

Interface and Supply module [Ex ib]

## IPC 3x0i

Versorgungsmodul [Ex ib]

## PSC 3x0i



### Installation Guide

Version 11.2

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## Safety Instructions

The personnel for installation, commissioning, diagnostics and maintenance must be fulfil the following requirements:

- Trained, qualified specialists must have a relevant qualification for this specific function and task
- Are authorised by the plant owner/operator
- Are familiar with federal/national regulations
- Before starting work: Read and understand the instructions in the manual and supplementary documentation, as well as the certificate (depending on the application)
- Following instructions and basic conditions

## Validity of Installation Instructions

- These installation guide apply to all interface and power supply modules IPC 3x0i and PSC 3x0i
- Your IBS agent will be able to give you information about any improvements or modifications.
- The manufacturer is not responsible for damage caused by incorrect or unauthorised use. Conversions and changes to the instrument must not be made, otherwise the certification and guarantee become invalid.

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# Table of Contents

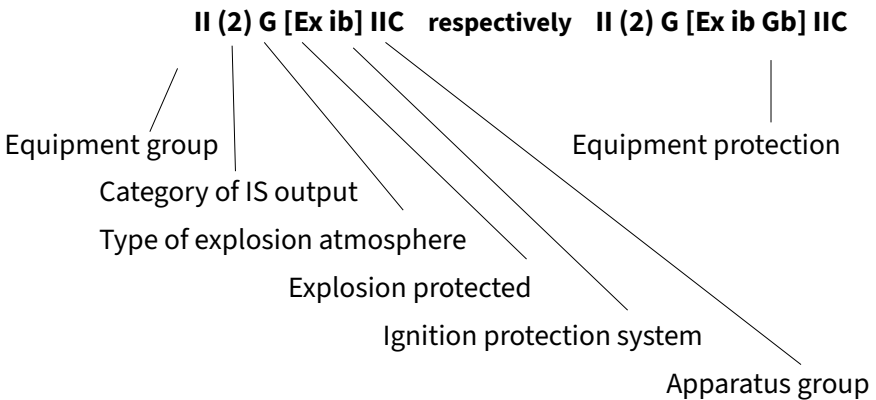
1	System description.....	4
1.1	Identification.....	4
1.2	Safety instructions.....	5
1.3	Intended use.....	6
2	Types of devices.....	7
3	Installation and initial operation.....	8
3.1	Assembly of the IPC 3x0i / PSC 3x0i.....	8
3.2	IP20 protective system.....	8
3.3	Mounting position.....	8
3.4	Arrangement.....	9
3.5	Terminals.....	9
3.6	Block diagram IPC 3x0i.....	10
3.7	Block diagram PSC 3x0i.....	10
3.7.1	Non-intrinsically safe power supply circuits.....	11
3.7.2	Non-intrinsically safe RS485 interface circuit.....	11
3.8	Interface termination.....	12
3.8.1	Supply circuit 1.....	13
3.8.2	Supply circuit 2.....	14
3.8.3	Interface circuit.....	15
3.8.4	Potential equalisation.....	15

# 1 System description

The supply and interface assembly IPC 3x0i or PSC 3x0i is used for the dc-insulated supply and interface connection of intrinsically safe operating equipment in a potential explosive atmosphere.

The input and the outputs are galvanically isolated from each other.

## 1.1 Identification



## 1.2 Safety instructions

If the device no longer appears to operate reliably or safely, it must be deactivated and safeguarded against inadvertent activation. Reasons for this type of situation include:

- Visible damage to the device
- Electrical malfunction
- Extended storage at temperatures over 85°C
- High stress during transport

Before the device is put into operation again, it is absolutely necessary to carry out a proper unit test in accordance with IEC 61010, Part 1. To ensure safety and adherence to guarantee terms, this test must be performed by the manufacturer.

### 1.3 Intended use

The assembly PSC 3x0i with up to two supply circuits is used to supply intrinsically safe operating equipment.

The assembly IPC 3x0i with one supply circuit and one TxD/RxD interface circuit is used for the supply and interface of one piece of intrinsically safe operating equipment.

Only the supply circuit 1 (terminals 1 + 2) supply circuit 2 (PSC 3x0i terminals 6 + 8) and the interface circuit (IPC 3x0i terminals 5, 6 + 7) comply with the ignition protection system designated "Intrinsic safety" of category "ib".

Only the intrinsically safe supply circuits and intrinsically safe interface circuit may be routed through the potentially explosive areas. Only certified intrinsically safe circuits may be connected to the two circuits.

**The maximum permissible ambient temperature range of -20°C to +70°C must not be exceeded.**

Before initial operation, proof of intrinsic safety must be brought for the connection of the circuits with the operating equipment including the cables.

The EC type-examination certificate and the requirements of standard EN 60079-14 et seq. must be observed.

## 2 Types of devices

<b>Type of device</b>	<b>Power Supply 1</b>	<b>Power Supply 2</b>	<b>Interface</b>
<b>PSC300i-1</b>	Ex ib IIC 24 V	–	–
<b>PSC300i-2</b>	Ex ib IIC 24 V	Ex ib IIC 24 V	–
<b>PSC310i-1</b>	Ex ib IIC 19 V 50 mA	–	–
<b>PSC310i-2</b>	Ex ib IIC 19 V 50 mA	Ex ib IIC 19 V 50 mA	–
<b>PSC320i-1</b>	Ex ib IIC 6 V	–	–
<b>PSC320i-2</b>	Ex ib IIC 6 V	Ex ib IIC 6 V	–
<b>PSC330i-2</b>	Ex ib IIC 24 V	Ex ib IIC 6 V	–
<b>PSC340i-1</b>	Ex ib IIC 19 V 32 mA	–	–
<b>PSC340i-2</b>	Ex ib IIC 19 V 32 mA	Ex ib IIC 19 V 32 mA	–
<b>IPC300i</b>	Ex ib IIC 24 V	–	Ex ib IIC
<b>IPC310i</b>	Ex ib IIC 19 V 50 mA	–	Ex ib IIC
<b>IPC320i</b>	Ex ib IIC 6 V	–	Ex ib IIC

## 3 Installation and initial operation

### 3.1 Assembly of the IPC 3x0i / PSC 3x0i

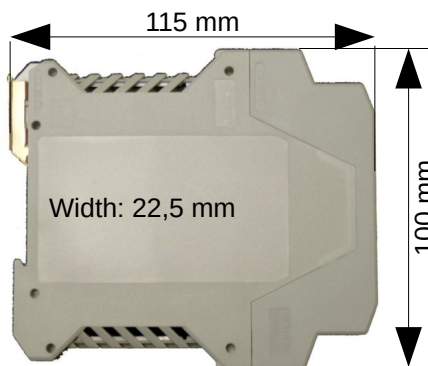
The assemblies IPC 3x0i / PSC 3x0i are respective operating equipment for use outside potentially explosive areas.

### 3.2 IP20 protective system

The compact top hat DIN rail housing provides the IP20 protective system required in accordance with IEC publication 144.

### 3.3 Mounting position

The assemblies must be mounted on a horizontal DIN rail.



### **3.4 Arrangement**

Connecting elements for the external, intrinsically safe circuits are to be arranged in compliance with paragraph 6.2.1 of EN 60079-11 so that bare conducting parts are at least 50 mm away from the connecting elements and bare conductors of circuits not intrinsically safe, or isolated from these items by a partitioning wall.

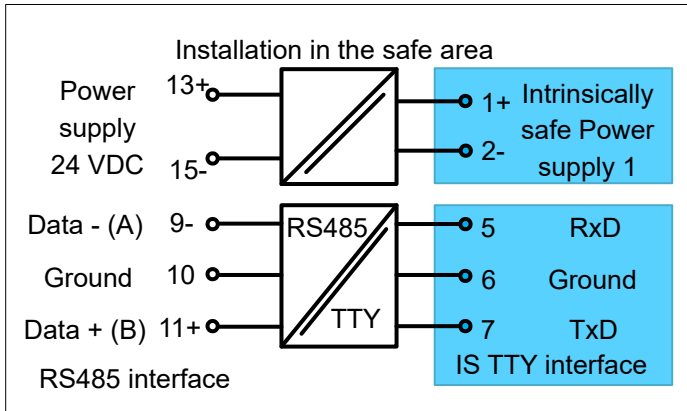
### **3.5 Terminals**

Blue terminals are provided for connecting intrinsically safe circuits. They are clearly marked [Ex ib] IIC on the front plate.

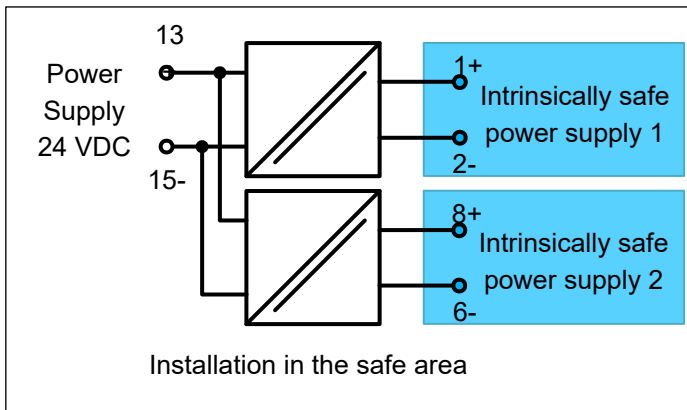
The terminal assignment for the auxiliary power is also clearly identified on the front plate.

The screwable terminals provide wiring space for wire cross-sections of up to 2.5 mm<sup>2</sup>.

### 3.6 Block diagram IPC 3x0i



### 3.7 Block diagram PSC 3x0i



### 3.7.1 Non-intrinsically safe power supply circuits

The PSC 3x0i and IPC 3x0i are supplied with auxiliary power via terminals 13/14 and 15/16.

#### Terminal 13/14 und Terminal 15/16

The following maximum supply voltages may be applied:

<b>Nominal voltage:</b>	$U =$	DC 20 – 32 V AC 18 – 28 V
<b>Maximum voltage for safety reasons:</b>	$U_m =$	AC 250V
<b>Maximum power consumption:</b>	$P_{max} =$	3.4 W

### 3.7.2 Non-intrinsically safe RS485 interface circuit

A supervisor system with RS485 interface is connected via terminals 9 to 11.

#### Terminals 9, 11 and Terminal 10

The following maximum supply voltages may be applied:

<b>Nominal voltage:</b>	$U <$	DC 6 V
<b>Nominal current:</b>	$I <$	100 mA
<b>Maximum voltage for safety reasons:</b>	$U_m <$	48V DC
<b>Maximum data transmission rate:</b>		19200 Baud

### 3.8 Interface termination

The RS485 interface is not terminated. To terminate the interface at the end of an RS485 link, carefully open the housing with a screwdriver. The upper section can then be withdrawn together with its circuit board from the lower section.

If the interface has to be terminated, both jumpers need to be switched over (diagram on the right).



### 3.8.1 Supply circuit 1

Supply circuit 1 is galvanically isolated.

<b>Terminal 1 (+) and Terminal 2 (-)</b> <b>Ignition protection system</b> <b>Ex ib IIC intrinsic safety:</b> <b>trapezoid output characteristics</b>					
		PSC300i-1 PSC300i-2 PSC330i-2 IPC300i	PSC310i-1 PSC310i-2 IPC310i	PSC340i-1 PSC340i-2	PSC320i-1 PSC320i-2 IPC320i
<b>Voltage</b>	$U_0$	DC 24 V	DC 19 V	DC 19 V	DC 6 V
<b>Current</b>	$I_0$	50 mA	50 mA	32 mA	100 mA
<b>Power</b>	$P_0$	1.2 W	1 W	591 mW	600 mW
<b>For group IIC</b>	$C_0$	125 nF	258 nF	258 nF	40 $\mu$ F
	$L_0$	9 mH	9 mH	25 mH	2 mH
<b>For group IIB</b>	$C_0$	930 nF	1580 nF	1580 nF	1000 $\mu$ F
	$L_0$	30 mH	30 mH	80 mH	8 mH
<b>Effective internal inductance: Negligible</b> <b>Effective internal capacitance: Negligible</b>					

### 3.8.2 Supply circuit 2

Supply circuit 2 is galvanically isolated.

<b>Terminal 8 (+) and Terminal 6 (-)</b> Ignition protection system Ex ib IIC intrinsic safety: trapezoid output characteristics					
		PSC300i-2	PSC310i-2	PSC340i-2	PSC320i-2 PSC330i-2
<b>Voltage</b>	$U_0$	DC 24 V	DC 19 V	DC 19 V	DC 6 V
<b>Current</b>	$I_0$	50 mA	50 mA	32 mA	100 mA
<b>Power</b>	$P_0$	1.2 W	1 W	591 mW	600 mW
<b>For group IIC</b>	$C_0$	125 nF	258 nF	258 nF	40 $\mu$ F
	$L_0$	9 mH	9 mH	25 mH	2 mH
<b>For group IIB</b>	$C_0$	930 nF	1580 nF	1580 nF	1000 $\mu$ F
	$L_0$	30 mH	30 mH	80 mH	8 mH
<b>Effective internal inductance: Negligible</b> <b>Effective internal capacitance: Negligible</b>					

### 3.8.3 Interface circuit

The interface circuit is galvanically isolated.

<b>Terminals 5, 6 and 7</b> <b>Ignition protection system</b> <b>Ex ib IIC intrinsic safety:</b> <b>trapezoid output characteristics</b>		
		IPC3x0i
<b>Voltage</b>	$U_0$	DC 13.4 V
<b>Current</b>	$I_0$	50 mA
<b>Power</b>	$P_0$	474 mW
<b>For group IIC</b>	$C_0$	880 nF
	$L_0$	9 mH
<b>For group IIB</b>	$C_0$	5500 nF
	$L_0$	30 mH
<b>Effective internal inductance: Negligible</b> <b>Effective internal capacitance: Negligible</b>		

### 3.8.4 Potential equalisation

<b>Terminal 12</b> <b>PE</b>	
Connect PE to Terminal 12 an.	Connect the standard DIN EN 50022 rail snapped on the housing to the potential equalisation terminal, as well.