

# HYDRUS 2.0 BULK

## ULTRASONIC METER



### APPLICATION

HYDRUS 2.0 BULK is a static ultrasonic bulk water meter designed for applications of cold and hot water supply enabling accurate measuring with long-term stability under difficult conditions (no measurement of air and insensitive to sedimentation). Developed within the framework of the MID, it complies with the European regulations and holds sanitary conformity certificates (AoC DEU, ACS, WRAS and others). The integrated communication function supports meter data provision via mobile reading (walk-by/drive-by/passive drive-by) or fixed network (upgrade without on-site configuration). In combination with Diehl Metering's IZAR fixed network system, which stands out with extra high coverage and strong performance to reach hard-to-read locations, high data granularity and timeliness will be maintained. This is what makes it a high responsive infrastructure to take actions immediately.

### FEATURES

- DN 50 to 200
- MID approved with dynamic range up to R 1000
- IP 68 suitable for outdoor installations
- Integrated communication
- based on OMS specification
- Wireless M-Bus for mobile reading in parallel to Fixed Network
- mioty® for Metering for extended radio range
- Wired M-Bus/Pulse/Pulse, wireless M-Bus, wireless M-Bus in combination with wired L-Bus/Pulse interface
- Display with error and alarm codes including leakage detection
- Battery lifetime up to 16 years
- U0 / D0, no need for calming sections

## TECHNICAL DATA

| HYDRUS 2.0 BULK                     |            |                                                                                                                  |      |
|-------------------------------------|------------|------------------------------------------------------------------------------------------------------------------|------|
| Medium temperature range            | °C         | +0.1 ... +50 (T30 / T50), +0.1 ... +90 (T90)                                                                     |      |
| Accuracy                            |            | Accuracy class 2 acc. 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                                                                 |      |
| Maximum admissible pressure         | MAP        | bar                                                                                                              | 16   |
| Minimum operating pressure          |            | bar                                                                                                              | 0.3  |
| Pressure loss class                 | $\Delta p$ | bar                                                                                                              | 0.16 |
| Power supply                        |            | 3.6 V lithium battery (D-cell)                                                                                   |      |
| Battery lifetime <sup>1</sup>       |            | Up to 16 years                                                                                                   |      |
| Communication interfaces            |            | Optical, OMS Generation 3/4 wireless M-Bus 434/868 MHz, mioty® for Metering 434/868 MHz, M-Bus, L-Bus            |      |
| Data storage                        |            | For errors, alarms and measuring values, data logging capabilities to record up to 1024 daily +32 monthly values |      |
| Protection class                    |            | IP 68                                                                                                            |      |

<sup>1</sup> 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 DN50-80   | Volume (m <sup>3</sup> + 2 decimal places) and flow rate (m <sup>3</sup> /h + 3 decimal places)                                                                                                                                                                                                                                                                           |
| Units displayed DN100     | Volume (m <sup>3</sup> + 2 decimal places) and flow rate (m <sup>3</sup> /h + 2 decimal places)                                                                                                                                                                                                                                                                           |
| Units displayed DN125-200 | Volume (m <sup>3</sup> + 1 decimal place) and flow rate (m <sup>3</sup> /h + 2 decimal places)                                                                                                                                                                                                                                                                            |
| 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 - display counter - low battery indication - leakage indication - metrological log access - radio signal ON/OFF - alarm indication - meter lock ON/OFF |

## INTERFACES - OVERVIEW

| HYDRUS 2.0 BULK     |                                                                                                                                                                                                      |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Optical             | For switching the display loop and configuring/reading via IZAR@MOBILE                                                                                                                               |
| wireless M-Bus      | 434 or 868 MHz, OMS Generation 3/4, OMS radio as standard for mobile reading (R3) sent every 14 / 64 seconds (default) and wireless M-Bus for fixed network (R4/ R4+) sent every 5 / 15 / 60 minutes |
| mioty® for Metering | 434 or 868 MHz, OMS Generation 3/4, OMS radio as standard for mobile reading (R3) sent every 64 seconds (default) and mioty® for Metering for fixed network (L1C) sent every 60 minutes              |
| M-Bus               | 2400 baud, cable length 5m, power supply only via built-in battery - is combined with two Pulse outputs                                                                                              |
| L-Bus               | In combination with radio, cable length 5m (only one interface communicating at the same time)                                                                                                       |
| Pulse (Open drain)  | Two Pulse outputs, or one Pulse and one L-Bus output, Pulse cable length 5m                                                                                                                          |

## SECURITY

| HYDRUS 2.0 BULK     |                                                                                       |
|---------------------|---------------------------------------------------------------------------------------|
| Wireless M-Bus      | OMS Generation 4 Profile B, individual keys (default) / OMS Generation 3 (selectable) |
| mioty® for Metering | OMS Generation 4 Profile B, individual keys (default) / OMS Generation 3 (selectable) |

## PRIVACY

The HYDRUS 2.0 BULK stores internally historical consumption values. Logging data is available by local reading with IZAR@MOBILE and remote reading. Optical and radio communication implements encryption and authentication according to OMS Specification.

## 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 - 100                         | I/pulse 1 / 10 / 100 / 1000                                                               |
| Pulse rates DN 65 - 200                         | I/pulse 10 / 100 / 1000                                                                   |
| Pulse output 1 variants                         | Net volume/ forward volume / total volume                                                 |
| Pulse output 2 variants                         | Net volume / forward volume / reverse volume / total volume / direction flag / error flag |
| Pulse frequency                                 | Max. frequency 35 Hz                                                                      |
| Pulse width                                     | Min. 14 ms                                                                                |

## POSSIBLE COMMUNICATION INTERFACES

| HYDRUS 2.0 BULK                               |                          |
|-----------------------------------------------|--------------------------|
| mioty® for Metering and OMS radio/Pulse/L-Bus | 434 or 868 MHz + 3 wires |
| M-Bus/Dual pulse                              | 5 wires                  |
| IZAR BE PULSE                                 | -                        |
| Dual pulse                                    | 4 wires                  |

## PERFORMANCE DATA - COLD WATER (T30 / T50) HORIZONTAL

| Nominal diameter                          | DN                | mm                | 50    | 65   | 80    | 100  | 125  | 150    | 200  |
|-------------------------------------------|-------------------|-------------------|-------|------|-------|------|------|--------|------|
| Permanent flow rate                       | Q <sub>3</sub>    | m <sup>3</sup> /h | 25    | 40   | 63    | 100  | 160  | 250    | 400  |
| Dynamic (Q <sub>3</sub> /Q <sub>1</sub> ) | R                 |                   | 800   | 800  | 800   | 800  | 800  | 800    | 800  |
| Overload flow rate                        | Q <sub>4</sub>    | m <sup>3</sup> /h | 31.25 | 50   | 78.75 | 125  | 200  | 312.50 | 500  |
| Transitional flow rate                    | Q <sub>2</sub>    | l/h               | 50    | 80   | 126   | 200  | 320  | 500    | 800  |
| Minimum flow rate                         | Q <sub>1</sub>    | l/h               | 31.25 | 50   | 78.75 | 125  | 200  | 312.50 | 500  |
| Starting flow rate                        |                   | l/h               | 15    | 27   | 35    | 45   | 70   | 140    | 200  |
| Pressure loss at Q <sub>3</sub>           |                   | bar               | 0.16  | 0.15 | 0.16  | 0.13 | 0.15 | 0.11   | 0.12 |
| Pressure loss at Q <sub>4</sub>           |                   | bar               | 0.25  | 0.23 | 0.25  | 0.2  | 0.23 | 0.18   | 0.19 |
| Maximum flow rate <sup>2</sup>            | Q <sub>high</sub> | m <sup>3</sup> /h | 54    | 87   | 134   | 250  | 400  | 625    | 1000 |
| Flow coefficient                          | K <sub>v</sub>    | m <sup>3</sup> /h | 63    | 105  | 158   | 280  | 420  | 747    | 1140 |

<sup>2</sup> Outlet pressure minimum 3 bar, closed pipeline network

## PERFORMANCE DATA - HOT WATER (T90) HORIZONTAL

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

## APPROVAL

## DN 50 - 200

|                                                 |   |                        |
|-------------------------------------------------|---|------------------------|
| Approval                                        |   | MID DE-19-MI001-PTB011 |
| Dynamic range (Q <sub>3</sub> /Q <sub>1</sub> ) | R | Up to 1000             |
| Standards                                       |   | ISO 4064, OIML R49     |
| Sanitary conformity                             |   | AoC DEU, ACS, WRAS     |

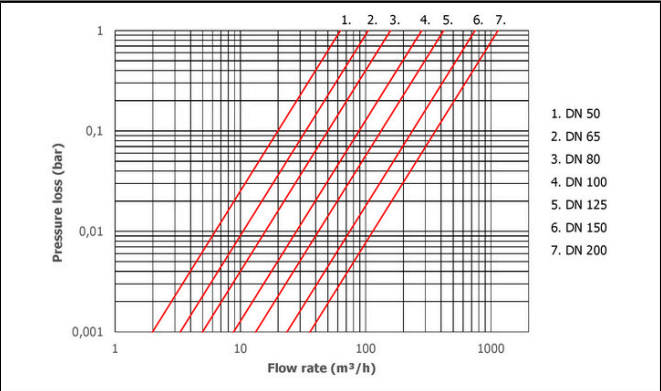
## DYNAMIC RANGE

## DN 50 - 200

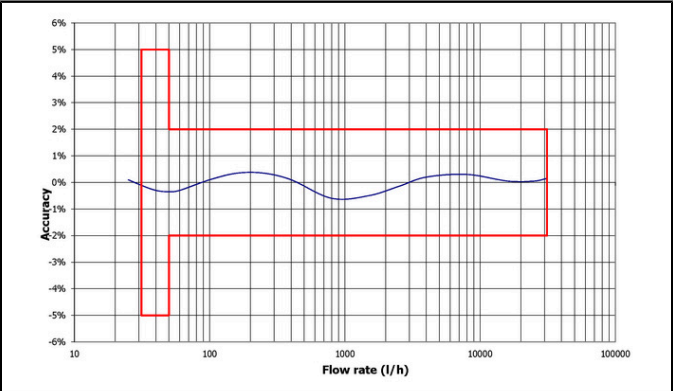
|                                                   |   |             |
|---------------------------------------------------|---|-------------|
| Q <sub>3</sub> 25 ... 400 m <sup>3</sup> /h - T30 | R | 800         |
| Q <sub>3</sub> 25 ... 400 m <sup>3</sup> /h - T50 | R | 800H / 250V |
| Q <sub>3</sub> 25 ... 100 m <sup>3</sup> /h - T90 | R | 400H / 160V |

H=horizontal installation position / V=vertical installation position

PRESSURE LOSS GRAPH / TYPICAL ERROR GRAPH

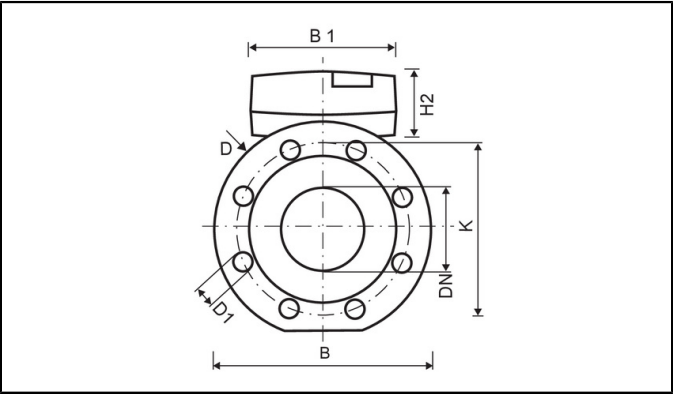
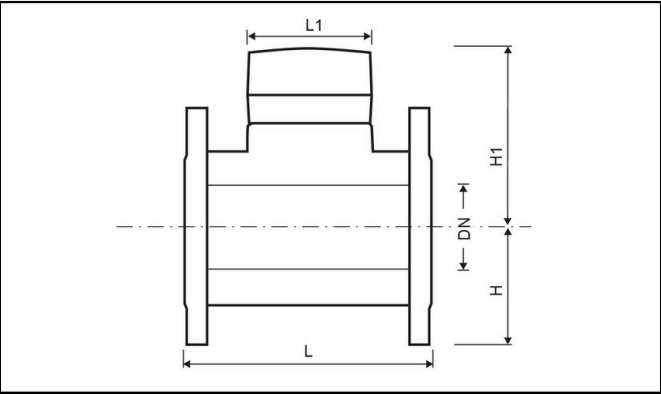


Pressure loss graph



Typical error graph - Q<sub>3</sub> 25 m³/h

DIMENSIONS



| Nominal diameter                  | DN | mm  | 50               | 65                     | 80                     | 100                    | 125   | 150       | 200             |
|-----------------------------------|----|-----|------------------|------------------------|------------------------|------------------------|-------|-----------|-----------------|
|                                   |    |     | 200 / 270 /      |                        | 200 / 225 /            |                        | 250 / |           |                 |
| Overall length (T30 / T50)        | L  | mm  | 300 <sup>3</sup> | 200 / 300 <sup>3</sup> | 300 / 350 <sup>3</sup> | 350 <sup>4</sup> / 360 | 250   | 300 / 500 | 350             |
| Overall length (T90)              | L  | mm  | 200              | 200                    | 200 / 225              | 250                    | -     | -         | -               |
| Flange diameter <sup>5</sup>      | D  | mm  | 165              | 185                    | 200                    | 220                    | 250   | 285       | 340             |
| Hole circle diameter <sup>5</sup> | K  | mm  | 125              | 145                    | 160                    | 180                    | 210   | 240       | 295             |
| Number of screwholes <sup>5</sup> |    | pcs | 4                | 4                      | 8                      | 8                      | 8     | 8         | 12 <sup>6</sup> |
| Screwhole diameter <sup>5</sup>   | 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             |
|                                   |    |     |                  |                        | 11 / 13 /              |                        |       |           |                 |
| Overall weight (approx.)          |    | kg  | 7 / 9 / 9        | 8 / 11                 | 14 / 15                | 17 / 19 / 20           | 23    | 38 / 45   | 51              |

<sup>3</sup> Optionally with rotatable flange  
<sup>4</sup> Rotatable flange  
<sup>5</sup> Flanges according to EN 1092, PN 10/16  
<sup>6</sup> 8 Screwholes for PN 10

## 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 components with the following substances in a concentration of more than 0.1% weight by weight (w/w):

- Lead titanium zirconium oxide (CAS no.: 12626-81-2)

## Economic Actor Information

Applicable regulation and legal obligations for products may change.

DIEHL METERING monitors applicable regulation to ensure their products comply at the date of placing on the market.

Each economic actor making products available on the market thereafter must independently keep informed about the current applicable regulation.

For questions, please contact: [metering-germany-info@diehl.com](mailto:metering-germany-info@diehl.com)

Diehl Metering S.A.S.  
Head Office  
67 rue du Rhône  
BP 10160  
FR-68304 Saint-Louis Cedex  
Phone: + 33 (0)3 89 69 54 00  
Fax: + 33 (0)3 89 69 72 20  
[metering-France-info@diehl.com](mailto:metering-France-info@diehl.com)

International Sales  
67 rue du Rhône  
BP 10160  
FR-68304 Saint-Louis Cedex  
Phone: + 33 (0)3 89 69 54 21  
Fax: + 33 (0)3 89 69 54 22  
[metering-France-export@diehl.com](mailto:metering-France-export@diehl.com)  
[www.diehl.com/metering](http://www.diehl.com/metering)

**EMPOWER A  
SUSTAINABLE  
FUTURE**