

**H 4200 / H 4400**  
**Woltmann Meter**  
Hydraulically balanced rotor  
for sensitive start-up



- ✘ Type WS / WS-H / WB.
- ✘ Nominal size DN 50 ... 200.
- ✘ Cold-water and hot-water meters – for optimal thermal stability.
- ✘ Borehole meter – tailor-made for borehole piping.
- ✘ Metrological excellence – for metering accuracy day in, day out.
- ✘ Quality that pays off – for modest maintenance outlay.
- ✘ Interchangeable registers – for sophisticated metering jobs.

# H 4 200 / H 4 400

## Woltmann Meter

### Superlatively made to measure

#### A successful marriage of old and new

Woltmann meter WS and borehole meter WB completely satisfy even the most demanding of users with their exemplary design and superlative workmanship. Our experts have incorporated all their experience, as well as valuable feedback from actual installations.

#### Metrological excellence

Metering accuracy, day in, day out, is exemplary. Fluctuating flow rates are faultlessly measured – small flow rates are sensitively registered.

#### Quality that pays off

Optimum materials and minimal maintenance soon show up in your bottom line.

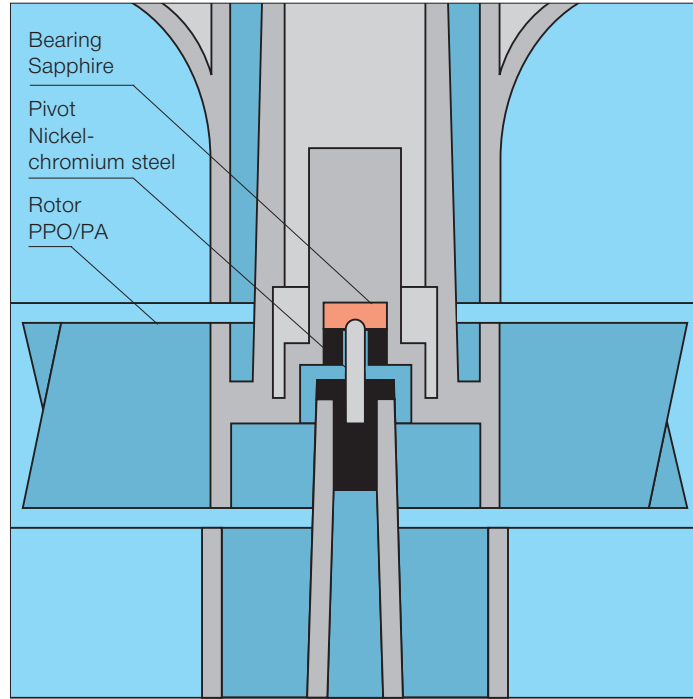
#### Interchangeable registers

With no less than three register options, you receive the right measuring system for every metering job.

#### Commitment to service

Sophisticated metrology is worth taking a lot of trouble. In our repair plants, ingenious staff make sure that your investment pays off over an entire metering lifetime. For WS and WB alike.

Hydraulically balanced rotor



*Typical*  
WS / WS-H / WB

#### Three in one

You may choose between three registers:

- ✘ MULTI-PULSE (standard)
- ✘ MULTI-PULSE-TROPIC
- ✘ MULTI-BUS.

#### Connection-friendly

When you've fitted MULTI-PULSE, you're triply connected to the outside world.

- ✘ One analog and two digital measured values may be communicated.

#### Clear-sighted

When you take a reading with your own eyes, you're fully in the picture.

- ✘ Non-misting register offers a clear view of the metering display.

#### Tough and sturdy


- ✘ Engineered to last.
- ✘ Durable corrosion protection.
- ✘ Full flow through the metering chamber.
- ✘ Hydraulically balanced rotor.
- ✘ Stability thanks to hard-metal sapphire components.


#### Dependably accurate

- ✘ Extended lower measuring range.
- ✘ Exceeds the EEC guidelines and ISO 4064 for cold water.

#### WS dry-dial

- ❑ Cold water up to 50 °C.

  $\frac{D 96}{6.132.38}$  DN 50 ... 100


  $\frac{D 85}{6.132.19}$  DN 150

- ❑ Installation horizontal. Approval  
DN 50 ... 150  
Class B, horizontal.
- ❑ Display capacity  
DN 50 ... 100  
999 999 m<sup>3</sup>,  
DN 150  
9 999 999 m<sup>3</sup>.
- ❑ Minimum scale value  
DN 50 ... 100  
0.0005 m<sup>3</sup>,  
DN 150  
0.005 m<sup>3</sup>.

#### WS-H dry-dial

- ❑ Hot water up to 130 °C.

  $\frac{22.16}{96.03}$  DN 50 ... 100

  $\frac{22.16}{86.01}$  DN 150

- ❑ Installation horizontal. Approval  
DN 50 ... 150  
Class C, horizontal.
- ❑ Display capacity  
DN 50 ... 100  
999 999 m<sup>3</sup>,  
DN 150  
9 999 999 m<sup>3</sup>.
- ❑ Minimum scale value  
DN 50 ... 100  
0.0005 m<sup>3</sup>,  
DN 150  
0.005 m<sup>3</sup>.

# The Registers

## Measuring up to the job

### 1. MULTI-PULSE

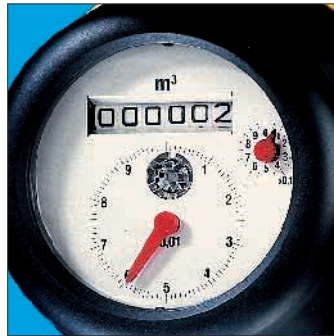
The standard register. Three data interfaces. Simply plugged in without damaging the calibration seal.

Condensation-free mechanical register.

### 2. MULTI-PULSE-TROPIC

For use under tough climatic conditions. Corresponds to MULTI-PULSE, but additionally encapsulated in a waterproof copper housing.

Condensation-free mechanical register.



#### Data interfaces

1. Reed switch pulse unit 1.
2. Reed switch pulse unit 2.
3. Opto-electronic pulse unit.  
Optional: inductive pulse unit.

#### Reed switch pulse units MULTI-PULSE / TDD / MULTI-PULSE-TROPIC

##### T 160

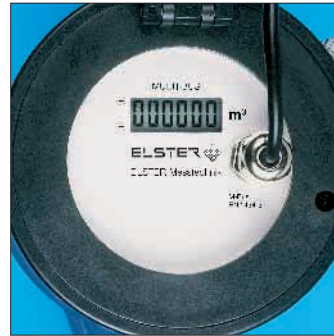
##### REED

- ✗ Contact loading 24 V/100 mA with suitable spark suppression.
- ✗ Pulse/interval sequence 20/80.
- ✗ Protective resistor 100 Ohm.
- ✗ Mean lifetime 10<sup>7</sup> operating cycles.
- ✗ Two-wire design.
- ✗ Cables 2 x 0.25 mm<sup>2</sup>, 2 m.
- ✗ Protected to IP 68.
- ✗ Explosion-protected, usable in intrinsically safe circuits Zone 1.
- ✗ 25 x 20 x 10 mm.
- ✗ Temperature range -10 °C ... +90 °C.

##### T 161

##### Double REED pulse units

- ✗ For forward-reverse-flow measuring.
- ✗ Overlapping pulses.
- ✗ Three-litres technique.



#### M-Bus output

1. Current volume.
2. Current flow rate.
3. Serial number.
4. Fixed day volume / date.
5. Current volume, high resolution.
6. Display test.

#### Opto-electronic pulse units MULTI-PULSE / TDD

##### T 180

##### PV 14

- ✗ Infrared optical sensor with OP amplifier.
- ✗ 12 V/15 ... 25 mA, 24 V with 1 kOhm.
- ✗ Pulse/interval sequence 50/50.
- ✗ Line resistance < 15 Ohm/core.
- ✗ Three-wire design.
- ✗ Cables 3 x 0.25 mm<sup>2</sup>, 2 m.
- ✗ Protected to IP 68.
- ✗ 25 x 20 x 10 mm.
- ✗ Temperature range -10 °C ... +70 °C.

### 3. MULTI-BUS

M-Bus output according to EN 1434. Without pulse outputs. Further details are available on demand.

Waterproof register with LC display, micro-processor-controlled. Protection rating to IP 68 for cold water up to 50 °C.

If pulse outputs are additionally needed, the MULTI-PULSE / TDD / MULTI-PULSE-TROPIC registers may be used, connected to M-Bus modules.

#### Inductive pulse units MULTI-PULSE / TDD

##### T 170

##### PV 13-3

- ✗ Connection circuitry: NAMUR DIN 19 234.
- ✗ U<sub>0</sub> 8 ... 12 V, R<sub>i</sub> 1 kOhm.
- ✗ Pulse range approx. 9 ms, closed-circuit current < 0.7 mA, operating current > 3 mA.
- ✗ Output frequency < 60 Hz.
- ✗ Line resistance < 50 Ohm/core.
- ✗ Two-wire design.
- ✗ Cables 2 x 0.25 mm<sup>2</sup>, 2 m.
- ✗ Protected to IP 68.
- ✗ 25 x 20 x 10 mm.
- ✗ Temperature range 0 °C ... +70 °C.

##### T 171

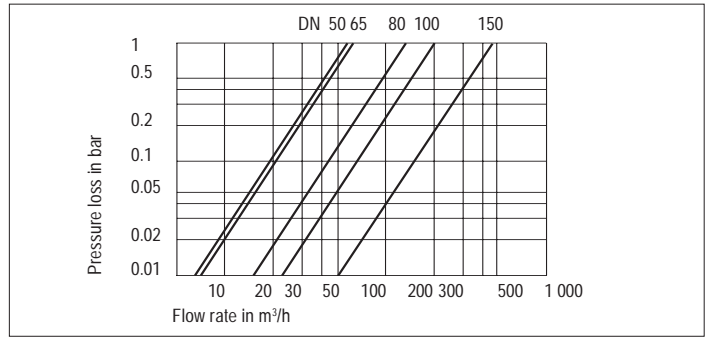
##### PV 13-3 LC

- ✗ Explosion-protected, usable in intrinsically safe circuits Zone 1.

# H 4 200

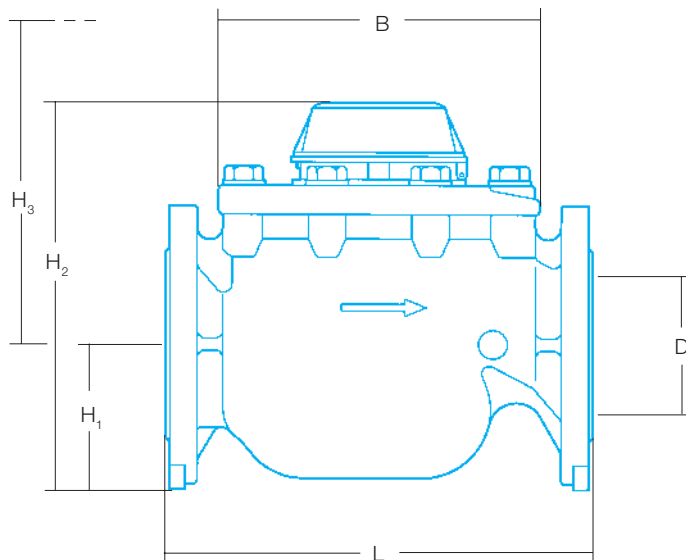
## Woltmann meter

### Cold water



Woltmann meter		H 4 200		WS				
Nominal size	DN	mm		50	65	80	100	150
Meter size / nominal flow rate	Q <sub>n</sub>	m³/h		15	25	40	60	150
D	Connection flange	DN	mm	50	65	80	100	150
L	Meter length							
	Standard	DIN 19 625	mm	270	300	300	360	500
	Option		mm	-	-	-	-	430
	Standard	DIN ISO 4064	mm	300	300	350	350	500
B	Width		mm	173	173	239	239	310
H <sub>1</sub>	Centerline height		mm	85	97	102	113	141
H <sub>2</sub>	Overall height		mm	220	232	280	303	492
H <sub>3</sub>	Height	Replacement of measuring insert	mm	240	240	330	340	620
Weight		PN 10/16	kg	14.5	18	24	28	80
		Installation horizontal						
Maximum flow rate	Q <sub>max</sub>	m³/h		50	50	110	180	350
Transitional flow rate	Q <sub>t</sub>	m³/h		1.5	2	2.5	3	10
Minimum flow rate	Q <sub>min</sub>	m³/h		0.2	0.2	0.25	0.3	0.8
Continuous load		m³/h		20	25	55	90	200
Temperature	T <sub>max</sub>	°C		50	50	50	50	50
Pressure rating		PN		10/16	10	10/16	10/16	10/16
		PN		25/40	25/40	25/40	25/40	25/40
Flow capacity	at 0.1 bar pressure loss	m³/h		> 19	> 21	> 42	> 70	> 160

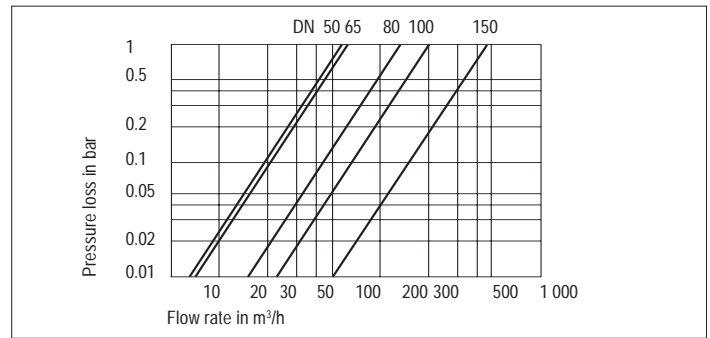
WS



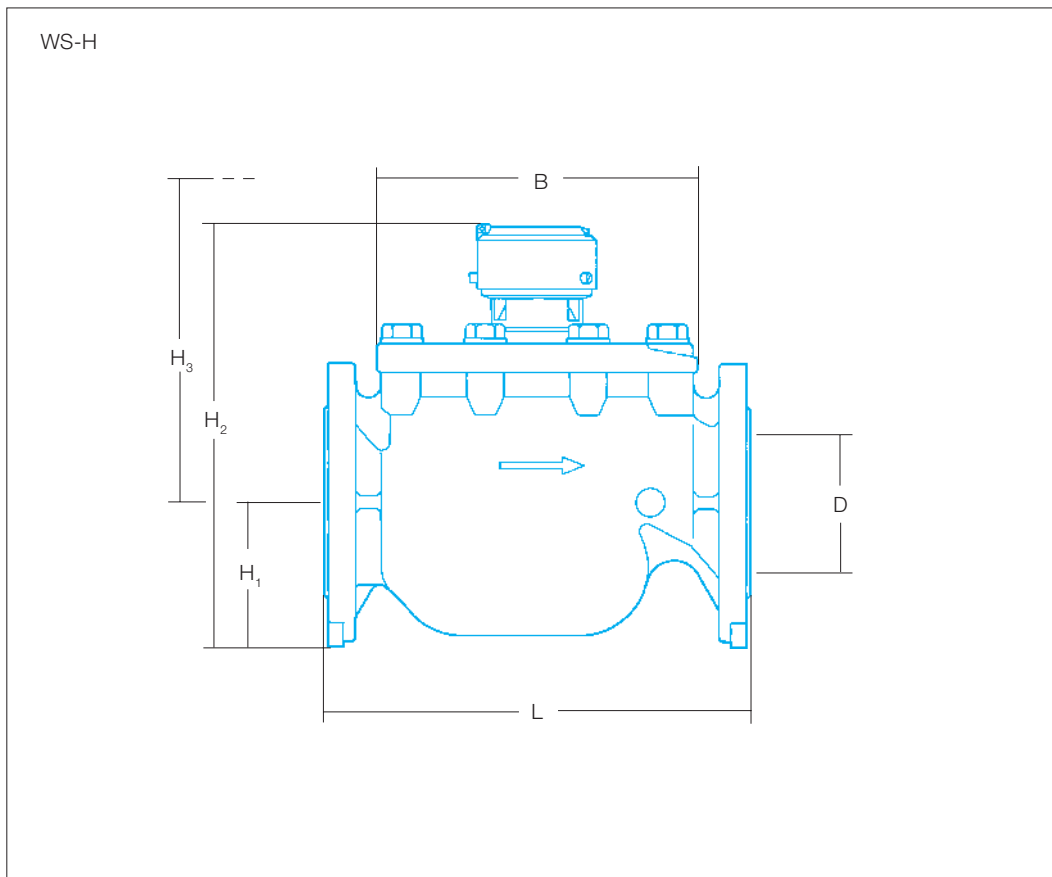
# H 4 400

## Woltmann meter

### Hot water



Woltmann meter		H 4 400		WS-H					
Nominal size	DN	mm	50	65	80	100	150		
Meter size / nominal flow rate	$Q_n$	m³/h	15	25	40	60	150		
D	Connection flange	DN	mm	50	65	80	100	150	
L	Meter length								
	Standard	DIN 19 625	mm	270	300	300	360	500	
	Option		mm	-	-	-	-	430	
	Standard	DIN ISO 4064	mm	300	300	350	350	500	
B	Width		mm	173	173	239	239	310	
$H_1$	Centerline height		mm	85	97	102	113	141	
$H_2$	Overall height		mm	260	272	320	343	532	
$H_3$	Height	Replacement of measuring insert	mm	280	280	370	380	660	
Weight		PN 10/16	kg	14.5	18	24	28	80	
		Installation horizontal							
	Maximum flow rate	$Q_{max}$	m³/h	50	50	110	180	350	
	Transitional flow rate	$Q_t$	m³/h	1.5	1.5	1.6	9	22.5	
	Minimum flow rate	$Q_{min}$	m³/h	0.2	0.2	0.3	1.2	2.0	
	Continuous load		m³/h	15	25	40	60	150	
	Temperature	$T_{max}$	°C	130	130	130	130	130	
	Pressure rating		PN	10/16	10/16	10/16	10/16	10/16	
			PN	25/40	25/40	25/40	25/40	25/40	
	Flow capacity	at 0.1 bar pressure loss	m³/h	> 19	> 21	> 42	> 70	> 160	



#### Hot-water-proof

The right supplement when it comes to measuring water of higher temperatures.

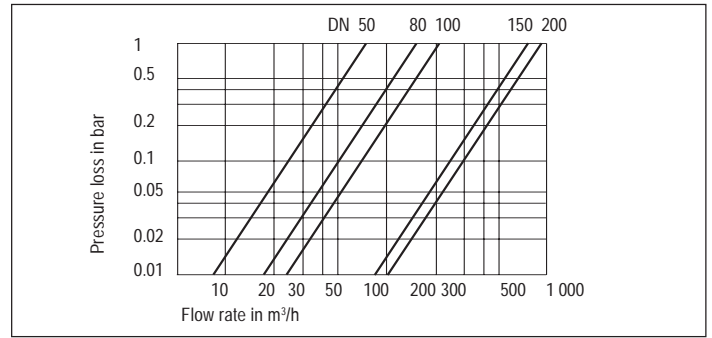
- ✘ Permanent thermal stability, thanks to top-quality materials and meticulous craftsmanship.
- ✘ Design empirically validated over years of tough continuous operation.
- ✘ Field-proven TDD register: combination of a mechanical register plus a pulse-type register with three interfaces.
- ✘ Compatible with VERTIX WS: Reed switch pulse unit, opto-electronic pulse unit, inductive pulse unit.

#### Accurate metering

- ✘ Meets or exceeds all international standards.

# H 4 400

## Borehole meter




Borehole meter		H 4200		WB				
Nominal size		DN	mm	50	80	100	150	200
Meter size / nominal flow rate		Q <sub>n</sub>	m <sup>3</sup> /h	15	40	60	150	250
D	Connection flange	DN	mm	50	80	100	150	200
L	Length to centerline	mm	150	180	200	250	300	
	Standard DIN 28 537	mm	150	165	180	220	260	
B	Width	mm	173	239	239	310	355	
	Height from centerline	mm	153	165	175	220	265	
H <sub>1</sub>	Height	mm	240	325	340	485	586	
H <sub>2</sub>	Height Replacement of measuring insert	mm						
Weight		kg	16	32	38	72	130	
Installation borehole piping								
Maximum flow rate		Q <sub>max</sub>	m <sup>3</sup> /h	35	110	180	350	600
Transitional flow rate		Q <sub>t</sub>	m <sup>3</sup> /h	1.5	3	4	10	40
Minimum flow rate		Q <sub>min</sub>	m <sup>3</sup> /h	0.2	0.28	0.35	0.8	4
Continuous load			m <sup>3</sup> /h	20	55	90	200	300
Temperature		T <sub>max</sub>	°C	50	50	50	50	50
Pressure rating		PN		10/16	10/16	10/16	10/16	10/16
Flow capacity at 0.1 bar pressure loss		PN		25	25	25	25	25
		m <sup>3</sup> /h		> 25	> 50	> 75	> 250	> 295

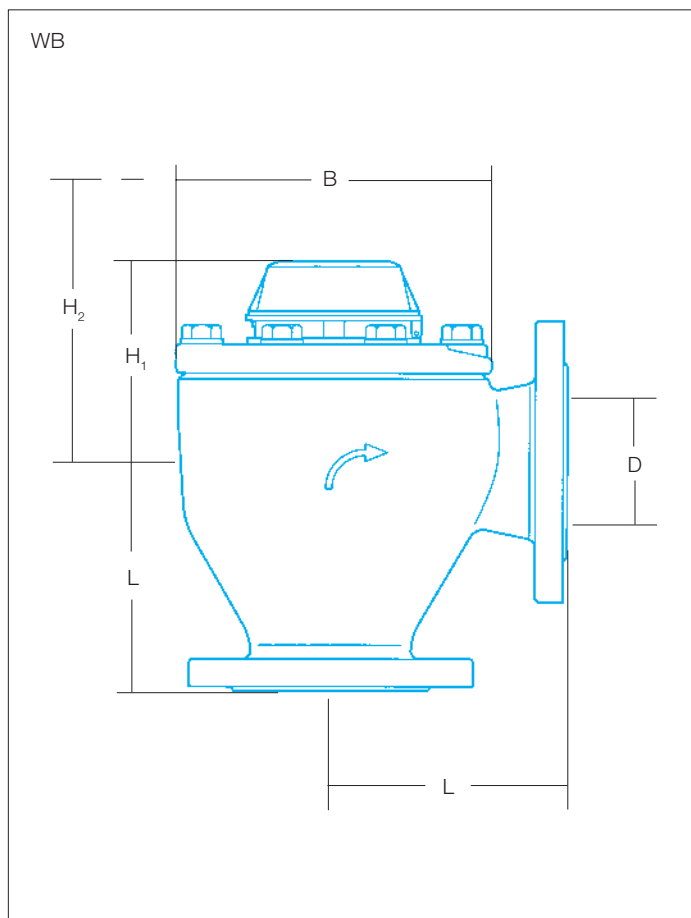
### WB dry-dial

- ❑ Cold water up to 50 °C.

 DN 50 ... 100

 DN 150 + 200

- ❑ Installed as 90° bend, borehole piping. Approval DN 50 ... 200 Class B, horizontal.
- ❑ Display capacity DN 50 ... 100 999 999 m<sup>3</sup>, DN 150 + 200 9 999 999 m<sup>3</sup>.
- ❑ Minimum scale value DN 50 ... 100 0.0005 m<sup>3</sup>, DN 150 + 200 0.005 m<sup>3</sup>.



### Tailor-made for borehole piping

The housing shape features the 90° bend specified in the relevant standard.

- ✘ Corrosion-proof and durable, thanks to top-quality materials and meticulous craftsmanship.
- ✘ Design empirically validated over years of tough continuous operation.
- ✘ Connection-friendly MULTI-PULSE register: Reed switch pulse unit, opto-electronic pulse unit, inductive pulse unit.
- ✘ Also on request the MULTI-PULSE-TROPIC and MULTI-BUS registers.

# Working with Woltmann meters

## Laws and regulations

Woltmann meters may be installed only by properly qualified craftspersons. The installation tips below are intended to help you get optimum results from our meters.

In addition, the current laws and regulations, plus recognized good engineering practice, must be meticulously complied with!

## Operating temperature

Woltmann meters are identified by blue housings for cold water, and brown ones for hot water. For both these models, the same instructions apply for installation and commissioning.

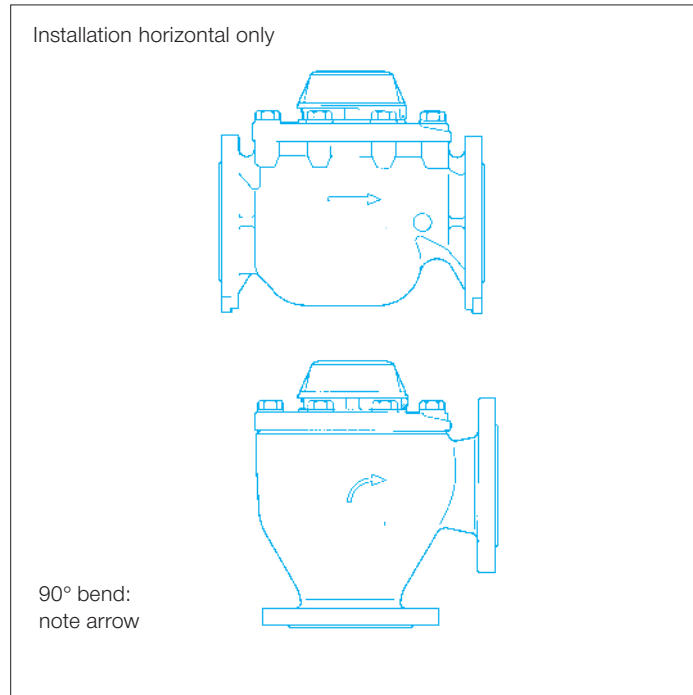
The operating temperature of  
 $T_{\max}$  50 °C for cold water,  
 $T_{\max}$  130 °C for hot water  
must be complied with.

## Transport and storage

Do not drop Woltmann meters or handle them roughly. Any damage will lead to inaccurate measurements.

Only a frost-proof and dust-free room will protect them against damage during storage. In the case of meters for cold water, the storage temperature must not significantly exceed 50 °C, since otherwise plastic components may be deformed; so be careful with radiators!

In order to avoid soiling, bring the meters to their place of installation in their original packing.



## Installation

Woltmann meters, like all water meters, must be installed where they will be safe from frost, and easy to read. The WS is approved for horizontal installation only. The WB may be installed only in well risers (90° bend) – with the dial horizontal.

Only seals suitable for drinking water may be used for installation.

If the pipe diameter is different from your meter's nominal diameter, you must use flanged adapters. No abrupt changes in cross-sectional area must be allowed immediately upstream and downstream of the meters.

The measuring points must be located so as to ensure that the meters are always filled completely with water.

Upstream and downstream of the meters, there must be an undisturbed, straight section of piping of the same diameter as the meters. It must be five times as long as the nominal diameter upstream of the meter, and three times as long downstream.

At narrow measuring points, shutoff valves can be installed immediately upstream and downstream of the meters, provided they are always completely open during operation.

## Commissioning

New or modified piping must be thoroughly flushed at as high a pressure as possible. Use pipe sections instead of the meters.

After flushing, you can install the meters. Make sure the direction of flow is correct. The meters are marked with arrows for this purpose. At commissioning, and also after every draining of the pipes, you must always make sure that the shutoff valves are opened slowly, so as to provide a gentle start-up for the meters, which will be running dry at first.

In order to preclude incorrect displays and damage, never allow water-air or water-steam mixtures to flow through the meters.

## Calibration validity and maintenance

Woltmann meters used or provided in business operations must be calibrated and certified.

Conforming to the EEC Guidelines, the duration of validity for such calibration is of course 6 years for cold water meters and 5 years for warm water meters. This period has proved to be a suitable maintenance interval for calibrated but uncertified meters as well.

Depending on the water quality and operating conditions involved, however, maintenance may be necessary more frequently.

## Warranty procedures

Should you have a warranty claim concerning one of our Woltmann meters, please send it in to us, unopened and sealed. Please give reference to our warranty obligations; otherwise no incoming inspection will take place and the cause of damage may no longer be traceable.

# Ordering information and pulse sequences

Order numbers		H 4200 Cold water									
Nominal size	DN mm	50	50	65	80	80	100	100	150	150	
Meter size / nominal flow rate	Q <sub>n</sub> m <sup>3</sup> /h	15	15	25	40	40	60	60	150	150	
Meter length	mm	270	300	300	300	350	350	360	430	500	
PN 10 WS	*4-hole (old standard)	—	—	—	*1171514	—	—	—	—	—	
PN 16 WS		1131350	1141968	1188174	1161985	1188182	1188190	1171522	1102903	1093955	
PN 25/40 WS		0645095	R	R	0630373	R	R	0629154	1102911	1101745	
Order numbers		H 4400 Hot water 130 °C									
Nominal size	DN mm	50	50	65	80	80	100	100	150	150	
Meter size / nominal flow rate	Q <sub>n</sub> m <sup>3</sup> /h	15	15	25	40	40	60	60	150	150	
Meter length	mm	270	300	300	300	350	350	360	430	500	
PN 10 WS-H-Z	4-hole (old standard)	—	—	—	*R	—	—	—	—	—	
PN 16 WS-H-Z		1193607	R	1193712	1193739	R	R	1193755	R	0628778	
PN 25/40 WS-H-Z		1193704	R	1193720	1193747	R	R	1193763	R	0628786	
Order numbers		H 4200 Cold water									
Nominal size	DN mm	50	80	80	100	100	150	150	200	200	
Meter size / nominal flow rate	Q <sub>n</sub> m <sup>3</sup> /h	15	40	40	60	60	150	150	250	250	
Meter length	mm	150	165	180	180	200	220	250	260	300	
PN 10 WB	*4-hole (old standard)	—	—	*1180211	—	—	—	—	—	—	
PN 10 WB		1180181	—	—	—	—	—	—	—	1094056	
PN 16 WB		1180181	0619965	1180246	1196274	1180262	1129631	1094021	1153311	1094048	
PN 25 WB		1180181	R	R	R	R	R	1101672	R	1101680	

R: on request

Pulse sequences		Standard			
Nominal size	DN mm	50 ... 100		150 ... 200	
Meter size / nominal flow rate	Q <sub>n</sub> m <sup>3</sup> /h	15 ... 60		150 ... 250	
T 160 / T 161	litres/pulse	Reed / Double-Reed	100/1 1 000/1	1 000/1 10 000/1	
T 180	litres/pulse	Opto-electronic	1/1	10/1	
T 170 / T 171	litres/pulse	Inductive / Ex-protective	1/1	10/1	



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