HYDAC | Diagnostics

HMG 500 Series
Hand Held Diagnostic Tool

Applications

Description

The HMG 500 is a hand-held diagnostic tool for simple measuring tasks on hydraulic and pneumatic systems. Typical applications are in analysis, maintenance and service.

The HMG 500 has two analog input channels and can record the signals from HYDAC HSI sensors which are connected to it. HSI sensors *(HYDAC Sensor Interface)* are HYDAC sensors for pressure, temperature, and flow rate with automatic sensor recognition.

The HMG 500 automatically reads the measuring range and unit from each sensor that is connected. Manual adjustments of the measuring range settings are no longer required.

The measured values, actual, minimum and maximum, are recorded from the sensors. Depending on the requirement and setting, the following are displayed: the actual measured values *(channel A, B)*, the minimum or the maximum values *(channel A, B)*. The min/max values can be reset at any time at the touch of a button.

Furthermore the HMG 500 is capable of measuring and displaying the differential between the values on channel A and B *(channel A - B)*.

HMG 500 Kit #1: Part #00909470

Includes:

- HMG 500-000
- HDA 4748-H-0600-000
- ZBE 30-02 *(cable M12x1 for HMG)* 6'
- Gauge Adapter G1/4 female to Testpoint 16x2
- Case for HMG 500

HMG 500 Kit #2: Part #00909471

Includes:

- HMG 500-000
- 2 pcs. HDA 4748-H-0600-000
- 2 pcs. ZBE 30-02 *(cable M12x1 for HMG)* 6'
- 2 pcs. Gauge Adapter G1/4 female to Testpoint 16x2
- Case for HMG 500

Technical Specifications

Sensor inputs:
The HMG 500 has two analog inputs on 2 input connections *(channels A and B)* for connecting HSI sensors with automatic sensor recognition *(pressure, temperature and flow rate transmitters)*.

Channel A and B:

- Automatic sensor recognition for HSI sensors *(pressure, temperature and flow rate transmitters)* and setting of measuring range and unit of measurement
- Measured value differential for channel A - B

Measurement accuracy of the input channels:

- ≤±0.1% of the measuring range

Measurement rate:

- 0.1 ms

Measurement & Display:

- Actual measured value
- Min/max values
- Measured value differential
- Change of the unit of measurement

Operating time using 9V battery (2 sensors):

- approx. 10 hours.

General Specifications

Items supplied:

- HMG 500
- Manual D/E/F
- 9 V battery

Dimensions: 3.94 x 6.69 x 1.57 in.

Weight: 0.90 lbs.

Operating/Operating Conditions
Operating temperature: 41° to 140°F (5° to 60°C)
Storage temperature: -40° to 158°F (-40° to 70°C)
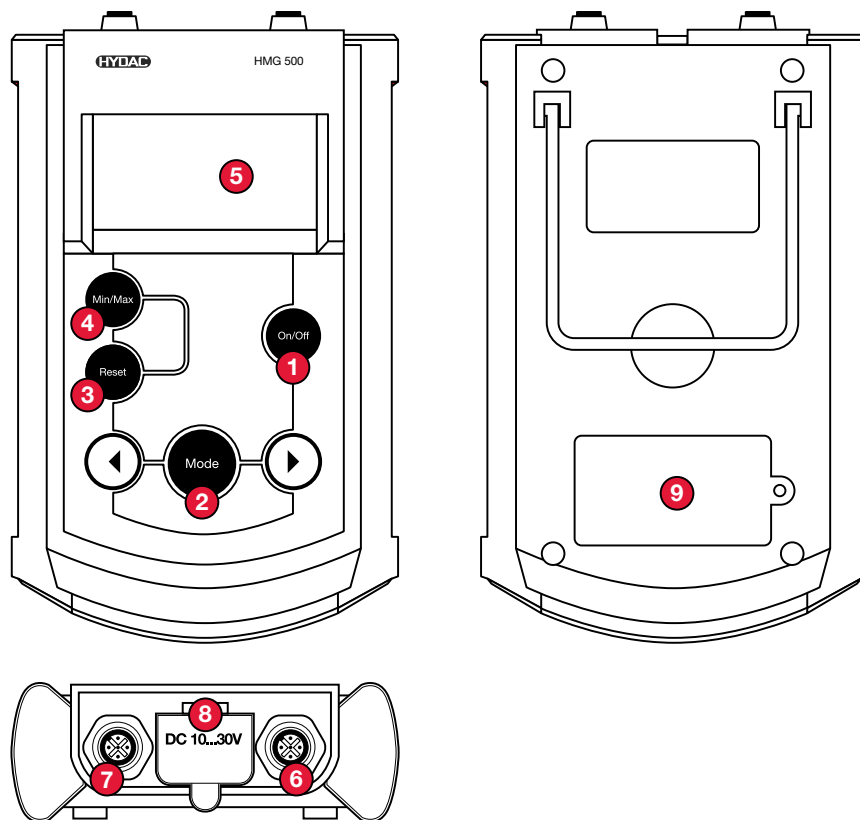Rel. humidity: 0 to 70 %

Power Supply
A standard 9 V battery is required for operation. It is also possible to operate the unit using the AC mains adaptor plug listed under Accessories.

CE mark
EN 610000-6-1 / 2 / 3 / 4

Special Features

Adjustment function for mechanical pressure switches

Display Panel & Connections

1. **On/Off button**
2. **Mode**
   Adjusting the menus
3. **Reset**
   Resetting the min/max values
4. **Min/Max**
   Display of the minimum and maximum values
5. **Display**
6. **Sensor Input Connector** (Channel A)
7. **Sensor Input Connector** (Channel B)
8. **Protective Cover**
   Connection for AC adaptor
9. **Battery Compartment**

Diagnostic Unit

Model Code	Description	Part No.
HMG 500-000-E	Includes: • HMG 500-000-E with Manual • 9V Battery	00909101

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 144 bar)	00920664
HDA 4778-H-9000-000	0 to 9000 psi (0 to 621 bar)	00920665

Temperature Transducer with HSI
(HYDAC Sensor Interface)

Model Code	Description	Part No.
ETS 4548-H-000	-13° to 212°F (-25° to 100°C)	00909298
ETS 4578-H-000	-13° to 212°F (-25° to 100°C)	00920662

Flow Sensor with HSI *(HYDAC Sensor Interface)*

Model Code	Description - g/min (l/min)	Part No.
Aluminum		
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
Stainless Steel		
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

Accessories

Model Code	Description	Part No.
ZBE 30-02	cable for M12x1 - 6'	06040851
ZBE 30-05	cable for M12x1 - 15'	06040852
Plastic Case	for HMG 500 and accessories	06043006
Power Supply	DC Charging unit for HMG 500	02702416

HYDAC | Diagnostics

HMG 510 Series
Hand-Held Diagnostic Tool

Description

The HMG 510 is a hand-held diagnostic tool for simple measurement tasks on hydraulic and pneumatic systems. Typical applications are primarily to be found in analysis, maintenance and servicing.

The HMG 510 features two analog inputs. HSI sensors *(HYDAC Sensor Interface)* or SMART sensors can be connected to these inputs. HSI sensors are HYDAC sensors featuring automatic sensor recognition. Consequently, manual adjustments of the measurement range settings are no longer required.

Furthermore the HMG 510 is capable of measuring and displaying the differential between the values on channel A and B (channel A–B), providing two sensors featuring the same unit of measurement are connected.

In addition to this, the HMG 510 enables measured values which have been saved in the SMART sensors to be uploaded to a PC.

With the aid of the HYDAC PC software CMWIN, the measurement data stored in the SMART sensors can be displayed on a PC screen in the form of a graph then analysed, edited and saved. The HMG 510 has a standard built-in USB port to enable this data transfer. To further extend the applications range, the HMG 510 has a function for setting mechanical pressure and temperature switches precisely and reliably.

Special Features

Adjustment function for mechanical pressure switches

Applications

Technical Specifications

Sensor inputs:
The HMG 510 features two analog inputs with automatic sensor detection at 2 input jacks *(channels A and B)*. Only HSI sensors *(pressure, temperature and flow rate transmitters)* and SMART sensors *(rel. humidity/temperature - AS1000, rel. humidity/temperature/dielectric constant - HLB 1300)* can be connected. **Channel A and B:**

- Automatic sensor recognition for HSI and SMART sensors; automatic setting of the measurement range and unit of measurement
- Measured value differential for channel A - B

Measurement accuracy of the input channels:

- $\leq$ +0.1% of the measurement range

Measurement rate:

- 0.1 ms

Measurement & Display:

- Current measured value
- Min/max values
- Measured value differential
- Change of the unit of measurement

Operating time using 9 V battery (2 sensors):

- approx. 10 hours

Standards with Which the HMG 510 Complies

- EMC: EN 61000-6-1 / 2 / 3 / 4
- Safety: EN 61010
- Protection rating: IP 54

General Specifications

Items supplied:

- HMG 510
- Manual Ger/Eng/Fra
- 9 V battery
- USB cable
- Y adapter, blue *(for HLB 1000)*
- Y adapter, yellow *(for CS 1000)*
- Sensor cable M12x1 (6')
- CD-ROM with CMWIN software
- Case for HMG 510

Dimensions: 3.94 x 6.69 x 1.57 in.

**Weight:** 090 lbs.

Operating/Ambient Conditions
Operating temperature: 41° to 140°F (5° to 60°C)
Storage temperature: -40° to 158°F (-40° to 70°C)
Rel. humidity: 0 to 70 %

Power Supply
A standard 9V battery is sufficient for operation. The unit can also be operated using the AC mains adaptor plug listed under Accessories. If you have any questions, suggestions, or encounter any problems of a technical nature, please contact your HYDAC sales office.
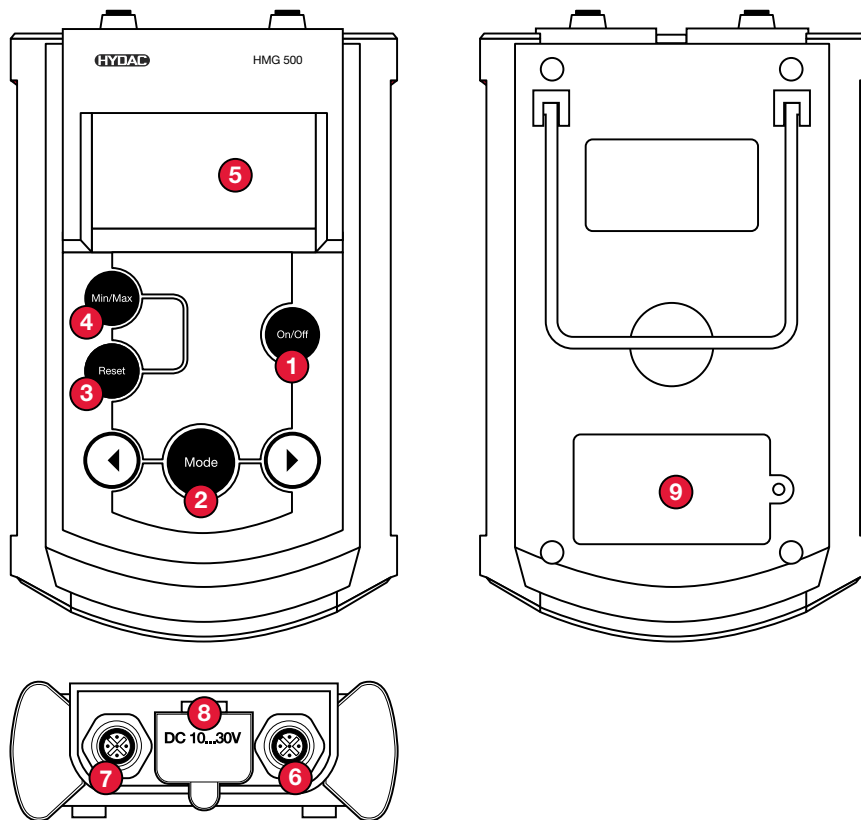
Display Panel & Connections

1. **On/Off button**
2. **Mode**
   Adjusting the menus
3. **Reset**
   Resetting the min/max values
4. **Min/Max**
   Display of the minimum and maximum values
5. **Display**
6. **Sensor Input Connector** (Channel A)
7. **Sensor Input Connector** (Channel B)
8. **Protective Cover**
   Connection for AC adaptor and mini USB connection
9. **Battery Compartment**

Diagnostic Unit

Model Code	Description	Part No.
HMG 510-000-E	Includes: • HMG 510-000-E with Manual • 9V Battery • USB cable • Y adapter, blue (for HLB 1000) • Y adapter, yellow (for CS 1000) • Sensor cable M12x1 (6') • CD w/ CMWIN software • Case for HMG 510	00909101

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
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Temperature Transducer with HSI
(HYDAC Sensor Interface)

Model Code	Description	Part No.
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ETS 4578-H-000	-13° to 212°F (-25° to 100°C)	00920662

Flow Sensor with HSI *(HYDAC Sensor Interface)*

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Stainless Steel		
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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

Accessories

Model Code	Description	Part No.
ZBE 30-02	cable for M12x1 - 6'	06040851
ZBE 30-05	cable for M12x1 - 15'	06040852
UVM 3000	Universal adapter	06040852
ZBE 26	Y adaptor, blue	03304374
ZBE 36	AS 1000 (Aqua Sensor) Adapter	00909737
ZBE 41	Y adaptor, yellow	00910000
USB Cable	Mini USB cable	06049553
Power Supply	DC Charging unit for HMG 510	02702416

HYDAC | Diagnostics

HMG 3000 Series
Portable Data Recorder & Diagnostic System

Applications

General

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

The HMG 3000 can concurrently evaluate signals 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. HYDAC offers matching HSI sensors *(HSI = HYDAC Sensor Interface)* for pressure, temperature and flow rate which are automatically recognized by the HMG 3000. Standard HYDAC sensors can also be used. However, these sensors do not feature any automatic sensor detection, consequently the initial setup has to be entered by hand.

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	49.5
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

Technical Specifications

Sensor Inputs	• 4 input jacks for 8 analog inputs *(channels A – H)* • 1 input jack for 2 digital inputs *(channels 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 sampling rate which can be set is dependent on the active measurement channels.)
The following applies:
• 0.1 ms = max. 2 analog input signals
• 0.2 ms = max. 4 analog input signals
• 0.5 ms = all 10 input channels

Battery service times *(battery is fully charged)* • Without any sensors = ca. 11 hours • With 2 sensors = ca. 9 hours • With 4 sensors = ca. 7 hours • With 8 sensors = ca. 4 hours	**Measured Value Memory** Single recording: up to 500,000 measured values Archive memory: 128 MB *(for approx. 100 individual recordings consisting of 500,000 measured values each)*

PC Link Interfaces
• USB port
• Standard serial port (RS 232) for commu-
  nication and evaluation using the HYDAC
  HMGWIN 3000 software
	Dimensions and Weight
	• Measurements: 9.68 x 6.85 x 2.28 in.
	• Weight: 2.42 lbs.

Operating and Ambient Conditions
• Operating temperature: 32 to 122°F
                (0° to 50°C)
• Storage temperature: -4 to 140°F
                (-20° to 60°C)
• Relative humidity: 0 to 70 %
	Standards with which the HMG 3000 Complies
	• EMC: EN 6000-6-1 / 2 / 3 / 4
	• Safety: EN 61010
	• Protection type/rating: IP40

HYDAC | INNOVATIVE FLUID POWER

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.
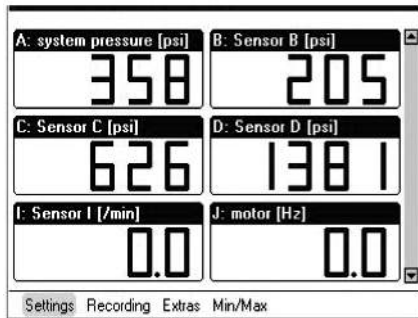

The HMG 3000 was designed in particular for capturing typical measurement values *(pressure, temperature, flow rate)* in hydraulic and pneumatic systems. A variety of other measurement tasks can be performed by virtue of additional inputs for voltage measurement. Example: checking the actuation of a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

In addition to the analog measurement inputs, the HMG 3000 features two digital inputs, 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.

A special feature of the HMG 3000 is its ability to record measurements of highly dynamic processes in a machine. To this end, two input channels are featured which are capable of recording measured values at a rate of 0.1 ms. This feature is dependent on the use of suitable, fast-acting sensors.

Another feature offered by 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.
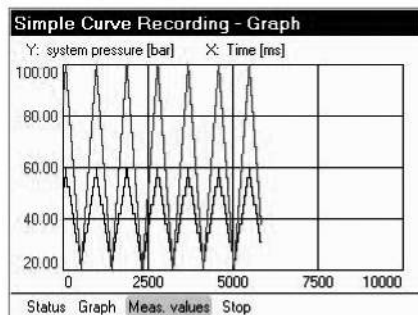

HMG Software

The HMG 3000 communicates with a computer via a USB or serial port. HYDAC offers HMGWIN 3000, the matching software for the HMG 3000, for convenient post-processing, rendering and evaluation of measurements at your computer. It also enables the HMG 3000 to be operated directly from your 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 100 of these measurement curves.

Display Options

In addition to enabling simple measurement curves to be recorded, the HMG 3000 also features other functions enabling event-driven measurements to be taken and event logs to be recorded. Various trigger options are available for triggering events.
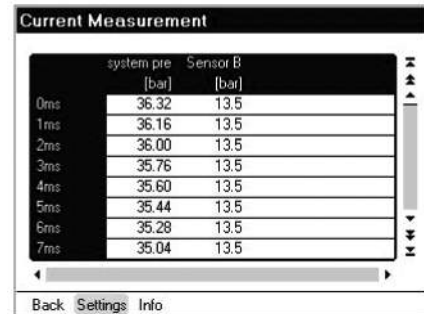

Apart from measurement curves, the HMG 3000 can store user-specific settings (user profiles). The main advantage of this is enabling identical measurements of various equipment items to be repeated for the purpose of preventive maintenance. All the user has to do is retrieve the respective user profile from the HMG 3000's memory.
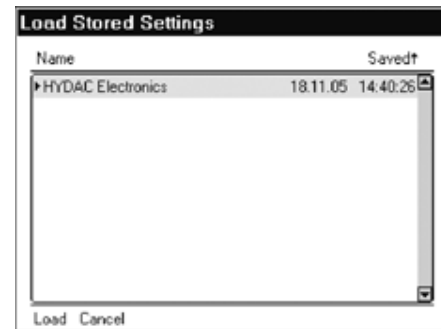
The HMG 3000 features a 3.5" color full-graphics display enabling the measured values to be rendered in an easy-to-read form as text or a measurement curve. Individual measured values can be displayed in a large format (7-segment format), enabling them to be read at an extended distance.

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
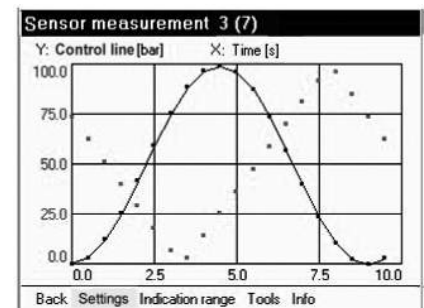
Curve rendering: *Dotted* and *Dotted and solid*