

Analog
measuring
case

Measuring system



for
professional

compressed air

Analyses

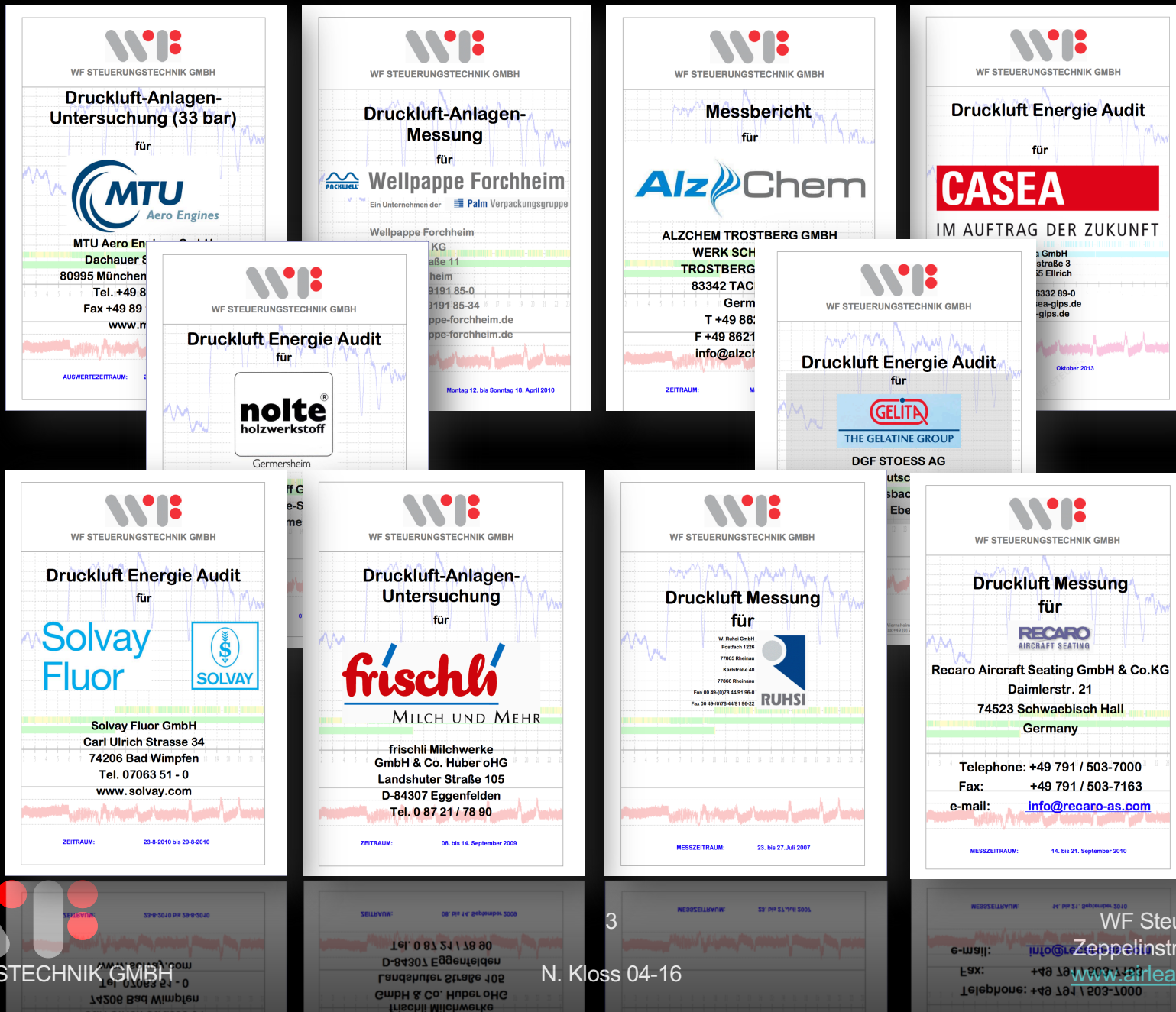


WF STEUERUNGSTECHNIK GMBH

A professional compressed air analysis

- provides an exact statement about the condition and effectiveness
the compressed air system on the customer's production side, as well
about compressed air consumption and quality in production
- based on real facts – measured amps, pressure,
Dew point, flow temperature, ...
- leads to an efficient compressed air system with the
highest possible required compressed air quality to the lowest
possible costs





A professional compressed air analysis

- is a unique sales advantage and conveys

Expert knowledge and competence versus purpose-oriented

“Free measurements”

- is the starting point for well-founded investment decisions
- creates customer loyalty
(and customer loyalty creates orders)
- is NOT free and (hopefully) not free
(if applicable, credit for order)



What does a professional DL analysis look like?

Proof of performance
Professional compressed air analysis
for medium and large systems



Proof of performance, professional compressed air analysis forms the basis for economical and operationally reliable Compressed air system. By signing this proof of performance, the entrepreneur guarantees that the Work was carried out in accordance with the specifications of EnergieSchweiz. This gives the operator one Analysis that shows him where the optimization potential lies in his compressed air system and what concrete measures he can take.

Checklist for
contractors (end
customers)

Source:



efficient compressed air - a campaign by Energieschweiz
www.druckluft.ch

Required basic data:



Measurement data!

Leistungs-Nachweis Druckluftanalyse

Der Leistungs-Nachweis fachgerechte Druckluftanalyse ist einerseits ein Beleg für den Unternehmer, dass er die Analysen gemäss den Empfehlungen von EnergieSchweiz durchgeführt hat. Andererseits erkennt der Betreiber auf einen Blick, dass alle versprochenen Leistungen erbracht wurden. Ergänzt wird der Leistungs-Nachweis mit den unternehmensspezifischen Messprotokollen, Plänen, Schemata und Empfehlungen. Die Analyse erarbeitet und empfiehlt, alle Punkte sowie bei Bedarf die vertieften Analysen durchzuführen.

Alle ausgeführten Analysen und Punkte bitte mit einem X bestätigen:

☒ Aufnahme technische Daten der Komponenten
Wir haben die technischen Daten der wichtigsten Komponenten in einer Tabelle zusammengestellt. Diese beinhaltet folgende:

- ☒ Kompressor: Verdichtungsart, Steuerungsart, Leistung gemäss DIN ISO 1217 Anhang C bei aktuellem und im Leerlauf, maximale Liefermenge, maximale Leistung bei minimaler Leistung.
- ☒ Trockner (Hersteller, Typ, eingestellte Luftfeuchtigkeit, Art der Teillaststeuerung).
- ☒ Kondensatabscheider (Typ, Standort, Filter (Hersteller, Typ)).
- ☒ Kondensatabscheider (Art, übergeordnete Steuerung (Art)).

☒ Aufstellungsplan der Druckluftanlage
Wir haben von den Komponenten der Zentrale (Kompressor, Kondensatabscheider, Kondensatabscheider, Speicher, Steuerungsplan mit dem entsprechenden Verlaufsplan, der angeordnet ist, erarbeitet.

☒ R-I-Schema der Zentrale
Wir haben von den Komponenten der Zentrale (Kompressor, Kondensatabscheider, Kondensatabscheider, Speicher, Steuerungsplan mit dem entsprechenden Verlaufsplan, der angeordnet ist, erarbeitet.

☒ Aufnahme der Hauptleitungen
Wir haben die Hauptleitungen, gemeinsam mit dem Betreiber, erfasst und vom Betreiber eingetragene Hauptleitungen in den Plan eingetragen. Alle Dimensionen und das Material der Leitungen eingetragen. Alle Dimensionen und das Material der Leitungen eingetragen. Alle Dimensionen und das Material der Leitungen eingetragen.

☒ Versorgungssicherheit
Wir haben die Anforderungen der Betreiber an die Versorgungssicherheit in der Tabelle eingetragen. Alle Dimensionen und das Material der Leitungen eingetragen. Alle Dimensionen und das Material der Leitungen eingetragen.

☒ Last-Leerlauf Messung
Wir haben das Last-Leerlauf-Nachweis durchgeführt. Alle Dimensionen und das Material der Leitungen eingetragen. Alle Dimensionen und das Material der Leitungen eingetragen.

☒ Kurven mit dem Tageslast-Leerlauf-Nachweis durchgeführt. Alle Dimensionen und das Material der Leitungen eingetragen. Alle Dimensionen und das Material der Leitungen eingetragen.

☒ Analyse des Last-Leerlauf-Nachweis durchgeführt. Alle Dimensionen und das Material der Leitungen eingetragen. Alle Dimensionen und das Material der Leitungen eingetragen.

☒ Empfehlungen für die Optimierung der Druckluftanlage
Wir haben die Empfehlungen für die Optimierung der Druckluftanlage in der Tabelle eingetragen. Alle Dimensionen und das Material der Leitungen eingetragen. Alle Dimensionen und das Material der Leitungen eingetragen.

Checklist!

☒ Compressed air quality requirements Variant A (for companies that know their compressed air quality requirements): We have recorded the required purity classes with regard to solid contamination, moisture and total oil content in accordance with the classes of ISO 8573-1 (2001) (target situation). We compared this with the quality that is produced with the existing processing (current situation). If there are differences between the actual and target situation, we have developed recommendations for optimization. Variant B (for companies that do not know the requirements for compressed air quality): We checked the quality based on the following indicators: - increased rejects during production - above-average wear on the tools - paper blown with compressed air shows oil, water and

☒ Pressure loss measurement We measured the pressure drop (differential pressure) between the container and at least three exposed consumers using a digital pressure measuring device (measurement accuracy ± 0.01 bar). If the pressure drop is more than 0.8 bar, the cause must be analyzed. From the analysis, we derived and suggested appropriate optimization measures. We also randomly analyzed the connection accessories (hoses, couplings, etc.) using a simple visual inspection to determine their age, length, dimensions and use and recorded any defects in list.

or particle residues. If one of the indicators is positive, it is recommended to carry out a more detailed analysis of the compressed air quality. As a further check, the data from the last filter change was checked. If the filters have not been changed for more than 1 year (all of them), they should be changed (see www.druckluft.ch). For medical applications, we checked together with the technical manager whether the GMP requirements of the IHS (Ingenieur Hospital Schweiz) were met.

☒ In-depth analyzes The following analyzes are optional and only need to be carried out if the previous analyzes show that an in-depth clarification makes sense.

☒ Operating times We checked together with the company's compressed air manager whether the entire system or parts of the system can be switched off outside of operating hours (at night and on weekends). We specifically clarified whether it would be possible to switch off the entire system or parts of it if individual (permanent) consumers were supplied with compressed air in another way (e.g. via a separate supply line from the headquarters or with a decentralized (small) compressor during off-peak times). We have recorded the options and shutdown times in writing.

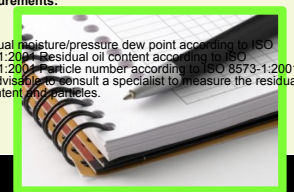
☒ Leak detection for systems with a maximum area of 120 m²
With a maximum height of 2.5 m, we checked all end users, all connections and couplings as well as the entire pipe network for leaks. For systems with an area of more than 120 m² and/or a height of more than 2.5 m, we have checked all end users, all connections, the compressed air center and the main line for leaks as far as possible. The identified leaks were listed in the leak report. Each leak is given a number. The report provides information about the location and size of the leaks and contains instructions on how to fix them. In the system, the leaks were marked with a clearly visible, approx. 5 cm large adhesive. The adhesive is labeled with the corresponding leak number.

☒ Waste heat utilization We have examined the possibility of economical waste heat utilization. We discussed the following waste heat utilization options with the operations manager:

☒ Measuring compressed air quality The clarifications regarding the requirements for compressed air quality have shown that measuring the compressed air quality is necessary. We carried out the following measurements:

☒ Heating space heating Hot water (heating or preheating) process heat (e.g. for drying or preheating) that the waste heat can be used. We roughly determined the economic efficiency using the "Heat recovery" calculation tool (www.druckluft.ch - Toolbox) or our own calculation program.

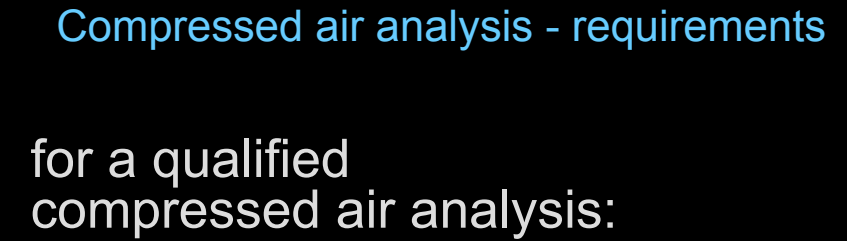
☒ Residual moisture/pressure dew point according to ISO 8573-1:2001 - Residual oil content according to ISO 8573-1:2001 - Particle number according to ISO 8573-1:2001 It is advisable to consult a specialist to measure the residual oil content and particles.



provides all
measurement
data



Leakage estimation



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Zeppelinstr. 7-9, 75446 Wiernsheim
www.airleader.de 0 70 44 – 911 100

To meet these requirements, the Airleader measuring case is the professional tool:

Security of supply means knowing peak consumption

Measure load-idle components

Measure total air consumption

Total load and idle kW

Total load and idle hours

Daily consumption profile

Daily compressor status overview

Daily pressure profile

Leakage (during downtimes)

Compressed air quality (dew point)

Differential pressure measurement



Versatile use – up to 8 channels in any order:

200 A
0 - 75 kW



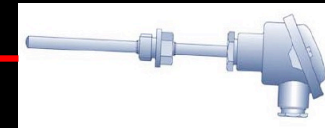
400 A
90 - 160 kW



1000 A
200-500 kW



Ambient temp.



Medium temp.



dew point



Pressure
differential pressure



Volume flow

Versatile use – use existing sensors:



4-20 mA

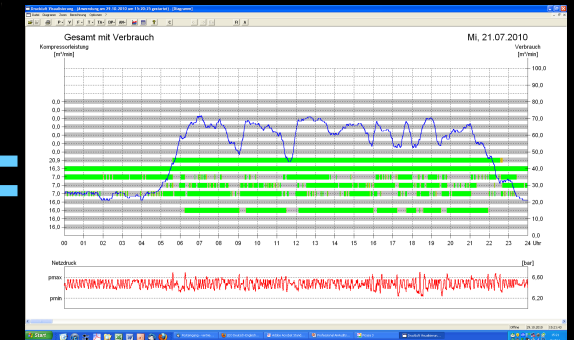
Any signal or sensor with 4 – 20 mA output

The software evaluates up to 4 cases used simultaneously:

4 compressor locations



1 evaluation

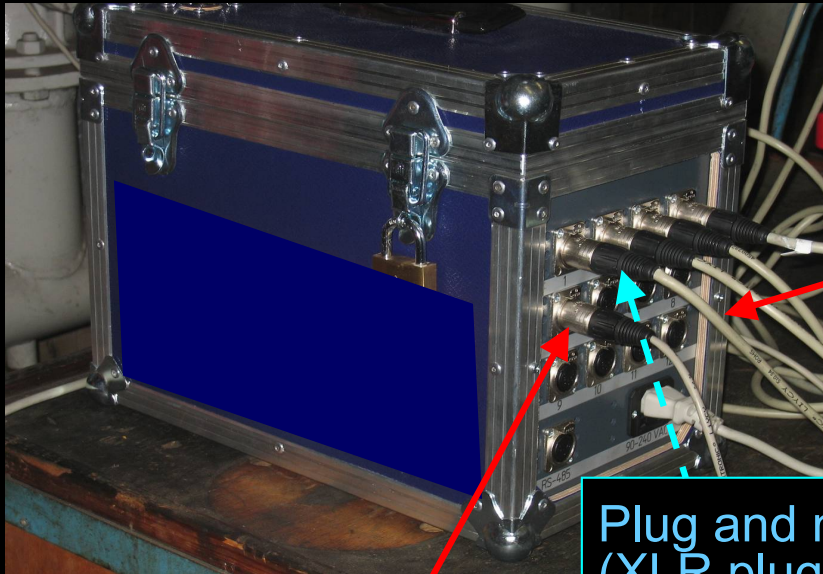


8 channels 16 channels 24 channels 32 channels 16 compressors 16 sensors



Easy to install and easy to evaluate

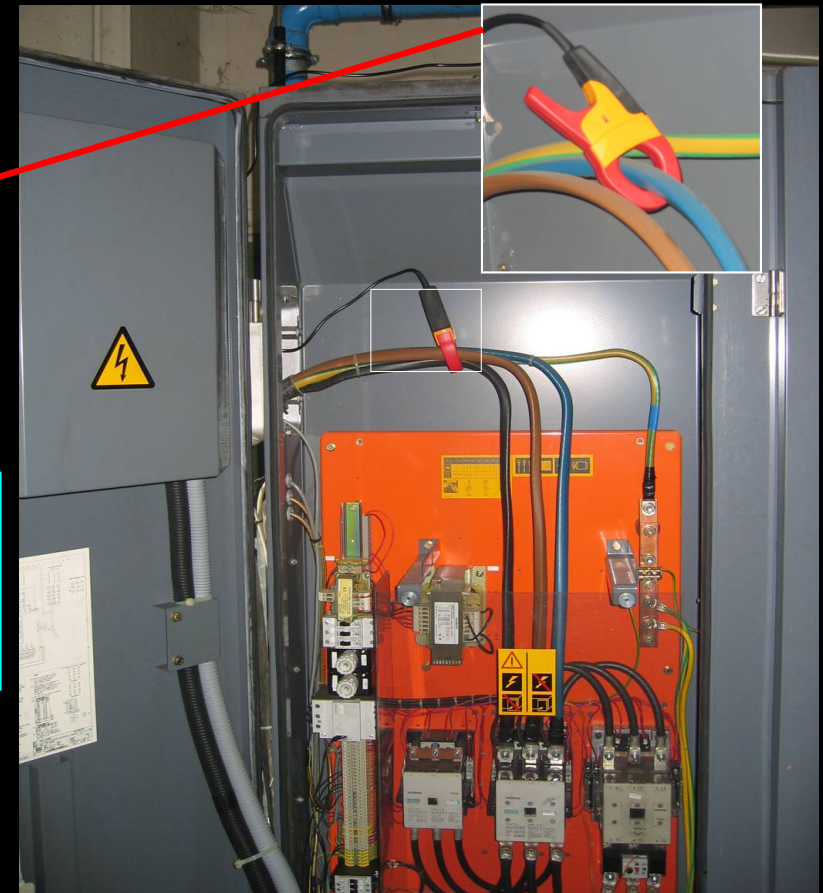
Easily installed (sales-safe!):



Plug and measure!
(XLR plug, e.g. at open
air concerts)



Pressure sensor



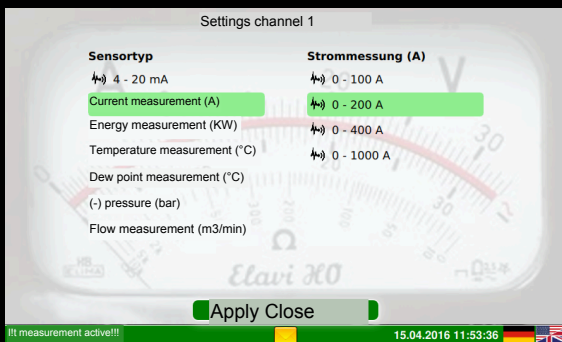
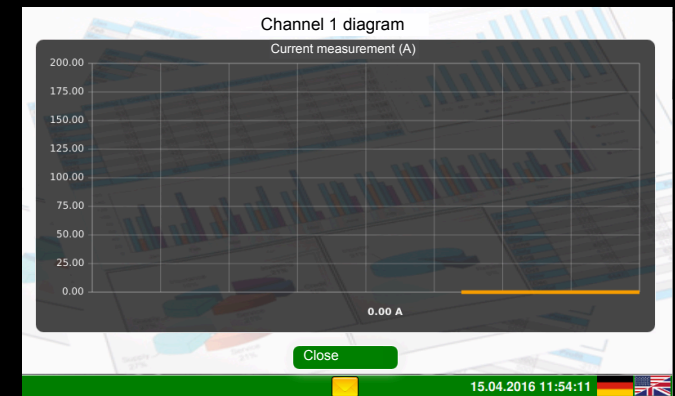
Ampere pliers

Easily installed (sales-safe!):



The standard touchscreen control panel not only makes operation easier and makes typing mistakes impossible.

It can also display the measurement data directly in chart form and the correct unit.



An on-site check of the measurement data for plausibility can be carried out directly - incorrect measurements are now (almost) impossible.



With GSM module

The GSM module (optional € 980) sends the measurement data daily by email. This has 2 tangible and monetary advantages:

- After 7 days you can do the evaluation and bring it with you when you dismantle the case.

This saves you a complete arrival and departure!

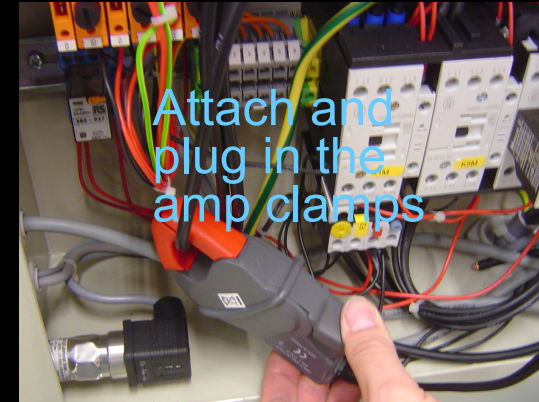
- After 24 hours at the latest you can check whether the measurement is still working correctly or whether someone has pulled the plug



Installation of the measuring case in the compressor room



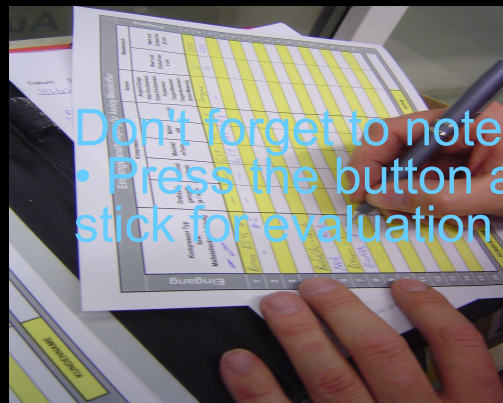
Suitable location for the suitcase (230V socket)



Attach and plug in the amp clamps



... Connect the dew point and pressure sensor

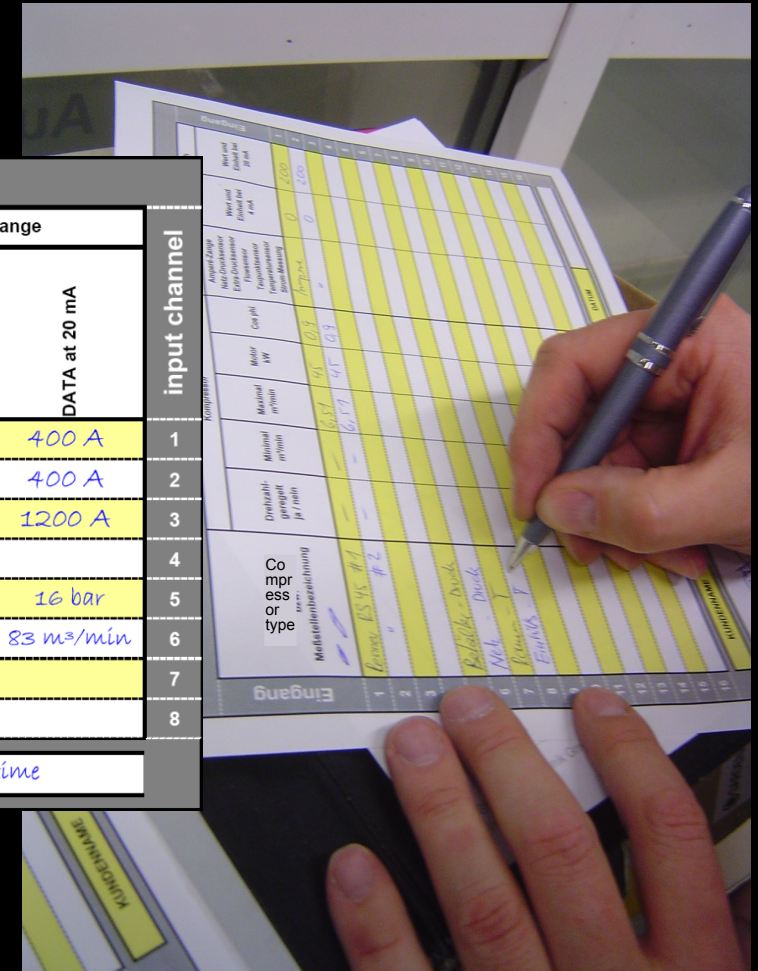


Don't forget to note down the channel assignment

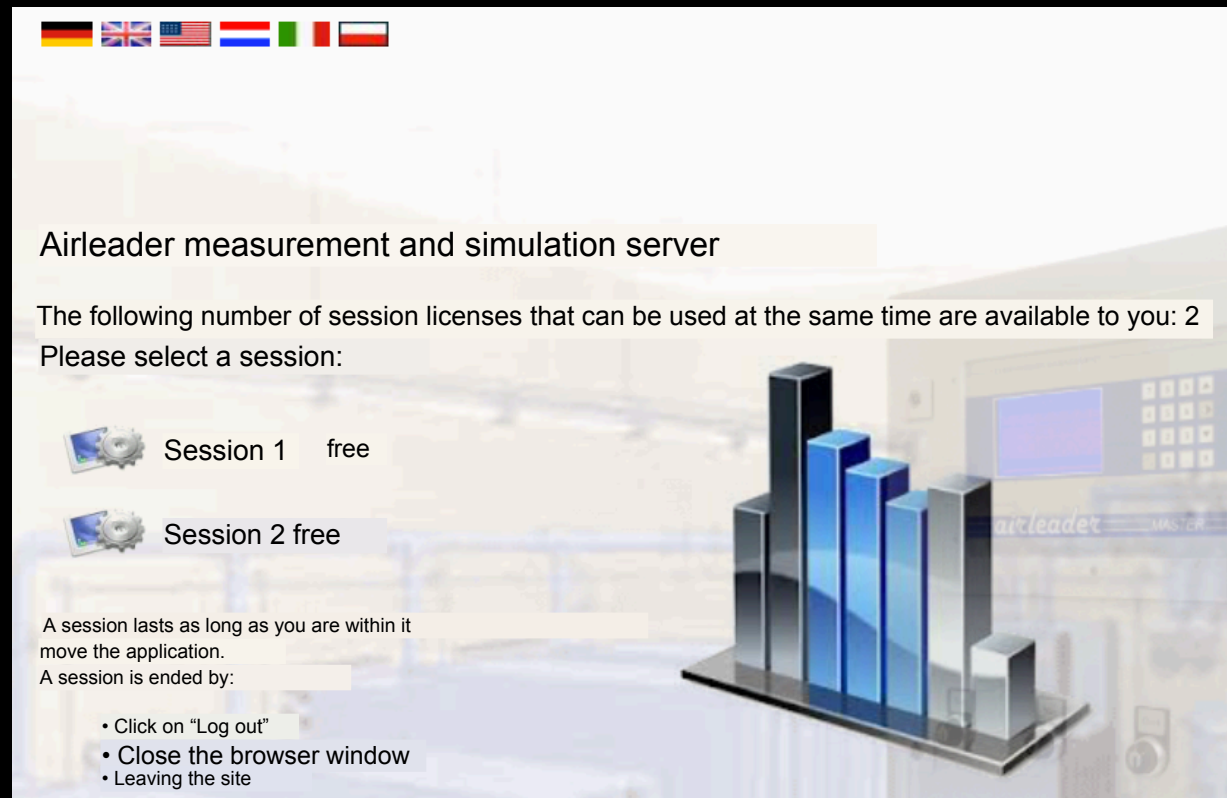
- Pressing a button starts the measurement
- Pressing a button after 1 (or more) week(s) stops the measurement
- Press the button again and the LOG files are on the USB stick for evaluation on the PC

No programming etc. on site – just a few notes!

Data list for measuring without System data programming									
input channel	compressor type or measuring point	compressor				sample		data range	
		VSD / FC yes / no	minimumm ³ /min	maximum m ³ /min	motor kW	Cos phi	Ampere clamp pressure sensor Flowsensor Dewpoint sensor Temperature sensor Extra pressure sensor	DATA at 4 mA	DATA at 20 mA
1	CompAir L132	no	-	24	132	0,93	amp	0	400 A
2	CompAir L132	no	-	24	132	0,93	amp	0	400 A
3	CompAir L250 RS	yes	12,0 -	40	250	0,99	amp	0	1200 A
4									
5	pressure probe	-	-	-	-	-	net pressure	oh cash	16 bar
6	flow sample	-	-	-	-	-	flow	0 m ³ /min	83 m ³ /min
7									
8									
customer		anyone anywhere				date		anytime	



The measurement and simulation software (MSS) automatically creates understandable diagrams and tables



Airleader measurement and simulation server

The following number of session licenses that can be used at the same time are available to you: 2

Please select a session:

 Session 1 free

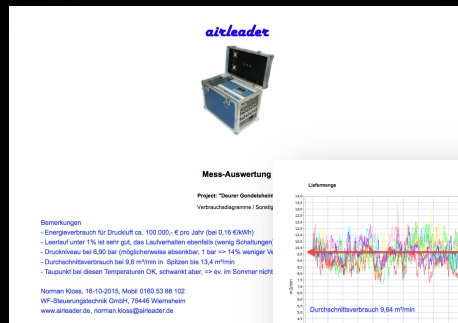
 Session 2 free

A session lasts as long as you are within it move the application.
A session is ended by:

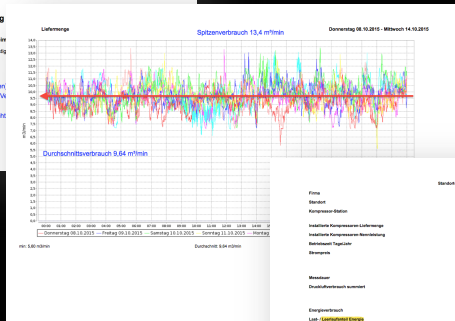
- Click on "Log out"
- Close the browser window
- Leaving the site

Complete measurement report creation in PDF format with a mouse click:

Cover sheet

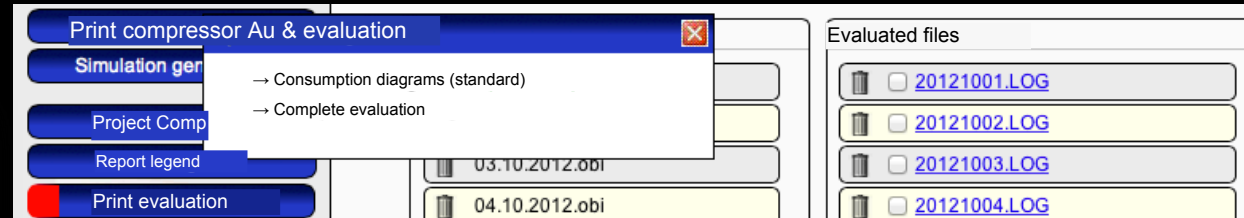


Weekly overview

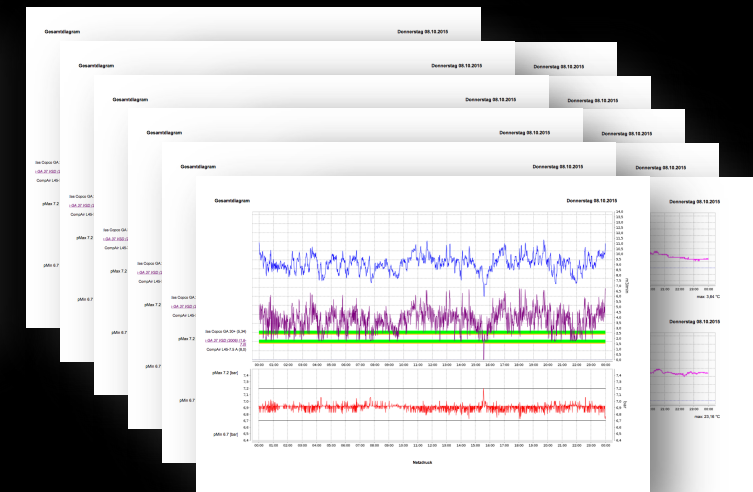


Actual status and projection

Compressor data and energy balance



Daily charts



Measurement report is the basis for



⇒ **Simulation**

- different compressor constellation
- other consumption
- other container sizes

->Planning discussion with customers

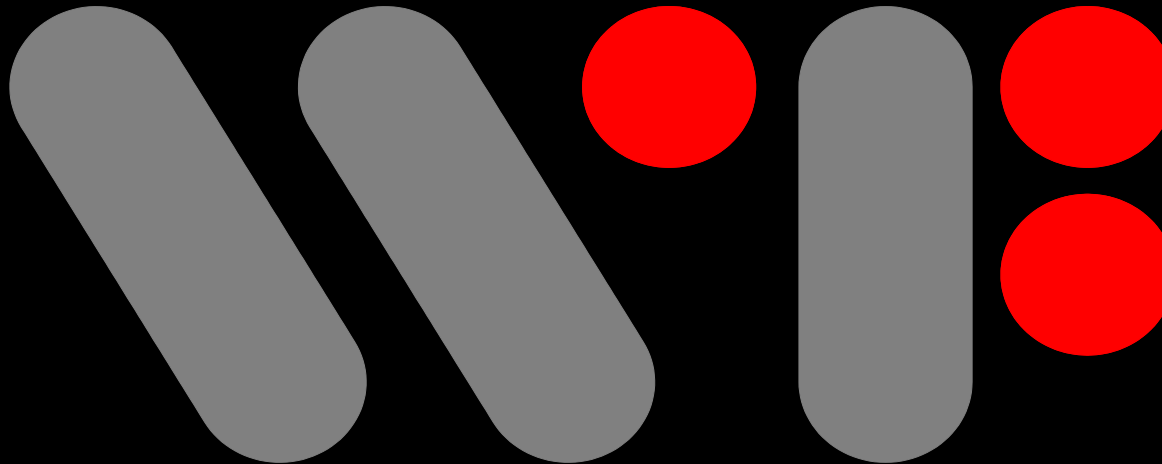
->Detailed compressed air analysis



DL analysis report – goal achieved!

- Fact-based current state
- Clearly demonstrated potential energy savings
- Recommendations with monetary benefits for the customer through high energy savings
- And last but not least, new business for you!





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