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Category
Signalling

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Specification - Connectors for Signalling Interface

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About This Standard

This Standard Specification defines the connector requirements for Interfacing any Equipment to Relay based Signalling Systems.

Document History

Primary Source – RIC Standard SC 01 32 01 00 SP Version 2.0

List of Amendments –

ISSUE	DATE	CLAUSE	DESCRIPTION
1.1	14/03/2005	Disclaimer	Minor editorial change
1.2	06/05/2005	All	Document reformatted

Contents

1. Scope

This Standard Specification defines the connector requirements for Interfacing any Equipment to Relay based Signalling Systems.

2. Applicable Documents

2.1. International Standards

The following international standards are referenced by this specification:

VDE 0110 Specification for clearances and creepage distances in electrical equipment.

VDE 0607 Specification for clamps of screwless terminals for connecting or joining copper conductors from 0.5 mm squared up to 16 mm squared.

3. Specific Requirements

3.1. General

Section 4 gives details of approved two part connectors for printed circuit board mounting.

3.2. Design

The connector shall be able to accept a wire size of between 0.5 mm square and 1.5 mm square.

Standard pitch for plug connecting terminal blocks shall be 5.08 mm pin to pin.

All socket connectors shall have enclosed ends, to prevent bending of pins during insertion and removal.

Plug and socket connectors shall provide full wiping contact on at least two sides of the contact pin.

The wire pull out force shall be greater than 30 newtons when tested as specified in VDE 0607 section 3.4.2.3. This specifies a wire pull test under 12Hz and 50Hz vibration with an amplitude of 1 mm.

3.3. Ambient

The connector shall be rated to operate from -5 to 80 degrees centigrade, with humidity from 10 - 90% relative and under shock vibration of 20m/sec squared.

3.4. Electrical

The minimum rated voltage shall be greater than 250 volts RMS in accordance with VDE 0110 Insulation group C.

The Insulation Resistance, terminal to terminal, or terminal to earth or mounting rail shall be greater than 100 meg ohm when tested at 500 volts.

Maximum current rating shall be greater than twice the rating of the DIN fuse to be

used on the circuit. (Normal fuse is rated at 4 ampere.)

Minimum current required for reliable operation shall be not greater than 1 milliamp.

3.5. Life and Usage

No special care shall be required when handling the connector or during insertion, removal or terminating.

The connector used shall be to a design which is proven and reliable in a similar application.

Materials used shall be flame resistant, and corrosion resistant.

The rated number of insertions and removals without damage to the connector shall be 1000.

Expected life shall be 20 years.

3.6. Application

The connector shall be designed to accept one wire per terminal.

The connector shall accept either solid or stranded conductors.

The terminal block shall be specifically designed to protect stranded conductors from splaying during insertion into the terminal. Alternatively the terminals shall allow for the use of crimped pin lugs.

The terminals shall provide access for testing with a multimeter. Preferably this test point shall hold a standard 2 mm probe for a multimeter.

Provision shall be made for Labelling of each circuit with a two digit number and or a letter.

No special terminating tools shall be required.

Two part connectors shall be polarised to prevent reverse insertion.

There shall be provision for coding of connectors to prevent insertion of an incorrect part.

There shall be provision for special retaining clips for applications with severe vibration and shock problems.

3.7. Print Circuit Board Mounting

Connections to Printed Circuit Boards (PCB) shall be made by means of a two-part (plug and socket) connector as described in Section 4. The male connector socket shall be permanently mounted on the PCB.

The Printed circuit board shall be divided into two sections, the Signalling section and the other section.

The Signalling part of the circuit board shall be isolated from the other section of the board by a 5 mm clearance between tracks from either section.

The electrical isolation between the Signalling section and the other section of the

Printed Circuit Board shall be greater than 3500 volts peak.

The creepage or air gap distance from Signalling Circuit to Signalling Circuit on the Printed Circuit Board shall be a minimum of 3 mm. Approval may be granted by the Signalling Standards Engineer to allow a smaller distance for particular parts of a circuit.

The Printed Circuit Boards shall have an insulation resistance of greater than 100 meg ohms at 1000 volts between Signalling Circuits (with no components fitted).

The breakdown voltage between Signalling Circuits for a new Printed Circuit Board (with no components fitted) shall be greater than 2500 volts.

The Printed Circuit Boards shall have a protective lacquer covering the printed circuit board, tracks and soldered connections using a solder through Lacquer such as ISONAL 642 or equivalent.

4. Two part Connectors for PCB's

4.1. General

This section describes the essential features of the preferred compliant two-part (plug and socket) connector for use with PCB's.

This section shall not override the requirements of sections 1 to 3 inclusive of this specification.

4.2. Male (Socket)

The male socket shall be as detailed in drawing M08-494.

4.3. Female (Plug)

The female shall be able to plug into the male (socket) defined in section 1.2.

4.4. Compliant Types

The following product ranges provide connectors that are fully compliant. Only those connectors that have a pitch of 5.08 mm, are two part, and have sockets with enclosed ends shall be used.

a) Wago type 231, and 232 connectors.

b) Phoenix Contact Printed Circuit Two Part Connectors.

c) Klippon Printed Circuit Board Two Part Connectors.

d) Weidmuller Printed Circuit Board Two Part Connectors.

This list is not exclusive. Other fully compliant connectors may also be approved.