



# JUMO CTI-500

## Inductive Conductivity/Concentration and Temperature Transmitter with switch contacts

### Type 202755

### Brief description

The instrument is used for the measurement/control of conductivity or concentration in liquid media. It is particularly suitable for application in media where severe deposits of dirt, oil, grease or gypsum/lime precipitates are to be expected. The integrated temperature measurement enables fast and accurate temperature compensation, which is of special importance when measuring conductivity. Additional functions permit the combined changeover of measuring range and temperature coefficient.

Two built-in switching outputs can be freely programmed to monitor conductivity/concentration and/or temperature limits. It is also possible to assign alarm and control functions (dilution).

The instrument is operated either from the membrane keypad and plain-text graphics display (operator language can be changed over) or through the user-friendly PC setup program. The display can be read off by simply rotating the housing cover. This applies to the installation both in horizontally and vertically arranged pipes. By using the setup program, the instrument configuration data can be saved for plant documentation and printed out. To prevent any tampering, the instrument can also be supplied without keypad or display. In this case, the setup program is needed for programming.

The JUMO CTI-500 is available either as a combined unit (transmitter and measuring cell together in one unit) or as a split version (transmitter and cell connected by cable). The split version is particularly suitable for plant subjected to strong vibration and/or significant heat radiation at the measurement point, or for installation on sites that are difficult to access. Immersion models up to 2000 mm are available for application in open containers or sluices.

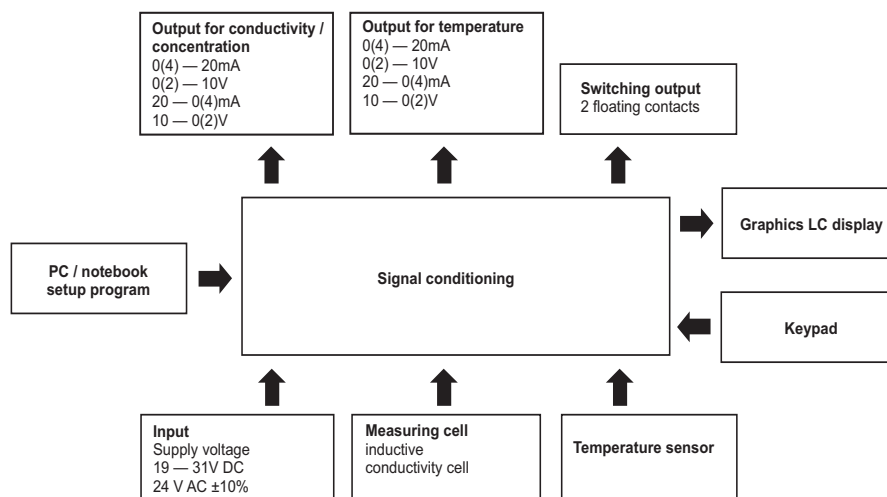
**Typical areas of application:** Freshwater and wastewater engineering, air conditioning systems and cooling tower monitoring (dilution control), rinsing baths (e.g. monitoring electroplating baths), inlet and final checks in factory water treatment plant, concentration monitoring, vehicle wash plant, etc.



### Key features

- Activation of up to four ranges
- Activation of up to four temperature coefficients
- Concentration measurement of
  - caustic soda NaOH
  - nitric acid HNO<sub>3</sub>
  - a freely definable curve (through the setup program)
- Fast-response temperature sensor
- Temperature compensation
  - linear
  - natural water
  - individual characteristic (learning function)
- Operation
  - via keypad and LC display
  - through setup program
- Operator languages: English, French, German, Italian, Dutch, Spanish, Polish, Portuguese, Russian, Swedish
- By using the setup program:
  - user-friendly programming
  - plant documentation
- Learning function for the temperature coefficient
- Individual characteristic for concentration indication
- Dilution control

### Block structure



**JUMO GmbH & Co. KG**  
 Delivery address: Mackenrodtstraße 14  
 36039 Fulda, Germany  
 Postal address: 36035 Fulda, Germany  
 Phone: +49 661 6003-0  
 Fax: +49 661 6003-607  
 Email: mail@jumo.net  
 Internet: www.jumo.net

**JUMO Instrument Co. Ltd.**  
 JUMO House  
 Temple Bank, Riverway  
 Harlow, Essex CM 20 2DY, UK  
 Phone: +44 1279 63 55 33  
 Fax: +44 1279 62 50 29  
 Email: sales@jumo.co.uk  
 Internet: www.jumo.co.uk

**JUMO Process Control, Inc.**  
 6733 Myers Road  
 East Syracuse, NY 13057, USA  
 Phone: +1 315 437 5866  
 Fax: +1 315 437 5860  
 Email: info.us@jumo.net  
 Internet: www.jumousa.com



## Functional description

The inductive measurement method permits largely maintenance-free acquisition of the specific conductivity, even in the toughest media conditions. As opposed to the conductive measurement method, problems such as electrode decomposition and polarization do not occur.

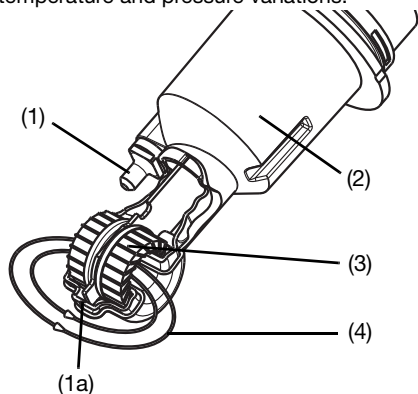
The conductivity is measured using an inductive probe. A sinusoidal a.c. voltage feeds the transmitting coil. Depending on the conductivity of the liquid to be measured, a current is induced in the receiver coil. The current is proportional to the conductivity of the medium.

## Instrument description

### Measuring cell

The measuring cell consists of a hermetically sealed polypropylene (PP) or polyvinylidene fluoride (PVDF) body inside which the two measurement coils are arranged. A bore in the measuring cell enables the medium to flow through. The measurement principle entails an inevitable electrical isolation between the sample medium and the signal output.

The measuring cell is largely unaffected by temperature and pressure variations.



- (1) Temperature sensor, exposed
- (1a) optionally: internal
- (2) Cell body in PP
- (3) Measurement coils
- (4) Liquid loop

### Exposed temperature sensor

The sensor (in a stainless steel sleeve) exhibits a very fast response to temperature variations. This is especially important for CIP processes (phase separation).

### Internal temperature sensor

The sensor is integrated in the PP body. This construction ensures that no metal parts come into contact with the sample medium (important with corrosive media). However, temperature acquisition is somewhat slower here.

## Temperature compensation

Since conductivity largely depends on the temperature of the medium, it is usually necessary to compensate for the temperature effect.

The instrument allows both linear and non-linear temperature compensation.

If required, temperature compensation can be switched off, for example, when the temperature conditions on the measurement site are stable or when temperature compensation is carried out in the software, in external evaluation devices (PLC or similar).

## Process connections

To cover a wide variety of applications, the instrument can be supplied with different process connections (also as an immersion model), see dimensions.

## Installation at the measurement point

The operating position is generally unrestricted. However, it is essential to ensure that there is a continuous exchange of the sample liquid in the flow channel.

## Transmitter

The CTI-500 transmitter has been designed for use on site. A rugged housing protects the electronics and the electrical connections from corrosive environmental conditions (IP67).

A vent screw with a PTFE membrane prevents condensation.

## Operation

The JUMO CTI-500 can be operated either from the instrument keys and the graphics LC display and/or through the setup program from a PC or laptop.

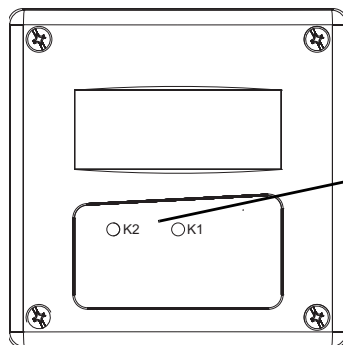
The instrument can be secured against unauthorized alteration by a password.

## Functions of the outputs

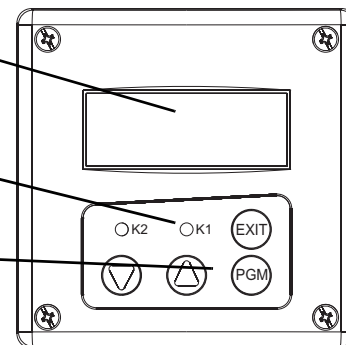
### Analog outputs

- One analog signal output for conductivity/concentration and temperature respectively.
- The analog output signals are freely scalable (range start and end values).
- The response of the analog outputs to over/underrange or alarm can be programmed.
- Simulation of the signal output:  
 The analog signal outputs can be freely set in the manual mode.  
 Application: "Dry-run" start-up of the plant, trouble-shooting, servicing.

## Displays and controls



Version without a display  
 Operation/configuration through the setup program only

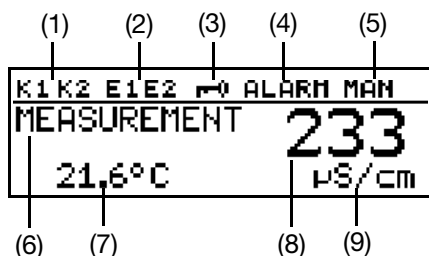


Version with a display  
 Operation/configuration from the keys or through the setup program

- (1) Graphics LC display
- (2) LEDs for the switching status indication of the outputs K1 and K2
- (3) Keys



## Graphics LC display



- (1) Switching output 1 or 2 is active
- (2) Binary input 1 or 2 is operated
- (3) Keypad is inhibited
- (4) Alarm has been activated
- (5) Instrument is in manual mode
- (6) Instrument status
- (7) Temperature of medium
- (8) Conductivity measurement
- (9) Unit of conductivity measurement

## Switching outputs

The instrument features two floating switching outputs (solid-state relays) as standard.

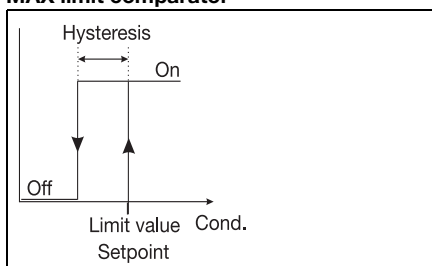
These can be used freely for monitoring the conductivity/concentration or the temperature.

The following functions can be assigned:

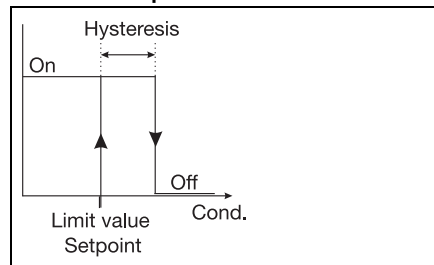
- Limit monitoring (MAX. or MIN. limit comparator) with programmable hysteresis
- Pulse function (the output switches briefly on reaching the switching point, then opens again).
- Pull-in and drop-out delay
- Inverted switching outputs
- Response to overrange/underrange or with activated measuring circuit monitoring (pull-in/drop-out).
- "Calibration timer run down" signal.

## Contact functions

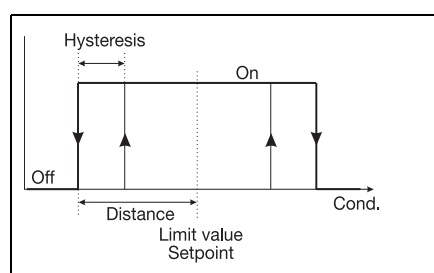
### MAX limit comparator



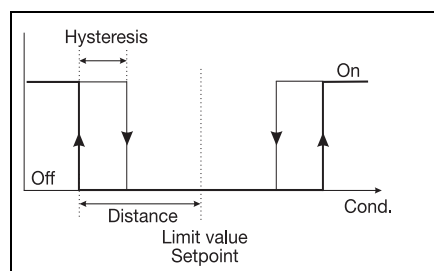
### MIN limit comparator



### Alarm window 1

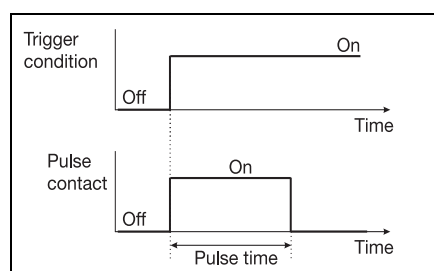


### Alarm window 2



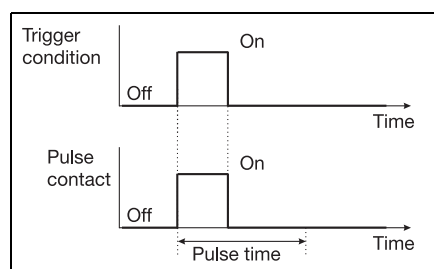
### Pulse contact

#### Trigger conditions longer than pulse time



### Pulse contact

#### Trigger conditions shorter than pulse time



## Binary inputs

The two binary inputs serve to implement the following functions:

- Key inhibit
- HOLD mode
- 4-fold range changeover
- 4-fold temperature coefficient changeover
- Initiation of dilution function and biocide dosing

## Special functions

- The learning function for the temperature coefficient enables exact measurement of media with a non-linear characteristic. During a temperature change, the instrument "learns" the temperature coefficient of the present medium and stores the profile. The stored values then enable the correct indication of the temperature-compensated conductivity.

- Individual characteristic for concentration indication.

An individual characteristic with 20 interpolation points can be entered through the setup program. This function can be used to generate special characteristics for specific media (e.g. special detergents). This results in correct measurements that contribute to assuring the quality and saving costs.

- Dilution control  
 Various processes that find their application in wet cooling towers are stored as sequence control (biocide dosing and subsequent inhibiting of dilution). Additional information can be found in the operating manual.

- Calibration timer  
 The calibration timer draws your attention to a calibration schedule. This function is activated by entering a number of days, after which recalibration has to be carried out (plant or operator requirement).

**JUMO GmbH & Co. KG**  
 Delivery address: Mackenrodtstraße 14  
 36039 Fulda, Germany  
 Postal address: 36035 Fulda, Germany  
 Phone: +49 661 6003-0  
 Fax: +49 661 6003-607  
 Email: mail@jumo.net  
 Internet: www.jumo.net

**JUMO Instrument Co. Ltd.**  
 JUMO House  
 Temple Bank, Riverway  
 Harlow, Essex CM 20 2DY, UK  
 Phone: +44 1279 63 55 33  
 Fax: +44 1279 62 50 29  
 Email: sales@jumo.co.uk  
 Internet: www.jumo.co.uk

**JUMO Process Control, Inc.**  
 6733 Myers Road  
 East Syracuse, NY 13057, USA  
 Phone: +1 315 437 5866  
 Fax: +1 315 437 5860  
 Email: info.us@jumo.net  
 Internet: www.jumousa.com



**Function of the binary inputs**

Setting parameters	Binary input 1	Binary input 2
Measuring range/ temperature coefficient changeover	Range1/TC1	open
	Range2/TC2	closed
	Range3/TC3	open
	Range4/TC4	closed
Key inhibit	closed	X
“Hold” function	X	closed
Start dilution function	close (edge 0 - 1)	open
Stop dilution function	open	close (edge 0 - 1)

Meas. ranges Transmitter	Tolerance (in % of range span)
0 – 500 µS/cm	≤0.5 %
0 – 1000 µS/cm	
0 – 2000 µS/cm	
0 – 5000 µS/cm	
0 – 10 mS/cm	
0 – 20 mS/cm	
0 – 50 mS/cm	
0 – 100 mS/cm	
0 – 200 mS/cm	
0 – 500 mS/cm	
0 – 1000 mS/cm	
0 – 2000 mS/cm <sup>a</sup>	

<sup>a</sup> not compensated for temperature

**Note:**

The overall tolerance is made up of the tolerance of the transmitter + the tolerance of the sensor.

**Technical data**

**General**

**A/D converter**

resolution: 15 bit  
 sampling time: 500msec = 2 meas. per sec

**Supply**

For operation with SELV and PELV circuits.  
 As standard:  
 19 – 31 V DC (24 V DC nominal),  
 the instrument incorporates reverse-polarity protection  
 ripple: < 5 %  
 extra code 844:  
 24 V AC ±10 %, 50 – 60 Hz  
 power consumption  
 with display: ≤ 3 W  
 power consumption  
 without display: ≤ 2.6 W

**Rating of the solid-state relays**

U < 50 V AC/DC  
 I ≤ 200 mA

**Electrical connection**

plug-in screw terminals 2.5 mm<sup>2</sup> or M12 plug/socket connectors

**Display (option)**

graphics LCD with background lighting;  
 contrast is adjustable  
 dimensions: 62 x 23 mm

**Permissible ambient temp. (transmitter)**

-5 to +50 °C  
 max. 93 % rel. humidity, no condensation

**Permissible storage temp. (transmitter)**

-10 to +75 °C  
 max. 93 % rel. humidity, no condensation

**Enclosure protection (transmitter)**

IP67

**Housing**

polyamide (PA)

**Weight**

depending on version and process connection  
 approx. 0.3 – 2 kg

**Conductivity/concentration transmitter**

**Concentration measurement**  
 (implemented in the instrument software)

- NaOH (caustic soda)  
 0 – 15 % by weight or 25 – 50 % by weight
- HNO<sub>3</sub> (nitric acid)  
 0 – 25 % by weight or 36 – 82 % by weight
- customer-specific concentration curve,  
 reely programmable through the setup program (see “special functions”)

**Calibration timer**

adjustable: 0 – 999 days (0 = off)

**Output signal for conductivity/  
 concentration**

0 – 10 V / 10 – 0 V  
 2 – 10 V / 10 – 2 V  
 0 – 20 mA / 20 – 0 mA  
 4 – 20 mA / 20 – 0.4 mA  
 The output signal is freely scalable.

**Burden**

≤ 500Ω for current output  
 ≥ 2kΩ for voltage output

**Analog output with “Alarm”**

Low (0 mA / 0 V / 3.4 mA / 1.4 V)  
 or  
 High (22.0 mA / 10.7 V)  
 or  
 a fixed setting

**Measuring ranges**

Four ranges can be selected. One of these ranges can be activated via an external switch or a PLC.

**Temperature transmitter**

**Temperature acquisition**

manually -200 to 25.0 to 150 °C/°F  
 or automatically

**Temperature measuring range**

-200 to 150 °C/°F

**Characteristic**

linear

**Accuracy**

≤ 0.5 % of measuring range

**Ambient temperature error**

≤ 0.1 % / °C

**Response time**

with exposed temperature sensor  
 t<sub>09</sub> ≤ 6 sec  
 with internal temperature sensor  
 t<sub>09</sub> ≤ 2 min

**Output signal for temperature**

0 – 10 V / 10 – 0 V  
 2 – 10 V / 10 – 2 V  
 0 – 20 mA / 20 – 0 mA  
 4 – 20 mA / 20 – 0.4 mA  
 The output signal is freely scalable within the range -20 to +200 °C.  
 The sensor can be applied within the range -10 to +100 °C.

**Burden**

≤ 500Ω for current output  
 ≥ 2kΩ for voltage output

**JUMO GmbH & Co. KG**  
 Delivery address: Mackenrodtstraße 14  
 36039 Fulda, Germany  
 Postal address: 36035 Fulda, Germany  
 Phone: +49 661 6003-0  
 Fax: +49 661 6003-607  
 Email: mail@jumo.net  
 Internet: www.jumo.net

**JUMO Instrument Co. Ltd.**  
 JUMO House  
 Temple Bank, Riverway  
 Harlow, Essex CM 20 2DY, UK  
 Phone: +44 1279 63 55 33  
 Fax: +44 1279 62 50 29  
 Email: sales@jumo.co.uk  
 Internet: www.jumo.co.uk

**JUMO Process Control, Inc.**  
 6733 Myers Road  
 East Syracuse, NY 13057, USA  
 Phone: +1 315 437 5866  
 Fax: +1 315 437 5860  
 Email: info.us@jumo.net  
 Internet: www.jumousa.com



**Analog output for "Alarm"**

Low (0 mA / 0 V / 3.4 mA / 1.4 V)  
 or  
 High (22.0 mA / 10.7 V)  
 or  
 a fixed setting

**Temperature compensation**

**Reference temperature**

15 to 30 °C, adjustable

**Temperature coefficient**

0.0 to 5.5 %/°C, adjustable

**Compensation range**

-20 to 150 °C

**Function**

- linear
- natural water (EN 27 888)
- non-linear (learning function, see special functions)

**Sensor**

**Material**

PP (polypropylene), suitable for foodstuffs

**Note:**

Temperature, pressure and sample medium affect the life of the cell!

**Temperature of the sample medium**

Process-connection	max. temperature
168 706	60 °C
169 607 617 690	80 °C short term 100 °C

**Pressure**

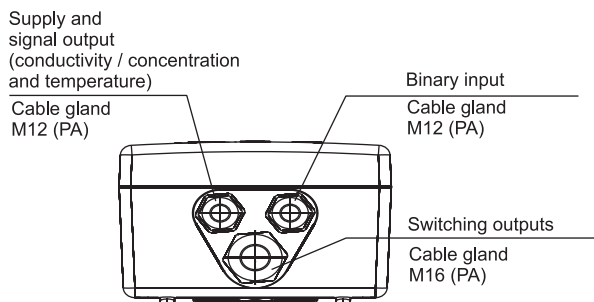
10 bar max. at 20 °C  
 6 bar max. at 60 °C

Measuring range Sensor	Tolerance (in % of range span)
0 – 500 µS/cm	≤1%
0 – 1000 µS/cm	
0 – 2000 µS/cm	≤0.5%
0 – 5000 µS/cm	
0 – 10 mS/cm	
0 – 20 mS/cm	
0 – 50 mS/cm	
0 – 100 mS/cm	
0 – 200 mS/cm	
0 – 500 mS/cm	≤1%
0 – 1000 mS/cm	
0 – 2000 mS/cm <sup>a1</sup>	

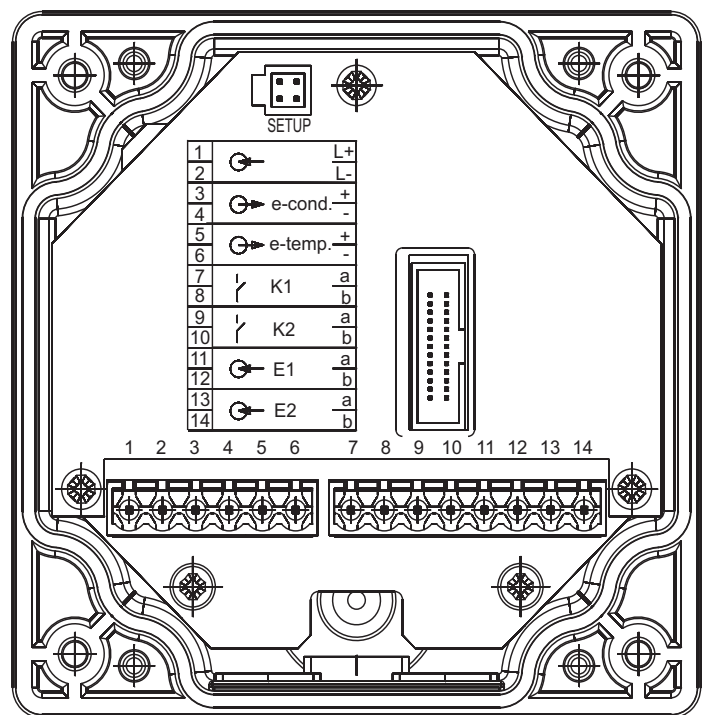
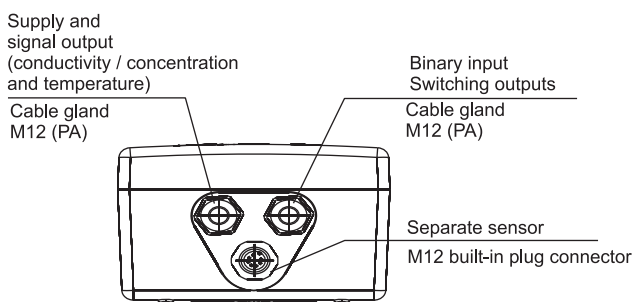
<sup>a</sup> not compensated for temperature.

**Electrical connection - head transmitter (transmitter with cable glands (-82))**

**Wiring recommendation - head transmitter**



**Wiring recommendation - with separate sensor**



**JUMO GmbH & Co. KG**  
 Delivery address: Mackenrodtstraße 14  
 36039 Fulda, Germany  
 Postal address: 36035 Fulda, Germany  
 Phone: +49 661 6003-0  
 Fax: +49 661 6003-607  
 Email: mail@jumo.net  
 Internet: www.jumo.net

**JUMO Instrument Co. Ltd.**  
 JUMO House  
 Temple Bank, Riverway  
 Harlow, Essex CM 20 2DY, UK  
 Phone: +44 1279 63 55 33  
 Fax: +44 1279 62 50 29  
 Email: sales@jumo.co.uk  
 Internet: www.jumo.co.uk

**JUMO Process Control, Inc.**  
 6733 Myers Road  
 East Syracuse, NY 13057, USA  
 Phone: +1 315 437 5866  
 Fax: +1 315 437 5860  
 Email: info.us@jumo.net  
 Internet: www.jumousa.com



Supply	Terminal assignment	Symbol
Supply (with reverse-polarity protection)	1 L + 2 L -	

Outputs	Terminal assignment	Symbol
Analog signal output: conductivity/ concentration (electrically isolated)	3 + 4 -	
Analog signal output: temperature (electrically isolated)	5 + 6 -	
Switching output K1 (floating)	7 8	
Switching output K2 (floating)	9 10	

Binary inputs	Terminal assignment	Symbol
Binary input E1	11 12	
Binary input E2	13 14	

**JUMO GmbH & Co. KG**  
 Delivery address: Mackenrodtstraße 14  
 36039 Fulda, Germany  
 Postal address: 36035 Fulda, Germany  
 Phone: +49 661 6003-0  
 Fax: +49 661 6003-607  
 Email: mail@jumo.net  
 Internet: www.jumo.net

**JUMO Instrument Co. Ltd.**  
 JUMO House  
 Temple Bank, Riverway  
 Harlow, Essex CM 20 2DY, UK  
 Phone: +44 1279 63 55 33  
 Fax: +44 1279 62 50 29  
 Email: sales@jumo.co.uk  
 Internet: www.jumo.co.uk

**JUMO Process Control, Inc.**  
 6733 Myers Road  
 East Syracuse, NY 13057, USA  
 Phone: +1 315 437 5866  
 Fax: +1 315 437 5860  
 Email: info.us@jumo.net  
 Internet: www.jumousa.com



## Electrical connection (transmitter with M12 connectors (-83))

### Head transmitter

Connector I

Supply and signal output for conductivity / concentration

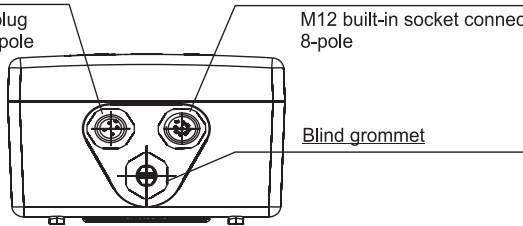
M12 built-in plug connector, 5-pole

Connector II

Signal output for temperature and binary input  
Switching outputs

M12 built-in socket connector 8-pole

Blind grommet



### Transmitter with separate sensor

Connector I

Supply and signal output for conductivity / concentration

M12 built-in plug connector, 5-pole

Connector II

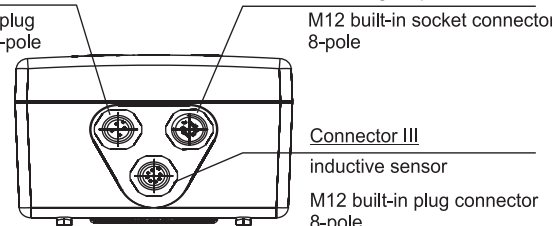
Signal output for temperature and binary input  
Switching outputs

M12 built-in socket connector 8-pole

Connector III

inductive sensor

M12 built-in plug connector 8-pole



Supply	Connector	Assignment	Symbol
Supply (with reverse-polarity protection)	I	L+ L-	

Outputs	Connector	Assignment	Symbol
Analog signal output: conductivity / concentration (electrically isolated)	I		
Analog signal output: temperature (electrically isolated)	II		
Switching output K1 (floating)	II		
Switching output K2 (floating)	II		

Binary inputs	Connector	Assignment	Symbol
Binary input E1	I II		
Binary input E2	I II		



**JUMO GmbH & Co. KG**  
 Delivery address: Mackenrodtstraße 14  
 36039 Fulda, Germany  
 Postal address: 36035 Fulda, Germany  
 Phone: +49 661 6003-0  
 Fax: +49 661 6003-607  
 Email: mail@jumo.net  
 Internet: www.jumo.net

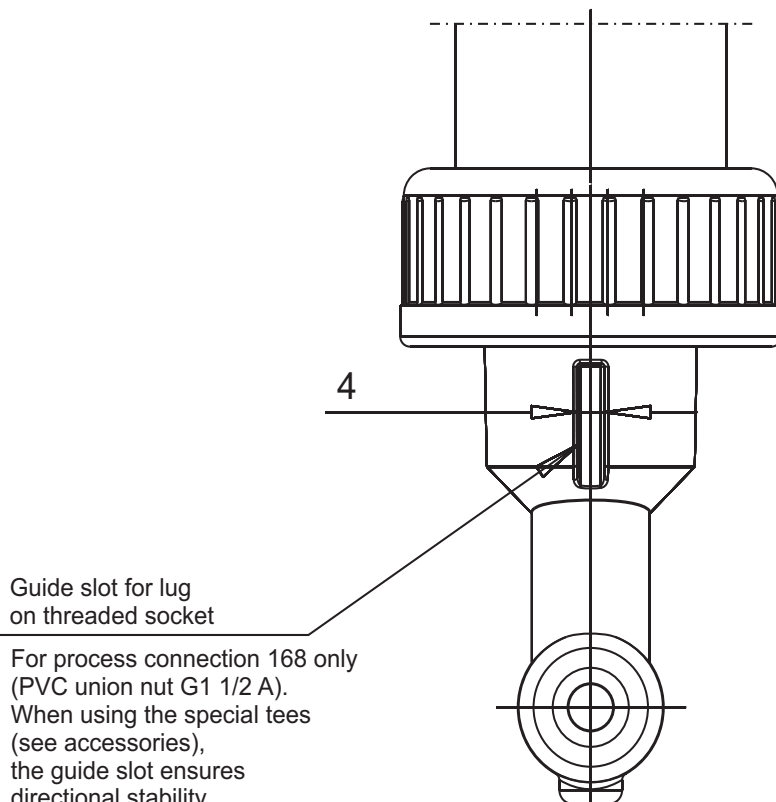
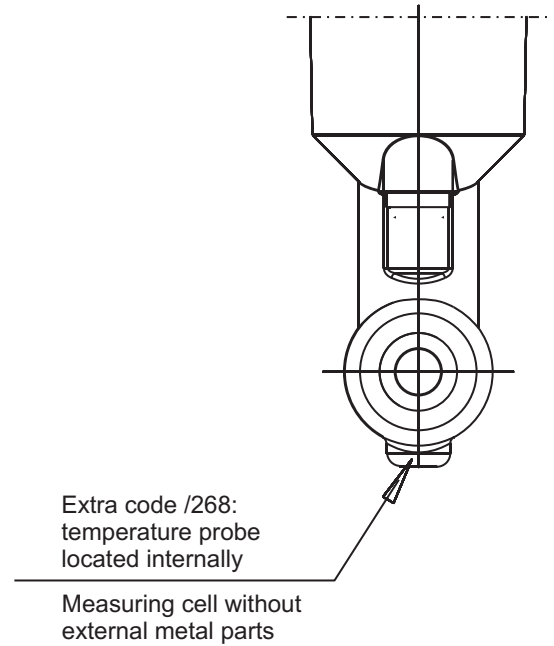
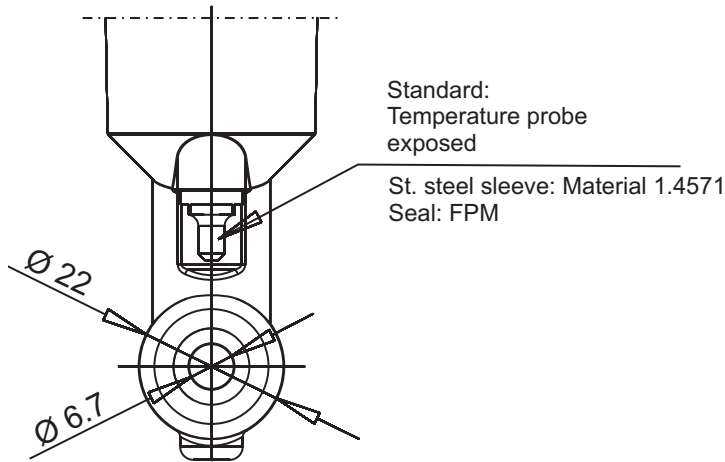
**JUMO Instrument Co. Ltd.**  
 JUMO House  
 Temple Bank, Riverway  
 Harlow, Essex CM 20 2DY, UK  
 Phone: +44 1279 63 55 33  
 Fax: +44 1279 62 50 29  
 Email: sales@jumo.co.uk  
 Internet: www.jumo.co.uk

**JUMO Process Control, Inc.**  
 6733 Myers Road  
 East Syracuse, NY 13057, USA  
 Phone: +1 315 437 5866  
 Fax: +1 315 437 5860  
 Email: info.us@jumo.net  
 Internet: www.jumousa.com



## Dimensions

### Sensor (detail)



For process connection 168 only  
 (PVC union nut G1 1/2 A).  
 When using the special tees  
 (see accessories),  
 the guide slot ensures  
 directional stability.  
 The cell can only be installed  
 in the correct orientation.



**JUMO GmbH & Co. KG**  
 Delivery address: Mackenrodtstraße 14  
 36039 Fulda, Germany  
 Postal address: 36035 Fulda, Germany  
 Phone: +49 661 6003-0  
 Fax: +49 661 6003-607  
 Email: mail@jumo.net  
 Internet: www.jumo.net

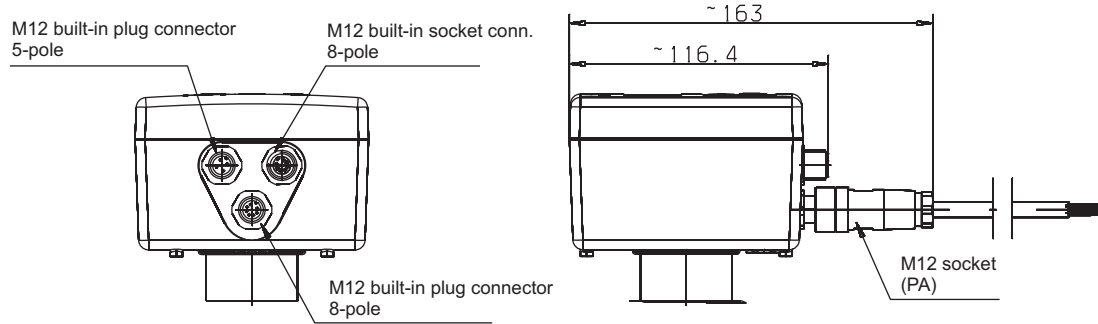
**JUMO Instrument Co. Ltd.**  
 JUMO House  
 Temple Bank, Riverway  
 Harlow, Essex CM 20 2DY, UK  
 Phone: +44 1279 63 55 33  
 Fax: +44 1279 62 50 29  
 Email: sales@jumo.co.uk  
 Internet: www.jumo.co.uk

**JUMO Process Control, Inc.**  
 6733 Myers Road  
 East Syracuse, NY 13057, USA  
 Phone: +1 315 437 5866  
 Fax: +1 315 437 5860  
 Email: info.us@jumo.net  
 Internet: www.jumousa.com



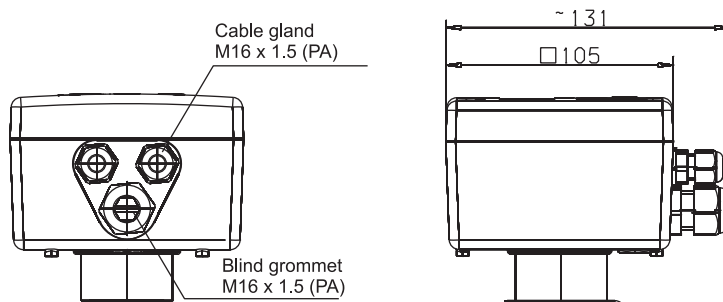
## Dimensions

### Transmitter with M12 plug connectors and M12 socket connectors



### Transmitter with M16 cable gland

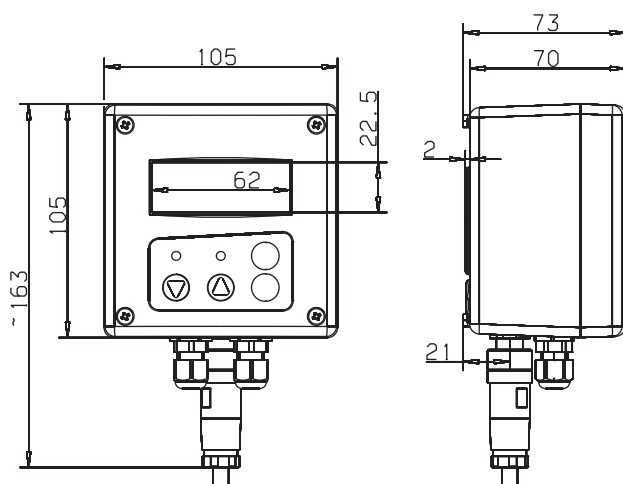
(only for the "head transmitter" model)



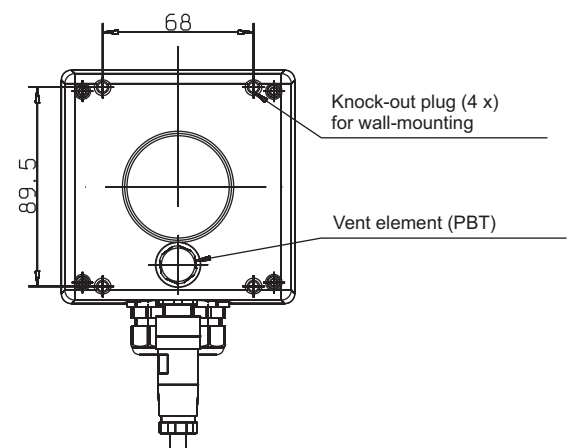
### Version:

### Transmitter with separate sensor (split version)

(basic type extensions /20, /25, /60 or /65)



### Drilling diagram



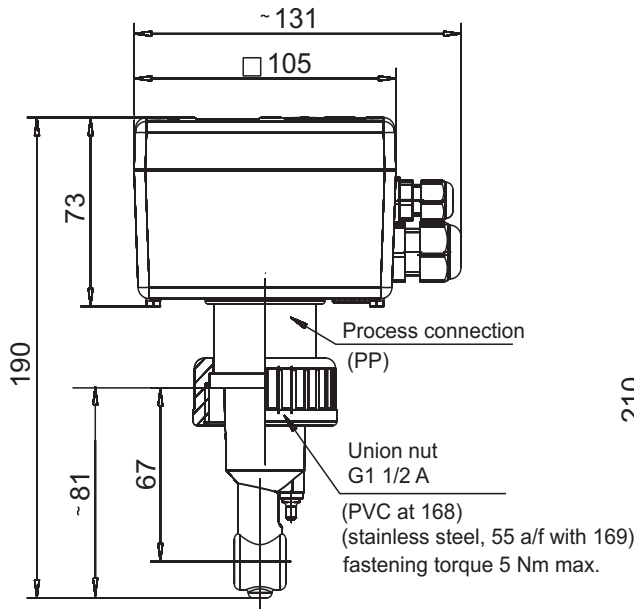
**JUMO GmbH & Co. KG**  
 Delivery address: Mackenrodtstraße 14  
 36039 Fulda, Germany  
 Postal address: 36035 Fulda, Germany  
 Phone: +49 661 6003-0  
 Fax: +49 661 6003-607  
 Email: mail@jumo.net  
 Internet: www.jumo.net

**JUMO Instrument Co. Ltd.**  
 JUMO House  
 Temple Bank, Riverway  
 Harlow, Essex CM 20 2DY, UK  
 Phone: +44 1279 63 55 33  
 Fax: +44 1279 62 50 29  
 Email: sales@jumo.co.uk  
 Internet: www.jumo.co.uk

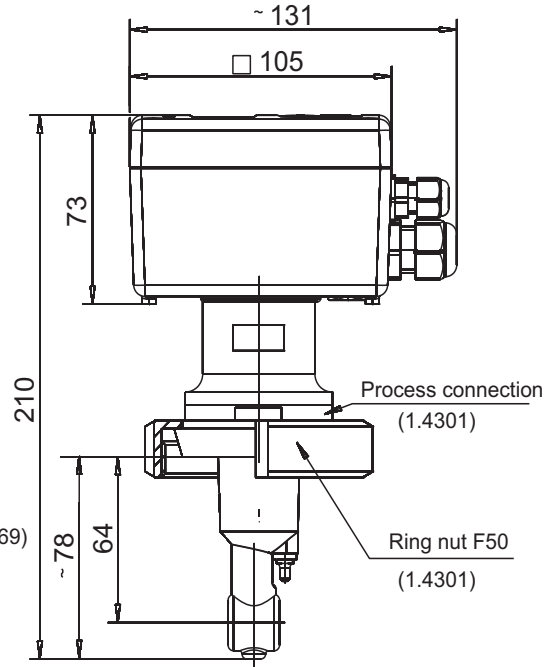
**JUMO Process Control, Inc.**  
 6733 Myers Road  
 East Syracuse, NY 13057, USA  
 Phone: +1 315 437 5866  
 Fax: +1 315 437 5860  
 Email: info.us@jumo.net  
 Internet: www.jumousa.com



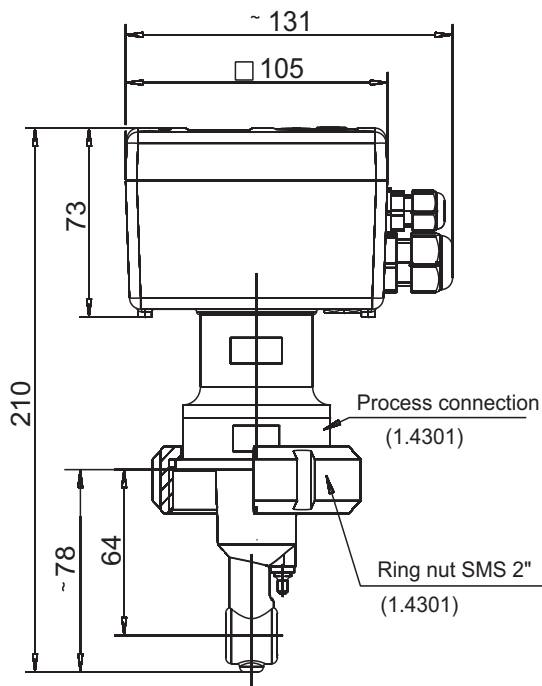
## Dimensions / Process connections (head transmitter)



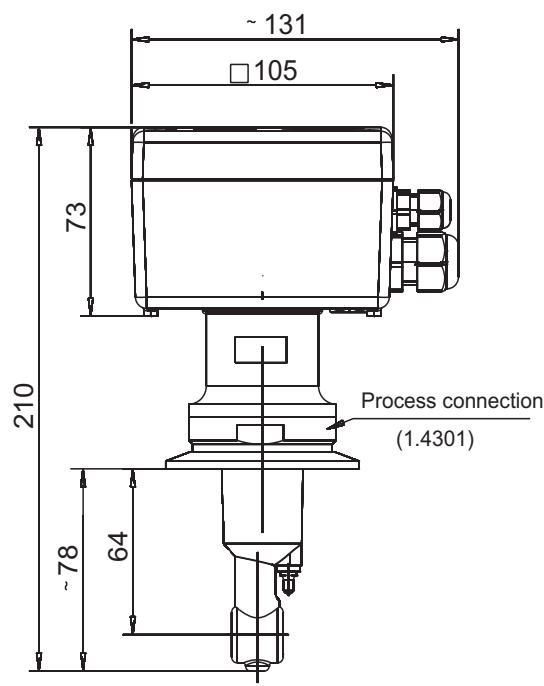
Version with process connection 168  
 DN32 and DN40



Version with process connection 607  
 MK DN40



Version with process connection 690  
 SMS 2"



Version with process connection 617  
 Clamp 2 1/2"  
 (retaining clip is not included in delivery)

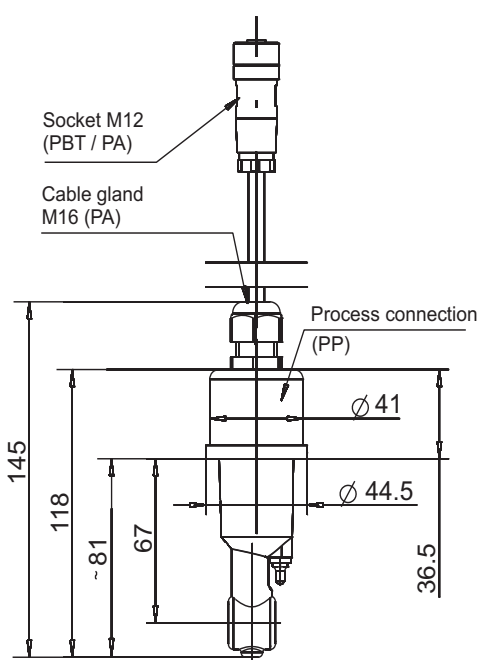
**JUMO GmbH & Co. KG**  
 Delivery address: Mackenrodtstraße 14  
 36039 Fulda, Germany  
 Postal address: 36035 Fulda, Germany  
 Phone: +49 661 6003-0  
 Fax: +49 661 6003-607  
 Email: mail@jumo.net  
 Internet: www.jumo.net

**JUMO Instrument Co. Ltd.**  
 JUMO House  
 Temple Bank, Riverway  
 Harlow, Essex CM 20 2DY, UK  
 Phone: +44 1279 63 55 33  
 Fax: +44 1279 62 50 29  
 Email: sales@jumo.co.uk  
 Internet: www.jumo.co.uk

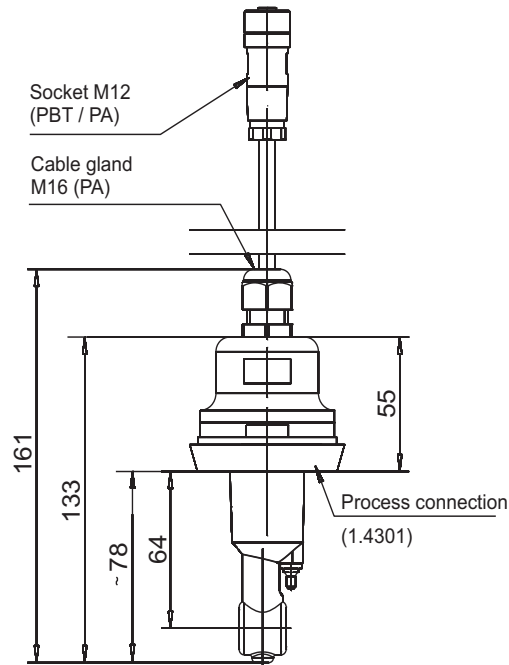
**JUMO Process Control, Inc.**  
 6733 Myers Road  
 East Syracuse, NY 13057, USA  
 Phone: +1 315 437 5866  
 Fax: +1 315 437 5860  
 Email: info.us@jumo.net  
 Internet: www.jumousa.com



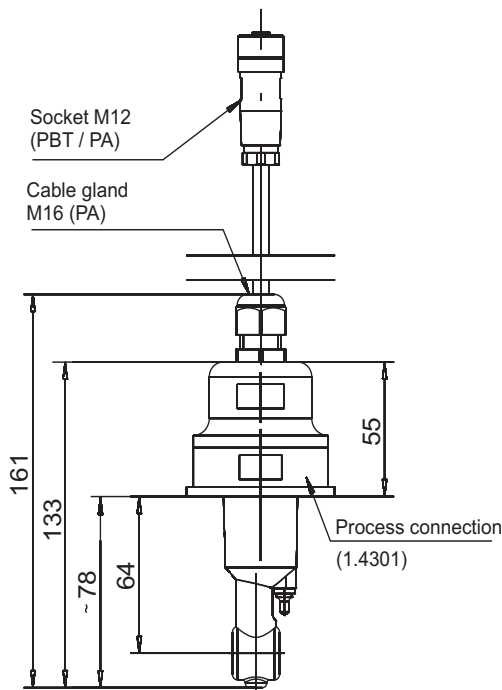
## Dimensions / Process connections (separate sensor)



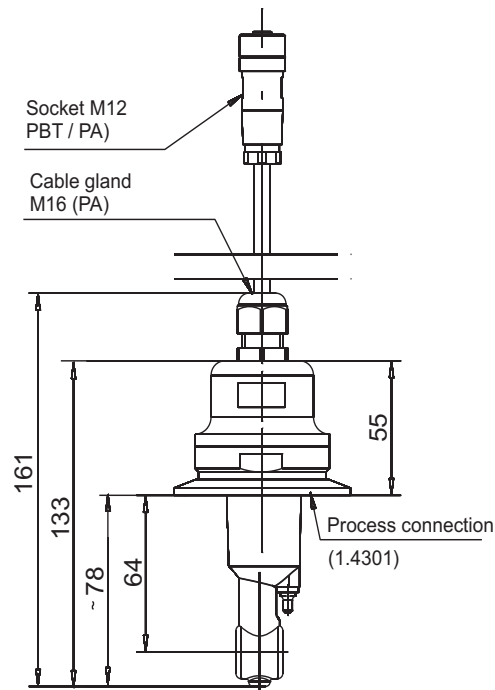
Split version  
 for process connection 168 and 169  
 DN32 and DN40  
 (union nut not included  
 in delivery)



Split version  
 for process connection 607  
 MK DN50  
 (union nut not included  
 in delivery)



Split version  
 for process connection 690  
 SMS 2"  
 (union nut not included  
 in delivery)



Split version  
 for process connection 617  
 Clamp 2 1/2"  
 (retaining clip not included  
 in delivery)

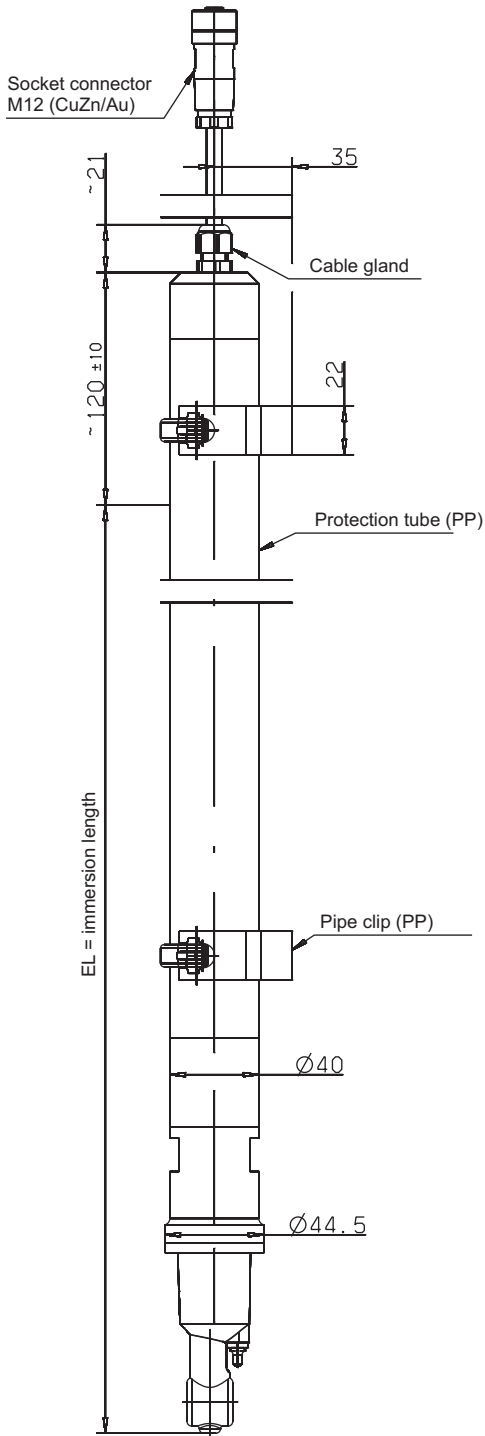
**JUMO GmbH & Co. KG**  
 Delivery address: Mackenrodtstraße 14  
 36039 Fulda, Germany  
 Postal address: 36035 Fulda, Germany  
 Phone: +49 661 6003-0  
 Fax: +49 661 6003-607  
 Email: mail@jumo.net  
 Internet: www.jumo.net

**JUMO Instrument Co. Ltd.**  
 JUMO House  
 Temple Bank, Riverway  
 Harlow, Essex CM 20 2DY, UK  
 Phone: +44 1279 63 55 33  
 Fax: +44 1279 62 50 29  
 Email: sales@jumo.co.uk  
 Internet: www.jumo.co.uk

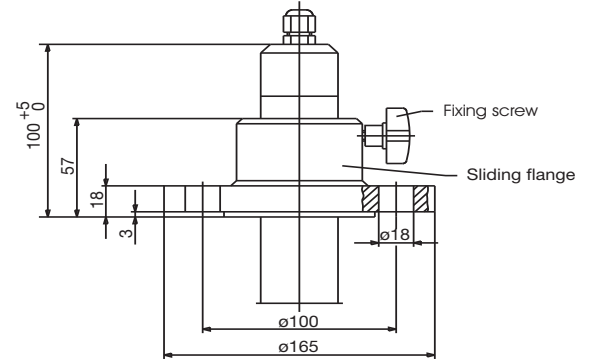
**JUMO Process Control, Inc.**  
 6733 Myers Road  
 East Syracuse, NY 13057, USA  
 Phone: +1 315 437 5866  
 Fax: +1 315 437 5860  
 Email: info.us@jumo.net  
 Internet: www.jumousa.com



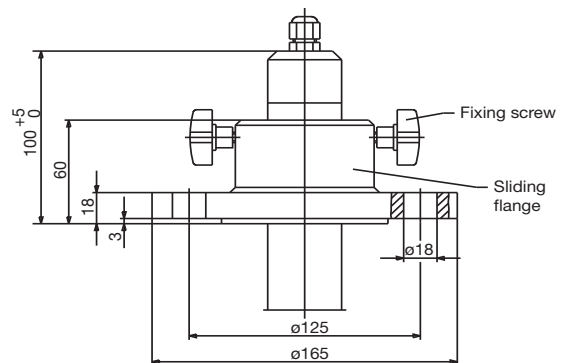
**Dimensions (separate sensor as immersion model)**



Split version  
 for process connection 706  
 immersion model  
 (pipe clips included in delivery)



Optional accessory:  
 flange DN32, part no. 00083375



Optional accessory:  
 flange DN50, part no. 00083376

**JUMO GmbH & Co. KG**  
 Delivery address: Mackenrodtstraße 14  
 36039 Fulda, Germany  
 Postal address: 36035 Fulda, Germany  
 Phone: +49 661 6003-0  
 Fax: +49 661 6003-607  
 Email: mail@jumo.net  
 Internet: www.jumo.net

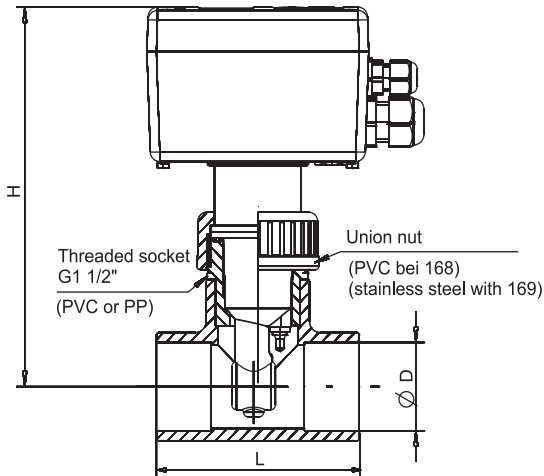
**JUMO Instrument Co. Ltd.**  
 JUMO House  
 Temple Bank, Riverway  
 Harlow, Essex CM 20 2DY, UK  
 Phone: +44 1279 63 55 33  
 Fax: +44 1279 62 50 29  
 Email: sales@jumo.co.uk  
 Internet: www.jumo.co.uk

**JUMO Process Control, Inc.**  
 6733 Myers Road  
 East Syracuse, NY 13057, USA  
 Phone: +1 315 437 5866  
 Fax: +1 315 437 5860  
 Email: info.us@jumo.net  
 Internet: www.jumousa.com



## Mounting examples

Version with  
 process connection 168 and 169

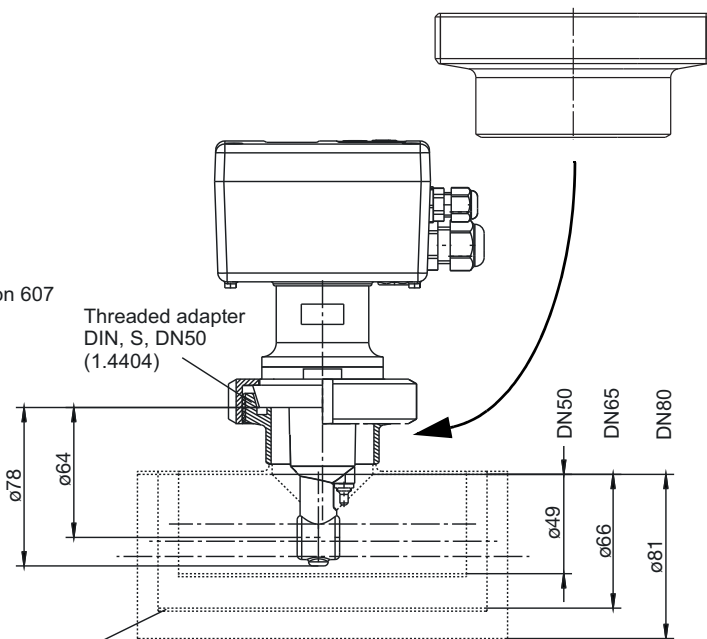
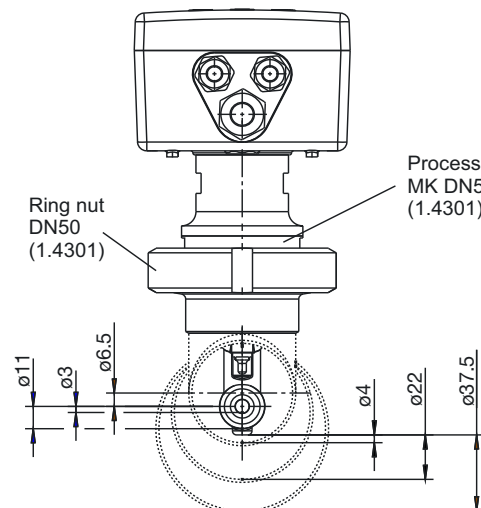


Optional accessory  
 Tee 90° (PVC or PP)

DN	ø D	L	H	Material	Maximum temperature	Part no.
32	40	98	172	PVC	+60 °C	00439247
40	50	118	177			00439249
32	40	88	179	PP	+80 °C	00449511
40	50	102	181			00449514
50	63	124	181			00449516

Weld-on threaded pipe adapter  
 DN50, DIN 11 851  
 (mating component for proc. connection 607),  
 part no. 00085020

Version with  
 process connection 607  
 screwed pipe fitting DN50  
 DIN 11 851 (milk cone)



Reducing tee (to be provided by plant operator; not supplied by JUMO)  
 DIN, short, SSS, DN50/50, DN65/50, DN80/50  
 (1.4301)

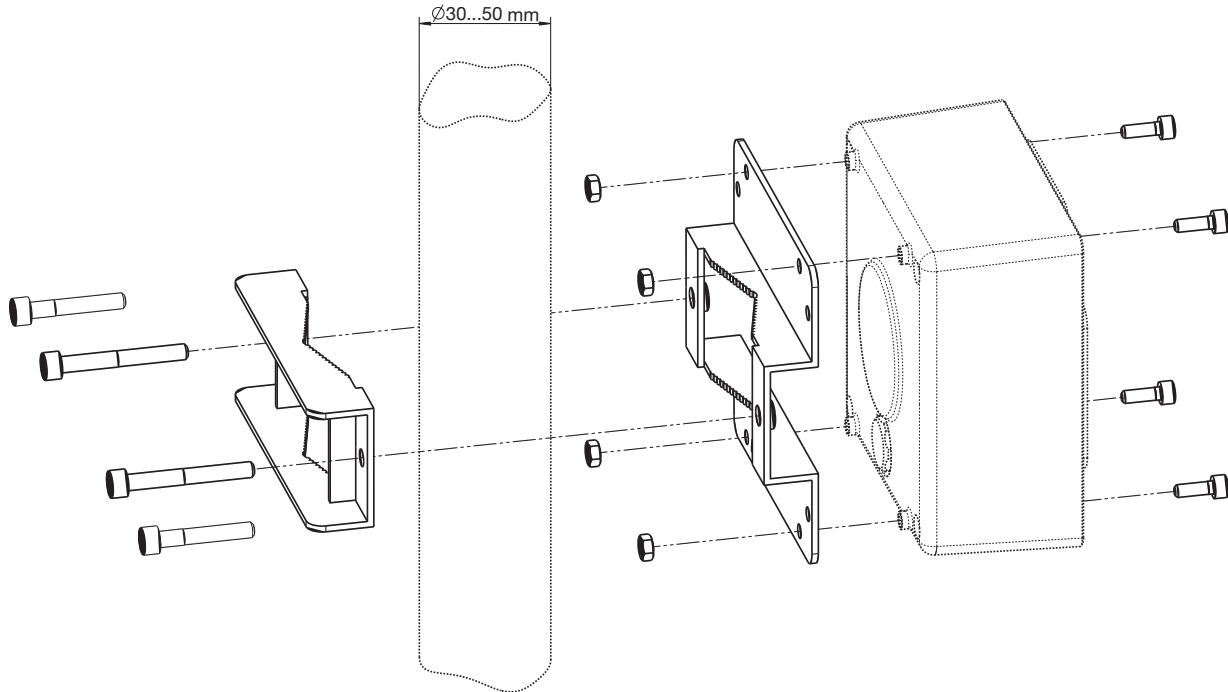
**JUMO GmbH & Co. KG**  
Delivery address: Mackenrodtstraße 14  
36039 Fulda, Germany  
Postal address: 36035 Fulda, Germany  
Phone: +49 661 6003-0  
Fax: +49 661 6003-607  
Email: mail@jumo.net  
Internet: www.jumo.net

**JUMO Instrument Co. Ltd.**  
JUMO House  
Temple Bank, Riverway  
Harlow, Essex CM 20 2DY, UK  
Phone: +44 1279 63 55 33  
Fax: +44 1279 62 50 29  
Email: sales@jumo.co.uk  
Internet: www.jumo.co.uk

**JUMO Process Control, Inc.**  
6733 Myers Road  
East Syracuse, NY 13057, USA  
Phone: +1 315 437 5866  
Fax: +1 315 437 5860  
Email: info.us@jumo.net  
Internet: www.jumousa.com



**Kit for pipe mounting**



**JUMO GmbH & Co. KG**  
 Delivery address: Mackenrodtstraße 14  
 36039 Fulda, Germany  
 Postal address: 36035 Fulda, Germany  
 Phone: +49 661 6003-0  
 Fax: +49 661 6003-607  
 Email: mail@jumo.net  
 Internet: www.jumo.net

**JUMO Instrument Co. Ltd.**  
 JUMO House  
 Temple Bank, Riverway  
 Harlow, Essex CM 20 2DY, UK  
 Phone: +44 1279 63 55 33  
 Fax: +44 1279 62 50 29  
 Email: sales@jumo.co.uk  
 Internet: www.jumo.co.uk

**JUMO Process Control, Inc.**  
 6733 Myers Road  
 East Syracuse, NY 13057, USA  
 Phone: +1 315 437 5866  
 Fax: +1 315 437 5860  
 Email: info.us@jumo.net  
 Internet: www.jumousa.com



**Order details: CTI-500 as "Head transmitter"**

	<b>(1) Basic type</b>	
	202755	JUMO CTI-500 - Inductive transmitter/switching device for conductivity/concentration and temperature
	<b>(2) Basic type extensions</b>	
	10	head transmitter without display/keypad <sup>a</sup>
	15	head transmitter with display/keypad
	<b>(3) Process connection</b>	
o	168	PVC union nut G1 <sup>1</sup> / <sub>2</sub> A <sup>b,c</sup>
o	169	stainless steel union nut G1 <sup>1</sup> / <sub>2</sub> A <sup>b</sup>
o	607	screwed pipe fitting DN50, DIN 11 851(MK DN50, milk cone)
o	617	clamp connection 2 <sup>1</sup> / <sub>2</sub> " <sup>d</sup> , ISO 2852 <sup>d</sup>
o	690	SMS 2"
	<b>(4) Immersion length</b>	
o	0	see dimensions
	<b>(5) Electrical connection</b>	
o	82	cable glands
o	83	M12 plug/socket connectors (instead of the cable glands) <sup>e</sup>
o	84	two M16 cable glands and one blind grommet
	<b>(6) Extra codes</b>	
x	000	no extra code
o	268	internal temperature sensor
o	768	cell material PVDF <sup>f</sup>
o	844	supply 24 AC V ±10%

<sup>a</sup> The PC setup program is required for programming the instrument, see accessories

<sup>b</sup> Special tee is not included in delivery, see accessories

<sup>c</sup> Maximum temperature of medium: 60 °C

<sup>d</sup> Mounting items (mounting brackets) do not come with delivery. If required, please include in your order (accessories)

<sup>e</sup> If required, order 1 set M12 plug / socket connectors, see accessories

<sup>f</sup> Only with process connections 168 and 169, in combination with extra code 268

x = standard

o = available as an option

**Order code**                    **(1)**                    **(2)**                    **(3)**                    **(4)**                    **(5)**                    **(6)**                    **(6)**  
   /                    -                    -                    -                    /                    ,                    ...<sup>a</sup>  
**Order example**                    202755                    /                    10                    -                    108                    -                    0                    -                    82                    /                    000

<sup>a</sup> List extra codes in sequence, separated by commas



**JUMO GmbH & Co. KG**  
 Delivery address: Mackenrodtstraße 14  
 36039 Fulda, Germany  
 Postal address: 36035 Fulda, Germany  
 Phone: +49 661 6003-0  
 Fax: +49 661 6003-607  
 Email: mail@jumo.net  
 Internet: www.jumo.net

**JUMO Instrument Co. Ltd.**  
 JUMO House  
 Temple Bank, Riverway  
 Harlow, Essex CM 20 2DY, UK  
 Phone: +44 1279 63 55 33  
 Fax: +44 1279 62 50 29  
 Email: sales@jumo.co.uk  
 Internet: www.jumo.co.uk

**JUMO Process Control, Inc.**  
 6733 Myers Road  
 East Syracuse, NY 13057, USA  
 Phone: +1 315 437 5866  
 Fax: +1 315 437 5860  
 Email: info.us@jumo.net  
 Internet: www.jumousa.com



**Order details: CTI-500 as "Transmitter with separate sensor"**

	<b>(1) Basic type</b>	
	202755	JUMO CTI-500 - Inductive transmitter/switching device for conductivity/concentration and temperature
	<b>(2) Basic type extensions</b>	
	20	transmitter without display/keypad (without sensor) <sup>a,b</sup>
	25	transmitter with display/keypad (without sensor) <sup>b</sup>
	60	transmitter without display/keypad including sensor (cable length: 10 m) <sup>a</sup>
	65	transmitter with display/keypad including sensor (cable length: 10 m)
	80	replacement sensor with a 10 m long cable without transmitter <sup>b,c</sup>
	<b>(3) Process connection</b>	
	000	not available
	168	PVC union nut G1 <sup>1</sup> / <sub>2</sub> A (media temperature: 60 °C max.) <sup>d,e</sup>
	169	stainless steel union nut G1 <sup>1</sup> / <sub>2</sub> A <sup>d</sup>
	607	screwed pipe fitting DN50, DIN 11 851(MK DN50, milk cone)
	617	clamp connection 2 <sup>1</sup> / <sub>2</sub> " , ISO 2852 <sup>c</sup>
	690	SMS 2"
	706	immersion model
	<b>(4) Immersion length</b>	
	0	not available
	500	500 mm
	1000	1000 mm
	1500	1500 mm
	2000	2000 mm (max. length)
	xxxx	special length (in 250 mm steps; e.g. 0250; 0750; 1250; 1750)
	<b>(5) Electrical connection</b>	
	21	attached cable with M12 socket connector on separate sensor
	82	cable glands on the operating unit
	83	M12 plug/socket connectors on operating unit <sup>f</sup>
	84	two cable glands and one blind grommet
	<b>(6) Extra codes</b>	
	000	no extra code
	268	internal temperature sensor
	768	cell material PVDF <sup>g</sup>
	844	supply voltage 24 V AC

<sup>a</sup> The PC setup program is required for programming the instrument, see accessories  
<sup>b</sup> A calibration kit is absolutely essential for commissioning. If required, please include in your order (accessories)  
<sup>c</sup> Mounting items (union/ring nuts, mounting brackets) do not come with delivery. If required, please include in your order (accessories)  
<sup>d</sup> Special tee is not included in delivery  
<sup>e</sup> Maximum temperature of medium: 60 °C  
<sup>f</sup> If required, order 1 set M12 plug / socket connectors, see accessories  
<sup>g</sup> Only with process connections 168 and 169, in combination with extra code 268

x = standard  
 0 = available as an option  
 - = not available

**Order code**                    **(1)**                    **(2)**                    **(3)**                    **(4)**                    **(5)**                    **(6)**                    **(6)**  
     /  -  -  -  /  ,                    ...<sup>a</sup>  
**Order example**                    202755                    /                    65                    -                    108                    -                    1000                    -                    21                    /                    000

<sup>a</sup> List extra codes in sequence, separated by commas

**JUMO GmbH & Co. KG**  
 Delivery address: Mackenrodtstraße 14  
 36039 Fulda, Germany  
 Postal address: 36035 Fulda, Germany  
 Phone: +49 661 6003-0  
 Fax: +49 661 6003-607  
 Email: mail@jumo.net  
 Internet: www.jumo.net

**JUMO Instrument Co. Ltd.**  
 JUMO House  
 Temple Bank, Riverway  
 Harlow, Essex CM 20 2DY, UK  
 Phone: +44 1279 63 55 33  
 Fax: +44 1279 62 50 29  
 Email: sales@jumo.co.uk  
 Internet: www.jumo.co.uk

**JUMO Process Control, Inc.**  
 6733 Myers Road  
 East Syracuse, NY 13057, USA  
 Phone: +1 315 437 5866  
 Fax: +1 315 437 5860  
 Email: info.us@jumo.net  
 Internet: www.jumousa.com



**Stock items** (shipment: 3 days after receipt of order)

Type	Part no.
202755/10-168-0-82/000	00445842
202755/15-168-0-82/000	00445843
202755/15-607-0-82/000	00445845

**Production items** (shipment: 10 days after receipt of order)

Type	Part no.
202755/65-607-0-82/000	00445840

**Accessories**

Type	Part no.	
Weld-on threaded adapter DN50, DIN 11 851 (mating component for process connection -607)	00085020	
Special tee DN32, PVC, including threaded socket <sup>a</sup>	max. 60 °C, mating component for process connection -168	00439247
Special tee DN40, PVC, including threaded socket <sup>a</sup>		00439249
Union nut G1 1/2, PVC	00439199	
Union nut G1 1/2, stainless steel	00452039	
Ring nut DN50, DIN 11 851	00343368	
Ring nut SMS DN2"	00345162	
Flange DN32, material: PP <sup>b</sup>	00083375	
Flange DN50, material: PP <sup>b</sup>	00083376	
Kit for pipe mounting, stainless steel	00515128	
Kit for DIN rail mounting	00459903	
Shackle for CTI-500 sensor and immersion fitting with diameter 40 mm	00453191	
M12 socket connector, 5-pole, straight, for assembly by user	necessary for versions 202755/xx-xxx-xxxx-83/xxx	00444313
M12 plug connector, 8-pole, straight, for assembly by user		00444307
M12 socket connector, 8-pole, straight, for assembly by user	replacement part for sensor 202755/80...	00444312
PC setup software for JUMO CTI-500	00447634	
PC interface cable with TTL / RS232 converter and adapter (serial connection cable)	00350260	
PC interface cable with USB / TTL converter and two adapters (USB connection cable)	00456352	
Switched-mode power supply for DIN rail mounting, Type PSSR-A24	input voltage: AC 100 to 240 V / 50 to 60 Hz output voltage: DC 24 V, 0.3 A	00374661
Cover with LC display and keypad (facilitates the programming of transmitters without display and keypad)	00443725	
Special tee DN32, PP <sup>a</sup>	including threaded socket (max. 80 °C), mating component for process connection -169	00449511
Special tee DN40, PP <sup>a</sup>		00449514
Special tee DN50, PP <sup>a</sup>		00449516
Calibration kit (for calibrating a replacement transmitter or replacement sensor)	00459436	
M12 plug/socket connectors set, suitable for electrical connection 83	00529482	

Additional concentration curves for the usual acids and lyes (20 interpolation points in tabular form), for entry on the CTI-500 through the setup program.	on request
---	------------

<sup>a</sup> with anti-rotation lug - the cell can only be installed in the correct orientation

<sup>b</sup> only in conjunction with a separate sensor in the immersion version 202755/60-706-... or 202755/65-706-... or 202755/80-706-...