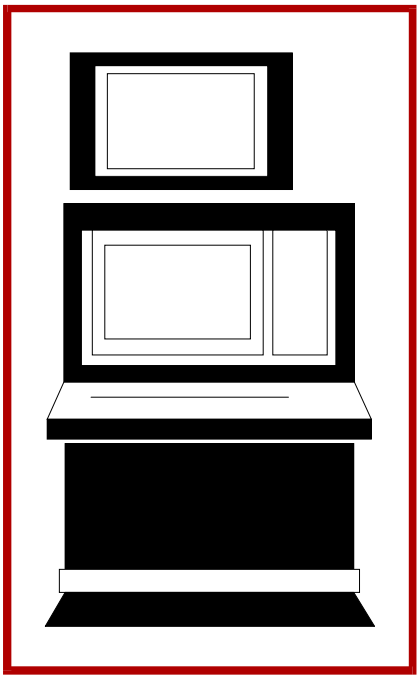
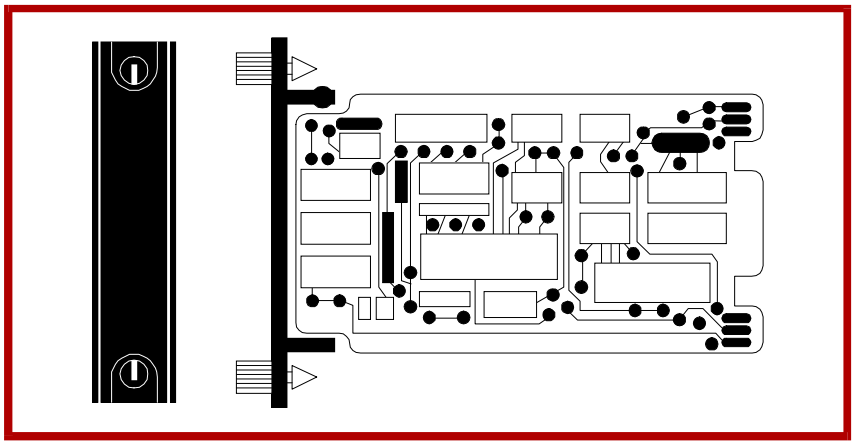
Bailey® infi 90®

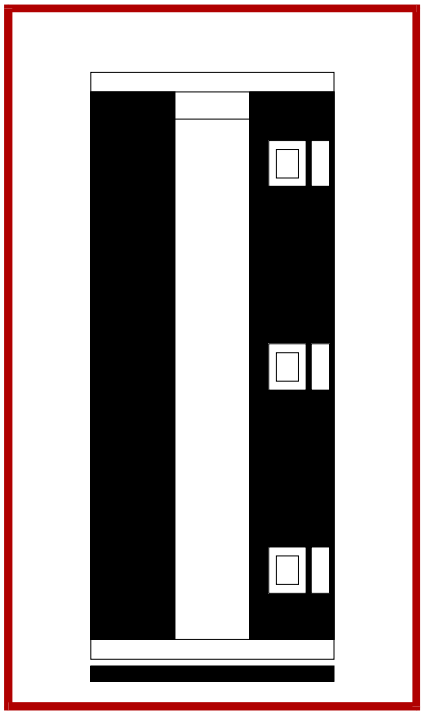
E96-285

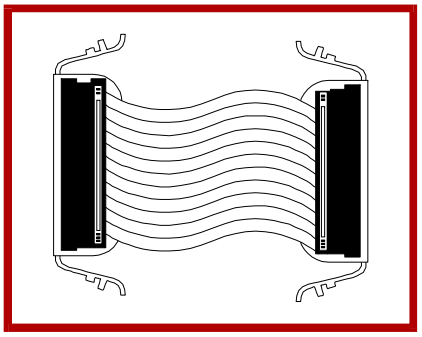
Instruction

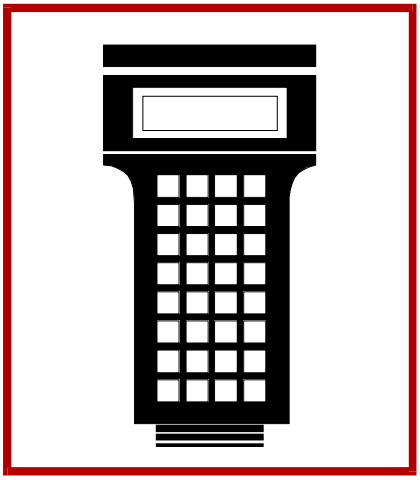
Rail Termination System

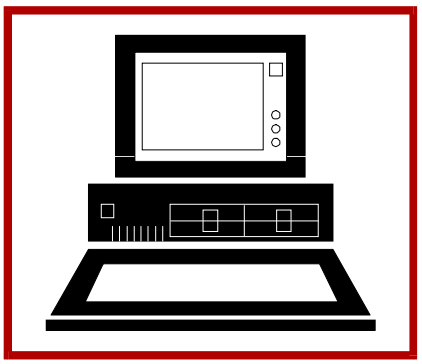












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WARNING notices as used in this instruction apply to hazards or unsafe practices that could result in personal injury or death.

CAUTION notices apply to hazards or unsafe practices that could result in property damage.

NOTES highlight procedures and contain information that assists the operator in understanding the information contained in this instruction.

WARNING

INSTRUCTION MANUALS

DO NOT INSTALL, MAINTAIN, OR OPERATE THIS EQUIPMENT WITHOUT READING, UNDERSTANDING, AND FOLLOWING THE PROPER **Elsag Bailey** INSTRUCTIONS AND MANUALS; OTHERWISE, INJURY OR DAMAGE MAY RESULT.

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MOST ELECTRONIC EQUIPMENT IS INFLUENCED BY RADIO FREQUENCY INTERFERENCE (RFI). CAUTION SHOULD BE EXERCISED WITH REGARD TO THE USE OF PORTABLE COMMUNICATIONS EQUIPMENT IN THE AREA AROUND SUCH EQUIPMENT. PRUDENT PRACTICE DICTATES THAT SIGNS SHOULD BE POSTED IN THE VICINITY OF THE EQUIPMENT CAUTIONING AGAINST THE USE OF PORTABLE COMMUNICATIONS EQUIPMENT.

POSSIBLE PROCESS UPSETS

MAINTENANCE MUST BE PERFORMED ONLY BY QUALIFIED PERSONNEL AND ONLY AFTER SECURING EQUIPMENT CONTROLLED BY THIS PRODUCT. ADJUSTING OR REMOVING THIS PRODUCT WHILE IT IS IN THE SYSTEM MAY UPSET THE PROCESS BEING CONTROLLED. SOME PROCESS UPSETS MAY CAUSE INJURY OR DAMAGE.

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MANUELS D'OPÉRATION

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LA PLUPART DES ÉQUIPEMENTS ÉLECTRONIQUES SONT SENSIBLES AUX PERTURBATIONS PAR FRÉQUENCE RADIO. DES PRÉCAUTIONS DEVRONT ÊTRE PRISES LORS DE L'UTILISATION DU MATÉRIEL DE COMMUNICATION PORTATIF. LA PRUDENCE EXIGE QUE LES PRÉCAUTIONS À PRENDRE DANS CE CAS SOIENT SIGNALÉES AUX ENDROITS VOULUS DANS VOTRE USINE.

PERTURBATIONS DU PROCÉDÉ

L'ENTRETIEN DOIT ÊTRE ASSURÉ PAR UNE PERSONNE QUALIFIÉE EN CONSIDÉRANT L'ASPECT SÉCURITAIRE DES ÉQUIPEMENTS CONTRÔLÉS PAR CE PRODUIT. L'AJUSTEMENT ET/OU L'EXTRACTION DE CE PRODUIT PEUT OCCASIONNER DES À-COUPS AU PROCÉDÉ CONTRÔLE LORSQU'IL EST INSÉRÉ DANS UNE SYSTÈME ACTIF. CES À-COUPS PEUVENT ÉGALEMENT OCCASIONNER DES BLESSURES OU DES DOMMAGES MATÉREILS.

NOTICE

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Preface

The Rail Termination System (RTS) is a termination method that provides a means to interface plant equipment to INFI 90 ® Open modules. This modularized system provides a base selection of six different styles of terminal blocks, fusing and a termination back panel for mounting to standard DIN rails in an INFI 90 Open cabinet.

This publication is for the use of technical personnel responsible for the installation, maintenance and component replacement for the RTS system.

It is important for safety reasons to read and understand this manual and all reference instruction books on associated equipment. Do not install equipment or complete any tasks or procedures related to this equipment until this information has been read.

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List of Effective Pages

Total number of pages in this instruction is 32, consisting of the following:

Page No.	Change Date
Preface	Original
List of Effective Pages	Original
iii through vi	Original
1-1 through 1-8	Original
2-1 through 2-8	Original
3-1 through 3-2	Original
4-1 through 4-4	Original
5-1 through 5-2	Original
Index-1 through Index-2	Original

When an update is received, insert the latest changed pages and dispose of the superseded pages.

NOTE: On an update page, the changed text or table is indicated by a vertical bar in the outer margin of the page adjacent to the changed area. A changed figure is indicated by a vertical bar in the outer margin next to the figure caption. The date the update was prepared will appear beside the page number.

Safety Summary

GENERAL WARNINGS	**Equipment Environment** All components, whether in transportation, operation or storage, must be in a noncorrosive environment. **Electrical Shock Hazard During Maintenance** Disconnect power or take precautions to insure that contact with energized parts is avoided when servicing.
SPECIFIC WARNINGS	There are exposed electrical connections inside the cabinet. These exposed electrical connections present a shock hazard that can cause injury or death. (p. 3-1) Replace the fuse with one of the same type and rating. Using an improper fuse can lead to injury to personnel and equipment damage from fire or electrical shock. (p. 4-4)
SPECIFIC CAUTIONS	It is strongly recommended that all power (cabinet, I/O, etc.) be turned off before doing any wiring. Verify all connections before applying power. Failure to observe these precautions could result in equipment damage. (p. 2-7)

Sommaire de Sécurité

AVERTISSEMENTS D'ORDRE GÉNÉRAL	**Environnement de l'équipement** Ne pas soumettre les composants à une atmosphère corrosive lors du transport, de l'entreposage ou l'utilisation. **Possibilité de chocs électriques durant l'entretien** Débrancher l'alimentation ou prendre les précautions pour éviter tout contact avec des composants sous tension durant l'entretien.
AVERTISSEMENTS D'ORDRE SPÉCIFIQUE	L'intérieur de cette armoire contient des bornes électriques qui sont à découvert. Ces bornes électriques à découvert constituent un risque de choc qui pourrait causer blessure ou même la mort. (p. 3-1) Remplacer le fusible avec un fusible du même type et de la même capacité. L'utilisation d'une fusible du mauvais type/capacité pourrait causer des blessures au personnel et des dommages à l'équipement résultant d'un incendie ou de choc électrique. (p. 4-4)
ATTENTIONS D'ORDRE SPÉCIFIQUE	Il est fortement recommandé de débrancher toute source d'alimentation (armoire, E/S, etc.) avant d'effectuer du travail au câblage. Vérifiez toutes les connexions avant de rétablir l'alimentation. Ces précautions permettent d'éviter des dommages a l'équipement. (p. 2-7)

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SECTION 1 - INTRODUCTION

OVERVIEW

The Rail Termination System (RTS) interfaces plant equipment to INFI 90 Open modules and offers an alternative to Termination Modules (TMs) and Termination Units (TUs). This modularized system provides a common mounting method with a base selection of six different styles of terminal blocks. These terminal blocks organize and route process analog and digital I/O to the correct channel on the process module.

The RTS termination method provides an alternative for I/O using the NTDI01 digital termination unit. When the RTS method is used for digital inputs with an IMDSI02 module or for digital outputs with an IMDSO04 module, the RTS rail mounted connector accepts the standard NKTU cable from the INFI 90 Open I/O module. The number of digital I/O installed on the panel is dependent on the type of terminal block selected. Full maximum density is sixteen I/O channels per rail (using four rails results in 64 channels per panel) when a compression type terminal block is used. Half density is eight I/O channels per rail (32 channels per panel) when a ring lug type terminal block is used.

Analog I/O typically requires the use of an analog termination unit, but the TU unit can be mounted on the RTS termination back panel adjacent to the terminal blocks. The RTS termination back panel provides space for two TUs and two rails with terminations. When analog outputs are provided from an IMASO01 analog output module, the TU can be eliminated with the I/O module connected directly to the selected terminals via the RTS rail mounted connector. When NTAI05 TUs are used for RTD inputs, compression straight-through style terminals are used to provide space for two TUs on the RTS termination back panel. Fusing per group of eight I/O channels protects INFI 90 Open module circuitry and plant equipment.

INTENDED USER

The installation or wiring engineer needs to know how to handle and work with electronic equipment safely. Installers should have formal training in INFI 90 Open processes and connection and routing of field wiring. The ***Site Planning and Preparation*** manual provides important wiring and grounding procedures.

DESCRIPTION

The RTS termination method contains modular terminal blocks installed on 35-millimeter (1.38-inch) standard DIN rails which may or may not be mounted on a 356-millimeter (14-inch) high termination unit style panel (Figure 1-1). When a termination back panel is used, up to four DIN rail assemblies can be mounted on each panel. A maximum of five panels can be mounted from both the front and rear of an INFI 90 Open cabinet. A 76-millimeter (3-inch) wide cable routing space is provided in the center of the panel in addition to the normal 152-millimeter (6-inch) cable routing space on each side of the panel (cabinet sidewalls). ***H*** cutouts allow cabling to run through the center of the RTS panel and provide for easy access to the center rails as well as to the outer sidewalls of the cabinet.

The RTS termination method is available in six standard terminal block combinations. These terminal block combinations will cover most applications (refer to Table 1-1). Two compression straight-through style terminal blocks provide maximum density for high density applications (Figures 1-2 and 1-3). Two screw style terminal blocks, used for ring lug terminated wiring, are available (Figures 1-4 and 1-5). Compression style plug disconnect type terminal blocks are available for those applications that require a disconnect feature (Figure 1-6). A sliding link style terminal block, the Phoenix, is also available where quick disconnect is desired (Figure 1-7).

INSTRUCTION CONTENT

This instruction provides information on methods of terminating process inputs and outputs to INFI 90 Open control systems and information systems. Read and understand this instruction thoroughly before completing any wiring operations. Refer to the following sections as required for more information.

Introduction — Provides an overview of the rail termination system, a description of the hardware, and a table of physical, electrical and environmental specifications.

Installation — Explains the important considerations and constraints applicable to the various terminal blocks.

Maintenance — Provides a maintenance schedule.

Repair/Replacement Procedures — Details information for replacing individual terminal blocks, fuses or the connector assembly.

Support Services — Describes the support services (spare parts, training, documentation, etc.) available from Bailey Controls Company.

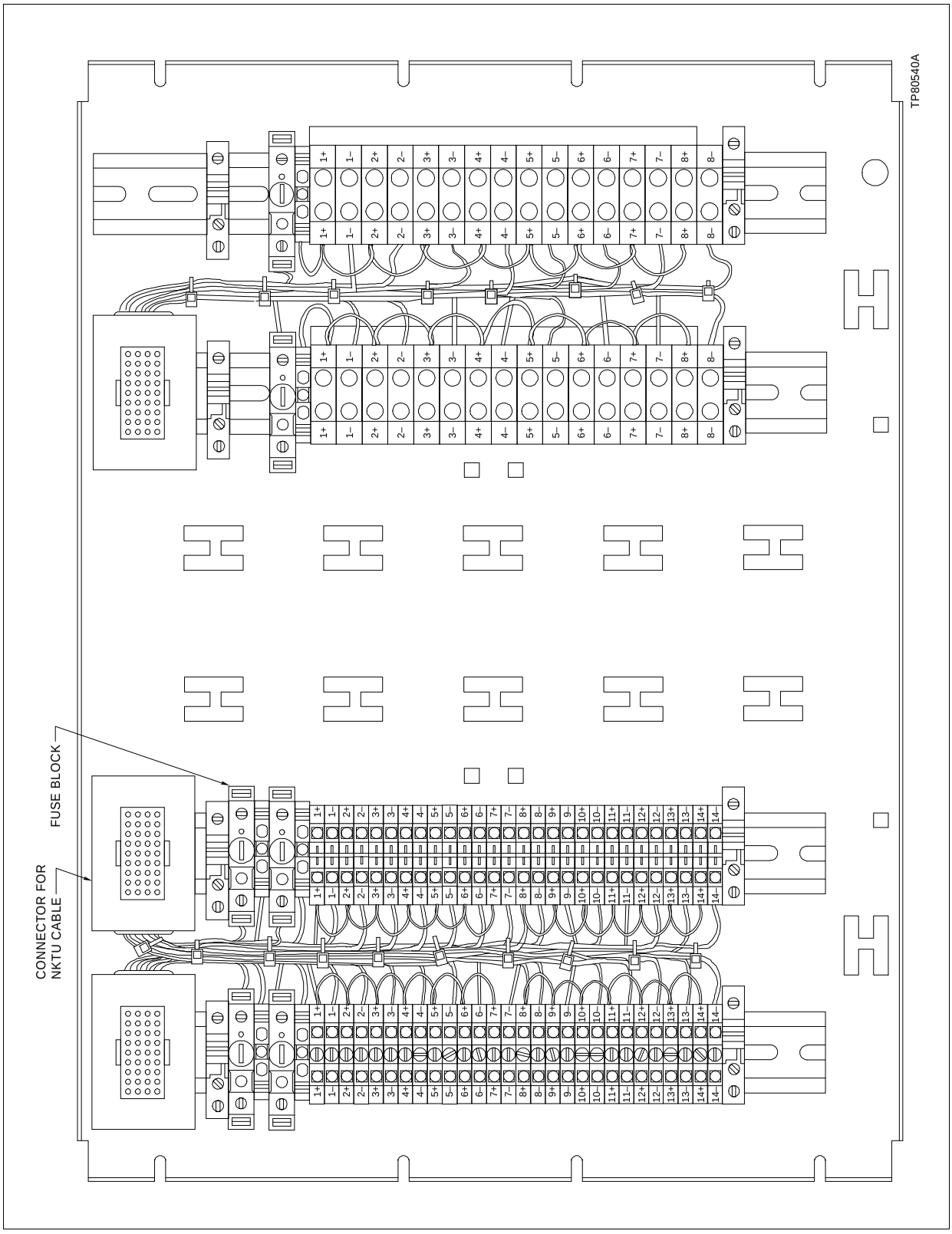

Figure 1-1. Modular Terminal Block Layout

Table 1-1. RTS Standard Terminal Blocks

Type	Max. I/O[1]	Ratings and Wire Sizes[2]	I/O Blocks			End Cover		
			Manuf. Part No.	Bailey Part No.	Dimensions mm (in.) (tw x w x h)[3]	Manuf. Part No.	Bailey Part No.	Dimensions mm (in.) (ecw x w x h)[4]
Compression Straight-Through. (Figure 1-2)	16	30 A, 600 V, 4.0 mm^2 (10 AWG) max.	Phoenix UK5 3004016	1949122□1	6.2x42.5x47.0 (0.24x1.67x1.85)	Phoenix D-UK4/ 10-3003020	1949085□1	1.8x42.5x47.0 (0.71x1.67x1.85)
Compression Straight-Through. Can accommo-date a minimum of 48 blocks. Recom-mended for RTD inputs. (Figure 1-3)	16	20 A, 600 V, 2.5 mm^2 (12 AWG) max.	Weidmuller WDU2.5	1949020□1	5.0x60.0x47.0 (0.19x2.36x1.85)	Weidmuller WAP2-5-10	1949025□1	1.5x60.0x47.0 (0.06x2.36x1.85)
6-32 Screw Terminal. (Figure 1-4)	8	30 A, 600 V, 2.5 mm^2 (12 AWG) max.	Weidmuller C9000676 (Type ST5)	1949292□1	9.5x42.0x42.5 (0.37x1.65x1.67)	Weidmuller C9000686	1949293□1	1.8x42.0x42.5 (0.07x1.65x1.67)
8-32 Screw Terminal. (Figure 1-5)	8	30 A, 600 V, 4.0 mm^2 (10 AWG) max.	Weidmuller C9001456 (Type ST5P)	1949290□1	13.0x41.6x45.0 (0.51x1.64x1.77)	Weidmuller C9001506	1949291□1	1.8x41.6x45.0 (0.07x1.64x1.77)
Compression Plug Disconnect. (Figure 1-6)	16	10 A, 300 V, 2.5 mm^2 (12 AWG) max.	Phoenix UK4-T-P/ P-3042010	1949084□1	6.2x42.5x56.0 (0.24x1.67x2.06)	Phoenix D-UK4/ 10-3003020	1949085□1	1.8x42.5x47.0 (0.07x1.67x1.85)
Sliding Link. 4 blocks with 4 ter-minals, each for 8 I/O channels. (Figure 1-7)	8	25 A, 600 V, 4.0 mm^2 (10 AWG) max.	Phoenix OTTA6-T-0790446	1949047□1	11.0x70.0x52.0 (0.43x2.76x2.05)	Phoenix D-OTTA6-T-0790459	1949164□1	1.5x70.0x52.0 (0.06x2.76x2.05)

NOTES:
1. Maximum I/O channels per rail (2 terminal blocks each).
2. AWG metric conversion is based on cross sectional area per IEC 228.
3. (tw x w x h) equals terminal width x block width x block height.
4. (ecw x w x h) equals end cover width x terminal width x end cover height.

HOW TO USE THIS MANUAL

Read this manual through in sequence. Read the installation section thoroughly. Refer to the ***Table of Contents*** or ***Index*** to find specific information.

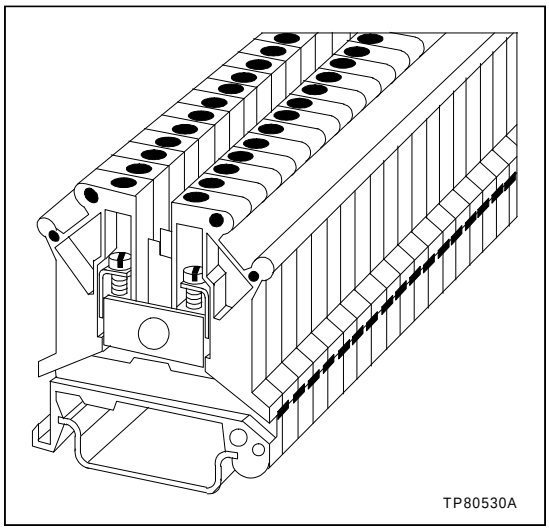

Figure 1-2. Phoenix Compression Straight-Through Terminal Block

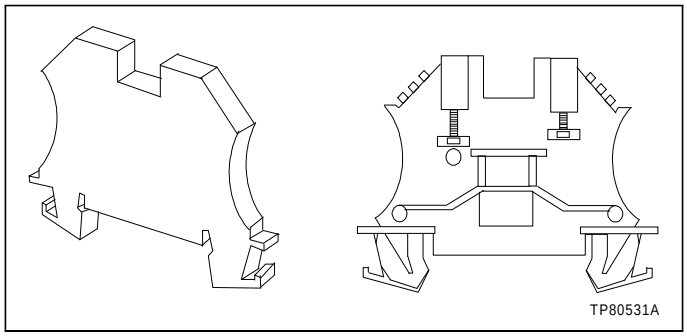

Figure 1-3. Weidmuller Compression Straight-Through Terminal Block

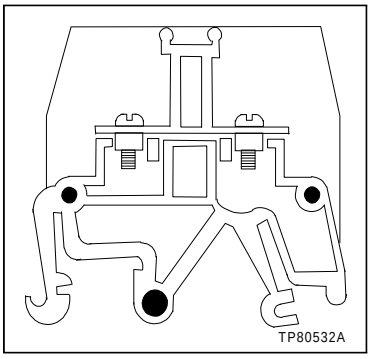

Figure 1-4. Weidmuller 6-32 Screw Terminal Block

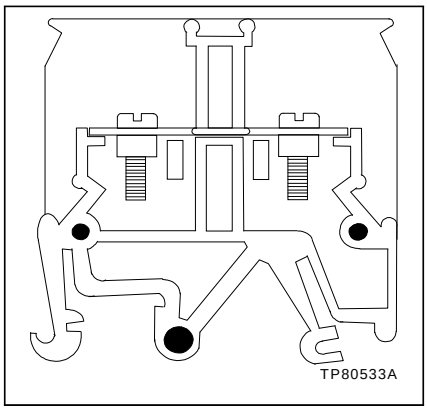

Figure 1-5. Weidmuller 8-32 Screw Terminal Block

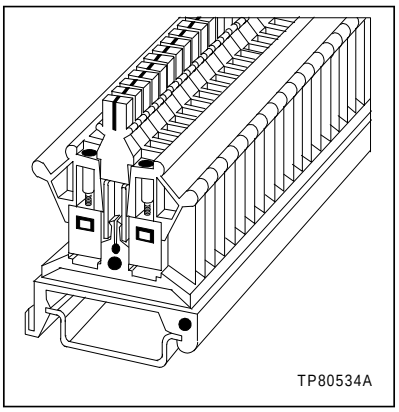

Figure 1-6. Phoenix Compression Plug Disconnect Terminal Block

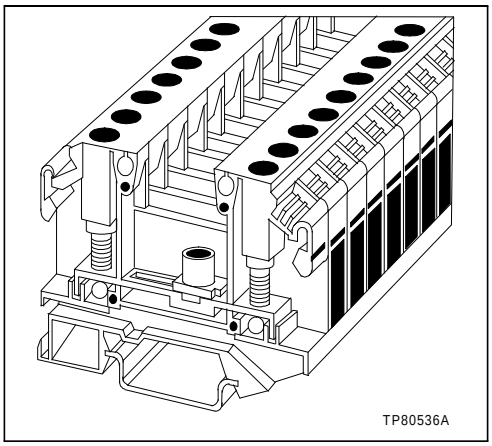

Figure 1-7. Phoenix Sliding Link Terminal Block

REFERENCE DOCUMENTS

Table 1-2 lists the documents referenced in this instruction.

Table 1-2. Reference Documents

Number	Title
I-E96-301	IMASI03 TC/RTD Input Module
I-E96-303	IMASO01 Analog Output Module
I-E96-307	IMDSI02 Digital Input Module
I-E96-310	IMDSO04 Digital Output Module
I-E96-416	NTAI05 Analog Input Termination Unit
I-E96-500	Site Planning and Preparation

GLOSSARY OF TERMS AND ABBREVIATIONS

Refer to Table 1-3 for those terms and abbreviations that are unique to Elsag Bailey or have a definition that is different from standard industry usage.

Table 1-3. Glossary of Terms and Abbreviations

Term	Description
Termination module	Provides input/output connection between plant equipment and INFI 90 Open/Network 90® modules.
Termination unit	

NOMENCLATURE

Refer to Table 1-4 for the nomenclature used in this instruction.

Table 1-4. Nomenclature

Nomenclature	Description
IMASI02	Analog input module
IMASI03	TC/RTD input module
IMASO01	Analog output module
IMCIS02	Control I/O module
IMDSI02	Digital input module
IMDSO04	Digital output module
IMFBS01	Field bus module
NKTU01/NKTU11	Termination unit cable
NTAI05/06	Analog input termination unit

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SPECIFICATIONS

Refer to Table 1-5 for specifications for the rail termination system (RTS).

Table 1-5. Specifications

Property	Characteristic
Mounting	35-mm (1.38-inch) DIN rail mounting. Rails are mounted on a 356-mm (14-inch) high panel. Up to four DIN rail assemblies can be mounted on each panel. A maximum of five panels can be mounted from the front and rear of an INFI 90 Open cabinet.
Wire size	Refer to Table 1-1
Environmental	
Ambient temperature	
Weidmuller terminal blocks:	
Part number WDU2.5 Terminal block material: Wemid	-50° to 120°C (-58° to 248°F)
Part numbers C9000676, C9001456 Terminal block material: polyamide	-50° to 100°C (-58° to 212°F)
Phoenix terminal blocks: Terminal block material: polyamide	-40° to 100°C (-40° to 212°F) **NOTE:** When terminal blocks are installed in an enclosure or cabinet, the temperature rating within the enclosure or cabinet shall apply.
INFI 90 Open internal cabinet rating	0° to 70°C (32° to 158°F)
Air quality	Noncorrosive
CTI (Comparative tracking index)[1]	Weidmuller: 600 Phoenix: 550
Ratings	Refer to Table 1-1
Certification	All terminal blocks are CSA (Canadian Standards Association) certified for use as process control equipment for use in an ordinary (nonhazardous) location.

NOTE:
1. Refer to UL746C and IEC 664A for CTI (comparative tracking index) information.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

SECTION 2 - INSTALLATION

INTRODUCTION

For most applications, the Rail Termination System (RTS) is already installed into an INFI 90 Open cabinet on a standard 483-mm (19-inch) wide by 356-mm (14-inch) high rack. This section explains the required procedures to install the RTS system, if necessary. The installation examples used are typical and do not represent the full line of applications available when using this flexible termination method. This section also includes information on installation considerations and precautions to be aware of when installing the RTS system.

SPECIAL HANDLING

The RTS termination method does not use electrostatic sensitive devices. However, during installation of the RTS system, it may be necessary to remove a module from the module mounting unit. Most I/O modules in the INFI 90 Open system use electrostatic sensitive devices and require special handling.

> **NOTE:** Always use Elsag Bailey's field static kit (Part No. 1948385□2). This kit consists of a wrist strap, ground cord assembly and alligator clip that should be used when working with static sensitive modules. The kit is designed to connect a technician and the static dissipative work surface to the same ground point to prevent damage to the module by electrostatic discharge.

UNPACKING AND INSPECTION

If the RTS system is shipped and received as a separate item, unpack and examine it immediately to verify it has not been damaged in transit.

1. Notify the nearest Elsag Bailey sales office of any damage.

2. File a claim for any damage with the transportation company that handled the shipment.

3. Use the original packing material and container to store the hardware in an environment of good air quality, free from temperature and moisture extremes.

INSTALLATION PRECAUTIONS AND CONSIDERATIONS

The RTS method does not contain dipshunts for selection of wetted or dry contacts on the same RTS rail. Mixing of user powered inputs and Elsag Bailey powered inputs is best accomplished by assigning the wetted inputs to a different I/O module and rail assembly. When shields are required, a

rail-mounted bus bar can be added to the rail where space permits.

Mixing of RTS termination back panels with field termination panels (FTP) directly adjacent to each other is not recommended. The FTP has a raised metal bridge in the center of the panel for plastic surface raceways (such as those manufactured by Panduit Corporation). The RTS system has no metal bridges and uses ***H*** cutouts in the center of the termination back panel to eliminate the need for surface raceways.

The RTS termination method allows user cabling to run through the center of the panel for easy access to the center rails as well as the outer sidewalls of the cabinet. The preferred area for INFI 90 Open I/O module cables is located on the cabinet inner sidewalls. This sharing of sidewall location by both user and Elsag Bailey cables provides the maximum use of the available space.

PHYSICAL INSTALLATION

When the RTS system is ordered as a separate entity and is not shipped with the cabinet, two mounting methods are available depending on the equipment ordered. The rail termination system can be provided with the terminal blocks and rail assemblies mounted to the termination back panel, or provided with the terminal blocks assembled to the RTS rail assembly only.

Using Termination Back Panels

1. Secure the RTS termination back panel to the mounting rails in the INFI 90 Open cabinet using customer supplied 10-24 x ½-inch screws.

> **NOTE:** The termination back panel sides are slotted for mounting onto any standard 19-inch EIA mounting rails. All eight screws do not have to be used. Four (one at each corner of the panel) is sufficient in most installations.

2. Once the RTS system is mounted, refer to ***GENERAL WIRING GUIDELINES*** in this section to aid in connecting wiring terminations for field equipment.

3. The actual I/O channel data for wiring is supplied by database or optional drawings. Contact an Elsag Bailey engineering service representative for additional information.

Using DIN Rails

The modular terminal blocks mounted on the rail assembly can also be installed in the INFI 90 Open cabinet without

using the RTS termination back panel. The RTS rail assembly attaches directly to the cabinet rail assembly.

1. Position the RTS rail assembly on the cabinet rail assembly.

2. Install two 8-32 x ¼-inch screws per rail and tighten.

INSTALLATION EXAMPLES AND NOTES

Figures 2-1, 2-2 and 2-3 provide examples of using the RTS method of termination in an INFI 90 Open cabinet. Drawings similar to these are shipped with each rail termination system. Included in the package are I/O channel data or database drawings with the wiring termination requirements. The channels are identified by cabinet, row, zone position and terminal block identification. The standard Elsag Bailey cabinet has ten divisions from top to bottom called ***rows*** and four location designations (A to D) called ***zones***.

Point Example: 01-03-A-TB02-10

01	= Cabinet
03	= Row
A	= Zone
TB02-10	= Terminal block

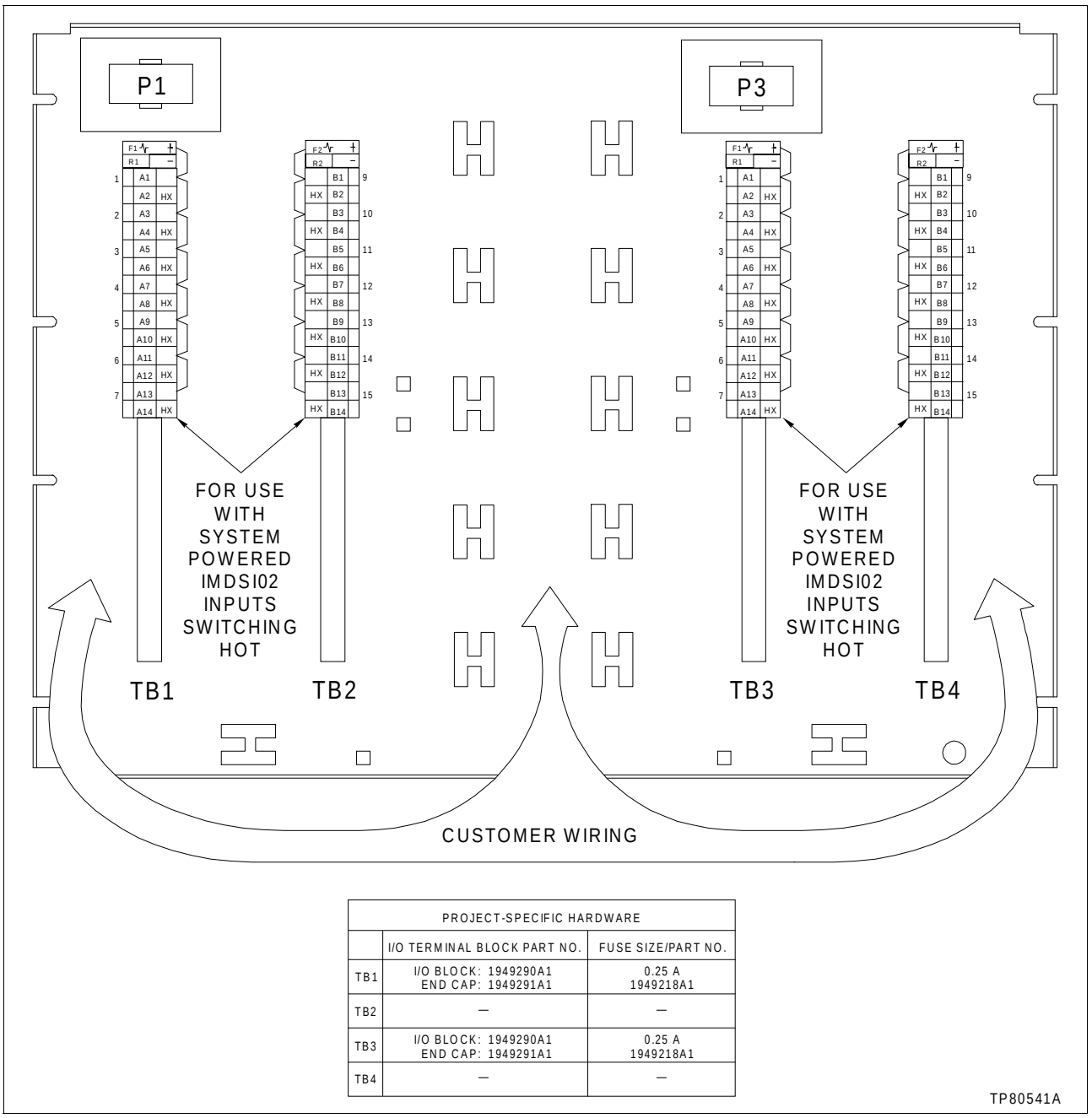
Figure 2-1 This example shows the rail termination system installed for digital inputs to an IMDSI02 digital input module using 8-32 screw terminal blocks.

Figure 2-2 This example shows the RTS system installed for digital inputs to an IMDSI02 digital input module using one of the compression straight-through style terminal blocks available.

Figure 2-3 This example shows the RTS system installed for analog inputs from an IMASI03 TC/RTD analog input module using the compression straight-through style terminal blocks available. Note the termination units (NTAI06) mounted on the left side of the panel.

In all installations, space along the bottom, up the center and along the sides of the termination back panel is reserved for customer wiring. Elsag Bailey wiring is confined to the spaces between the terminal strips.

Spacing of adjacent rails on the termination back panel is 86 mm (3.39 inches) center to center.



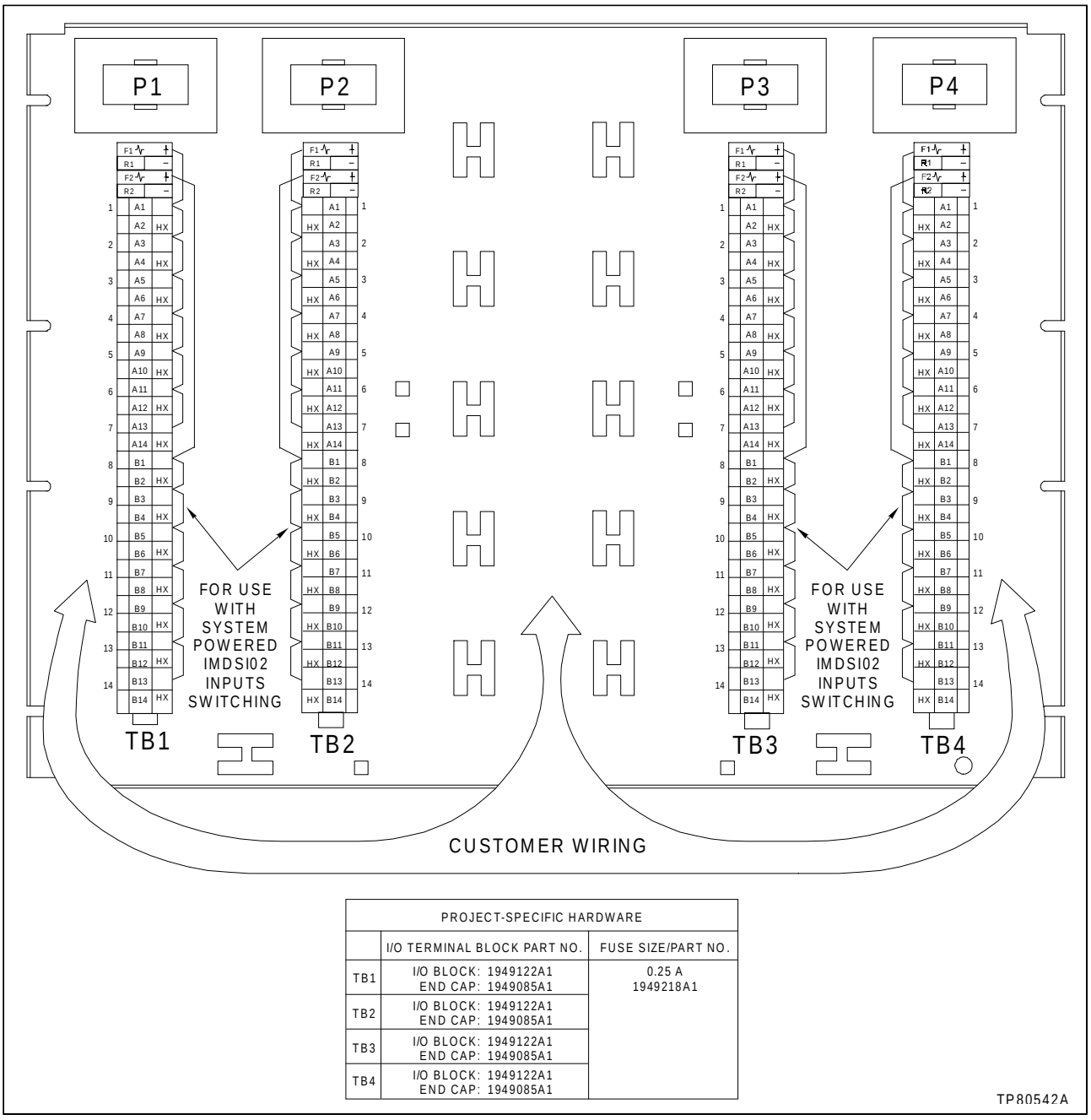
PROJECT-SPECIFIC HARDWARE		
	I/O TERMINAL BLOCK PART NO.	FUSE SIZE/PART NO.
TB1	I/O BLOCK: 1949290A1 END CAP: 1949291A1	0.25 A 1949218A1
TB2	—	—
TB3	I/O BLOCK: 1949290A1 END CAP: 1949291A1	0.25 A 1949218A1
TB4	—	—

Figure 2-1. Digital Inputs; 8-32 Screw Ring Lug Terminal Blocks

Optional wire ducts may be used up the center, across the bottom or both:

Center: 76 millimeters x 76 millimeters x 330 millimeters (356 millimeters if no bottom wiring duct is used); 3 inches x 3 inches by 13 inches (14 inches if no bottom duct is used).

Bottom: 25 millimeters x 76 millimeters x 483 millimeters (1 inch x 3 inches x 19 inches).



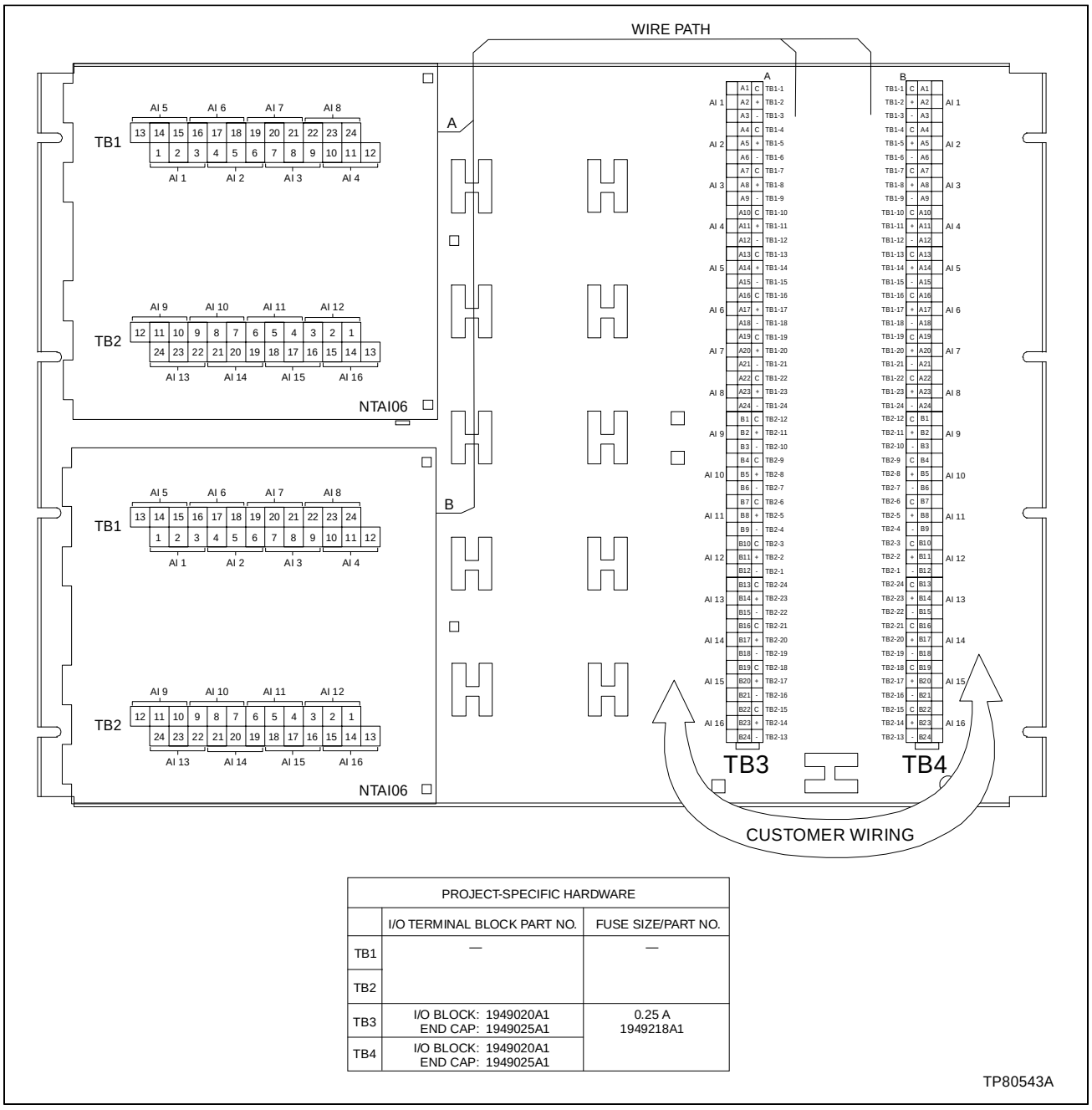
PROJECT-SPECIFIC HARDWARE		
	I/O TERMINAL BLOCK PART NO.	FUSE SIZE/PART NO.
TB1	I/O BLOCK: 1949122A1 END CAP: 1949085A1	0.25 A 1949218A1
TB2	I/O BLOCK: 1949122A1 END CAP: 1949085A1	
TB3	I/O BLOCK: 1949122A1 END CAP: 1949085A1	
TB4	I/O BLOCK: 1949122A1 END CAP: 1949085A1	

Figure 2-2. Digital Inputs; Compression Straight-Through Terminal Blocks

All Elsag Bailey wiring is 0.32 mm^2 nominal (22 AWG) stranded unless otherwise noted on the drawings. Maximum wire size for the terminal blocks is listed in Table 2-1.

All Elsag Bailey power, return, jumper and connector shield ground wiring is gray.

If bus bars are used because of mixing on the same I/O module and rail assembly, note that using multiple bus bars require



PROJECT-SPECIFIC HARDWARE		
	I/O TERMINAL BLOCK PART NO.	FUSE SIZE/PART NO.
TB1	—	—
TB2		
TB3	I/O BLOCK: 1949020A1 END CAP: 1949025A1	0.25 A 1949218A1
TB4	I/O BLOCK: 1949020A1 END CAP: 1949025A1	

Figure 2-3. Analog Inputs; Compression Straight-Through Terminal Blocks and Termination Units

they be chained together from row to row using 5.4 mm^2 nominal (10 AWG) wire.

GENERAL WIRING GUIDELINES

CAUTION	**It is strongly recommended that all power (cabinet, I/O, etc.) be turned off before doing any wiring. Verify all connections before applying power. Failure to observe these precautions could result in equipment damage.**
ATTENTION	**Il est fortement recommandé de débrancher toute source d'alimentation (armoire, E/S, etc.) avant d'effectuer du travail au câblage. Vérifiez toutes les connexions avant de rétablir l'alimentation. Ces précautions permettent d'éviter des dommages a l'équipement.**

Conduit is recommended for the field portion of the run. Wherever practical, it is recommended that trays containing analog signals be devoted exclusively to that use. Conduit containing analog signals should cross power lines, etc., at right angles and remain perpendicular for at least ten times the diameter of the crossed element on either side of the crossing joints.

Refer to the ***Site Planning and Preparation*** instruction for detailed information about the routing and connection of field wiring.

Maximum wire gauge for the terminal blocks is listed in Table 2-1.

Table 2-1. Maximum Wire Gauge

Part No.	Description (Manufacturer)	Max. mm² (AWG)
1949020□1	Compression straight-through (Weidmuller)	2.5 (12)
1949047□1	Sliding link (Phoenix)	4.0 (10)
1949084□1	Compression plug disconnect (Phoenix)	2.5 (12)
1949122□1	Compression straight-through (Phoenix)	4.0 (10)
1949290□1	8-32 screw terminal (Weidmuller)	4.0 (10)
1949292□1	6-32 screw terminal (Weidmuller)	2.5 (12)

Analog I/O Field Wiring

Wiring used for analog inputs must be carefully chosen with consideration for environmental and electrical conditions.

1. Shielded (overall or individually) twisted-pair wires for low level signal conduction are recommended to reduce the effects of electromagnetic and electrostatic noise coupling.

2. An aluminum Mylar® type with a drain wire has a very good electrostatic coupling shield efficiency.

3. All shields must be electrically insulated from other shields. Shields are to be grounded at one of the screws securing the termination back panel to the cabinet.

NOTE: Field end of shield should not be connected to a ground.

4. Wiring must bear a suitable voltage rating for the highest voltage connected to the terminal block (either signal or power) and a 75°C (167°F) minimum rating. Wiring must be in accordance with the National Electrical Code.

5. Field wiring should be 0.32 mm^2 nominal to 3.3 mm^2 nominal (22 to 12 AWG). Wires ends should be stripped 6.4 millimeters (0.250 inches) before connecting to the terminal blocks.

Digital I/O Field Wiring

1. Digital input wires should be twisted-pair, stranded wires insulated with low leakage insulation materials.

2. Individually shielded pairs provide greater protection against noise and crosstalk than nonindividually shielded pairs.

3. Shields are to be grounded at one of the screws located in the lower corners of the termination back panel.

NOTE: Field end of shield should not be connected to a ground.

4. Wiring must bear a suitable voltage rating for the highest voltage connected to the termination block (either signal or power) and a 75°C (167°F) minimum rating. Wiring must be in accordance with the National Electrical Code.

NOTE: The standard rail termination system includes fusing per group of eight points.

5. Field wiring should be 0.32 mm^2 nominal to 3.3 mm^2 nominal (22 to 12 AWG). Wire ends should be stripped 6.4 millimeters (0.250 inches) before connecting to the terminal blocks.

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SECTION 3 - PREVENTIVE MAINTENANCE

INTRODUCTION

The RTS termination equipment requires limited maintenance. It is designed for use within cabinets in typical industrial environments. Although all connection points are made corrosion-resistant by using alloys or plating, the termination system still requires some attention to insure its long term functionality.

The frequency of the checking and maintenance should be geared to the quality of the environmental conditions where the rail termination assembly is operating.

MAINTENANCE SCHEDULE

Equipment Required

Parallel-blade screwdriver for tightening the clamping screws in the terminals. Screwdriver tip should be ground square. Tapered blade screwdrivers may cause fractures in the molding when tightening the clamping screws. Select proper size tool for removing the clamp screws.

WARNING

There are exposed electrical connections inside the cabinet. These exposed electrical connections present a shock hazard that can cause injury or death.

AVERTISSEMENT

L'intérieur de cette armoire contient des bornes électriques qui sont à découvert. Ces bornes électriques à découvert constituent un risque de choc qui pourrait causer blessure ou même la mort.

As with any electrical installation, the integrity (tightness) of all electrical connections should be checked on a regular basis. Execute the tasks in Table 3-1 at the specified intervals. Torque values for terminal block clamping screws are listed in Table 3-2.

Table 3-1. Maintenance Schedule

Task	Frequency
Clean and tighten all power, I/O and grounding connections. Refer to Table 3-2 for recommended torque values.	Every 6 months or during plant shutdown, whichever occurs first.
Use a static safe vacuum cleaner to remove dust from the termination units if applicable.	

Table 3-2. Terminal Block Clamping Screw Torque Values

Part No.	Description	Torque Nm (in-lbs)
1949020□1	Compression straight-through	0.8 (7.0)
1949047□1	Sliding link	1.2 (11)
1949084□1	Compression plug disconnect	0.7 (6.2)
1949122□1	Compression straight-through	0.7 (6.2)
1949290□1	8-32 screw terminal	1.1 (10)
1949292□1	6-32 screw terminal	1.1 (10)

SECTION 4 - REPAIR/REPLACEMENT PROCEDURES

INTRODUCTION

This section discusses replacement procedures for the RTS termination system components.

TERMINAL BLOCK REPLACEMENT PROCEDURES

To replace any of the terminal blocks, use the following steps.

1. Turn off INFI 90 Open cabinet power.

2. Before removing wires from a terminal block, tag all wires to aid in reassembly.

3. For all terminal blocks, use a small parallel-blade screwdriver to loosen the screw and remove the wires. Note that some terminal blocks have the standard slotted screws, others have the test point screw head that has a slot in it.

There are two procedures that can be used for removing a single terminal block. Some terminal blocks can be removed by pivoting them off the rail assembly, others require that the screw hardware be removed from the end clamp and each individual terminal block be removed to access the one to be replaced. Use the following appropriate procedure.

Pivot removal procedure

4. For terminal blocks that have a small ribbed notch on the left side where it attaches to the rail (i.e., the 6-32 and 8-32 screw types), position a screwdriver as shown in Figure 4-1.

5. Gently apply pressure in the direction of the arrow shown in Figure 4-1 until the terminal block pops off the rail.

> **NOTE:** If the terminal block does not want to release from the rail, it may be necessary to remove the terminal number tag from the top of the terminal block (Figure 4-1). In some instances the tag will either stick or be attached to the adjacent terminal block preventing removal of block to be replaced.

6. Continue to rotate the terminal block to remove the block from the rail.

7. Install new terminal block.

Hardware removal procedure

8. Loosen the single screw in the end clamp used to secure the terminal block assemblies to the rail. There is an end clamp at each end of the rail assembly (Figure 4-2). Remove the end clamp closest to the terminal block to be replaced.

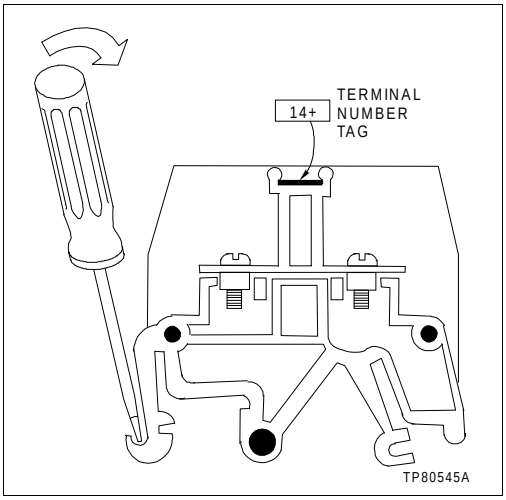

Figure 4-1. Removing a Single Terminal Block

9. Slide the end cover and terminal blocks off the rail assembly.

10. Install new terminal block on the rail assembly. Position the remainder of the terminal blocks on the rail assembly.

11. Assemble the end cover and end clamp. Install the end clamp screw and tighten.

12. Install wires removed in Step 3. Use the tags for proper wire position. Tighten all screws. Make certain each wire is securely in place. Refer to Table 3-2 for torque values of the clamping screws.

> **NOTE:** Use a parallel-blade screwdriver for tightening the clamping screws in the terminals. Screwdriver tips should be ground square. Tapered blade screwdrivers may cause fractures in the molding when tightening the clamping screws. Use care when selecting the proper screwdriver.

RAIL MOUNTED CONNECTOR ASSEMBLY REPLACEMENT

To replace the connector assembly used for the NKTU cable from an INFI 90 Open I/O module or an NTAI05/06 termination unit (for analog inputs), use the following procedure.

1. Turn off INFI 90 Open cabinet power.

2. Before removing wires from a terminal block, tag the block connections with wire color to aid in installation of new connector assembly.

3. For all terminal blocks, use the correct small parallel-blade screwdriver to loosen the screw and remove the wires. Note that some terminal blocks have the standard slotted screws,

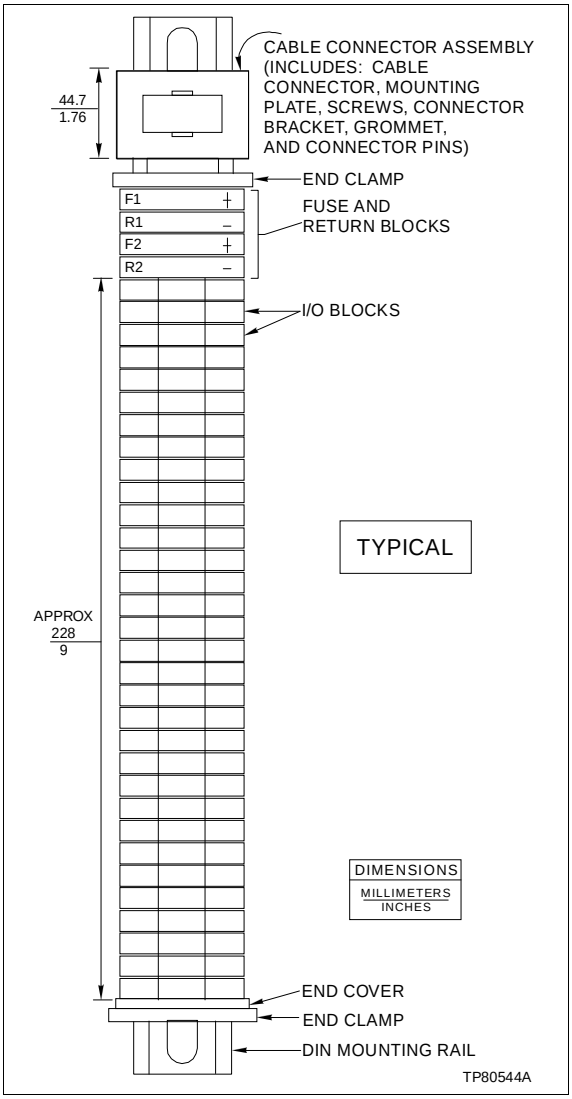

Figure 4-2. Rail Termination System Components

others have a test point screw head that has a slot in it to use a screwdriver to remove the screw. Select the correct screwdriver for the job.

4. Locate the orange tab extending from the green connector assembly mounting bracket. Insert the screwdriver in the slot in the tab. Pull away from the connector to release the tab holding the connector assembly to the rail.

5. Make certain the part number on the new connector assembly is the same as the one being removed. There are seven part number variations depending on the I/O module used. Refer to ***SUPPORT SERVICES*** in Section 5 for a listing of the part numbers. Install new connector assembly on rail assembly. Attach wires to correct terminal blocks using the

tags prepared in Step 2 of ***TERMINAL BLOCK REPLACEMENT PROCEDURES***.

TERMINATION UNIT REPLACEMENT

If the RTS system uses termination units (NTAI05/06) mounted on the termination back panel, refer to the appropriate instruction book for replacement procedures.

FUSE REPLACEMENT

WARNING	**Replace the fuse with one of the same type and rating. Using an improper fuse can lead to injury to personnel and equipment damage from fire or electrical shock.**
AVERTISSEMENT	**Remplacer le fusible avec un fusible du même type et de la même capacité. L'utilisation d'une fusible du mauvais type/ capacité pourrait causer des blessures au personnel et des dommages à l'équipement résultant d'un incendie ou de choc électrique.**

The fuse block is a window type with a pop-up indicator. A yellow indicator pops up when the fuse is blown.

1. To replace a fuse, unscrew the round knurled cap and the fuse will pop out.

2. Two fuses are used in the rail termination system, a ¼-A (250 V) medium time lag fuse is used for the inputs. A 2.5 A, 250 V, quick acting fuse is used for the outputs. Refer to ***SUPPORT SERVICES*** in Section 5 for fuse part numbers.

3. Install a new fuse and assemble the cap.

SECTION 5 - SUPPORT SERVICES

INTRODUCTION

Bailey Controls Company is always ready to assist in the operation and repair of its products. Send requests for sales or application services to the nearest sales or service office. Bailey Controls Company can also provide installation, repair and maintenance contract services.

REPLACEMENT PARTS AND ORDERING INSTRUCTIONS

Order replacement parts through a Bailey Controls Company sales or service office. Provide the following information when ordering parts.

1. Part description, part number and quantity.

2. Model and serial number (if applicable) and rating of the assembly the part has been ordered for.

3. The publication number and reference used in identifying the part.

When ordering parts, use part numbers and part description from equipment instructions. Parts with no commercial description must be ordered from the nearest sales or service office. Recommended spare parts are shown in Table 5-1 and 5-2. Spare parts prices on standard assemblies are available through the nearest sales or service office.

Table 5-1. Recommended RTS Spare Parts

Part No.	Description
1949020□1	Compression straight-through terminal block for RTD inputs
1949047□1	Sliding link terminal block
1949050□1	Return block
1949084□1	Compression plug disconnect terminal block
1949122□1	Compression straight-through terminal block
1949216□1	Fuse block, window-type, pop-up indicator
1949218□1	Fuse, 0.25 A, 250 V, medium time lag
1949219□1	Fuse, 2.5 A, 250 V, quick-acting
1949290□1	8-32 screw terminal type terminal block
1949292□1	6-32 screw terminal type terminal block

Table 5-2. RTS Rail Connector Assembly

Part No.	Description
6642349-1	System powered DSI02 switching hot
6642349-2	System powered DSO04 or return switching DSI02
6642349-3	Externally powered DSI02 or DSO04
6642349-4	For ASO01
6642349-5	Externally powered DSM04
6642349-6	Externally powered DSO01, DSO02, DSO03
6642349-7	System powered DSM04

TRAINING

Bailey Controls Company has a modern training facility available for training your personnel. On-site training is also available. Contact a Bailey Controls Company sales office for specific information and scheduling.

TECHNICAL DOCUMENTATION

Additional copies of this instruction, or other Bailey Controls instructions, can be obtained through the nearest Bailey Controls sales office at a reasonable charge.

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29801 Euclid Avenue
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152 Beach Road
Gateway East #20-04
Singapore 189721
Telephone 65-391-0800
Telefax 65-292-9011

EUROPE, AFRICA, MIDDLE EAST
Via Puccini 2
16154 Genoa, Italy
Telephone 39-10-6582-943
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