DIGITAL PRESSURE MANOMETER DIPTRON 3 PLUS

TECHNICAL INFORMATION

The high-quality **Wallace & Tiernan** digital manometer **DIPTRON 3 *plus*** is a pressure gauge suitable for demanding measurement and calibration tasks in instrument departments and development laboratories. It comprises all the features required of a modern measuring instrument for the use in the automation of measurement processes and test procedures. Because the **DIPTRON 3 *plus*** provides the possibility of DKD-calibration it is an adequate secondary pressure standard for the use in laboratories and instrument departments. The tracking of measurements for an internal quality management is guaranteed.

ADVANTAGES

- IEEE 488 for all functions as standard
- Analogue outputs current / voltage as standard
- Freely selectable measuring ranges and measurement units
- High accuracy
- DKD-calibration possible
- Bench or built-in housing
- Simple operation
- Acoustic overload warning
- CE certification
- Interference suppression testing BMPT No. 61/1991 Vfg. 243

GENERAL

The digital manometer **DIPTRON 3 *plus*** can be supplied as a gauge pressure, vacuum, differential or absolute pressure display instrument. The contact parts on the measuring side (Contact P) consist of stainless steel, silicon, glass and epoxy resin, for the reason that besides air and inert gases, the instruments can also be pressurised with substances that are compatible with the above materials. The differential pressure version of the reference side (connection “S”) must only be operated with dry and non-corrosive gases.

By means of a key on the front panel, the display can show two different units of pressure if requested. The pressure units are freely selectable. Without modification to the instrument’s construction it can also be equipped upon request with two different pressure sensors with variable measuring ranges in the gauge pressure or absolute pressure version. This version is also capable of switching between two different pressure units.

The microprocessor-controlled digital manometer **DIPTRON 3 *plus*** offers an overall accuracy of 0.04 % of full scale for the effective range. This accuracy covers not only linearity and hysteresis errors but also temperature-related deviations in the range between 10 °C and 30 °C. Therefore, the complete efficiency of the device is guaranteed in practice within this temperature range.

An IEEE-488 bus interface as well as analogue current and voltage outputs are included as standards in the **DIPTRON 3 *plus***. Operation and configuration can take place manually using the front panel keys, but are also fully controllable by means of the IEEE-488 interface integrated as standard. The installed semiconductor pressure sensors guarantee high overload protection and also offer a largely hysteresis-free output signal with very good long-term stability. The pressure sensors are selected according to very strict criteria.

WALLACE & TIERNAN
LEADER IN QUALITY
DIN EN ISO 9001 certified
DKD-K-02301 DIN EN ISO/IEC 17025

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CONSTRUCTION AND OPERATION

CONSTRUCTION

The **Wallace & Tiernan** digital manometer **DIPTRON 3** ***plus*** is manufactured using high-quality micro-electronic parts only.

For operating and configuring the device a sealed keypad is located on the front panel next to the LED digital display. LEDs show the operating mode in regard to measuring range and pressure unit connection as well as information on zero calibration and interface activities. On the rear panel of the instrument are connections for mains power, pressure and electrical outputs located. The mains' fuse can also be accessed from the rear panel.

The device is mounted in a 19" system housing and can be supplied as either a bench mounted unit or with optional adapters for panel mounting as a built-in module (½ x 19" plug-in module).

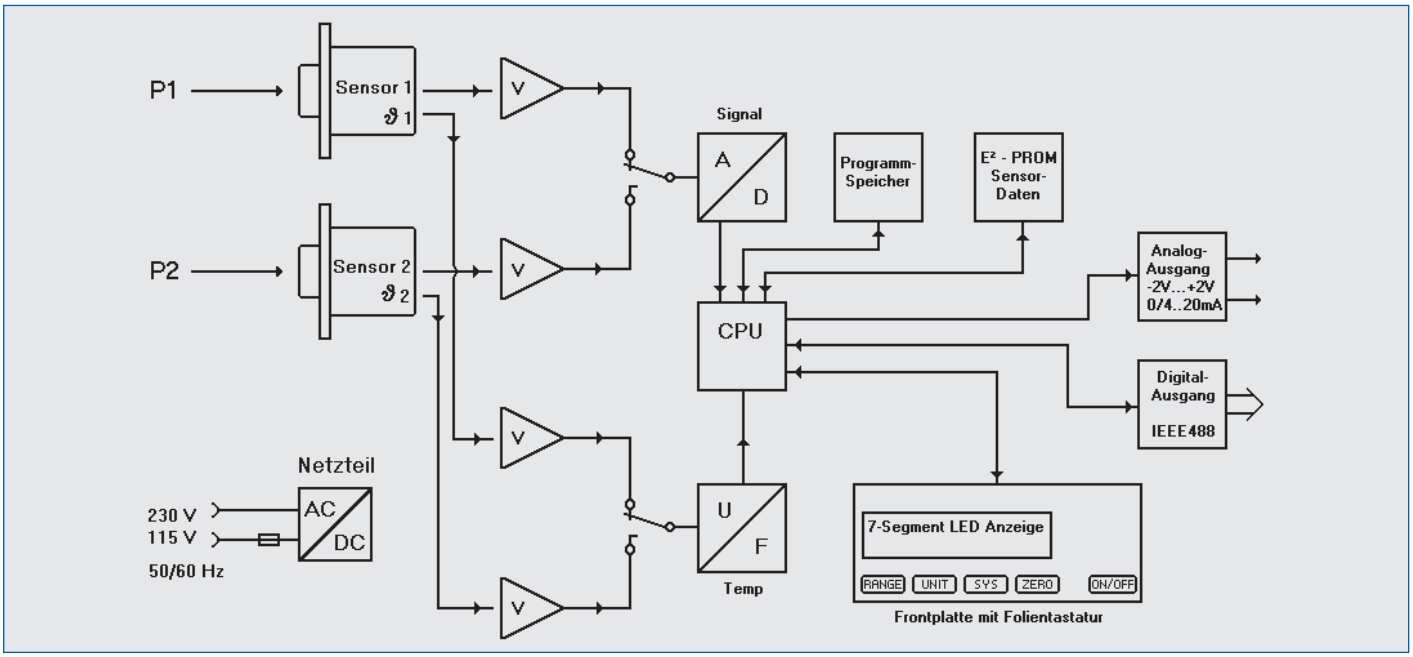
OPERATION

Pressure measurement takes place via a mono-crystalline semiconductor sensor (piezo-resistive pressure sensor). The lightweight silicon carrier enables the sensor element to achieve extremely fast reaction times and also guarantees a negligibly small effect in the case of changes in inclination.

The direct voltage signal proportional to the pressure produced by the sensor is transmitted to a downstream measuring amplifier and transferred to an analogue / digital converter (ADC) as an analogue signal. The CPU evaluates the digitalised pressure reading with the correction values stored in the EEPROM which then are applied to compensate for temperature errors and linearity deviations. Menu assistance takes place via text messages in the 7-segment LED display. A fast zero calibration is possible by pressing the "ZERO" key. With the "ON/OFF" key the device can be placed in stand-by mode.

PERFORMANCE CHARACTERISTICS

- Microprocessor controlled
- Menu-driven operation of device and configuration via front panel keys
- Standard IEEE-488 interface
- Standard current and voltage outputs
- Zero calibration using the "ZERO" key
- Automatic compensation of linearity deviations and temperature errors
- Large five-character LED display
- Stand-by function of the "ON/OFF" key for fast operational readiness
- Storage of device configuration also in case of power failure (EEPROM)
- Changes of inclination do not affect the display
- Complete operation via IEEE-488 interface is possible
- High measuring rate
- SRQ interrupt processing
- High overload protection with acoustic warning signal when the measuring range is exceeded by about 10 %
- Two different pressure sensors are available
- DKD calibration is possible
- CE certification



Block diagram showing DIPTRON 3 *plus*

TECHNICAL DATA

Accuracy:
(including linearity, hysteresis and temperature errors)

0.04 % of full scale
for ranges ≥ 10,000 digits

0.04 % of full scale ± 1 digit
for ranges < 10,000 digits

Resolution:
Max. ± 22,000 digits

Response time for 90 % of measuring range:
T_{90} < 1 s
(measuring rate 30 conversions / sec.)
with additional display filter (3 measurements / sec.)

Temperature effect:
Compensates between 10 °C and 30 °C
(within the reliable error tolerances up to
max. temperature changes of 6 °C / h)

Storage temperature:
– 10 °C to 70 °C

Overload capability:

Ranges	up to	0.2 bar:	7 times
	up to	2 bar:	4 times
	up to	10 bar:	2.5 times
	up to	20 bar:	2 times
	up to	200 bar:	1.5 times

Display system:
5-character LED 7-segment display, 14 mm high
max. display ± 22,000 digits
- flashing display at 1 % above upper limit of effective range
- acoustic warning signal at 10 % above upper limit
- OVERFLOW display at ADC overflow

Switching unit of measurement:
Switching between 2 pressure units possible (on request)

Effect on change in inclination:
negligible

Power supply:
230 V (± 15 %), 50 / 60 Hz, approx. 14 VA or
115 V (± 15 %), 50 / 60 Hz, approx. 14 VA

Voltage output:
0 … ± 2 V (related to main pressure unit)
Load ≥ 1 MOhm,
Accuracy ≤ 0.1 % of full scale
Temperature drift ≤ 0.1 % / 10K

Current output:
0 … 20 mA / 4 … 20 mA
(related to main pressure unit)
Load 500 Ohm (max. 10 Volts)
Accuracy ≤ 0.1 % of full scale
Temperature drift ≤ 0.1 % / 10K

Digital interfaces:
IEEE-488 (24 pole) functions:
SH1, AH1, T6, L4, SR1, RL, DC1

Warm-up time:
Approx. 15 – 30 minutes on cold start,
no warm-up time in stand-by mode

Connection:
⅛" NPT female thread

Materials exposed to the measuring medium:
Gauge pressure, absolute pressure and differential pressure manometer only Connection "P": stainless steel, silicon, glass, epoxy resin, araldite. Differential pressure manometer Connection "S": Silicon, aluminium, gold, stainless steel, epoxy resin, araldite.
(for dry, non-aggressive, gaseous measuring media)

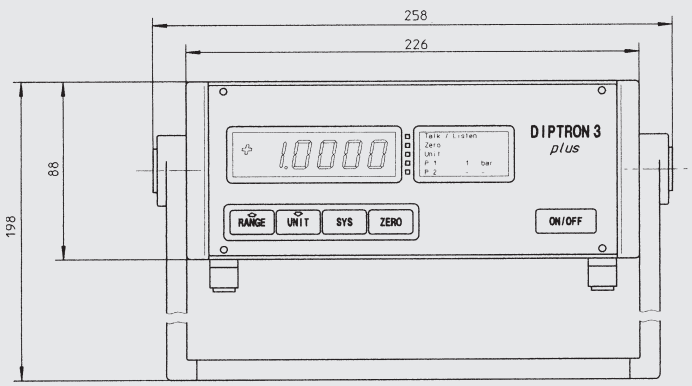
Static case pressure for differential manometers:
max. 10 bar

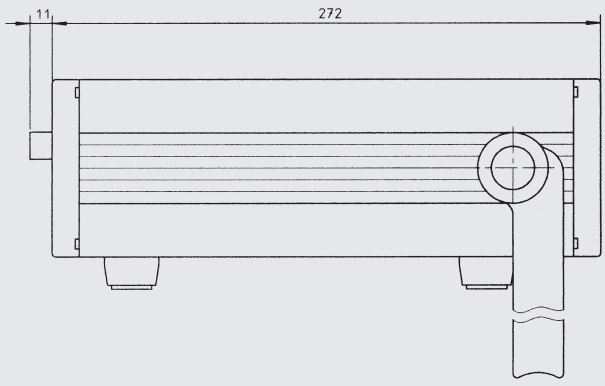
Dimensions (W x H x D):
19" system housing, 40 TE, 2HE
225.7 x 88.0 x 272.2 mm

Weight:
max. 2.5 kg

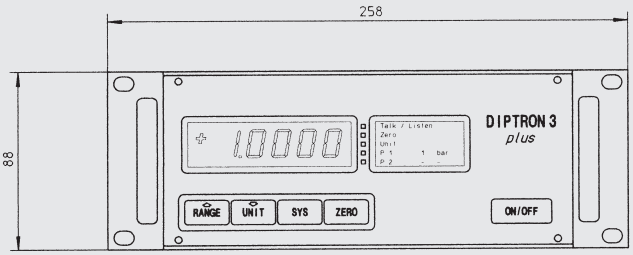
Enclosure:
IP 41

DIPTRON 3 plus – bench mounting arrangement

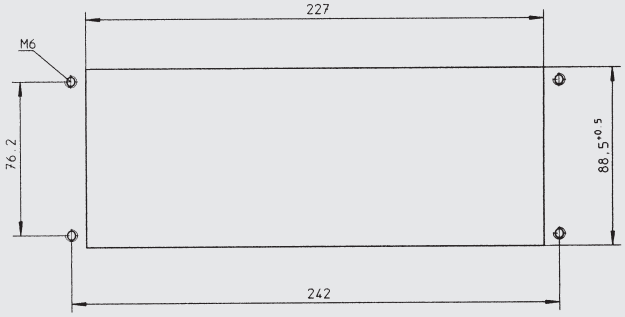




DIPTRON 3 plus – panel mounting arrangement



panel cutout



TECHNICAL DATA

TYPE NO. AND MEASURING RANGES

Order No.	Range	Resolution over full range
Gauge pressure:		
993-G-1	0 … 100 mbar	0.01 mbar
993-G-2	0 … 200 mbar	0.01 mbar
993-G-3	0 … 500 mbar	0.1 mbar
993-G-4	0 … 1 bar	0.0001 bar
993-G-5	0 … 2 bar	0.0001 bar
993-G-6	0 … 5 bar	0.001 bar
993-G-7	0 … 10 bar	0.001 bar
993-G-8	0 … 20 bar	0.001 bar
993-G-9	0 … 50 bar	0.01 bar
993-G-10	0 … 100 bar	0.01 bar
993-G-11	0 … 200 bar	0.01 bar
Vacuum/Gauge pressure:		
993-C-1	−100 … 0 … 400 mbar	0.1 mbar
993-C-2	−1 … 0 … 4 bar	0.001 bar
993-C-3	−1 … 0 … 10 bar	0.001 bar
993-V-1	−100 … 0 mbar	0.01 mbar
993-V-2	−500 … 0 mbar	0.1 mbar
993-V-3	−1 … 0 bar	0.0001 bar
Differential pressure (P ≥ S):		
993-D-1	0 … 100 mbar	0.01 mbar
993-D-2	0 … 200 mbar	0.01 mbar
993-D-3	0 … 500 mbar	0.1 mbar
993-D-4	0 … 1 bar	0.0001 bar
993-D-5	0 … 2 bar	0.0001 bar
993-D-6	0 … 5 bar	0.001 bar
993-D-7	0 … 10 bar	0.001 bar

Order No.	Range	Resolution over full range
Absolute pressure:		
993-A-1	600 … 1100 mbar	0.1 mbar
993-A-2	0 … 1100 mbar	0.1 mbar
993-A-3	0 … 2 bar	0.0001 bar
993-A-4	0 … 5 bar	0.001 bar
993-A-5	0 … 10 bar	0.001 bar
993-A-6	0 … 20 bar	0.001 bar
993-A-7	0 … 50 bar	0.01 bar

Other pressure units or switching to second pressure unit can be supplied for all versions on request without additional costs.
The order numbers relate to devices for 230 V operation. If 115 V operation is required a separate remark on the order is necessary.

Necessary details for orders:
Order number, measuring range, unit of pressure or units of pressure for switching, voltage

Bench or panel mounted design with adapters.

Other versions which can be supplied:
With two different pressure sensors
(any combination with pressure sensors in gauge and absolute pressure version is possible).
The differential pressure version can only be supplied with one sensor.
Remote mounted transducer
Installation set for bench mounting
115 V, 50 / 60 Hz operation

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