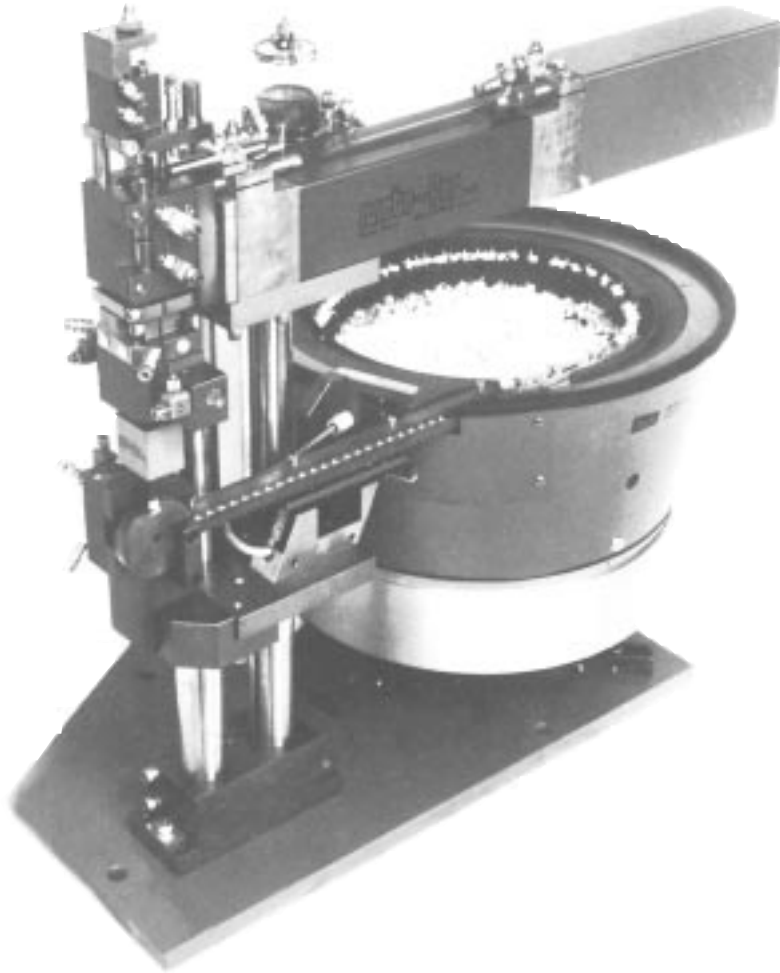


Load station for pick and place with vibratory bowl feeder

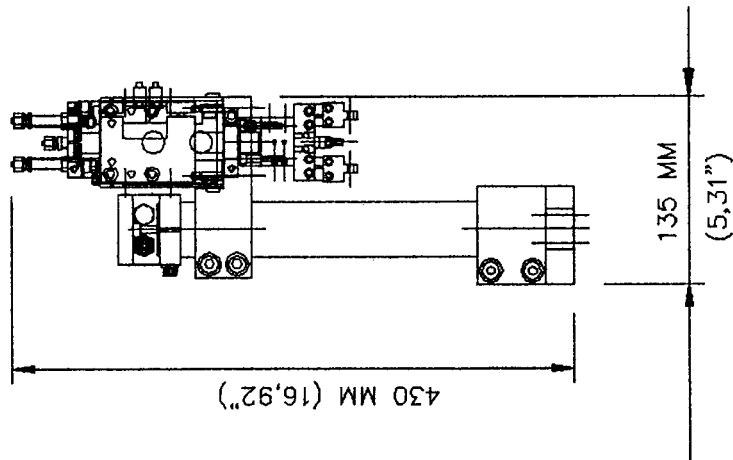
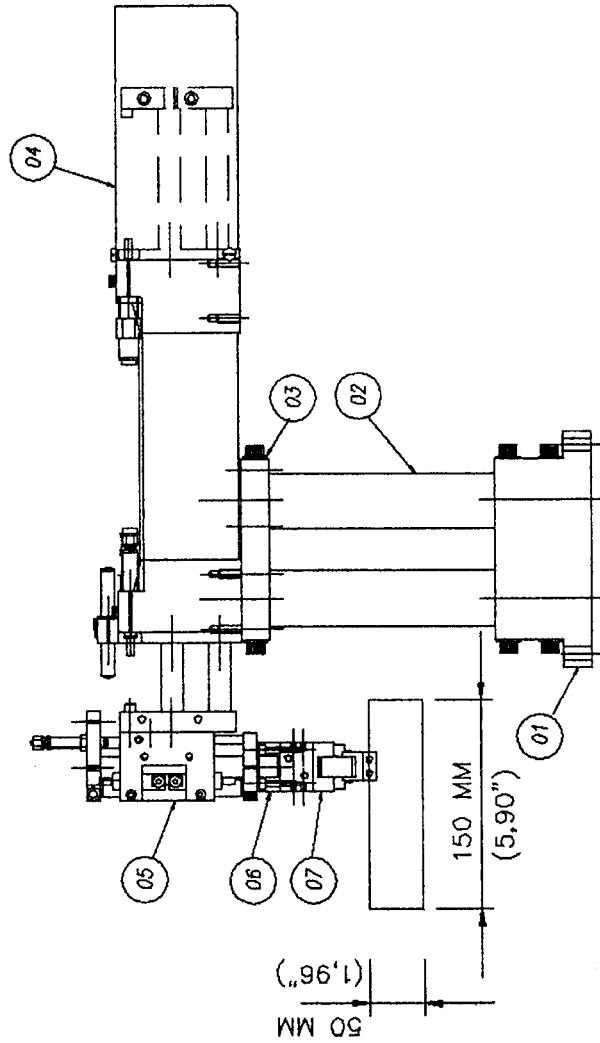
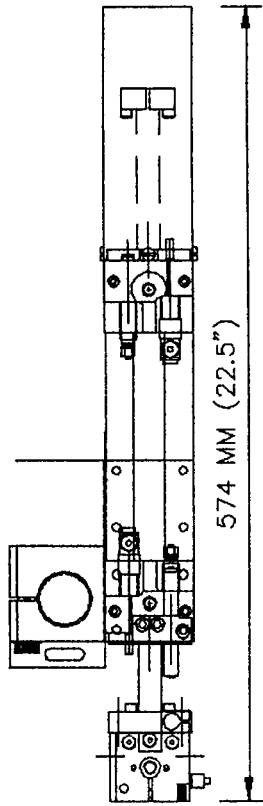


Complete turnkey loading station comprising modular automation elements.

The component is orientated in the bowl feeder and matched feed rails take it to the wait position for the pick up head.

The load station can be fitted with an independent control to sense the presence of a component regulate the feed rate.

Throughput about 60 pieces per minute according to the component involved.



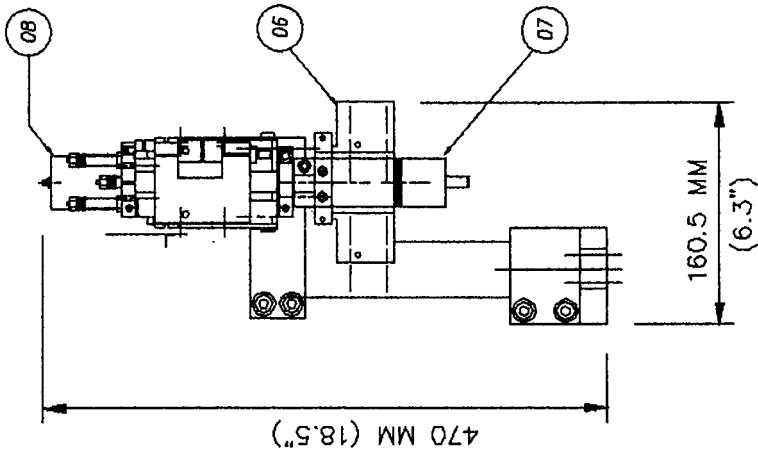
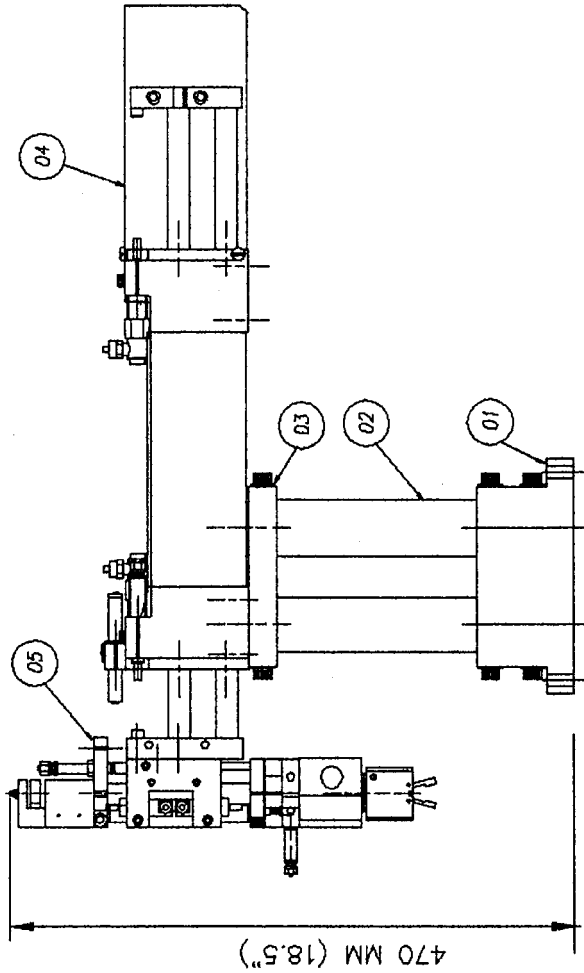
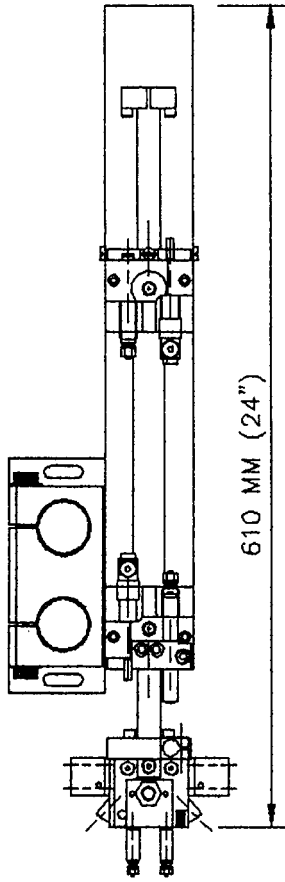
M F AUTOMATION PITTSBURGH, PA 15211		Date		Scale	
		DRAWN CHECKED APPR			
PART NAME PICK & PLACE		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES			
Drawing Number PP-001		DECIMALS XX ±.10 X ±.25		ANGULAR ±1°	
REVISIONS		THIS DRAWING AND INFORMATION IS THE PROPERTY OF M F AUTOMATION, INC.			
MATERIAL		PLATING			
THIRD ANGLE PROJECTION		THIS DRAWING AND INFORMATION IS THE PROPERTY OF M F AUTOMATION, INC.			

DWG MFAUTON © 1/4" B.S.11

METO-FER AUTOMATION COMPONENTS FOR PICK & PLACE DRAWING PP-001

ITEM	QUANTITY	DESCRIPTION	PART NO.	PAGE
1	1	STAND BASE	SD 01.001	6.002
2	2	PILLAR	SE 40X300	6.003
3	1	MOUNTING PLATE	SD 01.002	6.002
4	1	LINEAR UNIT	LH 150-A	1.001
5	1	VERTICAL UNIT	VE 52-A	1.011
6	1	MOUNTING PLATE	ZB 08.001	4.021
7	1	GRIPPER	KZP 20	4.011
8	2	FLOW CONTROL VALVE	DV-M5	5.021
9	2	FLOW CONTROL VALVE	DV-R 1/8	5.021
10	5	SENSOR (NPN)	QE-022-NS-11L	11.001
		OR		
	5	SENSOR (PNP)	QE-022-PS-11L	11.001
11	5	CABLE (2M, 6FT.)	ST-11G-3B-U2X	11.003

10/28/96 - PP-001

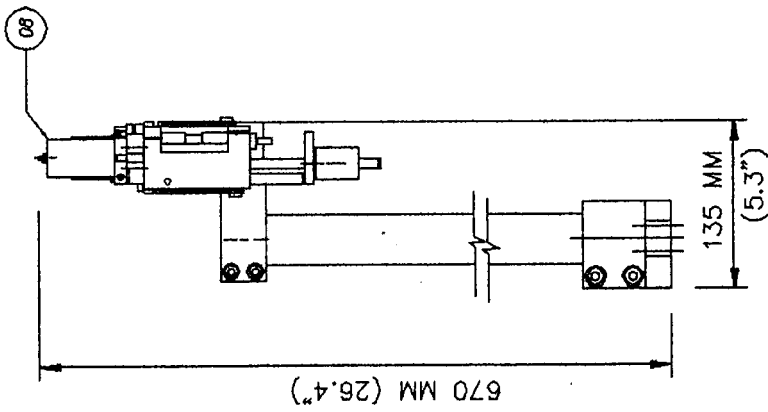
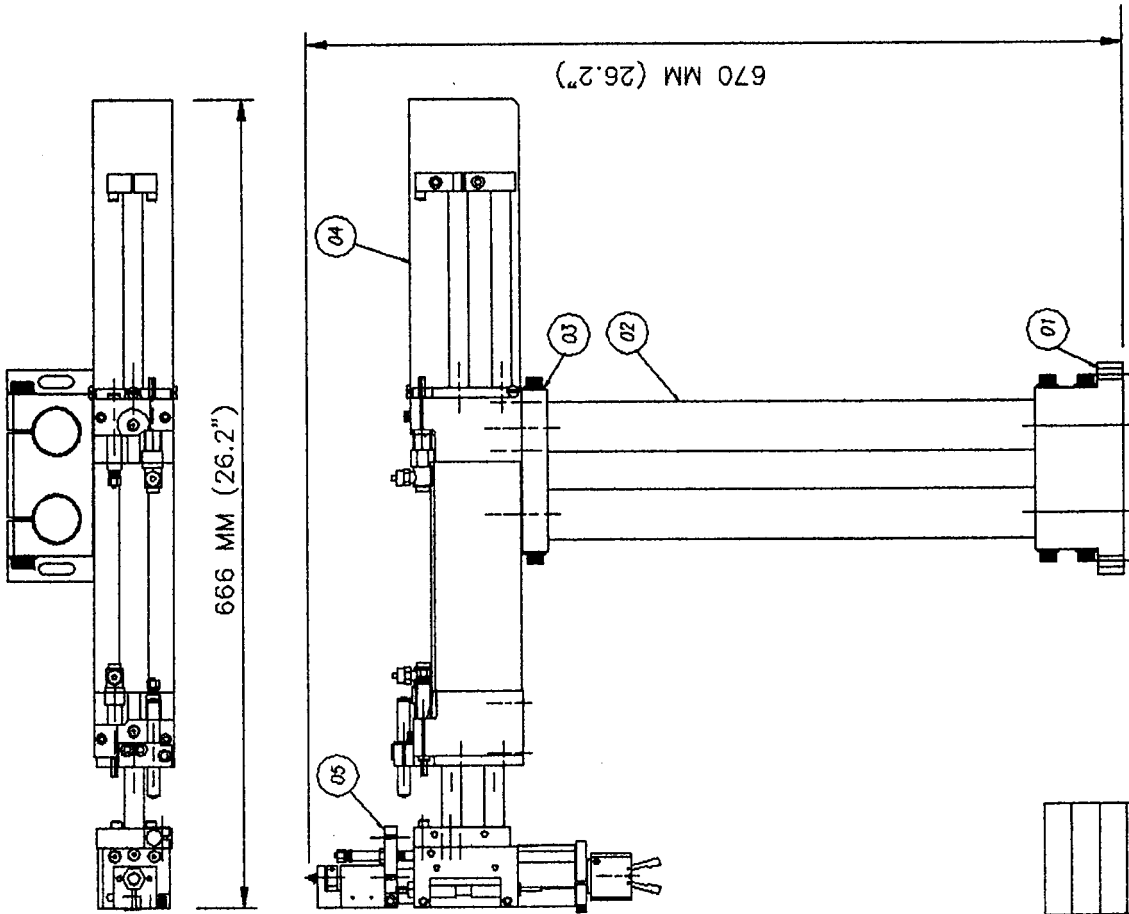


M F AUTOMATION PITTSBURGH, PA 15211		PART NAME		Drawing Number		REV.	
		PICK & PLACE PP-002		Drawing Number PP-002		REV.	
Revisions MATERIAL PLATING		Date Name Scale		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES DECIMALS XX ± .10 X ± .25 ANGULAR ± 1°			
THIRD ANGLE PROJECTION		THIS DRAWING AND INFORMATION IS THE PROPERTY OF M F AUTOMATION, INC.					

METO-FER AUTOMATION COMPONENTS FOR PICK & PLACE DRAWING PP-002

ITEM	QUANTITY	DESCRIPTION	PART NO.	PAGE
1	1	STAND BASE	SD 01.001	6.002
2	2	PILLAR	SE 40X300	6.003
3	1	MOUNTING PLATE	SD 01.002	6.002
4	1	LINEAR UNIT	LH 150-A	1.001
5	1	VERTICAL UNIT	VE 22-A	1.011
6	1	ROTARY GRIPPER HEAD ZD 12/180		3.061
7	1	MECHANICAL GRIPPER	MZ 12	4.001
8	1	GRIPPER CYLINDER	ZZ 12	4.001
9	1	CONICAL ROD	KS 01.017	3.022
10	4	FLOW CONTROL VALVE	DV-M5	5.021
11	2	FLOW CONTROL VALVE	DV-R 1/8	5.021
12	6	SENSOR (NPN)	QE-022-NS-11L	11.001
	6	OR SENSOR (PNP)	QE-022-PS-11L	11.001
13	6	CABLE (2M,6FT.)	ST-11G-3B-U2X	11.003

10/28/96 - PP-002



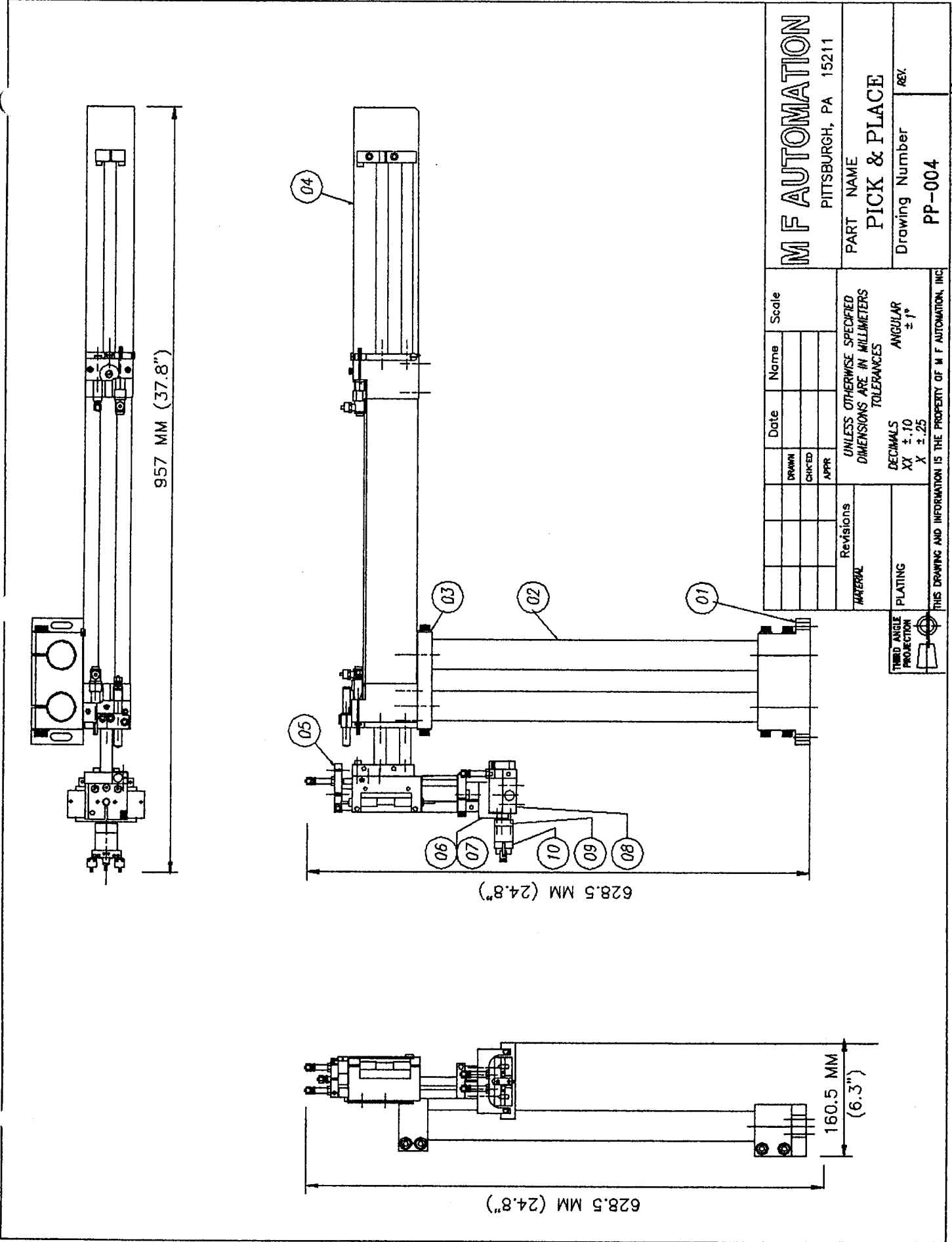
M F AUTOMATION PITTSBURGH, PA 15211		Scale		Name		Date		Revisions		THIRD ANGLE PROJECTION	
PART NAME PLACE & PICK		DRAWN		CHECKED		APPR		MATERIAL		PLATING	
REV. Drawing Number PP-003		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS		TOLERANCES		DECIMALS		ANGULAR		THIS DRAWING AND INFORMATION IS THE PROPERTY OF M F AUTOMATION, INC.	
		ANGULAR		DECIMALS		X ± .10		X ± .25			
		X ± 1									

DWG MFAUTO-017A 8.5x11

METO-FER AUTOMATION COMPONENTS FOR PICK & PLACE DRAWING PP-003

ITEM	QUANTITY	DESCRIPTION	PART NO.	PAGE
1	1	STAND BASE	SD 01.001	6.002
2	2	PILLAR	SE 40X300	6.003
3	1	MOUNTING PLATE	SD 01.002	6.002
4	1	LINEAR UNIT	LH 150-A	1.001
5	1	VERTICAL UNIT	VE 22-A	1.011
6	1	ROTARY GRIPPER HEAD ZD 12/180		3.061
7	1	MECHANICAL GRIPPER	MZ 12	4.001
8	1	GRIPPER CYLINDER	ZZ 12	4.001
9	1	CONICAL ROD	KS 01.017	3.022
10	4	FLOW CONTROL VALVE	DV-M5	5.021
11	2	FLOW CONTROL VALVE	DV-R 1/8	5.021
12	6	SENSOR (NPN)	QE-022-NS-11L	11.001
	6	OR SENSOR (PNP)	QE-022-PS-11L	11.001
13	6	CABLE (2M,6FT.)	ST-11G-3B-U2X	11.003

10/28/96 - PP-003



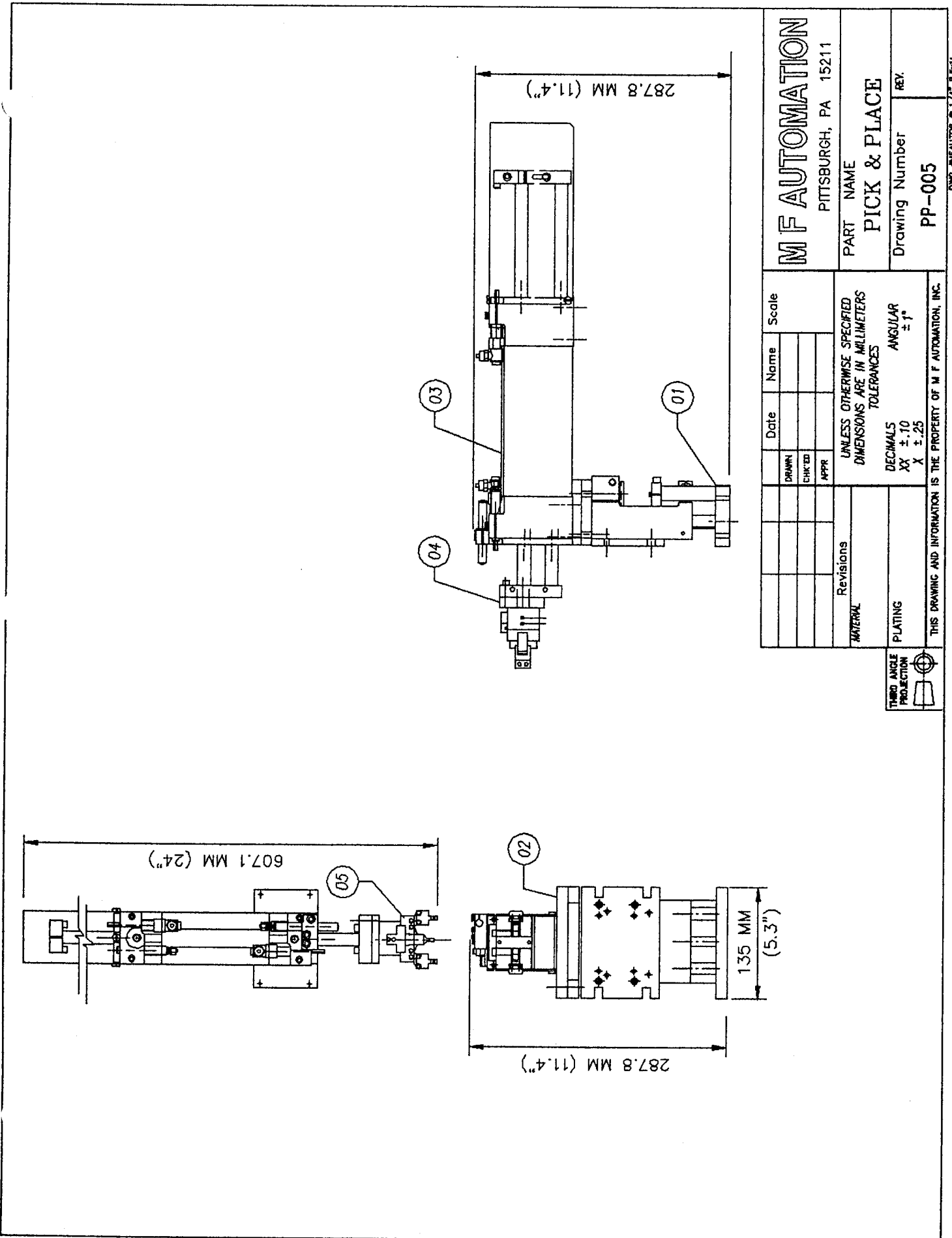
M F AUTOMATION		PITTSBURGH, PA 15211	
PART NAME		PICK & PLACE	
Drawing Number		PP-004	
REV.			
Revisions	Date	Name	Scale
MATERIAL			
PLATING			
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES			
DECIMALS			
XX ±.10			
X ±.25			
ANGULAR ±1°			
THIS DRAWING AND INFORMATION IS THE PROPERTY OF M F AUTOMATION, INC.			

DWG #MFAUT05 1/4" 5.5x11

METO-FER AUTOMATION COMPONENTS FOR PICK & PLACE DRAWING PP-004

ITEM	QUANTITY	DESCRIPTION	PART NO.	PAGE
1	1	STAND BASE	SD 01.001	6.002
2	2	PILLAR	SE 40X500	6.003
3	1	MOUNTING PLATE	SD 01.002	6.002
4	1	LINEAR UNIT	LH 300-A	1.001
5	1	VERTICAL UNIT	VE 52-A	1.011
6	1	ADAPTER PLATE	ZB 07.006	15.011
7	1	ADAPTER BRACKET	ZB 07.016	15.011
8	1	ROTARY GRIPPER HEAD	ZD 12/180	3.061
9	1	MOUNTING FLANGE	ZB 08.001	4.021
10	1	GRIPPER	KZP 20	4.011
11	2	FLOW CONTROL VALVE	DV-R 1/8	5.021
12	4	FLOW CONTROL VALVE	DV-M5	5.021
13	6	SENSOR (NPN)	QE-022-NS-11L	11.001
		OR		
	6	SENSOR (PNP)	QE-022-PS-11L	11.003
14	6	CABLE (2M, 6FT.)	ST-11G-3B-U2X	11.003

10/28/96 - PP-004



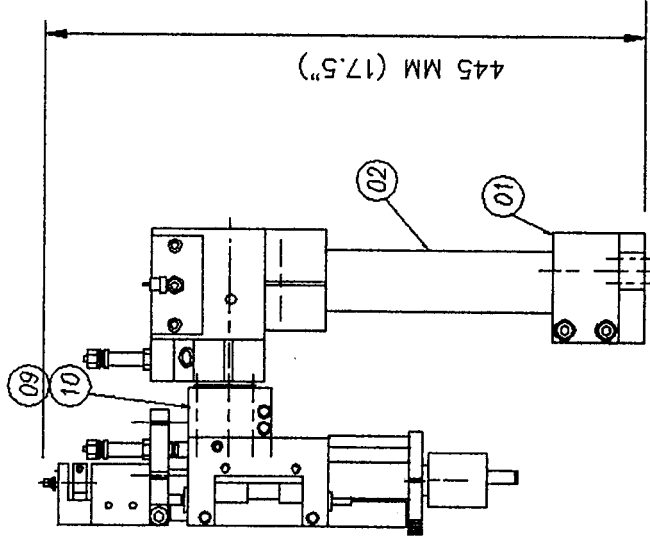
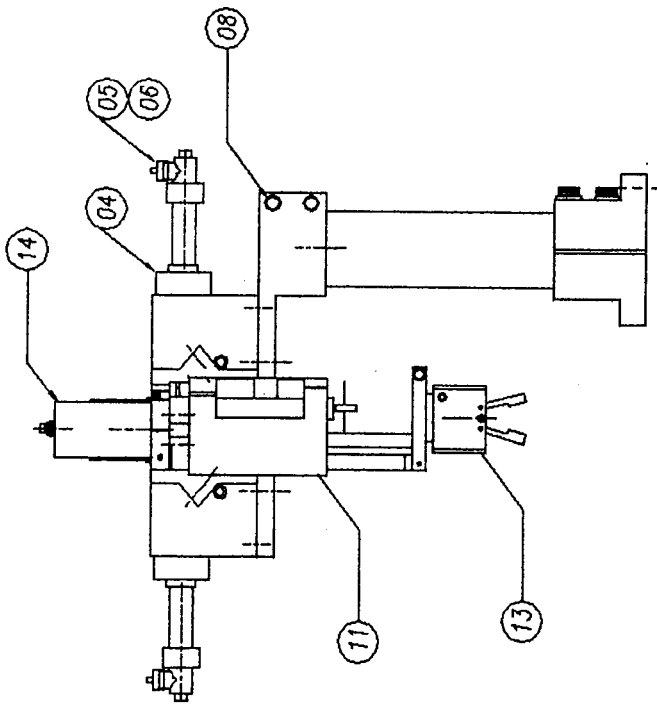
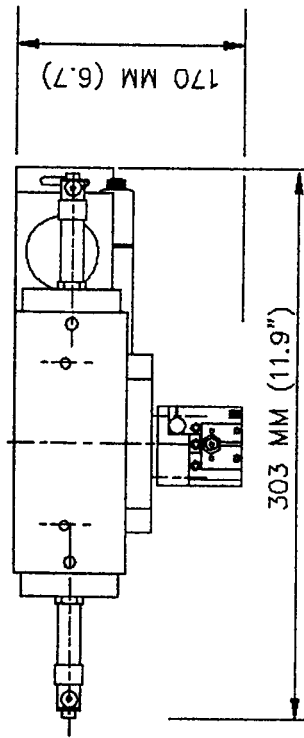
M F AUTOMATION		PITTSBURGH, PA 15211	
PART NAME		PICK & PLACE	
Drawing Number		PP-005	
REV.			
Date	Name	Scale	
DRAWN			
CHEK'ED			
APPR			
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES			
DECIMALS			
XX ± .10			
X ± .25			
ANGULAR ± 1°			
THIS DRAWING AND INFORMATION IS THE PROPERTY OF M F AUTOMATION, INC.			

THIRD ANGLE PROJECTION

METO-FER AUTOMATION COMPONENTS FOR PICK & PLACE DRAWING PP-005

ITEM	QUANTITY	DESCRIPTION	PART NO.	PAGE
1	1	ELEVATING TABLE	HT 50-KB	1.061
2	1	MOUNTING PLATE	ZB 01.004	
3	1	LINEAR UNIT	LH 150-A	1.001
4	1	MOUNTING PLATE	ZB 03.002	
5	1	GRIPPER	KZP 20	4.011
6	2	FLOW CONTROL VALVE	DV-M5	5.021
7	2	FLOW CONTROL VALVE	DV-R 1/8	5.021
8	4	SENSOR (NPN)	QE-022-NS-11L	11.001
	4	OR SENSOR (PNP)	QE-022-PS-11L	11.001
9	4	CABLE (2M,6FT.)	ST-11G-3B-U2X	11.003

10/28/96 - PP-005

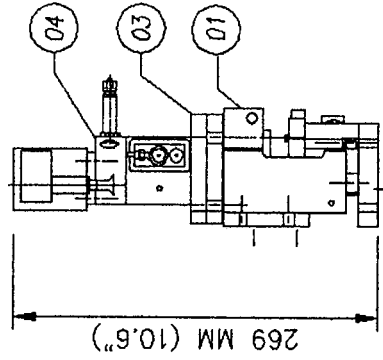
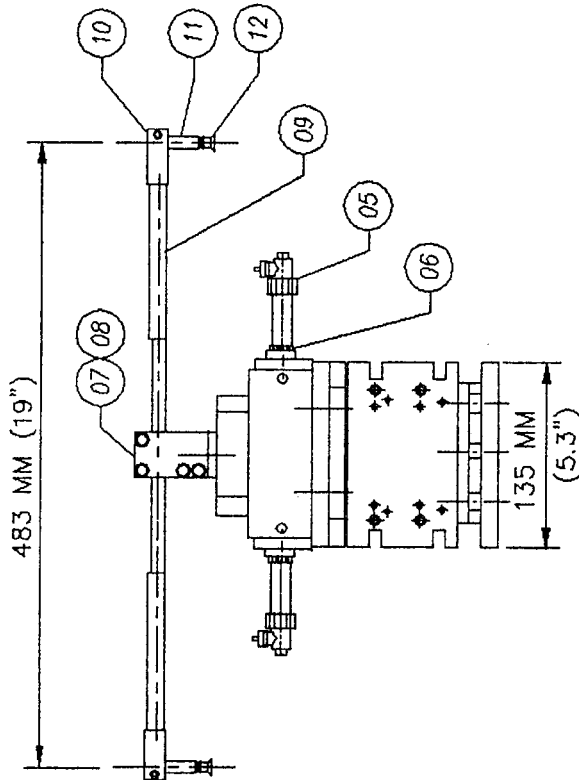
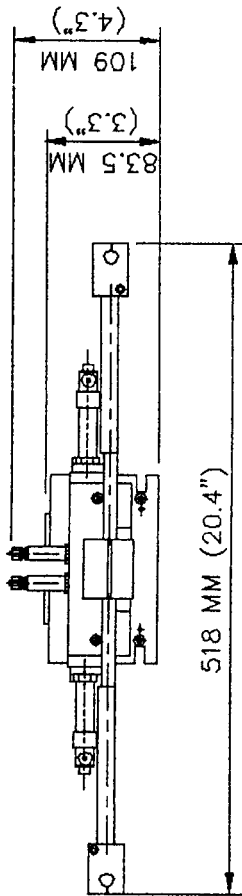


M F AUTOMATION		PITTSBURGH, PA 15211	
PART NAME		PICK & PLACE	
Drawing Number		PP-006	
REV		REV	
Date		Name	
Scale		Scale	
DRAWN		CHECKED	
APPR		APPR	
Revisions		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES	
MATERIAL		DECIMALS	
PLATING		ANGULAR	
THIRD ANGLE PROJECTION		THIS DRAWING AND INFORMATION IS THE PROPERTY OF M F AUTOMATION, INC.	

METO-FER AUTOMATION COMPONENTS FOR PICK & PLACE DRAWING PP-006

ITEM	QUANTITY	DESCRIPTION	PART NO.	PAGE
1	1	STAND BASE	SE 01.001	6.001
2	1	PILLAR	SE 40X300	6.003
3	1	MOUNTING PLATE	SE 01.004	6.001
4	1	ROTARY DRIVE	MD 32/180 B1	3.031
5	2	OIL CUSHION	OB 15/10L	5.001
6	2	SPECIAL NUT	MU 01.008	5.001
7	1	OIL RESERVOIR	KOB 50	5.001
8	1	MOUNTING PLATE (KOB)	SE 01.014	6.001
9	1	FLANGE	ZB 12.005	3.023
10	1	PLATE	ZB 02.007	3.094
11	1	LINEAR UNIT	VE 52-A	1.011
12	1	ASSEMBLY	NW-12-VE-52	4.001
13	1	MECHANICAL GRIPPER	MZ 12	4.001
14	1	GRIPPER CYLINDER	ZZ 12	4.001
15	1	CONICAL ROD		3.022
16	2	FLOW CONTROL VALVE	DV-M5	5.021
17	2	FLOW CONTROL VALVE	DV-R 1/8	5.021
18	4	SENSOR (NPN)	QE-022-NS-11L	11.001
		OR		
	4	SENSOR (PNP)	QE-022-PS-11L	11.001
19	4	CABLE (2M,6FT.)	ST-11G-3B-U2X	11.003

10/28/96 - PP-006



M F AUTOMATION		PITTSBURGH, PA 15211	
PART NAME		PICK & PLACE	
Drawing Number		PP-007	
Date		Scale	
DRAWN	NAME	UNLESS OTHERWISE SPECIFIED	
CHK'D		DIMENSIONS ARE IN MILLIMETERS	
APPR		TOLERANCES	
Revisions		DECIMALS	
MATERIAL		XX ±.10	
PLATING		X ±.25	
THIS DRAWING AND INFORMATION IS THE PROPERTY OF M F AUTOMATION, INC.		ANGULAR ±1°	

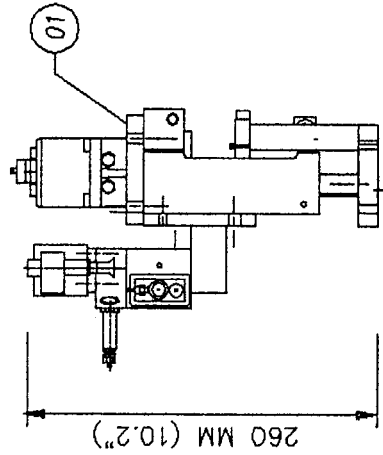
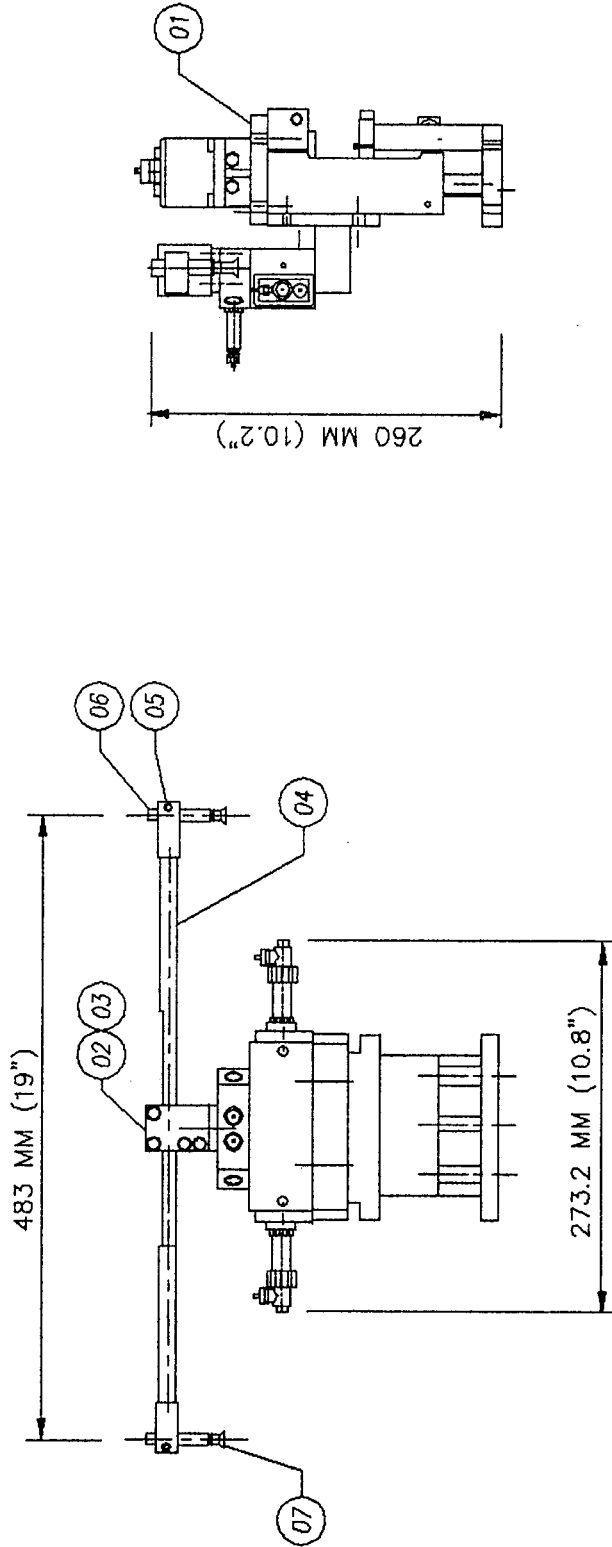
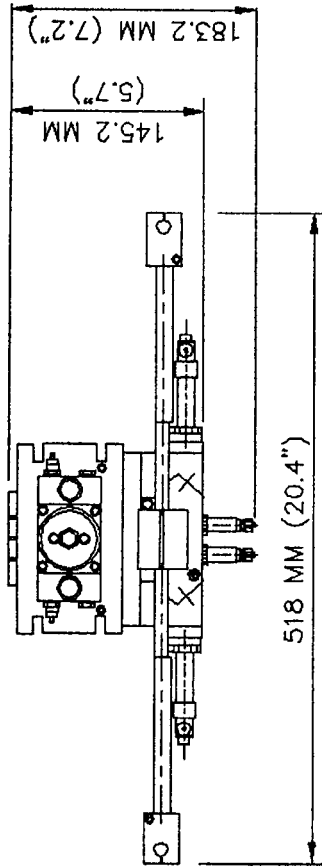


DWG #MFAUTOB 7/4 8.5x11

METO-FER AUTOMATION COMPONENTS FOR PICK & PLACE DRAWING PP-007

ITEM	QUANTITY	DESCRIPTION	PART NO.	PAGE
1	1	ELEVATING TABLE	HT 20-A	1.061
2	1	OIL RESERVOIR	KOB 50	5.001
3	1	ADAPTER	HT/MD	
4	1	ROTARY DRIVE	MD 20/180 B1	3.021
5	2	OIL CUSHION	OB 15/10	5.001
6	2	SPECIAL NUT	MU 01.008	5.001
7	1	FLANGE	ZB 13.000	3.023
8	1	BRACKET	HL 02.000	3.023
9	2	MOUNTING TABLE	ZR 01.007	3.023
10	2	CLAMP	ZB 19.003	3.023
11	2	SUCTION TUBE	ZR 19.008	3.023
12	2	SUCTION CUP	VA-SK-22	5.021
13	4	FLOW CONTROL VALVE	DV-M5	11.001
14	4	SENSOR (NPN) OR	QE-022-NS-11L	11.001
	4	SENSOR (PNP)	QE-022-PS-11L	11.001
15	4	CABLE (2M,6FT.)	ST-11G-3B-U2X	11.003

10/28/96 - PP-007



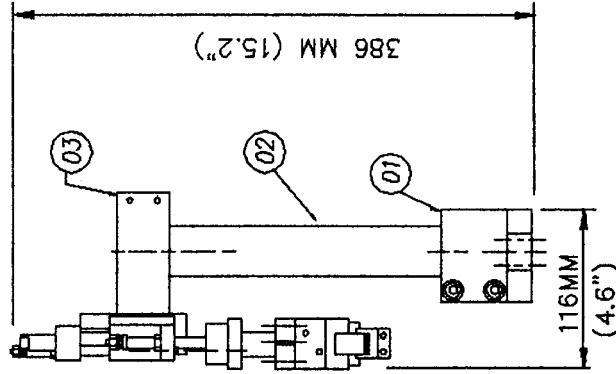
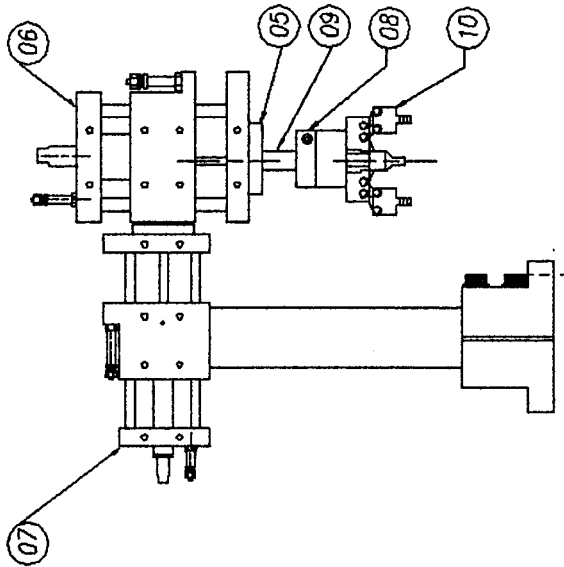
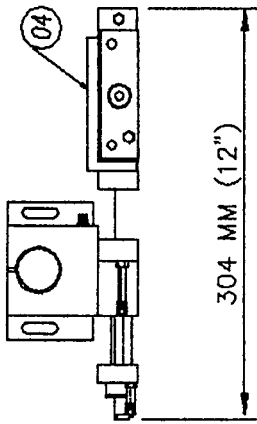
M F AUTOMATION		PITTSBURGH, PA 15211	
PART NAME		PICK & PLACE	
Drawing Number		PP-008	
REV.			
Date	Name	Scale	
DRAWN			
CHK'ED			
APPR			
Revisions		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES	
MATERIAL		DECIMALS XX ±.10 X ±.25	
PLATING		ANGULAR ±1°	
THIRD ANGLE PROJECTION		THIS DRAWING AND INFORMATION IS THE PROPERTY OF M F AUTOMATION, INC.	

DWG #FAUTOS 1/74 BLS11

METO-FER AUTOMATION COMPONENTS FOR PICK & PLACE DRAWING PP-008

ITEM	QUANTITY	DESCRIPTION	PART NO.	PAGE
1	1	ROTARY LOADER	DL 20/50K	3.001
2	1	FLANGE	ZB 13.000	3.023
3	1	BRACKET	HL 02.000	3.023
4	2	MOUNTING TUBE	ZR 01.007	3.022
5	2	CLAMP	ZB 19.003	3.022
6	2	SUCTION TUBE	ZR 19.008	3.023
7	2	SUCTION CUP	VA-SK-22	4.032
8	4	FLOW CONTROL VALVE	DV-M5	5.021
9	4	SENSOR (NPN)	QE-022-NS-11L	11.001
	4	OR SENSOR (PNP)	QE-022-PS-11L	11.001
10	4	CABLE (2M,6FT.)	ST-11G-3B-U2X	11.003

10/28/96 - PP-008



M F AUTOMATION		PITTSBURGH, PA 15211	
PART NAME		PICK & PLACE	
Drawing Number		PP-009	
REV.			
Revisions	Date	Name	Scale
MATERIAL			
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES			
DECIMALS XX ±.10			
ANGULAR X ±.25			
THIS DRAWING AND INFORMATION IS THE PROPERTY OF M F AUTOMATION, INC.			



METO-FER AUTOMATION COMPONENTS FOR PICK & PLACE DRAWING PP-009

ITEM	QUANTITY	DESCRIPTION	PART NO.	PAGE
1	1	STAND BASE	SE 01.001	6.001
2	1	PILLAR	SE 40X300	6.003
3	1	MOUNTING FLANGE	SE 01.017	6.001
4	1	MOUNTING PLATE	ZB 20.005	
5	1	MOUNTING PLATE	ZB 20.006	
6	1	MINI LINEAR (HORIZ.)	ML 13/75-A	1.041
7	1	MINI LINEAR (VERT.)	ML 13/50-A	1.041
8	1	MOUNTING FLANGE	ZB 08.001	4.021
9	1	MOUNTING TUBE	ZR 01.001	3.022
10	1	GRIPPER	KZP 20	4.011
11	4	FLOW CONTROL VALVE	DV-M5	5.021
12	4	SENSOR (NPN)	QE-022-NS-11L	11.001
	4	OR SENSOR (NPN)	QE-022-PS-11L	11.001
13	4	CABLE (2M,6FT.)	ST-11G-3B-U2X	11.003

10/28/96 - PP-009