H 611
14.04.08 MZ
REV. 01

SINGLE-JET VOLUMETRIC METERS WITH PULSE TRANSMITTER

KUF - KUC Eng.

- **For water:**
  – cold (KUF) & hot (KUC)
- **Unions:**
  – threaded male (unions supplied)
- **Installation:**
  – horizontal with Class B accuracy,
  – vertical with Class A accuracy.
- **Approved in accordance with:**
  – EEC directive No. 75/33 for cold water,
  – EEC directive No. 79/830 for hot water .

CE

1.APPLICATION

KUF – KUC volumetric meters are used for metering the flow of hot or cold water circulating in heating/cooling installations or for measuring the consumption of DHW or DCW.
By means of an incorporated pulse transmitter they transmit the measured instantaneous value to an electronic device which processes and displays the data according to the specific requirements.In the absence of electronic instrumentation, the measurement can be read directly on the dial of the mechanical totaliser on the top of the meter.

2. OPERATION

The meters incorporate a single-jet turbine with protected rollers. The number of revolutions of the turbine is directly proportional to the quantity of fluid in circulation. The rotary movement of the turbine is transmitted, via calibrated mechanisms, to the mechanical totaliser and, via magnetic transmission, to the pulse transmitter.
The pulse transmitter converts the magnetic signal) to an electronic device (Reed switch) which opens and closes in correspondence with the passage of the magnet and, accordingly, in proportion to the value of the instantaneous flow.
By means of a pre-wired cable the signal from the pulse transmitter is transmitted to a data processing device (e.g. the integrator of a calorie meter) which is able to processed the signal and shows it on the display.

3. MODELS AVAILABLE

Code	DN inches	T max °C	**Qn m³/h**	Qmax m³/h	Qt litri/h **Class B**	Q min litri/h **Class B**	Qt litri/h **Class A**	Q min litri/h **Class A**	Kvs m³/h	**Pulse trans. l/pul**	Weight Kg	Approval
Cold water												**CEE 75/33**
KUF 15 D	1/2"	30	**1.5**	3	120	30	150	60	3	**10**	0.45	B 93 322.01
KUF 20 D	3/4"	30	**2.5**	5	150	50	250	100	6	**10**	0.60	B 93 322.02
KUF 25 C	1"	30	**3.5**	7	280	70	350	140	7	**100**	0.92	01.06.01.042
KUF 32 C	1"1/4	30	**5**	10	400	100	500	200	10	**100**	1.25	–
Hot water												**CEE 79/830**
KUC 15 D	1/2"	90	**1.5**	3	120	30	150	60	3	**10**	0.45	B 93 - 48.01
KUC 20 D	3/4"	90	**2.5**	5	150	50	250	100	6	**10**	0.60	B 93 - 48.02
KUC 25 C	1"	90	**3.5**	7	280	70	350	140	7	**100**	0.92	–
KUC 32 C	1"1/4	90	**5**	10	400	100	500	200	10	**100**	1.25	–

Qn – Nominal flow: maximum continuous flow measurable by meter.
Qmax – Maximum temporary flow acceptable by meter.
Qt – Transition flow: minimum limit with error below ± 2%.
Qmin – Minimum flow: minimum limit with error below ± 5%.
Kvs – Flow coefficient: flow in m³/h with pressure drop of 100 kPa = 10 mWG = 1 bar.
For more details see section 5.

4. TECHNICAL DATA

Approval:	EEC Directive No. 75/33 for cold water EEC Directive No. 79/830 for hot water
Enclosure	OT 58 nickel-plated brass
Dial	dry
Dial protection	shockproof plastic
Direct readout	on 8 rollers 5 (black) per m^3 3 (red) for the submultiplesi
Nominal pressure	16 bar
Hydraulic checks	at three points (Qmin, Qt, Qmax)
Test bench	ISO 4064/3 and 4185 standards
Pulse transmitter output cable:	
– length	2 metres
– conductors	two-wire 2 x 0.50 mm
Maximum reading	100.000 m^3
Minimum reading	0.5 litres
Protection	IP 68
Weight	see table in section 3

5. SIZING & ACCURACY OF MEASUREMENT

5.1 Sizing of the meter

IMPORTANT:

1°) The meter must not be sized in relation to the DIAMETER of the pipework but in relation the FLOW of the site.

2°) To ensure the highest measurement precision, the maximum flow of the site, under normal operating conditions, must be AS CLOSE AS POSSIBLE to the nominal flow (Qn) of the volumetric meter. Values higher than the nominal flow (Qn) are permissIble only for brief transitory periods and, in any event, the value of the maximum flow (Qmax) of the volumetric meter must NEVER be exceeded.

5.2 Definitions regarding the accuracy of the metering

The parameters defining a volumetric meter are as follows:

- **Q min = portata minima**: the flow below which there is no guarantee of accuracy,
- **Qt = transitory flow**: the flow value which determines the shift from the accuracy of ± 5% (for values lower than Qt), to an accuracy of ± 2% (for values above Qt).
- **Qn = nominal flow**: the value of the maximum flow which can be accepted by the volumetric meter **continuously and for an indeterminate time**.,
- **Q max = maximum flow**: the value of the flow which must **never** be exceeded even for brief periods.

Q min	Qt	Qn	Q max	
Flow below Qmin	**Flow between Qmin & Qt**	**Flow between Qt & Qn**	**Flow between Qn & Qmax**	**Flow above Qmax**
No accuracy guaranteed Continuous operation for an unspecified time	**Accuracy ± 5% Continuous operation for an unspecified time**	**Accuracy ± 2% Continuous operation for an unspecified time**	**Accuracy ± 2% Operation at limited intervals of time**	**Value which must absolutely not be exceeded**

5.3 Measurement accuracy classes

The classes are defined on the basis of the relation between Qt (transition flow) and Qmin (minimum flow in respect of nominal flow Qn):

– Class A (the class regarding the installations C & D described in section 7.2) :

Qt = 0.10 Qn Qmin = 0.04 Qn Example with Qn = 1.5 m^3/h we have:

– Qt = 0.15 m^3/h = 150 litres/h

– Qmin = 0.06 m^3/h = 60 litres/h

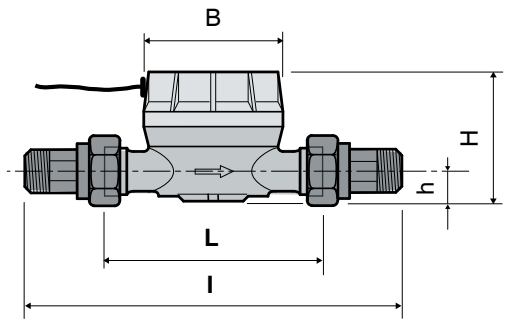
– Class B (the class regarding the installation A described in section 7.1) :

Qt = 0.08 Qn Qmin = 0.02 Qn Example with Qn = 1.5 m^3/h abbiamo:

– Qt = 0.12 m^3/h = 120 litres/h

– Qmin = 0.03 m^3/h = 30 litres/h

6. OVERAL DIMENSIONS AND WEIGHTS



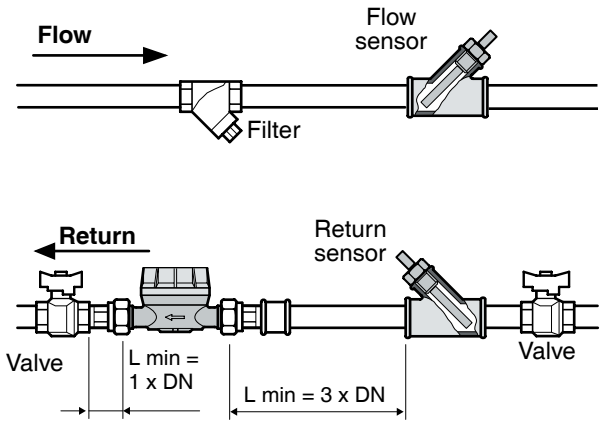
Code	L mm	l mm	H mm	h mm	B mm	Weight kg
KU.. 15	110	190	72	14	70	0.45
KU.. 20	130	228	77	17	70	0.60
KU.. 25	160	260	86	28	82	0.92
KU.. 32	160	282	86	33	82	1.25

7. INSTALLATION

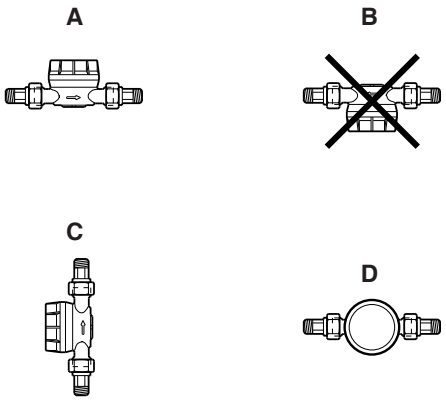
So that the volumetric meter retains its metering capacity within the declared error limits, the following installation instructions must be carefully followed::

- if used in a heating/conditioning circuit It must be installed on the return pipe of the site, respecting the flow direction indicated on the body, and positioning it between two shut-off valves in order to ensure access for maintenance,
- A filter must be installed upstream of the meter in order to prevent any impurities in the system from compromising the accuracy of the metering. This filter must be cleaned a couple of days after the first start-up of the site and subsequently at least once a year,
- It is advisable to ensure that upstream of the meter there is a straight length of pipe equal to three times its diameter; and, downstream, a straight length equal to its diameter.
  Moreover, it is advisable to reduce by a diameter the pipe upstream and downstream of the meter.

7.1 Example of hydraulic installation



7.2 Positioning of meter

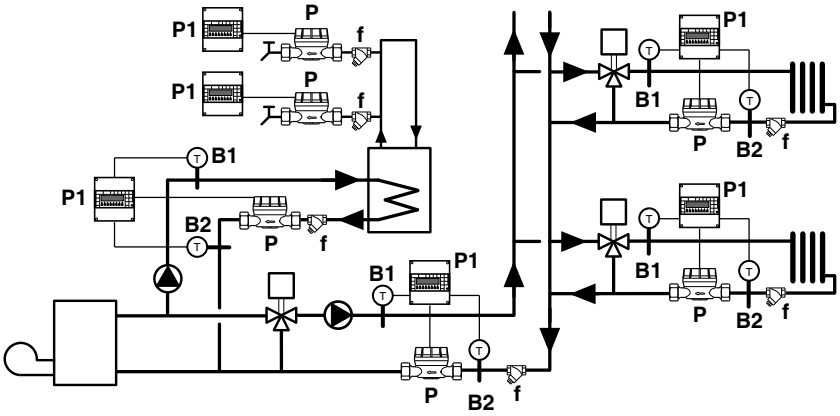


Installation A: the best installation which ensures the CLASS B ACCURACY.
This installation also ensures less wear of the rotating components

Installation B: this installation is not advised and does not ensure any accuracy class

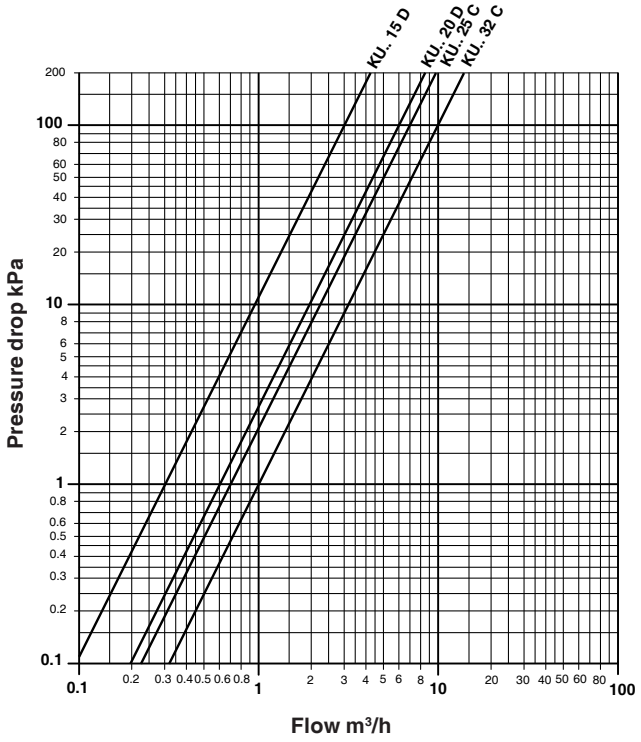
Installation C and D: these installations are possible and ensure CLASS A ACCURACY, slightly below CLASS B.

8. OPERATIONAL DIAGRAM



B1 – Integrator flow sensor,
B2 – Integrator return sensor,
f – Filter for impurities,
P – Volumetric meter,
P1 – Integrator for metering thermal energy and flows.

9. PRESSURE DROP



Pressure drop : 100 kPa = 10 mWG = 1 bar

Amendments to data sheets

Date	Revision No.	Page	Section	Amendment description
14.04.08 MZ	01	all	various	Clarification of accuracy class

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