Dew point set **DS 400**

for stationary dew point monitoring of refrigeration or adsorption dryers. The touch screen graphic display enables an intuitive operation and shows the progress of the measured values. 2 alarm relays are available for monitoring of threshold values. Available either with a classic analogue output 4...20 mA or optionally with digital interfaces like Ethernet and RS 485 (Modbus protocol). As a stand-alone solution the measured data stored in the optional data logger can be read-out via USB stick and evaluated by means of the software CS Soft Basic.

### Special features:

- 3.5” graphic display - easy operation with touch screen
- System ready for plug-in: Everything completely wired
- 2 alarm contacts (230 VAC, 3 A) pre- and main alarm freely adjustable
- **NEW:** An alarm delay can be set for each alarm relay
- 4...20 mA analogue output
- Option: Ethernet and RS 485 interface (Modbus protocol)
- Option: Webserver

### Technical data DS 400

**Dimensions:** 118 x 115 x 98 mm  
IP 54 (wall housing)  
92 x 92 x 75 mm (panel mounting)

**Inputs:** 2 digital inputs for FA 410 resp. VA 400/420

**Interface:** USB

**Power supply:** 100...240 VAC, 50-60 Hz

**Accuracy:** please see FA 410

**Alarm outputs:** 2 relays, (pot.-free)

**Options:**
- Data logger: 100 million measuring values start/stop time, measuring rate freely adjustable
- 2 additional sensor inputs: for connection of pressure sensors, temperature sensors, clamp-on ammeters, third-party sensors with 4...20 mA 0 to 10 V, Pt 100, Pt 1000

### Technical data FA 410

**Measuring range:** -80...+20 °Ctd resp. -20...+50 °Ctd

**Accuracy:** ± 1 °C at 20...-20 °Ctd  
± 2 °C at -20...-50 °Ctd  
± 3 °C at -50...-80 °Ctd

**Pressure range:** -1...+50 bar, special version up to 350 bar

### Description | Order No.
---|---
Dew point set DS 400 for adsorption dryers (-80...+20 °Ctd) | 0601 0410
Dew point set DS 400 for refrigeration dryers (-20...+50 °Ctd) | 0601 0412
Options
- Option: Integrated data logger for 100 million measured values | Z500 4002
- Option: Integrated Ethernet and RS 485 interface | Z500 4004
- Option: Integrated webserver | Z500 4005
- Option: 2 additional sensor inputs for analogue sensors (pressure sensor, temperature sensor and so on) | Z500 4001
Further accessories
- CS Soft Basic - data evaluation in graphic and table form - reading out of the measured data via USB or Ethernet | 0554 7040
- Alarm unit mounted at wall housing | Z500 0003
- Alarm unit for external mounting with 5 m cable | Z500 0004
**Calibration**
- Precision calibration at -40 °Ctd including ISO certificate | 0699 3396
- Precision calibration at +3 °Ctd including ISO certificate | 3200 0003

www.cs-instruments.com
Easy operation via touch screen

Actual measured values
All measured values can be seen at a glance. Threshold exceedings are indicated in red colour. A „measuring site name“ can be allocated to each sensor.

Graphic view
In the graphic view all measured values are indicated as curves. It is possible to browse back on the time axis by a slide of the finger (without data logger maximum 24 h, with data logger back to the start of the measurement).

Data logger
Measured values are stored in DS 400 by means of the option „integrated data logger“. The time interval can be freely set. Furthermore there is the possibility to fix the starting time and the end time of the data recording. Read-out of the measured data via USB interface or via the optional Ethernet interface.

Selection of the language
DS 400 „speaks“ several languages. The required language can be selected by means of the select button.

Adjustment of the alarm relays
Each one of the 2 alarm relays can be allocated individually to a connected sensor. The alarm thresholds and the hysteresis can be freely adjusted. NEW: It is possible to set an alarm delay for each alarm relay so that the relay is just triggered after that period of time.
DS 400 - Chart recorder

for all relevant parameters of compressed air

Software options:
- Integrated webservice
- Mathematics calculation function
- Totalizer function

Hardware options:
- Integrated data logger
- Ethernet / RS 485 interface
- additional sensor inputs (digital or analogue) selectable

The 2 sensor inputs board 1 and 2 can be selected according to the required sensors:

<table>
<thead>
<tr>
<th>Description</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS 400 - Mobile chart recorder with graphic display and touch screen</td>
<td>0500 4000 D</td>
</tr>
<tr>
<td>2 sensor inputs board 1</td>
<td>0500 4000 DD</td>
</tr>
<tr>
<td>2 sensor inputs board 2</td>
<td>0500 4000 DA</td>
</tr>
<tr>
<td>Digital (Z500 4003)</td>
<td>0500 4000 AA</td>
</tr>
<tr>
<td>Digital (Z500 4003)</td>
<td>0500 4000 D</td>
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<td>Digital (Z500 4003)</td>
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<td>Digital (Z500 4003)</td>
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<td>Analogue (Z500 4001)</td>
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<td>Analogue (Z500 4001)</td>
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<tr>
<td>Options</td>
<td>0500 4002</td>
</tr>
<tr>
<td>Option: Integrated data logger for 100 million measured values</td>
<td>0500 4004</td>
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<tr>
<td>Option: Integrated webserver</td>
<td>Z500 4005</td>
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<tr>
<td>Option: „Mathematics calculation function“ for 4 freely selectable channels, (virtual channels): addition, subtraction, division, multiplication</td>
<td>Z500 4007</td>
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<tr>
<td>Option: „Totalizer function for analogue signals“</td>
<td>Z500 4006</td>
</tr>
<tr>
<td>External Gateway Profibus</td>
<td>Z500 3008</td>
</tr>
</tbody>
</table>

Further accessories

CS Soft Basic - data evaluation in graphic and table form - reading out of the measured data via USB or Ethernet 0554 7040
CS Soft Network - Database Client/Server Solution (up to 5 DS 400) - database (MySQL) to Server - data evaluation via Client-Software 0554 7041
CS Soft Network - Database Client/Server Solution (up to 10 DS 400) - database (MySQL) to Server - data evaluation via Client-Software 0554 7042
CS Soft Network - Database Client/Server Solution (up to 20 DS 400) - database (MySQL) to Server - data evaluation via Client-Software 0554 7043
CS Soft Network - Database Client/Server Solution (>20 DS 400) - database (MySQL) to Server - data evaluation via Client-Software 0554 7044

Technical data DS 400

Dimensions: 118 x 115 x 98 mm
IP 54 (wall housing)
92 x 92 x 75 mm (panel mounting)

Inputs: 2 digital inputs for FA 410 resp. VA 410/420

Interface: USB

Power supply: 100...240 VAC, 50-60 Hz

Accuracy: please see FA 410

Alarm outputs: 2 relays. (pot.-free)

Options:
- Data logger: 100 million measuring values start/stop time, measuring rate freely adjustable
- 2 additional sensor inputs: for connection of pressure sensors, temperature sensors, clamp-on ammeters, third-party sensors with 4...20 mA 0 to 10 V, Pt 100, Pt 1000

Input signals
- Current signal internal or external power supply Measuring range (0...20mA/4...20mA)
  Resolution 0.001 mA
  Accuracy ± 0.003 mA ± 0.05 %
  Input resistance 50 Q
- Voltage signal Measuring range (0...1 V)
  Resolution 0.05 mV
  Accuracy ± 0.2 mV ± 0.05 %
  Input resistance 1 MΩ
- Voltage signal Measuring range (0...10 V / 30 V)
  Resolution 0.5 mV
  Accuracy ± 2 mV ± 0.05 %
  Input resistance 1 MΩ
- RTD Pt 100 Measuring range -200...850°C
  Resolution ± 0.2°C (-100...400°C)
  Accuracy ± 0.3°C (further range)
- RTD Pt 1000 Measuring range -200...850°C
  Resolution 0.1°C
  Accuracy ± 0.2° (-100...400°C)
- Pulse Measuring range min pulse length 500 μs frequency 0...1 kHz max. 30 VDC
### Suitable probes from the **CS Instruments** product range

#### Flow sensors VA 400:
- VA 400 flow sensor in basic version: Standard (92.7 m/s), sensor length 220 mm, without display  
  **Order No.** 0695 4001

#### Option for VA 400:
- Max. version (185 m/s)  
  **Order No.** Z695 4003
- High Speed version (224 m/s)  
  **Order No.** Z695 4002
- Sensor length 120 mm  
  **Order No.** ZLS 0120
- Sensor length 160 mm  
  **Order No.** ZLS 0160
- Sensor length 300 mm  
  **Order No.** ZLS 0300
- Sensor length 400 mm  
  **Order No.** ZLS 0400

#### Flow meters VA 420:
- Flow meter VA 420 with integrated measuring section, (R 1/4” DN 8)  
  **Order No.** 0695 0420
- Flow meter VA 420 with integrated measuring section, (R 1/2” DN 15)  
  **Order No.** 0695 0421
- Flow meter VA 420 with integrated measuring section, (R 3/4” DN 20)  
  **Order No.** 0695 0422
- Flow meter VA 420 with integrated measuring section, (R 1” DN 25)  
  **Order No.** 0695 0423
- Flow meter VA 420 with integrated measuring section, (R 1 1/4” DN 32)  
  **Order No.** 0695 0426
- Flow meter VA 420 with integrated measuring section, (R 1 1/2” DN 40)  
  **Order No.** 0695 0424
- Flow meter VA 420 with integrated measuring section, (R 2” DN 50)  
  **Order No.** 0695 0425

#### Dew point sensors:
- FA 410 dew point sensor, -80...+20 °Ctd incl.inspection certificate  
  **Order No.** 0699 0410
- FA 415 dew point sensor, -20...+50°Ctd, incl.inspection certificate  
  **Order No.** 0699 0415
- Standard measuring chamber for compressed air up to 16 bar  
  **Order No.** 0699 3390

#### Connection cables for flow sensors / dew point sensors:
- Connection cable 5 m  
  **Order No.** 0553 0104
- Connection cable 10 m  
  **Order No.** 0553 0105

#### Pressure sensors: (further pressure sensors on page 8)
- Standard pressure sensor CS 16 from 0…16 bar, ± 1 % accuracy of full scale  
  **Order No.** 0694 1886
- Standard pressure sensor CS 40 from 0…40 bar, ± 1 % accuracy of full scale  
  **Order No.** 0694 0356

#### Temperature sensors:
- Bendable temperature probe, Pt100 Class B, length 300 mm, 2 m probe connection cable glass fibre/stainless steel open end wires  
  **Order No.** 0604 0107
- Screw-in temperature probe Pt 100 Class A, length: 300 mm with measuring transducer 4 to 20 mA = -50 to +500 °C (2 wire technology)  
  **Order No.** 0693 0002
- Indoor/outdoor temperature probe -50...+100°C  
  **Order No.** 0604 0101
- Temperature probe cable Pt 100, Class A, length: 300 mm, Ø 6 mm, -50...+180°C, with 5 m connection cable with open ends  
  **Order No.** 0604 0102
- Temperature probe cable Pt 100, Class A, length: 150 mm, Ø 6 mm, +50...+180°C with 5 m connection cable with open ends  
  **Order No.** 0604 0100
- Clamp screwing 6 mm, G 1/2", PTFE clamping, pressure-tight up to 6 bar  
  **Order No.** 0554 6003
- Clamp screwing 6 mm, G 1/2", VA clamping, pressure-tight up to 10 bar  
  **Order No.** 0554 6004

#### Connection cables for pressure sensors / temperature sensors:
- Connection cable 5 m  
  **Order No.** 0553 0108
- Connection cable 10 m  
  **Order No.** 0553 0109

#### Clamp-on ammeters:
- Clamp-on ammeter 0...1000 A TRMS incl. 5 m connection cable with open ends  
  **Order No.** 0554 0507
- Clamp-on ammeter 0...400 A TRMS incl. 3 m connection cable with open ends  
  **Order No.** 0554 0510

#### Optional third-party sensors 0/4...20 mA, 0...1/10/30 V, Pt 100 / Pt 1000, KTY, pulse, RS 485 Modbus connectable.

#### Current / effective power meter (further current transformer please see on page 9)
- CS PM 710 current/effective power meter for panel mounting, current transformer from 100 A to 2000 A connectible  
  **Order No.** 0554 5343
- Current transformer 100/5 A connectible to current/effective power meter for panel mounting (for cables up to Ø 21 mm)  
  **Order No.** 0554 5344
- Current transformer 500/5 A connectible to current/effective power meter for panel mounting (for cables up to Ø 21 mm)  
  **Order No.** 0554 5347
- Connection cable to DS 400, 5 m, with open ends  
  **Order No.** 0553 0108
- Connection cable to DS 400, 10 m, with open ends  
  **Order No.** 0553 0109
CS Soft Basic - evaluation of measured data for single computers

The measured data stored in the data logger integrated in DS 400 can be read-out via USB stick.
If DS 400 has the optional Ethernet interface the measured data can also be read-out over big distances via the computer network.

- **Graphic evaluation**
  All measurement curves are indicated in different colours. All necessary functions like free zoom, selection/deselection of single measured curves, free selection of time periods, scaling of the axis, selection of colours and so on are integrated:
  This view can be stored as a pdf file and sent by e-mail. Different data can be merged in one million file.

- **Table view**
  All measured points are listed with the exact time interval. The desired measuring channels with the measuring site name can be selected via the diagram explorer.

- **Statistics**
  All necessary statistics data are apparent at a glance. So the user can quickly see which minimum or maximum measured values occurred at which time and for how long.

- **Energy and flow evaluation**
  The software carries out on energy and flow analysis for all connected flow sensors optionally as daily, weekly or monthly report.
CS Soft Network - evaluation of the measured data for several computers in the network

By means of the CS Soft Network an optional number of DS 500/DS 400 instruments can be evaluated via Ethernet. The software stores the measured data of all DS 500 / DS 400 cyclically (cycle freely selectable) in a SQL database on the server. In case of an exceeding of the stored alarm values the software automatically sends an SMS or an e-mail. Furthermore, different user levels can be defined in the server software so that single staff members only can access the measured data of certain DS 500 / DS 400.

The evaluation of the measured data can be carried out by means of the client software from each PC within the company.

Access to the measured values via the webserver

With the option „Webserver“ (order no. Z500 4005) DS 400 can be contacted without any special software from each web browser (e.g. Mozilla Firefox ®, Microsoft Internet Explorer ®).

The access can also be done via the World Wide Web. The webserver indicates the actual measured values of all sensors as well as the status of the alarm relays and the logger status in the web browser.

Connection to Bus system

With the option „Ethernet / RS 485 - interface“ (order no. Z500 4004) DS 400 can be connected to customer-owned Bus system (e.g. PLC, building management system BMS, central control system, SCADA,...).

The measured values of all sensors can be retrieved via Modbus protocol. A detailed protocol description is enclosed with each DS 400 instrument. When using the Ethernet interface the IP address at DS 400 can be freely adjusted. As an alternative DS 400 waits for the address allocation by a DHCP server.

Functions of the CS Soft Network (Server):
- Automatic data storage in My SQL database (cycle freely programmable)
- User administration
- Configuration alarm message, transmission via SMS/e-mail
- Configuration backup generation

Functions of the CS Soft Network (Client):
- Indication of current measured values
- Graphical chart with zoom function
- In table form
- Report generation (standard report with Min-Max values, number of alarm exceedings, moment of alarm exceeding)
- Automatic consumption report