

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, KTW/W270 and others).

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 40
- ▶ MID approval up to R=800
- ▶ IP 68
- ▶ Wireless M-Bus radio, Wired M-Bus/Pulse/Pulse, Wireless M-Bus radio/L-Bus/Pulse, IZAR BE PULSE compatible, M-Bus, Pulse/Pulse
- ▶ Display with alarm codes including leakage detection, radio on and error codes
- ▶ Battery lifetime up to 16 years

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ULTRASONIC METER

GENERAL

		HYDRUS 2.0 RESIDENTIAL	
Medium temperature range	°C	+0.1 ... +50	
Ambient operating temperature	°C	-10 ... +55	
Ambient storage temperature	°C	-10 ... +70 (>35 °C max. 4 weeks)	
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 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 values + 32 monthly values and an annual due date		
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 RESIDENTIAL	
Display indication	LCD, 9-digit, additional symbols/display counter/unit		
Units displayed DN 15 - 32	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 - 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 - calibrated value		

COMMUNICATION INTERFACES

		HYDRUS 2.0 RESIDENTIAL	
Optical	For switching the display loop, reading and configuration with IZAR@MOBILE 2		
Radio	434 or 868 MHz, Open Metering Standard radio 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 - can be combined with 2 pulse outputs		
L-Bus	In combination with radio, cable length 1.5 m* (only 1 interface communicating at the same time) and 1 pulse output		
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 ± 3.5% due to manufacturing tolerances.

SECURITY

		HYDRUS 2.0 RESIDENTIAL	
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 2. 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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ULTRASONIC METER

VOLUME / PULSE OPEN DRAIN

HYDRUS 2.0 RESIDENTIAL		
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 or error, reverse volume, forward volume	
Pulse frequency	Max. frequency 10 Hz	
Pulse width	125 ms	

AVAILABLE VERSIONS

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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
M-Bus only	2 wires
M-Bus/Pulse/Pulse	5 wires - forward volume on pulse output 1 and reverse volume on pulse output 2
Pulse/Pulse	3 wires - total volume on pulse output 1 and direction on pulse output 2
IZAR BE PULSE compatible	4 wires - total volume on pulse output 1 and direction on pulse output 2 with fraud

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)
- Lead titanium zirconium oxide

HYDRUS 2.0 RESIDENTIAL_{DN 15 - 20}

ULTRASONIC METER

TECHNICAL DATA

Nominal diameter	DN	mm	15	15	15	15	15
Permanent flow rate	Q ₃	m ³ /h	1.6	1.6	1.6	2.5	2.5
Overall length	L	mm	110	165	170	110	165
Dynamic (Q ₃ /Q ₁)	R		400	400	400	800	800
Overload flow rate	Q ₄	m ³ /h	2	2	2	3.125	3.125
Transitional flow rate	Q ₂	l/h	6.4	6.4	6.4	5	5
Minimum flow rate	Q ₁	l/h	4	4	4	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	0.19	0.19	0.19	0.46	0.46
Pressure loss at Q ₄		bar	0.3	0.3	0.3	0.72	0.72
Maximum flow rate ²	Q _{high}	m ³ /h	2.8	2.8	2.8	4.37	4.37
Flow rate at ΔP = 1 bar			3.67	3.67	3.67	3.69	3.69

Nominal diameter	DN	mm	15	20	20	20
Permanent flow rate	Q ₃	m ³ /h	2.5	2.5	2.5	4
Overall length	L	mm	170	130	190	105
Dynamic (Q ₃ /Q ₁)	R		800	800	800	400
Overload flow rate	Q ₄	m ³ /h	3.125	3.125	3.125	5
Transitional flow rate	Q ₂	l/h	5	5	5	16
Minimum flow rate	Q ₁	l/h	3.13	3.13	3.13	10
Starting flow rate		l/h	1.4	1.4	1.4	3.0
Pressure loss at Q ₃		bar	0.46	0.4	0.4	0.55
Pressure loss at Q ₄		bar	0.72	0.63	0.63	0.86
Maximum flow rate ²	Q _{high}	m ³ /h	4.37	4.37	4.37	7
Flow rate at ΔP = 1 bar			3.69	3.95	3.95	5.39

Nominal diameter	DN	mm	20	20	20	20
Permanent flow rate	Q ₃	m ³ /h	4	4	4	4
Overall length	L	mm	130	175	190	220
Dynamic (Q ₃ /Q ₁)	R		800	800	800	800
Overload flow rate	Q ₄	m ³ /h	5	5	5	5
Transitional flow rate	Q ₂	l/h	8	8	8	8
Minimum flow rate	Q ₁	l/h	5	5	5	5
Starting flow rate		l/h	2.5	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	7	7	7	7
Flow rate at ΔP = 1 bar			5.39	5.39	5.39	5.39

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

APPROVAL

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

HYDRUS 2.0 RESIDENTIAL_{DN 15 - 20}

ULTRASONIC METER

DYNAMIC RANGE (Q₃/Q₁)

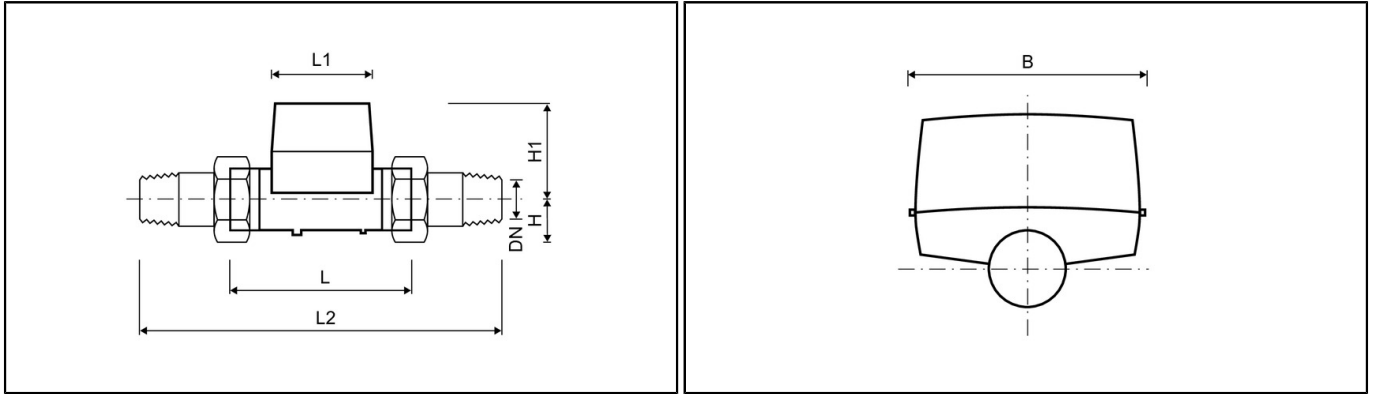
DN 15 - 20		
Q ₃ 1.6 m ³ /h - T30	R	160 / 400
Q ₃ 2.5 m ³ /h - T30	R	160 / 400 / 800
Q ₃ 4 m ³ /h - T30	R	160 / 400 / 800 (630 for L 105 mm)
Q ₃ 4 m ³ /h - T50	R	160 / 400 / 800H - 400V (630 for L 105 mm)

H=horizontal installation position / V=vertical installation position

HYDRUS 2.0 RESIDENTIAL_{DN 15 - 20}

ULTRASONIC METER

DIMENSIONS



Nominal diameter	DN	mm	15	15	15	15	15
Permanent flow rate	Q ₃	m ³ /h	1.6	1.6	1.6	2.5	2.5
Overall length	L	mm	110	165	170	110	165
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	245	250	190	245
Connection thread on meter		Inch	G ³ / ₄ B	G ³ / ₄ B	G ³ / ₄ B	G ³ / ₄ B	G ³ / ₄ B
Connection thread of coupling		Inch	R ¹ / ₂	R ¹ / ₂	R ¹ / ₂	R ¹ / ₂	R ¹ / ₂
Height	H1	mm	71	71	71	71	71
Weight without coupling (approx.)		kg	0.7	0.8	0.8	0.7	0.8
Weight with coupling (approx.)		kg	1.1	1.2	1.2	1.1	1.2
Height	H	mm	18	18	18	18	18

Nominal diameter	DN	mm	15	20	20	20
Permanent flow rate	Q ₃	m ³ /h	2.5	2.5	2.5	4
Overall length	L	mm	170	130	190	105
Counter length	L1	mm	89	89	89	89
Counter width	B	mm	89	89	89	89
Overall length with coupling	L2	mm	250	230	290	205
Connection thread on meter		Inch	G ³ / ₄ B	G1B	G1B	G1B
Connection thread of coupling		Inch	R ¹ / ₂	R ³ / ₄	R ³ / ₄	R ³ / ₄ ³
Height	H1	mm	71	74	74	74
Weight without coupling (approx.)		kg	0.8	0.8	0.9	0.8
Weight with coupling (approx.)		kg	1.2	1.2	1.3	1.2
Height	H	mm	18	21	21	21

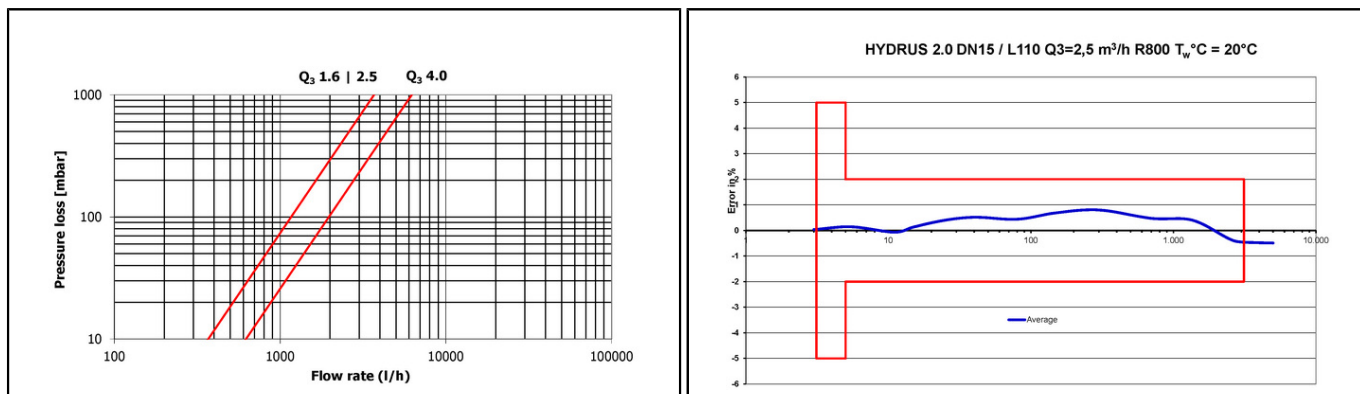
Nominal diameter	DN	mm	20	20	20	20
Permanent flow rate	Q ₃	m ³ /h	4	4	4	4
Overall length	L	mm	130	175	190	220
Counter length	L1	mm	89	89	89	89
Counter width	B	mm	89	89	89	89
Overall length with coupling	L2	mm	230	295	290	320
Connection thread on meter		Inch	G1B	G ¹ / ₄ B	G1B	G1B
Connection thread of coupling		Inch	R ³ / ₄	R1	R ³ / ₄	R ³ / ₄
Height	H1	mm	74	74	74	74
Weight without coupling (approx.)		kg	0.8	1.0	0.9	1.2
Weight with coupling (approx.)		kg	1.2	1.6	1.3	1.4
Height	H	mm	21	27	21	21

³ Wrench size should not exceed 38 mm

HYDRUS 2.0 RESIDENTIAL_{DN 15 - 20}

ULTRASONIC METER

PRESSURE LOSS GRAPH / TYPICAL ERROR GRAPH



HYDRUS 2.0 RESIDENTIAL_{DN 25 - 40}

ULTRASONIC METER

TECHNICAL DATA

Nominal diameter	DN	mm	25	25	25	25	25	25	25
Permanent flow rate	Q ₃	m ³ /h	6.3	6.3	6.3	6.3	10	10	10
Overall length	L	mm	135	150	175	260	150	175	260
Dynamic (Q ₃ /Q ₁)	R		400	400	400	400	800	800	800
Overload flow rate	Q ₄	m ³ /h	7.87	7.87	7.87	7.87	12.5	12.5	12.5
Transitional flow rate	Q ₂	l/h	25.2	25.2	25.2	25.2	20	20	20
Minimum flow rate	Q ₁	l/h	15.8	15.8	15.8	15.8	12.5	12.5	12.5
Starting flow rate		l/h	5	5	5	5	5	5	5
Pressure loss at Q ₃		bar	0.22	0.22	0.22	0.22	0.54	0.54	0.54
Pressure loss at Q ₄		bar	0.34	0.34	0.34	0.34	0.84	0.84	0.84
Maximum flow rate ²	Q _{high}	m ³ /h	11.02	11.02	11.02	11.02	17.5	17.5	17.5
Flow rate at ΔP = 1 bar			13.43	13.43	13.43	13.43	13.43	13.43	13.43

Nominal diameter	DN	mm	32	40	40
Permanent flow rate	Q ₃	m ³ /h	10	16	16
Overall length	L	mm	260	200	300
Dynamic (Q ₃ /Q ₁)	R		800	800	800
Overload flow rate	Q ₄	m ³ /h	12.5	20	20
Transitional flow rate	Q ₂	l/h	20	32	32
Minimum flow rate	Q ₁	l/h	12.5	20	20
Starting flow rate		l/h	5	8.7	8.7
Pressure loss at Q ₃		bar	0.54	0.5	0.5
Pressure loss at Q ₄		bar	0.84	0.78	0.78
Maximum flow rate ²	Q _{high}	m ³ /h	17.5	28	28
Flow rate at ΔP = 1 bar			13.43	22.63	22.63

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

APPROVAL

DN 25 - 40		
Approval		MID DE-19-MI001-PTB012
Dynamic range (Q ₃ /Q ₁)	R	Up to R=800
Standards		ISO 4064 | EN 14154 | OIML R49
Sanitary conformity		KTW/W270 | ACS | WRAS

DYNAMIC RANGE (Q₃/Q₁)

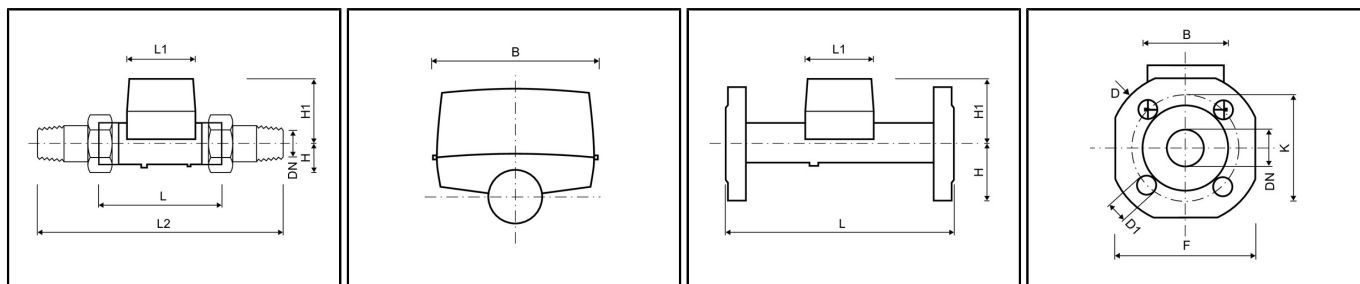
DN 25 - 40		
Q ₃ 6.3 m ³ /h - T30	R	160 / 400
Q ₃ 6.3 m ³ /h - T50	R	160 / 400H - 250V
Q ₃ 10 m ³ /h - DN 25 - T30	R	160 / 400 / 800
Q ₃ 10 m ³ /h - DN 25 - T50	R	160 / 400 / 800H - 400V
Q ₃ 16 m ³ /h - T30	R	160 / 400 / 800
Q ₃ 16 m ³ /h - T50	R	160 / 400 / 800H - 400 V

H=horizontal installation position / V=vertical installation position

HYDRUS 2.0 RESIDENTIAL_{DN 25 - 40}

ULTRASONIC METER

DIMENSIONS



Nominal diameter	DN	mm	25	25	25	25	25	25	25
Permanent flow rate	Q ₃	m ³ /h	6.3	6.3	6.3	6.3	10	10	10
Overall length	L	mm	135	150	175	260	150	175	260
Counter length	L1	mm	89	89	89	89	89	89	89
Counter width	B	mm	89	89	89	89	89	89	89
DIMENSIONS - THREAD			.	.	.	.	.	.	.
Overall length with coupling	L2	mm	255	270	295	380	270	295	380
Connection thread on meter		Inch	G1¼B	G1¼B	G1¼B	G1¼B	G1¼B	G1¼B	G1¼B
Connection thread of coupling		Inch	R1	R1	R1	R1	R1	R1	R1
Height	H1	mm	78	78	78	78	78	78	78
Weight without coupling (approx.)		kg	1.0	1.0	1.1	1.4	1.0	1.4	1.4
Weight with coupling (approx.)		kg	1.6	1.6	1.7	2.0	1.6	2.0	2.0
Height	H	mm	27	27	27	27	27	27	27
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

HYDRUS 2.0 RESIDENTIAL_{DN 25 - 40}

ULTRASONIC METER

Nominal diameter	DN	mm	32	40	40
Permanent flow rate	Q ₃	m ³ /h	10	16	16
Overall length	L	mm	260	200	300
Counter length	L1	mm	89	96	96
Counter width	B	mm	89	89	89
DIMENSIONS - THREAD					
Overall length with coupling	L2	mm	380	340	440
Connection thread on meter		Inch	G1½B	G2B	G2B
Connection thread of coupling		Inch	R1¼	R1½	R1½
Height	H1	mm	78	82	82
Weight without coupling (approx.)		kg	1.5	1.8	2.6
Weight with coupling (approx.)		kg	2.1	3.0	3.8
Height	H	mm	30	36	36
DIMENSIONS - FLANGE					
Flange diameter	D	mm	140	-	148
Hole circle diameter	K	mm	100	-	110
Number of screwholes		pcs	4	-	4
Screwhole diameter	D1	mm	18	-	18
Height	H	mm	62.5	-	69
Height	H1	mm	84	-	87
Width	F	mm	125	-	138
Weight with flanges (approx.)		kg	4.6	-	6.3

PRESSURE LOSS GRAPH / TYPICAL ERROR GRAPH

