# 🗖 simex

SIMEX Ltd., Wielopole 11, 80-556 Gda sk, Poland, tel. (+48) 58 762-07-77, www.simex.pl

## **Operating Manual**

Industrial pressure transmitter CCA-P / CCA-K screw-in transmitter CPA-P / CPA-K and OEM pressure transmitter CCE

CCA-K-331, CCA-K-331P, CCA-K-351, CCA-K-351P CCA-P-331, CCA-P-331i, CCA-P-331P, CCA-P-331Pi CCA-P-333, CCA-P-333i, CCA-P-334, CCA-P-334i, CCA-P-343 CPA-K-331, CPA-K-351, CPA-P-331, CPA-P-331i, CCE-17.6XXG, CCE-18.6XXG, CCE-26.6XXG, CCE-30.6XXG



## READ THOROUGHLY BEFORE USING THE DEVICE **KEEP FOR FUTURE REFERENCE**

Version: CCA CCE CPA INSSXEN v.1.00.000

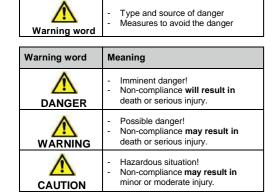
## 1. General and safety-related information on this operating manual

This operating manual enables safe and proper handling of the product, and forms part of the device. It should be kept in close proximity to the place of use, accessible for sta members at any time

All persons entrusted with the mounting, installation, putting into service, operation, maintenance, removal from service, and disposal of the device must have read and understood the operating manual and in particular the safety-related information. Complementary to this operating manual the current data sheet has to be adhered to.

Download the data sheet by accessing www.simex.pl.or request it: info@simex.pl | phone: +48 58 7620777 In addition, the applicable accident prevention regulations, safety requirements, and country-specific installation standards

as well as the accepted engineering standards must be observed. 1.1 Symbols Used



NOTE - draws attention to a possibly hazardous situation that may result in property damage in case of non-compliance.

ü Precondition of an action

## 1.2 Sta qualification

Qualified persons are persons that are familiar with the mounting, installation, putting into service, operation, maintenance, removal from service, and disposal of the product and have the appropriate qualification for their activity This includes persons that meet at least one of the following

- three requirements: They know the safety concepts of metrology and automation technology and are familiar therewith as project sta
- They are operating sta of the measuring and automation systems and have been instructed in the handling of the systems. They are familiar with the operation of the devices and technologies described in this documentation.
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All work with this product must be carried out by qualified persons!

1.4 Incorrect use Danger through incorrect use

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Only use the device in permissible media and in accordance with its intended use. Do not use the device as a ladder or climbing aid. WARNING The device must not be altered or modified in any way.

Manufacturer is not liable for damage caused by improper or incorrect use

## 1.5 Limitation of liability and warranty

Failure to observe the instructions or technical regulations, improper use and use not as intended, and alteration of or damage to the device will result in the forfeiture of warranty and liability claims.

## 1.6 Safe handling

NOTE - Do not use any force when installing the device to prevent damage of the device and the plant!

NOTE - Treat the device with care both in the packed and unpacked condition!

NOTE - Do not throw or drop the device!

NOTE - Excessive dust accumulation and complete coverage with dust must be prevented!

NOTE - The device is state-of-the-art and is operationally reliable. Residual hazards may originate from the device if it is used or operated improperly.

## 1.7 Scope of delivery

Check that all parts listed in the scope of delivery are included free of damage, and have been delivered according to your purchase order

- pressure transmitter or screw-in transmitter
- for mechanical pressure ports DIN 3852: O-ring (pre-mounted)

- mounting instructions or operating manual - for SIL2 version: safety data shee

## 1.8 UL approval (for devices with UL marking)

The UL approval was e ected by applying the US standards, which also conform to the applicable Canadian standards on safety. Observe the following points so that the device meets the

requirements of the UL approval:

- only indoor usage - maximum operating voltage: according to data sheet
- The device must be operated via a supply with energy limitation (acc. to UL 61010) or an NEC Class 2 energy supply

## 2. Product identification

The device can be identified by its manufacturing label. It provides the most important data. By the ordering code the product can be clearly identified.

Serial number Type designation Ordering code 
 SIMEX Sp. z o.o., 80-556 Gda sk, ul. Welopole 11 Poland, tel. (+48 8) 762-07-77, www.simex.pl

 CCA-P-331P
 500-1001-1-2-100-C61-1-1-2-000
 SN: 12345678
 <u>/</u>3 CE Input: 0... 1 bar gauge Connector Pinout:

Vs+: wh

X

ü

Supply: 8... 32V DC Vs-: bn Shield: gn/ye

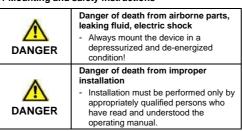
## Fig. 1: Example of manufacturing label

Output: 4... 20mA / 2 wire

NOTE - The manufacturing label must not be removed!

## 3. Mounting

3.1 Mounting and safety instructions



NOTE - Do not remove the packaging or protective caps of the device until shortly before the mounting procedure, in order to exclude any damage to the diaphragm and the threads! Protective caps must be kept! Dispose of the packaging properly!

 $\ensuremath{\textbf{NOTE}}$  - If there is increased risk of damage to the device by lightning strike or overvoltage, increased lightning protection must additionally be provided!

- NOTE Treat any unprotected diaphragm with utmost care; this can be damaged very easily.
- NOTE Provide a cooling line when using the device in steam piping and clarify the material compatibility.
- NOTE The measuring point must be designed in such a way

- Connect the device electrically straightaway after mounting or prevent moisture penetration, e.g. by a suitable protective cap. (The ingress protection specified in the data sheet applies to the connected device.)
- Select the mounting position such that splashed and condensed water can drain o . Stationary liquid on sealing surfaces must be excluded!
- If the device has a cable outlet or cable gland, the outgoing cable must be routed downwards. If the cable needs to be routed upwards, this must be done in an initially downward curve.
- Mount the device such that it is protected from direct solar radiation. In the most unfavourable case, direct solar radiation leads to the exceeding of the permissible operating temperature
- For devices with gauge reference in the housing (small hole next to the electrical connection), install the device in such a way, that the gauge reference is protected from dirt and moisture. Should the device be exposed to fluid admission. the functionality will be blocked by the gauge reference. An exact measurement in this condition is not possible. Furthermore, this can lead to damages on the device.

#### 3.2 Conditions for devices with 3-A symbol and / or EHEDG certificate

The device or its connecting piece must be installed in such a way that the surfaces are self-draining (permissible installation position 273°  $\ldots$  87°).

Make sure that the welding socket is mounted flush inside the tank

The user is responsible for:

- the correct size of the seal and the choice of an elastomeric sealing material that complies with the 3-A and / or EHEDG standard(s)
- an easy to clean installation position of the pressure transmitter with little dead space, as well as definition / verification / validation of a suitable cleaning process
- defining adequate service intervals 3.3 Conditions for oxygen applications



Make sure that your device was ordered for oxygen applications and delivered accordingly. (see manufacturing label - ordering code ends with the numbers "007")

when used improperly

Danger of death from explosion

Unpack the device directly prior to the installation. Skin contact during unpacking and installation must be avoided

to prevent fatty residues remaining on the device. Wear safety gloves!

The entire system must meet the requirements of BAM (DIN 19247)!

For oxygen applications > 25 bar, devices without seals are recommended.

Transmitters with o-rings of FKM (Vi 567): permissible maximum values: 25 bar / 150°C (BAM approval)

3.4 Mounting steps for connections according to DIN 3852

NOTE - Do not use any additional sealing material such as yarn, hemp or Teflon tape!

- The O-ring is undamaged and seated in the designated ü groove
- The sealing face of the mating component has a flawless ü surface. (Rz 3.2)
- Screw the device into the corresponding thread by hand.
  - Devices equipped with a knurled ring: 2 only tighten by hand
  - 3 Devices with a spanner flat must be tightened using an open-end wrench. Permissible tightening torques for pressure transmitter:
    - wrench flat made of steel:
    - G1/4": approx. 5 Nm
    - G1/2": approx. 10 Nm G3/4": approx. 15 Nm
    - approx. 20 Nm G1"
    - G1 1/2": approx. 25 Nm

- wrench flat made of plastic: max. 3 Nm

#### 3.5 Mounting steps for connections according to EN 837

- A suitable seal for the medium and the pressure to be measured is available. (e.g. a copper seal) The sealing face of the mating component has a flawless
- surface. (R<sub>7</sub> 6.3)
- Screw the device into the corresponding thread by hand. Then tighten it using an open-end wrench. Permissible 2 tightening torques for pressure transmitter:

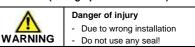
G1/4": approx. 20 Nm G1/2": approx. 50 Nm

NOTE - note the permitted pressure according to EN 837:

G1/4" EN 837	p <sub>N</sub> 600 bar	Counterpart has to be of steel according to	
G1/2" EN 837	p <sub>N</sub> 1000 bar	DIN 17440 with strength $R_p 0.2$ 190 N/mm <sup>2</sup>	
G1/4" EN 837	p <sub>N</sub> > 600 bar, p <sub>N</sub> 1000 bar	Counterpart has to be of steel according to	
G1/2" EN 837	$p_N > 1000 \text{ bar}, p_N = 1600 \text{ bar}$	DIN 17440 with strength $R_p 0.2$ 260 N/mm <sup>2</sup>	

#### 3.6 Mounting steps for NPT connections

## 3.9 Mounting steps for internal threads M20x1.5 and 9/16" UNF (for high-pressure devices)



amfer of the pressure port. (sealing cone 60°)

the pressure transmitter.

max 120 Nm)

groove.

2

ü

ü

1

2

3

ü

ü

2

ü

1

2

ü

NOTE - The high-pressure tube will seal metal-to-metal in the

Screw the high-pressure fitting into the internal thread of

Then tighten it using an open-end wrench. The required

specifications for the high-pressure pipe you are using.

(permissible tightening torque for pressure transmitter

The O-ring is undamaged and seated in the designated

EHEDG conformity is only ensured in combination with

Centre the dairy pipe connection in the counterpart.

Screw the cup nut onto the mounting part.

3.11 Mounting steps for Clamp and Varivent

T-ring seal from Combifit International B.V.

Then tighten it using a hook wrench.

be measured is available.

for Clamp connections:

for Varivent connections:

supplier's instructions.

4. Electrical connection

multicore cable is recommended.

DANGER

insulation)

and cleftlessly!

EPDM-O-ring which is FDA-listed

above the counterpart with seal.

3.12 Mounting steps for flange connections

flange version) on the counter flange.

4.1 Connection and safety instructions

be measured is available. (e.g. a fiber seal)

Chapter "3.2" has been noticed.

ASEPTO-STAR k-flex upgrade seal by Kieselmann GmbH

A suitable seal for the measured fluid and the pressure to

EHEDG conformity is only ensured in combination with an approved seal. This is e.g.:

Place the seal onto the corresponding mounting part.

Centre the clamp connection or Varivent connection

semi-ring or retractable ring clamp) according to the

Then fit the device with a suitable fastening element (e. g.

A suitable seal for the measured fluid and the pressure to

Put the seal between connecting flange and counter flange

Danger of death from electric shock

depressurized and de-energized

Always mount the device in a

Install the device with 4 resp. 8 screws (depending on

condition!

NOTE - For the electrical connection a shielded and twisted

NOTE - If the device is equipped with plug ISO 4400 or field

field housing code 880:  $\varnothing$  5 ... 14 mm Moreover you have to ensure that it lies in the cable gland firmly

housing, it must be ensured that the external diameter of the

used cable is within the permissible clamping range:

NOTE - When devices with ISO 4400 or Buccaneer

connector are used, the cable socket must be properly

mounted so that the ingress protection specified in the data sheet is ensured! Ensure that the delivered seal is placed

between plug and cable socket. After connecting the cable

NOTE - On devices with field housing, the terminal clamps

electrically, the cap must be screwed o . Before the cap is screwed on again, the O-ring and the sealing surface on the

housing have to be checked for damages and if necessary to be changed! Afterwards screw the metal cap on by hand and make

static installation: 8-fold cable diameter dynamic application: 12-fold cable diameter

dynamic application: 20-fold cable diameter

ventilation tube, the PTFE filter located at the cable end on

the ventilation tube must neither be damaged nor removed!

connection box which is as dry as possible and free from

In case of devices with cable outlet and integrated

Route the end of the cable into an area or suitable

aggressive gases, in order to prevent any damage.

When routing the cable, following bending radiuses have to

10-fold cable diameter

fasten the cable socket on the device by using the screw.

are situated under the metal cap. To install the device

sure that the field housing is firmly locked again.

cable without ventilation tube:

cable with ventilation tube:

static installation:

NOTE - for devices with cable outlet

be complied with:

cable socket ISO 4400: Ø 4 ... 6 mm field housing code 850: Ø 2 ... 8 mm

The supply corresponds to protection class III (protective

tightening torque depends on the manufacturer's

3.10 Mounting steps for dairy pipe connections

Chapter "3.2" has been noticed.

an approved seal. This is e.g.:

#### 1.3 Intended use

The device is intended for converting the physical parameter of pressure into an electric signal. It has to be used only for this purpose, considering the following information.

The above listed pressure transmitters have, according to the type, been developed for applications in overpressure and vacuum as well as for absolute pressure measurement.

The screw-in transmitters are intended for level and process measurement

Devices with 3-A and / or EHEDG certified process connection have been developed especially for applications in food and pharmaceutical industry. The process connection is hygienic and can be sterilized.

Permissible measuring and cleaning media are gases or liquids, which are compatible with the media wetted parts of the device (according to data sheet) and your system. This must be ensured for the application.

The user must check whether the device is suited for the selected use. In case of doubt, please contact our sales department: info@simex.pl | phone: +48 58 7620777

Manufacturer assumes no liability for any wrong selection and the consequences thereof!

The technical data listed in the current data sheet are engaging and must absolutely be complied with. If the data sheet is not available please order or download it from our homepage. http://www.simex.pl

that cavitation and pressure surges are avoided.

NOTE - When installing the device, avoid high mechanical stresses on the pressure port! This will result in a shift of the characteristic curve or to damage, in particular in case of very small pressure ranges and devices with a pressure port made of plastic

NOTE - In hydraulic systems, position the device in such a way that the pressure port points upward (ventilation).

**NOTE** - If the device is installed with the pressure port pointing upwards, ensure that no liquid drains o on the device. This could result in humidity and dirt blocking the gauge reference in the housing and could lead to malfunctions. If necessary, dust and dirt must be removed from the edge of the screwed joint of the electrical connection.

 $\ensuremath{\textbf{NOTE}}$  - The permissible tightening torque depends on the conditions on site (material and geometry of the mounting point). The specified tightening torques for the pressure transmitter must not be exceeded!

#### NOTES - for mounting outdoors or in a moist environment:

Please note that your application does not show a dew point, which causes condensation and can damage the pressure transmitter. There are specially protected pressure transmitters for these operating conditions. Please contact us in such case.

- ü Suitable fluid-compatible sealing material, e.g. PTFE tape, is available
- Screw the device into the corresponding thread by hand
- Then tighten it using an open-end wrench. Permissible 2 tightening torques for pressure transmitter

1/4" NPT: approx. 30 Nm 1/2" NPT: approx. 70 Nm

## 3.7 Mounting steps for G1 cone connection

- Screw the device into the mating thread by hand (seal produced metallically)
- 2 Then tighten it using an open-end wrench. Permissible tightening torques for pressure transmitter

p<sub>N</sub> < 10 bar: 30 Nm p<sub>N</sub> 10 bar: 60 Nm

### 3.8 Installation steps for flare

- Cut the end at right angle to the piping and remove all nternal and external burrs.
- 2 Make the flare; depending on the usage, the device has to be tightened with max 10 Nm

**NOTE** - If a transition is desired from a transmitter cable with gauge tube to a cable without gauge tube, we recommend our terminal box KL 1 or KL 2.

#### 4.2 Electrical installation

Establish the electrical connection of the device according to the technical data shown on the manufacturing label, the following table and the wiring diagram.

Pin configuration

Electrical connection	ISO 4400	Binder 723 (5-pin)
Supply +	1	3
Supply –	2	4
Signal + (for 3-wire)	3	1
Shield	ground pin  🕀	5

Electrical connection	Binder 723 (7-pin)
Supply +	3
Supply –	1
Signal + (for 3-wire)	6
Shield	2
Communication - RxD	4
interface TxD	5
GND	7

NOTE - The communication interface RS232 may not be connected directly to the PC. A suitable adapter is available as an accessory.

Electrical connection	M12x1 metal (4-pin)	
Code	M10 / M20	M13 (17.620G)
Supply +	1	1
Supply –	2	3
Signal + (for 3-wire))	3	2
Shield	4	plug housing
Electrical connection	Micro	
Code	C10	CB0 (17.620G)
Supply +	1	1
Supply –	2	3
Signal + (for 3-wire)	3	2
Shield	ground pin  🕀	ground pin  🕀

Electrical connection	field housing	cable colours (IEC 60757)
Supply +	IN +	WH (white)
Supply –	IN –	BN (brown)
Signal + (for 3-wire)	OUT +	GN (green)
Shield	÷	GNYE

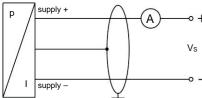
Electrical connection	Buccaneer (4-pin)	TRIM TRIO (4-pin)
Supply +	1	1
Supply –	2	2
Signal + (for 3-wire)	3	3
Shield	4	4

Electrical connection	Bayonet MIL-C-26482 (10-6)	
Electrical connection	2-wire	3-wire
Supply +	A	А
Supply –	В	D
Signal + (for 3-wire)	-	В
Shield	Dressu	e nort

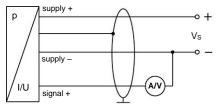
 $\label{eq:NOTE-Thepsilon} \textbf{NOTE} - \textbf{The pin configuration for di} \ \textbf{erent electrical}$ connections can be found on the manufacturing label.

Wiring diagrams:





3-wire-system (current/voltage)



## 5. Commissioning



leaking fluid, electric shock - Operate the device only within the specification! (according to data sheet)

Danger of death from airborne parts,

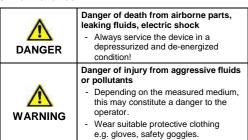
The device has been installed properly. ü

- ü The device does not have any visible defect
- The device is operated within the specification. ü (see data sheet)

In case of highly precise devices with an accuracy of 0.1 % FSO, a microcontroller-controlled electronic system is used for signal processing. This electronic system is used for signal improvement. Due to the principle, the processing of measured values requires a longer time than with purely analogue sensors, which only comprise amplification circuitry. Due to the longer processing time, the output signal follows the measured value not continuously but in jumps. In case of relatively stable and slowly changing measured values, this property plays a minor role. Compare this with the information on the adjusting time in the data sheet.

In the case of i-devices with optional communication interfaces can also be configured by these electronics. O set, span and damping are programmable within the limits given in the data sheet. For configuring the device, the programming kit CIS 510 consisting of Adapt 1, Windows compatible programming software P-Scale 510, power supply and connecting cable is necessary. This can be ordered additionally.

## 6. Maintenance



If necessary, clean the housing of the device using a moist cloth and a non-aggressive cleaning solution cleaning media used in combination with the media-wetted materials of the pressure measuring devices. Permissible concentrations and temperatures must be observed. Verification/ validation by the user is essential.

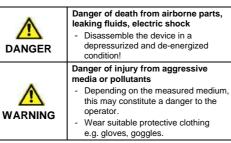
## 7. Troubleshooting

reasioniteening		
٨	Danger of death from airborne parts, leaking fluids, electric shock	
	<ul> <li>If malfunctions cannot be resolved, put the device out of service (proceed according to chapter 8 up to 10)</li> </ul>	

In case of malfunction, it must be checked whether the device has been correctly installed mechanically and electrically. Use the following table to analyse the cause and resolve the malfunction, if possible.

Fault: no output signal			
Possible cause	Fault detection / remedy		
Connected incorrectly	Checking of connections		
	Checking of all line		
Conductor/wire breakage	connections.		
	Checking of ammeter		
Defective measuring device	(miniature fuse) or of analogue		
(signal input)	input of your signal processing		
	unit		
Fault: analogue output signal to	o low		
Possible cause	Fault detection / remedy		
Lead resistance too high	Checking of load resistance		
Load resistance too high	(value)		
Supply voltage too low	Checking of power supply		
Supply voltage too low	output voltage		
	Checking of the power supply		
Defective energy supply	and the supply voltage being		
	applied to the device		
Fault: slight shift of the output s	signal		
Possible cause	Fault detection / remedy		
Diaphragm of senor is	Checking of diaphragm; if		
severely contaminated,	necessary, send the device to		
calcified or crusted	manufacturer for cleaning		
Fault: large shift of the output signal			
Possible cause	Fault detection / remedy		
Diaphragm of sensor is	Checking of diaphragm; when		
damaged (caused by	damaged, send the device to		
overpressure or mechanically)	manufacturer for repair		
Fault: wrong or no output signal           Possible cause         Fault detection / remedy			
	Checking of cable; pitting		
	corrosion on the stainless-steel		
Cable damaged mechanically,	housing as a result of damage		
thermally or chemically	on cable; when damaged, send		
anonnany or chornouny	the device to manufacturer for		
	repair		

#### 8. Removal from service



NOTE - After dismounting, mechanical connections must be fitted with protective caps

## 9. Service / repair

Information on service / repair:

www.simex.pl

info@simex.pl Service phone: +48 58 7620777

## 9.1 Recalibration

During the life-time of a transmitter, the value of o set and span may shift. As a consequence, a deviating signal value in reference to the nominal pressure range starting point or end point may be transmitted. If one of these two phenomena occurs after prolonged use, a recalibration is recommended to ensure furthermore high accuracy.

#### 9.2 Return

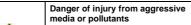


Before every return of your device, whether for recalibration, decalcification, modifications or repair, it has to be cleaned carefully and packed shatter-proofed. You have to enclose a notice of return with detailed defect description when sending the device. If your device came in contact with harmful substances, a declaration of decontamination is additionally required.

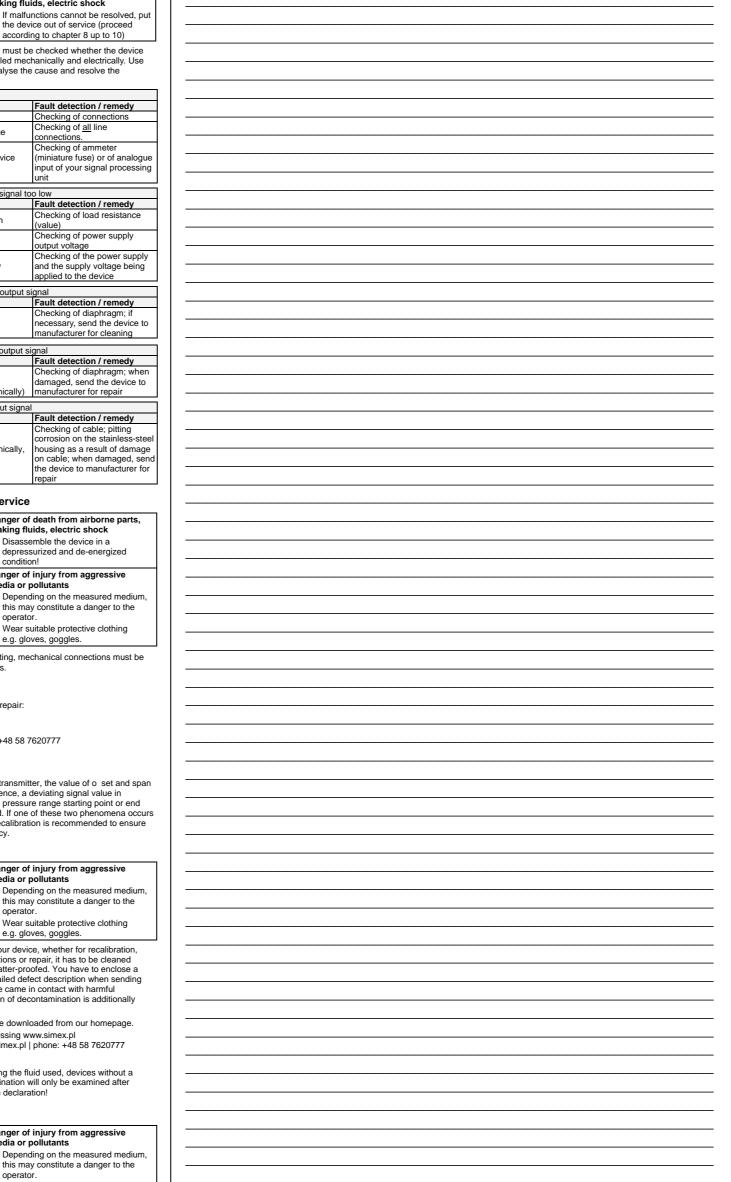
Appropriate forms can be downloaded from our homepage. Download these by accessing www.simex.pl or request them: info@simex.pl | phone: +48 58 7620777

In case of doubt regarding the fluid used, devices without a declaration of decontamination will only be examined after receipt of an appropriate declaration!

## 10. Disposal



## Notes:



Deposits or contamination may occur on the diaphragm/ pressure port in case of certain media. Depending on kind and quality of the process, suitable cyclical maintenance intervals must be specified by the operator. As part of this, regular checks must be carried out regarding corrosion, damage of diaphragm/seal(s) and signal shift. A periodical replacement of the seal(s) may be necessary.

If the diaphragm is calcified, it is recommended to send the device to manufacturer for decalcification. Please note the chapter Service / repair below.

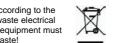
NOTE - Wrong cleaning or improper touch may cause an irreparable damage on the diaphragm. Therefore, never use pointed objects or pressured air for cleaning the diaphragm.



this may constitute a danger to the operator.

Wear suitable protective clothing e.g. gloves, goggles





NOTE - Dispose of the device properly!

## 11. Warranty terms

The warranty terms are subject to the legal warranty period of 24 months, valid from the date of delivery. If the device is used improperly, modified or damaged, we will rule out any warranty claim. A damaged diaphragm will not be accepted as a warranty case. Likewise, there shall be no entitlement to services or parts provided under warranty if the defects have arisen due to normal wear and tear

## 12. EU declaration of conformity / CE

The delivered device fulfils all legal requirements. The applied directives, harmonised standards and documents are listed in the EC declaration of conformity, which is available online at: http://www.simex.pl

Additionally, the operational safety is confirmed by the CE sign on the manufacturing label.