



EnergyMetering

Bulk water meters

Parallel Woltman meters

Vertical Woltman meters

Compound Woltman meters

Irrigation Woltman meters

Single-jet meters

Accessories



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 m³/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.

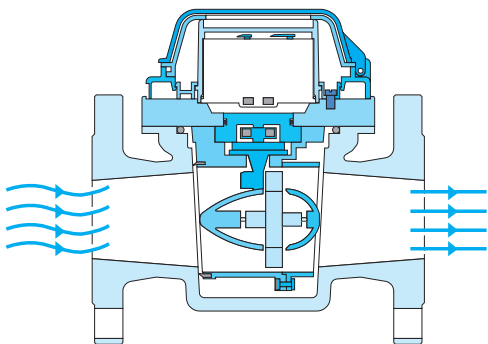
Construction principle

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.

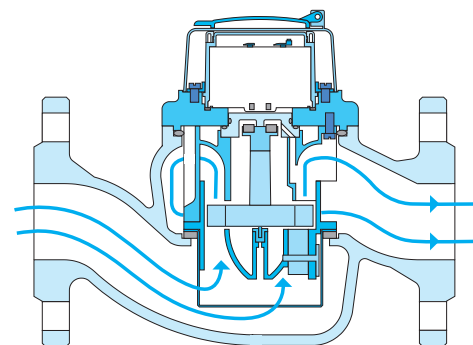
The unique form of the “paddle wheels” enable the Woltman meters to cover a very large measuring range with especially low head loss. Aside from their construction for high flow rates, they also reliably start measuring with small water quantities.

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.

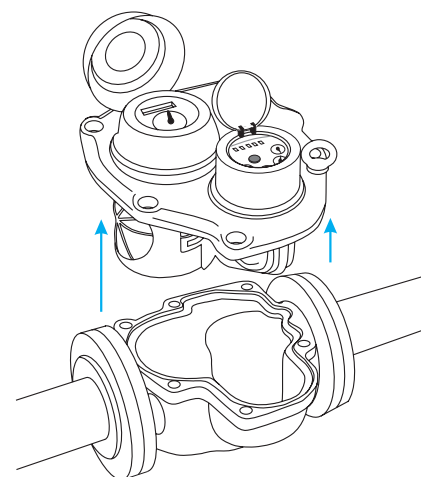


In the Vertical Woltman meters (WS), the turbine shaft stands perpendicular to the axis of the pipeline. The water is deflected in an S-form and flows through the turbine from the “bottom” to the “top”. The movement of the turbine can be directly transmitted without diversion to the dry dial counter.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

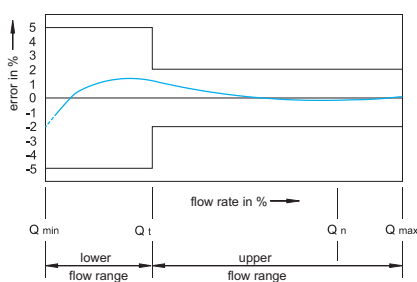
Body

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 m³/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

Woltman meter with parallel turbine shaft

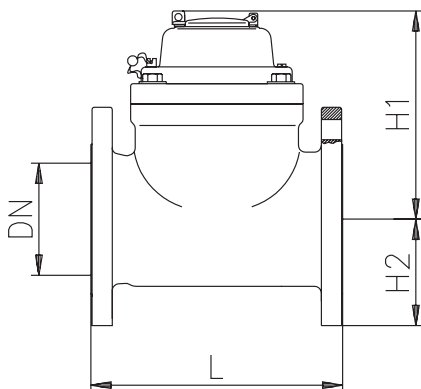
Woltman Parallel type meters are always used when high flow rates with a relative constant flow rate profile are to be measured. Through its robust construction they not only are capable of covering a large measuring range, but the measuring accuracy is also long-term stable.

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

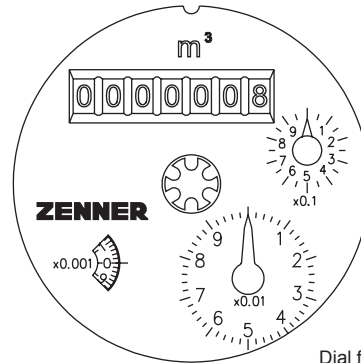
- Low starting flow, high overload security
- Wide measuring range
- Removable measuring insert
- Low head loss
- Hydraulic bearing relieve for long-term measuring stability
- Retrofittable with active and passive pulsers
- Metal protective cover serially, plastic optional
- Evacuated counter protected 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



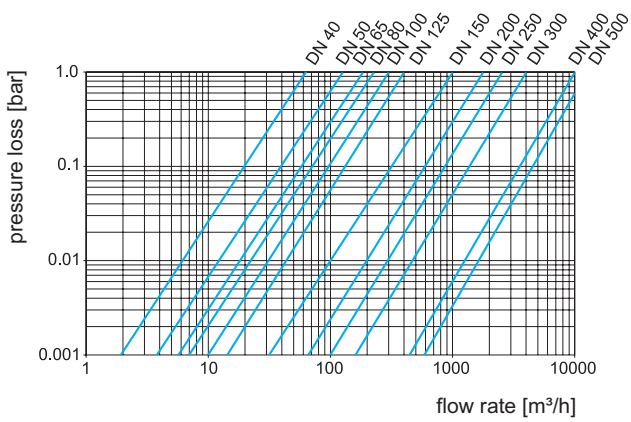
Dimensions WPH-N

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
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

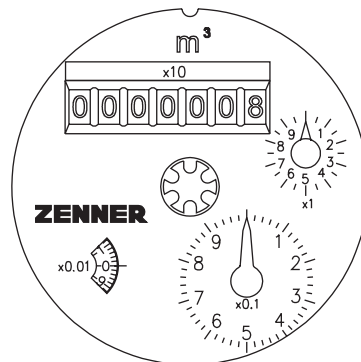
Technical data WPH-N								
Nominal flow	Qn	m³/h	150	250	400	600	1000	1500
Nominal diameter	DN	mm	150	200	250	300	400	500
Overall length	L	mm	300	350	450	500	600	800
Metrological class			B	B	B	B	B	B
Maximum flow (short-term)	Qmax	m³/h	350	650	1200	1500	2500	4000
Maximum flow (constant)		m³/h	250	325	600	700	1250	2000
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



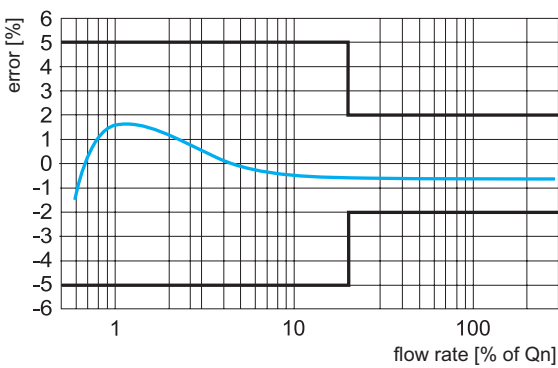
Dial from DN 40 to DN 125



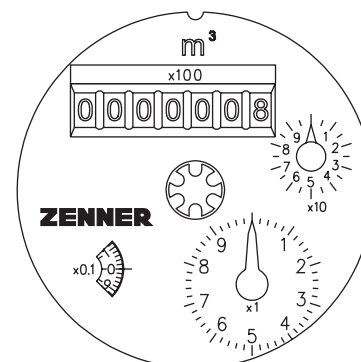
Head loss curves



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:

- Woltman meters 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

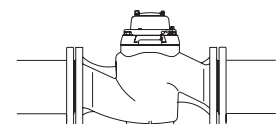
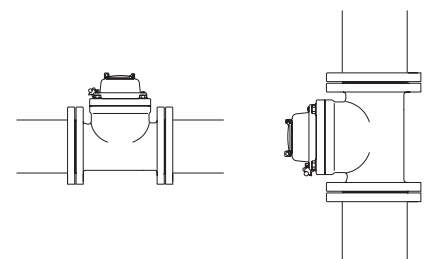
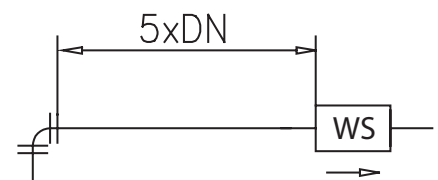
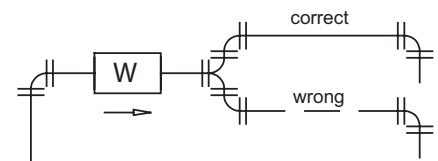
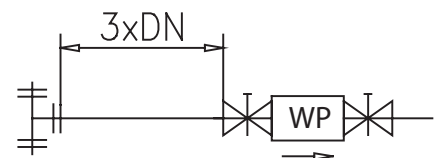
Installation positions

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.





WS-N

Woltman meters with perpendicular turbine shafts

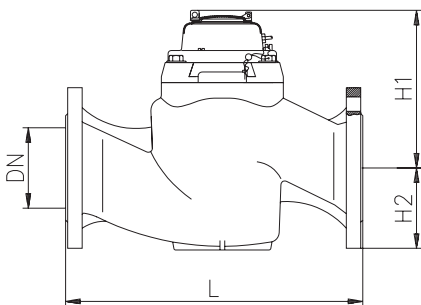
The WS type Woltman meter will show its advantages during fluctuating flow rates. Since the turbine is arranged perpendicular to the pipe axis, there's no need for a direction change of the transmission through the worm gear to the counter. WS meters can achieve smaller starting values than WP meters through reduced friction.

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.

Retrofitting with active and passive pulsers is possible at any time without damaging the calibration seal. With the Reed sensor, optical and inductive-NAMUR sensors all common sensor variations are possible and make the integration in data communication or automation and control systems very easy.

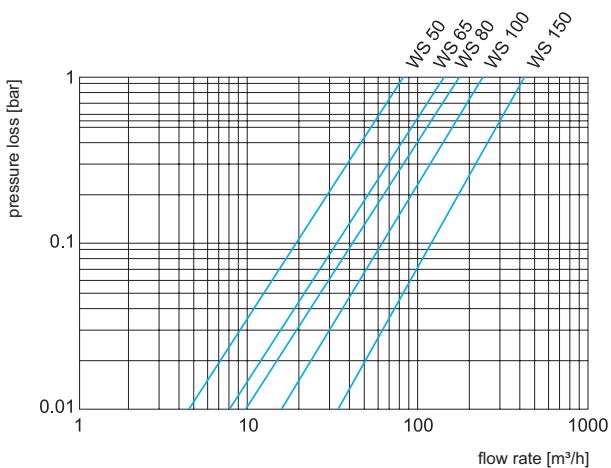
Performance characteristics in overview

- Removable measuring insert
- Evacuated counter protected from condensation
- Low starting flow and high measuring accuracy
- Integrated filter made of stainless steel
- Especially reinforced sapphire bearing
- Hydraulic bearing relieve for long-term measuring stability
- Dry dial counter with large number rollers simplifies the readability
- Retrofittable with active and passive pulsers
- High pressure model PN25/40 upon request
- For cold water up to 30°C, with security up to 50°C
- For horizontal installation position
- Optional short installation lengths for DN80 and DN100 available

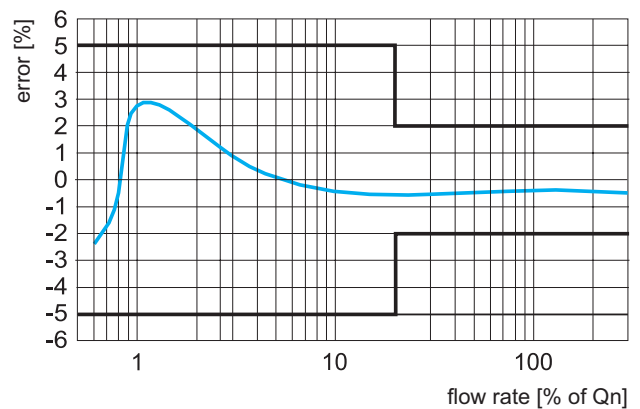


Dimensions WS-N

Technical data							
Nominal flow	Qn	m³/h	15	25	40	60	150
Nominal diameter	DN	mm	50	65	80	100	150
Overall length	L	mm	270/300	300	300/350/370	350/360/370	500
Metrological class			B	B	B	B	B
Maximum flow (short-term)	Qmax	m³/h	30	70	110	180	350
Maximum flow (constant)		m³/h	20	40	55	90	200
Transitional flow	Qt	m³/h	1	3	3	5	10
Minimum flow	Qmin	m³/h	0,15	0,2	0,2	0,3	0,8
Flow rate with 0.1 bar head loss		m³/h	20	35	40	70	150
Display range	min	l	0,5	0,5	0,5	0,5	0,5
	max	m³	9.999.999	9.999.999	9.999.999	9.999.999	9.999.999
Maximum temperature		°C	30	30	30	30	30
Operating pressure, max.	PN	bar	16	16	16	16	16
Head loss at Qmax		bar	0,2	0,2	0,2	0,3	0,6
Height	H	mm	228	238	290	306	435
Flange diameter	D	mm	165	185	200	220	285
Bolt circle diameter	D1	mm	125	145	160	180	240
Number of bolts		Pcs.	4	4	8 (4)	8	8
Bolt diameter		mm	18	18	18	18	22
Weight		kg	14	23	29	31	78



Head loss curves



Typical accuracy curve

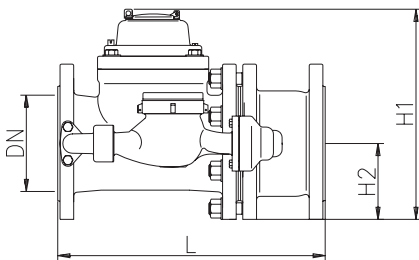


WPV

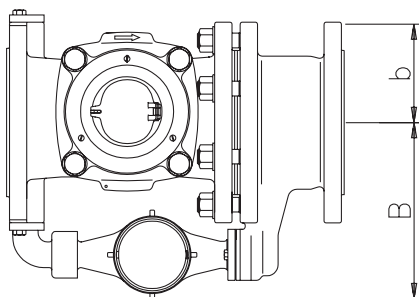
Compound Woltman meters

Compound meters were conceived for measuring extremely fluctuating water amounts. For example, in the case of a fire, a very high flow rate must be measured at a tap connection where under normal circumstances a domestic meter would be sufficient. In this operation case, the spring loaded valve opens and the main meter also measures the volume flowing through. Typical locations for these are schools, homes, office buildings, or supply lines of smaller residential areas, where the flow rate must be exactly measured during the night.

Our Compound meters are characterized by a high measuring accuracy in the commutation range and the low pressure loss during maximum load. They are simple in design, stable during use and have a relatively low weight. The counter of the main meter is designed as a dry dial meter. The secondary meter, which is usually arranged to the right, is typically a wet dial meter. A variation with the secondary meter arranged to the left, or with other secondary meter types, is available upon request.



Reed sensor, optical and inductive-NAMUR sensors in the counter can always be retrofitted without damaging the calibration seal. The secondary meter is supplied serially retrofittable and can be easily retrofitted with a Reed sensor.

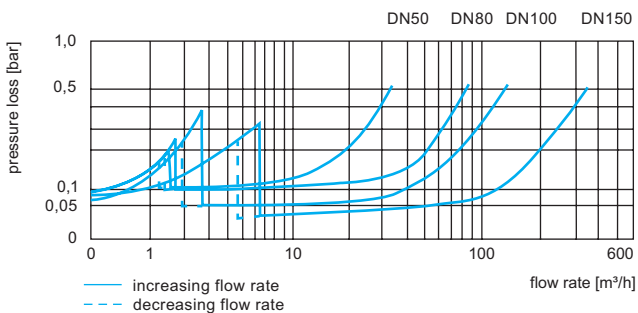


Dimensions WPV

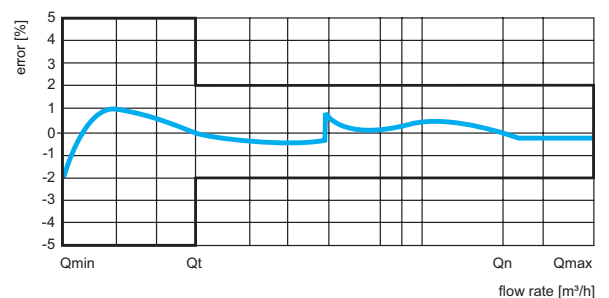
Performance characteristics in overview

- Extremely wide measuring range
- For cold water up to 30° C
- Evacuated counter protected from condensation
- Low starting flow and high measuring accuracy
- Flanges according to DIN 2501, PN 10
- Secondary meters arranged to the right, upon request to the left
- Main meter of WPH type
- For horizontal installation position

Technical data							
Nominal flow	Qn	m³/h	15	40	60	150	250
Nominal diameter	DN	mm	50	80	100	150	200
Nominal flow secondary meter		m³/h	2,5	2,5	2,5	10	10
Overall length	L	mm	270	300	360	500+-15	1200+-15
Metrological class			B	B	B	B	B
Maximum flow (short-term)	Qmax	m³/h	70	200	220	350	650
Maximum flow (constant)		m³/h	35	120	180	250	325
Transitional flow	Qt	m³/h	0,0375	0,0375	0,0375	0,15	0,15
Minimum flow	Qmin	m³/h	0,02	0,02	0,02	0,08	0,08
Commutation flow rate	increasing	m³/h	1,9	1,9	2,8	6,2	10
	decreasing	m³/h	1,2	1,2	1,6	4,8	6
Flow rate with 0.1 bar head loss		m³/h	2	7	40	115	310
Display range	min	l	0.5	0.5	0.5	0.5	0.5
	max	m³	9.999.999	9.999.999	9.999.999	9.999.999	9.999.999
Maximum temperature		°C	50	50	50	50	50
Operating pressure, max.	PN	bar	16	16	16	16	16
Head loss at Qmax		bar	0,5	1	0,9	0,4	0,2
Height	H1	mm	193	234	146	347	422
	H2	mm	75	94	106	135	172
Width	B	mm	190	220	220	290	325
	b	mm	85	110	110	145	170
Flange diameter	D	mm	165	200	220	285	340
Bolt circle diameter	D1	mm	125	160	180	240	295



Head loss curves



Typical accuracy curve



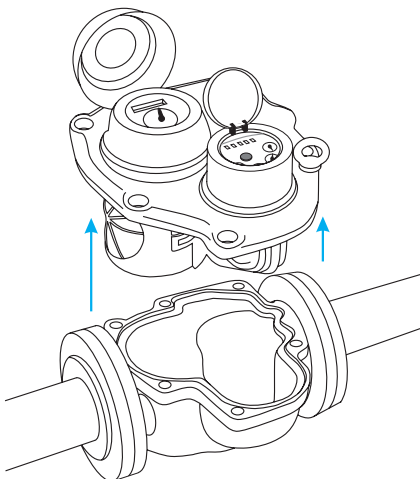
WPV-T

Turbo Compound Woltman meters

The Turbo Compound meter is a special Compound meter designed for measuring extreme fluctuating flow rates. The difference to the normal Compound meter is that during periodical replacement the meter body can remain in the piping and only the calibrated measuring insert is interchanged. The main meter, the secondary meter and the spring loaded valve are all assembled on one plate. The periodical replacement is therefore simple, quick and cost-effective.

The main meter is designed as a Parallel Woltman meter; the secondary meter is a multi-jet measuring cartridge. Only a body, where the secondary meter is arranged on the right side, is available. In order to determine the meter reading, like with the classic Compound meters, the meter reading of the main and the secondary meter need to be added.

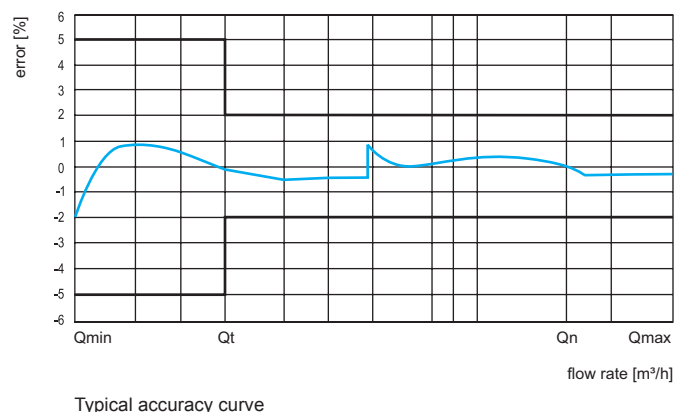
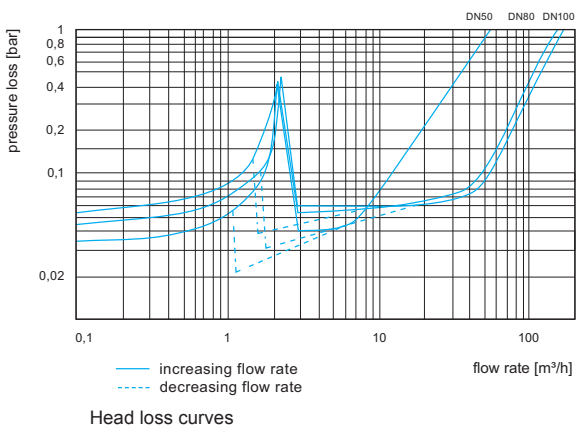
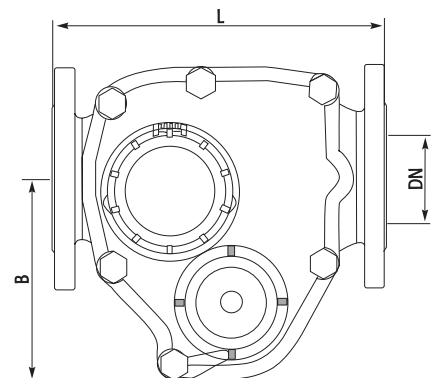
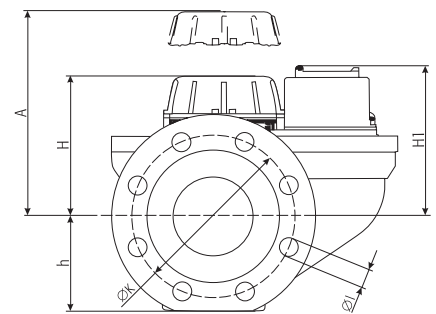
Reed sensor, optical and inductive-NAMUR sensors can always be mounted on the counter of the main meter without damaging the calibration seal on the counter. The secondary meter measuring cartridge is serially retrofittable and can be easily retrofitted with a Reed sensor. The integration in data communications and automation and control systems is therewith simple.



Performance characteristics in overview

- Interchangeable calibrated measuring insert consisting of main meter, spring loaded valve, and secondary meter
- Body remains in the pipeline during the interchange of measuring insert
- Prevention of deposits, dead water or air pocket accumulation through special construction
- No measurement errors in the commutation range
- For cold water up to 30°C (secure up to 50°C)
- For horizontal installation position
- Secondary meter at the right side of the main meter

Technical data					
Nominal flow	Qn	m³/h	15	40	60
Nominal diameter	DN	mm	50	80	100
Nominal flow secondary meter	Qn	m³/h	2,5	2,5	2,5
Overall length	L	mm	270	300	360
Metrological class			B	B	B
Maximum flow (constant)	Qmax	m³/h	35	120	230
Maximum flow (short-term)		m³/h	90	200	300
Transitional flow	Qt	m³/h	0,0375	0,0375	0,0375
Minimum flow	Qmin	m³/h	0,02	0,02	0,02
Commutation flow rate	increasing	m³/h	2,2	2,3	2,3
	decreasing	m³/h	1,0	1,5	1,5
Maximum temperature		°C	30	30	30
Operating pressure, max.	PN	bar	16	16	16
Flow rate with 0.1 bar head loss		m³/h	1,8	1,2	1,5
Head loss at Qmax		bar	0,5	1	1,1
Height	H	mm	130	140	140
	h	mm	75	93	105
	H1	mm	136	146	146
Disassembling Height	A	mm	245	280	280
Width	B	mm	160	180	180
Flange diameter		mm	165	200	220
Bolt circle diameter	K	mm	125	160	180
Weight		kg	17,4	25,5	29





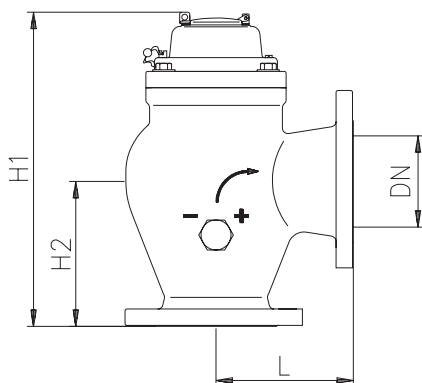
WB-N

Woltman well meters

Well water meters are vertical Woltman meters with a special design of the body. They can be attached as a wellhead in place of a 90° elbow according to DIN 28537 and DIN 28637.

The body is especially designed for the conditions of a well construction. The well water enters at the underside of the meter, flows through the perpendicular standing turbine and leaves the meter through the 90° elbow. The unique construction of our turbine ensures low starting values and offers enough reserves in the overload range for reliably measuring high flow rates. The coating on the inside and outside reliably protects the meter from corrosion. Minerals in the water cannot affect the fully encapsulated dry dial counter.

Our design is ideally suited for narrow well shafts with small dimensions. An extra installation spot for a classical Woltman meter does not need to be planned.

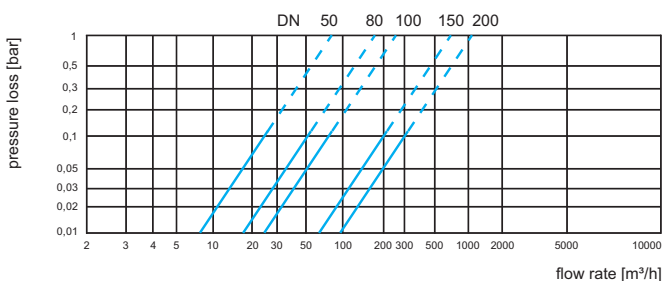


Dimensions WB-N

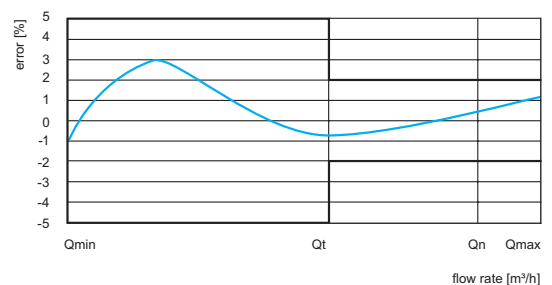
Performance characteristics in overview

- Removable measuring insert
- Pulser can be retrofitted without damaging the calibration seal
- Counter can turn 350°
- Operating pressure up to 16 bar
- For measuring a big range of flow rates
- High pressure design upon request
- For cold water up to 30°C (security up to 50°C)
- For horizontal installation in place of 90° elbows according to DIN28537 and DIN 28637 respectively

Technical data							
Nominal flow	Qn	m³/h	15	40	60	150	250
Nominal diameter	DN	mm	50	80	100	150	200
Arm length (DIN 28537)	L	mm	150	180	200	250	300
Arm length (DIN 28637)	L	mm		165	180	220	260
Metrological class			BxH	BxH	BxH	BxH	BxH
Maximum flow (short-term)	Qmax	m³/h	50	110	180	350	600
Maximum flow (constant)		m³/h	25	55	90	200	300
Transitional flow	Qt	m³/h	1,5	2,5	3	10	40
Minimum flow	Qmin	m³/h	0,2	0,25	0,3	0,8	4
Flow rate with 0.1 bar head loss		m³/h	25	50	78	250	295
Display range	min	l	1	1	1	1	1
	max	m³	9.999.999	9.999.999	9.999.999	9.999.999	9.999.999
Maximum temperature		°C	30	30	30	30	30
Operating pressure, max.	PN	bar	16	16	16	16	16
Head loss at Qmax		bar	0,1	0,12	0,15	0,9	0,9
Height	H	mm	124	140	149	219	264
Width	B	mm	88,5	103	103	132	180
Flange diameter	D	mm	165	200	220	300	360
Bolt circle diameter	D1	mm	125	160	180	240	295
Number of bolts		Pcs.	4	8 (4*)	8	8	8 (12*)
Bolt diameter		mm	18	18	18	23	23
Weight		kg	14,2	26,6	33,3	71,5	130



Head loss curves



Typical accuracy curve



WI-N

Irrigation Woltman meters for loaded water

Strongly loaded water, for example in agriculture, wastewater treatment plants, or sewage works requires especially robust meters that are also working reliably under difficult conditions. Our irrigation meters achieve this by having their measuring insert arranged in the upper part of the pipe where, in flowing water, usually only few suspended particles are found. The meter can easily handle a load ratio of up to 30%. We recommend an addition of external filters in front of the meter for very strong load.

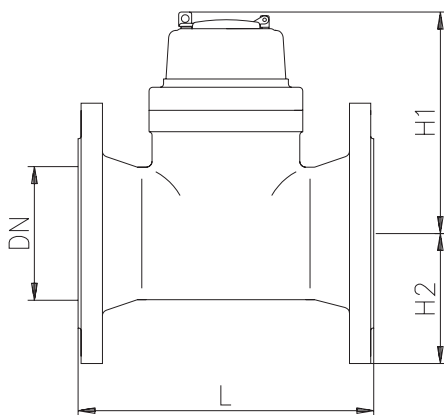
The factory tested measuring insert is the same for all meter sizes and is available in the following measuring accuracies:

Q_{max-Qt} : $\pm 3\%$ (Value Class A+B)

Q_t-Q_{min} : $\pm 5\%$ (Value Class A)

The roller counter is fully encapsulated and therewith protected from impurities. The meters are serially available with a lockable metal protecting cover, which reliably protects the counter under rough conditions.

Retrofitting with active and passive pulsers is possible at any time without damaging the calibration seal. All common sensor variations are available with Reed sensors, optical and inductive-NAMUR sensors; the integration in data communications and automation and control systems is therewith simple.



Dimensions WI-N

Performance characteristics in overview

- Meter for loaded water or as a control meter for raw water
- Easy to maintain through removable measuring insert
- Measuring accuracy corresponding to Class A
- For horizontal and vertical installation position

Technical data									
Nominal flow	Qn	m³/h	30	50	90	125	175	250	450
Nominal diameter	DN	mm	50	65	80	100	125	150	200
Overall length	L	mm	200	200	225	250	250	300	350
Measuring accuracy			A	A	A	A	A	A	A
Maximum flow (short-term)	Qmax	m³/h	100	120	150	300	350	500	900
Maximum flow (constant)		m³/h	70	120	120	300	300	500	800
Transitional flow	Qt	m³/h	6	12	12	30	30	50	80
Minimum flow	Qmin	m³/h	2,4	4,8	4,8	12	12	20	32
Display range	min	l	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	max	m³	9.999.999	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	50
Operating pressure, max.	PN	bar	16	16	16	16	16	16	16
Height	H1	mm	230	240	250	260	275	305	335
	H2	mm	75	85	95	105	120	135	180
Flange diameter	D	mm	165	185	200	220	250	285	340
Bolt circle diameter	D1	mm	125	145	160	180	210	240	295
Number of bolts	Pcs.		4	4	8	8	8	8	12
Bolt diameter		mm	19	19	19	19	19	23	23
Weight		kg	11	12	14	18	22	27	43,5



ETK-N-C

Single-jet bulk water meters



Our new ETK-N-C is a meter suitable for high flow rates with measuring accuracy of Class C.

Developed for the very exact measuring of water amounts, especially in the starting flow range, combined with a wide load range, this meter type will be used either for the highly accurate measuring of strongly fluctuating flow rates amounts, or as an alternative to the classic Compound meters with main and secondary meters.

The inflowing water is accelerated according to the venturi-principle at the inlet and tangentially hits the turbine wheel. Thereby extremely low starting values can be attained with simultaneously high overload guarantee. In the starting flow range similar to a secondary meter of a WPV, it has a sufficient reserve in the upper flow range to be capable of accurately measuring very high flow rates.

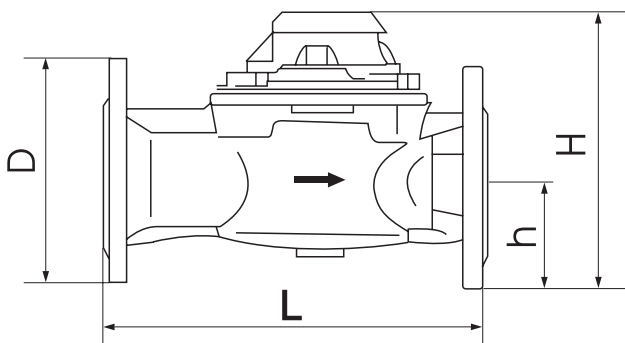
In contrast to the Woltman meters, the ETK-N-C does not require an inlet straight pipe section, because as a single-jet meter it is not sensitive to a twisted flow profile. Approved in vertical and horizontal positions, this meter type is very flexible and can be an alternative for almost all the classic Compound meters.

Performance characteristics in overview

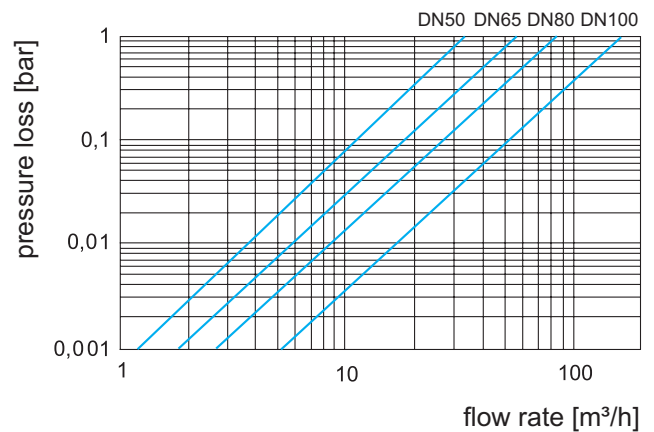
- Can be retrofitted with pulsers
- Turnable counter
- Good long-term measuring stability
- Wide measuring range
- High accuracy in the lower measuring range
- Coated body – optimal protection
- High overload security
- For vertical and horizontal installation
- For cold water up to 30°C (security up to 50°C)



Technical data						
Nominal flow	Qn	m ³ /h	15	20	30	50
Nominal diameter	DN	mm	50	65	80	100
Overall length	L	mm	270	300	300	360
Metrological class			CxH	CxH	CxH	CxH
			BxV	BxV	BxV	BxV
Maximum flow (constant)	Qmax	m ³ /h	30	40	60	100
Transitional flow	Qt	m ³ /h	0,225	0,3	0,45	0,75
Minimum flow	Qmin	m ³ /h	0,09	0,12	0,18	0,3
Flow rate with 0.1 bar head loss		m ³ /h	11	19	28	51
Display range	min	l	0,5	0,5	0,5	0,5
	max	m ³	999.999	999.999	999.999	999.999
Maximum temperature		°C	50	50	50	50
Operating pressure, max.	PN	bar	16	16	16	16
Head loss at Qmax		bar	0,8	0,5	0,5	0,4
Height	H	mm	180	196	218	230
	h	mm	70,5	80,5	95	105
Flange diameter	D	mm	165	182	200	220
Bolt circle diameter	D1	mm	125	145	160	180
Number of bolts		Pcs.	4	4	8	8
Bolt diameter		mm	18	18	18	18
Weight		kg	11,8	16,6	20	23,5



Dimensions ETK-N-C



Head loss curves

Filters

Dirt and magnet filters

For improvement of the water quality in situations where difficult water quality must be accounted for, ZENNER offers two different types of filters.

Dirt filters

Large suspended particles and fibrous contamination in the water can impact the measuring characteristics of Woltman meters and can deposit in the bearings. The dirt filter can filter particles up to 4mm* from the water and reliably protect the meters that follow.

Magnet filters

Additionally, the magnet filter makes it possible to filter ferromagnetic particles from the measured medium. It is therefore equipped with strong permanent magnets on which the magnetic fine dirt deposits. Dry dial meters are especially sensitive to rust, which can affix to the magnets and impact on the measuring result. With the available hot water version, flow sensors can be ideally protected in heating applications.

Both filters are available as T or Y models. They can be opened, and the rust-free stainless steel filter insert can be easily washed and cleaned.

Performance characteristics in overview

- No contamination of the piping by particles
- Additional protection for a following water meter
- Easy to maintain through removable insert
- Operating pressure 16 bar
- Application for cold water up to 50°C and hot water up to 130°C
- High pressure version upon request

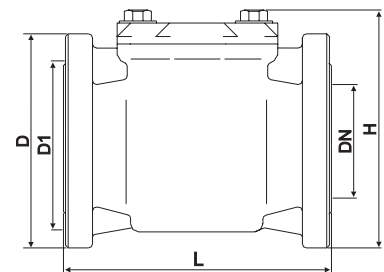
*Both filters are available with two different mesh versions:

PN 10/16-4: Hole diameter mesh= 4 mm. PN 10/16-5: Hole diameter mesh= 5 mm

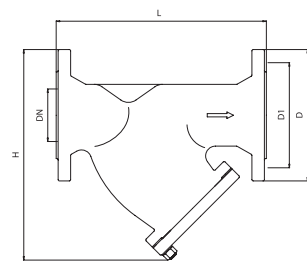


Technical data T-Filter										
Nominal diameter	DN	mm	50	65	80	100	125	150	200	250
Overall length	L	mm	200	200	225	250	250	300	350	450
Height	H	mm	176	193	224	234	245	277.5	363	395
Flange diameter	D	mm	165	185	200	220	250	285	340	395
Bolt circle diameter	D1	mm	125	145	160	180	210	240	295	350
Number of bolts	Pcs.		4	4	8	8	8	8	8	12
Bolt diameter		mm	19	19	19	19	19	23	23	23
Weight		kg	12,3	13,7	15	17,6	26,8	35,7	67,5	94

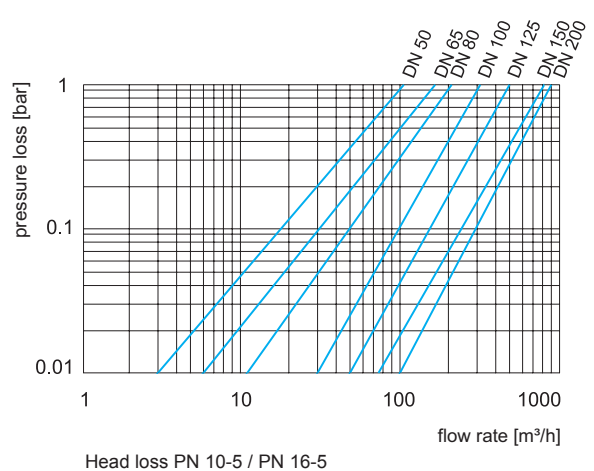
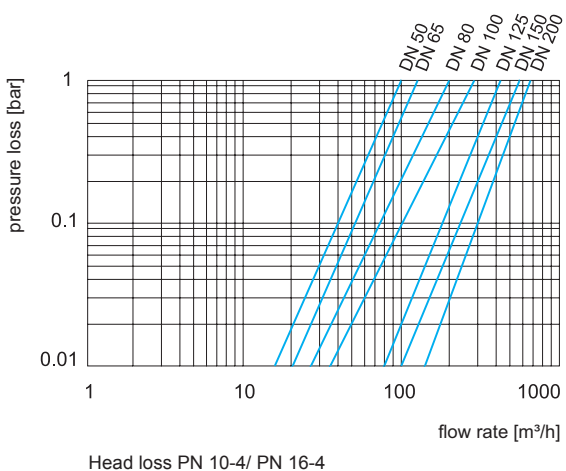
Technical data Y-Filter										
Nominal diameter	DN	mm	50	65	80	100	125	150	200	250
Overall length	L	mm	290	320	320	400	450	480	580	680
Height	H	mm	260	287	321	364	420	482	577	688
Flange diameter	D	mm	165	185	200	220	250	285	340	405
Bolt circle diameter	D1	mm	125	145	160	180	210	240	295	355
Number of bolts	Pcs.		4	4	8	8	8	8	8	12
Bolt diameter		mm	19	19	19	19	19	23	23	28
Weight		kg	13,3	16,2	20,7	28,6	51	68	110	140



Dimensions T-Filter



Dimensions Y-Filter



Pulsers

Active and passive sensors for data communication

All of our Woltman meters can be retrofitted with active or passive pulsers without damaging the calibration seal. Up to 2 Reed sensors and one active pulser can be simultaneously attached.

All pulsers, that do not require their own power supply, are referred to as passive sensors. Active sensors require a power supply and typically require a transducer with mains supply, to be activated.

Reed sensors

As a passive pulser, the Reed sensor is designed as a potential-free normally open contact. It is closed with a frequency proportional to the flow rate by a serially integrated magnet within the counter, and opens itself automatically again. Typical pulse values are 100, 1000, and 10,000 L/Imp., depending on meter size and mounting position.

The Reed sensor does not require its own power supply and is therefore the ideal partner for all electronic devices whose energy supply comes from a battery.

Optical sensors

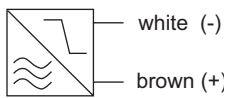
The active optical sensor is an electronic switch, which produces an impulse in the serially integrated light barrier in the counter. Its advantage over the Reed sensor is that higher resolutions of the impulse value are possible. Depending on the meter size, 1 and 10 L/Imp is typical.

As an active sensor, the optical sensor requires a power supply and is commonly activated by a transducer.

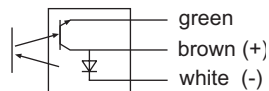
Inductive-NAMUR sensors

The Inductive-NAMUR sensor is available as an alternative to the optical sensor. It functions according to the principle of an inductive proximity switch and recognizes the activating pulse with the help of an inductor in the sensor. The data communication works according to the standard NAMUR, where power supply for the sensor and the impulse communication is done with two wires. Depending on the meter size, 1 and 10 L/Imp is typical.

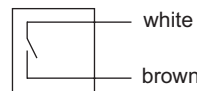
As an active sensor the Inductive-NAMUR sensor needs to be activated with a transducer, which guarantees power supply and impulse counting.



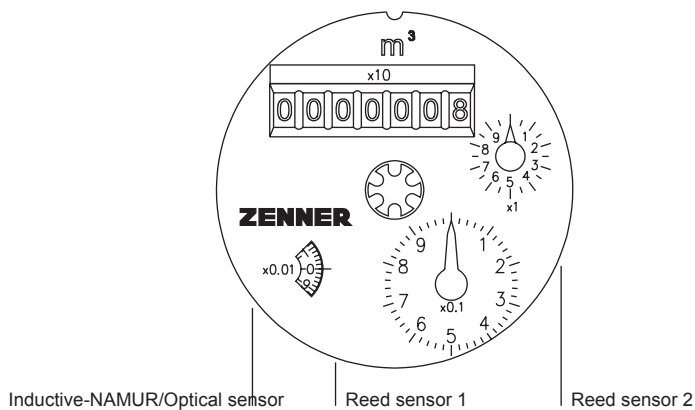
Inductive-NAMUR



Optical sensor



Reed sensor



Inductive-NAMUR/Optical sensor

Reed sensor 1

Reed sensor 2

Technical data Pulser			
Pulser	Pulse value	Pulse value	Pulse value
	DN 40 .. 125	DN 150 .. 300	DN 400 .. 500
Reed sensor	0,1 und 1 m ³	1 und 10 m ³	10 und 100 m ³
Optical sensor	0,001 m ³	0,01 m ³	0,1 m ³
Inductive-NAMUR sensor	0,001 m ³	0,01 m ³	0,1 m ³

Honeycomb flow straightener

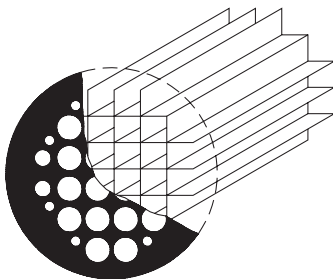
For rectifying the flow profile at the inlet



In order to achieve accurate measuring results with Woltman meters, the water must flow across the turbine with an undisturbed flow profile. To guarantee this, inlet and outlet straight pipe sections are specified.

Tee pieces, 90° elbows, and not fully opened gate valves cause irregular and twisted flow profiles in the water. If this turbulence reaches the meter, the measuring results will be strongly influenced. The honeycomb flow straightener can solve this problem.

32 axial quadratic channels eliminate the twisting of the flow within the pipeline. A breaker plate is found at the inlet of the honeycomb piece whose cross-section approximately corresponds to the half cross-section of the pipe. The flowing water is lowered down and the following quadratic channels eliminate all of the twisting.



The pressure loss due to the honeycomb flow straightener is for a flow velocity of 3 m/sec approx. 0.1 bar. The flange plate of the breaker plate serves to fasten the flow straightener between two flanges; the honeycomb piece thereby shows downstream.

Performance characteristics in overview

- Manufactured from rust-free steel
- To rectify the flow profile

Technical data									
Nominal diameter	DN	mm	50	65	80	100	125	150	200
Overall length	L	mm	50	63	79	99	123	148	197
Diameter sealing strip	D1	mm	102	122	138	158	188	212	268
Number of bolts		Pcs.	4	4	8	8	8	8	8
Weight		kg	2,8	3,6	4,8	5,7	8,5	10,6	16,9

Adjustable compensating piece

For the compensation of varying installation lengths

Adjustable compensating pieces are installed when the installation point is larger than the meter to be installed. Differences in installation lengths of the varying meter types can be easily compensated with them, without difficult reconstruction measures.

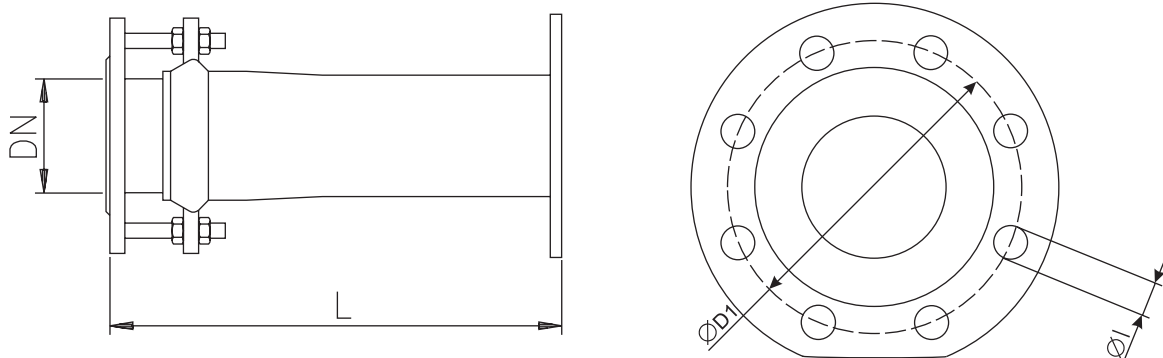
The adjustable piece can also compensate “uneven” installation lengths and can be easily mounted. It is fully coated inside and outside making it optimally protected from corrosion.



Performance characteristics in overview

- Large flexible range
- Fully coated
- Optimal for the installation of Compound meters

Technical data						
Nominal diameter	DN	mm	50	80	100	150
Overall length	L	mm	327+20	397+40	442+25	500
Flange diameter	D	mm	165	200	220	285
Bolt circle diameter	D1	mm	125	160	180	240
Number of bolts	Pcs.		4	4/8	8	8
Bolt diameter	mm		19	19	19	23



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