technical datasheet

9188

8 segment redundant fieldbus power for Yokogawa CENTUM CS3000

- Redundant fieldbus power for Foundation™ fieldbus cards
- Integrated connections to redundant ALF111 Foundation fieldbus™ communication modules
- Flexible N+1 redundancy
- Low lifetime costs
- Low capital cost whilst supporting future expansion
- Fully isolated
- Hot swappable power modules*
- Low power dissipation
- On-line diagnostics option
- Pluggable trunk surge protection option

The 9188 fieldbus power system is designed to provide redundant power for eight, or four, Foundation™ fieldbus H1 segments on the Yokogawa CENTUM CS3000. It is optimised for use in general purpose and hazardous area High Energy Trunk architectures which, with the appropriate FieldPlus wiring components, supports fieldbus devices using all hazardous area protection techniques. The power supply has been designed to optimise cabinet layouts, maximising the number of fieldbus segments powered per cabinet while providing space for installing and maintaining cable connections and minimising the operating temperature.

Power for the fieldbus segments is provided by two groups of up to three 919x-FP 4-segment power modules, operating in N+1 redundant configuration (load sharing). For redundant applications requiring 250 to 500mA current per segment, three 9191-FP power modules are fitted on the carrier for each 4 segment group. For redundant applications, initially requiring up to 250mA current per segment, two 9191-FP modules are fitted on the carrier, with the option of adding a third power module to allow for future segment expansion.

Failure alarms and galvanic isolation are incorporated into each 919x-FP module. Passive inductors and terminators on each fieldbus segment deliver the highest level of availability.

Each 919x-FP module monitors the output of the four fieldbus segments and indicates an alarm (by means of a built-in, normally-closed relay) if any of the segments is shorted, or its output is below the minimum output voltage threshold. Failure of either of the bulk power input supplies is also announced. The alarm contacts are volt-free and galvanically isolated from other circuitry. Connections to the alarm relays are made via terminals on the 9188-CA-Px carrier; a separate alarm module is not required for this function. LED indicators show the status of each 919x-FP module and that of the four individual segments. In normal operation each segment LED is lit, showing that the segment is powered. If a segment is shorted, this LED is extinguished, and the module Alarm LED is lit.

The 919x-FP module provides galvanic isolation between the 24V DC input power and the fieldbus segments, as required by the IEC61158-2 fieldbus standard and the Fieldbus Foundation™ FF-831 validation test for power supplies. There is also galvanic isolation between the fieldbus segments, thereby preventing multiple segment failures due to ground faults on more than one segment.

A separate physical layer diagnostics module may be installed on the carrier to automatically collect and distribute additional diagnostic information for each of the eight fieldbus segments. For more information see the **F809F** product specification.

Pluggable surge-protection components for each fieldbus trunk are available as an option reducing the installed cost of providing surge protection on fieldbus networks.

Redundant 24V DC (nom.) input power is connected to the 9188-CA-Px carrier using two-part pluggable connectors. System connections are compatible with ALF111 fieldbus communication modules, via AKB336 cables, and field wiring connections are available with either pluggable screw terminals (9188-CA-PS) or pluggable spring clamp terminals (9188-CA-PC). The pluggable connections are screw-retained providing a reliable connection in an industrial environment.

* *Gas clearance certificate required in Zone 2/Division 2 hazardous areas*

SPECIFICATION

Location of equipment
Safe area,
Class I Div 2 Groups ABCD T4 or
Class I Zone 2 IIC T4 †

OUTPUT

	9191-FP
Number of channels	Four (4)
Voltage (DC)	28.0 - 32.0V
Design current (per segment)	0 to 250mA
Current limit	>320mA
Minimum load	0mA

9189 SYSTEM

Input voltage (DC)	19.2 - 30.0V
Isolation	
Fieldbus to input power	500V AC rms withstand ‡
Segment to segment	850V DC withstand

‡ *in accordance with FF-831*

	9188-61-P*	9188-91-P*
Current consumption (24V input, all outputs fully loaded)	2.9A	5.7A
Power dissipation/segment (24V input, all outputs fully loaded)	1.3W	2.5W
Number of channels	Eight (8)	Eight (8)
Voltage (DC)	As module	As module
Design current (per segment)	0 to 250mA	0 to 500mA

	9188-21-P*	9188-41-P*
Current consumption (24V input, all outputs fully loaded)	1.5A	2.9A
Power dissipation/segment (24V input, all outputs fully loaded)	1.3W	2.5W
Number of channels	Four (4)	Four (4)
Voltage (DC)	As module	As module
Design current (per segment)	0 to 250mA	0 to 500mA

ALARMS

Alarm contact rating
1A maximum @ 30V DC maximum

Alarm contact status
Normally closed

Alarm threshold	**9191-FP**
Segment output voltage	<16V

CONNECTIONS

ELECTRICAL CONNECTIONS

System connectors
Host 1A, Host 1B, Host 2A, Host 2B via AKB336 cables to ALF111 modules

Optional Diagnostics segment terminals
3-way fixed screw terminal connector 0.14 to 2.5 mm^2

Field & Power terminals
Pluggable rising cage-clamp screw terminals (-PS)
Conductor size: 0.14 to 2.5 mm^2
Pluggable spring-clamp screw terminals (-PC)
Conductor size: 0.2 to 2.5 mm^2

Alarm & ground terminals
2-way fixed screw terminal connector 0.14 to 2.5 mm^2

Cable screen ground connections
Common connection for segment shields and ground

Terminators
A single termination is provided on each segment

ENVIRONMENTAL

Ambient temperature - operating
–20°C to +60°C (optimum orientation)
–20°C to +50°C (non-optimum orientation)

Ambient temperature - storage
–40°C to +85°C

Relative Humidity
< 95%, non-condensing

Ingress protection
IP20 to BS EN 60529 (Additional protection by means of enclosure)

MECHANICAL

Dimensions
See following page

Mounting options
- Integrated fixings for 'Top hat' DIN rail, 35mm x 7.5mm to EN50022
- Four-hole surface mount - M4

Weights

9191-FP	0.2kg
9188-CA-P*	1.1kg

ELECTRICAL

EMC Compliance
To EN61326:2006 Electrical equipment for measurement, control and laboratory use - EMC requirements

PHYSICAL NETWORKS

IEC61158-2
ISA-S50.02 Part 2-1992
Foundation™ fieldbus H1
Profibus PA

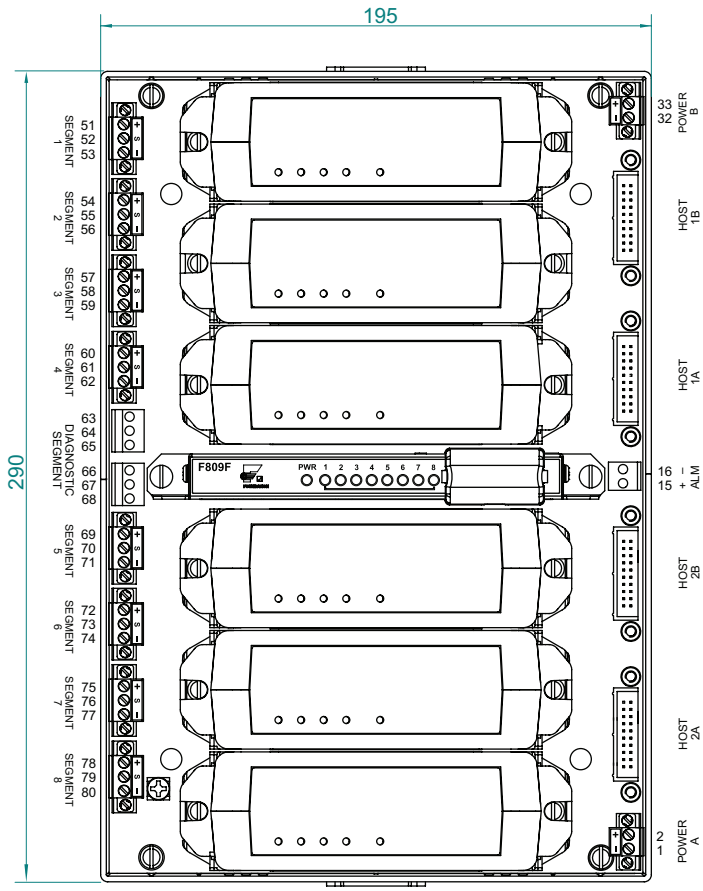
ORDERING INFORMATION

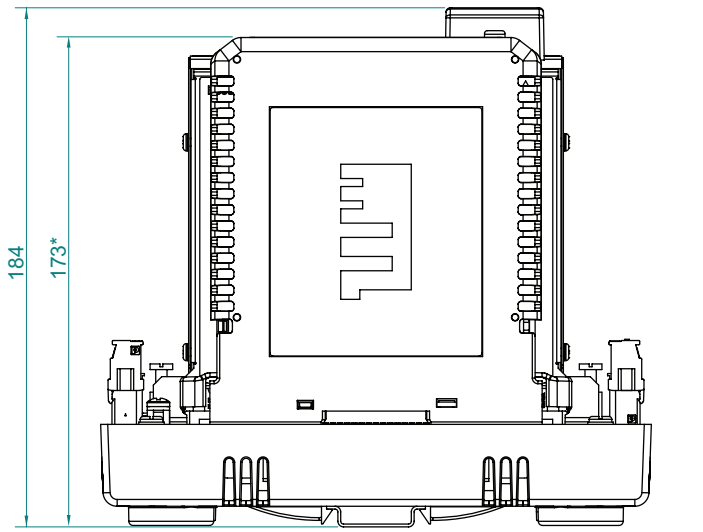
PART NO	DESCRIPTION
9188-CA-P*	Carrier, unpopulated
9191-FP	4-segment power module: 28V, 250mA
9197-BLK	Alarm blanking module *(used in any empty power module position to defeat the carrier alarm)*
9188-21-P*	4 segment system with 9188-CA-P* carrier, 2 x 9191-FP and 4 x 9197-BLK
9188-41-P*	4 segment system with 9188-CA-P* carrier, 3 x 9191-FP and 3 x 9197-BLK
9188-61-P*	8 segment system with 9188-CA-P* carrier, 4 x 9191-FP and 2 x 9197-BLK
9188-91-P*	8 segment system with 9188-CA-P* carrier and 6 x 9191-FP
F809F	Fieldbus diagnostic module

* = S or C
S = Pluggable Screw Terminal Connectors
C = Pluggable Spring Clamp Connectors

† *certificate pending*

DIMENSION DRAWING





* This dimension applies if the F809F diagnostic module is not used.

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APPROVALS - *for the latest certification information visit www.mtl-inst.com/support/certificates/*

Region (Authority)	Standard	Certificate	Approved for	Ratings
(Fieldbus Foundation™)	FF-831	PS079000	–	Power Supply Type 132
US (FM)	3600, 3611, 3610	Pending	Class I, Div 2, ABCD, T4 Class I, Zone 2, IIC, T4	V_{max} = TBA
Canada (FM)	C22.2 No. 213 C22.2 No. 142	Pending	Class I, Div 2, ABCD, T4 Class I, Zone 2, IIC, T4	V_{max} = TBA
IECEx (Baseefa)	IEC 60079-0:2004 IEC 60079-15:2005	Pending	Ex nA IIC T4	U_o = TBA
Europe (MTL)	EN 60079-0:2011 EN 60079-15:2010	Pending	Ex nA IIC T4	U_o = TBA

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