

HYDRUS 2.0 BULK

ULTRASONIC METER

DIEHL
Metering



APPLICATION

HYDRUS 2.0 BULK is a static water meter operating on ultrasonic measuring technology. This technology enables accurate calculation of water consumption with long-term stability and eliminates measuring deviations caused by sand, suspended particles, scale or air pockets. Moreover it does not require any earthing.

Developed within the framework of the MID, HYDRUS 2.0 BULK complies with the European regulations and holds sanitary conformity certificates (ACS, WRAS, BELGAQUA, DM174 and others). The meter is also designed for cold and hot water.

Its integrated radio enables remote reading of the meter's index and alarms both in mobile (walk-by, drive-by, passive drive-by) and fixed network mode.

HYDRUS 2.0 BULK offers a wide choice of connectivities compatible with the different IZAR reading modes.

A complete Diehl Metering solution is thus available to meet your needs.

FEATURES

- ▶ DN 50 to 200
- ▶ MID approval up to R=1,000
- ▶ IP 68
- ▶ Wireless M-Bus radio, Wired M-Bus/Pulse/Pulse, Wireless M-Bus radio/L-Bus/Pulse, Pulse (IZAR BE PULSE compatible)
- ▶ Display with symbols and error codes
- ▶ Self-monitoring function
- ▶ Battery lifetime up to 16 years

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TECHNICAL DATA

HYDRUS 2.0 BULK			
Water temperature	°C	+0.1 ... +50 (T30 / T50) +0.1 ... +90 (T90)	
Accuracy		Class 2 according to ISO 4064:2014 / OIML R49:2013	
Ambient operating temperature	°C	-10 ... +55	
Ambient storage temperature	°C	-10 ... +70 (>35 °C max. 4 weeks)	
Environmental class		O (Outdoors)	
Mechanical environmental class		M2	
Electromagnetic environmental class		E2	
Flow profile sensitivity class		U0/D0 (no calming sections required)	
Installation position		Horizontal, inclined 45°, inclined 90°, vertical	
Nominal pressure	PN	bar	16
Pressure loss class	Δp	bar	0.16
Power supply		3.6 V lithium battery (D-cell)	
Battery lifetime ¹		Up to 16 years (all communication interfaces)	
Communication interfaces		Optical, OMS wireless M-Bus 434 or 868 MHz, M-Bus, L-Bus and Pulse	
Data storage		For errors, alarms and measuring values, data logging capabilities to record up to 512 daily + 32 monthly values	
Protection class		IP 68	

¹ Theoretical lifetime, depends on the sending interval of the radio telegram, the telegram length and the ambient temperature at the installation.

TECHNICAL DATA DISPLAY

HYDRUS 2.0 BULK	
Display indication	LCD, 9-digit, additional symbols/display counter/unit
Units displayed DN 50 - 100	Volume (m ³ + 2 digits after decimal point) and flow rate (m ³ /h + 3 digits after decimal point)
Units displayed DN 125 - 200	Volume (m ³ + 1 digit after decimal point) and flow rate (m ³ /h + 3 digits after decimal point)
Values displayed	Display test - volume - battery lifetime - firmware version - software checksum - flow - current/continuous/historical error - alarm status - high resolution volume - due date - due date volume - reverse volume - flow direction - display counter - low battery indication - leakage indication - metrological log access - radio signal ON/OFF - alarm indication - billing value

COMMUNICATION INTERFACES

HYDRUS 2.0 BULK	
Optical	For switching the display loop, reading and configuration with IZAR@MOBILE 2
Radio	434 or 868 MHz, Open Metering Standard (OMS) radio frame (short frame) for mobile reading sent every 14 seconds, long range radio frame for fixed network sent every 5 minutes, extra long range radio frame for fixed network sent every 15 minutes
M-Bus	2,400 baud, cable length 1.5 m*, power supply only via built-in battery - is combined with 2 pulse outputs
L-Bus	In combination with radio, cable length 1.5 m* (only 1 interface communicating at the same time)
Pulse (Open drain)	2 pulse outputs, or 1 pulse and 1 L-Bus output, pulse cable length 1.5 m*

*May vary by up to $\pm 3.5\%$ due to manufacturing tolerances.

SECURITY

HYDRUS 2.0 BULK	
Versions	OMS Generation 3 - Profile A or OMS Generation 4 - Profile B

PRIVACY

The HYDRUS 2.0 BULK saves 512 daily consumption values. This data can be read locally and accessed only by using the IZAR@MOBILE 2. As a second logging, a small amount of 32 monthly consumption values can be stored. Both the radio protocol and the optical interface are encrypted by default.

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VOLUME / PULSE OPEN DRAIN

HYDRUS 2.0 BULK	
Max. input voltage	V 30
Max. input current	mA 27
Max. voltage drop at active output	V/mA 2 / 27
Max. current through inactive output	µA/V 5 / 30
Max. reverse voltage without destroying outputs	V 6 (in case current does not exceed 27 mA)
Pulse rates DN 50	l/pulse 1 / 10 / 100 / 1,000 (depending on nominal size)
Pulse rates DN 65 - 150	l/pulse 10 / 100 / 1,000 (depending on nominal size)
Pulse rates DN 200	l/pulse 100 / 1,000 (depending on nominal size)
Configuration pulse output 1	Total volume or forward volume
Configuration pulse output 2	Flow direction or error, reverse volume, forward volume
Pulse frequency	Max. frequency 10 Hz
Pulse width	50 ms

AVAILABLE VERSIONS

HYDRUS 2.0 BULK	
Wireless M-Bus radio/Pulse/L-Bus	3 wires - only forward volume for pulse output 2 (minimum 10L/pulse)
Wireless M-Bus radio only	without wire
Wired M-Bus/Pulse/Pulse	5 wires - forward volume on pulse output 1 and reverse volume on pulse output 2
Pulse (IZAR BE PULSE compatible)	4 wires - total volume on pulse output 1 and direction on pulse output 2 with fraud

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PERFORMANCE DATA - COLD WATER (T30 / T50) HORIZONTAL

Nominal diameter	DN	mm	50	65	80	100	125	150	200
Permanent flow rate	Q ₃	m ³ /h	25	40	63	100	160	250	400
Dynamic (Q ₃ /Q ₁)	R		800	800	800	800	800	800	800
Overload flow rate	Q ₄	m ³ /h	31.25	50	78.75	125	200	312.50	500
Transitional flow rate	Q ₂	l/h	50	80	126	200	320	500	800
Minimum flow rate	Q ₁	l/h	31.25	50	78.75	125	200	312.50	500
Starting flow rate		l/h	15	27	35	45	70	250	400
Pressure loss at Q ₃		bar	0.16	0.15	0.16	0.13	0.15	0.11	0.12
Pressure loss at Q ₄		bar	0.25	0.23	0.25	0.2	0.23	0.18	0.19
Maximum flow rate ²	Q _{high}	m ³ /h	62.5	100	157.5	250	400	625	1000
Flow rate at ΔP = 1 bar		m ³ /h	63	105	158	280	420	747	1140

² Outlet pressure minimum 3 bar, maximum 100 hours per year, closed pipeline network

PERFORMANCE DATA - HOT WATER (T90) HORIZONTAL

Nominal diameter	DN	mm	50	65	80	100	125	150	200
Permanent flow rate	Q ₃	m ³ /h	25	40	63	100	-	-	-
Dynamic (Q ₃ /Q ₁)	R		400	400	400	400	-	-	-
Overload flow rate	Q ₄	m ³ /h	31.25	50	78.75	125	-	-	-
Transitional flow rate	Q ₂	l/h	100	160	250	400	-	-	-
Minimum flow rate	Q ₁	l/h	63	100	160	250	-	-	-
Starting flow rate		l/h	15	27	35	45	-	-	-
Pressure loss at Q ₃		bar	0.16	0.15	0.16	0.13	-	-	-
Pressure loss at Q ₄		bar	0.25	0.23	0.25	0.2	-	-	-
Flow rate at ΔP = 1 bar		m ³ /h	63	105	158	280	-	-	-

APPROVAL

DN 50 - 200		
Approval		MID DE-19-MI001-PTB011
Dynamic range (Q ₃ /Q ₁)	R	Up to R=1,000
Standards		ISO 4064 EN 14154 OIML R49
Sanitary conformity		ACS WRAS DM174 BELGAQUA

DYNAMIC RANGE

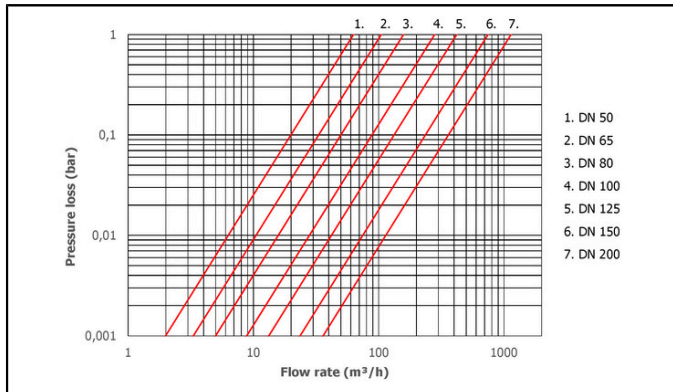
DN 50 - 200		
Q ₃ 25 ... 400 m ³ /h - T30	R	800
Q ₃ 25 ... 400 m ³ /h - T50	R	800H / 250V
Q ₃ 25 ... 100 m ³ /h - T90	R	400H / 160V

H=horizontal installation position / V=vertical installation position

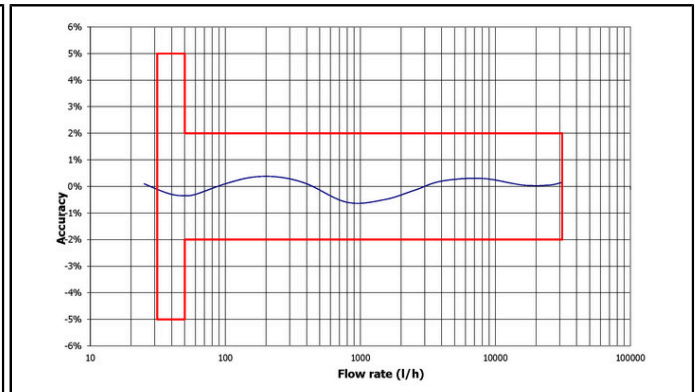
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PRESSURE LOSS GRAPH / TYPICAL ERROR GRAPH

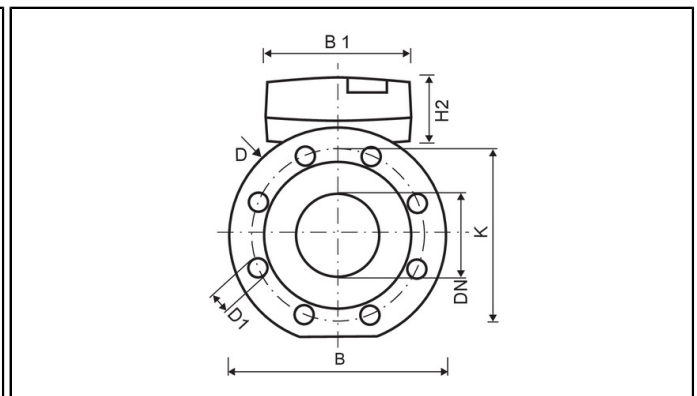
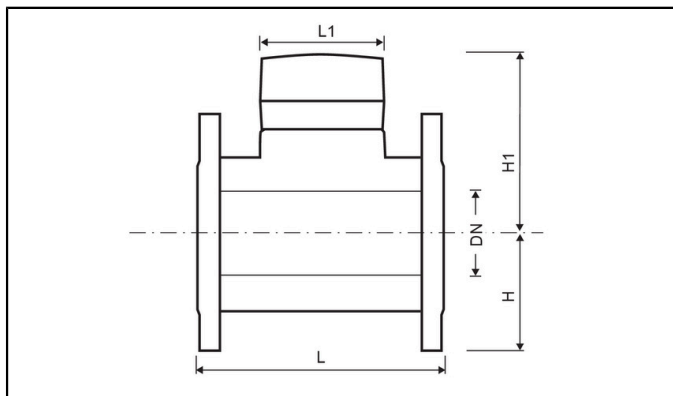


Pressure loss graph



Typical error graph - $Q_3=25 \text{ m}^3/\text{h}$

DIMENSIONS



Nominal diameter	DN	mm	50	65	80	100	125	150	200
Overall length (T30 / T50)	L	mm	200/ 270 / 300 ³	200 / 300 ³	200 / 225 / 300 / 350 ³	250 / 350 ⁴ / 360	250	300 / 500	350
Overall length (T90)	L	mm	200	200	200 / 225	250	-	-	-
Flange diameter ⁵	D	mm	165	185	200	220	250	285	340
Hole circle diameter ⁵	K	mm	125	145	160	180	210	240	295
Number of screwholes ⁵		pcs	4	4	8	8	8	8	12 ⁶
Screwhole diameter ⁵	D1	mm	19	19	19	19	19	23	23
Height	H	mm	74	87	95	105	120	135	161
Height	H1	mm	121	143	147	165	177	185	215
Height	H2	mm	61	61	61	61	61	61	61
Counter length	L1	mm	98	98	98	98	98	98	98
Meter width	B	mm	165	185	200	220	250	285	340
Counter width	B1	mm	139	139	139	139	139	139	139
Overall weight (approx.)		kg	7 / 9 / 9	8 / 11	11 / 13 / 14 / 15	17 / 19 / 20	23	38 / 45	51

³ Optionally with rotatable flange

⁴ Rotatable flange

⁵ Flanges according to EN 1092, PN 10/16

⁶ 8 Screwholes for PN 10

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METER BODY VARIANTS



- a) The cold water meters come with an epoxy-coated cast iron housing as standard. ISO short length variants can optionally be manufactured with a stainless steel housing.
- b) ISO long length meters with diameters up to DN 100 can optionally come with rotatable flanges.
- c) Hot water meters are always provided with stainless steel housings (EN 1.4408, AISI 316).

REACH

Information pursuant to Article 33 (1) of Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006:

This product series contains articles with the following substances in a concentration of more than 0.1% weight by weight (w/w):

- Lead