

DUCT LEAKAGE TESTER

Manual – V5.31-ES20160714



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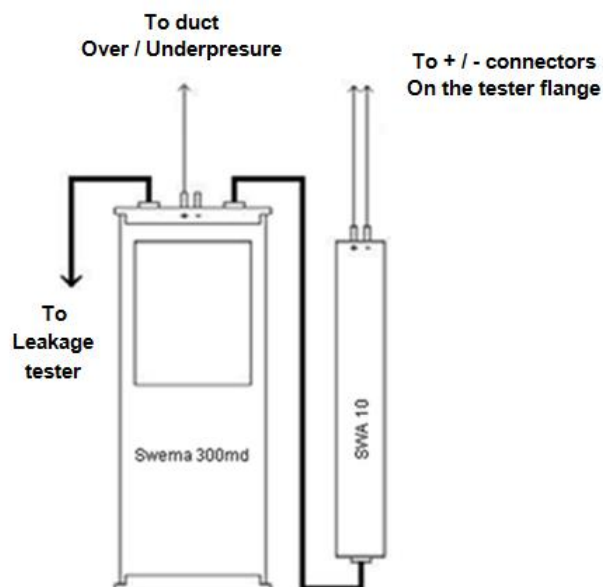
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The universal instrument Swema 3000md with SWA 10, controls the leakage tester for duct, at selected pressure levels up to 1900Pa. A leakage level is saved together with the pressure level. Swema 3000md inbuilt differential pressure sensor measures the over pressure in duct and the differential pressure probe, SWA 10 measures the leakage flow over a throttle device (flange) with a certain k-factor. A radial fan is used to be able to provide highest possible pressure at these moderate air flows.

The supply and the exhaust of the ventilation are tighten with tightness bladders.

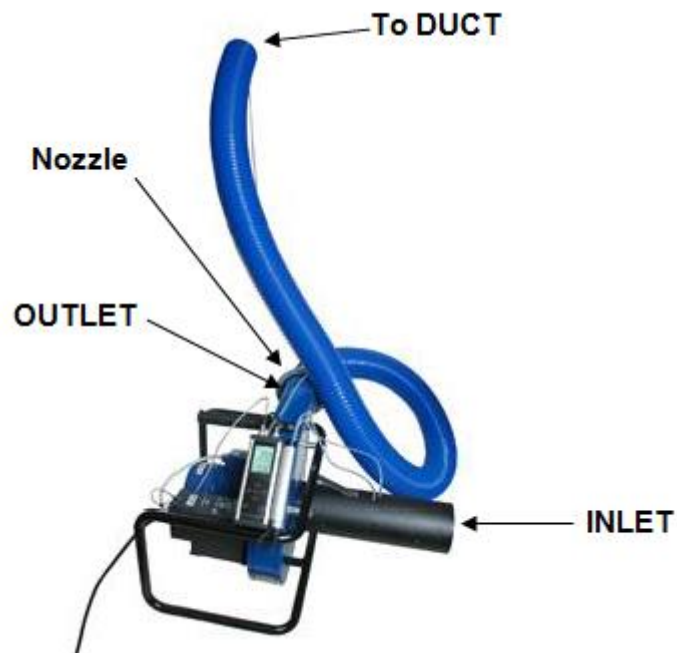
The duct leakage tester is used according to European standard EN 12237 and EN 1507.

LEAKAGE TESTER AND ACCESSORIES



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CONNECTING FOR MEASURING OVER PRESSURE AND UNDER PRESSURE



For **OVERPRESSURE** measurements the nozzle of the blue hose is connected to the **OUTLET** of the leakage tester.

For **UNDER PRESSURE** measurements the nozzle of the blue hose is connected to the **INLET** of the leakage tester (the flange).

Notes:

1. For the measurements be aware that the right and corresponding K-factor must be used. Refer to the calibration certificate to see the 4 different k-factors.
2. The diameter of the Inlet and the Outlet are the same, therefore it is possible to assemble the nozzle of the hose (in the picture connected to the outlet) to the Inlet to measure under pressure.

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SETTINGS

1. Control the leakage tester automatically with Swema 3000md and the sensor SWA 10.
2. The built-in differential pressure sensor in Swema 3000md measures over pressure and under pressure in the duct. Connect the pressure hose (silicone hose) on the positive pressure connector (marked with +).
3. Connect the valves of the probe SWA 10 to the valves on each side of the orifice plate in the flange with the pressure hoses (silicone hoses) to measure the leakage flow. Follow the convention + to + and . to -.
4. Connect the cable from the leakage tester to the RS232 contact on Swema 3000md.
5. Turn Swema 3000md on and select measuring mode DUCT in MENU1 (See picture 1).
6. Set the K-factors on the label of the flange (See picture 1)..
7. Set the surface area of the duct to be tested. The selected area is used to calculate l/sm^2 and m^3/hm^2 if these units are selected (See picture 1).
8. Set the tightness (density) class to be used for the measurement of the leakage in the duct. Select between classes A, B, C or D. In the saved protocol the selected class, used for calculations, and the limit for the leakage on the test are shown. The limit depends on the selected class and the pressure during the test (See picture 2).
9. Set the unit for the measurement, select between l/s , m^3/h , l/sm^2 or m^3/hm^2 . The unit l/sm^2 or m^3/hm^2 are calculated with the selected area of the duct (See picture 1).
10. Set the I-factor for duct leakage tester. 1000 is the standard factor for Swema 3000md to control the fan with PID-regulation, however any other factor can be selected (See picture 1).
11. Set the actual ambient temperature. Swema 3000md compensates for air density calculating with the selected temperature and the measured barometric pressure. The temperature can be measured also with a thermocouple type-k connected to Swema 3000md (See picture 1).

Menu 1				
Mode	Duct			
Time Constant	5s			
K-factor 20	19,40			
Area				
Tightness Class	A			
Unit	l/s			
Atmos. P A	988.3hPa			
Temp.	20.0°C			
I-factor	1000			
Note Book	1			
File	3/ (3)			
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%; text-align: center;">EXIT</td> <td style="width: 33%; text-align: center;">MENU2</td> <td style="width: 33%; text-align: center;">SET</td> </tr> </table>		EXIT	MENU2	SET
EXIT	MENU2	SET		

Picture 1: Menu 1

File 1 Note 3 of (4)						
2015-02-23 13:06:20						
Duct leakage test						
Temperature	20.0	°C				
K-factor	19.40					
Barometer	988.3	hPa				
Area	30.2	m ²				
Class A, v = Test passed						
No	Pa	l/sm ²	Limit			
1	282.9	1.5	1.06			
2	282.4	1.5	1.06			
3	282.3	1.5	1.06			
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%; text-align: center;">EXIT</td> <td style="width: 33%; text-align: center;">PRINT</td> <td style="width: 33%; text-align: center;">ERASE</td> </tr> </table>				EXIT	PRINT	ERASE
EXIT	PRINT	ERASE				

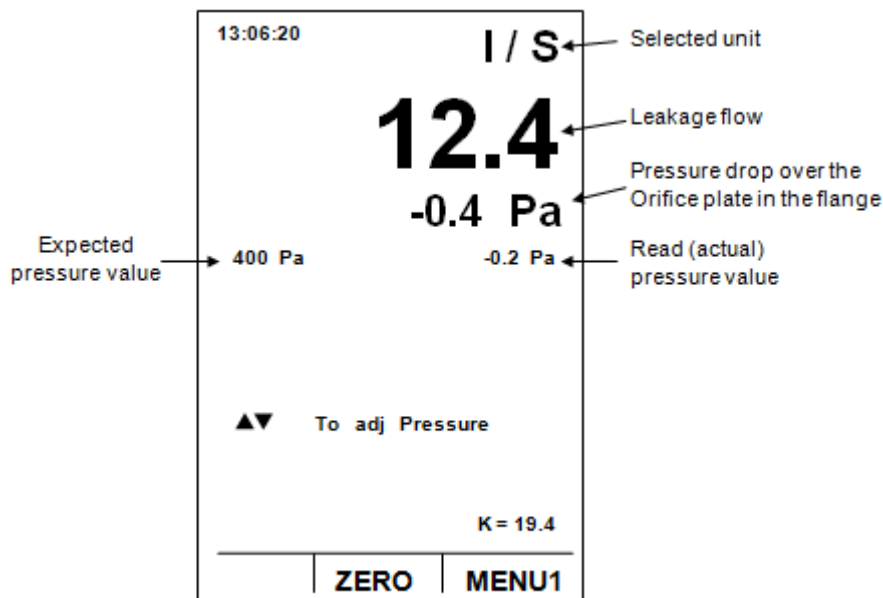
Picture 2: File

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MEASUREMENT

1. Select in Swema 3000md, the external pressure sensor. The letters %NT.+are shown on the left at the lower part of the display. It is also possible to measure with the internal pressure sensor, but then the pressure hoses (silicone hoses) must be changed, and the letters %EXT.+ are shown instead.
2. Before measuring starts, both differential pressure sensors must be zeroed. Press %NT.+to access the built-in pressure sensor in Swema 3000md, and press ZERO. Afterwards, press %EXT.+to return to the externally connected pressure sensor and ZERO it.
3. In measuring mode the display shows 4 measuring parameters. The largest digits at the top show the leakage flow (l/s, m³/h, l/sm² or m³/hm²), below the leakage flow, the pressure drop over the orifice plate in the flange used to calculate the leakage flow. The two pressures shown below the pressure drop, and with small digits, are the expected pressure value at the left and the read value (actual value) of the measured pressure to the right (See picture 3).
4. Press the arrow keys UP/DOWN to adjust the value of the pressure to be measured, wait until Swema 3000md is stabilized at the read value (true value) of the pressure. (See picture 3).
5. Measure by pressing the ENTER button.



Picture 3: Measuring mode

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Instrumentation:

Duct leakage tester (765900) with measuring flange for 10ö 140l/s (766430)
Swema 3000md (764202)
SWA 10(761430)
Holder(764760) 2pcs, to attach SWA 10 to Swema3000md
Stop (764870) 1pc, to prevent SWA 10 from sliding on Swema3000md
Silicon hose (762470) 8m, between tester and Swema 3000md and duct

Accessories:

With the bladders below, tighten the ventilation supply and exhaust.

Bladder Ø 250mm (765080) To seal duct, as many as needed
Bladder Ø 400mm (765090) To seal duct, as many as needed
Bladder Ø 600mm (765100) To seal duct, as many as needed
Pump (766620) Pump with connector to pump up bladders by hand

TECHNICAL DATA

Max flow (without hose): 144 l/s

Max Flow (leakage tester with hose Ø 100mm):

Overpressure

16 l/s	at 1900 Pa
50 l/s	at 1500 Pa
73 l/s	at 1200 Pa
85 l/s	at 1000 Pa
110 i/s	at 500 Pa
114 l/s	at 400 Pa
122 l/s	at 200 Pa

Underpressure

128 l/s	at -500 Pa
120 l/s	at -750 Pa

Min Flow: 10 l/s

Uncertainty: ±4.5% read value (when used together with Swema 3000md and SWA10
95% coverage probability for non-condensing, non-moist air
<80% RH for non-aggressive gases)

Spare part: Measuring flange for 10ö 140l/s (766430)
Measuring flange for 3ö 30l/s (767890)

Weight: 18 kg

Power supply: 220 VAC (0.37 KW)

