ADM METERS LLP

WMAP EVO
BULK METER

ARROW
MODULE SYSTEM

DS ASDG

MAG 5100 W

DS TRP

DS ASD

ELECTO SONIC

BRASS BALL VALVE

FERRULE

AQUACY PUNE

CATALOGUE

Residential Use

DS TRP WATER METER

IS 779:1994

LICENCE MADDALENA

IP 68 APPROVED

Sealed register permanently protected dial multi-jet meter

DS TRP is the latest range of sealed register permanently protected dry dial multi-jets by ADM designed to meet the strict requirements of the Directive IS 779:1994.

DS TRP combines high performance at low flow rates and maximum resistance to high flow rates and pressure.

DS TRP is designed for remote communication: it may be equipped with a pulser of the latest generation and a radio module maintaining the mechanical and metrological characteristics and without affecting readability.

DS TRP is guaranteed by ADM under the licence of MADDALENA (Italy): manufacturer of high quality measuring instruments for the past century.

ADM METERS LLP
IMPECCABLE TECHNOLOGY

In Collaboration with

maddalena®
Italy

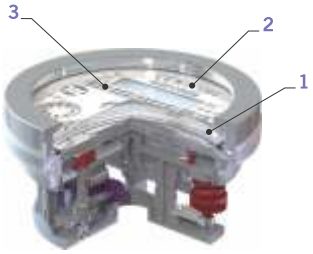
DS TRP WATER METER

DS TRP multi-jet water meters feature a sealed register and permanently protected dial design.
The plate showing the measurement and the IS 779:1994 inscriptions does not come into contact with the flowing water.
As a result it remains perfectly clear ensuring reading with scaling and ferrous water and suspended particles contained in water.
Readability is also ensured by the mineral tempered glass lens which has a flat and smooth surface and, unlike plastic lenses, is scratch resistant and does not turn opaque.
DS TRP meters are unaffected by external magnetic interference and are tamper proof. Performance is unaffected by the installation conditions and the water characteristics.
DS TRP water meters may be equipped with a new generation bidirectional static pulser. The pulser may also be retrofitted in **pre-equipped water meters** maintaining the meter characteristics, the design and **the mineral glass lens.**

NEW VERSION

DS TRP meters are now available in a new version ready for retrofitting an inductive pulser. They are the only sealed register meters available in this design and that retain the glass lens. This has been made possible by the introduction of a new glass (GORILLA GLASS), widely used in electronic devices, that enables the use of a fully non-magnetic sensor (patent pending).

DS TRP water meters are certified in accordance with the Directive IS 779:1994.
DS TRP water meters are also certified for use with potable water in accordance with IS 779:1994.



Technical Specifications

- **Tempered mineral glass** lens of adequate thickness **(1)**
  The inductive design features a high-performance glass lens
- **The numbered drums, the cubic meter fractions, the inscriptions and the serial number are in the sealed register and do not come into contact with water ensuring continued readability (2)**
- Pre-equipped meters maintain both the mineral glass lens and the standard inscriptions
- **The serial number is marked on the dial both in digits and in barcode form. It is also marked on the closing ring (3)**
- No upstream or downstream straight pipe requirements
- Installation in vertical pipes available on DN 15 and DN 20 meters (see relevant data sheet)
- R50 meters for vertical installation are also available
- PiiP certification mark available upon request on Q_3 2.5 water meters
- Internal and external epoxy powder coating
- Stainless steel numbered drums' shaft
- Inlet strainer with wide straining area
- Non-return valve available upon request
- Internal components made of anhygroscopic, anti-scaling and wear resistant plastic materials
- Maximum water temperature: 50 °C; 90 °C version available on request (not approved)
- Nominal working pressure: 16 bar

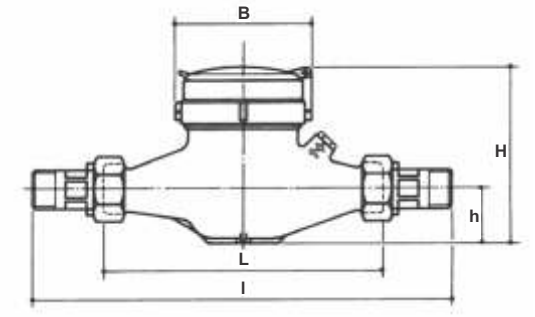
AQUACY PUNE

HYDRAULIC PERFORMANCE

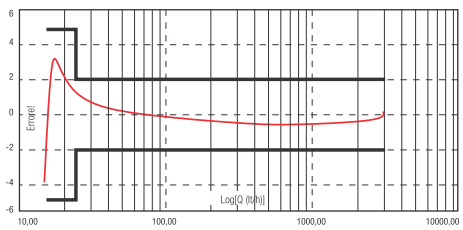
Size	mm	15	20	25	30	40	50
	in	½"	¾"	1"	1.¼"	1. ½"	2"
Performance in accordance with IS 779:1994, class B							
Q_{min}	l/h	30	50	70	100	200	450
Q_t	l/h	120	200	280	400	800	3000
Q_n	m^3/h	1.5	2.5	3.5	5	10	15
Q_{max}	m^3/h	3	5	7	10	20	30
Real performance							
Q_{min}	l/h	25	25	50	50	100	450
Q_t	l/h	37.5	37.5	75	75	150	3000
Q_n	m^3/h	1.5	2.5	3.5	5	10	15
Q_{max}	m^3/h	3	5	7	10	20	30
Starting flow rate	l/h	8-10	8-10	20-22	23-25	25-30	30-35
Head of loss at Q_{max}	bar	0.6	0.8	0.5	0.95	0.85	0.9
Head of loss at Q_n	bar	0.15	0.2	0.13	0.25	0.22	0.23
Nominal pressure	bar	16	16	16	16	16	16
Maximum reading	m^3	100,000	100,000	100,000	100,000	1,000,000	1,000,000
Minimum reading	l	0.05	0.05	0.05	0.05	0.05	0.05
Turbine revolutions per litre		19.41	19.41	10.04	10.04	4.40	3.16
Weight	kg	1.450	1.610	2.300	2.370	4.500	9.500 threaded 14.000 flanged
Pulse options	l/pulse	1-10 (Quadraplus); 1-10-100-1000 (reed switch)					

DIMENSIONS

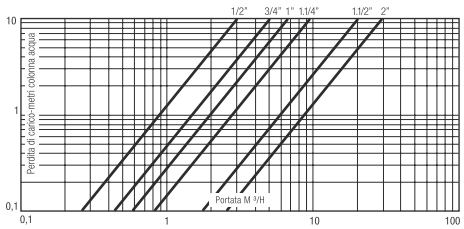
Length (L)	mm	110-130 145-160-165 170-190	160-190	220-260	220-260	300	300
Length with couplings (l)	mm	190-210-225 240-245-250	258-288	378	378	438	461 (flanged 300)
H	mm	114	114	123	123	163	175
h	mm	36.5	36.5	43	43	64.5	77
B	mm	97.5	97.5	97.5	97.5	130	154



Typical error curve



Head loss diagram



ACCESSORIES

SINGLE REED SWITCH PULSER
Suitable for industrial batching.

QUADRAPLUS PULSER
Static bidirectional pulser; equipped with false pulse detection device; battery-powered.

ARROW RADIO MODULE
In combination with the Quadraplus static pulser or the single reed switch pulser it enables the remote reading of water meters.

NON-RETURN VALVE
Mounted in the meter outlet to protect it from backflow.

COUPLING KIT
It includes two nuts, two tail pieces and two gaskets.

SEALS
Designed to secure the water meter to the pipe.

For more information on the accessories please refer to the relevant data sheet.

ADM METERS LLP
IMPECCABLE TECHNOLOGY

Plot No 7, Block No. 22, Opp. Ramdev Masala,
near Zydus Biotech Park, Sarkhej-Bavla Highway,
Changodar, Gujarat - 382 210.

Phone: +91 99981 11064 / +91 98985 07911
Email: info@admmeters.com
Web: www.admmeters.com

For more information, please contact your sales representative.

AQUACY PUNE

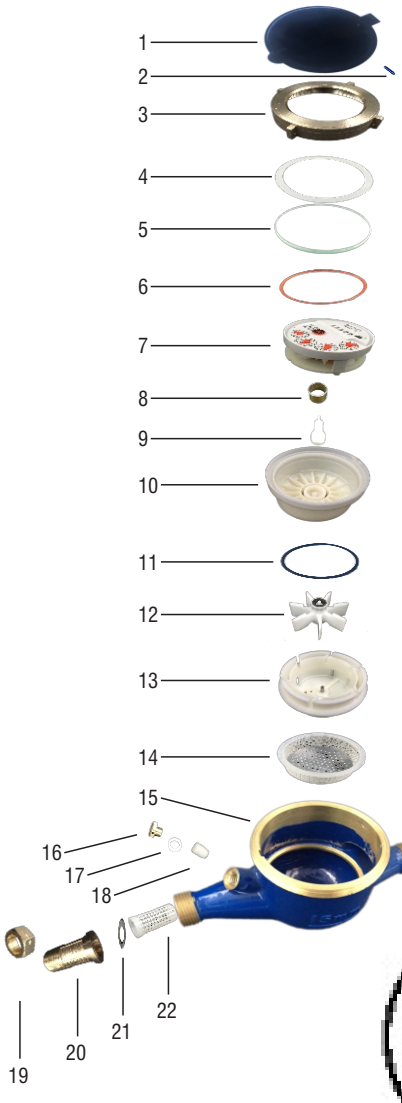
Rev. 0 09/17 ADM I Subject to technical change

Residential Use

DS ASDG WATER METER

PRODUCT FEATURE:

- Multi-jet, Rotaryvane wheel type.
- Dry-dial, Magnetic drive, Resistance to exterior magnet interface.
- Selected high quality materials for steady, reliable characteristic & good looking.
- Vacuum sealed register ensures the dial kept free from fog and keep the reading clear in a long term service.
- Measuring accuracy conform to ISO 4064 Class B Standard.
- Universal use. Easy for interchange and maintenance.
- Brass body
- Hot water meter, remote reading transmission system and anti-theft device, the pulse constant:
  10 L/Pulse, 100 L/Pulse, 1000 L/Pulse for option.
  (optional at additional cost)



1. Lid
2. Hinge Pin
3. Cover
4. Cover Gasket
5. Glass
6. O-Sealing Ring
7. Register
8. Magnetic Protecting Ring
9. Center Gear
10. Gear Unit
11. Seal Washer
12. Vane Wheel Assembly
13. Vane Wheel Box
14. Stainer
15. Brass Body
16. Adjusting Screw
17. Washer
18. Plug
19. Nut
20. Nipple
21. Rubber Washer
22. Filter

AQUACY PUNE

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IMPECCABLE TECHNOLOGY

Plot No. 7, Block No. 22, Opp. Ramdev Masala,
Nr. Zydus Cadila Biotech Park, Sarkhej - Bavla Highway,
Changodar, Ahmedabad, Gujarat - 382 213.

Phone: +91 99981 11064 / +91 98985 07911
Email: info@admmeters.com
Web: www.admmeters.com

DS ASDG WATER METER

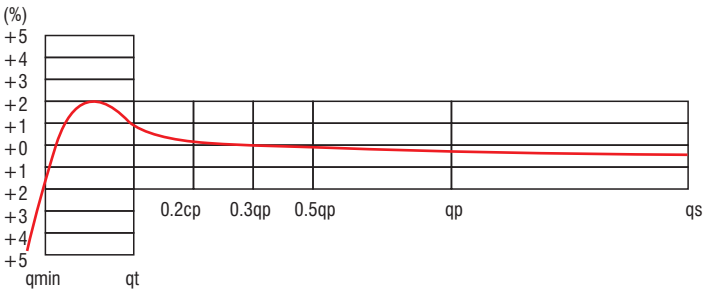
HYDRAULIC PERFORMANCE

Size	mm	15	20	25	32	40	50
	in	½"	¾"	1"	1.¼"	1.½"	2"
Performance in accordance with IS 779:1994, class B							
Q_{min}	l/h	30	50	70	120	200	450
Q_t	l/h	120	200	280	480	800	3000
Q_n	m^3/h	1.5	2.5	3.5	6	10	15
Q_{max}	m^3/h	3	5	7	12	20	30
Starting flow rate	l/h	14	16	19	25	56	70
Maximum reading	m^3	99999	99999	99999	99999	99999	99999
Minimum reading	m^3	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Weight	kg	1.5/1.6	1.7/1.8	2.6/2.4	2.8/2.7	5.4/4.5	7.2 threaded 14 flanged
Pulse options	l/pulse	10L/Pulse, 100L/Pulse, 1000L/Pulse					

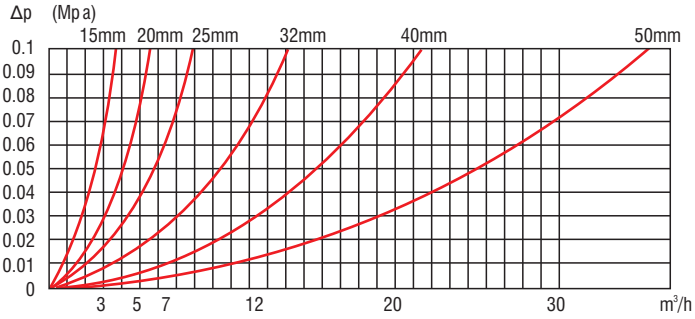
DIMENSIONS

Length (L)	mm	165/190	190/195	260/225	260/230	300/245	300 280
Connecting thread (D)		G3/4B	G 1B	G1-1/4B	G1-1/2B	G 2B	G2-1/2B G B/17241.2 D=165 D1=125

FLOW ERROR CURVE



HEAD LOSS CURVE

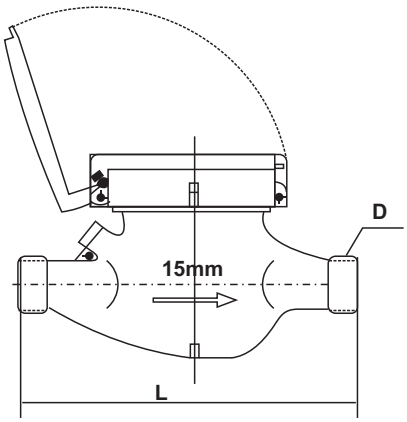


WORKING CONDITION

Water temperature: $0^0C \leq t \leq 40^0C$ (For cold water meter)

MAXIMUM PERMISSIBLE ERROR

- In the lower zone from Qmin inclusive up to but excluding Qt is ± 5%.
- In the upper zone from Qt inclusive up to and including Qs is ± 2%.



MAKE IN INDIA

For more information, please contact your sales representative.

AQUACY PUNE

Rev. 0 07/2018 AMD I Subject to technical change

Bulk Meters

WMAP EVO WATER METER

Axial helix Woltmann meter with interchangeable mechanism

WMAP EVO is the advanced range of Maddalena Woltmann water meters.
This range of dry dial, interchangeable mechanism water meters has been developed in order to meet the strict requirements of the Directive 2014/32/EU (MID) and European Standard ISO 4064.
WMAP EVO meters can be equipped with a static pulser or a radio module maintaining the mechanical and metrological features and without affecting readability.
The radio modules available support various transmission technologies (wireless M-Bus, LoRaTM, Sigfox). The continuous improvement of hydraulic performance has made it possible to obtain a measuring range (Q_3/Q_1) of R250.
WMAP EVO meters are guaranteed by Maddalena: manufacturer of high quality measuring instruments for a century.

maddalena®
METERING EXPERTISE

ADM METERS LLP
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WMAP EVO WATER METER

WMAP EVO is an axial helix (the axis of the helix is coaxial to the axis of the pipe) Woltmann meter with removable mechanism. The magnetically driven register operates in a dry compartment: the helix is the only component in contact with the network water. The register is housed in a copper can and glass lens enclosure for waterproof protection (IP68).
WMAP EVO meters are pre-equipped for three pulse outputs (one inductive output and two reed switch outputs) as a standard. This allows the meters to be retrofitted with a pulser or radio module without affecting their functionality and design. The radio modules available support various transmission technologies (wireless M-Bus, LoRa™, Sigfox).
WMAP EVO meters can be installed both in horizontal and vertical position. Performance is unaffected by the installation conditions or the water characteristics.
WMAP EVO meters comply with the Directive 2014/32/EU (Annex MI-001) and have undergone conformity assessment procedure B+D.
The maximum measuring range (Q_3/Q_1) certified is 250. Lower measuring ranges are also available (R200, 160, 100, 80, etc.).
WMAP EVO meters are certified for use with potable water in accordance with Italian (Ministerial decree 6 April 2004 no. 174) and international regulations.

WMAP EVO with
ARROW^{WAN} radio module

Structural and functional features

Copper can register and transparent mineral glass lens (IP68)

The register is housed in a dry compartment, which has no contact with the water, for continued readability

The serial number is printed on the dial both in numbers and in barcode format

The MID inscriptions are engraved on a metallic label applied on the flange

Direct read dial with 7 numbered drums for cubic meters (8 on DN 180 and DN 200 meters) and 2 pointers for decimals

Plastic cover and lid

Cast iron flanged body; internal and external epoxy powder coating

Steel pivot, synthetic sapphire bearing

Internal mechanism made of anhygroscopic, anti-scaling and hard-wearing plastic materials

The pulsed version retains the metrological seal and is protected by a cover

No upstream and downstream straight pipe requirements (U0-D0)

Maximum operating temperature: 50 °C

Nominal pressure (PN): 10 bar or 16 bar

Hydraulic tests are carried out at three flow rates (Q_1, Q_2, Q_3) on all the meters. Our testing benches comply with the Standards ISO 4064/3 and ISO 4185 (EN 14154/3) and are approved by a European notified body

AQUACY PUNE

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HYDRAULIC PERFORMANCE

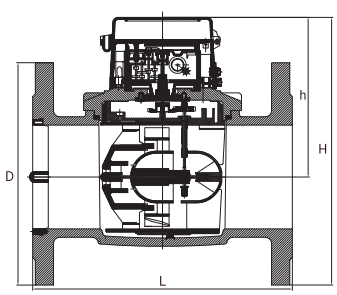
Size	mm	50	65	80	100	125	150	200
	in	2	2.½	3	4	5	6	8
Module B no.		TCM 142/17-5473						
Module D no.		0119-SJ-A010-08						
MID metrological class R Q_3/ Q_1		H↑ ≤ 250 H→; V↑; V↓ inclined ≤160					H↑; V↑; inclined ≤250 H→; V↓; ≤125	
Performance in accordance with Directive 2014/32/EU								
Q_3	m^3/h	40	63	100	160	160	250	400
Q_4	m^3/h	50	78,8	125	200	200	312.5	500
R 250								
Q_1	l/h	160	250	400	640	640	1,000	1,600
Q_2	l/h	260	400	640	1020	1,020	1,600	2,560
R 100 (standard)								
Q_1	l/h	400	630	1,000	1,600	1,600	2,500	4,000
Q_2	l/h	500	788	1,250	2,000	2,000	3,125	5,000

TECHNICAL FEATURES

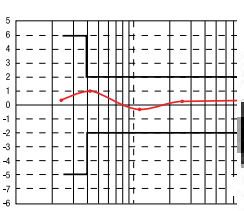
Maximum permissible error between Q_1 and Q_2 (excluded)		+/- 5%						
Maximum permissible error between Q_2 (included) and Q_4		+/- 2% with water temperature ≤ 30° C +/- 3% with water temperature > 30° C						
Temperature class		T50						
Flow profile sensitivity classes		U0 - D0						
Starting flow rate	l/h	125	190	320	450	700	1200	1800
Head loss (ΔP @ Q_3)		ΔP25	ΔP40	ΔP25	ΔP40	ΔP40	ΔP16	ΔP40
Working pressure	bar	10/16	10/16	10/16	10/16	10/16	10/16	10/16
Maximum registration	m^3	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	100,000,000	100,000,000
Minimum registration	m^3	0.002	0.002	0.002	0.002	0.002	0.02	0.02
Turbine revolutions/litre		1.08	1.02	0.39	0.32	0.40	0.25	0.15
Weight	kg	10.0	11.2	15.2	17.2	22.4	29.0	42.6
Pulse options Reed switch pulser V max. ≤24V; I max. 0.1A	l/pulse	10-1,000	10-1,000	10-1,000	10-1,000	10-1,000	100-10,000	100-10,000
Pulse options Inductive pulser V max. ≤24V; I max. 0.1A	l/pulse	10	10	10	10	10	100	100

DIMENSIONS

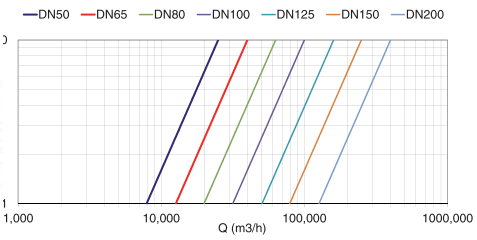
L	mm	200	200	225	250	250	300	350
H	mm	209	218	249	258	271	316	345
h	mm	132	132	154	154	154	183	183
D	mm	165	185	200	220	250	280	340



Typical error curve



Head loss



ACCESSORIES

ARROW^{WAN} WMAP 169 MHz

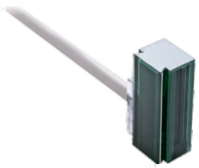
Compact radio module with inductive sensor.
Compatible with wireless M-Bus, AFNOR E17Z and LoRa™ systems.

ARROW^{WAN} WMAP 868 MHz

Compact radio module with inductive sensor.
Compatible with wireless M-Bus, LoRaWAN™ and Sigfox systems.

ARROW RADIO MODULE

Used in conjunction with a pulser for remote meter reading.



SINGLE REED SWITCH PULSER

Suitable for transmission of consumption data and industrial batching.

COUNTERFLANGE KIT

It consists of two flanges, two rubber gaskets and screws.

FLOW STRAIGHTENER

It allows the meter to be installed without straight pipe sections.
To be fitted upstream of the meter.

For more information on the accessories please refer to the relevant data sheet.

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ICIM UNI EN ISO 9001:2015 CERTIFIED MANAGEMENT SYSTEM

Rev. 1 09/17 | Subject to technical change

ElecTo

ELECTO SONIC

AQUACY PUNE

ELECTRONIC ULTRASONIC METER

ElecTo SONIC is the ultrasonic meter offering built-in data communication thanks to its innovative electronic register with multi-protocol radio communication facilities. It ensures excellent performance in all installation conditions and is insensitive to the chemical and physical characteristics of water. It is the ideal solution for Utility installations. Its wide 9-characters LCD display (digits and symbols) makes it very easy to read, while providing additional information to both users and operators. ElecTo SONIC supports remote data reading with fixed and mobile system, while offering maximum interoperability.

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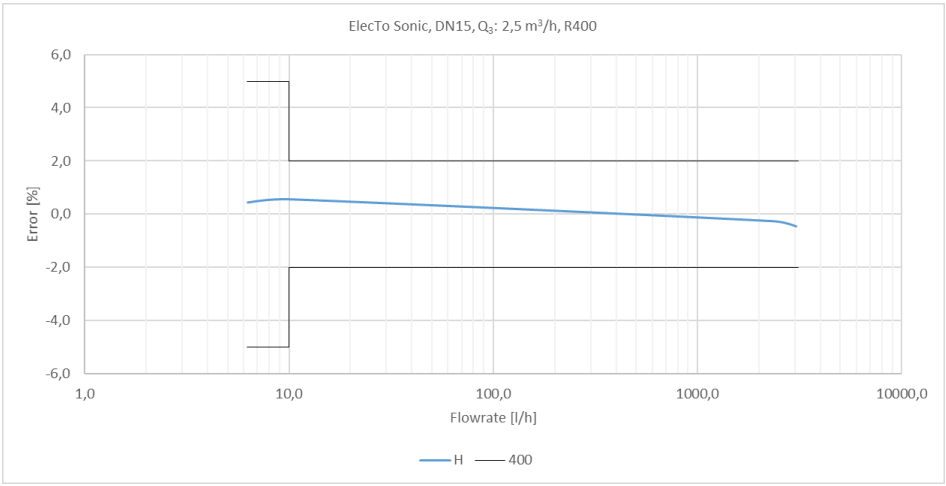
ELECTO SONIC

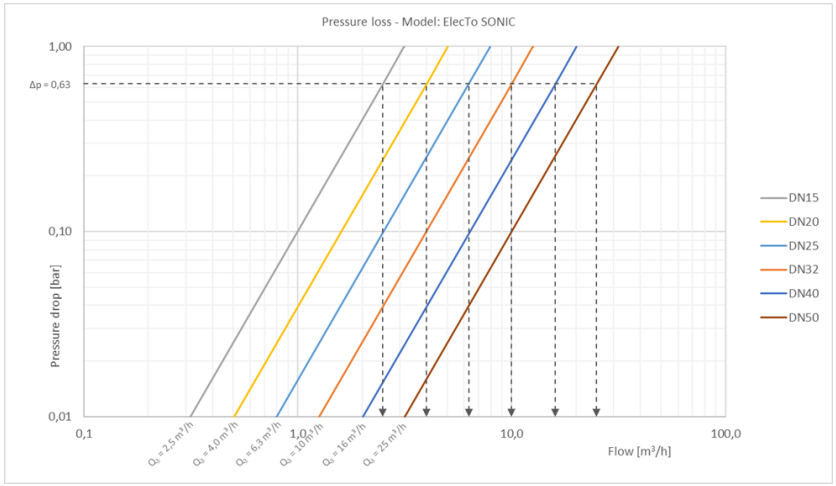
FEATURES

- Ultrasonic measuring technology
- DN: 15 to 50
- MID certificate: R MAX 800
- Health certifications available for a number of countries
- IP68 protection rating
- 9-characters display (digits and symbols)
- Datalogging with a storage capacity of over 11,000 values
- Integrated wM-Bus and LoRaWAN radio (battery life with default configuration 16 years)
- Optimized antenna for maximum radio range
- NB-IoT integrated radio available
- Fault detection: low water temperature, low battery, empty line / air, overconsumption, no consumption, reversed meter, leakage, backflow and expiry of testing period
- Local NFC interface
- Programming and testing kit available upon request
- For further information on electronic register and radio transmission functions, please refer to the instruction manual

TYPICAL ERROR CURVE



HEAD LOSS DIAGRAM



METROLOGICAL PERFORMANCE

Size	mm	15	20	25
	in	½	¾	1

Module B no.		IT-041-22-2213			
Module D no.		0119-SJ-A010-08			
Q_3/Q_1 = R Referred to installation position		Any ≤ 500	Any ≤ 800	Any ≤ 500	Any ≤ 800
MID standard performance *					
Q_3	m^3/h	1,6	2,5	4,0	6,3
Q_4	m^3/h	2	3,13	5	7,88
R		250	400	250	400
Q_1	l/h	6,40	6,25	10	15,75
Q_2	l/h	10,24	10	16	25,20

* Other values of R available upon request.

TECHNICAL DATA

Maximum permissible error between Q_1 and Q_2 (excluded)	+/- 5%
Maximum permissible error between Q_2 (included) and Q_4	+/- 2% with water temperature ≤ 30°C +/- 3% with water temperature > 30°C
Temperature class	T50
Flow profile sensitivity classes	U0 – D0

Starting flow rate	l/h		5	7
Head loss		ΔP63		
Nominal pressure	bar	16		
Maximum reading	m^3	999.999		
Minimum reading	l	0,001		
Indicative weight	kg	0,67	0,76	1,32

AQUACY PUNE

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Italy

METROLOGICAL PERFORMANCE

Size	mm	32	40	50
	in	1 ¼	1 ½	2

Module B no.			IT-041-22-2213	
Module D no.			0119-SJ-A010-08	
Q_3/Q_1 = R Referred to installation position			Any ≤ 800	
MID standard performance *				
Q_3	**m³/h**	10	16	25
Q_4	**m³/h**	12,50	20	31,25
R			**400**	
Q_1	**l/h**	25	40	62,5
Q_2	**l/h**	40	64	100

* Other values of R available upon request.

TECHNICAL DATA

Maximum permissible error between Q_1 and Q_2 (excluded)			+/- 5%	
Maximum permissible error between Q_2 (included) and Q_4			+/- 2% with water temperature ≤ 30°C +/- 3% with water temperature > 30°C	
Temperature class			T50	
Flow profile sensitivity classes			U0 - D0	
Starting flow rate	**l/h**	12	25	31
Head loss			ΔP63	
Nominal pressure	**bar**		16	
Maximum reading	**m³**		999.999	
Minimum reading	**l**		0,001	
Indicative weight	**kg**	1,55	2,12	3,2

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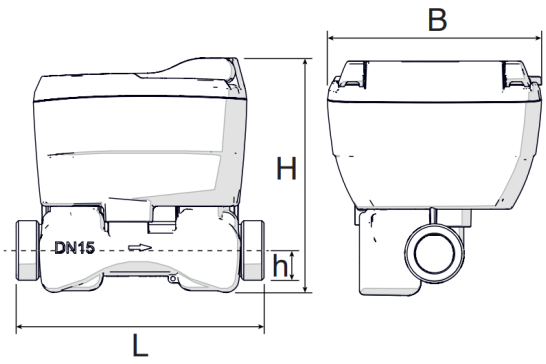
DIMENSIONS



Size	mm	15	20	25
	in	½	¾	1

Thread	in	G ¾ B | G 1 B	G 1 B	G 1 ¼ B
L	mm	110/165	130/190	160/260
H	mm	104	105	119
h	mm	19	21,5	25
B	mm		95	

Size	mm	32	40	50
	in	1 ¼	1 ½	2

Thread	in	G 1 ½ B	G 2 B	G 2 ½ B
L	mm	160/260	200/300	300
H	mm	119	126	143
h	mm	29	34	38,5
B	mm		95	

AQUACY PUNE

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In Collaboration with
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Italy

ElecTo

E-BULK

STATIC METER

E-BULK is the modern solution for large volume metering in the utility, industrial and commercial sectors. Thanks to the ease of use of ultrasonic technology in these fields, E-BULK provides excellent levels of performance in all conditions of installation. Its extremely low starting flow rate, its wide measuring range and the absence of moving parts allow the accounting of the entire consumption, making it easier to identify leaks. E-BULK makes mechanical meters obsolete, particularly combined meters. Robust, long lasting and suitable for the most challenging environments. It can be equipped with the latest remote data transmission technologies.

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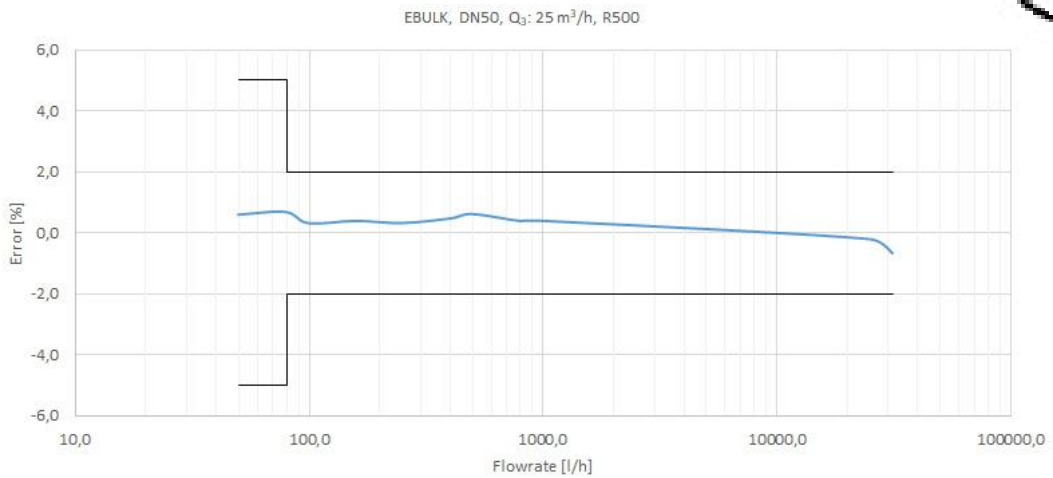
E-BULK

FEATURES

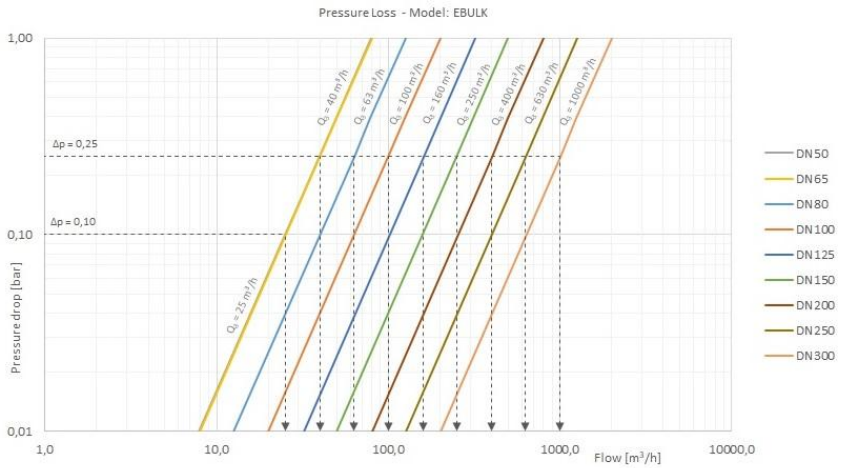
- Ultrasonic meter for cold water
- Ideal for large volumes for utilities and industrial use
- MID-certified: R max 500
- DN: 50÷300*
- Optional 4-20mA analog output, 24V passive
- Health certifications available for a number of countries
- No moving parts
- Can be installed in all positions while maintaining its metrological characteristics
- Large display with information on volume, flow rate and alarms
- IP68 protection rating
- Battery life: 13 years
- Can be provided fitted with wired (Split) or integrated radio communication module (wireless m-Bus)
- Ready for pulse emitter (DN 50÷100) 1P=10L, (DN 125÷200) 1P=100L

*Up to DN400 on request

TYPICAL ERROR CURVE



HEAD LOSS DIAGRAM



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METROLOGICAL PERFORMANCE

Size	mm	50	65	80	100
	in	2	2 ½	3	4

Module B no.			RO-2275-19454		
Module D no.			0119-SJ-A010-08		
Q_3/Q_1 = R **Referred to installation position**			≤ 500		
MID standard performance *					
Q_3	**m³/h**	25	40	63	100
Q_4	**m³/h**	31,25	50	78,75	125
R			**500**		
Q_1	**l/h**	50	80	126	200
Q_2	**l/h**	80	128	201,60	320

* Other values of R available upon request.

TECHNICAL DATA

Maximum permissible error between Q_1 and Q_2 (excluded)			+/- 5%		
Maximum permissible error between Q_2 (included) and Q_4			+/- 2% with water temperature ≤ 30°C +/- 3% with water temperature > 30°C		
Temperature class			T30,T50		
Flow profile sensitivity classes			U0 – D0		
Starting flow rate	**l/h**		10		
Head loss			ΔP25		
Nominal pressure	**bar**		16		
Maximum reading	**m³**		9.999.999		
Minimum reading	**l**		1		
Indicative weight	**kg**	10,3	13	16	17,25

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METROLOGICAL PERFORMANCE

Size	mm	125	150	200	250	300
	in	5	6	8	10	12

Module B no.				RO-2275-19454		
Module D no.				0119-SJ-A010-08		
Q_3/Q_1 = R **Referred to installation position**				≤ 500		
MID standard performance *						
Q_3	**m³/h**	160	250	400	630	1000
Q_4	**m³/h**	200	312,50	500	787,50	1250
R				**500**		
Q_1	**l/h**	320	500	800	1260	2000
Q_2	**l/h**	512	800	1280	2016	3200

* Other values of R available upon request.

TECHNICAL DATA

Maximum permissible error between Q_1 and Q_2 (excluded)		+/- 5%
Maximum permissible error between Q_2 (included) and Q_4		+/- 2% with water temperature ≤ 30°C +/- 3% with water temperature > 30°C
Temperature class		T30,T50
Flow profile sensitivity classes		U0 – D0
Starting flow rate	**l/h**	10
Head loss		ΔP25
Nominal pressure	**bar**	16
Maximum reading	**m³**	99.999.999
Minimum reading	**l**	1
Indicative weight	**kg**	25 / 28 / 35 / 67 / 80

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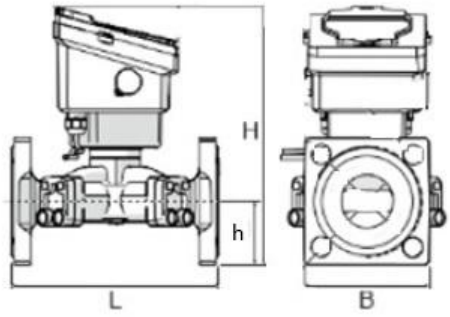
DIMENSIONS



Size	mm	50	65	80	100
	in	2	2 ½	3	4
L	mm	200/270/300	200/300	225/300/350	250/360
H	mm	245	250	275	290
h	mm	65	70	90	100
B	mm	130	140	180	200

Size	mm	125	150	200	250	300
	in	5	6	8	10	12
L	mm	250	300	350	400/450	450/500
H	mm	380	400	470	525	575
h	mm	125	130	170	198	223
B	mm	250	285	340	396	446

COMMUNICATION MODULES

ARROW^{EVO} 868 SPLIT — M-Bus wireless, OMS®

ARROW^{WAN} 169 SPLIT — M-Bus wireless

ARROW^{WAN2} SPLIT — M-Bus wireless, OMS®, LoRaWAN

ARROW^{WAN} NB–IoT SPLIT — NB-IoT

For more information on all the accessories available, consult the specific technical data sheets on the website www.maddalena.it

Systems

ARROW RADIO SYSTEM

ARROW radio system
accurate reading
of consumption data via radio

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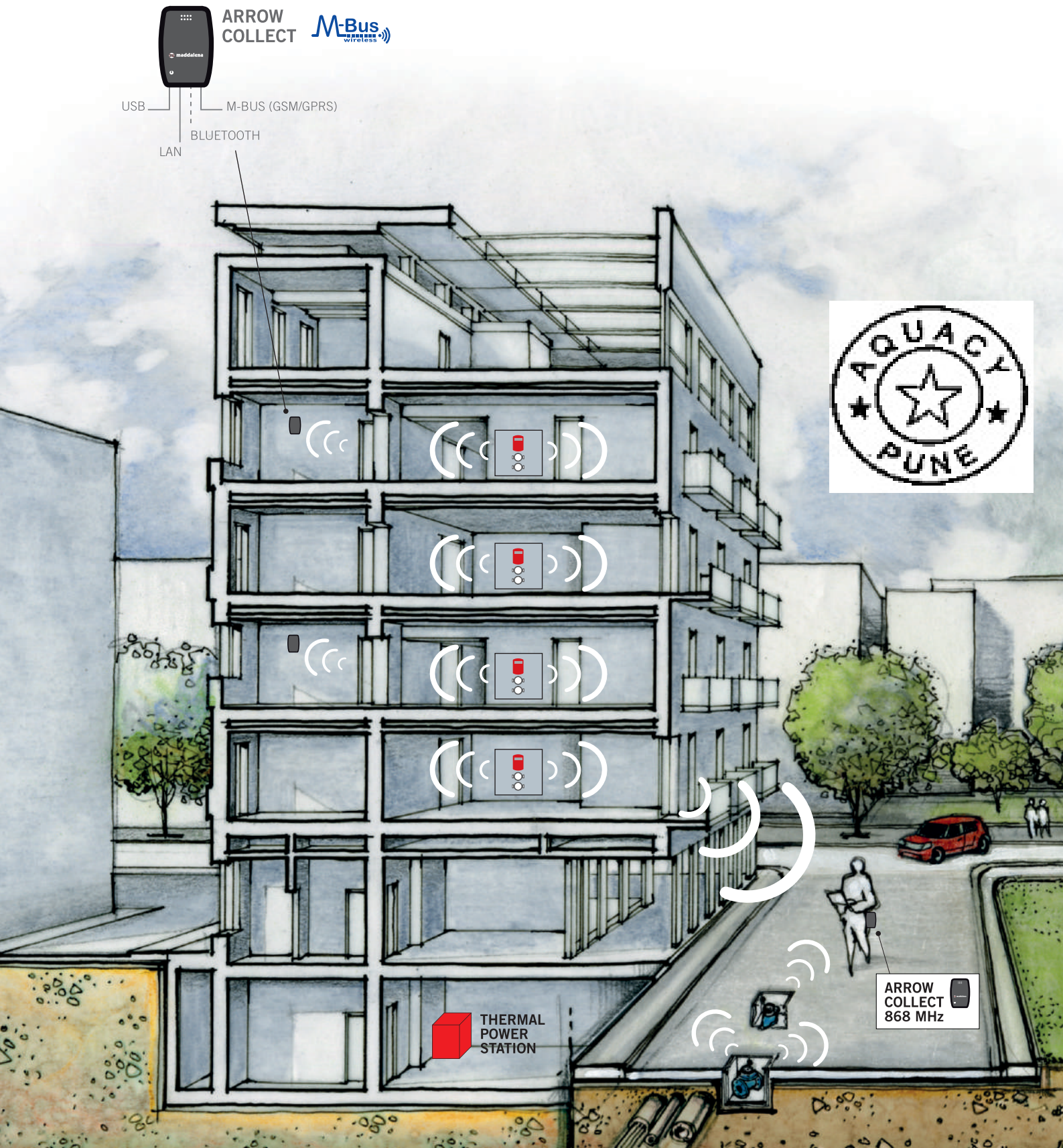
ARROW RADIO SYSTEM

Nowadays, the responsible and sustainable management of valuable resources such as water and heat is of fundamental importance. Remote reading of consumption data is the ideal solution to control the water and energy resources and it is becoming increasingly popular. In fact, the management of data collection with simple and effective systems that optimise and simplify the task, helps to pursue saving these resources.
The ARROW radio system is designed to meet these needs and is the result of Maddalena's over ninety year experience in the field of metering instruments and the ten years of which it has been successfully offering effective remote systems.



REMOTE READING

ARROW is a system designed for faster, easier and better management of the meter reading and control in any installation conditions (manholes under or on the edge of a road, within apartments in an apartment block, in recesses).
The communication protocol and transmission frequency of the data complies with current European regulations.
The meter reader simply has to pass near the meters equipped with the ARROW Collect radio receiver to automatically collect the data without having to access homes, common or shared areas of apartment blocks or manholes.
The collected information is stored in the internal memory of the radio receiver; it can be transmitted via a Bluetooth interface to a mobile device with which the meter reader can check the details of each meter, its location and messages regarding the status of the reading process. All this is possible with ARROW Mobile, a simple software with a clear and intelligible graphics interface.
When the round of readings has been completed, the data can be exported into a standard Excel format without the need for any additional software. This file is configurable and compatible with the most commonly used billing or analysis softwares. The ARROW Mobile software also allows the file of readings to be directly uploaded in remote onto a dedicated FTP server (data connection is required on the mobile device).

SUB-METERING

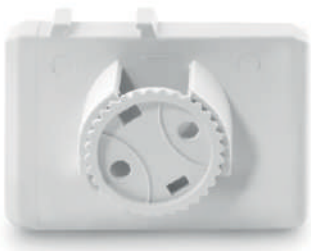
Even where meters are already equipped with the ARROW remote reading system, sub-metering can be implemented at a later date (indoor installation). This makes it possible to perform automatic periodic readings at the frequency required by the user, without having to go on site. The ARROW Collect radio receiver can be used as a permanent radio receiver exploiting the data logging capabilities of its interfaces allowing the collected data to be automatically downloaded through: a mini-USB or Bluetooth (up to 100 metres) or remotely via the M-Bus or LAN
The M-Bus interface connected with the special GSM-GPRS (CMe series) master allows the transmission of data via email, ftp or sms to one or more recipients.
In the case of complex indoor plants, more than one receiver can be installed to ensure the correct reception from all installed meters.
In permanent mode, ARROW Collect has to be externally powered and upon request a suitable wall mounting kit is available.

ARROW RADIO MODULES

ARROW is a two-way 868 MHz Wireless M-Bus (EN 13757) transceiver that records the reading and then transmits it via radio while managing the input pulses, direction signals and alarms (removal, manipulation and presumed leak; ARROW Quadra Plus, ARROW MVM).
ARROW can be used with any type of meter that has a pulse output (ARROW Pulse) or it can be directly connected to the static pulse emitter QuadraPlus for Maddalena CDONE DS TRP and TRP meters (ARROW Quadra Plus version).
A compact radio module dedicated to Maddalena MVM and MVM PLUS C (ARROW MVM) meters is also available.
In this case, the static pulse emitter is integrated in the same container as the radio.
When the meter is installed, the ARROW module must be activated/programmed with the characteristic data, such as serial number, current cumulated consumption, pulse factor, unit of measure, the periodic reading and the associated reading round. This is done via radio using a mobile device with the special ARROW Collect software
Thanks to the complete internal resin of the electronic system and battery, ARROW is waterproof (IP68) and therefore ensures correct operation even in difficult conditions such as installation in manholes or in very damp environments (resistant to water-immersion). Power is supplied by an internal lithium battery (12 years).

TECHNICAL DATA

Radio	868 MHz FSK (EN13757)
Communication protocol	Wireless M-Bus (EN13757)
Certification	CE RTTE
Power supply	1 3V lithium battery
Battery life	12 years
Input	Contact, NPN
Operating temperature	-15 °C ÷ +55 °C
Stock temperature	-15 °C ÷ +55 °C
Enclosure rating	IP68
Programming interface	Via radio, in the vicinity
Size	45 x 69,5 x 33mm (Arrow Pulse)
Transmission distance	From 20 m (manhole) to 500 m (open air)
Installation	Fixing ring to the wall/pipe (ARROW Pulse) or compact on meter (ARROW Quadraplus, ARROW MVM)



Wall fixing ring

ARROW COLLECT

ARROW Collect is a radio transceiver that can be used in mobile or fixed read mode. It enables receipt via radio and storage of the consumption data of meters equipped with Wireless M-Bus (EN 13757) compliant 868 MHz radio module and therefore not necessarily only ARROW modules. It also allows the remote activation and programming of individual ARROW radio modules via Bluetooth, in combination with a handheld device or tablet-PC. It is sufficient for the meter reader to walk near the meter with the device to automatically collect the data. ARROW Collect can also be used without the support of a mobile device: in this case the data collected and stored in the device will be downloaded later via mini USB. The device has a built-in rechargeable lithium battery. ARROW Collect is also designed to be used for remote reading of indoor systems. A classic example is the centralised consumption data in an apartment block (sub-metering). In fact, ARROW Collect can be used as a permanent radio receiver (datalogger function). All the stored readings in the time gap chosen by the user, are then available for download via: miniUSB, Bluetooth (up to 100 metres), LAN, M-Bus, GSM / GPRS (Master CMe or LAN router) . In the case of a permanent installation, ARROW Collect can be wall mounted (with an appropriate kit) and is arranged for an external power supply (only required in permanent mode).
The miniUSB interface of the receiver allows easy upgrade/update of the internal firmware (new releases, changing modes: permanent/mobile.

TECHNICAL DATA

Radio	868 MHz FSK (EN13757)
Supported communication protocols transmission mode	Wireless M-Bus (EN13757), OMS / T1
Certification	CE RTTE
Alimentation	Lithium rechargeable battery, 220V external power supply arrangement (permanent installation)
Rechargeable battery duration	10 hours
Supported firmware	Permanent or mobile
Firmware updating / replacement	Via miniUSB
Internal memory	500 MB F RAM
Max number of manageable counters	Illimitato (modalità mobile) / 500 contatori (modalità fissa)
Max number reading logs	Max number reading logs From 40,000 to 75,000 depending on the radio frame type (water counter, heat counter, distribution frame, etc.)
Available integrated interface	miniUSB, Bluetooth, LAN, M-BUS
Size	150 x 90 x 30 mm
Enclosure rating	IP42
Operating temperature	0 °C ... +60 °C, 10% ... 70% relative humidity
Optional equipment	Box wall mounting kit, Master M-Bus GSM-GPRS, CMe2100 series, Router LAN GSM/GPRS

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Arrow Collect package

MOBILE DEVICE AND SOFTWARE

The activation, programming, reading, and import/export of data is carried out by means of a mobile device with ARROW Mobile management software. ARROW Mobile, installed on a handheld device (Windows Mobile CE) or tablet-PC (Windows), allows real-time monitoring of data collection, reading rounds, master data of the installations and interfaces available. Expensive desktop software licenses are no longer required thanks to ARROW Mobile, as the consumption data that is collected either through ARROW Collect or manually entered are exported to the PC directly in Excel format. This standard file is easy to interface with the most commonly used billing or analysis softwares. In fact, a customised Excel data table can be created by selecting the fields to be displayed among those available and the order in which they are displayed. The ARROW Mobile Software for tablet-PC (Windows) also allows direct uploading of the readings file on a dedicated FTP server (data connection on the device is necessary).

Tablet - PC (Windows)

Handheld Terminal

TRANSMITTED DATA

- Radio module ID
- Meter serial number
- User ID and address
- Current reading, previous reading (last round), consumption data
- Automatic reading at a preset date (programmable)
- Presumed leak alarm (abnormal consumption) and reflux
- Fraud or manipulation alarm
- Emitter removal from counter alarm
- Battery status

COMPATIBLE METERS

ARROW QUADRAPLUS

In this version the **radio module is coupled to the QuadraPlus static pulses emitter**, which is compatible with the Maddalena meters of the CDONE TRP TRP and DS series arranged for data transmission. QuadraPlus is able to discriminate the flow direction and ensures the absolute insensitivity to mechanical vibrations. The use of static sensors coupled to a microprocessor allows the alarms relating to fraud and abnormal consumption to be managed.

COMPATIBLE METERS

CD ONE TRP

DS TRP

ARROW MVM

The compact radio module for Maddalena MVM **counters features a compact size and is easy to install directly on the meter**.
It is equipped with an integrated fully non-magnetic inductive sensor for extremely reliable reading. It also allows the flow direction to be discriminated and management of fraud and abnormal consumption alarms.

COMPATIBLE METERS

MVM

MVM PLUS C

ARROW PULSE

This is compatible with the Maddalena CDSD PLUS, CD ONE TRP, DS TRP series meters. Large utilities and irrigation provided with pulses emitter. **The ARROW Pulse module can, however, be combined with any meter provided with pulses emitter** (even not Maddalena).

MADDALENA SUGGESTS

CDSD EVO and microCLIMA WITH INTEGRATED RADIO
In the case of simple divisional domestic indoor installations, we recommend using integrated solutions. The water meter CDSD EVO Maddalena and all the thermal energy meters of the microCLIMA series can be equipped with an integrated 868 MHz Wireless M-Bus (EN 13757) remote radio module. For further information, please refer to the relevant data sheet.

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Plot No 7, Block No. 22, Opp. Ramdev Masala,
near Zydus Biotech Park, Sarkhej-Bavla Highway,
Changodar, Gujarat - 382 210.

Phone: +91 99981 11064 / +91 98985 07911
Email: info@admmeters.com
Web: www.admmeters.com

ISO 9001 - Cert. n° 0773/5

For more information, please contact your sales representative:

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ARROW^{EVO} module

Compact version

Add-on version

Compact radio module with built-in bidirectional inductive sensor, designed for Maddalena MVM, MVM PLUS C and WMAP EVO water meters.

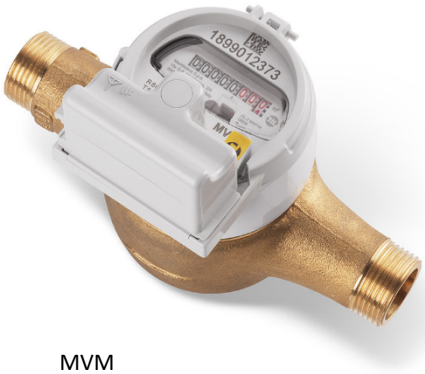
Add-on version also available. It mounts on compatible pulsed meters.

Designed for reading remotely consumption data and alarms, ensuring ease and efficiency. It is ready for use and the factory settings enable both mobile (walk-by) and fixed (AMR) reading. The factory settings can be changed locally via radio with the configuration kit (optional).

- Inductive, bidirectional sensor (compact version)
- Direct mount, wireless (compact version)
- **868 MHz, with open data protocol wM-Bus (EN 13757), OMS**
- Data transmitted: current volume, historical volume, serial number of the meter, alarms
- **Mobile (walk-by) or fixed (AMR) reading**
- **Battery service life up to 15 years**
- Protection rating: IP68
- Compact size

DESCRIPTION

Based on the inductive principle, which ensures insensitivity to magnetic interference fields, the internal sensor of Arrow^{EVO} detects the revolutions of the meter's pointer, calculates the volume (in both directions) and manages the alerts.
The module manages the following alarms: overflow (the threshold must be activated and can be configured), backflow (threshold set, can be configured), leak, meter blocked or non-used (days threshold set, configurable), magnetic and mechanical tampering (removal).
Arrow^{EVO} complies with the wM-Bus data communication protocol regulated at European level by the standard EN 13757. This ensures interoperability with different reading systems, as well as by third parties.



MVM

WMAP EVO

TECHNICAL SPECIFICATIONS

SENSOR		Inductive (bidirectional) or pulse input (add-on module)
COMPATIBLE METERS		MVM, MVM PLUS C, WMAP EVO or pulsed meters
SENSOR RESOLUTION		Configurable
ALARMS		Tampering, magnetic fraud, backflow, suspected leak, meter blocked, maximum flow rate, meter inverted, removal
CONFIGURATION		Via radio (local interface)
POWER SUPPLY		Battery, service life up to 15 years (depending on the configuration selected)
APPROVALS		CE in accordance with the European standards. EMC: EN 610000-4-2, EN 610000-4-3, ETSI EN 301 489-1 v1.9.2, ETSI EN 301 489-3 v1.6.1, ETSI 300 220 ISO 4064 Ancillary device 6.3
RADIO	STANDARD	Wireless M-Bus, OMS 4.0*
	MODES	C1*, T1
	FREQUENCY	868 MHz
	TRANSMISSION DISTANCE	500 m in line of sight
	REFERENCE STANDARDS	EN 13757; the short frame and very short frame are OMS approved
	DATA TRANSMITTED	- Short frame: current volume, volume on the billing dates, serial number of the meter, alarms - Very short frame*: current volume, volume on the billing dates, serial number of the meter, alarms - Long frame: same as the short frame plus the values of the latest 12 months - Arrow frame (compatible with previous generation): current volume, historical volume, billing date, alarms
ENVIRONMENTAL CONDITIONS		Storage temperature: -20 °C ÷ +60 °C Operating temperature: -10 °C ÷ +55 °C
PROTECTION RATING		IP68

*Factory settings

DATA COLLECTION DEVICES AND SOFTWARE

Maddalena offers a full range of radio transceivers for mobile (walk-by) and fixed (AMR) reading. They are compatible both with Maddalena water meters featuring a wM-Bus interface and with water meters from other brands complying with the standard EN 13757.
The main software and devices for mobile reading are described below.

✓ **USB RADIO TRANSCEIVER (868 MHz)**

Specifically designed for reading wM-Bus devices and changing the factory settings. Available with an antenna that can be connected remotely (kit for car use on request).
Low in price and easy to use.

UniCo >> Universal Connecting Tool (868 MHz)

Powerful and fast wM-Bus radio receiver with built-in rechargeable battery, Bluetooth communication interface. Windows and Android APP

✓ **SOFTWARE ARROW MOBILE**

Mobile reading software for O.S. Windows and Android for Maddalena mobile radio receivers.
The version for Android devices is specifically designed for drive-by reading and enables georeferencing of the meters location.

Arrow NB-IoT

ARROW NB-IOT RADIO MODULE

NB-IoT Radio Module available in a compact version with inductive sensor for direct mounting on the meter, or in a separate version with pulse input to upgrade any compatible pulse-output meter to a smart device. Data communication uses a low-latency UDP protocol with wM-Bus application layer compliant with EN 13757-8:2023, ensuring interoperability and reliability.
NB-IoT connectivity provides long-range coverage via the 4G cellular network, both in urban and suburban environments. Battery-powered operation ensures up to 13 years of autonomy, depending on configuration and transmission frequency.
Activation and configuration are performed via NFC interface using a dedicated Android app or through OTA (Over-The-Air) mode.

COMPACT VERSION

The module is designed for direct installation and sealing on Maddalena MVM meters DN 15÷40; the front cover allows visual access to the totalizer and the dial markings.

SEPARATE VERSION

Five-wire pulse input with the option for installation and sealing on a bracket for pipe, wall, or fixed mounting on Maddalena E-BULK meters.

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Arrow NB-IoT

GENERAL FEATURES

• NB-IoT communication technology (LTE Cat-NB2)
• Communication protocol compliant with MBAL M-Bus adaptation layer standard (EN13757-8:2023)
• Antenna optimized for bands: B3, B5, B8, B20, B28
• Integrated MFF2 SIM (sim-on-chip)
• NFC interface for installation, configuration, and verification (Android app)
• Estimated lifetime of 13 years (depending on configuration type)
• Integrated static memory even in case of depleted battery
• Manual or automatic activation of the radio module

TECHNICAL FEATURES

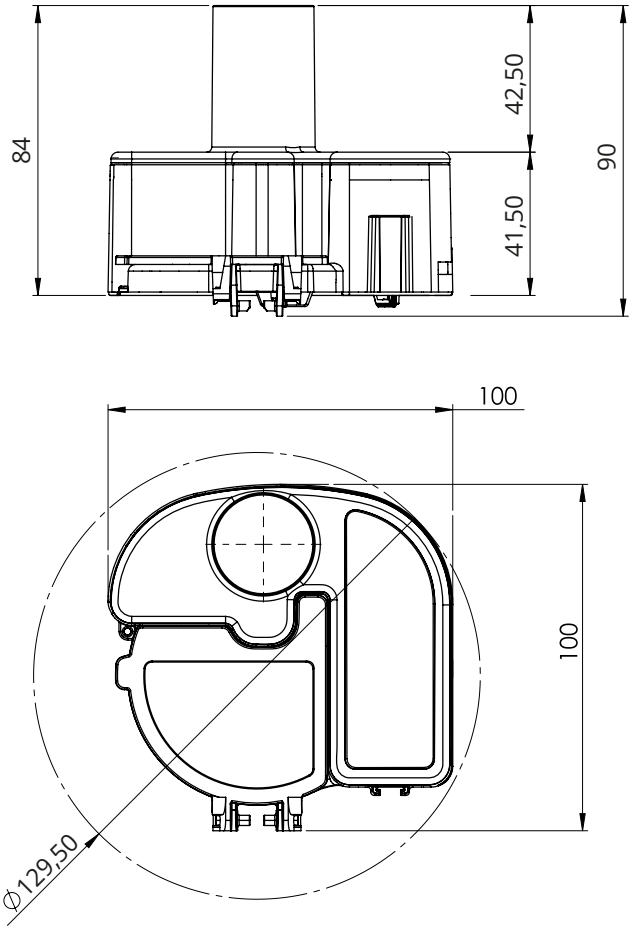
Integrated radio interface	NB-IoT LTE Cat-NB2
TRP (Total Radiated Power)	23 dBm
TIS (Total Isotropic Sensitivity)	-116 dBm
Transmission distance	3-25 km (depending on the frequency band and the network cell load)
Configuration	Factory default or customer-specific
Alarms	Consumption threshold exceeded, no consumption, reversed meter, reverse flow, suspected leak, low battery, magnetic fraud, mechanical fraud
Available data frames	Reading indexes with the following periods: 1 day (hourly consumption delta) 3 days (6-hour consumption delta) 15 days (daily consumption delta)
Operating temperature range	from -10 °C to +55 °C
Grado di protezione	IP68
User interfaces	NFC interface (installation and configuration) Standard contactless interface: ISO 15693 (frequency: 13.56 MHz)
Meter interfaces	Bidirectional inductive sensor (compact version) Open-drain pulse input (split version)
Battery lifetime	Up to 13 years (depending on configuration)

STANDARDS COMPLIANCE

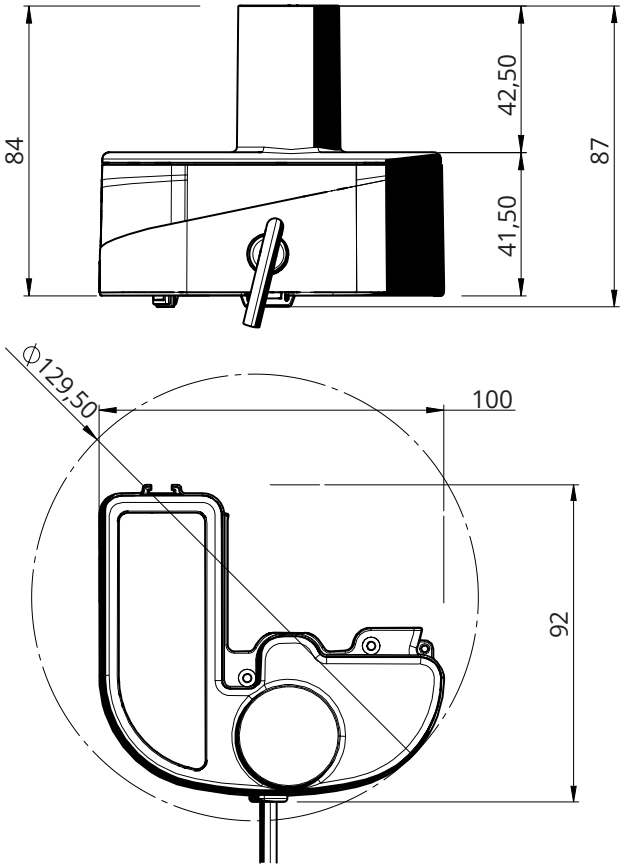
ETSI EN 301 489-1	IEC 62368-1 :2018+COR1 :2020
ETSI EN 301 489-52	EN IEC 62368-1 :2020+A11 :2020+AC :2020
ETSI EN 301 908-13	EN 62479:2010
Directive RoSH2 2011/65/EU	EN 62311
Directive RED 2014/53/EU	Directive EMC 2014/30/EU

DIMENSIONAL FEATURES

Compact version



Split version



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ARROW$^{WAN\ 2}$

SEPARATE RADIO MODULE ARROW^{WAN2}

Separate wMBus and LoRaWAN™ radio module for the ISM 868 MHz band for water meters equipped with pulse sensor. Compatible with all Maddalena meters from DN 15 to DN 300.
Data communication protocol compliant with the OMS wMBus (EN 13757) and LoRaWAN™ standards.
The multiprotocol radio guarantees a high level of interoperability with a range of mobile and fixed reading systems, including third-party ones.
Battery powered, with a battery life of up to 15 years (depending on the type of configuration and the number of readings/transmissions).
Activation and configuration are carried out locally using the NFC interface and a dedicated Android app.

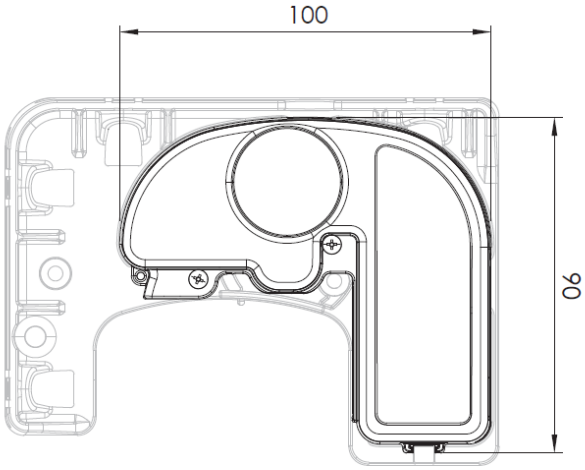
MAIN FEATURES

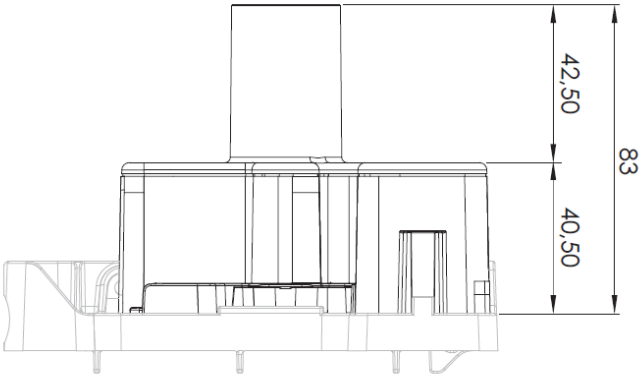
- ISM Band 868 MHz
- Communication protocol compliant with the OMS wMBus and LoRaWAN™ standards.
- wMBus protocol in T1, C1 communication mode
- LoRaWAN™ protocol with two-way communication
- Dual or single mode operation available
- Low-power pulse meter interface
- Omnidirectional internal antenna
- Easy installation using mounting bracket (code 5300020A): wall, pipe (vertically or horizontally) or E-BULK meter.

TECHNICAL SPECIFICATIONS

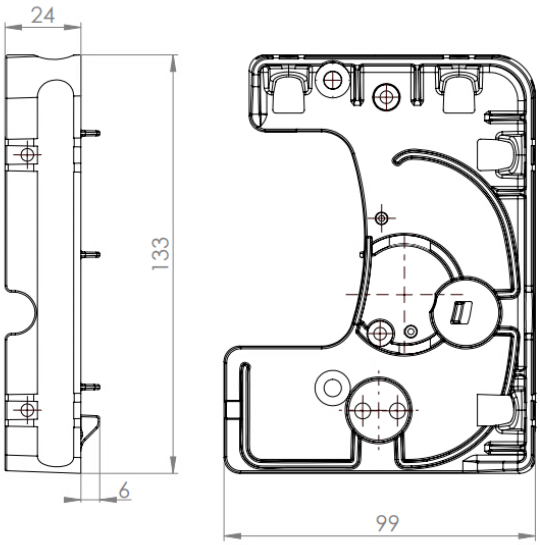
Built-in radio interface	EN 13757 OMS - wM-Bus T1, C1 LoRaWAN™ v. 1.03 class A - LoRa SF7-12, BW125-500, CR=4/5
Operation frequency band	863 to 870MHz
Reception sensitivity	Up to -136 dBm (maximum)
Transmission power	Up to 14 dBm (25 mW)
Transmission range	Up to 500 m with wM-Bus Up to 15 km with LoRaWAN
Configuration	Factory default or customer-specific, configurable
Data	Reading indexes (depending on configuration)
Alarms	Excess consumption, no consumption, reversed meter, return flow, leak, low battery, magnetic fraud, mechanical fraud
Operating temperature range	-10 °C to +55 °C
Protection rating	IP68
Meter interface	4 wire: earth, pulses, flow direction, fraud Types of meters supported: open drain transistor, reed switch or any other open/close switch Maximum pulse frequency: 12.5 Hz nominal Minimum pulse width: >40 ms nominal Cable length: 1.5 m nominal
User interfaces	NFC interface (installation and configuration procedure) Standard contactless interface: ISO 15693 (frequency: 13.56 MHz)

DIMENSIONS (mm)





MOUNTING BRACKET DIMENSIONS (mm)



Pipe installation

Installation on E-BULK meter

Wall installation
(with screws not supplied)

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IMPECCABLE TECHNOLOGY

Reed switch TRP

Reed switch pulser for CD/SJ and DS TRP multi-jet. Gives a number of pulses proportional to the volume flowed

- Pulse options:
  CD/SJ ONE, DS TRP: 1 pulse every 1/10/100/1000 L
- Retrofits to pre-equipped meters
- Easy to install and replace
- No influence on the meter's performance
- Designed for remote reading systems, batching systems, etc.

TECHNICAL FEATURES

- Resin potted reed switch contact
- Protection rating: IP68
- Contact ratings: 24 Vac/Vdc, 0.1 A
- Cable length: standard 1 m
- Operating temperature:

  -10°C ÷ +50°C (DS TRP)

  -10°C ÷ +90°C (CD/SJ ONE)
- Storage temperature: -20 °C ÷ +70 °C

AQUACY PUNE

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Thank you