

TestMate® Series

HMG 3000 Data Recorder



The HMG 3000 data recorder is a portable unit for measurement and data capturing tasks involving hydraulic and pneumatic systems. Applications extend primarily to maintenance and servicing, troubleshooting, test stands, and quality inspecting.

The HMG 3000 can concurrently evaluate signals from up to 10 sensors. The unit features 5 input jacks for connecting the sensors. If necessary, this number can be doubled using a Y adapter for measurement operations involving more than 5 sensors. Schroeder offers HSI sensors (HSI = *Hydraulic Sensor Interface*) for pressure, temperature and flow rate, which are automatically recognized by the HMG 3000. Standard analog sensors can also be used, but these sensors must be manually configured.

Current Measured Values				
Designation	Value	Unit	Min	Max
A Sensor A	19.4	bar	0.0	100.0
B Sensor B	12.2	bar	4.5	43.5
C Sensor C	77.9	bar	0.0	99.9
D Sensor D	87.9	bar	0.0	100.0
E Sensor E	40.9	bar	0.6	100.0

Settings Recording Extras Min/Max Reset

Features

The HMG 3000 is user-friendly by virtue of its easy-access selection menus leading to all of the unit's functions and settings. The unit features a combination keypad for entering numeric values and text.

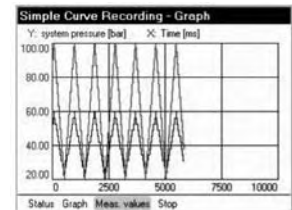
The HMG 3000 was designed for capturing typical measurement values (*pressure, temperature, volumetric flow rates*) in hydraulic and pneumatic systems. A variety of other measurement tasks can be performed by virtue of additional inputs for analog signal measurement. Example: Checking the actuation of a switching valve or plotting the characteristic curve of a valve setpoint. In addition, it is possible to determine differential values between the measured values of individual sensors. One example of this is taking a volumetric flow measurement using a differential pressure orifice plate.



In addition to the analog measurement inputs, the HMG 3000 features two digital outputs, enabling frequencies or speeds to be recorded, thus expanding the unit's range of potential applications.

When taking measurements of rapid, dynamic machine processes, all 8 analog input signals can be concurrently captured at a rate of 0.5 ms per sample.

A special feature of the HMG 3000 is its ability to record the dynamic processes of a machine in the form of a measurement curve and render them as a graph – on-line and in real time.



HMG Software

The HMG 3000 communicates with a computer via a USB port. Schroeder offers HMGWIN 3000, the matching software for the HMG 3000, for convenient post-processing, rendering, and evaluation of measurements on a PC. It also enables the HMG 3000 to be operated directly from a computer.

The HMG 3000 is equipped with specially developed software providing for fast data collection and processing. A measurement curve can comprise up to 500,000 measured values. The HMG 3000's measured value memory is capable of storing at least 60 of these measurement curves.

Display Options

In addition to recording measurement curves, the HMG 3000 can be configured for event-triggered measurement and recording.

Apart from measurement curves, the HMG 3000 can store user-specific settings (user profiles). The main advantage of this is enabling identical measurements of various equipment items to be repeated for the purpose of preventive maintenance. All the user has to do is retrieve the respective user profile from the HMG 3000's memory.

The HMG 3000 features a 3.5" color full-graphics display enabling the measured values to be rendered in an easy-to-read form as text or a measurement curve. Individual measured values can be displayed in a large format (7-segment format), enabling them to be read at an extended distance.

The HMG 3000 also provides for a variety of user-friendly features for displaying, evaluating and processing measured values:

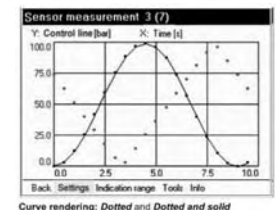
- Table
- Graph
- Scaling
- Ruler
- Tracker
- Zoom

Current Measurement		
	system pres. Sensor B [bar]	Sensor B [bar]
Dist	36.32	13.5
Temp	36.16	13.5
Flow	36.00	13.5
Act	35.76	13.5
Act	35.60	13.5
Act	35.44	13.5
Act	35.28	13.5
Act	35.04	13.5

Back Settings Info

Load Stored Settings	
Name	Saved
HYDAC Electronics	18.11.05 14:40:26

Load Cancel



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On/Off button

Brightness/contrast setting of the display

ESC key – For canceling an entry or going back step by step

Shift key – Switches the number pad to a text pad when pressed; the text pad is active only as long as the Shift key is pressed.

Keypad – Numbers and letters can be entered via the combination keypad in a fashion similar to that of mobile phones.

Numbers: 0 to 9;
 “. ” (decimal separator)
 and “-” (minus)

Text Entry: upper and lower case alphanumeric characters

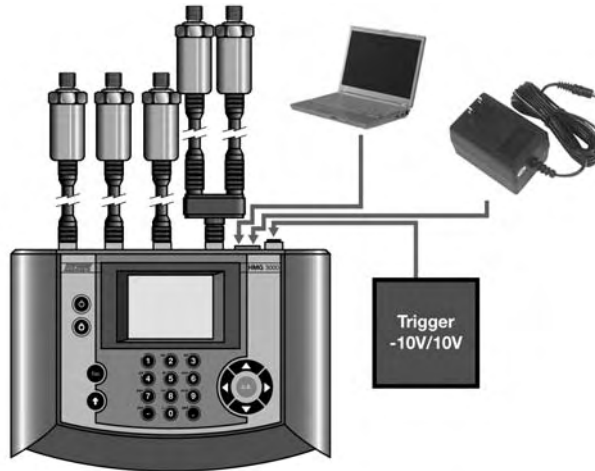
INS = insert; DEL = delete;

Entry of spaces: SHIFT + INS (simultaneously)

Deletion of characters: SHIFT + DEL (simultaneously)

Graphic display – Display of the menu and operating functions, measured values and measurement curves

5-way navigation key – For navigating step by step in the display OK key for inputting, concluding, accepting or storing an entry



HMG Display Panel

TCM
 TCM-FC
 TMU
 TPM
 TIM
 CTU
 TWS-C
 ET-100-6

HMG 3000

EWC

EPK

HTB

GS

Trouble
 Check Plus

Test Points

Adapters

Hose
 Joiners

Microflex
 Hose

Pressure
 Limiters

Pressure
 Gauges

Test Kits

Probalizer

Filtration
 Station

MFS, MFD

AMS, AMD

KLS, KLD

AKS, AKD

KLC

X Series

MTS

HFS

SVD

TDS

IXU

Appendix

A - D & E - H 4 sensor input jacks for up to 8 sensors with an analog signal (channel A – D and E – H*), (e.g. for sensors for measuring pressure, temperature or flow rate.)

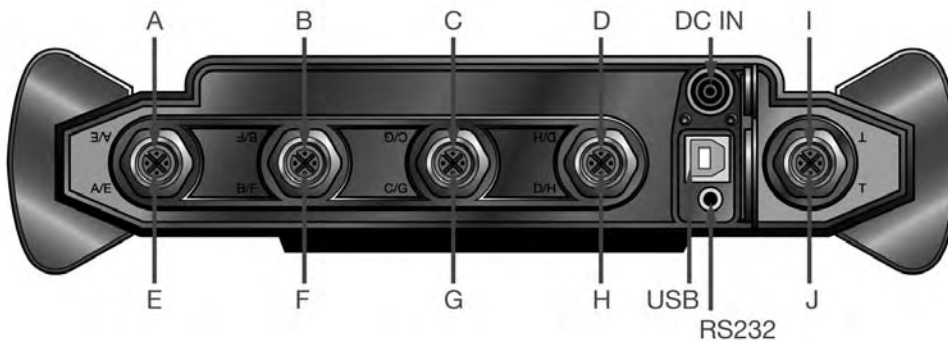
The 4 input jacks can be doubled by plugging in Y adapters.

*Channel H can be used for sensors with an analog signal as well as for voltage measurements of -10V to 10V.

I / J 1 or 2 input jacks for:
 2 digital signals, (e.g., for frequency or speed measurements) (channel I, J)
 1 voltage input (-10V to 10V, channel H*)

DC IN Female connector for power supply

USB 1 USB connector



Connections

HMG 3000

continued

Specifications

Sensor Inputs: 4 input jacks for 8 analog inputs (*channel A – H*)
 1 input jack for 2 digital inputs (*channel I – J*)
 Voltage input of -10 V to 10 V (*shown at channel H*)
 Connecting the sensors is done using a standard M12 x 1 plug connector (*5-pin*)

Channel A to H: Automatic detection for HSI sensors (*pressure, temperature, volumetric flow rate transducers*)
 Connection of standard sensors with current or voltage signals
 Differential channels for channel A – B; channel C – D

A & B	C & D	E to G	H
4 to 20 mA	4 to 20 mA	4 to 20 mA	4 to 20 mA
0 to 20 mA	0 to 20 mA	0 to 20 mA	0 to 20 mA
0 to 10 V	0 to 50 V		-10 to +10 V
0 to 5 V	0 to 10 V		
1 to 5 V	0 to 5 V		
1 to 6 V	1 to 5 V		
0.5 to 4.5 V	1 to 6 V		
0.5 to 5.5 V	0.5 to 4.5 V		
	0.5 to 5.5 V		

Channel I and J: Frequency channels (*speed (rpm) measurement, counting function*)
 Frequency range: 1 to 30 000 Hz
 Switching threshold: 2 V
 Maximum input voltage: 50 V

Sampling Rates: The following applies: 0.1 ms = max. 2 analog input signals
 (The sampling rate which can be set is dependent on the active measurement channels.) 0.2 ms = max. 4 analog input signals
 0.5 ms = all 10 input channels

Battery service times: Without any sensors = 11 hours
 (battery is fully charged) With 2 sensors = 9 hours
 With 4 sensors = 7 hours
 With 8 sensors = 4 hours

Measured Value Memory: Single recording: up to 500,000 measured values
 Archive memory: 64 MB
 (for approx. 60 individual recordings consisting of 500,000 measured values each)

PC Link Interfaces: USB port
 Standard serial port (RS 232) for communication and evaluation using the HMGWIN 3000 software

Dimensions and Weight: Measurements: 9.68 x 6.85 x 2.28 in (246 x 174 x 58 mm)
 Weight: 2.42 lbs. (1.10 kg)

Operating and Ambient Conditions: Operating temperature: 0°F to 122°F (0°C to 50°C)
 Storage temperature: -4°F to 140°F (-20°C to 60°C)
 Relative humidity: 0 - 70 %

Standards with which the HMG 3000 Complies: EMC: EN 61000-6-1, EN 610 0-6-2, EN 61000-6-3, EN 61000-6-4
 Safety: EN 61010
 Protection type/rating: IP40

TestMate® Series

	Description	Part Number
Diagnostic Unit	HMG 3000 Battery and Charging Unit HMGWIN Software USB Cable User Manual	HMG-3000
Pressure Transducers with HSI	0 to 232 psi (0 to 16 bar) -15 to 131 psi (-1 to 9 bar) 0 to 1450 psi (0 to 100 bar) 0 to 3625 psi (0 to 250 bar) 0 to 5800 psi (0 to 400 bar) 0 to 8700 psi (0 to 600 bar)	HDA 4748-H-0016 HDA 4748-H-0009 HDA 4748-H-0100 HDA 4748-H-0250 HDA 4748-H-0400 HDA 4748-H-0600
Temperature Transducer with HSI	-13°F to 212°F (-25°C to 100°C)	ETS-4548-H
Additional Sensors	RPM Sensor (M12x1 2M Cable) RPM Sensor Reflective Strips (25 pcs) TestMate® Contamination Monitor (TCM) TestMate® Water Sensor (TWS-C)	HDS-1000-002 HMG-100 See page 30 See page 44
Flow Sensor with HSI	1.6 to 15.9 gpm (Aluminum) 10.6 to 159.0 gpm (Aluminum) 4.0 to 79.3 gpm (Aluminum) 0.3 to 5.3 gpm (Aluminum) 1.6 to 15.9 gpm (Stainless Steel) 10.6 to 159.0 gpm (Stainless Steel) 4.0 to 79.3 gpm (Stainless Steel) 0.3 to 5.3 gpm (Stainless Steel)	EVS-3100-H-1 EVS-3100-H-2 EVS-3100-H-3 EVS-3100-H-5 EVS-3110-H-1 EVS-3110-H-2 EVS-3110-H-3 EVS-3110-H-5
Accessories	TWS-C Adapter 2M Cable for M12x1 5M Cable for M12x1 M12/Binder Adapter M12/Hirschmann Adapter M12 "Y" Adapter Universal Connection Module Case	HMG-101 ZBE-30-02 ZBE-30-05 ZBE-34 ZBE-35 ZBE-38 HMG-102 HMG-103
Spare Parts	DC Charging Unit	HMG-104

Model Number Selection

- TCM
- TCM-FC
- TMU
- TPM
- TIM
- CTU
- TWS-C
- ET-100-6
- HMG 3000**
- EWC
- EPK
- HTB
- GS
- Trouble Check Plus
- Test Points
- Adapters
- Hose Joiners
- Microflex Hose
- Pressure Limiters
- Pressure Gauges
- Test Kits
- Probalizer
- Filtration Station
- MFS, MFD
- AMS, AMD
- KLS, KLD
- AKS, AKD
- KLC
- X Series
- MTS
- HFS
- SVD
- TDS
- IXU
- Appendix

Deluxe HMG Kit – Part Number HMG-3000-D includes the following:

Quantity	Description	Part Number
1	HMG-3000 Diagnostic Unit	HMG-3000
2	0 to 5800 psi (0 to 400 bar) Pressure Transducer (w/HSI)	HDA-4748-H-0400
1	0 to 8700 psi (0 to 600 bar) Pressure Transducer (w/HSI)	HDA-4748-H-0600
1	-13°F to 212°F (-25°C to 100°C) Temperature Transducer (w/HSI)	ETS-4548-H
4	2M M12x1 Cable	ZBE-30-02
3	Direct Gauge Adapter	S1215DCG14CU
1	Case	HMG-103