

# Automatic Dry Air Leak Testing

## JWF Leak Test Panels Series 400

JWFROEHLICH

MFL 400



IO/1



Leak Simulation Water Jacket

JWF Proj. No.: 0/40 286

Leak Simulation Oil Cavity



JWF CALT Test Parameter Simultaneous Start System Mode Reset Help

Water Cavity Oil Cavity Oil/Water Drainball Seal Ring

### Water Cavity TEST

1,038 bar  
0,7 sec

Test Pressure  
**0,511** bar

Leak Rate  
**0,96** Std cm<sup>3</sup>/min

LEAK TEST

4: V8 Engine

Stop

Test Pressure [bar]

Leak Rate [Std cm<sup>3</sup>/min]

9 pneumatics 9.24.2004 3:44

The New Direction in Leak Testing:

## JWF Leak Test Panels Series 400

Capable of performing virtually every type of leak and flow test.

### JWF Leak Test Panel MPS 400

Relative Pressure Measurement

- Test methods:
  - Pressure Decay or Rise
  - Overpressure or Vacuum
- Resolution: from 1 Pa

### JWF Leak Test Panel MPS 450

Differential Pressure Measurement

- The transmitter isolation valve is automatically monitored for proper closure during the test phase.
- Resolution: from 0,1 Pa

### JWF Leak Test Panel MFL 400

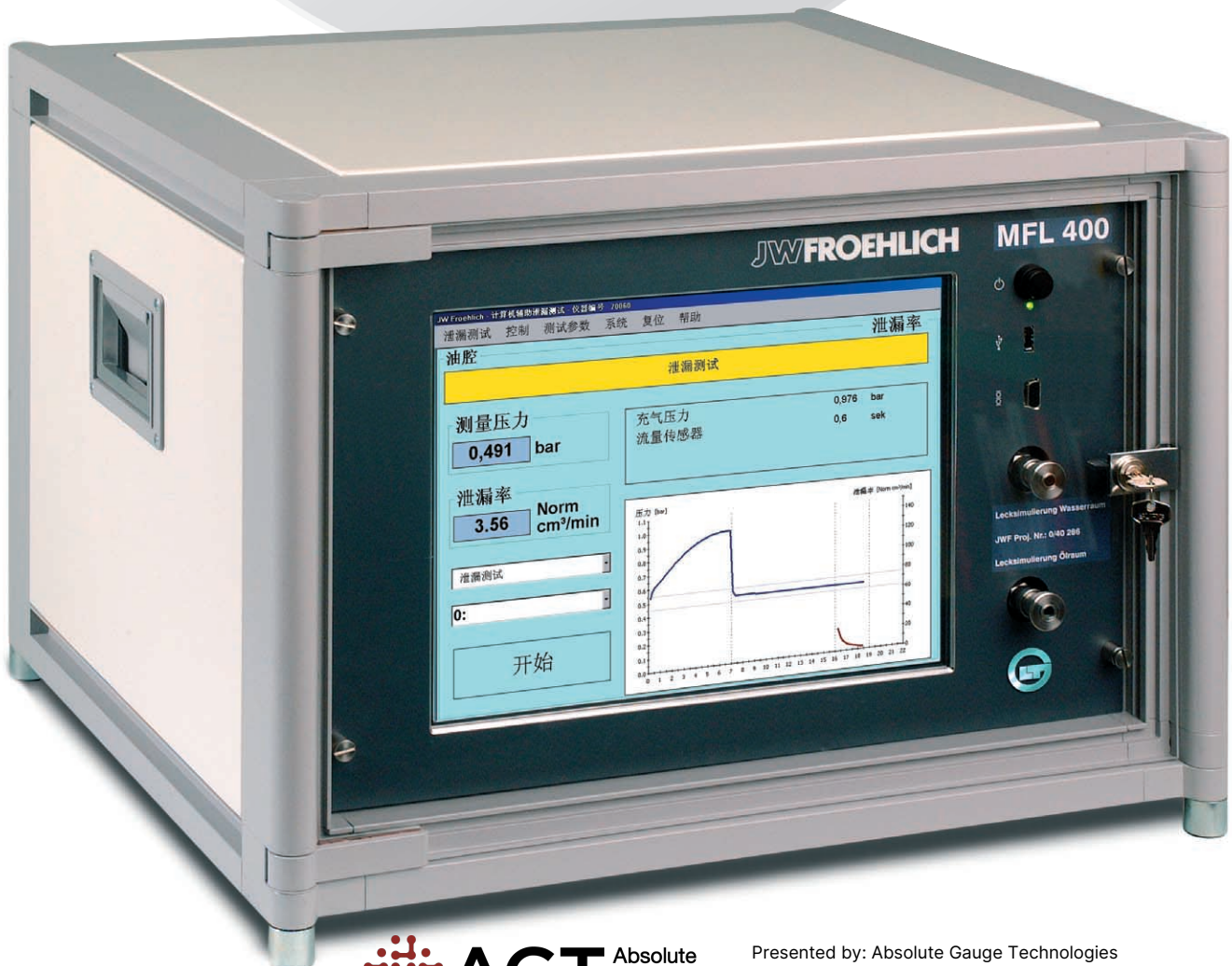
Mass Flow Measurement

- Using the Zero Resistance JWF Mass Flow Sensor
- The measurement signal is independent of atmospheric pressure and temperature.
- The measurement signal directly corresponds to the leaking air flow.
- Particularly suitable for large volume components
- Resolution: from 0,01 Std cc/min

### JWF Leak Test Panel MFL 450

Volume Flow Measurement

- For large flow rates
- Suitable for combination of leak and flow test in one system
- Resolution: from 1 Std cc/min





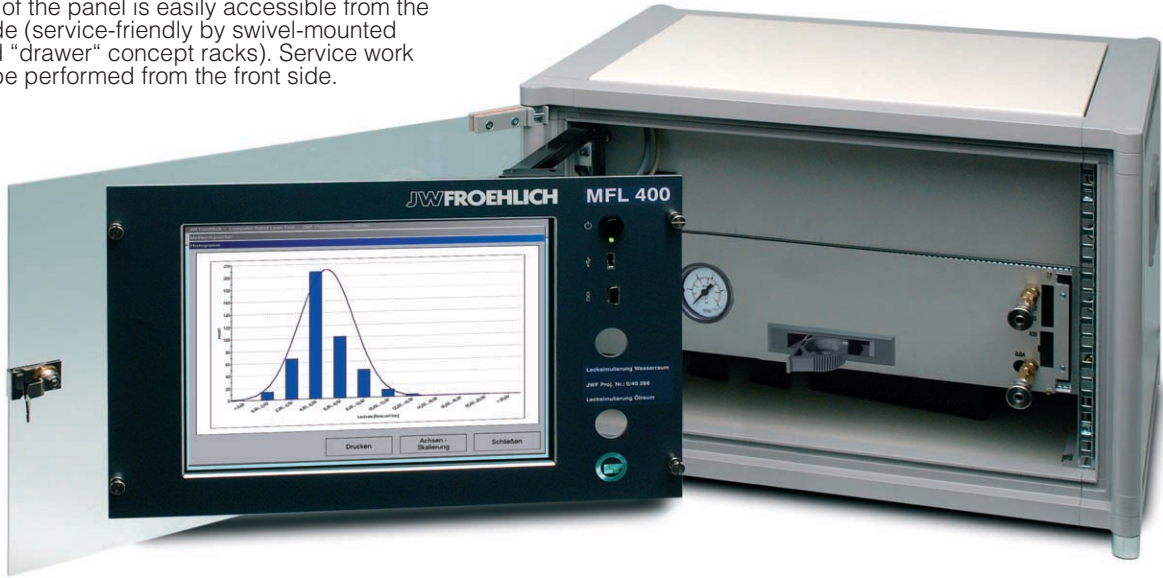
Display of a 4 Channel MFL 400 after leak testing of an engine assembly.

## Technical Data

- Windows user interface
  - 15 inch Touch Screen Monitor
  - On-line display of the test sequence
  - Instruction manual and help texts displayed on the Monitor
  - Data Storage Module for
    - 100.000 test results
    - 5.000 measurement signal curves
  - Statistical Analysis of the test results:
    - mean value, standard deviation, trend analysis
    - quality control chart
    - normal curve of distribution
  - Number of measurement channels: 1 to max. 12
  - Number of test programmes: 32 for each measurement channel, fully programmable
  - Communication ports:
    - on front side of panel
      - 1 x serial connector
      - 1 x USB connector (for external mouse or keyboard)
    - on rear side of panel
      - 1 x Profibus
      - optional:
        - max. 30 inputs 24 VDC
        - max. 18 discrete outputs (dry contacts)
        - optional:
          - 1 x Ethernet
  - On-line connection to a remote JWF Leak Calibrator. The amplification factor of the leak test panel is automatically adjusted according to the leak rate value of the JWF Leak Calibrator.
  - Free programmable test pressure adjustment
  - Optimised accessibility. All of the panel interior is easily accessible from the operator side.
  - Automatic self test
  - Lockable inspection door
  - Steel cabinet 19" - 7 HE, protection class IP 54,
  - Dimensions: 575 x 415 x 500 mm
  - Weight: approx. 42 kg
  - Electrical supply: 24 VDC, 5 A
  - Pneumatical supply: Compressed air
    - min. 0,5 bar and max. 1,0 bar above the fill pressure
    - free of oil and water according to DIN ISO 8573-1 class 3
- ### Optional
- Air Filtration Unit incl. dirt and water trap, pressure regulator and pressure gauge (delivered as loose item)
  - Power Supply Unit for electrical connection to 110/230 V, 50/60 cycles (delivered as loose item)
  - Temperature Compensation
  - Selectable Languages
  - Tele-Service (Remote Communication)
  - JWF QAT 40 Software: Test result output in Q-DAS ASCII-Format.
  - Freely programmable electrical control system for sealing fixtures

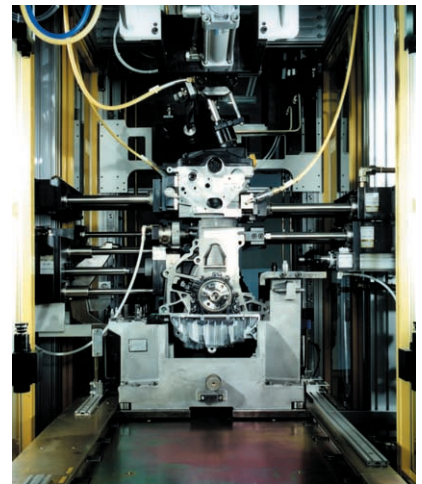
**Service friendly concept**

The interior of the panel is easily accessible from the operator side (service-friendly by swivel-mounted monitor and "drawer" concept racks). Service work can easily be performed from the front side.

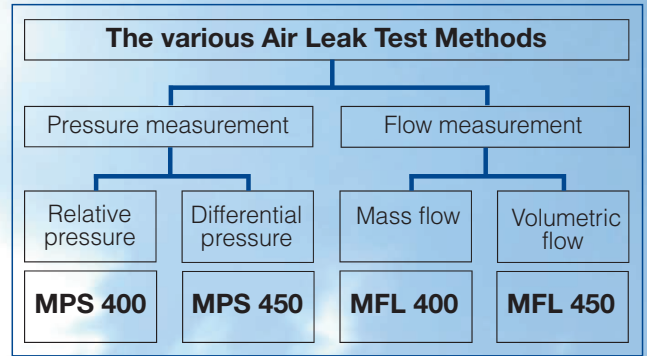


We do not only offer Leak Test Panels but provide custom turnkey Leak Test Systems

Leak Test Station for engine assemblies



# Automatic dry air leak testing



When conducting any form of automatic dry air leak testing the part to be tested is subjected to a pressure difference and checked for air escaping. The escaping air itself cannot be measured directly but its consequences can. There are two different methods used to measure these affects: pressure measurement and flow measurement.

## Pressure Measurement

Principle: The workpiece is pressurised with air, isolated from the compressed air source and test pressure changes monitored during the measurement phase. Pressure measurement is the most commonly used method in mass production. With small test chambers it is possible to detect leaks as small as 0.1 cm<sup>3</sup>/min.

The Relative Pressure method enables the use of a simple test system and requires the smallest possible measurement system volume. It is also distinguished by high reliability and a wide measuring range.

The Differential Pressure method is recommended when using high test pressure (above 5 bar), as the measurement signal resolution is independent of the test pressure.

The Pressure Decay measurement method replicates the usual operating condition.

The Pressure Rise measurement method in a vacuum test reduces the influences of temperature variations and volumetric instability of the sealing fixture or the workpiece. Dirt, chips and other residues may, however, be sucked into the pneumatic test circuit contaminating the test system. Using pressure rise measurement in the overpressure test method (capsule method) does not require the use of a balance phase. Also, in this case the test sensitivity is not limited by the range of the measuring sensor as it is not subjected to the actual test pressure.

## Flow Measurement

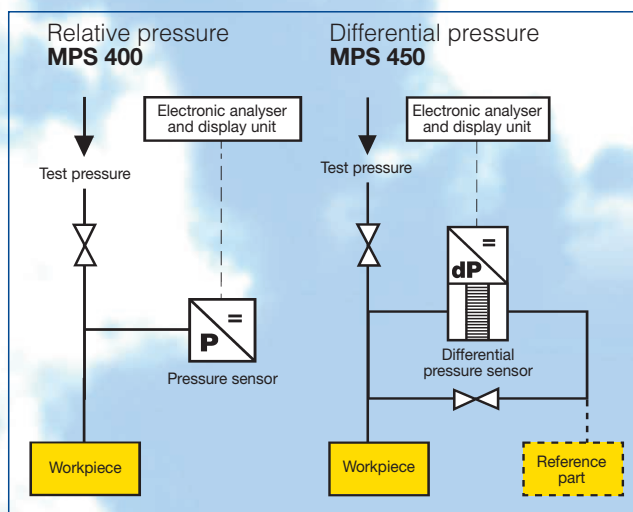
Principle: The workpiece is pressurised with air and remains connected to the compressed air source during the measurement phase. The test system monitors whether the air continues to flow into the workpiece during this phase.

Whereas the pressure measurement test signal becomes smaller with increasing test volume, the flow measurement test signal is independent of the test volume. This is an advantage in calibration because the flow measurement test signal corresponds directly to the air flow rate of the calibrated leak. It is not necessary to know the size of the test volume when determining the actual leak rate.

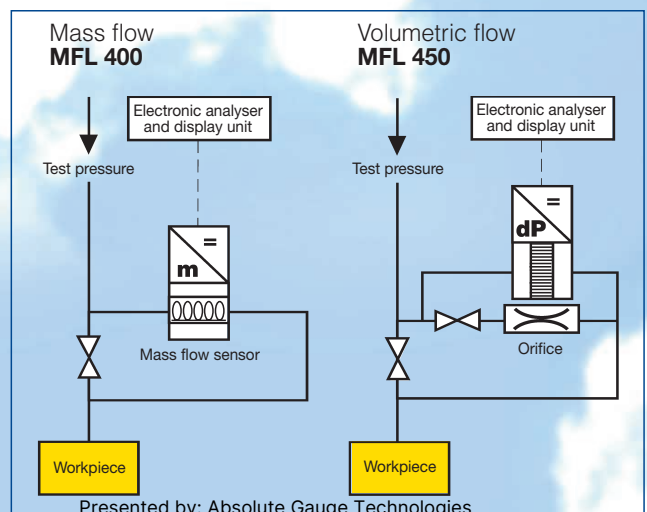
The Volumetric Flow measurement method (pressure drop across an orifice using a differential pressure sensor) is normally not used for leak testing, but for flow control, for example in monitoring unrestricted flow of gas systems. The same differential pressure sensor can be used for a subsequent pressure decay leak test.

With Mass Flow rate measurement (thermal measuring methods) the test signal is not only independent of the size of the test volume but also of the atmosphere pressure and atmosphere temperature. The test signal corresponds directly to the leak rate in standard cm<sup>3</sup>/min. The leak rate does not have to be calculated, as in pressure measuring methods.

## Pressure Measurement method



## Flow Measurement method



# JWF LTG Tele-Service



**AGT** Absolute Gauge Technologies™

Presented by: Absolute Gauge Technologies  
sales@absolutegauge.com; www.absolutegauge.com  
Toronto: 416 754 3168, Montreal: 514 695 5147, Toll Free: 1 888 754 7008

## JWF is certified

Quality-Management ISO 9001:2000  
Quality-Management VDA 6.4  
Environmental-Management ISO 14001  
Q1 Award  
QAT 40 Version 3.2



## JWF Leak Calibrator



# JWFROEHLICH

**AGT** Absolute Gauge Technologies™

Presented by: Absolute Gauge Technologies  
sales@absolutegauge.com; www.absolutegauge.com  
Toronto: 416 754 3168, Montreal: 514 695 5147, Toll Free: 1 888 754 7008