

HYDRUS 2.0 COMPOSITE

Ultrasonic Meter

DIEHL
Metering



APPLICATION

HYDRUS 2.0 is a static ultrasonic water meter designed for all applications of domestic cold water supply enabling accurate measuring with long-term stability under difficult conditions (no measurement of air and insensitive to sedimentation). Developed within the framework of the MID, it complies with the European regulations and holds sanitary conformity certificates (AoC DEU, ACS, WRAS and others). The integrated communication function supports meter data provision via mobile reading (walk-by/drive-by/passive drive-by) or fixed network (upgrade without on-site configuration). In combination with Diehl Metering's IZAR fixed network system, which stands out with excellent coverage, high data granularity and timeliness will be maintained. This is what makes it a high responsive infrastructure to take actions immediately. The meter offers integrated mioty® for Metering or LoRaWAN® for fixed network reading over private/public networks.

FEATURES

- ▶ DN 15 to 50
- ▶ MID approved with dynamic range up to R 800
- ▶ IP 68 suitable for outdoor installations
- ▶ Integrated radio communication based on Open Metering telegram
- ▶ OMS over LoRaWAN® for fixed network with wM-Bus for mobile reading
- ▶ mioty® for Metering for fixed network with wM-Bus for mobile reading
- ▶ M-Bus/Pulse/Pulse, wM-Bus, wM-Bus along with L-Bus/Pulse
- ▶ Display with error and alarm codes including leakage detection
- ▶ Battery lifetime up to 16 years
- ▶ U0 / D0, no need for calming sections

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GENERAL

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Medium temperature range	°C	+0.1 ... +90	
Ambient operating temperature	°C	-10 ... +55	
Ambient storage temperature	°C	-10 ... +70 (>35 °C max. 4 weeks)	
Nominal pressure	PN	bar	16
Power supply	Two 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 wM-Bus / Long range radio (R4, R4+, mioty® for Metering) 434 or 868 MHz, M-Bus, L-Bus and Pulse, LoRaWAN® 868 MHz		
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 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	Volume (m ³ + 3 decimal places) and flow rate (m ³ /h + 3 decimal places)
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 - display counter - low battery indication - leakage indication - metrological log access - radio signal ON/OFF - alarm indication - billing value indication - and more display loop options to choose from

INTERFACES - OVERVIEW

HYDRUS 2.0 Composite	
Optical	For switching the display loop and configuring / reading the meter via IZAR@MOBILE
wMBus (R3)	434 or 868 MHz, Open Metering radio as standard (R3) for mobile reading sent every 14 / 64 seconds (default)
Long range radio R4 / R4+ / mioty® for Metering	434 or 868 MHz, OMS for fixed network sent every 5 / 15 / 60 minutes
LoRaWAN®	868 MHz - OMS over LoRaWAN® for fixed network sent every 3 h / 5 h / 6 h (default) and OMS wM-Bus for mobile network sent every 64s (default); Complies to v1.0.3, certified to v1.0.2, Class A, supports Adaptive data rate (ADR)
M-Bus	2400 baud, cable length 1.5 m, power supply only via built-in battery - can be combined with two Pulse outputs
L-Bus	In combination with radio, cable length 1.5 m (only one interface communicating at the same time)
Pulse (Open drain)	Two Pulse outputs, or one Pulse and one L-Bus output, Pulse cable length 1.5 m

SECURITY

HYDRUS 2.0 Composite	
wM-Bus (R3), R4, R4+, mioty® for Metering	OMS Generation 3 or OMS Generation 4 Profile B, selectable
LoRaWAN®	Fixed Network uses internal LoRaWAN® transport encryption; Mobile Network uses OMS Generation 4 Profile B Individual keys

PRIVACY

The HYDRUS 2.0 saves 1024 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. The HYDRUS 2.0 has a minimal sending interval of about 14 seconds and uses the OMS Generation 3 (not available with radio meters with C1 mobile mode or LoRaWAN®/C2) or 4, Profile B security level. 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	Decadic 1 / 10 (depending on nominal diameter)
Pulse output 1 variants	Total volume or forward volume	
Pulse output 2 variants	Flow direction or error, reverse volume	
Pulse frequency	Max. frequency 10 Hz	
Pulse width	50 - 125 ms	

POSSIBLE COMMUNICATION INTERFACES

HYDRUS 2.0 Composite	
wM-Bus/Pulse/L-Bus	3 wire
wM-Bus only	without wire
R4 / R4+ / mioty® for Metering	without wire
LoRaWAN® and OMS radio	without wire
M-Bus only	2 wire
M-Bus/Pulse/Pulse	5 wire
Pulse/Pulse	3 wire
IZAR BE PULSE	4 wire

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 titanium zirconium oxide (CAS no.: 12626-81-2)

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TECHNICAL DATA

Nominal diameter	DN	mm	15	15	20	20
Permanent flow rate	Q ₃	m ³ /h	1.6	2.5	2.5	4
Overall length	L	mm	110	110	190	190
Dynamic (Q ₃ /Q ₁)	R		400	800	800	800
Overload flow rate	Q ₄	m ³ /h	2	3.125	3.125	5
Transitional flow rate	Q ₂	l/h	6.4	5	5	8
Minimum flow rate	Q ₁	l/h	4	3.13	3.13	5
Starting flow rate		l/h	1.4	1.4	1.4	2.5
Pressure loss at Q ₃		bar	0.19	0.46	0.4	0.4
Pressure loss at Q ₄		bar	0.3	0.72	0.63	0.63
Maximum flow rate ²	Q _{high}	m ³ /h	2.8	4.37	4.37	7
Flow rate at ΔP = 1 bar			3.67	3.69	3.95	5.39

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

³ Please see table DIMENSIONS

APPROVAL

DN 15/20		
Approval		MID DE-19-MI001-PTB012
Dynamic range (Q ₃ /Q ₁)	R	Up to 800
Standards		EN 4064, EN 14154, OIML R49
Sanitary conformity		AoC DEU, ACS, WRAS and others
LoRaWAN® certification		1.0.2

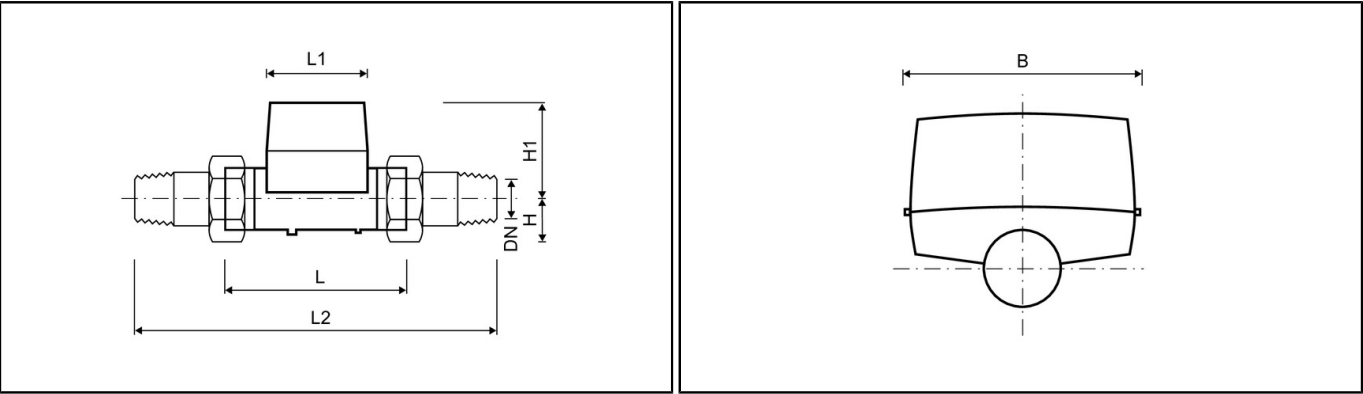
DYNAMIC RANGE (R=Q₃/Q₁)

DN 15/20		
Q ₃ 1.6 m ³ /h - T30 / T50	R	400
Q ₃ 1.6 m ³ /h - T70 / T90	R	400H; 250V
Q ₃ 2.5 m ³ /h - T30 / T50	R	160; 800
Q ₃ 2.5 m ³ /h - T70 / T90	R	160; 400; 800H / 400 V

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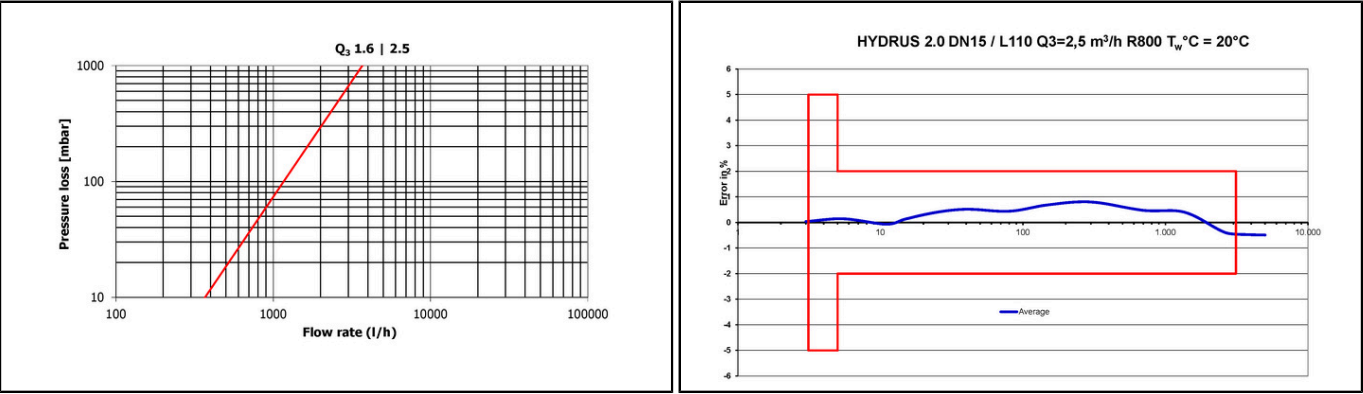
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DIMENSIONS



Nominal diameter	DN	mm	15	15	20	20
Permanent flow rate	Q ₃	m ³ /h	1.6	2.5	2.5	4
Overall length	L	mm	110	110	190	190
Counter length	L1	mm	89	89	89	89
Counter width	B	mm	89	89	89	89
Overall length with coupling	L2	mm	190	190	290	290
Connection thread on meter		Inch	G ³ / ₄ B	G ³ / ₄ B	G1B	G1B
Connection thread of coupling		Inch	R ¹ / ₂	R ¹ / ₂	R ³ / ₄	R ³ / ₄
Height	H1	mm	71	71	74	74
Weight without coupling (approx.)		kg	0.5	0.5	0.6	0.6
Weight with coupling (approx.)		kg	0.9	0.9	1.0	1.0
Height	H	mm	18	18	21	21

PRESSURE LOSS GRAPH / TYPICAL ERROR GRAPH



Pressure loss graph

Typical error graph