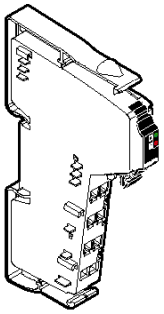


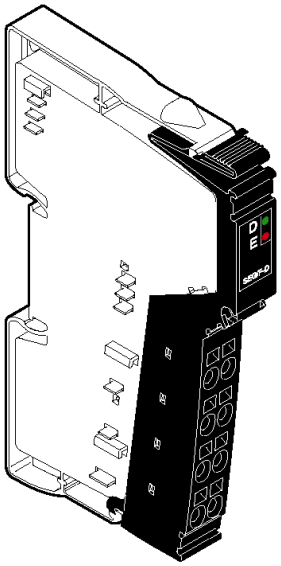
VersaPoint Power Terminal

Segment Terminal Fused, with Diagnostics 24VDC
IC220PWR013

GFK-2009 *February 2002*

Segment Terminal module IC220PWR013 is used to create a protected partial circuit (segment circuit) within the main circuit. It is not used to supply power and has no elements for the protection against polarity reversal and overvoltage.

This module has an LED for bus diagnostics and provides input data that indicates the presence of the supply voltage and the state of the fuse.



Module with Power Terminal Strip plugged in

Module IC220PWR013 requires one (1) Power Terminal Strip, IC220TBK087 ordered separately. See the ordering information below.

Features

- Automatic creation of a segment circuit within the main circuit
- Segment circuit protected by internal fuse
- Diagnostic LEDs
- Diagnostic input data

Ordering Information

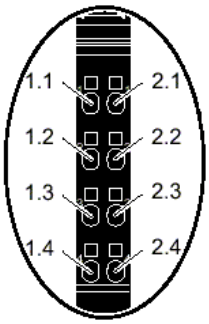
IC220PWR013	Segment Terminal, Fused, with Diagnostics, 24VDC
IC220TBK087	Power Terminal Strip, quantity 10

Module Specifications	
Housing dimensions (width x height x depth)	12.2mm x 120mm x 71.5mm (0.480in. x 4.724in. x 2.815in.)
Operating temperature	-25°C to +55°C (-13°F to +131°F)
Storage temperature	-25°C to +85°C (-13°F to +185°F)
Operating humidity	75% average Appropriate measures against increased humidity (> 85%) must be taken.
Storage humidity	75% average Appropriate measures against increased humidity (> 85%) must be taken.
Degree of protection	IP 20 according to IEC 60529
Class of protection	Class 3 according to VDE 0106, IEC 60536

Power Consumption	
Communications power U_L	7.5VDC
Current consumption from the local bus U_L	25mA, maximum
Power consumption from the local bus	0.19W, maximum
Main power U_M	24VDC (nominal value)
Nominal current consumption at U_M	4.0A (nominal value)

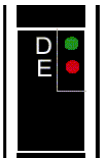
Terminal Assignment

The terminal points are only for measuring purposes.



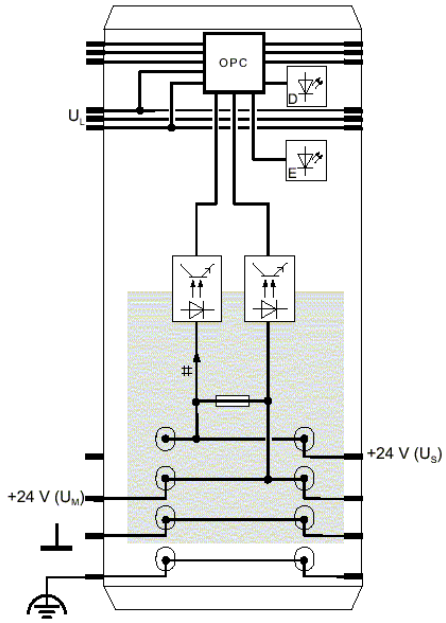
Terminal	Assignment
1.1, 2.1	Segment voltage U_S (after the fuse)
1.2, 2.2	Main power U_M
1.3, 2.3	GND of the supply voltages
1.4, 2.4	Functional earth ground FE

LEDs



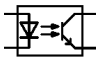
LED	Color	Meaning
D	Green	Bus Diagnostics
	ON	Bus active
	Flashing	
	0.5Hz	Comms power present, bus not active.
	2Hz	Comms power present, I/O error
	4Hz	Comms power present, local bus error
	OFF	Comms power not present, bus not active.
E	**Red**	**Fuse in main circuit U_M**
	OFF	Fuse OK
	ON	Fuse has blown
A blown fuse is indicated on both LEDs; the red LED (E) lights up and the green LED (D) flashes at 2Hz.		

Internal Circuit Diagram

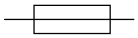


Protocol chip (bus logic including voltage conditioning)

LED with details of the display designation “D” or “E”.



Optocoupler



Fuse

Isolated area

Program Data

ID code	BE hex (190 decimal)
Length code	C2 hex
Input address area	2 bits
Output address area	0 bits (not used)
Parameter channel (PCP)	0 bits
Register length (bus)	2 bits

The input process data maps the status of the fuse and the main power. The following table shows how to interpret the bit states.

Bit 1	**Bit 0**	**Meaning**
1	1	Main power is present, fuse OK
1	0	Main power is present, fuse blown or not present
0	0	Main power not present, fuse blown or not present

Technical Data

24VDC I/O Supply

The power terminal is supplied by the NIU or by a power terminal module. The segment voltage is provided automatically at this terminal and protected by the internal fuse.

The segment terminal module has no connections for a supply voltage. The terminal points are provided only for measuring purposes.

Permissible Total Current in the Voltage Jumpers of the Main and Segment Circuit

Maximum total current in the voltage jumpers	6.3A
Nominal current of the module	4.0A
Tolerance	+10%
The module is supplied with a 6.3A slow-blow fuse.	

Power Dissipation

Formula to calculate the power dissipation of the electronics

$$P_{EL} = 0.180W + I_L^2 \times R_F$$

With

P_{EL} Total power dissipation of the module
I_L Load current in the main circuit
R_F Resistance of the fuse
The resistance of fuse RF for a 6.3AT fuse is approximately 12mΩ.

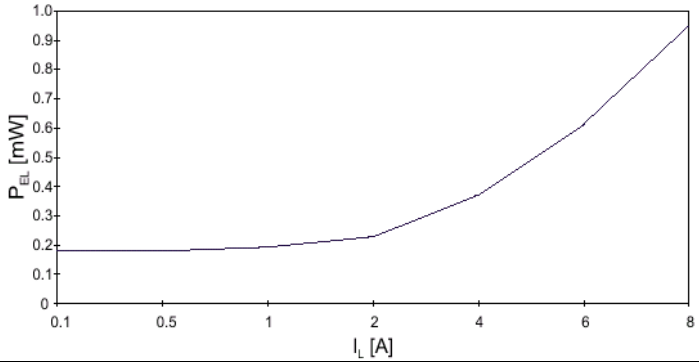
The power dissipation of the electronics for a theoretical maximum current of 6.3A (nominal current = 4.0A) is calculated as follows:

P_{EL} $= 0.18W + 39.69A^2 \times 0.012\Omega$
$= 0.66W$

Power dissipation of the housing(P_{HOU})

P_{HOU} = 0.7W in the total permissible ambient temperature range

Typical power dissipation of the electronics depending on the load current of the main circuit



P[mW] Power dissipation in mW
I_L[A] Load current in the segment circuit in Amps

This test was carried out with a 6.3A T fuse.

Derating of the Load Current in the Segment Circuit
No derating

Safety Devices	
Overload/short circuit in segment circuit	Fuse 5 x 20 with 6.3A, slow-blow. You may also add fuses with other values. Fuses must be slow-blow type higher than 2 Amps. The maximum fuse value should not exceed 6.3A.
Overvoltage	Components in the NIU or power terminal module.
Protection against polarity reversal	Components in the NIU or power terminal module.

Electrical Isolation
To provide electrical isolation between the logic level and the I/O area, it is necessary to supply these areas from the Network Interface Unit (NIU) module, or from both the NIU and a Power Terminal module using separate power supplies. Interconnection of power supply units in the 24V range is not allowed. For detailed information, refer to the user manual.

Common potentials
24Vmain power, 24V segment voltage, and GND have the same potential.
FE (functional earth ground) is a separate potential area.

Separate system potentials consisting of NIU/power terminal and I/O terminal	
- Test distance	**- Test voltage**
5V supply incoming remote bus / 7.5V supply (bus logic)	500VAC, 50Hz, 1 min.
5V supply outgoing remote bus / 7.5V supply (bus logic)	500VAC, 50Hz, 1 min.
7.5V supply (bus logic) / 24V supply (I/O)	500VAC, 50Hz, 1 min.
24V supply (I/O) / functional earth ground	500VAC, 50Hz, 1 min.

Error Messages to the Control System
I/O error message for defective or missing fuse