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1. Information on This Operating Instruction

- The manual is aimed at specialists and semi-skilled personnel.
- Please read the instructions carefully before carrying out any operation and keep the specified order.
- Thoroughly read and understand the information in chapter 2 "Safety Instructions".

If you have any problems or questions, please contact your supplier or contact us directly at:



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1.1 Pictographs Used

In this manual, pictographs are used as hazard warnings.

Particular information, instructions and restrictions designed for the prevention of personal or substantial property damage:



WARNING! Is used to warn you against an imminent danger that may result in personal injury or death.

IMPORTANT! Is used to warn you against a possibly hazardous situation that may result in personal, property or environmental damage.

CAUTION! Is used to draw your attention to important recommendations to be observed. Disregarding them may result in property damage.



Passages in the text containing **explanations, information or advice** are highlighted with this pictograph.



The following symbol highlights **actions** you have to conduct or **instructions** that have to be strictly observed.

1.2 Exclusion of Liability

We accept no liability for any damage or malfunction resulting from incorrect installation, inappropriate use of the device or failure to follow the instructions in this manual.

2. Safety Instructions

Please read this operating instruction thoroughly before operating the digital pressure gauge.

Disregarding the containing warnings, especially the safety instructions, may result in danger for people, the environment, and the device and the system it is connected to.

The digital pressure gauge corresponds with the state of engineering at the time of printing. This concerns the accuracy, the operating mode and the safe operation of the device. In order to guarantee that the device operates safely, the operator must act competently and be conscious of safety issues.

The ARMANO Messtechnik GmbH provides support for the use of its products either personally or via relevant literature. The customer verifies that our product is fit for purpose based on our technical information. The customer performs customer and application specific tests to ensure that the product is suitable for the intended use. With this verification, all hazards and risks are transferred to our customers. Our warranty expires in case of inappropriate use.



Qualified personnel:

- The personnel that is charged for the installation, operation and maintenance of the instrument must hold a relevant qualification. This can be based on training or relevant tuition. The personnel must be aware of this manual and have access to it at all times.
- The electrical connection shall be carried out by a fully qualified electrician only.

Operating Instructions

Digital Pressure Gauge DPG 2600

General safety instructions:

- In all work, the existing national regulations for accident prevention and safety at the workplace must be complied with. Any internal regulations of the operator must also be complied with, even if these are not mentioned in this manual.
- Please ensure that the process is unpressurised before installing or removing the device. Otherwise, there is a risk that hot, corrosive, toxic or explosive substances leak.



IMPORTANT! Risk of burns, chemical burns, poisoning or explosion!




IMPORTANT! Risk of injury or material damage due to overpressure!

- Exceeding the maximum permissible overload values may lead to material failure of the digital pressure gauge. This may also cause serious damage to health.
- Please check if the instrument model is suitable for your application before ordering and installation.
- Degree of protection according to DIN EN 60 529: Ensure that the ambient conditions at the installation location do not exceed the requirements of the specified degree of protection (⇒ chapter 4 “Technical Data”).
- Use the instrument in its perfect technical condition only. Damaged or defective instruments need to be checked immediately and replaced if necessary.
- Only use appropriate tools for mounting, connecting and dismantling the instrument.
- Nameplates or other information on the device shall neither be removed nor obliterated, since otherwise any warranty and manufacturer responsibility expires.
- In order to ensure measurement accuracy and durability of the instrument and to avoid damage, the limit values indicated in the technical data have to be observed.
- In case of visible damage or malfunctions, the instrument must be put out of operation immediately.

Special safety instructions:

Warnings, which are specifically relevant to individual operating procedures or activities, are to be found at the beginning of the relevant sections of this operating instruction.

- The operating pressures of the digital pressure gauge have to be within the specifications of the device.
- Ensure that construction type and materials of the digital pressure gauge are resistant regarding application conditions and medium.
- Minimise external mechanical influences, such as oscillations, vibrations and shocks, by an appropriate installation.
- Reduce the influence of vapour, abrasive/aggressive media, dust and soot or others by selecting a suitable installation location.
- Avoid direct sunlight and immediate vicinity to hot objects as far as possible.
- Avoid strong electromagnetic fields.
- Modifications or other technical changes of the instrument by the customer are not permitted. Otherwise, you will lose your warranty.

 Please observe the following warnings for safe operations:

- Ensure that the battery terminals are in the correct position.
- Do never short-circuit the batteries.
- Do never cause the batteries to overheat.
- Do not use batteries that show signs of damage.
- Do never deeply discharge the batteries.
- Do never attempt to open the batteries.
- Dispose of the batteries properly (⇒ chapter 10 “Dismounting and Disposal”).

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Digital Pressure Gauge DPG 2600

3. Device Description

The digital pressure gauge DPG 2600 has been developed for the calibration of pressure transmitters, pressure gauges and pressure switches.

The DPG 2600 is available in two versions:

- all-rounder DPG 2600 A
with a measurement uncertainty of $\leq \pm 0.05\%$ FS
- all-rounder+ DPG 2600 A+
with a measurement uncertainty of $\leq \pm 0.02\%$ FS

With the latest microprocessor technology, the DPG 2600 is the most advanced portable digital pressure gauge in terms of accuracy. Fully compensated in the operating temperature range, the polynomial error compensation ensures accurate measurements at each point of every pressure range.

It is suitable for calibrating and testing pressure measuring instruments such as analogue pressure gauges, digital pressure gauges, pressure transmitters, pressure switches.

The DPG 2600, combined with one of ARMANO's hand test pumps, is the perfect solution for on-site calibrations. In calibration laboratories, the DPG 2600 can be combined with one of our DPC 3800 or DPC 4800 series high-precision pressure controllers.

Nameplate and sticker:

The nameplate is located on the device. It contains the most important technical data and information.



Figure 1: nameplate

Scope of delivery:

- Digital pressure gauge DPG 2600
- Calibration certificate
- Operating instruction
- Mains adapter 230 V AC – 9 V DC at 500 mA
- 4 NiMH batteries

3.1 Intended Use

The technical data specified in the current data sheet are binding and must be adhered to. If you do not have the data sheet, please request it or download it from our website (www.armano-messtechnik.com).

Applications that are not explicitly listed as according to regulations, are improper to intended purpose!

The operational safety of the device supplied is only guaranteed by intended use. The specified limit values (\Rightarrow chapter 4 "Technical Data") must not be exceeded.

4. Technical Data

Process connection	
• material	stainless steel 316L
• connection thread	1/2" BSP
Case	stainless steel 1.4301
Pressure units	mbar, bar, Pa, hPa, kPa, MPa, kg/cm ² , kg/m ² , mmHg, cmHg, mHg, mmH ₂ O, mH ₂ O, mH ₂ O, torr, atm, psi, inHg, inH ₂ O, ftH ₂ O
Measurement accuracy	DPG 2600 A with $\leq \pm 0.05\%$ FS DPG 2600 A+ with $\leq \pm 0.02\%$ FS
Pressure ranges	overpressure, compound pressure or absolute pressure from $-200 / +200$ mbar up to $0 - 1000$ bar
Storage temperature	-20 °C to $+70\text{ °C}$ (-4 °F to $+158\text{ °F}$) humidity $< 95\%$ non-condensing
Supply	either via 4 NiMH batteries or via the included mains adapter; the batteries are charged during mains operation

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5. Mounting

Prior to mounting, please check the following aspects:

- Are the goods undamaged and complete?
- Do the goods match the shipping documents?
- Is the instrument suitable for the case of application?
- Is the maximum possible process pressure within the measuring range of the device to be installed?
- Does the process connection comply with the requirements?
- Pay attention to adequate protection against weather!
- Avoid direct sunlight.
- Avoid proximity to heat sources.
- Note the degree of protection according to DIN EN 60 529 (⇒ chapter 4 "Technical Data").
- Operation and control shall only be carried out by authorised personnel.
- Take appropriate precautions to protect the device from damage!



IMPORTANT! Mounting and dismantling of the device shall only be carried out in an unpressurised state!

Connection

Please use two spanners ($\frac{1}{4}$ " BSP F or $\frac{1}{2}$ " BSP F) when connecting the pressure port of the device to avoid damage to the sensor and/or the device itself.

The DPG 2600 can be operated without batteries using only the mains adapter.

Four NiMH batteries (size AAA) are installed as standard power supply, which can also be recharged via the mains adapter.

6. Commissioning

Before commissioning, check for proper installation and for any visible defects of the device.

Commissioning shall only be carried out by qualified personnel, who read and understood this manual!

The device has to be operated within the specifications only! (Please refer to the technical data in the data sheet.)

7. Operation

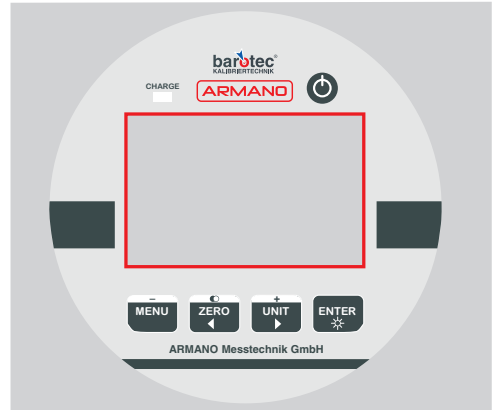


Figure 7.1: membrane keypad

The DPG 2600 has five buttons

Top right:



on/off button

Four control buttons below the display:



The **MENU** button for selecting and exiting menu functions and for reducing the display contrast when pressed together with the **ZERO** button.



The **ZERO** button for zeroing the measurements in the overpressure mode, for adjusting the contrast and for scrolling to the left in the menu mode.



The **UNIT** button for changing the unit.

When pressed together with the **ZERO** button, it increases the display contrast.



With the **Enter** button, the backlight can be switched on and off.

The buttons   and  are also used for navigation in the menu functions.

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The DPG 2600 has the following menu functions:

DECIMALS increase or decrease the number of the indicated decimal places.

FILTER OFF/ON enables the following function:
activate or deactivate measured value filtering.

FILTER RESET
resets the measured value filter.

FILTER WEIGHT
sets the weighting of the filter between 10...100 %.

MAX-MIN RESET
resets the minimum and maximum values.

OFFSET tares the indication and the currently displayed measured value.

FREEZE freezes the indication at the current measured value.

USE BAROMETRIC
(with optional barometric reference only)
when ON, the measurement mode changes to **Absolut**.

NOTE: The **G** shown in the display indicates the sensor type and not the measuring mode (when absolute measuring mode is active, "g-->a" is displayed).

LOG SAMPLE TIME sets the sample time of the measured value logging.

LOG TIME configures the time period of the measured value logging.

LOG SLOT software slot (CSV file).

LOG switches logging on and off. A flashing symbol is displayed on the screen during logging. Up to 8 logs in CSV format can be downloaded via the RS-232 port (optional RS-232 data cable and software).

BAUD RATE sets the baud rate of the serial communication.
available values are OFF-300-600-1200-2400-4800-9600-19200-38400-57600-115200

SERIAL ADDR currently not in use
(please keep set to 1).

AUTO BKL-OFF when activated (ON), the display backlight turns off after some time to extend the battery life.

AUTO PWR-OFF when activated (ON), the device switches off automatically after some time to extend the battery life.

Pressure units

mbar, bar, Pa, hPa, kPa, MPa, kg/cm², kg/m², mmHg, cmHg, mHg, mmH₂O, cmH₂O, mH₂O, torr, atm, psi, inHg, inH₂O, ftH₂O
(note: Hg @ 0 °C; H₂O @ 4 °C; 1 atm = 101325 Pa)

Battery life

When the batteries are low, a warning appears on the display. Connect the device to the power supply. During charging, the battery status indicator remains at 100 %. The end of charging is reached when the yellow charging LED goes out.

Interfaces

RS-232 interface

On the back of the DPG 2600 in the form of an M12 connector plug.
An RS-232 data cable and an RS-232 USB converter are available upon request.

Power supply

On the back of the DPG 2600.
9 V DC – 600 mA

Polarity of the coaxial power connector:



8. Maintenance/Cleaning, Storage and Transport



CAUTION! Material damage and loss of warranty!

Any modifications or interventions in the device, made by the customer, might damage important parts or components. Such intervention leads to the loss of any warranty and manufacturer's responsibility!

→ Never modify the device or perform any repairs yourself.

Maintenance:

In principle, the device is maintenance-free. If necessary, the housing of the device can be cleaned with a damp cloth and a non-aggressive cleaning solution when switched off.

Cleaning:

Depending on the medium, deposits or contamination may occur. If such a contamination of the medium is known, the operator has to specify appropriate cleaning intervals.



CAUTION! Incorrect cleaning may cause irreparable damage. Therefore, never use any sharp objects or compressed air for cleaning.



IMPORTANT! Improper transport can destroy the device and cause considerable personal and property damage.

Please inspect the transport packaging and the delivered items immediately upon their receipt to determine their integrity, completeness and conformity with the delivery documents.

The permissible ambient conditions for storage and transport can be found in the data sheet.

Storage:

- If possible, store the instrument in its original packaging.
- If possible, remove the packaging not until installation of the device.
- Store the instruments in a dry place, not exposed to direct sunlight.
- The storage temperature of the instruments should not fall below or exceed the permissible temperature limitations specified in the data sheet.

Transport:



Electronic components!

The device is equipped with sensitive electronic components and has to be handled with due care.



Remove batteries!

If the device is not in use for extended periods, the batteries should be removed from the device to preclude any leaking damage.

- Use the original packaging or comparable packaging for transport.
- Avoid impacts or strong vibrations.
- Protect the device against moisture.

9. Return

Prior to any return, whether for recalibration, decalcification, for modification or for repair, the instrument has to be cleaned thoroughly and packaged carefully. Please enclose a notice of return with a detailed description of the faults when returning a defective device. If your instrument came into contact with harmful substances, a declaration of contamination is required additionally. A corresponding template can be found on our website www.armano-messtechnik.com. If you send in your device without a declaration of contamination and our service department has doubts regarding the medium used, then the repair will only be started once a corresponding declaration has been submitted.



If the device came into contact with harmful substances, appropriate precautions are to be taken during cleaning!

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10. Dismounting and Disposal



WARNING! Risk of injury!

Never remove the device from a system in operation.

Make sure that the system is switched off professionally.

Before dismounting:

Check before dismounting, whether the system

- is switched off,
- is in a safe and currentless state,
- is unpressurised and cooled down.

Dismounting:

Pay attention to potentially leaking media. Take appropriate precautions to collect them.

Disposal:

In compliance with the directives 2011/65/EU (RoHS) and 2012/19/EU (WEEE), the device must be disposed of separately as electrical and electronic waste. Please regard legal regulations of the country of distribution.



NO DOMESTIC WASTE!

The instrument comprises various materials. It shall not be disposed of together with domestic waste.

→ Bring the device to your local recycling plant

or

→ send the device back to your supplier or to the ARMANO Messtechnik GmbH.

Disposal of used batteries:

- Cover the poles with tape during storage and disposal to avoid short circuits.
- Dispose of used batteries properly in commercial collection boxes or at municipal collection points.



WARNING! Depending on the medium used, residues on the device may cause a risk for the user and the environment. Therefore, take appropriate precautions and dispose of the device properly.

11. Warranty Conditions

The warranty conditions are subject to the statutory warranty period of 24 months, valid from the date of delivery.

Any warranty claims are excluded in case of improper use, modification of or damage to the device. Damaged membranes are not accepted as warranty claim. Furthermore, defects resulting from normal wear are not subject to warranty services.

12. CE Conformity



The CE marking of the instruments certifies the conformity with prevailing EU directives for placing products on the market within the European Union. The following directives apply:

2014/30/EU (EMC)

2014/68/EU (PED)

The corresponding declaration of conformity is enclosed or available upon request.

13. Declaration of Conformity

EU-Konformitätserklärung

EU Declaration of Conformity

Für die nachfolgend bezeichneten Erzeugnisse

We hereby declare for the following named goods

**Digital-Manometer Typ DPG 2600
gem. Datenblatt 9668**

**Digital Pressure Gauge Model DPG 2600
according to data sheet 9668**

wird hiermit bestätigt, dass sie den wesentlichen Schutzanforderungen entsprechen, die in den nachfolgend bezeichneten Richtlinien festgelegt sind:

that they meet the essential protective requirements, which have been fixed in the following directives:

RICHTLINIE 2014/30/EU DES EUROPÄISCHEN PARLAMENTS UND DES RATES vom 26. Februar 2014 zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über die elektromagnetische Verträglichkeit – kurz: **EMV-Richtlinie**

*DIRECTIVE 2014/30/EU OF THE EUROPEAN PARLIAMENT AND THE COUNCIL from February 26, 2014 on the approximation of the laws of the Member States relating to the electromagnetic compatibility – short: **EMC Directive***

RICHTLINIE 2014/68/EU DES EUROPÄISCHEN PARLAMENTS UND DES RATES vom 15. Mai 2014 zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über Druckgeräte – kurz: **Druckgeräterichtlinie**

*DIRECTIVE 2014/68/EU OF THE EUROPEAN PARLIAMENT AND THE COUNCIL from May 15, 2014 on the approximation of the laws of the Member States relating to pressure equipment – short: **Pressure Equipment Directive***

RICHTLINIE 2011/65/EU DES EUROPÄISCHEN PARLAMENTS UND DES RATES vom 8. Juni 2011 zur Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten – kurz: **RoHS-Richtlinie**

*DIRECTIVE 2011/65/EU OF THE EUROPEAN PARLIAMENT AND THE COUNCIL from June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment – short: **RoHS Directive***

Die Geräte entsprechen folgenden technischen Vorschriften:

The devices comply with following technical specifications:

Norm: Standard:	Richtlinienbezug Reference to directive
DIN EN 55011:2018-05	Industrielle, wissenschaftliche und medizinische Geräte - Funkstörungen - Grenzwerte und Messverfahren <i>Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement</i>
DIN EN 61000-4-2:2009-12	Elektromagnetische Verträglichkeit (EMV): Prüf- und Messverfahren - Prüfung der Störfestigkeit gegen die Entladung statischer Elektrizität <i>Electromagnetic compatibility (EMC): Testing and measurement techniques - Electrostatic discharge immunity test</i>
DIN EN 61000-4-3:2011-04	Elektromagnetische Verträglichkeit (EMV): Prüf- und Messverfahren - Prüfung der Störfestigkeit gegen hochfrequente elektromagnetische Felder <i>Electromagnetic compatibility (EMC): Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test</i>
DIN EN 61000-4-8:2010-11	Elektromagnetische Verträglichkeit (EMV): Prüf- und Messverfahren - Prüfung der Störfestigkeit gegen Magnetfelder mit energietechnischen Frequenzen <i>Electromagnetic compatibility (EMC): Testing and measurement techniques - Power frequency magnetic field immunity test</i>
DIN EN 61326-1:2013-07	Elektrische Mess-, Steuer-, Regel- und Laborgeräte - EMV-Anforderungen: Allgemeine Anforderungen <i>Electrical equipment for measurement, control and laboratory use - EMC requirements: General requirements</i>

Diese Erklärung wird verantwortlich für den Hersteller:

This declaration is issued under the sole responsibility of the manufacturer:

ARMANO Messtechnik GmbH

abgegeben durch/by
Grünhain-Beierfeld, 2021-08-30

Bernd Vetter

Geschäftsführender Gesellschafter / Managing Director

ARMANO

ARMANO Messtechnik GmbH

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