



DS 500 PM mobile – efficiency measurement for compressors

All-in-one measurement: electrical energy, pressure, dew point, temperature and consumption

Besides common measurements such as compressed air consumption or humidity, even more complex measurement tasks can be tackled with this all-round mobile device. With the DS 500 PM mobile, conducting an energy analysis according to DIN ISO 50001 is simple.

Its clear, simple operating method makes it possible, for example, to carry out an analysis of compressed air costs by simultaneously measuring energy consumption (kW/kWh) and compressor output (m³/m³/h). And the data logger with its integrated effective power meter is perfect for auditors or service technicians.

Power consumption

Current rating	[A]
Voltage	[V]
Effective power	[kW]
Active energy	[kWh]
Apparent power	[kVA]
Reactive power	[kVar]
Power Factor	[Cos Phi]

Special features:

- Magnetic voltage measuring tips for picking off the voltage during operation.
- Hinged current transformers encompass the conductors of phases L1, L2, L3 or Rogowski Coils

Can also be used during operation.

For universal use:

- Up to 11 devices can be connected, including third-party sensors incl. power supply

Reliable:

- Reliably stores all measured values on a memory card. Easy readout possible via USB stick

Energy analysis according to DIN ISO 50001:

- Costs in \$/€ per m³/CF air generated
- Specific output in kWh/CF (kWh/m³)
- Consumption of single lines including summation



Flow meters

- Can be installed and removed under pressure via standard 1/2" ball valve
- A safety ring prevents uncontrollable ejection during installation/removal under pressure
- Can be used with different gases: compressed air, nitrogen, argon, CO₂, oxygen



Compressed air consumption

Dew point sensors

- Extreme long-term stability
- Short adaption time
- Wide measuring range -112 °Ftd to 68 °Ftd
- For all dryers: (adsorption dryers, membrane dryers and refrigeration dryers)
- Easy to install under pressure using the standard measuring chamber with quick coupling



Pressure dew point

Pressure sensors

- Large selection of pressure sensors with different measuring ranges for each measuring purpose
- Quick to install under pressure by quick coupling



Pressure

Temperature sensors

- Large selection of temperature sensors e.g. for measurement of the ambient temperature or gas temperature
- Pt 100 (2-wire or 3-wire)
- Pt 1000 (2-wire or 3-wire)
- Temperature sensors with measuring transducer (4-20 mA output)



Temperature

Compressed air quality

- Monitoring of compressed air quality according to ISO 8573
- Residual oil, particles, moisture
- Particle counter PC 400 in service case up to 0.1 µm or up to 0.3 µm



Residual oil/particles



Mobile electricity/effective power meter
CS PM 600

Compressed air generated

- Compressed air flow [CF]
- Pressure dew point [° Ftd]
- Pressure [psi]
- Temperature [° C/°F]
- Residual oil content [mg/m³]
- Particle content [Cts/m³]

With one or more additional electricity/effective power meters, it is possible to carry out efficiency measurements of several compressors simultaneously.

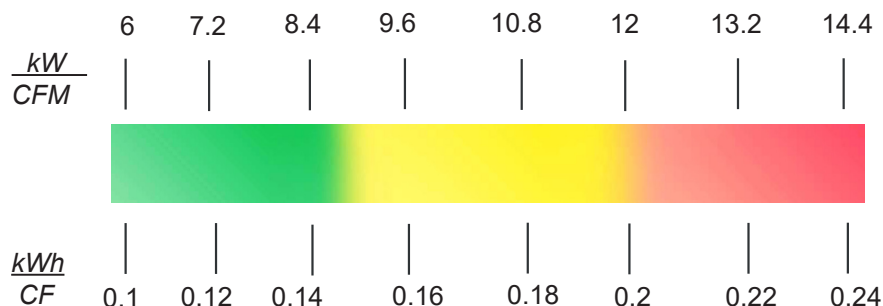


Analysis of specific power:

By measuring power consumption and delivery volume simultaneously, it is possible to calculate the specific power of the compressor. The specific power is calculated using the ratio of the required energy consumption in kWh to the volume of air in CF output during the same period.

$$\text{Specific power} = \frac{kWh}{CF}$$

The specific performance indicator of the compressor supplies information about the compressor's characteristics. The "to" graphic below can be used as an aid to assessment:



Typical specific power requirement for an oil-injected compressor

Delivery volume: 43.7 Nm³/min
(according to ISO 1217 based on 20° C + 1 bar)

Total power consumption: 272.7 kW

Specific power requirement = 272.7 kW/43.7 m³/min
= 6.24 kW/m³/min
= 0.104 kWh/m³

DS 500 PM MOBILE TECHNICAL DATA

Case dimensions:	14.1 x 10.6 x 5.9 Inches
Weight:	9.9 lbs
Material:	Diecast, front foil polyester, ABS
Sensor inputs:	3/7/11 sensor inputs for analog and digital sensors; freely allocatable. See options Digital CS sensors for dew point and consumption with FA/VA series SDI interface, RS 485/Modbus RTU digital third-party sensors. Analog CS Sensors for pressure, temperature, clamp-on ammeters preconfigured. Analog third-party sensors 0/4...20 mA, 0...1/10/30 V, pulse, Pt 100/Pt 1000, KTY
Voltage supply for sensors:	24 VDC, max. 130 mA per sensor, integrated mains unit, max. 24 VDC, 25 W. For 8/12 sensor input version: 2 integrated mains units, each max. 24 VDC, 25 W
Interfaces:	USB stick, Ethernet/RS 485 Modbus RTU/TCP, SDI (other bus systems on request), webserver optional
Memory card:	Micro SD memory card, memory size 16 GB
Power supply:	100...240 VAC, 50-60 Hz
Colour display:	TFT transmissive 7" touch panel, graphics, curves, statistics
Accuracy:	Please see sensor specifications
Operating temperature:	32...122 °F
Storage temperature:	-4...158 °F



Example order code for DS 500 PM mobile:

0500 5340_A1_B1_C1_D1_E1

Number of additional sensor inputs	
A1	3 inputs
A2	7 inputs
A3	11 inputs

Current transformers – set consisting of 3 transformers (recommendation refers to 400 volt)	
B1	100 A/1 A – up to 55 kW
B2	600 A/1 A – up to 340 kW
B3	1000 A/1 A – up to 600 kW
B4	3000 A @ 50 Hz / 2500 A @ 60 Hz

Mathematics calculation function (4 virtual channels)	
C1	without mathematics calculation functions
C2	with mathematics calculation functions

Totalizer function for analog signals	
D1	without totalizer function for analog signals
D2	with totalizer function for analog signals

Webserver	
E1	without webserver
E2	web server integrated

TECHNICAL DATA CURRENT/ACTIVE POWER METER

Parameters:	Voltage (Volt) Current (Ampere) Cos phi Effective power (kW) Apparent power (kVA) Reactive power (kVar) Active energy (kWh) Power frequency (Hz)
Measuring range:	Voltage measurement: B1 - B3: max. 400 V B4: max: 600 V, 45-65 Hz
Sensor connections:	3x current transformers or Rogowski coils (L1, L2, L3), 4x voltage measurements (L1, L2, L3, N)
Current transformer size / Rogowski Coil:	100 A / 1 A (max. 24 mm conductor), 600 A / 1 A (max. 36 mm conductor) 1000 A / 1 A (max. 43 x 42 mm conductor) 3000 A (Ø 80 mm)

DESCRIPTION	ORDER NO.
DS 500 PM mobile chart recorder with integrated effective power meter for the analysis of compressors and other consumers	0500 5340 + Order code A...E_
CS Basic – data evaluation in graphic and table form. Readout of measured data via USB or Ethernet. Licensed for 2 work sites	0554 8040
CS Soft Energy Analyzer for energy and leakage analysis of compressed air stations	0554 7050
Connection cable for pressure, temperature and third-party sensors to mobile devices, ODU/open ends, 16 ft.	0553 0501
Connection cable for pressure, temperature and third-party sensors to mobile devices, ODU/open ends, 32 ft.	0553 0502
Connection cable for VA/FA sensors to mobile devices, ODU/M12, 16 ft.	0553 1503
Extension cable for mobile devices, ODU/ODU, 32 ft.	0553 0504
Case for all sensors (dimensions: 19.7 x 14.18 x 4.72 x Inches)	0554 6006