

MANUAL

**PRESSURISED  
ENCLOSURE SYSTEM  
PCU300A**



With regard to the supply of products, the current issue of the following document is applicable:  
The General Terms of Delivery for Products and Services of the Electrical Industry, as published by  
the Central Association of the "Elektrotechnik und Elektroindustrie (ZVEI) e.V.",  
including the supplementary clause "Extended reservation of title".

We at Pepperl+Fuchs recognise a duty to make a contribution to the future.  
For this reason, this printed matter is produced on paper bleached without the use of chlorine

<b>1</b>	<b>General</b> . . . . .	<b>3</b>
1.1	Symbols used in this document . . . . .	3
1.2	Declaration of conformity . . . . .	3
1.3	EC-Type Examination Certificate . . . . .	4
<b>2</b>	<b>Safety information</b> . . . . .	<b>5</b>
2.1	Intended use . . . . .	5
2.2	General safety instructions . . . . .	5
2.3	Safety instructions for the use in zone 21 (dust-Ex) . . . . .	5
<b>3</b>	<b>Automatic pressurised enclosure system</b> . . . . .	<b>7</b>
3.1	Function description . . . . .	7
3.2	Mode of operation "leakage compensation" . . . . .	8
3.3	Mode of operation "continuous purging (diluting)" . . . . .	9
3.4	Option "external controls and displays" . . . . .	10
3.5	PCU300A applications with "containment systems" . . . . .	10
3.6	Summary . . . . .	10
<b>4</b>	<b>Installation</b> . . . . .	<b>12</b>
4.1	PCU300A control unit . . . . .	12
4.2	Digital and proportional valves . . . . .	12
4.3	Operation panels . . . . .	12
<b>5</b>	<b>Connecting and commissioning</b> . . . . .	<b>13</b>
5.1	Terminal diagram . . . . .	13
5.2	Terminal assignment for the PCU300A pressurised enclosure system . . . . .	14
5.3	Parameter settings . . . . .	15
<b>6</b>	<b>Operation, indicator, keyboard</b> . . . . .	<b>16</b>
6.1	PCU multi-function keys . . . . .	16
6.2	Parameter input . . . . .	17
6.3	Description of the menu items . . . . .	18
6.4	Example Ex p system . . . . .	20
<b>7</b>	<b>Alarms and error messages</b> . . . . .	<b>23</b>

<b>8</b>	<b>Flowcharts</b> .....	<b>24</b>
8.1	Operating mode .....	24
8.2	Main menu .....	25
8.3	Language menu .....	26
8.4	Structure menu .....	27
8.5	Parameter menu .....	28
8.6	Code menu .....	29
<b>9</b>	<b>Control unit F**-PCU300A-Ex.O**</b> .....	<b>30</b>
<b>10</b>	<b>Solenoid valve F**-PV32*-Ex</b> .....	<b>32</b>
<b>11</b>	<b>Operation panel FD0-T301A-Ex.*</b> .....	<b>33</b>
<b>12</b>	<b>Back-up fuse for solenoid valves PCU-F-Ex.****MA</b> .....	<b>34</b>
<b>13</b>	<b>Documentation table</b> .....	<b>35</b>

## 1 General

### 1.1 Symbols used in this document



Warning

*This symbol warns of a serious hazard. Failure to observe this warning may result in death or the destruction of property.*



Attention

*This symbol warns of a possible failure. Failure to observe this caution may result in the total failure of the device or the system or plant to which it is connected.*



Note

*This symbol highlights important information.*

### 1.2 Declaration of conformity

The pressurised enclosure system PCU300A has been developed and manufactured with regard to the applicable European standards and directives.



Note

*An appropriate declaration of conformity can be demanded from the manufacturer.*

The manufacturer of the product, Pepperl+Fuchs GmbH, D-68301 Mannheim, operates a certificated quality assurance system in accordance with ISO 9001.



### **1.3 EC-Type Examination Certificate**

EC-Type Examination Certificate, Statement of Conformity, Declaration of Conformity and instructions have to be observed. For information see [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com) and enter the type code.

## 2 Safety information

### 2.1 Intended use

The pressurised enclosure system PCU300A provides explosion protection for electrical equipment which is used in compliance with applicable standards in Ex zone 1, 2, 21 and 22.

### 2.2 General safety instructions



Warning

*Any use other than that described in these instructions endangers the safety and functionality of the device and the connected systems.*

*The connection of the device and maintenance on the live device must only be carried out by a qualified electrical specialist.*

*If malfunctions cannot be eliminated, place the device out of service and protect it from accidental use.*

*Repairs must only be carried out by the manufacturer. Interventions in the device and modifications to it are not permissible and render the guarantee null and void.*

*Responsibility for adhering to local safety regulations and directives is held by the operator.*

*Caution: the device is operated with mains voltage! Failure to observe the warnings may cause serious personal injury or material damage.*

*The VDE DIN 57 165 Directive "Errichten elektrischer Anlagen in explosionsgefährdeten Bereichen" (Installation of Electrical Systems in Hazardous Areas), and the EC-Type Examination Certificate DMT 00 ATEX E 004 X must be observed.*

### 2.3 Safety instructions for the use in zone 21 (dust-Ex)

#### 2.3.1 Purging phase -> cleaning phase: cleaning the housing

For the use in zone 21 the interior of the Ex p housing must not be purged as in the gas Ex zone. For this purpose, the purging volume must be set to zero "0 [l]" in the control unit.

The purging would result in a possible dust layer being raised in the housing, thus creating an Ex zone in the housing itself.

The purging phase, which precedes the commissioning of the integrated, electrical safe area equipment in the gas Ex zone, was replaced in zone 21 by **cleaning** the interior of the housing in order to remove possible combustible layers of dust.

After cleaning, the excess pressure in the housing prevents dust from entering and the safe area equipment can be switched on immediately.

### 2.3.2 Sign on the housing

A sign with the following text must be attached to the housing in a clearly visible position:

**WARNING:  
REMOVE ALL DUST FROM THE INSIDE OF  
THE ENCLOSURE BEFORE CONNECTING OR  
RESTORING THE ELECTRICAL SUPPLY!**

On Ex p housings for zone 21, whose doors can be opened without tools, the following sign must be attached:

**WARNING:  
DO NOT OPEN WHILE ENERGIZED  
UNLESS IT IS OBVIOUS THAT NO  
COMBUSTIBLE DUST IS PRESENT!**

### 3 Automatic pressurised enclosure system

#### Pressurised enclosure system EExp acc. to EN 50016, release 5/1996

According to EN 50016, second release from May 1996, only such pressurised enclosure systems are allowed, which are safety examined according to EN 954-1.

The PCU300A reaches **category 3 according to EN 954-1** [4] (single fault evaluation). That means that a single arbitrary fault can occur without losing safety functionality.

#### 3.1 Function description



##### Warning

*Observe the safety instructions and the safety instructions for the use in zone 21 in section 2.*

The pressurised enclosure system consists of a **PCU300A** control unit with an integral pressure monitor and a solenoid valve. The control unit supervises the purging of the enclosure as required by CENELEC EN 50016 and also monitors the minimum overpressure during operation.

Once switched on, the control unit initiates the purging process automatically when the minimum overpressure in the enclosure reaches the specified level (at least 0.8 mbar). In addition to the pressure, the flowrate is also monitored to ensure optimum purging results.

If the rate of flow of the purging medium drops below a minimum level (e. g. as the result of a flow obstruction at the output), the system responds differently according to the type of valve being used:

The purging process is **halted** if a **digital valve** and a **time-dependent** purging process is being employed. Once the obstruction has been removed, the control unit starts a **new** purging operation when the specified minimum value is reached.

In the case of a **proportional valve** or **digital valve** and a purging process that uses the **integration** function, the integrand is simply set to zero and the purging volume remains **constant** at its present level until the obstruction is removed. The purging operation is then resumed. The display indicates "Purge" all the time.

The following table shows the necessary minimum flowrate as a function of the size of the orifice of the PCU300A.

Orifice size $\varnothing$ [mm]	Minimum flowrate	
	[litre/sec.]	[litre/h]
6	0,15	540
10	0,35	1260
14	0,85	3060
18	1,25	4500

The system is programmed directly on the device or via the **T301A** operation panel and LCD display, which is available as an optional accessory. This displays the status of the system and any operational and error messages in text form and also enables the instantaneous measured pressure and flowrate values to be displayed.

Use of the T301A is particularly recommended in situations where the control unit is to be installed in the enclosure system and the display on the unit cannot be seen.

The system can be configured for two different modes of operation, depending on the application:

- leakage compensation
- continuous purging

### 3.2 Mode of operation "leakage compensation"

In **conventional time-dependent processes**, the purging volume is determined from the preselected minimum flowrate and the time. The purging volume, which is at least 5 times the volume of the enclosure, depends on the size of the nozzle (diameter 1 mm ... 6 mm) in the solenoid valve and the inlet pressure and can be derived from tables. It must always be greater than the minimum flowrate, as there must always be a safety margin to compensate for leakage in the enclosure. The valve closes when purging is complete. A mechanically adjustable bypass in the valve body (diameter 0.3 mm ... 1 mm) compensates for loss through leakage.

In the case of the **integration process**, the actual volume rate of flow at the outlet from the enclosure is measured and integrated until it reaches the required, programmed purging volume. The system nevertheless continues to monitor the flowrate against a minimum value that is dependent on the type of orifice. Integration is stopped if the flowrate drops below this minimum value. This provides a safe and economical way of purging.

The internal pressure in the enclosure is monitored in both versions.

However, a disadvantage of this valve system is the amount of surplus inert gas that remains following purging. This surplus remains because to provide adequate operational safety and system availability, there has to be a considerably greater volume of gas available than is absolutely necessary in order to maintain the required minimum pressure in the enclosure (> 0.5 mbar). Unused purging medium is vented through the outlet of the control unit. The built-in particle trap means this can take place directly in Ex Zone 1 or 2.

The use of **PV321/322 proportional valves** avoids the problem of excessive inert gas usage. The proportional pressure and flowrate technology, implemented for the first time in the PCU300A control unit, in conjunction with a proportional valve control output, controls the input pressure. The proportional valve only permits as much inert gas (e. g. nitrogen) to flow as is required by the leakage rate.

The benefits of this technology are:

- considerably lower inert gas consumption
- greater operational safety as the result of having a constant internal pressure in the enclosure
- higher leakage rates caused by ageing do not lead to sudden system failures
- less flow noise.

In addition, use of the proportional valve means the pressure regulation is also effective during the purging process. In this case, the purging pressure in the enclosure is regulated to the previously entered setpoint value; at the same time, the volume rate of flow exiting the enclosure is measured and integrated until the required purging volume is reached.

This has further benefits:

- defined overpressure during the purging process; pressure-sensitive components such as membrane keypads or viewing windows are not overloaded.
- integration of the actual volume rate of flow means the specified purging volume will be achieved exactly; this means significant cost savings in the use of inert gases (e. g. nitrogen).

### 3.3 Mode of operation "continuous purging (diluting)"

This mode of operation is required when, for example, analysis equipment inside the pressurised enclosure system may itself create an explosive atmosphere and necessitate constant dilution of the internal area or forced cooling of the equipment. The flowrate is increased and monitored following purging. The **PV321** or **PV322** proportional valve is the preferred solenoid valve.

### 3.4 Option "external controls and displays"

As an option, additional operation panel can be connected to the control unit via intrinsically-safe control circuits. External operation of the device is therefore possible, especially in situations where it has been installed **inside** the enclosure, and monitoring of the individual operating conditions is also possible.

Another option is to create an external intrinsically-safe alarm loop. This works on the closed-circuit current principle and interrupts the power supply to the connected equipment.

Alternatively, the intelligent **T301A-Ex F/H** panel is available.

This panel displays operating and error messages in text form. Its four membrane keypads enable the PCU300A unit to be controlled. The current pressure and flowrate levels or remaining purging time can be called up as and when required.

### 3.5 PCU300A applications with "containment systems"

"Containment systems" are those parts of the equipment in a pressurised enclosure system which themselves release flammable gases (or occasionally explosive atmospheres; Zone 1 mixtures).

A "containment system" that is itself not fail-safe in accordance with EN 50016 is classified as "no release" when the following conditions are satisfied:

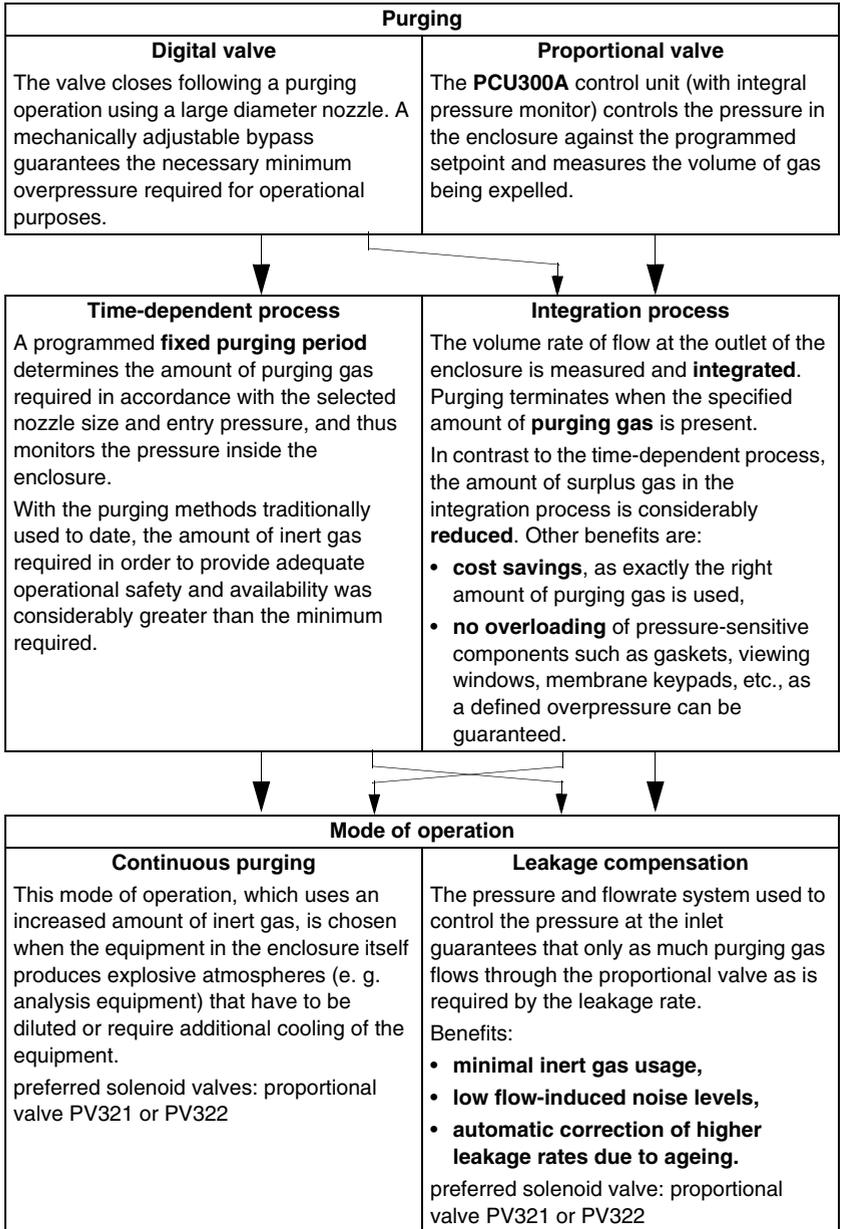
1. The flammable material in the "containment systems" is within the specified operational temperature limits in the gas or vapour phase.
2. The specified minimum pressure for the pressurised enclosure system is at least 50 Pa higher than the specified maximum pressure for the "containment systems".
3. An automatic safety device checks the difference in pressure and trips when it falls below 50 Pa.

The safety device can, for example, be a differential pressure switch (in accordance to EN 954, category 3), inserted in the external alarm loop (terminal 4/10 on the PCU300A). When it trips, the control unit switches off the non-intrinsically safe device. Once the alarm has been reset, the pressurised enclosure system resumes operation with the purging phase. The external alarm loop is a closed-current circuit.

### 3.6 Summary

The following purging and operating modes are possible using the devices supplied by Pepperl+Fuchs:

(see next page)



## 4 Installation



Warning

*Observe the safety instructions and the safety instructions for the use in zone 21 in section 2.*

### 4.1 PCU300A control unit

The PCU300A control unit is designed for use in Zone 1 and 2 hazardous areas. The unit can be installed in any position, either inside or outside the enclosure.

The control unit is fixed in place using 4 drill holes in the rear panel; it is however sufficient just to use the screw connection on either the inlet or outlet.



Note

*Purging valves and control unit (or pressure monitor) should be mounted on the enclosure as far away from each other as possible (e. g. diagonally)*

*This ensures there are no dead spots during the purging operation.*

*The relevant local installation regulations, especially those in DIN VDE 60079-14, must be observed.*

### 4.2 Digital and proportional valves

The solenoid valves can also be installed inside or outside the enclosure. The data sheet contains a dimensional drawing and terminal details.

### 4.3 Operation panels

#### T301A-Ex F operation panel

The T 301A-Ex F operation panel is mounted, minus its rear panel, directly onto the enclosure. Several drill holes must be made in the enclosure to fix the panel and to feed through the connecting cable. The data sheet includes a dimensional drawing and drilling template which shows the positions and size of the drill holes for the T 301A-Ex F.

#### T301A-Ex H operation panel

The T 301A-Ex H operation panel is supplied in an IP65 housing. It can be installed anywhere within Zone 1 and 2 hazardous areas. The data sheet includes a dimensional drawing showing the positions and size of the drill holes.

## 5 Connecting and commissioning



Warning

Observe the safety instructions and the safety instructions for the use in zone 21 in section 2.

Following installation, the additional intrinsically-safe devices are connected via terminals 1 ... 10, and the power supply, solenoid valves and any non-intrinsically safe devices are connected as shown on the terminal diagram.

### 5.1 Terminal diagram



Warning

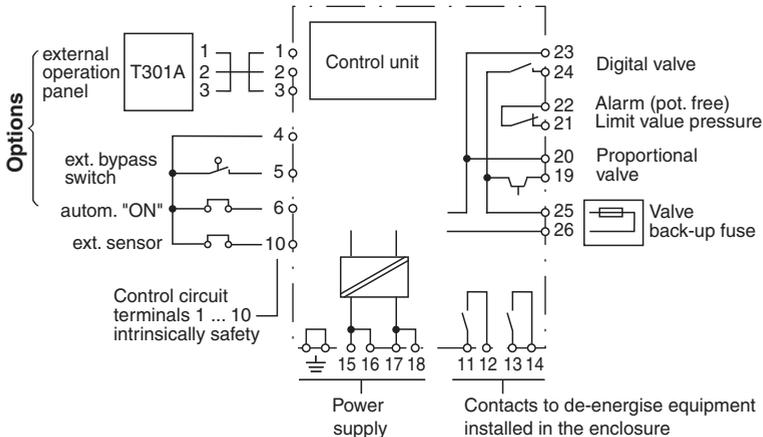
Mains voltage! Serious personal injury or damage to property may occur if the warnings are ignored.



Attention

The installation regulations laid down in DIN VDE 0165 and the EC-Type Examination Certificate DMT 00 ATEX E 004 X must be observed.

The limits specified for the individual terminals must be observed at all times. Limit values can be found in the technical data or the Certificate of Conformity.



Note

If the T301A operation panel is being used, the bypass function can be activated via an external key switch.

To do this, set the bypass code to 9999. The key switch is to be connected to terminals 4 and 5 of the control unit.



Note

**Potential free alarm contact**

Within the pressure range (0.8 mbar ... 15 mbar) the alarm contact can be freely programmed as limit detector switch. When the value falls below the limit value within the operating phase, a potential free contact (e. g. pre-alarm or signalling of leaks) opens.

**5.2 Terminal assignment for the PCU300A pressurised enclosure system**

Terminals control unit	Assignment
1	terminals for FD0 -T301A-Ex operation panel
2	
3	
4	external bypass key switch
5	 <b>Attention</b>
4	
6	<p><i>If an external operation panel is not being used, a bridge between terminals 4 and 10 is required so the control unit can automatically switch the installed equipment on when purging is complete.</i></p>
4	bridge or external sensor (NC function)
10	
11, 12	open circuit 1
13, 14	open circuit 2
15, 16 (-), (-)	power supply terminal N, or negative pole in the case of a DC supply
17, 18 (+), (+)	power supply terminal L, or positive pole in the case of a DC supply
19, 20 (+), (-)	terminals for proportional valve PV321 or PV322
21, 22	potential free alarm message (NO)
23, 24 (+), (-)	terminals for digital valve DV311
25, 26	valve fuse terminals in control unit

### 5.3 Parameter settings

The following values are set in the factory when the control unit is first commissioned:



Attention

*If the "Enter" key is pressed at the same time as the unit is switched on, the system is reset to the factory settings!*

	Parameter	Indicator	Value	Comments
Structure	Mode: leakage compensation Purging method: time basis Valve type: digital			
Codes	Main menu: (M-Code)	0001		The setting 0000 disables the coding (not in the case of M code)
	Bypass code (By-Code)	0002		The setting 9999 switches bypass to key switch function
	ON/OFF-Code	0000		
Pressure and flowrate	Purging time	00-10-00	10 min	only in the case of time-dependent purging
	Purging volume	500.0	500 ltr.	only in the case of purging using integration
	Min. flowrate - purging	1.0	1 l/sec	only in the case of time-dependent purging
	Min. flowrate - operation	0.5	0.5 l/sec	only in the case of continuous purging
	Set flowrate	2.0	2 l/sec	only in the case of continuous purging
	Min. pressure in enclosure	8.0	0.8 mbar	
	Max. pressure in enclosure	15.0	15 mbar	
	Set pressure - purging	10.0	10 mbar	only when proportional valve is being used
	Set pressure - operation	2.,0	2 mbar	only when proportional valve is being used
Limit value alarm	0.8	0.8 mbar	during the operating phase	

## 6 Operation, indicator, keyboard

The PCU300A system is operated via an indicator and keyboard, or via the external T301A operation panel.

The inputs and displays are identical on both the control unit and the operation panel.

Operating status, current pressure or flowrate data, and error messages, can be displayed in text form on the 8-digit indicator.

### 6.1 PCU multi-function keys

The four multi-function keys have different meanings and functions depending on the display and mode of operation.

Symbol	Key	Mode	Function
	ON/OFF	Operation	Switches the equipment on and off when the system is ready.
		Menu	Cursor is moved to the right.
	BYPASS	Operation	Enables the bypass (jumpering).   <i>Fire certificate required!</i> <b>Attention</b>
		Menu	Moves to the next menu item.
	INFO P/Q/T	Operation	Toggles between the displays: current internal pressure in enclosure, current flowrate, remaining purging time or purging volume
		Menu	Returns to last used menu item.
	MENU	Operation	Changes from operation to main menu.
		Menu	Changes to indicated menu item or terminates a parameter input session.

The current status of the pressurised enclosure system is always displayed in the info display. In addition to the info display, the display can be switched to show pressure, flowrate and remaining purging time or volume.

## 6.2 Parameter input

The possible modes of operation are programmed by the user in a menu-driven dialogue. The menu structure is described below.

If the reader is already familiar with programming the system, then he/she can go straight to the flowchart (see section 8) and skip the following detailed description.

### Menu structure



Attention

*The system continues to work in the background during configuring and parameter input!*

*Every change to a parameter has a direct impact on the response of the system!*

<b>Main menu</b>	All operating data and parameters are entered from the main menu. The input options are divided among the following submenus: <ul style="list-style-type: none"> <li>• Language</li> <li>• Structure</li> <li>• Parameters</li> <li>• Codes</li> </ul>
<b>Language</b>	Choose which language is required. The following are currently available: <ul style="list-style-type: none"> <li>• English</li> <li>• French</li> <li>• German</li> </ul>
<b>Structure</b>	The following structures are available: <ul style="list-style-type: none"> <li>• Mode of operation: leakage compensation or continuous purging</li> <li>• Use of integration or time-dependent purging</li> <li>• Digital or proportional valves</li> </ul>
<b>Parameters</b>	The associated operating parameters are entered depending on the structure selected: <ul style="list-style-type: none"> <li>• Purging time</li> <li>• Purging volume</li> <li>• Minimum flowrate during purging, monitoring of minimum/maximum pressure/alarm</li> </ul>
<b>Codes</b>	3 codes are set in this submenu: <ul style="list-style-type: none"> <li>• M-Code: for main menu</li> <li>• By-Code: to enable system jumpering</li> <li>• On/Off-Code: enables installed equipment to be switched on and off</li> </ul>

### 6.3 Description of the menu items

The display of the PCU300A (or T301A operation panel) has 8 digits. The structure and parameter names for the pressurised enclosure system are unique, even when they are displayed in abbreviated form.

Certain modes of operation are mutually exclusive and this is taken into account in the menu structure (see flowcharts).

The individual menu items are explained below.

1st level	Hierarchy		Description
	2nd level	3rd level	
Structure	Valves	P Valve	Selection of a <b>proportional valve</b> as the valve for the purging medium.
		D Valve	Selection of a <b>digital valve</b> .
	Integ.	Integ.Y	<b>Integration</b> has been programmed as the <b>purging method</b> .
		Integ.N	The <b>time-dependent purging method</b> (fixed purging time) has been selected.
	Cont.Flow	C.Flow Y	" <b>Continuous purging</b> " mode has been enabled.
		C.Flow N.	Alternatively, " <b>leakage compensation</b> " mode has been enabled.
Param.	Pur.Time	.....	<b>Purging time.</b> A fixed purging time has been entered in hrs/min/sec. This display only appears when <b>time-dependent</b> purging has been selected.
	Pur.Vol.	.....	Alternatively, a prompt is given for entry of the following parameter <b>Purging volume</b> , when <b>integration</b> is being employed.
	Min.FL.P	.....	<b>Minimum flowrate during purging operation.</b> The flowrate during the purging operation is monitored against this minimum value.
	Min.FL.O	.....	<b>Minimum flowrate during operation.</b> The flowrate during operation is monitored against this minimum value.

1st level	Hierarchy 2nd level	3rd level	Description
	Rated FL.	.....	<b>Flowrate setpoint.</b> The flowrate required during “continuous purging” operation is set here.
	Min.Pres.	.....	<b>Minimum pressure in enclosure.</b> The pressure in the enclosure is continuously monitored against this minimum value. Only values $\geq 0.8$ mbar can be entered (extra safety in accordance with EN 50016)
	Max.Pres.	.....	<b>Maximum pressure in enclosure.</b> The pressure in the enclosure is continuously monitored against this maximum value to prevent the risk of housing failure.
	R.Pre.Pu.	.....	<b>Setpoint pressure during purging.</b> The pressure during purging is controlled to this setpoint value.
	Rated Pr.	.....	<b>Setpoint pressure during operation.</b> The pressure during operation is controlled to this setpoint value.
	ALARM	.....	<b>Limit value.</b> Potential free contact opens below the set pressure value.
Codes	M-Code	.....	<b>Menu code.</b> Code word that has to be entered to access the main menu during operation. The code word cannot be disabled by entering a value of “0000”.
	By-Code	.....	<b>Bypass code.</b> Code word that has to be entered to enable the bypass. The bypass code can be disabled by entering the code “0000”. The bypass itself can be disabled by entering the code “9999”. This means that system bypassing can only be activated with an external key switch.
	On/Off-C	.....	<b>On/Off code.</b> Code word used to switch non-intrinsically safe devices on and off. The code word can be disabled by entering the code “0000”.

## 6.4 Example Ex p system

⇒ Pressurised enclosure system: 500 l

⇒ Language: English

⇒ Structure:

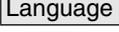
- Mode of operation: leakage compensation
- Purging using integration function
- Proportional valve

⇒ Parameters:

- Purging volume: 2500 l
- Minimum pressure of pressurised enclosure system: 0.8 mbar
- Maximum pressure of pressurised enclosure system: 12 mbar
- Setpoint pressure for purging operation: 10 mbar
- Setpoint pressure during operation: 1.5 mbar
- Alarm: 1.2 mbar

⇒ Codes:

- M-Code: 0100
- By-Code: 0200
- On/Off-Code: 0000 (disabled)

	When the <b>Enter key</b> is pressed, the main menu will prompt for the M-Code.
	The factory setting for the M-Code word is "0001".
	Start entering the M-Code.
	The code "0000" appears in the display, with the first zero flashing.
	Press the key combination shown here to display...
	
	"0001", the current M-Code word.
	Press the <b>Enter key</b> to terminate the input of the code.
	The main menu is now active. The first submenu "Language" is displayed. As "deutsch" is the factory setting, this submenu can be skipped by pressing the
	<b>up arrow key</b> .

Structure



Valve



D Valve



P Valve



Cont.Flow.



Param.



Pur.Vol.



\_00500 l



\_00500 l



The next submenu is the structure menu. To set the required enclosure system structure, press the **Enter key**.

The structure menu begins by prompting the selection of a valve for the purging operation.

The modification is introduced by pressing the **Enter key**.

The current default value (digital valve) is displayed.

The “proportional valve” option is displayed when the **up arrow key** is pressed.

The selection is confirmed and terminated by pressing the **Enter key**.

The “continuous purging” mode of operation can be selected using the next menu item. As the system default value, “leakage compensation”, corresponds to the requirement in this case, this menu item can be skipped by pressing the

**up arrow key**.

The structure menu is now complete and the parameter menu appears.

Press the **Enter key** to start the parameter menu.

with the first menu item “purging volume”.

The required purging volume of 2500 l is entered as follows:

Starting with a purging volume of 500 l, enter the following key sequence

002500 I



to enter 2500 I and then press the **Enter key**.

Min.Pres.

The setting of the minimum pressure in the enclosure of 0.8 mbar can be skipped by pressing the **up arrow key**, since this value is the factory-set default value. The parameter can be checked by pressing the **Enter key**.

Max.Pres.

The maximum pressure in the enclosure of 12 mbar, on the other hand, must be entered in the following menu item. The value is entered as shown above.

012.0mbar

R.Pre.Pu.

This parameter determines the setpoint pressure during the purging phase. In this case it will be 10 mbar, which again agrees with the factory setting, so this menu item can be skipped.

Rated Pr.

The setpoint pressure during operation is to be 1.5 mbar. This value is entered in this menu item.

ALARM

Limit value of the selected pressure in the housing interior 1.2 mbar. Below this value, a potential free contact (terminal 21/22) opens.

Codes

The parameter menu is now complete and the code submenu appears:

M-Code

The code for the main menu is to be set to "0100". **The M-Code cannot be disabled by entering "0000"**.

By-Code

The code to enable the bypass is set to "0200" as required.

On/Off-C

The code to enable the non-intrinsically safe device to be switched on or off is set to "0000" as required and is therefore disabled.

END

The structuring and entering of parameters for the pressurised enclosure system is now complete.



The pressurised enclosure system will be in operation after the **Enter key** is pressed.

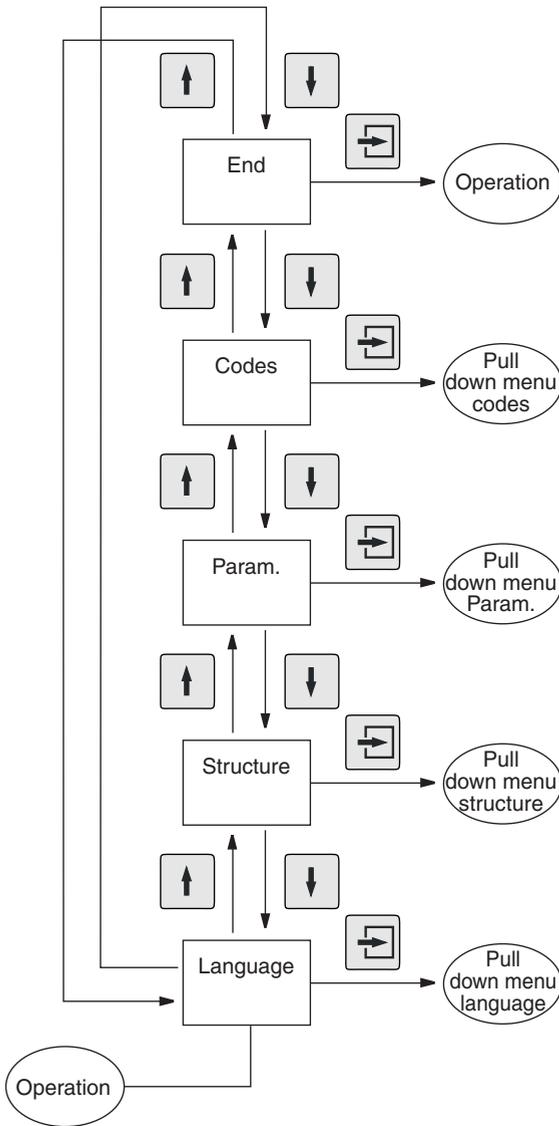
## 7 Alarms and error messages

Alarm	Cause	Actions
Ext.SEN	The external alarm loop has tripped. If the loop is not used, it should be bridged using a wire jumper.	Connect wire jumper to terminals 4 and 10 of the PCU300A control unit.

Error message	Cause	Remedy
Error E.	A read error has occurred with the EEPROM. The system data is either incomplete or corrupt.	Turn off and on again. If the error persists, the PCU300A control unit should be returned to the manufacturer.
Error P.	The integral pressure sensors are not working properly and are providing unreliable pressure and flowrate readings.	
Error Q.	The analog/digital signal convertor is not working properly. Pressure and flowrate readings may be incorrect.	
Error K.	Hardware error	



## 8.2 Main menu

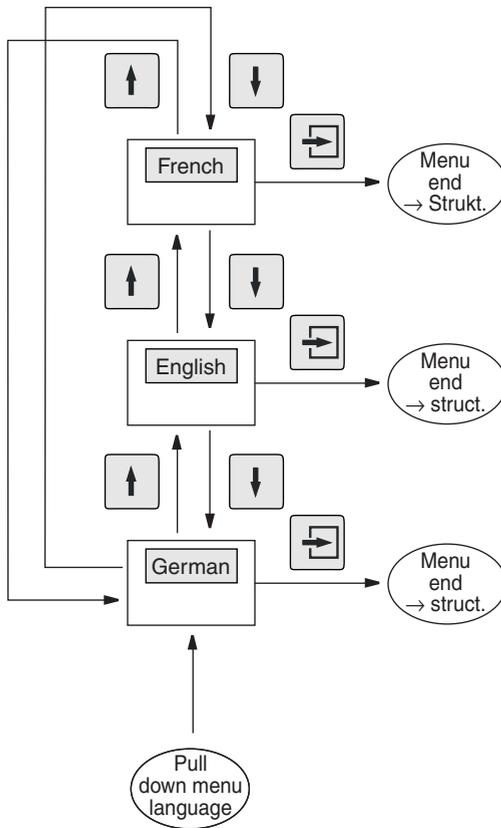


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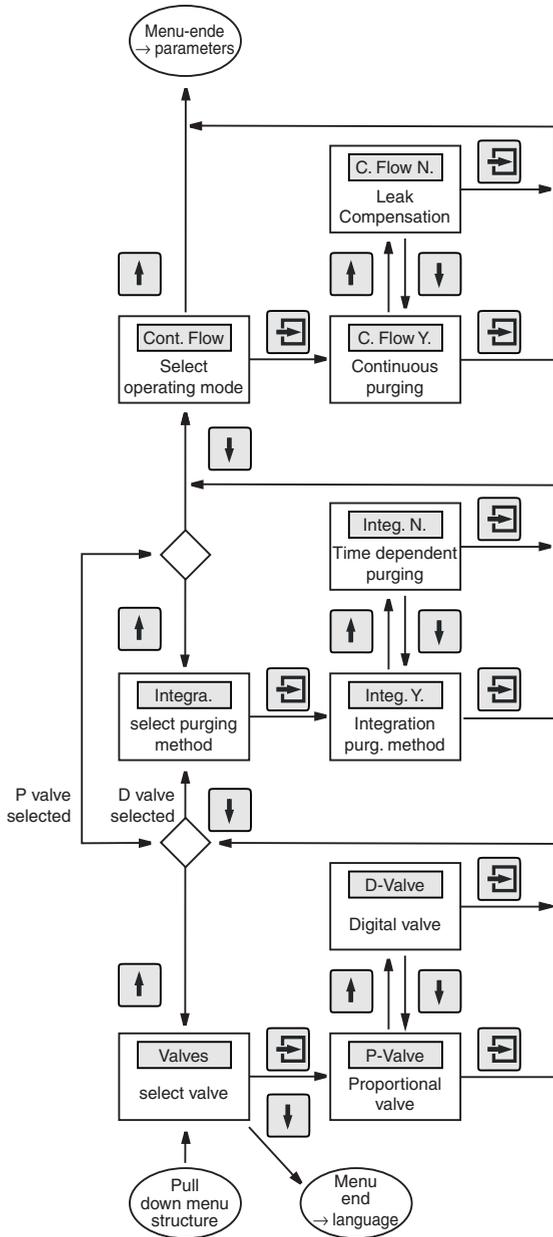
06/2009

Edition

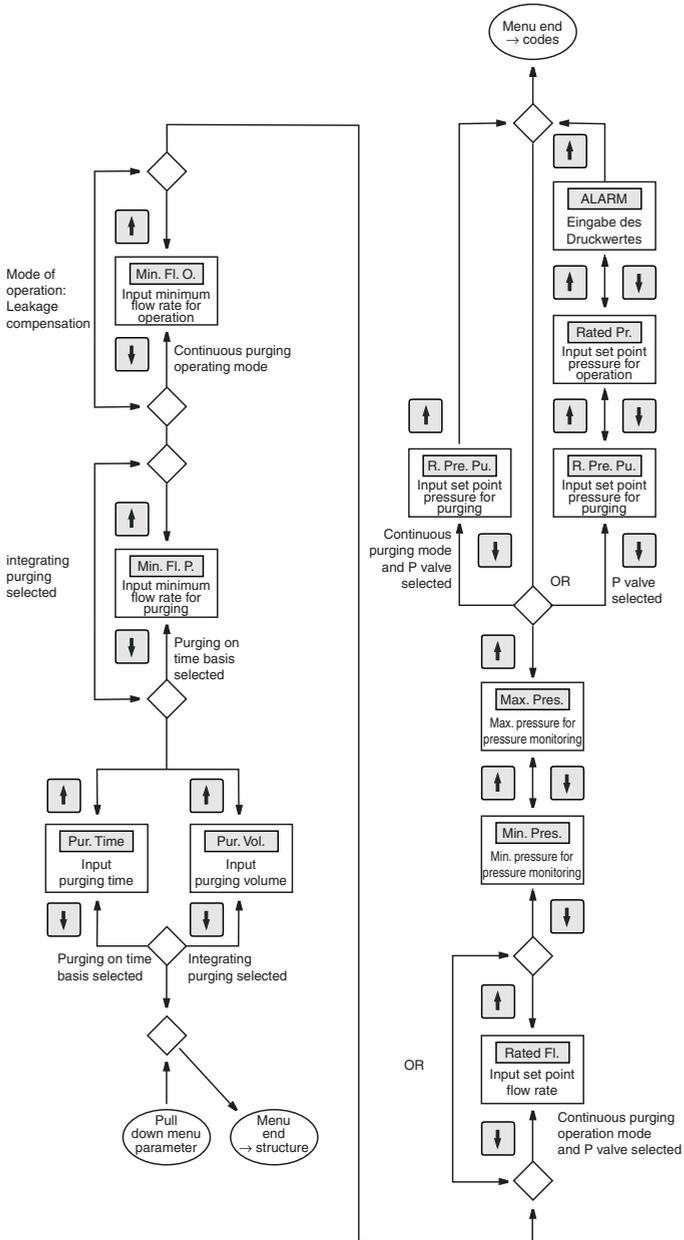
### 8.3 Language menu



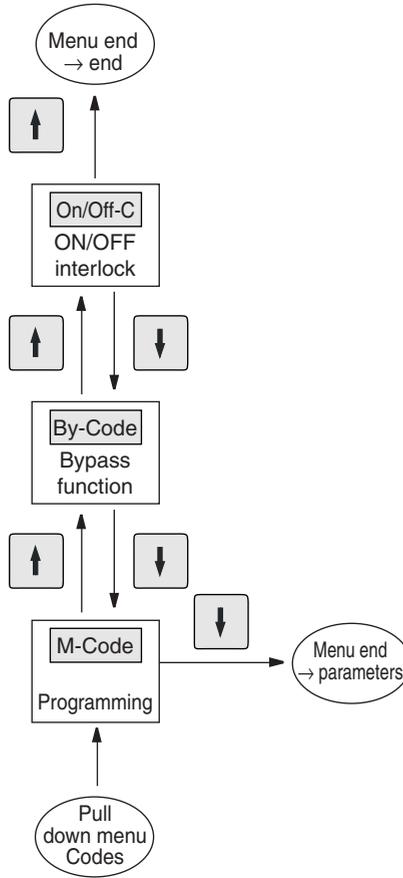
8.4 Structure menu



8.5 Parameter menu



8.6 Code menu

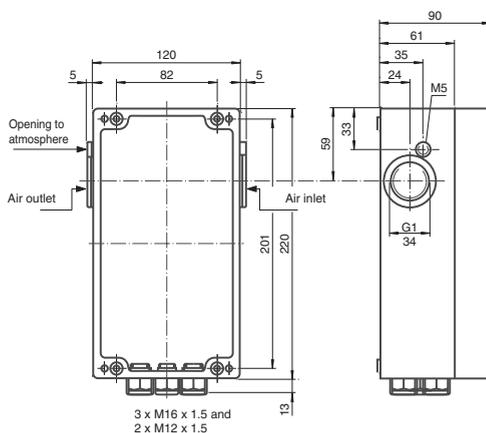


## 9 Control unit F\*\*-PCU300A-Ex.O\*\*

### Features

- Compact design
- Easy installation
- Economical purging method
- High safety standard
- LCD indication of operating status
- Menu driven programming

### Dimensions



### Function

The pressure control unit with integrated pressure switch monitor the purge-gas pressure and throughput. Operating modes and parameters can be programmed and called-up with 4 keys. They are displayed in an 8-character LC display.

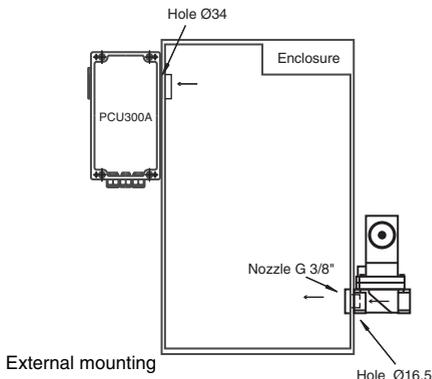
Optimum adaptation to the application is provided by the choice of orifice meters.

### Technical data

Supply	
Rated voltage	D2: 24 V DC, A5: 115 V AC, 48 ... 62 Hz, A6: 230 V AC, 48 ... 62 Hz
Power consumption	approx. 2.5 VA
<b>Conformity</b>	
Protection degree	IEC 60529
<b>Input characteristics</b>	
Measurement range	pressure measurement range 0 ... 18 mbar volumetric flow measurement range depends on the orifice size
<b>Operating conditions</b>	
Mounting conditions	inside or outside the enclosure Back-up fuse for solenoid valve in the control unit must be ordered separately (see selection table in data sheet PCU-F-Ex.***MA).
<b>Ambient conditions</b>	
Ambient temperature	-20 ... 45 °C (253 ... 318 K) at T6 -20 ... 60 °C (253 ... 333 K) at T4
<b>Mechanical specifications</b>	
Protection degree	IP65 (without consideration of the air outlet opening)
Material	aluminium, lacquer-coated
Dimensions	220 x 120 x 90 mm (8.7 x 4.7 x 3.5 in)
<b>Data for application in conjunction with hazardous areas</b>	
EC-Type Examination Certificate	DMT 00 ATEX E 004 X, for additional certificates see <a href="http://www.pepperl-fuchs.com">www.pepperl-fuchs.com</a>
Group, category, type of protection	(Ex) II 2G EEx em [ib] [p] IIC T6 (-20 °C ≤ T <sub>amb</sub> ≤ 45 °C) (Ex) II 2G EEx em [ib] [p] IIC T4 (-20 °C ≤ T <sub>amb</sub> ≤ 60 °C) (Ex) II 2D Ex tD [ibD] [pD] IP65 T70°C (-20 °C ≤ T <sub>amb</sub> ≤ 60 °C)

<b>Supply</b>	
Safety maximum voltage $U_m$	253 V (Attention! $U_m$ is no rated voltage.)
<b>Output</b>	
Contact loading	250 V AC/5 A/cos $\varphi > 0.7$ /30 V DC/5 A/150 W
<b>Directive conformity</b>	
Directive 94/9 EC	EN 50014, EN 50016, EN 50019, EN 50020, EN 50028, EN 954-1, IEC 61241-0, IEC 61241-1, IEC 61241-11
<b>General information</b>	
Supplementary information	EC-Type Examination Certificate, Statement of Conformity, Declaration of Conformity and instructions have to be observed. For information see <a href="http://www.pepperl-fuchs.com">www.pepperl-fuchs.com</a> .

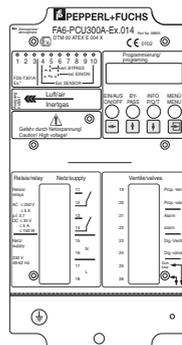
### Mounting example



### Type code/model number

	<b>Control unit</b>	<b>F * * PCU300A-Ex.O **</b>	
Operating voltage	230 V AC .....	A 6	Minimum flow (l/s)
	115 V AC .....	A 5	
	24 V DC .....	D 2	
Orifice*	6 mm .....	6	0.15
	10 mm .....	10	0.35
	14 mm (preferred type).....	14	0.85
	18 mm .....	18	1.25

\*See the operating instruction for selection assistance.

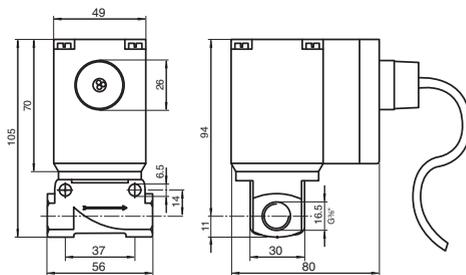


## 10 Solenoid valve F\*\* -PV32\* -Ex

### Features

- Minimal purging gas consumption
- High level of operating safety
- Low flow noise
- Defined overpressure during purging

### Dimensions



### Function

The valve functions as an actuator for the pressurising system. It admits only sufficient purge gas to compensate for leakage losses from the housing.

The defined pressure during purging ensures that pressure-sensitive components such as membrane keypads or viewing windows are not overloaded.

The valve can be installed inside or outside the enclosure.

### Technical data

#### Supply

Rated voltage

U2: 24 V DC, U5: 115 V AC, U6: 230 V AC

#### Operating conditions

Process conditions

Process pressure (static pressure)

F\*\* -PV321-Ex: 0 ... 7 bar, F\*\* -PV322-Ex: 0 ... 3.5 bar

#### Mechanical specifications

Protection degree

IP65

Connection

cable, length 3 m

Dimensions

56 x 80 x 105 mm (2.2 x 3.1 x 4.1 in)

#### Data for application in conjunction with hazardous areas

EC-Type Examination Certificate

PTB 00 ATEX 2202 X (firm Bürkert)

#### General information

Supplementary information

EC-Type Examination Certificate, Statement of Conformity, Declaration of Conformity and instructions have to be observed. For information see [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com).

### Type code/model number

Proportional valve F \* \* PV32 \* -Ex

Operating voltage      230 V AC..... U 6  
                                  115 V AC..... U 5  
                                  24 V DC..... U 2

Enclosure volume    < 300 ltr. (NW 4) .....1  
                                  > 300 ltr. (NW 6) .....2\*

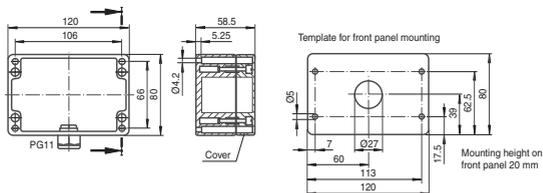
\* for use with orifice 18 mm

## 11 Operation panel FD0-T301A-Ex.\*

### Features

- Intelligent operation panel
- Operating and error messages

### Dimensions



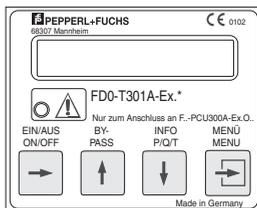
### Function

The control panel is used primarily when the PCU300A control unit is installed in the pressurised housing. It permits the operation and call of all operating parameters.

### Technical data

<b>Operating conditions</b>	
Mounting conditions	
Installation position	type F: front panel mounting (mounting height 20 mm (0.8 in)) type H: housing
<b>Ambient conditions</b>	
Ambient temperature	-20 ... 40 °C (253 ... 313 K)
<b>Mechanical specifications</b>	
Protection degree	IP65 (with housing)
Dimensions	58.5 x 80 x 120 mm (2.3 x 3.15 x 4.7 in)
<b>Data for application in conjunction with hazardous areas</b>	
EC-Type Examination Certificate	DMT 00 ATEX E 004 X , for additional certificates see <a href="http://www.pepperl-fuchs.com">www.pepperl-fuchs.com</a>
Group, category, type of protection	$\text{Ex}$ II 2G EEx ib IIC T6 ( $T_{\text{amb}} \leq 40 \text{ }^\circ\text{C}$ ) $\text{Ex}$ II 2D Ex ibD T80°C ( $T_{\text{amb}} \leq 40 \text{ }^\circ\text{C}$ )
<b>Supply</b>	
Safety maximum voltage $U_m$	253 V (Attention! $U_m$ is no rated voltage.)
<b>Output</b>	
Contact loading	250 V AC/5 A/cos $\varphi > 0.7$ /30 V DC/5 A/150 W
<b>Directive conformity</b>	
Directive 94/9 EC	EN 50014, EN 50016, EN 50019, EN 50020, EN 50028, EN 954-1, IEC 61241-0, IEC 61241-1, IEC 61241-11
<b>General information</b>	
Supplementary information	EC-Type Examination Certificate, Statement of Conformity, Declaration of Conformity and instructions have to be observed. For information see <a href="http://www.pepperl-fuchs.com">www.pepperl-fuchs.com</a> .

Notes



When the bypass button is pressed, the operating safety instructions must be complied with (e. g. presentation of a fire permit).

Operation panel FD0-T301A-Ex.\*

Front panel mounted ..... F  
 Housing IP65 ..... H

## 12 Back-up fuse for solenoid valves PCU-F-Ex.\*\*\*MA

### Function

The fuse must be selected acc. to type (digital valve DV or proportional valve PV) and operating voltage and ordered separately.

Maximum fusing values when using other solenoid valves:

- 230 V AC 200 mA
- 115 V AC 315 mA
- 24 V DC 2000 mA

### Type code/model number

Back-up fuse for solenoid valves			PCU-F-Ex.***MA
	DV	PV	
80 mA	230 V		80
100 mA			100
160 mA	115 V		160
200 mA		230 V	200
315 mA			315
400 mA		115 V	400
630 mA	24 V		630
1000 mA			1000
1600 mA		24 V	1600
2000 mA			2000

### 13 Documentation table

<b>System identification</b>	Plant number:	Date:
<b>PCU300A</b>	Serial number:	Purging medium valve:

Inputs	Description	Display	Value/setting	
<b>Language</b>	Language setting for PCU300A	Language		
<b>Structure</b>	Valve selection: Is a digital valve or a proportional valve being used in this system?	Valve  Tick as appropriate	P-Valve  <input type="checkbox"/>	D-Valve  <input type="checkbox"/>
	Purging method: Time-dependent (fixed purging times) or purging using integration?	Integ.  Tick as appropriate	Integ. Y.  <input type="checkbox"/>	Integ. N.  <input type="checkbox"/>
	Mode of operation: "continuous purging" or "leakage compensation"	Cont Flow.  Tick as appropriate	C. Flow Y.  <input type="checkbox"/>	C. Flow N.  <input type="checkbox"/>
<b>Parameters</b>	Purging time	Pur. Time		
	Purging volume	Pur. Vol.		
	Minimum flowrate during purging	Min.Fl.P.		
	Minimum flowrate during operation in "continuous purging" mode	Min.Fl.O.		

<b>Parameters</b> (continuation)	Flowrate setpoint in "continuous purging" mode	Rated Fl.	
	Overpressure in enclosure, monitored minimum value	Min. Pres.	
	Overpressure in enclosure, monitored maximum value	Max. Pres.	
	Pressure setpoint during purging	R.Pre.Pu.	
	Pressure setpoint during operation	Rated Pr.	
	Signalisation limit value pressure	Sig. Pr.	
<b>Codes</b>	Code for main menu	M-Code	
	Code for bypass	By-Code	
	Code to switch non-intrinsically safe device on and off	On/Off-Code	

With regard to the supply of products, the current issue of the following document is applicable:  
The General Terms of Delivery for Products and Services of the Electrical Industry, as published by  
the Central Association of the "Elektrotechnik und Elektroindustrie (ZVEI) e.V.",  
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