

FELTEST EQUIPMENT

Feltest AirSpeed/2



Instruction manual

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2. Safety instructions

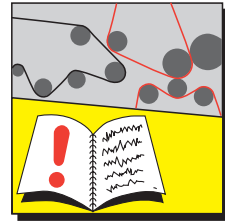
2.1 Intended use

The Feltest AirSpeed/2 is intended to measure the airflow through a press felt over an Uhle box on running paper machines. The instrument may not be used on any other object, like for example dryer screens or conveyor belts.

2.2 Safety precautions

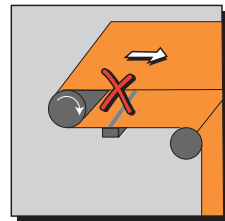
Running paper machines can be very dangerous! Therefore it is very important to read this manual and its safety instructions before operating the Feltest AirSpeed/2.

- Before using the instrument, read this manual carefully, it contains important safety information. If you not fully understand this manual, please contact Feltest Equipment bv for more information. Keep this manual where the operator can easily find it.

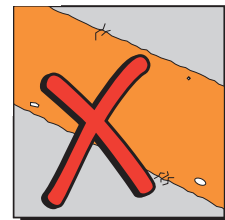


- Use the instrument as intended and according to this manual. Do not measure the airflow through forming fabrics or dryer fabrics on running paper machines.

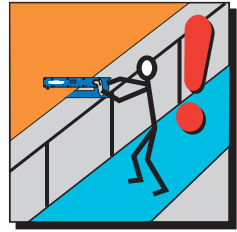
- Be aware of the danger of rotating machine parts. Do not make measurements close to in-going nips. You or the instrument could be grabbed into the machine, which can result in severe life threatening injuries and very costly damages.



- Do not measure press felts with holes or damaged edges. Before starting your measurements, check with the staff of the paper machine if holes or damaged edges are known. At the machine, first look very carefully for any defects or signs indicating defects, before starting the measurement. If you have any doubt, do not measure.



- Before starting a measurement, make sure you find a stable position with two feet on a solid base. Do not bend over into the machine. If you must lean against a safety fence (or something similar), first check its stability.
- Always follow the safety instructions that apply for the location where the measurements are done. Do not ignore or remove safety constructions from the paper machine.



Please note:



Doing measurements (of any kind) on running paper machines is dangerous and requires alertness, concentration and common sense. The Feltest instruments are designed and constructed to be as safe as possible for their intended use. Nevertheless it is the user's responsibility to actually use the instrument in a safe way. Feltest Equipment bv can not be held responsible or liable in any way for suffered injuries or damages that occurred while using their instruments.

3. About the instrument

With this air speed meter (or anemometer) you have acquired a precision instrument of exceptional quality. You also obtain the benefit of our many years' experience in measuring physical data on running paper machine clothing.

All probes have been calibrated in a wind tunnel and are checked to conform to the required tolerances.

3.1 Names of parts



The instrument is built up out of an electronic read out unit, a probe with a small propeller that is installed in a plastic measuring head and a telescopic grip.

- The air flow is measured by a small, aerodynamically optimised propeller which is extremely accurate and reliable.
- The plastic measuring head is made from HDPE which ensures low friction with the felt. Contamination will not stick to the material, therefore it can be cleaned easily.



Average, minimum and maximum values can be called up at any time. As the calculation of these values takes place simultaneously they can be requested at any time, the test result is not affected.



3.2 Working principle

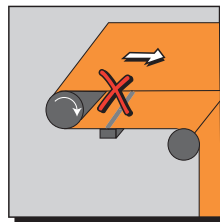
The Feltest AirSpeed/2 works with a vane or propeller anemometer as the propeller has proved to be more accurate and durable than a thermal anemometer in the harsh environment of a paper machine.

The propeller speed, directly corresponding to the flow rate, is sensed electronically without inducing any reaction force and is transmitted to the read out unit.

The read-out unit operates through a microprocessor with a minimum current loading. This makes it possible to perform all functions and measurements by using only a few keys and allows the data to be called up at any time. The measuring data are read on the LCD display. The unit is battery operated.

4. The measurement

It is of utmost importance to work safely when measuring the air speed through a press felt. Find a safe and stable position close to the Uhle box, expand the telescopic grip so it will not be necessary to bend over into the machine but most important is to **stay away from any in-going nip!**



4.1 Measuring procedure

Preparation

The connector and cable of the probe are led through the telescopic grip. Then the measuring head and the telescopic grip can be mounted together. The connector is clicked into the read out unit (watch the red dots) and the instrument can be switched on with the **On/Off** key.

The instrument performs a functional test lasting about 2 seconds. During this time the display shows the probe code 15.20. The first 2 digits indicate the propeller head diameter, the last 2 digits the full-scale reading in m/s.

The instrument now measures continuously and shows the average value of the last 2 seconds on the display. The display is refreshed every 0,5 second. Changeover to 6 or 22 seconds average: press the

Fast or **Slow** key. To return to the 2-second average the instrument must be switched off and on again.

Error indication

If the display shows **E.xx** when switching on or during operation, this indicates a fault. The fault can be identified from the E-number details under Technical Data in chapter 5.

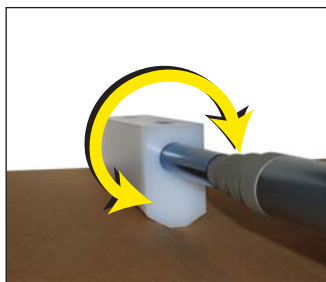
Measurement

When it is safe to measure the air speed, the measuring head is held against the felt, above the slit of the Uhle box. The slit in the measuring head should be in contact with the felt, the round hole should be 'on top'.

By rotating the measuring head a few degrees clockwise and counter clockwise one will see that the measured air flow will vary.

There is no rule of thumb for the right angle; it depends on felt weight and water content, felt speed, width of the slit and the

force with which the measuring head is pressed onto the felt. Generally spoken the position which gives the highest test results is the best.



After switching on the instrument, averages are calculated over 2 seconds (every 0,5 second a value). Pressing the **Min/Max** key will return the minimum and maximum test results measured. Pressing the **Flow** key will return to the current test values.

Where greater accuracy is required and the flow is rather irregular the test time can be extended, resulting in an average over 6 seconds (press the **Fast** key) or 22 seconds (press the **Slow** key). During the measurement the remaining test time up to the end is indicated in seconds. The **Mean** or average value of the complete measuring cycle will be calculated when the measuring time has ended. A new measurement is started by pressing the **Fast** or **Slow** key again. To return to the 2 second average, the instrument needs to be switched off and on again.

When the display shows **BATT** the battery (9 Volt) has to be replaced.

4.2 Interpretation of the results

By measuring the air speed through a press felt it becomes possible to quantify the felt's permeability or openness. Generally the measured air speed should be between roughly 2 and 10 m/s. If the test results are too low, the Uhle box will hardly remove any water out of the press felt and values over 10 m/s will only cost vacuum without increasing the amount of removed water.

Still, only measuring the air speed is not enough to determine the felt's condition. The applied vacuum is very important and should be measured as well (for example with the *Feltest RealVac*) as manometers on Uhle boxes are seldom reliable. To compare the permeability from several measurements over time with different levels of vacuum, one could calculate a relative "dynamic permeability". This means to measure both vacuum and air speed and then calculating the air speed towards a standard vacuum of 10kPa.

An example:

Measured vacuum	Measured air speed	Dynamic Perm @ 10 kPa
20 kPa	4.0 m/s	2.0 m/s
30 kPa	4.0 m/s	1.3 m/s
35 kPa	4.0 m/s	1.1 m/s

This examples makes clear that, although the measured air speed is always 4.0 m/s, the felt becomes more closed as the applied vacuum is increasing.

If the air flow through a felt decreases, this can be the result of contamination or compaction of the felt. Also a high water content in the felt will reduce the air flow over the Uhle box. Only by also measuring the caliper with a *Feltest Caliper Gauge* and the water content, one gets the whole picture and is it possible to accurately determine the felts condition.

5. Technical data

Probe

Medium:	non-corrosive gases
Measuring range:	0,5 to 20 m/s
Start-up code:	15.20
Connector:	Lemo FCG.0B.305.CLCD52Z
Accuracy:	2,0% full scale plus 5% reading
Operating temperature:	0 to +120° C
Storage temperature:	65 to +150° C

Read out unit

Medium:	non-corrosive gases
Unit of meas.:	flow in m/s
Display:	LCD 4 characters
Measuring rate:	2 values/sec.
Supply:	Battery (1 x 9 Volt, size PP3)
Current consumption:	approx. 15 mA
Battery life:	approx. 12 hours
Case dimensions:	80x145x39 mm (ABS plastic)
Case protection:	IP64 (splash water proof)
Weight:	230 g
Operating temperature:	0 to + 50° C
Storage temperature:	-30 to + 80° C
Air humidity:	0 to 90% rh, non condensing
Standard:	laser controlled wind tunnel (Certificate in accordance with EN 45001)

Error diagnosis

- E.01 = probe type not recognised
- E.03 = over velocity measuring range

6. Declaration of conformity



Instrument: MiniAir Junior
Instrument type: Vane anemometer
Type designation: V7

The signing legal authorities state, that the above mentioned equipment meets the requirements of the electromagnetic compatibility (EMC) according to the Guideline of Counsel 89/336/EEC of 03.05.1989

The evaluation procedure of conformity was assured according to the following standards:

- a) Emission : EN 55022 : 1994
- b) Immunity : EN 50082-1 : 1992

This EC – Declaration of conformity is based on the test report No. 95.1 10951 of the EMC-Testcenter of SEV/ASE, CH-8320 Fehraltorf.

Signed on January 1st 1996,

A handwritten signature in blue ink, appearing to read 'M.F. Lensvelt', is written over a light blue background.

M.F. Lensvelt
Managing Director

Postal address:

Feltest Equipment BV
Postbus 205
NL-6960 AE Eerbeek
The Netherlands

Visiting address:

Feltest Equipment BV
Bijenkorf 55
NL-6961 PA Eerbeek
The Netherlands



P.O. Box 205
NL – 6960 AE Eerbeek
The Netherlands

T: +31 313 652 215
F: +31 313 654 068
E: info@feltest.com
W: www.feltest.com