Operating Manual

LF1-LF4 i2380-87

Oct. 2005
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iotronic ELEKTROGERÄTEBAU GMBH

Contents

1.0 General Guidelines for Safety

WARNING

(Nonobservance or misapplication of the contents of the „Warning“ section could lead to serious accident, including death or injury)

Turn off the power supply.
Working without disconnecting the power supply may cause an electrical shock. Before engaging upon any working procedures make sure to disconnect the power supply.


Electrical Shock

No remodelling !
Never remodel an analyser. Otherwise, a serious accident may result. IOTRONIC will not be responsible for any accident or damage of any kind which is caused by the user remodelling the analyser.


No Remodeling

Operating site must be free of water and humidity
The analytical instrument is not designed to be water-proof or dust-proof. The use of the analyser in places where water splashes or humidity is high may result in an electrical shock or short-circuit.


Prohibited

CAUTION !

(Nonobservance or misapplication of the contents of the „Caution“ section could lead to serious physical injury to the user or serious damage to the product.)

Specified power only
Do not operate the analyser on voltage which is not specified on the label on the right side of the transmitter housing. Failure to do so can result in damage or fire. Only the specified power level is to be applied.


Caution

Do not damage or change power cable !
Do not scratch, damage, process, or pull the power cable forcibly. Nonobservance could cause a fire or an electrical shock.


Caution

Notes on operation

- Dropping the device or subjecting it to strong impacts may result in faulty performance. Handle the analyser with care.
- Select an installation site convenient for future maintenance and inspection, and fix the device carefully so that it is free of vibrations.

2.0 Principle of measuring

The main difference between the common conductive way and the inductive technique is the electrodeless measuring. No conductive electrodes are touch with the liquid.Inside the probe there is a fully capsulated ring-core-transformer wich induces an ac current in the surrounding liquid.The value of the current is proportional to the conductivity of the liquid.With a second ring-core, wich acts as an current transformer the induced current is measured and after electronic processing in the measuring instrument displayed as conductivity.
The inductive technique garantees a lasting stable and perfect reading even in strong contaminated, oily or agressive liquids. Problems of conventional elektrodes with the influence of reading caused by wear, corruption and polarisation are eliminated as a matter of principle.
The expenditure of calibration,cleaning and maintenance is limited to a minimum or even not necessary in most applications.
The unit of conductivity is S/cm.Derivations are mS/cm and µS/cm.

3.0 Calibration

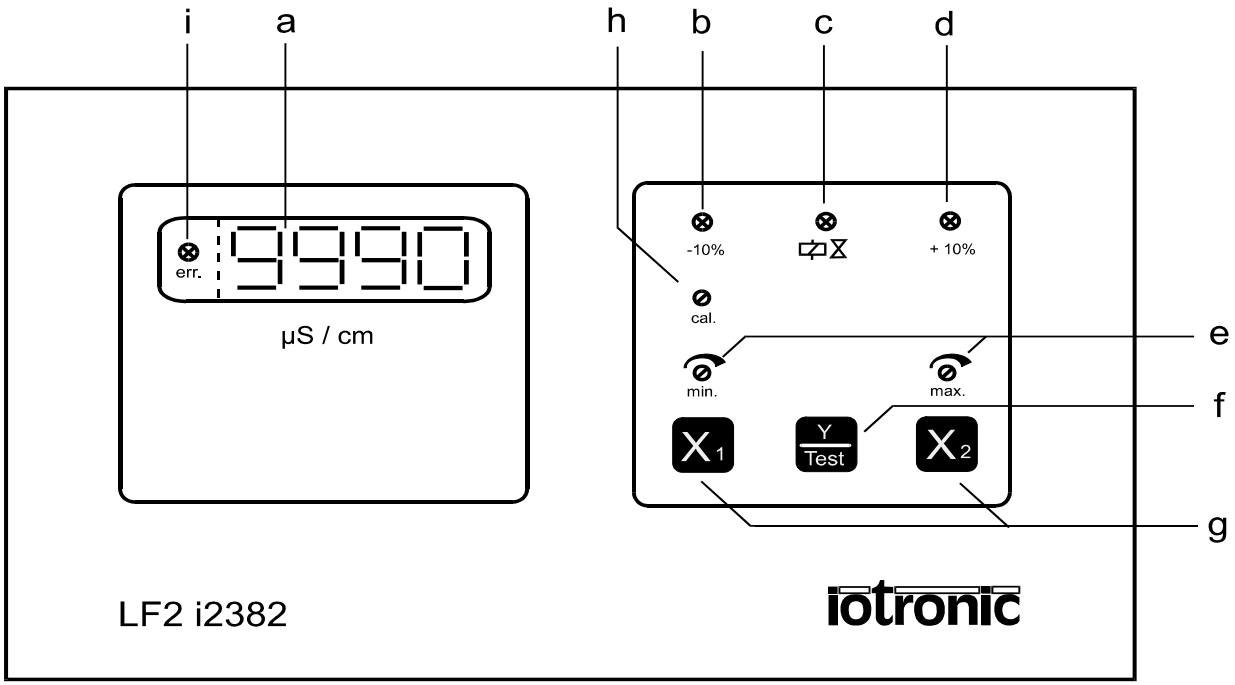
The instrument is calibrated by factory.
To compensate tolerances of the cell, it is possible to adjust the measured value for +/- 10%.
For a simple calibration, one need a buffersalution (potassiumchlorid 0,01 mol/l;=1913 µS/cm)
Set the temperature compensation to 2,1%/°C.
Then dip the sensor into the the buffer solution and wait until the reading does not change.
Now set the reading with the slope adjustment element to a value of 1410 µS/cm.

4.0 Description of the instrument

LF1 i2380: Device with maximum-function of relais
LF2 i2382: **Device with maximum-function of relais**
LF3 i2384: Device with maximum-function of relais
LF4 i2386: Device with maximum-function of relais

LF1 i2381: Device with minimum-function of relais
LF2 i2383: Device with minimum-function of relais
LF3 i2385: Device with minimum-function of relais
LF4 i2387: Device with minimum-function of relais

Front view (Example):



a : LED-display
b: indicator light “alarm –10%”
c: indicator light “valve open”
d: indicator light “alarm +10%”
e: potentiometer to adjust limit values
f: manual override to operate valve
g: keys to display limit values
h: potentiometer to adjust slope
i: overflow (only LF2)

The limit values may be adjusted by turning the screw of the appropriate potentiometer. The current limit values may be displayed by pressing the appropriate key (X1 or X2).

The instrument has two potential-free relay contacts. Relay K2 may be used to control dosing devices (e.g. a valve). Relay K1 is an alarm relay that will be activated either if the measured value is 10% above or 10% below the preset limit values.

5.0 Switching Functions of the Relays

Relay K2

XX x2380:
XX x2382: (Blowdown plant)
XX x2384:
XX x2386:
The relay contact K2 will be activated if the measured value goes beyond the preset limit value X2.It remains activated until measured value falls below preset value X1

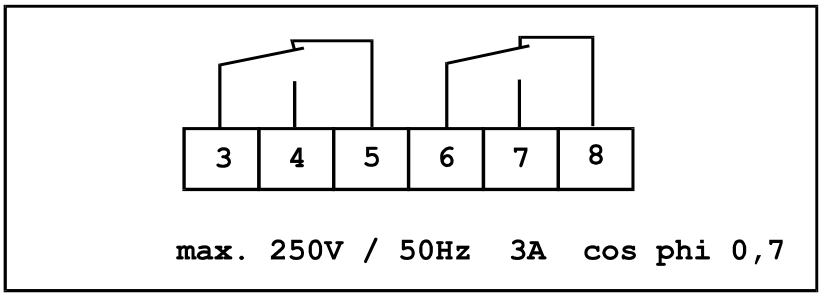
XX x2381:
XX x2383:
XX x2385:
XX x2387:
XX x2389:
The relay contact K2 will be activated if the measured value has fallen below the preset limit value X1. It remains activated until the preset limit value X2 is exceeded.

Relay K1

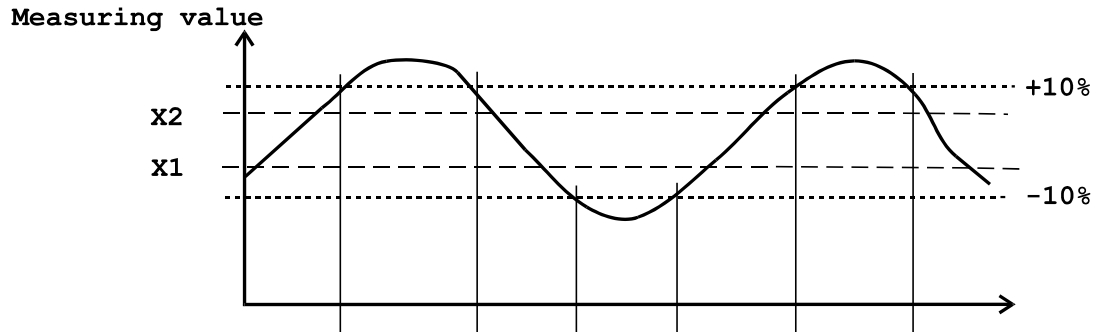
The relay contact K1 will be activated either if the measured value has fallen below limit value X1 by more than 10% or the limit value X2 is exceeded by more than 10%. It may be used to control alarm devices like horn or light.

Contact position shown not activated

Please observe technical specifications.

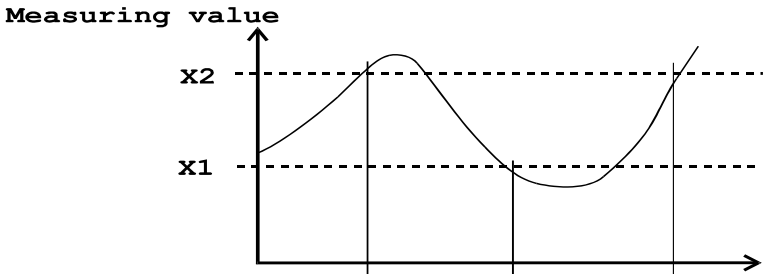


5.1 Function-diagram for contact K1



contact							
LED +10%	off	on	off	off	off	on	off
LED -10%	off	off	off	on	off	off	off

5.2 Function-diagram for contact K2



XX x2380 XX x2382 XX x2384 XX x2386	contact				
	LED	off	on	off	on
XX x2381 XX x2383 XX x2385 XX x2387 XX x2389	contact				
	LED	off	off	on	off

Manual Override of Relay K2

Pressing the key “Y/Test” may activate the relay contact K2. The contact is activated as long as the key is pressed.

6.0 Setting of Limit Values

Adjust the limit values by using a screwdriver. The values may be adjusted by pressing the key X1 or X2 and turning the potentiometer located above each key until the desired value is displayed.

Note: Limit value X2 has to be programmed higher than limit value X1.

7.0 Remote control

To terminals 24/25 a remote contact may be connected.It controls the action of the relais.Only when the remot contact is close,the relays may be active.
When no remote control is used,terminals 24/25 must be linked. (Normal operation).
Function of spezial operation is invers.

Be shure not to connect strange voltage to terminal 24/25.Nonob-servance could result in an electrical shock.

8.0 Display

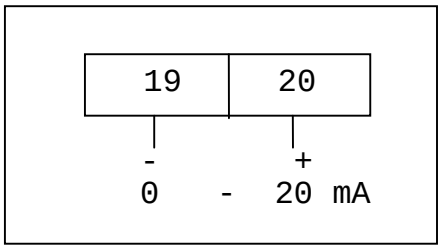
8.1 LED-Display

The multi-digit LED displays the present actual value. The programmed values for X1 or X2 are displayed by pressing the appropriate keys. In the event that the measuring range is exceeded the digits disappear and the highest digit indicates the fault.

8.2 Indicator Lights of the Limit Values

Indicator lights indicate when the pre-set limit value is exceeded or the measured value has fallen below the pre-set limit value.

9.0 Setting of the 20 mA Analog Output



The instrument delivers a current output, 0 or 4 to 20 mA, which may be used as input to remote recording devices, for data processing, controlling functions etc. The current output is independent of resistance load up to a value of 500 ohms.

Be shure not to connect strange voltage to the terminal 19/20.Non-observance could result in an electrical shock.
The recorder output can be switched over from 0-20mA to 4-20mA by means of a jumper.

0 -20 mA 4 -20 mA

10.0 Installion of the measuring device

The instrument is build into a plastic-housing with dimensions 212 x 185 x 114 mm. The separate terminal box has on ist bottom- and rearplate 11 pre-pressed cable bushings.
On the back of the housing,there are 3 holes for wall-fixing.The control hole is to hang up the device,the other ones to fix it.

WARNING

Only Qualified Personnel !

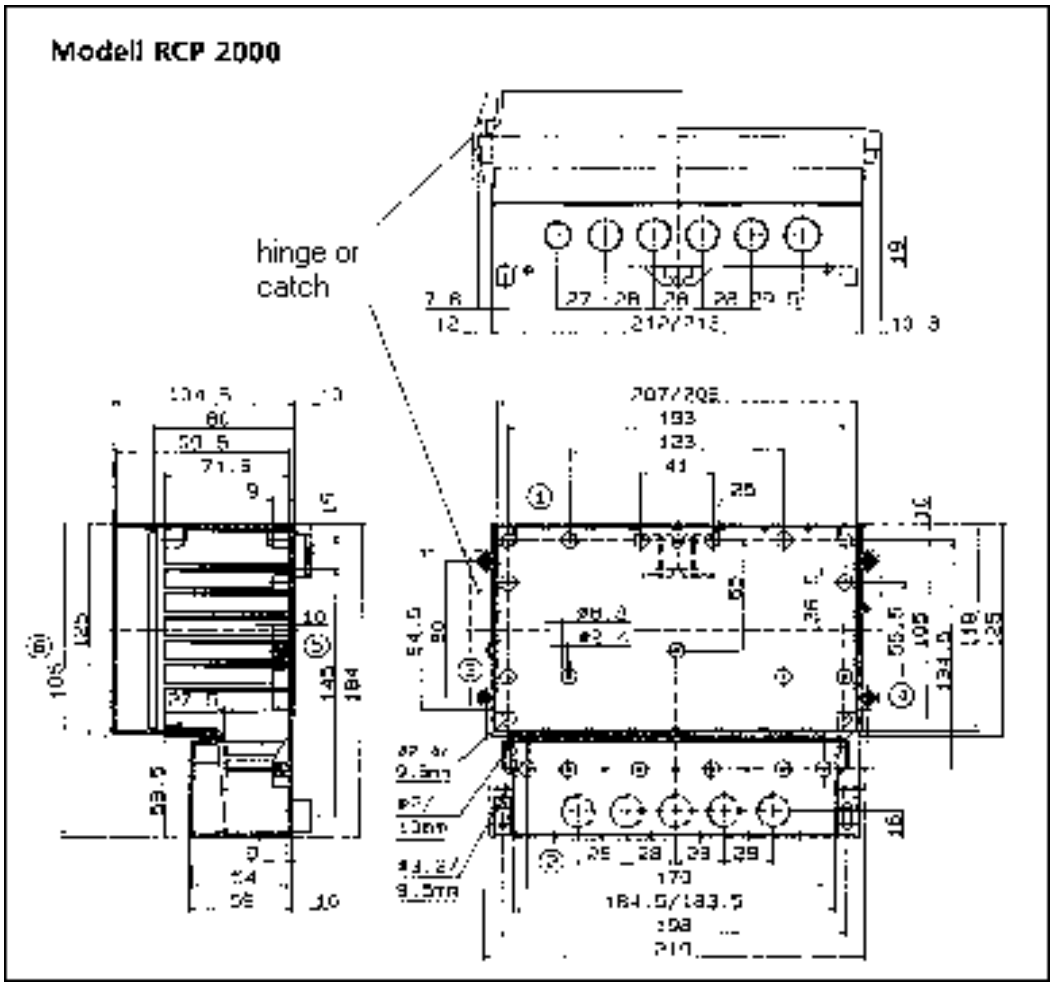
Only Specified Power Supply !
See required power supply as noted on instrument.

Observe local regulations!

Install a power supply that can be disconnected (plug, switch).

Use suitable cable bushings for cable inlet.Take care for sufficient fixing of the connection cables.
Do not install measuring-or control cables in parallel or close distance in the same cable guide with power supply.

10.1 Dimension sheet



11.0 Technical data

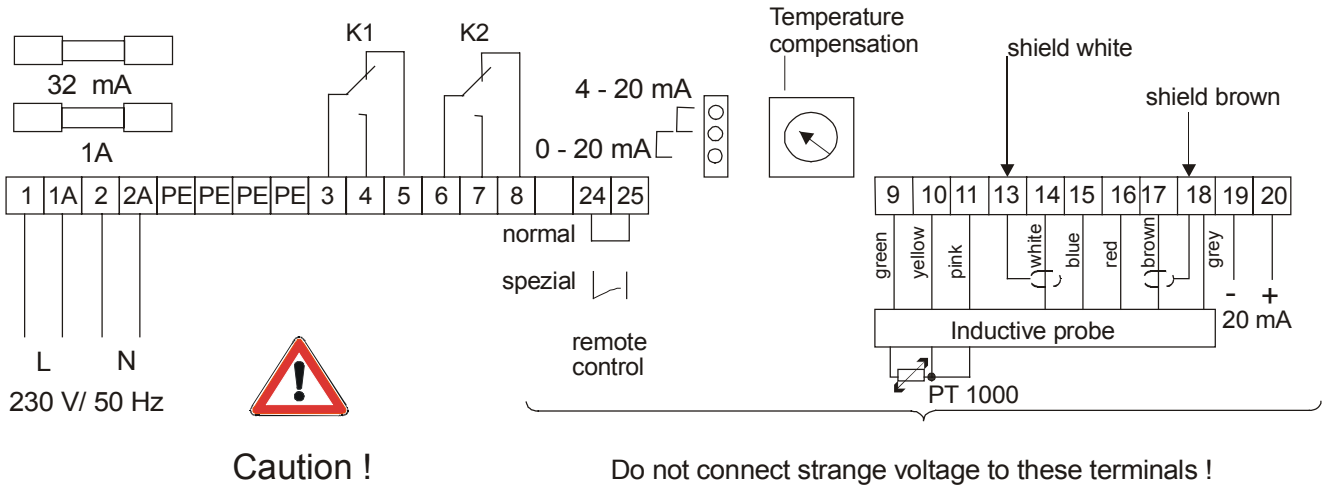
Range:	0-1999 µS/cm(Resulotion:1 µS/cm),**LF1** 0-9990 µS/cm(Resulotion:10 µS/cm),**LF2** 0-19,99 mS/cm(Resulotion:0,01 mS/cm),**LF3** 0-199,9 mS/cm(Resulotion:0,1 mS/cm),**LF4**
Reference temperature:	25°C
Recorder output:	0/4 - 20 mA - burden max. 500 Ohm
Display:	multi-digit LED-display
Indications:	3 LED for limit value
Relay contact:	2 potential free SPDT max. 250V 50Hz 3A, cos phi min 0,7

General data

Supply voltage:	230 V / 50 Hz (+10%/-15 %) (other voltages on request)
Power consumption:	approx. 4,5 VA
Dimensions:	212 x 185 x 114 mm(width x height x depth)
Protection:	IP 65
Connection:	Inline terminals 1,5 mm^2
Ambient temperature:	- 5°C bis 50°C

Technical modifications reserved !

11.1 Connection diagram

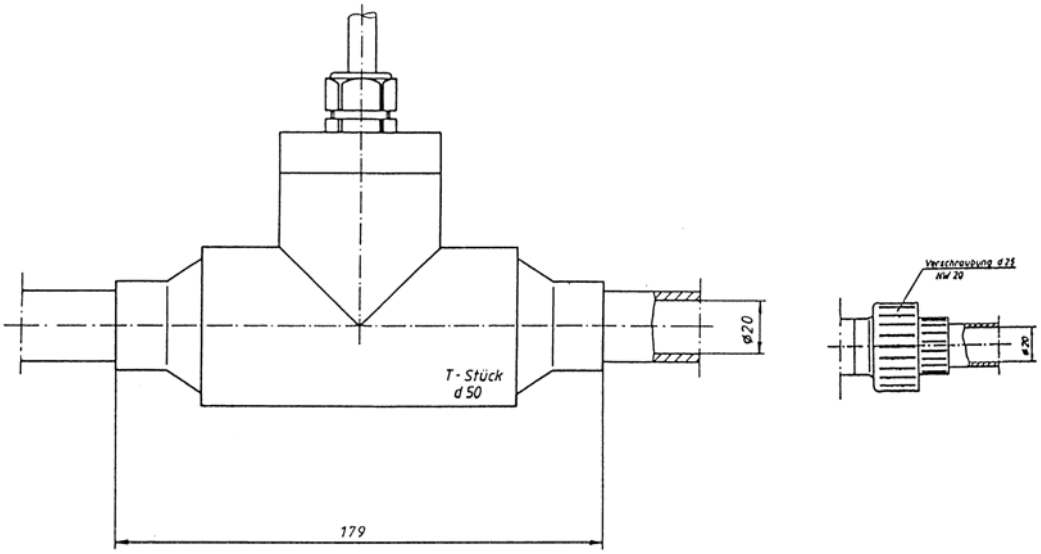


Inductive conductivity probe MES 500

- Measuring range : 0-200 mS/cm
- Temperature sensor PT 1000 integrated
- Conductivity probe completely mounted in PVC T-piece
- Screw connection (no further fittings required for installation)
- Pressure range PN 10 at max. 40 °C
- Nominal diameter 20 mm (DN 20)
- Appropriate SENSOCON switching and control units:

  LF1..3 i2380..6 (MAX-Function)
  LF1..3 i2381..7 (MIN-Function)

Order No. 330 500 01



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