
Original Instruction Manual EMA 84 Digital Pressure Gauge



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The manufacturer owns the copyright to this instruction manual. It contains technical data, instructions and drawings detailing the device's features and how to use them. It must not be copied either wholly or in part or made available to third parties.

The instruction manual is part of the product. Please read this manual carefully, follow our instructions, and pay special attention to the safety information provided. This instruction manual should be available at all times. Please contact the manufacturer if you do not understand any part of the instructions.

The manufacturer reserves the right to continue developing this device model without documenting such development in each individual case. The manufacturer will be happy to determine whether this manual is up-to-date.

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Purpose of instruction manual

This instruction manual describes the features of the EMA 84 digital pressure gauge and provides guidelines for its use.

Improper use of this instrument or failure to follow these instructions may cause injury or equipment damage. Every person who uses this device must therefore read the manual and understand the possible risks. The instruction manual, and in particular the safety precautions contained therein, must be followed carefully. **Contact the manufacturer if you do not understand any part of this instruction manual.**

Handle this manual with care:

- It must be readily available throughout the lifecycle of the instrument.
- It must be provided to any individuals who assume responsibility for operating the instrument at a later date.
- It must include any supplementary materials provided by the manufacturer.

Conformity

This device is state of the art.

It complies with the statutory requirements of the EC and UK-directives.

This is documented by the CE and the UKCA mark being affixed.



1 Safety precautions

1.1 Appropriate use

The EMA 84 is a portable, battery-powered digital pressure gauge for measuring positive and negative differential pressures. At the heart of this precision instrument is a pressure measurement capsule containing a membrane spring; the deflection of this spring is then ascertained via an inductive measurement principle. Because it is durable and easy-to-use, the EMA 84 lends itself well to maintenance work and customer service applications for heating, air-conditioning and ventilation units, where it can be used for monitoring filters, measuring fireplace drafts and wind pressure, etc. Its precision and reproducibility also make the EMA 84 highly suitable for use in laboratory applications.

Always observe the operating requirements—particularly the permissible supply voltage—indicated on the rating plate and in the “Technical data” section of this manual.

The instrument may only be handled as indicated in this manual. Modifications to the instrument are prohibited. The manufacturer is not liable for damages caused by improper use or failure to follow these instructions. Violations of this type render all warranty claims null and void.

1.2 Shipping, assembly, electrical connections and start-up

Only technical personnel who are appropriately trained and authorized by the operator of the facility may assemble the instrument and set up its electrical connections.

The instrument may only be operated by appropriately trained individuals who have been authorized by the operator of the facility.

Specific safety precautions are given in individual sections of this manual.

1.3 Troubleshooting, maintenance, repairs, disposal

The individual responsible for the electrical connections must be notified immediately if the instrument is damaged or if errors occur.

This individual must take the instrument out of service until the error has been corrected and ensure that it cannot be used unintentionally.

This instrument requires no maintenance.

Only the manufacturer may perform repairs that require the housing to be opened.

The electronic components of the instrument contain materials that can be reused. For this reason the instrument must be recycled in accordance with the environmental guidelines of the jurisdiction in question once it has been taken permanently out of service.

1.4 Symbols

The symbols given below are used throughout this manual to indicate instances when improper operation could result in the following hazards:



WARNING!

This warns you of a potential hazard that could lead to bodily injury up to and including death if the corresponding instructions are not followed.



CAUTION!

This warns you of a potential hazard that could lead to significant property damage if corresponding instructions are not followed.



INFORMATION!

This indicates that the corresponding information is important for operating the instrument properly.

2 Instrument description

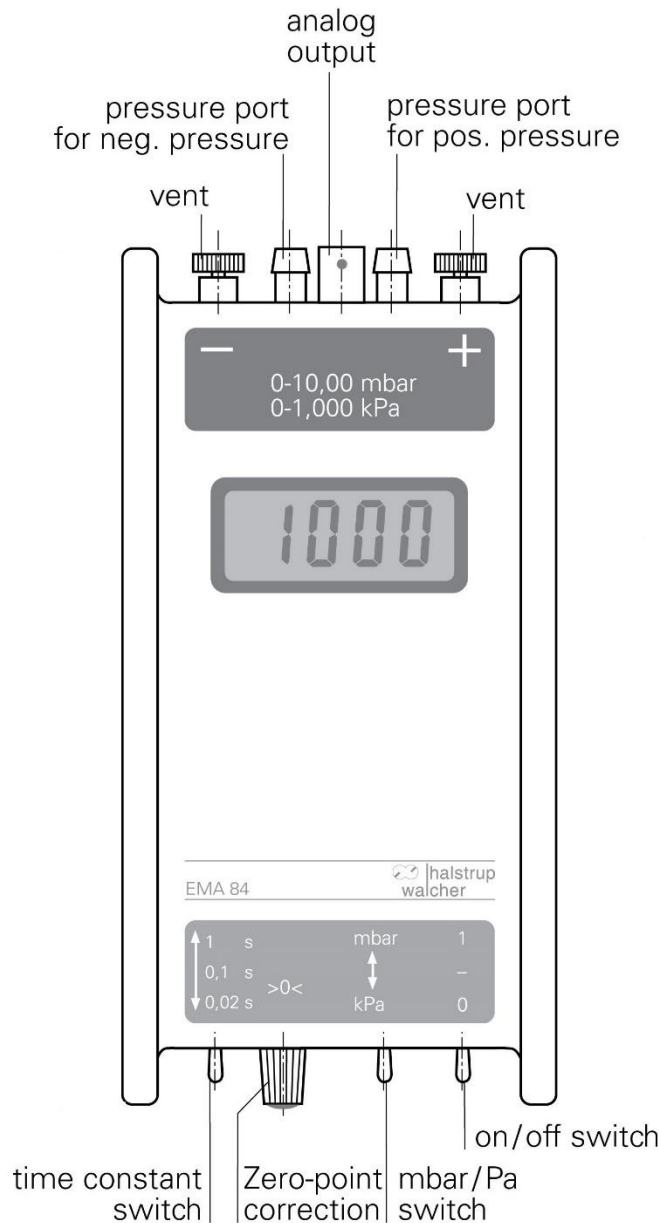
2.1 Features

The EMA 84 is a battery-operated, digital precision pressure gauge for measuring overpressure, vacuum and differential pressure of non-aggressive gases. Operating range is 100 Pa to 100 kPa.

Because it is robust, easy-to-use and includes an analog output, this instrument is especially suitable for maintenance, customer service and record-keeping for heating, ventilation and air-conditioning units.

At its heart is a pressure measurement capsule with a beryllium bronze membrane spring, which is displaced by the pressure difference between the two chambers of the measurement capsule. A distance measurement system converts this displacement into an electrical signal.

2.2 Operating elements



3 Start-up

3.1 Electrical connections



Use only IEC 6 LR 51 batteries.

Open the battery compartment on the rear of the instrument by sliding down the silver locking button. Clip the battery to the battery connector, making sure that the battery terminals match those of the connector. Place the battery in the compartment and replace the cover.

3.2 Pneumatic connections

Connect the EMA 84 to the pressure source at the overpressure port (+) when measuring overpressure, at the vacuum port (-) when measuring vacuum pressure, or at both ports (making certain to connect the + and - ports appropriately) when measuring differential pressure.

The two valves next to the pressure ports should always be kept open (by turning all the way to the left) when transporting the instrument or when beginning a measurement. Turning the valves to the right will close them.

The valve of the overpressure port (+) must be closed when measuring overpressure, and the valve of the vacuum port (-) must be closed when measuring vacuum pressure. Both valves should be closed when measuring differential pressure.

3.3 Operating the instrument

The battery voltage must be greater than 7 V for proper operation. The battery must be replaced if this is not the case. "LO BAT" will be displayed when the battery charge reaches a critical level.

Turn the instrument on by flipping switch D to the up position.

Use switch C to set the desired units (kPa – mbar).

Use switch A to set the desired response time. The lowest possible response time ("FAST" or 20 ms) is generally the best option. If, however, the pressure being measured fluctuates to the point where a precise reading cannot be taken, the response time can be lengthened by flipping switch A up to "MED" (0.1s) or "SLOW" (1 s).

Proceed as outlined in section 4 ("Zero-point calibration") if the display does not read 000 when the valves are open and/or when the pressure ports are disconnected. The instrument will then be ready for use.

4 Zero-point calibration

The instrument has a built-in potentiometer for calibrating the zero-point, a procedure that must be carried out with the **pressure ports and/or valves open** before every measurement. This is accomplished by turning potentiometer dial B until the display reads 000. Zero-point calibration allows the instrument to compensate for positional errors, temperature-induced errors and long-term instrument drift. The zero point must be calibrated with the instrument in the same position as it will be in when operated.

The potentiometer may not be used to compensate for errors caused by overloading the pressure measurement capsule; in other words, the zero-point can no longer be calibrated in this case and the instrument must be returned to the manufacturer.

5 Troubleshooting

Error description	Potential cause	Corrective action
display does not appear	dead battery	install new battery use a 9V IEC 6 LR 51 battery
instrument returns false values	zero point has shifted battery is low	adjust zero point (see section 4) display reads 'LOW BAT,' i.e., replace the battery
zero-point calibration cannot be performed	defective pressure measurement capsule	send the instrument to the manufacturer for repair

6 Calibration

Please keep in mind that part I of DIN 16 005 requires reference instruments to be at least four times as precise as the device being calibrated.

Equipment used to test halstrup-walcher pressure calibration devices are monitored continuously and our instruments are themselves calibrated using reference pressures based on national standards.

In order to maintain this high level of quality over a long period of time, we recommend sending your pressure calibration device to the manufacturer for recalibration at least once a year. A halstrup-walcher factory calibration certificate or a calibration certificate according to DKD-R-6-1 is available upon request.

Please note when the next calibration is due (indicated on the rear of the instrument).

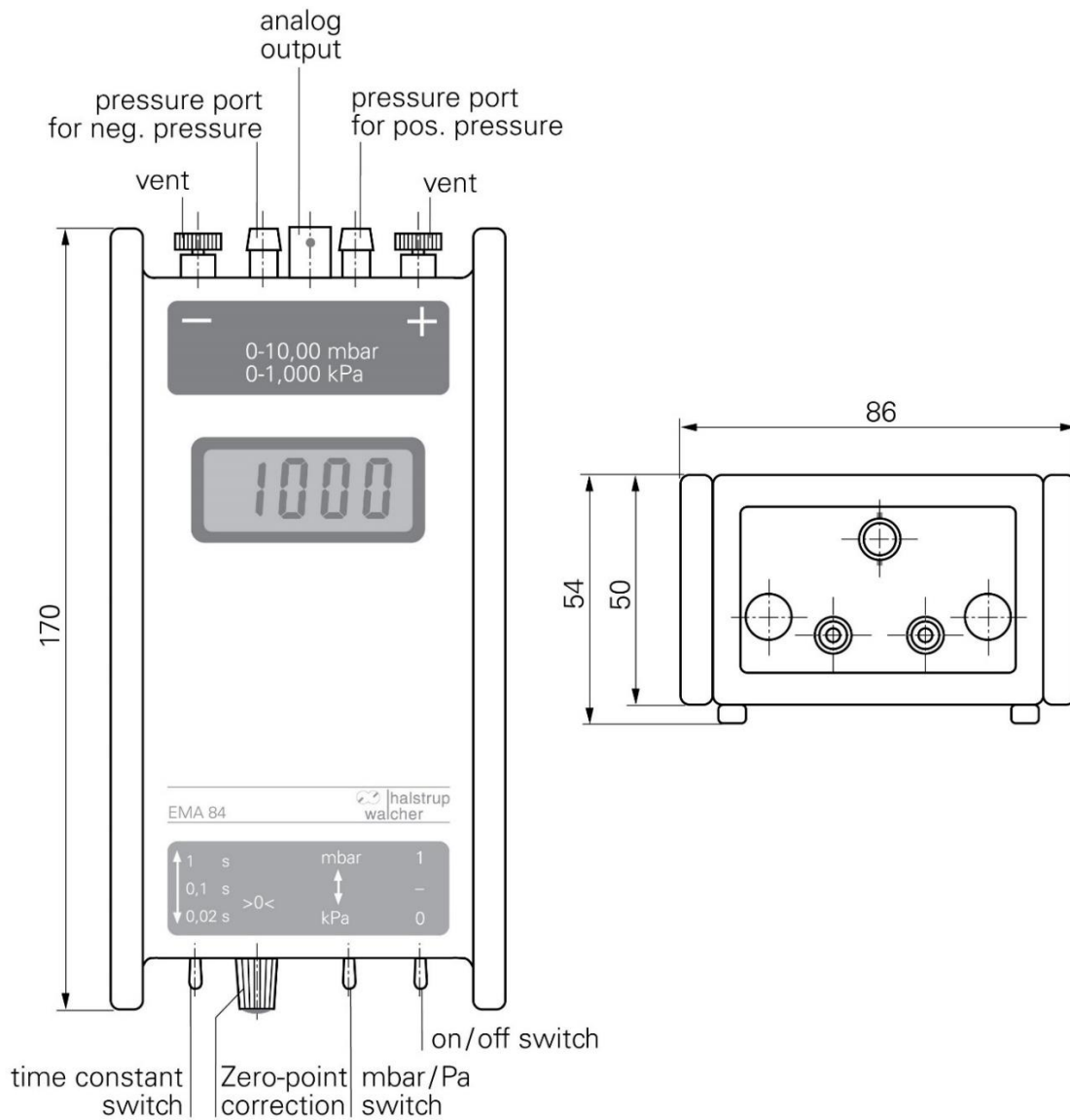
7 Technical data

Measurement data	
measurement ranges	0...100 Pa (0...1 mbar) 0...1 kPa (0...10 mbar) 0...10 kPa (0...100 mbar) 0...100 kPa (0...1000 mbar)
overload capacity	10 x the final value of the measurement range (for measurement ranges \leq 10 kPa) 2 x the final value of the measurement range (for measurement ranges $>$ 10 kPa)
hysteresis	0.1 %
step response time (T63) (time constant)	may toggle between 0.02 s, 0.2 s and 1 s
measurement accuracy (measurement accuracy for the reference: 0,3 Pa)	1 % 0.5 % option (only measurement ranges 1 kPa to 100 kPa) 0.2 % option (only measurement ranges 1 kPa to 10 kPa)
zero-point correction	via potentiometer on front panel
Ambient conditions	
medium	air, all non-aggressive gases
rated temperature range	0° C to +60° C
storage temperature	-10° C to +70° C
relative humidity	0...80 %
certificates	CE / UKCA (upon request)
Electrical data	
supply voltage	9 V battery
output signal (optional)	0 to 1 V (BNC connector)
load resistance R_L	$R_L \geq 2 \text{ k}\Omega$ for an output voltage of 0.. 1 V
display	3½-place LCD, character height = 13 mm
battery life	approx. 120 hours under constant operation
Physical data	
pressure ports	Ø 6.5 mm for NW6 tubing (interior tubing diameter = 5 mm)
operating position	preferably horizontal
dimensions (w x h x d)	86 x 54 x 170 mm
protection class	IP54
weight	approx. 0.8 kg, including battery

Appendix A: Parts in contact with measurement medium

- Beryllium bronze CuBe2
- Mu metal (nickel alloy)
- Brass CuZn39Pb3
- Aluminium AlCuMgPb / AlMg3
- Silicon (tubing), optional: Viton
- Crastin (PTBP)
- Araldite CY236 / HY988
- Loctite 242e
- Carbonyl iron
- KEL (FPM: fluorinated rubber)
- Vepuran Vu 4457/51
- UHU-Plus endfest 300 binder

8 Dimension drawings

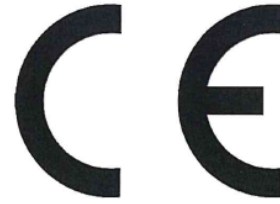


For more information on our measurement technology products, please visit our homepage at:

www.halstrup-walcher.de/en/products/measurement-technology/



9 Declaration of Conformity



EU-Konformitätserklärung EU Declaration of Conformity

Company	halstrup-walcher GmbH, Stegener Str. 10, 79199 Kirchzarten erklärt als Hersteller in alleiniger Verantwortung, dass das Produkt declares as manufacturer under sole responsibility, that the product	
Product	Digital-Manometer Digital Pressure Gauge	EMA84
Regulations	den folgenden Europäischen Richtlinien entspricht: conforms to following European Directives: EMC 2014/30/EU RoHS 2011/65/EU	
Standards	angewandte harmonisierte Normen: applied harmonized standards: EN IEC 61000-6-2:2019 EN IEC 63000:2018	
Declaration	EU Konformitätserklärung ausgestellt von EC Type Examination Certificate issued by	



Geschäftsführer

Managing Director

Kirchzarten, 17. Nov. 2022

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Notes:
