

# HYDRUS

## Ultrasonic Water Meter

Installation and user guide

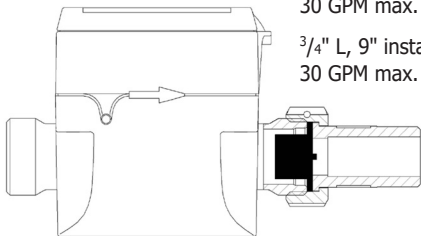


**I**

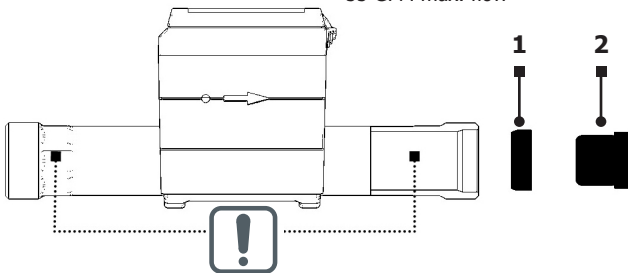
$\frac{5}{8}$ " x  $\frac{3}{4}$ ", 7  $\frac{1}{2}$ " installation length,  
20 GPM max. flow

$\frac{3}{4}$ " S, 7  $\frac{1}{2}$ " installation length,  
30 GPM max. flow

$\frac{3}{4}$ " L, 9" installation length,  
30 GPM max. flow

**II**

1", 10  $\frac{3}{4}$ " installation length  
55 GPM max. flow



<b>1</b>	Compensating ring
<b>2</b>	Non-return valve

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## 1. General information on the installation and user guide

### Signs and symbols

To help use this guide quickly and safely.



Identifies important information about how to use the HYDRUS most effectively!



Identifies important information warning against incorrect use of and possible damage to the HYDRUS.

### Target audience

This guide is intended for trained experts. For this reason, basic process steps are not listed.



The HYDRUS should only be installed by trained meter installers. Personnel must be trained in the handling of electrical equipment as well as the AWWA M6 Manual "Water Meters Selection, Installation, Testing, and Maintenance."

### References

- American Water Works Association (AWWA), M36 Manual, Water Audits and Loss Control Programs Third Edition, 2009
- AWWA, M6 Manual, Water Meters - Selection, Installation, Testing and Maintenance Fifth Edition, 2012

## 2. General description

The HYDRUS is an electronic water meter designed to determine potable water consumption.

The ultrasonic technology of the HYDRUS works reliably and yields precise results even if exposed to dirty water and sand. Air in the pipe is not measured. This eliminates measurement errors and manipulations.

The UV-resistant housing and the completely encapsulated electronics ensure a high durability and a long service life – even with high humidity, flooded pits and pressure surges in the pipe system.

The HYDRUS is equipped with an optical interface and either a Nicor<sup>®</sup>, ITRON<sup>®</sup> connector or wire end to read the data.

## 3. Use and operation

### Intended use

The HYDRUS described here is used to measure the potable water consumed in closed systems.

The HYDRUS may be used indoors or outdoors in accordance with the technical specifications (see "1. General information on the installation and user guide" at page 4).

### Non-compliant use

Any use other than that previously described or a modification to the device are considered non-compliant use. Such use or modification must be requested in advance in writing and must be specially approved.



Do not use the HYDRUS as a tool or a lever.



Any manipulation or installation not performed properly or not in accordance with the specifications relieves the manufacturer of all responsibility.

This is borne exclusively by the person responsible.

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#### 4. Guidelines for the HYDRUS

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Do not break the seal on the HYDRUS!.  
A broken seal immediately voids the factory warranty.

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IZAR@MOBILE2 software is used to read data and set parameters. This software can be found at <https://www2.diehl.com/metering/en/diehl-metering/support-center/downloads>.

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#### 5. Transport and storage

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Water meters are precision devices! They must be protected against impacts and vibration!

Make sure the meter is protected against frost when in storage and during transport (the HYDRUS can be damaged by the effects of frost)!

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#### 6. Mounting / Installation

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Install in accordance with the manufacturer's specifications and/or AWWA M6 standard.

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Do not install ultrasonic meters near areas subject to a sudden drop in pressure.

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Install the HYDRUS only in waterpipe frostfree areas!  
If there is danger of frost, drain the waterpipe and remove HYDRUS if necessary.

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Install using supplied fiber washers in order to properly seal connection to service line.

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The HYDRUS operates in water temperatures between 34 °F and 122 °F.

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## 6.1 Installing the HYDRUS

### Installation location

- Maintain sufficient distance between the HYDRUS and possible sources of electromagnetic interference (switches, electric motors, fluorescent lamps, etc.).
- Calming sections upstream and downstream of the HYDRUS are not necessary.
- Avoid a mounting position where air bubbles may accumulate in the HYDRUS.

### Preparations

- If the water is dirty, install a dirt trap in the feed line **upstream** of the HYDRUS.
- Flush the pipes thoroughly before installing the HYDRUS.

### Mounting

- Close the shutoff valves upstream and downstream of the water meter or spacer and release the pressure in the pipeline.
- Remove the spacer or old water meter.
- Remove old washer, clean sealing faces and install fiber gaskets.
- Install the HYDRUS so that the arrow on the housing points with in the direction of the water flow.



Install the HYDRUS in the pipeline, avoid mechanical stresses. Protect the HYDRUS against pressure surges in the pipeline.

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## Finishing tasks

- Slowly open the shutoff valves upstream and downstream of the HYDRUS.
- Check for possible leaks at the connections.



The HYDRUS must always be completely filled with water.

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Failure to use provided fiber gaskets or equivalent may result in connection leaks and damage to the HYDRUS.

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## 6.2 Non-return valve

If desired, the HYDRUS can be delivered with a non-return valve (accessory). This valve must be installed in the discharge of the HYDRUS.

- $5/8" \times 3/4"$ ;  $3/4" \text{ S}$ ;  $3/4" \text{ L}$  (see Fig. I, page 2) NSF certified
- 1" (see Fig. II, page 2) NSF certified

## 7. Communication

The HYDRUS has different communication interfaces:

- Optical
- Encoder

### 7.1 Optical interface

The HYDRUS can be configured by using the integrated optical interface. IZAR@MOBILE2 software is used to read data and set parameters. This software can be found at <https://www2.diehl.com/metering/en/diehl-metering/support-center/downloads>.

If an error occurs during configuration, configuration must be started again using the optical interface.

For correct configuration, place the opto head on the optical interface of the HYDRUS.

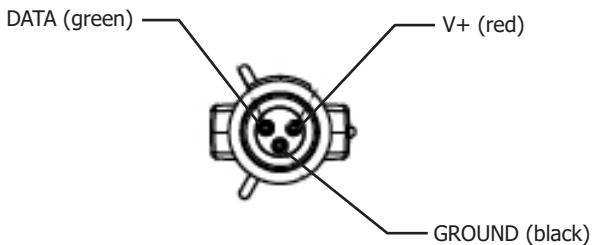
We recommend the Bluetooth Opto Head IZAR OH BT for configuration.



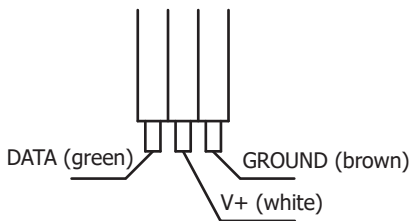
## 7.2 Encoder protocol

Encoder is the standard communication protocol for connecting a radio module, for example:

### Pin assignment Nicor<sup>®</sup> connector \*

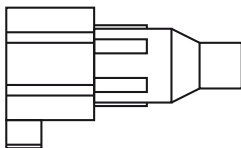


### Pin assignment Bare wire \*



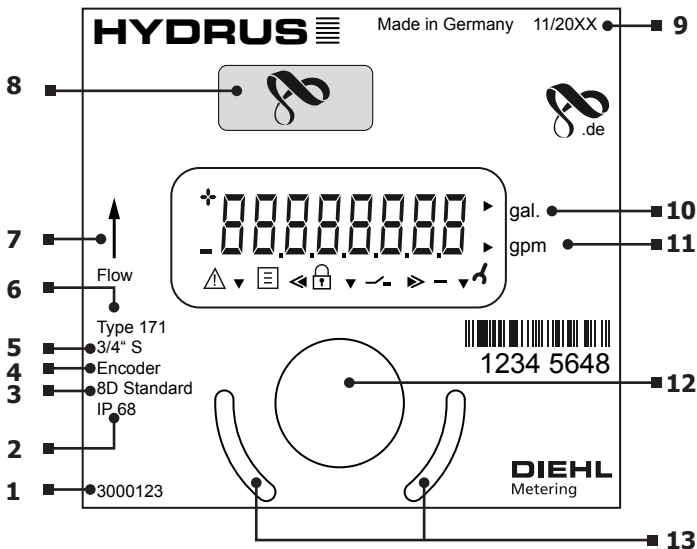
\* depending on variant

### Pin assignment ITRON<sup>®</sup> sceam



## 8. Operation

To read the HYDRUS from the display, various information (for example, flow rate, volume, date, reporting date, water temperature) are available consecutively by touching the optical pushbutton.



1	Part no.	8	Seal
2	Protection class	9	Country of manufacture / Date
3	Digits	10	Unit
4	Interface	11	Flow rate
5	Nominal diameter	12	Optical pushbutton
6	Type	13	Positioning aid for the opto head
7	Flow direction		

An optical pushbutton (see item 12) is positioned on the front panel of the HYDRUS. By using the pushbutton the individual display loops are shown. To save battery life, the display turns off if no control actions are taken for 4 minutes. By pressing the optical pushbutton the display becomes active again and the current status appears in the display for about 2 seconds. If there is a fault, an error message appears, E -- 7 -- A (air in the pipe), for example.

**Factory setting for the operating mode of the optical pushbutton (short button press):**

- Error message
- Total volume
- Current flow
- Temperature
- High resolution reading
- Software
- Display test

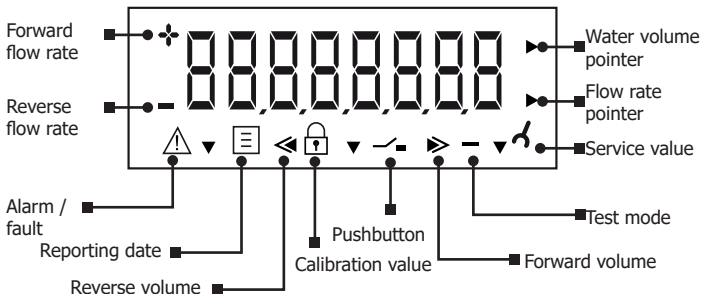


The loop settings can be customized using the IZAR@MOBILE2 software.

Download the software from the Internet at <https://www2.diehl.com/metering/en/diehl-metering/support-center/downloads>.

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## 8.1 Display / icons



## 8.2 Reporting date function (optional)

On the set reporting date, the consumption values to the next reporting date are saved in memory. You can read them on the display or transfer them via the encoder or the optical interface. You can program the reporting date as desired.

Factory setting = 12/31. Year of delivery.

## 9. Messages in the display

### 9.1 Error messages

- Visual indication on the LC display in the event of an error

Error code	Description
C1	Basic parameters in the flash or RAM destroyed (replace the HYDRUS).
E1	Faulty temperature measurement (temperature out of range, sensor short, sensor open). In the event of a sensor short or a sensor open, replace the HYDRUS.
E4	Hardware fault, defective ultrasonic transducer or short circuit ultrasonic transducer (replace the HYDRUS).
E5	Too frequent readout (no communication possible).
E7	No ultrasonic signal, air in the measurement section.

### 9.2 Alarm messages

- Constant visual indication on the LC display in the event of an alarm

Alarm code	Description
A1	Reverse flow
A3	No consumption
A4	Malfunction / failure of the ultrasonic or temperature measurement
A5	Leakage alarm
A6	Low temperature (below 37 °F)
A7	Air in the measurement section, no volume measurement
A9	Low battery charge

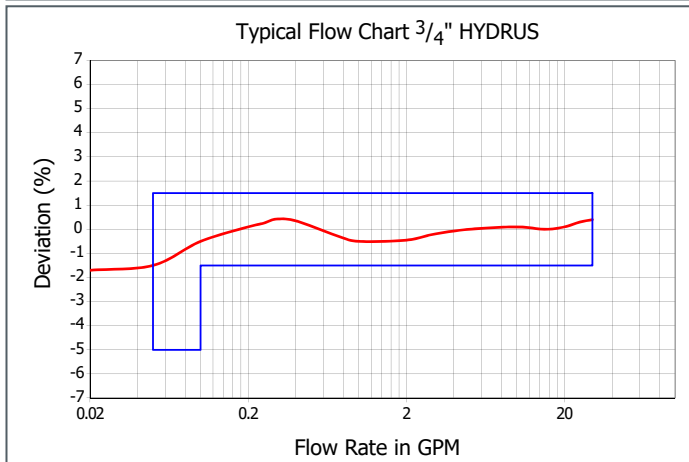
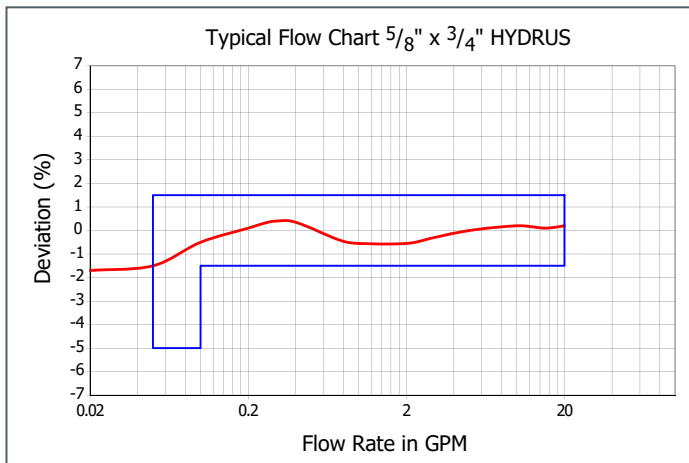


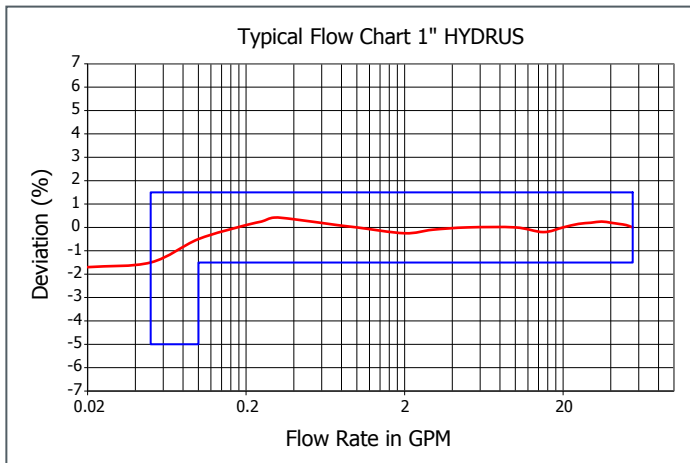
Combinations of fault and alarm messages may also occur, for example, E17, corresponding to E1 and E7.

## 10. Technical data

Description	Value
Water temperature range	34 to 122 °F
Ambient temperature during operation	34 to 158 °F
Storage temperature range	-4 to +158 °F (>90 °F max. 1 h)
Rated pressure	300 psi
Power supply	3.6 VDC lithium battery
Battery life	Up to 20 years
Interfaces	Industry Standard Encoder Protocol
Data storage	For alarms and consumption values
Protection class	IP 68

## 11. Error curves





## 12. Environmental notice

Dispose of the HYDRUS in an environmentally friendly way, take it to a local recycling center after use.



## 13. Certifications

### 13.1 NSF International

# NSF International

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RECOGNIZES

**Diehl Metering GmbH**  
Germany

AS COMPLYING WITH NSF/ANSI 61, 372 AND ALL APPLICABLE REQUIREMENTS.  
PRODUCTS APPEARING IN THE NSF OFFICIAL LISTING ARE  
AUTHORIZED TO BEAR THE NSF MARK.



ANSI  
American National Standards Institute  
Certification Program  
Accredited by the  
International Council  
of Standards Institutes



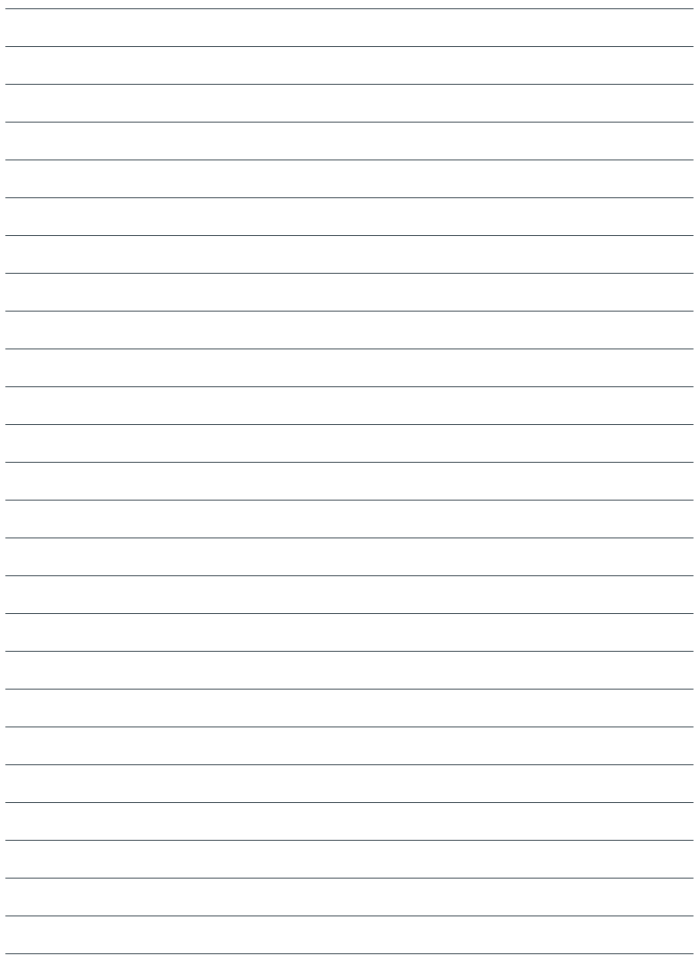
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Certificate# C0232233 - 01

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Technical changes reserved

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