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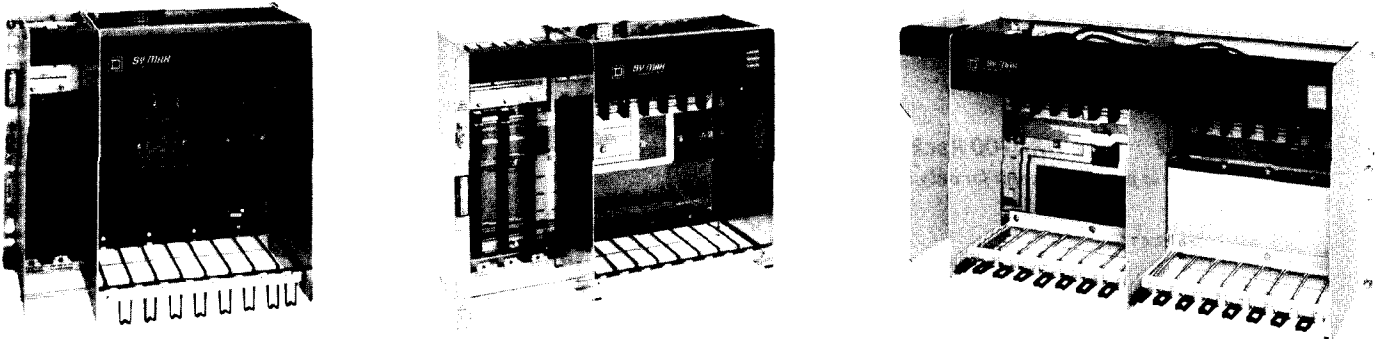
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Instruction Bulletin

SY/MAX®

CLASS 8030 TYPE HRK100, 200 8 Function I/O Rack Assembly and TYPE HRK150 Register/Digital Rack Assembly



Note: Register racks may be painted black or plated (as pictured above) depending upon the series number.

Figure 1 Type HRK100, 150, and 200 Rack Assemblies

DESCRIPTION

The Type HRK100, 150, and 200 Register Rack Assemblies provide the mounting slots for the Type HIM and HOM Eight (8) function digital I/O modules and Register modules. The table below shows the number and type of slots in each rack assembly.

Rack Assembly	I/O module slots	Register module slots	CPU slots
HRK100	8 (64 I/O points)	1	1
HRK150	8 (64 I/O points)	3	1
HRK200	16 (128 I/O points)	1	1

Additional features of the rack assemblies include:

- A power supply connector, on the top of the rack, provides power for the I/O and Register modules and the Model 300, 400, 600, or 650 processor.
- A ground terminal, on the left mounting bracket, ties the rack assembly to ground.
- A latching clamp, directly above the mounting slots, secures the modules in the slots.
- Nylon wire routing clips, on the bottom of the racks, route the input and output field wires to the proper I/O modules.
- A dead front cover is also provided to cover the I/O wiring.

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Each HRK rack has a Divider Plate to separate the Module slots from the Register and CPU slots (refer to Figure 2 and Figure 3). Each rack has one CPU slot directly to the left of the Divider Plate. The CPU slot can house a Model 300, 400, 600 or 650 processor or a Remote I/O Interface module.

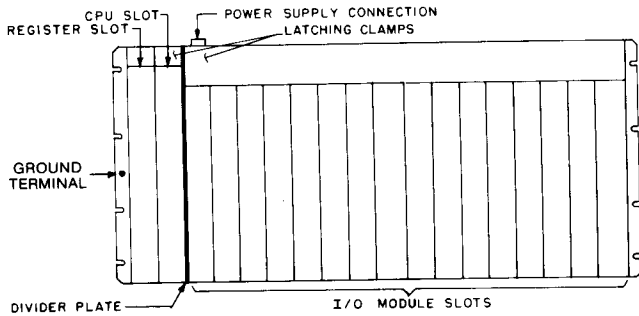


Figure 2 Type HRK200 Rack Assembly
(HRK100 rack is identical except for only 8 I/O Module slots)

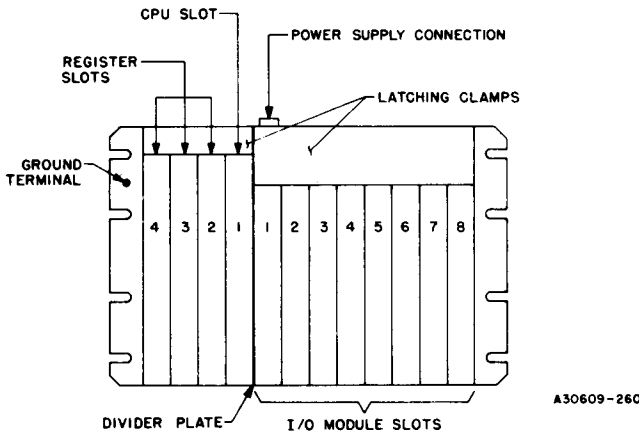


Figure 3 Type HRK150 Rack Assembly

The HRK100 and HRK200 racks also have a register slot to the left of the CPU slot. The HRK150 has 3 register slots to the left of the CPU slot. These slots can be used for any other register module as listed in the Specifications section under Module Compatibility.

SPECIFICATIONS

I/O points per rack:

HRK100:
64 (8 eight function digital I/O modules) with register slot

HRK150:
64 (8 eight function digital I/O modules) with register slot

HRK200:
128 (16 eight function digital I/O modules) with register slot

Ambient Temperature . . . 0 to 60°C

Humidity Rating 5 - 95% (non-condensing)

Weight (unpackaged) . . HRK100: 16.9 lbs. / 7.6 kg.
HRK150: 21 lbs. / 9.4 kg.
HRK200: 26.2 lbs. / 11.8 kg.

Module compatibility:

I/O slots:

- HIM101, 102, 131, 141, 151, 161, 191, 310
- HOM211, 221, 222, 231, 241, 251, 261, 271

CPU slots:

- All SCP3XX, SCP4XX, SCP6XX processors
- CRM222, CRM232, EQ-5138-G2

Register slots:

- RIMXXX, ROMXXX, DLMXXX, CRMXXX,
- EQ-5138-G1

RACK ASSEMBLY MOUNTING CONSIDERATIONS

HRK100 racks are designed for panel mounting but can be 19" rack mounted using the optional CBP113 Mounting Brackets.

HRK150 racks are designed for 19" rack mounting but can be panel mounted using the optional CBP113 Mounting Brackets.

HRK200 racks can only be panel mounted because they are wider than 19 inches.

Mounting Considerations for all HRKXXX racks:

- The rack assemblies (Figure 4) can be mounted above each other or side by side. A minimum clearance of four inches (101.6 mm) is required between racks mounted above each other. If a vertical duct is used between racks mounted side by side, appropriate spacing must be allowed.

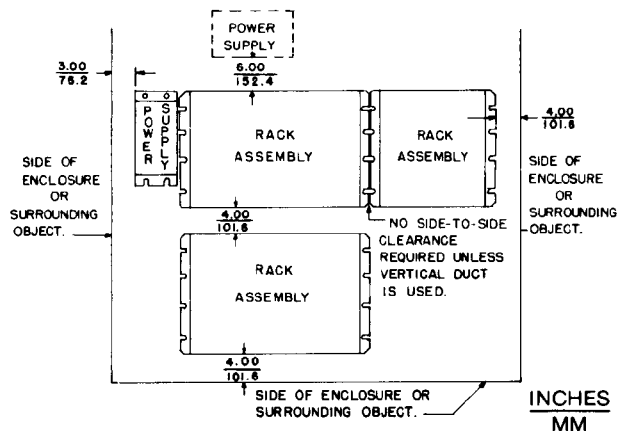


Figure 4 Rack Assembly Mounting Configurations

- A minimum four inch clearance is required between the rack and surrounding objects or the sides of an enclosure. SY/MAX® power supplies may be mounted vertically directly adjacent to the rack assembly or horizontally above the rack. If mounted above the rack, a minimum clearance of six inches is required between the power supply and the top edge of the rack.
- There should be a minimum six inch (152.4 mm) clearance between the rack and any electro-mechanical device. When mounting electro-mechanical devices above the rack, a barrier should be installed between the two sections to prevent debris from falling onto the rack.
- Racks must be mounted to allow for adequate heat dissipation. If conditions produce temperature "hot spots" higher than the allowed range, a fan must be installed to circulate the air so that the ambient temperature around the rack is 60°C or less.

- The power supply must be mounted within available cable distance from the rack assembly. The power supply cable connector labeled "PR1," "PR2," or "RACK" is attached to the rack assembly. See Power Supply Instruction Bulletin (30598-159) for cable usage and lengths.
- Care must be taken to provide for unobstructed insertion and removal of modules from a rack located in an enclosure.
- The following register modules extend beyond the front edge of the rack and require additional clearance as indicated in the table below.

Device	Additional Clearance Required
Model 600 or 650 Processor	3.0 inches
with key inserted	4.0 inches
with cable attached	5.0 inches
Model 700 Processor	3.0 inches
with key inserted	4.0 inches
with cable attached	5.0 inches
RIM331	3.0 inches
ROM441	3.0 inches
MicroCell	3.0 inches
with cable attached	5.0 inches
MiniCell	3.5 inches
with keyboard cable or Comms port cable attached	5.0 inches

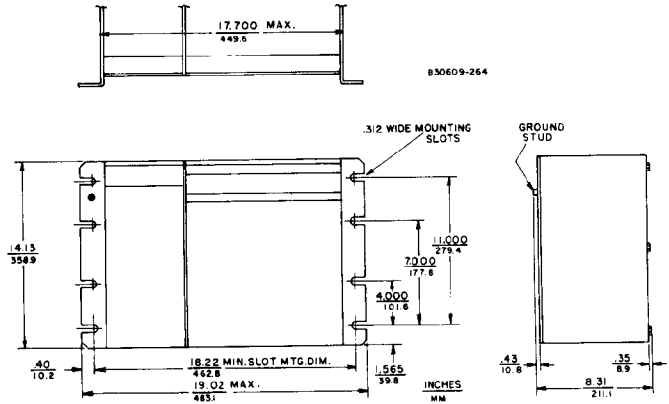
- To minimize coupling of electrical noise, all AC power wires should be kept isolated from 1) DC signal wiring, 2) rack to rack communication cable, and 3) SY/MAX power supply cables. AC and DC signal wires should not be combined in the same wire troughs or bundled together in parallel runs. Right angle crossovers should be used for wires crossing each other.
- To maintain stored program and register information for modules that require battery backup, the cable from the power supply must remain connected to the rack.
- 10-24 UNC mounting screws should be used to panel mount or rack mount the rack assembly.
- Unused Register slots should be covered with a CBP106 register slot cover plate (one per slot).
- Unused I/O slots should be covered with a CBP107 I/O slot cover plate (one per slot).

GROUNDING REQUIREMENTS

Tie the register rack assembly ground terminal (located on the left mounting plate) to a building column or grounding electrode that is determined to be a "true earth" ground by means of wire equal in size to the incoming power wires (#14 gauge minimum).

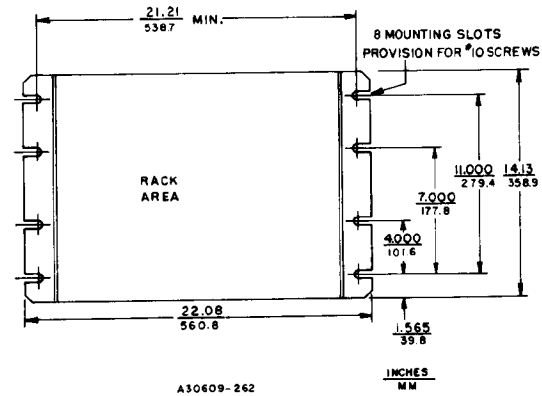
WARNING

Safety ground is not connected through the power supply wires. Rack assemblies must have a separate safety ground connection. Failure to do so may endanger life, cause unpredictable operation in the presence of electrical noise, or cause premature failure of modules.



HRK-150 Rack Assembly Rack Mounting Dimensions

MOUNTING DIMENSIONS



HRK-150 Rack Assembly Panel Mounting Dimensions

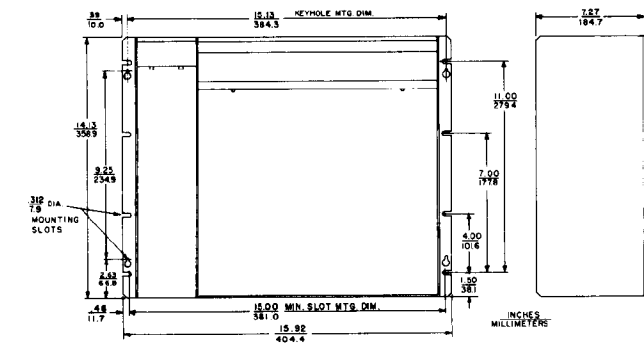
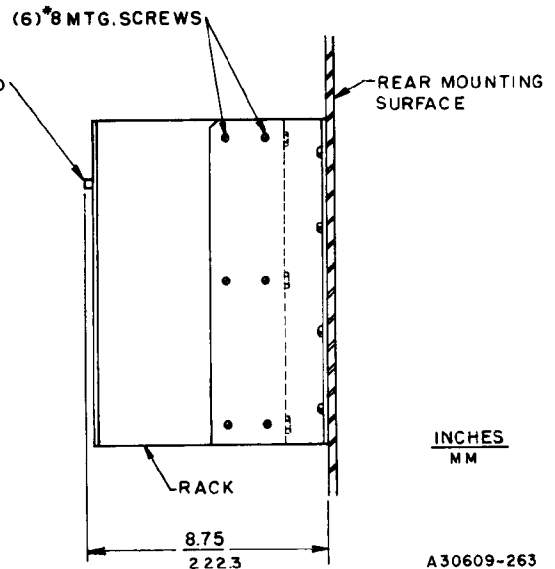


Figure 5 Type HRK100 Rack Assembly Mounting Dimensions



HRK-150 Rack Panel Mount Bracket Illustration

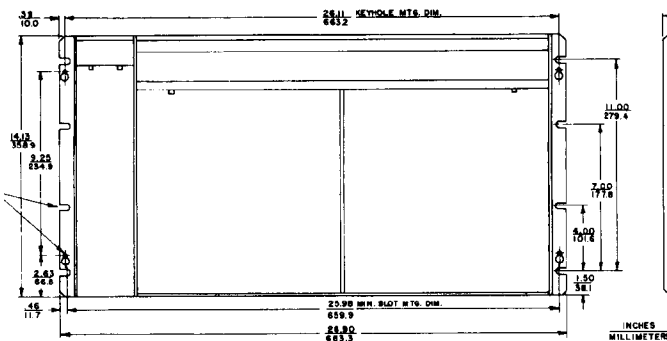


Figure 6 Type HRK200 Rack Assembly Mounting Dimensions

Figure 7 Type HRK150 Rack Assembly Dimensions

OPTIONAL MOUNTING BRACKETS

HRK100 racks are designed for panel mounting but can be 19" rack mounted using the optional CBP113 Mounting Brackets.

HRK150 racks are designed for 19" rack mounting but can be panel mounted using the optional CBP113 Mounting Brackets.

HRK200 racks can only be panel mounted because they are wider than 19 inches.

To install 19-inch mounting brackets, simply align brackets with mounting holes on side of the rack and secure with supplied #8 mounting screws. See Figure 8.

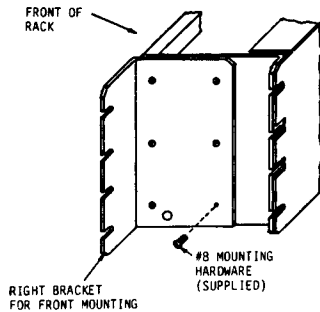


Figure 8 19-inch Mounting Bracket Installation

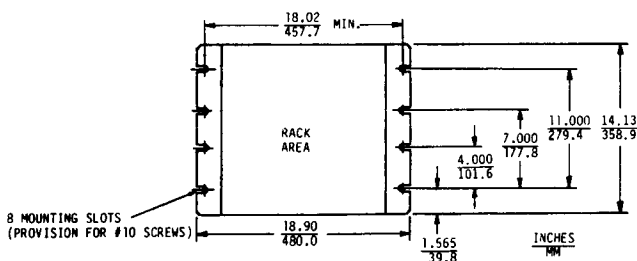


Figure 9 19-inch Rack Mounting Dimensions

MODULE KEYING

Each connector in a register rack assembly may be keyed with keying pins to accept only one type of module. The keying pins are inserted manually with a keying pin insertion tool (Figure 12). This keying pin is provided with a "Keying Pin Kit" Class 8030 Type CBP104.

CAUTION

When inserting or removing the keying pins, use care to avoid touching the contact fingers within the connector. Improper insertion/removal may damage the connector.

Register and Digital modules and their respective keying pin locations for the rack assembly connectors are listed in Figure 11 and Figure 12.

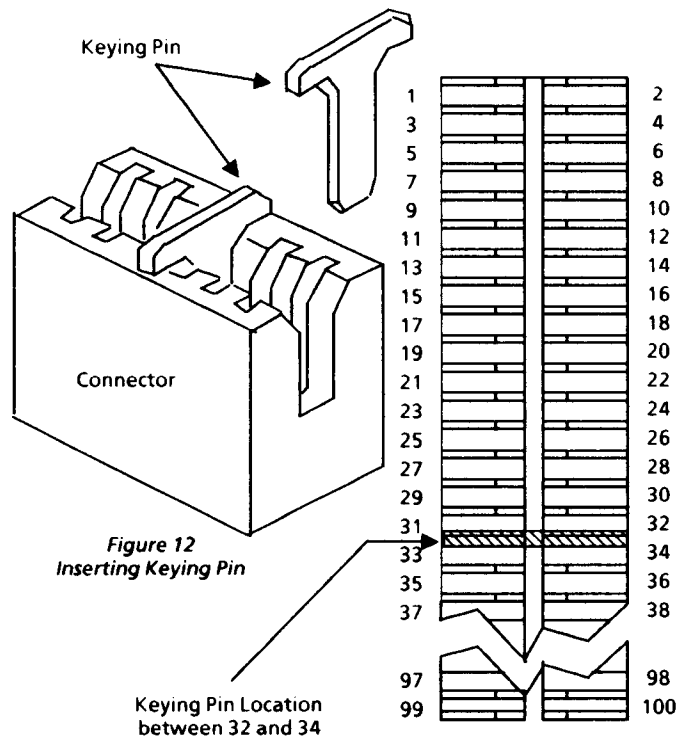


Figure 12 Inserting Keying Pin

Figure 13 Module Rack Connector

Figure 10 Module Keying

Type	Digital Module Description	Keying Pin Location Between Positions:*
HIM101	120V AC/DC Input Module	14 and 16
HIM131	6-24V AC/DC Input Module	8 and 10
HIM141	48V AC/DC Input Module	10 and 12
HIM151	TTL Input Module	12 and 14
HIM161	240V AC/DC Input Module	16 and 18
HOM211	12-50V AC Output Module	18 and 20
HOM221	120V AC Output Module	20 and 22
HOM231	240V AC Output Module	22 and 24
HOM241	9-55V DC Output Module	24 and 26
HOM251	60-160V DC Output Module	26 and 28
HOM261	TTL Output Module	28 and 30
HOM271	Reed Relay (Form A) Output Module	30 and 32

Figure 11 Digital Module Keying Pin Locations

Type	Register Module Description	Keying Pin Location Between Positions:*
AXS211	Access Interface Module	46 and 48
CRM115	Bus Expander Driver	88 and 90
CRM116	Bus Expander Terminator	None *
CRM210, 211, 214, 230	Local Interface	92 and 94
CRM 220, 222, 232	Remote Interface	None*
CRM310	Fiber Optic Interface	76 and 78
CRM 510, 511, 540, 570, 580	Network Interface	14 and 16
CRM560, 565	Remote Network Interface	14 and 16
CRM601	Dual Interface Converter	10 and 12
CRM720	Speech Module	22 and 24
DLM110, 120	D-LOG Data Controller	32 and 34

* Connectors are also keyed between positions 4 and 6 for all modules except Model 500 and 700 processors, CRM232 and Bubble Memory.

Figure 12 Register Module Keying Pin Locations

Type	Register Module Description	Keying Pin Location Between Positions:*
EQ-5138-G1 EQ-5138-G2	Parallel Digital Driver Parallel Digital Receiver	28 and 30 28 and 30
RIM101	16 Function Input	40 and 42
RIM121	4-Function Analog Input	82 and 84
RIM123	High Speed Analog Input	66 and 68
RIM125	Standard High Density In.	56 and 58
RIM126	Analog/TC Input, 8 Function Isolated	68 and 70
RIM127	RTD Input	70 and 72
RIM131	High Speed Counter Input	12 and 14
RIM144	BCD Multiplex Input	84 and 86
RIM331	32 Function 24 VDC Input	16 and 18
RIM361	16 Function Input	42 and 44
ROM121	Standard Analog Out	90 and 92
ROM122	4 Point Isol./Analog Output	20 and 22
ROM131	Stepper Motor Output	8 and 10
ROM141	BCD Multiplex Output	80 and 82
ROM221	16 Function Output	54 and 56
ROM271	16 Point Relay Output	60 and 62
ROM431	16 Function Output	52 and 54
ROM441	32 Function 24 VDC Output	18 and 20
SCP311 through 344	Model 300 Processors	None*
SCP401, 423, 424, 444	Model 400 Processors	46 and 48
SCP521 through 544	Model 500 Processors	64 and 66
SCP631, 632	Model 600 Processors	48 and 50
SCP654, 655	Model 650 Processors	58 and 60
SCP721 through 724	Model 700 Processors	44 and 46
SMM710, 720, 721	Model 700 Bubble or RAM Memory	36 and 38
MCM701, 702, 713	MicroCell Controller Bubble or RAM Memory	36 and 38

* Connectors are also keyed between positions 4 and 6 for all modules except Model 500 and 700 processors, CRM232 and Bubble Memory.

Figure 12 (cont.) Register Module Keying Pin Locations

MODULE INSTALLATION

Prior to inserting modules into the register rack, the rack connectors may be keyed to accept only certain modules. See "Module Keying".

Power should be removed from the register rack before installing or removing modules in the rack assembly.

NOTE: When a module occupying two slots is to be mounted in a register slot, the plastic module guide (located on the top of the rack assembly) between the two slots being used must be removed. This module guide can be pried off with a screwdriver.

To mount modules in a Rack, release the module latching clamp by pivoting it upward (see Figure 13). Next, insert the modules into the rack assembly and secure them by tightening the fastening screw at the base of each module. After the modules are fastened to the rack assembly, pivot the latching clamp back down over the modules. When a module is inserted into its slot, the screw on the bottom of the module must be tightened to the rack to ensure proper operation and grounding.

Register slots that are not used should be covered with Class 8030 Type CBP106 Register Rack Slot Cover Plates and I/O slots should be covered with the Class 8030 Type CBP107 I/O Slot Cover Plate.

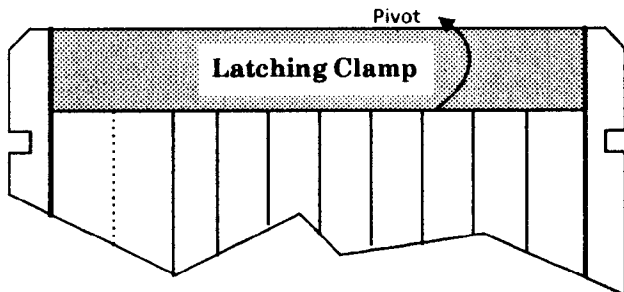


Figure 13 Latching Clamp Operation

Nylon wire routing clips are provided to help route the input and output field wires to the proper I/O module. After the rack assembly has been mounted, install the routing clips by inserting them in the holes at the bottom front edge of the rack (refer to Figure 14). Depending on the wire routing to the I/O modules, the clips may be installed to the right or left of each I/O slot.

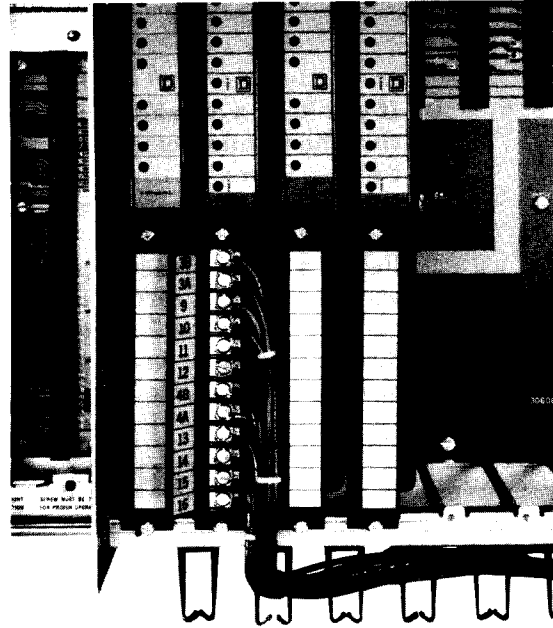


Figure 14 Routing Clips

A dead front cover (Figure 15) is provided with each rack assembly. Two mounting pegs are located on the lower front of the I/O section in the assembly. The type HIM and HOM I/O modules also provide a ridge for this cover. The grooved edge of the dead front cover is placed under the mounting pegs of the rack assembly. By snapping the top edge over the mounting ridge of the I/O module, the dead front cover is secured into place.

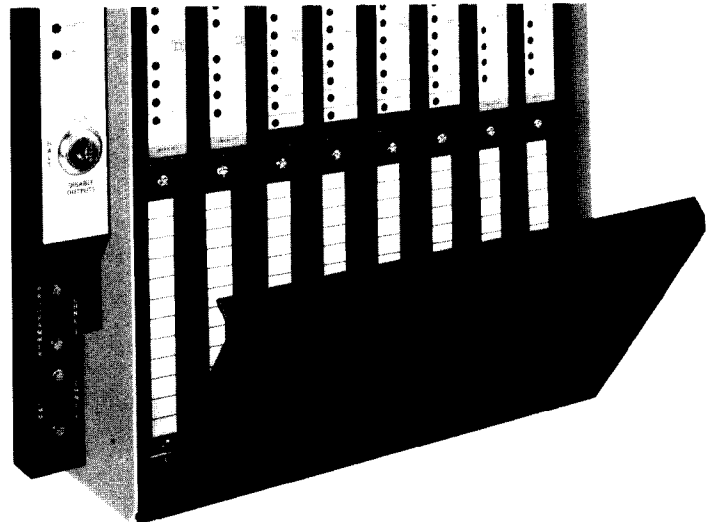


Figure 15 Dead Front Cover



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