Check Box M1-M5 - Affordable mobile chart recorder

Energy analysis - flow measurement - leakage calculation at compressed air systems

Features & Benefits

- Easy operation via 3.5″ color display with touch panel
- Internally rechargeable Li-Ion battery - about 8 hours continuous operation

Versatile:

- Up to 4 sensors / meters can be connected, including third-party sensors / counters incl. Power supply

Reliable:

- Stores all measured values on a memory card. Easy reading out via USB stick possible

Intelligent energy analysis:

- Daily / weekly / monthly evaluations mathematical functions for internal calculations e. g., the typical key figures of a compressed air system
  - Costs in € per generated m³ air
  - kWh/m³ generated air
  - Flow of single lines including summation

Up to 4 sensors can be connected including power supply for all sensors

Options

Flow sensors

Dew point sensors

Pressure sensors

Temperature sensors

Clamp-on ammeters

Current/effective power meters

Sensors for Check Box M6 / Check Box M1-M5

Digital

Flow meters
for compressed air and gases

- Installation and removal under pressure via standard 1/2” ball valve
- A safety ring avoids the uncontrolled ejection in case of installation/removal under pressure
- Usable for different gases: compressed air, nitrogen, argon, CO2, oxygen

Digital

Dew point sensors

- Extremely long-term stable
- Quick adaption time
- Large measuring range (-80° to +20°Ctd)
- For all driers: Desiccant driers, membrane driers, refrigeration driers
- Easy installation under pressure via the standard measuring chamber with quick coupling

Analog

Pressure sensors

- Large selection of pressure sensors with different measuring ranges for each measuring purpose
- Quick installation under pressure by quick coupling
- Pressure sensors 0-10/16/40/100/250/400/600 bar overpressure
- Pressure sensors -1 - +15 bar (under-/ overpressure)
- Differential pressure 0-1,6 bar
- Absolute pressure 0-1.6 bar (abs:)

Analog

Temperature sensors

- Large selection of temperature sensors e.g. for measurement of the ambient temperature or gas temperature
- Pt100 (2-wire or 3-wire)
- Pt1000 (2-wire or 3-wire)
- Temperature sensors with measuring transducer (4-20 mA output)

Analog

Clamp-on ammeters

- For the analysis of compressors (load and idle times, energy consumption, on/off cycles) the current consumption of up to 12 compressors is recorded by current clamp
- Measuring range of the current clamps: 0 - 400 A 0 - 1000 A

Digital

Current/effective power meters

- PMH PM 600 mobile current/active power meter with external current transformers for large machines and plants
- external current transformers for encompassing the phases (100 A or 600 A)
- external magnetic measuring tips for picking up the voltage
- measures KW, kWh, cos phi, kVar, kVA
- Data transmission Check Box M1-M5 mobile via Modbus

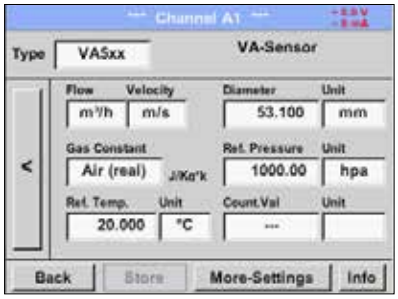
By means of the chart recorder Check Box M1-M5, all measured data of a compressor station can be recorded, indicated and evaluated. All digital sensors of our product range can be connected to the digital inputs.

Flow meter, dew point sensors, current/effective power meters and third-party sensors with Modbus RS 485 could be connected.

At analog sensor inputs third party sensors and meters with the following signal output could be connected: 4-20 mA, 0-20 mA | 0-1 V / 0-10 V / 0-30 V | Pt 100 (2- or 3-wire), Pt 1000 (2- or 3-wire), KTY | pulse outputs (e.g. of gas meters) | frequency output | Modbus protocol.

Configuration of flow sensor

- In the menu of the Check Box M6/ Check Box M1-M5, the flow sensor Flow Check Universal can be set to the respective pipe inside diameter. Furthermore, the unit, the gas type and the reference condition can be set. The meter reading can be set to „zero“ if necessary.



Configuration of flow sensor

Graphic view

- In the graphic view all measured values are indicated as curves.It is possible to browse back on the time axis by a slide of the finger (without data logger maximum 24 h, with data logger back to the start of the measurement).

Graphic view

Data logger

- With the option „integrated data logger“ the measured values are stored in the Check Box M6/ Check Box M1-M5. The time interval can be free be determined. It is also possible to set the start time and end time of the data recording. Reading the measured data via USB interface or via the optional Ethernet interface.

Data logger

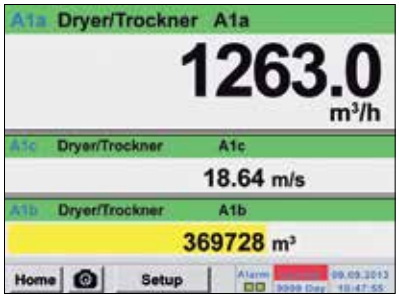
Selection of the language

- Many languages are already stored in every Check Box M6 mobile/ Check Box M1-M5. The desired language can be selected via the selection button.

Selection of the language

All relevant parameters at a glance

- In addition to the flow rate in m³/h, the Check Box M6/ Check Box M1-M5 also displays other parameters such as total consumption in m³ and speed in m/s.



All relevant parameters at a glance

Technical data of the Check Box M1 - M5

Technical data Check Box M1-M5	
Dimensions	270 x 225 x 156 mm (W x H x D)
Weight	2.2 kg
Inputs	2 x 2 sensor inputs for digital or analogue sensor signals
Interface	USB (standard), Ethernet (optional)
Power supply	Internal rechargeable Li-Ion batteries, approx 8 h continuos operation, 4 h charging time
Options	
Integrated data logger	100 million measuring values start/stop time, measuring rate freely adjustable
2 additional sensor inputs	for connection of pressure sensors, temperature sensors, clamp-on ammeters, third-party sensors with 4-20 mA 0 to 10 V, Pt100, Pt1000

Description				Order no.
Check Box M1-M5 chart recorder with graphic display touch screen and integrated data logger		**Sensor input 1 and 2**	**Sensor input 3 and 4**	
	M1	Digital	--------	2255330402
	M2	Digital	Digital	2255330403
	M3	Digital	Analog	2255330404
	M4	Analog	--------	2255330405
	M5	Analog	Analog	2255330406
Option				
Option: Integrated Ethernet and RS 485 interface				2255460216
Option: Integrated webserver				2255460218
Option: „Mathematics calculation function“ for 4 freely selectable channels, (virtual channels): addition, subtraction, division, multiplication				2255332469
Option: „Totalizer function for analogue signals“				2255332470
Further accessories				
PMH Basic – data evaluation graphically and in tabular form - reading of the measured data via USB or Ethernet, license for 2 workstations				2255332468
PMH Soft Energy Analyzer for energy and leakage analysis of compressed air stations				2255331729
Connecting cable for pressure, temperature and external sensors to mobile devices, ODU/open ends, 5 m				2255332514
Connecting cable for pressure, temperature and external sensors to mobile devices, ODU/open ends, 10 m				2255332515
Connection cable for Flow/ PDP sensors to mobile devices, ODU/M12, 5m				2255332516
Extension cable for mobile devices, ODU/ODU, 10 m				2255332517
Connecting cable for mobile current / active power meter to mobile devices, length 5 m				2255332519
Case for all sensors (dimensions: 500x360x120 mm)				2255332518

Suitable sensors can be found on pages 30 to 33

Input signals	
Current signals Internal or external power supply Measuring range Resolution Accuracy Input resistance	(0-20mA/4-20mA) 0-20 mA 0.0001 mA ± 0.03 mA ± 0.05 % 50 Ω
Voltage signal Measuring range Resolution Accuracy Input resistance	(0-1 V) 0-1 V 0.05 mV ± 0.2 mV ± 0.05 % 100 kΩ
Voltage signal Measuring range Resolution Accuracy Input resistance	(0-10 V / 30 V) 0-10 V 0.5 mV ± 2 mV ± 0.05 % 1 MΩ
RTD Pt 100 Measuring range Resolution Accuracy	 -200-850°C 0.1°C ± 0.2°C (-100-400°C) ± 0.3°C (further range)
RTD Pt 1000 Measuring range Resolution Accuracy	 -200-850°C 0.1°C ± 0.2° (-100-400°C)
Impuls Measuring range	Min pulse length 500 µs frequency 0-1 kHz max. 30 VDC

Digital	Digital	Digital	Digital
m³/h, m³	°Ctd	A, kW/h	
			MOD-BUS
Flow sensor	Dew point sensor	Current meter	Thirt-party with RS 485

Analog	Analog	Analog	Analog
bar	A	°C	°C
			4-20 mA 0-20 mA 0-10 V Pulse Pt 100 Pt 1000
Pressure sensor	Clamp-on ammeter	Temperature sensor	Third party sensor analog output