



VERSAFLOW SONIC 1000/TWS 9000

Supplementary instructions

Addendum for hazardous areas. These additional instructions are an extension to the VersaFlow Sonic 1000/TWS 9000 quick start and handbook



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1.1 Safety instructions from the manufacturer

1.1.1 Disclaimer

The manufacturer will not be liable for any damage of any kind by using its product, including, but not limited to direct, indirect, incidental, punitive and consequential damages.

This disclaimer does not apply in case the manufacturer has acted on purpose or with gross negligence. In the event any applicable law does not allow such limitations on implied warranties or the exclusion of limitation of certain damages, you may, if such law applies to you, not be subject to some or all of the above disclaimer, exclusions or limitations.

Any product purchased from the manufacturer is warranted in accordance with the relevant product documentation and our Terms and Conditions of Sale.

The manufacturer reserves the right to alter the content of its documents, including this disclaimer in any way, at any time, for any reason, without prior notification, and will not be liable in any way for possible consequences of such changes.

1.1.2 Product liability and warranty

Ultrasonic flowmeters are designed solely for measuring the flow rate and the velocity of sound of process liquids.

Responsibility as to suitability and intended use of these ultrasonic flowmeters rests solely with the operator. The supplier does not accept any liability resulting from misuse by the operator. Improper installation and operation of the flowmeters (systems) may lead to loss of warranty. In addition, the "General conditions of sale" which forms the basis of the purchase agreement are applicable.

1.1.3 Information concerning the documentation

To prevent any injury to the user or damage to the device it is essential that you read the information in this document and observe applicable national standards, safety requirements and accident prevention regulations.

If this document is not in your native language and if you have any problems understanding the text, we advise you to contact your local office for assistance. The manufacturer can not accept responsibility for any damage or injury caused by misunderstanding of the information in this document.

This document is provided to help you establish operating conditions, which will permit safe and efficient use of this device. Special considerations and precautions are also described in the document, which appear in the form of underneath icons.

1.1.4 Warnings and symbols used

Safety warnings are indicated by the following symbols.



DANGER!

This information refers to the immediate danger when working with electricity.



DANGER!

This warning refers to the immediate danger of burns caused by heat or hot surfaces.



DANGER!

This warning refers to the immediate danger when using this device in a hazardous atmosphere.



DANGER!

These warnings must be observed without fail. Even partial disregard of this warning can lead to serious health problems and even death. There is also the risk of seriously damaging the device or parts of the operator's plant.



WARNING!

Disregarding this safety warning, even if only in part, poses the risk of serious health problems. There is also the risk of damaging the device or parts of the operator's plant.



CAUTION!

Disregarding these instructions can result in damage to the device or to parts of the operator's plant.



INFORMATION!

These instructions contain important information for the handling of the device.



LEGAL NOTICE!

This note contains information on statutory directives and standards.



• **HANDLING**

This symbol designates all instructions for actions to be carried out by the operator in the specified sequence.

➔ **RESULT**

This symbol refers to all important consequences of the previous actions.

1.2 Safety instructions for the operator

**WARNING!**

- *Do not change the device. Unauthorized changes affect the explosion safety of the devices.*
- *The prescriptions and regulations as well as the electrical data described in the EC type examination certificate must be obeyed.*
- *Beside the instructions for electrical installations in non-hazardous locations according to the applicable national standard (equivalent to HD 384 or IEC 364, e.g. VDE 0100), especially the regulations in EN 60079-14 "Electrical installations in hazardous locations" or equivalent national standard (e.g. DIN VDE 0165 Part 1) must be strictly followed.*
- *Installation, establishment, utilization and maintenance are only allowed to be executed by personnel with an education in explosion safety!*

These additional instructions are an extension to the installation and operating instructions and only apply to the Ex-versions of the VersaFlow Sonic 1000 and TWS 9000 ultrasonic flowmeters. All technical information as described in the Installation and Operating Instructions is applicable, when not specifically excluded, completed or replaced by the instructions in these additional instructions.

1.3 Approval

The ultrasonic flowmeters are manufactured according to the European Directive 94/9 EC (ATEX 100a). These flowmeters are approved for installation and use in hazardous classified locations of Zone 1 and 2 by the PTB and are in accordance with the European Standards of the EN 60079 series. They have approval number:

VersaFlow Sonic 1000 sensor: **PTB 08 ATEX 2018 X**

VersaFlow TWS 9000 F(i) signal converter: **PTB 08 ATEX 2019 X**

The **FM** approval original project ID is **3031570**.

The **CSA** approval certificate is **1969571**.

1.4 VersaFlow Sonic 1000

The VersaFlow Sonic 1000 is a clamp-on ultrasonic flow sensor and has intrinsically safe transducer circuits. It is available in three sizes (small, medium or large), designed for the size of the pipeline on which the flow sensor is installed.

It is marked with the explosion safety code:

II 2 G Ex ia IIC T6...T4

The intrinsically safe transducer connections of the VersaFlow Sonic 1000 are connected to an associated device and have the following maximum values:

$U_i = 8,5 \text{ V}$	$I_i = 250 \text{ mA}$	$P_i \leq 0,625 \text{ W}$	$C_i \leq 4,5 \text{ nF}$	$L_i \leq 400 \text{ } \mu\text{H}$
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1.5 VersaFlow TWS 9000 F(/i)

The VersaFlow TWS 9000 F(/i) is the separate version of the ultrasonic signal converter and has intrinsically safe connections to the ultrasonic flow sensor in separate version. The ultrasonic signal converter is either provided with increased safety or intrinsically safe in-/outputs that are located in the terminal compartment, which can either be configured as "Ex d" or "Ex e".

The converter is marked with one of the following codes:

- **II 2(1) G Ex de [ia] IIC T6** or **II 2 G Ex de [ia] IIC T6** for the terminal compartment of the signal converter housing in type of protection increased safety "Ex e" in accordance with EN 60079-7.
- **II 2(1) G Ex d [ia] IIC T6** or **II 2 G Ex d [ia] IIC T6** for the terminal compartment of the signal converter housing designed as flameproof enclosure "Ex d" according to EN 60079-1. The customer must provide "Ex d" approved cable glands in accordance with the European Directive 94/9 EC (ATEX 100a).

The terminal compartment contains the connecting terminals for the mains supply and in-/outputs. It has three M20 x 1,5 - 6H cable/conduit entry holes for use with appropriate cable glands, blind plugs or conduit adapters ("Ex e" or "Ex d" approved).



WARNING!

*"Ex d" approved cable glands / blind plugs are **not** part of the standard delivery package and must be provided by the customer or explicitly ordered at the manufacturer.*

When conduits are used, the terminal compartment must be a flameproof enclosure "Ex d" according to EN 60079-1. The conduits must be sealed by "Ex d" approved sealing devices, e.g. a stopping box with setting compound, directly at the conduit entrances.

The intrinsically safe transducer output connections have the following values:

$U_o = 8,2 \text{ V}$	$I_o = 210 \text{ mA}$	$P_o = 435 \text{ mW}$	$C_o = 1,3 \text{ }\mu\text{F}$ or $0,8 \text{ }\mu\text{F}$	$L_o = 0,5 \text{ mH}$ or $1,2 \text{ mH}$
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1.6 Marking labels

See the marking labels (i.e. data stickers) below of respectively the rail, the cover, the splitter box (only for large version) and the VersaFlow TWS 9000 F(/i) ultrasonic signal converter.



Honeywell Made in The Netherlands 512 Virginia Drive Fort Washington PA 19034, U.S.A.	 II 2G Ex ia IIC T6...T4 PTB 08 ATEX 2018 X Ta = -40...+70°C  0344
VersaFlow Sonic 1000 S/N: A0x-xxxxx Manufactured: 20xx Tm: -40...+120°C Calibration nr.: xxx xxxxxxx	IP66/IP67 according to EN 60529 Intrinsically safe sensor circuits (entity parameters): Ui = 8.5 V Ci ≤ 4.5 nF Pi ≤ 0.625 W Ii = 250 mA Li ≤ 400 uH

Figure 1-1: VersaFlow Sonic 1000 rail



Honeywell Made in The Netherlands 512 Virginia Drive Fort Washington PA 19034, U.S.A.	 II 2G Ex ia IIC T6...T4 PTB 08 ATEX 2018 X Ta = -40...+70°C  0344
VersaFlow Sonic 1000 Manufactured 20xx Tm: -40...+120°C	IP67 according to EN 60529 Intrinsically safe sensor circuits (entity parameters): Ui = 8.5 V Ci ≤ 4.5 nF Pi ≤ 0.625 W Ii = 250 mA Li ≤ 400 uH

Figure 1-2: VersaFlow Sonic 1000 cover



Honeywell Made in The Netherlands 512 Virginia Drive Fort Washington PA 19034, U.S.A.	 II 2G Ex ia IIC T6...T4 PTB 08 ATEX 2018 X Ta = -40...+70°C  0344
VersaFlow Sonic 1000 Splitter Box S/N: A0x-xxxxx Manufactured: 20xx Tm: -40...+120°C	IP67 according to EN 60529 See EC-type examination certificate for electrical data.

Figure 1-3: VersaFlow Sonic 1000 splitter box





Honeywell 512 Virginia Drive, Fort Washington PA 19034, U.S.A.	 II 2 (1)G or II 2G Ex de [ia] IIC T6 or Ex d[ia] IIC T6 PTB 08 ATEX 2019 X Tamb = -40...+60°C  0344
VersaFlow TWS 9000 F (i) S/N A0x xxxxx CG34xxxxxx Made in The Netherlands: 20xx	Intrinsically safe transducer circuits (xD, xU; x = 1, 2 or 3): U _o = 8.2 V C _o = 1.3 uF or C _o = 0.8 uF I _o = 210 mA L _o = 0.5 mH L _o = 1.2 mH P _o = 435 mW
  www.honeywell.com	Optional: Outputs A,B,C,D (only for VersaFlow TWS9000 F/i), see sticker on the inside of terminal compartment cover for data.
100 - 230 VAC -15% / +10% 50 - 60 Hz, 22 VA, Um=253 V	Do not open flameproof enclosure when energized! Minimum waiting time before opening: T6 = 35 min., T5 = 10 min.
	Degree of protection: IP67 according to EN 60529
	Tag: xxxxxxxxxxxxxxxx

Figure 1-4: VersaFlow TWS 9000 F(i)

The typeplates of the FM approved flowmeters look similar, but they bear the FM logo and the project ID number.

The typeplates of the CSA approved flowmeters look similar, but they bear the CSA logo and the certificate number.

2.1 General

Due to the influence of the process temperature, ultrasonic flow sensors in separate version with type designation VersaFlow Sonic 1000 are not allocated to any fixed temperature class. For the temperature classification table refer to *VersaFlow Sonic 1000* on page 10.

The temperature limits apply under the following conditions:

- The instrument is installed and operated in accordance with the installation directions given in the quickstart and handbook.
- The instrument is not heated up by any additional heat radiation (direct solar radiation, heat from adjacent plant parts) so causing it to operate above the permissible ambient temperature range.
- Insulation is not hindering free ventilation of the ultrasonic signal converter housing.

2.2 VersaFlow TWS 9000 F(/i)

The VersaFlow TWS 9000 F(/i) ultrasonic signal converter in separate version is not influenced by the temperature of the process medium, because it is installed on a distance of the pipe-line and thus not physically connected to the pipe-line. The VersaFlow TWS 9000 F(/i) signal converter has a temperature classification of T6 (85°C). The permissible ambient temperature is dependent on the material that the electronics housing is made of, namely:

- die-casted aluminum: -40...+60°C
- die-casted stainless steel: -40...+55°C

2.3 VersaFlow Sonic 1000

The VersaFlow Sonic 1000 clamp-on ultrasonic flow sensor has the following maximum process temperatures at the maximum ambient temperature T_a of 70 °C.

Temperature class	Maximum process temperature [°C] at $T_a = 70\text{ °C}$
T6	80
T5	95
T4	120

3.1 General

The electrical connection between the ultrasonic flow sensor and the signal converter is established with MR 02 - RGX 316 triax signal cable. The ends of the coaxial cables are provided with SMB plugs. The signal cable is provided with the system.

3.2 Cable marking

Please refer to *Signal cable connections* on page 12 for the connection of the different versions.

3.3 Cable parameters

The maximum permitted total capacitance and inductance for the connecting cable is:

$$C_L = 1,29 \mu\text{F} \text{ or } 0,79 \mu\text{F}$$

$$L_L = 0,1 \text{ mH} \text{ or } 0,8 \text{ mH}$$

The cable supplied with the instrument has the following parameters:

distributed capacitance C_C (core/screen) = 94 pF/m

distributed inductance L_C (core/screen) = 0,24 $\mu\text{H}/\text{m}$



INFORMATION!

The standard length of the signal cable is 5 m. In case a longer length is required, please contact your local representative for detailed information.

3.4 Equipotential bonding

3.4.1 Signal converter

The VersaFlow TWS 9000 F(i) ultrasonic signal converter **must always** be incorporated within the equipotential bonding system of the installation in the hazardous classified location. For this purpose it must be connected to the external U-clamp screw terminal (size M5) on the wall-mounting device.

The separate bonding conductor must be at least 4 mm² (11 AWG) or 2.5 mm² (14 AWG) in case it is mechanically protected, see Clause 413 of HD 384.4.41 or IEC 364-4-41. Make sure that the core of the bonding wire is properly mounted under the U-clamp of the external M5 terminal and that the screw is tightly fixed.

3.4.2 Flow sensor

The intrinsically safe transducer circuits of the flow sensor are galvanically isolated from earth, therefore an equipotential bonding conductor between the flow sensor and the signal converter does not have to be connected.

3.5 Signal cable connections

See the pictures below for details.

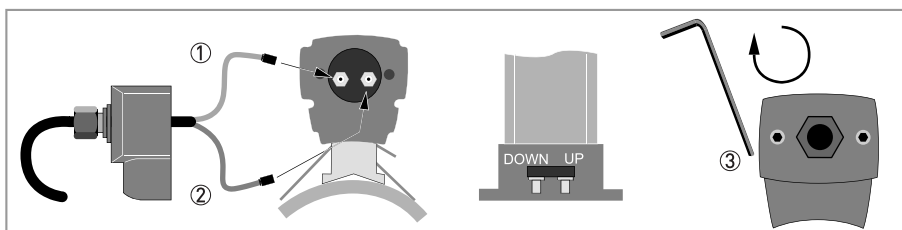


Figure 3-1: Connecting the signal cable to the rail (small and medium version)

- ① Connect the green cable to "DOWN"
- ② Connect the blue cable to "UP"
- ③ Turn the screws clockwise to secure the cap

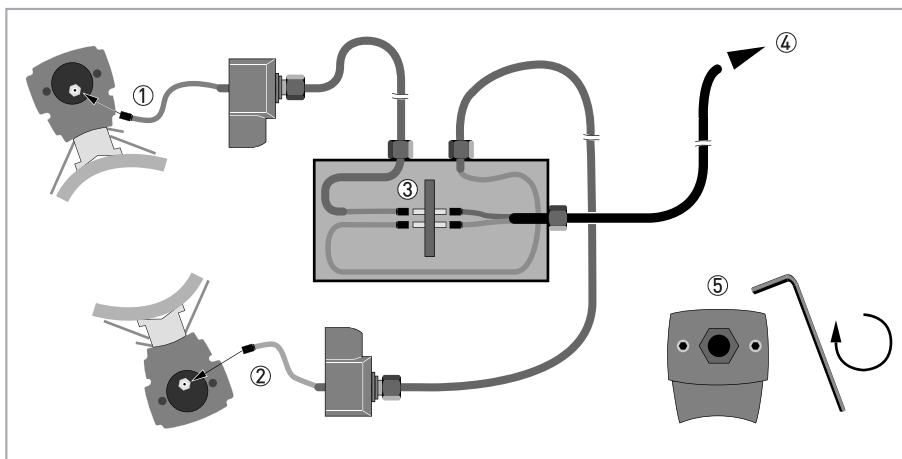


Figure 3-2: Connections in cable box (large version)

- ① Connect the blue cable to the UP rail.
- ② Connect the green cable to the DOWN rail.
- ③ Make connections in cable box.
- ④ Cable to converter
- ⑤ Turn the screws clockwise to secure the caps.

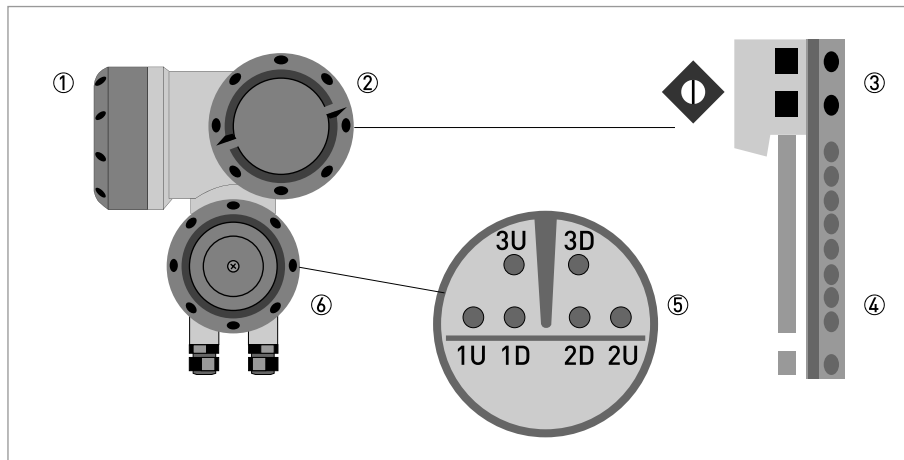


Figure 3-3: Construction (field version)

- ① Cover, electronics compartment
- ② Cover, terminal compartment for power supply and inputs/outputs
- ③ Cable entry for power
- ④ Cable entry for inputs/outputs
- ⑤ Cable entry for sensor cable
- ⑥ Cover, sensor terminal compartment

4.1 General

The display cover seals the electronics compartment of the converter housing and provides type of protection “flameproof enclosure”. The terminal compartment is default in type of protection “increased safety” (“Ex e”) and can optionally be performed as flameproof enclosure (“Ex d”). The threaded joints formed by the covers and housing are a tight fit due to the requirements for type of protection “flameproof enclosure”. Screw the covers on and off with care and never use excessive force !

Keep the screw-threads free of dirt and well-greased (e.g. with PTFE grease). The grease will help to prevent the threads from locking due to corrosion.

To unscrew the covers, first release the interlocking devices (one at each cover). Therefore unscrew the M4 head screw with internal hexagon socket set using a No. 3 Allen key until the interlocking device can be turned. After the covers are screwed back onto the housing, make sure that the interlocking devices are properly refitted.



WARNING!

Allow the electronics to de-energize before opening the electronics compartment of the flow converter housing. Wait at least 35 minutes for T6 and 10 minutes for T5 before opening.

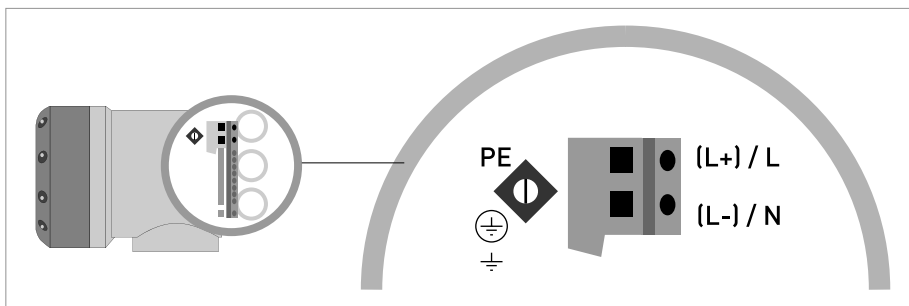


Figure 4-1: Electrical connections

Terminals	Function, electrical data
L, N L+, L-	Connections for mains supply, always non-Ex i 100...230 V AC, +10%/-15%, 22 VA, 50/60 Hz 12...24 V DC, +30%/-10%, 12W 24 V AC, +10%/-15%, 22 VA, 50/60 Hz 24 V DC, +30%/-25%, 12 W $U_m = 253 \text{ V}$
A, A-, A+ B, B- C, C- D, D-	Connections for signal I/Os (PELV circuits), non-“Ex i” or “Ex i”, are dependent on the specific version of the TWS 9000 converter ordered. Consult the tables with CG34 numbers for details.

The exact I/O-configuration for circuits A, B, C and D is order-specific and can be determined by the CG34 number shown on the I/O sticker inside the terminal compartment. Therefore check the data on the back of the TWS 9000 electronics unit. The CG34 number contains 10 characters of which the last three characters (XYZ) determine the configuration of the I/O circuits:

CG34	*	*	*	X	Y	Z
Pos 1...4	5	6	7	8	9	10
				determine I/O circuits		

For schematic overviews of the CG34 numbers, refer to “Ex i” I/O connections on page 18 and refer to Non-“Ex i” I/O connections on page 17. These overviews do not show all details. The exact connection diagram of a specific TWS 9000 signal converter can be found on the sticker inside the terminal compartment.

For use in gaseous hazardous areas: The chosen cable glands must have the appropriate type of protection for the terminal compartment that is increased safety (Ex e) or flameproof enclosure (Ex d). They MUST be suitable for the conditions of use and correctly installed.

The flowmeter with the terminal compartment in type of protection increased safety “Ex e” is factory supplied with two “Ex e” approved cable glands and one “Ex e” approved blanking element (i.e. stopping plug).

**WARNING!**

The flowmeter with the terminal compartment performed as flameproof enclosure “Ex d” is supplied with one “Ex d” approved stopping plug and two temporary plugs. The temporary plugs are only intended for sealing the housing against entry of dust, moisture or else during transport, handling and storage. These temporary plugs must be replaced by suitable “Ex d” approved cable glands, stopping plugs or conduit adapters with sealing devices before the flowmeter is put into operation. Unused openings must be sealed by suitable certified plugs.

The wiring of instruments has to be in accordance with the requirements as specified in the relevant national or international standard for electrical installations in hazardous areas, e.g. EN 60079-14. Section 9 (wiring systems) of this standard applies to all types of protection. Section 10 (additional requirements for type of protection “d” - flameproof enclosures), section 11 (additional requirements for type of protection “e” - increased safety) and section 12 (additional requirements for type of protection “i” - intrinsic safety) apply to respectively “Ex d”, “Ex e” and “Ex i” performed connection (terminal) compartments.

4.2 Non-"Ex i" I/O connections

The following non-intrinsically safe I/O (inputs/outputs) are available:

I/O PCB	Input/output functions, $U_n < 32 \text{ V DC}$, $I_n < 100 \text{ mA}$, $U_m = 253 \text{ V}$
Basic I/O	Current Output, active or passive, with HART Status Output / Control Input Status Output Pulse / Status Output
Modular I/O	Current Output, active or passive, with HART Pulse / Status Output, active or passive, highC or Namur
Modular carrier with 1 or 2 I/O modules	Each module: 1 out of following 3 in-/output functions: Current Output, active or passive Pulse / Status Output, active or passive, highC or Namur Control Input, active or passive, highC or Namur
The options separated by "/" are software selectable (can be changed by the user) The options separated by "or" are hardware versions (must be ordered as such) All outputs are passive unless otherwise indicated HighC means High Current input/output, Namur means that the in-/outputs are according to the NAMUR NE43 standard	

Overview of the possible combinations, defined by characters XYZ of the CG34 number					
Characters XYZ	Name of I/O circuits	Terminals A, A-, A+	Terminals B, B-	Terminals C, C-	Terminals D, D-
100	Basic I/O	CO CO(a) over A+	SO/CI	SO	PO/SO
488 to 4LL 588 to 5LL 688 to 6LL 788 to 7LL 888 to 8LL A88 to ALL B88 to BLL C88 to CLL	Modular I/O or Modular Carrier with 1 or 2 I/O modules	Many combinations possible			
Used abbreviations for in-/output functions: CO = Current Output, PO = Pulse Output, SO = Status Output, CI = Control Input, PA = Profibus PA, FF = Foundation Fieldbus, DP = Profibus DP, RS485 = RS485 Modbus, n.c. = not connected. All in-/outputs are passive unless otherwise noted as active with extension (a).					

4.3 "Ex i" I/O connections

The following intrinsically safe I/O connections are available:

I/O PCB	I/O functions	
Exi-IO	Current Output + HART communication Pulse / Status Output Current Output, active + HART communication	Ex ia IIC $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 1,0 \text{ W}$ $C_i = 10 \text{ nF}$, $L_i = \text{negligibly low}$ Ex ia IIC $U_o = 21 \text{ V}$, $I_o = 90 \text{ mA}$, $P_o = 0,5 \text{ W}$ Linear characteristics $C_o = 90 \text{ nF}$, $L_o = 2,0 \text{ mH}$ $C_o = 110 \text{ nF}$, $L_o = 0,5 \text{ mH}$
Exi-Option	Current Output Pulse / Status Output / Control Input Current Output, active	Ex ia IIC $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 1,0 \text{ W}$ $C_i = 10 \text{ nF}$, $L_i = \text{negligibly low}$ Ex ia IIC $U_o = 21 \text{ V}$, $I_o = 90 \text{ mA}$, $P_o = 0,5 \text{ W}$ Linear characteristics $C_o = 90 \text{ nF}$, $L_o = 2,0 \text{ mH}$ $C_o = 110 \text{ nF}$, $L_o = 0,5 \text{ mH}$

The I/O circuits titled "Exi-IO" and "Exi-Option" are always provided with type of protection Intrinsic Safety (Ex ia).

Up to a maximum of 4 intrinsically safe (Ex ia) in-/outputs are possible. All intrinsically safe circuits are galvanically isolated with respect to earth and each other. To avoid summation of voltages and current, the wiring of these "Ex ia"-circuits must be sufficiently separated, e.g. in accordance with the requirements of standard EN 60079-14, clause 12.2.

The "Ex ia" in-/outputs may only be connected to other "Ex ia" or "Ex ib" approved devices (e.g. intrinsically safe isolation amplifiers), even if such devices are installed in a non-hazardous location !

Connection to non-"Ex i" devices cancels the "Ex ia" properties of the flowmeter.

Terminals L and N (or L+ and L-) for connection of the mains supply are not available with type of protection "intrinsic safety". To achieve the necessary separation distances according to EN 60079-11 between the non-"Ex i" and "Ex i" circuits, the mains terminals are provided with a semi-circular protection cover with a "snap-in" lock. This cover MUST be closed before establishing the power supply to the converter.



INFORMATION!

For converters with an “Ex e” terminal compartment, the compartment can be opened in an energized state for short periods of time, to access the intrinsically safe terminals for possible checks. However, the semi-circular insulation cover over the non-intrinsically safe mains supply terminals L and N (or L+ and L-) MUST be kept closed.

Overview of possible "Ex ia" in-/outputs, defined by characters XYZ of the CG 34 numbers					
Characters XYZ	Name of I/O circuits	Terminals A, A-, A+	Terminals B, B-	Terminals C, C-	Terminals D, D-
200	Exi-IO	n.c.	n.c.	CO{a}	PO/SO
300		n.c.	n.c.	CO	PO/SO
210	Exi-IO with Exi-Option	CO{a}	PO/SO/CI	CO{a}	PO/SO
220		CO	PO/SO/CI	CO{a}	PO/SO
310		CO{a}	PO/SO/CI	CO	PO/SO
320		CO	PO/SO/CI	CO	PO/SO
Used abbreviations for in-/output functions: CO = Current Output, PO = Pulse Output, SO = Status Output, CI = Control Input, n.c. = not connected All in-outputs are passive unless otherwise noted as active with extension {a}.					

5.1 Maintenance

The flowmeters are maintenance free with respect to the flowmetering properties. Within the scope of periodic inspections required for electrical equipment installed in hazardous areas it is recommended to check the flameproof converter housing and covers for signs of damage or corrosion.

5.2 Before and after opening

**WARNING!**

the following instructions must always be carefully followed, if the housing of the signal converter has to be opened respectively closed again.

Before opening:

- Make absolutely sure that there is no explosion hazard!
- Gas-free certificate!
- Make sure that all connecting cables are safely isolated from all external sources!
- Allow the electronics to de-energize before opening the electronics compartment of the converter housing. Wait at least 35 minutes for T6 and 10 minutes for T5 before opening.

When the instructions above are strictly followed, the display cover (includes glass window) of the electronics compartment may be removed. First unscrew the head screw with internal hexagon socket set (size M4) of the interlocking device by a No. 3 Allen key, until the cover can rotate freely.

After opening:

- Before the cover is screwed back onto the housing, the screw-thread must be clean and well-greased with an acid and resin-free grease, e.g. PTFE grease.
- Screw the cover as tight as possible onto the housing by hand, until it cannot be opened by hand anymore. Fixate the screw of the interlocking device tight with the No. 3 Allen key.

5.3 Replacement of mains fuse



WARNING!

Before commencing the work, refer to Before and after opening on page 20, then continue as follows:



- Pull the display unit of the mounting frame and turn display unit carefully aside.
- Unscrew the two screws size M4 that hold the mounting frame with the electronics unit.
- Carefully pull the mounting frame with electronics unit out of the housing, until the small printed circuit board with the six soldered coaxial cables can be pulled off of the sensor driver PC-board. Now carefully remove the unit from the housing, while keeping the small printed circuit board with coaxial cables down, close to the housing wall.
- The mains fuse is located in a fuse holder at the back-end of the electronics unit on the top printed circuit board (power supply PCB). The specifications must be as follows:

Fuse type: 5 x 20 mm (H) according to IEC 60127-2/V	
Power supply	Electrical data
12...24 V DC	250 V / 2 A
24 V AC/DC	250 V / 2 A
100...230 V AC	250 V / 0,8 A



WARNING!

Before reassembling the unit, refer to Before and after opening on page 20, then:



- Reassemble the unit in reverse order.

5.4 Exchange of electronics unit

Before opening the converter housing:



DANGER!

All work on the electrical connections may only be carried out with the power disconnected. Take note of the voltage data on the nameplate!



WARNING!

Observe without fail the local occupational health and safety regulations. Any work done on the electrical components of the measuring device may only be carried out by properly trained specialists.



INFORMATION!

Make notes of important specific data, before exchanging the electronics.

Menu settings are stored on the circuit board (or backplane), that is fixed to the housing. After exchange of electronics unit and power-up, the following start up screen appears:

Load all data?



- Select yes

➞ - if in the screen appears **“load sensor data”**, the electronics units were not fully compatible. You can proceed by selecting yes. Note that all settings need to be checked and changed. Only the sensor calibration data are loaded.

- if in the screen appears **“load no data”**, all data have been lost. Contact your local representative.



DANGER!

All work on the electrical connections may only be carried out with the power disconnected. Take note of the voltage data on the nameplate!

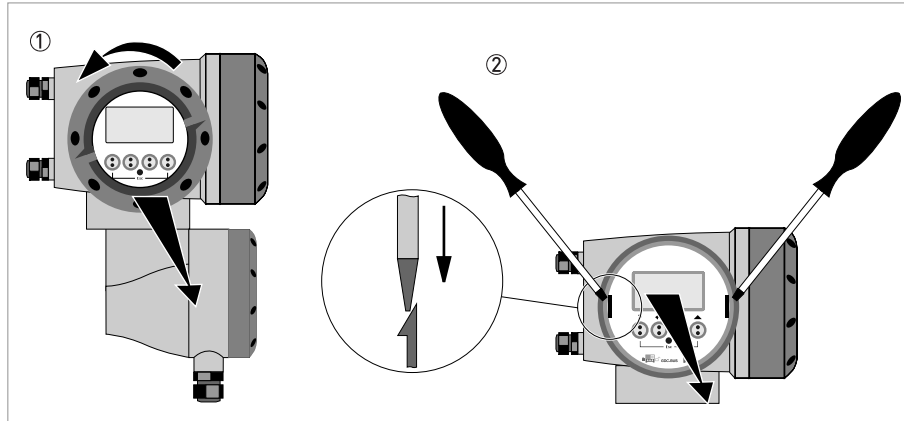


Figure 5-1: Unscrew the cover and remove the display

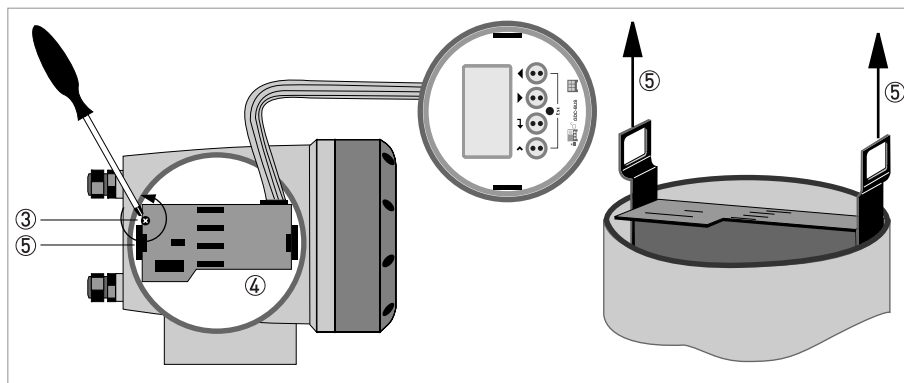


Figure 5-2: Pull off printed circuit board



Perform the following procedures:

- Unscrew the display cover of the electronics compartment by hand, by turning it counter clockwise ①.
- Remove the display by using two screwdrivers ②.
- Unscrew the two M4 screws ③ at the electronics unit ④.
- Pull the two metal pullers ⑤ at the left and right of the display, using a screwdriver or similar tool and partially pull out the electronics unit.



CAUTION!

Please pay attention that the same amount of force is applied on both pullers, otherwise the connector at the backside can be damaged.

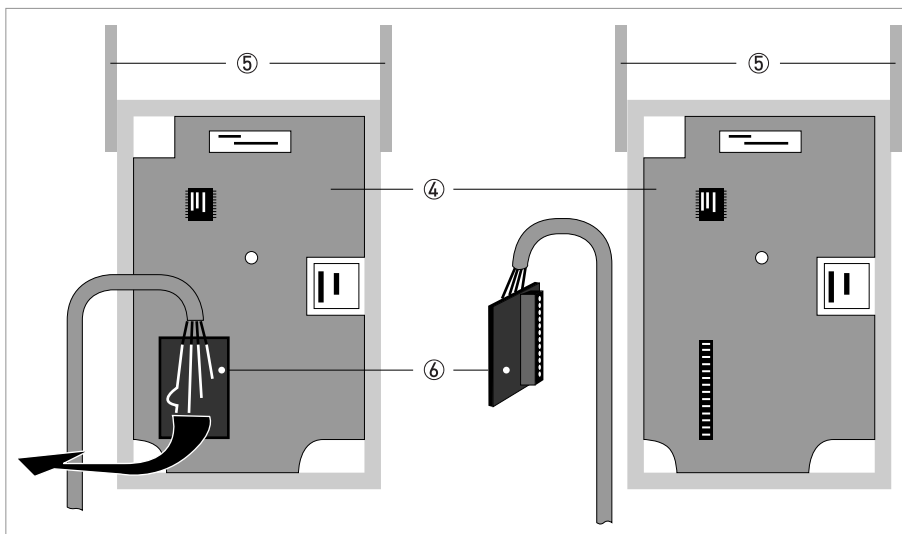


Figure 5-3: Small printed circuit board and electronics unit



DANGER!

Electrostatic discharge (ESD) can damage electronic parts. Make sure to discharge yourself by wearing a wrist strap. If no wrist strap is available, ground yourself by touching a metal surface that is grounded.



- Remove the printed circuit board ⑥ from the electronics unit ④.
- Check compatibility between the removed and new electronics unit ④, by checking the power voltage.
- Slide the new electronics unit ④ partially back into the housing.
- Mount the small printed circuit board back onto the electronics unit ④.
- Push the metal pullers ⑤ back to their original position.
Don't use excessive force, otherwise the connector at the backside can be damaged!
- Screw the electronics unit back to the housing.
- Re-install the display and make sure not to kink the display's flat ribbon cable.
- Replace cover and tighten by hand.
- Connect power.

5.5 Service / repair information

This device has been carefully manufactured and tested. If installed and operated in accordance with these operating instructions, it will rarely present any problems.

**CAUTION!**

Should you nevertheless need to return a device for inspection or repair, please pay strict attention to the following points:

- *Due to statutory regulations on environmental protection and safeguarding the health and safety of our personnel, the manufacturer may only handle, test and repair returned devices that have been in contact with products without risk to personnel and environment.*
- *This means that the manufacturer can only service this device if it is accompanied by the following certificate (see next section) confirming that the device is safe to handle.*

**CAUTION!**

If the device has been operated with toxic, caustic, flammable or water-endangering products, you are kindly requested:

- *to check and ensure, if necessary by rinsing or neutralizing, that all cavities are free from such dangerous substances,*
- *to enclose a certificate with the device confirming that is safe to handle and stating the product used.*

5.6 Form (for copying) to accompany a returned device

Company:		Address:	
Department:		Name:	
Tel. no.:		Fax no.:	
Manufacturer's order no. or serial no.:			
The device has been operated with the following medium:			
This medium is:	water-hazardous		
	toxic		
	caustic		
	flammable		
	We checked that all cavities in the device are free from such substances.		
	We have flushed out and neutralized all cavities in the device.		
We hereby confirm that there is no risk to persons or the environment through any residual media contained in the device when it is returned.			
Date:		Signature:	
Stamp:			

5.7 Disposal

**CAUTION!**

Disposal must be carried out in accordance with legislation applicable in your country.

Honeywell Field Solutions
512 Virginia Drive
Fort Washington, PA 19034
www.honeywell.com/ps