



MULTITRONIKS

2000 LX

**FLEXIBLE SMD
PLACEMENT SYSTEM**

**2000 LX
Automatic
Pick & Place
Manual**

- Installation
- Maintenance

MULTITRONIKS

2000 LX

WELCOME:

Congratulations on one of your most recent business decisions! The Multitroniks 2000 LX Automatic Pick and Place Machine will provide a more efficient production process which will ultimately stimulate your profits. We at Multitroniks would like to welcome you to the growing number of satisfied customers who have taken steps in order to maintain the competitive edge on which successful businesses thrive.

INTRODUCTION:

Multitroniks, Inc. has been manufacturing PCB assembly systems for more than a quarter of a century. We take pride in being able to offer you the state-of-the-art equipment you deserve for about half the price of the competition. The all new Multitroniks 2000 LX Automatic Pick & Place System has a clean, simplified design which provides long term reliable and diversified performance with minimal maintenance. The 2000 LX machine represents the most efficient, economical and reliable short to medium run PCB assembly equipment in the industry.



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Installation

FEATURES:

In this manual we will show you how to use the versatile features of the 2000 LX machine. This guide is divided into sections which will demonstrate how to benefit from the following features made possible by Multitroniks' breakthrough engineering:

Stationary Wireless Feeders: designed for quick changeovers and efficient setup. These feeders incorporate automatic sensing which allows for the re-picking of components. Vibrating feeders and waffle trays are also available.

Flexibility: The rugged modular system accommodates a multitude of configurations to accommodate your individual needs as they change and grow.

The X/Y engine: Each axis uses a DC servo motor and controller with a resolution of 0.0003" (0.0076mm).

Handles up to 100 different components: Pick-up heads can be changed on-line smoothly and automatically. Up to five different nozzle sizes are available at any time in order to accommodate virtually any size component. In addition, the work surface has ample capacity for enough feeder stations to accommodate up to 112 different components. Special nozzle sizes can be obtained tailored to your individual specifications, for difficult to handle components.

User Friendly Software: The 2000 LX machine comes with an IBM compatible computer, fully equipped with hard drive, 3½" floppy disk drive, and a SVGA color monitor. The software has been designed to access a multitude of options while maintaining a user friendly menu environment. These two advantages have been combined to establish a system, facilitating the most challenging programming assignments. As a result of the simplified design, large and complex boards can be set up quickly and edited effortlessly.

Accuracy and Speed: Another distinguishing characteristic of the Multitroniks 2000 LX is its placement rate of 2000 components per hour. With a machine accuracy of $\pm 0.001"$ (0.025mm), component placement is accomplished effectively, efficiently and reliably.

Component Types: The Multitroniks 2000 LX Automatic Pick & Place machine has the capability to place chip resistors, capacitors, SOTs, SOICs, PLCCs & Flatpacks, with lead pitch as precise as 25 mils.

SUPPORT:

At Multitroniks, we emphasize the streamlined simplicity of the 2000 LX design which makes it easy to use. This manual will guide you clearly and concisely through all of the procedures entailed in activating the system. We stand behind the 2000 LX Pick & Place system, with dedication and tireless resolve. After training and installation, our applications engineering staff will continue to remain available for assistance or questions, if necessary. In order to facilitate a smooth transition to this state-of-the-art equipment, we encourage you to call us if you are concerned about the smallest detail. Although we don't anticipate any complications, we want you to rest assured that you have our complete support.

SATISFACTION GUARANTEED:

With the Multitroniks 2000 LX Automatic Pick & Place machine, you will be able to create surface mount PC Assembly boards quickly, easily and efficiently. Once you have mastered the system, the 2000 LX will save you time and energy, virtually transforming your production process. We, at Multitroniks, are delighted to provide you with equipment that meets the standards of today's ever-changing technological and business environments. Purchasing the Multitroniks 2000 LX Automatic Pick & Place machine is a business decision that you can be proud of. We predict that your association with Multitroniks will continue to satisfy your needs far into the future.

Multitroniks Inc.

2000 LX Assembly System

Installation Guide

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Section 1 - Specifications

PCB Work area:	15" x 19"
Speed/Placement Rate:	Up to 2000 CPH. (Typical rate is 2000 CPH)
X/Y POSITIONING:	
Machine Accuracy:	$\pm 0.001"$ ($\pm 0.025\text{mm}$)
Machine Repeatability:	$\pm 0.0005"$ ($\pm 0.012\text{mm}$)
System Resolution:	0.0003" (0.0076mm)
Placement Repeatability:	$\pm 0.0005"$ ($\pm 0.012\text{mm}$)
Feeder Capacity:	112 parts - Combination of Tape, Stick and Tray
Component Types:	SOT, SOIC, PLCC, chip resistors and capacitors
Component Size Range:	From 0.03" to 1.00"
Pick heads:	5 standard sizes: .050", .060", .090", .125", .150" Special sizes available upon request.
Electrical Supply:	110/120 VAC, 60Hz, 1000 watts (Also Available: 220/240 VAC, 50Hz, 1000 watts)
Air Supply:	80 PSI, 2 CFM, clean, dry air
2000 LX Frame:	
Weight:	800 Lb.
Dimensions:	Width: 40", Length: 41", Height: 59"
Computer Cabinet:	
Weight:	150 Lb.
Dimensions:	Width: 22", Length: 25", Height: 37"

Section 2 - Installation

Site Preparation

The Multitroniks 2000 LX assembly system has been designed to use feeders on all four sides, and therefore requires placement away from any walls or other equipment. FIGURE 1 shows that a minimum of three feet (1 meter) is required on all sides for an operator to comfortably load or remove component feeders.

The cabinet which contains the computer and the motor drive electronics, is usually located near the front corner of the 2000 LX, on the right hand side. However, The cables which connect the computer cabinet to the machine frame are of sufficient length so the computer cabinet may be located on the left side of the machine frame, if desired.

The floor that supports the 2000 LX should be level and capable of supporting the weight of the machine. The machine frame is in a weight range where it can not be moved by hand, but requires the use of a fork-lift. Therefore, it is recommended that the 2000 LX be located on a ground floor level because of the added difficulty of lifting the machine to the above ground floors.

Unpacking the System and Machine Set-up

The Multitroniks 2000 LX Surface Mount Assembly system has been shipped to you in two crates. The larger crate contains the main frame of the assembly system, and the smaller crate contains the computer cabinet and all of the accessories.

1. Remove the outer box from the larger crate.
2. Remove the protective plastic wrapping by carefully slicing it with a knife or razor.
3. Pull open the scrap collection drawer, which is located on the rear panel.
4. Locate the black plastic rail locks which are located on each slide rail. Press in both left and right rail locks towards the drawer and lift the drawer up. When the drawer has been unlocked from the slides, remove the drawer by pulling it straight out.
5. The front and rear panels are attached with a hook-and-loop type of fastening tape (similar to Velcro). Remove the front and rear panels by first pulling out the bottom and then the top of the panel.
6. Using a wrench, remove the nuts on the two shipping brackets which hold the machine frame to the shipping skid.
7. Raise the machine off of the skid by having the forks of a fork-lift extend from the front to the back of the machine underneath the lower horizontal cross pieces, and then lifting. (SEE FIGURE 2).

8. Move machine to final position.
9. Before lowering the machine to the floor, attach the 4 corner support feet into the holes located on the foot plates so that 1" of the threaded foot bolt extends out of the foot plate. (SEE FIGURE 3).
10. The lock nut should be located halfway between the full lower and upper stop points so that it turns freely, and yet does not block the 'flat' edges of the threaded foot bolt.
11. After lowering the machine to the floor, adjust the 4 feet by turning the flattened part of the foot bolt with a wrench so that the machine base plate is level and does not rock between diagonally opposite corners.
12. Raise and tighten the locking nuts up against the foot plates.
13. Replace the front and rear panels.
14. Replace the scrap collection drawer, locking it onto the slide rails.
15. Open the front clear safety cover and remove the shipping strap which holds the Y-axis arm in place. (SEE FIGURE 4).
16. Remove the shipping strap holding the Z-axis head in place.
17. Remove the protective wrapping from around the pick boot nest.

Accessory Package Contents

The accessory package contains the cabinet which holds the computer and the motor controls, as well as, all the standard and optional pieces ordered with the assembly system. Please compare the contents of this package with the packing list included. Note that this section will only describe the set up and use of the standard items. Refer to the appendix for instructions on the proper set up and use of any optional accessories.

1. Remove the outer box from the smaller crate
2. Lift the cabinet off of the shipping skid and locate in it's final position.
3. Remove the protective plastic wrapping by carefully slicing it with a knife or razor.
4. Remove the computer, keyboard and monitors from their shipping boxes.
5. Open the rear door of the cabinet and slide the computer in on the top shelf. Push the computer towards the front of the cabinet until the front face of the computer extends through the front panel of the cabinet.
6. Pull out the keyboard shelf and place the keyboard on this shelf.
7. Feed the keyboard cable around either edge of the shelf and into the cabinet through the computer opening in the front panel. The cable and connector should be pushed along the top of the computer so that it reaches the back plate of the computer.
8. Place the computer monitor and video camera monitor screens on the top of the computer cabinet (SEE FIGURE 5).

Cable & Air Hose Connections

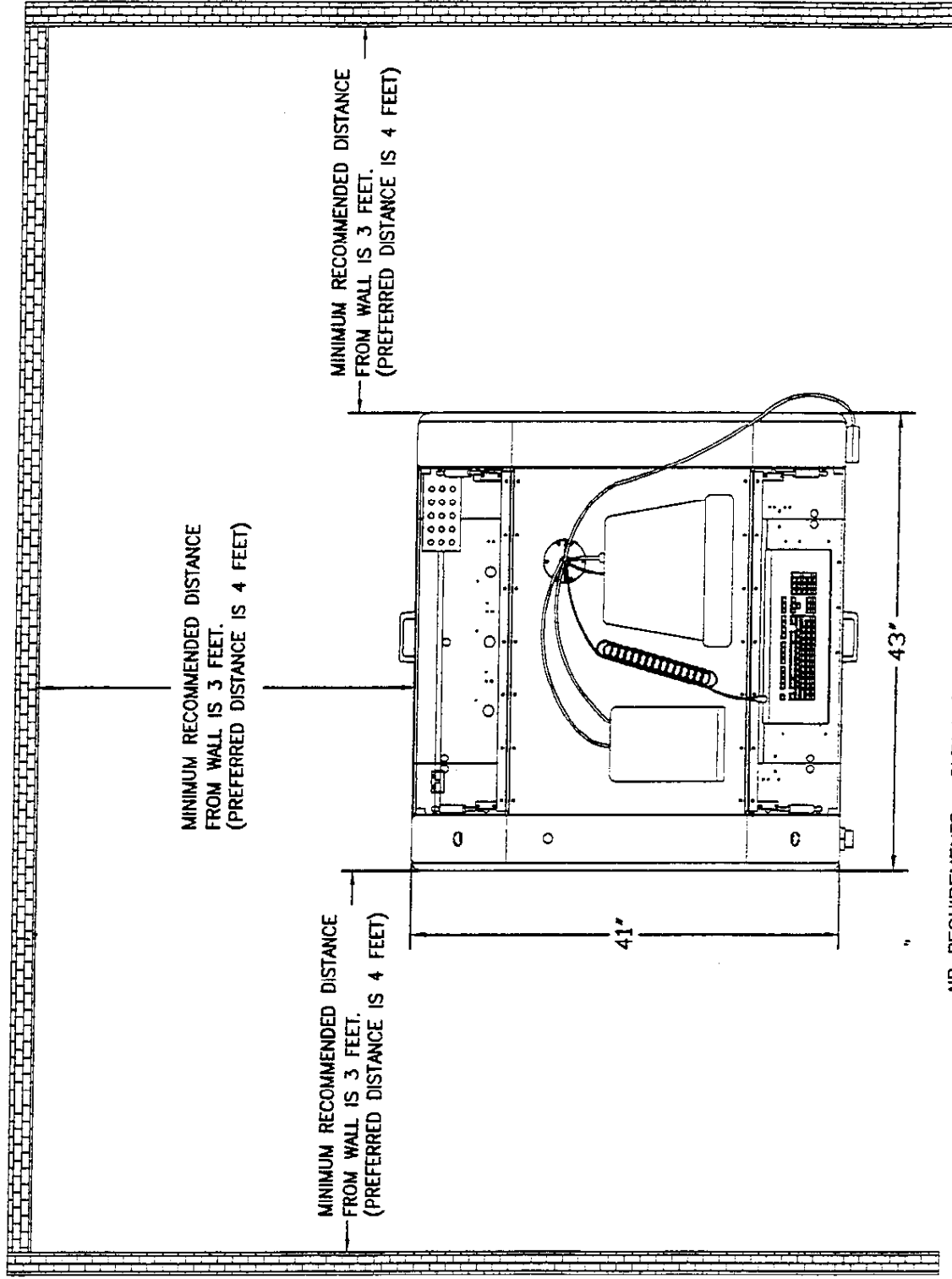
1. Remove the round rubber grommet from the cable access hole located on top of the cabinet.
2. Push the VGA screen video connector through the grommet.
3. Find the VGA power cord in the VGA box and plug the cord into the monitor.
4. Push the VGA power cord through the grommet.
5. Find the video monitor cable in the video monitor box and attach the BNC end to the video monitor.
6. Set the two switches on the back of the video monitor as follows:
 OHM = ON
 DC CLAMP = OFF
7. Push the video monitor power and video cables through the grommet.
8. Feed the monitor cables down through the cable access hole, located at the back of the top cabinet plate.
9. Reattach the grommet to the cable access hole.
10. Open the rear door of the cabinet and attach the monitor, keyboard and cabinet harness cables to their appropriate connectors. (SEE FIGURE 6).
11. Find the hand-held controller and attach it to the connector on top of the computer cabinet.

12. Find the box with the cabinet/frame connection cables and attach the cables to the connectors on the back of the cabinet. (SEE FIGURE 7).
13. Attach the other end of the cables to the matching connectors on the machine frame. (SEE FIGURE 8).
14. Attach the system power cord to the power input connection which is located at the lower part of the computer cabinet. Attach the other end of this cord to your power source.
15. Connect the air supply inlet to a source of clean, dry air at 80 PSI.

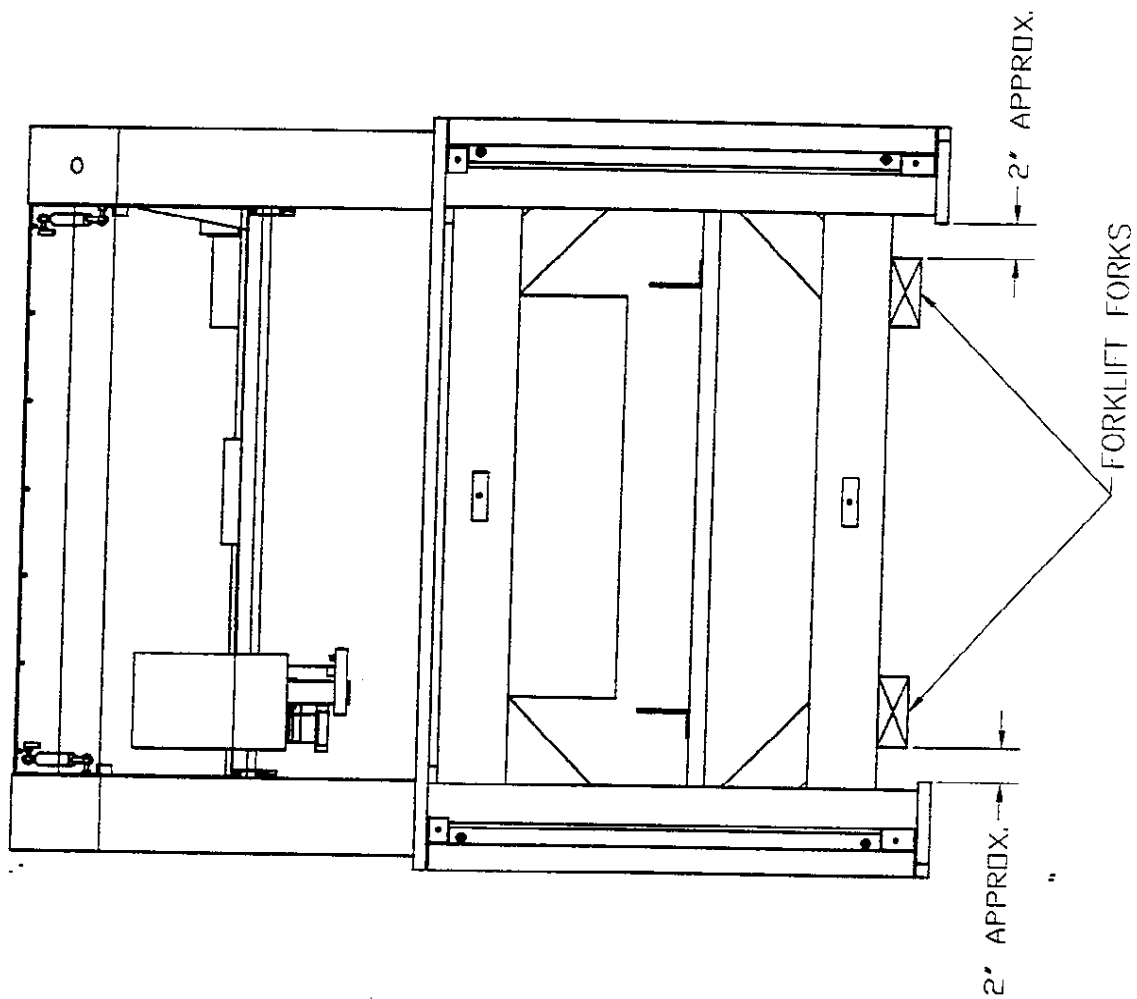
Applying Power to the System

1. Turn the CABINET POWER switch located in the rear of the computer cabinet to the "ON" position.
2. Press the switch on the display screen to the "ON" position.
3. Press the power switch on the PC controller to the "ON" position. The computer should present the 2000 LX Start-Up screen.
4. Turn the GREEN MAIN POWER switch located on the top of the computer cabinet to the "ON" position.
5. If any of the RED Emergency Stop (ESTOP) lights are lit, rotate each of the 3 ESTOP switches to release the emergency stop safety system.
6. Press the YELLOW RESET switch located on the top of the computer cabinet.
7. The computer screen should now indicate a successful POWER-UP sequence and present the 2000 LX MAIN MENU.

Please Note: If the Multitroniks SMD 2000 LX has been modified for use with 220/240 volts, you will be required to supply an external surge suppresser.

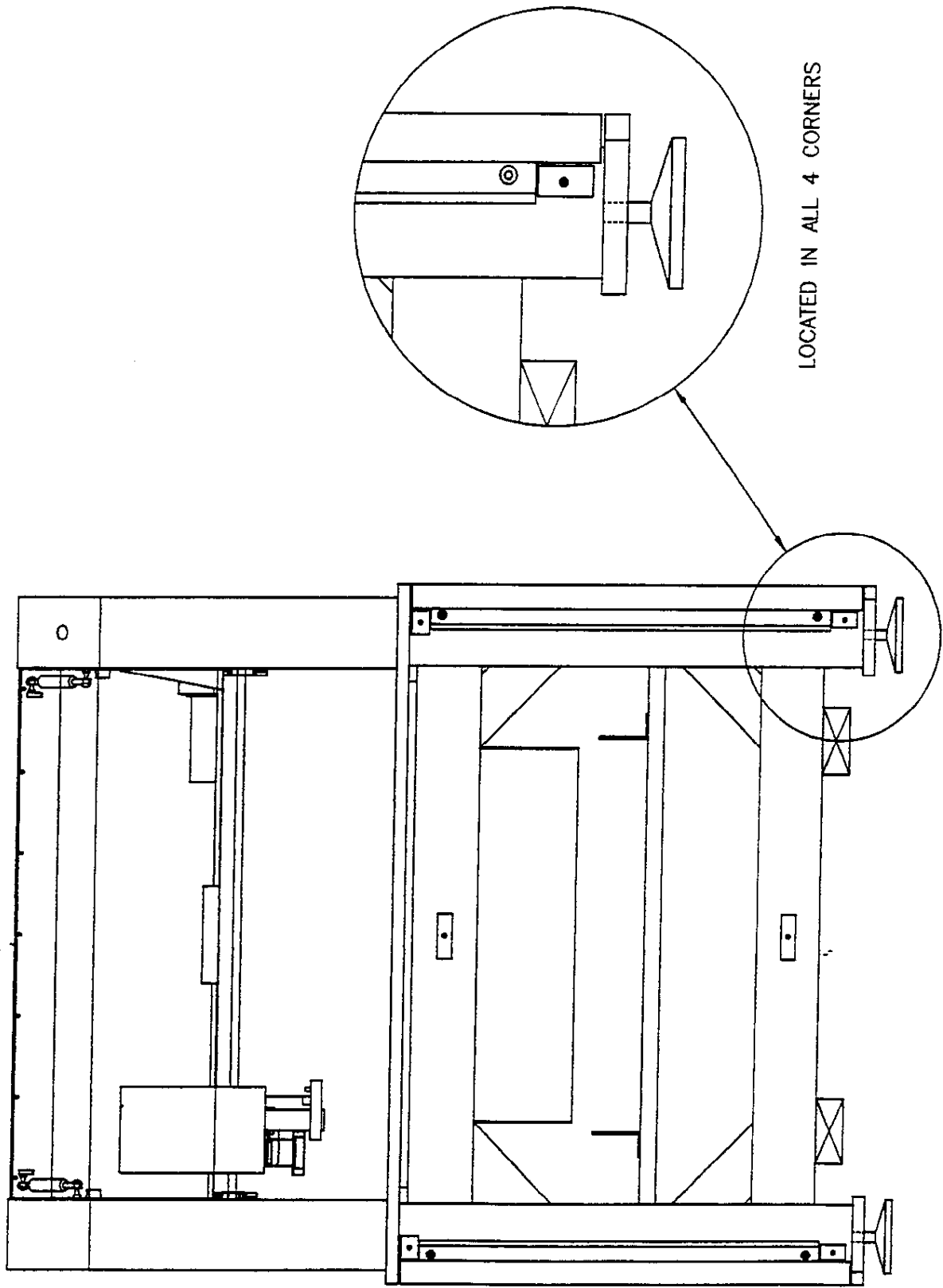


AIR REQUIREMENTS: CLEAN, DRY AIR AT 90 PSI, 2 CFM
 ELECTRICAL REQUIREMENTS: 110 VOLTS A.C., 10 AMPS
 (ALSO AVAILABLE: 220V A.C., SINGLE PHASE, 5 AMPS)



FRONT OF 2000

MULTITRONICS
 ONE FREDERICK ROAD - WARREN, NEW JERSEY 07059



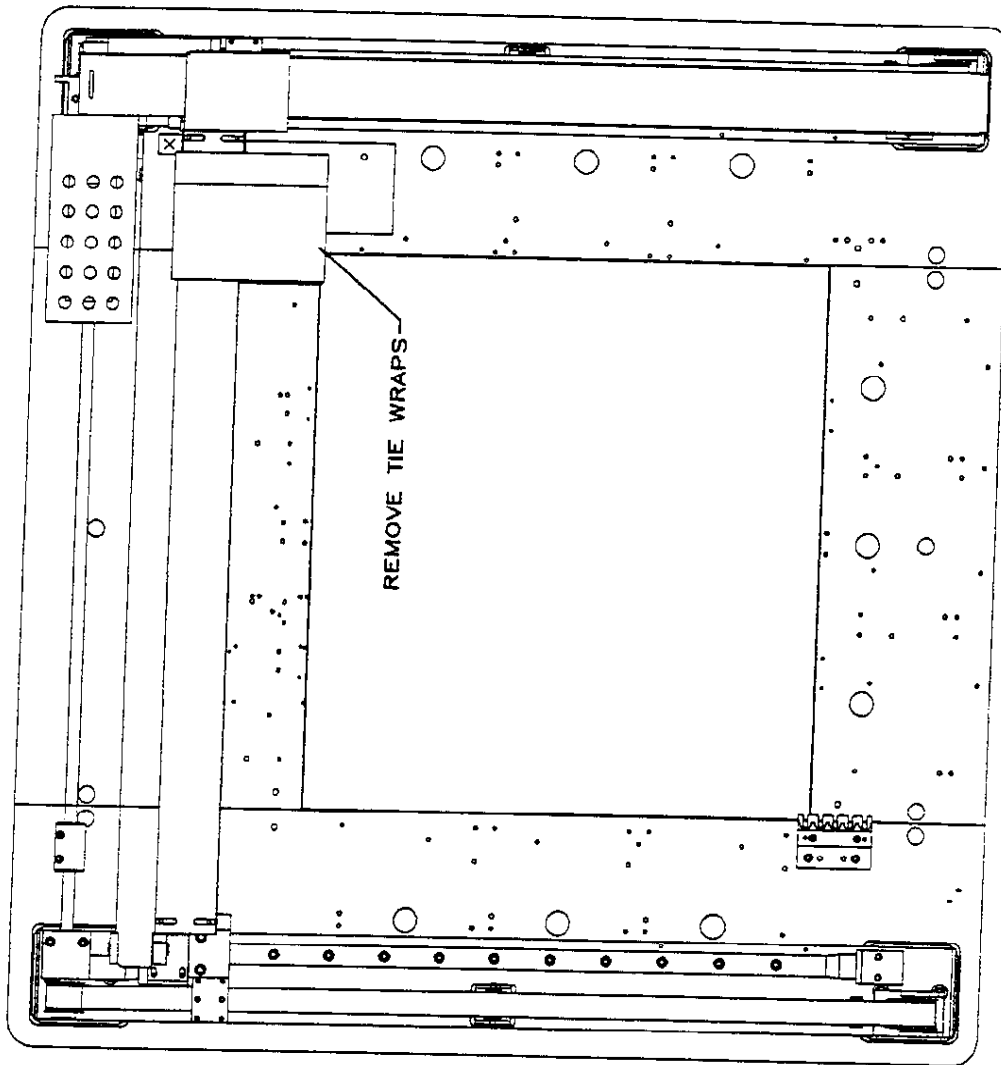
LOCATED IN ALL 4 CORNERS

MULTITRONICS

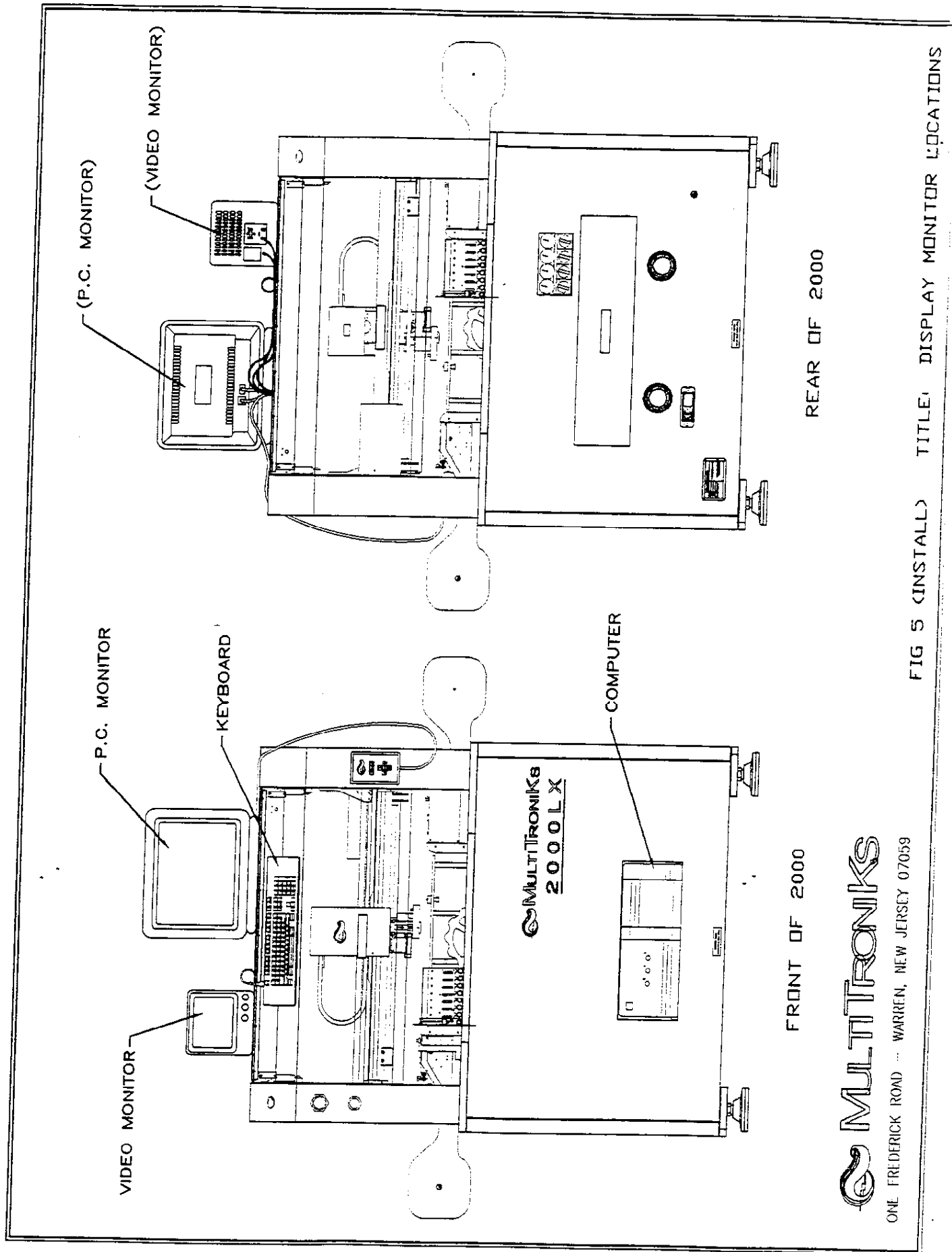
ONE FREDERICK ROAD -- WARREN, NEW JERSEY 07059

FIG 3 (INSTALL) TITLE: MACHINE FOOT ATTACHMENT

REAR OF 2000



FRONT OF 2000



(P.C. MONITOR)

(VIDEO MONITOR)

P.C. MONITOR

KEYBOARD

VIDEO MONITOR

COMPUTER

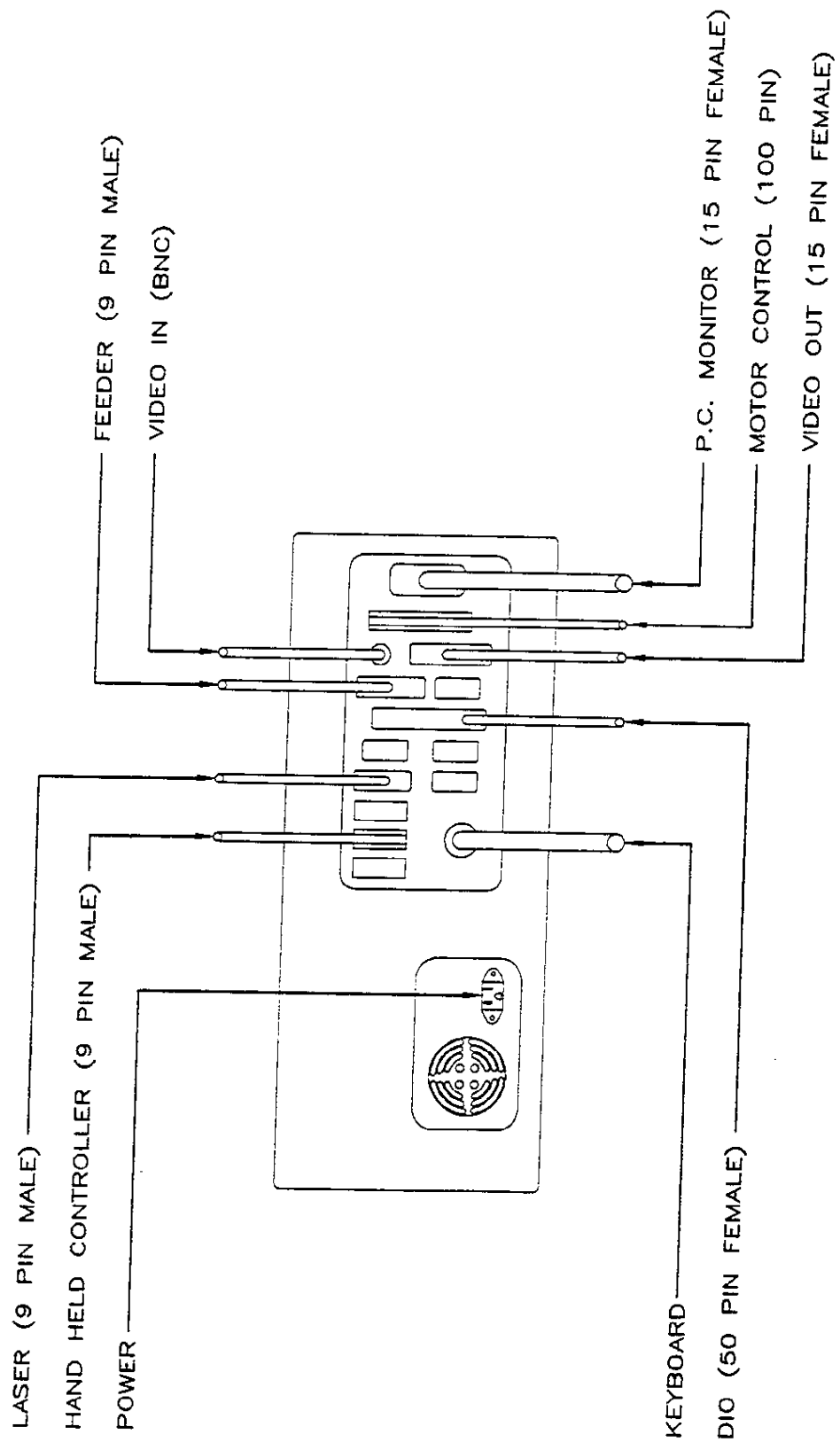
FRONT OF 2000

REAR OF 2000

MULTITRONICS

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FIG 5 (INSTALL) TITLE: DISPLAY MONITOR LOCATIONS

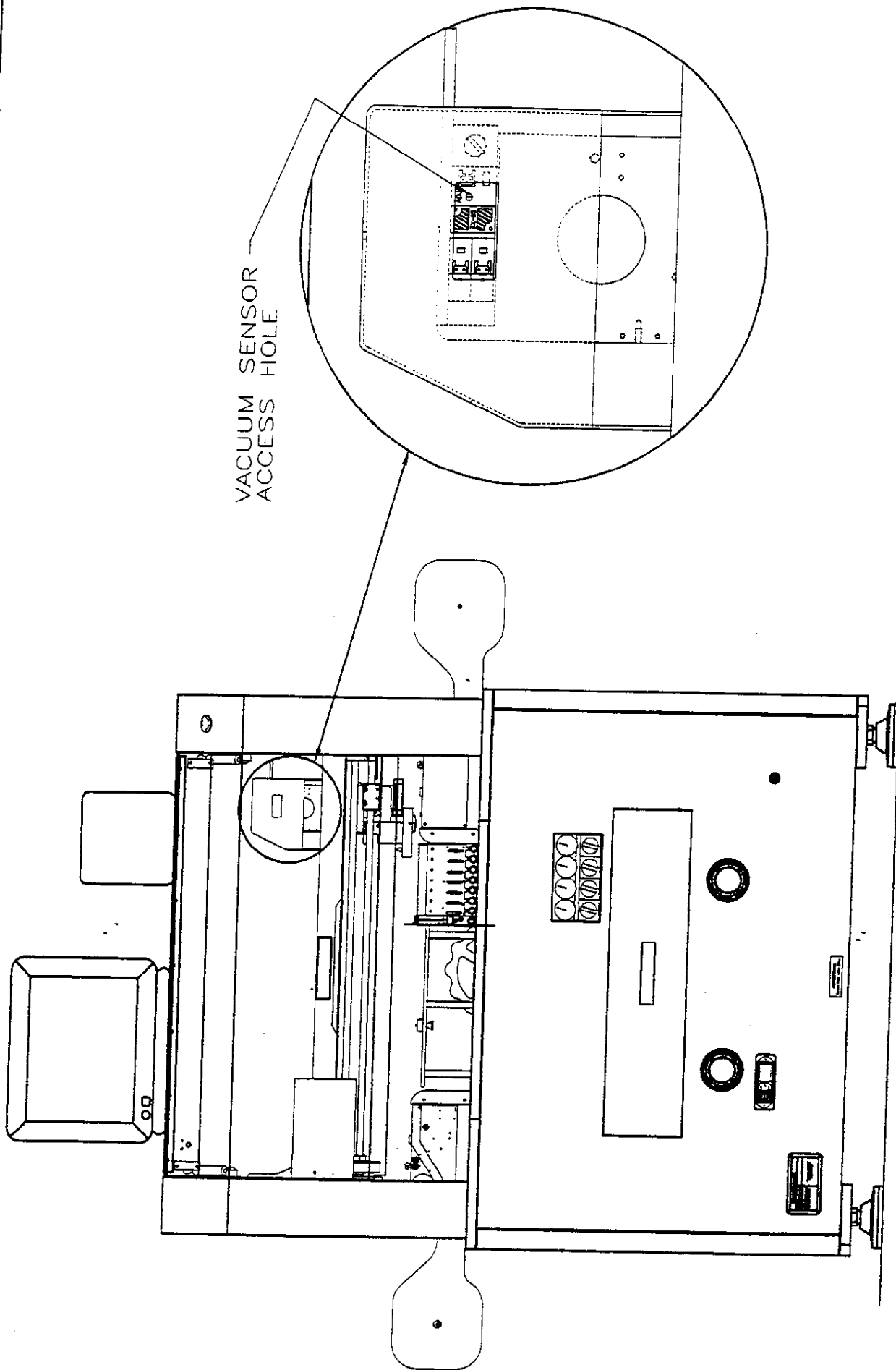


REAR OF COMPUTER



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FIG 6 (INSTALL)



VACUUM SENSOR
ACCESS HOLE

REAR OF MACHINE

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FIG 1c (REF) TITLE: VACUUM SENSOR ADJUSTMENT



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Maintenance

MultiTroniKs 2000 LX Maintenance Manual

The MultiTroniKs 2000 LX will need periodic maintenance with the interval for each item based on the use of the system. The following list contains the items and their recommended service intervals:

1. Lubrication of the Y-axis linear slide bearings

The Y-axis linear slide bearings should be checked every 2 to 3 months for the correct amount of grease. See appendix 1 for the details of this inspection process and for the method of adding grease.

2. Cleaning of the X-axis slide rails

The X-axis slide rails should be cleaned every month with a lint-free cloth. The bearings for the X-axis are self-lubricating and do not require the addition of any grease.

3. Cleaning of the picker boots

The five picker boots should be inspected and cleaned on a daily basis. The magnets on the exterior of the picker boots could pick up stray pieces of metal and require careful inspection and cleaning with a lint-free cloth. The central vacuum channel should also be checked to make sure that it is clear. If this becomes clogged with dust, dirt or solder paste, you will notice an increase in dropped parts due to a reduction in the amount of vacuum pressure.

4. Cleaning of the vacuum tip

The vacuum tip which picks up the picker boots also has magnets which should be inspected for stray pieces of metal and cleaned on a daily basis. The central air channel should also be inspected for visible clogs, which could also decrease the amount of vacuum pressure.

5. Cleaning of the video camera lens

The video camera lens should be cleaned every 2 to 3 months using an optical cleaning cloth. It is important to use a material which will not scratch the glass lens, and should be specifically designed for cleaning optical surfaces.

6. Cleaning of the laser align optical surfaces

The laser align head has two optical surfaces, an emitter and a detector, which should be cleaned every 2 to 3 months with an optical cleaning cloth.

7. Cleaning or replacing the vacuum filter

The vacuum generator contains a filter to catch any dust, dirt or other debris that might be picked up by the picker boots. This filter should be cleaned or replaced every 2 to 3 months, or sooner if the filter becomes clogged.



Lubrication of IKO Linear Way, Linear Roller Way

Lubricant and lubrication method must be carefully select considering operating conditions to reduce friction and wear and to obtain stable running accuracies of Linear Motion Rolling Guides.

1, Lubricant

Grease or oil is used to lubricate Linear Motion Rolling Guide. Some special case, IKO can supply dry lube type Linear Motion Rolling Guide.

a, Grease is used in wide applications including general industrial use. Ease of handling and maintenance and cost saving in lubrication equipment will be achieved. IKO Linear Way / Linear Roller Way series are generally pre-packed with SHELL Alvania EP-2 grease, and ready to use on delivery. And IKO can supply with special grease DUPONT KRYTOX240AD for vacuum or clean room specification.

b, Oil with viscosity range 30 to 100 cSt is recommended. When using light oil, care must be taken to prevent leakage of oil from raceway grooves.

c, Special case, IKO can supply dry lube type. The Linear Way / Linear Roller Way race way has dry film lubricant as DICRONITE. This lubricant is for special conditions such as low or high temperature(-35CF to 100CF), inspection system(eliminate oil composition give influence sensor) or vacuum condition.

2, Lubricating Method

Grease may be applied directly on the raceway or supplied through the grease nipple attached to the slide unit using a hand grease gun or a central lubrication equipment. Oil may be dripped on the raceway or supplied using a central lubrication equipment.

In case of central oil or grease lubrication, grease nipple must be taken off and special pipe joints must be attached to the slide unit. If user pipe thread is not same as IKO Linear Way or Linear Roller Way thread, IKO can supply two type of pipe joint adapter as attached drawing (Model number ZE series). There two adapter types, one is Straight connector and the other is L connector. Because some Linear Way or Linear Roller Way slide unit thread is made by engineering plastic, so, pay attention to connect pipe joint. Generally, connect by hand and after feel tight, turn 1/4 to 1/2 by wrench by carefully. In some setting positions of Linear Motion Rolling Guides, oil may not be delivered to the raceways located above the oil inlet level. Oil route must be carefully checked.

3, Amount of lubricant

Grease is supplied through the grease nipple using a grease gun until all the used grease come out from the seal gap. The amount supplied at this time is the standard amount of re-greasing. Before re-greasing, deteriorated grease left on the track rail must be wiped off. Again, after re-greasing, deteriorated grease leaked through the seal must be wiped off.

4, Inspection interval and re-lubrication interval

a, Grease

Inspect initial operation and every 2 to 3 months interval. The initial operation, check rail raceway surfaces. If there is grease film at the race way surface to check by finger touch or eye examination, can increase inspection interval months. The very long track rail case, it is very important, because the rail surface area is very large. And also, check grease condition if there is mixed with cutting chips, dirt, e.t.c. The dusty condition, IKO recommend 2 to 3 months inspection interval. If the track rails protected by bellows or metal cover (or not dusty condition), it is not necessary to inspect every 2 to 3 months. Generally, IKO recommend every 6 months grease re-lubrication for machine tool application. But, the grease re-lubrication interval is depend on the applications, decide the suitable interval. Check track rail race way. If there is grease film and not so dirty, it is possible to increase grease re-lubrication time. Short length rail, clean condition and light load, it is possible to increase grease re-lubrication time as few years. Some electric small application case, there is no re-lubrication on their machine life. This is special case. But some times, used this idea for ball bearings application (Small motor bearing, Computer hard disk bearing, e.t.c.)

And after give grease(re-lubrication), recommend to move end to other end(full stroke) for spread grease film to all raceway area.

b, Oil

Inspect initial operation and Every 1 week(or every morning when machine will be started), Check race way surface there are oil films at the both race way surfaces. And every 1 week(or every morning), check oil amount of oil feeder and dusty condition. Re-lubrication or changing interval is depend on system. Check oil amount, dirt, e.t.c. If oil lube system is circulation type, check oil color and amount. And supply oil at every inspection if necessary. In case of oil central lubrication, check oil amount. The supply oil to slide unit is generally 0.1 to 0.3cc per 30 minutes per one slide unit. This amount is one of the sample. If track rail is very long, check race way wet condition and increase oil amount.

5, Examples of lubricants

Grease

General purpose types

ALVANIA NO.1 (SHELL):-35 to +120C, centralized greasing, Li soap

ALVANIA NO.2 (SHELL):-20 to +120C, centralized greasing, Li soap

ALVANIA NO.3 (SHELL):-20 to +120C, Li soap

MOBILAX GREASE NO.2 (MOBIL):-20 to +120C, Li soap

ANDOC C (ESSO):-20 to +120C, Na complex, Low temperature

ALVANIA GREASE RA (SHELL):-40 to +130C, Li soap

BEACON 325 (ESSO):-55 to +120C, Low torque, Li soap

ISOFLEX LDS18 SPECIAL A (KLUBER):-50 to +120C, High speed, Extreme pressure, Li soap

ISOFLEX SUPER LDS 18 (KLUBER):-50 to +120C, High speed, Low noise, Li soap

Wide temperature

ANDOC 260 (ESSO): -20 to +150C, High speed, Low water proof, Na soap

TEMPREX N3 (ESSO): -20 to +160C, Li complex

RPM GREASE SRI 2 (CALTEX): -20 to +150C, Polyurea base, Extreme pressure

ALVANIA EP-2 (SHELL): -10 to +110C, Extreme pressure, Centralized greasing, Li soap

MOLYKOTE BR2-PLUS (DOW CORNING): -30 to +150C, with MoS₂, Li soap

MOLUB-ALLOY #777-2 (IMPERIAL): 0 to +135C, with MoS₂, Li soap

Others

KRYTOX 240AD (DUPONT): -29 to +288C, Stability in high temperature, Chemical non-activation, Anti-solvent, Fluorinated (for clean room, vacuum area)

BARRIERTA L55/2 (KLUBER): -35 to +260C, Low evaporation in high temperature, Chemical non-activation, Fluorinated

BARRIERTA IMV (KLUBER): -50 to +220C, For high vacuum, Fluorinated base

DOLIUM GREASE R (SHELL): -30 to +150C, Anti-high temperature, Superior in high temperature with stable anti-oxidation, Polyurea base

VALLANT GREASE U2 (SHELL): -20 to +180C, Anti-high temperature with stable anti-oxidation, Polyurea base

Note: Generally, IKO recommend SHELL ALVANIA EP-2 for general use. And for clean room application, IKO recommend DUPONT KRYTOX 240AD. If automatic lube system, it is necessary to select soft grease looks like as ALVANIA EP-2, No.1, No.2. If use for food machinery, can use Aluminum soap base grease which is approved by FDA.

Oil

MOBIL VACTRA OIL No.2 or No.4

Can use other oils between 30 to 100 cSt viscosity

6, Grease amount based on the room volume of Linear Motion Rolling Guide

For re-lubrication of grease, followings Linear Motion Rolling Guide internal room volume show you how much grease give to slide unit when change all grease (Old to New).

LWH15 1.5CC, LWH20 2CC, LWH25 4CC, LWH30 6CC, LWH35 9CC, LWH45 16CC, LWH55 27CC, LWH65 53CC

LWHG20 3CC, LWHG25 5CC, LWHG30 8CC, LWHG35 11CC, LWHG45 20CC, LWHG55 27CC, LWHG65 53CC

Note: Applicable to LWH, LWHG, LWHT types. (Almost same as LWA, LWS types too)

LRW20 3CC, LRW30 6CC, LRW40 16CC, LRW50 30CC, LRW60 50CC

LRWH25 3CC, LRWH35 6CC, LRWH45 14CC, LRWH55 26CC, LRWH65 44CC

LRWX35 10CC, LRWX45 19CC, LRWX55 34CC, LRWX75 73CC

LWE15 0.7CC, LWE20 1.2CC, LWE25 2CC, LWE30 6CC, LWE35 8CC, LWE45 15CC

LWEC15 0.5CC, LWEC20 0.9CC, LWEC25 1.5CC

7, Applicable pipe joint type

Followings Linear Motion Rolling guide numbers and pipe joint numbers(ZE) are shown for applicable types. () pipe joint models case, must check user table conditions. Because () pipe joint models interfere the table surface or track rail top, it is necessary to check user table area or mounting angle.

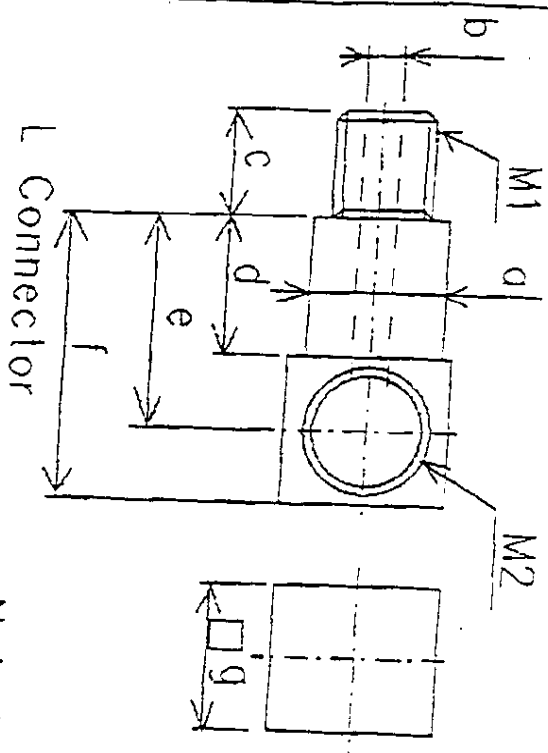
Models : Pipe joint

LWA15,20: ZE876, ZE879	LWA25,30,40,50,75: ZE879, ZE896	
LWS15: (ZE876), (ZE879), (ZE896)	LWS20,25,30,40,50,70: ZE876, ZE879	
LWF40,60: ZE876, ZE879	LWF90: ZE879, ZE896	
LRW20: (ZE876), (ZE879), (ZE896)	LRW30: ZE876, ZE879	LRW40,50,60: ZE877, ZE880
LWH15: (ZE878), ZE936, ZE3023	LWH(G)20: ZE876, (ZE879), (ZE896)	LWH(G)25,30: ZE876, ZE879, (ZE896)
LWH(G)35,45,55,65: ZE877, ZE880		
LRWH25,35: ZE876, ZE879, (ZE896)	LRWH45,55,65: ZE877, ZE880	
LRWX35: ZE876, ZE879, ZE896	LRWX45,55,75: ZE877, ZE880	
LWE(C)15: ZE936, (ZE3023)	LWE(C)20: (ZE876), (ZE896)	LWE(C)25: (ZE876), (ZE879), (ZE896)
LWE30: (ZE876), ZE879, (ZE896)		
LWE35,45: ZE877, ZE880, ZE3006		

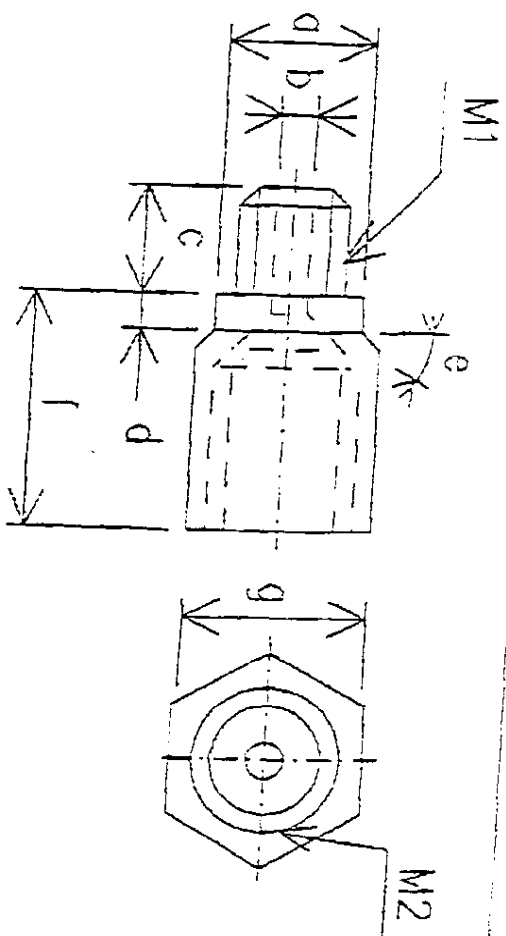
8, Special grease gun adapter

IKO can supply special grease gun adapter for LWH15 because the grease nipple of LWH15 is smaller than standard type grease nipple. And also, IKO can supply special grease injector for LWL type which are no grease nipple. Please contact IKO if necessary.

9, Pipe joint adapter dimensions



(Type A)



Note: M1 is for L/W unit.
M2 is for user.

Straight Connector
(Type B)

Model	a	b	c	d	e	f	g	M1	M2	Type
ZE876	9	3	5.4	6	12	18	12	MT6X0.75	1/8-27NPTF 6deep	A
ZE877	10	5	6	6	12	18	12	PT1/8-28	1/8-27NPTF 6deep	A
ZE878	5	2	4	1.2	30deg	10	7	M4X0.7	10-32UNF 5deep	B
ZE879	9	3	5.4	3.6	30deg	16	12	MT6X0.75	1/8-27NPTF 8deep	B
ZE880	-	5	6	-	30deg	12	12	PT1/8-28	1/8-27NPTF 8deep	B
ZE896	9	3	5.4	11.5	17.5	23.5	12	MT6X0.75	1/8-27NPTF 6deep	A
ZE936	5	2	4	1.4	20deg	10	7	M4X0.7	10-32UNF 7deep	B
ZE3023	4.3	1.8	5.5	2.5	6.8	9.8	6	MT4X0.7	M4x0.7 4.5deep	A

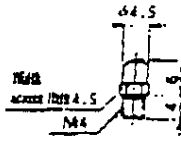
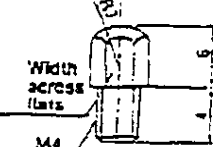
Unit:mm

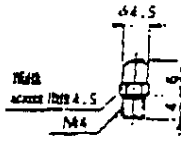
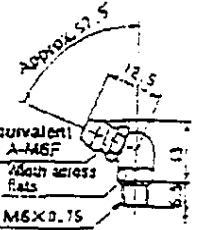
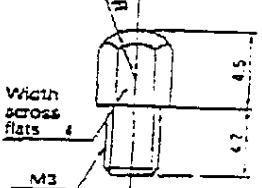
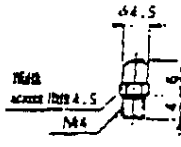
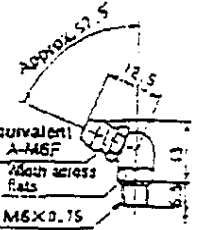
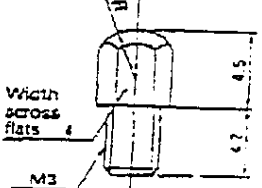
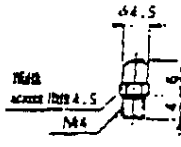
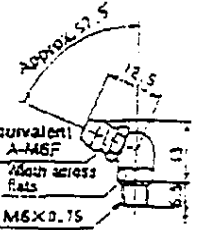
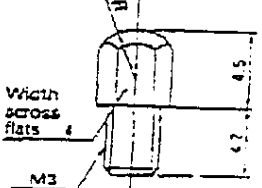
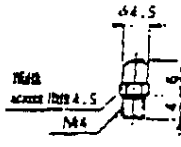
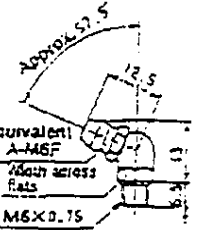
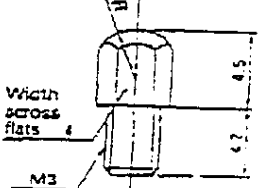
10, IKO Linear Way/Roller Way standard grease nipple

IKO Linear Way series are attached grease nipple as followings,

a, LWH, LWE, LWL-B series

LWL-B small series have oil holes. And IKO supply special grease feeder looks like injection type.

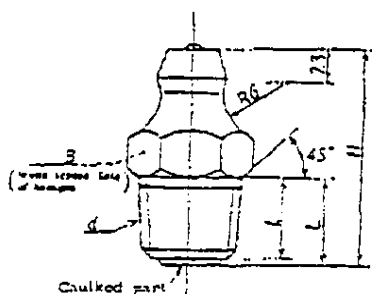
LWH 15-B	---		LWE 15 C1	
LWHT 15-B	---		LWEC 15 C1	
LWHD 15-B	---		LWES 15 C1	
LWHS 15-B	---		LWESC 15 C1	

LWH 20-B	LWHG 20		LWE 20 C1 - LWE 30 C1		LWL 15-B CS	
-LWH 30-B	-LWHG 30		LWEC 20 C1 - LWEC 35 C1		LWL 20-B CS	
LWHT 20-B	LWHTG 20		LWES 20 C1 - LWES 30 C1		LWLF 30-B CS	
-LWHT 30-B	-LWHTG 30		LWESC 20 C1 - LWESC 25 C1		LWLF 42-B CS	
LWHD 25-B	LWHDG 25		LWES 20 C1 - LWES 30 C1		LWL 15-B CS	
-LWHD 30-B	-LWHDG 30		LWESC 20 C1 - LWESC 25 C1		LWL 20-B CS	
LWHS 20-B	LWHS 20		LWES 20 C1 - LWES 30 C1		LWLF 30-B CS	
-LWHS 30-B	-LWHS 30		LWESC 20 C1 - LWESC 25 C1		LWLF 42-B CS	
LWH 35-B	LWHG 35		LWE 35 C1 - LWE 45 C1		LWL 15-B CS	
-LWH 65-B	-LWHG 65		LWEC 35 C1 - LWEC 45 C1		LWL 20-B CS	
LWHT 35-B	LWHTG 35		LWES 35 C1 - LWES 45 C1		LWLF 30-B CS	
-LWHT 65-B	-LWHTG 65		LWESC 35 C1 - LWESC 45 C1		LWLF 42-B CS	
LWHD 35-B	LWHDG 35		LWES 35 C1 - LWES 45 C1		LWL 15-B CS	
-LWHD 65-B	-LWHDG 65		LWESC 35 C1 - LWESC 45 C1		LWL 20-B CS	
LWHS 35-B	LWHS 35		LWES 35 C1 - LWES 45 C1		LWLF 30-B CS	
-LWHS 65-B	-LWHS 65		LWESC 35 C1 - LWESC 45 C1		LWLF 42-B CS	

b, Other series

Other Linear Way series have A-M6F or A-PT1/8 grease nipple as shown JIS as followings,

A-M6F type is applicable for M1 - MT6x0.75 pipe joint series as shown on "7, Applicable pipe joint type" and "9, Pipe joint adapter dimensions". But, both type have same head form(can use same grease gun).



Unit: mm

Type	Designation of screw threads (d)	l1	l	l max.	l2
Type A-M 6 F	M 6x0.75	11.5 ± 0.4	4	5.4	7.0 ± 0.2
Type A-PT 1/8	(PT) 1/8	20 ± 0.4	8	9.5	10.0 ± 0.2



FOR FURTHER DETAILS CONTACT:

IKO INTERNATIONAL, INC.