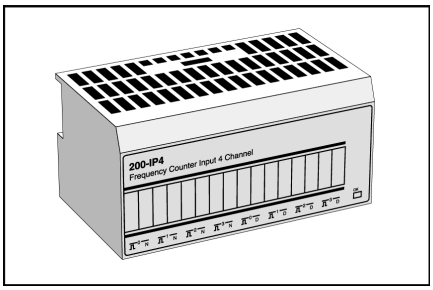
200-IP4



I/O unit with four pulse transmitter interfaces, each with two optocoupled inputs. The maximum pulse frequency is 100 kHz. The I/O unit is configured using the control system program.

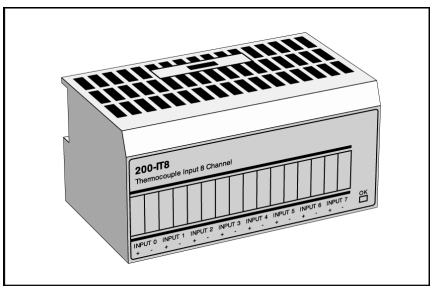
200-IP4 can be adapted for a wide range of applications, for example, for counting pulses from flow and density meters, quantity counting and speed calculation.

200-IP4 has two 16-bit counters per channel. Each can be individually configured for either period time measurement, using one 16-bit counter and accumulating pulse counting using the other 16-bit counter **or** period time measurement using a 32-bit counter.

An internal clock (1 or 10 MHz) is used for the period time measurement.

The status of each input signal is indicated by a yellow LED. One bi-coloured LED indicates function status.

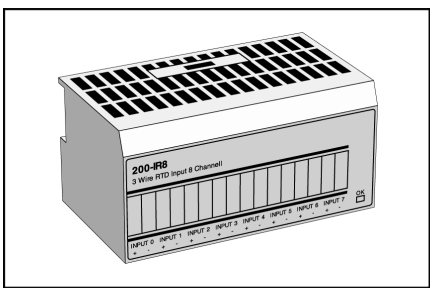
200-IT8



I/O unit for eight thermocouple input signals with programmable filters and 16-bit resolution. One bi-coloured LED indicates power on/off.

Terminal base unit TB3T must always be used. An additional power supply is required.

200-IR8

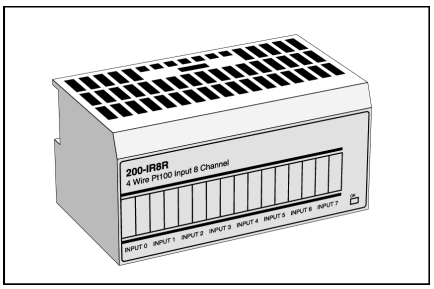


I/O unit for eight three-wire RTD input signals with programmable filters and 16-bit resolution. A number of sensors are supported. One bi-coloured LED indicates function status.

The inputs are, as a group of eight, galvanically isolated from the system by optocouplers. Each channel can be turned off to improve system throughput.

An additional power supply is required.

200-IR8R



I/O unit for eight four-wire RTD input signals. The inputs have programmable filters and 16-bit resolution. One sensor type is supported.

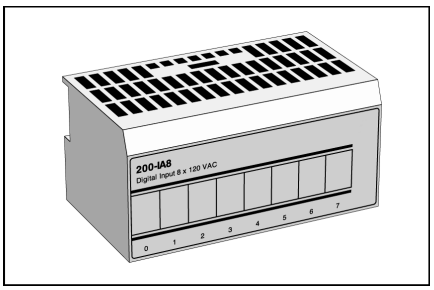
The status of each input signal is indicated by a yellow LED. A green LED indicates function status.

The inputs are, as a group of eight, galvanically isolated from the system by optocouplers. Each channel can be turned off to improve system throughput.

An additional power supply is required.

200-IA8

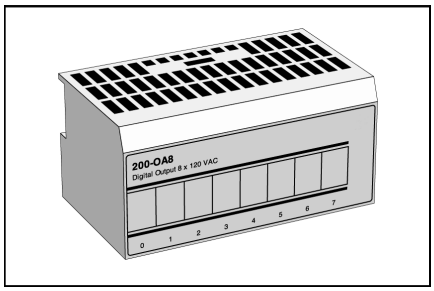
I/O unit for eight digital 120 V AC input signals. The status of each input signal is indicated by a yellow LED. Each signal is filtered with a low-pass filter.



The input signals are sampled at intervals determined by the filter time. The signal status is changed only if two consecutive samples are the same. The filter time is set with the programming software.

The eight inputs share a common voltage connection.

200-OA8



I/O unit for eight digital 120 V AC output signals. The status of each output signal is indicated by a yellow LED.

Output indicators will not work unless 120 V AC is supplied.

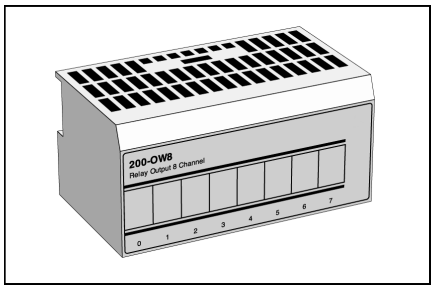
The eight outputs share a common 0 V AC connection.

200-OW8

I/O unit for eight relay output signals. The status of each output signal is indicated by a yellow LED.

If the voltage exceeds 132 V, terminal base unit 200-TBN or 200-TBNF must be used.

An additional power supply is required.



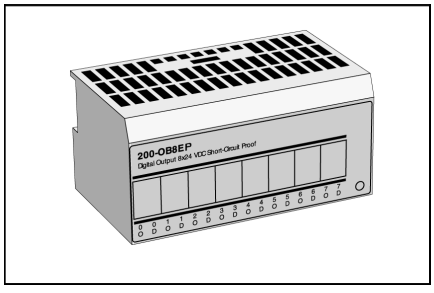
200-OB8EP

I/O unit for eight short-circuit proof output signals. The unit is intended for detection of short-circuit condition in its output circuit or low impedance loads causing excessive current drain. Each of the eight output channels has a current sensing circuit. The unit is designed to allow up to 2.0 A current per channel.

The status of each output signal is indicated by a yellow LED. Diagnostics are carried out for each output and a fault is indicated by a red LED.

By pressing a manual reset button, all output faults are reset simultaneously. Diagnostics and reset functions are fully accessible from the application.

The eight outputs share a common ground connection.



Technical Data

General specifications

Power supply	24 V DC (19.2–30 V DC) incl. 5% ripple acc. to EN 61131-2 standard i.e. +20%, -15% and max. 5% ripple
Temperature (unless stated otherwise)	
Operating	±0 °C to +55 °C
Non-operating	–40 °C to +85 °C
Protection rating	IP20
Environment	Industrial areas
Approvals (when product or packaging is marked)	CE marked and meets EMC directive 89/336/EEC according to EN 50081-2 and EN 50082-2. Low Voltage Directive 73/23/EEC with suppl. 93/68/EEC acc. to EN 61131-2 (only appl. for units connected to 50–1000 V AC and/or 75–1500 V DC). UL listed according to UL 508. CSA certified; class 1 div. 2 hazardous locations.
Package volume	
1 unit	H133 x W133 x D93 mm (1.65 dm^3)
10 units	H278 x W470 x D150 mm (19.60 dm^3)
Dimensions	H 46 x W 94 x D 53 mm
Weight (unless stated otherwise)	0.085 kg excl. package 0.180 kg incl. package

200-IB16

Number of inputs	16 positive logic
Galvanic isolation	Yes (via optocouplers)
Status indicators	16 yellow LEDs for input indications
ON-state input voltage	10.0 V DC min., 24 V DC nominal, 31.2 V DC max.
ON-state input current	2.0 mA min., 8.0 mA nominal at 24V DC, 12.0 mA max.
OFF-state input voltage	5.0 V DC max.
OFF-state input current	Current must be ≤1.5 mA to be defined as being in OFF state
Filter time	Software programmable
Filter	First-order, low-pass filter with time constant 5 µs
Input impedance	4.6 kΩ max.
Isolation voltage	100% tested at 850 V DC for 1 s between user and system. No isolation between individual channels
Internal current consumption (from serial bus)	30 mA max.
Power dissipation	6.1 W at 31.2 V DC max.
Unit identity	281H
Counter	5 bits on channel 15. 500 Hz max. Min. pulse width 1 ms
Backplane key code	2
Humidity	Max. 5–95%, non-condensing
Order code	200-IB16

200-OB16, 200-OB16P

Number of outputs	16 positive logic
Galvanic isolation	Yes (via optocouplers)
Status indicators	16 yellow LEDs for output indications
ON-state voltage range	10 V DC min., 24 V DC nominal, 31.2 V DC max.
ON-state voltage drop	0.5 V DC max.
Output current rating	8 A (16 outputs at 0.5 A)
ON-state current	1.0 mA min. per channel 450 mA max. per channel when in parallel 500 mA max. per channel
OFF-state voltage	31.2 V DC max.
Surge current	
200-OB16	2 A for 50 ms, repeatable every 2 s
200-OB16P	1.5 A for 50 ms, repeatable every 2 s
OFF-state leakage	0.5 mA max.
Isolation voltage	100% tested at 850 V DC for 1 s between plant and system. No isolation between individual channels
Output signal delay	
OFF to ON	0.5 ms max.
ON to OFF	1.0 ms max.
Internal current consumption (from serial bus)	
200-OB16	80 mA max.
200-OB16P	60 mA max.
Power dissipation	5.3 W at 31.2 V DC max.
Unit identity	
200-OB16	191H
200-OB16P	108H
Backplane key code	2
External DC power	
Supply voltage	24 V DC nom. (19.2–31.2 V DC)
Supply current	49 mA at 24 V DC (38 mA–65 mA)
Humidity	Max. 5–95%, non-condensing
Fuse	
200-OB16	800 mA (when used in TBNF)
200-OB16P	Outputs are electronically protected
Order codes	200-OB16 200-OB16P

200-IB10xOB6

General specifications:

Galvanic isolation	Yes (via optocouplers)
Status indicators	16 yellow LEDs for in/output indications
Isolation voltage	100% tested at 2100 V DC for 1 s between plant and system
Internal current consumption (from the serial bus)	35 mA max.
Power dissipation	4.0 W at 31.2 V DC max.
Unit identity	100H
Backplane key code	2
External DC Power	
Supply voltage	24 V DC nom. (19.2–31.2 V DC)
Supply current	70 mA at 24 V DC (not incl. outputs)
Humidity	Max. 5–95%, non-condensing
Order code	200-IB10xOB6

Input specifications:

Number of inputs	10 positive logic, non-isolated
ON-state input voltage	10 V DC min., 24 V DC nominal, 31.2 V DC max.
ON-state input current	2.0 mA min., 8.0 mA nominal, 11.0 mA max.
OFF-state input voltage	5 V DC max.
OFF-state input current	Current ≤1.5 mA to be defined as being in OFF state
Input impedance	4.4 kΩ max.
Filter time	Software programmable
Filter	First-order, low-pass filter with time constant 100 µs (i.e. time to reach 63% of FS)

Output specifications:

Number of outputs	6 positive logic
ON-state voltage range	10 V DC min., 24 V DC nominal, 31.2 V DC max.
ON-state current	1.0 mA per output min., 2.0 A per output max., 10 A per unit max.
OFF-state voltage	31.2 V DC max.
Output current rating	2 A per output, 10 A per unit
Surge current	4 A for 50 ms each, repeatable ev. 2 s
OFF-stage leakage	0.5 mA max.
ON-stage voltage drop	2 V DC at 2 A, 1 V DC at 1 A

200-IP2, 200-IP4

Number of inputs	
200-IP2	2 pulse counter interfaces, each with 4 inputs
200-IP4	4 frequency counter interfaces, each with 2 inputs
Counting frequency	Max. 100 kHz. Each signal condition must be stable for at least 2 µs to be recognized by the counter logic
200-IP4 only	Min. 15.3 Hz for a 16 time period measurement and internal clock = 1 MHz. Only one period can be measured. Min. 153 Hz for int. clock = 10 MHz
Galvanic isolation	Yes (via optocouplers)
Status indicators	
200-IP2	2 x 6 yellow LEDs for I/O status 1 red/green LED for OK status
200-IP4	4 x 2 yellow LEDs for I/O status 4 x 2 yellow LEDs for selected measurement function 1 red/green LED for OK status
Input range (2 x 4 input signals) **Terminal "+" and "-" for each input**	
Input ON (active)	Max. +26.4 V DC, (24 V DC +10 %). Min. +6 V DC
Input OFF (inactive)	Max. +3.0 V DC Min. –26.4 V DC
Input current	Typ. 3 mA at 6 V DC Typ. 8 mA at 12 V DC Typ. 15 mA at 24 V DC
Voltage range – external power supply	12–24 V DC ±10 %
Current consumption – external power supply	150 mA at 12 V DC 75 mA at 24 V DC
Isolation voltage	500 V DC
Internal current consumption (from serial bus)	5 mA
Power dissipation	Max. 5 W (at 24 V input voltage at all inputs)
Unit identity	
200-IP2	1800 (hex)
200-IP4	1A00 (hex)
Backplane key code	1
Temperature	
Operating	+5 °C to +55 °C
Non-operating	–25 °C to +70 °C
Humidity	5–95%, non-condensing
Weight	0.12 kg excl. package 0.20 kg incl. package
Order codes	200-IP2 200-IP4

200-IE8

Number of inputs	8 single-ended
Galvanic isolation	Yes (via optocouplers)
Status indicators	One green LED for Power
Resolution	12-bit
Input current range	4–20 mA, 0–20 mA
Input voltage range	2–10 V DC, ±10 V DC, 0–10 V DC
Input resistance	
Voltage	200 kΩ
Current	238 Ω
Filter	First-order, low-pass filter with time constant 100 ms (i.e. time to reach 63% of FS)
Non-linearity	
Voltage	0.05% max.
Current	0.10% max.
Accuracy	
Voltage terminal	± 0.2% FS at 25 °C
Current terminal	± 0.2% FS at 25 °C
Accuracy drift with temperature	
Voltage terminal	± 0.0043% FS/°C
Current terminal	± 0.0041% FS/°C
Repeatability	± 0.05% of FS
Overload (without damage)	
Voltage	30 V DC continuously
Current	32 mA continuously, one channel at a time max.
Isolation voltage	Type-test voltage: 850 V DC for 1 s between user and system. No isolation between individual channels
Internal current consumption (from serial bus)	20 mA max.
Power dissipation	3 W at 31.2 V DC max.
Unit identity	1924H
Backplane key code	3
External DC Power	
Supply voltage	24 V DC nom. (19.2–31.2 V DC)
Supply current	60 mA at 24 V DC (typ.)
Humidity	Non-condensing
Operating	Max. 5–95%
Non-operating	Max. 5–80%
Order code	200-IE8

200-OE4

Number of outputs	4
Galvanic isolation	Yes (via optocouplers)
Status indicators	One green LED for Power
Resolution	12-bit plus sign
Output voltage range	2–10 V DC, ±10 V DC, 0–10 V DC
Output current range	4–20 mA, 0–20 mA
Time to reach 63% of FS	24 ms (first-order, low-pass filter time constant)
Current load on voltage output	3 mA max.
Resistive load on mA output	15–750 Ω
Non-linearity	
Voltage	0.1%
Current	0.1%
Accuracy	
Voltage terminal	± 0.13% FS at 25°C
Current terminal	± 0.43% FS at 25°C
Accuracy drift with temperature	
Voltage terminal	± 0.005% FS/°C
Current terminal	± 0.007% FS/°C
Isolation Voltage	Type-test voltage: 850 V DC for 1 s between user and system. No isolation between individual channels
Internal current consumption (from serial bus)	20 mA max.
Power dissipation	4.5 W at 31.2 V DC max.
Unit identity	1125H
Backplane key code	4

External DC Power	
Supply voltage	24 V DC nom. (19.2–31.2 V DC)
Supply current	70 mA at 24 V DC (not incl. outputs)
Humidity	Non-condensing
Operating	Max. 5–95%
Non-operating	Max. 5–80%
Order code	200-OE4

200-IE4xOE2

General specifications:

Number of inputs	4 single-ended
Number of outputs	2 single-ended
Galvanic isolation	Yes (via optocouplers)
Status indicators	One green LED for Power
Resolution	12-bit
Isolation Voltage	Type-test voltage: 850 V DC for 1 s between user and system. No isolation between individual channels
Internal current consumption (from serial bus)	20 mA max.
Power dissipation	4.0 W at 31.2 V DC max.
Unit identity	1526H
Backplane key code	5
External DC Power	
Supply voltage	24 V DC nom. (19.2–31.2 V DC)
Supply current	70 mA at 24V DC (not incl. outputs)
Humidity	Non-condensing
Operating	Max. 5–95%
Non-operating	Max. 5–80%
Order code	200-IE4xOE2

Input specifications:

Number of inputs	4 single-ended
Input voltage range	2–10 V DC, ±10 V DC, 0–10 V DC
Input current range	4–20 mA, 0–20 mA
Input resistance	
Voltage	200 kΩ
Current	238 Ω
Filter	First-order, low-pass filter with time constant 100 ms (i.e. time to reach 63% of FS)
Accuracy	
Voltage terminal	± 0.3% FS at 25°C
Current terminal	± 0.3% FS at 25°C
Accuracy drift with temperature	
Voltage terminal	± 0.0045% FS/°C
Current terminal	± 0.0045% FS/°C
Overload without damage	
Voltage	30 V DC continuously
Current	32 mA continuously, one channel at a time max.

Output specifications:

Number of outputs	2 single-ended, non-isolated
Output current range	4–20 mA, 0–20 mA
Output voltage range	2–10 V DC, ±10 V DC, 0–10 V DC
Time to reach 63% of FS	24 ms (first-order, low-pass filter time constant)
Current load on voltage output	3 mA max.
Resistive load on mA output	15–750 Ω
Non-linearity	
Current	0.1%
Voltage	0.1%
Accuracy	
Voltage terminal	± 0.14% FS at 25°C
Current terminal	± 0.43% FS at 25°C
Accuracy drift with temperature	
Voltage terminal	± 0.005% FS/°C
Current terminal	± 0.007% FS/°C

200-IT8

Number of inputs	8
Galvanic isolation	Yes
Status indicator	Bi-colour (green/red) LED for OK
Resolution	16-bits
Input voltage range	± 76.5 mV DC
Overvoltage capability	35 V DC, 25 V AC continuous at 25 °C, 250 V peak transient
Accuracy with filter	0.025% of FSR ± 0.5 °C max.
Accuracy without filter	0.05% of FSR ± 0.5 °C max.
Filter	Programmable
Internal current consumption (from serial bus)	20 mA max.
Normal mode noise rejection	–60 dB at 60 Hz
Common mode rejection	–115 dB at 60 Hz; –100 dB at 50 Hz
System throughput	Progammable 28–325 ms for 1 channel; 2.6 s for 8 channels
Open-thermocouple detection	Out of range reading (upscale)
Open-thermocouple detection time	1 s, typically
Input offset drift with temperature	± 6 µV/°C max.
Gain drift with temperature	10 ppm/°C
Overall drift with temperature	50 ppm 1 °C of span max.
Supported thermo-couple types	Millivolt ± 76.5 mV Type B: +300–+1800 °C Type C: ±0–+2315 °C Type E: -270–+1000 °C Type J: -210–+1200 °C Type K: -270–+1372 °C Type N: -270–+1300 °C Type R: -50–+1768 °C Type S: -50–+1768 °C Type T: -270–+400 °C
Power dissipation	3 W at 31.2 V DC max.
Unit identity	1B00H
Backplane key code	3
External DC Power	
Supply voltage	24 V DC nom. (19.2–31.2 V DC)
Supply current	60 mA at 24 V DC
Humidity	
Operating	5–95%, non-condensing
Non-operating	5–80%, non-condensing
Order code	200-IT8

200-IR8

Number of inputs	8
Galvanic isolation	Yes (via optocouplers)
Status indicators	Bi-colour (green/red) LED for Power
Resolution	16-bit across 435 Ω
Input range	1–433 Ω
Overvoltage capability	±35 V DC, 25 V AC continuous at 25 °C, 250 V peak transient
Filter	Programmable
Accuracy without calibration and at low humidity levels	0.05% of FSR max. in normal mode (0.01% of FSR typ. in enhanced mode) at 25 °C

Internal current consumption (from serial bus)	20 mA max.
Normal mode noise rejection	60 dB at 60 Hz
Calibration	Programmable
Common mode rejection	120 dB at 60 Hz, 100 dB at 50 Hz. For A/D filter cut-off at 10 Hz
System throughput	Normal mode, programmable 28 ms–325 ms/channel. Enhanced mode, programmable 56 ms–650 ms/channel
Open-wire detection	Out of range reading (upscale)
Open-wire detection time	< 1 s
RTD excitation current	718 µA
Input offset drift with temperature	1.5 mΩ/°C max.
Gain drift with temp.	35 ppm/°C
Supported sensors (resistance)	1–433 Ω 500 Ω Pt Euro -200–+630 °C 200 Ω Pt Euro -200–+630 °C 100 Ω Pt Euro -200–+870 °C 100 Ω Pt U.S. -200–+630 °C 500 Ω Ni -60–+250 °C 200 Ω Ni -60–+250 °C 120 Ω Ni -80–+290 °C 100 Ω Ni -60–+250 °C 10 Ω Cu -200–+260 °C
Unit identity	1B25H
Power dissipation	3 W at 31.2 V DC max.
Backplane key code	7
External DC power	
Supply voltage	24 V DC nominal
Supply current	60 mA at 24 V DC
Humidity	Non-condensing
Operating	Max. 5–95%
Non-operating	Max. 5–80%
Order code	200-IR8

200-IR8R

Number of inputs	8
Galvanic isolation	Yes
Status indicators	8 yellow LEDs for I/O status 1 green LED for OK status
Resolution	16-bits
Input range	0–100% (0–65535) corresponding to -60 °C to +160 °C
Overvoltage capability	±35 V DC, 25 V AC continuous at 25 °C, 250 V peak transient
Filter	Programmable
Accuracy	±0.1 °C in the range -5 to +100 °C Pt100 sensor: Type IEC 751
Long term stability	
1 year	±0.006 °C
3 years	±0.013 °C
Internal current consumption (from serial bus)	20 mA max.
Normal mode noise rejection	60 dB at 50 Hz for A/D filter cut-off at 10 Hz
Calibration	Factory calibrated
Common mode rejection	120 dB at 60 Hz; 100 dB at 50 Hz for A/D filter cut-off at 10 Hz
System throughput	150 ms per channel at 50 Hz
Open or short-circuit RTD detection	Out of range reading and individual fault indication
Open-wire detection or short-circuit detection time	< 1 s
RTD excitation current	About 1.8 mA, alternating direction
RTD algorithm	ITS 90
Supported sensors (resistance)	100 Ω Pt Euro -60–+160 °C (α = 0.00385) IEC 751
Unit identity	1900H
Power dissipation	3 W at 30.0 V DC max.
Backplane key code	2
External DC power	
Supply voltage	24 V DC nominal (19.2–30.0 V DC)
Supply current	100 mA at 24 V DC
Temperature	
Operating	+5 °C to +55 °C
Non-operating	–25 °C to +70 °C
Humidity	Non-condensing
Operating	Max. 5–95%
Non-operating	Max. 5–80%
Order code	200-IR8R

200-IA8

Number of inputs	8 (1 group of 8), non-isolated
Galvanic isolation	Yes (via optocouplers)
Status indicators	8 yellow LEDs (field side indication)
ON-state voltage	65 V AC min.
OFF-state voltage	43 V AC max.
ON-state current	7.1 mA min.
OFF-state current	2.9 mA max.
Filter time	Software programmable
Filter	First-order, low-pass filter with time constant 8 ms
Isolation voltage	100% tested at 2150 V AC for 1 s between user and system. No isolation between individual channels
Input impedance	10.6 kΩ nominal
Internal current consumption (from serial bus)	30 mA max.
Power dissipation	4.5 W at 132 V AC max.
Unit identity	285H
Backplane key code	8
External AC Power	
Supply voltage	120 V AC nominal
Input frequency	47–63 Hz
Voltage range	85–132 V AC
Humidity	Max 5–95%, non-condensing
Order code	200-IA8

200-OA8

Number of outputs	8 (1 group of 8), non-isolated
Galvanic isolation	Yes (via optocouplers)
Status indicators	8 yellow LEDs
Output voltage range	85–132 V AC, 47–63 Hz
Output current range	4.0 A (8 outputs at 500 mA)
ON-state voltage drop	1.0 V AC at 0.5 A min.
Inrush current	7 A for 45 ms, repeatable every 8 s
OFF-state leakage	2.25 mA max.
Isolation voltage	100% tested at 1250 V AC for 1 s between user and system. No isolation between individual channels
Output signal delay	
OFF to ON	1/2 cycle max.
ON to OFF	1/2 cycle max.
Internal current consumption (from serial bus)	80 mA max.
Power dissipation	5.2 W at 132 V AC
Unit identity	195H
Backplane key code	8