Ultrasonic Evaporation Transmitter

Instruction for use 6.1432.20.400
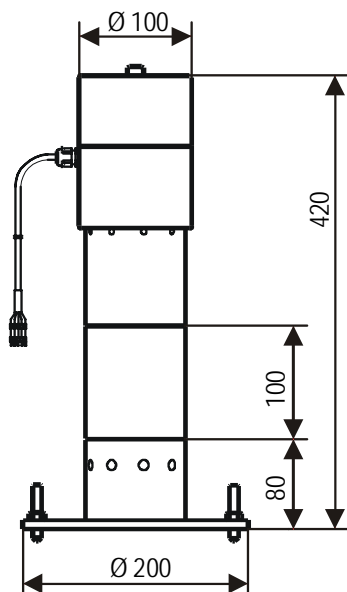
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1. Field of Application

The Ultrasonic Evaporation Transmitter is designed for measuring the evaporation level in an evaporation pan type „Class A Pan". The instrument is well-suited for plant-garden, plant- and semen cultivation companies, and for agriculture-research-institutes to find out the individual water requirement of plants, and for the artificial water supply of fields, in order to achieve an optimal yield.

The measuring result is transmitted as electrical digital signal via a serial, synchronous interface to the datalogger DL 15 for further data processing. For additional control functions there is a LCD-display on the top of the evaporation transmitter housing. This display shows the actual values of the evaporation level.
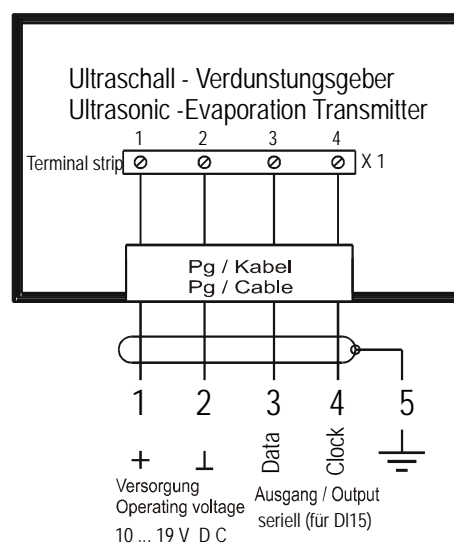
2. Technical Data

Measuring range	: 0 - 100 mm
Solution	: 0,1 mm
Accuracy of measurement	: ±3% of full scale range. (at -10... 50°C)
Measuring rate	: measuring mode 255 s ; test mode 1 s
Operating voltage	: 10 ... 19 V DC
Current consumption	: active, approx. 60 ma; standby, approx. 0,6 ma
Electr. output	: Serial, synchronous interface (for Datalogger DL 15)
amplitude	: 0...5 V
data protocol	: 12 data bits und 12 control bits
Water high level indication	: measuring value = 0 mm
Water low level indication	: measuring value = 100 mm
Operating temperature	: - 20 ... + 60°C
Cable	: 5 m; LiYCY 4 x 0,25 mm²
Weight	: 3,5 kg

Dimensions

Ø 100
420
100
80
Ø 200

Connecting Diagram

Ultraschall - Verdunstungsgeber
Ultrasonic -Evaporation Transmitter
1   2   3   4
Terminal strip   X 1

Pg / Kabel
Pg / Cable

1   2   3   4   5

+   ⊥   Data   Clock

Versorgung   Ausgang / Output
Operating voltage   seriell (für DI15)
10 ... 19 V D C

3. *Ultrasonic - Interface*

The utrasonic-interface is the control unit between the ultrasonic sensor and the datalogger DL 15.

It fulfils the following tasks:

Switching-on the ultrasonic sensor after 255 seconds, and carrying out measurement
Carrying out temperature compensation of the measurement values.
Transmitting the result of level height to the shift-register (output interface).
Switching-off the ultrasonic-sensor for 255 seconds

Independently from the measurement rate (255 seconds), the measurement value in the shift-register can be read out at any time.

3.1 Layout
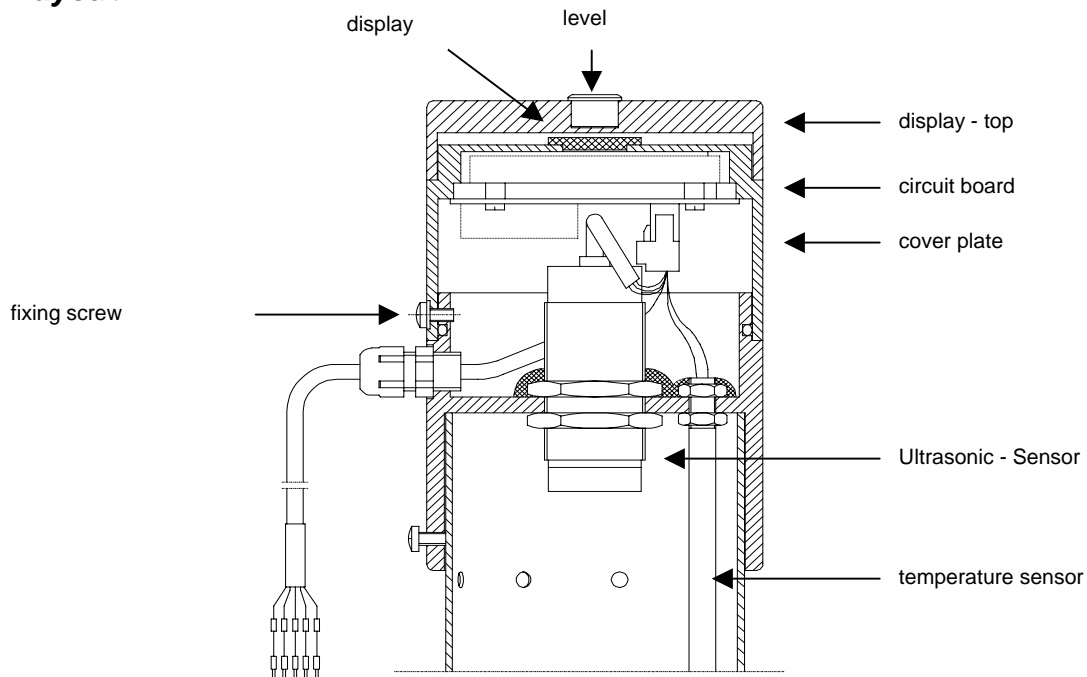
3.2 Terminal Strip (on circuit board)

Terminal strip 1	Pin 1 = supply (+)	
	Pin 2 = supply (GND)	
	Pin 3 = data - out	
	Pin 4 = clock – In	

Terminal strip 2 US-sensor, temperature sensor
                                  Pin 1 = + VCC sensor
                                  Pin 2 = signal sensor
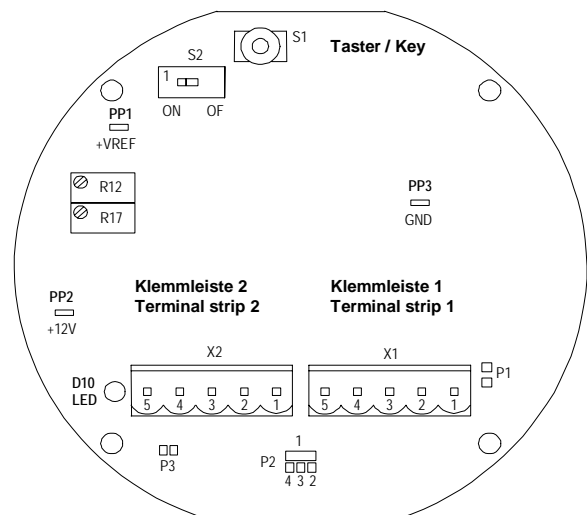   Pin 3 = GND Sensor
                                  Pin 4 = NTC
                                  Pin 5 = NTC

Test points	PP 1 = V ref 2,49 V
	PP 2 = + 12V(sensor supply)
	PP 3 = GND

LED	D 10 = lights up (red), when
	ultrasonic sensor, and measurement process
	are switched-on

Potentiometer (R12/17), and switch (S2) : do not adjust !! (factory adjustment)

3.3 Key / Display

With the key **S1** the ultrasonic interface can be switched into the test mode. In this „test mode" the ultrasonic sensor is in operation, and the measurement values are continuously updated. The letter „s" in the display indicates the updating. Activating the key S1 affects also a switching-over into another display mode of the measurement value, which is indicated by the symbols "SP1" to "SP4".

SP1 water level temperature-compensated
SP2 water level not compensated
SP3 temperature inside the measuring tube
SP4 see SP1

50 seconds after the last key operation the ultrasonic interface returns automatically into "measuring mode" (SP4 in the display).

Error display:
During the operation different self tests are continuously carried out. In case of errors they are indicated in the form of error codes on the display.

Possible error – codes:		
	ERROR 01	AD – value ref2/3 erroneous
	ERROR 02	AD – value ref1/3 erroneous
	ERROR 03	AD – value distance erroneous
	ERROR 04	AD – value temperature erroneous
	ERROR 05	division by zero
	ERROR 06	Adjusting value zero in the EEPROM
	ERROR 01	AD – value distance not constant

4. Serial Interface

The calculated water level (dim. mm) will be transmitted in a binary code via the serial interface.

| Possible values:	0....1000	current level mark x 0,1 mm
	> 2048	general error code

5. Preparation for Operation

Put the ultrasonic evaporation sensor into the evaporation pan, and connect it to a supply voltage or to the receiving instrument (for ex. datalogger DL 15). Fill the evaporation pan with water up to the high-level mark of the instrument. In order to control the filling process remove the display cover, and activate the key S1 until the symbol „SP1" is indicated in the display. Now read the exact water level.
The following error messages are possible during the filling process, and are indicated in the display as follows:
„ Er03"   signalises that the filling level is out of measurement range.
„ Er07"   signalises that the measurement value changes too quickly during the filling process.
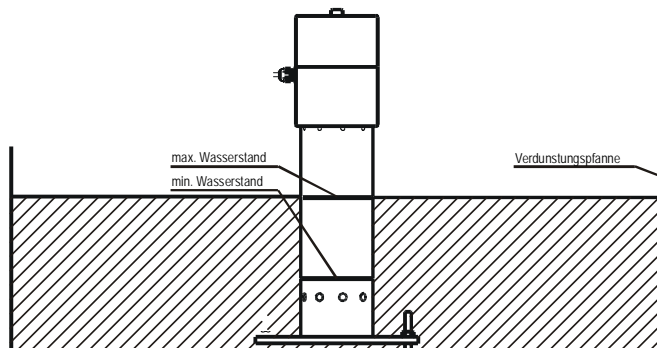
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