

# HYDRUS

ULTRASONIC METER

**DIEHL**  
Metering



## APPLICATION

HYDRUS is a static water meter based on the ultrasonic technology. This technology enables accurate calculation of water consumption and eliminates measuring deviations caused by sand, suspended particles or air pockets.

## FEATURES

- ▶ Long-term stability under difficult conditions
- ▶ Leak and pipe burst detection
- ▶ MID approval up to R=400 (cold water) and R=160 (hot water)
- ▶ No straight line required
- ▶ No measurement of air
- ▶ Insensitive to scale and sand
- ▶ Installation in any position
- ▶ Battery lifetime up to 16 years
- ▶ Available in cold water version and hot water version
- ▶ Available with integrated radio 434 or 868 MHz, M-Bus or pulse
- ▶ Data communication in Prios, Real data or Open Metering protocol (selectable OMS Generation 3 profile A or OMS Generation 4 profile B)

# HYDRUS

## ULTRASONIC METER

### GENERAL

|   |  | HYDRUS   |    |
|---|--|--|----|
| Medium temperature range                            | °C   | +1 ... +50 (cold water) / +1 ... +90 (hot water) |    |
| Ambient operating temperature                       | °C   | +1 ... +70                                       |    |
| Ambient storage temperature                         | °C   | -20 ... +70 (>35 °C max. 4 weeks)                |    |
| Nominal pressure                                    | PN   | bar  | 16 |
| Power supply  | 2 x 3.6 VDC lithium-batteries (only 1 battery with M-Bus possible) |  |    |
| Battery lifetime T30 <sup>1</sup> /T50 <sup>1</sup> | Up to 12 years (1 battery), up to 16 years (2 batteries)           |  |    |
| Battery lifetime T90 <sup>1</sup>                   | Up to 12 years (all interfaces)                                    |  |    |
| Interfaces  | Optical, radio (434 or 868 MHz), M-Bus, Pulse                      |  |    |
| Data storage  | For events and consumption 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 |  |
|---|---|--------|--|
| Display indication                            | LCD, 8-digit  |        |  |
| Units DN 15 - DN 32                           | Flow and volume (m <sup>3</sup> + 3 digits after the decimal point)   |        |  |
| Units DN 40 + DN 50                           | Flow (m <sup>3</sup> + 3 digits after the decimal point); Volume (m <sup>3</sup> + 2 digits after the decimal point)  |        |  |
| Values displayed (depending on configuration) | Volume <sup>2</sup> - flow - mediums temperature - display test <sup>2</sup> - current error and alarm status <sup>2</sup> - date - primary and secondary address - radio signal ON/OFF - battery lifetime <sup>2</sup> - accounting day - error hour counter - pulse values - software checksum <sup>2</sup> |        |  |

<sup>2</sup> Display according to approval (always on)

### INTERFACES

|                        |  | HYDRUS |  |
|------------------------|--|--------|--|
| Optical                | For configuration of display and radio telegram, to switch to the various displays   |        |  |
| Radio                  | 434 or 868 MHz, Prios, Real data, Open Metering Standard (OMS-Generation 3, Profile A, or OMS-Generation 4, Profile B, selectable) |        |  |
| M-Bus                  | 2400 Baud (adjustable to 300 Baud), configurable telegram, cable length 1.5 m, power supply only via built-in battery              |        |  |
| Pulse (Open collector) | 2 configurable pulse outputs, cable length 1.5 m   |        |  |

### VOLUME- / PULSE OPEN COLLECTOR

|   |   | HYDRUS              |  |
|---|---|---------------------|--|
| 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                   |  |
| Pulse rates                                     | l/pulse   | Decadic 0.1 ... 100 |  |
| Pulse output 1 variants                         | Total volume or forward volume                  |                     |  |
| Pulse output 2 variants                         | Forward volume, direction <sup>3</sup> or error |                     |  |
| Pulse duration                                  | Depending on device configuration <sup>4</sup>  |                     |  |
| Pulse break                                     | Depending on device configuration <sup>4</sup>  |                     |  |
| Pulse frequency                                 | Depending on device configuration <sup>4</sup>  |                     |  |

<sup>3</sup> when total volume on pulse output 1, only direction possible on pulse output 2

<sup>4</sup> detailed description on request

# HYDRUS<sup>DN 15 - 20</sup>

## ULTRASONIC METER

### TECHNICAL DATA\*

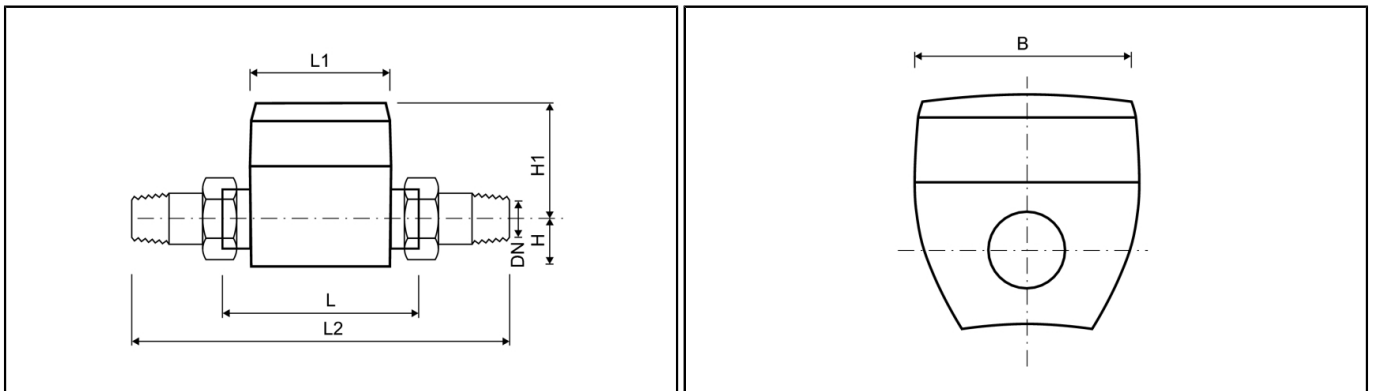
|                                 |                |                   |       |       |       |      |      |
|---------------------------------|----------------|-------------------|-------|-------|-------|------|------|
| Nominal flow rate               | Q <sub>3</sub> | m <sup>3</sup> /h | 2.5   | 2.5   | 2.5   | 4    | 4    |
| Nominal diameter                | DN             | mm                | 15    | 15    | 15    | 20   | 20   |
| Overall length                  | L              | mm                | 110   | 165   | 170   | 130  | 190  |
| Overload flow rate              | Q <sub>4</sub> | m <sup>3</sup> /h | 3.125 | 3.125 | 3.125 | 5    | 5    |
| Transitional flow rate          | Q <sub>2</sub> | l/h               | 16    | 16    | 16    | 25.6 | 25.6 |
| Minimum flow rate               | Q <sub>1</sub> | l/h               | 10    | 10    | 10    | 16   | 16   |
| Starting flow rate              |                | l/h               | 2.6   | 2.6   | 2.6   | 4.3  | 4.3  |
| Pressure loss at Q <sub>3</sub> |                | bar               | 0.33  | 0.33  | 0.33  | 0.3  | 0.3  |

\* at dynamic range R=250 / further overall lengths on request

### APPROVAL

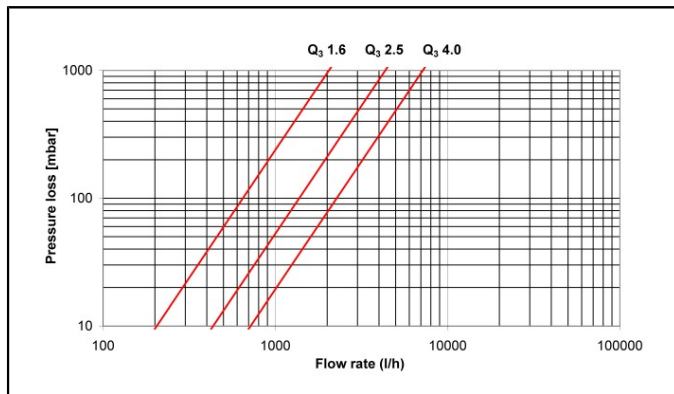
|  |  |                             | DN 15 - 20 |  |  |  |  |
|--|--|-----------------------------|------------|--|--|--|--|
| Approval   | MID LNE 14586, OIML R49, EN 14154, TVO, KTW, ACS |                             |            |  |  |  |  |
| Dynamic range (Q <sub>3</sub> /Q <sub>1</sub> ) - Q <sub>3</sub> 2.5 m <sup>3</sup> /h (T30 - T50) | R  | 160 / 200 / 250 / 315 / 400 |            |  |  |  |  |
| Dynamic range (Q <sub>3</sub> /Q <sub>1</sub> ) - Q <sub>3</sub> 4 m <sup>3</sup> /h (T30 - T50)   | R  | 160 / 200 / 250             |            |  |  |  |  |
| Dynamic range (Q <sub>3</sub> /Q <sub>1</sub> ) - Q <sub>3</sub> 1.6 - 4 m <sup>3</sup> /h (T90)   | R  | 160 / 200                   |            |  |  |  |  |

### DIMENSIONS

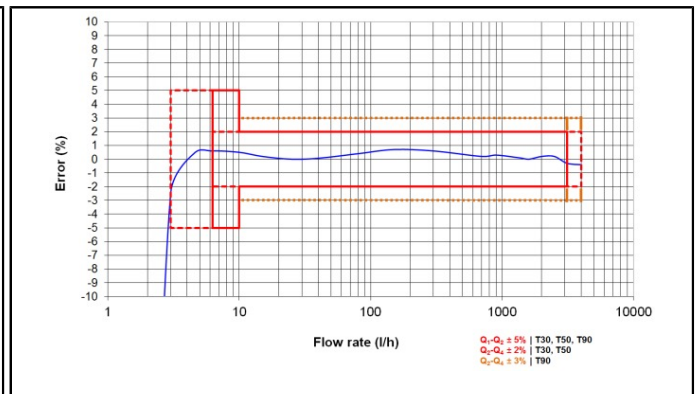


|                                   |                |                   |                                 |                                 |                                 |                               |                               |
|-----------------------------------|----------------|-------------------|---------------------------------|---------------------------------|---------------------------------|-------------------------------|-------------------------------|
| Nominal flow rate                 | Q <sub>3</sub> | m <sup>3</sup> /h | 2.5                             | 2.5                             | 2.5                             | 4                             | 4                             |
| Nominal diameter                  | DN             | mm                | 15                              | 15                              | 15                              | 20                            | 20                            |
| Overall length                    | L              | mm                | 110                             | 165                             | 170                             | 130                           | 190                           |
| Counter length                    | L1             | mm                | 88                              | 88                              | 88                              | 88                            | 88                            |
| Counter width                     | B              | mm                | 94                              | 94                              | 94                              | 94                            | 94                            |
| Overall length with coupling      | L2             | mm                | 190                             | 245                             | 250                             | 230                           | 290                           |
| Connection thread on meter        |                | inch              | G <sup>3</sup> / <sub>4</sub> B | G <sup>3</sup> / <sub>4</sub> B | G <sup>3</sup> / <sub>4</sub> B | G1B                           | G1B                           |
| Connection thread of coupling     |                | inch              | R <sup>1</sup> / <sub>2</sub>   | R <sup>1</sup> / <sub>2</sub>   | R <sup>1</sup> / <sub>2</sub>   | R <sup>3</sup> / <sub>4</sub> | R <sup>3</sup> / <sub>4</sub> |
| Height                            | H1             | mm                | 67                              | 67                              | 67                              | 65                            | 65                            |
| Weight without coupling (approx.) |                | kg                | 0.8                             | 1                               | 1                               | 0.9                           | 1.1                           |
| Weight with coupling (approx.)    |                | kg                | 1                               | 1.2                             | 1.4                             | 1.3                           | 1.5                           |
| Height                            | H              | mm                | 32                              | 32                              | 32                              | 34                            | 34                            |

## PRESSURE LOSS GRAPH / TYPICAL ERROR GRAPH



Pressure loss graph



Typical error graph

# HYDRUS<sub>DN 25 - 50</sub>

## ULTRASONIC METER

### TECHNICAL DATA\*

|                                 |                |                   |       |      |       |       |      |
|---------------------------------|----------------|-------------------|-------|------|-------|-------|------|
| Nominal flow rate               | Q <sub>3</sub> | m <sup>3</sup> /h | 6.3   | 6.3  | 10    | 10    | 10   |
| Nominal diameter                | DN             | mm                | 25    | 32   | 25    | 32    | 40   |
| Overall length                  | L              | mm                | 260   | 260  | 260   | 260   | 300  |
| Overload flow rate              | Q <sub>4</sub> | m <sup>3</sup> /h | 7.87  | 7.87 | 12.5  | 12.5  | 12.5 |
| Transitional flow rate          | Q <sub>2</sub> | l/h               | 50.4  | 50.4 | 80    | 80    | 80   |
| Minimum flow rate               | Q <sub>1</sub> | l/h               | 31.5* | 31.5 | 50*   | 50*   | 50   |
| Starting flow rate              |                | l/h               | 10    | 10   | 10    | 10    | 16   |
| Pressure loss at Q <sub>3</sub> |                | bar               | 0.25  | 0.25 | 0.55  | 0.55  | 0.1  |
| Nominal flow rate               | Q <sub>3</sub> | m <sup>3</sup> /h | 16    | 16   | 25    | 25    |      |
| Nominal diameter                | DN             | mm                | 40    | 50   | 50    | 50    |      |
| Overall length                  | L              | mm                | 300   | 270  | 270   | 300   |      |
| Overload flow rate              | Q <sub>4</sub> | m <sup>3</sup> /h | 20    | 20   | 31.25 | 31.25 |      |
| Transitional flow rate          | Q <sub>2</sub> | l/h               | 128   | 128  | 200   | 200   |      |
| Minimum flow rate               | Q <sub>1</sub> | l/h               | 80*   | 80   | 125*  | 125   |      |
| Starting flow rate              |                | l/h               | 16    | 25   | 25    | 25    |      |
| Pressure loss at Q <sub>3</sub> |                | bar               | 0.24  | 0.1  | 0.25  | 0.25  |      |

\* at dynamic range R=200; for other dynamics please contact your Diehl Metering agency.

### APPROVAL

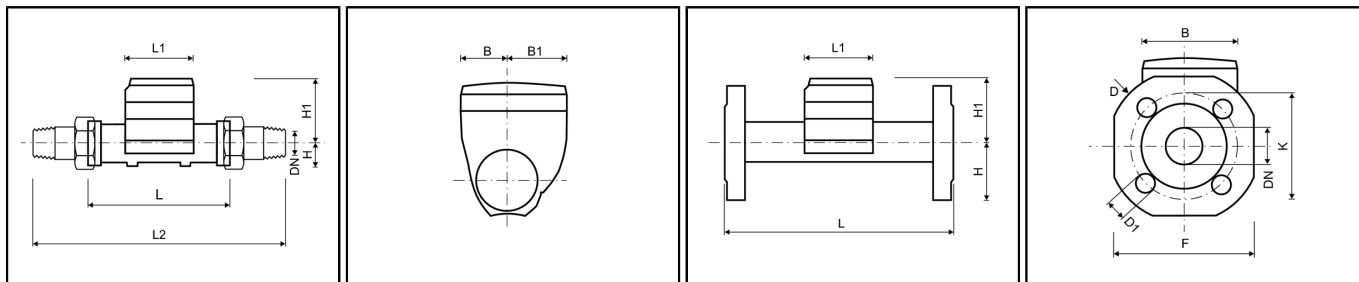
| DN 25 - 50   |   |  |
|--|---|--|
| Approval   |   | MID LNE 14586, OIML R49, EN 14154, TVO, KTW, ACS |
| Dynamic range (Q <sub>3</sub> /Q <sub>1</sub> ) - Q <sub>3</sub> 6.3 m <sup>3</sup> /h (T30 - T50) | R | 40 / 80 / 160 / 200                              |
| Dynamic range (Q <sub>3</sub> /Q <sub>1</sub> ) - Q <sub>3</sub> 10 m <sup>3</sup> /h (T30 - T50)  | R | 40 / 80 / 160 / 200 / 250                        |
| Dynamic range (Q <sub>3</sub> /Q <sub>1</sub> ) - Q <sub>3</sub> 16 m <sup>3</sup> /h (T30 - T50)  | R | 40 / 80 / 160 / 200 / 250 / 315* / 400*          |
| Dynamic range (Q <sub>3</sub> /Q <sub>1</sub> ) - Q <sub>3</sub> 25 m <sup>3</sup> /h (T30 - T50)  | R | 40 / 80 / 160 / 200 / 250 / 315 / 400            |
| Dynamic range (Q <sub>3</sub> /Q <sub>1</sub> ) - Q <sub>3</sub> 6.3 - 25 m <sup>3</sup> /h (T90)  | R | 40 / 80 / 160                                    |

\* not for DN 50

# HYDRUS<sup>DN 25 - 50</sup>

## ULTRASONIC METER

### DIMENSIONS



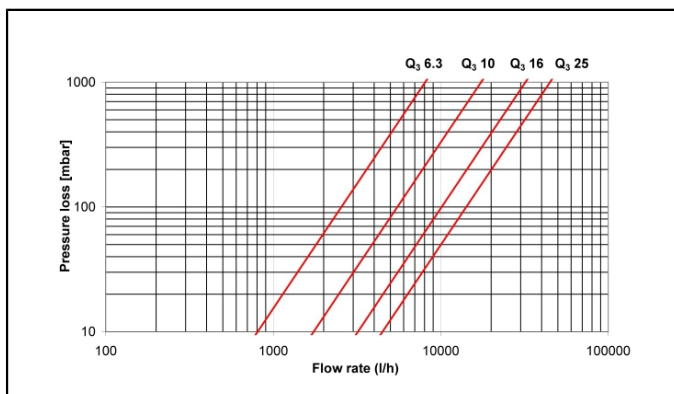
|                                   |                |                   |      |      |      |      |      |
|-----------------------------------|----------------|-------------------|------|------|------|------|------|
| Nominal flow rate                 | Q <sub>3</sub> | m <sup>3</sup> /h | 6.3  | 6.3  | 10   | 10   | 10   |
| Nominal diameter                  | DN             | mm                | 25   | 32   | 25   | 32   | 40   |
| Overall length                    | L              | mm                | 260  | 260  | 260  | 260  | 300  |
| Counter length                    | L1             | mm                | 92   | 92   | 92   | 92   | 92   |
| Counter width                     | B              | mm                | 94   | 94   | 94   | 94   | 94   |
| DIMENSIONS - THREAD               |                |                   |      |      |      |      |      |
| Overall length with coupling      | L2             | mm                | 380  | 380  | 380  | 380  | 440  |
| Connection thread on meter        |                | inch              | G1¼B | G1½B | G1¼B | G1½B | G2B  |
| Connection thread of coupling     |                | inch              | R1   | R1¼  | R1   | R1¼  | R1½  |
| Height                            | H1             | mm                | 84   | 84   | 84   | 84   | 87   |
| Weight without coupling (approx.) |                | kg                | 1.6  | 1.8  | 1.6  | 1.8  | 3.05 |
| Weight with coupling (approx.)    |                | kg                | 2.2  | 2.4  | 2.2  | 2.4  | 4.25 |
| Height                            | H              | mm                | 26   | 26   | 26   | 26   | 31   |
| DIMENSIONS - FLANGE               |                |                   |      |      |      |      |      |
| Flange diameter                   | D              | mm                | 115  | 140  | 115  | 140  | 148  |
| Hole circle diameter              | K              | mm                | 85   | 100  | 85   | 100  | 110  |
| Number of screwholes              |                | pcs               | 4    | 4    | 4    | 4    | 4    |
| Screwhole diameter                | D1             | mm                | 14   | 18   | 14   | 18   | 18   |
| Height                            | H              | mm                | 50   | 62.5 | 50   | 62.5 | 69   |
| Height                            | H1             | mm                | 84   | 84   | 84   | 84   | 87   |
| Width                             | F              | mm                | 100  | 125  | 100  | 125  | 138  |
| Weight with flanges (approx.)     |                | kg                | 3.45 | 4.7  | 3.45 | 4.7  | 6.67 |

# HYDRUS<sup>DN 25 - 50</sup>

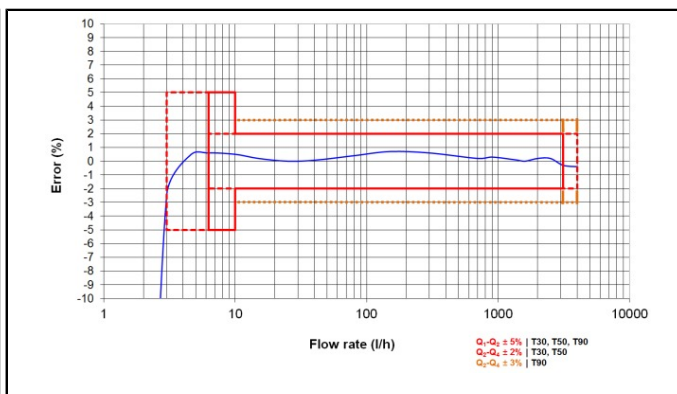
## ULTRASONIC METER

|                                   |                |                   |      |      |      |      |
|-----------------------------------|----------------|-------------------|------|------|------|------|
| Nominal flow rate                 | Q <sub>3</sub> | m <sup>3</sup> /h | 16   | 16   | 25   | 25   |
| Nominal diameter                  | DN             | mm                | 40   | 50   | 50   | 50   |
| Overall length                    | L              | mm                | 300  | 270  | 270  | 300  |
| Counter length                    | L1             | mm                | 92   | 92   | 92   | 92   |
| Counter width                     | B              | mm                | 94   | 94   | 94   | 94   |
| DIMENSIONS - THREAD               |                |                   |      |      |      |      |
| Overall length with coupling      | L2             | mm                | 440  | 390  | 390  | 420  |
| Connection thread on meter        |                | inch              | G2B  | G2½B | G2½B | G2½B |
| Connection thread of coupling     |                | inch              | R1½  | R2   | R2   | R2   |
| Height                            | H1             | mm                | 87   | 90   | 90   | 90   |
| Weight without coupling (approx.) |                | kg                | 3.05 | 3.9  | 3.9  | 4.05 |
| Weight with coupling (approx.)    |                | kg                | 4.25 | 5.5  | 5.5  | 5.65 |
| Height                            | H              | mm                | 31   | 41   | 41   | 41   |
| DIMENSIONS - FLANGE               |                |                   |      |      |      |      |
| Flange diameter                   | D              | mm                | 148  | 163  | 163  | 163  |
| Hole circle diameter              | K              | mm                | 110  | 125  | 125  | 125  |
| Number of screwholes              |                | pcs               | 4    | 4    | 4    | 4    |
| Screwhole diameter                | D1             | mm                | 18   | 18   | 18   | 18   |
| Height                            | H              | mm                | 69   | 73.5 | 73.5 | 73.5 |
| Height                            | H1             | mm                | 87   | 90   | 90   | 90   |
| Width                             | F              | mm                | 138  | 147  | 147  | 147  |
| Weight with flanges (approx.)     |                | kg                | 6.67 | 7.23 | 7.23 | 7.47 |

### PRESSURE LOSS GRAPH / TYPICAL ERROR GRAPH



Pressure loss graph



Typical error graph