H 650
20.11.07 MC
REV. 01

STATIC VOLUMETRIC ULTRASOUND METERS WITH PULSE TRANSMITTER

KSG.. – KSF.. Eng.

- **Power supply: 3.6 V – (default) or 5 V –**
- **Static, no moving parts**
- **Ultrasound sensor: "DOPPLER" effect**
- **Measurement range:**
  – ratio (Qn) / (Q-min) = 100:1
- **Unions:**
  – KSG .. : threaded male **PN 16**
  – KSF.. : flanged **PN 16**
- **Approval: EN 1434, Class 2, Ambience C**

1. APPLICATION

This ultrasound volumetric meter is designed for measuring the flow and quantity of water circulating in refrigeration and /or heating sites.

The output for the transmission of signals is of the "pulses per litre" type

To process the signals transmitted it is connected to an electronic integrated energy meter (IET 7…) which also provides the power. The power output of IET 7.. (terminal G) provides 3.6 volts d.c. (default) or 5 volts d.c.

2. OPERATION

The metering unit consists of two transmitters/receivers which exchange ultrasound pulses.
Exploiting the "DOPPLER" effect, the time differential for the distance covered by the waves is measured, and this is linked to the speed of the water running in the pipework.

It is especially suited for District Heating, with superheated water up to 130°C, even with peaks of up to 150°C, provided such temperatures do not last for more than a total of 2,000 hours.

3. MODELS

Code	DN body	Unions	Tmax °C	**Qn** m^3/h	Qmax m^3/h	Qstart l/h	Qmin l/h	**Pulses p/l**	Δp Qn mbar	Kvs m^3/h	Error max.	Weight Kg	Approval EN 1434 C2
Threaded male		inches											
KSG 15 - 0.6	1/2"	3/4"	130	**0.6**	1,2	2,4	6	**10**	140	1.6	Class2	1	PTB -7.6-4016539
KSG 15 - 1.5	1/2"	3/4"	130	**1.5**	3	6	15	**10**	130	4.2	Class2	1	PTB -7.6-4016539
KSG 20 - 2.5	3/4"	1"	130	**2.5**	5	10	25	**10**	205	5.3	Class2	1.5	PTB -7.6-4016539
KSG 25 - 3.5	1"	1" 1/4	130	**3.5**	7	14	35	**10**	65	14.3	Class2	3	PTB -7.6-4016539
KSG 25 - 6	1"	1" 1/4	130	**6**	12	24	60	**10**	190	14.6	Class2	3	PTB -7.6-4016539
KSG 40 - 10	1" 1/2	2"	130	**10**	20	40	100	**10**	120	29	Class2	4	PTB -7.6-4016539
Flanged		DN											
KSF 25 - 3.5	25	25	130	**3.5**	7	14	35	**10**	65	14.3	Class2	3	PTB -7.6-4016539
KSF 25 - 6	25	25	130	**6**	12	24	60	**10**	190	14.6	Class2	5	PTB -7.6-4016539
KSF 40 - 10	40	40	130	**10**	20	40	100	**10**	120	29	Class2	7	PTB -7.6-4016539
KSF 50 - 15	50	50	130	**15**	30	60	150	**2**	120	43	Class2	8	PTB -7.6-4016539
KSF 65 - 25	65	65	130	**25**	50	100	250	**2**	70	94	Class2	11	PTB -7.6-4016539
KSF 80 - 40	80	80	130	**40**	80	160	400	**1**	120	115	Class2	13	PTB -7.6-4016539
KSF 100 - 60	100	100	130	**60**	120	240	600	**0.5**	140	160	Class2	22	PTB -7.6-4016539

Qn – Nominal flow: continuous flow measurable by the meter with error below ± 2% (Class C)
Qmax – Maximum temporary flow measurable by meter with error outside Class C
Qstart – Minimum limit flow for the measurement (with lower flow the meter does not total).
Qmin – Minimum flow: minimum metering limit with error below ± 4%..
p/ l – **The pulse transmitter sends a certain number of pulses for each litre of water flowing past (see Table 3)**
NB: Integrator IET 7.. should be calibrated according to the instructions given on the previous line (Note pulses/litre)
Δp – Pressure drop in mbar, along the measurement pipe, when the flow is Qn.
Kvs – Class 2: standard EN 1434 gives the following error formula for Class 2. E% = ± (2 + 0.02 Qn/Q) where Q is the instantaneous flow measured at that moment. The volumetric meter has its own error, which changes for each flow value; in any event it is always below (about a half) the figure given in the standard..

4. TECHNICAL DATA

Power supply	3.6 V– (default); 5 Volt –
Nominal pressure	PN 16 bar
Unions:	
– KSG..	threaded PN 16
– KSF..	flanged PN 16
Protection	IP 54
Body	brass
Installation ambience	Class C
Installation	horizontal / vertical
Operating temperature	10...130 °C
Maximum temperature for 2,000 hours	150 °C
Liquid measured	water
Approval	EN 1434 Class 2

5. ELECTRICAL CONNECTIONS

The meter is powered by the IET 7... integrator,.
The connection to the integrator is made using a three-wire cable.

BROWN WIRE = 0 volt to be connected to terminal M of the IET.
WHITE WIRE = power supply of 3.6 Volts– (default) or 5 Volts– to be connected to terminal **G** of the IET.
GREEN WIRE = pulse output to be connected to terminal BW of the IET.

6. INSTALLATION OF THE MEASUREMENT PIPE

So that the volumetric meter maintains over time its metering capacity within the declared error margins, the following installation instructions must be carefully followed:

- It is advisable to install the meter on the return pipe, paying attention to the flow direction indicated on the body, and positioning it, if possible, between two shut-off organs in order to facilitate any maintenance required.
- It is useful to install a filter upstream of the meter in order to prevent any impurities in the system compromising the accuracy of the instrument. Such a filter must be cleaned a couple of days after the first start-up and, of course, if it should become clogged.
- If possible, installation should be carried out so that above and below the meter there is a straight length of pipe equal to the length of the measurement pipe.

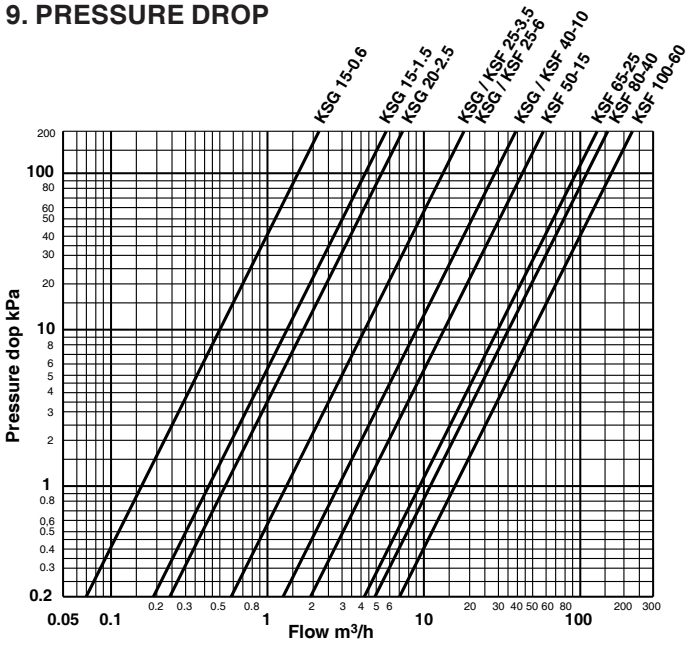
7. INSTALLATION OF THE ELECTRONIC MEASUREMENT UNIT

The electronic unit is connected to the measurement pipe by a cable of about one metre. Normally, the meter is supplied with the measurement unit inserted in the measurement pipe and with the cable stored in a space provided. It is advisable to remove the measurement unit when the pipe has a temperature above 90°C, particularly if it has not been insulated.
The measurement unit can be wall-mounted by unscrewing the accessory provided from the pipe and screwing it to the wall.

8. SAFETY SEAL

The measurement unit is usually supplied sealed in order to avoid tampering: the system meters certain data on the basis of which invoices may be prepared and so any form of tampering must obviously be avoided.

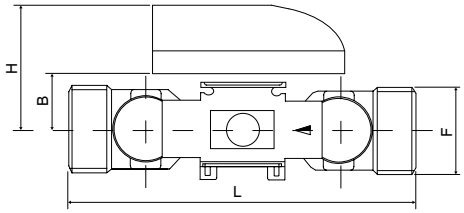
9. PRESSURE DROP



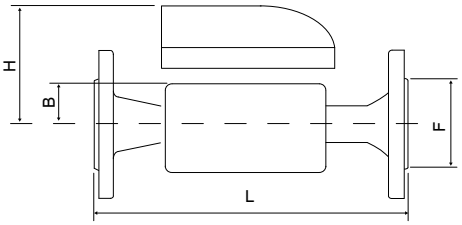
100 kPa = 10 mWG = 1 bar

10. OVERALL DIMENSIONS

THREADED METERS (KSG..)



FLANGED METERS (KSF..)



Model	L mm	B mm	H mm	F male threading
KSG 15-0.6	110	–	77	3/4"
KSG 15-1.5	110	–	77	3/4"
KSG 20-2.5	130	–	74	1"
KSG 25-3.5	260	51	111	1" 1/4
KSG 25-6	260	51	111	1" 1/4
KSG 40-10	300	68	108	2"

Model	L mm	B mm	H mm	F flanged
KSF 25-3,5	260	51	111	DN 25
KSF 25-6	260	51	111	DN 25
KSF 40-10	300	48	108	DN 40
KSF 50-15	270	46	106	DN 50
KSF 65-25	300	52	112	DN 65
KSF 80-40	300	56	116	DN 80
KSF 100-60	360	68	128	DN 100

Amendments to data sheet

Date	**Revisione No.**	Page	Section	Details of amendments
12.05.06 MC	–	1-2	General, 3 and 9	General update & layout.;Layout text & insertion data (Kvs) omitted.; Insertion diagram.
		2	10-Overall dimensions	Diagrams amended (reduced in size).
03.07.06 MC	–	1	3-Versions	Modificati parametri riguardanti il lanciaimpulsi; (in tabella e nella descrizione).
12.02.07 MC		1-2	4 and 5	Detail on value of default power supply
20.11.07 MC	**01**	1	4.Technical data	Adjust unions **KSF value** (from PN 25 to PN 16).

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