

## Portable Data Recorder HMG 3010

### Description:

The HMG 3010 is an impressive, top performance portable measuring and data recording device.

Automated setting procedures, a simple, self-explanatory operator guide and many comprehensive functions ensure the operator is able to carry out a wide range of measuring tasks within a very short time and to work in a way which is both time-saving and cost-effective.

The HMG 3010 thus quickly becomes a reliable and helpful tool in the working environment of service, maintenance, development, test rig technology, quality assurance or commissioning of systems and machines.

The HMG 3010 is designed primarily to record pressure, temperature and flow rate values which are the standard variables in hydraulics and pneumatics. For this purpose, special sensors are available, with which the variable, the measurement range and unit are automatically detected by the HMG 3010. The device also offers measurement inputs for standard sensors with current and voltage signals. In addition to the analogue inputs, the HMG 3010 also has two digital inputs (e.g. for frequency or rpm measurements).

The ability to connect the HMG 3010 to a CAN bus and thus to display messages from the CAN bus completes the range of applications.

Due to the wide range of functions and its simple handling, the HMG 3010 is just as appropriate for users who take measurements only occasionally as it is for professionals for whom measuring and documentation are routine.

The update capability of the HMG 3010 via the integral USB port ensures that the user can benefit from future upgrades of the device software.

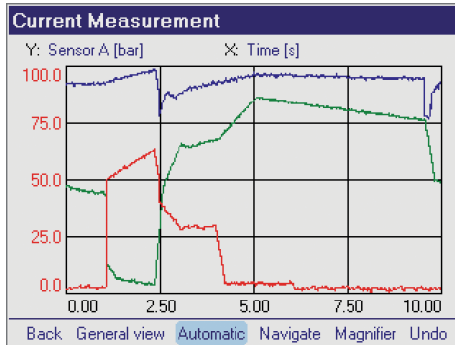


### Special features:

- Simple, user-friendly operation
- Practical, robust design
- Large, full-graphics colour display
- Quick and independent basic setting of the device 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
- Can be connected to a CAN bus
- 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

## Function:

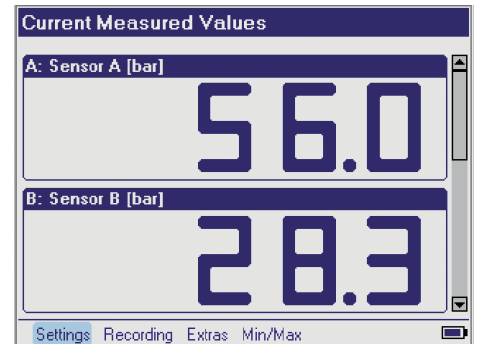
- Clear and graphical selection menus guide the operator very simply to all the device functions available. A navigation pad on the keypad ensures rapid operation.
- The HMG 3010 can monitor signals from up to **ten sensors simultaneously**. For this there are 5 robust standard input sockets. By using Y adapters, the number of inputs can be doubled individually to make a total of between 6 and 10.
- Up to 8 sensors can be connected to 4 of these input sockets:
  - 8 sensors (e.g. for pressure, temperature, and flow rate) with the special digital HSI interface (HYDAC Sensor Interface); this means the basic device settings (measured variable, range, and unit of measurement) are undertaken automatically
  - 8 standard analogue sensors with current and voltage signals
  - 4 Condition Monitoring sensors\* (SMART sensors); again, the basic device settings are carried out automatically
- 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 3010 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).
- The connection to a **CAN bus** in conjunction with the CAN adapter ZBE 3010 makes it possible to record CAN messages (e.g. motor speed, motor oil pressure) in combination with measured data from the hydraulic system.
- HYDAC CAN bus sensors connected directly to the CAN adapter can be parameterized using the HMG 3010 (node ID and baud rate)
- 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 3010 is its ability to record dynamic processes "online", i.e. in real-time, as a **measurement curve** and to render them as graphs in the field.



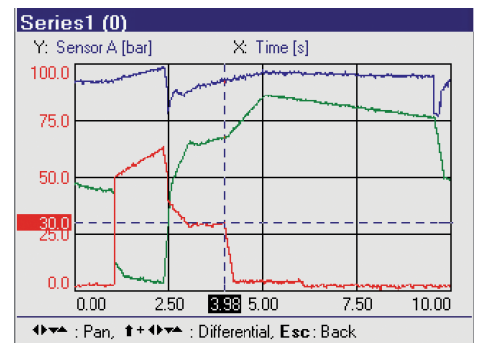
- The **data memory** for recording curves or logs can hold up to 500,000 measured values. At least 100 such full-length data records can be stored in an additional archive memory.
- For specific, **event-driven curves or logs**, the HMG 3010 has four independent triggers, which can be linked together 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 3010 has an easy-to-use handheld recording function.
- User-specific device 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 device settings.

Name	Saved↑
power unit 10	28.06.06 12:44:58
injection machine 17	28.06.06 12:44:41
hydraulic press	28.06.06 12:43:04
power unit	28.06.06 12:42:03
injection machine 12	28.06.06 12:41:14

- Measured values, curves or texts are visualized 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, differential value graph creation and individual scaling, which are particularly for use when analysing the recorded measurement curves.



- The HMG 3010 communicates with a PC via the built-in USB port or RS 232 port.

## HMGWIN 3000:

The PC software HMGWIN 3000 is also supplied with the device. This software is a convenient and simple package for analysing and archiving curves and logs which have been recorded using the HMG 3010, or for exporting the data for integration into other PC programs if required. It is also possible to operate the HMG 3010 directly from the computer, to undertake basic settings, and to start measurements online and display them directly on the PC screen as measurement curve progressions.

## CMWIN:

The HYDAC software CMWIN is also supplied with the device.

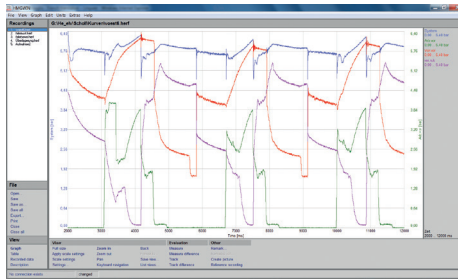
This software enables you to communicate directly with SMART sensors \*) connected to the HMG 3010 from your PC.

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 3010
- 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.

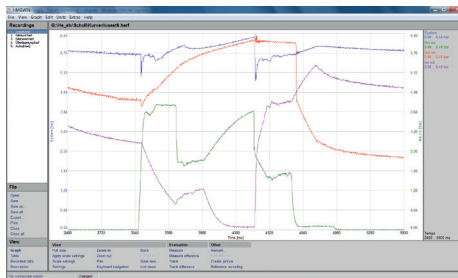
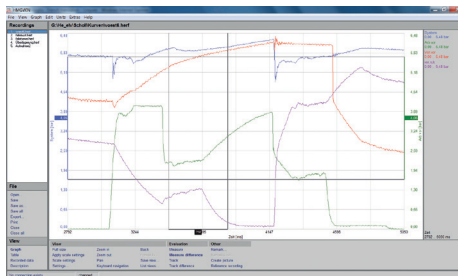
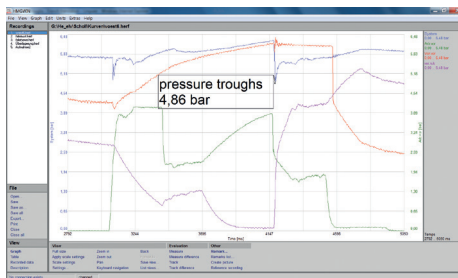


Fig.: Zoomed section of measurement curve

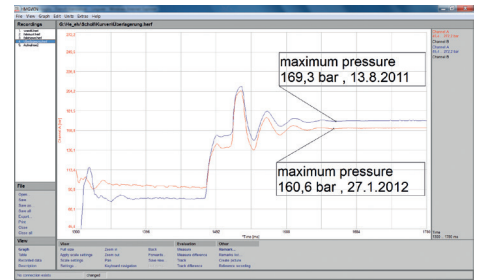
- **Accurate measurement** of the curves using the ruler tool (time values, amplitude values, and differentials)



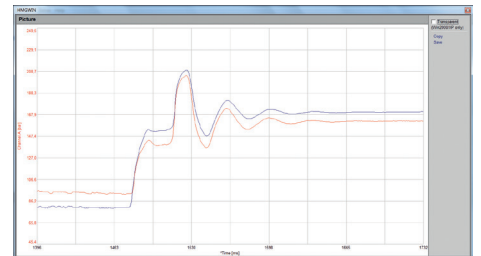
- Individual **comments** and measurement information can be inserted into the graph



- **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 graphics and/or tables are combined into a professional report and saved as a pdf file.
- **Online function:** Starting, recording, and online display of measurements (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 data:

<b>Meas. inputs</b>	● 4 input sockets (channels A-H) for connecting up to 8 analogue sensors or up to 4 SMART sensors.
	● 1 input socket with 2 digital inputs (channels I-J) and one voltage input of -10 V to +10 V (shown on channel H) Sensors are connected using standard M12x1 male connectors (5 pole)

### Channels A, B, E, F, G

(Accuracy)	HSI	( $\leq \pm 0.1\%$ FS max.)
	4 .. 20 mA	( $\leq \pm 0.1\%$ FS max.)
	0 .. 20 mA	( $\leq \pm 0.1\%$ FS max.)
	0 .. 4.5 V	( $\leq \pm 0.1\%$ FS max.)
	0 .. 5 V	( $\leq \pm 0.2\%$ FS max.)
	0 .. 10 V	( $\leq \pm 0.1\%$ FS max.)
	0.5 .. 4.5 V	( $\leq \pm 0.1\%$ FS max.)
	0.5 .. 5.5 V	( $\leq \pm 0.2\%$ FS max.)
	1 .. 5 V	( $\leq \pm 0.2\%$ FS max.)
	1 .. 6 V	( $\leq \pm 0.2\%$ FS max.)

Channels C and D (Accuracy)	HSI	( $\leq \pm 0.1\%$ FS max.)
	4 .. 20 mA	( $\leq \pm 0.1\%$ FS max.)
	0 .. 20 mA	( $\leq \pm 0.1\%$ FS max.)
	0 .. 4.5 V	( $\leq \pm 0.1\%$ FS max.)
	0 .. 5 V	( $\leq \pm 1.0\%$ FS max.)
	0 .. 10 V	( $\leq \pm 0.5\%$ FS max.)
	0 .. 50 V	( $\leq \pm 0.1\%$ FS max.)
	0.5 .. 4.5 V	( $\leq \pm 0.1\%$ FS max.)
	0.5 .. 5.5 V	( $\leq \pm 1.0\%$ FS max.)
	1 .. 5 V	( $\leq \pm 1.0\%$ FS max.)
	1 .. 6 V	( $\leq \pm 1.0\%$ FS max.)

Channel H (Accuracy)	HSI	( $\leq \pm 0.1\%$ FS max.)
	4 .. 20 mA	( $\leq \pm 0.1\%$ FS max.)
	0 .. 20 mA	( $\leq \pm 0.1\%$ FS max.)
	0 .. 4.5 V	( $\leq \pm 0.1\%$ FS max.)
	0 .. 5 V	( $\leq \pm 0.2\%$ FS max.)
	0 .. 10 V	( $\leq \pm 0.1\%$ FS max.)
	0.5 .. 4.5 V	( $\leq \pm 0.1\%$ FS max.)
	0.5 .. 5.5 V	( $\leq \pm 0.2\%$ FS max.)
	1 .. 5 V	( $\leq \pm 0.2\%$ FS max.)
	1 .. 6 V	( $\leq \pm 0.2\%$ FS max.)
	-10 .. +10 V	( $\leq \pm 0.5\%$ FS max.)

Channels I and J (Accuracy)	Frequency range: 1 .. 30 000 Hz	( $\leq \pm 0.1\%$ FS max.)
	Switching / switch-back threshold: 2 V / 1 V	
	Max. input voltage: 50 V	

Differential channels	A - B	
	C - D	
	Difference channel for flow rate-measurement orifice (shown on channel B)	

<b>Measuring rate</b> (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

<b>Resolution</b>	12 bit
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<b>Memory</b>	At least. 100 measurement curves, each with up to 500,000 measured values
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<b>Display</b>	3.5" colour display
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<b>Interfaces</b>	1 USB, 1 serial port
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<b>CE mark</b>	EN 61000-1/2/3/4
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<b>Safety</b>	EN 61010
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<b>Protection class</b>	IP 40
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<b>Ambient conditions</b>	Operating temp.:	0 .. +50 °C
	Storage temp.:	-20 .. +60 °C
	Rel. humidity:	0 .. 70 %

<b>Weight</b>	1100 g
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**Note:**  
FS (Full Scale) = relative to the full measuring range

## Order details:

HMG 3010 - 000 - X

### Operating manual and documentation

D = German  
E = English  
F = French

### Items supplied

- HMG 3010
- Power supply for 90 .. 230 V AC
- Operating manual
- CD-ROM containing USB drivers, HMGWIN 3000 and CMWIN software
- USB connection cable

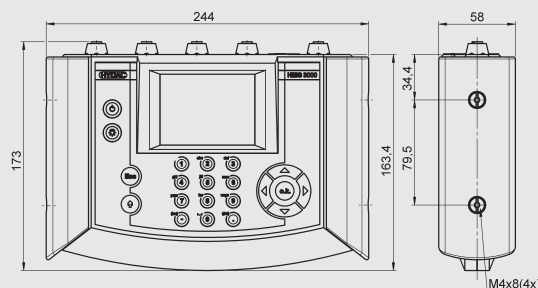
### Accessories:

- CAN adapter, required for CAN bus operation ( to be ordered separately)  
ZBE 3010 CAN adapter for HMG 3010  
Material No. 921238



- Additional accessories, such as electrical and mechanical connection adapters, power adapters, etc. can be found in the "Accessories - Service devices" catalogue section

## Dimensions:



shown with protective cover open



## Pressure Transducer with HSI

(HYDAC Sensor Interface)

Model Code	Description	Part No.
HDA 4748-H-0009-000	-14.5 to 130.5 psi (-1 to 9 bar)	00909429
HDA 4748-H-0016-000	0 to 230 psi (0 to 16 bar)	00909425
HDA 4748-H-0060-000	0 to 870 psi (0 to 60 bar)	00909554
HDA 4748-H-0100-000	0 to 1450 psi (0 to 100 bar)	00909426
HDA 4748-H-0250-000	0 to 3625 psi (0 to 250 bar)	00909337
HDA 4748-H-0400-000	0 to 5800 psi (0 to 400 bar)	00909427
HDA 4748-H-0600-000	0 to 8700 psi (0 to 600 bar)	00909428
HDA 4778-H-0135-000	-14.5 to 135.5 psi (-1 to 9.34 bar)	00920755
HDA 4778-H-0150-000	0 to 150 psi (0 to 10 bar)	00920663
HDA 4778-H-1500-000	0 to 1500 psi (0 to 103 bar)	00920757
HDA 4778-H-3000-000	0 to 3000 psi (0 to 207 bar)	00920756
HDA 4778-H-6000-000	0 to 6000 psi (0 to 413 bar)	00920664
HDA 4778-H-9000-000	0 to 9000 psi (0 to 621 bar)	00920665

## Accessories

Model Code	Description	Part No.
USB Cable	Connection to PC	6040585
ZBE 30-02	cable for M12x1 - 6'	6040851
ZBE 30-05	cable for M12x1 - 15'	6040852
ZBE 34	M12x1 / Binder adapter	3236597
ZBE 35	M12x1 / Hirschmann adapter	3236601
ZBE 36	AS 1000 (Aqua Sensor) Adapter	909737
ZBE 38	M12 Y-adapter (doubles the inputs)	3224436
Hydraulic Adaptor Set (2 pieces each)	Adapter hose DN 2 / 1620/1620, 400mm and 1000 mm, pressure gauge con- nectors 1620 / G1/4, adapter 1615/1620, bulkhead couplings 1620/1620	903083
UVM 3000	Universal connection module for HMG 3010	909752
Bag	with carry strap	909795
Power Supply	DC Charging unit for HMG 3010	6054296
ZBE 31	Car Charger for HMG 3010	909739
Pelican Case	for HMG 3010 and accessories	2702730
Aluminum Case	for HMG 3010 and accessories	6042959

## Flow Sensor with HSI (HYDAC Sensor Interface)

Model Code	Description - g/min (l/min)	Part No.
<b>Aluminum</b>		
EVS 3108-H-0020-000	0.26 to 5.28 (1.2 to 20)	00909405
EVS 3108-H-0060-000	1.59 to 15.9 (6 to 60)	00909293
EVS 3108-H-0300-000	3.96 to 79.3 (15 to 300)	00909404
EVS 3108-H-0600-000	10.6 to 159 (40 to 600)	00909403
<b>Stainless Steel</b>		
EVS 3118-H-0020-000	0.26 to 5.28 (1.2 to 20)	00909409
EVS 3118-H-0060-000	1.59 to 15.9 (6 to 60)	00909406
EVS 3118-H-0300-000	3.96 to 79.3 (15 to 300)	00909408
EVS 3118-H-0600-000	10.6 to 159 (40 to 600)	00909407

## Temperature Transducer with HSI

(HYDAC Sensor Interface)

Model Code	Description	Part No.
ETS 4148-H-006-000	-13° to 212°F (-25° to 100°C)	923398
ETS 4578-H-000	-13° to 212°F (-25° to 100°C)	920662

## Additional Sensors

Model Code	Description	Part No.
HDS 1000-002	RPM Sensor (plug M12x1) 2M Includes HDS 1000 Reflector Set (part no. 00904812)	00909436
HDS 1000 Reflector Set	Reflective foil set 25 pieces	00904812
SSH 1000	Sensor simulator for 2 HSI (ideal for training purposes)	00909414

HYDAC HSI sensors are part of a new plug and play, self-identifying sensor line. HSI sensors must be used with the HMG 500 and facilitate easy use with the HMG 3010. The HMG 3010 is capable of reading standard sensors as well as competitive models.

## 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.

## HYDAC ELECTRONICS

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