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REPORT

On

PROGRAMMABLE CONTROLLERS
FOR USE IN HAZARDOUS LOCATIONS

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DESCRIPTION

PRODUCT COVERED:

USL, CNL - Class I, Div. 2, Groups A, B, C, D Hazardous Locations
Fiber optic repeaters, Models OZD-CN-RA-MM may be followed by /B,
OZD-CN-RA-SM may be followed by /B, OZD genius G12, OZD Modbus G12, OZD
genius G12-1300. OZD 485 G12 may be followed by -1300, may be followed
by PRO.

ENGINEERING CONSIDERATIONS (NOT FOR FIELD REPRESENTATIVE'S USE):

For all models:

**CNL indicates investigation to Canadian Standards C22.2 No. 213-M1987
"Nonincendive Electrical Equipment for Use in Class I, Div. 2 Hazardous
Locations".**

**USL indicates investigation to United States Standard ANSI/ISA-
12.12.01-2012, "Nonincendive Electrical Equipment for Use in Class I and II,
Division 2 and Class III, Division 1 and 2 Hazardous (Classified) Locations".**

**For OZD-CN-RA-MM(/B), OZD-CN-RA-SM(/B), OZD genius G12, OZD Modbus G12 and
OZD genius G12-1300:**

*CNL indicates investigation to Canadian Standard C22.2 No. 142-M1987
"Process Control Equipment".

*USL indicates investigation to United States Standard **UL 508**,
Seventeenth Edition, "Industrial Control Equipment".

GENERAL:

*OZD-CN-RA-MM(/B), OZD-CN-RA-SM(/B):

These are open type fiber optic repeater modules, DIN rail mounted,
designed to mount within an enclosure and mate with Rockwell Automation
Modular Repeater Adapter, Cat. Nos. 1786-RP(xx). They receive Class 2 power
from the Rockwell module. The four fiber optic modules are identical except
for the transmit and receive diodes. Models OZD-CN-RA-MM(/B) are for multi-
mode glass fiber; Models OZD-CN-RA-SM(/B) are for single-mode glass fiber.
Models designated with /B additional feature fault contacts.

OZD genius G12, OZD Modbus G12 and OZD genius G12-1300:

The Fiber-optic repeater OZD Genius G12 is designed for use in optical
Genius bus Field bus networks. It permits conversions of electrical Genius
bus interface into optical Genius bus interface and vice versa. The
mechanical structure comprises a compact, rigid metal (die-cast zinc/sheet
aluminum) housing, which can either be mounted on a hat rail or on any flat
base. Model OZD genius G12 is for multi-mode glass fiber; Model OZD genius
G12-1300 is for single-mode glass fiber. They receive Class 2 power from a
SELV power supply.

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OZD 485 G12(PRO), and OZD 485 G12-1300(PRO):

The Fiber-optic repeater OZD 485 G12 is designed for use in field bus networks. It permits conversions of electrical RS485 bus interface into optical bus interface and vice versa. The mechanical structure comprises a compact, rigid metal (die-cast zinc/sheet aluminum) housing, which can either be mounted on a hat rail or on any flat base. The PRO modules are comprised in a plastic housing.

Model OZD 485 G12 (PRO) is for multi-mode glass fiber (860 nm); Model OZD 485 G12-1300 (PRO) is for single-mode glass fiber as well (1300 nm). They receive Class 2 power from a SELV power supply.

The OZD 485 G12(PRO) and OZD 485 G12-1300(PRO) products shall comply with ordinary locations File E175531, issued date 2004-12-07, Programmable Controllers, covering for this manufacturer and with the following description. Should the Procedure File E175531, issued date 2004-12-07 be withdrawn, labeling under this Procedure must be discontinued until authorization to resume is received.

ENVIRONMENTAL RATINGS:

Models OZD-CN-RA-MM, OZD-CN-RA-SM, OZD-CN-RA-MM(/B), OZD-CN-RA-SM(/B), OZD Modbus G12:

Ambient Temperature Range: 0°C to +60°C. Temperature Code T4.

OZD genius G12, and OZD genius G12-1300:

Ambient Temperature Range: 0°C to +55°C. Temperature Code T4.

OZD 485 G12 and OZD 485 G12-1300:

Ambient Temperature Range: -25°C to +60 °C. Temperature Code T4.

OZD 485 G12 PRO, and OZD 485 G12-1300 PRO:

Ambient Temperature Range: -25°C to +70 °C. Temperature Code T4.

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ELECTRICAL RATINGS:**All Models:****Relay contact Entity Parameters:**

Vmax = 30 Vdc

Imax = 0.09 A

Ci = 200 nF

Li = 5 mH

See Control Drawing 000100622DNR, I11. 20.

OZD-CN-RA-MM, OZD-CN-RA-SM:

5 Vdc, 2 W

OZD-CN-RA-MM(/B), OZD-CN-RA-SM(/B):

5.3 Vdc, 570 mA

OZD genius G12, and OZD genius G12-1300:

24 Vdc, 200 mA

OZD Modbus G12:

*24 Vdc, 150 mA - 48VDC, 85mA

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OZD 485 G12 and OZD 485 G12-1300:

*18 - 32 Vdc, 200 mA or less.

OZD 485 G12 PRO, and OZD 485 G12-1300 PRO:

*18 - 24 Vdc, 200 mA or less.

Optic output < 5 mW.

CONSTRUCTION DETAILS:

General - The assembly and construction details are shown in the following photographs associated descriptive pages, and illustrations. The general shape, size, and arrangement shall be as shown in the photographs unless specifically indicated. All dimensions are approximate unless otherwise indicated.

Edge Connectors and Wire Connectors - All edge connectors and wire connectors are provided with means for mechanically latching all mating plugs and receptacles. The **models OZD-CN** connect to other modules and **are** mechanically held in place.

Spacings - Spacings are not specified since the modules receive Class 2 power input from adjacent modules via the system "backplane" connector.

Models OZD-CN-RA-MM/B and OZD-CN-RA-SM/B:
Spacing of default relays contact circuit is 3.53 mm minimum.

Corrosion Protection - All iron or steel parts are suitably plated or painted to resist corrosion.

Printed Wiring Board - Any board rated 105°C minimum and soldered within the time/temperature limits tabulated in R/C directory is acceptable.

INSTALLATION AND OPERATING INSTRUCTIONS:

Installation and Operating Instructions are provided with each device. Installation Instructions should include statement that wiring must be in accordance with Class I, Div. 2 wiring methods and in accordance with the authority having jurisdiction.

Manual to contain the following statements:

- A. THIS EQUIPMENT IS SUITABLE FOR USE IN CLASS I, DIVISION 2, GROUPS A, B, C AND D OR NON-HAZARDOUS LOCATIONS ONLY.
- B. WARNING - EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.
- C. WARNING - EXPLOSION - HAZARD - DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.
- *D. Manual shall contain CONTROL DRAWING with **Entity parameters**.
- *E. **These devices are open-type devices that are to be installed in an enclosure suitable for the environment.**

MARKING:

The following marking is to be provided on the top of each enclosure:

- *1. **Listee or trademark or Filenumber.**
- 2. **Catalog or Model Number.**
- 3. **Electrical ratings: Voltage, frequency and either amperes, volt-amperes, or watts.**
- 3. Hazardous Location marking as shown under Product Covered.
- 4. "WARNING: Do not connect or disconnect while circuit is alive unless area is known to be non-hazardous" **or equivalent**
- 5. "For use in Class 2 circuits" **or equivalent.**
- 6. **Temperature marking "Temperature Code _", or the equivalent. See Environmental Ratings.**
- 7. **Reference number to Control Drawing (000100622DNR).**
- 8. **Ambient Temperature Range, See Environmental Ratings.**

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FIGURES AND ILLUSTRATIONS

| Name/Description | Drawing | Fig./Ill | Revision | Date |
|--|--------------|----------|----------|------|
| RESERVED | - | Ill. 1 | - | - |
| OZD 485 G12 circuit diagram | 000071208DNR | Ill. 2 | 3.10 | - |
| OZD 485 G12 1300 circuit diagram | 000070151DNR | Ill. 3 | 2.30 | - |
| RESERVED | - | Ill. 4 | - | - |
| RESERVED | - | Ill. 5 | - | - |
| RESERVED | - | Ill. 6 | - | - |
| RESERVED | - | Ill. 7 | - | - |
| RESERVED | - | Ill. 8 | - | - |
| RESERVED | - | Ill. 9 | - | - |
| RESERVED | - | Ill. 10 | - | - |
| RESERVED | - | Ill. 11 | - | - |
| OZD 485 G12 PRO circuit diagram | 000086141DNR | Ill. 12 | 2.00 | - |
| OZD 485 G12 1300 PRO circuit diagram | 000086142DNR | Ill. 13 | 2.10 | - |
| RESERVED | - | Ill. 14 | - | - |
| RESERVED | - | Ill. 15 | - | - |
| RESERVED | - | Ill. 16 | - | - |
| RESERVED | - | Ill. 17 | - | - |
| OZD 485 G12 PRO Endmontage (final assembly) | 943-894-321 | Ill. 18 | 02 | - |
| OZD 485 G12-1300 PRO Endmontage (final assembly) | 943-895-321 | Ill. 19 | 02 | - |
| Control Drawing | 000100622DNR | Ill. 20 | 2.0 | - |
| OZD-CN-RA-MM External | - | Fig. 1 | - | - |
| OZD genius G12 External | - | Fig. 2 | - | - |
| OZD 485 G12 External view | - | Fig. 3 | - | - |
| OZD 485 G12 Internal view | - | Fig. 4 | - | - |
| OZD 485 G12-1300PRO Internal view | - | Fig. 5 | - | - |
| OZD 485 G12-1300PRO External view-1 | - | Fig. 6 | - | - |
| OZD 485 G12-1300PRO External view-2 | - | Fig. 7 | - | - |

MODELS OZD-CN-RA-MM(/B) OR OZD-CN-RA-SM(/B) -
FIG. 1 (N00-25405)

***General - Communications devices. Fig. 1 shows OZD-CN-RA-MM(/B) which is representative of the OZD-CN-RA-SM(/B).**

*1. Enclosure Cover - Plastic, **approx.** 100 mm by 90 mm by 55 mm. Ventilation slots are **approx.** 3 mm by 12 mm, 18 slots in front; 54 slots in rear.

*Mounting Base - Plastic, **approx.** 100 mm by 90 mm by 13 mm.

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2. Relay - UL R/C (NWFN), manufactured by Tyco Electronics EC K K, Part No. PCN - 105D3MHZ, rated at 3 A, 30 V/250 V res. Relay contacts are limited in energy by Entity Parameters, see Control Drawing 000100622DNR.

Alternate - UL R/C (NRNT), manufactured by Matsushita / NAIS PA1a-5V

3. Bus Connector - UL R/C (XCFR), manufactured by RIA CONNECT INC, rated at 300 V, 12 A. Mounted on the side of the equipment and is used to interconnect similar devices together on the same DIN rail. Considered mechanically secure when DIN rail mounted.

4. Communications connectors - BNC type, considered to be mechanically secured.

5. Potentiometers - RV601 and RV701 - Internally mounted and inaccessible in normal use.

MODELS OZD genius G12, OZD Modbus G12 OR OZD genius G12-1300
FIG. 2 (D02-00048)

Fig. 2 shows an external view of OZD genius G12, and represents the modules OZD genius G12-1300 also covered by this report.

1. Enclosure Material - Die-cast zinc/sheet aluminum, approx. 110 mm by 75 mm by 40 mm.
2. Relay - UL R/C (NWFN), manufactured by Tyco Electronics EC K K, Part No. PCN - 105D3MHZ, rated at 3 A, 30 V/250 V res. Relay contacts are limited in energy by Entity Parameters, see Control Drawing 000100622DNR.

Alternate - UL R/C (NRNT), manufactured by Matsushita / NAIS PA1a-5V

3. Terminal Block R/C - (XCFR2), 4 pole, manufactured by PHOENIX CONTACT GMBH & CO KG, MVSTBR 2.5/4-ST-BK with MSTBA 2.5/4-G. Secured by non-90deg latch hook on the connector assembly.

Alternate - same as above, except manufactured by RIA CONNECT INC., Cat. No. 31030104 with 31009104. Secured by non-90deg latch hook on the connector assembly.

4. Communications connectors - BNC type, considered to be mechanically secured.

MODELS OZD 485 G12, OZD Modbus G12 OR OZD 485 G12-1300
FIG. 3 and 4

Fig. 3 shows an external view of OZD 485 G12, and OZD 485 G12-1300 also covered by this report.

Fig. 4 shows an internal view of OZD 485 G12, and OZD 485 G12-1300 also covered by this report.

1. Enclosure Material - Die-cast zinc/sheet aluminum, approx. 110 mm by 75 mm by 40 mm.
2. Relay - UL R/C (NWFN), manufactured by Tyco Electronics EC K K, Part No. PCN - 105D3MHZ, rated at 3 A, 30 V/250 V res. Relay contacts are limited in energy by Entity Parameters, see Control Drawing 000100622DNR.

Alternate - UL R/C (NRNT), manufactured by Matsushita / NAIS PALa-5V

3. Terminal Block R/C - (XCFR2), 12 pole, manufactured by RIA CONNECT INC, cat. no. 31379112 with 31392112, rated 300V, 8 A, suitable for field wiring. Secured by screws.
4. Terminal Block R/C - (XCFR2), 5 pole, manufactured by PHOENIX CONTACT GMBH & CO KG, MVSTBR 2.5/5-ST-BK with MSTBA 2.5/5-G. Secured by non-90deg latch hook on the connector assembly.

Alternate - same as above, except RIA CONNECT INC., Cat. No.31030105 with 31009105. Secured by non-90deg latch hook on the connector assembly.

5. Terminal Block R/C - (XCFR2), 3 pole, manufactured by RIA CONNECT INC., cat. no. 31330103 with 31313103. Secured by non-90deg latch hook on the connector assembly.

Alternate - same as above, except PHOENIX CONTACT GMBH & CO KG, MC 1,5/3-ST-5.08 with MC 1.5/3-G. Secured by non-90deg latch hook on the connector assembly.

6. Communications connectors - BNC type, considered to be mechanically secured.
7. DIP switch array - 8 way, in a Nonincendive circuit protected by Voltage Regulator IC203 (3.3Vdc), IC302 (Altera EP1CT100I7) switch pins inherently limited to 25mA and resistors R324 to R331 rated 15kohm.
8. Potentiometers - RV601 and RV701 - Internally mounted and inaccessible in normal use.

Models OZD 485 G12(PRO), and OZD 485 G12-1300(PRO)

The PRO modules are comprised in a plastic housing.

These modules must be installed in an ANSI/UL50 enclosure suitable for the locations.

These modules must be installed as non-incendive, in accordance with control drawing Ill.20

Fig. 6-7 shows an external view of OZD 485 G12-1300PRO also covered by this report.

Fig. 5 shows an internal view of OZD 485 G12-1300PRO also covered by this report.

Control Drawing: Ill.20.

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1. Enclosure Cover - Plastic, approx. 110 mm by 75 mm by 40 mm.
2. Relay - UL R/C (NWFN), manufactured by Tyco Electronics EC K K, Part No. PCN - 105D3MHZ, rated at 3 A, 30 V/250 V res. Relay contacts are limited in energy by Entity Parameters, see Control Drawing 000100622DNR.

Alternate - UL R/C (NRNT), manufactured by Matsushita / NAIS PALa-5V
3. Terminal Block R/C - (XCFR2), 12 pole, manufactured by RIA CONNECT INC, cat. no. 31379112 with 31392112, rated 300V, 8 A, suitable for field wiring. Secured by screws.
4. Terminal Block R/C - (XCFR2), 7 pole, manufactured by PHOENIX CONTACT GMBH & CO KG, MVSTBR 2.5/7-STF-5 with MSTBA 2.5/7-G. Secured by screws.

Alternate - same as above, except RIA CONNECT INC., Cat. No.31218107 with 31236207. Secured by screws.
5. Terminal Block R/C - (XCFR2), 3 pole, manufactured by RIA CONNECT INC., cat. no. 31379103 with 31392103. Secured by screws.

Alternate - same as above, except PHOENIX CONTACT GMBH & CO KG, MC 1,5/3-STF-3 with MC 1.5/3-GF. Secured by screws.
6. Communications connectors - BNC type, considered to be mechanically secured.

7. DIP switch array (G12 and G12-1300) - 8 way, in a Nonincendive circuit protected by Voltage Regulator IC203 (3.3Vdc), IC302 (Altera EP1CT100I7) switch pins inherently limited to 25mA and resistors R324 to R331 rated 15kohm. See Ills. 2 and 3.
8. DIP switch array (G12 PRO and G12-1300 PRO) - 4 way, in a Nonincendive circuit protected by Voltage Regulator IC203 (3.3Vdc), IC302 (Altera EP1CT100I7) switch pins inherently limited to 25mA and resistors R324 to R327 rated 15kohm. See Ills. 12 and 13.
9. Potentiometers - RV401 and RV501 - Internally mounted and inaccessible in normal use.