



Compressed air analyzer DS 300 mobile

Energy analysis – consumption measurement – leakage calculations at compressed air systems



The measuring instrument **DS 300 mobile** enables the analysis of compressed air stations. Up to 4 clamp-on ammeters measure the current consumption of every single compressor. Optionally also 4 pressure sensors, temperature sensors or any other analogue sensors can be connected.

In addition, the DS 300 mobile measures the discharged compressed air in m^3/h , m^3 and the dew point temperature in $^{\circ}\text{Ctd}$ at the same time.

The integrated data logger stores up to 1 million measured values.

The **CS analysis software** enables the graphical and statistical evaluation of the stored data at the PC.

From the stored current values it is possible to calculate the costs in **€ for the energy consumption (kWh)** as well as the load and idle times of every single compressor including switch-on/switch-off cycles.

The costs per m^3 and the total costs per year in € are calculated from the actually consumed quantity of compressed air. A special leakage calculation determines the cost share of the leakages in comparison to the total costs in €.

For documentation of the measured values the user gets a DIN A 4 graphics printout for each compressor in a day view and in a week view at the touch of a button.

The additional printout with the statistical values contains all necessary data for a complete analysis of the compressor stations (see page 24).

Complex Excel® calculations and the issuing of reports are no longer necessary. Each service company can issue a report for the end customer with their own logo and additional information.

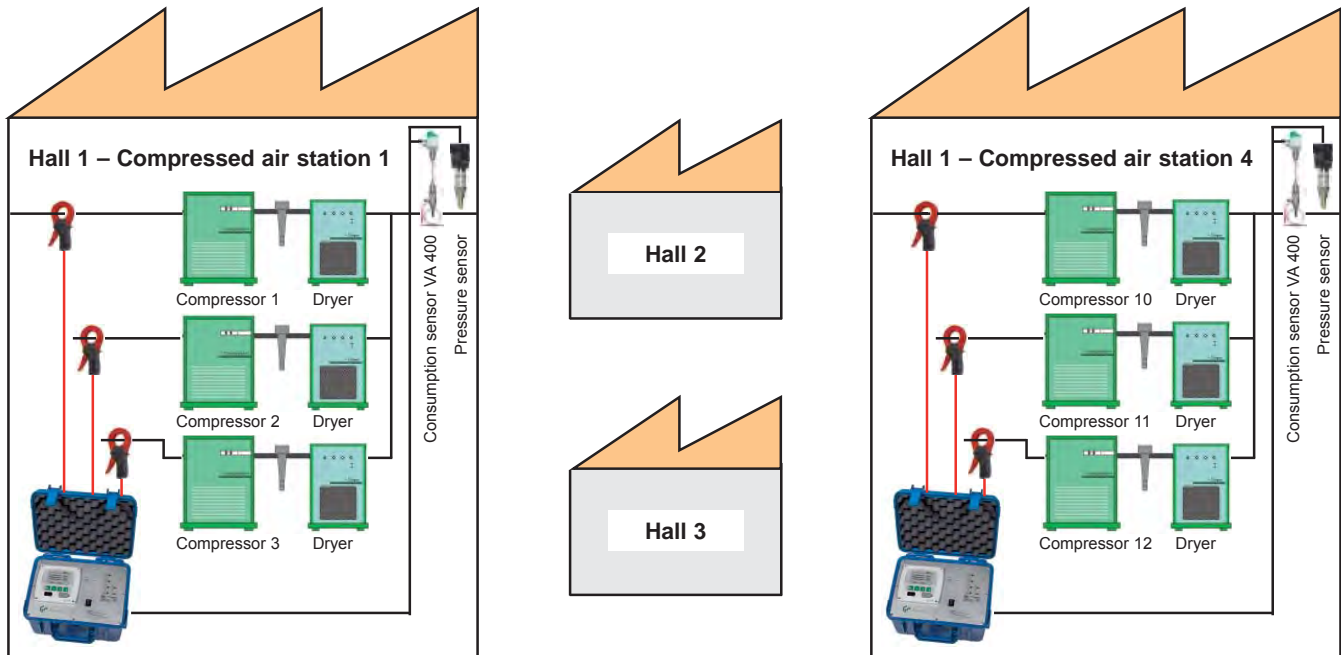


Step 1: Current measurement of up to 12 compressors

A special advantage is that up to 12 compressors can be measured at the same time with 3 DS 300 mobile.

So compressed air stations which are often far away from each other can be measured separately and then

summarized synchronously in one evaluation at the PC.



Step 2: Analysis of the measured values at the PC

1 Compressor analysis (current measurement)

The energy consumption of every single compressor is measured by means of a clamp-on ammeter. The produced compressed air quantity is calculated by the software on the basis of the performance data of the compressor which have to be entered.

The following parameters are calculated additionally: Energy consumption in (kWh), load-, idle-, stop time, compressor load in %, number of loads/load removal (load cycles).

2 System analysis (current measurement and real consumption measurement)

The system analysis has the same function like the compressor analysis, however, it additionally offers the possibility to measure the actually produced resp. used quantity of compressed air by means of the consumption sensor VA 400.

With the additional "real consumption measurement" the leakages and therefore the cost share of the leakages in comparison to the total costs in € can be determined.

3 Leakage calculation

The leakage calculation is done during the production free time (shutdown, weekend, holidays). The consumption sensor VA 400 measures the supplied quantity of air. During the down time the compressor delivers compressed air in order to keep a constant pressure. According to statistics even if production is carried out day and night there is at least one short period of time during which all load is switched off. By means of this data the software defines a leakage rate and calculates the incurred leakage costs in €.



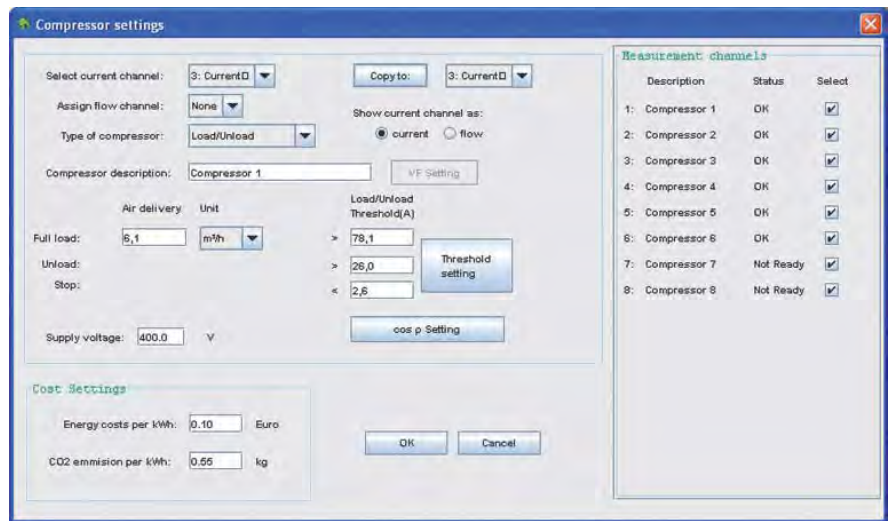
Step 3:

Evaluation at the PC with graphics and statistics

3.1 Entry of necessary parameters

Specific data have to be entered before the analysis is carried out:

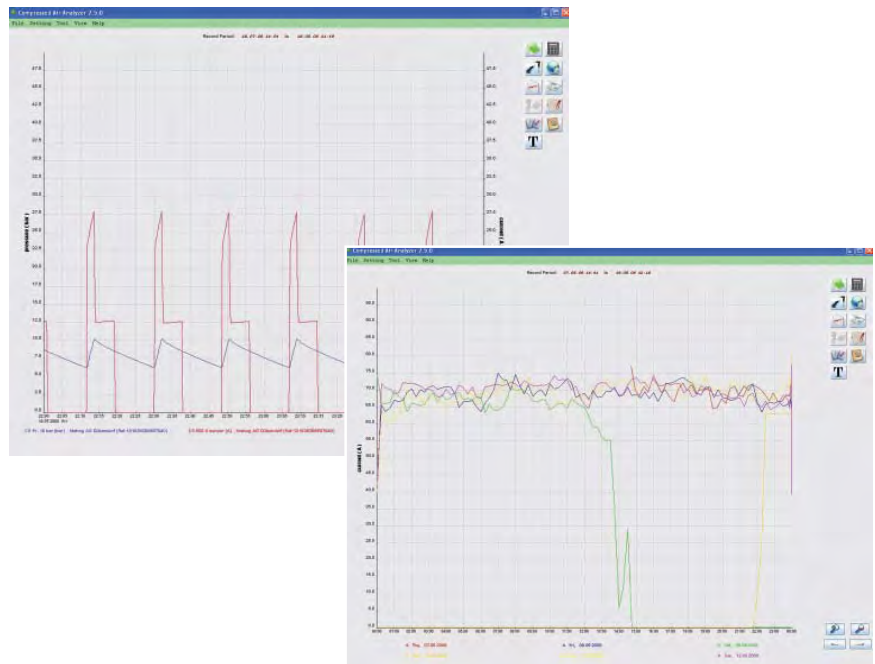
- Selection of compressor type (load/idle resp. variable speed drive controlled)
- as well as entry of the performance data according to data sheet
- Period of measurement
- Costs in € for 1kWh



3.2 Graphic evaluation with day view and week view

Everything at a glance: The user gets a day and a week view of all stored measured data with his company logo (can be easily integrated) at the touch of a button.

By means of the zoom and the crosslines function peak values can be determined.



3.3 Compressed air costs in €

At the touch of a button the user gets all important data like e. g.

- Energy costs,
- Compressed air costs,
- Leakage costs in €,
- Compressor data with load/ idle times

Statistics Report				
1 Statistics for the selected time period: 12.01.2010 10:00:00 to 19.01.2010 10:00:00				
2 System Analyzes				
	Compressor 1	Compressor 2	Compressor 3	Sum Of All
3	Load/Unload	Variable Frequency	Load/Unload	
4				
5				
6	Valid record time	167.1 h	167.1 h	167.1 h
7	Load analyzes			
8	Full load time (h(%))	30.8 (18%)	119.0 (71%)	54.2 (32%)
9	Unload time (h(%))	0.1 (0%)	0.8 (0%)	0.5 (0%)
10	Stop time (h(%))	136.2 (81%)	47.3 (28%)	112.5 (67%)
11	Number of starts	11	68	33
12	Number of load/unload cycles	32	118	97
13				
14	Energy			
15	Full load energy (kwh)	999.9	3010.5	1687.1
16	Unload energy (kwh)	1.6	4.4	5.4
17	Stop energy (kwh)	0.2	58.7	0.9
18	Total energy consumption (kwh)	1001.7	3073.6	1693.4
19	Specific power (kwh/m³)	0.117	0.132	0.113
20				
21	Costs			
22	Full load costs (Euro)	99	301	188
23	Unload costs (Euro)	0	0	0
24	Stop costs (Euro)	0	5	0
25	Total costs (Euro)	99	306	188
26	Costs per m³ (Euro)	0.0116	0.0131	0.0112
27				
28	Air delivery			
29	Average flow (m³/min)	0.9	2.3	1.5
30	Max flow (m³/min)	4.63	6.13	4.63



DS 300 mobile – Easy operation without any instruction manual

The DS 300 mobile convinces due to its sophisticated operational concept which is similar to the self-explanatory operation of modern mobile phones.

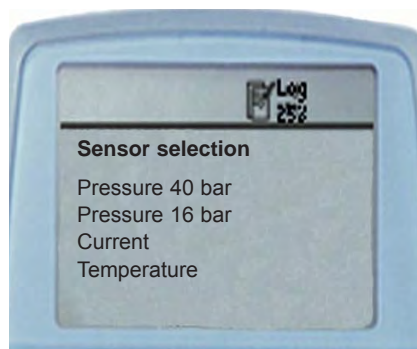
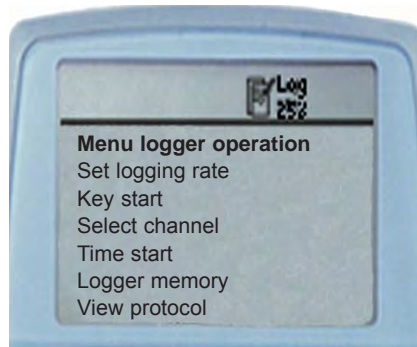
By using the **<Enter>** key the user enters the menus, by using the **<Back>** key each step can be cancelled. Selection is done by the **<arrow up>** and **<arrow down>** key.

All important parameters can be adjusted on-site via the keypad.

In the menu "logger operation" e. g. the measuring rate (freely adjustable as of one second) and the start time are fixed.

Under "view protocol" the user gets the min-, max- and average values of the stored protocols. In the menu "sensor selection" the connectable sensors are selected.

So it can be decided on-site with which sensors the measurement should be carried out.



Technical data DS 300 mobile:

- 2 digital inputs for FA 410 / VA 400 dew point and consumption
- 4 analogue inputs with DS 300-P6 resp. 2 analogue inputs with DS 300-P4 for connection of clamp-on ammeters, pressure sensors, temperature sensors
- Easy sensor recognition and selection
- USB interface
- 4 keys operation, self-explanatory
- 100-240 VAC, 50-60 Hz, add. internal rechargeable batteries for 4 hours operation time
- 0-50°C operation temperature
- -20...70°C transport temperature
- Data logger for 1 million meas. values
- Logging cycle freely adjustable from 1 second up to 1 hour
- Data logging at the touch of a button or with variable time start
- Housing dimensions: 280 x 230 x 155 mm
- Weight 2.3 kg

Technical data FA 410:

Measuring range:	-80...20 °Ctd
Accuracy:	± 1 °C at 20...-20 °Ctd ± 2 °C at -20...-50 °Ctd ± 3 °C at -50...-80 °Ctd
Pressure range:	-1...50 bar
Protection class:	IP 65
Operation temp.:	-20...70 °C
Screw-in thread:	G1/2"
Dimensions:	Ø 30 mm, Length: ca. 130 mm
Via DS 300 mobile:	Select units: % RH, °Ctd, g/m³, g/kg, mg/m³, ppm V/V

Technical data VA 400:

Parameters:	m³/h Standard, nach DIN 1945, ISO 1217 20 °C, 1000 mbar
Via DS 300 mobile selectable:	m³/h, m³/min, l/min, l/s, ft/min, cfm, m/s, kg/h, kg/min
Via DS 300 mobile selectable:	Diameter for volume flow calculation, counter resettable
Meas. principle:	Calorimetric measurement
Meas. medium:	Air, gases
Gas types selectable via instrument:	Air, nitrogen, argon, CO2, oxygen
Accuracy:	± 4 % m. v. ± 3 % m. v. via 5 point ISO precision calibration
Operation temp.:	-30...110 °C probe tube -30...80 °C housing
Operat. pressure:	Up to 50 bar
Probe tube:	Stainless steel, 1,4301 Mounting length 220 mm, Ø 10 mm
Mounting thread:	G1/2"
Diameter housing:	65 mm

Description	Order no.
DS 300-P6 mobile, with data logger for 1 million measured values including 2 digital inputs and 4 analogue inputs in a robust case	0500 3226
DS 300-P4 mobile, with data logger for 1 million measured values including 2 digital inputs and 2 analogue inputs in a robust case	0500 3225
Consumption sensor VA 400 max. version (185 m/s) incl. certificate, 5 m cable	0695 0122
Option for VA 400: HighSpeed version (224 m/s)	Z695 4002
FA 410 dew point sensor from -80...20 °Ctd incl. mobile measuring chamber, 5 m cable	0699 0411
Precision pressure sensor CS 16 (0...16 bar)	0694 3555
Connection cable for pressure probe, 5 m, with ODU plug for DS 300 mobile	0553 0110
Clamp-on ammeter 0...1000 A TRMS, 5 m cable, incl. ODU plug	0554 0506
CS Analysis Software for leakage and cost calculation incl. CS Soft Professional software for data evaluation in graphic and table form	0599 2011
Case for Dewpoint and consumption sensor (dim.: 480 x 360 x 120 mm)	0554 6005
Case for all sensors (dimensions: 500 x 360 x 120 mm)	0554 6006
Further accessories:	
CS Soft Professional software for data evaluat. in graphic and table form incl. USB interface	0554 7010
Extension cable 5 m for probes	0553 0103
Connection cable for third-party sensors (open ends), 5 m, with ODU plug for DS 300 mobile	0553 0110