Portable Data Recorder
HMG 3000

Description:

The HMG 3000 is an impressive, top-performance portable measuring instrument.

It enables the user to carry out a wide range of measurement tasks in the quickest possible time and in a cost and time effective way through the use of automated setting procedures, simple operation and extensive functions.

Once in use the HMG 3000 will soon become a reliable and useful tool for all those involved in service, maintenance, development, test rig technology, quality assurance or commissioning of systems and machines.

The HMG 3000 is designed primarily for recording pressure, temperature and flow rate values which are the standard parameters in hydraulics and pneumatics. With additional inputs for voltage measurement, a wider variety of measurements can be taken.

In addition, SMART sensors can be connected to the HMG 3000.
This is a generation of sensors from HYDAC which can provide a variety of different measurement values.

As well as the analogue inputs, the HMG 3000 has two digital inputs (e.g. for frequency or rpm measurements) to complete the range of applications.

The breadth of functions and the handling of the unit are equally suitable for those users who take measurements only occasionally as for professionals for whom measuring and documentation is routine. The update capability of the HMG 3000 via the integral USB port enables the user to benefit from future upgrades in instrument software.

Special features:

- Simple, user-friendly operation
- Designed for real-world applications
- Large, full-graphics colour display
- Quick and independent basic setting of the instrument through the use of automatic sensor recognition
- Up to 10 sensors can be connected simultaneously
- Up to 32 measurement channels can be displayed at a time
- Measuring rates up to 0.1 ms
- Extended voltage measurement -10 .. +10 V and 0 .. 50 V
- Very large data memory for archiving measurement curves
- Various measurement modes:
  – Normal measuring
  – Fast curve recording
  – Long term measuring
- 4 independent triggers, can be logically linked
- PC connection
  – USB
  – RS 232
- Convenient visualisation, archiving and data processing using the HMGWIN 3000 and CMWIN software supplied

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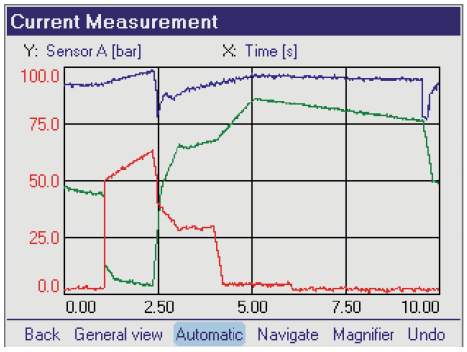
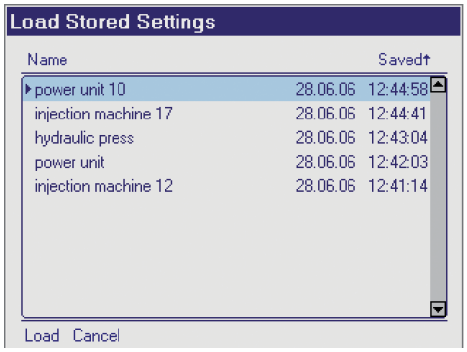
Function:

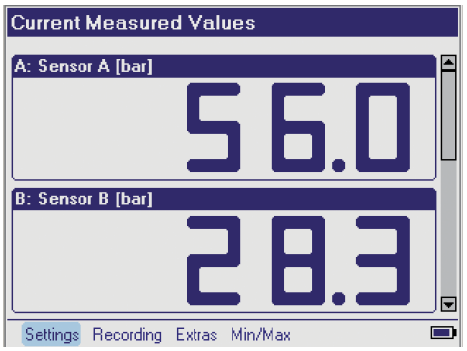
- Clear and graphical selection menus guide the operator very simply to all the instrument functions available. A navigation pad on the keypad ensures rapid operation.
- The HMG 3000 can monitor signals from up to ten sensors simultaneously. For this there are 5 robust standard input sockets. By using Y adapters the number of inputs can be doubled individually to make a total of between 6 and 10.
- The instrument has 4 input sockets for connecting up to 8 analogue sensors or up to 4 SMART sensors *).
- Sensors (e.g. for pressure, temperature etc.) with the special digital HSI interface (HYDAC Sensor Interface) and Condition Monitoring Sensors (SMART sensors) are immediately recognised by the HMG and the basic settings are automatically adapted accordingly. Older versions of HYDAC sensors or other makes of sensor available commercially can also be connected.
- Frequency measurements, counter functions or triggers for data logging can be implemented via the fifth input socket with 2 digital inputs.
- For extended voltage measurement, the HMG 3000 offers the possibility of recording signals of 0 .. 50 V on two inputs and a signal of -10 .. +10 V on one input (e.g. proportional valve control).
- All input channels can operate simultaneously at a measurement rate of 0.5 ms (1.0 ms for SMART sensors). To record highly dynamic processes, 2 analogue inputs are capable of recording measured values of 0.1 ms.
- The most impressive function of the HMG 3000 is its ability to record dynamic processes "online", i.e. in real-time, as a measurement curve and render them as graphs in the field.



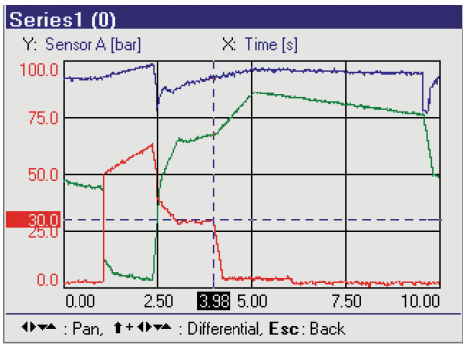
- The data memory used for recording curves and logs can hold up to 500,000 measured values. At least 100 such full length data records can be stored in an additional archive memory.
- For specific, event-driven curves or logs, the HMG 3000 has 4 independent triggers which again can be linked together logically.
- It is also possible to determine differential values between different input signals from sensors. Particularly when measuring flow rate by means of differential pressure measurement across a measuring orifice, the accuracy can be significantly improved by using a stored calibration curve. To generate such calibration curves, the HMG 3000 has an easy-to-use recording function.
- User-specific instrument settings can be stored and re-loaded at any time as required. This means that repeat measurements can be carried out on a machine again and again using the same instrument settings.



- Measured values, curves or texts are visualised on a full-graphics colour display in different selectable formats and display forms.



- Numerous useful and easy-to-use auxiliary functions are available e.g. zoom, ruler tool, creating differential value graphs, individual scaling, particularly for use when analysing the recorded measurement curves.



- The HMG 3000 communicates with a PC via the built-in USB port or RS 232 port.

HMGWIN 3000:

The PC software HMGWIN 3000 is supplied with the HMG 3000.
This software is a convenient and simple package for analysing and archiving curves and logs which have been recorded using the HMG 3000, or for exporting the data for integration into other PC programs, if required.
In addition it is also possible to operate the HMG 3000 directly from the computer. Basic settings can be made, and measurements can be started online and displayed directly on the PC screen in real-time as measurement curves progress.

CMWIN:

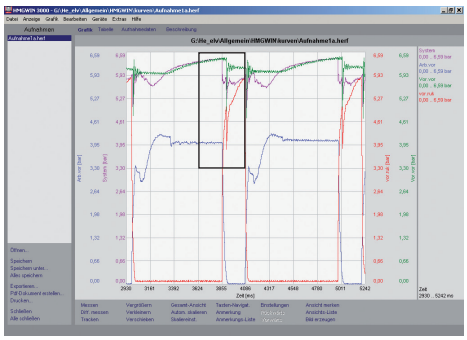
The HYDAC software CMWIN is also supplied with the unit.
This software enables you to communicate directly with SMART sensors *) connected to the HMG 3000 from your PC.

Both programs can be run on PCs with Windows Vista / XP / 2000 and Windows 7 operating systems.

*) SMART sensors (Condition Monitoring Sensors) are a generation of sensors from HYDAC, which can provide a variety of different measured values.

Some examples of the numerous useful additional functions:

- Transfer and archiving of measurements recorded using the HMG 3000
- Display of the measurements in graph form or as a table



- Zoom function:
  Using the mouse a frame is drawn around an interesting section of a measurement curve which is then enlarged and displayed.

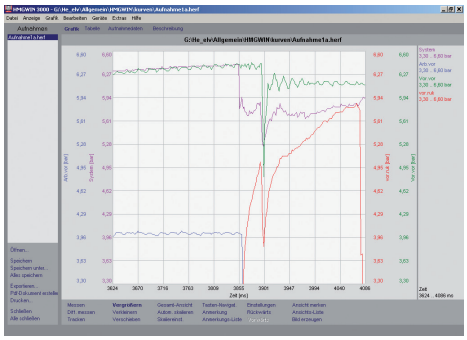
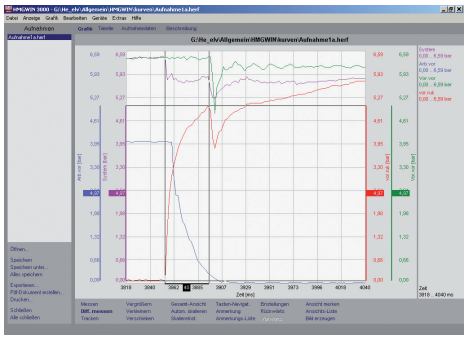
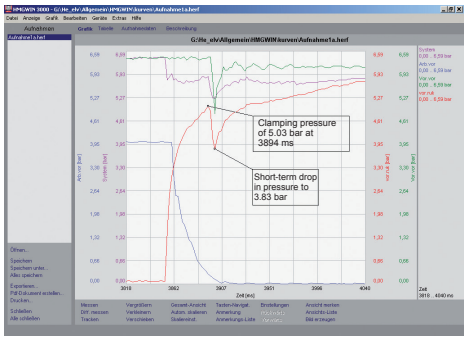


Fig.: Zoomed section of measurement curve

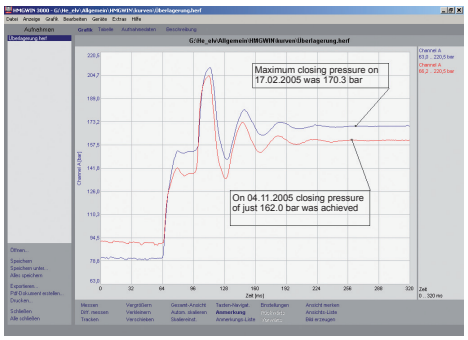
- Accurate measurement of the curves using ruler tool (time values, amplitude values and differentials).



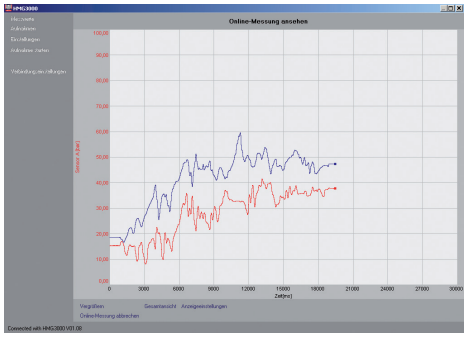
- Individual comments and measurement information can be added to the graph



- Overlay of curves, for example to document the wear of a machine (new condition / current condition).



- Using mathematical operations (calculation functions, filter functions) new curves can be added.
- Snap-shot function: comparable to the function of a digital camera, a picture can be taken immediately of any graph and saved as a jpg file.
- A professional measurement report can be produced at the click of a mouse:
  HMGWIN 3000 has an automatic layout function.
  Starting with a table of contents, all recorded data, descriptions and graphs and/or tables are combined into a professional report and saved as a pdf file.
- Online function:
  Start, record and display measurements in real-time (similar to the function of an oscilloscope)



- Change of axis assignment of the recorded measurement parameters in graph mode (e.g. to produce a p-Q graph)

Technical specifications:

Meas. inputs	● 4 input sockets (channel A-H) for connecting up to 8 analogue sensors or up to 4 SMART sensors. ● 1 input socket with 2 digital inputs (channel I-J) and one voltage input of -10 V to + 10 V (shown on channel H) Sensors are connected using standard M12x1 connectors (5 pole)
Channel A and B (accuracy)	4 .. 20 mA (≤ ± 0.1 % FS max.) 0 .. 20 mA (≤ ± 0.1 % FS max.) 0 .. 10 V (≤ ± 0.1 % FS max.) 0 .. 5 V (≤ ± 0.2 % FS max.) 1 .. 5 V (≤ ± 0.2 % FS max.) 1 .. 6 V (≤ ± 0.2 % FS max.) 0.5 .. 4.5 V (≤ ± 0.1 % FS max.) 0.5 .. 5.5 V (≤ ± 0.2 % FS max.)
Channel C and D (accuracy)	4 .. 20 mA (≤ ± 0.1 % FS max.) 0 .. 20 mA (≤ ± 0.1 % FS max.) 0 .. 10 V (≤ ± 0.5 % FS max.) 0 .. 50 V (≤ ± 0.1 % FS max.) 0 .. 5 V (≤ ± 1 % FS max.) 1 .. 5 V (≤ ± 1 % FS max.) 1 .. 6 V (≤ ± 1 % FS max.) 0.5 .. 4.5 V (≤ ± 0.1 % FS max.) 0.5 .. 5.5 V (≤ ± 1 % FS max.)
Channels E to G (accuracy)	4 .. 20 mA (≤ ± 0.1 % FS max.) 0 .. 20 mA (≤ ± 0.1 % FS max.) 0.5 .. 4.5 V (≤ ± 0.1 % FS max.)
Channel H (accuracy)	4 .. 20 mA (≤ ± 0.1 % FS max.) 0 .. 20 mA (≤ ± 0.1 % FS max.) -10 .. +10 V (≤ ± 0.5 % FS max.) 0.5 .. 4.5 V (≤ ± 0.1 % FS max.)
Channel I and J (accuracy)	Frequency range: 1 .. 30 000 Hz (≤ ± 0.1 % FS max.) Switch / switch-back threshold: 2 V / 1 V Max. input voltage: 50 V
Differential channels	A - B C - D Differential channel for flow rate measurement orifice (shown on channel B)
Measuring rate (dependent on the number of active channels)	0.1 ms, max. 2 analogue input channels 0.2 ms, max. 4 analogue input channels 0.5 ms, all 10 input channels 1.0 ms, for SMART sensors
Resolution	12 bit
Memory	At least 100 measurement curves, each with up to 500,000 measured values
Display	3.5" colour display, 7 segment display
Interfaces	1 USB, 1 serial port
CE mark	EN 61326-1+A1+A2
Safety	EN 61010
Safety type	IP 40
Ambient conditions	Operating temp.: 0 .. +50 °C Storage temp.: +20 .. +60 °C Rel. humidity: 0 .. 70 %
Weight	1100 g

Note:
FS (**F**ull **S**cale) = relative to the full measuring range

Ordering Details:

HMG 3000 - 000 - X

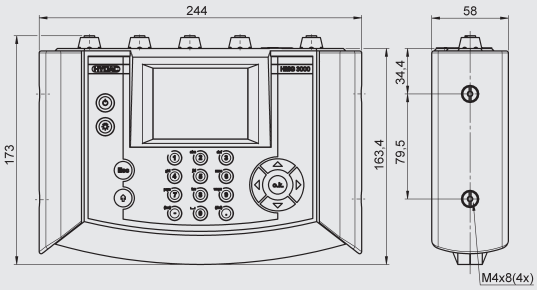
Operating manual and documentation
D = German
E = English
F = French

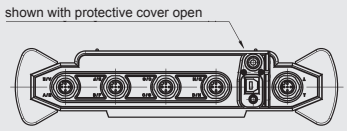
Items supplied
- HMG 3000
- Charger for 90 .. 230 V AC
- Operating manual
- CD-ROM containing USB drivers, HMGWIN 3000 and CMWIN software
- USB connection cable

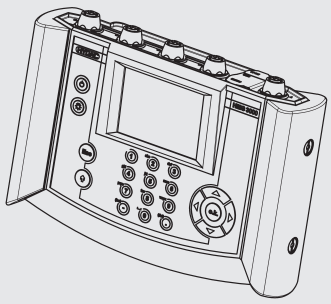
Accessories:

Appropriate accessories, such as electrical and mechanical connection adapters, power supply, etc. can be found in the Accessories section.

Dimensions:







Note:

The information in this brochure relates to the operating conditions and applications described.
For applications or operating conditions not described, please contact the relevant technical department.
Subject to technical modifications.

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