CS INSTRUMENTS GmbH

INSTRUCTION MANUAL

FA 400

Humidity measuring instruments with display and alarm for **measurement of the pressure dew point and the atmospheric dew point** in different applications:

- compressed air plants (refrigeration/adsorption driers)
- granulate driers
- medical gases
- non-corrosive gases, e. g. nitrogen

V4-02-2011

INTRODUCTION

Dear customer,

Thousands of customers buy our high standard products every year. There are a few good reasons for doing so:

- The cost-performance ratio - reliable quality at a fair price.
- We have the ideal solutions for your measuring tasks based on our expert experience gained over 20 years.
- Our high quality standard.
- Of course, our instruments carry the CE symbol required by the EU.
- We issue calibration certificates and hold seminars.

Our service guarantees fast help.

CE

Measuring instrument conforms with **DIN EN 61326-1 and 61010-1**

SAFETY INSTRUCTIONS

Please read carefully before starting the device!

Attention: Do not exceed a pressure range of > 50 bar with standard version. With special versions up to 350 bar.

Observe measuring ranges of the sensor! The probes will be damages if they are overheated. Observe max. storage and transport temperature as well as max. operating temperature (e. g. protect measuring instrument from direct sunlight).

The manufacturer cannot be held liable for any damage which occurs as a result of non-observance or non-compliance with these instructions. Should the device be tampered with in any matter other than a procedure which is described and specified in the manual, the warranty is cancelled and the manufacturer is exempt from liability.

The device is destined exclusively for the described application.

CS Instruments GmbH offers no guarantee for the suitability for any other purpose and is not liable for errors which may have slipped into this operation manual. CS Instruments GmbH is also not liable for consequential damage resulting from the delivery, capability or use of this device.

We offer you to take back the instruments of the instruments family FA 400 which you would like to dispose of.

Adjustments and calibrations should only be carried out by qualified employees from the measurement and control technology branch.

Important: Before installation briefly bleed the compressed air in order to remove condensate and particles. This prevents soiling of FA 400. Standing air leads to long measuring times.

BESCHREIBUNG

The FA 400 (from -80 bis 20 °Ctd) is the ideal dew point meter with integrated display and alarm relay for refrigeration, membrane and adsorption driers.

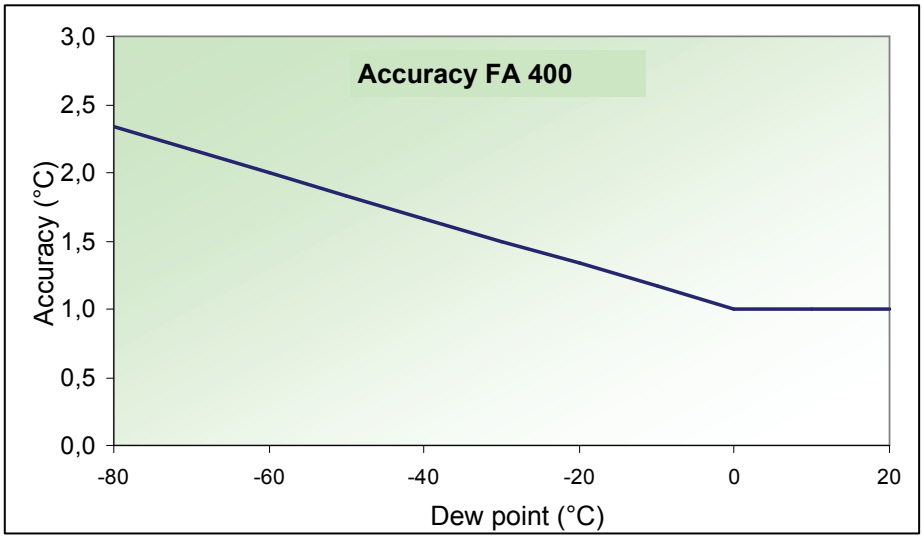
Special features:

- -80 to 20 °Ctd
- Integrated display
- Alarm adjustable via keyboar (60 V, 0.5 A)
- Pressure-tight up to 350 bar (special version)
- Extremely long-term stable langzeitstabil
- Fast response time
- 4...20 mA analogue output
- 2 versions, for refrigeration and for adsortpion driers

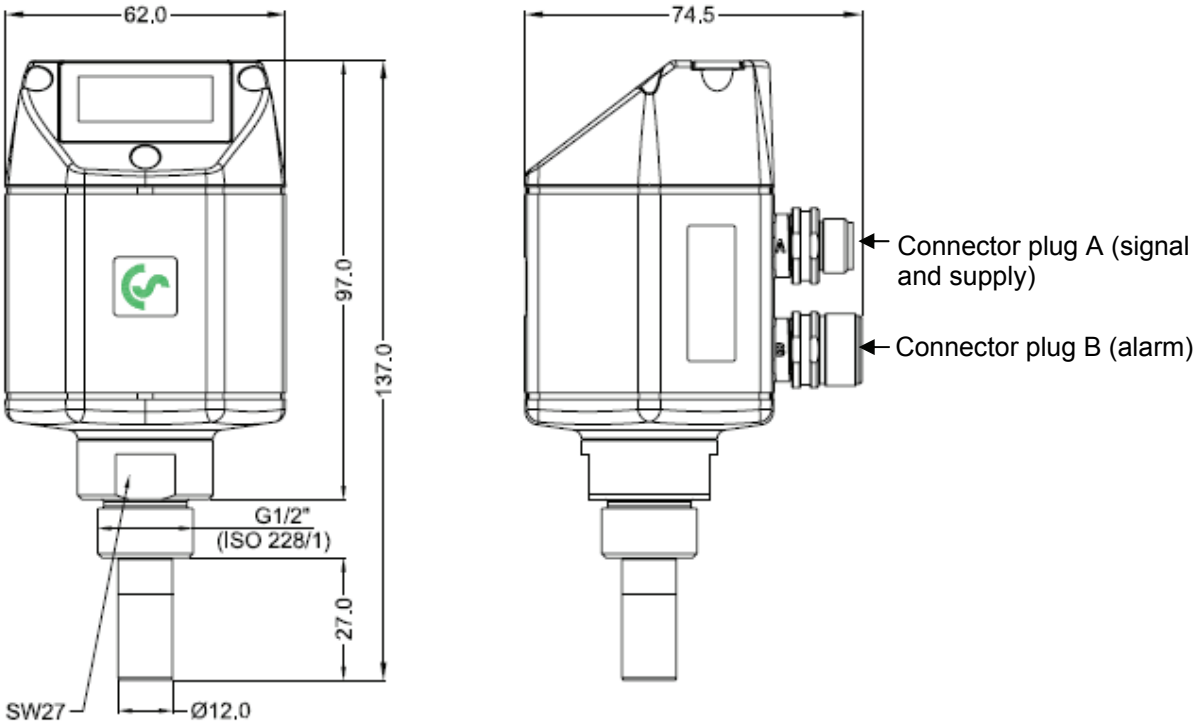
Programming via SFA Software.

- Analogue output 4…20 mA scalable, switching for alarm relay adjustable
- Calibration and ajustment including certificate
- Switching between °Ctd, % RH, g/m³ and so on
- Read out of service data

Measuring range	-80…50 °C pressure dew point resp. dew point in °Ctd 0…100 % RH -30…70 °C
Type 0699.0401, FA 400	-20…50 °Ctd ≙ 4…20 mA
Type 0699.0402, FA 400	-80…20 °Ctd ≙ 4…20 mA
Type 0699.0403, FA 400	-60…30 °Ctd ≙ 4…20 mA
Accuracy:	typical ± 2 °Ctd from -80…-40 °Ctd ± 1,5 °Ctd from -40…0 °Ctd ± 1 °Ctd from 0…20 °Ctd



Pressure range:	-1…50 bar standard, high pressure version up to 350 bar
Power supply:	24 VDC smoothed (16...30 VDC/60 mA)
Output:	4…20 mA 3-Draht-Technik
Protection class:	IP 65
EMV:	DIN EN 61326
Operating temperature:	0…50 °C
Storage temperature:	-40…80 °C
Burden for analogue output:	< 500 Ohm
Screw-in thread:	G 1/2" stainless steel
Material housing:	Zinc alloy, PC, ABS
Sensor protection:	Sintered filter 50 µm stainless steel
Connection:	M12, 5-pole
Response time t95:	< 30 seconds (dry) < 10 seconds (humid)
Display:	4-digit LCD
Alarm relay:	max. 60 V, 0.5 A, NO relay opens in case of alarm and power failure, alarm value adjustable via keyboard, please see page 9



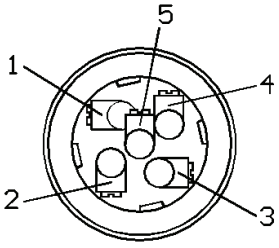
		Pin 1	Pin 2	Pin 3	Pin 4	Pin 5
FA 400	**Connector plug A**	SDI	-VB	+VB	+I 4...20 mA	NC
	Connection cable A 0553.0104 (5 m) 0553.0105 (10 m)	brown	white	blue	black	grey
	Connector plug B	NC	NC	NC	REL	REL
	Connection cable B 0553.0106 (5 m) 0553.0107 (10 m)	NC	NC	NC	black	grey

SDI	Digital Signal (internal data transfer)
-VB	Negative supply voltage 0 V
+VB	Positive supply voltage 16...30 VDC smoothed
+I	Positive 4...20 mA signal
NC	Not connected
REL	Relay output

FA 400: Relay NO (60 V, 0.5 A)
Relay opens in case of alarm and power failure

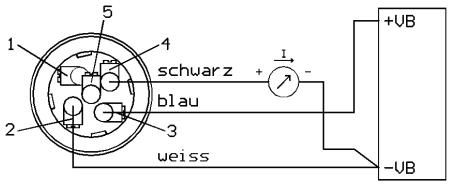
If no connection cable (0553 0104, 0553 0105) is ordered the sensor will be supplied with a M12 connector plug. the user can connect the supply and signal cables as indicated in the connection diagram.

M12 Connector plug A/B

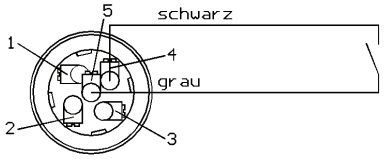


Connector plug

Connector plug A :



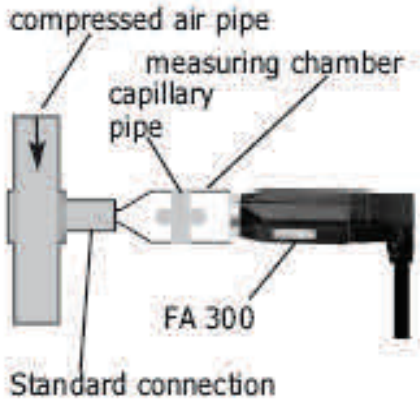
Connector plug B :



Please note : **CS Instruments recommends the indirect installation with measuring chamber**

Advantage : Easy mounting and dismounting of the probe without interruption of the line.
Quick response time due to quick coupling.
Optimum sensor protection.

Indirectly in the compressed air system



Connect probe with measuring chamber to the compessed air pipe by means of a quick coupling. In case of compressed air containing oil and dirt particles a pre-filter should be installed in front of the measuring chamber. Compressed air flows continuously (at 7 bar approx. 1 l/min expanded) in the capillary pipe of the measuring chamber. The reaction times for the humidity reading are shorter than in case of a direct mounting.

Directly in the compressed air system

Screw in probe with G 1/2" thread pressure-tight in the center or at the top of the compressed air pipe. Take care that measurement is effected close to the compressed air flow. U-bend pipes or non-flowing compressed air result in very slow reaction times for the moisture reading.

Measurable gases:

In general, humidity can be measured in all non-corrosive gases. In case of measurements incorrosive gases please consult CS Instruments GmbH.

Display

FA 400 can display up to 3 measured values. This are temperature, rel. humidity and dew point. For better reading only one measured value is displayed. The measured values are toggled during normal operation mode every 3 seconds.

The following changes an be made:

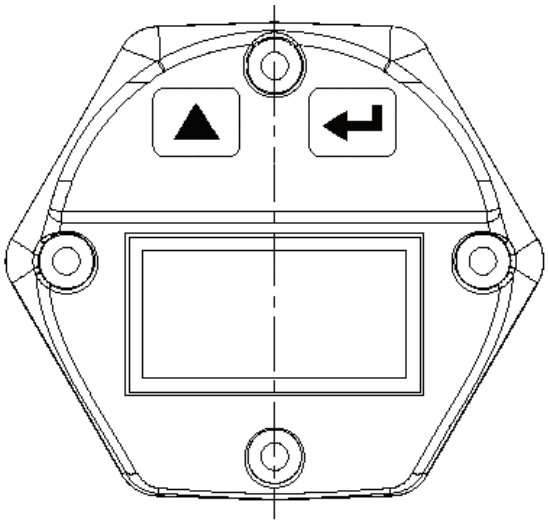
- Alarm value
- Display of measured value (temperature, rel. humidity and dew point)
- Display contrast
- Display upside down

Settings ex work:

- Dew point in °Ctd

Menu buttons

On the top of FA 400 are the capacitive key buttons to operate the display menu.



FA 400 is configured to be connected to DS 300. In this mode, alarm function in FA 400 is disabled and will be handled by DS 300

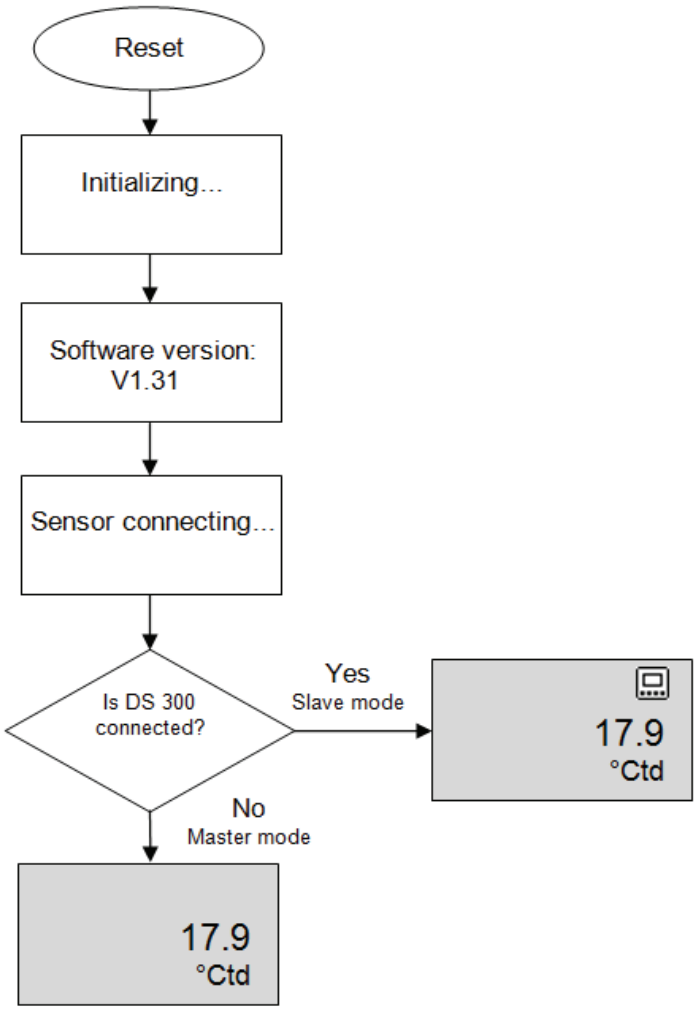
Indicates that an alarm is reached. The relay will be switched and the measurement value is blinking

Connection FA 400

After power on, the display will go through an initialisation procedure and will finally show the actual online value (ex work dew point). Via the configuration menu up to 3 measuring values can be configured for online display. FA 400 will toggle between the measuring values every three seconds.

Display current set alarm value

A short click on the “Enter”-button shows the current set alarm value.
Changing of the alarm value see next page.

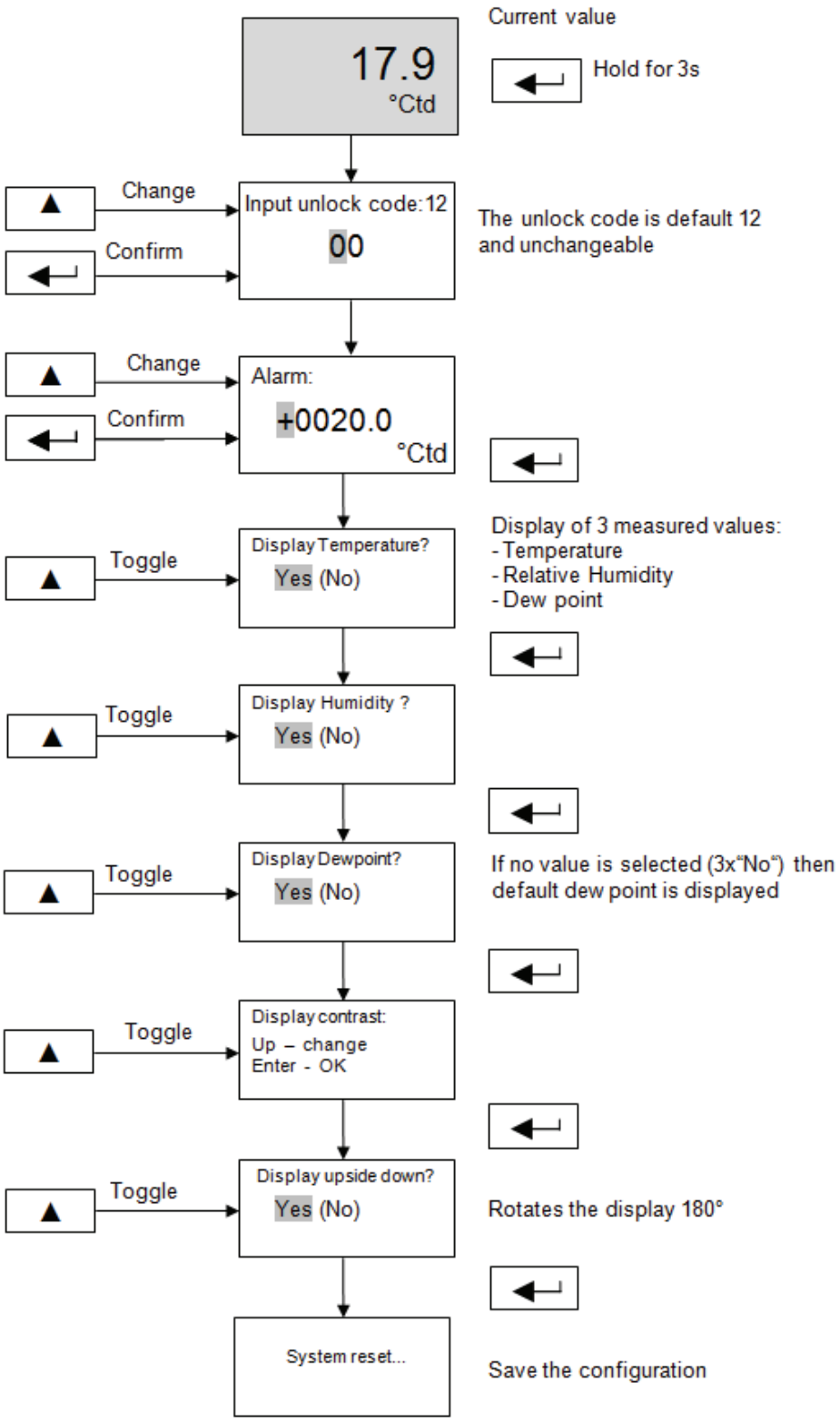


Slave mode
Changing the settings is only possible with DS 300

Master mode
Changing the settings with pusbuttons FA 400

Alarm setting

In order to change the alarm value and the configuration, keep the „Enter“ button pressed for 3 seconds. After input of the unlock code the menu begins with alarm setting. The first digit will start blinking and can be changed with the „Up“ key. Every digit has to be confirmed with the „Enter“ button.



Menu

You can exit the configuration process by pressing and keeping the “Enter” key for 3 sec or no key event for 20sec. The configuration before this picture will be save and effected late.

According to DIN ISO certification of the measuring instruments we recommend to calibrate and if applicable to adjust the instruments regularly from the manufacturer. The calibration intervals should comply with your internal specificaton. According to DIN ISO we recommend a calibration interval of one year for the instrument FA 400.

WARRANTY

If you have reason for complaint we will of course repair any faults free of charge if it can be proven that they are manufacturing faults. The fault should be reported immediately after it has been found and within the warranty time guaranteed by us. Excluded from this warranty is damage caused by improper use and non adherence to the instruction manual.

The warranty is also cancelled once the instrument has been opened - as far as this has not been mentioned in the instruction manual for maintenance purposes - or if the serial number in the instrument has been changed, damaged or removed.

The warranty time for the FA 400 is 12 months. If no other definitions are given the accessory parts have a warranty time of 6 months. Warranty services do not extend the warranty time.

If in addition to the warranty service necessary repairs, adjustments or similar are carried out the warranty services are free of charge but there is a charge for other services such as transport and packaging costs. Other claims, especially those for damage occurring outside the instrument, are not included unless responsibility is legally binding.

After sales service after the warranty time has elapsed
We are of course there for you even after the warranty time has elapsed. In case of malfunctions please send us the instrument with a short-form description of the fault. Please do not forget to indicate your telephone number so that we can call you in case of any questions.

Order no.	Description
0699.0401	FA 400 dew point sensor for refrigeration driers, -20...50 °Ctd
0699.0402	FA 400 dew point sensor for adsorption driers, -80...20 °Ctd
0699.0403	FA 400 dew point sensor, -60...30 °Ctd
0533 0112	Cable FA 200 to FA 400
0553.0104	Connection cable, length 5 m
0553.0105	Connection cable, length 10 m
0553.0106	Alarm cable, length 5 m
0553.0107	Alarm cable, length 10 m
0699.3390	Standard measuring chamber for compressed air up to 16 bar
0699.3590	High pressure measuring chamber up to 350 bar *
0699.3690	Measuring chamber for atmospheric dew point
0699.3790	Measuring chamber for respiratory air bottles up to 350 bar
0699.4004	Special scaling, output in ppm, V/V, % RH, mg/m³
0699.3495	Mains unit in wall housing 230 VAC/24 VDC with alarm processing
0554.0002	Control and calibration set 11.3 % RH
0554.0004	Control and calibration set 33 % RH
0554.0005	Control and calibration set 75.3 % RH
0554.2005	CS Service Software for VA/FA 400 sensors incl. PC connection set, USB connection and interface adapter to the sensor as well as CS Soft Professional incl. USB-cable A-A
3200.0003	Precision calibration at 0 °Ctd and 10 °Ctd incl. ISO certificate
0699.3396	Precision calibration at -40 °Ctd incl. ISO certificate
0699.4003	* Special version FA 400 for 350 bar

Declaration of Conformity

Dew point sensor **FA 400**

CS Instruments GmbH as the manufacturer herewith declares that the above dew point sensor complies with the following directives :

Electro-magnetic compliance	**2004/ 108/ EG**
Low voltage directive	**2006/ 95/ EG**

For assessing the instrument, the following standards have been referred to:

Electromagnetic compatibility

Emitted interference:	DIN EN 61326-1: 2006-10 +DIN EN 61326-1/ Ber.1: 2008-06 +DIN EN 61326-1/ Ber.2: 2011-04
Interference resistance:	DIN EN 61326-1: 2006-10 +DIN EN 61326-1/ Ber.1: 2008-06 +DIN EN 61326-1/ Ber.2: 2011-04

Low voltage derective

Reliability	DIN EN 61010-1: 2002-08 +DIN EN 61010-1/ Ber.1: 2002-11 +DIN EN 61010-1/ Ber.2: 2004-01

Year of first marking with CE label: 07

The product is labeled with the indicated mark CE

CS Instruments GmbH
Zindelsteiner Str. 15
78052 VS-Tannheim

Phone: +49 (0)7705 978 99-0
Fax: +49 (0)7705 978 99-20

Tannheim, 21. April 2011

Wolfgang Blessing, Managing Director

This declaration does not guarantee any procuct characteristics.
Please do also adhere to the safety instructions stated in the enclosed product documentation.

Sales Office SOUTH

Zindelsteiner Str. 15
D-78052 Villingen-Schwenningen

Phone +49 (0) 7705 97 89 9-0
Fax +49 (0) 7705 97 89 9-20

info@cs-instruments.com
www.cs-instruments.com

Sales office NORTH

Am Oxer 28c
D-24955 Harrislee

Phone +49 (0) 461 700 20 25
Fax +49 (0) 461 700 20 26

info@cs-instruments.com
www.cs-instruments.com