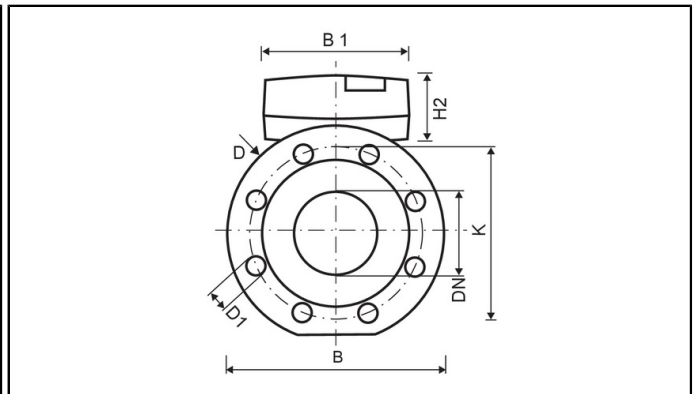
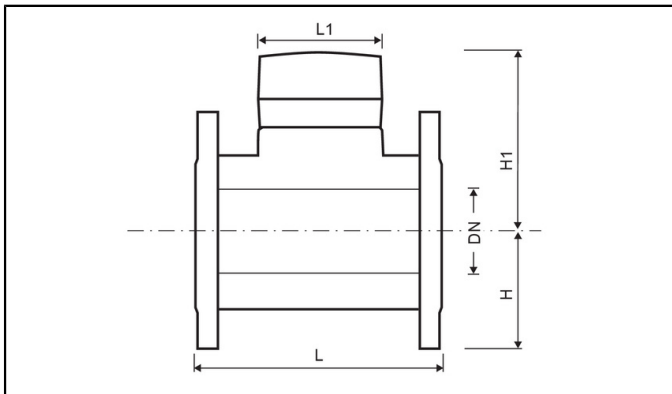


Pressure loss graph



Typical error graph - $Q_3=25 \text{ m}^3/\text{h}$

DIMENSIONS



| Nominal diameter | DN | mm | 50 | 65 | 80 | 100 | 125 | 150 | 200 |
|-----------------------------------|----|-----|--------------------------------|------------------------|---------------------------------------|---------------------------------|-----|-----------|-----------------|
| Overall length (T30 / T50) | L | mm | 200/ 270 / 300 ³ | 200 / 300 ³ | 200 / 225 / 300 / 350 ³ | 250 / 350 ⁴ / 360 | 250 | 300 / 500 | 350 |
| Overall length (T90) | L | mm | 200 | 200 | 200 / 225 | 250 | - | - | - |
| Flange diameter ⁵ | D | mm | 165 | 185 | 200 | 220 | 250 | 285 | 340 |
| Hole circle diameter ⁵ | K | mm | 125 | 145 | 160 | 180 | 210 | 240 | 295 |
| Number of screwholes ⁵ | | pcs | 4 | 4 | 8 | 8 | 8 | 8 | 12 ⁶ |
| Screw hole diameter ⁵ | D1 | mm | 19 | 19 | 19 | 19 | 19 | 23 | 23 |
| Height | H | mm | 74 | 87 | 95 | 105 | 120 | 135 | 161 |
| Height | H1 | mm | 121 | 143 | 147 | 165 | 177 | 185 | 215 |
| Height | H2 | mm | 61 | 61 | 61 | 61 | 61 | 61 | 61 |
| Counter length | L1 | mm | 98 | 98 | 98 | 98 | 98 | 98 | 98 |
| Meter width | B | mm | 165 | 185 | 200 | 220 | 250 | 285 | 340 |
| Counter width | B1 | mm | 139 | 139 | 139 | 139 | 139 | 139 | 139 |
| Overall weight (approx.) | | kg | 7 / 9 / 9 | 8 / 11 | 11 / 13 / 14 / 15 | 17 / 19 / 20 | 23 | 38 / 45 | 51 |

³ Optionally with rotatable flange

⁴ Rotatable flange

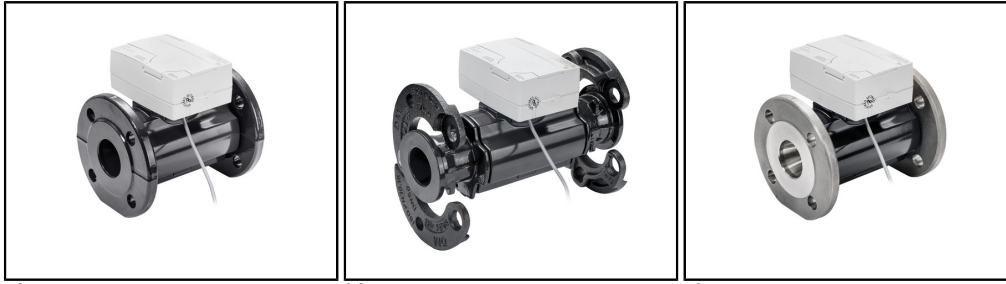
⁵ Flanges according to EN 1092, PN 10/16

⁶ 8 Screwholes for PN 10

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METER BODY VARIANTS



- a) The cold water meters come with an epoxy-coated cast iron housing as standard. ISO short length variants can optionally be manufactured with a stainless steel housing.
- b) ISO long length meters with diameters up to DN 100 can optionally come with rotatable flanges.
- c) Hot water meters are always provided with stainless steel housings (EN 1.4408, AISI 316).

REACH

Information pursuant to Article 33 (1) of Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006:

This product series contains articles with the following substances in a concentration of more than 0.1% weight by weight (w/w):

- Lead