

EnergyMetering

## Bulk water meters

*Parallel Woltman meters*

*Vertical Woltman meters*

*Compound Woltman meters*

*Irrigation Woltman meters*

*Single-jet meters*

*Accessories*



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**ZENNER**  
All that counts.



## Bulk water meters

### Woltman meters for high flow rates

Woltman type water meters can be used for flow rates higher than  $Q_n 15 \text{ m}^3/\text{h}$ . They are thereby distinguished by ensuring an especially low head loss, even with high flow rates. The newly developed measuring insert with a special construction of the turbine where the water flows through, guarantees a high measuring accuracy and long-term stability of the measuring results. Large number rollers on the dry dial counter ensure the readability of the numbers at all times.

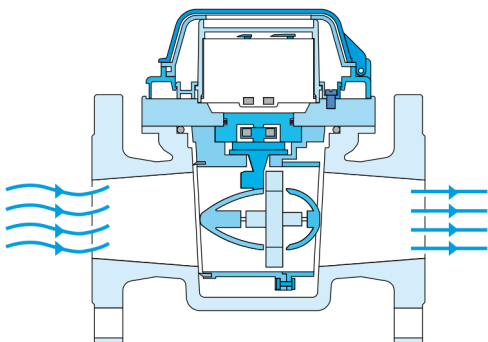
### Construction principle

Similar to multi-jet meters, Woltman meters measure the velocity of the water flowing through with the help of a turbine. The volume is mechanically calculated, through the known volume of the measuring chamber, and indicated with the roller counters in cubic meters.

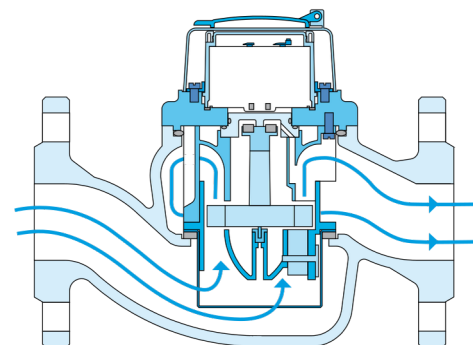
The unique form of the “paddle wheels” enable the Woltman meters to cover a very large measuring range with especially low head loss. Aside from their construction for high flow rates, they also reliably start measuring with small water quantities.

### Construction forms

In the Parallel Woltman meters (WPH), the turbine shaft is arranged parallel to the axis of the pipeline. The rotation of the turbine is transmitted through a worm gear to the dry dial counter. A very large diameter range of DN 40 to DN 500 can be covered with this construction. A very robust construction, little head loss, and a large measuring range characterize the WPH.

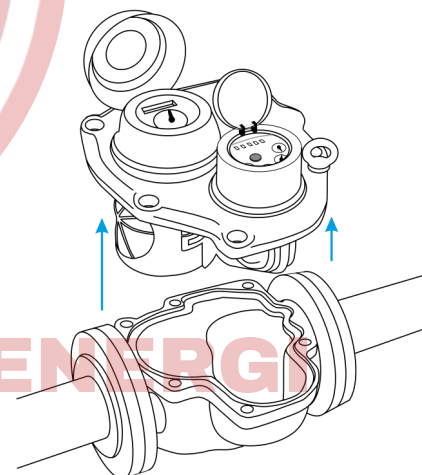


In the Vertical Woltman meters (WS), the turbine shaft stands perpendicular to the axis of the pipeline. The water is deflected in an S-form and flows through the turbine from the “bottom” to the “top”. The movement of the turbine can be directly transmitted without diversion to the dry dial counter. There is an advantage over the Parallel Woltman meters in the improved starting flow and during fluctuating flow rates.



An extremely large measuring range can be covered with Compound water meters. During low flow rates, the water is only flowing through the secondary meter. If the flow rate increases above the switching point of the built in valve, the spring loaded valve opens the main arm. The water flows through the main (type WP) and secondary meters (type MNK). Both counters need to be added in order to determine the meter's consumption.

The modern construction of the Compound water meter is the Turbo Compound meter, in which the main meter, the secondary meter and the spring loaded valve are all assembled on one plate. The advantage is that the meter body can remain in the piping during periodical replacement, and the calibrated measuring insert simply needs to be interchanged. The main meter is designed as a WPH and the secondary meter as a measuring cartridge.



A particular construction form of the Woltman meters is the Well water meter. In principle it is a WS meter whose body is customized to the conditions of a well construction. The water enters on the underside of the meter, flows through the perpendicular standing turbine and is directed out of the meter through the 90° elbow.

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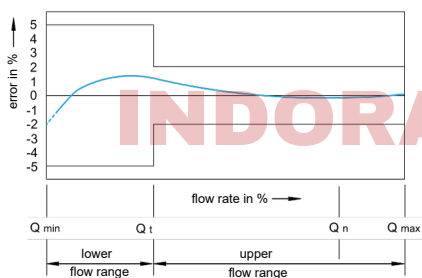
### Body

The bodies of the Woltman meters are traditionally produced with GG25 grey cast iron and are coated inside and outside with a potable water approved epoxy coating. This reliably protects the meter from corrosion and ensures that the potable water remains safe. The standard meters are fitted with a metal protective cover that reliably protects the counter even in rough conditions.

Woltman meter bodies are equipped with flanges according to the standards DIN 2501 and ISO 7005 PN10/PN16 respectively.

### Communication

Active or passive sensors are available for communication with pulse counting modules or automation and control systems. Inductive NAMUR, optical, and Reed sensors can be retrofitted without damaging the calibration seal. Active sensors have a pulse value, depending on the meter size, of either 1 or 10 L/Imp. Reed sensors are mountable in two positions (also simultaneously) and have a pulse value of 100 L/Imp up to 10 m<sup>3</sup>/Imp, depending on the meter size.



### Accuracy curve

Our meters are always constructed for long-term adherence to the accuracy curve. Because of the use of special materials they have great long-term stability and hardly change their accuracy curve. Regarding the measuring accuracy in our meters, we surpass legal requirements with no problem.

### Installation positions

Parallel Woltman meters (WPH) can be installed horizontally and vertically, that is, in horizontal, vertical, and inclined pipelines. The best measuring results can be obtained if the meter is installed in horizontal position with the counter “facing upwards”.

The Vertical Woltman meters (WS) and the Compound water meters can only be installed horizontally so the counter **must be** “facing upwards”.

The “overhead installation” with the counter “facing downwards” is not admissible with any meter type.

### Norms and regulations

All of the meters we manufacture comply with the installation and connecting dimensions from DIN ISO 4064 resp. DIN 19684 Part 3 and other national and international standards and regulations. The existing EEC approvals have a right of continuance until 2016 and guarantee our customers reliable measurement technology.

We are perfectly equipped for all of the up-and-coming developments in the European approval procedures. We already successfully implement the approval and procedure with regard to the declaration of conformity in compliance with the regulations of the MID.

### Our responsibility

It goes without saying, that we not only conform to all of the applicable legal requirements to environmental and health compatibility, but also fulfil our own, much stricter guidelines. The safety of all of the materials used is tested regularly with regard to drinking water suitability.

We only use tested and approved plastic from well-known manufacturers for our counters. Our meter casings are made of quality grey cast iron.





## WPH-N

### Woltmanmeter with parallel turbine shaft

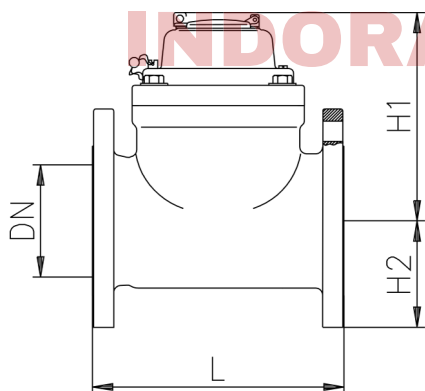
Woltman Parallel type meters are always used when high flow rates with a relative constant flow rate profile are to be measured. Through its robust construction they not only are capable of covering a large measuring range, but the measuring accuracy is also long-term stable.

The hydrodynamic optimized turbine is reliably operated already at small flow rates and “upwards” it has enough power reserves to reliably measure flow rate peaks. Especially strong bearings with low friction guarantee a long life of the meter.

Reed sensors, optical and inductive-NAMUR sensors can always be retrofitted without damaging the calibration seal. Then the meter can be integrated with data communication or automation and control systems in a simple and flexible way.

### Performance characteristics in overview

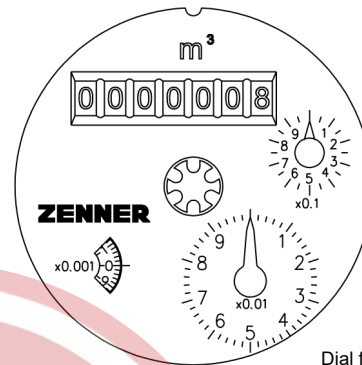
- Low starting flow, high overload security
- Wide measuring range
- Removable measuring insert
- Low head loss
- Hydraulic bearing relieve for long-term measuring stability
- Retrofittable with active and passive pulsers
- Metal protective cover serially, plastic optional
- Evacuated counter protected from condensation
- Dry dial counter with large number rollers simplifies the readability
- For cold water up to 30°C, with security up to 50°C
- For horizontal, vertical and inclined installation positions
- High pressure model PN25/40 upon request



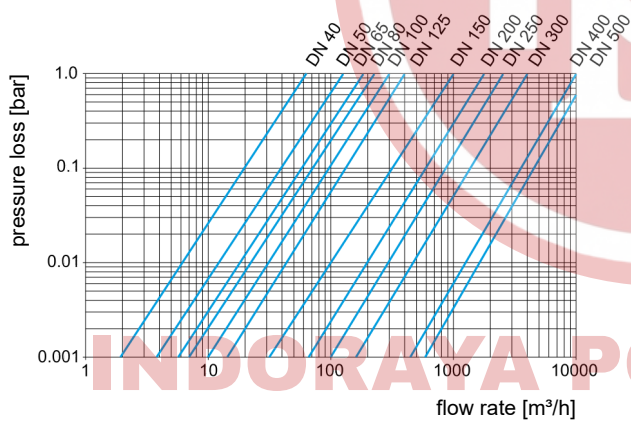
Dimensions WPH-N

| Technical data WPH-N             |      |      |           |           |           |           |           |           |
|----------------------------------|------|------|-----------|-----------|-----------|-----------|-----------|-----------|
| Nominal flow                     | Qn   | m³/h | 15        | 15        | 25        | 40        | 60        | 100       |
| Nominal diameter                 | DN   | mm   | 40        | 50        | 65        | 80        | 100       | 125       |
| Overall length                   | L    | mm   | 200       | 200       | 200       | 225       | 250       | 250       |
| Metrological class               |      |      | B         | B         | B         | B         | B         | B         |
| Maximum flow (short-term)        | Qmax | m³/h | 60        | 90        | 120       | 150       | 250       | 300       |
| Maximum flow (constant)          |      | m³/h | 30        | 45        | 60        | 90        | 125       | 170       |
| Transitional flow                | Qt   | m³/h | 1         | 1         | 2         | 3,2       | 4,8       | 8         |
| Minimum flow                     | Qmin | m³/h | 0,35      | 0,35      | 0,45      | 0,8       | 1,5       | 3         |
| Flow rate with 0.1 bar head loss |      | m³/h | 20        | 30        | 50        | 70        | 100       | 150       |
| Head loss at Qmax                |      | bar  | 0,2       | 0,1       | 0,1       | 0,2       | 0,2       | 0,2       |
| Display range                    | min  | l    | 2         | 2         | 2         | 2         | 2         | 2         |
|                                  | max  | m³   | 9.999.999 | 9.999.999 | 9.999.999 | 9.999.999 | 9.999.999 | 9.999.999 |
| Maximum temperature              |      | °C   | 50        | 50        | 50        | 50        | 50        | 50        |
| Operating pressure, max.         | PN   | bar  | 16        | 16        | 16        | 16        | 16        | 16        |
| Height                           | H    | mm   | 206       | 200       | 208       | 255       | 275       | 290       |
| Flange diameter                  | D    | mm   | 150       | 165       | 185       | 200       | 220       | 250       |

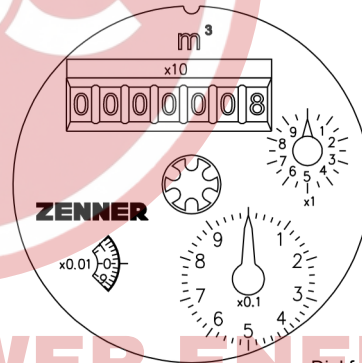
| Technical data WPH-N             |      |      |           |           |           |            |            |            |
|----------------------------------|------|------|-----------|-----------|-----------|------------|------------|------------|
| Nominal flow                     | Qn   | m³/h | 150       | 250       | 400       | 600        | 1000       | 1500       |
| Nominal diameter                 | DN   | mm   | 150       | 200       | 250       | 300        | 400        | 500        |
| Overall length                   | L    | mm   | 300       | 350       | 450       | 500        | 600        | 800        |
| Metrological class               |      |      | B         | B         | B         | B          | B          | B          |
| Maximum flow (short-term)        | Qmax | m³/h | 350       | 650       | 1200      | 1500       | 2500       | 4000       |
| Maximum flow (constant)          |      | m³/h | 250       | 325       | 600       | 700        | 1250       | 2000       |
| Transitional flow                | Qt   | m³/h | 12        | 20        | 32        | 48         | 80         | 120        |
| Minimum flow                     | Qmin | m³/h | 3,5       | 6,5       | 12        | 18         | 30         | 45         |
| Flow rate with 0.1 bar head loss |      | m³/h | 200       | 650       | 1000      | 1500       | 2500       | 4000       |
| Head loss at Qmax                |      | bar  | 0,2       | 0,05      | 0,05      | 0,05       | 0,05       | 0,05       |
| Display range                    | min  | l    | 20        | 20        | 20        | 20         | 200        | 200        |
|                                  | max  | m³   | 9.999.999 | 9.999.999 | 9.999.999 | 99.999.999 | 99.999.999 | 99.999.999 |
| Maximum temperature              |      | °C   | 50        | 50        | 50        | 50         | 50         | 50         |
| Operating pressure, max.         | PN   | bar  | 16        | 16        | 16        | 16         | 16         | 16         |
| Height                           | H    | mm   | 305       | 375       | 470       | 495        | 635        | 740        |
| Flange diameter                  | D    | mm   | 285       | 340       | 395       | 445        | 565        | 670        |



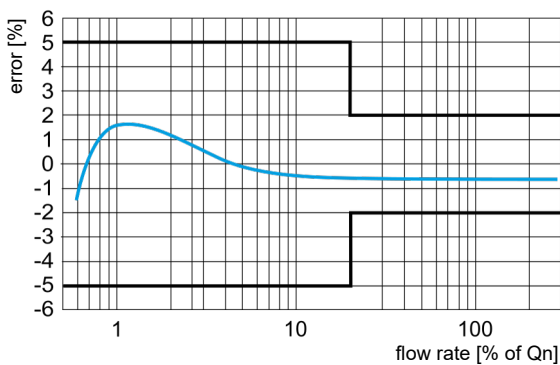
Dial from DN 40 to DN 125



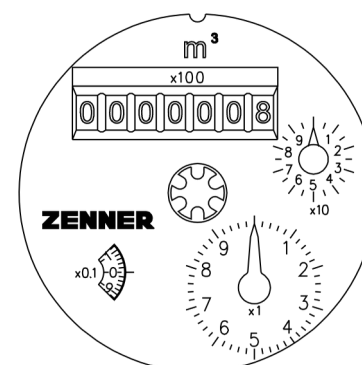
Head loss curves



Dial from DN 150 to DN 300



Typical accuracy curve



Dial DN 400 and DN 500

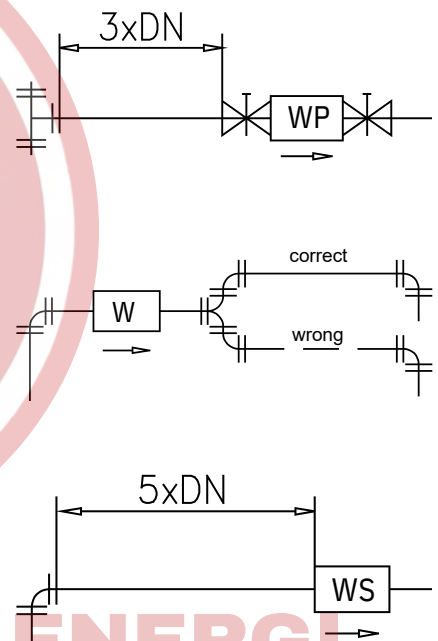
### Installation of Woltman meters

The best measuring results can be achieved with all Woltman meters if some simple but important installation rules are followed. The instructions and engineering rules according to the calibration regulations serve as a basis, in particular the documents PTB-A6.1, PTB-A6.2 and the DIN 1988.

Woltman meters are by construction sensitive to the incident flow profile. Tee pieces or gate valves that are not completely opened within close proximity to the meter, effectively influence the measuring result.

#### Exemplary the most important installation rules:

- Woltmanmeters must be operated in the correct flow direction.
- There must be a minimum of 3 x DN of straight pipe section for WPH type upstream of the meter.
- There must be a minimum of 5 x DN of straight pipe section for WS type upstream of the meter.
- If a sufficient straight pipe section is not possible, then a honeycomb flow straightener should be installed.
- Ideally a straight pipe section of at least 2 x DN is present downstream of the meter.
- To avoid air pockets in the meter, it should not be installed on the highest point of the piping.
- Gate valves or other shut-off valves in front of the meter should be completely opened during operation.



### Installation positions

WPH type Woltman meters can be installed horizontally or vertically, that is in horizontal or in perpendicular pipelines; the counter either is facing upwards or is tilted 90° to the side.

Type WS and WPV Woltman meters can only be mounted horizontally, that means only in horizontal pipelines with the counter facing upwards.

The overhead installation is not permitted for any meter type.

Complete installation instructions can be found on [www.zenner.com](http://www.zenner.com).

