

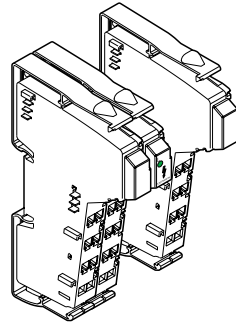
# IB IL 120 PWR IN

## INTERBUS Inline Power Terminal for the 120 V AC Voltage Range

Data Sheet 5766AC02

11/2000

5766A001



This data sheet is only valid in association with the INTERBUS Inline System Manual IB IL SYS PRO UM E.

### Features

- Phase supply L (120 V AC)
- Diagnostic indicator

### Function

The terminal enables the supply of the 120 V AC supply voltage in the 120 V AC area of an Inline station.

The power terminal is supplied with the end terminal (IB IL PWR IN END), which must be used to close the 120 V AC area.



#### **Dangerous voltage**

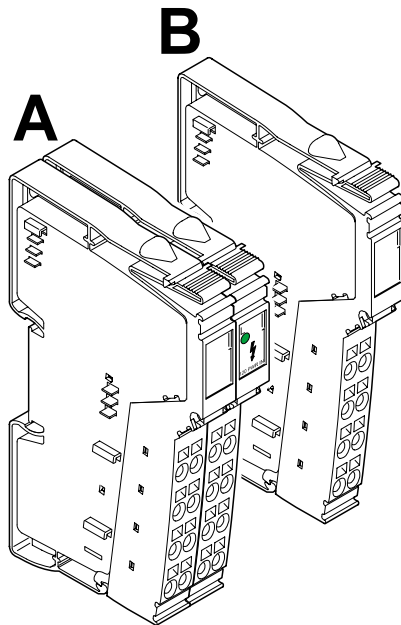
Connecting and disconnecting the terminal is only allowed if the **power supply is disconnected**.

When working on the terminal and wiring, always switch off the supply voltage and ensure it cannot be switched on again.

**If these instructions are not followed, there is a danger of damage to health, or even of a life-threatening injury.**



This terminal does not have an INTERBUS protocol chip and therefore is not a bus device.



5766A002

Figure 1 IB IL 120 PWR IN (power terminal (A) and end terminal (B)) with connectors



Please note that the connectors are not supplied with the terminal. Please refer to Ordering Data on page 14 to order the appropriate connectors for your application.



## **Safety Instructions for Inline Terminals for Installation in Areas Outside the SELV (Low Voltage Area)**

Only qualified personnel may work on low voltage area Inline terminals.

Qualified personnel are people who, because of their education, experience and instruction, and their knowledge of relevant standards, regulations, accident prevention and service conditions, have been authorized by those responsible for the safety of the plant to carry out any required operations, and who are able to recognize and avoid any possible dangers.

(Definitions for skilled workers according to EN 50110-1:1996.)

**The instructions given in this data sheet must be followed during installation and startup.**

Technical modifications reserved.

## **Correct Usage**

The terminal is only to be used within an Inline station as specified in this data sheet and the INTERBUS Inline System Manual. Phoenix Contact accepts no liability if the device is used for anything other than its designated use.

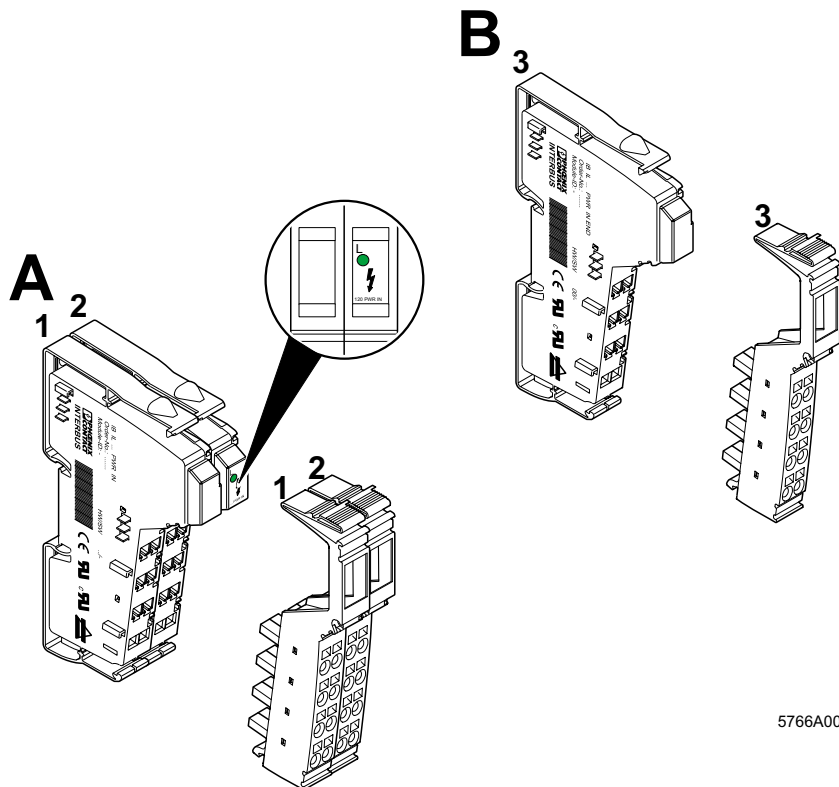


This data sheet describes the module-specific features of the IB IL 120 PWR IN terminal.



For general information on the INTERBUS Inline product family, please refer to the INTERBUS Inline System Manual IB IL SYS PRO UM E.

## General Description



5766A003

Figure 2 IB IL 120 PWR IN and IB IL PWR IN END terminals with appropriate connectors

A Power terminal IB IL 120 PWR IN  
 B End terminal IB IL PWR IN END

### Local Diagnostic and Status Indicators

Des.	Color	Meaning
L	Green	120 V AC supply voltage available

### Function Identification

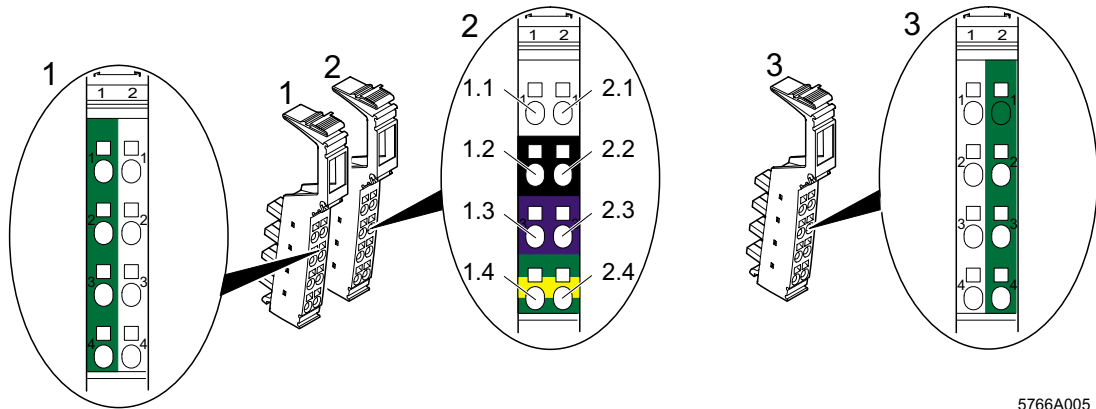
White with lightning bolt

### Housing/Connector Color

Gray housing

Gray connectors, color-coded according to function

Terminal Assignment

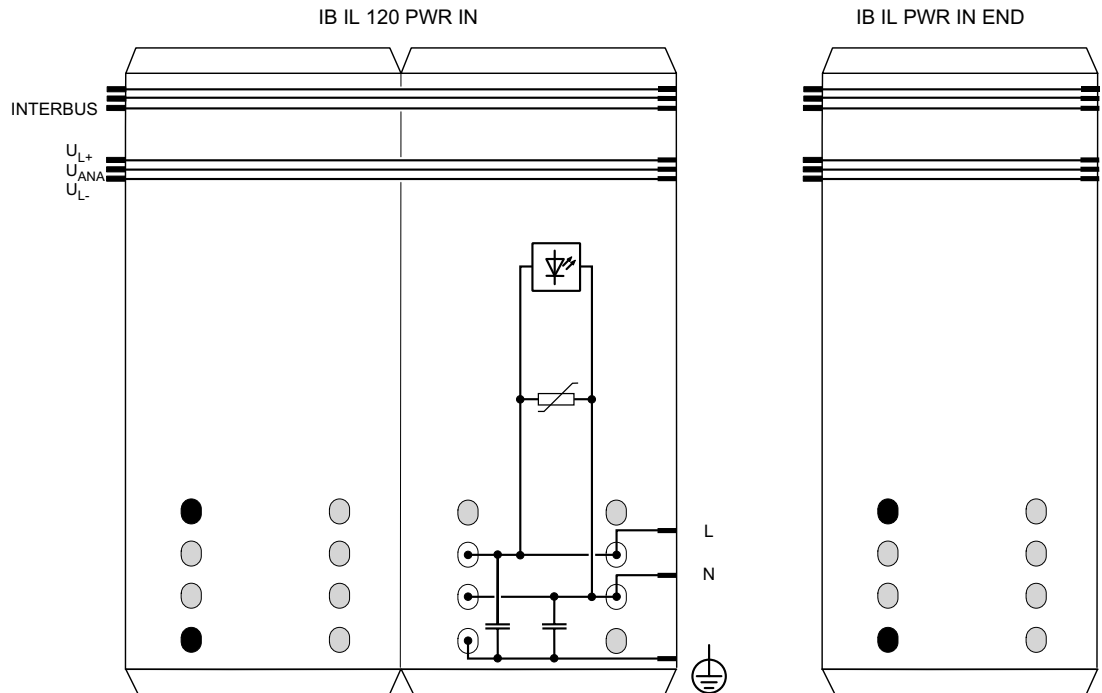


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Figure 3 Terminal assignment

Terminal Point	Des.	Assignment	Marking
<b>Power terminal (A in Figure 2)</b>			
<b>Connector 1</b>			
All		Not used	Left: green
<b>Connector 2 (marking according to function)</b>			
1.1, 2.1		Not used	
1.2, 2.2	L	Input points for the phase of supply L	Black
1.3, 2.3	N	Neutral conductor connection	Blue
1.4	PE	Protective conductor connection	Green/yellow
		The contact is directly connected with the voltage jumper PE. Ground the terminal with the PE connection. If the 120 V AC area is structured correctly, this ensures that all of the terminals in this area are connected to protective earth ground.	
2.4		Not used	
<b>End terminal (B in Figure 2)</b>			
<b>Connector 3</b>			
All		Not used	Right: green







# Internal Circuit Diagram



5766B006

Figure 4 Internal wiring of the terminal points

Key:

- |   |                        |   |  |
|---|------------------------|---|--|
|  | LED                    |  | Terminal point, without metal contact                              |
|  | Overvoltage protection |  | Terminal point, without metal contact, with filler plugs           |
|  | Capacitor              |  | Other symbols are explained in the IB IL SYS PRO UM E User Manual. |

## General Installation Instructions

### Installing the System



Install the system according to the requirements of EN 50178.

### Starting Up an Inline Station

An Inline station can only be started up if it has been properly installed. This means:

- all terminals must be installed with their connectors
- the station must be terminated with the end plate and the two end clamps.

## Installation Instructions for a Low Voltage Area (120 V AC; AC Area)



### Dangerous Voltage

Please note that these are dangerous voltages when working on circuits that do not meet SELV requirements.

Connecting and disconnecting the terminals for the 120 V AC voltage area is only allowed if the power supply is disconnected.

When working on terminals and wiring, always switch off the supply voltage and ensure it cannot be switched on again.



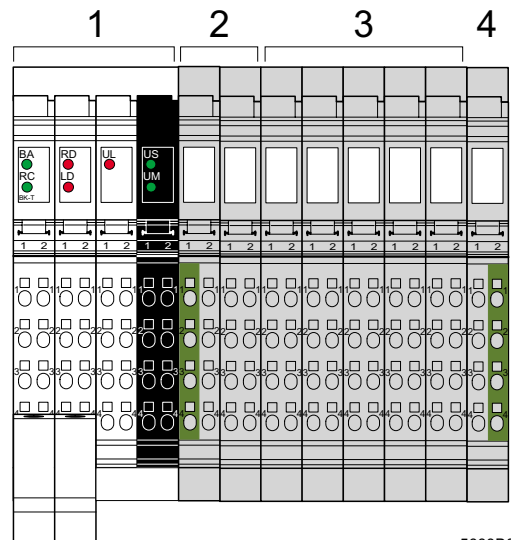
### Please Use Grounded AC Networks

Inline terminals for the 120 V AC voltage area must only be operated in grounded AC networks.

### Structure of an AC Area

A 120 V AC area **must** have a 120 V AC power terminal at one end and a 120 V AC end terminal at the other.

I/O terminals that are suitable for this range can be used between these terminals. They are limited in number by the INTERBUS/INTERBUS Inline system restrictions (see IB IL SYS PRO UM E User Manual).



5663B012

Figure 5 Example of an Inline AC area

- 1 Bus terminal
- 2 120 V AC power terminal
- 3 Various I/O terminals
- 4 AC end terminal

### Fusing an AC Area

Protect each AC area using an intrinsically safe fuse.



Please note that the fuse required depends on the specific application.

### Connecting the Supply and the I/O in the AC Area



#### Multiple Supplies Are Not Permitted

The supply voltage must **only** be supplied to the power terminal for which it is meant.

The connecting cables of all actuators and sensors should only be connected to the Inline AC terminals. The use of external bus bars for group voltages is **not permitted**.

### Interrupting PE Jumpering in the AC Area

The PE jumper begins at the power terminal of the AC area and, in a complete AC area, ends at the end terminal.

If a terminal is removed from this area, the PE jumper is interrupted.

As long as the installation instructions are followed, all subsequent terminals will be disconnected.



## Terminals and Connectors of the AC and SELV Areas



In this section, the term "AC area" applies to both the 120 V AC area and the 230 V AC area.

A SELV (Safety Extra-Low Voltage) area is referred to here as a 24 V area.

AC terminals and the corresponding connectors can be distinguished from the terminals and connectors of the 24 V area by their color:

Area	Terminal	Connector
24 V DC	Green	Green or black
120 V AC	Gray	Gray
230 V AC	Gray	Gray

### Protection Against the Insertion of 24 V Terminals in an AC Area

- 24 V terminals cannot be snapped onto the AC terminals because there is no keyway on the right-hand side of the AC terminals.

**Exception:** 24 V power terminals can be inserted in an AC area. In this case, the minimum isolation distance is the distance between two adjacent connectors.

### Protection Against Connecting Connectors of the 24 V Area to AC Terminals

- Two terminal points of the AC I/O terminals are closed by filler plugs, so that the 24 V terminals cannot be connected to the AC terminals.

**Exception 1:** The connectors for 24 V terminals can be connected to AC power terminals.



This does not endanger the electrical components, but may lead to system malfunctions.

Therefore only insert the connectors that are designed for AC power terminals.

**Exception 2:** The connectors for 24 V terminals can be connected to relay terminals. As the relay outputs are electrically isolated, this exchange is permitted.

### Protection Against the Connection of Live AC Connectors in the 24 V Area




If the I/O terminal connectors are wired according to the installation instructions, they are disconnected from the power when removed.

The following connectors may be live in the AC area:

- 1 Connectors for AC power terminals  
IB IL 120 PWR IN and IB IL 230 PWR IN
  - 2 Connectors for the relay module  
IB IL 24/230 DOR 1/W
- These connectors are closed by filler plugs at certain points and therefore cannot be connected to the 24 V terminals.

### Response When Inserting an AC Terminal in the 24 V Area

An AC terminal can be inserted in the 24 V area, but 24 V terminals cannot be connected to the AC terminal, because there is no keyway on the right-hand side of the AC terminal to which the 24 V terminal can be connected.

AC Terminal in the 24 V Area	Description/Effect
AC power terminal in the 24 V DC area	<p>Specific interface between AC and SELV area.</p> <p>The AC power terminal consists of two functional parts:</p> <ul style="list-style-type: none"> <li>– The left-hand part interrupts the jumpering of <math>U_S</math>, <math>U_M</math>, GND and FE.</li> <li>– The connections for the voltage supply and the jumper contacts for L, N and PE are on the right-hand part.</li> </ul>
Digital AC output terminal in the 24 V DC area	<p>No direct danger to people.</p> <p>If the output is switched on, the Triac output may force tripping and no longer switch off if the supply voltage does not pass through zero.</p> <div style="display: flex; align-items: center;">  <p>This is likely to cause a malfunction of the relevant actuator.</p> </div>
Digital AC input terminal in the 24 V DC area	<p>No danger to people or machines.</p> <p>The input does not function because it has no ground.</p>
Relay terminal in the 24 V DC area	<p>No direct danger to people.</p> <p>The module does not have diagonal routing so there is no direct danger from the terminal even when using a connector, which supplies 230 V. This means that the shortest isolating distance is the distance from one connector to the next.</p>
AC end terminal in the 24 V DC area	<p>No danger to people or machines.</p> <p>The terminal offers neither diagonal routing nor connector connection.</p>

## Connection Example



Protect the 120 V AC supply with an external fuse.



**Ensure Complete Current Carrying Capacity**

Use both of the adjacent contacts to provide the voltage (according to Figure 6 on page 11).

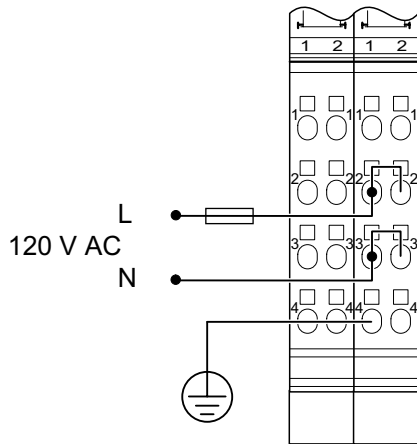


**Observe the Current Carrying Capacity**

The maximum total current flowing through the potential jumpers is 8 A.



To create another voltage area after the 120 V AC voltage area, start this voltage area with a new power terminal.





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Figure 6 Example connection of the supply voltage


Key:

 Fuse

## Technical Data

General Data	
Power terminal housing dimensions (width x height x depth)	24.4 mm x 120 mm x 66.6 mm (0.961 in. x 4.724 in. x 2.622 in.)
End terminal housing dimensions (width x height x depth)	12.2 mm x 120 mm x 66.6 mm (0.480 in. x 4.724 in. x 2.622 in.)
Weight (power terminal/end terminal)	80 g / 35 g (without connector)
Permissible temperature (operation)	-25°C to +55°C (-13°F to + 131°F)
Permissible temperature (storage/transport)	-25°C to +85°C (-13°F to + 185°F)
Permissible humidity (operation)	75%, on average, 85%, occasionally  In the range from -25°C to +55°C (-13°F to +131°F) appropriate measures against increased humidity (> 85%) must be taken.
Permissible humidity (storage/transport)	75%, on average, 85%, occasionally  For a short period, slight condensation may appear on the housing if, for example, the terminal is brought into a closed room from a vehicle.
Permissible air pressure (operation)	80 kPa to 106 kPa (up to 2000 m [6562 ft.] above sea level)
Permissible air pressure (storage/transport)	70 kPa to 106 kPa (up to 3000 m [9843 ft.] above sea level)
Degree of protection	IP 20 according to IEC 60529

120 V I/O Supply	
Connection	Phase L N Terminal points 1.2 and 2.2 (connector 2) Terminal points 1.3 and 2.3 (connector 2)
Rated value	120 V AC
Tolerance	-15% / +20%
Permissible range	108 V AC to 135 V AC
Permissible current	8 A, maximum

<b>Safety Devices</b>	
 Protect the supply voltage externally.	
Permissible fuses	10 A T, maximum
Short circuit protection of the semiconductor outputs	Super fast-blow fuse with a maximum fusible element of 4.5 A <sup>2</sup> s
Overvoltage	Yes; VAR 275 V


<b>Electrical Isolation/Isolation of the Voltage Areas</b>	
<b>Common Isolated Groups</b>	
Phase and neutral conductor have the same potential. PE is a separate potential area.	
<b>Isolated potentials in the system from bus terminal/power terminal in the 24 V DC area and power terminals/I/O terminals in the 120 V AC area</b>	
<b>- Test distance</b>	<b>- Test voltage</b>
5 V supply incoming remote bus/7.5 V supply (bus logic)	500 V AC, 50 Hz, 1 min
5 V supply outgoing remote bus/7.5 V supply (bus logic)	500 V AC, 50 Hz, 1 min
7.5 V supply (bus logic) / I/O area 120 V AC	2500 V AC, 50 Hz, 1 min
Routine test	1200 V AC, 50 Hz, 1 min
I/O area 120 V AC / PE	500 V AC, 50 Hz, 1 min
Output/phase	500 V AC, 50 Hz, 1 min


<b>Error Messages to the Higher-Level Control or Computer System</b>
None


## Ordering Data

Description	Order Designation	Order No.
Power terminal	IB IL 120 PWR IN	27 31 70 4
End terminal (supplied with the power terminal)	IB IL 120 PWR IN END	
To connect the power terminal and end terminal, you need either the connector set or one of each of the connectors listed.		
Connector set Package unit: 1 set comprising one of each of the listed connectors.	IB IL PLSET-PWR-IN-AC	27 40 18 0
Voltage supply connectors pack of 10	IB IL SCN-PWR-IN-AC-CP	27 40 20 3
Connectors (power terminal connector 1 (see Figure 2)); pack of 10	IB IL SCN-AC-IN	27 40 19 3
Connector (end terminal) pack of 10	IB IL SCN-AC-OUT	27 40 28 7
INTERBUS Inline System Manual	IB IL SYS PRO UM E	27 43 04 8

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