

HYDRUS 2.0 RESIDENTIAL

ULTRASONIC METER

DIEHL
Metering



APPLICATION

HYDRUS 2.0 RESIDENTIAL 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 RESIDENTIAL 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 RESIDENTIAL 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 15 to 50
- ▶ MID approval up to R=800
- ▶ IP 68
- ▶ OMS radio, Wired M-Bus/Pulse x2, OMS radio/L-Bus/Pulse, Pulse x2, Remote radio with IZAR BE PULSE
- ▶ Display with symbols and error codes
- ▶ Alarm functions
- ▶ Battery lifetime up to 16 years
- ▶ U0 / D0, no calming section needed

HYDRUS 2.0 RESIDENTIAL

ULTRASONIC METER

GENERAL

HYDRUS 2.0 RESIDENTIAL			
Medium temperature range	°C	+0.1 ... +90	
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	
Nominal pressure	PN	bar	16
Power supply	2x 3.6 VDC lithium batteries		
Battery lifetime T30 ¹ /T50 ¹	Up to 16 years		
Battery lifetime T70 ¹ /T90 ¹	Up to 16 years		
Communication interfaces	Optical, OMS 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 1024 daily values +32 monthly values and two annual due dates		
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

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Display indication	LCD, 9-digit, additional symbols/display counter/unit
Units displayed DN 15 - DN 50	Volume (m ³ + 3 digits 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 rate - 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 symbol

COMMUNICATION INTERFACES

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Optical	For switching the display menu, reading and configuration with IZAR@MOBILE
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 15 minutes
M-Bus	2,400 baud, cable length 1.5 m*, power supply only via built-in battery
L-Bus	Only active when radio is deactivated
Pulse (Open drain)	1 or 2 pulse outputs with cable length 1.5 m*, Pulse output soldered with IZAR BE PULSE cable length 1.5m*

*May vary by up to ± 3.5% due to manufacturing tolerances

SECURITY

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Versions	OMS Generation 3 - Profile A or OMS Generation 4 - Profile B

PRIVACY

The HYDRUS 2.0 RESIDENTIAL saves 512 consumption values with a daily interval. This data can be read locally and accessed only by using the IZAR@MOBILE. As a second logging, a small amount of 32 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

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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	l/pulse	1 / 10 (depending on nominal diameter)
Configuration pulse output 1	Total volume or forward volume	
Configuration pulse output 2	Flow direction, error, reverse volume or forward volume	
Pulse frequency	Max. frequency 10 Hz	
Pulse width	50 - 125 ms	

AVAILABLE VERSIONS

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OMS radio + Pulse / L-Bus + Pulse	3 wires - radio and forward volume on pulse output / 3 wires - L-Bus and forward volume on pulse output
Wired M-Bus + Pulses x2	5 wires - forward volume on pulse output 1 and reverse volume on pulse output 2
Pulses x2	4 wires - total volume on pulse output 1 and direction on pulse output 2 with fraud
Remote radio with IZAR BE PULSE	With IZAR BE PULSE completely soldered to HYDRUS 2 to put a radio clip-on module (LoRaWAN, Sigfox, Wize, OMS)

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 components with the following substances in a concentration of more than 0.1% weight by weight (w/w):

- Lead (only for the flange variants) - (CAS no.: 7439-92-1)
- Lead titanium zirconium oxide (CAS no.: 12626-81-2)

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ULTRASONIC METER

TECHNICAL DATA

Nominal diameter	DN	mm	15	15 ³	15	15	20
Permanent flow rate	Q ₃	m ³ /h	2.5	2.5	2.5	2.5	2.5
Overall length	L	mm	110	115	165	170	130
Dynamic (Q ₃ /Q ₁)	R		800	800	800	800	800
Overload flow rate	Q ₄	m ³ /h	3.125	3.125	3.125	3.125	3.125
Transitional flow rate	Q ₂	l/h	5	5	5	5	5
Minimum flow rate	Q ₁	l/h	3.13	3.13	3.13	3.13	3.13
Starting flow rate		l/h	1.4	1.4	1.4	1.4	1.4
Pressure loss at Q ₃		bar	0.46	0.46	0.46	0.46	0.4
Pressure loss at Q ₄		bar	0.72	0.72	0.72	0.72	0.63
Maximum flow rate ²	Q _{high}	m ³ /h	4.37	4.37	4.37	4.37	4.37
Flow rate at ΔP = 1 bar			3.69	3.69	3.69	3.69	3.95

Nominal diameter	DN	mm	20	20	20	20
Permanent flow rate	Q ₃	m ³ /h	2.5	4	4	4
Overall length	L	mm	190	130	165	190
Dynamic (Q ₃ /Q ₁)	R		800	800	800	800
Overload flow rate	Q ₄	m ³ /h	3.125	5	5	5
Transitional flow rate	Q ₂	l/h	5	8	8	8
Minimum flow rate	Q ₁	l/h	3.13	5	5	5
Starting flow rate		l/h	1.4	2.5	2.5	2.5
Pressure loss at Q ₃		bar	0.4	0.4	0.4	0.4
Pressure loss at Q ₄		bar	0.63	0.63	0.63	0.63
Maximum flow rate ²	Q _{high}	m ³ /h	4.37	7	7	7
Flow rate at ΔP = 1 bar			3.95	5.39	5.39	5.39

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

³ Please see table DIMENSIONS

Other on request

APPROVAL

DN 15 - 20		
Approval		MID DE-19-MI001-PTB012 UK/0126/0326
Dynamic range (Q ₃ /Q ₁)	R	Up to R=800
Standards		ISO 4064 EN 14154 OIML R49
Sanitary conformity		ACS WRAS DM174 BELGAQUA KTW / W270

DYNAMIC RANGE (R=Q₃/Q₁)

DN 15 - 20		
Q ₃ 2.5 m ³ /h - T30 / T50	R	800
Q ₃ 2.5 m ³ /h - T70 / T90	R	800H / 400V
Q ₃ 4 m ³ /h - T30	R	800
Q ₃ 4 m ³ /h - T50 / T70 / T90	R	800H / 400V

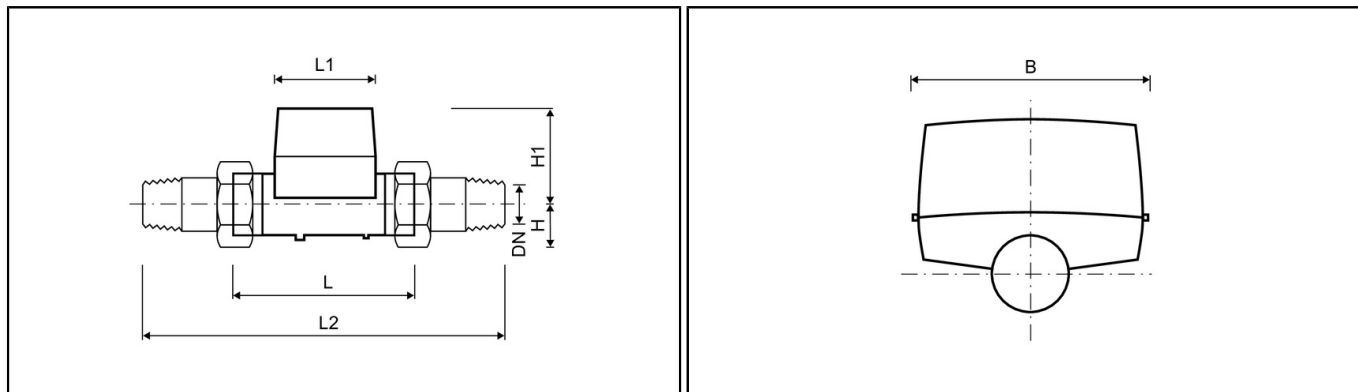
H=horizontal installation position / V=vertical installation position

Other values on request

HYDRUS 2.0 RESIDENTIAL^{DN 15 - 20}

ULTRASONIC METER

DIMENSIONS

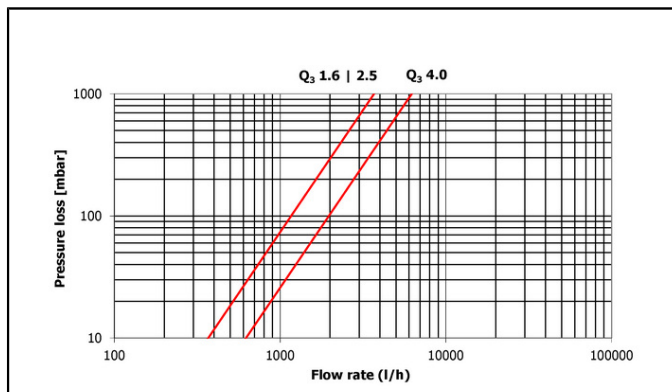


Nominal diameter	DN	mm	15	15 ³	15	15	20
Permanent flow rate	Q ₃	m ³ /h	2.5	2.5	2.5	2.5	2.5
Overall length	L	mm	110	115	165	170	130
Counter length	L1	mm	89	89	89	89	89
Counter width	B	mm	89	89	89	89	89
Overall length with coupling	L2	mm	190	195	245	250	230
Connection thread on meter		Inch	G ³ / ₄ B	G ³ / ₄ B	G ³ / ₄ B	G ³ / ₄ B	G1B
Connection thread of coupling		Inch	R ¹ / ₂	R ¹ / ₂	R ¹ / ₂	R ¹ / ₂	R ³ / ₄
Height	H1	mm	71	71	71	71	74
Weight without coupling (approx.)		kg	0.7	0.7	0.8	0.8	0.8
Weight with coupling (approx.)		kg	1.1	1.1	1.2	1.2	1.2
Height	H	mm	18	18	18	18	21

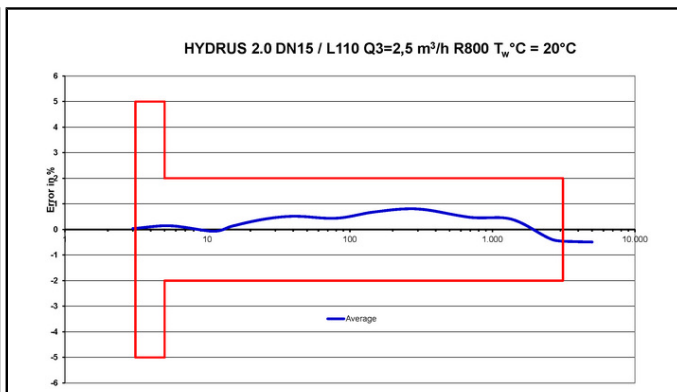
Nominal diameter	DN	mm	20	20	20	20
Permanent flow rate	Q ₃	m ³ /h	2.5	4	4	4
Overall length	L	mm	190	130	165	190
Counter length	L1	mm	89	89	89	89
Counter width	B	mm	89	89	89	89
Overall length with coupling	L2	mm	290	230	295	290
Connection thread on meter		Inch	G1B	G1B	G1B	G1B
Connection thread of coupling		Inch	R ³ / ₄	R ³ / ₄	R1	R ³ / ₄
Height	H1	mm	74	74	74	74
Weight without coupling (approx.)		kg	0.9	0.8	1.0	0.9
Weight with coupling (approx.)		kg	1.3	1.2	1.6	1.3
Height	H	mm	21	21	27	21

³ Further version with connection thread on meter inlet G7/8B and meter outlet G3/4B on request

PRESSURE LOSS GRAPH / TYPICAL ERROR GRAPH



Pressure loss graph



Typical error graph

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Subject to technical adjustments.

HYDRUS 2.0 RESIDENTIAL_{DN 25 - 50}

ULTRASONIC METER

TECHNICAL DATA

Nominal diameter	DN	mm	25	25	50	50	50	50
Permanent flow rate	Q ₃	m ³ /h	6.3	10	16	16	25	25
Overall length	L	mm	260	260	270	300	270	300
Dynamic (Q ₃ /Q ₁)	R		400	800	250	250	400	400
Overload flow rate	Q ₄	m ³ /h	7.87	12.5	20	20	31.25	31.25
Transitional flow rate	Q ₂	l/h	25.2	20	102	102	100	100
Minimum flow rate	Q ₁	l/h	15.8	12.5	64	64	62.5	62.5
Starting flow rate		l/h	5	5	25	25	25	25
Pressure loss at Q ₃		bar	0.22	0.54	0.1	0.1	0.25	0.25
Pressure loss at Q ₄		bar	0.34	0.84	0.19	0.19	0.45	0.45
Maximum flow rate ²	Q _{high}	m ³ /h	11.02	17.5	32.13	32.13	32.13	32.13
Flow rate at ΔP = 1 bar			13.43	13.43	46.0	46.0	46.0	46.0

² Outlet pressure minimum 3 bars, maximum 100 hours per year, closed pipeline network
Other on request

APPROVAL

DN 25 - 50		
Approval		MID DE-19-MI001-PTB012 UK/0126/0326
Dynamic range (Q ₃ /Q ₁)	R	Up to R=800
Standards		EN 4064, EN 14154, OIML R49
Sanitary conformity		ACS WRAS DM174 BELGAQUA KTW / W270

DYNAMIC RANGE (R=Q₃/Q₁)

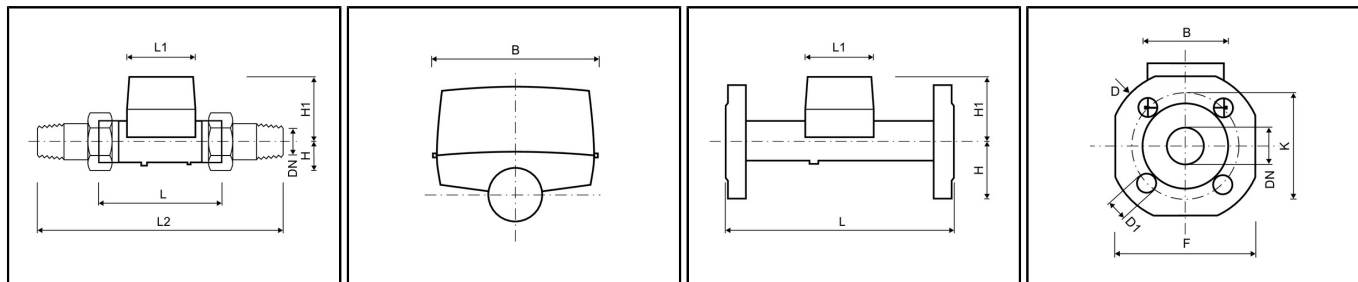
DN 25 - 50		
Q ₃ 6.3 m ³ /h - T30	R	400
Q ₃ 6.3 m ³ /h - T50 / T70 / T90	R	400H / 250V
Q ₃ 10 m ³ /h - T30	R	800
Q ₃ 10 m ³ /h - T50 / T70 / T90	R	800H / 400V
Q ₃ 16 m ³ /h - T30	R	800
Q ₃ 16 m ³ /h - T50 / T70 / T90	R	800H / 400V
Q ₃ 16 m ³ /h - DN 50 - T30 / T50 / T70 / T90	R	250
Q ₃ 25 m ³ /h - DN 50 - T30 / T50 / T70 / T90	R	400

H=horizontal installation position / V=vertical installation position

HYDRUS 2.0 RESIDENTIAL_{DN 25 - 50}

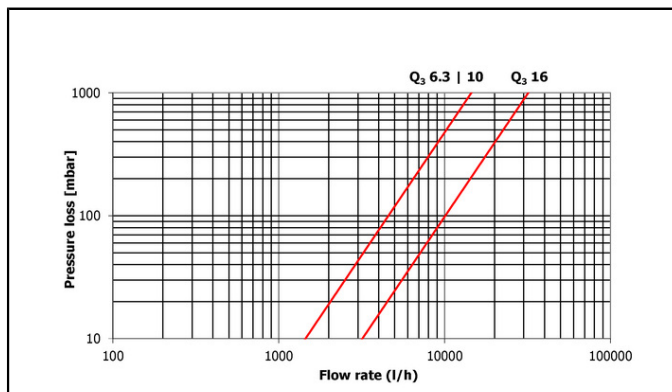
ULTRASONIC METER

DIMENSIONS

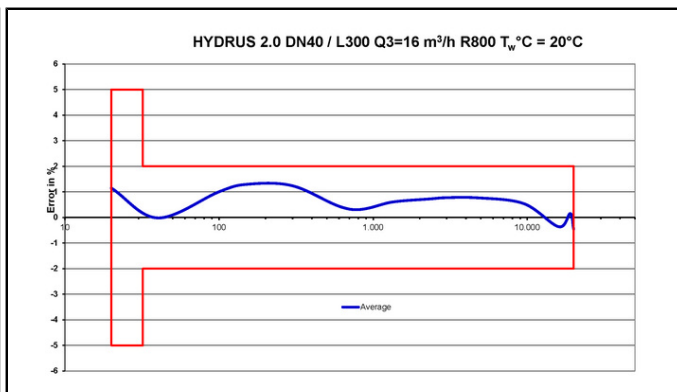


Nominal diameter	DN	mm	25	25	50	50	50	50
Permanent flow rate	Q ₃	m ³ /h	6.3	10	16	16	25	25
Overall length	L	mm	260	260	270	300	270	300
Counter length	L1	mm	89	89	92	92	92	92
Counter width	B	mm	89	89	94	94	94	94
DIMENSIONS - THREAD								
Overall length with coupling	L2	mm	380	380	390	420	390	420
Connection thread on meter		Inch	G1¼B	G1¼B	G2½B	G2½B	G2½B	G2½B
Connection thread of coupling		Inch	R1	R1	R2	R2	R2	R2
Height	H1	mm	78	78	90	90	90	90
Weight without coupling (approx.)		kg	1.4	1.4	3.9	4.05	3.9	4.05
Weight with coupling (approx.)		kg	2.0	2.0	5.5	5.65	5.5	5.65
Height	H	mm	27	27	41	41	41	41
DIMENSIONS - FLANGE								
Flange diameter	D	mm	115	115	-	-	-	-
Hole circle diameter	K	mm	85	85	-	-	-	-
Number of screwholes		pcs	4	4	-	-	-	-
Screwhole diameter	D1	mm	14	14	-	-	-	-
Height	H	mm	50	50	-	-	-	-
Height	H1	mm	84	84	-	-	-	-
Width	F	mm	100	100	-	-	-	-
Weight with flanges (approx.)		kg	3.4	3.4	-	-	-	-

PRESSURE LOSS GRAPH / TYPICAL ERROR GRAPH



Pressure loss graph



Typical error graph