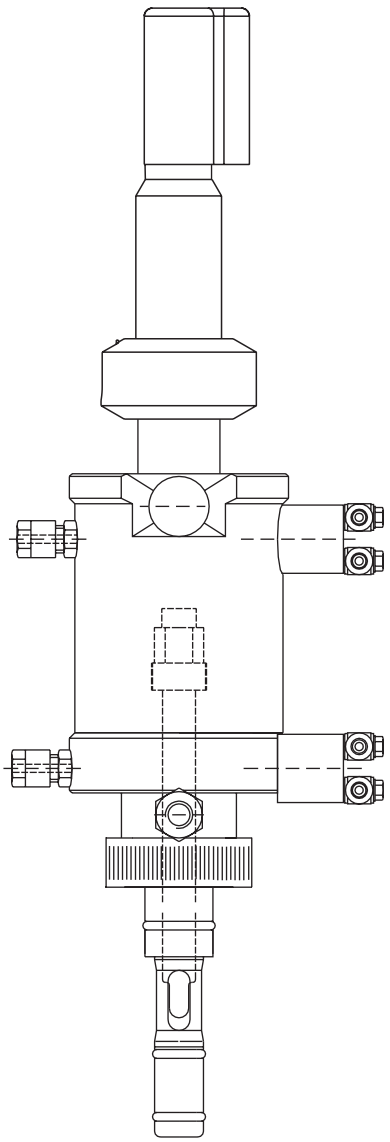
BA 217C/07/en/03.00
No. 51502594

CleanFit P CPA 471
Retractable Assembly for Measuring pH/Redox

Operating Instructions



Endress+Hauser
The Power of Know How

Table of Contents

1 Safety 2

1.1 Safety symbols 2
1.2 Intended application 2
1.3 Installation, start-up and operation 2
1.4 Operational safety 2
1.5 Return 3

2 Identification 4

2.1 Equipment name 4
2.2 Scope of supply 5
2.3 Registered trademark 6

3 Installation 7

3.1 Measuring system 7
3.2 Installation conditions 8
3.3 Installation 11

4 Operation 17

4.1 Starting up the assembly 17
4.2 Operating the CPA 471 in manual mode 18
4.3 CPA 471 in pneumatic mode 18

5 Maintenance 19

5.1 Cleaning 19
5.2 Calibration 20
5.3 Repairs 21

6 Accessories 22

6.1 Connection accessories 22
6.2 Electrodes 22
6.3 Spare parts 22
6.4 Control of retractable assembly during cleaning / calibration 23

7 Technical Data 24

Index 26

1 Safety

1.1 Safety symbols

Warning!
This symbol alerts you to hazards which could cause serious injuries as well as damage to the instrument if ignored.

Caution!
This symbol alerts you to possible faults which could arise from incorrect operation. They could cause damage to the instrument if ignored.

Note!
This symbol indicates important items of information.

1.2 Intended application

The hand-operated or pneumatically operated retractable assembly CleanFit P CPA 471 is designed for installing pH/redox sensors in tanks and pipes.

Its mechanical design permits its use in pressurised systems (see Technical Data).

The responsibility for compliance with the following safety requirements lines with the operator:
- Explosion protection regulations
- Installation instructions
- Operating instructions for the assembly and its materials
- Local prevailing standards and regulations

1.3 Installation, start-up and operation

Warning!
- Installation, electrical connection, start-up, operation and maintenance of the measuring instrument must be carried out exclusively by trained specialists authorised by the system operator.
- Technical personnel must be familiar with the instructions in this manual and must adhere to them.
- When the assembly is operated in explosive atmospheres, it is imperative to comply with the regulations applicable.
- Before switching on the system check all the connections again for correctness.
- Do not operate damaged assemblies which could pose a danger, and mark them as defective.
- Measuring point faults may only be repaired by authorised and trained personnel.
- If faults cannot be repaired, the assembly must be taken out of service and secured against unintentional start-up.
- Repairs may only be carried out by the manufacturer or by the Endress+Hauser service organisation.

1.4 Operational safety

The assembly CPA 471 has been designed for safety according to the state of the art and in compliance with the applicable regulations and EC directives (see Technical Data).
However, if it is used improperly or other than for its intended purpose, it may pose a hazard, e.g. through incorrect installation or the wrong operating conditions.

Warning!
- If the device is used for any application other than those described in this manual, it may lead to unsafe and improper functioning of the measuring system and is therefore not permitted.
- Make sure you strictly adhere to the warnings and notes in these Operating Instructions.

Instructions for installation in pressurised systems

Warning!
- Do not exceed the maximum assembly operating pressure.
- Depressurise the system before installing or removing the assembly.
- Inspect screw unions, valves and pipes for leaks or damage on a regular basis.

1.5 Return

If the assembly has to be repaired, please return it **cleaned** to the Endress+Hauser sales centre responsible. Please use the original packaging.

2 Identification

2.1 Equipment name

2.1.1 Nameplate

The assembly variant is recognisable from the order code on the nameplate.

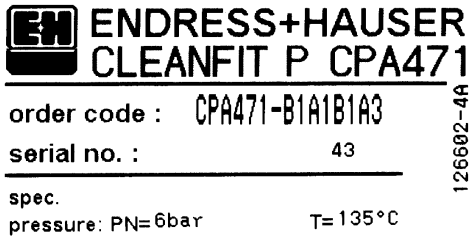


Fig. 2.1: Nameplate of CleanFit P CPA 471

2.1.2 Product structure

Drive and limit switches									
A	Manual drive (not modifiable to pneumatic)								
B	Pneumatics without limit switch (retrofittable)								
C	Pneumatics with 2 pneumatic limit switches								
Y	Special design to customer specifications								
		Electrode holder seal							
		1	Standard version (only process connection A, B, G, H)						
		2	Sterilisable version (only immersion depth 1, process connection A, C, D additional equipment with rinse fittings 3, 4)						
		9	Special design to customer specifications						
			Electrode holder						
			A	For gel electrodes with Pg 13.5 (gland)					
			B	For KCl electrodes with Pg 13.5 (gland) (only immersion depth 1)					
			Y	Special design to customer specifications					
				Immersion depth					
				1	Short version up to 101 mm (dependent on process connection) (possible electrode lengths: A = 120 mm, B = 225 mm)				
				2	Long version up to 208 mm (dependent on process connection) (possible electrode length: A = 225 mm)				
				9	Special design to customer specifications				
					Assembly material (in contact with medium)				
					A	In contact with medium SS 316L with PA housing			
					B	In contact with medium SS 316L with housing SS 316Ti			
					C	In contact with medium SS 316L with test certificate 3.1B acc. to EN10204 with housing PA			
					D	In contact with medium SS 316L with test certificate 3.1B acc. to EN10204 with housing SS 316Ti			
					Y	Special design to customer specifications			
						Seal material (in contact with medium)			
						1	EPDM		
						2	VITON®		
						3	KALREZ®		
						9	Special design to customer specifications		
							Process connection		
							A	G 1¼ internal thread (thread adapter nut)	
							B	NPT 1" external thread	
							C	Tri-Clamp 2"	
							D	Sanitary tube DN 50	
							G	Flange DN 50 (only immersion depth 2)	
							H	Flange ANSI 2" (only immersion depth 2)	
							Y	Special design to customer specifications	
								Additional equipment	
								1	Without rinse fitting (not retrofittable)
								3	With rinse fittings 2 x G ¼ internal thread
								4	With rinse fittings 2 x NPT ¼" internal thread
								9	Special design to customer specifications
CPA 471-									Complete order code

2.2 Scope of supply

Caution!
- Make sure the packaging is undamaged! If any damage is found, contact your postal service or forwarding agent. Keep any damaged packaging until matters have been clarified.
- Make sure the contents are undamaged! If any damage is found, contact your postal service or forwarding agent and inform the suppliers. Keep any damaged goods until matters have been clarified.
- Inspect the delivery for completeness and quantity according to the delivery papers, and the instrument type and version as shown on the nameplate.

The following items are included in the delivery:
- CleanFit P CPA 471 assembly
- Operating Instructions BA 217C/07/en

In case of any queries, please contact your supplier or the Endress+Hauser sales centre responsible (see back page of these Operating Instructions).

2.3 Registered trademark

KALREZ®
Registered trade mark of E.I. Du Pont de Nemours & Co., Wilmington, USA.
Tradename for FFKM

VITON®
Registered trade mark of E.I. Du Pont de Nemours & Co., Wilmington, USA.
Tradename for FKM

TRI-CLAMP®
Registered trade mark of Ladish & Co., Inc., Kenosha, USA

3 Installation

The following procedure should be followed for a complete measuring system installation:
1. Mounting and connecting an electrode (see Chapter 3.3.1)
2. Water connection to the rinse fittings (see Chapter 3.3.2)
3. Installing the assembly (see Chapter 3.3).

3.1 Measuring system

A full measuring system comprises:

- Retractable assembly CleanFit P CPA 471
- 1 pH combination electrode (120 or 225 mm)
- pH/redox measuring transmitter, e.g. Mycom CPM 152, MyPro CPM 431, Liquisys M CPM 223/253
- Measuring cable CPK 1, CPK 7 or CPK 9 (terminated)

Optional:
- Junction box VBA for measuring cable extension
- Measuring cable CYK 71 (unterminated) for measuring cable extension
- Cleaning device with injector CYR 10

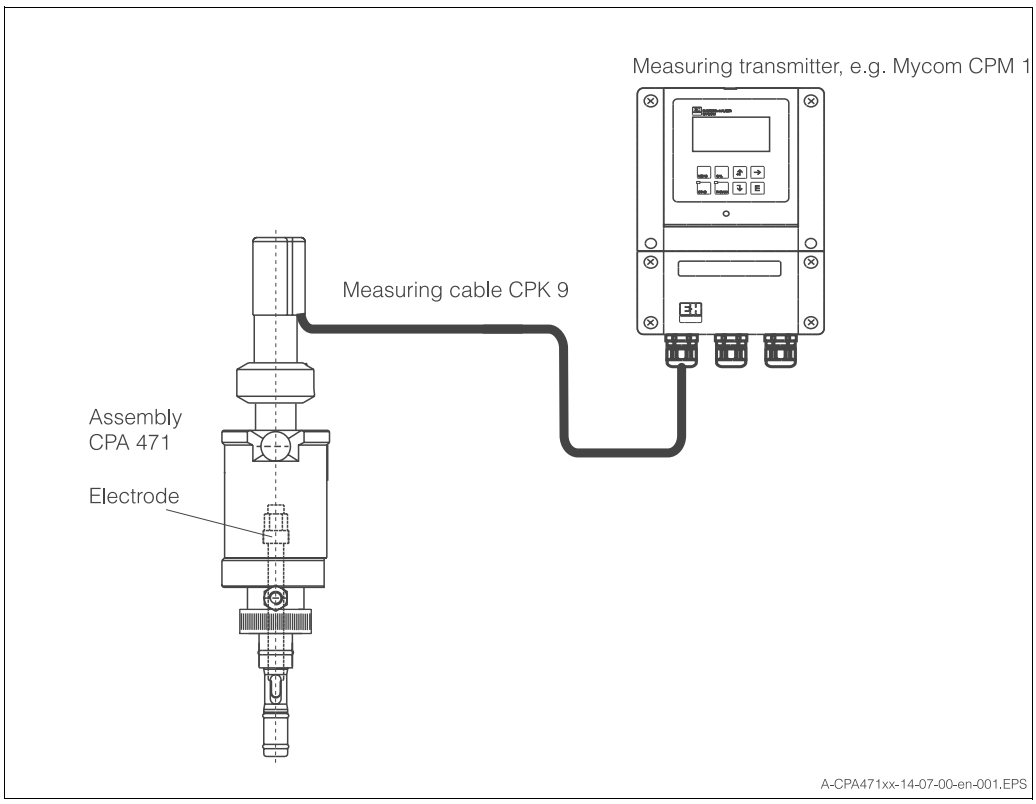


Fig. 3.1: Complete measuring system for CPA 471 with Mycom CPM 152

3.2 Installation conditions

3.2.1 Dimensions

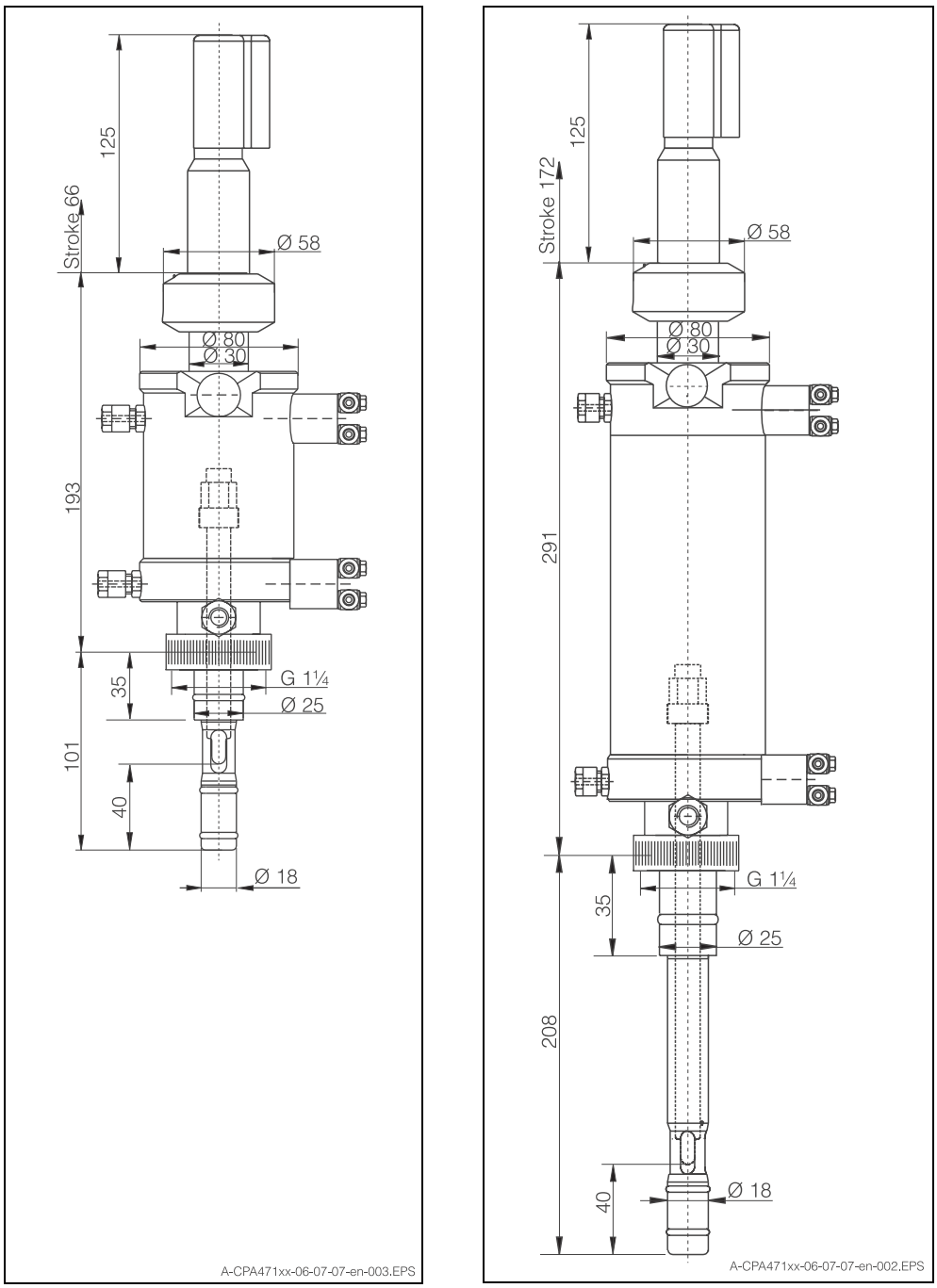


Fig. 3.2: (left): Dimensions of CPA 471, short version (for electrode length of 120 mm)
Fig. 3.3: (right): Dimensions of CPA 471, long version (for electrode length of 225 mm)

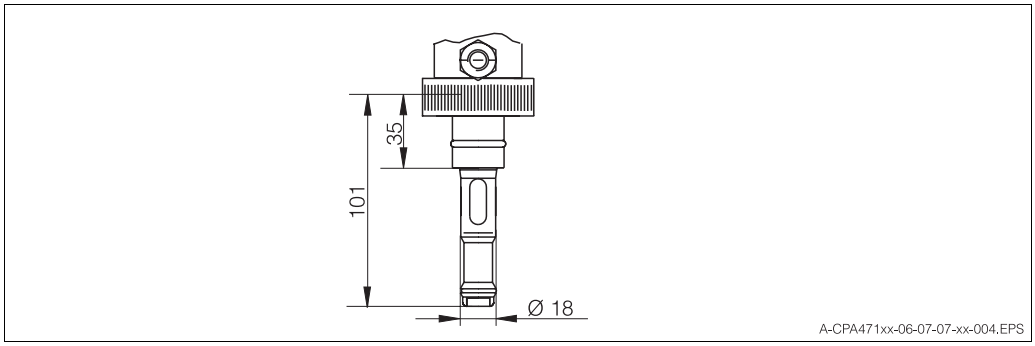


Fig. 3.4: Dimensions of electrode holder in sterile version

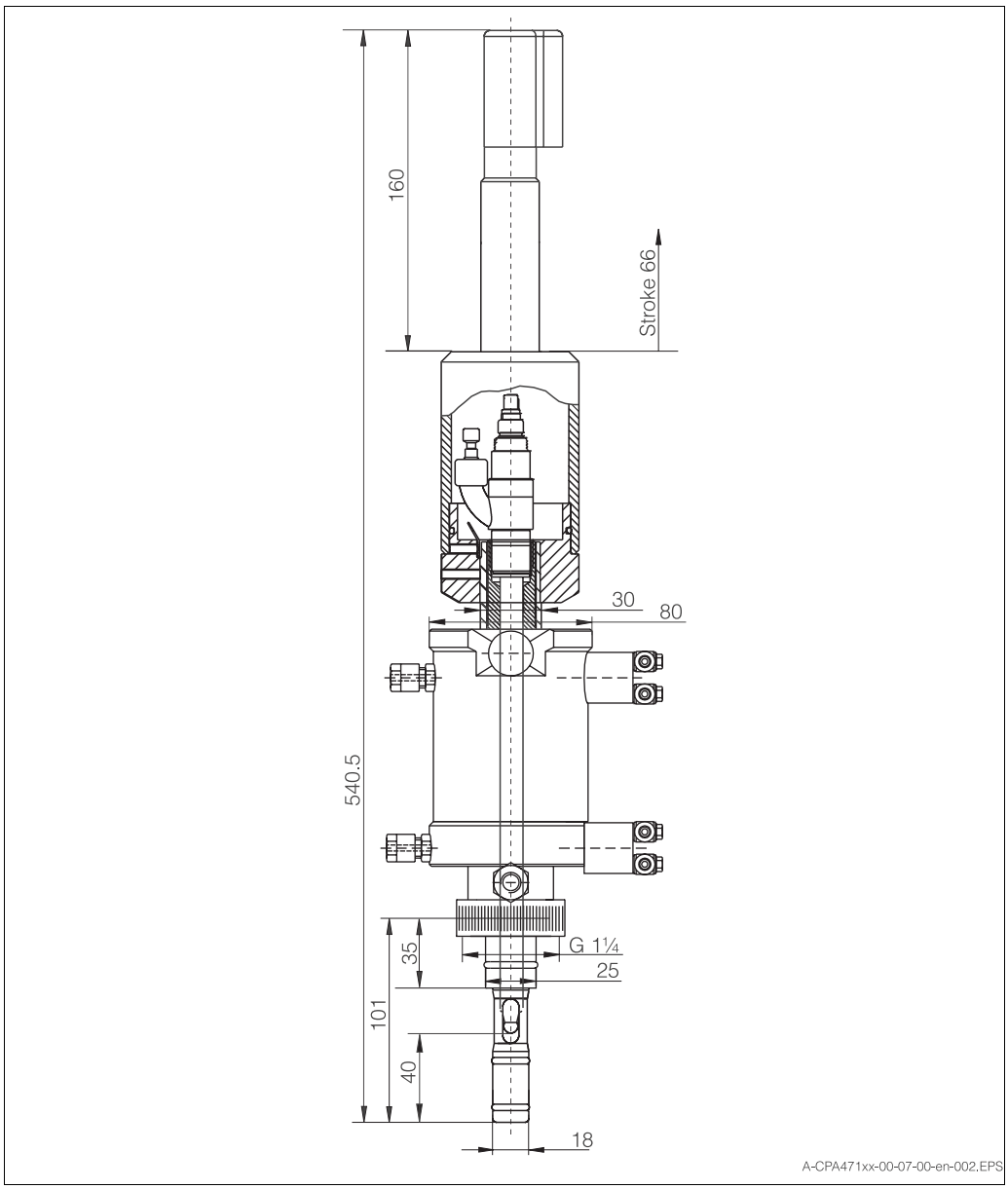


Fig. 3.5: Dimensions of CPA 471, short version, with 225 mm liquid KCl electrode CeraLiquid P CPS 41 (with hose connection for refilling with KCl)

3.2.2 Installation location/position

The CPA 471 assembly is designed for installation on tanks or pipes. Suitable connections must be available.

Note!
It is imperative to maintain an installation angle of min. 15°.

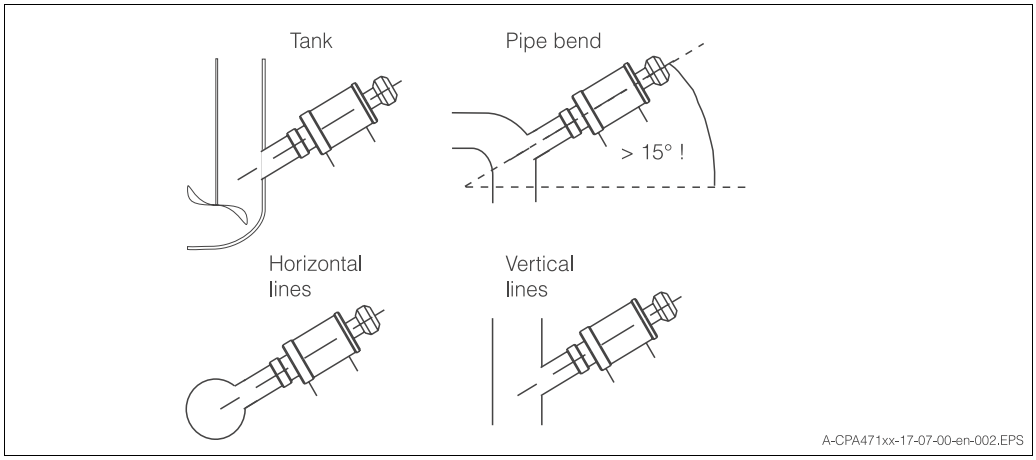


Fig. 3.6: Installation examples: The minimum installation angle is 15° to the horizontal.

Note!
- The assembly requires a minimum nominal width of DN 80 for installation in a pipe.
- For thinner pipes please use a flow vessel. This is available as an accessory (DN 25, stainless steel SS 316L; Order No., see Accessories section).

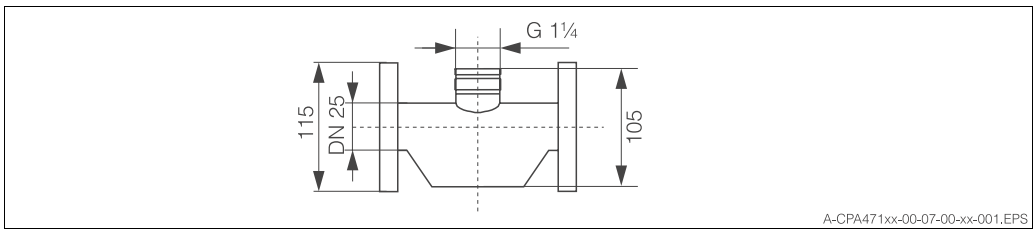


Fig. 3.7: Flow vessel for CPA 471; DN 25, stainless steel 316L

Caution!
Risk of frost damage!

If there is a risk of temperatures below 0°C, the assembly and any air or water tubes must be heated.

3.3 Installation

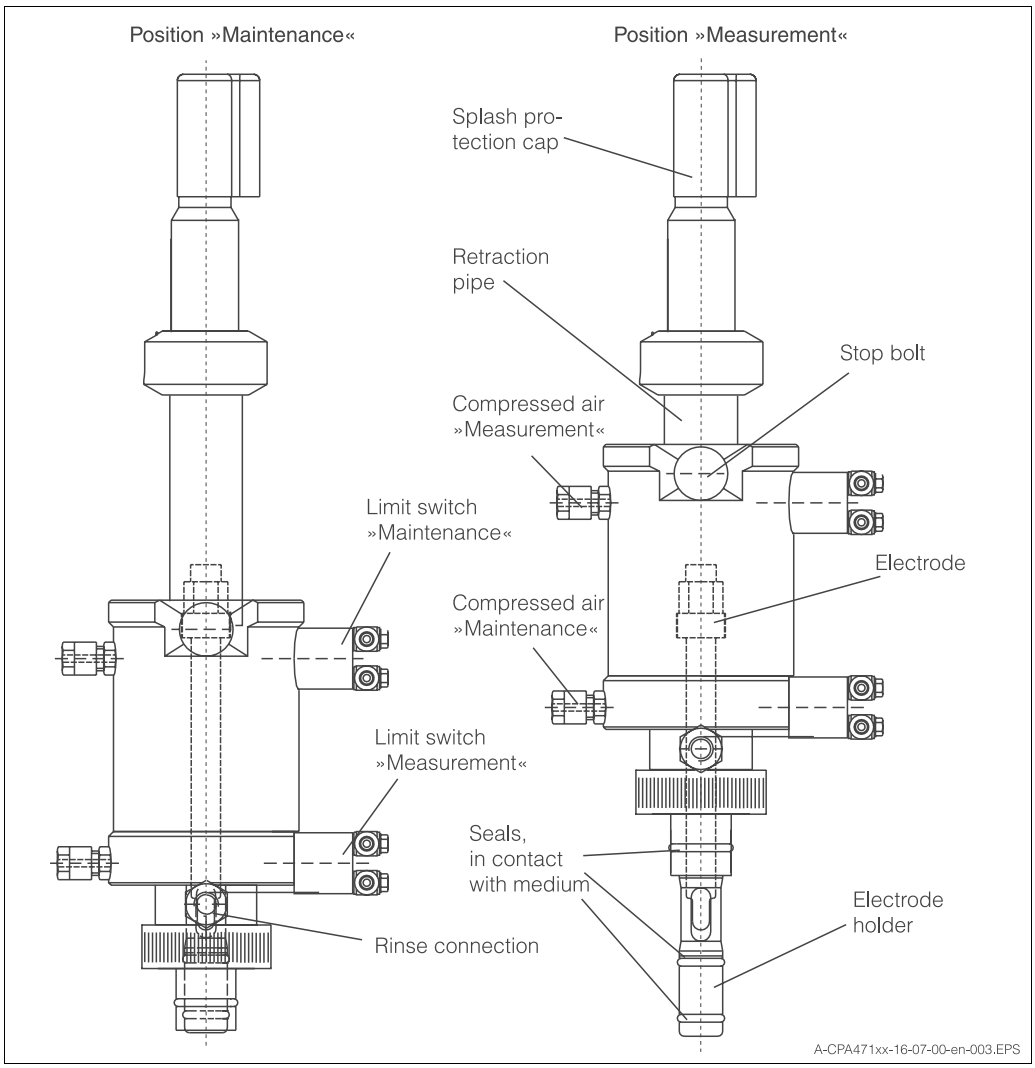
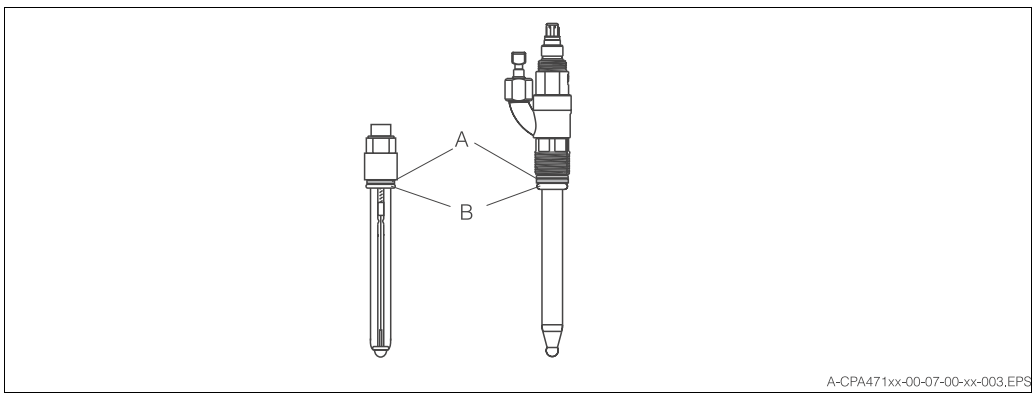


Fig. 3.8: Overview of mounting parts of CPA 471

3.3.1 Installing the electrode

Note!
- Before installing a new electrode, make sure that the electrode shaft is fitted with O-ring B and thrust collar A and that the protection cap is removed.
- Moisten the electrode shaft before installing the electrode. Simply immerse in water.



Gel electrode

1. Pull lifting tube fully into assembly (in »Maintenance« position, see Fig. 3.8).
2. Turn stop bolt lock through 90° so that plastic grooves are located above the recesses.
3. Turn lifting tube clockwise until stop bolt lock engages.
4. Remove splash protection cap from assembly.
5. Now remove lifting tube by turning anticlockwise.
6. Insert electrode hand-tight in electrode holder that is now visible and tighten by ¼ turn using socket spanner (WAF17).
7. Insert measuring cable from top through handle and lifting tube.
8. Screw measuring cable on electrode plug-in head and tighten hand-tight.
9. Screw lifting tube hand-tight back on assembly.
10. Place measuring cable in splash protection tube and insert on protective tube.
11. Push PM connector on PM connection (PM = Potential Matching Line).
12. Release stop bolt lock catch: Remove stop bolt lock and turn through 90°.

Remove electrode in the reverse sequence of operations.

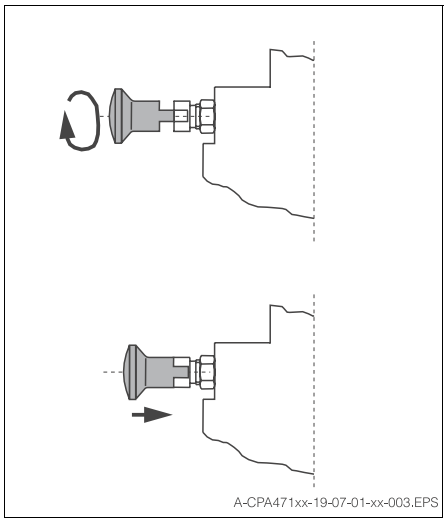


Fig. 3.9: top: Turn stop bolt lock through 90° so that plastic grooves are located above recesses.
bottom: When turning lifting tube, stop bolt lock engages.

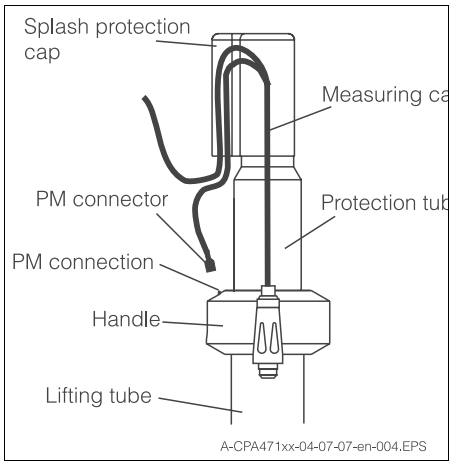


Fig. 3.10: PM connector on CPS 11/12

KCl electrode

1. Pull lifting tube fully into assembly (in »Maintenance« position, see Fig. 3.8)
2. Turn stop bolt lock through 90° so that plastic grooves are located above recesses.
3. Turn lifting tube clockwise until stop bolt lock engages.
4. Remove splash protection cap.
5. Then slacken lifting tube by turning anticlockwise. Unscrew tension sleeve.
6. Remove electrode tube from lifting tube.
7. Insert electrode in electrode tube (①), screw it in and tighten with socket spanner (WAF17) by ¼ turn (②).
8. Insert electrode and electrode tube in lifting tube.
9. Insert tension sleeve from bottom in lifting tube (③) and screw to electrode tube (④).
10. Screw lifting tube and electrode hand-tight on assembly.
11. Insert measuring cable from top through protective tube and KCl hood.
12. Screw measuring cable on electrode plug-in head and tighten hand-tight.
13. Push PM connector on PM connection.
14. Insert electrolyte supply tube through KCl hood and connect to electrode electrolyte connection.
15. Place measuring cable and electrolyte supply tube in splash protection cap and place this assembly on protection tube.
16. Release stop bolt lock catch: Remove stop bolt lock and turn through 90°.

Remove electrode in the reverse sequence of operations.

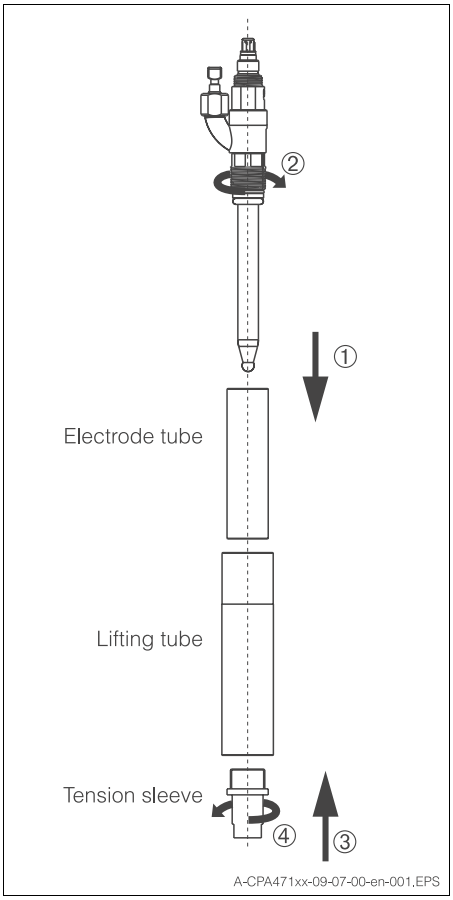


Fig. 3.11: Installing the liquid KCl electrode in the lifting tube

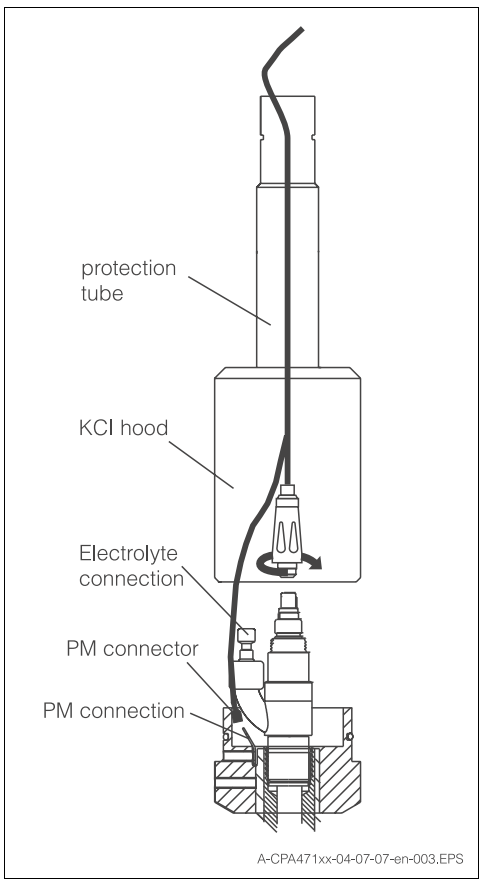


Fig. 3.12: Connection on CPS 41 electrode

3.3.2 Water connection (only on version with rinse fitting)

Connect the water supply to the rinse fittings with internal thread provided (see Fig. 3.8). One connection is for the water inlet, the other is the water outlet. Make sure that the discharge is free and pressureless.

The CPA 471 assembly is operated at a water pressure of 2 to 6 bar. A dirt trap and a non-return valve should be installed in the water supply line.

Note!
- If the water pressure can rise above 6 bar (including any transient pressure surges), install a pressure reducing valve upstream, otherwise the assembly may be damaged.
- The outlet should be located above the inlet as far as possible so that the electrode does not run dry in the rinse chamber.

Besides water, other or additional cleaning solutions may be used in the rinse chamber. However, pay attention to the material resistance of the assembly and comply with the maximum permitted temperatures (see Technical Data).

3.3.3 Compressed air connection to assembly control (only when equipped accordingly)

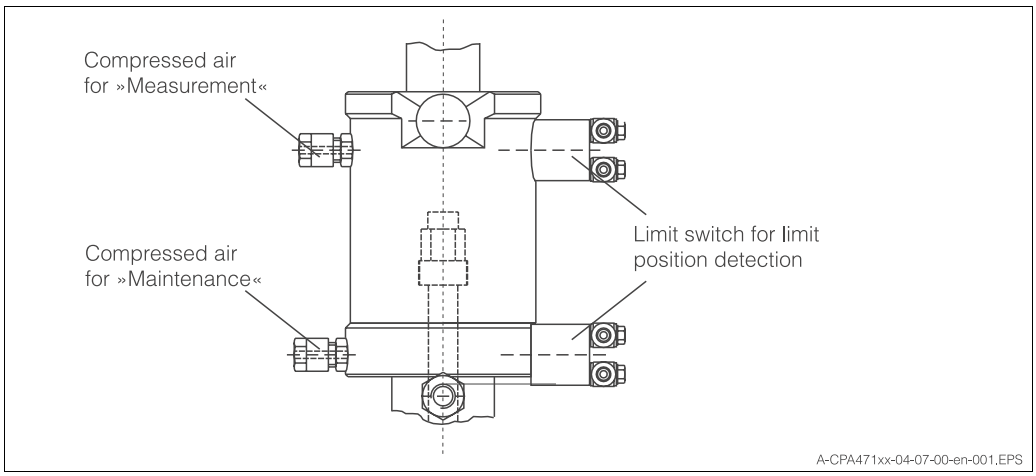


Fig. 3.13: Compressed air connections for CPA 471

- Connect the compressed air supply line for »Measurement« to the upper ¼" screw union.
- Connect the compressed air supply line for »Maintenance« to the lower ¼" screw union.

The CPA 471 assembly is operated at an air pressure of 4 to 8 bar.
The air must be filtered (40 µm), and be water- and oil-free.
There is no continuous air consumption.

Note!
If the air pressure can rise above 8 bar (including any transient pressure surges), install a pressure reducing valve upstream, otherwise the assembly may be damaged.

3.3.4 Connecting the pneumatic limit switches (only when equipped accordingly)

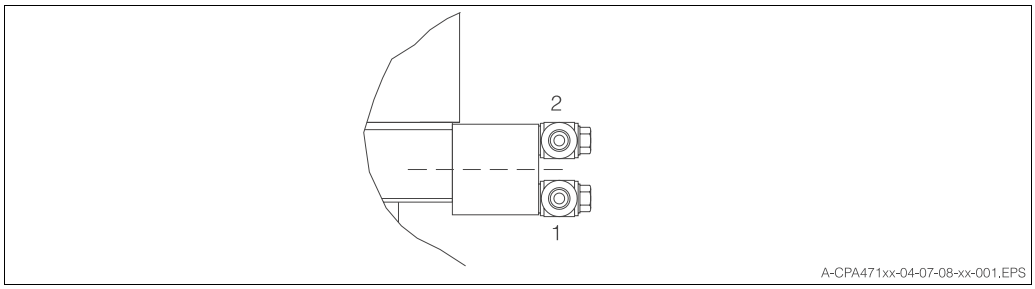


Fig. 3.14: Pneumatic limit switch (1 = input, 2= output)

The lower limit switches are for the »Measurement« function and the upper switches for the »Maintenance« function.

The air lines must have a minimum nominal width of DN 4 mm.

Connect the pneumatic limit switches to the compressed air lines on the assembly control (see Chapter 3.3.3) as follows:

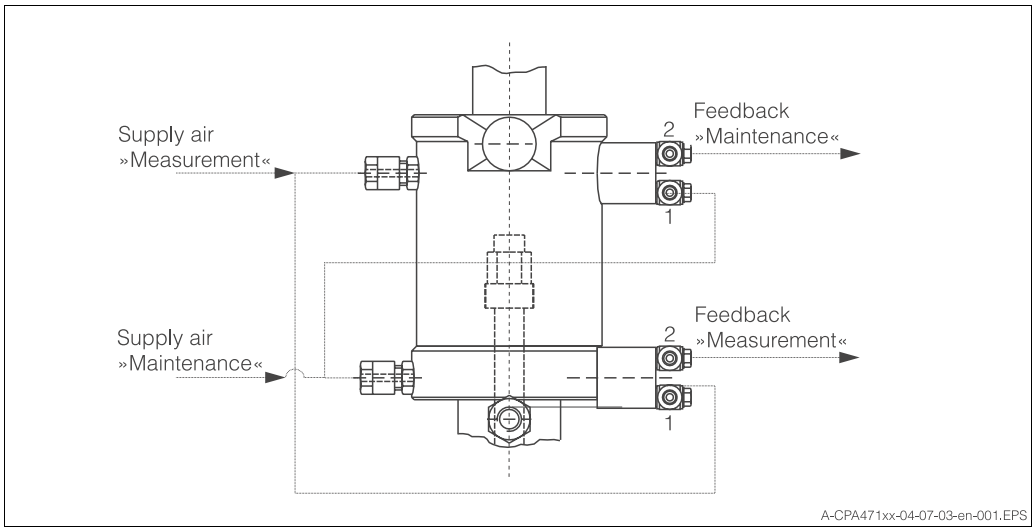


Fig. 3.15: Connection of the pneumatic lines to the CPA 471 assembly 1 = input, 2 = output

Connect the compressed air lines for the »Measurement« position feedback signal to the lower limit switch at the connections marked 1 (= inlet) and 2 (= outlet). When the »Measurement« position is reached, the air applied to inlet 1 is switched through and can be tapped at connection 2.

Connect the compressed air lines for the »Maintenance« position feedback signal to the upper limit switch at the connections marked 1 and 2. When the »Maintenance« position is reached, the air applied to inlet 1 is switched through and can be tapped at connection 2.

3.3.5 Installing the assembly

Set the assembly in maintenance position (see Fig. 3.8) and attach it with the selected connection to the tank or pipe.

Process connections are available for the CPA 471 assembly:

G 1¼ thread adapter nut internal thread, Tri-Clamp 2", flange DN 50, flange ANSI 2", sanitary tube union (DIN 11851), NPT 1" external thread

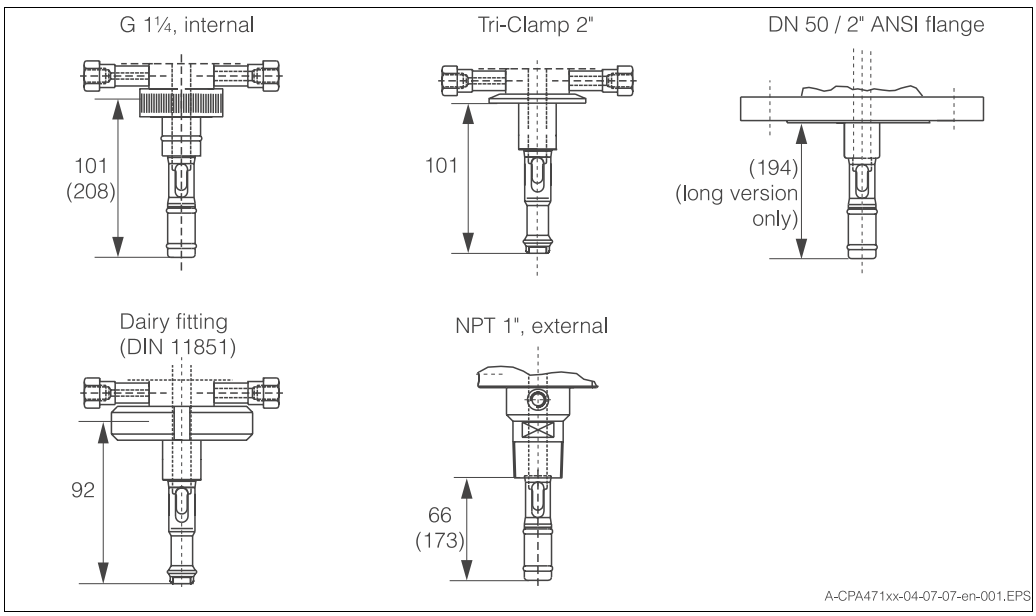


Fig. 3.16: Existing process connections for the CPA 471 assembly
The immersion depth is specified in each case (long assembly version in brackets)

Note!
Note the following depending on the process connection fitted:

All connections:
- Check the correct seating of the O-rings on the assembly.

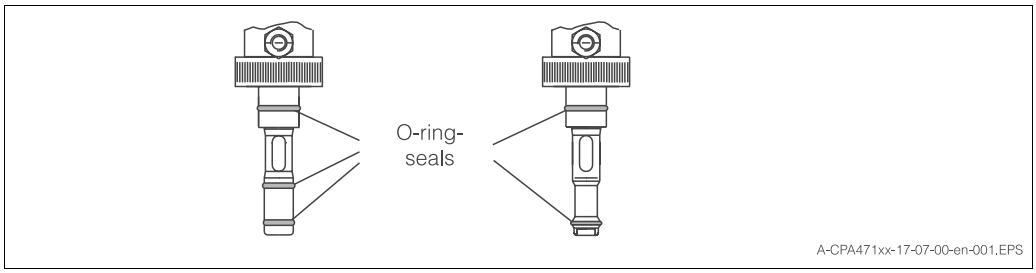


Fig. 3.17: O-ring seals of the CPA 471 (in contact with medium)
left: Electrode holder, standard
right: Electrode holder, sterile version

:
Check the seat of the flange seal between the flanges.

G 1¼ thread adapter nut:
This thread adapter nut does not function as a seal. Therefore, only tighten it hand-tight.

4 Operation

The assembly stop bolt lock arrests the lifting tube. Its operation is described in the two figures below:

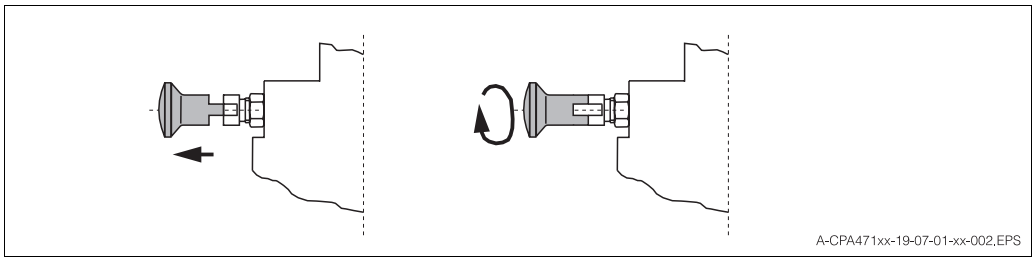


Fig. 4.1: Release stop bolt lock:
Remove stop bolt and turn through 90° so that the plastic grooves rest on the metal edge.

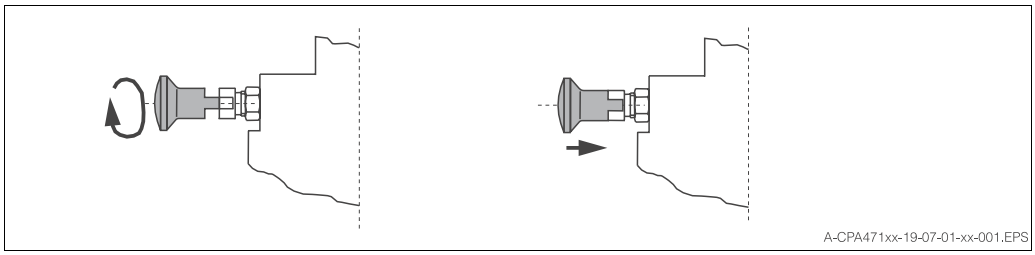


Fig. 4.2: Arrest stop bolt lock:
left: Turn stop bolt lock through 90° so that the plastic grooves are located above the recesses
right: When you turn the lifting tube clockwise, the stop bolt lock engages.

4.1 Starting up the assembly

Note!
Before the first start-up, make sure of the following points:

- All seats are correctly seated (on the assembly and process connection)
- Electrode is correctly installed and connected
- Water supply line is correctly connected to the rinse fittings (if fitted)
- Limit switches (depending on equipment fitted) are correctly connected

Warning!
Before applying compressed air to the pneumatic assembly, make sure the connection is correctly fitted!

4.2 Operating the CPA 471 in manual mode

»Measurement« process
- Release stop bolt lock catch.
- Introduce electrode and lifting tube completely in process.
- In this position, arrest electrode holder with stop bolt lock to prevent lifting tube from retracting unintentionally.

Warning!
Risk of injury! If the lifting tube is not arrested in the measurement position, the process pressure may exit uncontrolled and endanger the operator.

»Maintenance« process
- Release stop bolt lock catch.
- Pull lifting tube completely in assembly (»Maintenance« position, see Fig. 3.8)
- Arrest electrode holder in this position with the stop bolt lock.
- Carry out maintenance work (see Chapter 5)

4.3 CPA 471 in pneumatic mode

Operating the pneumatic version depends on the control fitted. Refer to the control operating manual for instructions.
It is not possible to lock pneumatic assembly in »Measurement« position. The pneumatic system maintains the back-pressure to the process pressure.

Caution!
- During maintenance work (e.g. installing and removing electrode), lock the assembly in maintenance position using the stop bolt lock.
- During the automatic rinsing process, do not arrest the lifting tube with the stop bolt lock, otherwise the assembly can no longer move automatically to the measurement position.
- If a maintenance switch is fitted on the measuring transmitter, set it to »Maintenance« or »Service«.

5 Maintenance

Warning!
Risk of injury! Before starting maintenance work on the assembly, make sure that the process line and the tank are depressurised, empty and rinsed. Move the assembly to the »Maintenance« position and arrest it using the stop bolt lock (see Fig. 4.2).

The measurement can be corrupted by electrode fouling or malfunction, e.g.:

- deposits on pH-sensitive part of glass electrode
  → causes poor response time and low sensitivity or slope.
- fouling or blocking of diaphragm
  → causes poor response time and unstable measurement.

To ensure a reliable measurement, the electrodes must be cleaned at regular intervals. The frequency and intensity of the cleaning operation depend on the measuring medium.

5.1 Cleaning

Clean the electrode:

- before every calibration
- at regular intervals during operation as necessary.

Cleaning can take place manually by removing the electrode or via the rinse fitting (if fitted).

Note!
- Do not use any abrasive cleaning agents for cleaning the electrodes. This can lead to irreparable damage to the measuring surfaces.
- After cleaning, rinse the rinse chamber with copious amounts of water (possibly distilled or de-ionised). Any residual cleaning agent can falsify the measurement drastically.
- After every cleaning operation, re-calibrate the measuring system.

Manual cleaning

All parts in contact with the medium, e.g. the electrode and the electrode holder, must be cleaned at regular intervals. Remove the electrode in the reverse sequence of operations 1 to 12 described in Chapter 3.3.1.

- Light dirt can be removed using suitable cleaning agents.
- Severe fouling must be removed with a soft brush and then a suitable cleaning agent.
- Remove persistent fouling by soaking in a liquid cleaner.

Cleaning via the rinse fitting
(only when equipped accordingly)

The rinse fitting is used to clean the assembly automatically, e.g. using Autoclean CPC 20.

Selecting cleaning agents

The selection of cleaning agent depends on the type of fouling. The most frequent fouling and the associated cleaning agents are listed in the table below:

Type of contamination	Cleaning agent
Greases and oils	Substances containing tensides (alkaline) or water-soluble organic solvents (e.g. alcohol)
Calciferous deposits, metal hydroxide deposits, heavy biological deposits	3% HCl or with Chemoclean: HCl (10%) in injector thinned to approx. 3%
Sulphide deposits	Mixture of hydrochloric acid (3%) and thiocarbamide (commercially available)
Protein deposits	Mixture of hydrochloric acid (01 molar) and pepsin (commercially available)
Fibres, suspended substances	Water under pressure, poss. with surface-active agents
Light biological deposits	Water under pressure

Note!
Do not use solvents containing halogen for cleaning. This could destroy the plastic components on the assembly.

Note!
Only clean redox electrodes mechanically. Chemical cleaning applies a potential to the electrode that takes several hours to decay. This potential causes measuring errors.

5.2 Calibration

Careful and regular calibrations are indispensable to ensure reliable and precise measurement. Calibration cycles depend on the application and the required measurement accuracy.

In practice, calibration cycles must be determined on a case by case basis. At the start, we recommend frequent calibration, e.g. one a week, in order to familiarise yourself with the running characteristics.

When carrying out the calibration, always refer to the calibration instructions of the associated measuring transmitter (see Operating Instructions of the measuring transmitter).

Calibration with electrode removed

Note!
- The calibration times depend on the process conditions and the measuring medium.
- If the assembly has a balanced, high-impedance connection, set up an electrical connection between the potential matching connection (PM) and the buffer solution.
- Do not allow electrodes to stand in distilled water.
- Do not allow electrodes to stand dry.

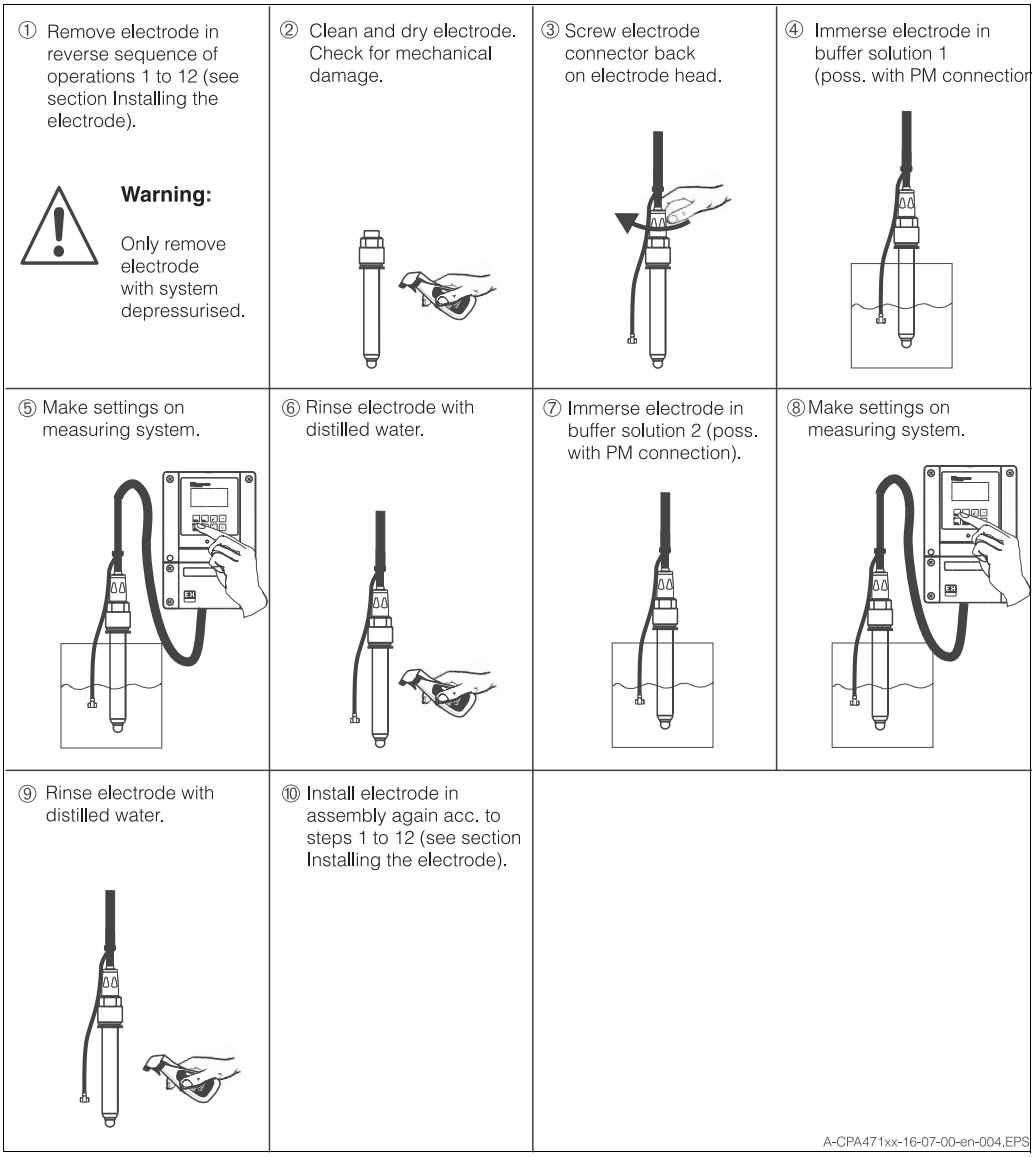


Fig. 5.1: Calibrating the electrode when removed

5.3 Repairs

The CPA 471 retractable assembly largely require very little maintenance. The following repair work is needed to ensure reliable operation:

- Replace damaged assembly parts.
- Keep O-rings and sealing surfaces on the assembly free of dirt.
- Grease dry O-rings.
- Inspect O-rings (see Fig. 3.17) in contact with the medium regularly and replace at reasonable intervals.
- Remove deposits clinging to the assembly for time to time.

Warning!
Any other intervention or modifications to the assembly are not permitted and will render all warranty claims null and void.

6 Accessories

Endress+Hauser offers the following accessories specially designed for the CPA 471 retractable assemblies:

6.1 Connection accessories

- Weld-on connections
  G1¼, straight, stainless steel SS 316L; Order No.: 51502798
  G1¼ angle 15°, stainless steel SS 316L; Order No.: 51502799
- Blind plug for G 1¼ process connection
  stainless steel SS 316L with VITON® Seal, G 1¼ connection, internal thread; Order No.: 51502800
- Flow vessel
  DN 25, G 1¼ external thread, stainless steel SS 316L; Order No.: 51502801
- Hose nozzle set for rinse fittings
  G ¼, DN 12, stainless steel SS 316L (2 pcs); Order No.: 51502808
- Retrofit set of limit switches
  Set of pneumatic limit switches (2 pcs); Order No.: 51502874
  Set of electric limit switches (2 pcs); Order No.: 51502873

6.2 Electrodes

- pH/redox combination electrode, length 120 mm
  OrbiSint W CPS 11/12
- pH/redox combination electrode, length 225 mm
  OrbiSint W CPS 11/12
  CeraLiquid P CPS 41/42 (with SSA or ESS head)
- Calibration solution CPY 2
- Measuring cable CPK 1, CPK 7 or CPK 9
  e.g. CPK 1, 10 m, SSA head, up to 80°C: Order No. CPK1-100A
  e.g. CPK 7, 10 m, SSA head, up to 80°C, Ex: Order No. CPK7-10Z
  e.g. CPK 9, 10 m, SSA head, up to 130°C, Order No. CPK9-HBA1A

6.3 Spare parts

- Set of seals, in contact with medium
  Electrode holder, standard:EPDM; Order No.: 51502802
  VITON®; Order No.: 51502803
  KALREZ®; Order No.: 51502804
  Electrode holder, sterile version:EPDM; Order No.: 51502805
  VITON®; Order No.: 51502806
  KALREZ®; Order No.: 51502807

6.4 Control of retractable assembly during cleaning / calibration

- Autoclean CPC 20
  Automatic cleaning control for CleanFit P retractable assemblies. Control cabinet with pneumatic valves, switches for position feedback signal, terminal strip for status signals. Protection class IP 54.
  Technical Information TI 161C/07/en (Order No. 50089137)
- Liquisys M CPM 223/253
  pH and redox measuring transmitter. Integrated electrode function monitoring, measured value monitoring, free configuration of alarm contact
  Technical Information TI 194C/07/en (Order No. 51500276)
- Mycom CPM 152
  pH/redox field measuring transmitter. Integrated electrode function monitoring, alpha value compensation, calibration messages, history memory, menu prompting and communication display. Protection class IP 65.
  Technical Information TI 143C/07/en (Order No. 50077399)

7 Technical Data

General specifications	
Manufacturer	Endress+Hauser
Product name	CleanFit P CPA 471
Ambient conditions	
Ambient temperature (nominal operating conditions)	> 0°C !
Process conditions	
Process temperature range	0 ... 135°C (dependent on selected material and process pressure)
Process pressure range	0 ... 4 bar in manual mode 0 ... 6 bar in pneumatic mode
Physical data	
Electrode* immersion depth	up to 101 mm (short version) up to 208 mm (long version)
Required freedom of installation	approx. 0.5 m
Electrode lengths	120 mm, 225 mm
Weight of assembly	approx. 2.5 kg (short version) approx. 9 kg (long version)
Materials	
Materials in contact with medium	Electrode holder stainless steel SS 316L Seals: EPDM, VITON®, KALREZ®
Materials not in contact with medium	Housings PA, stainless steel SS 316Ti
Process connections	
G 1¼ internal thread, Tri-Clamp 2", flange DN 50, flange ANSI 2", sanitary tube union (DIN 11851), NPT 1" external thread	
Network connections	
Rinse fittings	2 x G ¼ (ID) 2 x NPT ¼" (ID) rinse water pressure 2 ... 6 bar
Compressed air connections	Pressure 4 ... 8 bar air filtered (40 µm), water- and oil-free air tubes with minimum DN 4 mm
Limit switches	pneumatic 3/2-way valve

* At an immersion depth of 208 mm no CeraLiquid P -electrodes (CPS 41/42) can be installed.

Pressure-temperature chart

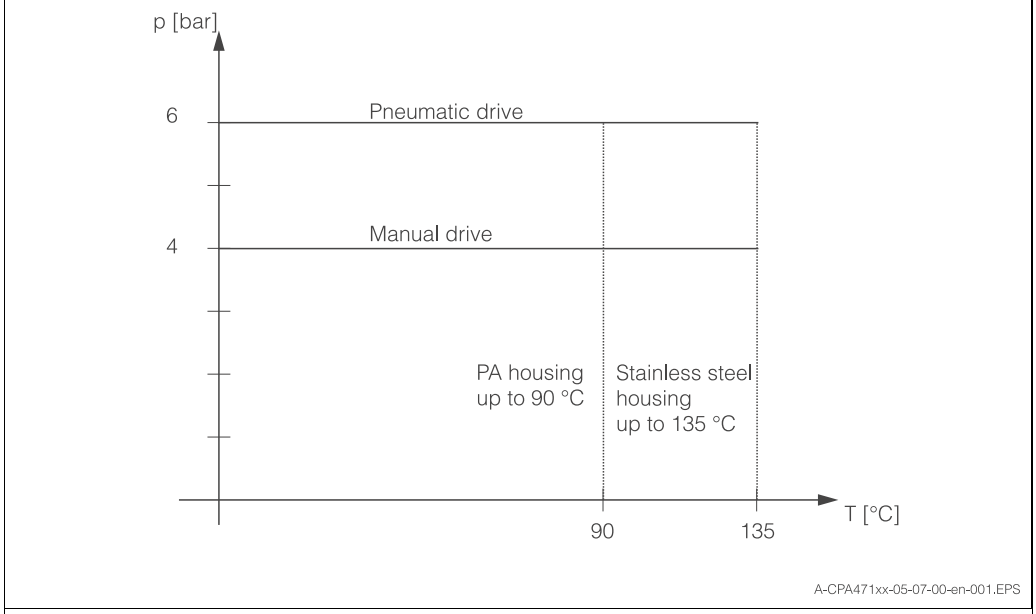


Fig. 7.1: Pressure-temperature chart of Assembly CPA 471

Subject to modifications.

Index

A
Accessories . . . 22
Air pressure . . . 14
Arrest stop bolt lock . . . 17
Automatic cleaning . . . 23

C
Calibration . . . 20
Cleaning . . . 19
Cleaning agents . . . 20
Cleaning via the rinsing connection . . . 19
Complete installation . . . 7
Compressed air connection . . . 14
Connection accessories . . . 22

D
Deposits . . . 20
Dimensions . . . 8

E
Electrode holder, standard . . . 16
Electrode holder, sterile version . . . 9, 16
Electrodes . . . 22

F
Flow vessel . . . 10
Fouling . . . 20
Frost . . . 10

G
Gel electrode . . . 12

I
Identification . . . 4
Installation . . . 2, 7, 11
Installation angle . . . 10
Installation position . . . 10
Installing the assembly . . . 16
Installing the electrode . . . 11
Intended application . . . 2

K
KCl electrode . . . 9, 13

L
Limit switch . . . 11
Limit switch, pneumatic . . . 15

M
Maintenance . . . 19–22
Maintenance, manual mode . . . 18
Manual cleaning . . . 19
Manual mode . . . 18
Measurement, manual mode . . . 18
Measuring system . . . 7
Monitoring and safety devices . . . 3

N
Nameplate . . . 4

O
Operating pressure . . . 3
Operation . . . 2, 17
Operational safety . . . 2
O-rings . . . 16
Overview of mounting parts . . . 11

P
Pipe diameter, minimum . . . 10
PM connection . . . 12–13, 20
Pneumatic mode . . . 18
Pressure-temperature chart . . . 25
Process connections . . . 16
Product structure . . . 5

Q
Queries . . . 6

R
Registered trademark . . . 6
Repairs . . . 21
Return . . . 3
Rinse connections . . . 14

S
Safety . . . 2
Safety instructions . . . 2–3
Scope of supply . . . 5
Seat of seals . . . 22
Spare parts . . . 22
Start-up . . . 2, 17
Stop bolt lock . . . 17

T
Technical Data . . . 24

W
Water connection . . . 14
Water pressure . . . 14

Gefahrgutblatt für Reparaturen an E+H-Geräten
Safety regulation form for repairs of E+H instruments
Bulletin de marchandises dangereuses pour réparations des instruments E+H

Lieber Kunde, bitte helfen Sie uns mit Ihren Informationen, damit wir Ihre Reparatur schnell, exakt und risikofrei durchführen können.
Dear customer, please help us with your information to handle your repair fast, exact and free of any risks for the technicians.
Cher client, aidez-nous avec vos informations, afin que nous puissions exécuter vos réparations rapidement, exactement et sans risques.

Firma / company / entreprise: _____

Abt. / dept. / service: _____

Anschrift / address / adresse: _____

Name / name / nom: _____

Tel. / phone: _____

Fax: _____

Sensortyp / type of sensor / modèle de détecteur: _____

Auswertegerät / type of instrument / type d´appareil: _____

Seriennummer / serial no. / numéro de série: _____

Seriennummer / serial no. / numéro de série: _____

Prozessdaten / process data / données des opérations

Medium: _____

Chemische Formel:
Chemical formula:
Formule chimique: _____

Gereinigt mit / cleaned with / nettoyé avec

Medium: _____

_____

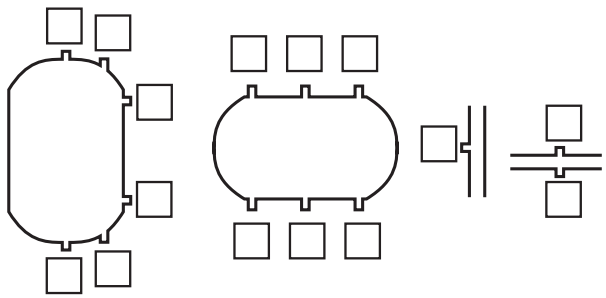
SAFE ☐
Ungefährlich
Safe to handle
Sans danger

Aggregatzustand / state of aggregation / état d´agrégation

flüssig/liquid liquide ☐ fest/solid solide ☐

gasförmig/gazeous gazéiforme ☐ pulverig/powdery poudreux ☐

Einbauort / mounting place / lieu de montage



Ex-Anlage / Ex-Zone / Ex-plan

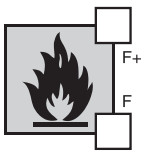
Ja Yes Oui ☐ Nein No Non ☐ Zone Class _____

Sicherheitshinweise / safety regulations / normes de sécurité

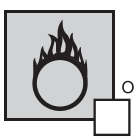
Umweltgefährlich
Dangerous for the envir.
Dangereux pour l'envir.

Radioaktiv
Radioactive
Radioactif

Giftig
Toxic
Toxique

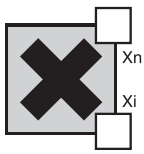


Entzündlich
Flammable
Inflammable

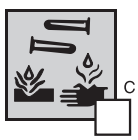


Brandfördernd
Oxidizing
Comburant

Expl.gefährlich
Explosive
Explosif



Schädlich / Reizend
Harmful / Irritant
Nocif / Irritant



Ätzend
Corrosive
Corrosif

Ungefährlich
Safe to handle
Sans danger

➤ Hiermit bestätigen wir, dass die zurückgeschickten Geräte frei sind von jeglichen Gefahr- oder Giftstoffen (Säuren, Laugen, Lösungsmitteln, usw.). Radioaktiv kontaminierte Geräte müssen vor Einsendung entsprechend den Strahlenschutzvorschriften dekontaminiert werden. Falls spezielle Handhabungsvorschriften nötig sind, legen Sie diese bitte bei.
➤ We herewith confirm that the returned instruments are free of any dangerous or toxic materials (acids, caustics, solvents, etc.). Radioactive contaminated instruments must be decontaminated according to nuclear safety regulations prior to shipment. If special handling regulations are required, please attach.
➤ Par la présente, nous certifions que les instruments en retour sont exempts de tous risques de contamination ou de matières toxiques. Avant expédition les instruments contaminés par de la radio-activité doivent être décontaminés en référence aux prescriptions des règles de securité en vigueur contre les radiations nucléaires. Au cas où des règles de manipulations spécifiques sont nécessaires, veuillez les joindre s. v. p.

Datum / date:
Firmenstempel / stamp / cachet: _____

Unterschrift:
Signature: _____

Europe

Austria
❑ Endress+Hauser Ges.m.b.Hthread adapter nut.
Vienna
Tel. ++43 (1) 88056-0, Fax (1) 88056-35
Belarus
Belorgsintez
Minsk
Tel. ++375 (172) 263166, Fax (172) 263111
Belgium / Luxembourg
❑ Endress+Hauser S.A./N.V.
Brussels
Tel. ++32 (2) 2480600, Fax (2) 2480553
Bulgaria
INTERTECH-AUTOMATION
Sofia
Tel. ++359 (2) 664869, Fax (2) 9631389
Croatia
❑ Endress+Hauser GmbH+Co.
Zagreb
Tel. ++385 (1) 6637785, Fax (1) 6637823
Cyprus
I+G Electrical Services Co. Ltd.
Nicosia
Tel. ++357 (2) 484788, Fax (2) 484690
Czech Republic
❑ Endress+Hauser GmbH+Co.
Praha
Tel. ++420 (26) 6784200, Fax (26) 6784179
Denmark
❑ Endress+Hauser A/S
Søborg
Tel. ++45 (70) 131132, Fax (70) 132133
Estonia
Elvi-Aqua
Tartu
Tel. ++372 (7) 422726, Fax (7) 422727
Finland
❑ Endress+Hauser Oy
Espoo
Tel. ++358 (9) 8596155, Fax (9) 8596055
France
❑ Endress+Hauser
Huningue
Tel. ++33 (3) 89696768, Fax (3) 89694802
Germany
❑ Endress+Hauser Messtechnik GmbH+Co.
Weil am Rhein
Tel. ++49 (7621) 97501, Fax (7621) 975555
Great Britain
❑ Endress+Hauser Ltd.
Manchester
Tel. ++44 (161) 2865000, Fax (161) 9981841
Greece
I & G Building Services Automation S.A.
Athens
Tel. ++30 (1) 9241500, Fax (1) 9221714
Hungary
Mile Ipari-Elektro
Budapest
Tel. ++36 (1) 2615535, Fax (1) 2615535
Iceland
Vatnshreinsun HF
Reykjavik
Tel. ++354 (5) 619616, Fax (5) 619617
Ireland
Flomeaco Company Ltd.
Kildare
Tel. ++353 (45) 868615, Fax (45) 868182
Italy
❑ Endress+Hauser Italia S.p.A.
Cernusco s/N Milano
Tel. ++39 (02) 92106421, Fax (02) 92107153
Latvia
Raita Ltd.
Riga
Tel. ++371 (7) 312897, Fax (7) 312894
Lithuania
Agava Ltd.
Kaunas
Tel. ++370 (7) 202410, Fax (7) 207414
Netherlands
❑ Endress+Hauser B.V.
Naarden
Tel. ++31 (35) 6958611, Fax (35) 6958825
Norway
❑ Endress+Hauser A/S
Tranby
Tel. ++47 (32) 859850, Fax (32) 859851
Poland
❑ Endress+Hauser Polska Sp. z o.o.
Warszawy
Tel. ++48 (22) 7201090, Fax (22) 7201085
Portugal
Tecnisis - Tecnica de Sistemas Industriais
Linda-a-Velha
Tel. ++351 (1) 4172637, Fax (1) 4185278
Romania
Romconseng SRL
Bucharest
Tel. ++40 (1) 4101634, Fax (1) 4101634
Russia
❑ Endress+Hauser Moscow Office
Moscow
Tel. ++7 (095) 1587564, Fax (095) 1589871
Slovak Republic
Transcom Technik s.r.o.
Bratislava
Tel. ++421 (74) 4888684, Fax (74) 4887112
Slovenia
❑ Endress+Hauser D.O.O.
Ljubljana
Tel. ++386 (61) 1592217, Fax (61) 1592298
Spain
❑ Endress+Hauser S.A.
Barcelona
Tel. ++34 (93) 4803366, Fax (93) 4733839
Sweden
❑ Endress+Hauser AB
Sollentuna
Tel. ++46 (8) 55511600, Fax (8) 55511600
Switzerland
❑ Endress+Hauser AG
Reinach/BL 1
Tel. ++41 (61) 7157575, Fax (61) 7111650
Turkey
Intek Endüstriyel Ölcü ve Kontrol Sistemleri
Istanbul
Tel. ++90 (212) 2751355, Fax (212) 2662775
Ukraine
Industria Ukraïna
Kiev
Tel. ++380 (44) 26881, Fax (44) 26908
Yugoslavia
Meris d.o.o.
Beograd
Tel. ++381 (11) 4446164, Fax (11) 4441966

Africa

Egypt
Anasia
Heliopolis/Cairo
Tel. ++20 (2) 417900, Fax (2) 417900
Morocco
Oussama S.A.
Casablanca
Tel. ++212 (2) 241338, Fax (2) 402657
Nigeria
J F Technical Invest. Nig. Ltd.
Lagos
Tel. ++234 (1) 62234546, Fax (1) 62234548
South Africa
❑ Endress+Hauser Pty. Ltd.
Sandton
Tel. ++27 (11) 4441386, Fax (11) 4441977
Tunisia
Controle, Maintenance et Regulation
Tunis
Tel. ++216 (1) 793077, Fax (1) 788595

America

Argentina
❑ Endress+Hauser Argentina S.A.
Buenos Aires
Tel. ++54 (1) 145227970, Fax (1) 145227909
Bolivia
Tritec S.R.L.
Cochabamba
Tel. ++591 (42) 56993, Fax (42) 50981
Brazil
❑ Samson Endress+Hauser Ltda.
Sao Paulo
Tel. ++55 (11) 50313455, Fax (11) 50313067
Canada
❑ Endress+Hauser Ltd.
Burlington, Ontario
Tel. ++1 (905) 6819292, Fax (905) 6819444
Chile
❑ Endress+Hauser Chile S.A.
Santiago de Chile
Tel. ++56 (2) 2088608, Fax (2) 2088608
Colombia
Colsein Ltd.
Bogota D.C.
Tel. ++57 (1) 2367659, Fax (1) 6107868
Costa Rica
EURO-TEC S.A.
San Jose
Tel. ++506 (2) 961542, Fax (2) 961542
Ecuador
Insetec Cia. Ltda.
Quito
Tel. ++593 (2) 269148, Fax (2) 461833
Guatemala
ACISA Automatizacion Y Control Industrial S.A.
Ciudad de Guatemala, C.A.
Tel. ++502 (3) 345985, Fax (2) 327431
Mexico
❑ Endress+Hauser I.I.
Mexico City
Tel. ++52 (5) 568965, Fax (5) 568418
Paraguay
Incoel S.R.L.
Asuncion
Tel. ++595 (21) 213989, Fax (21) 226583
Uruguay
Circular S.A.
Montevideo
Tel. ++598 (2) 925785, Fax (2) 929151
USA
❑ Endress+Hauser Inc.
Greenwood, Indiana
Tel. ++1 (317) 5357138, Fax (317) 5358489
Venezuela
H. Z. Instrumentos C.A.
Caracas
Tel. ++58 (2) 9440966, Fax (2) 9444554

Asia

China
❑ Endress+Hauser Shanghai Instrumentation Co. Ltd.
Shanghai
Tel. ++86 (21) 54902300, Fax (21) 54902303

❑ Endress+Hauser Beijing Office
Beijing
Tel. ++86 (10) 68344058, Fax (10) 68344068

❑ Endress+Hauser (H.K.) Ltd.
Hong Kong
Tel. ++852 (2) 5283120, Fax (2) 8654171
India
❑ Endress+Hauser India Branch Office
Mumbai
Tel. ++91 (22) 8521458, Fax (22) 8521927
Indonesia
PT Grama Bazita
Jakarta
Tel. ++62 (21) 7975083, Fax (21) 7975089
Japan
❑ Sakura Endress Co., Ltd.
Tokyo
Tel. ++81 (422) 540611, Fax (422) 550275
Malaysia
❑ Endress+Hauser (M) Sdn. Bhd.
Petaling Jaya, Selangor Darul Ehsan
Tel. ++60 (3) 7334848, Fax (3) 7338800
Pakistan
Speedy Automation
Karachi
Tel. ++92 (21) 7722953, Fax (21) 7736884
Papua New Guinea
SBS Electrical Pty Limited
Port Moresby
Tel. ++675 (3) 251188, Fax (3) 259556
Philippines
Brenton Industries Inc.
Makati Metro Manila
Tel. ++63 (2) 6388041, Fax (2) 6388042
Singapore
❑ Endress+Hauser (S.E.A.) Pte., Ltd.
Singapore
Tel. ++65 (5) 668222, Fax (2) 666848
South Korea
❑ Endress+Hauser (Korea) Co., Ltd.
Seoul
Tel. ++82 (2) 6587200, Fax (2) 6592838
Taiwan
Kingjarl Corporation
Taipei R.O.C.
Tel. ++886 (2) 27183938, Fax (2) 27134190
Thailand
❑ Endress+Hauser Ltd.
Bangkok
Tel. ++66 (2) 996781120, Fax (2) 9967810
Vietnam
Tan Viet Bao Co. Ltd.
Ho Chi Minh City
Tel. ++84 (8) 8335225, Fax (8) 8335227

Iran
PATSA Co.
Tehran
Tel. ++98 (21) 8754748, Fax (21) 8747761
Israel
Instrumetrics Industrial Control Ltd.
Tel-Aviv
Tel. ++972 (3) 6480205, Fax (3) 6471992
Jordan
A.P. Parpas Engineering S.A.
Amman
Tel. ++962 (6) 4643246, Fax (6) 4645707
Kingdom of Saudi Arabia
Anasia
Jeddah
Tel. ++966 (2) 6710014, Fax (2) 6725929
Lebanon
Nabil Ibrahim
Jbeil
Tel. ++961 (3) 254052, Fax (9) 548038
Sultanate of Oman
Mustafa & Jawad Science & Industry Co.
L.L.C.
Ruwi
Tel. ++968 (60) 2009, Fax (60) 7066
United Arab Emirates
Descon Trading EST.
Dubai
Tel. ++971 (4) 653651, Fax (4) 653264
Yemen
Yemen Company for Ghee and Soap Industry
Taiz
Tel. ++976 (4) 230664, Fax (4) 212338

Australia + New Zealand

Australia
ALSTOM Australia Ltd.
Sydney
Tel. ++61 (2) 97224777, Fax (2) 97224888
New Zealand
EMC Industrial Group Ltd
Auckland
Tel. ++64 (9) 4155110, Fax (9) 4155115

All other countries

❑ Endress+Hauser GmbH+Co. Instruments International
D-Weil am Rhein
Germany
Tel. ++49 (7621) 97502, Fax (7621) 975345

For more Endress+Hauser product please visit: www.ainstru.com
Mail: Sales@ainstru.com

❑ Member of the Endress+Hauser Group

51502594

Endress+Hauser
The Power of Know How

BA 217C/07/en/03.00
Printed in Germany / FM 5.5 / DT