EN

OPERATING MANUAL
DYNAMIC PRESSURE
ANEMOMETER

》TROTEC

Table of contents

Notes regarding the operating manual

Symbols

Hazardous electric current!
Warns about hazards from electric current which can lead to injuries or even death.

Danger!
Warns of a hazard which can lead to personal injury.

Caution!
Warns of a hazard which can lead to property damage.

The current version of the operating manual can be found at:

TA400

http://download.trotec.com/?sku=3510004007&id=1

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The only party responsible for determining valid measured results, drawing conclusions and deriving actions is the user! Trotec GmbH & Co. KG accepts no claims of warranty for the correctness of the determined measured values or measured results. Further, Trotec GmbH & Co. KG accepts no liability whatsoever for possible mistakes or damage which have been caused by utilising the determined measured results.

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Warranty and liability

The device complies with the fundamental health and safety requirements of the applicable EU regulations and was tested at the factory for perfect functionality multiple times.

If malfunctions occur nonetheless, please contact your dealer or distributor.

When manufacturer's instructions or legal regulations have not been followed, or after unauthorised changes to the device are made, the manufacturer is not responsible for the resulting damages. Changes to the device or unauthorised replacement of individual parts can drastically impact the electrical safety of this product and will result in the loss of the warranty. Liability does not extend to damages to people or property caused by the device being used other than as described in the instructions in this operating manual. Subject to changes to technical design and model changes as part of constant development and product improvement without prior notice.

No liability is accepted for damages resulting from improper use. In such a case, any warranty claims will be voided also.

Operating manual – dynamic pressure anemometer TA400

Safety

Read this manual carefully before starting or using the device. Always store the manual in the immediate vicinity of the device or its site of use!

- Do not use the device in potentially explosive rooms.
- Do not use the device in aggressive atmosphere.
- Do not immerse the device in water. Do not allow liquids to penetrate into the device.
- The device may only be used in dry surroundings and must not be used in the rain or at a relative humidity exceeding the operating conditions.
- Protect the device from permanent direct sunlight.
- Do not remove any safety signs, stickers or labels from the device. Keep all safety signs, stickers and labels in legible condition.
- Do not open the device with a tool.
- Observe the storage and operating conditions (see chapter Technical data).

Intended use

Only use the device for indoor measurements of air pressure, velocity, volume flow and temperature within the measuring range specified in the technical data. Observe and comply with the technical data. To use the device for its intended use, only use accessories and spare parts which have been approved by Trotec.

Improper use

Do not use the device in potentially explosive atmospheres, for measurements in liquids or at live parts. Trotec accepts no liability for damages resulting from improper use. In such a case, any warranty claims will be voided.

Any unauthorised changes, modifications or alterations to the device are forbidden.

Personnel qualifications

People who use this device must:
- have read and understood the operating manual, especially the Safety chapter.

Residual risks

⚠ **Danger!**
Do not leave the packaging lying around. Children may use it as a dangerous toy.

⚠ **Danger!**
The device is not a toy and does not belong in the hands of children.

⚠ **Danger!**
Dangers can occur at the device when it is used by untrained people in an unprofessional or improper way! Observe the personnel qualifications!

⚠ **Caution!**
To prevent damages to the device, do not expose it to extreme temperatures, extreme humidity or moisture.

⚠ **Caution!**
Do not use abrasive cleaners or solvents to clean the device.

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Information about the device

Device description

The device can measure the following parameters:

- Air pressure
  - PSI
  - mbar
  - inH_2O
  - mmH_2O
  - Pa
- Air velocity
  - metres per second (m/s)
  - feet per minute (ft/min)
  - kilometres per hour (km/h)
  - miles per hour (mph)
  - nautical miles per hour in knots (kn)
- Air volume flow
  - CFM (cubic feet per minute)
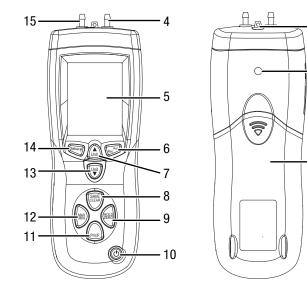 - CMM (cubic metres per minute)
- Air temperature
  - degrees Celsius
  - degrees Fahrenheit

The device is equipped with a HOLD function as well as with a Max/Min value display.

Optionally, it also possible to read and save measurement data directly on a PC by means of the software included in the scope of delivery.
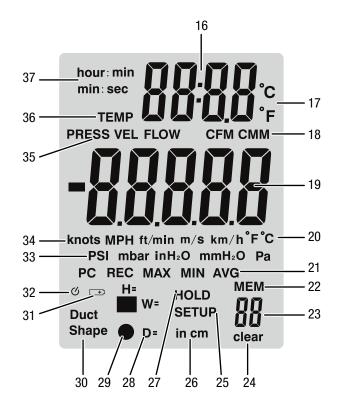
Device depiction

No.	Designation
1	Temperature sensor
2	Tripod thread
3	Battery compartment
4	**+** input
5	Display
6	AVG/REC button
7	Unit ▲ button
8	SAVE/CLEAR button
9	HOLD/ZERO button
10	Power button
11	P/V/F button
12	MAX/MIN button
13	Unit ▼ button
14	Setup / illumination button
15	**-** input

Display

No.	Designation
16	Temperature/time display
17	°C / °F indication for display 16
18	Indication of the units CFM / CMM
19	Measurement value display
20	°C / °F indication for the measurement value display (19)
21	REC, MAX, MIN, AVG indication
22	Memory indication
23	Memory space indication
24	Clear memory indication
25	Setup active indication
26	Indication of the unit for data referring to the duct diameter
27	HOLD function active indication
28	Height (H) / width (W) / diameter (D) indication
29	Round / angular indication referring to the shape of the flow channel
30	Duct diameter selection mode active indication
31	Battery status indication
32	Automatic switch-off active indication
33	Indication of the pressure unit
34	Indication of the velocity unit
35	Measuring mode indication
36	TEMP indication
37	Time format indication

Technical data

Parameter	Value
Dimensions of the device (height x width x depth)	210 x 75 x 50 mm
Weight of the device incl. Pitot tube and battery	540 g
Length of the Pitot tube	335 mm
Diameter of the Pitot tube	8 mm
Hose lengths	850 mm each
Operating conditions	0 °C to +50 °C, < 90 % RH
Storage conditions	0 °C to +50 °C, < 90 % RH
Power supply	1 x 9 V battery IEC 6LR61
Air pressure	
Accuracy	± 0.3 % at +25 °C
Pressure range	0 to 5000 Pa
Pressure, max.	5000 Pa
Measuring range	PSI: 0.7252 mbar: 50.00 inH_2O: 20.07 mmH_2O: 509.8 Pa: 5000
Resolution	PSI: 0.0001 mbar: 0.01 inH_2O: 0.01 mmH_2O: 0.1 Pa: 1
Air velocity	
Measuring range	m/s: 1 to 80.000 ft/min: 200 to 15733 km/h: 3.5 to 288.0 MPH: 2.25 to 178.66 knots: 2.0 to 154.6
Resolution	m/s: 0.001 ft/min: 1 km/h: 0.1 MPH: 0.01 knots: 0.1
Accuracy	m/s: ±2.5 % at 10 m/s ft/min, km/h, MPH, knots: The accuracy depends on the air velocity and the size of the air duct.
Air volume flow	
Measuring range	CFM: 0 to 99.999 ft^3/min CMM: 0 to 99.999 m^3/min
Resolution	CFM: 0.0001 to 100 CMM: 0.001 to 100
Temperature	
Measuring range	°C: 0 to 50 °C °F: 32.0 to 122.0 °F
Resolution	°C: 0.1 °F: 0.1
Accuracy	°C: ±1.0 °C °F: ±2.0 °F

Scope of delivery

- 1 x Dynamic pressure anemometer TA400
- 1 x 9 V battery
- 1 x Pitot tube
- 1 x Tube, white
- 1 x Tube, black
- 1 x Transport case
- 1 x Mini USB cable
- 1 x CD-ROM with *Manometer&Flowmeter* software
- 1 x Getting started guide

Transport and storage

Transport

For transporting the device, use the transport case included in the scope of delivery in order to protect the device from external influences.

Before transporting the device, please observe the following:
- Remove the hoses from the connections at device and Pitot tube.

Storage

Remove the hoses from the connections at device and Pitot tube prior to storage.

When the device is not being used, observe the following storage conditions:
- dry and protected from frost and heat.
- protected from dust and direct sunlight.
- use the transport case to protect it from invasive dust.
- The storage temperature is the same as the range given in the Technical data chapter.
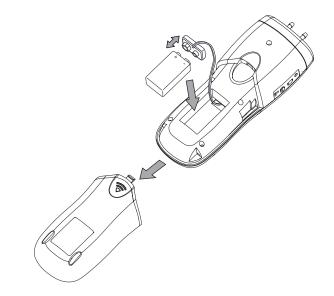- Remove the batteries from the device.

Operation

Inserting the battery

⚠ **Caution!**
Make sure that the surface of the device is dry and the device is switched off.

1. Open the battery compartment at the rear of the device by sliding the cover down at the arrow mark.
2. Use the battery clip to connect the 9 V battery with correct polarity.
3. Place the battery with the battery clip into the battery compartment.
4. Slide the cover back onto the battery compartment.
   ⇨ The cover should click into place.

Switching the device on

Note:
Note that moving from a cold area to a warm area can lead to condensation forming on the device's circuit board. This physical and unavoidable effect can falsify the measurement. In this case, the display shows either no measured values or they are incorrect. Wait a few minutes until the device has become adjusted to the changed conditions before carrying out a measurement.

1. Press the power button (10).
   ⇨ The device is switched on.

Measuring the differential pressure

In the measuring mode for *differential pressure measurements* the differential pressure of a zone 1 can be determined with regard to a reference environment (zone 2 / equipment location).

The differential pressure can be indicated in 5 different units:

- PSI
- mbar
- inH_2O
- mmH_2O
- Pa

1. Connect the white tube to the **+** input (4).
   ⇨ The **-** input (15) will not be connected to a tube.

2. Press the P/V/F button (11) until *PRESS* appears in the measuring mode display (35).
3. Press the Unit ▼ button (13) to select the desired unit for the measurement.
   ⇨ The selected unit appears in the pressure unit display (33).
4. Press the HOLD/ZERO button (9) for approx. 2 s to carry out a zero point reset.

5. Position the free end of the tube in the area (zone 1) the differential pressure of which is to be determined with regard to the measuring device (zone 2).
   ⇨ The measured differential pressure value will be indicated in the measurement value display (19).
   ⇨ A positive measured value indicates that the pressure in zone 1 is higher than in zone 2.
   ⇨ A negative measured value indicates that the pressure in zone 1 is lower than in zone 2.
   ⇨ The measured value 0 indicates an identical pressure in both zones.

Note:
Additionally, you can connect the black tube to the **-** input (15). Bear in mind that in that case the reference environment zone 2 is equivalent to the end of the black tube, not the device location.

Measuring the air velocity

In the measuring mode for *air velocity measurements* the current air velocity is measured with defined standard conditions (temperature 21.1 °C / 70 °F, air pressure 14.7 psi / 1013 mbar).

The air velocity can be indicated in 5 different units:
- metres per second (m/s)
- feet per minute (ft/min)
- kilometres per hour (km/h)
- miles per hour (mph)
- nautical miles per hour in knots (kn)

1. Connect the white tube to the **+** input (4) of both the device and the Pitot tube.
2. Connect the black tube to the **-** input (15) of both the device and the Pitot tube.

3. Press the HOLD/ZERO button (9) for approx. 2 s to reset the measurement to zero.
4. Press the P/V/F button (11) until *VEL* appears in the measuring mode display (35).
5. Press the Unit ▼ button (13) to select the desired unit for the measurement.
   ⇨ The selected unit appears in the velocity unit display (34).
6. Point the upper end of the Pitot tube towards the air flow. In doing so, make sure that the Pitot tube is not inclined more than 10° with regard to the air current.
   ⇨ The measured value will be indicated in the measurement value display (19).

If a negative measured value or the message *Error* is displayed, please check the connections at Pitot tube and device for proper fit and correct polarity.
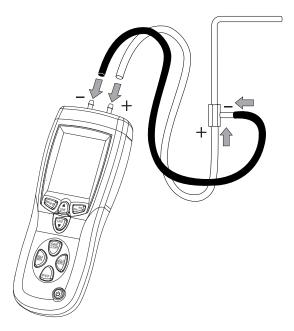
Measuring the air volume flow

In the measuring mode for *air volume flow measurements* the air volume flow is measured with defined standard conditions (temperature 21.1 °C / 70 °F, air pressure 14.7 psi / 1013 mbar).

To achieve a measurement that is as accurate as possible, you can indicate round and angular current cross-sections incl. the precise cross-sectional areas.

The air volume flow can be indicated in 2 different units:
- CFM (cubic feet per minute)
- CMM (cubic metres per minute)

1. Connect the white tube to the **+** input (4) of both the device and the Pitot tube.
2. Connect the black tube to the **-** input (15) of both the device and the Pitot tube.

3. Press the P/V/F button (11) until *FLOW* appears in the measuring mode display (35).
4. Press the Unit ▼ button (13) to select the desired unit for the measurement.
   ⇨ The selected unit appears in the CFM / CMM units display (18).
5. Point the upper end of the Pitot tube towards the air flow. In doing so, make sure that the Pitot tube is not inclined more than 10° with regard to the air current.
   ⇨ The measured value will be indicated in the measurement value display (19).

Changing duct dimensions

If you want to change details regarding the shape and dimensions of the duct or flow channel, please proceed as follows:

1. Press the Setup button (14) for approx. 2 s.

    ⇨ The setup menu will be opened.

2. Repeatedly press the Unit ▲ (7) or Unit ▼ button (13) until the indication *Duct Shape* (30) appears in the bottom left corner.

3. Press the REC/AVG button to confirm the selection.

    ⇨ The submenu for the duct shape will be opened.

4. Press the Unit ▲ (7) or Unit ▼ button (13) to choose the quadrangular or round duct shape.

5. Press the REC/AVG button (6) to confirm the selection.

    ⇨ The duct shape is set.

If you selected a **round duct**, you can now specify the diameter (*D=*) in cm:

✓ The *D=* indication 28 appears on the display.

1. Press the Unit ▲ (7) or Unit ▼ button (13) to change the position of the decimal point.

2. Press the SAVE/CLEAR button (8) to select a digit.

    ⇨ The currently selected digit flashes.

3. Press the Unit ▲ (7) or Unit ▼ button (13) to adjust the value (ranging between 0 and 9).

4. Repeat these steps until the duct diameter is indicated correctly.

5. Press the REC/AVG button (6) to save the setting.

    ⇨ The menu item *Type* is displayed.

6. Press the Setup button (14) for approx. 2 s to exit the settings menu.

If you selected a **quadrangular flow channel**, you can now specify its width (*W=*) and height (*H=*) in cm:

✓ The *W=* indication 28 appears on the display.

1. Press the Unit ▲ (7) or Unit ▼ button (13) to change the position of the decimal point.

2. Press the SAVE/CLEAR button (8) to select a digit.

    ⇨ The currently selected digit flashes.

3. Press the Unit ▲ (7) or Unit ▼ button (13) to adjust the value (ranging between 0 and 9).

4. Repeat these steps until the width of the flow channel is indicated correctly.

5. Press the REC/AVG button (6) to save the setting.

    ⇨ The *H=* indication 28 appears on the display.

6. Repeat the steps for setting the width until the height of the flow channel is also indicated correctly.

7. Press the REC/AVG button (6) to save the setting.

    ⇨ The menu item *Type* is displayed.

8. Press the Setup button (14) for approx. 2 s to exit the settings menu.

Measuring the air temperature

The air temperature will be indicated in the temperature/time display (16).

In the measuring mode you can always switch between the units °C and °F:

1. Press the Unit ▲ button (7).

    ⇨ The displayed unit will change from °C to °F or vice versa.

    ⇨ An acoustic confirmation signal will be emitted.

Displaying MIN / MAX / AVG values

The minimum (MIN), maximum (MAX) and average (AVG) values can be determined via a measurement interval.

1. Press the MAX/MIN button (12) until the desired function is indicated in display 21.

    ⇨ The temperature/time display (16) will be switched from temperature to time (min:sec).

    ⇨ A new measurement interval will be started.

    ⇨ The *REC* indication (21) appears on the display.

2. Press the MAX/MIN button (12) to switch between the functions.

3. Press the MAX/MIN button (12) for approx. 2 s to return to the normal measuring mode.

Hold function

The currently measured value can be frozen in all measuring modes.

1. Press the HOLD/ZERO button (9) to freeze the currently measured value.

2. Press the HOLD/ZERO button (9) again to deactivate the Hold function.

Saving and calling up measured values

In each measuring mode you can save up to 99 data sets.

To save a measured value, please proceed as follows:

1. Press the SAVE/CLEAR button (8).

   ⇨ The current measured value will be saved.

   ⇨ An acoustic confirmation signal will be emitted.

   ⇨ The number of saved values below the MEM indication (22) is increased by one.

To call up a measured value, please proceed as follows:

1. Press the REC/AVG button (6) for approx. 2 s.

   ⇨ *REC* will be displayed in the temperature/time indication (16).

2. Press the Unit ▲ (7) or Unit ▼ button (13) to choose the desired memory location.

   ⇨ The saved measured value is displayed in the measurement value display (19).

3. Press the REC/AVG button (6) for approx. 2 s to return to the measuring mode.

Settings

In the setting menu you can adjust some of the basic settings for the device. The following table shows an overview of the available options.

Menu text	Designation	Setting options
Unit	Unit for the duct dimensions	for determining the unit in which the duct dimensions will be indicated
Duct Shape	Shape of the duct	for specifying the shape and dimensions of the duct
Type	Display options for measuring modes	1 = measuring modes for air pressure and air velocity 2 = measuring modes for air velocity and air volume flow 3 = measuring modes for air pressure, air velocity and air volume flow
Sleep	Automatic switch-off	for de-/activating the automatic switch-off function
ALL	Clear memory	for clearing the memory; yes or no

To access the setup menu, please proceed as follows:

✓ The device is switched on.

1. Press the Setup button (14) for approx. 2 s.

   ⇨ The setup menu will be opened.

2. Select the desired option using the Unit ▲ (7) or the Unit ▼ button (13).

3. Press the REC/AVG button (6) to confirm the selection.

   ⇨ The desired submenu will be opened.

Setting the measuring unit for ducts

1. Press the Setup button (14) for approx. 2 s.

   ⇨ The setup menu will be opened.

2. Repeatedly press the Unit ▲ (7) or Unit ▼ button (13) until *unit* is displayed.

3. Press the REC/AVG button to confirm the selection.

   ⇨ The indication of the unit for data referring to the duct diameter (26) appears along with the currently selected unit (in or cm).

4. Repeatedly press the Unit ▲ (7) or Unit ▼ button (13) until the desired unit is displayed.

5. Press the REC/AVG button (6) to save the setting.

6. Press the Setup button (14) for approx. 2 s to exit the settings menu.

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Deleting saved measurements

There are two ways to delete measured values:
- Deleting all saved measurements
- Deleting a certain measured value

To delete **all** saved entries, please proceed as follows:
1. Press the Setup button (14) for approx. 2 s.
   ⇨ The setup menu will be opened.
2. Repeatedly press the Unit ▲ (7) or Unit ▼ button (13) until *ALL* is displayed.
   ⇨ At the same time the clear memory indication (24) appears in the bottom right corner.
3. Press the REC/AVG button (6) to confirm the selection.
   ⇨ The measuring modes are indicated in the measuring mode display (35).
   ⇨ *YES* will be indicated in the temperature/time display (16).
4. Press the Unit ▲ (7) or Unit ▼ button (13) to choose whether to delete the memory (*yes*) or not (*no*).
5. Press the REC/AVG button to confirm the selection.
6. Press the Setup button (14) for approx. 2 s to exit the settings menu.

To delete **one** specific measured value, please proceed as follows:
1. Press the REC/AVG button (6) for approx. 2 s.
   ⇨ *REC* will be displayed in the temperature/time indication (16).
2. Press the Unit ▲ (7) or Unit ▼ button (13) to choose the desired memory location.
   ⇨ The saved measured value is displayed in the measurement value display (19).
3. Press the SAVE/CLEAR button (8).
   ⇨ The selected measurement will be deleted.
   ⇨ An acoustic confirmation signal will be emitted.
   ⇨ The next saved measurement will be displayed.
4. Press the REC/AVG button (6) for approx. 2 s to return to the measuring mode.

Setting the automatic switch-off

With activated automatic switch-off function the device switches off automatically after approx. 5 minutes of non-use.
1. Press the Setup button (14) for approx. 2 s.
   ⇨ The setup menu will be opened.
2. Repeatedly press the Unit ▲ (7) or Unit ▼ button (13) until *SLEEP* is displayed.
3. Press the REC/AVG button (6) to confirm the selection.
   ⇨ *On* or *off* (activated or deactivated automatic switch-off) will be indicated in the temperature/time display (16).
4. Press the Unit ▲ (7) or Unit ▼ button (13) to choose the desired setting.
5. Press the REC/AVG button (6) to confirm the selection.
6. Press the Setup button (14) for approx. 2 s to exit the settings menu.

Setting the background illumination

The display comes with a background illumination that can be switched on as needed.
1. Press the Setup / illumination button (14) to switch the background illumination on or off.

Switching the device off
1. Press the power button (10).
   ⇨ The device is switched off.

Software

The supplied free software is designed for useful basic functionalities. Trotec assumes no liability with regard to this free software and also provides no support on that score. Trotec accepts no liability concerning the use of this free software and is under no obligation to make adjustments or to further develop updates or upgrades.

Installation requirements

Ensure that the following minimum requirements for installing the PC software are fulfilled:

- Supported operating systems (32 or 64 bit version):
  - Windows 10
  - Windows 8
  - Windows 7
  - Windows Vista
  - Windows XP
- Hardware requirements:
  - processor speed: min. 90 MHz
  - 32 MB RAM, minimum
  - 7 MB hard disk space, minimum
  - a minimum screen resolution of 1024 x 768 with a 16 bit colour depth

Installing the PC software

Administrator rights are required for the software installation.

1. Place the supplied software CD into the CD-ROM drive.
2. Open the CD-ROM contents in an Explorer window and double-click the *setup.exe* file.
3. Follow the instructions of the installation wizard.

Starting the PC software

1. Connect the measuring device to your PC via the mini USB cable provided in the scope of delivery.
2. Switch on the measuring device if necessary.
3. Start the *Manometer&Flowmeter* software.

Information about using the PC software is provided in the online help.

Errors and faults

The following error codes can be displayed:

Error code	Cause	Remedy
OL	air pressure or air velocity above the measuring range	• Check the battery voltage and insert a new high quality battery for testing purposes.
-OL	air pressure below the measuring range	• Choose a different location for measuring.
Error	air velocity or air volume flow below the measuring range	If the message continues to be displayed, carry out a reference measurement at a known location:
		1. Choose a site within the measuring range for this measurement.
		2. Press the HOLD/ZERO button for approx. 2 s to carry out a zero reset.
		3. Read the measured value from the measurement value display.
		If the error code is still displayed, the device may be defective. Please contact the Trotec customer service.

Maintenance and repair

Cleaning

Clean the device with a soft, damp and lint-free cloth. Ensure that no moisture enters the housing. Do not use any sprays, solvents, alcohol-based cleaning agents or abrasive cleaners, but only clean water to moisten the cloth.

Repair

Do not modify the device or install any spare parts. For repairs or device testing, contact the manufacturer.

Battery change

A battery change is required when the device can no longer be switched on (see chapter Inserting the batteries).

Disposal

In the European Union, electronic equipment must not be treated as domestic waste, but must be disposed of professionally in accordance with Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE). At the end of its life, please dispose of this device according to the valid legal requirements.

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