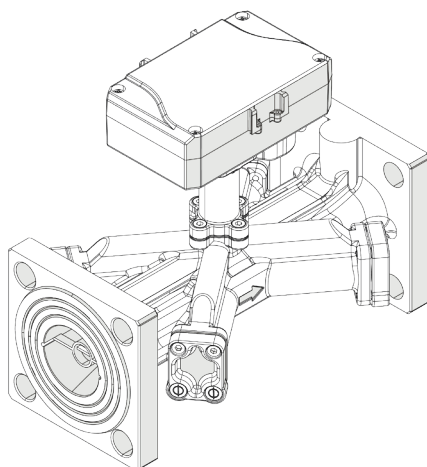


K-BULK

Ultrasonic flow meter



INSTRUCTIONS FOR INSTALLATION, USE AND MAINTENANCE

Translation of the original instructions.

Before installing and using the device, please read this manual carefully and keep it with the product.

Symbols used in this manual and relative meaning



WARNING!

Indicates particularly important information.



DANGER!

Identifies actions that may lead to injury or damage to the device if not performed correctly.



PROHIBITED

Indicates actions that **MUST NOT** be performed..

Compliance

Maddalena S.p.A. declares that **K-BULK** is compliant with the mandatory requirements of the following directives and standards:

- Direttiva 2014/32/UE MID (Measurement Instruments Directive)
- Direttiva 2011/65/UE and subsequent revisions (RoHS)



The full declaration of compliance is available from the following website:
www.maddalena.it.



WARNING!

Images for demonstration purposes only; elements may vary.

Warranty

Conditions of sale and warranty

The conditions of sale and warranty are available on the website **www.maddalena.it**.

Warranty limitations

Maddalena S.p.A. declines all responsibility, with immediate invalidation of the warranty in relation to:

- Damage or defects caused by transport or loading/unloading
- Incorrect installation caused by a failure to observe the instructions provided
- Use for purposes other than those indicated in this manual
- Use by unqualified or untrained personnel

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1 General information

1.1 Warnings and safety rules



WARNINGS

- This manual is the property of **Maddalena S.p.A.** and may not be reproduced or transferred to third parties: all rights reserved. It is an integral part of the product; make sure it is always with the device, even if it is sold/transferred to another owner, so that it can be consulted by the user or by personnel authorised to carry out maintenance and repairs.
- Read this manual carefully before using the device to ensure safe operation.
- The device must be used as intended by **Maddalena S.p.A.**, which is not liable for damage caused to persons, animals or property by installation, adjustment or maintenance errors or improper use of the device.
- After unpacking, ensure the delivery is intact and complete. If it does not correspond to what was ordered, contact the local distributor who sold you the device.
- The device must be installed and used in an area protected from freezing.
- The device must be protected against extreme humidity and heat: intense weather conditions can damage the battery and the device. The maximum permissible temperature during operation is 55°C.
- If in doubt about the condition and/or functionality of the device and its parts, please contact your local distributor for further information.
- Once the device has been commissioned, report any faults or malfunctions found to the product supplier.
- In the event of complete destruction of the device, with the electrolyte escaping, avoid skin and eye contact with the electrolyte. Do not inhale the vapours produced and ventilate the room adequately.
- This device is not intended for use by persons with reduced mental or motor capacities, or lack of experience and knowledge (including children), unless they are supervised by a person responsible for their safety and given appropriate instruction on how to use the device.

1.2 Restrictions



PROHIBITED

- Make modifications and/or attempt to repair the product. Any intervention may only be carried out by authorised personnel.
- Shorten or lengthen the pulse output cable in order not to impair meter performance.
- Leave the device exposed to the weather.
- Place the device near heat sources and expose it to direct sunlight.
- Place the device close to sources of electromagnetic interference.
- Use the device in environments where the temperature drops below 0°C.
- Open the device and/or replace the battery.
- Use solvents to clean the device.
- Dispose of the packaging material in the environment and leave it within reach of children, as it can be a potential source of danger: it must be disposed of in accordance with current legislation.
- Dispose of the device with household waste.

1.3 Device description

The **K-BULK** is an ultrasonic flow sensor (primary element) for heating water. It allows measurement of the volume of heat transfer fluid flowing into a heating or cooling system using ultrasonic technology.

The meter, for its proper use, should preferably be combined with the following instruments supplied by **Maddalena S.p.a.**:

- temperature probes (**KPTEG**)
- electronics for metering (**KS3C**)

The flow meter can operate with different elements from the above, subject to functional verification.

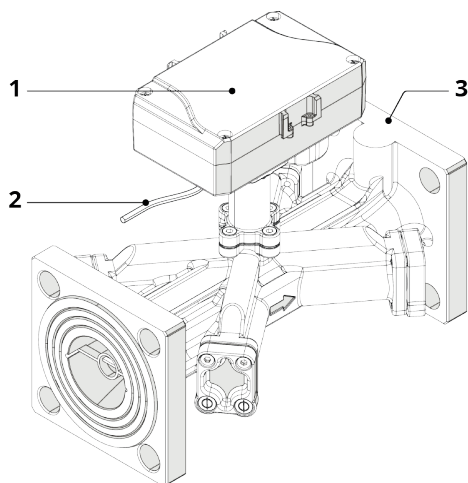
The main technical features of the K-BULK design are:

- No moving parts.
- Wear-resistant and constant operation over time;
- Lithium battery. Estimated service life under normal use: 10 years;
- Integrated pulse output;
- No upstream or downstream straight sections required (U0-D0);

1.4 Usage limits

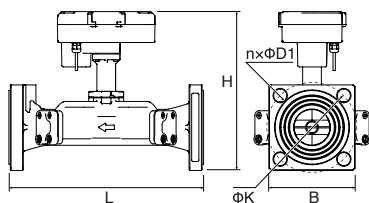
The product can be used exclusively with diameters from DN 50 to DN 300 and with a maximum temperature of the transfer fluid of +130°C.

1.5 Structure

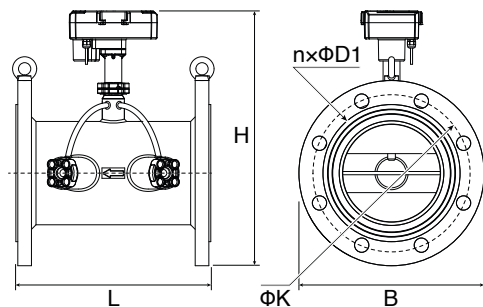


- 1 Electronic housing
- 2 Pulse output cable
- 3 Body of the flow meter

1.5.1 Dimensions



DN 50 - DN100





DN 125 - DN300

PN	PN25								
DN [mm]	50	65	80	100	125	150	200	250	300
L [mm]	270	300	300	360	350	350	350	400	450
H [mm]	221	229	253	281	370	400	450	520	575
D [mm]	165	185	200	235	270	300	360	425	485
K [mm]	125	145	160	190	220	250	310	370	430
n x ΦD1	4 x Φ18	4 x Φ18	8 x Φ18	8 x Φ22	8 x Φ26	8 x Φ26	12 x Φ26	12 x Φ30	16 x Φ30

1.6 Identification

The **K-BULK** meter is identifiable by the data marked on the label attached to the instrument itself.

CE M24 1383	DE-24-M1004-PTB005	Flow sensor
Type: K-BULK	Q _s : xxx m ³ /h	Class 2 acc (EN1434)
DNxx	Q _p : xxx m ³ /h	E2/M2 S/N: xxxxxxxx
PS/PN25 U0-D0	Q _i : xxx m ³ /h	IP68 
Pulse out: xx l/Impulse	Θ : 1 ... 130 °C	Maddalena S.p.A. via G.B. Maddalena, 2/4 33040 Povoletto (Ud)
Pulse length: xxx ms	Art: KUSPL150.0001	

1

2

3

- 1 Mechanical information
- 2 Metrological information
- 3 Installation information

1.7 Pulse output

	Description
Type	Open drain collector class OC acc. EN 1434-2
Pulse length	100ms
Pulse sequence	Synchronous
Cable length	3m
Tension	max. 12Vdc
Current	max. 10 mAdc
Closed-contact resistor	100 Ω
Maximum pulse output frequency	10Hz

	DN50÷DN100	DN125÷DN300
Pulses/ litres	1P=10L	1P=100L
Pulse duration	100ms	

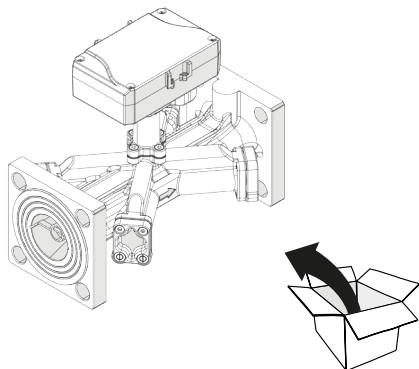
Conductor	Signal	Description
Green	Pulses	Pulse signal with both positive and negative flow
Blue	Ground	Common ground signal
Yellow	Signal	Activation of test mode in case of blue cable connection

1.8 Technical specifications

Description	Characteristics	U.M.
Accuracy class	2	
Maximum working pressure	2,5	MPa
Maximum temperature of the fluid	130 (150 for <2000 hours)	°C
Sensitivity class for installation conditions	H U0-D0, V U0-D0	
Protection class	IP68	
Power supply	3,6 lithium battery	Vcc
Useful battery life	10	years
Storage temperature	-20°C ÷ +60°C	
Environmental class	Class C (+5°C ÷ +55°C)	
Mechanical class	M2	
Electromagnetic class	E2	
Liquid	Water	
Installation position	Any	
Pressure drop	25	KPa

2 Installation

2.1 Receipt of the product



WARNING!

The instruction manual is an integral part of the device and should therefore be read and stored carefully.



PROHIBITED

Packaging material must be properly disposed of and kept out of children's reach as it may represent a hazard. Disposal must be performed in line with applicable laws.

2.2 Assembly

Authorised personnel: specialised installer or plumber, assigned by the metering operator.



WARNING!

Only authorised and suitably trained personnel with sufficient technical experience may install and operate the device.

Before installing the device, make sure that the two sections of tube are even to prevent mechanical stress, clean them with care (especially in the case of empty tubes) and let water run for a while, using a stub pipe on the tube instead of the meter.

If there is no water in the pipeline, open the valve upstream of the device before installing it. This is necessary because opening the valve after installation is complete may cause air suction that could damage the device.

Before using the meter, first fully remove air from the pipe and the device itself. The interception/adjustment valves must be fully open when doing this. Open the valve at the start first and then the valve at the end.

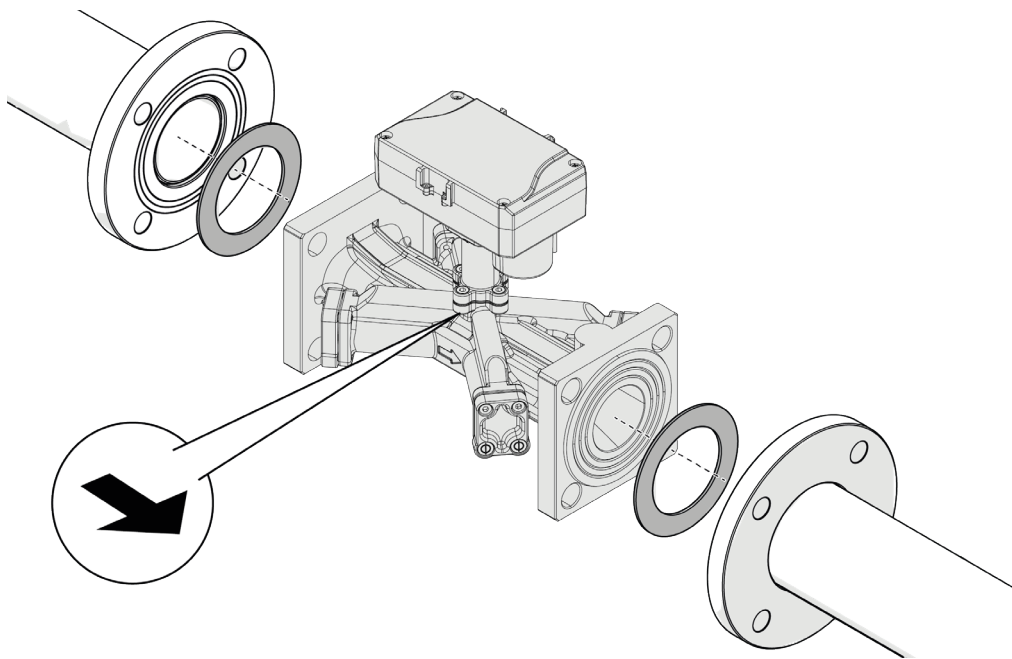
Install the flow meter:

- in the lowest part of the system to avoid air accumulation;
- protected from impact or tampering;
- with the arrow direction on the device coinciding with the flow direction;
- in a position consistent with what is displayed on the paired electronics unit (delivery or return position).

Install upstream and downstream of the meter suitable flow shut-off devices to allow maintenance, device verification and system control operations.

**WARNING!**

Before positioning the seal, make sure that it is not damaged.
Make sure that the seal is not damaged during installation.
Make sure that the level of the seal matches that of the tubing.
Check that the seal does not protrude from the tube.
Make sure that the surfaces of the flange are clean and undamaged.

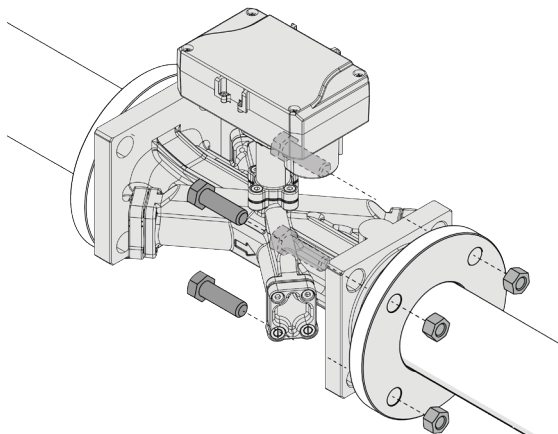


- Fasten the meter flange (1) to the counterflange (2) using nuts and bolts (not provided) (3).


WARNING!

Make sure that the seal is positioned correctly and that it is level with the flange.

- Tighten the bolts.


WARNING!

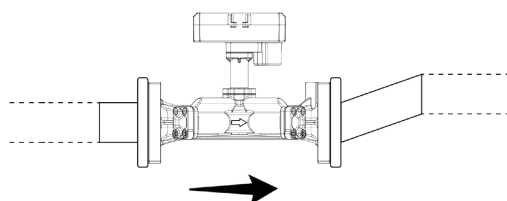
Check the seal hold to prevent leakage.


WARNING!

Sensitivity class in installation conditions: H U0-D0, V U0-D0

If the U and/or D letters are followed by the letter S, install a flow straightener.

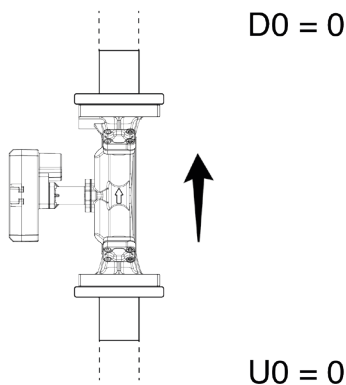
H U0-D0



U0 = 0

D0 = 0

V U0-D0



D0 = 0

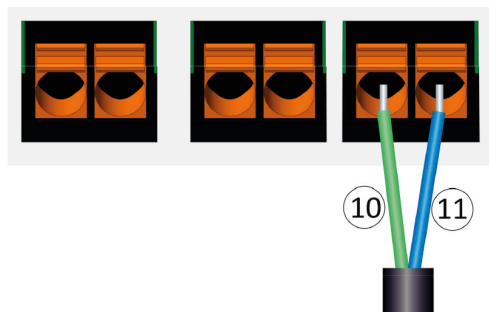
U0 = 0

4.2 Connection

Authorised personnel: specialised installer, commissioned by the metering operator.

Connect the green and blue cables to the separate electronics unit (**KS3C**) observing polarity as follows

- green cable - terminal 10
- blue cable - terminal 11



3 Use

The ultrasonic flow meter is ideal for large applications and, thanks to the absence of moving parts, is wear-resistant and ensures constant operation over time.

The instrument comes into operation after water is detected in the absence of air inside the pipe.

If air is present inside the pipe, the flow meter cannot detect any values.

4 Maintenance

4.1 Battery

The meter is fitted with 3.6V lithium batteries that cannot be recharged or replaced. The estimated lifespan of the battery is 10 years, calculated using factory set-up and with the following operating conditions:

- from 5°C ÷ +30°C for 90% of the lifespan
- from +31°C ÷ +55°C for 10% of the lifespan



WARNING!

Humidity and intense heat may damage the battery and reduce its lifespan.

4.3 Cleaning

No particular cleaning procedures are required. However, the installation area should be kept clean and periodic checks should be performed to ensure the required environmental conditions are met.



PROHIBITED

It is forbidden to use abrasive products, methyl alcohol, hydrochloric acid (35%), sodium bicarbonate (10%), tricresyl phosphate, benzol, concentrated ethanol, toluol, industrial petrol, methylisobutylketone, acrylonitrile, cosmetic solvents, sodium hydrate (10%), ammonium hydrate (10%), nitric acid (40%), potassium dichromate, acetone, diesel naphtha, petrol.

4.4 Disposal

The device is made from various materials such as: metal and plastic materials, electrical and electronic components. It must be disposed of in accordance with current local regulations on industrial and special waste. It must not be disposed of with household waste.

The device does not contain any toxic/hazardous substances or elements, including lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyl.

At the end of the product's life, ensure safe removal and responsible disposal of components, including recycling of batteries, in compliance with applicable environmental laws in the country of installation.



5 Certificates and approvals



DICHIARAZIONE DI CONFORMITÀ UE EU DECLARATION OF CONFORMITY

Modello
Model

K-BULK

Nome e indirizzo del fabbricante
Name and address of the manufacturer

Maddalena S.p.A.
Via G.B. Maddalena 2/4 – 33040 Povoletto (UD), Italy

La presente dichiarazione di conformità è emessa sotto la responsabilità esclusiva del fabbricante.
This declaration of conformity is issued under the sole responsibility of the manufacturer.

Oggetto
Object

Sensore di flusso per contatori di energia termica
Flow sensor for thermal energy meters

L'oggetto della dichiarazione di cui sopra è conforme alla pertinente normativa di armonizzazione dell'Unione:
Direttiva 2014/32/UE, Allegato MI-004.
*The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:
Directive 2014/32/EU, Annex MI-004.*

Norme armonizzate pertinenti, documenti
normativi e riferimenti alle altre specifiche tecniche
utilizzate per la dichiarazione
*Relevant harmonised standards and normative
documents and references to other technical
specifications used for declaration*

EN 1434:2022

Nome e numero dell'organismo notificato <i>Name and number of the notified body</i>	Attività <i>Activity</i>	Certificato nr. <i>Certificate no.</i>
Physikalisch-Techn. Bundesanstalt, NB 0102, Bundesallee 100 D-38116 Braunschweig	Certificato di esame UE del tipo in accordo al Modulo B della Direttiva 2014/32/UE <i>EU-type certification in accordance with Module B of Directive 2014/32/EU</i>	DE-24-MI004-PTB005
Czech Metrology Institute, NB 1383 Okružní 31 638 00 Brno Czech Republic	Certificazione di prodotti, collaudo e controlli finali in accordo al Modulo D della Direttiva 2014/32/UE <i>Certification of production, final product inspection and testing in accordance with Module D of Directive 2014/32/EU</i>	0119-SJ-A010-08

Povoletto, 30/05/2024

Maddalena S.p.A.


Dott. Ing. Franco Maddalena
Amministratore Delegato
Chief Executive Officer





METERING EXPERTISE

MADDALENA spa

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