# The reference for air conditioning/ventilation units

## www.esis.com.au

Ph 02 9481 7420 Fax 02 9481 7267 esis.enq@esis.com.au

Esis Pty Ltd www.esis.com.au

## testo 400

testo

## VAC module now included

testo 400, with the VAC module, is currently the only measurement system in the world with which a fast and objective assessment of the functionality of a VAC system is possible without the need for additional manual calculations.

Of course, measurement stipulations are based on the EN Standard 12599 as well as the Ashrae Standard USA.

The measurement technician always has one hand free.

The measurement data saved in testo 400 is uploaded to the PC at the touch of a button. Timeconsuming manual written work is now a thing of the past, the required calculations are completed automatically by testo 400. Measurement results are documented in an EN standardised layout.



### testo 400

testo 400, multi-functional meas. instr., incl. meas. value store up to 500,000 readings, VAC-module (determination of volume flow with error calc.), battery, Li-cell and calibration protocol

Applications for:

- Flow velocity, volume flow
- Humidity, pressure
- Temperature
- CO<sub>2</sub>, current/voltage

### Part no. 0563 4001

## Additional benefits of testo 400

- 2 freely selectable channels
- Memory for 500,000 readings
- Up to 6 measurement parameters simultaneously in display
- Extended software functions e.g. measurement program is started if readings are exceeded
- Attachable printer

### Measurement data processing with "Retrieval Guarantee"

Data is filed using a clear tree structure with "retrieval guarantee" - in the large display and, of course, on your PC. Specific sites are combined as required and divided into groups, e.g. according to products.

Versatile display, presentation and analysis options, e.g. calculation functions in tables, diagrams, histograms, digit boxes or forms, are available on your PC.

For scheduling purposes, locations with site can be compiled on your PC and then downloaded to your handheld instrument. Assessment of measurement directly on site with built-in uncertainty calculation

> 10.0 % turbulen 0.26 m/s 24.4 °C

Display with calculated

degree of turbulence, mean air velocity and air temperature

> The coordinates required for the grid measurement are shown in the display. The depth data on the vane telescope makes your work much easier.

> > Precision probes

racv

0.05 °C

Humidity probe with 1% accu-

Precision temperature probe

Current/voltage cable

with a system accuracy of up to

400

### Reference probes

### Vane probes

- Professional telescopic handle for plug-in vanes Ø 16 mm and Ø 100 mm
- Vane measurement probe Ø 16 mm with built-in temperature measurement and extended measurement range 0.4 to 60 m/s
- Vane probe Ø 100 mm with meas. range from 0.1 m/s

### Differential pressure probes

- Wide selection of probes for measuring smallest pressures from 100 Pa up to 400 bar high
- pressure probe

## Comprehensive monitoring of processes

All relevant parameters such as beginning and end of measurement, measurement intervals, undershooting/exceeding and date/time are programmable.

Online measurement via PC is also possible.

Spot measurement with immedi-

ate printout of log which includes company logo, site and measurement data is also provided.

For example, for measuring and

adjusting stationary transmitters

12

Mean 2.0 ± 0.8 m/s 14760 ± 5525 m3/h

ndustrial Electronics

13

And Database       Model: https://www.intermation.com/database       Model: https://www.intermation.com/database       Part Inc.                Provide our proces for and of D450 GH1, for measure intermation of websites of D450 GH1, for measure intermation websites of D450 GH1, for measure intermation.com/database              -0.1 6 - 16 m/m model: 0.000 GH3 GH1, for measure intermation websites of D450 GH1, for measu	Flow probes	100 A 100 A				
Construction       Construction <td< td=""><td>Dendahla yana praha ( ha hartha 000) C</td><td>illustration</td><td></td><td>weas. range</td><td>Accuracy</td><td>Part no.</td></td<>	Dendahla yana praha ( ha hartha 000) C	illustration		weas. range	Accuracy	Part no.
$ \begin{array}{c} eq: box bits of bits of$	100 mm, attachable to handle 0430 3545 or telescopic handle 0430 0941, for measure- ments on ventilation outlets		Ø 100 mm	+0.1 to +15 m/s Oper. temp. 0 to +60 °C	±(0.1 m/s ±1.5% of mv) (+0.1 to +15 m/s)	0635 9340
Protectory Intelscope hands, br play-mute probles, not. In ling              4430 0441            Extension of telescope hands, br play have probles              0430 042            Determing of telescope hands, br play have probles              0430 042            Operating of telescope hands, br play have probles              040 042            Operating of telescope hands, br play have probles              040 042            Operating of telescope hands, br play have probles              040 042            Operating probles              010 - 420 m/S               010 - 420 m/S               000 - 420 m/S            Operating probles              010 - 420 m/S               000 - 420 m/S               000 - 420 m/S               000 - 420 m/S            Operating probles              000 - 420 m/S               000 - 420 m/S               000 - 420 m/S               0000 - 420 m/S            Operating probles              000 m/C               000 m/C               000 m/C               000 m/C               000 m/C            I wind the state method me	Vane/temperature probe, Ø 16 mm, attacha- ble to 0430 3545 handle or 0430 0941 teles- copic handle		180 mm Ø 16 mm	+0.4 to +60 m/s -30 to +140 °C	±(0.2 m/s +1% of mv) (+0.4 to +40 m/s) ±(0.2 m/s +2% of mv) (+40.1 to +50 m/s)	0635 9540
Extension for relescopic handle, 2 m into puede a dio voter the C490 0033 actering on a dial of the C400 mSH into	Professional telescopic handle for plug-in van	ie probes, max. 1 m	n long			0430 0941
Handle for plug-in vane prodes         0480 3846           Underkation hange wind releted on the wind resolution         0 a 20 mm vind vind vind vind vind vind vind vind	Extension for telescopic handle, 2 m long. ple	ase also order the	0409 0063 extension	cable		0430 0942
Chalceschol not wire protes, 0:10 nm, with base wire valced, range with reaction recognition base wire valced, range with reaction recognition base wire valced, range with reaction recognition base wire valced, range with reaction recognition proteins with relation reaction with recognition proteins with relation reaction with relation reaction in with relation reaction relation relation reaction recomment relation relation relation relation recomment relation relation relation relation relation recomment relation relation relation relation relation recomment relation relation relation relation recomment relation relation relation relation recomment relation relation relation relation recomment relation relation recomment relation relation recomment relation relation recomment relation recomment relation relation recomment relation relation recomment relation recomment relation relation recomment relation relation recomment relation relation relation recomment relation relation relation recomment relation relat	Handle for plug-in vane probes					0430 3545
Differential pressure measurement         Nustation         Meas. range         Accuracy         Part no.           Pressure prote mode and shade whether with measure perdentin, net mayned to their shade measure and the speech (in contrasts). $30.3 \text{ Prandom Max}$ $30.3 \text{ Prandom Max}$ $00.5  Prandom Max$	Quick-action hot wire probe, Ø 10 mm, with telescopic handle, for measurements in the lower velocity range with direction recognition	ן 	760 mm	0 to +20 m/s -20 to +70 °C	±(0.03 m/s ±4% of mv) (0 to +20 m/s)	0635 1041
Protection, Inc.         Conc. Play itself.         Out - 10 Play         at 0.5 H A/2         Oct33 H A/2           Out - 10 Play	Differential pressure measurement	Illustration		Meas. range	Accuracy	Part no.
production, not, magnet for last attachment, measure to mean dimension and measure dimension on the set attachment, measure to mean dimension of the set attachment mean di	Pressure probe in robust metal housing with impact		Conn.: Plug-in head.	0 to +100 Pa	±(0.3 Pa ±0.5% of mv)	0638 1347
an with Ritz Lize)       actual       0 to -100 hPg       -100 hPg       -100 hPg       -000 mm (rog. 10 + 100 hPg)       0688 1547         Pilot Ube, 1000 mm (rog. 15th/less teel, measure forces teel, po to 10 bar	protection, incl. magnet for fast attachment, measu- res differential pressure and flow speeds (in combina		0143 or 0430 0145	0 to +10 hPa	±0.03 hPa	0638 1447
Protect base (100 mm long) statistics steel, measure long out o where steel in the statistics steel in the 10 bit with the statistics steel in the 10 bit with the steep in the s	tion with Pitot tube)	-	required	0 to +100 hPa	±0.5% of mv (+20 to +100 hPa) ±0.1 hPa (0 to +20 hPa)	0638 1547
pressue probe       Dire H800 °C       Largth 350 mm       D655 2145         Low pressure probe, refigherent-proof statiness steel, up to 10 bar       Image: here probe made of refigherent- proof statiness steel, up to 10 bar       0638 1741       O638 1741         High pressure probe made of refigherent- proof statiness steel       Image: here probe made of refigherent- proof statiness steel       0638 1741       O638 1741         Com: Plage here, domain and of refigherent- proof statiness steel       Image: here probe       1 to 440 bar       1 to 440 bar       1 to 440 bar       0 638 1741         Com: Plage here, domain and of refigherent- proof statiness steel       Image: here probe       0 638 1741       0 638 1741         Com: Plage here, domain and of refigherent- proof statiness steel       Image: here probe       0 608 170 UNF       1 to 4400 bar       1 to 4400 bar       1 to 4400 bar       0 638 2141         Comon Plage here hore probe       Image: here hore probe       0 to + 50 °C	Pitot tube, 1000 mm long, stainless steel, measures flow speed in combination with	350 mm /	Ø 7 mm	Oper. temp.	Length 1000 mm	0635 2345
Low pressure probe, indigerant-proof data less steel, up to 10 bar       Construction of the state of the steel of the state of the steel of the state of the state of the steel of the state of the st	pressure probes			0 to +600 °C	Length 350 mm	0635 2145
High pressure probe made of refrigerant- proof stallards stead       Image: head, connection cable 0409 0202       D0538 1941       D0538 1941         More probes       Illustration       Meas. range       Accuracy       Part no.         Confort level probe for measuring degree of furthises N1 13729 requirements       Illustration       Meas. range       Accuracy       Part no.         Confort level probe for measuring degree of furthise N1 13729 requirements       Illustration       Meas. range       Accuracy       Part no.         CO2p robe measures indoor air quality and monitors the workplace. With plug-in head, connection cable 04300 143 or 0430 0145       Image: Part no.       Of to +50 °C disperson 00 gits n-100 gem 00, at% of my(to +50 °C)       Of to +50 °C disperson 00 gits n-100 gem 00, at% of my(to +50 °C)       Of to +50 °C disperson 00 gits n-100 gem 00, at% of my(to +50 °C)       Of to +50 °C disperson 00 gits n-100 gem 00, at% of my(to +50 °C)       Of the 400 gem 00, at% of my(to +50 °C)       Of the 400 gem 00, at% of my(to +50 °C)       Of the 400 gem 00, at% of my(to +50 °C)       Of the 400 gem 00, at% of my(to +50 °C)       Of the 400 gem 00, at% of my(to +50 °C)       Of the 400 gem 00, at% of my(to +50 °C)       Of the 400 gem 00, at% of my(to +50 °C)       Of the 400 gem 00, at% of my(to +50 °C)       Of the 400 gem 00, at% of my(to +50 °C)       Of the 400 gem 00, at% of my(to +50 °C)       Of the 400 gem 00, at% of my(to +50 °C)       Of the 400 gem 00, at% of my(to +50 °C)       Of the 400 gem 00, at% of my(to +50 °C)       Of the 400 gem 00, at% of m	Low pressure probe, refrigerant-proof stainless steel, up to 10 bar		screw-in thread 7/16" UNF	d -1 to +10 bar	±1% of fsv Overload 25 bar	0638 1741 Conn.: Plug-in head, connection cable 0409 0202 required
Some Thigh these connection cable 0409 0202         Iteration         Meas. range         Accuracy         Part no.           Control level probes         Illustration         Meas. range         Accuracy         Part no.           Control level probe for measuring degree of Luthuleroe, with telescopic headed and stand.         Image: telescopic headed and stand.         Image: telescopic headed and stand.         00 to +50 °C         10 to +50 °C         10 to +50 °C         00 to +50 °C </td <td>High pressure probe made of refrigerant-</td> <td></td> <td>screw-in thread</td> <td>-1 to +40 bar</td> <td>±1% of fsv Overload 120 bar</td> <td>0638 1941</td>	High pressure probe made of refrigerant-		screw-in thread	-1 to +40 bar	±1% of fsv Overload 120 bar	0638 1941
Image: Note: probes     Illustration     Meas. range     Accuracy     Part no.       Confort level probe for measuring degree of trubulence. with belescopic handle and stand. Image: Part no.     0 to +50 °C     10.03 °C (0 to +50 °C)     0628 2009       Ambient CO probe, for detecting CO in bulk-register of true with verses     0 to +50 °C     10 to +50 °C     10 to +50 °C     00 rem CO (0 to +50 °C)     0632 2331       CO2 probe measures indoor air quality and monitors its workplaces subjected to hand, in accordance with SO 1043 or 0430 0143     0 to +100 °C     10 to +100 °C     10 to +100 °C     10 to +100 °C     10 to +100 °C     00 to +100 °C     0053 2331       Wet Bulk Cicke temperature probe to assess workplaces subjected to hand, in accordance with ISO 7243 or DIN 33403, incl. WBGT     0 to +100 °C     10 to +100 °C     10 to +100 °C     10 to +00 °C     10 to +100 °C     10 to +00 °C     10 to +100 °C     10 to +00 °C     0058 8988       ID No. 0699 4239/1     0 to +100 °C     10 to +100 °C     10 to +00 °C     0058 9741     00638 9741       Coale action surface probe with sprung thermostant air probe to +0°C     10 to +100 °C     10 to +100 °C     10 to +00 °C     10 to	Conn.: Plug-in head, connection cable 0409 0202 required			-1 to +400 bar	±1% of fsv Overload 600 bar	0638 2141
Control texel probe for measuring degree of terthelescopic handle and stand.       Image: point fease of the first of the	More probes	Illustration		Meas. range	Accuracy	Part no.
Ambient CO probe, for detecting CO in buil- dings and rooms       0 to +500 pm CO       ±5% of mv (100.1 to +500 pm CO) ±5 pm CO (10 to +100 pm CO)       0632.3331         CO2 probe measures indoor air quality and monitors the workplace. With plug-in head. connection cable 0430 0143 or 0430 0143       0 to +1 V0.4 % CO) 0 to +1000 pm CO, 25% of mv/loto +500 0 to +1000 pm CO, 25% of mv/loto +500 0 to +1000 pm CO, 25% of mv/loto +500 0 to +1000 pm CO, 25% of mv/loto +500 multicop multicop pm CO, 25% of mv/loto +500 multicop multicop pm CO, 25% o	Comfort level probe for measuring degree of turbulence, with telescopic handle and stand Fulfills EN 13779 requirements	890 mm	Ø 90 mm	0 to +5 m/s 0 to +50 °C	±(0.03 m/s ±4% of mv) (0 to +5 m/s) ±0.3 °C (0 to +50 °C)	0628 0009
CO2 probe measures indoor air quality and monitors the workplaces. With plug-in head, connection cable 0430 0143 or 0430 0143       Image: Connection cable 0430 0143 or 0430 0144       Image: Connection cable 0430 0143 or 0430 0145       Image: Connection cable 0430 014	Ambient CO probe, for detecting CO in buil- dings and rooms	•		0 to +500 ppm CO	±5% of mv (+100.1 to +500 ppm CO) ±5 ppm CO (0 to +100 ppm CO)	0632 3331 Conn.: Fixed cable
Wet Bulb Globe temperature probe to assess workplaces subjected to heat, in accordance with ISO 7243 or DIN 33403, incl. WBGT case       0 to +120 °C       In accordance with ISO 7243 or DIN 33403       0635 8888 ID No. 0699 4239/1         Highly accurate reference humidity/temp.       0 to +100 °C       1 SRH (+10 to +30 SRH)*       0635 9740       0635 9740         Standard ambient air probe up to +70°C       0 to +100 %RH       -2 %RH (+2 to +88 %RH)       0636 9741       0636 9741         Quick-action surface probe with sprung ther mocouple strip, measuring range short-term to +500°C       0 to +100 %RH       -2 %RH (+2 to +88 %RH)       0636 9740         Quick-action surface probe with sprung ther mocouple strip, measuring range short-term to +500°C       0 to +100 %RH       -2 %RH (+2 to +88 %RH)       0604 0194         Comm: Flug-in head. connection cable 0330 0143 or 0430 0145       -200 to +300 °C       Class 2       199       0604 0194         Comm: Flug-in head. connection cable 0430 0143 or 0430 0145       -200 to +300 °C       Class 2       199       0604 0194         Comm: Flug-in head. connection cable 0430 0143 or 0430 0145       -200 to +300 °C       Class 2       199       0610 1094         Comm: Flug-in head. connection cable 0430 0143 or 0430 0145       -200 to +300 °C       Class 2       199       0610 1094         Comm: Flug-in head. connection cable 0430 0143 or 0430 0145       -200 to +300 °C       Class 2       <	CO2 probe measures indoor air quality and monitors the workplace. With plug-in head,			0 to +1 Vol. % CO <sub>2</sub>	±(50 ppm CO <sub>2</sub> ±2% of mv)(0 to +5000 ppm CO <sub>2</sub> )	0632 1240
Highly accurate reference humidity/temp.       Image: Constant of the second seco	required			CO <sub>2</sub>	±(100 ppm CO <sub>2</sub> ±3% of mv)(+5001 to +10000 ppm CO <sub>2</sub> )	Conn.: Plug-in head. connection cable 0430 0143 or 0430 0145 required
Standard ambient air probe up to +70°C	Wet Bulb Globe temperature probe to assess workplaces subjected to heat, in accordance with ISO 7243 or DIN 33403, incl. WBGT case	Ø 150 mm	n	0 to +1000 ppm CO <sub>2</sub> 0 to +120 °C	+(100 ppm CO <sub>2</sub> +3% of mv)(+5001 to +10000 ppm CO <sub>2</sub> ) In accordance with ISO 7243 or DIN 33403	Conn.: Plug-in head. connection cable 0430 0143 or 0430 0145 required 0635 8888 ID No. 0699 4239/1
Quick-action surface probe with sprung thermocouple strip, measuring range short-term       150 mm       -200 to +300 °C       Class 2       199       0604 0194         Accessories for measuring instrument/probes       295 mm       -40 to +300 °C       ±0.05 °C (+0.01 to +100 °C) ±(0.05 °C ± 0.05% of mv) ±(100.01 to +300 °C)       199       0614 0240         Accessories for measuring instrument/probes       Part no.       Printer and Accessories       Part no.         testovent 410, volume flow funnel, Ø 190 mm/230x330 mm, incl. case       0554 0410       Attachable printer (securely attached) including 1 roll of thermal paper and batteries.       0554 0570         Rech. batt. set for instrugent       0554 0196       Testo printer with wireless IRDA and infrared interface, 1 roll of thermal paper and 4 AA batteries, for printout of reading on site       0554 0547         SoftCase for instrument and printer       Part no.       Part no.       Part no.	Connection cable 0430 0143 or 0430 0145 required Wet Bulb Globe temperature probe to assess workplaces subjected to heat, in accordance with ISO 7243 or DIN 33403, incl. WBGT case Highly accurate reference humidity/temp. probe incl. cal. cert.	8 (Ø 150 mm	021	0 to +10000 ppm CO <sub>2</sub> 0 to +120 °C 0 to +100 %RH -20 to +70 °C	+(100 ppm CO2, ±3% of mv)(+5001 to +10000 ppm CO2) In accordance with ISO 7243 or DIN 33403 +1 %RH (+10 to +90 %RH)* ±2 %RH (remaining range) ±0.2 °C (+10 to +40 °C) ±0.4 °C (remaining range)	Conn.: Plug-in head. connection cable 0430 0143 or 0430 0145 required           0635 8888           ID No. 0699 4239/1           0636 9741           Conn.: Plug-in head. connection cable 0430 0143 or 0430 0145 required
Highly accurate immersion/penetration probe       295 mm       -40 to +300 °C       ±0.05 °C (+0.01 to +100 °C) ±0.05 °C (±0.05% of mv) (±0.05 °C ±0.05% of mv) (±10.01 to +300 °C)       199       0614 0240         Accessories for measuring instrument/probes       Part no.       Printer and Accessories       Part no.         testovent 410, volume flow funnel, Ø 190 mm/330x330 mm, incl. case       0554 0410       Attachable printer (securely attached) including 1 roll of thermal paper and batteries       0554 0570         Rech. batt. set for instr. (2 rech. 2.4V/1100mAh), selected for quick recharging in instrument       0554 0196       Testo printer with wireless IRDA and infrared interface, 1 roll of thermal paper and 4 AA batteries, for printout of reading on site       0554 0547	Connection cable 0430 0143 or 0430 0145 required Wet Bulb Globe temperature probe to assess workplaces subjected to heat, in accordance with ISO 7243 or DIN 33403, incl. WBGT case Highly accurate reference humidity/temp. probe incl. cal. cert. Standard ambient air probe up to +70°C	0 150 mm	0 21 n 0 21 n 0 12 mm	0 to +10000 ppm CO <sub>2</sub> 0 to +120 °C 0 to +120 °C 0 to +100 %RH -20 to +70 °C 0 to +100 %RH -20 to +70 °C	+(100 ppm CO2, ±3% of mv)(+5001 to +10000 ppm CO2) In accordance with ISO 7243 or DIN 33403 +1 %RH (+10 to +90 %RH)* ±2 %RH (remaining range) ±0.2 °C (+10 to +40 °C) ±0.4 °C (remaining range) ±2 %RH (+2 to +98 %RH) ±0.4 °C (-10 to +50 °C) ±0.5 °C (remaining range)	Conn.: Plug-in head. connection cable 0430 0143 or 0430 0145 required 0635 8888 ID No. 0699 4239/1 0636 9741 Conn.: Plug-in head. connection cable 0430 0143 or 0430 0145 required 0636 9740 Conn.: Plug-in head. connection cable 0430 0143 or 0430 0145
Accessories for measuring instrument/probes       Part no.       Printer and Accessories       Part no.         testovent 410, volume flow funnel, Ø 190 mm/330x330 mm, incl. case       0554 0410       Attachable printer (securely attached) including 1 roll of thermal paper and batteries       0554 0570         testovent 415, volume flow funnel, Ø 190 mm/210x210 mm, incl. case       0554 0415       Testo printer with wireless IRDA and infrared interface, 1 roll of thermal paper and A batteries, for printout of reading on site       0554 0547         Rech. batt, set for instrument       0554 0196       SoftCase for instrument and printer       Part no.	Connection cable 0430 0143 or 0430 0145         required         Wet Bulb Globe temperature probe to assess workplaces subjected to heat, in accordance with ISO 7243 or DIN 33403, incl. WBGT case         Highly accurate reference humidity/temp. probe incl. cal. cert.         Standard ambient air probe up to +70°C         Quick-action surface probe with sprung ther- mocouple strip, measuring range short-term to +500°C		0 21 n 0 21 n 0 12 mm 150 mm 0 10 mm	0 to +10000 ppm CO <sub>2</sub> 0 to +120 °C 0 to +120 °C 0 to +100 %RH -20 to +70 °C 0 to +100 %RH -20 to +70 °C -200 to +300 °C	+(100 ppm CO2, ±3% of mv)(+5001 to +10000 ppm CO2) In accordance with ISO 7243 or DIN 33403 ±1 %RH (+10 to +90 %RH)* ±2 %RH (remaining range) ±0.2 °C (+10 to +40 °C) ±0.4 °C (remaining range) ±2 %RH (+2 to +98 %RH) ±0.4 °C (-10 to +50 °C) ±0.5 °C (remaining range) Class 2 t99 3 s	Conn.: Plug-in head. connection cable 0430 0143 or 0430 0145 required 0635 8888 ID No. 0699 4239/1 0636 9741 Conn.: Plug-in head. connection cable 0430 0143 or 0430 0145 required 0636 9740 Conn.: Plug-in head. connection cable 0430 0143 or 0430 0145 required 0604 0194 Conn.: Plug-in head. connection cable 0430 0143 or 0430 0145 required
testovent 410, volume flow funnel, Ø 190 mm//330x330 mm, incl. case       0554 0410       Attachable printer (securely attached) including 1 roll of thermal paper and batteries       0554 0570         testovent 415, volume flow funnel, Ø 190 mm//210x210 mm, incl. case       0554 0415       Testo printer with wireless IRDA and infrared interface, 1 roll of thermal paper and 4 AA batteries, for printout of reading on site       0554 0547         Rech. batt. set for instrument       0554 0196       SoftCase for instrument and printer       Part no.	Connection cable 0430 0143 or 0430 0145         required         Wet Bulb Globe temperature probe to assess workplaces subjected to heat, in accordance with ISO 7243 or DIN 33403, incl. WBGT case         Highly accurate reference humidity/temp. probe incl. cal. cert.         Standard ambient air probe up to +70°C         Quick-action surface probe with sprung ther- mocouple strip, measuring range short-term to +500°C         Highly accurate immersion/penetration probe incl. certificate		0 21 m 0 12 mm 0 12 mm 0 10 mm 0 10 mm 0 4 mm	0 to +10000 ppm           CO2           0 to +120 °C           0 to +100 %RH           -20 to +70 °C           0 to +100 %RH           -20 to +70 °C           -200 to +300 °C           -40 to +300 °C	$\begin{array}{c} (100 \ \text{pm} \ \text{CO}_{2} \ \text{3\% of mv})(+5001 \ \text{to} \\ +10000 \ \text{pm} \ \text{CO}_{2} \ \text{3\% of mv})(+5001 \ \text{to} \\ +10000 \ \text{pm} \ \text{CO}_{2} \ \text{3\% of mv})(+5001 \ \text{to} \\ \text{Todou pm} \ \text{CO}_{2} \ \text{S}^{-1} \ \text{S}^$	Conn.: Plug-in head. connection cable 0430 0143 or 0430 0145 required 0635 8888 ID No. 0699 4239/1 0636 9741 Conn.: Plug-in head. connection cable 0430 0143 or 0430 0145 required 0636 9740 Conn.: Plug-in head. connection cable 0430 0143 or 0430 0145 required 0604 0194 Conn.: Plug-in head. connection cable 0430 0143 or 0430 0145 required 0614 0240 Conn.: Plug-in head. connection cable 0430 0143 or 0430 0145 required
testovent 415, volume flow funnel, Ø 190 mm/210x210 mm, incl. case       0554 0415       Testo printer with wireless IRDA and infrared interface, 1 roll of thermal paper and 4 AA batteries, for printout of reading on site       0554 0547         Quick recharging in instrument       0554 0196       SoftCase for instrument and printer       Part no.	Connection cable 0430 0143 or 0430 0145         required         Wet Bulb Globe temperature probe to assess workplaces subjected to heat, in accordance with ISO 7243 or DIN 33403, incl. WBGT case         Highly accurate reference humidity/temp. probe incl. cal. cert.         Standard ambient air probe up to +70°C         Quick-action surface probe with sprung ther- mocouple strip, measuring range short-term to +500°C         Highly accurate immersion/penetration probe incl. certificate	<ul> <li>Ø 150 mm</li> <li>Ø 150 mm&lt;</li></ul>	0 21 m 0 21 m 0 12 mm 0 12 mm 0 10 mm 0 10 mm 0 4 mm	0 to +10000 ppm           CO2           0 to +120 °C           0 to +100 %RH           -20 to +70 °C           0 to +100 %RH           -20 to +70 °C           -200 to +300 °C           -40 to +300 °C           -20 to +300 °C	±(100 ppm CO2, ±3% of mv)(+5001 to         ±(10000 ppm CO2,)         In accordance with ISO         7243 or DIN 33403         ±1 %RH (±10 to ±90 %RH)*         ±2 %RH (remaining range)         ±0.2 °C (±10 to ±40 °C)         ±0.4 °C (remaining range)         ±2 %RH (*2 to ±98 %RH)         ±0.4 °C (=10 to ±50 °C)         ±0.5 °C (remaining range)         Class 2       199         3 s         ±0.05 °C (±0.01 to ±100 °C)       199 ±00 °C)         ±(0.05 °C ±0.05% of mv)       60 s         ±(100 °C) ±0.05% of mv)       60 s	Conn: Plug-in head. connection cable 0430 0143 or 0430 0145 required 0635 8888 ID No. 0699 4239/1 0636 9741 Conn: Plug-in head. connection cable 0430 0143 or 0430 0145 required 0636 9740 Conn: Plug-in head. connection cable 0430 0143 or 0430 0145 required 0604 0194 Conn: Plug-in head. connection cable 0430 0143 or 0430 0145 required 0614 0240 Conn: Plug-in head. connection cable 0430 0143 or 0430 0145 required
Rech. batt. set for instr. (2 rech. 2.4V/1100mAh), selected for quick recharging in instrument       0554 0196       0554 0196       0554 0196         SoftCase for instrument and printer       Part no.	Connection cable 0430 0143 or 0430 0145         required         Wet Bulb Globe temperature probe to assess workplaces subjected to heat, in accordance with ISO 7243 or DIN 33403, incl. WBGT case         Highly accurate reference humidity/temp. probe incl. cal. cert.         Standard ambient air probe up to +70°C         Quick-action surface probe with sprung ther- mocouple strip, measuring range short-term to +500°C         Highly accurate immersion/penetration probe incl. certificate         Accessories for measuring instrument/probe testovent 410, volume flow funnel, Ø 190 mm/330x330 incl. case	<ul> <li>O 150 mn</li> <li>O 150 mn&lt;</li></ul>	0 21 1 0 21 1 0 12 mm 0 12 mm 0 10 mm 0 10 mm	0 to +10000 ppm CO2           0 to +120 °C           0 to +120 °C           mm           0 to +100 %RH -20 to +70 °C           0 to +100 %RH -20 to +70 °C           -200 to +300 °C           -40 to +300 °C           Printer and Accessorie           Attachable printer (securely methods)	$\begin{array}{c} \mbox{+}(100 \ \mbox{pm}\ CO_{2}, 33\% \ \mbox{of}\ \mbox{mv})(+5001 \ \mbox{to} \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$	Conn.: Plug-in head. connection cable 0430 0143 or 0430 0145 required 0635 8888 ID No. 0699 4239/1 0636 9741 Conn.: Plug-in head. connection cable 0430 0143 or 0430 0145 required 0636 9740 Conn.: Plug-in head. connection cable 0430 0143 or 0430 0145 required 0604 0194 Conn.: Plug-in head. connection cable 0430 0143 or 0430 0145 required 0614 0240 Conn:: Plug-in head. connection cable 0430 0143 or 0430 0145 required 0614 0240 Conn:: Plug-in head. connection cable 0430 0143 or 0430 0145 required
	Connection cable 0430 0143 or 0430 0145         required         Wet Bulb Globe temperature probe to assess workplaces subjected to heat, in accordance with ISO 7243 or DIN 33403, incl. WBGT case         Highly accurate reference humidity/temp. probe incl. cal. cert.         Standard ambient air probe up to +70°C         Quick-action surface probe with sprung ther- mocouple strip, measuring range short-term to +500°C         Highly accurate immersion/penetration probe incl. certificate         Accessories for measuring instrument/probe testovent 410, volume flow funnel, Ø 190 mm/330x330 incl. case		0 21 a 0 21 a 0 12 mm 0 12 mm 0 10 mm 0 4 mm	0 to +10000 ppm CO2           0 to +120 °C           0 to +100 %RH -20 to +70 °C           0 to +100 %RH -20 to +70 °C           -200 to +300 °C           -40 to +300 °C           Printer and Accessorie           Attachable printer (securely mal paper and batteries           Festo printer with wireless IF	#(100 ppm CO2, ±3% of mv)(+5001 to         +10000 ppm CO2,         In accordance with ISO         7243 or DIN 33403         ±1 %RH (+10 to +90 %RH)*         ±2 %RH (remaining range)         ±0.2 °C (+10 to +40 °C)         ±0.4 °C (remaining range)         ±2 %RH (+2 to +98 %RH)         ±0.4 °C (remaining range)         ±0.5 °C (remaining range)         class 2       199         3 s         ±0.05 °C (±0.01 to ±100 °C)       109         ±0.05 °C ±0.05% of mv)       60 s         ±0.05 °C ±0.05% of mv)       60 s         ±1005 °C ±0.05% of mv)       100 s         ±1000 °C)       100 s         ±20.5 °C (remaining range)       50 s         ±0.05 °C (10 to ±100 °C)       109         ±0.05 °C ±0.05% of mv)       60 s         ±0.05 °C ±0.05% of mv)       100 s         ±1005 °C ±0.05% of mv)       100 s         ±0.05 °C ±0.05% of mv) <td< td=""><td>Conn.: Plug-in head. connection cable 0430 0143 or 0430 0145 required 0635 8888 ID No. 0699 4239/1 0636 9741 Conn.: Plug-in head. connection cable 0430 0143 or 0430 0145 required 0636 9740 Conn:: Plug-in head. connection cable 0430 0143 or 0430 0145 required 0604 0194 Conn:: Plug-in head. connection cable 0430 0143 or 0430 0145 required 0614 0240 Conn:: Plug-in head. connection cable 0430 0143 or 0430 0145 required 0614 0240 Conn:: Plug-in head. connection cable 0430 0143 or 0430 0145 required 0614 0240 Conn:: Plug-in head. connection cable 0430 0143 or 0430 0145 required 0554 0570</td></td<>	Conn.: Plug-in head. connection cable 0430 0143 or 0430 0145 required 0635 8888 ID No. 0699 4239/1 0636 9741 Conn.: Plug-in head. connection cable 0430 0143 or 0430 0145 required 0636 9740 Conn:: Plug-in head. connection cable 0430 0143 or 0430 0145 required 0604 0194 Conn:: Plug-in head. connection cable 0430 0143 or 0430 0145 required 0614 0240 Conn:: Plug-in head. connection cable 0430 0143 or 0430 0145 required 0614 0240 Conn:: Plug-in head. connection cable 0430 0143 or 0430 0145 required 0614 0240 Conn:: Plug-in head. connection cable 0430 0143 or 0430 0145 required 0554 0570

Rech. batt. set for instr. (2 rech. 2.4V/1100mAh), selected for	0554 0196	thermal paper and 4 AA batteries, for printout of reading on site		
quick recharging in instrument		SoftCase for instrument and printer	Part no.	
Mains unit 230 V/ 8 V/ 1 A, for instrument (European plug), for mains operation and battery recharging	0554 1084	SoftCase (protects instrument from impact) with carrier strap, magnetic holder and probe holder.	0516 0401	
Connection hose, silicone, 5m long, max. load 700 hPa (mbar)	0554 0440	SoftCase for attachable printer (protects printer from	0510.0414	
Software and Accessories	Part no.	dirt/impact)	0516 0411	
		System case	Part no.	
base, analysis and graphics function, data analysis, trend curve		System case (plastic) for measuring instrument, probes and	0516.0400	
RS232 cable, connects instrument to PC (1.8 m) for data trans- fer	0409 0178	(540 x 440 x 130 mm)	0310 0400	
For more information, refer to the brochure "Reference Measurement Tech-		System case (aluminium) for measuring instrument, probes and	0516 0410	

nology for Industry" and www.testo.com.

## The professional set for assessing workplaces subjected to heat, testo 400





۹C

۹C

24.9

Measure with testo 400 and WBGT probe





°C

°C |

Mean

20.5

25.1

Τw

Та



testo 400 on-site printout e.g. with attachable printer

WBGTS

Calculated WBGT and WBGTS indices are displayed directly



The WBGT case for fast assessment of workplaces

### Wet Bulb Globe Temperature Probe

The measurement task involves assessing workplaces, particularly those subjected to heat radiation:

The WBGT probe is used to determine the WBGT (Wet Bulb Globe Temperature) climate index in accordance with DIN 33403 and ISO 7243.

The WBGT index is used to determine the maximum allowable exposure time at workplaces subjected to heat.

- Possible applications are e.g.:
- Steel industry
- Foundries
- Glass industry
- Furnaces
- Ceramics industry.

Heat radiation causes an increase

- in temperature based on: - the thermal influence of the surroundings
- Work intensity
- Thermal transfer of clothing
- Duration of exposure.

If this burden is too high, there is a risk of a circulatory collapse, heat cramps or heat stroke.

Three different temperatures have to be measured for WBGT calculation:

- Temperature of a naturally aired, humidified thermometer (Tw), natural wet bulb temperature

- Globe temperature (Tg)
- Air temperature (Ta).

Calculation occurs inside and outside the building without exposure to sun:

WBGT = 0.7 Tw + 0.3 Tg

Outside buildings with exposure to sun:

WBGTS = 0.7 Tw + 0.2 Tg + 0.1Та

The testo 400 measuring instrument calculates indices and shows them in its display.

Recommended Set:	Part no.
testo 400, multi-functional meas. instr., incl. meas. value store up to 500,000 readings, VAC-module (determination of volume flow with error calc.), battery, Li-cell and calibration protocol	0563 4001
Wet Bulb Globe temperature probe to assess workplaces subjected to heat, in accordance with ISO 7243 or DIN 33403, incl. WBGT case	0635 8888 ID No. 0699 4239/1
Attachable printer (securely attached) including 1 roll of thermal paper and batteries, quickly prints readings on location	0554 0570
We recommend the following for each of the 3 temport	erature probes:
ISO calibration certificate/temperature	0520 0181

for air/immersion probes, calibration points -8°C; 0°C; +40°C

testo

## The pro set for comfort level measurements & occupational safety/health, testo 400

The thermal well-being of humans depends to a great extent on ambient air flow. Humans react sensitively to draughts. Draught air is the most common reason for complaints about ambient conditions.

Testo's direction-independent comfort probe has been specially designed to analyse draughts. When used together with the testo 400 reference measuring instrument, it is possible to set up a reading sequence and to calculate the corresponding mean.

However, the mean air flow alone is not sufficient to assess the effect on people. The fluctuations over time in ambient air flow are also of interest. The degree of turbulence required in the respective standards and guidelines is a measure of this. It is also calculated automatically by the testo 400 reference measuring instrument.

Standards recommend that air flow is measured directly at the workplace at a height of 0.1 m, 0.6 m and 1.1 m (for seated persons) or 0.1 m, 1.1 m and 1.7 m (for standing persons).

The maximum mean air flow depends on the air temperature measured and the degree of turbulence calculated in each case (see graphic).

- Draught prevention in the workplace

## Recommended Set:

testo 400, multi-functional meas. instr., incl. meas. value store up to 500,000 readings, VAC-module (determination of volume flow with error calc.), battery, Li-cell and calibration protocol 2 channel multi-function measuring instrument	0563 4001
Comfort level probe for measuring degree of turbulence, with telescopic handle and stand. Fulfills EN 13779 requirements	0628 0009
Attachable printer (securely attached) including 1 roll of thermal paper and batteries	0554 0570
We recommend: CO2 probe measures indoor air quality and monitors the workplace. With plug-in head, connection cable 0430 0143 or 0430 0145 required	0632 1240
Standard ambient air probe up to +70°C Measures all physical parameters in the psychrometric chart, Plug-in head, connection cable 0430 0143 or 0430 0145 required	0636 9740
Quick-action surface probe with sprung thermocouple strip, measuring range short-term to +500°C, Plug-in head, connection cable 0430 0143 or 0430 0145 required	0604 0194
Cable, 1.5 m long, connects probe with plug-in head to meas. instrument PUR coating material	0430 0143
Cable, 5 m long, connects probe with plug-in head to measuring instrument	0430 0145

- Measure ambient air flow in airconditioned rooms in accordance with EN 13779
   Automatic calculation of degree of
- turbulence (with testo 400)

Part no.



The normally time-consuming degree of turbulence calculation is carried out automatically by the testo 400 measuring instrument. Example: Air temp.: 24.4°C, degree of turbulence: 10% Degree of turbulence calculation: maximum mean air flow 0.26 m/s





testo 400 printout e.g. on attachable printer

testo 400 display with calculated degree of turbulence, mean air flow and air temperature

testo 400 set up with turbulence degree probe

esto

## The pro set for cleanroom technology, testo 400





Example of layout of a clean room



testo 400 display during the calibration of a stationary transmitter:

Left display half: Reference humidity probe

Right display half: 4-20 output measurement in a transmitter using current/voltage cable (scaling 0-100%RH)

### The Pro Set for clean room technology

testo 400, multi-functional meas. instr., incl. meas. value store up to 500,000 readings, VAC-module (determination of volume flow with error calc.), battery, Li-cell and calibration protocol	0563 4001
Precision pressure probe, 100 Pa (differential pressure)	0638 1347
Precision air probe , Plug-in head, connection cable 0430 0143 or 0430 0145 required	0628 0017
Highly accurate reference humidity/temp. probe incl. cal. cert., Plug-in head, connection cable 0430 0143 or 0430 0145 requi- red	0636 9741
Connection cable, length 1.5 m, for probes with plug-in heads	0430 0143
Connection cable, 5 m long, for probe with plug-in head	0430 0145
Thermal anemometer probe, Ø 10 mm, w. telescopic handle, measures air flow in lab fume cupboards to DIN EN 14175	0635 1047
Bendable vane probe (90° bend radius) Ø 100 mm, attachable to handle or telescope	0635 9340
Pro telescope for plug-in vane probes, length max. 1 m	0430 0941
Current/voltage cable (±1 V, ±10 V, 20 mA)	0554 0007
System case (aluminium) for measuring instrument, probes and accessories	0516 0410
ComSoft 3 - Professional with data management	0554 0830
RS232 cable	0409 0178

#### We recommend:

DKD calibration certificates for temperature, humidity, velocity, pressure

Defined process ambient conditions must be assured for the qualification and validation of the high quality standards of production units in clean rooms.

Air exchange and the resulting air flow are linked directly to air temperature and air moisture. Specified air flows produce defined positive pressures which prevent the ingress of impurities from outside.

Testo's measurement technology has proven to be ideal for testing process ambient conditions.

With the testo 400 reference measuring instrument, you have the possibility of connecting 2 probes simultaneously. The measuring instrument can then be used to monitor measurements on-site or for long-term measurements thanks to the integrated readings memory with capacity for 500,000 data.

#### Typical measurement tasks: differential pressure monitoring using the 100 Pa probe

The testo 100 Pa probe with an accuracy of ±(0.3 Pa + 0.5 % of the reading) is the ideal solution.

Position dependencies are completely eliminated thanks to the revolutionary double membrane technology and fluctuations in temperature no longer have any influence on the measured result thanks to temperature compensation.

### Accurate air temp. measurement

testo 400 achieves a system accuracy of 0.1°C and a resolution of 0.01°C when used together with the precision air probe (Pt100 Class B 1/10).

#### Accurate air moisture measurement

The task at hand is to monitor exactly the fluctuations in air moisture with an accuracy of up to ±1%RH. testo 400 sets new standards in terms of accuracy and long-term stability. The worldwide inter-laboratory test with the patented humidity sensor in leading. international institutes confirm the stated values.

#### Measurement of ideal air supply

testo 400, with its thermal, vane and pitot tube measurements, has all the engineering available to measure air flow. A calibration accuracy from 0.5% of the reading is assured thanks to the first PTB accredited DKD laboratory for flow.

#### Measuring laminar flow

The probe 0635 1047 for testing laboratory fume cupboards and for measuring laminar flow is new. Owing to its optimum flow impact characteristics with a directionindependent measurement within a possible twist angle (20°) and an accuracy of  $\pm(0.02 \text{ m/s} + 5\% \text{ of}$ reading), the probe is optimally designed for the measurement of laminar flow.

### Stationary transmitters

The check is carried out using the current/voltage cable (0 to 20 mA, 0 to 1 V, 0 to 10 V) and there is a possibility of integrating additional parameters.



Checking flow speed using the hot wire probe Part no.: 0635 1047

testo

## On site test procedure to DIN EN 14175, testo 400

### Laboratory fume cupboard probe

The thermal anenmometer probe is used for measurements and monitoring of fume cupboards. The probe corresponds to the new DIN EN 14175.

The advantages of the new thermal anemometer probe are the optimum flow impact behaviour and the easy handling. testo 400 provides necessary calculation such as mean value and standard deviation.

The objective of the on-site test procedure is to test the correct setup of the fume cupboard, and to establish the performance of the fume cupboard under the prevailing conditions (indoor air flow/outgoing air system). For this purpose, the inflow as well as the outflow is measured.

For commissioning test (Part 4), the requirements of the measuring instrument are identical to those in the design check (Part 3).

- Direction-dependent, however measurement must be possible within ± 20 °
- Time constant (t63) 0.5 s
- Accuracy  $\pm$  (0.02 m/s + 5% of reading) in measuring range 0.2 to 1 m/s

- Anemometers must be calibrated

For the repetition test (Part 3), the anemometer must show an accuracy of 10% of reading for the inflow velocity test, and ±(0.02 m/s +5% of reading) for the outflow velocity test in the range from 0.3 m/s. The new laboratory fume cupboard probe here fulfils the requirements from Parts 3 and 4.

General indoor air conditions during air tests, including temperature, air pressure, air humidity and pressure difference between indoor air input and indoor air output, must continue to be measured. According to DIN EN 14175-3: 2003, the anemometer must be able to measure indoor air velocity independently of direction.

With additional probes testo 400 offers the possibility of measuring the general indoor conditions.

#### testo 400

- Multi-function instrument testo 400 for measuring temperature, humidity,  $\Delta P$ , flow velocity, absolute pressure
- PC interface and ComSoft 3

#### Advantages of the laboratory exhaust probe

- optimum flow impact characteristics
- robust probe with protective cap - corresponds to norm DIN EN

0563 4001

14175



On-site testing of a laboratory fume cupboard with testo 400



Optimum flow impact behaviour of the laboratory fume cupboard probe (0635 1047)

Hot wire probe (0635 1041) optimized for duct measurement with direction recognition

We recommend:	
ComSoft 3 - Professional with data management	0554 0830
RS232 cable	0409 0178
Attachable printer (securely attached) including 1 roll of thermal paper and batteries	0554 0570
SoftCase (protects instrument from impact) with carrier strap, magnetic holder and probe holder	0516 0401
SoftCase for attachable printer (protects printer from dirt/impact)	0516 0411
System case (aluminium) for measuring instrument, probes and accessories	0516 0410
DKD calibration certificate/velocity, hot wire anemometer; calibration points 0.1; 0.2; 0.5; 0.8; 1 m/s	0520 0224
ISO calibration certificate velocity, hot wire, vane anemometer; calibration points 0.5; 0.8; 1; 1.5 m/s	0520 0024



www.esis.com.au Ph 02 9481 7420

## Recommended set testo 400, multi-functional meas. instr., incl. meas. value store

flow with error calc.), battery, Li-cell and calibration protocol	
Mains unit 230 V/ 8 V/ 1 A, for instrument (European plug)	0554 1084
Rech. batt. set for instr. (2 rech. 2.4V/1100mAh)	0554 0196
Thermal anemometer probe, Ø 10 mm, w. telescopic handle, measures air flow in lab fume cupboards to DIN EN 14175	0635 1047
Standard ambient air probe up to +70°C, Plug-in head, con- nection cable 0430 0143 or 0430 0145 required	0636 9740
Pressure probe, 2000 hPa, measures absolute pressure, in robust metal housing with impact protection, incl. quick-closing coupling (M8 $\times$ 0.5), magnet for fast attachment	0638 1847
Precision pressure probe, 100 Pa, measures differential pres- sure, in robust metal housing with impact protection, incl. mag- net for fast attachment	0638 1347
Cable, 1.5 m long, connects probe with plug-in head to meas. instrument	0430 0143
Comfort level probe for measuring degree of turbulence, with telescopic handle and stand. Fulfills EN 13779 requirements	0628 0009