xylem

Let's Solve Water

620C / 620MC
Volumetric Meter-Composite Body Dry Dial

Main Features

DN 15 to 20, PN16

Light and easy to handle

Compatibility with all new and planned regulations for potable water

Unrivalled accuracy and measuring range

High resistance to impurities and aggressive water

Quiet operation

APPLICATIONS

The 620C/620MC is a high precision meter.

Due to its unique piston measuring chamber even drops of water are counted.

With the 620C/620MC you are assured of continuously good metrology.

A clear view is either provided through a register with an integrated wiper or a sealed metal/glass register that does not fog. For a faster and more comfortable readout the 620C/620MC is prepared for AMR.

Due to our broad product range of system solutions you can adapt the 620C/620MC to all your AMR needs.

Not least by its tamper proof design and its long life span you can be confident in selecting the 620C/620MC.

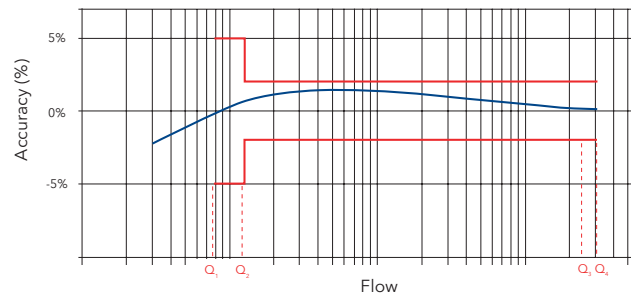**sensus**

a **xylem** brand

620C / 620MC
Volumetric Meter-Composite Body Dry Dial

Typical Marking

Markings can vary according different market or metrological specifications.

## Typical Accuracy Curve

Accuracy and reliability

Thanks to the advanced design of its measuring chamber the meter has an extreme low starting flow.

It can be supplied with metrological seal according the MID regulation 2014/32/EU with a ratio R up to 400.

Foreign matter present in the water is filtered out by either the tubular strainer on the inlet or the seat strainer. Particles can go through the meter without damage; the patented elastic pivot enables the particles to pass between the piston and the measuring chamber. All the gears are situated in the dry register, which eliminates any risk of blockage due to suspended particles in the water.

The 620C/620MC water meter keeps its metrological accuracy for many years of operation, even in very difficult working conditions.
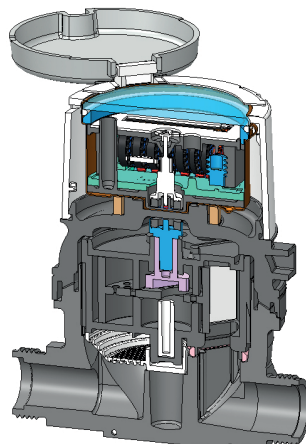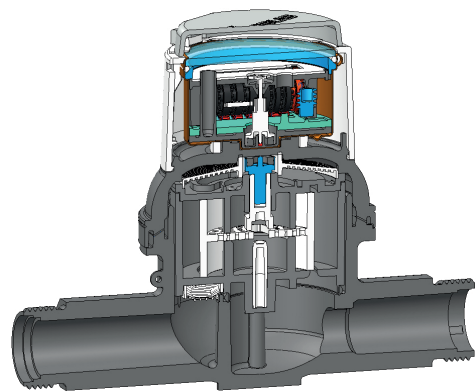
Typical Head Loss Curve
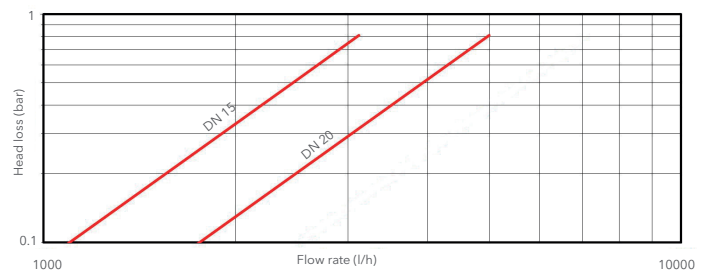
Cross Section
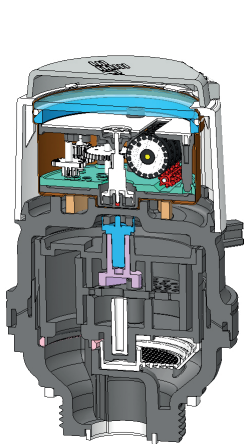
620MC

620C, DN15

620C, DN 20

620C / 620MC
Volumetric Meter-Composite Body Dry Dial

Approvals

EC type-examination certificate

in conformity with

- 2014/32/EU (MID)
- OIML R49:2013
- EN 14154:2005+A2:2011
- ISO 4064:2014

Q_3 2.5   DE-07-MI001-PTB002

Q_3 4   DE-09-MI001-PTB004

Certificate of compliance for potable drinking water

- KTW/DVGW (D)   ACS (F)
- WRAS (UK)   Hydrocheck (B)
- KIWA ATA (NL)

Performance Data

Metrological characteristics in accordance with Measuring Instruments Directive

			Coaxial Manifold	inline	
Nominal Size	DN	mm	#	15	20
Permanent flowrate	Q_3	m³/h	2.5	2.5	4
Ratio "R"	Q_3/Q_1	R	40 / 80 / 160 / 315 / 400		
Maximum flowrate [1]	Q_4	m³/h	3.125	3.125	5.0
Minimum flowrate [1] (tolerance ±5%)	Q_1	l/h	6.25	6.25	10.0
Transitional flowrate [1] (tolerance ±2%)	Q_2	l/h	10.0	10.0	16.0

[1] Values for R=400   [2] at R160

Legibility

The display on 8 drums (5 for m³, 3 for litres) and 1 pointer ensures perfect readability. The lowest resolution is 0.05 litres. The dial has a central disc whose rotation indicates the passage of water. This indicator can be used to reveal a downstream leak.

The plastic dial is equipped with a wiper for optimum legibility under all conditions. The 620C/620MC water meter can operate in any position and its dry dial register can be rotated up to 350°. The dial can therefore be easily read under all conditions of use. As an option, the meter can be supplied with a metal/glass register, making it perfectly water-tight (IP 68).
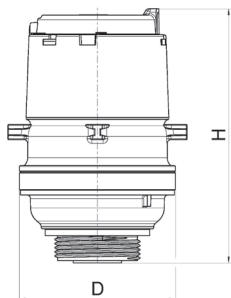
Dimensions and Weights

			Coaxial Manifold	inline	
Nominal Size	DN	mm	#	15	20
Length	L	mm		170 [1]	190 [3]
Width	D	mm	87	87	97.2
Total height	H	mm	140.3	142.6	149
Total height with HRI	H'	mm	155.9	161.5	167.9
Height to pipe axis	h	mm		18.95	21.5
Tail Diameter		inch	G 1½" B	G ¾" B [2]	G 1" B
Piece		mm	47.8	26.44	33.25
Thread Pitch			2.31	1.81	2.31
Weight		kg	0.5	0.6	0.68

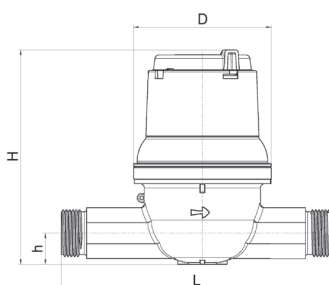(1) Also available in length 110, 115, 134 and 165 mm

(2) Also available in length 165 and 190 mm with 1" threads

(3) Also available in length 105, 165 and 220 mm
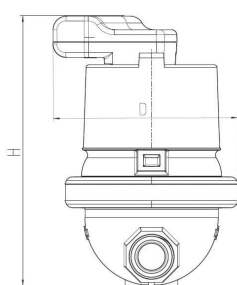
Dimensional Diagram

620MC

620C DN20

620C DN15 with HRI

For the installation guidelines please refer to the manual "Volumetric Meter Manual" on our website.

620C / 620MC
Volumetric Meter-Composite Body Dry Dial

Metrological Data

Nominal size		Coaxial Manifold	2.5 m³/h	4 m³/h
Connection size		#	DN 15	DN 20
Flow range	Q_1	0.00625 m³/h	0.00625 m³/h	0.010 m³/h
	Q_2	0.010 m³/h	0.010 m³/h	0.016 m³/h
	Q_3	2.5 m³/h	2.5 m³/h	4 m³/h
	Q_4	3.125 m³/h	3.125 m³/h	5 m³/h
	Q_2 / Q_1	1.6		
	Q_3 / Q_1	400*		
Accurarcy class		$\pm$ 2 % ($Q_2 \leq Q \leq Q_4$) for water temperatures $\leq$ 30 °C		
		$\pm$ 3 % ($Q_2 \leq Q \leq Q_4$) for water temperatures > 30 °C		
		$\pm$ 5 % ($Q_1 \leq Q \leq Q_2$)		
Temperature range		0.1 °C ... 50 °C		
Pressure range (MAP)		0.3 bar (0.03 MPa) - 16 bar (1.6 MPa)		
Pressure loss class ΔP		0.63 bar (0.063 MPa)		
Environmental class		I		
Mechanical Environmental Conditions		M2		
Climatic Environmental Conditions		5 °C ... 70 °C		
Electromagnetic Conditions		E2		

* further available ratios Q_3 / Q_1: 315, 250, 200, 160, 125, 100, 80, 63, 50, 40

HRI options

The dial of the meter is equipped as standard with a pointer able to activate the HRI sensor. By detecting the rotation of the pointer and its direction, the electronic circuitry of the HRI converts this into reliable electrical output signals.

There are two main variants of HRI:

1. HRI Pulse Unit (A-version)

This gives a pulse output which can be used for reliable counting of the volume.

2. HRI Data Unit (B-version)

The HRI Data Unit a is a data interface which supplies serial output according M-Bus standard EN13757 which can be connected to M-Bus converters.

The serial interface can also be used to configure a pulse output. This pulse output can be used alternatively to the serial output.

For more information please refer to the HRI datasheet.

xylem

640C, 640MC

Volumetric Meter - Composite Body with Electronic Register

Main characteristics

- DN 15 to 20 and Coax, MAP 16, T50 (temperature range 0.1 to 50 °C)
- Light and robust
- Easy to handle
- Meets current and anticipated regulations for potable water
- 33% lower carbon footprint than equivalent brass meters
- High resistance to impurities and aggressive water
- Quiet operation
- Ready for wireless communication with integrated radio functionality (available in different frequencies)
- Long battery life expectation inclusive of metrology and radio function
- The register includes two lithium batteries

Accuracy and Reliability

Thanks to the advanced design of its measuring chamber the meter has a low starting flow.

It can be supplied with metrological seal according the MID regulation 2014/32/EU with a ratio up to R400.

Foreign matter present in the water is filtered out by either the tubular strainer on the inlet or the seat strainer. All electronic components of the register are hermetically sealed and assembled in a glass copper casing which allow the protection class IP68.

The 640C/640MC water meter retains its metrological accuracy for many years of operation, even in difficult working conditions.

APPLICATIONS

The 640C/640MC is a high precision meter.

Due to its unique piston and measuring chamber design, the smallest drops of water are measured.

With the 640C/640MC you are assured of lasting metrology.

The 640C meter range includes an electronic register with integrated radio functionality which enables easy and fast communication.

Due to our broad range of system solutions you can adapt the 640C/640MC to all your AMR, AMI requirements.

The protection class of the electronic register of the 640C family is IP 68.

With a tamper proof design and its long life span you can be confident when selecting the 640C/640MC.

Certificate of compliance for potable drinking water

- KTW/DVGW (D)
- ACS (F)
- WRAS (UK)
- Hydrocheck (B)
- KIWA ATA (NL)

Approvals

EU type-examination certificate in conformity with

- 2014/32/EU (MID)
- OIML R49:2013
- EN 14154-4:2014
- ISO 4064:2017

Q_3 2.5 DE-07-MI001-PTB002
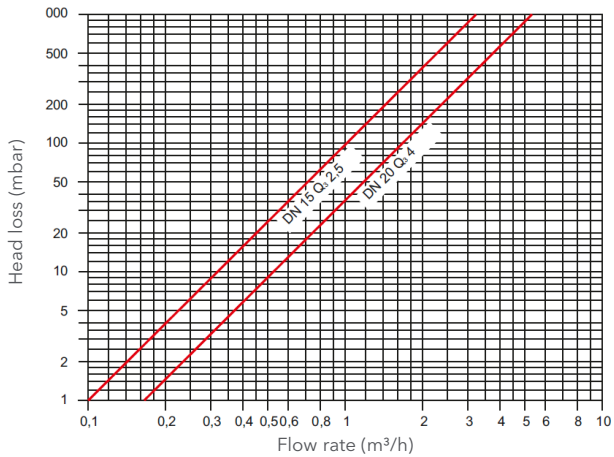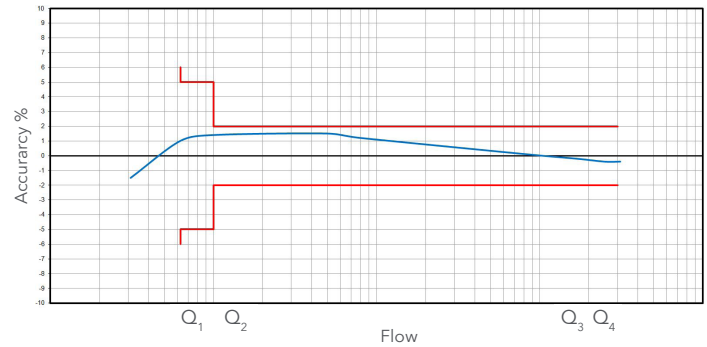
Q_3 4 DE-09-MI001-PTB004

640C, 640MC
Volumetric Meter - Composite Body with Electronic Register

Typical Headloss Curve

Typical Error Curve

METROLOGICAL CHARACTERISTICS IN ACCORDANCE WITH MEASURING INSTRUMENTS DIRECTIVE

Nominal Size	DN	mm	Coaxial Manifold	15	20
Permanent flowrate	Q_3	m³/h	2.5	2.5	4
Ratio "R"	Q_3/Q_1	R	400*		
Maximum flowrate	Q_4	m³/h	3.125	3.125	5.0
Minimum flowrate (tolerance ±5%)	Q_1	l/h	6.25	6.25	10.0
Transitional flowrate (tolerance ±2%)	Q_2	l/h	10.0	10.0	16.0
Accuracy class			± 2 % ($Q_2 \leq Q \leq Q_4$) for water temperatures ≤ 30 °C		
			± 3 % ($Q_2 \leq Q \leq Q_4$) for water temperatures > 30 °C		
			± 5 % ($Q_1 \leq Q \leq Q_2$)		
Temperature range			0.1 °C ... 50 °C		
Pressure range (MAP)			0.3 bar (0.03 MPa) - 16 bar (1.6 MPa)		
Pressure loss class ΔP			0.63 bar (0.063 MPa)		
Environmental class			I		
Mechanical Environmental Conditions			M2		
Climatic Environmental Conditions			5 °C ... 70 °C		
Electromagnetic Conditions			E2		

* further available ratios Q3 / Q1: 315, 250, 200, 160, 125, 100, 80, 63, 50, 40

Typical Marking
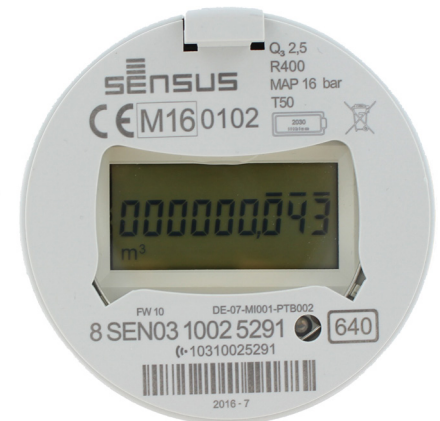
Markings may vary depending on particular markets or metrological specifications.
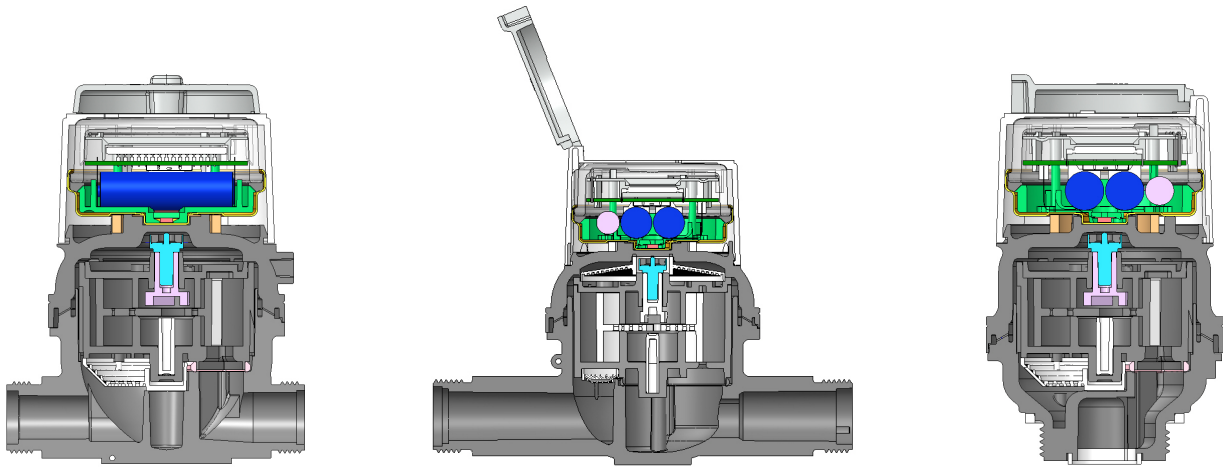
STARTING FLOW

Coaxial Manifold	1l/h
DN 15	1l/h
DN 20	2l/h

640C, 640MC
Volumetric Meter - Composite Body with Electronic Register

Cross Section

640C 110 mm

640C 190 mm

640MC

Legibility

The display with 9 digits (6 for m^3, 3 for litres) ensures exceptional readability. The highest resolution in testing mode is 0.05 litres.

Icons are also displayed on the LCD to indicate important information have been registered:

⚑ Alarm is triggered

🏷 Low battery level is reached

((• Radio is activated

🔔 System is set up in hydraulic testing mode

⊕⊖ Indicates positive or negative flow

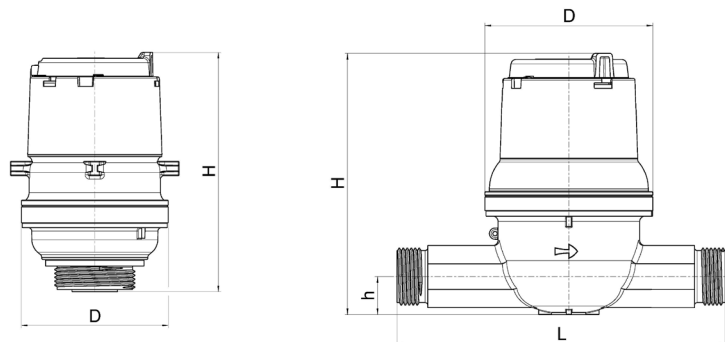m^3 Indicates the unit programmed in use

DIMENSIONS AND WEIGHTS

Nominal Size	DN	mm	Coaxial Manifold	15	20
Length	L	mm		170 [1]	190 [3]
Width	D	mm	87	87	97.2
Total height	H	mm	140.3	142.6	149
Height to pipe axis	h	mm		18.95	21.5
Tail	Diameter	inch	G 1½" B	G ¾" B [2]	G 1" B
Piece		mm	47.8	26.44	33.25
Thread	Pitch		2.31	1.81	2.31
Weight		kg	0.5	0.6	0.68

(1) Also available in length 110, 115, 134 and 165 mm
(2) Also available in length 165 and 190 mm with 1" threads
(3) Also available in length 105, 165 and 220 mm

Dimensional Diagram

BATTERY LIFETIME

Radio interval profile 640C / 640MC with 15 years battery lifetime [1]	
wM-Bus T1	SensusRF
≥ 3600 sec	BUP 15 sec / LAT 60 sec

(1) calculated lifetime with typical power consumption of electronics under allowed ambient condition

For the installation guidelines please refer to the manual "Volumetric Meter Manual" on our website.

640C, 640MC

Volumetric Meter - Composite Body with Electronic Register

640C / 640MC Infrastructure

The 640C product range has SensusRF integrated technology providing the advantages of both uni- and bidirectional system architecture as described below. SensusRF is the optimized license free radio system for battery driven endpoints and repeaters. Scalable for mobile and remote reading without exchange of components, it is available in 433 MHz and 868 MHz. OMS® compatible.

SensusRF offers two communication modes

1. Fixed Radio Network

- Auto configuration wizard (gateway sniffing for endpoints and repeaters)

- Integrating repeaters (up to 7 hops in a chain)

- Self-healing network (using alternative routes)

- Meter reading transparent and local

- Fast track alarms

- DMA snap shot (snap shot of a water network for evaluation)

- TCP/IP technology for the WAN communication

- High level of data security (end-to-end encryption)

- Enables cloud technologies, FTP and other remote database applications

2. Mobile read - Walk-by / Drive-by

- Unidirectional telegrams

- Bidirectional communication

- Spontaneous reception possible without route

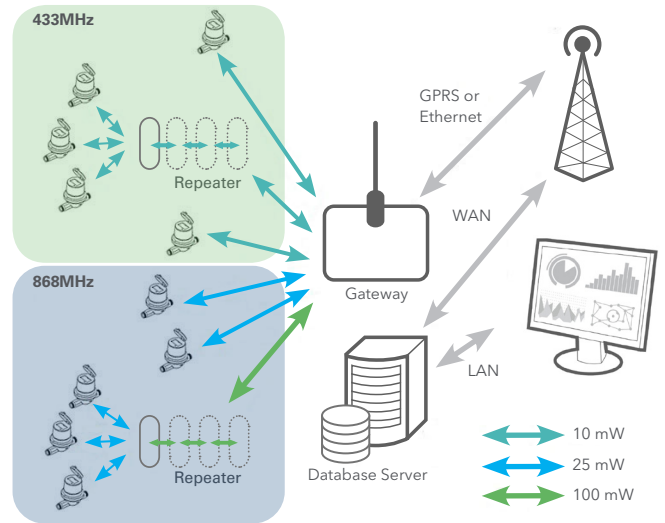- Configuration of the endpoint

SIRT (Sensus Interface Radio Tool)

SIRT is a radio modem for SensusRF radio, connected to a handheld via Bluetooth and using DIAVASO Mobile Reading software with the following features:

- Installation and readout of devices

- Reception of frequently transmitted radio messages from Sensus RF radio endpoints

- Request additional information from the radio endpoints

- Change configuration of radio endpoints (alarm, level settings...)

For further information please refer to the SensusRF brochure.

640C / 640MC Fixed radio network - Remote Access & Monitoring

433MHz
Repeater
868MHz
Repeater
GPRS or Ethernet
WAN
Gateway
LAN
Database Server

↔	10 mW
↔	25 mW
↔	100 mW

Unidirectional/Bidirectional communication

SIRT

SIRT linked via Bluetooth with handheld device

500 m

868 MHz Drive-by

1000 m distance with 50 km/h speed
telegram with meter ID, index and alarm

---

xylem

Xylem.com | Sensus.com

qualityaustria
SYSTEM CERTIFIED
ISO 9001:2015   No.03496/0

xylem
Let's Solve Water

MeiStream

Bulkmeter for cold potable water DN 40 … 300

APPLICATIONS

- Measurement for billing of cold potable water up to 50 °C
- Measurement of high flowrates e.g. in pumped pipes
- Measurement of low flow e. g. in light load periods
- For leakage detection

MATERIALS

Body	Cast iron (PN16) Ductile iron (PN40)
Metrological module	Engineering polymer
Rotor	Engineering polymer
We also use the following materials	Brass Stainless steel

ENVIRONMENTAL CONDITIONS

- According to ISO 4064-1:2017
- Environmental class O acc. to OIML R49-1:2013
- Environmental temperature: 5 °C … 70 °C
- Mechanical environmental conditions: class M2

Main characteristics

- Meter with MID pattern approval acc. to annex MI001
- Exchangeable metrological unit with MID pattern approval acc. to annex MI001
- Unique measuring range; $Q_3/Q_1 \geq 100$
- High overload capability
- No straight inlet length necessary (U0D0 acc. to OIML R49:2013 and ISO 4064-1:2017)
- Installation position horizontal and vertical
- Meter body in short (WP) and long (WS) overall length acc. to DIN 19625 and ISO 4064-1:2017 available
- Meter can be submerged; protection class IP68
- Used materials are temperature resistant up to 70 °C
- Register prepared for HRI-Mei pick-up
- Use of optical pulsers type OD is still possible

Available options

- Encoder register with different data protocols (M-Bus, Sensus, IEC 1107)
- BMF version free of copper alloy for aggressive water (DN 40 … 150)
- Register with 7 digits without multiplier (DN 150 … 300)
- Version for high pressure up to PN 40 (DN 50 … 150)
- Version for use in hazardous area
- HRI-Mei factory mounted
- ¼" pressure monitoring port

Approval Mark

Meter cpl. and exchangeable metrological module

Marking CE M-XX* 0102

DN 40 … 150: DE-09-MI001-PTB 010

DN 200 … 300: DE-15-MI001-PTB 014

* year of production

sensus
a xylem brand

MeiStream
Bulkmeter for cold potable water DN 40 ... 300

METROLOGICAL DATA ACC. TO MANUFACTURERS VALUES

	Size	DN	40	50	65	80	100
Q_s	Max. Peak Flow	m³/h	60	90	120	200	300
Q_3'	Continuous Flow	m³/h	40	50	70	120	230
Q_{2h}	Transitional Flowrate horizontal	m³/h	0.32	0.4	0.63	0.51	0.81
Q_{1h}'	Minimum Flow horizontal	m³/h	0.2	0.15	0.2	0.2	0.3
Q_{2v}	Transitional Flowrate vertical	m³/h	0.4	0.51	0.81	0.8	1.28
Q_{1v}'	Minimum Flow vertical	m³/h	0.25	0.28	0.4	0.5	0.5
	Starting Flow	m³/h	0.05	0.05	0.07	0.1	0.11

	Size	DN	125	150	200	250	300
Q_s	Max. Peak Flow	m³/h	350	600	1200	1600	2000
Q_3'	Continuous Flow	m³/h	250	450	800	1250	1400
Q_{2h}	Transitional Flowrate horizontal	m³/h	1.02	1.6	4.0	6.3	16.0
Q_{1h}'	Minimum Flow horizontal	m³/h	0.5	0.8	2.0	3.5	9.0
Q_{2v}	Transitional Flowrate vertical	m³/h	1.6	3.2	4.0	10.1	25.4
Q_{1v}'	Minimum Flow vertical	m³/h	1	1.6	2.5	6.3	15.9
	Starting Flow	m³/h	0.15	0.3	1.5	3	8

METROLOGICAL DATA ACC. TO 2014/32/EU (MID)

	Size	DN	40	50	65	80	100
Q_4	Overload Flowrate acc. to MID	m³/h	31.25	50	78.75	125	200
Q_3	Permanent Flowrate acc. to MID	m³/h	25	40	63	100	160
Q_{2h}	Transitional Flowrate horizontal acc. to MID	m³/h	0.32	0.4	0.63	0.51	0.81
Q_{1h}	Minimum Flowrate horizontal acc. to MID	m³/h	0.2	0.25	0.39	0.32	0.51
Q_{2v}	Transitional Flowrate vertical acc. to MID	m³/h	0.635	0.64	1.0	1.28	1.6
Q_{1v}	Minimum Flowrate vertical acc. to MID	m³/h	0.4	0.4	0.63	0.8	1.0
Q_3/Q_1 h	Max. Ratio horizontal		125	160	160	315	315
Q_3/Q_1 v	Max. Ratio vertical		63	100	100	125	160
Q_3/Q_1	Standard Marking		63	100	100	100	100
Δp	Headloss at Q_3 acc. to ISO 4064-1:2017	bar	0.1	0.16	0.32	0.16	0.34

	Size	DN	125	150	200	250	300
Q_4	Overload Flowrate acc. to MID	m³/h	200	500	787.5	787.5	1250
Q_3	Permanent Flowrate acc. to MID	m³/h	160	400	630	630	1000
Q_{2h}	Transitional Flowrate horizontal acc. to MID	m³/h	1.02	1.6	4.03	8.06	25.4
Q_{1h}	Minimum Flowrate horizontal acc. to MID	m³/h	0.64	1	2.52	5.04	15.9
Q_{2v}	Transitional Flowrate vertical acc. to MID	m³/h	2.05	3.2	4.03	10.1	25.4
Q_{1v}	Minimum Flowrate vertical acc. to MID	m³/h	1.28	2	2.52	6.3	15.9
Q_3/Q_1 h	Max. Ratio horizontal		250	400	250	125	63
Q_3/Q_1 v	Max. Ratio vertical		125	200	250	100	63
Q_3/Q_1	Standard Marking		100	100	100	100	63
Δp	Headloss at Q_3 acc. to ISO 4064-1:2017	bar	0.19	0.27	0.11	0.07	0.08

MeiStream

Bulkmeter for cold potable water DN 40 ... 300

Typical Headloss Curve
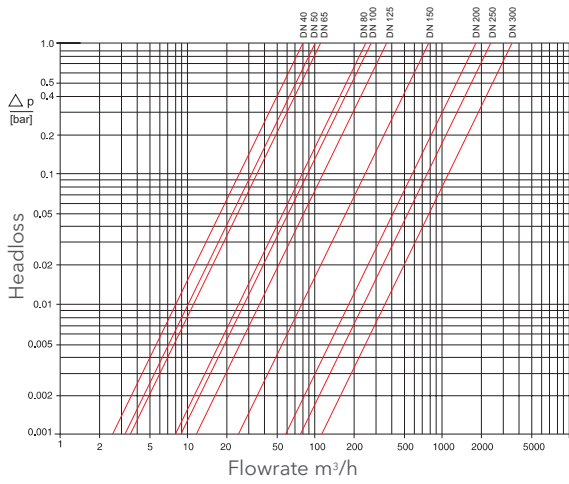
Typical Error Curve
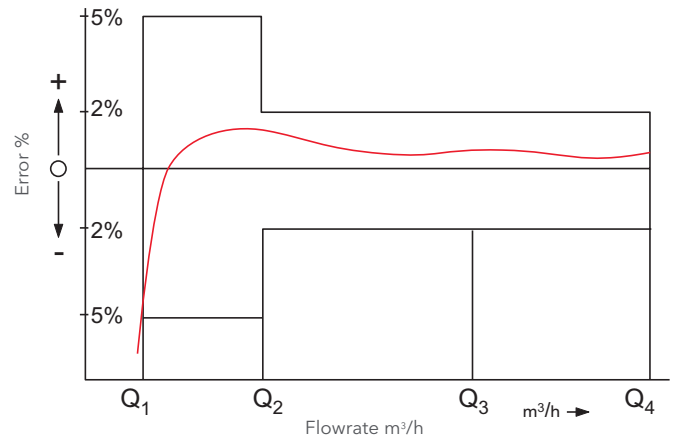
Dial
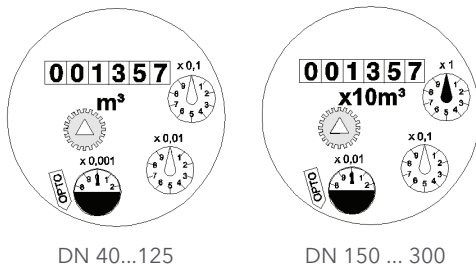
DN 40...125

DN 150 ... 300

Nominal diameter DN	Smallest reading m³	Max. reading m³
40 ... 125	0.0005	999,999.999
150 ... 300	0.005	9,999,999.99

PULSE VALUES

| Pulser Type		Pulse Value DN 40 ... 125	Pulse Value DN 150 ... 300
HRI-Mei (Leaflet see LS 8400)		0.01; 0.05; 0.1 or 1 m³	0.1; 0.5; 1 or 10 m³
OD 01 (Leaflet see LB 8300)		0.001 m³	0.01 m³
OD 03 (Leaflet see LB 8300)		0.01 m³	0.1 m³

INSTALLATION

Pipe	horizontal vertical
Meter head	upwards sideways

Installation Requirements

- Unrestricted straight pipe upstream 0 x DN

- No abrupt restrictions directly downstream of the meter

Dimension Picture
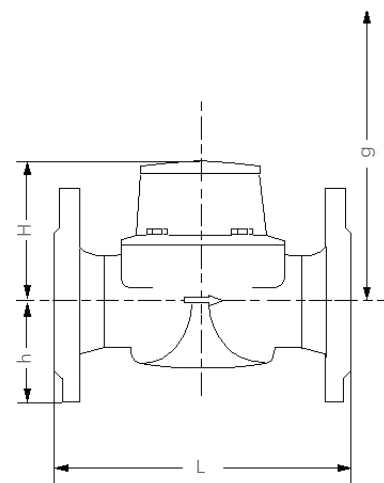
MeiStream

Bulkmeter for cold potable water DN 40 ... 300

Order Example

MeiStream, DN 50, T50, PN16 — Type / Size / Max. medium temperature / Nominal pressure

Drilling EN 1092 PN16 — Drilling pattern

Length 270 mm — Body length

mechanical register / m³ — Register type / unit

with MID conformity — Approval standard

DIMENSIONS

Nominal Diameter		DN	40	50	50	50	65	65	80	80	80	80
Overall length	L	mm	220	200	270	300	200	300	200	225	300	350
Height	H	mm	120	120	120	120	120	120	150	150	150	150
Height to pipe axis	h	mm	69	73	73	73	85	85	95	95	95	95
Dismantling height	g	mm	200	200	200	200	200	200	270	270	270	270

Nominal Diameter		DN	100	100	100	125	150	150	200	250	300
Overall length	L	mm	250	350	360	250	300	500	350	450	500
Height	H	mm	150	150	150	160	177	177	214	238	264
Height to pipe axis	h	mm	105	105	105	118	135	135	162	194	226
Dismantling height	g	mm	270	270	270	280	356	356	449	474	499

WEIGHT PN 16

Nominal Diameter		DN	40	50	50	50	65	65	80	80	80	80
Overall length	L	mm	220	200	270	300	200	300	200	225	300	350
Meter		kg	8.0	8.5	9.6	9.9	10.1	12.0	12.4	14.2	16.3	17.7
Metrological module		kg	1.5	1.5	1.5	1.5	1.5	1.5	3.2	3.2	3.2	3.2
Body		kg	6.5	7.0	8.1	8.4	8.6	10.5	9.2	11.0	13.1	14.5

Nominal Diameter		DN	100	100	100	125	150	150	200	250	300
Overall length	L	mm	250	350	360	250	300	500	350	450	500
Meter		kg	17.0	20.0	20.2	20.7	35.9	44.2	56.9	79.4	103.8
Metrological module		kg	3.2	3.2	3.2	3.2	5.9	5.9	9.6	9.6	9.6
Body		kg	13.8	16.8	17.0	17.5	30.0	38.3	47.3	69.8	94.2

WEIGHT PN 40

Nominal Diameter		DN	50	50	65	80	80	100	100	150	150
Overall length	L	mm	200	270	300	225	300	250	360	300	500
Meter		kg	9.7	10.7	13.1	17	18.6	20.4	22.9	44.6	52.9
Measuring insert		kg	1.7	1.7	1.7	4	4	4	4	9.3	9.3
Body		kg	8	9	11.4	14.6	14.6	16.4	18.9	35.3	43.6

xylem
Let's Solve Water

Cordonel®

Static flow meter for potable water DN 40...100

Applications

- Measurement for billing of potable water up to 50 °C
- Radio equipped flow meter for walk-by/drive-by readout applications
- Metering endpoint in radio based fixed Smart Water Networks
- Measurement of high flowrates, for example in pumped pipes for irrigation
- Measurement of low flow, for example in light load periods
- Leakage detection
- Flow meter for controlling industrial processes using a pulse output
- Flow meter supplying rich data for DMA analysis

Available options

- Integrated pressure sensor
- Radio communication on alternative frequencies
- Pulse output with different pulse modes

Environmental conditions

- According to ISO 4064-1:2017
- Environmental class O acc. to OIML R49-1:2013
- Environmental temperature: -10 °C ... 70 °C
- Mechanical environmental conditions: class M2
- Electromagnetic environmental conditions: class E2

FEATURES

- Uses ultrasonic technology with no moving parts or obstruction to the flow
- Maintenance free over its operational lifetime
- Large measuring range; Q_3/Q_1 R1000
- Advanced U0D0 capability
- Meter with MID pattern approval according to annex MI001
- Meter conforms to OIML R49:2013 and ISO 4064:2017
- Constant accuracy over lifetime, no degradation as components age
- Installation in horizontal and vertical pipe orientations
- LCD for consumption, flow, temperature, pressure (optional) and status information
- Integrated radio communication and data logger
- Secure encrypted data transmission
- Meter can be submerged; meets protection class IP68 acc. to 60529:2014
- NFC wireless interface for readout of the last volume reading
- 20-year average meter lifetime incl. battery under standard usage conditions
- Optional pulse output with programmable values and lengths

PERFORMANCE DATA

	Size	DN	40	50	65	80	100
Q_s	Max. Peak Flow	m³/h	78	90	125	200	310
Q_4	Overload Flowrate acc. to MID	m³/h	50	50	78.75	125	200
Q_3	Permanent Flowrate acc. to MID	m³/h	40	40	63	100	160
Q_2	Transitional Flowrate horizontal acc. to MID	m³/h	0.06	0.06	0.1	0.16	0.25
Q_1	Minimum Flowrate horizontal acc. to MID	m³/h	0.04	0.04	0.06	0.1	0.16
Q_3/Q_1	Max. Ratio		1000	1000	1000	1000	1000
	Starting Flow	m³/h	0.012	0.012	0.02	0.033	0.054

sensus
a xylem brand

Cordonel®
Static flow meter for potable water DN 40...100
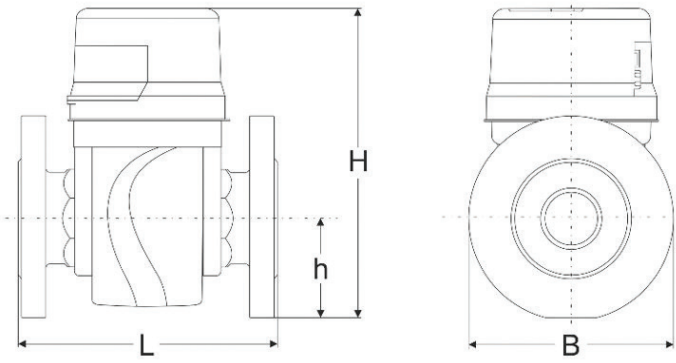
MATERIALS

|	
Body	Cast iron
Measuring Transducers	High grade polymer
Inner tube	High grade polymer; stainless steel
Battery	Lithium
Gaskets	EPDM
Other materials	Glass fiber reinforced polymer; stainless steel

DIMENSIONS AND WEIGHTS

Nominal diameter		DN	40	50	50	50	65	65	80
Overall length	L	mm	220	200	270	300	200	300	200
Height	H	mm	238	238	238	238	258	258	297
Height to pipe axis	h	mm	69	73	73	73	85	85	95
Width	B	mm	166	166	166	166	186	186	201
Meter Weight		kg	7.8	9.0	9.7	10.1	11.0	12.8	13.4
Meter Weight with pressure sensor		kg	7.9	9.1	9.8	10.2	11.1	12.9	13.5

Nominal diameter		DN	80	80	80	100	100	100
Overall length	L	mm	225	300	350	250	350	360
Height	H	mm	297	297	296	315	315	315
Height to pipe axis	h	mm	95	95	95	105	105	105
Width	B	mm	201	201	201	220	220	220
Meter Weight		kg	13.9	15.9	16.8	17.9	20.4	20.7
Meter Weight with pressure sensor		kg	14.0	16.0	16.9	18.0	20.5	20.8

Typical Headloss Curve

Typical Error Curve

Cordonel®
Static flow meter for potable water DN 40...100
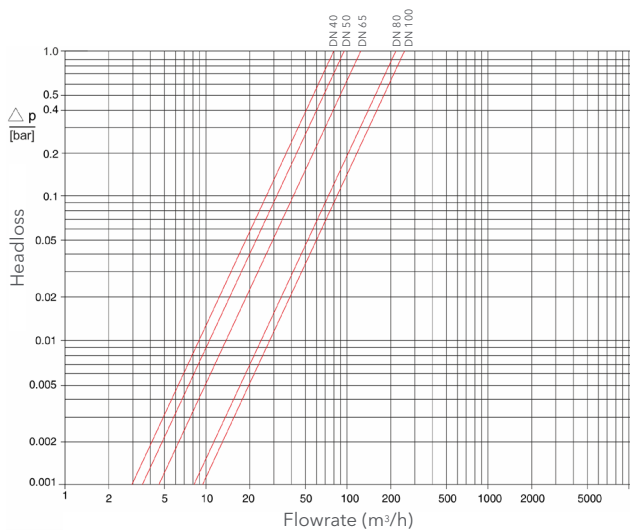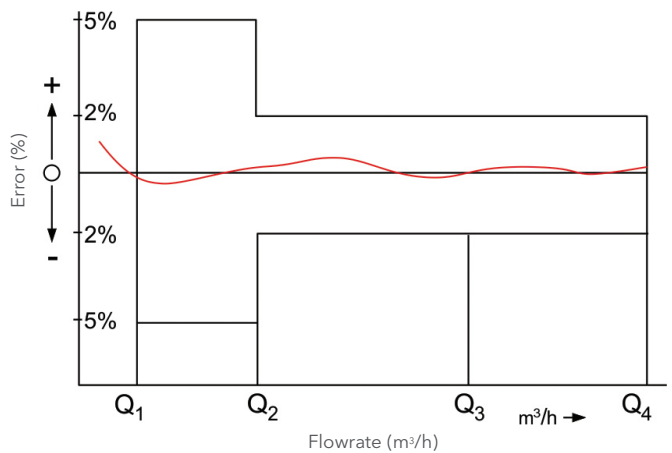
Display
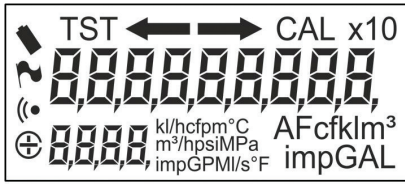
🏴 Alarm is triggered

🏷 Low battery level is reached

((• Radio is activated (flashing)

TST System is set up in hydraulic testing mode

⊕⊖ Indicates positive or negative flow

	Smallest reading	Maximum reading
Working Mode DN 40 ... 100	0.001 m³	999999.999 m³
Test Mode DN 40 ... 100	000.000001 m³	999.999999 m³

The bottom line displays flow, temperature or optionally pressure in an automatic loop.

INSTALLATION

Pipe	horizontal vertical	
Meter head	upwards sideways	

- Unrestricted straight pipe upstream and downstream 0 x DN U0D0 acc. to OIML R 49-1:2013
- Meter display should not be installed with the display pointed downwards

APPROVALS

Metrology	DE-19-MI001-PTB008
Marking	CE M-XX* 0102 (*year of conformity assessment)
Potable Water	KTW / DVGW WRAS ACS KIWA

Order Example

Type
Size
Maximum medium temperature
Nominal pressure

Cordonel, DN 50, T50, PN16

Drilling EN 1092 PN16 ——————————— Drilling pattern
Length 200 mm ——————————— Body length
m³ ——————————— Display unit
with MID conformity ——————————— Approval standard

HRI

(High Resolution Interface) A Comprehensive Pulse and Data System

Mobile Reading

Fixed Network

Data Logger

Frequency Converter

Inductive Probe

Fixed Radio

Laptop

Modem

Sensus PulseRF

M-Bus

HRI - A
Pulse Unit

HRI - B
Data Unit

Main Features

- Suitable for a wide range of meters
- Load-free sensor detecting the pointer's rotation
- May be retrofitted to pre-equipped meters
- Detects flow direction
- No influence to the meters performance
- Contact bounce suppression
- Self-diagnostics
- Ultra long battery life
- Hermetically-sealed housing (IP68)
- Non magnetic principle

Description

HRI (high resolution interface) is a universal sensor which is compatible with a wide range of meters, including single-jet, multi-jet and piston meters with dry-dial and semi-dry registers in glass-copper or plastic housing. HRI can be retrofitted on all Sensus meters since 2008 pre-equipped with an HRI modulator.

HRI is available in two versions:

The **HRI-A PulseUnit** is a high resolution pulser which detects the flow direction.

The **HRI-B DataUnit** is an electronic register with a data interface which supports both hard-wired M-Bus systems and battery-driven MiniBus devices such as mobile meter reading systems. The HRI-B can alternatively be used as a pulse type with configurable pulse output.

The HRI is more than an extension of a simple sensor. It has been expanded to provide a reliable data source for remote reading of a conventional meter.

It is the interface for all today's requirements for data interrogation and remote transmission.

HRI
(High Resolution Interface) A Comprehensive Pulse and Data System

HRI-A (pulse unit)

HRI-A and HRI-B are using the same proven pick up principle.

HRI-A4 compensates reverse flow pulses with its balanced pulse output.

HRI-A3 is a special version for applications requiring a direction signal like external radio modules.

Technical Data

Power supply
3V Lithium battery with expected lifetime 12 years.

Dimensions

max.: d x h -   66 mm x 32 mm
Additional height of the meter: 25.5 mm
Weight: 136 g
Casing: ABS
Colour: grey

Cable length

1.5 m - possible cable extension up to max. 30 m. Transient voltage protection is highly recommended for wiring outside buildings.

Environmental

• Storage Temperature: -10 °C.....+65 °C

• Operation Temperature: -10 °C.....+65 °C [1]

• Hermetically-sealed housing IP 68

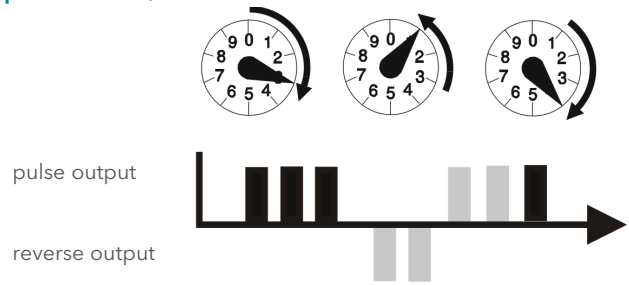• EMC acc. EEC directive 98/34 equal European standards EN61000-6-1

[1] Usable on hot water meters up to 90 °C water temperature e.g. Sensus 120C meter. A requirement for this application is that the pulser is in free air to ensure adequate cooling.

HRI-A3

(only where direction signal is applicable)
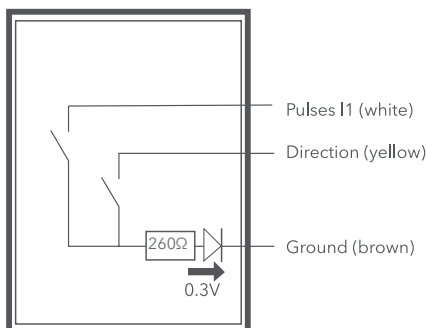
## Balanced pulses Output at HRI-A4 (pulse unit)

Reverse volume pulses are compensated by identical number of forward pulses before continuing with output pulses.

A remote counter at the HRI-A4 will represent the identical counter reading as at the meter!

Electrical Connection

HRI-A4 provides a solid state switch

	HRI-A4
Brown (Ground) (-)	Balanced Pulses (see above)
White (Pulses) (+)	
Umax	24 V (DC)
Imax	20 mA
Pmax	0.48 VA
Remaining voltage at switch closure	$0,3\ V + I * 260\ \Omega$
Fixed pulse length	See table of variants
Reverse pulse buffer	Up to 1,000,000 pulses
Cable cut	Closed (open when cable cut)
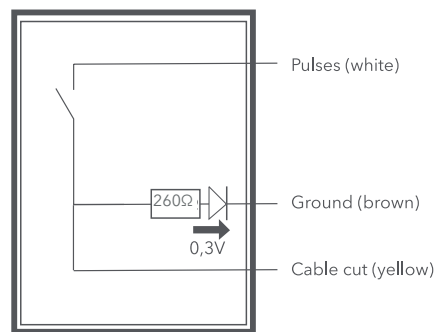
Available variants

The HRI-A4 is available with following alternative output pulse weights: D = 1 or 10 or 100

	Pulse Weight (pulse length)			
	HRI-A4			HRI-A3
Meter Nominal diameter	D1 (124 ms)	D10 (500 ms)	D100 (500 ms)	D1 (124 ms)
Qn 1,5 - 10	1L	10L	100L	1L
DN40 – 125[2]	100L	1.000L	10.000L	100L
DN150 – 300[2]	1.000L	10.000L	100.000L	1.000L

[2] only for HRI prepared C&I meters like MeiTwin Encoder

HRI
(High Resolution Interface) A Comprehensive Pulse and Data System

HRI-B (data unit)

The HRI-B has the same pick up principle like the HRI-A. But the HRI-B has a serial output and a pulse output which can be used alternatively. Parallel usage of serial output and pulse output is not recommended and can cause problems.
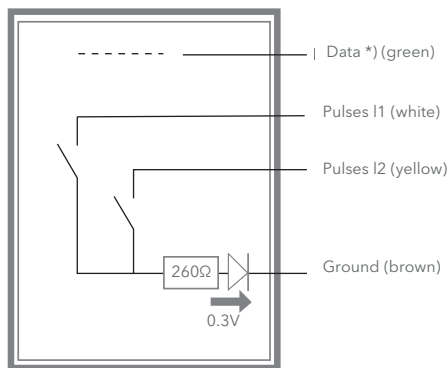
The serial interface can also be used to configure the pulse output

Technical Data

Cable length 1.5 m (5 m optional)
Operational cable length: several km with transient voltage protection
Temperature range

- Storage: -20 °C to +65 °C

- Operation: -10 °C to +65 °C

Battery lifetime: typ 12 years

* active for HRI Data Unit only External power supply of 5 to 24 V DC possible if data line is not used (green)

HRI-B Pulse Output

2 pulse outputs (I1, I2) according to ISO / TC 30 / SC 7 / WG 8

- Switched voltage: max. 24 V

- Switched current: max. 20 mA

- Power input: max. 0,48 VA

- Pulse length: 124 ms pulse width fixed

- Memory for up to 1,000,000 reverse pulses (B4)

Depending on the application, the HRI-B Pulse Outputs can be offered in three modes: Mode B2, B3 and B4.

Mode B2

Output l1: Forward flow pulses
Output l2: Reverse flow pulses

Mode B3

Output l1: Forward and reverse flow pulses
Output l2: Flow direction (open = forward)

Mode B4 (default mode)

Output l1: Balanced pulses [3]
Output l2: Cable cut detection
Output l2 is permanently closed. If the cable is cut, it can be detected as open.

[3] Reverse pulses are compensated by identical number of forward pulses. See HRI-A.

Data interface (DATA)

The HRI DataUnit has an interface to read out the data and subsequent Configuration e. g. programming the Pulse output in the field. Counter reading and settings are retained in case of power failure.

The programming is required to clear buffer and to synchronize the counter reading and the ID of the attached meter.

- M-Bus and MiniBus (Auto speed detection 2400/300 Baud)

- Protocol according to IEC 870 / EN 1434-3 / EN 13757

Readout Data

counter reading
meter Identification number (meter ID)

Programming Data

The HRI DataUnit has an interface to read out the data and subsequent configuration. The pulse output is also programmable in the field.

Default settings are:

Mode	B4 (B2, B3)
Divisor[4]	1 (2.5 / 5 / 10 / 25 / 50 / 100 / 250 / 500 or 1,000)
Meter number	HRI production number (8 digit number)
Counter reading	00,000.000 m³ (HRI-B8L) (meter counter)
Primary Address	0 (0...255)
Secondary Address	HRI production number (8 digit number)

[4]Divisor:

D = number of litres per output pulse divided by the number of litres per pointer rotation (Z)
- Possible values for D: 1 / 2,5 / 5 / 10 / 25 / 50 / 100/ 250 / 500 or 1000

Output pulse value = Z x D:

- Example for residential meters where usually z = 1:
D = 1 means 1 l per pulse at the output
D = 100 means 100 l per pulse at the output etc.

For C&I meters like MeiTwin Encoder the number of liters per pointer rotation are different (Z = 100l or 1000l). To get the right pulse value at the output means for example:

Number of liters per pointer rotation Z = 100
(MeiTwin Encoder DN50-100)

pulse divider D = 10

output pulse value = 100 x 10 = 1000l per pulse at the output!

Variants and settings

All modes and variables are factory-set according to customer's specification.
All settings are also programmable in the field.

HRI-B programming tools

- MiniCom is a software to program the HRI-B using a PC e.g. a Notebook with Windows OP system.
- The software can be used with our M-Bus level converters.
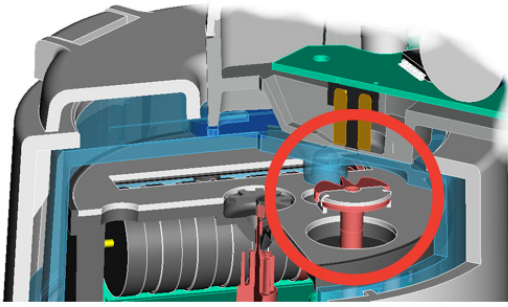
Alternatively

The software can be used with a toolset consisting of:

- MiniPad and MDK-USB to connect the HRI-B with a PC

HRI
(High Resolution Interface) A Comprehensive Pulse and Data System

HRI Interface Principle

The HRI pickup system technology enables the

load-free sensor detecting of the pointer's rotation

of pre-equipped meters

• No influence to the meter performance

• Can be retrofitted to pre-equipped meters

• Detects flow direction

HRI-A order information

Standard version

HRI-A4/D100
(can not be changed after installation)

HRI-B order information

Standard version

HRI-B4 / D1/ 8L
(can be changed after installation)

Data Readout

Meter ID

Meter Reading (in l resolution)

Application

Route-planned meter reading for billing, for example mobile reading systems.

Load profiles via a fixed network using M-Bus or via radio, telephone or GSM Modem.

Industrial application e.g. dosing.

Remote reading of flow rate and cumulative flow using a frequency converter.

Leakage detection when connected to a data logger.

Generation and transmission of flow profiles using a data logger and GSM modem. The design of the HRI allows the system to be installed in extreme conditions, such as flooded meter pits.

HRI-A pulse output

Default version (please specify when ordering)

Mode	A4 (A3)
Divisor	D100 (D1, D10) (A3 D1 only)

HRI-B output

Default setting*

Mode	B4 (B2, B3)
Divisor	1 (2.5 / 5 10 / 25 / 50 / 100 / 250 / 500 or 1,000)
Meter number**	HRI production number
Counter reading**	00,000.000 m³ (HRI-B8L)
Primary Address	0
Secondary Address	HRI production number

* Please specify, when ordering, if settings are to be different from the above

** HRI which are pre-equipped to a Sensus meter will be programmed and synchronized to the meters

xylem