

TYPE 8226

Inductive Conductivity Transmitter



Instruction Manual

bürkert
Easy Fluid Control Systems



INTRODUCTION

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1.1 SYMBOLS USED



Indicates information which must be followed. Failure to follow the information could endanger the user and effect the function of the device.



Indicates that the page contains general information.



Indicates a quickstart guide for quickly commissioning the transmitter.



Indicates that the page contains information about installation.



Indicates that the page contains information about configuration, programming and operation.



Indicates important information, tips and recommendations.



Indicates a worked example.



Indicates an action which has to be continued or reference to a relevant section.



Indicates information about repairs, service, maintenance and spare parts.

1.2 GENERAL SAFETY INSTRUCTIONS

Congratulations on purchasing our 8226 Digital Conductivity Transmitter.



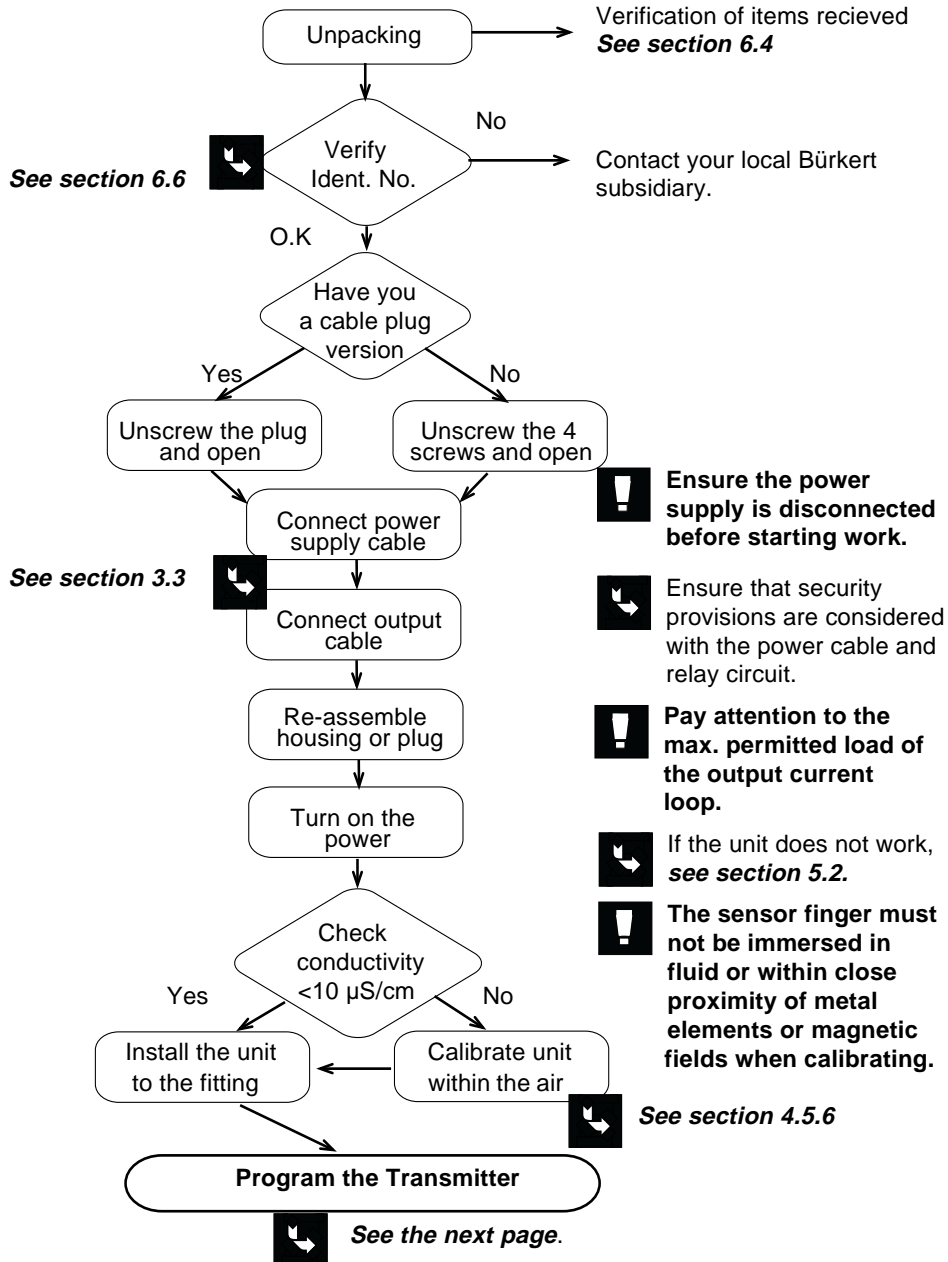
Before installing or using this product, please read this manual and any other relevant documentation to ensure you fully benefit from all the advantages the product can offer.

- Please verify that the product is complete and free from any damage. (see reference table section 6.6).
- It is the customer's responsibility to select an appropriate transmitter for the application, ensure the unit is installed correctly and maintain all components.
- This product should only be installed or repaired by specialist staff using the correct tools.
- Please observe the relevant safety regulations throughout the operation, maintenance and repair of the product.
- Always ensure that the power supply is switched off before working on the device / system.
- If these instructions are ignored, no liability will be accepted and the guarantee on the device and accessories will become invalid.

This section provides a comprehensive installation and operation guide which will assist with the commissioning of the 8226 Conductivity Transmitter.

2.1



INSTALLATION



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2.1

QUICK START

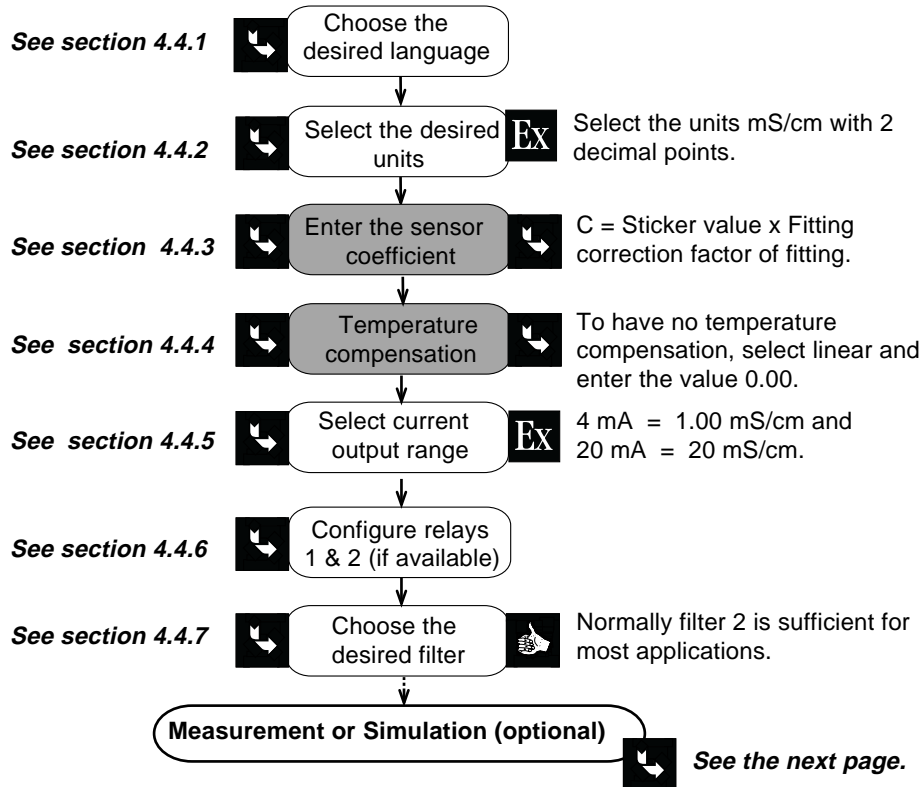


To access the **CALIBRATION MENU** simultaneously press   for 5 seconds.




- Ensure that the enter key is unlocked - section 4.1.
- Reference can additionally be made to the menu guide - section 4.2.




2.2 PROGRAMMING



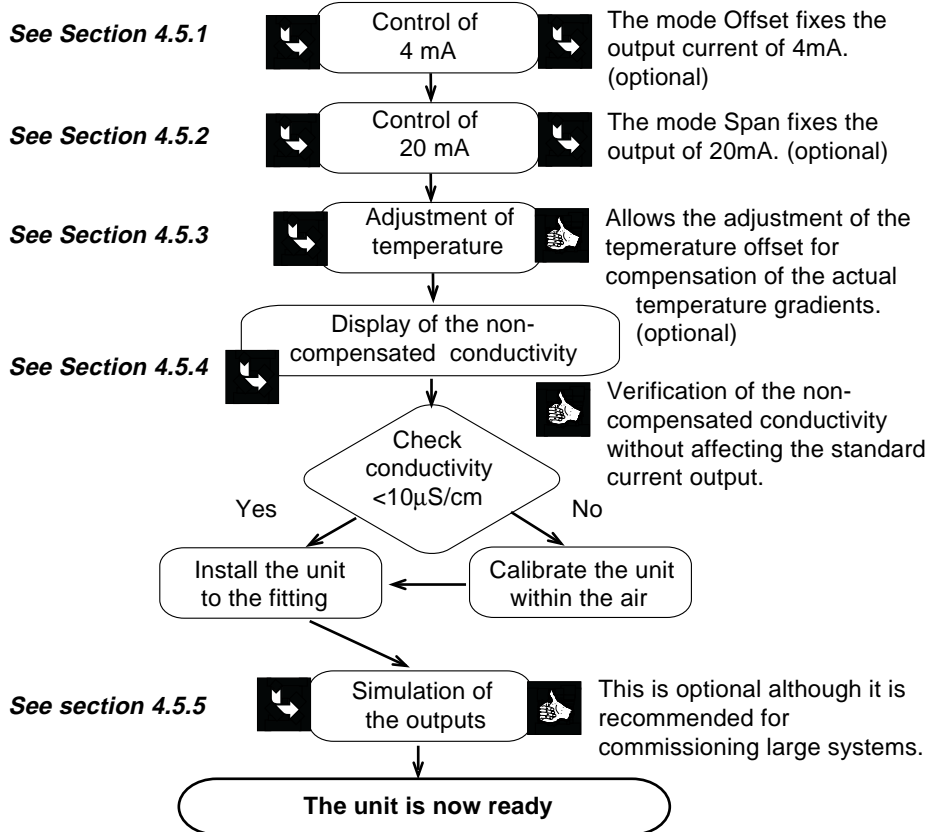
ENGLISH
2.2



The actions which are highlighted in grey  must be fully completed for accurate measurement.

To access the **TEST MENU** simultaneously press    for 5 seconds.

2.3 TESTING



ENGLISH

2.3

INSTALLATION



3.1 INSTALLATION GUIDELINES

- **Pressure - Temperature Diagram**

Please be aware of the pressure-temperature dependence according to the respective fitting and sensor material as shown in the diagram below.

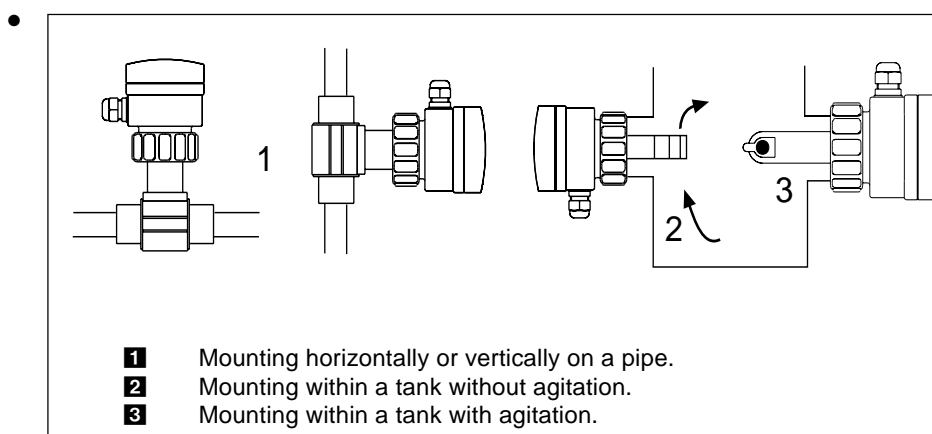
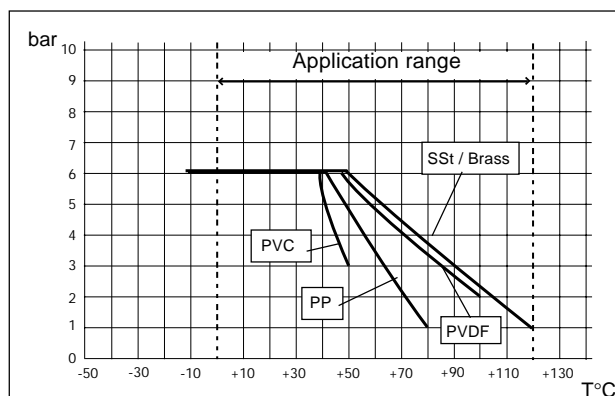


Fig. 3.1 8226 Transmitter positioning

- Select the appropriate installation position to avoid air bubbles or cavities.
- The device must be protected against constant heat radiation and other environmental influences such as magnetic fields or direct exposure to sunlight.
- **Dismounting precautions:**



All precautions must be taken before removing the transmitter depending on the process used as the pipe may contain dangerous / aggressive fluids which maybe hot.



INSTALLATION

3.2 INSTALLATION

The 8226 conductivity transmitter can be easily installed into pipes using our specially designed fitting system.

- Place the plastic nut **3** onto the fitting **4** and snap the plastic ring **2** into the guide -bush **5**.
- Ensure that the sensor is fully inserted and sitting correctly, making sure that the lug **6** is aligned correctly onto the fitting and that the sensor housing **1** cannot be rotated.



The plastic nut must only be tightened by hand!

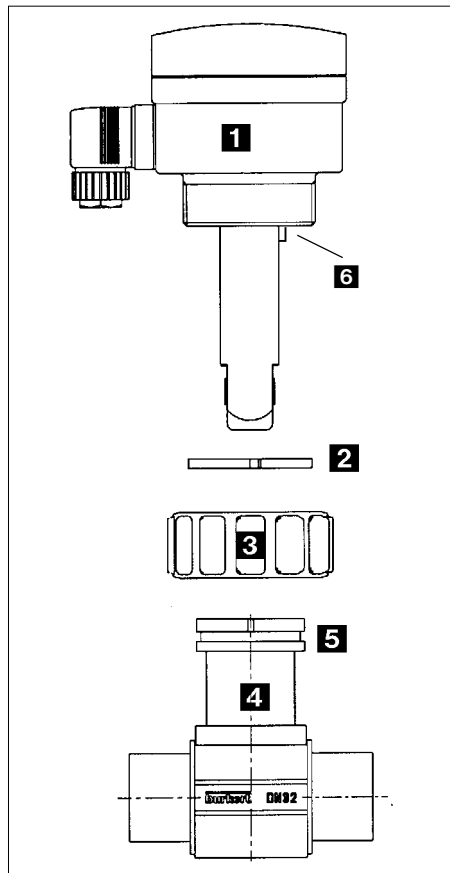


Fig. 3.2 8226 Transmitter installation

ENGLISH

3.2

INSTALLATION



3.3 GENERAL ELECTRICAL CONNECTION

- Use cables with a temperature limit of 80°C minimum.
- For normal operating conditions the measuring signal can be transmitted by a simple cable of 0.75 mm² cross section.
- The line must not be installed in combination with carrying lines with a higher voltage or frequency.
- If a combined installation cannot be avoided, a minimum space of 30 cm (1 ft) or shielded cables should be adopted.
- When using shielded cables observe faultless grounding of the shield.



- In case of doubt, always use shielded cables.
- The power supply must be regulated - section 6.1.



- **Do not open and wire the transmitter with the power supply connected.**
- **It is advisable to put security devices on :**
Power supply : Fuse (eg/ 250mA) and an interrupter
Relay : 3A fuse max. and circuit breaker (depending on application).

ELECTRICAL WIRING 12-30 VDC

3.3.1 Wiring via a cable plug without relay.

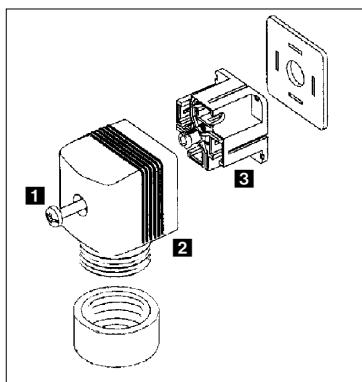


Fig. 3.3 Plug assembly type 2508

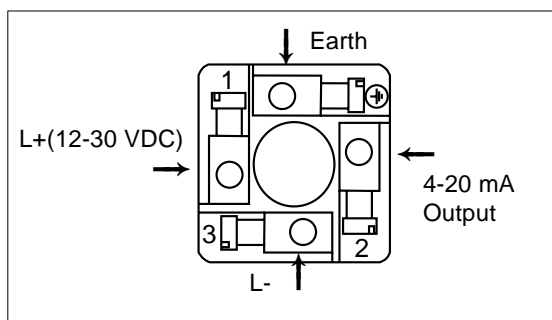


Fig. 3.4 Pin assignment

- 1: L+ (12-30 VDC)
- 2: 4-20 mA Output
- 3: L-
- ⊕: Earth

1. To open the connector remove screw **1** and the plastic ring (Fig. 3.3).
2. Remove the internal part **3** from the external casing **2** with a screwdriver blade.
3. Connect the transmitter according to the pin assignment in Fig. 3.4
4. When re-assembling, the internal part can be rotated in 90° steps to a desired position before inserting back into the casing **2**.



INSTALLATION

3.3.2 12-30 VDC version without relay, with PG 13.5

Remove the cover via the screws on the front display and pull the cable through the Pg 13.5 and wire according to one of the pin assignment diagrams below. The electronics within the 8226 allows a sourcing or sinking PLC to be connected. Position A (Fig 3.5) provides a sourcing configuration and Position B (Fig 3.6) a sinking configuration.

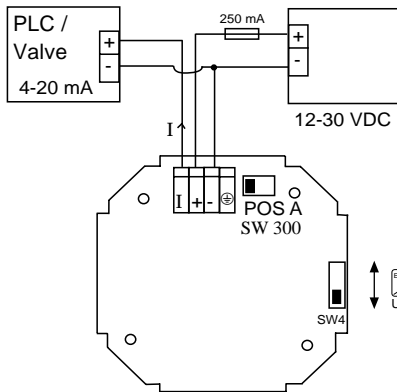


Fig. 3.5 Pin assignment, Position A

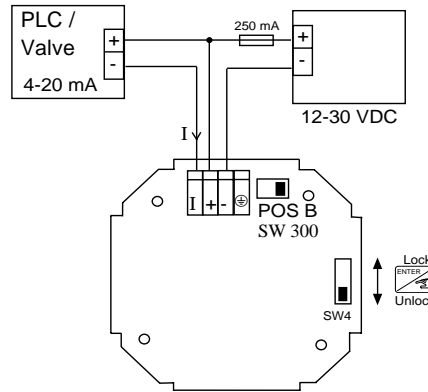


Fig. 3.6 Pin assignment, Position B

ENGLISH

3.3.2

3.3.3 12-30 VDC version with relays and PG 13.5

The electrical wiring of this model is possible via the use of 2 cable glands. Remove the cover via the screws on the front display and pull the cables through the Pg 13.5's and wire according to pin assignment diagram below (Fig. 3.7).

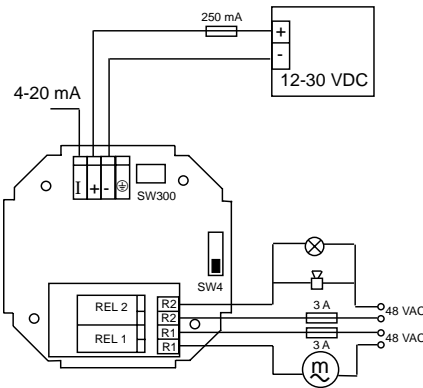



Fig. 3.7 Pin assignment for relays



- The  Key can be locked to avoid accidental or unauthorised access.
- The device can be easily connected to a PLC independently of the respective version.

INSTALLATION



3.3.4 115/230 VAC version without relay, with PG 13.5

Remove the cover via the screws on the front display and pull the cable through the Pg 13.5 and wire according to one of the pin assignment diagrams below. The electronics within the 8226 allows a sourcing or sinking PLC to be connected. Position A (Fig 3.5) provides a sourcing configuration and Position B (Fig 3.6) a sinking configuration.



- **Do not open and wire the transmitter with the power supply connected.**
- **Ensure that the power supply switch is selected for the appropriate voltage 115VAC or 230 VAC.**



The connection for relays 1 and 2 are identical to that of the 12...30VDC on the previous page - section 3.3.3.

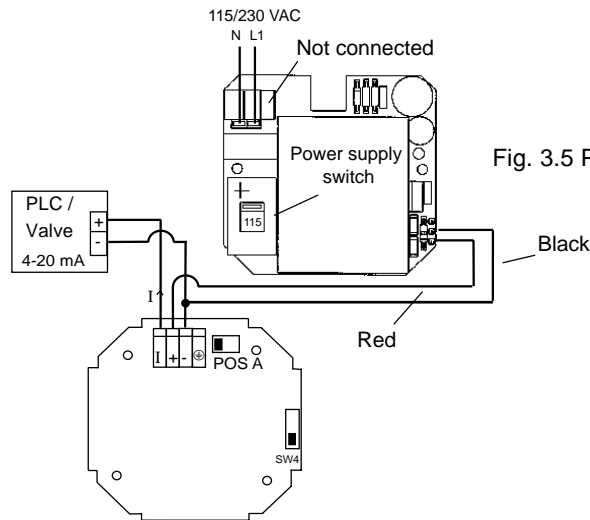


Fig. 3.5 Pin assignment, Position A

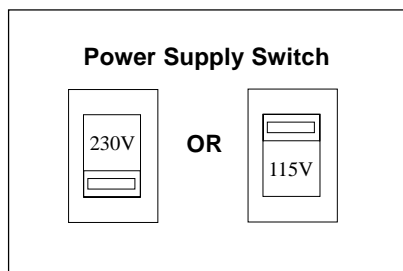
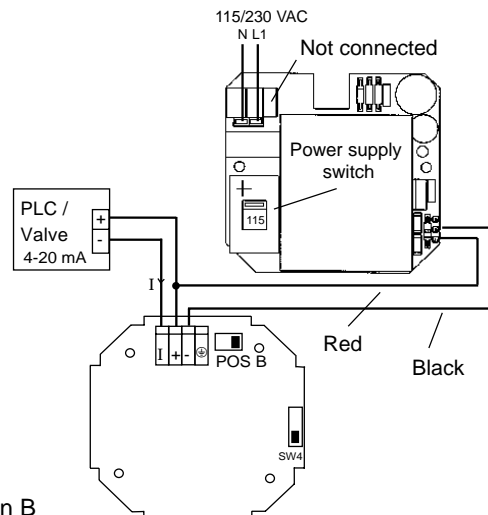


Fig. 3.6 Pin assignment, Position B



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3.3.4

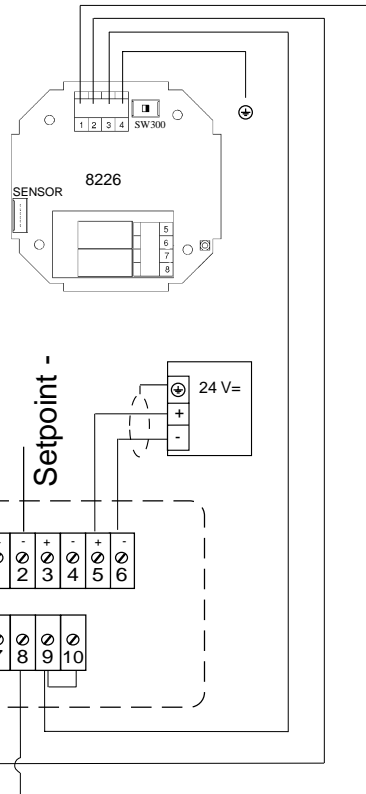


INSTALLATION

3.4 EASY LINK CONNECTIONS



Jumper



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3.4

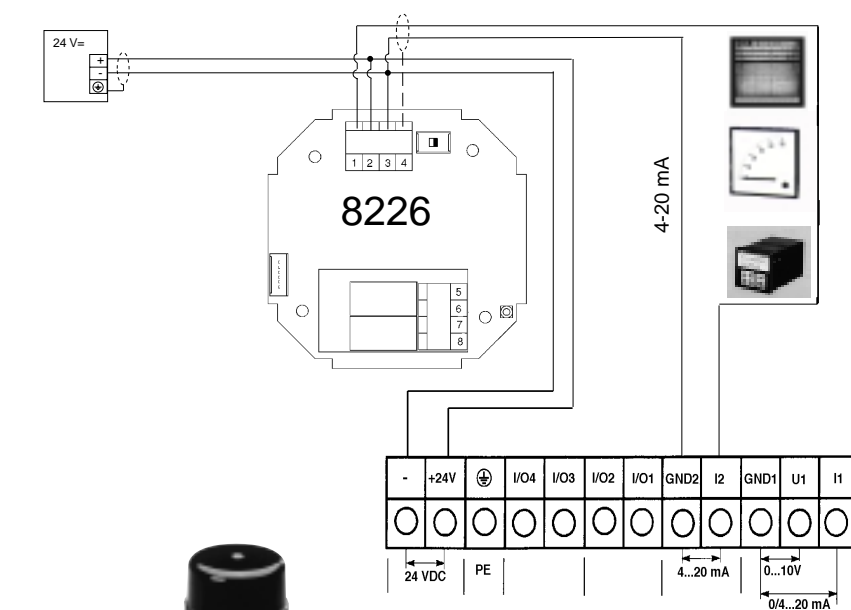


TopControl Positioner

Example: *Easy* LINK - Type 8630

Connection of a compact Conductivity Transmitter 8226 12-30 VDC with relays.

INSTALLATION



Positioner Type 1067



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3.4

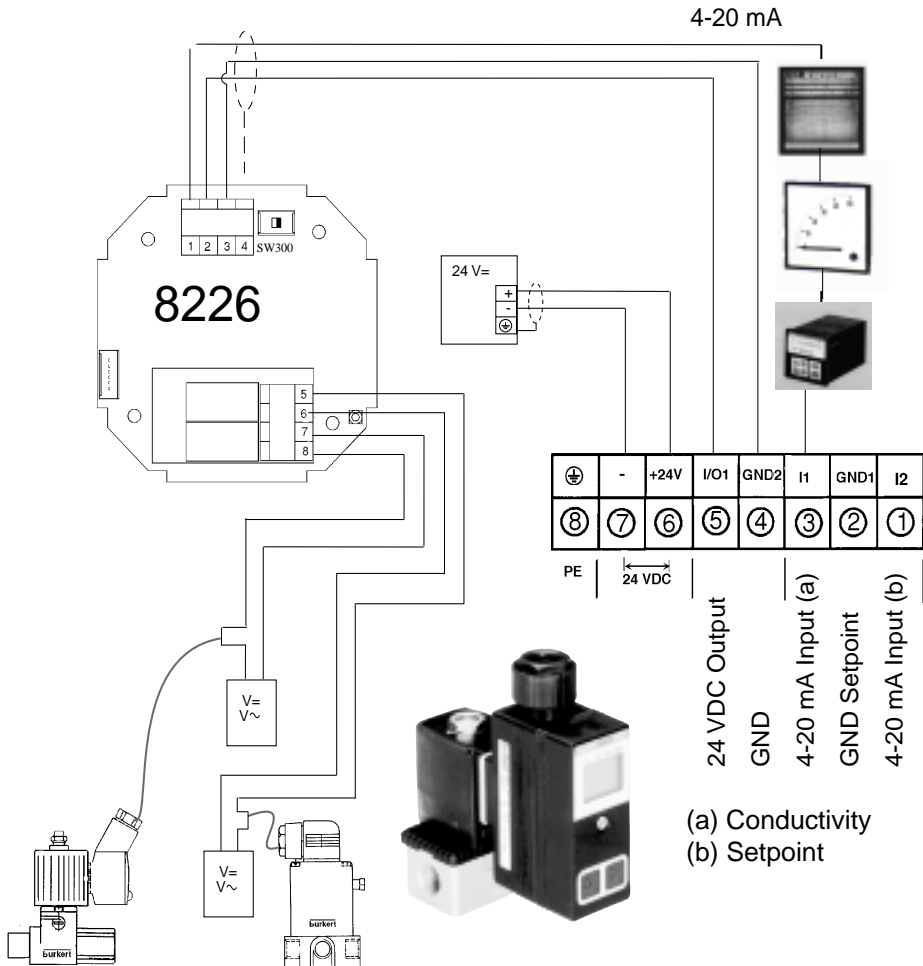
Example: *Easy* LINK - Type 1067

Connection of a compact Conductivity Transmitter 8226 12-30 VDC with relays



INSTALLATION

3.4 ENGLISH



Solenoid control valve with PI-controller Type 8624

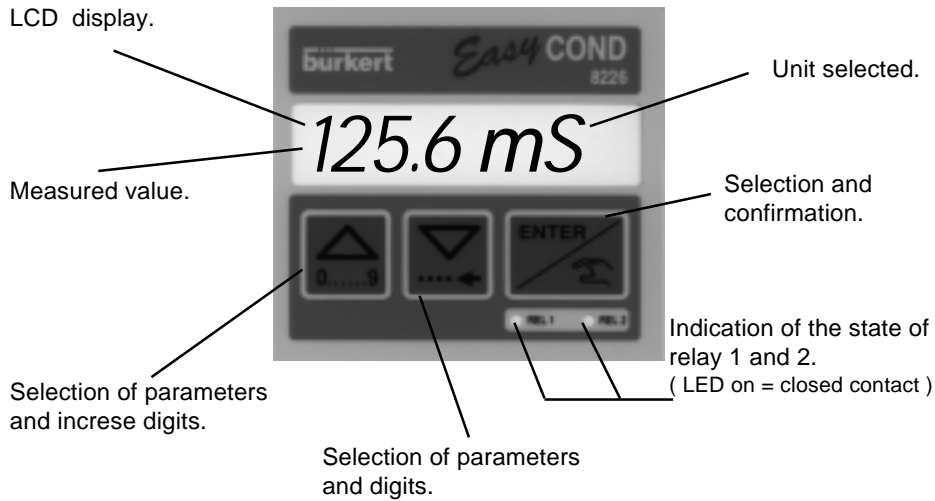
Example: *Easy* LINK - Type 8624

Connection of a compact Conductivity Transmitter 8226 12-30 VDC with relays

OPERATION



4.1 OPERATING AND CONTROL GUIDE



Touches	Mode Menu	Finding a value
	Previous Menu	Increase from the blinking digit
	Next Menu	Advance to the next digit
	Activate the menu display (If "END" is displayed, save the modified parameters and return to the main menu)	Validate the displayed value
	Activating or deactivating the HOLD MENU*	
	Stop the Teach-In option	
	Access to the CALIBRATION MENU*	
	Access to the TEST MENU*	

* Only available within the main menu.



The Key can be locked to avoid accidental or unauthorised access.

For further information see section 3.3.2.


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4.1



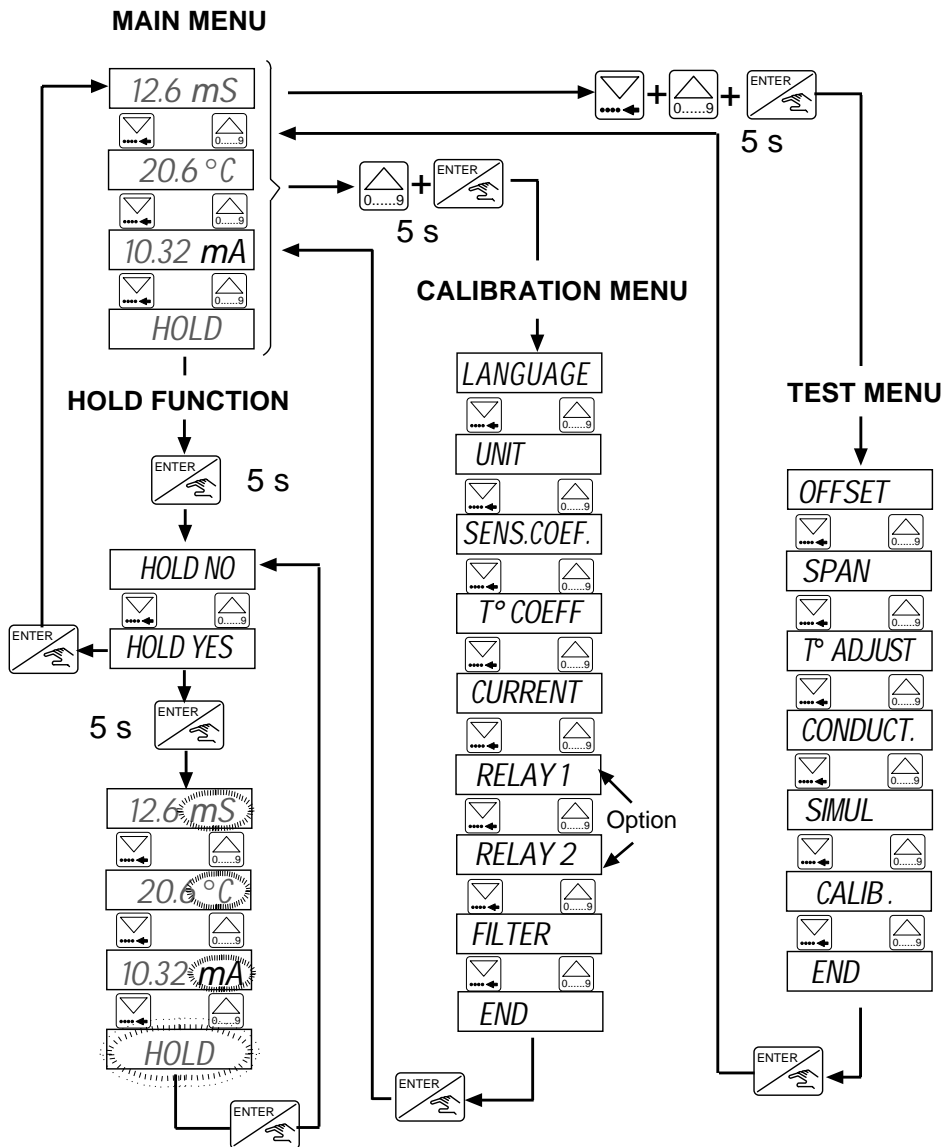
OPERATION

4.2 MENU GUIDE



- The menu guide below will assist in quickly and easily finding a desired parameter and programming the 8226 conductivity transmitter.
-  Indicates blinking digits.

ENGLISH
4.2

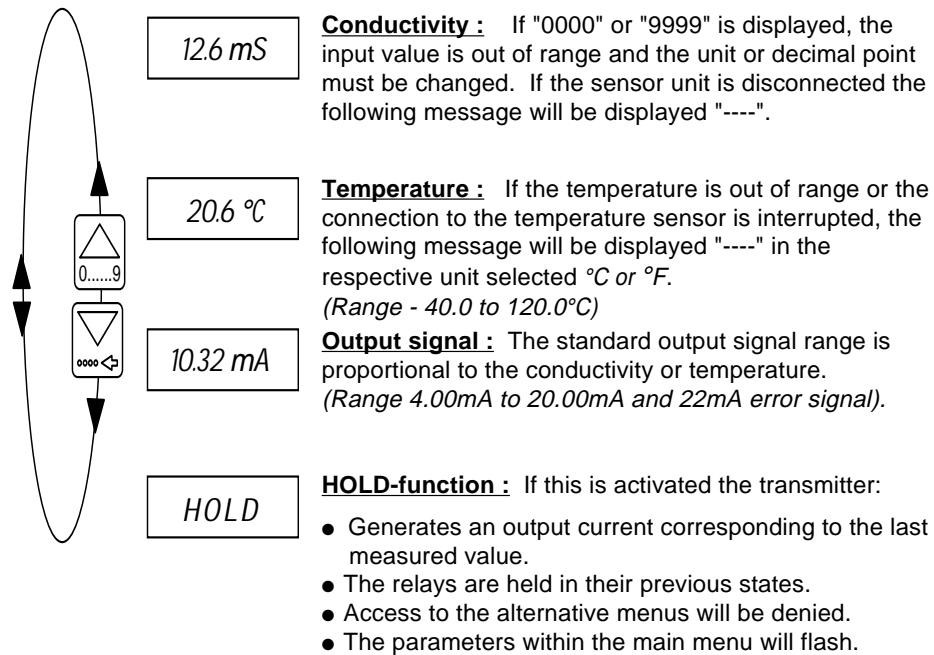


MAIN MENU



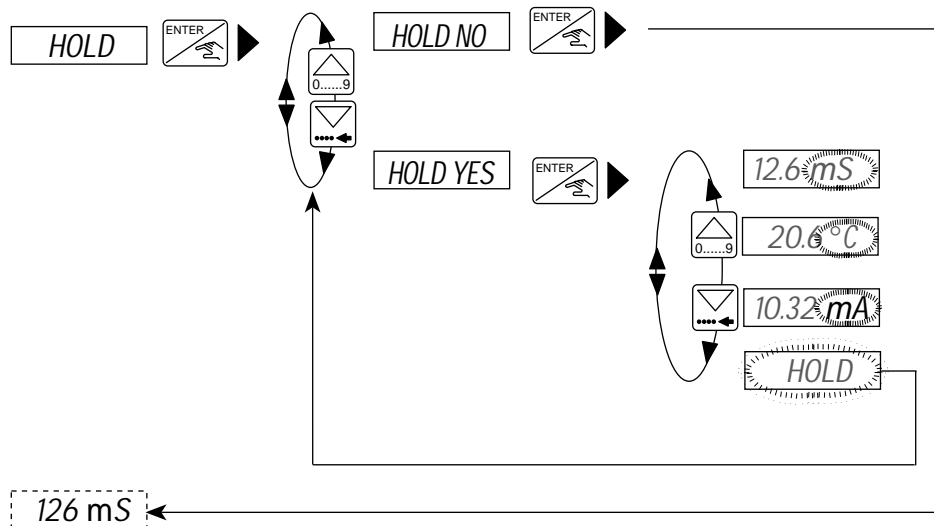
4.3 MAIN MENU

The following information is displayed within the Main Menu:



ENGLISH

4.3





CALIBRATION MENU



4.4 CALIBRATION MENU

PRESS   SIMULTANEOUSLY FOR 5 SECONDS

The following parameters can be set within this menu:

SECTIONS

ENGLISH
4.4

 LANGUAGE	Selection between English, German, French, Italian or Spanish.	4.4.1
UNIT	Selection of engineering units for conductivity and temperature.	4.4.2
SENS.COEF.	Enter the coefficient of the sensor. (Range 0 to 50.000)	4.4.3
T°Coeff	Selection of the temperature compensation mode (linear, automatic or Teach-in function). (Linear range 0.00 to 9.99% / °C)	4.4.4
 CURRENT	Determination of the 4...20 mA measuring range. (Selection between conductivity and temperature)	4.4.5
RELAY 1	Parameter definition of relay 1. This message only appears if this relay option is available.	4.4.6
RELAY 2	Parameter definition of relay 2. This message only appears if this relay option is available.	4.4.6
FILTER	Damping selection. There are ten different steps available. (Range 0 to 9)	4.4.7
END	Back to the operation mode; store the new parameters set.	



The following sections explain how to change the parameter values within the calibration menu above.

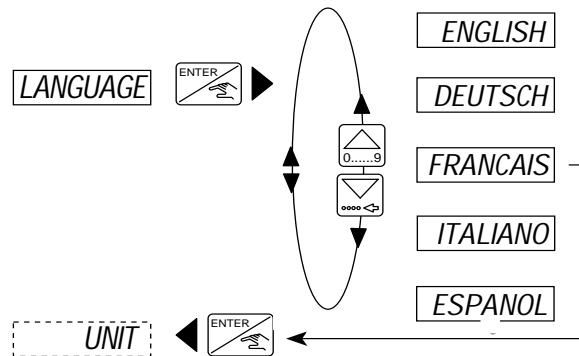
CALIBRATION MENU



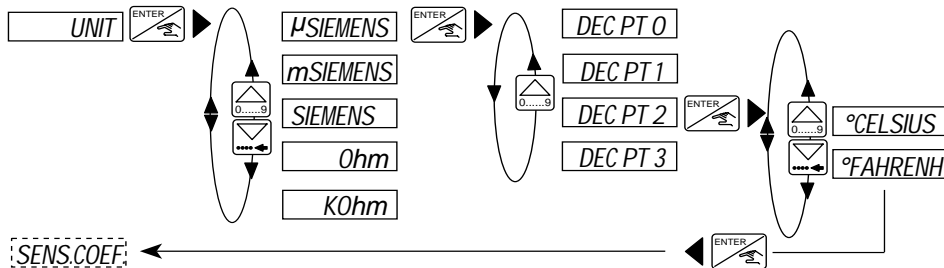
4.4.1 LANGUAGE



The selection of an alternative language is confirmed by the Enter-key and becomes immediately active.



4.4.2 ENGINEERING UNITS



- The selection of units is confirmed by the Enter-key and becomes immediately active.
- The conductivity can be displayed with 0, 1, 2 or 3 decimal places but 4 digits will always be displayed. (μ Siemens/cm are always expressed in integer values; Siemens/cm always with 3 decimal points).

ENGLISH
4.4.1



CALIBRATION MENU

4.4.3 SENSOR COEFFICIENT

4.4.3.1 Initial calculation of the cell constant

The cell constant is a specific value for each sensor depending on the material and diameter of the fitting used. It is calculated by using the following equation:

$$C = C_s \times C_f$$

Where :
C = Sensor coefficient to be calculated and programmed
C_s = Basic cell constant of the sensor. This value is written on a sticker on the side of the sensor housing or on the cell cable.
C_f = Correction factor of the fitting used (see table).



$$\begin{aligned} C_s &= 6.295 \\ C_f &= 0.985 \text{ (DN 50 in Brass)} \\ C &= 6.295 \times 0.985 = \mathbf{6.200} \end{aligned}$$

SENS.COEF. [ENTER] K=06.000



T° COEFF [ENTER] K=06.200

ENGLISH

4.4.3

Correction Factor Tables for the 8226 Transmitter

DN	Weld Ends Male / Female threaded ports		True union and Solvent spigots		
	Brass	Stainless Steel	PVDF	PP	PVC
32	0.991	0.989	1.113	1.098	1.093
40	0.989	0.989	1.049	1.045	1.045
50	0.985	0.983	1.022	1.021	1.022

DN	Solvent or Fusion spigots				Saddles
	Brass	Stainless Steel	PVDF	PP	PVC
65	--	0.993	1.020	1.019	1.025
80	--	0.995	1.020	1.019	1.022
100	--	0.998	1.019	1.017	1.010



- If a DN fitting > 100 is used which is not listed or a reservoir, a correction factor of 1.000 should be applied.
- For high precision it is recommended that the coefficient of the sensor is recalculated. (See following section).
- For DN 32 with a reduction to DN 15,20 or 25 take the correction factor for DN32.

CALIBRATION MENU



4.4.3.2 Modification of the cell constant.



The cell constant may drift with time due to deposits on the sensor or the fitting. It is advisable to periodically check this value by measurement with a buffer solution or reference device and ensure that the sensor finger is clean.

A new cell constant can be calculated as follows:

$$C_{new} = C_{old} \times \frac{\text{Cond}_{ref}}{\text{Cond}_{8226}}$$

Where :	C_{new}	- New value for the known sensor coefficient.
	C_{old}	- Old value for the programmed sensor coefficient.
	Cond_{ref}	- Value for the measured conductivity.
	Cond_{8226}	- Value for the conductivity indicated by the 8226 transmitter.

ENGLISH

4.4.3



Calibration with a solution of 10.00 mS

Electric cell constant programmed = 6.295

Conductivity measured by the 8226 = 10.50

$$\text{Elec cst}_{new} = 6.295 \times 10.00 / 10.50 = 5.995$$



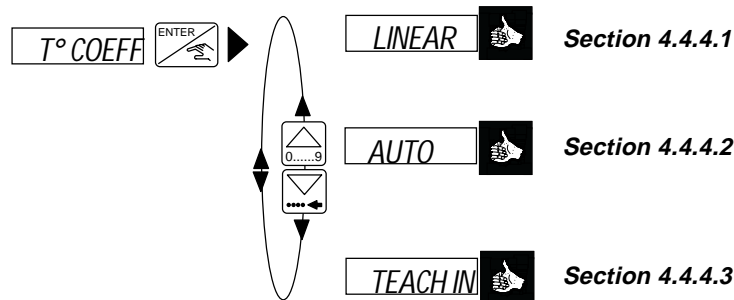
- In cases of the sensor finger replacement, please take into account the new cell constant value.



CALIBRATION MENU

4.4.4 TEMPERATURE COMPENSATION COEFFICIENT

The Conductivity Transmitter offers 3 different types of temperature compensation; Linear, Automatic and Teach-In.



ENGLISH

4.4.4

1) Linear Compensation (*LINEAR*)

Enter a single value for compensation over the entire conductivity and temperature ranges (e.g. 2.1 % / °C).



For no compensation enter 0.0% / °C within this option.

2) Compensation with memorized curves (*AUTO*)

Select one of the 4 pre-programmed compensation curves for commonly used products. The available compensation curves include; NaOH, HNO₃, H₂SO₄, NaCl or special (determined by Teach-In).

3) Teach-In function (*TEACH-IN*)

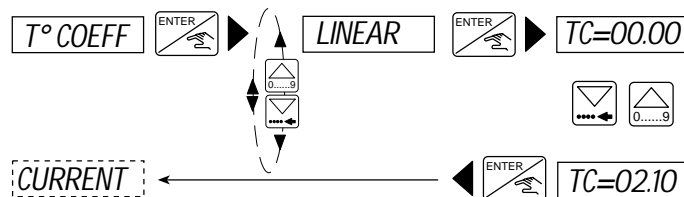
This function allows the user to practically determine with the transmitter a compensation curve within the desired temperature range. From entering the temperature limits and starting measurement the conductivity transmitter automatically computes the compensation curve.

CALIBRATION MENU



4.4.4.1 LINEAR TEMPERATURE COMPENSATION (LINEAR)

In some cases linear compensation provides enough precision for process monitoring or control. Linear temperature compensation requires just one input value which is the average compensation for both the temperature and conductivity ranges.



- The units for this option are %/°C
- The linear limit range is 0.00...9.99%/°C
- For calculating the average compensation value α , the following equation can be used:

$$\alpha = \frac{\Delta\chi}{\Delta T} \times \frac{1}{\chi_{25}}$$

The figure below explains the significance of the linear temperature compensation coefficient.

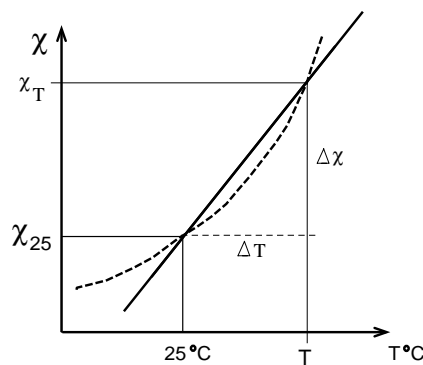


Figure 4.1 - Linear Compensation

ENGLISH

4.4.4



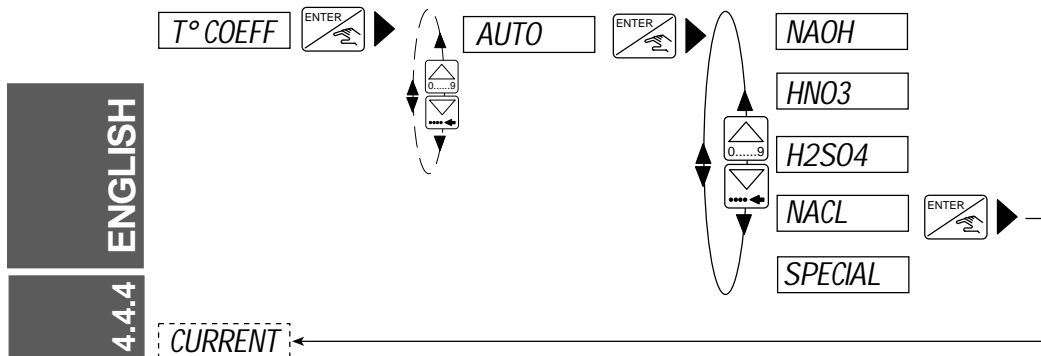
CALIBRATION MENU

4.4.4.2 AUTOMATIC TEMPERATURE COMPENSATION (AUTO)

The compensation curves for NaOH, HNO₃, H₂SO₄ and NaCl have been determined over the temperature range of 10...80°C for the following concentrations:

NaCl :	0,2%
NaOH :	1,0%
HNO ₃ :	1,0%
H ₂ SO ₄ :	20.0% from 5 to 55°C

The option "special" stores the compensation curve achieved by the customer through the Teach-In function (see next section).



- The "SPECIAL" option is not available until a Teach-In function has been completed, i.e. there is no temperature compensation of the conductivity.
- The memorized compensation curve for NaCl applies for concentrations between 60mg/l ($\cong 100\mu\text{S}$) to 270 g/l ($\cong 220\text{mS}$). In most cases the compensation within this option will be sufficient for water and diluted solutions.

CALIBRATION MENU



4.4.4.3 TEACH-IN TEMPERATURE COMPENSATION (TEACH-IN)


This option enables the practical definition of the compensation curve over a specified temperature range.

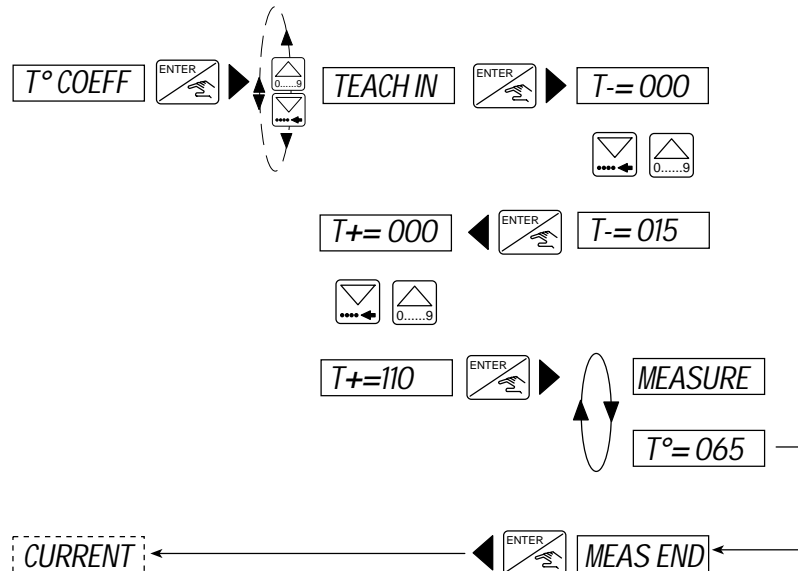


Steps for successful measurement.

- Enter the temperature range (T - and T +) of the fluid making sure the difference between T - and T + exceeds 5°C.
- During the measurement the temperature of the solution must reach 25°C.
- Immerse the device into the solution and heat slowly from T - or 25°C until T + or 25°C has been reached.
- The compensation coefficients are automatically calculated and stored for further reference within the "SPECIAL" option within the automatic compensation option.
- If the message "ERROR" appears on display, it means that a problem has occurred (for example the liquid has been heated too quickly). In this case the operation must be repeated.



The increase in temperature must be slow in order to compensate the thermal resistance of the temperature sensor. Please avoid bubbles appearing on the surface of the sensor. The user can quit the Teach-In option at any time by pressing   for a duration of 5 sec.



ENGLISH

4.4.4



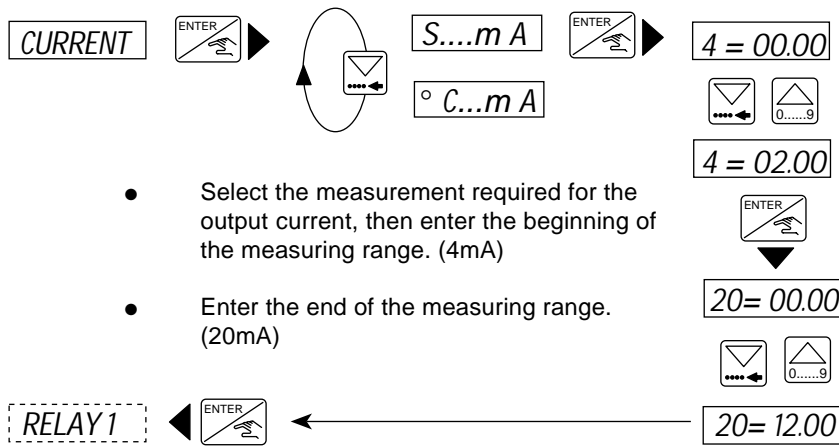
CALIBRATION MENU

4.4.5 CURRENT OUTPUT

Within this option the measuring range for the conductivity or temperature can be defined corresponding to the output current of 4...20 mA.



- The beginning of the measuring range might be larger than the end creating an inverted signal, eg/ 0...10 mS/cm corresponds to 20...4 mA.
- The adjustments (engineering unit and decimal point) selected for the conductivity or temperature display will be valid within this option.



- Select the measurement required for the output current, then enter the beginning of the measuring range. (4mA)
- Enter the end of the measuring range. (20mA)



- 2...12 mS/cm corresponds to 4...20 mA.
- The figure below shows the type of relationship between the 4...20mA output and the associated measuring range.

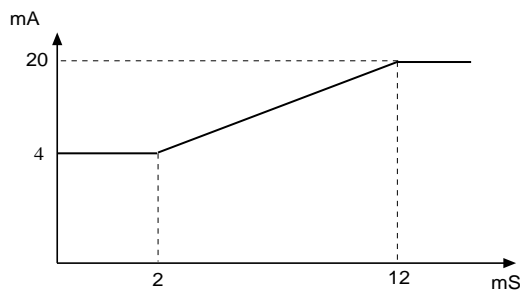


Figure 4.3 - Output Signal

CALIBRATION MENU



4.4.6 RELAY (OPTION)

The parameter definition of the limit contacts is completed within this mode. Two limit values are entered for each relay : - 1, + 1 and - 2, + 2. The user also has the option to invert the relays and to set a delay time between 0 and 180 seconds. This delay shall prevent the relays from being activated too quickly, eg/ when time for homogenization is required (eg/ measurements within tanks with agitator). If the conductivity exceeds a limit value, the transmitter will wait for the designated delay time before activating the relay. If the conductivity does not exceed the limit value or drops under the limit value before the delay is completed the relay will not be activated.



The unit and decimal point for conductivity or temperature are activated within this option as selected within the "UNIT" menu (see section 4.4.2).

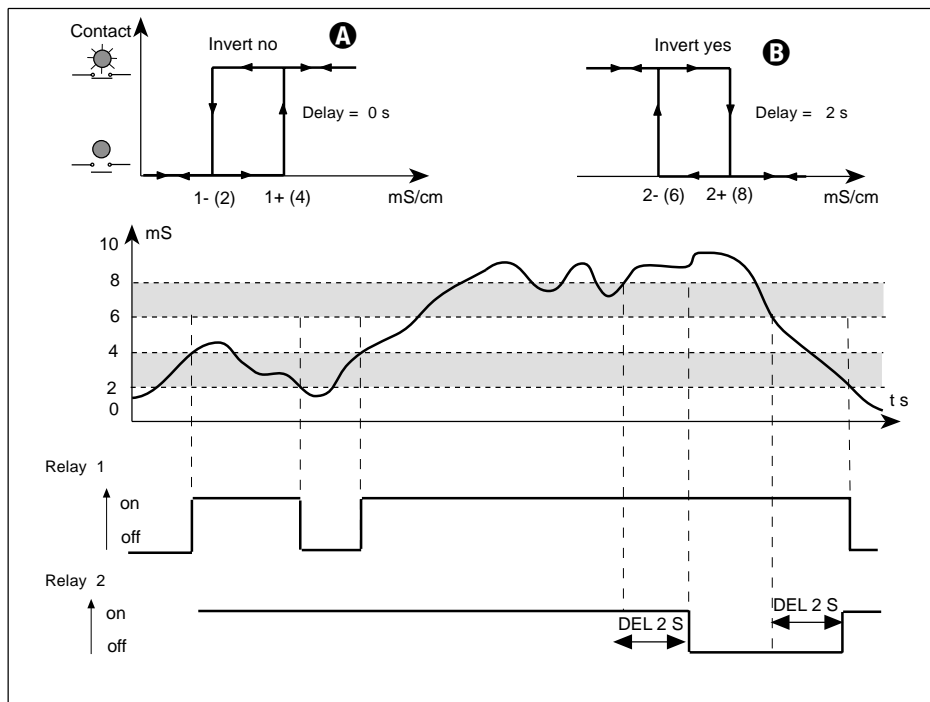


The following conditions must be observed: 1- 1+, 2- 2+.



- A** Relay 1 : Non inverted with thresholds of 2 and 4 mS/cm and no delay.
- B** Relay 2 : Inverted with thresholds of 6 and 8 mS/cm and delay of 2 Sec.

1- and 2- = the low settings for both relays
1+ and 2+ = the high settings for both relays



ENGLISH

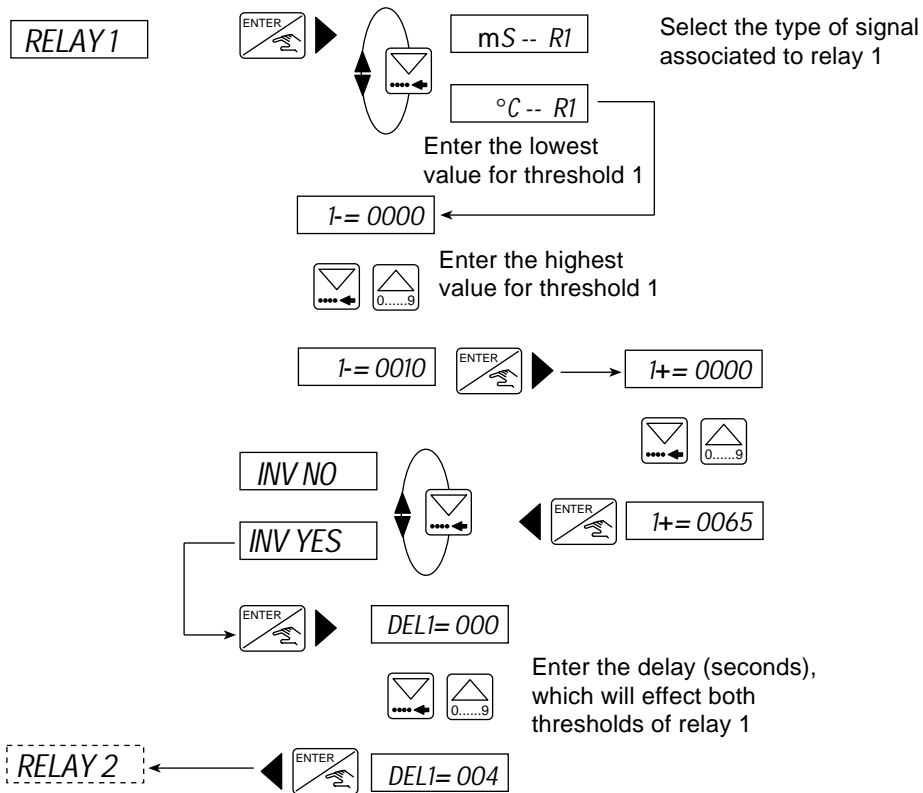
4.4.6



CALIBRATION MENU

4.4.6.1 RELAY 1

Relay 1 may be configured as a conductivity or temperature alarm as shown in the diagram below.



To deactivate a relay configuration the conductivity of the threshold 1+ and 1- must equal 0.00.

ENGLISH

4.4.6

CALIBRATION MENU



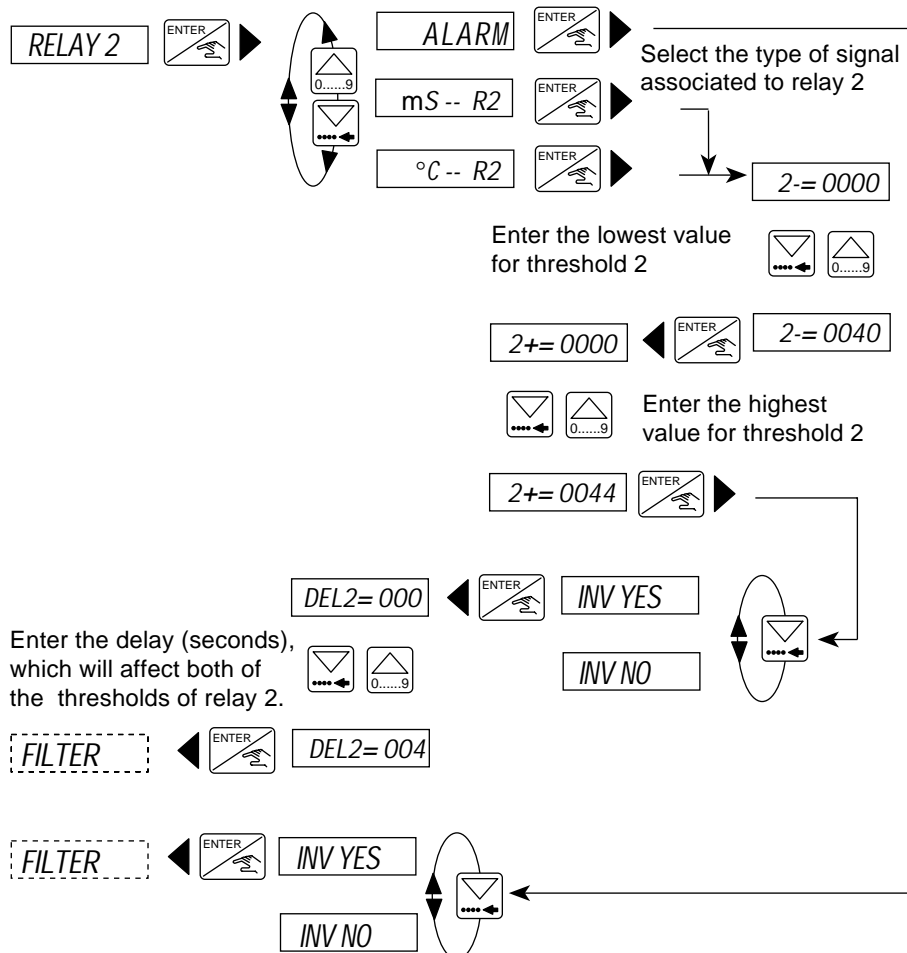
4.4.6.2 RELAY 2

Relay 2 maybe configured as conductivity, temperature or a general alarm for a connection failure.



The alarm is activated in the following situations:

- Problem with the power supply (display "PWR FAIL")
 - Supply < 12V or it is not regulated
- Measurement problem
 - Sensor finger is disconnected
- Measurement is out of range
 - $\chi > 2\text{S/cm}$ or - $40^\circ\text{C} < T < 120^\circ\text{C}$



ENGLISH
4.4.6



If the relay 2 is used as an alarm, ensure that the normally open state of the relay corresponds to a safe position of the process.



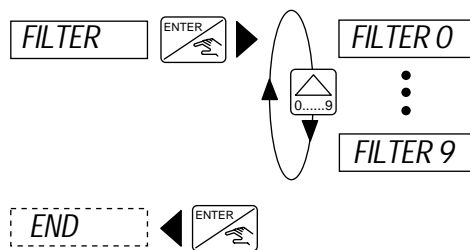
CALIBRATION MENU

4.4.7 FILTER FUNCTION

The filter function provides a damping effect to prevent fluctuation within the output current and display. There are 10 levels available from 0 to 9 with 0 having no damping effect.

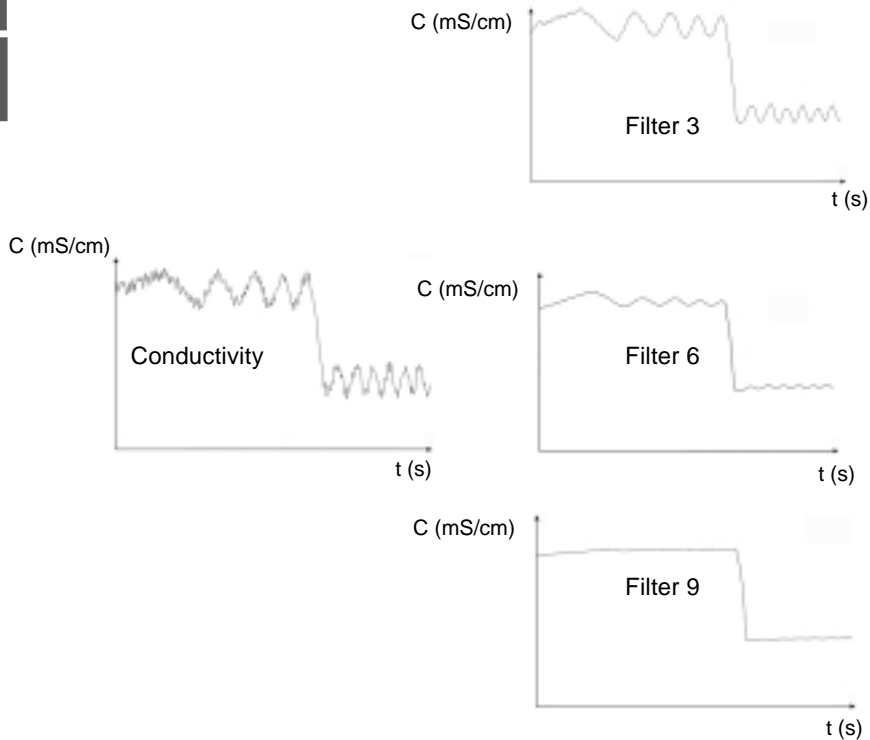


The filter which will be appropriate for most applications is filter 2.



ENGLISH

From the diagram below it is possible to see how the different filters influence the conductivity output and display over time.



TEST MENU










4.5 TEST MENU

PRESS  

SIMULTANEOUSLY FOR 5 SECONDS

The following parameters are selected and set within this menu;

SECTIONS

	OFFSET	Zero point compensation (4 mA).	4.5.1
	SPAN	Span compensation (20 mA).	4.5.2
	T° ADJUST	Temperature correction + / - 5 °C or 9 °F.	4.5.3
	CONDUCT.	Display of non-compensated conductivity.	4.5.4
	SIMUL	Input of the conductivity to be simulated. The current and relay outputs will react according to this value.	4.5.5
	CALIB	Calibration of the zero point. This must be completed if the conductivity is > 10 µS/cm before mounting the device.	4.5.6
	END	Return to the main menu and store the new parameters set for OFFSET and SPAN. If one of the two values is inappropriate, the device will automatically return to the "OFFSET" parameter and new values must be entered.	

ENGLISH

4.5



The following sections explain how to change and investigate the parameter values within the test menu above.



TEST MENU

4.5.1 OFFSET COMPENSATION

Within this option the user has the possibility of correcting the basic setting of 4 mA generated by the transmitter. The transmitter generates a value of 4mA by pressing




when "OFFSET" is displayed within the main test menu.

Measure the generated current with an ammeter. If the displayed value is incorrect it can be corrected by entering the measured value on the ammeter.

Adjustment range : + / - 0.5mA

OFFSET  OF= 04.00




SPAN  OF= 04.02 Enter the measured value

ENGLISH

4.5.1

4.5.2 SPAN COMPENSATION


Span compensation provides the option of changing the basic setting of 20 mA. The procedure is identical to that of the offset compensation above. The transmitter generates 20mA if the  key is pressed when "SPAN" is displayed within the main test menu.

Measure the generated current with an ammeter. If the displayed value is incorrect it can be corrected by entering the measured value on the ammeter.

Adjustment range : + / - 0.5mA

SPAN  SP= 20.00




T° ADJUST  SP= 19.96 Enter the measured value

TEST MENU



4.5.3 TEMPERATURE ADJUSTMENT

The 8226 conductivity transmitter possesses a temperature probe within the sensor. The value from the temperature sensor can be adjusted by an offset for compensation of the actual temperature gradients. To enter a desired offset press  when "T ADJUST" is displayed within the test menu and enter the value.



- The offset range is + or - 5°C.
- The selected temperature value will influence the compensated conductivity value.
- The temperature adjustment remains active until another value is entered.

T° ADJUST  ► + 0.0 ° C




Enter the temperature offset in (°C or °F)

CONDUCT. ◀  + 1.2 ° C

ENGLISH

4.5.3

4.5.4 DISPLAY OF NON-COMPENSATED CONDUCTIVITY

This option provides a conductivity value without any compensation for verifying the actual conductivity. To view this value press  as shown in the diagram below.

CONDUCT.  ► 8.34 mS.

SIMUL ◀ 



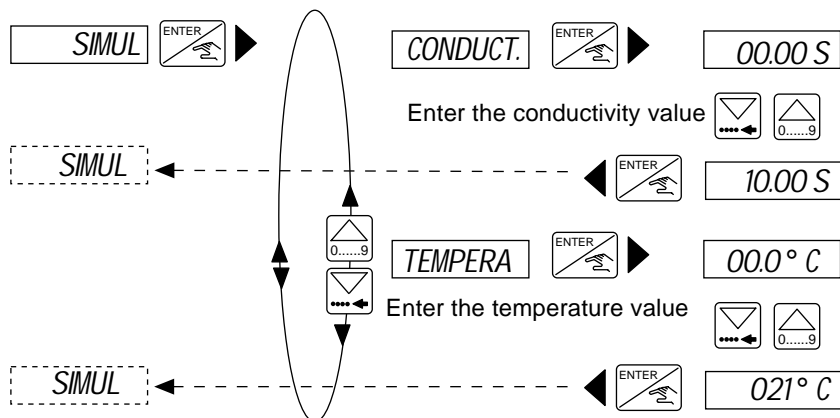
The decimal point behind the unit indicates the difference between the display within this option and the compensated value within the normal function mode in the main menu.



TEST MENU



4.5.5 CONDUCTIVITY SIMULATION

A conductivity or temperature value can be simulated within this menu, allowing the user to test the system without any liquid being present. The simulated value influences all the outputs including the relays.



ENGLISH

4.5.5

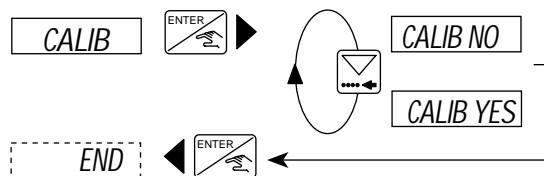
Quit the sub-menu SIMUL by pressing  or .



The simulation will remain active until the user enters another parameter or menu.

4.5.6 CALIBRATION OF THE ZERO POINT

If the conductivity display within the main menu is greater than 10 $\mu\text{S}/\text{cm}$ in the air, perform a new calibration of the transmitter with the sensor in the air. To calibrate the unit, hold the sensor in the air and select "CALIB YES" and the unit will automatically perform a calibration test.



The measure for calibration continues for a duration of about 1 min.



4.6 8226 SETTINGS

The 8226 Conductivity Transmitter is calibrated within the factory before delivery to the settings shown in the table below.

4.6.1 FACTORY SETTING OF CONDUCTIVITY TRANSMITTER TYPE 8226

Language:	English	Relay:	1-:	00.00
Unit of conductivity:	mS/cm		1+:	00.00
Unit of temperature:	°C		2-:	00.00
Decimal points:	2		2+:	00.00
Cell constant:	≅ 6.30		DEL1:	000
Temperature compensation			DEL2:	000
coefficient:	00.00%/°C	Filter:		Filter 2
Current:	4 mA: 00.00			
	20 mA: 00.00			



The table below allows the configuration settings for the 8226 conductivity transmitter to be written for future reference and quick referral.

4.6.2 USER SETTING OF CONDUCTIVITY TRANSMITTER TYPE 8226

IDENT N°:

SERIAL N°:

Language:	.....	Relay:	1-:	.....
Unit of conductivity:	.....		1+:	.....
Unit of temperature:	.....		2-:	.....
Decimal points:	.....		2+:	.....
Cell constant:	.....		DEL1:	.....
Temperature compensation			DEL2:	.....
coefficient:	.....	Filter:		.....
Current:	4 mA:			
	20 mA:			

ENGLISH
4.6



MAINTENANCE

5.1 STORING AND CLEANING OF THE SENSOR

Inductive conductivity sensors do not require any special maintenance, however the hole / duct of the sensor must never become blocked especially by conductive deposits. If necessary, the sensor can be easily cleaned with slightly acidic-containing solutions or any solvent compatible with PVDF.



While checking the sensor, the HOLD function can be activated.



Ensure that the pipe does not contain any fluid before dismantling.

5.2 TROUBLE SHOOTING GUIDE



If any problems persist, please contact your local Bürkert subsidiary or return the product with a full explanation of the problem.

This section is designed to assist with problems which may occur during installation or operation. If in doubt please do not hesitate to contact your local Bürkert subsidiary.

ENGLISH

5.1

Faults	Status	Actions	
The transmitter does not work			
Transmitter connected ?	No	Connect the device	3.3
Fuses OK (if any) ?	No	Change the fuses	3.3
Switch ON (if any) ?	No	Set the switch ON	----
Power supply on terminal + and - OK ?	No	Check the connection	3.3
Transmitter programming / testing unavailable			
Switch SW4 up (ENTER key locked) ?	Yes	Set SW4 switch down	3.3
The unit is blinking	Yes	Deactivate the hold option	4.3
Display 'PWR FAIL'			
Power supply not stabilised or inferior to 12 VDC ?	Yes	Change the power supply	----
Display 'ERROR'			
Display at the start-up (EEPROM failure) ?	Yes	Restart the device	----
Error at each start-up?	Yes	Return the device	6.8
Display after validation of the menu (EEPROM failure)	Yes	Configure the device again	4.4
Failure at each validation of the menu?	Yes	Return the device	6.8
Display within the Teach-In mode ?	Yes	Perform the Teach-In again	4.4.4.3
Display '---- °C'			
Temperature of the fluid between -40 and 120 °C?	No	Device out of range	----
Black connector connected (Open the transmitter)	No	Connect the black connector again	3.3
Display '---- mS'			
Black connector connected (Open the transmitter)	No	Connect the black connector again	3.3
Display always '00.00 mS'			
Sensor coefficient = 0?	Yes	Configure sensor coefficient	4.4.3
Coaxial cable connected (brown)	No	Reconnect the cable	----

MAINTENANCE



Faults	Status	Actions	
Blinking display of the conductivity : '2,000 S' Conductivity > 2 S/cm?	Yes	Device out of range	---
Blinking unit	Yes	Turn off the hold option	4.3
Conductivity measurement incorrect Ensure the sensor finger is clean	No	Clean the sensor finger	5.1
Air conductivity < 10µS/cm (zero drift) ?	No	Perform a calibration within the air	4.5.4
Temperature compensation value OK ?	No	Select a correct temperature compensation value	4.4.4
Sensor coefficient OK ?	No	Enter the coefficient	4.4.4
Current output of 22 mA Fluid temperature between -40 and 120 °C ?	No	Device out of range	---
Conductivity > 2 S/cm ?	Yes	Device out of range	---
Display message ' ERROR' ?	Yes	Indicates loss of data - reprogramme the unit.	4.4
Current output value zero or different from the display SW300 correctly set (sinking or sourcing) ?	No	Modify SW300	3.3.2
Connection of the current output OK ?	No	Connect current output	3.3
Failure < 1 mA ?	Yes	Set the offset and span	4.5
Fixed current output value (4 or 20 mA) Parameters for current output OK ?	No	Program the current output	4.4.5
Conductivity or temperature value out of range	Yes	Program the current output	4.4.5
The devices connected to the relays do not work Parameter relays OK (threshold, inversion and delays) ?	No	Program the relay output again	4.4.6
Conductivity or temperature out of the threshold range?	Yes	Program the relay output again	4.4.6
Relays correctly connected ?	No	Connect relays	3.3.3
Connection of relays 1 and 2 inverted ?	Yes	Connect relays accordingly	3.3.3
Protection fuses for the relays OK (if any) ?	No	Change the fuses	3.3
Relay switches ON (if any) ?	No	Relay switches 'ON'	---

ENGLISH

5.2



SPECIFICATIONS

6.1 SPECIFICATIONS

Specifications in relation to the process

Conductivity measurement

Measurement type	Inductive conductivity measurement
Measuring range	0...2 S/cm (minimum)
Accuracy	+ / - 2% of the measured value from 100µS...2S/cm
Temperature drift	0.1 % / °C (maximum)
Response time	< 1 s

Temperature measurement

Measurement type	Numeric measurement
Measuring range	- 40...120 °C
Accuracy	+ / - 0.5°C from 0...110°C and + / - 1°C from - 40°C...0°C and 110°C...120°C

Piping installation

Pipes	Stainless steel, brass or plastic (PVDF, PP and PVC)
Connection	Solvent/fusion spigots, threaded ports (G, NPT,Rc), butt welding ends, flange, Tri-clamp - See instruction manual SO20 - Ident. No. 429633S
Pressure rating	PN 6
Fluid temperature	0...120°C
Material contacting the fluid:	Sensor body : PVDF Seals : EPDM or FPM

ENGLISH

6.1

Specification in relation to the control outputs

Electrical connection

Power supply	12...30 VDC regulated +/- 5% 115/230 VAC
Consumption	250mA (maximum)

Proportional output

Output type	Current output from 4...20 mA (error signal 22 mA)
Accuracy	+ / - 1%
Wiring	Sinking or sourcing mode
Maximum load	1000 Ω at 30VDC 800 Ω at 24VDC 450 Ω at 15VDC 330 Ω at 12VDC
Adjustment	Selectable software measuring range (4... 20mA) for conductivity or temperature measurement 22mA if the signal is out of the measuring range (Conductivity > 2S or T < - 40, T > 120°C)
Output calibration	Software: offset (4mA) and span (20mA) adjustable

Relay output

Output type	Normally open relays
Load	DC: 75V = ; 3A AC: 48V ≅ ; 3A -
Life expectancy	100 000 cycles (minimum)
Thresholds	Hysteresis programmable according to the temperature or conductivity.
Switching delay	Programmable from 0...180 s

SPECIFICATIONS



Specifications in relation to the user

User's interface

Display	8 digits alphanumeric LCD 9mm high
Conductivity units	μ S/cm without decimal point mS/cm with 4 positions for the decimal point S/cm with 3 positions for the decimal point
Resistance units	Ω and k Ω with 4 positions for the decimal point
Temperature units	Temperature °C of °F with 1 decimal point
Display :	
Current output	Generated current indication : 'xx.xx mA'
Relay state	Red LED's on when the contact is closed
Programming	Menus with 3 programming keys
Protection	Lockable switch for the 'Enter' key

Processing

Assistance for commissioning	Simulation of the conductivity or temperature to check the correct running of the installation
Filtering of the conductivity	10 levels of filtering (Filter 0...9)
Temperature adjustment	+ / - 5°C maximum, programmable
Temperature compensation	Reference of 25°C
Type of compensation : Linear:	(from 0.00...9.99% / °C)
	Automatic: Sodium chloride (NaCl) from 0.05...270g/l from 0...80°C Nitric acid (HNO ₃) dosing 1% from 10...80°C Sodium hydroxyde (NaOH) dosing 1% form 10...80°C Sulfuric acid (H ₂ SO ₃) dosing 20% from 5...55°C
	Teach-In: Teach-In of the variations from the conductivity according to T°C splitting the variations curve into 5 linear segments
Maintenance	HOLD function to maintain the output signals

ENGLISH

6.1

Specifications in relation to the environment

Ambient conditions

Storing temperature	0...60°C (32...140°F)
Storing humidity	Maximum of 80%
Operating temperature	0...60°C (32...140°F)
Operating humidity	Maximum of 80%
Enclosure rating	IP65

Construction

Dimensions maximum	188 x 88 x 126mm
Weight	550 g (maximum)

Materials in contact with the environment

Electronic housing	PC 20% glass reinforced fibre
Front plate	Polyester

Conformity to standards

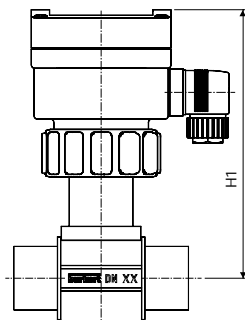
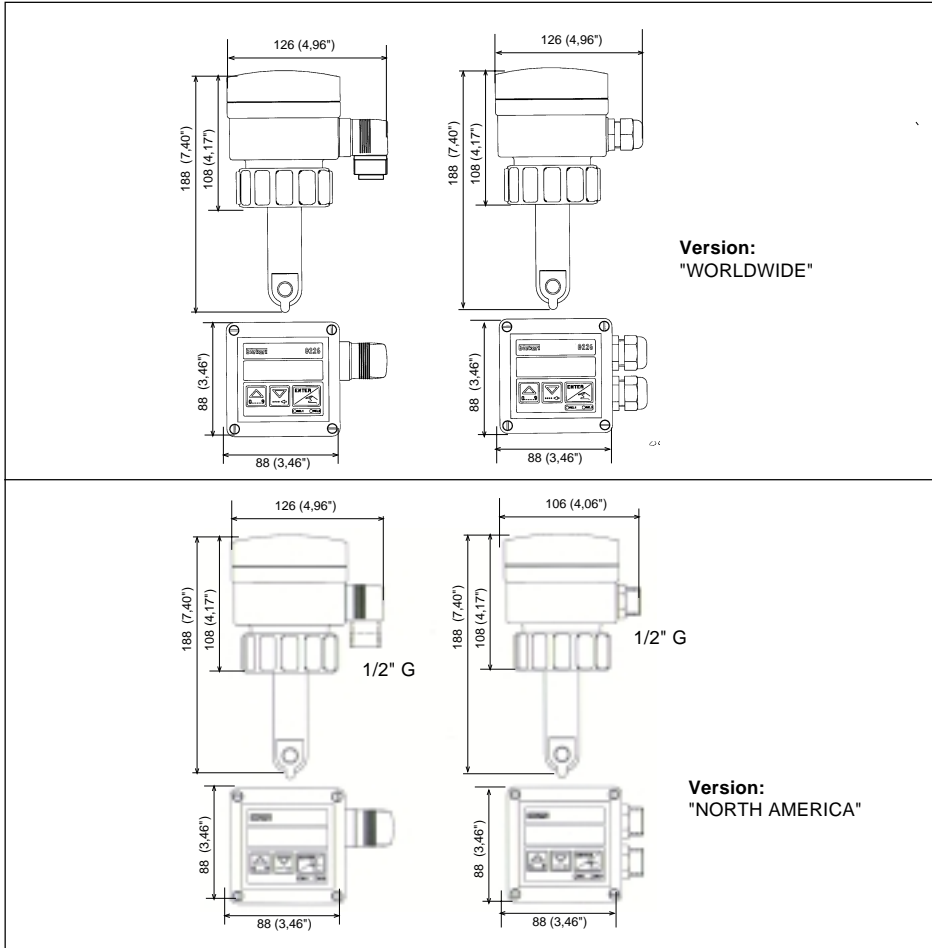
Emission	According to generic norm EN 50081.1
Immunity	According to generic norm EN 50082.2
	Output current accuracy +/- 2% according to Test ENV 50145 (only valid for 115/230 VAC with relay)
Safety	According to safety regulations for measuring instruments for regulation and laboratory NF EN 61010-1



INFORMATION

6.2 DIMENSIONS - (IN MM)

6.2 ENGLISH



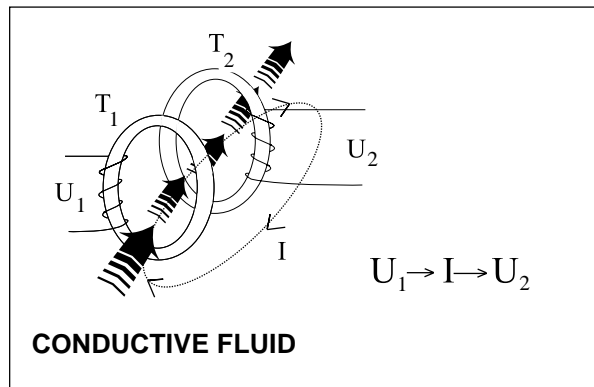
Variable dimensions (in mm)

DN	H1
15	177
20	177
25	177
32	177
40	178
50	184

6.3 MEASURING PRINCIPLE

Conductivity is the ability of a liquid / solution to conduct an electrical current. To measure the conductivity of a solution the 8226 conductivity transmitter uses the following principle:

- A voltage is connected to the primary magnetic coil.
- The magnetic field induced generates a current in the secondary magnetic coil.
- The intensity of the current is a direct function of the conductivity of the solution between the 2 magnetic coils.



ENGLISH
6.3

6.4 STANDARD DELIVERY

From a standard delivery you should of recieved the following:

- 1 8226 Inductive Conductivity Transmitter
- 1 Instruction Manual (3 languages)

(If the transmitter has 1 or 2 Pg13.5 connections you should additionally recieve 1 or 2 multiway seals depending on the version).



ANNEX

6.5 TYPE SPECIFICATION

Inductive Type 8226 Conductivity Transmitter

Worldwide types

4-20 mA output

Power supply	Relays	Gasket	Connection	Ident N°
12...30 VDC	No	FPM	DIN 43650	431673U
12...30 VDC	No	EPDM	DIN 43650	431675W
12...30 VDC	No	FPM	1x PG 13,5	431674V
12...30 VDC	No	EPDM	1x PG 13,5	431676X
12...30 VDC	2	FPM	2 x PG 13,5	431679A
12...30 VDC	2	EPDM	2 x PG 13,5	431680Y
115/230 VAC	No	FPM	2x PG 13,5	431677Y
115/230 VAC	No	EPDM	2x PG 13,5	431678H
115/230 VAC	2	FPM	2x PG 13,5	431681M
115/230 VAC	2	EPDM	2x PG 13,5	431682N

Inductive Conductivity Transmitter Type 8226

North America types; G 1/2" connection

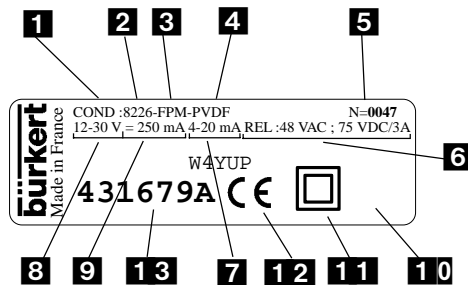
4-20 mA output

Power supply	Relays	Gasket	Connection	Ident N°
12...30 VDC	No	FPM	1 x G1/2"	431683P
12...30 VDC	No	EPDM	1 x G1/2"	431684Q
12...30 VDC	2	FPM	2 x G1/2"	431687K
12...30 VDC	2	EPDM	2 x G1/2"	431688U
115/230 VAC	No	FPM	2 x G1/2"	431685R
115/230 VAC	No	EPDM	2 x G1/2"	431686J
115/230 VAC	2	FPM	2 x G1/2"	431689V
115/230 VAC	2	EPDM	2 x G1/2"	431690S

ENGLISH

6.5

6.6 LABEL TYPE 8226



- 1 Conductivity
- 2 Type
- 3 Seal material
- 4 Sensor material
- 5 Serial number
- 6 Relay characteristics
- 7 Output current
- 8 Power supply
- 9 Power/current consumption
- 10 (Factory internal N°)
- 11 Protection rating
- 12 CE mark
- 13 Ident. No.



6.7 SPARE PARTS LIST

Position	Specifications	Ident. No.
1	Sensor housing with cable plug DIN43650	432753V
2	Sensor housing with ring, and 1 PG13.5	427252S
3	Sensor housing with ring, and 2 PG13.5	433446K
4	Cable plug (standard)	424205Z
5	Cable plug USA-version	424206S
6	PG 13,5 standard version	418339G
7	PG 13,5 USA-version (G 1/2 ")	418340M
8	NBR Gasket PG13.5	415719S
9	Cover with screws, sheeting and printed circuit board Transmitter without relays	431691P
10	Cover with screws, sheeting and printed circuit board Transmitter with relays	431692Q
11	Ring	619205L
12	Union nut	619204K
13	Inductive conductivity sensor	427139R
14	FPM seal kit EPDM seal kit	425554P 425555Q
15	Instruction manual in 3 languages (D, GB, F)	428979C

ENGLISH

6.7

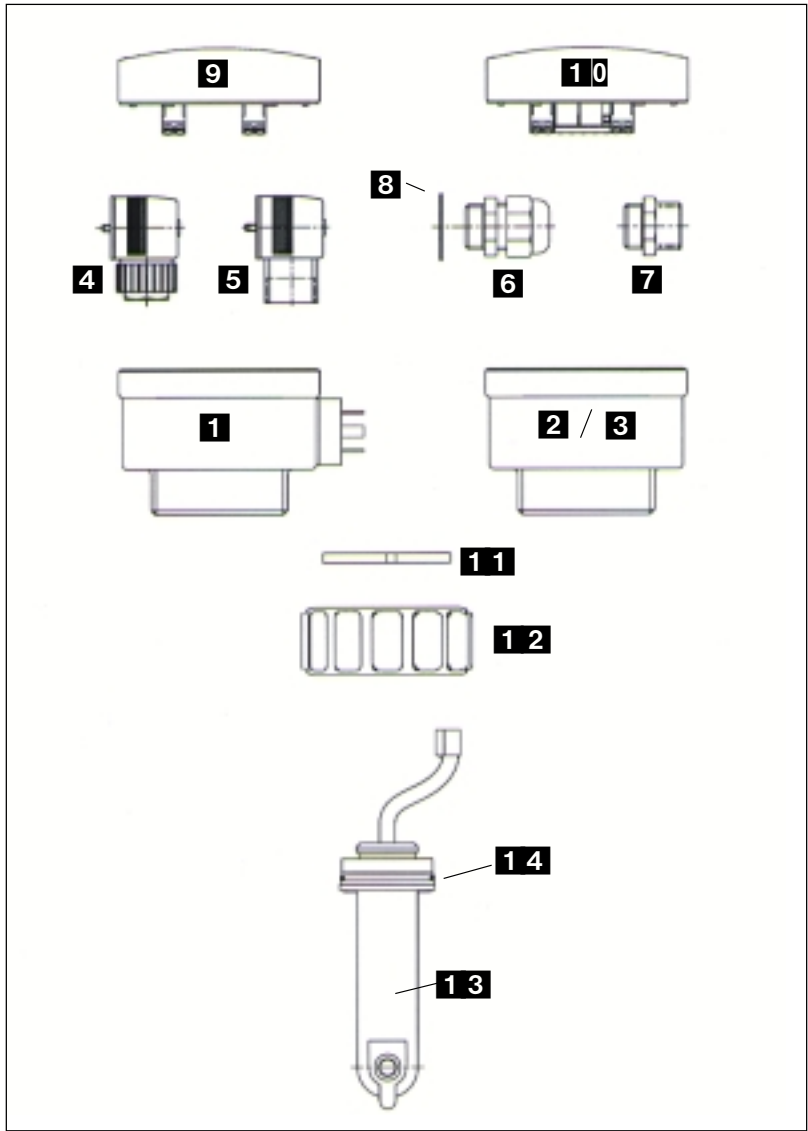


For easy identification of the spare parts an exploded diagram is provided on the next page.



ANNEX

6.7 ENGLISH



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Fax +43 1 894 13 00

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SERVICE

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