APPENDIX A

SY/MAX POWER SUPPLY SPECIFICATIONS

POWER SUPPLY TYPE	PS-10	PS-20	PS-30		PS-40	PS-50	PS-60		PS-70
Input Voltage Range	102-132 VAC (47-63 Hz)	102-132 VAC (47-63 Hz)	102-132 VAC (47-63 Hz)		204-250 VAC (47-63 Hz)	195-250 VAC (47-63 Hz)	195-250 VAC (47-63 Hz)		22.5-28 VDC
Input Power Consumption	138 VA	90 VA	480 VA		138 VA	90 VA	480 VA		80 watt
Power Loss Ride Through (At full rated load)	0.5 ms (at 102 V)	16 ms (at 102 V)	16 ms (at 102 V)		0.5 ms (at 204 v)	16 ms (at 204 V)	16 ms (at 204 V)		16 ms (at 22.5 V)
Input Fuse Rating	1½ A 125 V	2 A 125 V	---		½ A 250 V	1 A 250 V	---		4 A 250 V
Input Fuse Type or Equivalent	BUSS MDL-1½	BUSS MDL-2	---		BUSS MDL-½	BUSS MDL-1	---		BUSS MTH-4
Circuit Breaker	---	---	6A Thermal Trip		---	---	3A Thermal Trip		---
Approximate I/O Capacity	64	128	512		64	128	512		128
Output Voltage Range	5.15 - 5.25 VDC		5.15 - 5.25 VDC	12.4 - 12.6 VDC	5.15 - 5.25 VDC		5.15 - 5.25 VDC	12.4 - 12.6 VDC	5.15 - 5.25 VDC
Output Current Capacity @ 40°C	4A	12A	23A	2.2A	4A	12A	23A	2.2A	10A
Output Current Capacity @ 50°C	4A	9A	20.2A	1.9A	4A	9A	20.2A	1.9A	10A
Output Current Capacity @ 60°C	3A	7A	17.4A	1.6A	3A	7A	17.4A	1.6A	7A
Weight (unpackaged) lb/kg	10.4/4.72	8.6/3.90	16.5/7.48		10.4/4.72	8.6/3.90	16.5/7.48		8.5/3.86

Ambient Temperature Rating ..... 0-60°C
Humidity Rating ..... 0-95% non-condensing
Battery Type ..... Three MALLORY DURACELL® Size D Alkaline Batteries or equivalent
Battery Life - no load ..... 3 years minimum at 25°C, 1 year at 60°C

Battery Life after Red "BATTERY LOW" LED Indicator Illuminates ..... 2 weeks minimum
Battery Life - with load (Processor RAM Memory Support Time) ..... 1 year. (Decreases with battery age.)

APPENDIX B

INSTRUCTION BULLETIN LIST

TAB	CLASS	TYPE	DESCRIPTION	*INSTRUCTION* BULLETIN
INSTALLATION	8020	—	SY/MAX PC Planning & Installation Guide	30598-175-01
PROCESSORS	8020	SCP-1XX	Model 100 Processor	30598-101-01
	8020	SCP-3XX	Model 300 Processor	30598-103-02
	8020	SCP-5XX	Model 500 Processor	30598-105-01
	8020	SCP-7XX	Model 700 Processor	30598-107-01
DIGITAL I/O	8030	CBP-103	Dead Front Duct Cover Conversion Kit	30598-144-01
	8030	CBP-104	Keying Pin Kit	30598-145-01
	8030	CIM-101	120V AC/DC Input Module	30598-111-01
	8030	CIM-131	12-24 AC/DC Input Module	30598-112-01
	8030	CIM-141	48V AC/DC Input Module	30598-113-01
	8030	CIM-151	TTL Input Module	30598-114-01
	8030	CIM-161	240V AC/DC Input Module	30598-115-01
	8030	CIM-191	Input Simulator Module	30598-116-01
	8030	COM-221	120 VAC Output Module	30598-118-01
	8030	COM-231	240 VAC Output Module	30598-119-01
	8030	COM-241	9-55 VDC Output Module	30598-120-01
	8030	COM-251	60-160 VDC Output Module	30598-121-01
	8030	COM-261	TTL Output Module	30598-122-01
	8030	COM-271/281	Reed Relay Output Modules	30598-123-01
	8030	COM-291	Output Simulator Modules	30598-124-01
	8030	CRK-XXX	Standard I/O Rack Assembly	30598-139-01
	8030	CRM-10	SY/MAX-20 I/O Interface	30598-147-01
	8030	CRM-115/116	Bus Expander Driver & Terminator Modules	30598-148-01
	8030	DIM-101	120V AC/DC Deluxe (Isolated) Input Module	30598-126-01
	8030	DIM-141	6-48V AC/DC (Isolated) Input Module	30598-127-01
	8030	DIM-161	240V AC/DC Input Module	30598-128-01
	8030	DOM-221	120 VAC Deluxe Output Module	30598-130-01
	8030	DOM-231	240 VAC Deluxe Output Module	30598-131-01
	8030	DOM-241	9-55 VDC Deluxe Output Module	30598-132-01
	8030	DOM-251	60-160 VDC Deluxe Output Module	30598-133-01
	8030	DOM-225	120 VAC 5A Deluxe Output Module	30598-134-01
	8030	DOM-235	240 VAC 5A Deluxe Output Module	30598-135-01
	8030	DRK-XXX	Deluxe I/O Rack Assembly	30598-140-01
	8030	GOM-221	120 VAC Isolated Output Module	30598-137-01
	8030	GRK-XXX	Isolated I/O Rack Assembly	30598-141-01
	8030	HIM-101	8 Function 120V AC/DC Input Module	30598-185-01
	8030	HIM-131	8 Function 12-24V AC/DC Input Module	30598-186-01
	8030	HIM-141	8 Function 48V AC/DC Input Module	30598-187-01
	8030	HIM-151	8 Function TTL Input Modules	30598-188-01
	8030	HIM-161	8 Function 240V AC/DC Input Module	30598-189-01
	8030	HIM-191	8 Function Input Simulator Module	30598-190-01
	8030	HOM-211	8 Function 12-50 VAC Output Module	30598-192-01
	8030	HOM-221	8 Function 120 VAC Output Module	30598-193-01
	8030	HOM-231	8 Function 240 VAC Output Module	30598-194-01
	8030	HOM-241	8 Function 9-55 VDC Output Module	30598-195-01
	8030	HOM-251	8 Function 60-160 VDC Output Module	30598-196-01
	8030	HOM-261	8 Function TTL Output Module	30598-197-01
	8030	HOM-271	8 Function Reed Relay (Form A) Output Module	30598-198-01
	8030	HRK-XXX	8 Function I/O Rack Assembly	30598-201-01
	8030	PS-XX	Power Supply	30598-156-02
	8030	RRK-XXX	Register Rack Assembly	30598-265-01

TAB	CLASS	TYPE	DESCRIPTION	INSTRUCTION BULLETIN
PROGRAMMERS	8010	PP-XXX	Printers	30598-180-01
	8010	SLM-100	Loader/Monitor	30598-163-02
	8010	SLR-100/110	Cartridge Tape Loader/Recorder	30598-162-02
	8010	SPK-200	CRT Key Cap Kit (used with 8881)	30598-181-01
	8010	SPR-100	Hand-Held Programmer	30598-164-01
	8010	SPR-200/210	CRT Programmer	30598-165-01
	8010	SPR-201/211	CRT Programmer (SY/MAX-20 Supplement)	30598-166-01
	8010	SPR-250,260	CRT Programmer	30598-174-01
	8010	SPR-300,310	Deluxe CRT Programmer	30598-167-01
	8010	SFW-110	Deluxe CRT Executive Tape for D-LOG Module Tape Operations	30598-303-01
	8010	SFW-321	SY/MAX Communication Software for IBM® Personal Computers	30598-310-01
	8010	SFW-115	Deluxe CRT Executive Tape for Programming Model 500 EPROMS	30598-304-01
REGISTER MODULES AND INTERFACES	8030	CRM-210,211,220,222	Local/Remote Interface Modules	30598-247-02
	8030	CRM-310	Fiber Optic Interface Module	30598-254-02
	8030	CRM-510	Network Interface Module	30598-257-01
	8030	CRM-530	Network Interface Module (App. #1)	30598-259-01
	8030	CRM-560	Remote Network Interface Module	30598-150-01
	8030	CRM-601	Dual RS-232/RS-422 Converter Module	30598-152-01
	8030	DLM-110,120	D-LOG Data Controller	30598-272-02
	8030	RIM-121	Analog Input Module	30598-203-01
	8030	RIM-131	High Speed Counter Module	30598-210-01
	8030	RIM-141,143	BCD Input Module	30598-213-02
	8030	ROM-121	Analog Output Module	30598-204-01
	8030	ROM-141	Multiplexed BCD Output Module	30598-214-01
	8030	CRM-720	Speech Output Module	30598-222-01
PROCESS CONTROL	8040	PCM-110	Process Control Module	30598-240-01
	8040	PCM-901	Manual Control Station	30598-244-01
	8040	PCM-902	Process Control Station	30598-243-01
MISC.	8010	—	PID Closed Loop Control Using SY/MAX Model 300	30598-301-02
	8010	—	Simplified Communication Protocol For Register READ/WRITE from SY/MAX Processors	30598-351-01

APPENDIX C

COMPONENT WEIGHTS

TAB	CLASS	TYPE	DESCRIPTION	APPROXIMATE WEIGHT (lb/kg)
PROCESSORS	8020	SCP-3XX	Model 300 Processor	3.0/1.36
	8020	SCP-5XX	Model 500 Processor	4.0/1.81
	8020	SCP-7XX	Model 700 Processor	4.9/2.22
	8020	SMM-710,720	Memory Module	4.5/2.04
DIGITAL I/O	8030	CIM-101	120V AC/DC Input Module	0.5/0.23
	8030	CIM-131	12-24 AC/DC Input Module	0.5/0.23
	8030	CIM-141	48V AC/DC Input Module	0.5/0.23
	8030	CIM-151	TTL Input Module	0.5/0.23
	8030	CIM-161	240V AC/DC Input Module	0.5/0.23
	8030	CIM-191	Input Simulator Module	0.5/0.23
	8030	COM-221	120 VAC Output Module	0.7/0.32
	8030	COM-231	240 VAC Output Module	0.7/0.32
	8030	COM-241	9-55 VDC Output Module	0.7/0.32
	8030	COM-251	60-160 VDC Output Module	0.7/0.32
	8030	COM-261	TTL Output Module	0.5/0.23
	8030	COM-271/281	Reed Relay Output Modules	0.9/0.41
	8030	COM-291	Output Simulator Modules	0.6/0.27
	8030	CRM-10	SY/MAX-20 I/O Interface	0.8/0.36
	8030	CRM-115	Bus Expander Driver Module	0.7/0.32
	8030	CRM-116	Bus Expander Terminator Module	1.2/0.54
	8030	DIM-101	120V AC/DC Deluxe (Isolated) Input Module	0.8/0.36
	8030	DIM-141	6-48V AC/DC (Isolated) Input Module	0.8/0.36
	8030	DIM-161	240V AC/DC Input Module	0.8/0.36
	8030	DOM-221	120 VAC Deluxe Output Module	1.2/0.54
	8030	DOM-231	240 VAC Deluxe Output Module	1.2/0.54
	8030	DOM-241	9-55 VDC Deluxe Output Module	1.1/0.50
	8030	DOM-251	60-160 VDC Deluxe Output Module	1.1/0.50
	8030	DOM-225	120 VAC 5A Deluxe Output Module	1.1/0.50
	8030	DOM-235	240 VAC 5A Deluxe Output Module	1.1/0.50
	8030	GOM-221	120 VAC Isolated Output Module	1.2/0.54
	8030	HIM-101	8 Function 120V AC/DC Input Module	1.2/0.54
	8030	HIM-131	8 Function 12-24V AC/DC Input Module	1.1/0.50
	8030	HIM-141	8 Function 48V AC/DC Input Module	1.2/0.54
	8030	HIM-151	8 Function TTL Input Modules	1.2/0.54
	8030	HIM-161	8 Function 240V AC/DC Input Module	1.2/0.54
	8030	HIM-191	8 Function Input Simulator Module	1.0/0.45
	8030	HOM-211	8 Function 12-50 VAC Output Module	1.8/0.82
	8030	HOM-221	8 Function 120 VAC Output Module	1.8/0.82
	8030	HOM-231	8 Function 240 VAC Output Module	1.9/0.86
	8030	HOM-241	8 Function 9-55 VDC Output Module	1.8/0.82
	8030	HOM-251	8 Function 60-160 VDC Output Module	1.8/0.82
	8030	HOM-261	8 Function TTL Output Module	1.2/0.54
	8030	HOM-271	8 Function Reed Relay (Form A) Output Module	1.9/0.86
RACK ASSEMBLIES	8030	CRK-100	4 Slot Standard without Register Slot	4.3/1.95
	8030	CRK-200	8 Slot Standard without Register Slot	7.5/3.40
	8030	CRK-210	8 Slot Standard with Register Slot	7.9/3.58
	8030	CRK-300	16 Slot Standard with Register Slot	17.1/7.76
	8030	DRK-210	8 Slot Deluxe with Register Slot	9.3/4.22
	8030	DRK-300	16 Slot Deluxe with Register Slot	19.9/9.03
	8030	GRK-110	4 Slot Isolated with Register Slot	6.2/2.81
	8030	GRK-210	8 Slot Isolated with Register Slot	8.8/3.99
	8030	HRK-100	8 Slot 8 Function I/O Rack Assembly	16.9/7.6
	8030	HRK-200	16 Slot 8 Function I/O Rack Assembly	26.2/11.8
	8030	RRK-100	5 Slot Register Rack Assembly	12.0/5.44
	8030	RRK-200	9 Slot Register Rack Assembly	16.5/7.48

TAB	CLASS	TYPE	DESCRIPTION	APPROXIMATE WEIGHT (lb/kg)
POWER SUPPLIES	8030	PS-10	64 I/O, 120 VAC	10.4/4.72
	8030	PS-20	128 I/O, 120 VAC	8.6/3.90
	8030	PS-30	512 I/O, 120 VAC	16.5/7.48
	8030	PS-40	64 I/O, 240 VAC	10.4/4.72
	8030	PS-50	128 I/O, 240 VAC	8.6/3.90
	8030	PS-60	512 I/O, 240 VAC	16.5/7.48
	8030	PS-70	128 I/O, 24 VDC	8.5/3.86
PROGRAMMERS	8010	PP-12,13	OKIDATA 82A Printers	19.6/8.9
	8010	PP-11	Teletype Model 43 Printer	40.0/18.14
	8010	PP-20	Teletype Model 40 Printer	56.0/25.40
	8010	SLM-100	Loader/Monitor	3.4/1.54
	8010	SLR-100/110	Cartridge Tape Loader/Recorder	13.5/6.12
	8010	SPR-100	Hand-Held Programmer	1.9/0.86
	8010	SPR-200/210	CRT Programmer	30.6/13.88
	8010	SPR-250	CRT Programmer	36.2/16.39
	8010	SPR-300	CRT Programmer	36.2/16.39
REGISTER MODULES	8030	CRM-210,211,222	Local/Remote Interface Modules	3.0/1.36
	8030	CRM-220	Remote Interface Module (4 Function Racks)	1.0/0.45
	8030	CRM-310	Fiber Optic Interface Module	1.9/0.86
	8030	CRM-510,530	Network Interface Module	2.7/1.22
	8030	DLM-110,120	D-LOG Data Controller	3.0/1.36
	8030	RIM-121	Analog Input Module	2.7/1.22
	8030	RIM-131	High Speed Counter Module	2.7/1.22
	8030	RIM-144	BCD Input Module	2.9/1.31
	8030	ROM-121	Analog Output Module	2.8/1.27
	8030	ROM-141	Multiplexed BCD Output Module	2.9/1.31
	8030	CRM-720	Speech Output Module	3.3/1.49
PROCESS CONTROL	8040	PCM-110	Process Control Module	3.3/1.49
	8040	PCM-901	Manual Control Station	4.0/1.81
	8040	PCM-902	Process Control Station	6.0/2.72

APPENDIX D

COMPONENT DIMENSIONS

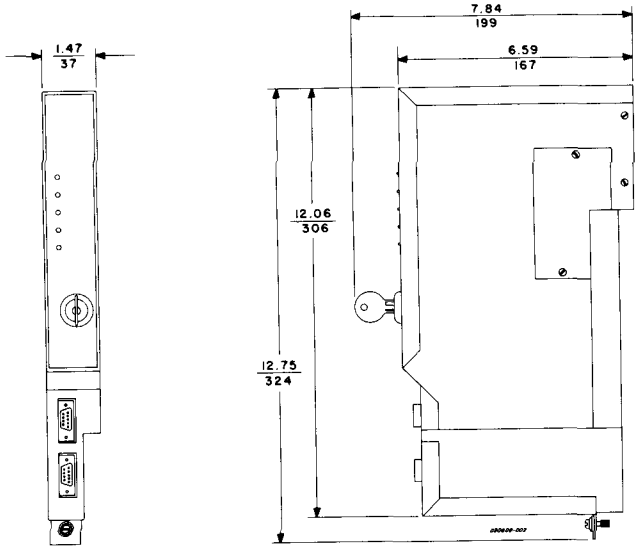


Figure D.1 - Model 300 Processor

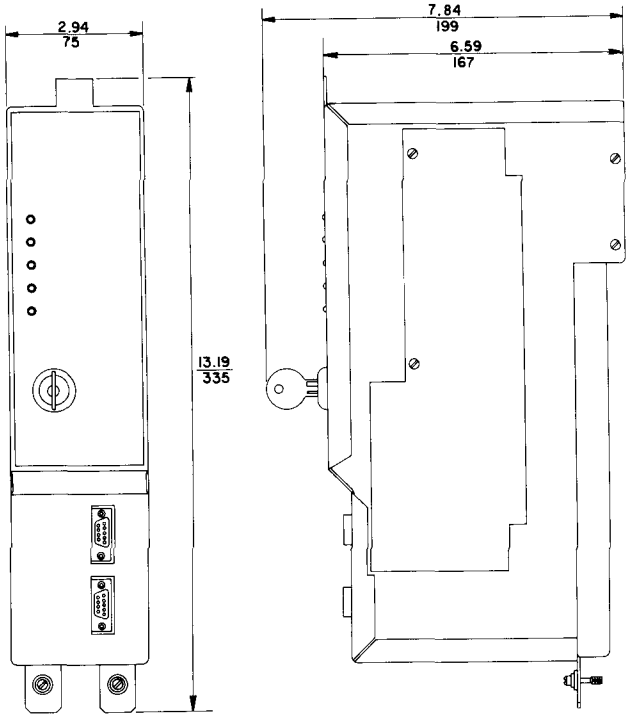


Figure D.2 - Model 500 Processor

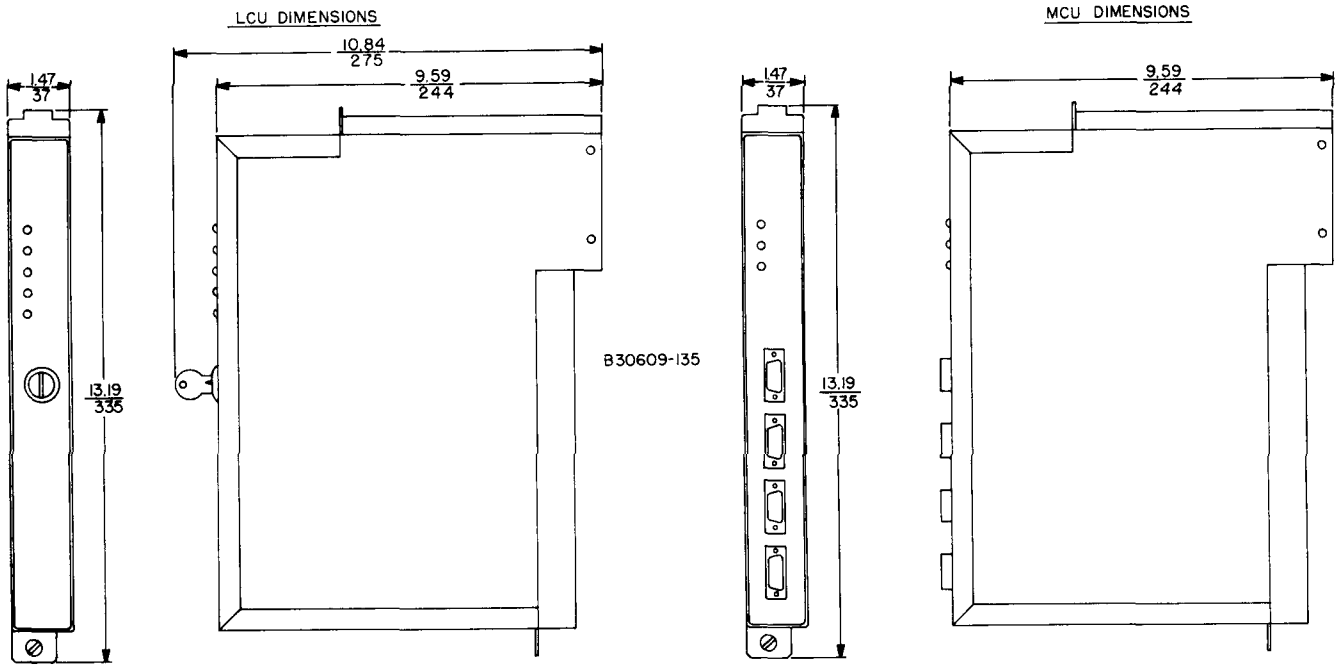
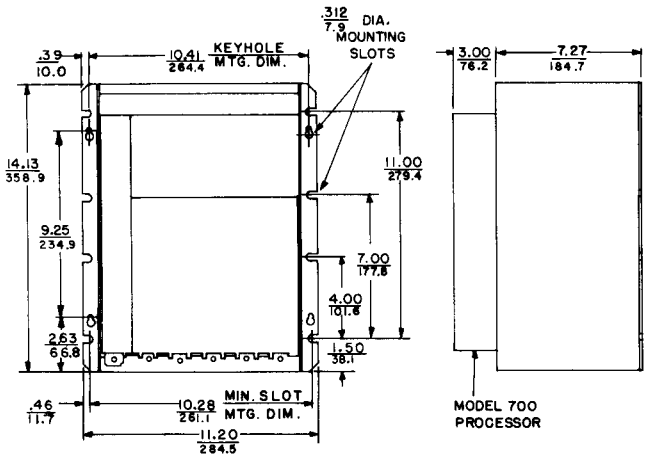
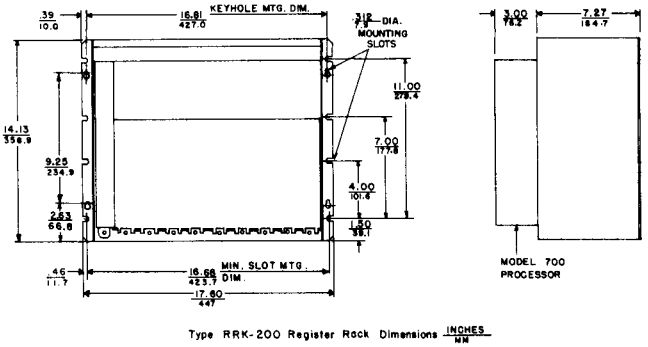


Figure D.3 - Model 700 Processor and Memory Module



Type RRK-100 Register Rack Dimensions INCHES / MM

Figure D.4 - Type RRK-100 Register Rack I/O Rack



Type RRK-200 Register Rack Dimensions INCHES / MM

Figure D.5 - Type RRK-200 Register I/O Rack

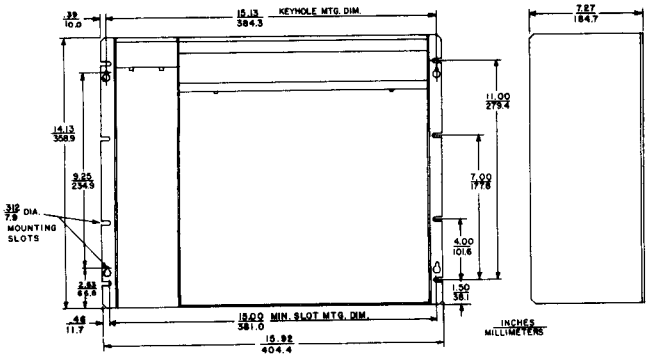


Figure D.6 - Type HRK-100 I/O Rack

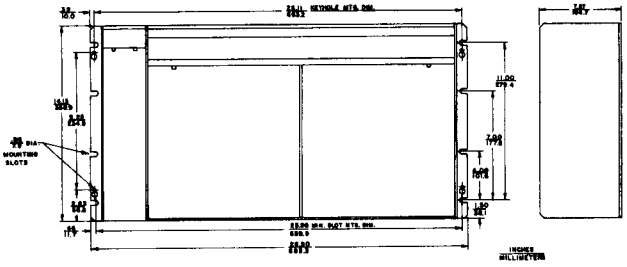
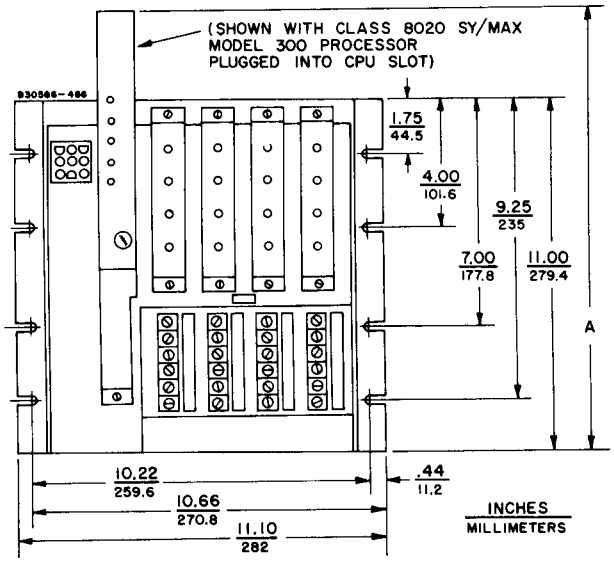


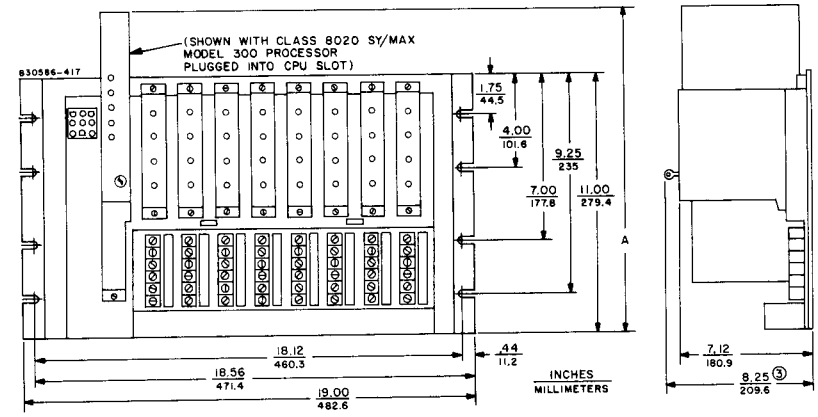
Figure D.7 - Type HRK-200 I/O Rack



①-WHEN USING CLASS 8020 SY/MAX MODEL 300 PROCESSOR IN CPU SLOT.
②-WHEN USING CLASS 8030 TYPE CRM-116 BUS EXPANDER/TERMINATOR OR TYPE CRM-10 SY/MAX-20 I/O INTERFACE IN CPU SLOT.

	A①	A②
INCHES	14.00	11.00
MILLIMETERS	355.6	279.4

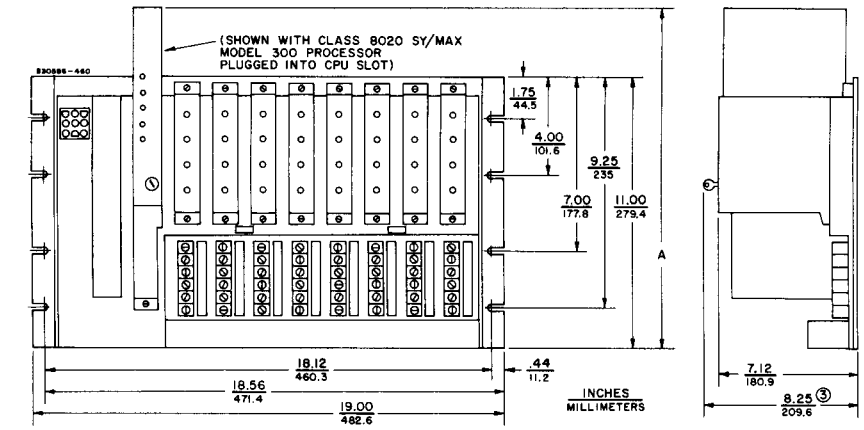
Figure D.8 - Type CRK-100 I/O Rack



①-WHEN USING CLASS 8020 SY/MAX MODEL 300 PROCESSOR IN CPU SLOT.
②-WHEN USING CLASS 8030 TYPE CRM-116 BUS EXPANDER/TERMINATOR OR TYPE CRM-10 SY/MAX-20 I/O INTERFACE IN CPU SLOT.
③-KEY SWITCH CLEARANCE REQUIRED ONLY FOR SY/MAX MODEL 300 PROCESSOR.

	A①	A②
INCHES	14.00	11.00
MILLIMETERS	356.6	279.4

Figure D.9 - Type CRK-200 I/O Rack



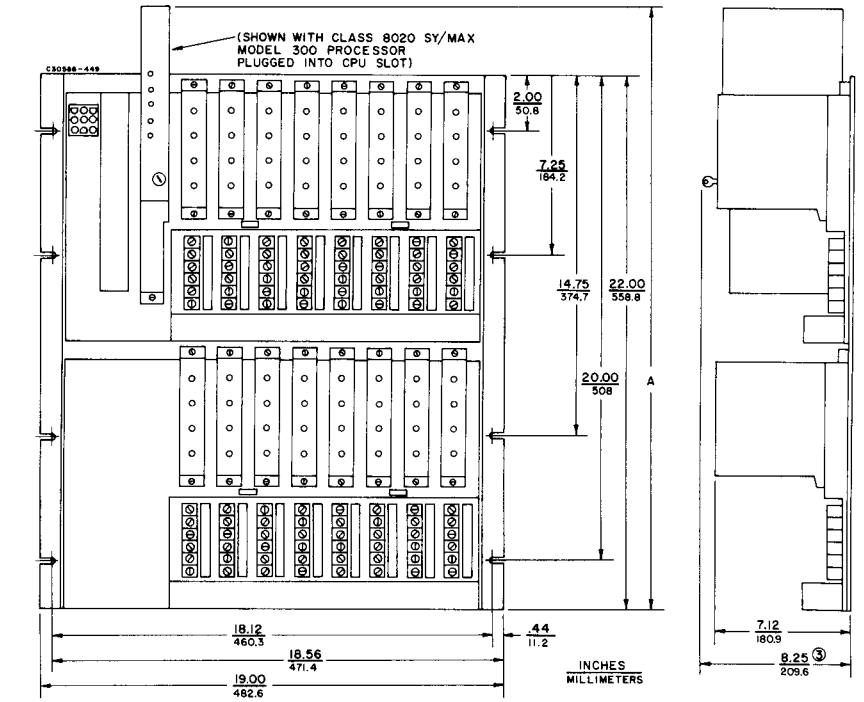
	A ①	A ②
INCHES	14.00	11.00
MILLIMETERS	355.6	279.4

① - WHEN USING CLASS 8020 SY/MAX MODEL 300 PROCESSOR IN CPU SLOT.

② - WHEN USING CLASS 8030 TYPE CRM-116 BUS EXPANDER/TERMINATOR OR TYPE CRM-10 SY/MAX-20 I/O INTERFACE IN CPU SLOT.

③ - KEY SWITCH CLEARANCE REQUIRED ONLY FOR SY/MAX MODEL 300 PROCESSOR.

Figure D.10 - Type CRK-210 I/O Rack



	A ①	A ②
INCHES	25.00	22.00
MILLIMETERS	635	558.8

① - WHEN USING CLASS 8020 SY/MAX MODEL 300 PROCESSOR IN CPU SLOT.

② - WHEN USING CLASS 8030 TYPE CRM-116 BUS EXPANDER/TERMINATOR OR TYPE CRM-10 SY/MAX-20 I/O INTERFACE IN CPU SLOT.

③ - KEY SWITCH CLEARANCE REQUIRED ONLY FOR SY/MAX MODEL 300 PROCESSOR.

Figure D.11 - Type CRK-300 I/O Rack

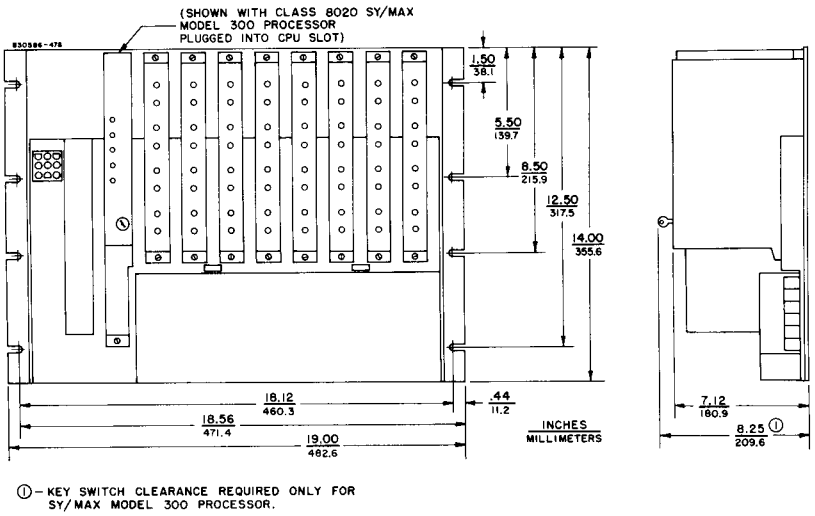


Figure D.12 - Type DRK-210 I/O Rack

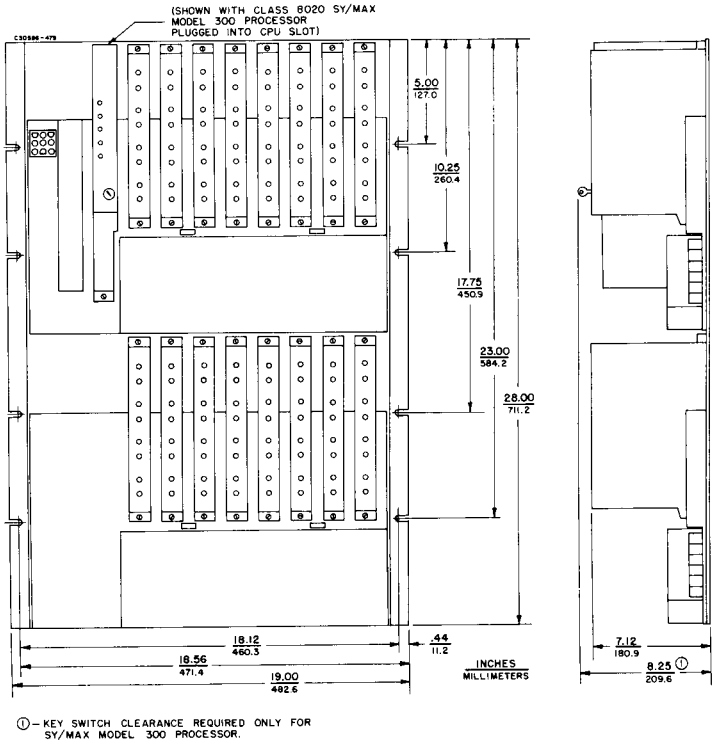
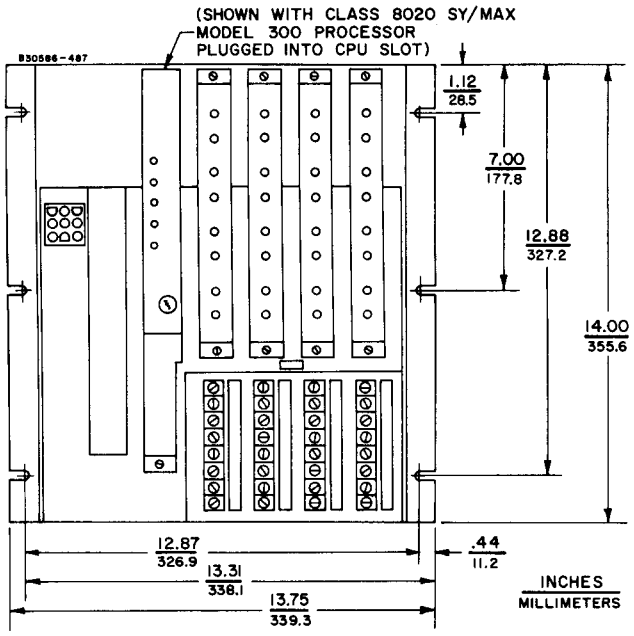
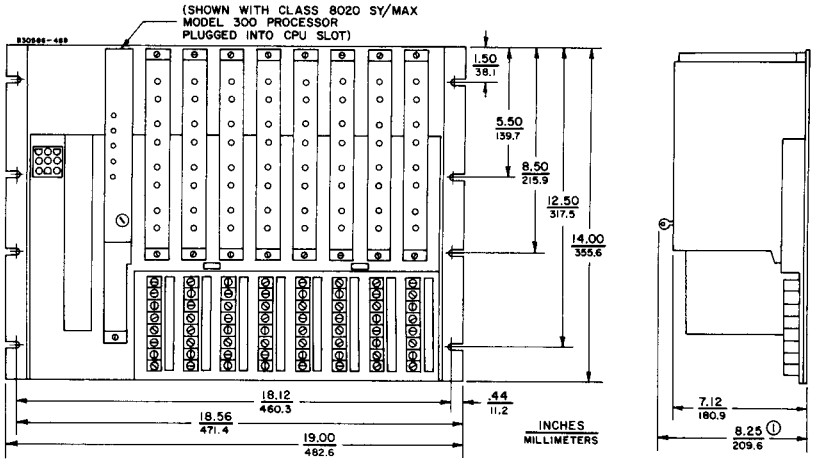


Figure D.13 - Type DRK-300 I/O Rack



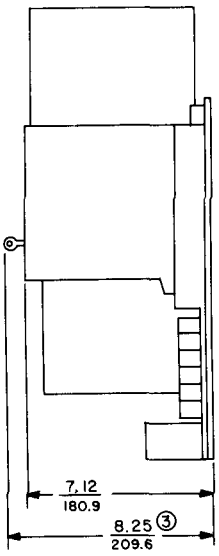
① - KEY SWITCH CLEARANCE REQUIRED ONLY FOR SY/MAX MODEL 300 PROCESSOR.

Figure D.14 - Type GRK-110 I/O Rack



① - KEY SWITCH CLEARANCE REQUIRED ONLY FOR SY/MAX MODEL 300 PROCESSOR.

Figure D.15 - Type GRK-210 I/O Rack



③-KEY SWITCH CLEARANCE REQUIRED ONLY FOR SY/MAX MODEL 300 PROCESSOR.

Figure D.16 - Type CRK I/O Rack - Side View

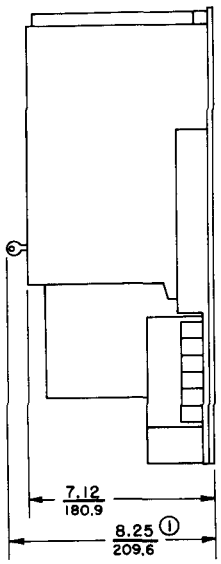
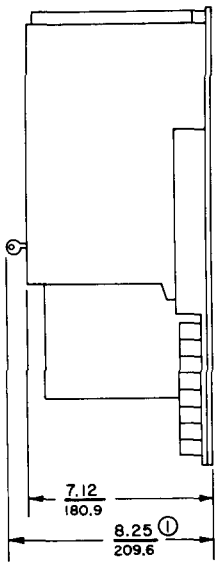


Figure D.17 - Type DRK I/O Rack - Side View



③-KEY SWITCH CLEARANCE REQUIRED ONLY FOR SY/MAX MODEL 300 PROCESSOR.

Figure D.18 - Type GRK I/O Rack - Side View

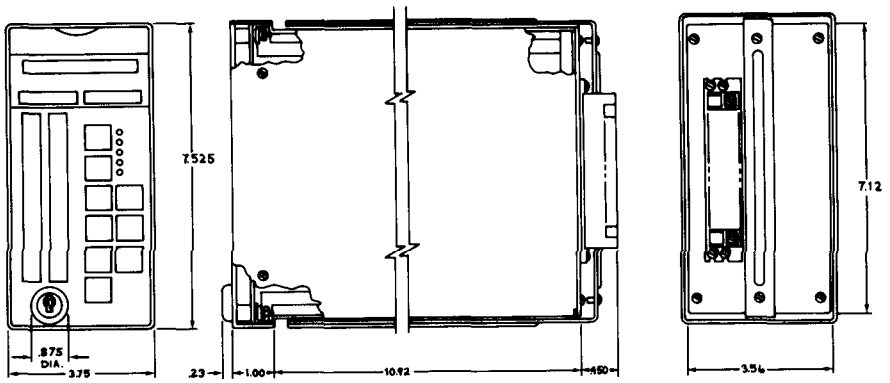


Figure D.19 - Type PCM-901 Manual Control Station and PCM-902 Process Control Station

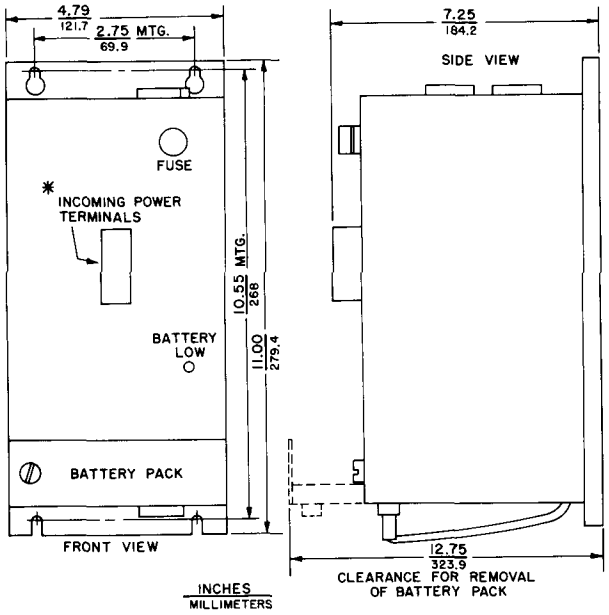


Figure D.20 - Type PS-10,20,40,50,70 Power Supply

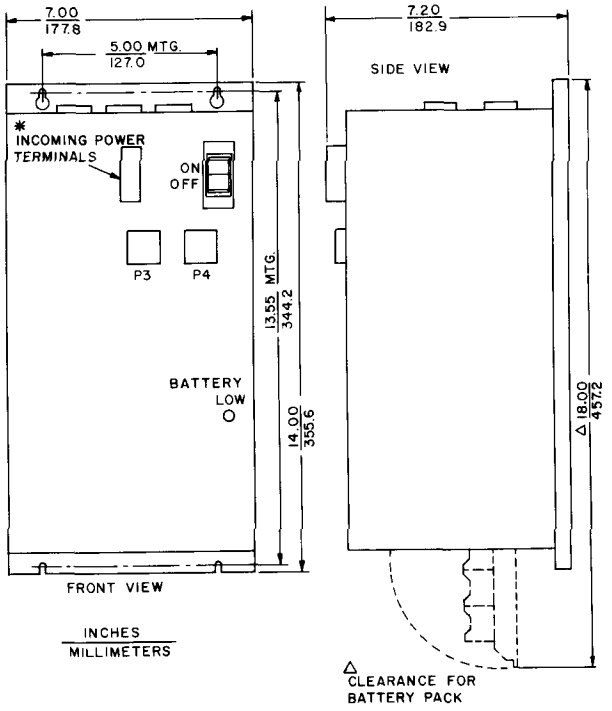


Figure D.21 - Type PS-30,60 Power Supply

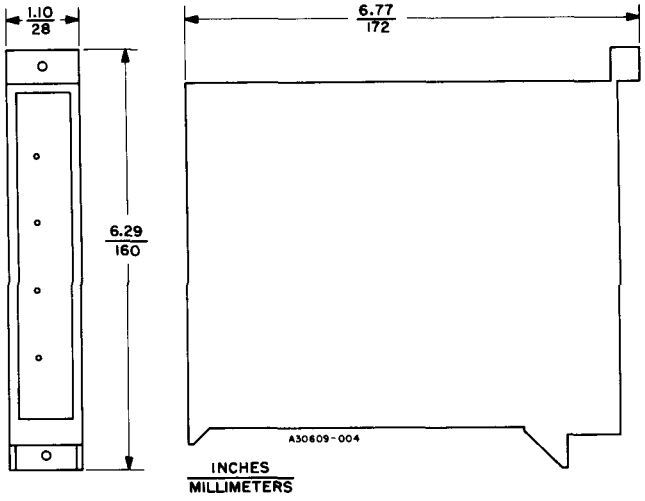


Figure D.22 - Type CIM I/O Module

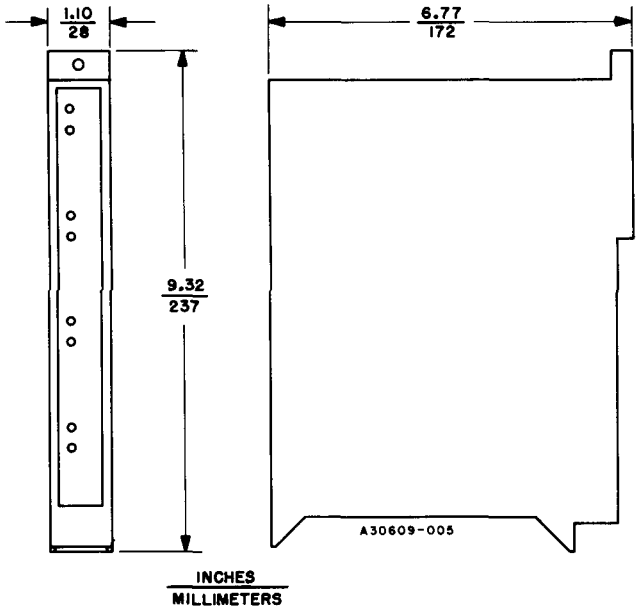


Figure D.24 - Type DIM I/O Module

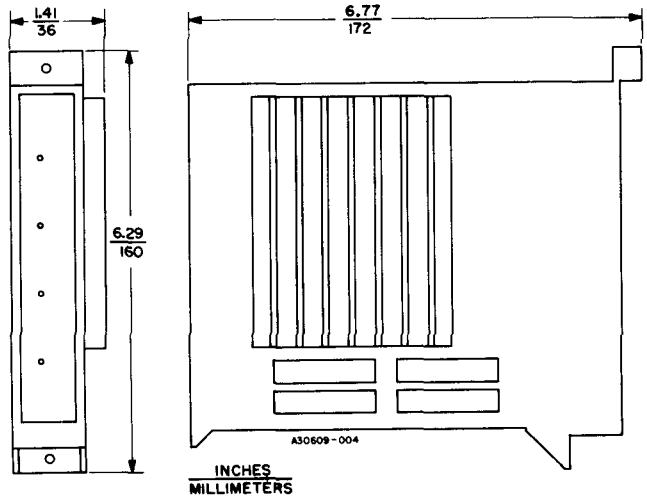


Figure D.23 - Type COM I/O Module

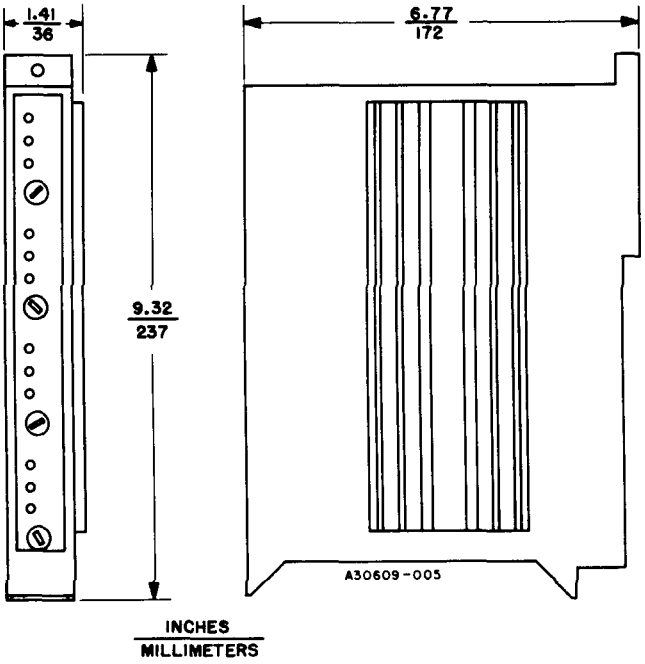


Figure D.25 - Type DOM, GOM I/O Module

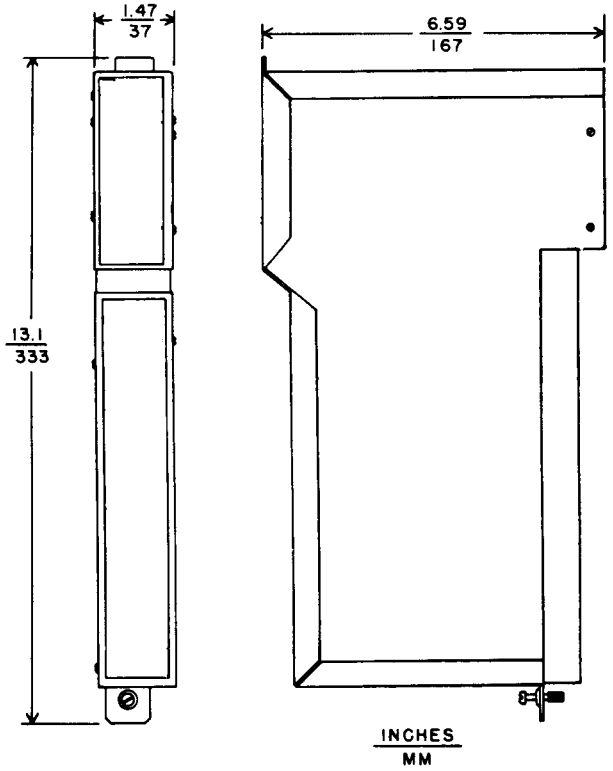


Figure D.26 - Type RIM, ROM, DLM, CRM, Module (Differences in ports, terminals, keyswitches, may require greater depth)

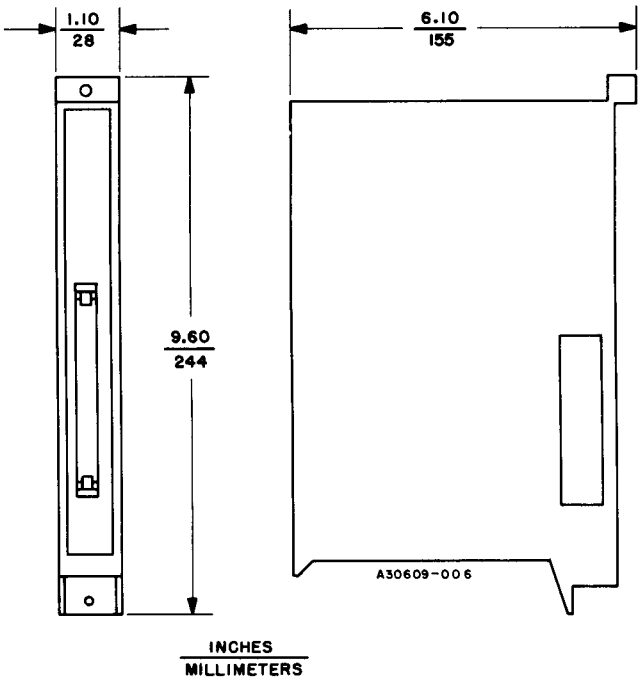


Figure D.28 - Type CRM-115,116 Bus Expander Modules, Type CRM-220 Remote Interface Module

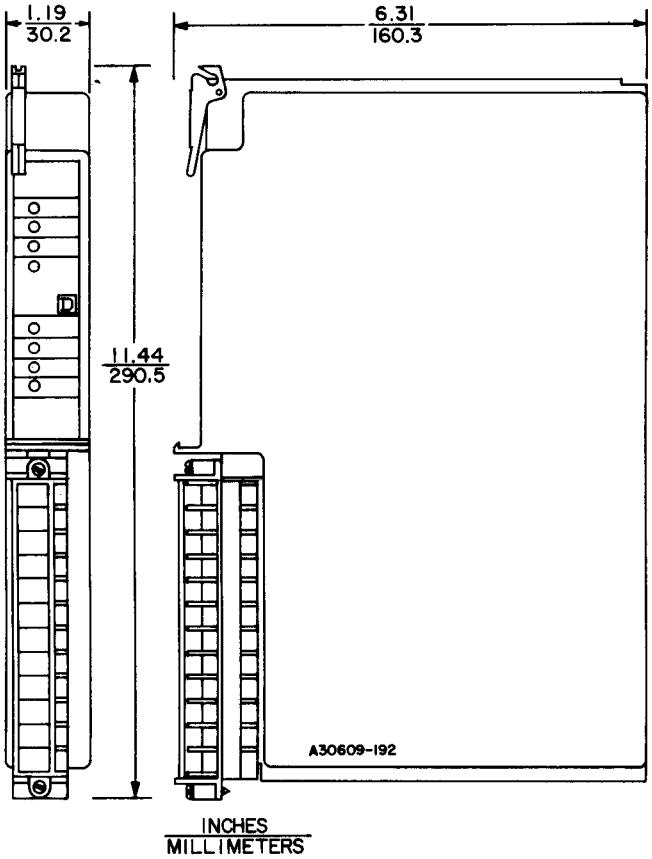


Figure D.27 - Type HIM, HOM I/O Module

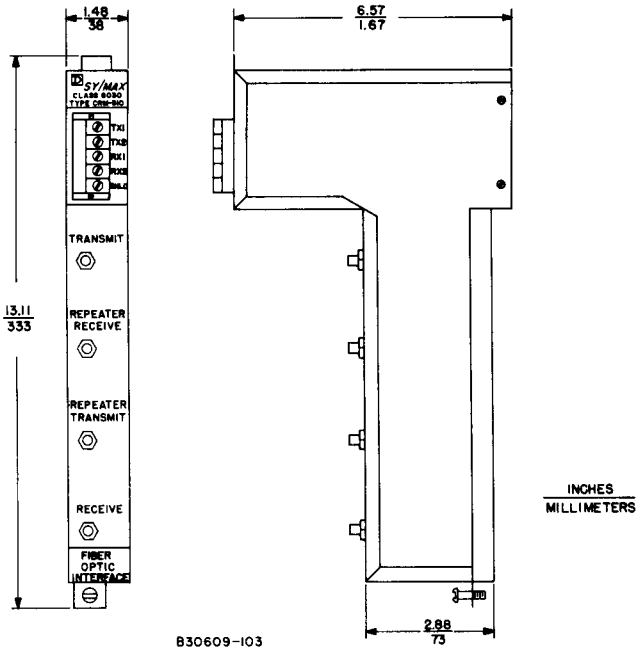


Figure D.29 - Fiber Optic Interface Module

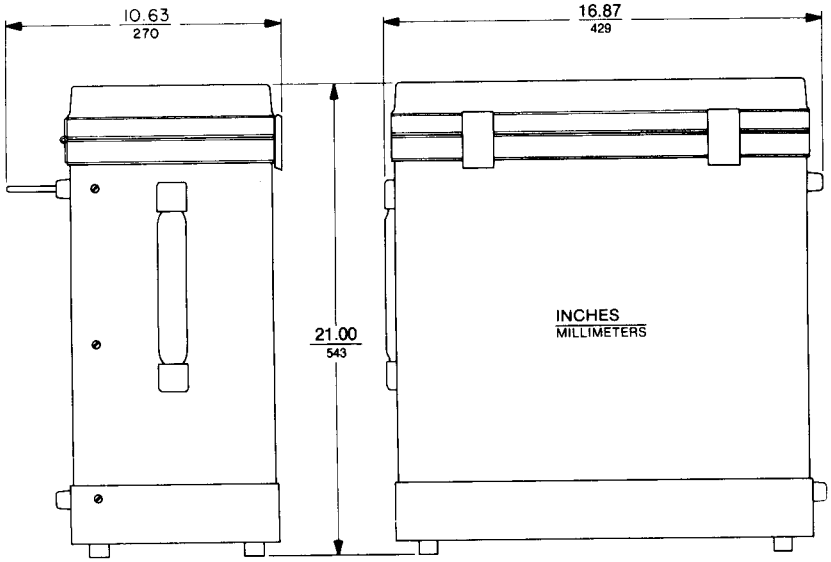


Figure D.30 - Type SPR-250,260,300,310 CRT Programmer

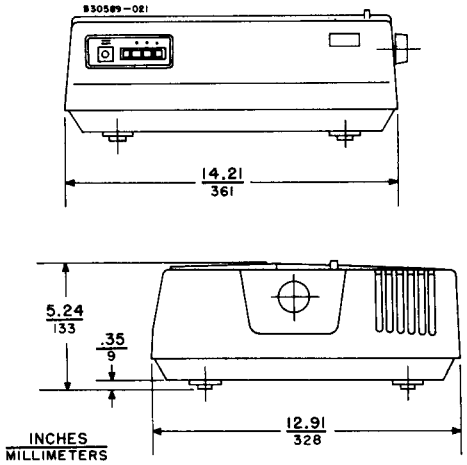
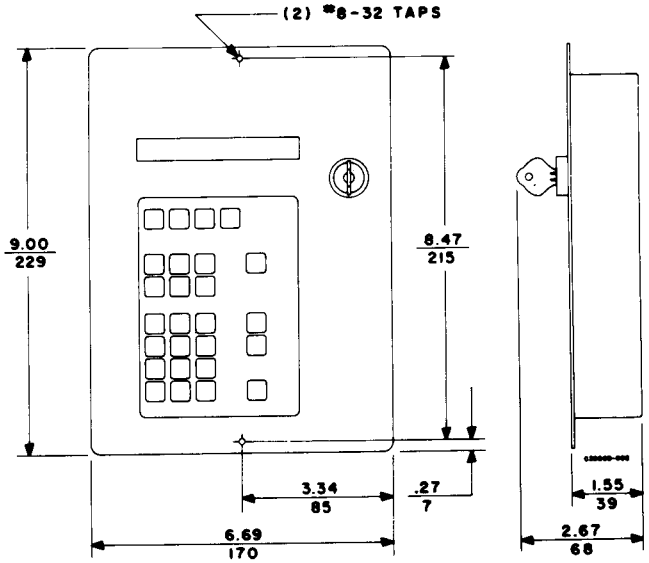


Figure D.32 - Type PP-12, PP-13 Printer



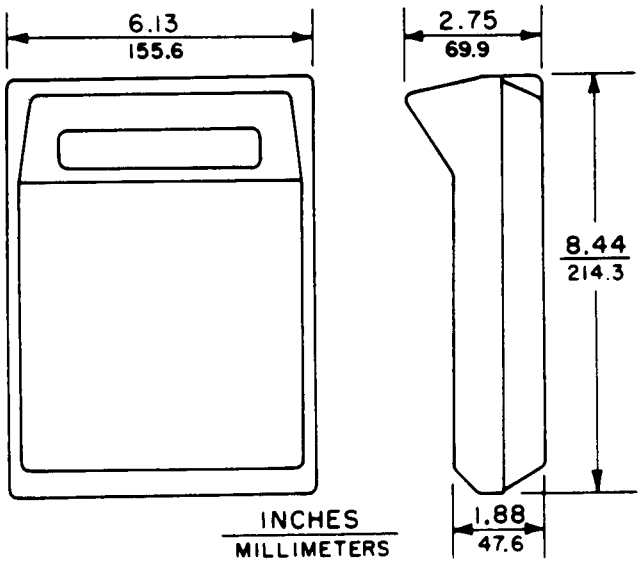


Figure D.33 - Type SPR-100 Hand Held Programmer

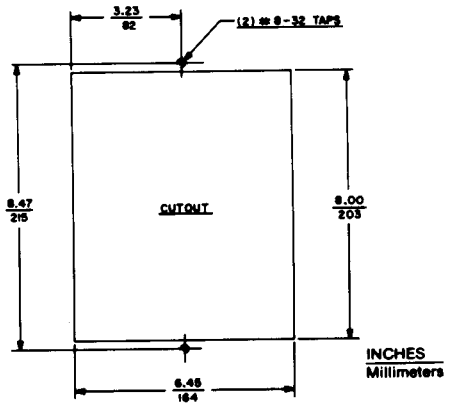


Figure D.31 - Type SLM-100 Loader/Monitor

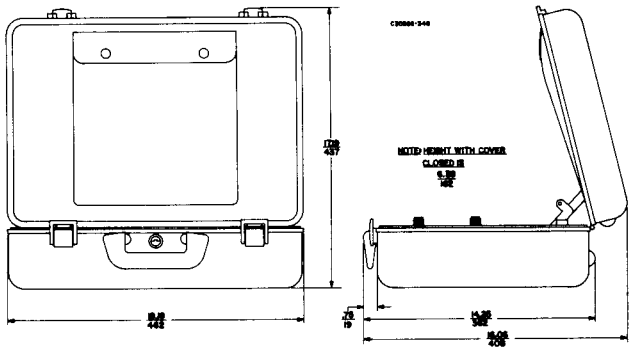


Figure D.34 - Type SLR-100,110 Tape Loader/Recorder

APPENDIX E

DIRECT PROCESSOR TO PROCESSOR COMMUNICATION

In addition to communication over the SY/NET network, two SY/MAX processors can communicate directly to each other over a serial communication cable plugged into a communications port on each processor. This arrangement allows storage register and I/O data to be transferred from one processor to the other.

Communications are initiated by instructions programmed into one of the processors. A processor with READ, WRITE, and ALARM commands in its instruction set is required to initiate communication (all Model 700 and 500 processors and Deluxe Model 300 processors have these commands). However, all SY/MAX Family processors (including Model 100 and Standard Model 300 processors) can respond to communication commands programmed in another processor.

For directions on how to program communication instructions, refer to the "Communication to External Devices" section of the CRT Programmer Instruction Bulletin.

The Type CC-100 (10 ft. - 3 m) or Type CC-101 (30 ft. - 9.1 m) Communication Cable may be used for processor to processor communication, or an equivalent cable up to 10,000 ft. (3,048 m) can be made. Communications may be sent from and received by any of the processor communications ports ("CHNL 1", "CHNL 2", etc.). More than two processors may be connected using this method (see Figure E.1).

In the system shown in Figure E.1, if data were to be sent from Processor 1 to Processor 3, the data would first have to be transferred from Processor 1 to Processor 2 using a READ or WRITE operation. Then using another READ or WRITE operation, the data could be transferred from Processor 2 to Processor 3.

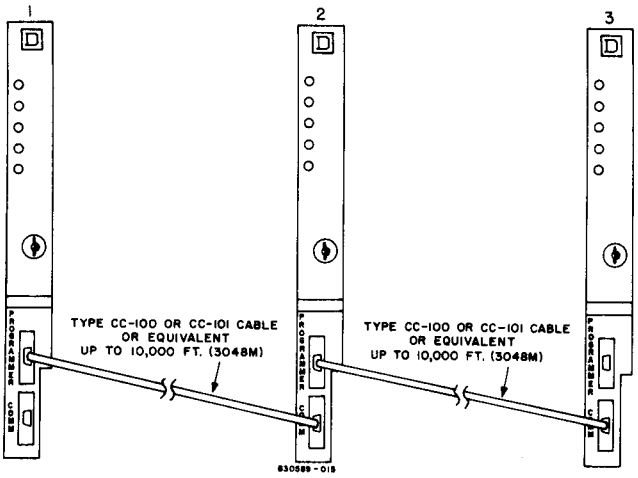


Figure E.1 - Processor to Processor Communication