

Technical Note			TN-025		
Test: All tests			Test no.:		
Assumption: Flow restrictor pressure loss			Assumption no: 58		
Rev: 03	Date: 18/01/2022	Author: Valeria Khnykina	Checked: Tom Naughton		

1. Introduction

2.17 The measured pressure drop across the HIU is to include the heat meter flow sensor. In the case that a heat meter has not been fitted, a restrictor of 25 kPa at 1 m³/h will be fitted to simulate a typical heat meter.

2. Consideration 1

A number of heat meters types and manufacturers have been reviewed and the pressure loss compared with the test assumption.

Summary of results:

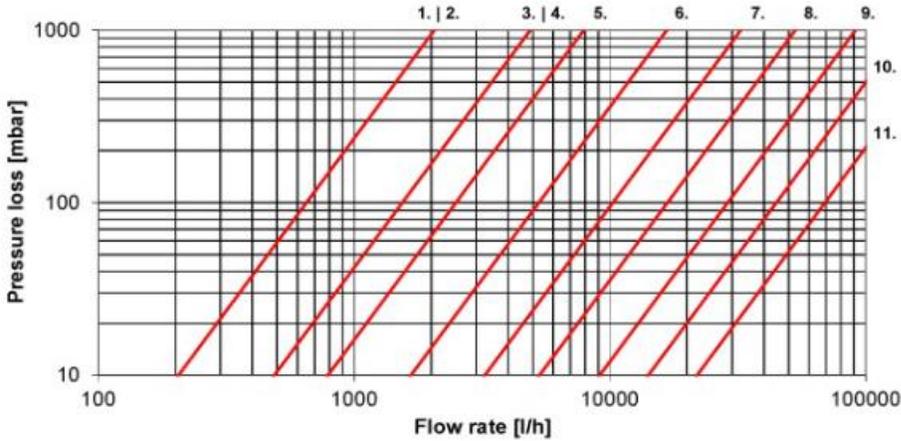
	Qp	Nominal Diameter	Flow rate, m ³ /h	Pressure loss, mbar	Type
Sharky 775	qp 1.0/1.5	DN15	1.0	40	Ultrasonic
Kamstrup 403	qp 1.5	DN15	1.0	40	Ultrasonic
Sontex 749	qp 1.5	DN15	1.0	90	Oscillation
Sontex 449	qp 1.5	DN15	1.0	90	Oscillation
Danfoss SonoSelect 10	qp 1.5	DN15	1.0	70	Ultrasonic
Ista Ultego III Smart plus	qp 1.5	DN20	1.0	70	Ultrasonic
Sharky 775	qp 0.6	DN15	1.0	250	Ultrasonic
Kamstrup 403	qp 0.6	DN15	1.0	80	Ultrasonic
Sontex 749	qp 0.6	DN15	1.0	500	Oscillation
Danfoss SonoSelect 10	qp 0.6	DN15	1.0	85	Ultrasonic
Ista Ultego III Smart plus	qp 0.6	DN20	1.0	400	Ultrasonic

(1 kPa = 10 mbar = 0.01 bar)

Typically heat meters with Qp 1.5 within HIU units, heat meters with Qp 0.6 are shown for comparison.

1. Sharky 775

- | | | | |
|--------------------------|---------------------------|---------------------|---------------------------|
| 1. q_p 0.6 DN 15 | 4. q_p 1.0/1.5 DN 20 | 7. q_p 10 DN 40 | 10. q_p 40 DN 80 |
| 2. q_p 0.6 DN 20 | 5. q_p 2.5 DN 20 | 8. q_p 15 DN 50 | 11. q_p 60/100 DN 100 |
| 3. q_p 1.0/1.5 DN 15 | 6. q_p 3.5/6 DN 25/32 | 9. q_p 25 DN 65 | |



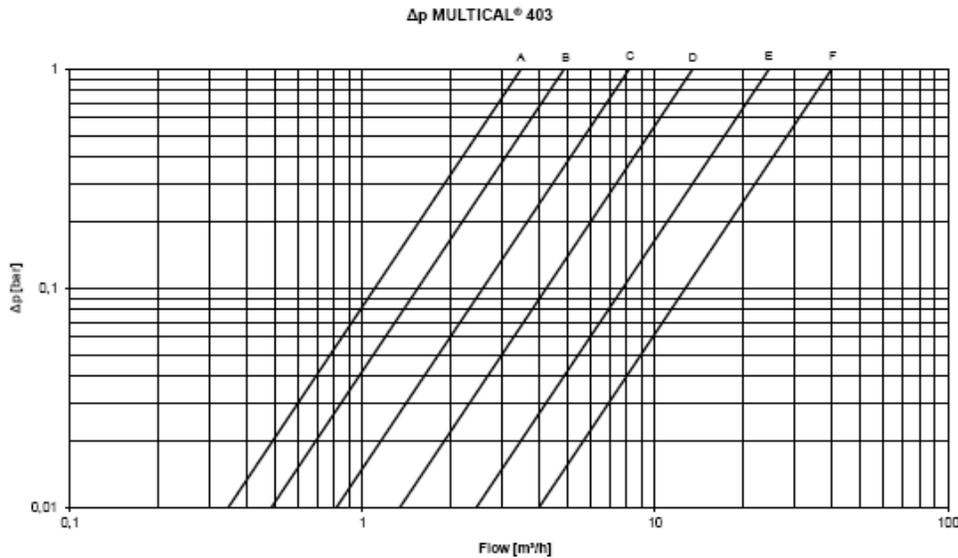
2. Kamstrup 403

Pressure loss

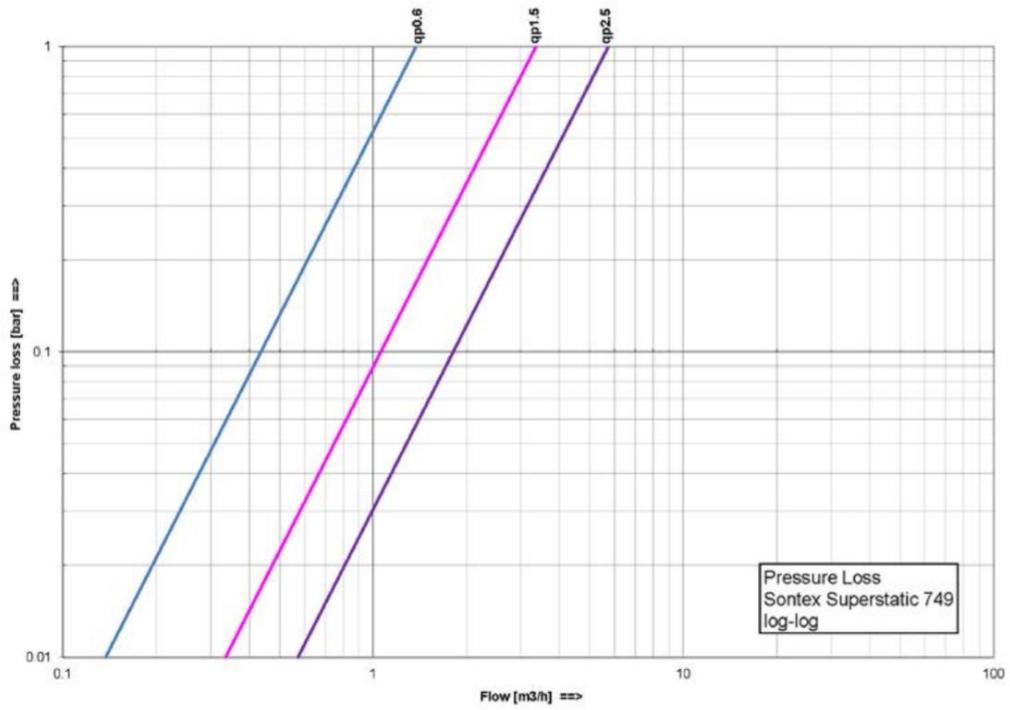
Pressure loss in a flow sensor is stated as max pressure loss at q_p .
According to EN 1434, maximum pressure must not exceed 0.25 bar.

Graph	Nom. flow q_p [m ³ /h]	Max flow q_s [m ³ /h]	Min. flow q_i^* [l/h]	Min. flow cut-off [l/h]	Saturation flow [m ³ /h]	Nom. diameter [mm]	$\Delta p@q_p$ [bar]	k_v	$q@0.25$ bar [m ³ /h]
A	0.6	1.2	6	3	1.5	DN15/DN20	0.03	3.46	17
B	1.5	3.0	15	3	4.6	DN15/DN20	0.09	4.89	2.4
C	2.5	5.0	25	5	7.6	DN20	0.09	8.15	4.1
D	3.5	7.0	35	7	9.2	DN25	0.07	13.42	6.8
E	6	12	60	12	18	DN25	0.06	24.5	12.3
F	10	20	100	20	30	DN40	0.06	40.83	20.4
F	15	30	150	30	46	DN50	0.14	40.09	20.1

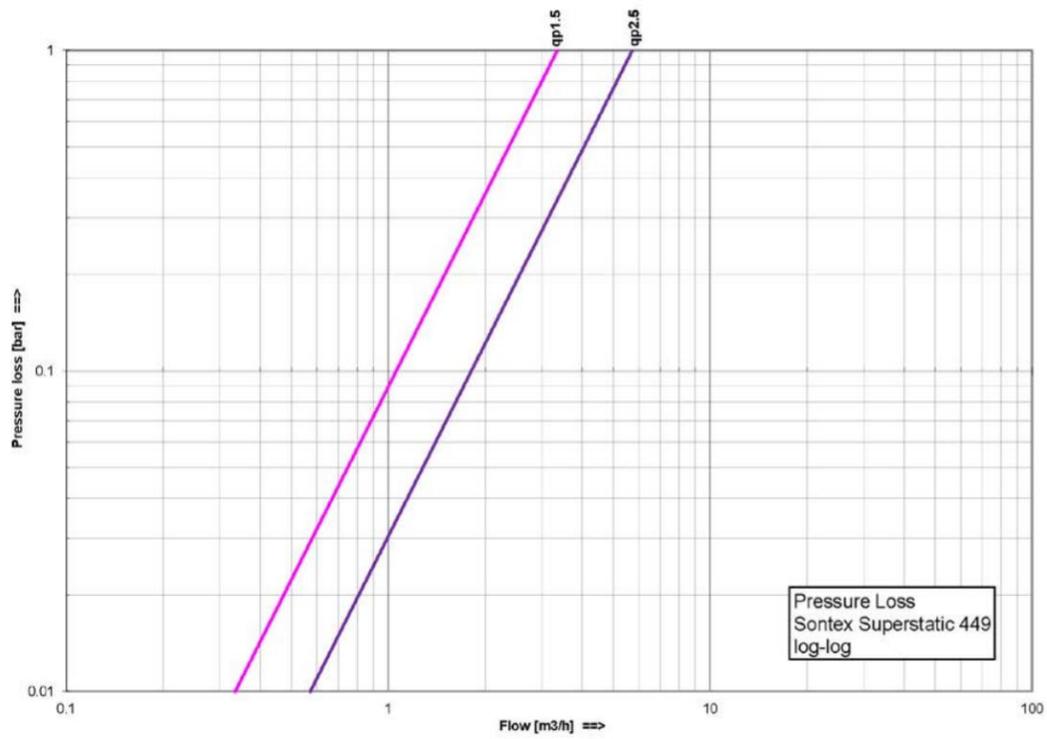
* Dynamic range $q_p:q_i = 100:1$



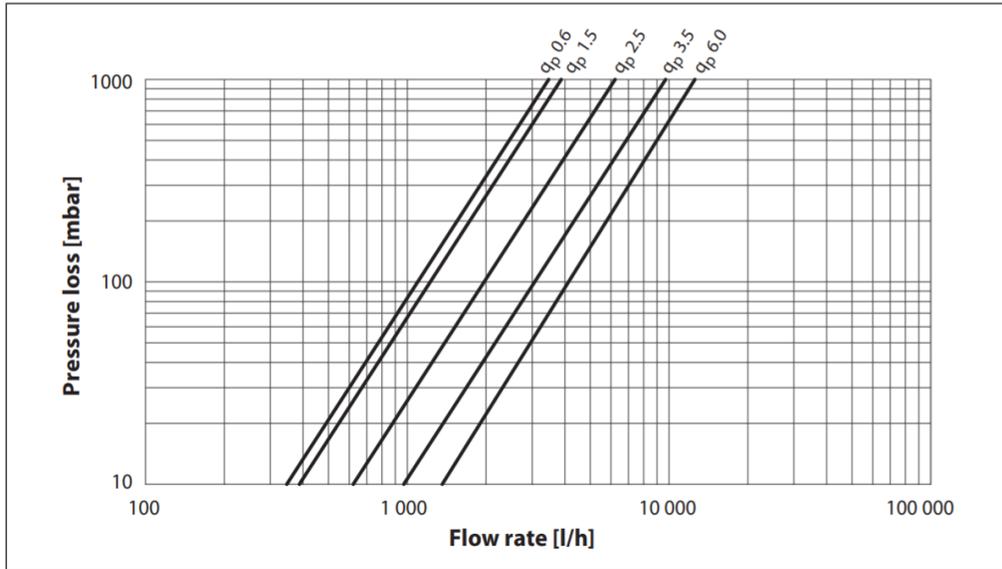
3. Sontex Superstatic 749



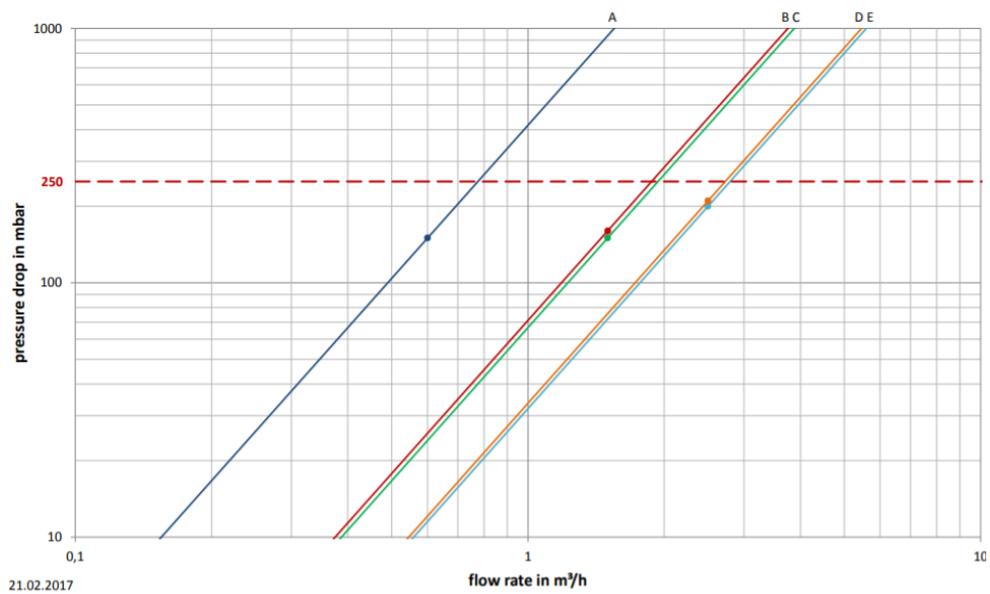
4. Sontex Superstatic 449



5. Danfoss Sonoselect 10



6. Ista Ultego III Smart Heat Meter



3. Consideration 2

British Standards: BS EN 1434-4, Table B.1 – Checklist for type approvals of heat meters according to EN 1434:

6.1.5. The Maximum pressure loss at Q_p shall not exceed 0.25 bar (250mbar/25kPa), except where the heat meter includes a flow controller or also acts as a pressure reducing valve.

4. Recommendation

For a typical domestic heat meter with Q_p 1.5 the pressure loss at 1.0 m³/h is significantly lower than the restrictor pressure loss 25 kPa currently used in the test.

The recommendation is:

1. To reduce the pressure loss to 10 kPa (100 mbar) for the restrictor to simulate a typical heat meter.
2. HIU units are proposed to be tested with the restrictor installed to replace the meter.
3. The manufacturer can select an option to test with their preferred heat meter. The pressure loss of the meter "X" kPa at 1.0 m³/h should be stated in the components list.

If a HIU is tested with a specific heat meter (option 3 above), the test results will only be applicable for any HIU using a heat meter with the same pressure loss as the installed heat meter or an equivalent heat meter with the same or lower pressure loss when measured at 1.0 m³/h. An HIU that was supplied with a heat meter with a great pressure loss across the heat meter would need to be retested in order to be BESA certified.

5. References

[1] Sharky 775 Data Sheet

[2] Kamstrup 403 Data Sheet

[3] Sontex Superstatic 749 and 449 Data Sheet

[4] Danfoss SonoSelect 10 Data Sheet

[5] Ista Ultego III Smart plus Data Sheet

[6] BS EN 1434-4:2015, Heat Meters