

Test report of the measurement of the housing leakages

Customer: Aerotechnik Siegwart GmbH
Untere Hofwiesen
66299 Friedrichsthal

Test object: Constant volume flow controller, ID no. 233
Ø 200

Test basis: DIN EN 1751, issue 01.99

Test date: 11-02-2008

Inspected by: Mahren (Graduate Engineer – Dipl. Ing. (FH))

Test report no.: L-SL-56-9/constant volume flow controller, circular, class C

No. of pages: 5

1. General information

Aerotechnik E. Siegwart GmbH, Friedrichsthal, commissioned us to inspect the housing leakages of a circular, constant volume flow controller in accordance with DIN EN 1751, class C. The purpose of the test was to establish whether DIN EN 1751-C.3 requirements were met.

2. Description of the inspected system

The description of the inspected VRK-233-1 in accordance with the manufacturer's specification is included in enclosure 1. The documents presented to us do not contain production tolerances.

3. Test structure and realisation of measurements

The test station structure was realised as illustrated in DIN EN 1751-illustration 2b. A diaphragm gas meter was used to measure the air volume and a differential pressure measuring instrument (Spezial Instruments) to measure the pressure.

4. Measuring results

Measuring results are listed in table 1 of the report.

The leakage air flows measured are less than values specified in DIN EN 1751 (as illustrated in table 1).

The test did not include an examination of type or design acceptance, an examination of endurance, material research or production inspection. The measuring results are only valid for the inspected regulator.

Table 1

Housing leakages of volume flow controller, circular, in accordance with DIN EN 1751, class C

Dimensions \varnothing [mm]	Perimeter [m]	Δp [Pa]	Free surface [m ²]	Permissible leakage air flow [—] h • m ²	Measured leakage air flow [—] h • m ²
200	0,628	1000	0,628	962	14,320

Table 2**List of measuring instruments employed:**

Ser. no.	Measuring instrument designation	Measurement range	Measurement uncertainty	Calibrated yes/no	Comment
1	Diaphragm gas meter	0....10 m ³ /h	± 1,0% of measurement value	yes	
2	Micromanometer Manufacturer: SI	0....200 Pa 0....2000Pa	± 0,5% of measurement value	yes yes	

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Sulzbach, 18-02-2008

Building Services and Conveying Engineering

Assessor:

Signature

Mahren (Graduate Engineer – Dipl. Ing. (FH))

Enclosure

Manufacturer's description

Calculation example

TC

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Calculation example:

Volume flow controller, circular, in accordance with DIN EN 1751, \varnothing 200 mm

\varnothing	200 mm
Test pressure	1000 Pa
Free surface A	0,628 m ²

Perimeter: $\Pi \cdot d = \Pi \cdot 0,2 \text{ m}$

Equivalent length 1,0 m:

$\Pi \cdot 0,2 \cdot 1,0 \text{ m} = 0,628 \text{ m}^2$

Class C:

$0,003 \cdot p_t^{0,65} \cdot 10^{-3} \text{ m}^3 \cdot \text{s}^{-1} \cdot \text{m}^{-2}$

In case of 1000 Pa:

$0,003 \cdot 1000^{0,65} \cdot 10^{-3} \text{ m}^3 \cdot \text{s}^{-1} \cdot \text{m}^{-2}$

$0,2674 \cdot 10^{-3} \text{ m}^3 \cdot \text{s}^{-1} \cdot \text{m}^{-2}$ corresponds to: $962 \text{ l} \cdot \text{h}^{-1} \cdot \text{m}^{-2}$

Measurement value: 9,000 l/h

Leakage:

$V [\text{l} / \text{h}] / A [\text{m}^2] = 9,000 / 0,628 \cdot \text{l} / \text{h} \cdot \text{m}^2 = 14,320 \text{ l} / \text{h} \cdot \text{m}^2$

$14,320 \text{ l} / \text{h} \cdot \text{m}^2 < 962 \text{ l} / \text{h} \cdot \text{m}^2$

$0,00398 \cdot 10^{-3} \cdot \text{m}^3 \cdot \text{s}^{-1} \cdot \text{m}^{-2} < 0,267 \cdot 10^{-3} \text{ m}^3 \cdot \text{s}^{-1} \cdot \text{m}^{-2}$