User's manual

Digital Indicator

D122.PA

Edition of standards 2010, software version 1.1.3, Rev.1

User's manual for indicators
D122.PA.7.0.0 D122.PA.7.0.3K

Gönnheimer Elektronic GmbH
http://www.goennheimer.de Email: info@goennheimer.de
Zertifiziertes Qualitäts-Managementsystem nach DIN EN ISO 9001
Dr.-Julius-Leber-Straße 2
67433 Neustadt/Weinstraße
Postfach 10 05 07
67405 Neustadt, Germany
phone: +49 (6321) 49919- 0
fax: +49 (6321) 49919 - 41

Table of contents

The symbols WARNING, CAUTION, NOTE

 **Warning**	This symbol warns of a serious hazard. Failure to observe this warning may result in death or the destruction of property.
 **Caution**	This symbol warns of a possible failure. Failure to observe this caution may result in the total failure of the device or the system or plant to which it is connected.
 **Note**	This symbol highlights important information.

1 Operation instruction for Explosion protected device

Application and Standards

This instruction manual applies to explosion-protected control panels of type of protection types below. This apparatus is only to be used as defined and meets requirements of EN 60 079 particularly EN60 079-14 "electrical apparatus for potentiality explosive atmospheres".

Use this manual in hazardous locations, which are hazardous due to gases and vapours according to the explosion group and temperature class as stipulated on the type label. When installing and operating the explosion protected distribution and control panels you should observe the respective nationally valid regulations and requirements.

General Instructions

The device has to have a back-up fuse as stipulated. The mains connection must have a sufficient short circuit current to ensure safe breaking of the fuse. To achieve an impeccable and safety device operation, please take care for adept transportation, storage and mounting, as well as accurate service and maintenance. Operation of this device should only be implemented by authorised persons and in strict accordance with local safety standards.

The electrical data on the type label and if applicable, the "special conditions" of the test certificate TÜV 99 ATEX 1488 are to be observed.

For outdoor installation it is recommended to protect the explosion protected distribution and control panel against direct climatic influence, e.g. with a protective roof. The maximum ambient temperature is 40°C, if not stipulated otherwise.

Intrinsically Safe Circuits

Erection instructions in the testing certificates of intrinsically safe apparatus are to be observed. The electrical safety values stipulated on the type label must not be exceeded in the intrinsically safe circuit. When interconnecting intrinsically safe circuits it is to be tested, whether a voltage and/or current addition occurs. The intrinsic safety of interconnected circuits is to be ensured. (EN 60079-14, section 12)

Safety Measures: to read and to comply

 **Warning**	Work on electrical installations and apparatus in operation is generally forbidden in hazardous locations, with the exception of intrinsically safe circuits. In special cases work can be done on non-intrinsically safe circuits, on the condition that during the duration of such work no explosive atmosphere exists. Only explosion protected certified measuring instruments may be used to ensure that the apparatus is voltage-free. Grounding and short-circuiting may only be carried out, if there is no explosion hazard at the grounding or short circuit connection.
 **Warning**	Danger of static charge! Clean only with humid cloth! Do not open when an explosive dust atmosphere is present!

2 Digital Indicator D122.PA

2.1 Field housing for dust ex area

The digital indicator D122.PA.7.x.x is suitable for dust ex- area Zone 21 and 22.

2.2 Short description

The digital indicator D122.PA/FF operates as an indicator for process data in a Profibus PA or field bus foundation H1 network.
The indicator behaves as a “Listener”, i.e. it does not appear in the bus as a participant with an own address. It separates a programmed field bus address and indicates the value of this address.
The advantage of this conception is that the D122.PA/FF must not be initialized by the bus master and does not in-crease bus traffic. The programming of the address can be done by the front side keyboard and is code word protected.

The D122.PA/FF indicates the process value of the sensor or actuator as a number of five figures. It shows the process value status by limit value marks.

Beside the measured value, the display includes a 41- segment bar graph for fast trend observation, which can be scaled separately from the indicator value. The D122.PA/FF is built into durable powder-coated aluminum housing

2.3 .Features overview

2.3.1 Basic functions

- Gas- and dust Ex- protection
- 5-digits 7-segment LCD,
- 30 mm figure height
- Bargraph for fast trend observation, limit bargraph
- Powder coated (RAL 7035) aluminum housing, protection class IP66
- Ex- protection according FISCO model

Housings

- Field housing, protection class IP 65

Ergonomy

- µ-Processor technology for extensive configuration
- Scaleable by keyboard and display, without any reference current
- Separately scaleable bargraph (Zoom)
- Present value control button
- Keeps the configuration by turn off
- Ability to change configuration during operation
- Exchangeable dimension signs

2.3.2 Option: three channel monitoring Options

- Additional limit bargraph
- Field housing with additional (2^{nd}) PG-Connector

2.4 Conformity with Standards

The explosion proof indicators type D122 meets requirements of listed standards in the attachment (Declaration of conformity). They were developed, manufactured and tested in accordance with state-of-the-art engineering practice and ISO9001:2008.

3 Installation and Connection

3.1 Field housing D122.PA / FF

When mounting the housing box on a wall, be sure that it is securely supported by anchoring the screws into a stud or other solid surface.

How to insert the Dimension-symbol

First, cut the desired dimension symbol out of the set. Then pull off the four screws of the cap and remove the cap from the housing.

Now push the prepared dimension-symbol into the dimension-symbol-slot. Make sure that the symbol is facing the front.

The dimension-symbol-slot lies below the display, on the internal side of the cap.

Finally replace the cup on the housing.

Devices with option 3 channel (D122.x.7.0.3K) have a slot for dimension symbol stripe in the front cup.

3.2 Connection D122 with field housing

The terminals of the indicators with field housing are inside. The placement of the terminals is shown at the following figures.

Figure 1 shows the terminals of the indicator D122.A.5. **Fehler! Verweisquelle konnte nicht gefunden werden.** shows the terminals of the indicator D122.A.6.

The terminals 5, 6 and 7,8 are absent by indicators without alarm monitoring.

Caution

Connect the indicator exclusive to an intrinsically safe Profibus.

With danger by static loading the housing is to be grounded.

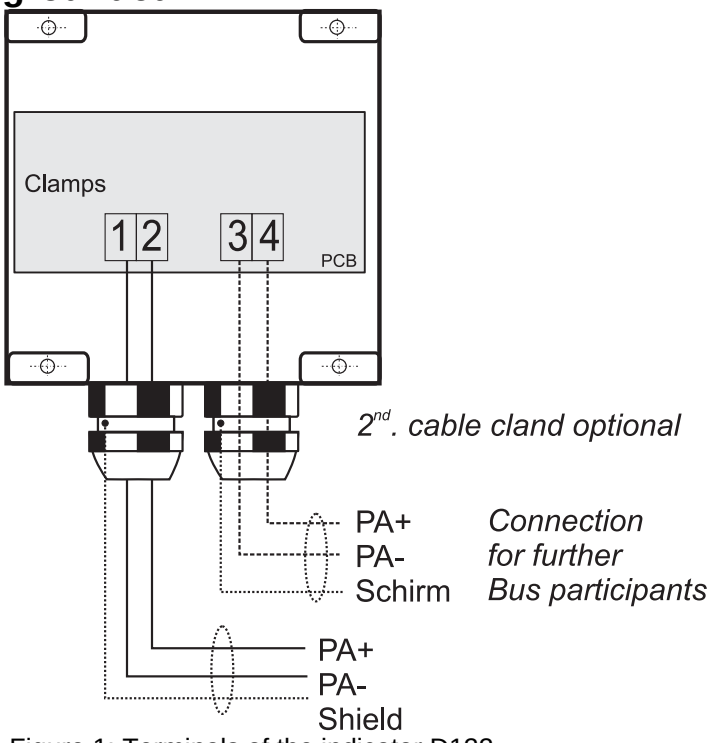


Figure 1: Terminals of the indicator D122

Note

The screen of the lead must be leading connected with the screw connection. With the employment within the highly combustible range the housing must be connected by the external grounding connection with the potential equalization. (EN 60079-14, exp. 12.2.2.3). Necessary repeated dung may take place only capacitively. (EN 60079-14, exp. 12.2.2.3c)

Note

Regard the terminal maximum values of the attached EC- type certificate TÜV 99 ATEX 1488 .

3.3 How to connect the calbe shield

See the following figure to connect the cable shield correctly to the metal gland.

Note

After connecting, a **display test** (all segments of the display are turned on) appears immediate during one second. Thereupon the display shows the **software version** of the indicator.

3.3.1 Default parameters

The following parameters are active ex works:

Option: The colored fields are for he three channel option only (-3K)

Quantity of the indicated channels	Chan	1
Automatic channel rolling	Auto	No
Field bus address	Addr.1 Addr.2 Addr.3	0
Offset (location of the indicator value)	OFFS1 OFFS2 OFFS3	1
A-show the in and/or the output data of the bus of Masters	OUT. I1 OUT I2 OUT I3	In ,
Exchanges that more highly and low order byte of the data items	SfL1 SFL2 SFL3	No
Right-of-comma positions	DP.PO1 DP.PO2 DP.PO3	1
Display the bar graph?	BAR	Yes
Max value for the bar graph	BAR H1 BAR H2 BAR H3	100
Display the status- bar graph?	STATU	Yes
Measured value scaling factor	SFAC1 SFAC2 SFAC3	1,000
Measured value scaling offset	SOFS1 SOFS2 SOFS3	0,0
Menu password	CODE	0001
Menu- End	END	/

3.3.2 Ex works settings – Device reset

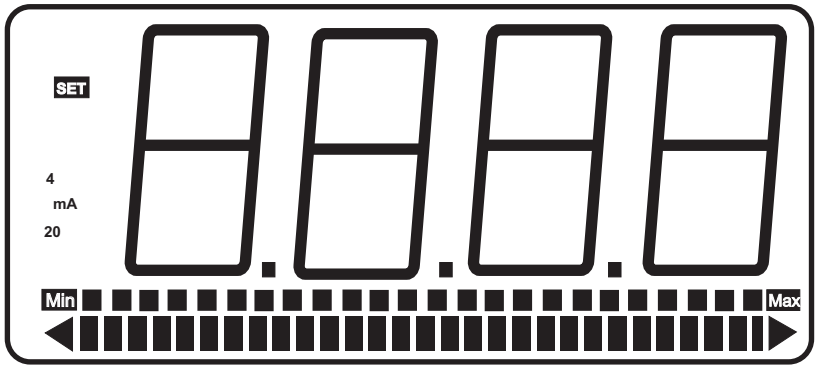
Note

Press the Enter- and Right-button during the start sequence to reactivate the default parameters. (Hardware-Reset)

A reset activates also the ex works calibration.

4 Operating manual

4.1 Front view



5 Figure display

Bargraph for actual value

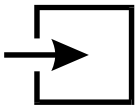
Bargraph status information

4.2 Keyboard

On the front side of the indicator are tree buttons with several function symbols. With these tree buttons, the user can activate each function and enter all parameters for any individual setting.

The buttons are named by their functions:

Enter-button



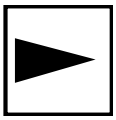
Pressing the *enter*-button starts the input menu.
In general, the *enter*-button activates the menu item or accepts the manipulated value of a parameter.

Up-button

Functions of the up-button are:

1. Display the status byte
2. modification of the selected figure
3. pass menu items

Right-button



Functions of the right-button are:

1. Switch forward the displayed channel[1]
2. select figures
3. pass menu items

[1] For three channel option only (122.PA.7.0.3K)

4.3 LED Indications

The D122.PA has up to 3 LED indicators. Using a 3 channels device D122.PA.7.0.3K the LED indicates the actual channel und the associated physical unit.

Further more the LED light has the following meaning:

LED- Status	*Denotation*
On (green)	This channel is active. Data is clearly received and indicated
Blinking	The D122 could not find bus data on the reselected bus address. See also “Error C”
Off	This channel is not indicated

4.4 Configuration

It is easy to set the parameters and change the configuration of the indicator. The parameters are logically grouped by a menu structure. See also the appropriate **flow diagram** in the appendix.

☞ Normal state

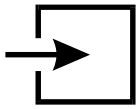
After connecting, the indicator D122 starts to initialise its configuration. The configuration data is stored in an internal EEPROM due to the previous run. By the first start, the D122 indicator initialises the default configuration.

Directly past starting sequence the indicator begins to display the measured current digital and analogous on the bargraph. This state is called the ‘normal state’ of the D122 and the indicator is also ready for inputs.

☞ Status byte

Pressing and holding the *up*-button (**current control button**) the display shows the status byte.

4.4.1 How to set the parameters



Back in the normal state of the indicator we start the

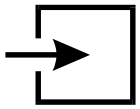
☞ Input menu

by pressing the *enter*-button.

The **configuration of the indicator is protected** against manipulations by unauthorized persons with the **code 1**.

To get the input menu enter the code 1 default [0001].

It's **impossible to switch off the code 1** interrogation.



After entering the right code word the indicator proposes to join the Parameter menu

If an invalid value is entered for any of the parameters, you will not be able to quit the input menu. Instead, the program switches automatically into edit mode to the found valid value.

4.5 Parameter definitions

The parameters can be shown on 7 segment announcements only simplistically. The following listing shows the full name and values of the parameters and adds an explanation:

Option:	The colored deposited fields are valid only for announcement devices with the 3-canal Opion.3K:
Chan	After the Enter key was pressed, enter the quantity (1-3) of the channels.
Auto	If more than one channel should be indicated, is able by auto = yes - an automatic rolling (delay approx. 4 sec.) of the canals are activated. Otherwise, a channel persists on the display, until the operator switches manually to the next.
Addr1	The parameter bus address appears. Here the bus address, which should be „listened“, is displayed. If several channels were activated, appear afterwards "Addr2" and "Addr3".
OFFS1	The parameter "Offset" gives the index (offset) of the first byte of the value to be indicated from the conceiving data. If several channels were activated, appear afterwards "OFFS2" and "OFFS3".
OUT..I1	With the parameter "Out I1" (Data out 1) it defined whether the dates of receipt or the source data of the Profibus slave will be indicated. (The receipt data is from master to slave) "In D" shows the source data, "Out D" gives the dates of receipt. If several canals were activated, appear afterwards "Out 2" and "Out 3".
S FL1	With the parameter "S. FL1" (Swap Float) it is to be exchanged possibly the valence of both bytes in the data word. This is necessary according to use of the Profibus Slaves. If several channels were activated, appear afterwards "S. FL2" and "S. FL.3"
dP.P01	The position of the decimal point is fixed with this menu point. If several canals were activated appear afterwards "dP.Pos2" and "dP.Pos3".
bAr.	In this menu point it is defined whether values bargraph should be indicated, or not. „Bar= Yes“ indicates the Bargrah; with „bar = No“ appears no bar graph.
bar.H1	If in precede menu point the bar graph was activeted, now the maximum value of the Bargraphs (= bar graph High 1) must be defined with all canals to scale the bar graphs customised. If several canals were activated appear afterwards „bar. H2“

and „bar. H3“.

STATU	In this menu point it is defined whether the status bar graph should be indicated, or not.
SFAC1	With the menu item "SFAC1" (= data Factor) the factor is defined by him the actually indicated value is multiplied. With SFAC1 = 10.0 appears around 10 times bigger announcement value than the value read in the data word. The factor can become up to 3 figures behind the comma, the indication scrolls automatically with the input to the left. If several canals were activated appear afterwards "SFAC2" and "SFAC3".
SOFF1	With the menu item "SOFF1" (= data offset) the additive constant is fixed. Then the announcement displays the sum from the read data value and the SOFF1. With SOFF1 =-10,0 is drawn off from the read data word 10, before it is indicated. If several canals were activated appear afterwards „SOFF2 and "SOFF3".
COdE	The Menu-code-word ex works "0001" can become here a new one to deny the access to the configuration menu unauthorized persons.
End	Leave finally the menu by confirming with the input key. The working condition is restored. The inputs are effective immediately and remain after one clamping of the D122 of the bus (D122 is switched off) are stored.

4.6 Configuration example

By the example of a temperature indication with limit value warning the parameter input is described in the following attitudes

Field bus address	41
Offset (Location of the indicator value)	0
Show the output data of the bus of Masters	Out
Exchanges that more highly and low order byte of the data items	NO
Right-of-comma positions	2
Max value for the bar graph	5000
Measured value scaling factor	1
Measured value scaling offset	0
Menu password	0001

Procedure:

With pressure on the *input* key will leave the operational

status indicator and activated **input the menu**.

COdE	The password Nr.1 is queried. The factory-installed stopped password Nr.1 reads [0001].
	Enter the password using the arrow keys. Subsequently, the *input* key presses.

Measured value and bar graph scaling:

ADDR	The parameter bus address appears. *The input* key to the input presses.
_002	Below the sign a flashing bar appears. By operation the to the right-groped is selected the number which can be changed and increased with the upward-groped in the value by unity. With this proceeding the address 41t is entered. The input is locked through pressures of the *input* key.
	
OFFSE	The next parameter „offset “is also passed with the UP- key.
	
Out IN	The next parameter „Display In or Output data “is also passed with the UP- key.
	
SFLO	The next parameter „Swap-Float“ is also passed with the UP-key.
	
DP.Po1	The decimal point so adjusted that two right-of-comma positions are indicated.
	The input is locked through pressures of the *input* key.
bAr.H1	Enter the value “5000” to the upper bargraph scaling range
STATU	Press the *right*-button to select the next figure.
SFAC1	The next parameter „Scaling-Factor“ is also passed with the right key.

SOFF1

The next parameter „Offset-Factor“ is also passed with the right key.

COdE

The last parameter „Set codes“ is also passed with the right key.

End

Finally quit the scale menu hitting the *enter*-button.

The indicator is back in normal state. The changes are immediately active and will be stored after turn off (disconnecting the indicator).

Note

If an invalid value is entered for any of the parameters, you will not be able to quit the input menu. Instead, the program switches automatically into edit mode to the found valid value.

5 Annex

5.1 Specifications

	Field indicator	D122.PA
General	Ex- protection	II 2 (1) G, Ex ia IIC T6 Gb II 2 D, Ex tb IIIC IP65 T 70°C Db
	Ex- limits FISCO- conformity	U_i = 30 V I_i = 660 mA P_i = 1,6 W C_i = 0 F, Li = 0 H
	EC- type certificate	TÜV 99 ATEX 1488
	Ambient temperature Ta	-10°C ...+45°C at T6. -10°C ...+60°C at T5 -10°C ...+65°C at II 2 D Devices for -20°C on demand
Housing	Type	Field housing
	Protection class	IP 66 according to IEC 60529
	Dimensions HxWxD [mm]	140 x 140 x 71
	Material	Aluminum
	Weight	900 g
	Color	RAL 7035
Display	LCD	5-stellige LCD-Seven-Segment
	Figure height	30mm
	Display range	-9999 ... +99999
	Dimension symbols	Selectable
	Decimal points	Selectable
	Bargraph	41 Segments
	Limit- monitoring	Limit set points
Electric Specifications	Power supply	None – power over bus (9 ..30V)
	Power cunsumption (Bus)	< 10 mA
	Status byte monitoring	Display of the actual status byte

5.2 Marking

CE 0044 Ex	Marking according to 50014 ff	Marking according to EN 60079:2010
D122.x.7.x.0 D122.x.7.x.MU	II 2 G; EEx ia IIC T6 at Ta < 45°C II 2 G; EEx ia IIC T5 at Ta < 60°C II 2 D; Ex IP65 T70°C	II 2 G; Ex ia IIC T6 Gb at Ta < 45°C II 2 G; Ex ia IIC T5 Gb at Ta < 60°C II 2 D; Ex tb IIIC IP65 T70°C Db
D122.x.7.x.BM	II 2 G; EEx ia [ib] IIC T6 at Ta < 45°C II 2 G; EEx ia [ib] IIC T5 at Ta < 60°C II 2 D; Ex IP65 T 70°C	II 2 G; Ex ia [ib] IIC T6 Gb at Ta < 45°C II 2 G; Ex ia [ib] IIC T5 Gb atTa < 60°C II 2 D; Ex tb IIIC IP65 T70°C Db

5.3 Failure messages

Message	Symptom	Bug-fix
Err_E	"EEPROM Error, - corrupted data in EEPROM detected	Turn off an turn on the device, if the fault remains, send the device back to Gönnheimer
Err_C	The D122 can not find data on the pre selected bus address	Verify the bus address

5.4 Type code

Device series D122		**.**	**.**	**.**
Device: Indicator		**.A**		
	Indicator with curve fitting option	**.AS**		
	Profibus PA indicator[3]	**.PA**		
	Field bus foundation[3]	**.FF**		
	Totalizer	**.Z**		
	Transmitter software	**.T**		
Housing:	Control panel housing 48 x 96 mm		**.0**	
	Control panel housing 72 x 144 mm		**.3**	
	Field housing (30 mm figure height)		**.5**	
	Field housing (50 mm figure height)		**.6**	
	Aluminum field housing (30 mm figure height)		**.7**	
Digital output:	without			**.0**
	with 2 digital outputs			**.2**
	with reset input and pulse output			**.3**
Additional option:				
Internal zener barrier[1]		**.BM**		
Internal two wire readings recorder[2]		**.MU**		
Display of 3 measure values		**.3K**		

1: Not suitable for D122.x.0.x.x
2: For flied housings only, a combination with internal zener barrier (.BM) is not possible
3: The field bus indicators are only in aluminum field housing available

5.5 Dimensions

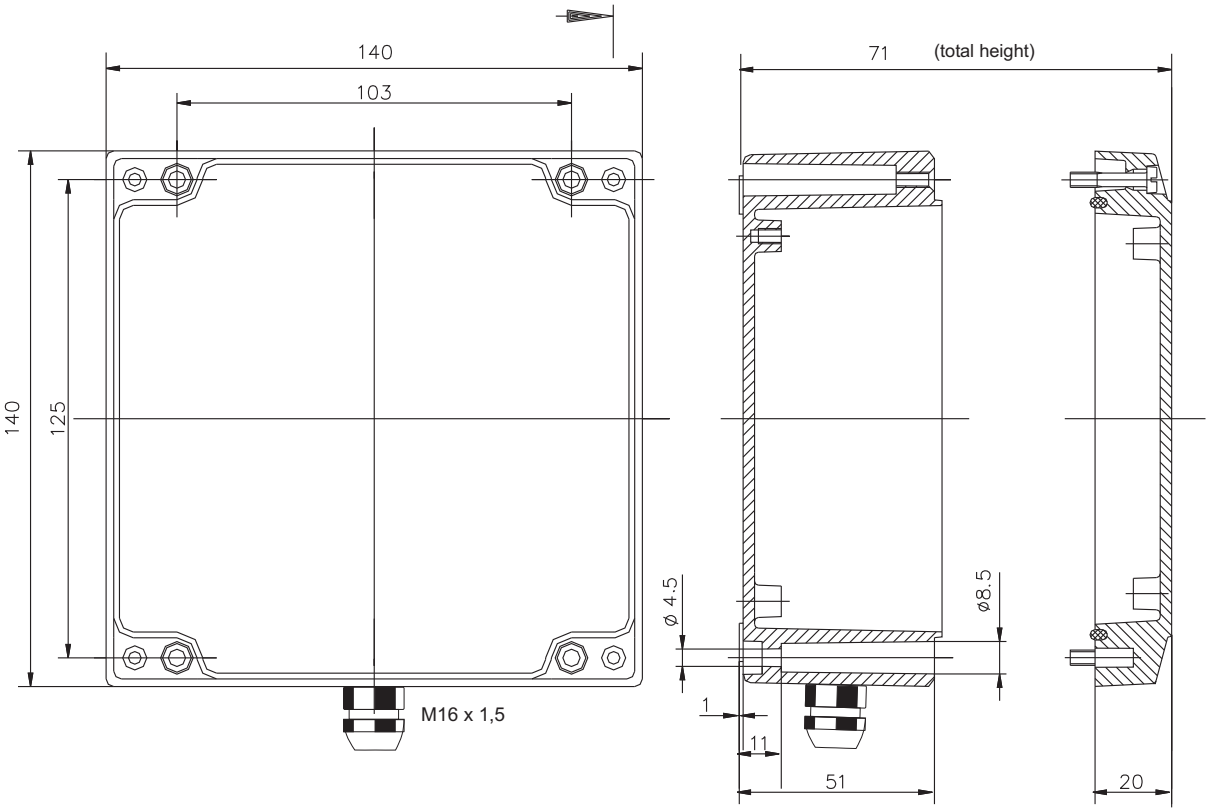


Figure 2: Field housing

5.6 Transport, Storing, Repairs und Disposal

Transport	Vibration-free in origin package, do not pitch, handle carefully
Storing	Store the device dry, inside of the origin package
Disposal	When the explosion proof multipurpose distribution, switching and control units are eventually disposed of, the national regulations governing the disposal of waste materials in the country concerned must be rigorously observed.
Repairs	Defective parts may only be replaced by the Manufacturer or by personnel specially trained and supervised by the Manufacturer. Only genuine spare parts from the Manufacturer may be fitted.

5.7 List of Parameters

The customer is free to use this chart for archiving the parameters of his indicator D122.PA

The grey deposited fields are valid only for indicator devices with the 3-canal option.3K:

Description	Display	Value
Number of the indicated canals (channel)	Chan	
Automatic canal wide circuit	Auto	
Field coach address (n)	Addr.1 Addr.2 Addr.3	
Index (offset) of the first byte of the value to be indicated from the conceiving benefit data	OFFS1 OFFS2 OFFS3	
Display output or input data.	OUT. I1 OUT I2 OUT I3	
Exchange of the higher and down valued bytes of the Float values	SfL1 SFL2 SFL3	
Post comma places, canal fix	DP.PO1 DP.PO2 DP.PO3	
Should the bar graph be indicated?	BAR	
Maximum for the bar graph	BAR H1 BAR H2 BAR H3	
Should the status bar graph be indicated?	STATU	
Scale factor factor	SFAC1 SFAC2 SFAC3	
Offset	SOFS1 SOFS2 SOFS3	
Menu-code -word	CODE	
Menu-end	END	