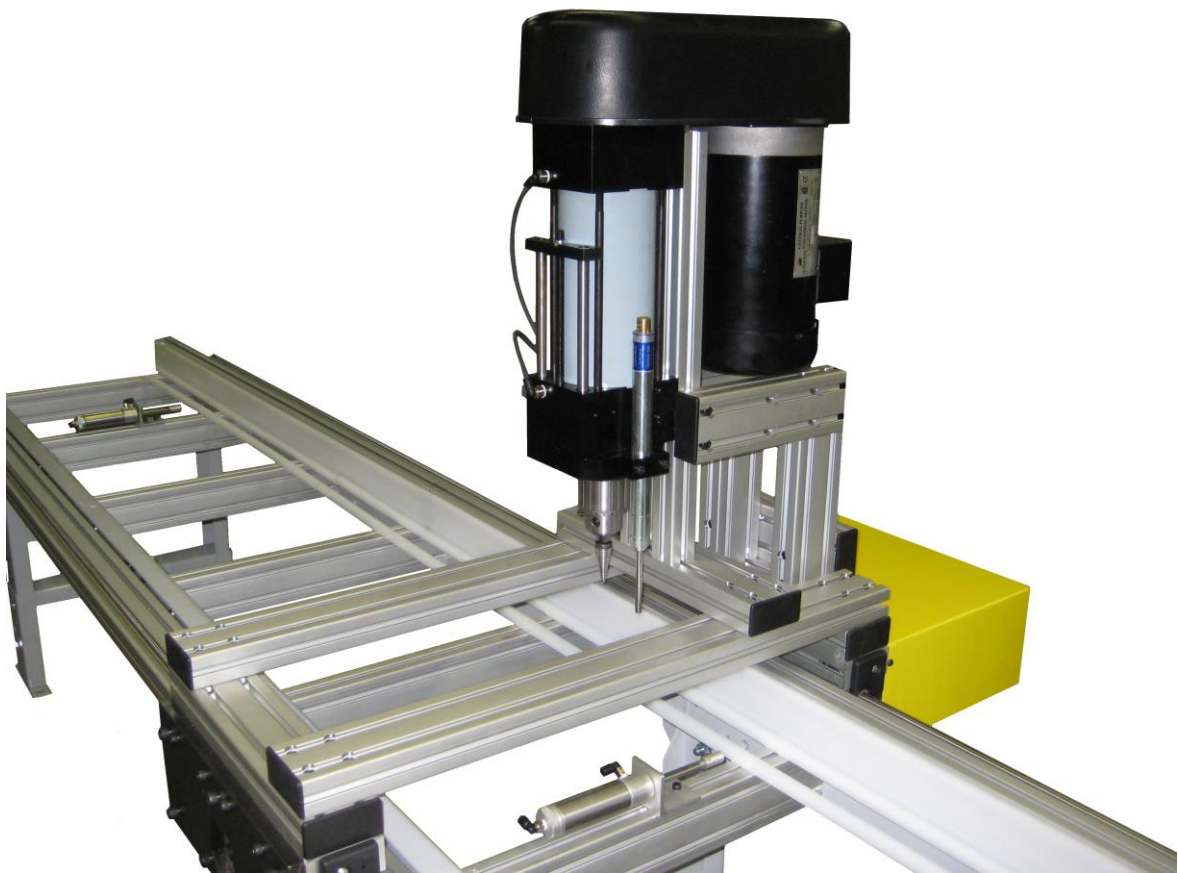




# **KDP Rack & Pinion Automatic Drill System**



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## **INSTRUCTION MANUAL**

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Hymark Ltd. – 427 Bark Cove – Owensboro, KY 42303  
(270) 683-3500 – Fax (270) 683-2500  
[www.kentuckygauge.com](http://www.kentuckygauge.com)



**Identification Data**

Model	KDP
Serial Number	
Controller PartNumber	PS312P
Software Number	
Controller Serial Number	

**Customer Data**

Inventory-Number	
Location	

**Technical support and Spare Parts**

Hymark Ltd  
427 Bark Cove  
Owensboro, KY 42303  
USA

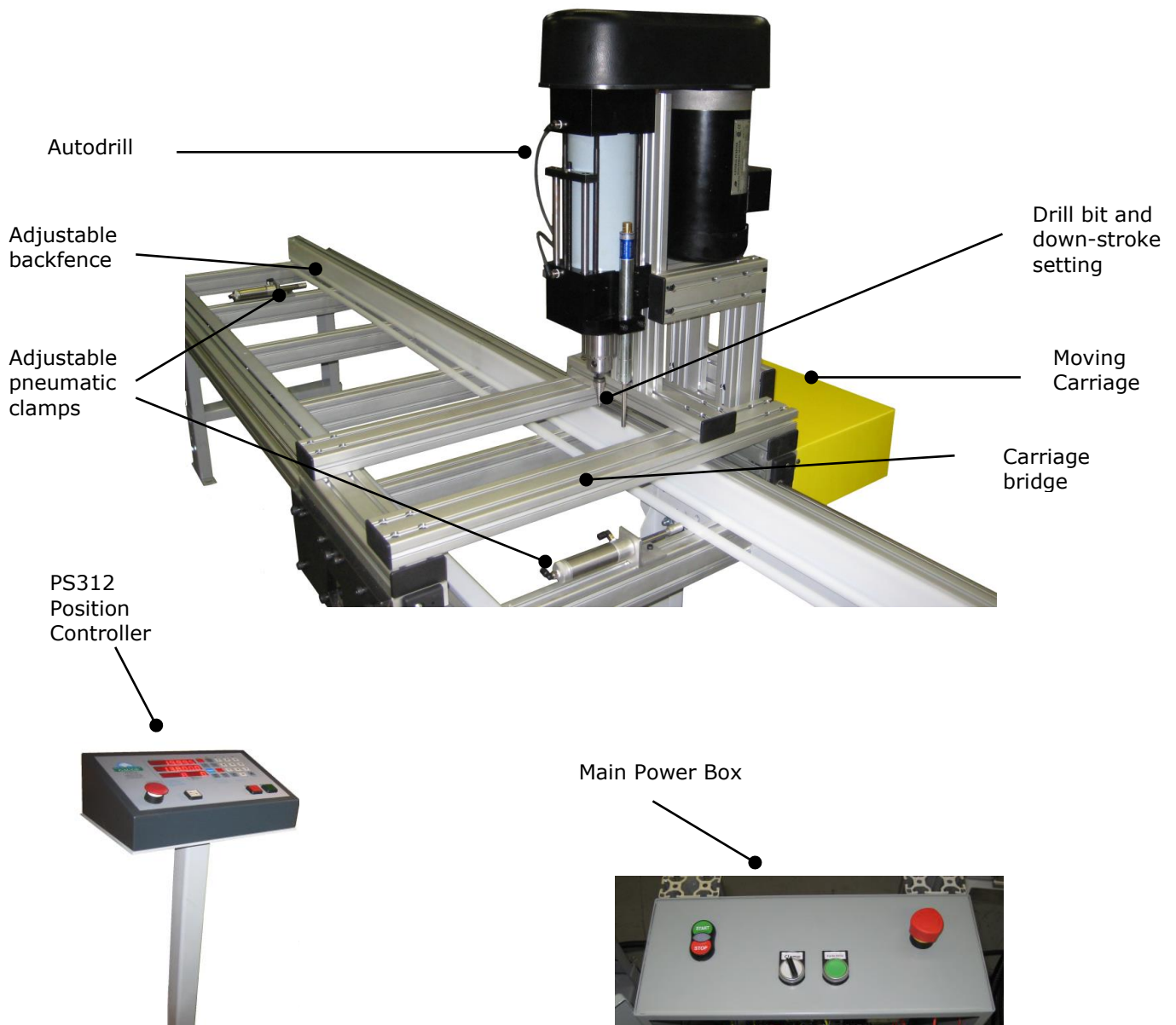
Phone (270) 683 3500  
Fax (270) 683 2500

Document Number of the Manual	
Version	
Date	
Last changings	

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# 1. Product Description



**Important Note: Your Purchase of the Kentucky Gauge KDP Drilling machine includes a KDP set-up & operation instruction DVD video. Please review this video prior to setup & operation. A full PS312 position controller manual is also provided in a separate document.**

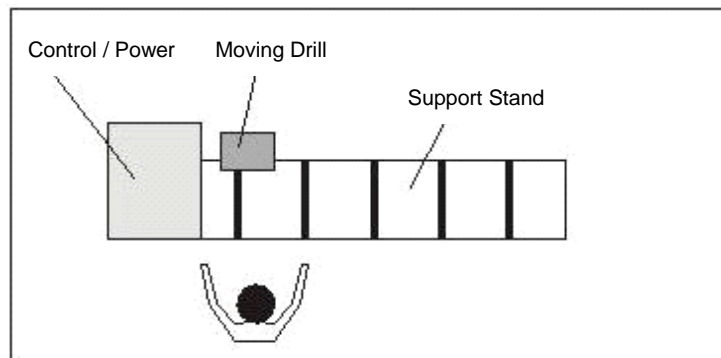
## General Operating Procedure of the Machine:

1. Engage the desired material to be drilled with the material clamps.
2. Enter positions of hole pattern to be drilled into PS312 position controller.
3. Start the drill at the main power box.
4. Press start at the PS312 controller, the drilling sequence occurs.
5. Disengage the material clamps and remove the material.

### 1.1 Intended Use

The only acceptable use for the KDP as a length gauging / drill system. Any other use is not intended and is a misuse of the system.

## 1.2 Work Area



*Operator work area*

When the machine is powered on, the only acceptable operator location in the work area is standing in front of the control stand on the opposite side of the moving drill (see picture above) Never place any material on the support stand that is not intended to be drilled.

## 1.3 Danger Zones

- The carriage
- The area between the face plate or carriage and the drill
- The clamping zones
- The drill head / bit

These areas are always dangerous and have the potential to harm the operator or others. Please take special safety precautions when working inside these areas.

## 1.4 Technical Specifications

### General Data

Power supply for PS312 controller	110VAC, 6A
Power supply for the Autodrill	230 VAC 3 phase, 7A
Shop air requirement	100 – 120 PSI, 1/4NPT quick connect
Current	Max 6A for 110VAC, 7A for 230 3-phase
Fuse positioning controller	6A, slow-blow fuse 20 x 5 mm
Travel speed carriage max	16 inches / sec
Operating Temperature	+ 5° C to + 45° C (41°F to 113°F)

## **2. Basic Safety Hints**

### **2.1 Read and follow all hints inside the Instruction Manual**

Basic requirements for the correct use of the drilling system or the machine are the knowledge of the basic safety hints and the safety precautions. This instruction manual contains the most important safety hints.

- This instruction manual, especially the safety hints and precautions must be followed by every person working with this gauge or machine.
- Also follow all general plant safety rules and precautions not mentioned in this manual.

### **2.2 Owner Obligations**

The owner agrees to only allow the machine to be used by qualified and trained persons who:

- Have been instructed in the general safety rules and precautions
- Have been instructed in the correct use of the drill and machine
- Have read and understood the safety chapters and caution hints of this instruction manual.

### **2.3 Operator Obligations**

All persons working with this drilling machine agree to the following before starting to work:

- Agree to follow the general safety rules.
- Agree to read and understand the safety chapters and caution hints of this instruction manual.

### **2.4 Intended Use**

The only acceptable use for this KDP is as a length gauging and drilling system. Any other use is not intended and is a misuse of the gauging system.

Hymark is not liable for any damages resulting from misuse.

Intended use also means:

- Following all safety hints and precautions mentioned in this manual
- Following the maintenance and inspection procedures as mentioned in this manual.

## 2.5 Warranty and Liability

Hymark Ltd Co (henceforth Hymark), warrants this product for a period of twelve (12) months from the date of shipment. During the warranty period, under authorized return component parts to Hymark freight prepaid, the company will repair, or at its option, replace any part found to be defective in material or workmanship, without charge to the owner for parts, service labor, or associated customary shipping costs.

This same protection will extend to any subsequent owner during the warranty period. It does not apply to damage caused by accident, misuse, fire, flood or acts of God, or from failure to properly install, operate, or maintain the product in accordance with the printed instructions provided.

This warranty is in lieu of any other warranties, expressed or implied, including merchantability or fitness for a particular purpose, which are expressly included. The owner agrees that Hymark's liability with respect to this product shall be set forth in this warranty, and incidental or consequential damages are expressly excluded

Hymark is not liable in part or in whole for any personal or equipment damage caused by of the following:

- Unintended use of the machine
- Improperly mounting, installing, maintaining or operating the machine.
- Operating the machine when the safety devices are damaged or not properly installed or if the safety or protection devices are not working properly.
- Disregarding the hints, notes and warnings concerning the transportation storing mounting installing using or maintaining the machine.
- Changing the construction or assembly of the machine.
- Replacing the original motor or other components or changing the load bearing components of the machine.
- Not monitoring the machine parts that wear.
- Improper repair or replacement.
- Acts of God or damage caused by impact of materials not involved in machine operation.



### 3. Safety Instructions

#### 3.1 Symbol and Hints Explanation

In this manual the following symbols are used:



##### **Danger!**

This symbol means an immediate impending life threatening or personal injury possibility if caution is not taken.

*Not following these hints can cause major injury.*



##### **Danger by electrical power!**

This symbol warns of an immediate life threatening or personal injury risk by electric shock if the warning is not followed.

*Not following these hints can cause major injury.*



##### **Caution!**

This symbol means that there is a possibly dangerous situation may occur.

*Not following these warning may cause personal or device damage.*



##### **Important!**

These symbols give important hints for proper operation of the machine.

*Not following these warnings can cause the machine to operated improperly.*



##### **Note!**

Under this symbols you get user hints and other special use of the machine for optimal use of the machine functions.

*Following these hints will help with the optimal machine usage.*

#### 3.2 Owner Responsibilities

The owner is responsible for any necessary personal protection equipment need for safe operation of the machine.

The owner is responsible for the correct function of any and all safety devices.

### 3.3 Safety Devices

Before any operation of the machine all safety devices must be installed properly and tested.

Safety devices may be removed only

- when the machine is at a standstill
- after making sure that the machine cannot be run (i.e. removing power to the controller or main power box).

When any component of the machine is replaced or removed the safety devices must be properly installed and tested.

### 3.4 Operator Training

Only trained personel can operate the machine.

The training requirements for assembling, operating, maintaining the machine must be clearly defined. Personel in training, must be accompanied by trained personel.

Personel	Trained operators	Mechanically trained personel	Electrically trained personel
Job function			
Operating	X	--	--
Troubleshooting	X	X	X
Repairing	X	X	X
Maintainance	--	X	X

X...allowed --...not allowed

### 3.5 Position Controller

- Only trained personel are allowed to use the position controller.
- Only personel with electronic training are allowed to open the position controller.

### 3.6 Safety Measures for Drill Use

- Only operate the machine when all the safety devices are working properly and have been fully tested.
- Before applying power be sure that noone can be harmed by machine movement or operation.
- The machine should be checked at least once a day to check for recognizable damage and proper function.

### 3.7 Danger by Electrical Power

- Only properly trained and qualified electrical personel can work on the power supply.
- Check electrical devices frequently

- Immediately replace any loosed connection or cables that show wear.

### **3.8 All electirical panels keys and controller access codes must be stored in a secure area with restricted access to unauthorized personel. Special Danger Zones**

- The Carriage and Drill areas.
- The Clamping zone between clamps and backfence.

### **3.9 Maintenance and Troubleshooting**

- Follow the maintainance and inspection schedule.
- All operating mediums (i.e. air pressure) must be secured against unintentional activation.
- Unplug power cord any time for maintenance or repair.
- Check all bolts if tightened correctly.
- After finishing with maintenance check all safety devices before running the machine.

### **3.10 Machine Design Changes**

- Do not change any mechanical or electrical components of the machine without written manufacturer permittance.
- Replace all non-working or damaged electrical components and machine parts immediately.
- Use only original parts and equipment from the manufacturer.
- There is no warranty or liability if parts and equipment from different suppliers are used.

### **3.11. Machine Cleaning and Disposal**

Handle any lubricants properly especially

- When working with grease
- When working with chemicals.

### **3.12. Exposure to noise**

- Safety and protection devices such as ear plugs or head phones may be necessary

## 4. Transportation of the gauge



### **Danger!**

Danger caused by moving loads. Immediate impending life threatening or personal injury possibility by moving and dropping the gauge with a crane.

Don't stay underneath the lifted gauge.

The minimum age for operating personal is 21 years.

*Personal has to be authorized and trained before using a crane, a forklift or any other transportation vehicle*

- ☞ Avoid bumping the KDP during transportation as damage may occur.
- ☞ Use a crane or a vehicle with allowed maximum weight of 1500lbs.
- ☞ Move machine only at slow speed.
- ☞ Do not drive on any ramp while moving the machine.

### **4.1. Installation Location**

The load carrying capacity of the floor must be minimum 300lbs per square meter.

## 5. Installation



### **Danger!**

Danger caused by second or additional personal while testing and running the drill. Immediate impending life threatening or personal injury possibility if caution is not taken.

Before installation and while running the machine ensure that no other person is within the danger areas of the gauge

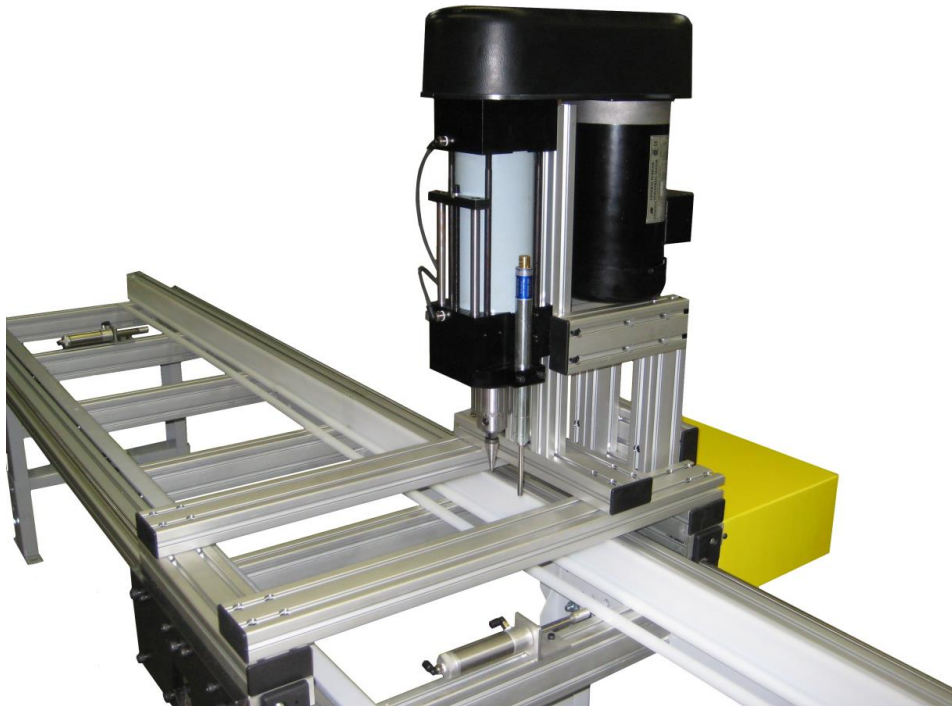


### **Note!**

Before installation, please check the machine for any damages or defects.

Eliminate any damage or defect before installing or running the machine or contact the manufacturer.

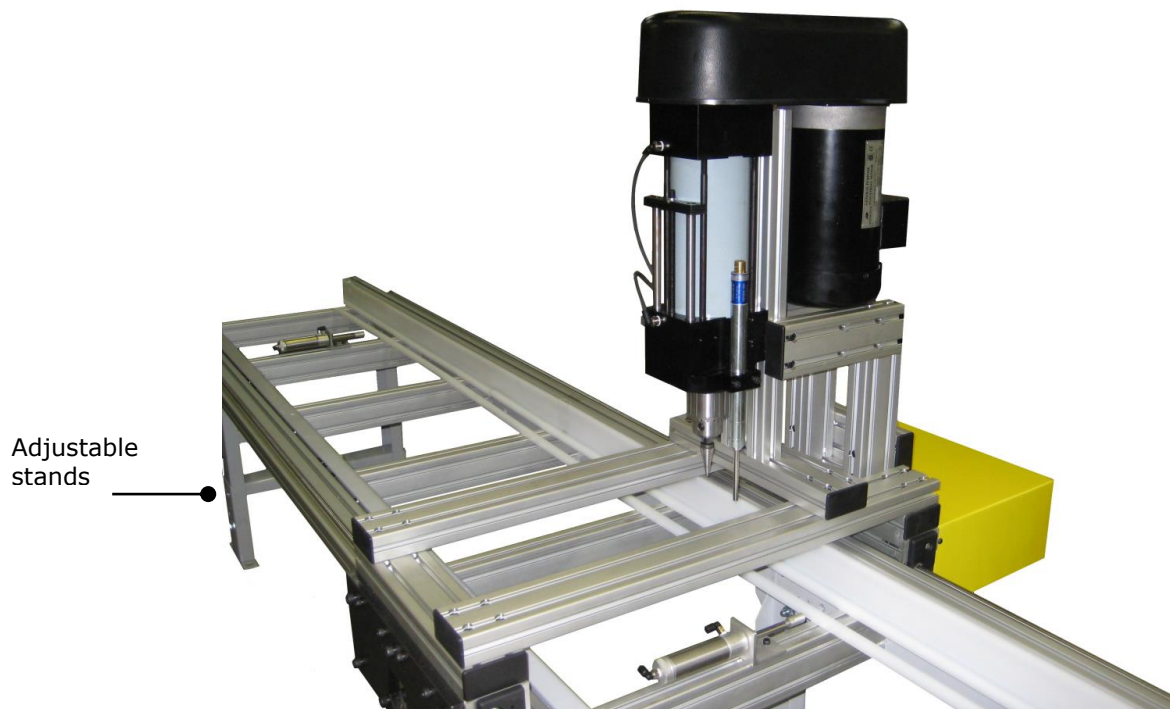
### 5.1 Installation procedure



**Note: The KDP should arrive in a form of fully or near fully assembled. Please remove the machine and accompanying part from the box or crate carefully, ensuring no damage or accidental loss of the parts in packing material discard.**

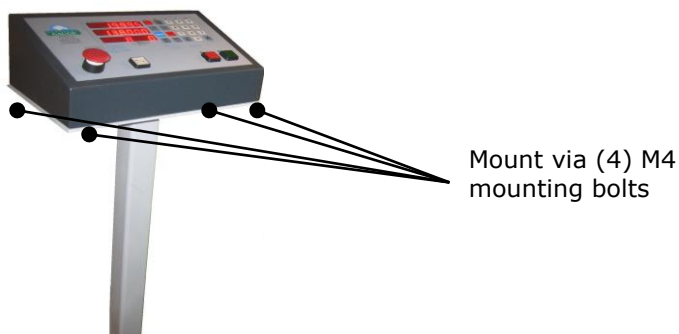
### 5.1.1 Placement and leveling

- ☞ Place the KDP in the desired location for operation. Please note again the requirements are 110VAC, 230VAC 3 phase, 100-120PSI shop air with 1/4NPT quick connect.
- ☞ There are (3) height adjustable support legs that may be altered if to desired working height.
- ☞ Level the system using a level and the height adjustable bolts.
- ☞ Once leveled and in the desired location, it is recommended to anchor the system to the floor.
- ☞ Tighten or check for loose bolts between the legs and stands and throughout the machine. Bolts may have come loose during transportation.



### 5.1.2 Setting up controller & connecting power requirements

- ☞ Locate and stand upright the pedestal style free standing, place in a desired location of operation. Note: this may be moved to a different location later as desired.
- ☞ Place the control box on top of the stand and secure mounting with (4) M4 mounting bolts (supplied) on the underside of the control stand plate



- ☞ Plug in power cable to position controller (standard PC Monitor cable to 110VAC, supplied).
- ☞ Plug in the remaining connections into the rear of the controller. Each connection is uniquely matched to the connector / cable lead. Depending upon your application, it may be the case that not all connectors on the rear of the panel are occupied.
- ☞ A full PS312 Position Controller Manual is provided in a separate document
- ☞ There are 4 loose wires in the main power box. 3 of the wires are used for the main power lines. The 4<sup>th</sup> wire is used for grounding. The grounding wire comes pre-grounded to the main power box.

Regulator Main with 1/4NPT quick connect (100PSI)



- ☞ There are 2 air regulators located on the machine. Locate the regulator with the 1/4NPT quick connect plug and provide 100PSI pressure. Adjust to 100PSI setting, up to 120PSI is acceptable.

Regulator for downfeed (20-40PSI)



- ☞ There is a downfeed drill air feed regulator that adjusts the speed of downfeed. This regulator has (2) 90 degree fittings and should be set in the 20 – 40 PSI range, depending upon your drilling requirements. Higher PSI ranges may result in erratic drilling.  
*\*Regulator may be located under carriage hood*

Power Box On / OFF



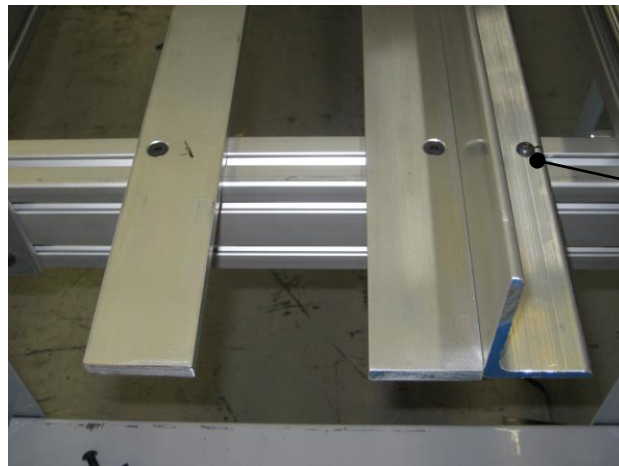
*\*Button styles may vary, but operation will remain the same*

- ☞ There are 2 power switches, one located on the main gray power box, and the other is located on the rear of the PS312 controller. Both need to be in the ON position for drill / gauge operation.



- ☞ Optimization of the positioning ramps have been entered into the PS312 parameters. Please refer to the procedures inside PS312 position controller manual how to change controller functions.
- ☞ Please refer to the procedures inside PS312 position controller manual how to datum (reference the system).
- ☞ Please refer to the procedures inside PS312 position controller manual on how to enter a program for hole pattern.

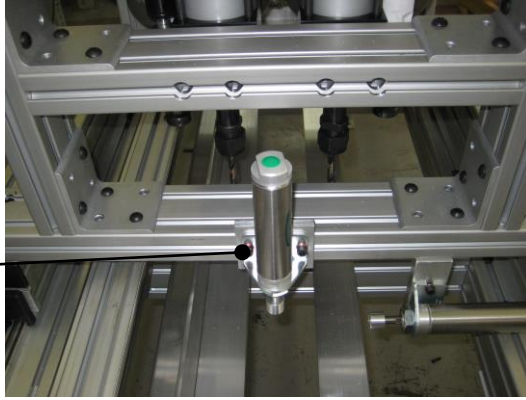
### 5.1.3 Operation



Adjustable by  
loosening & tightening

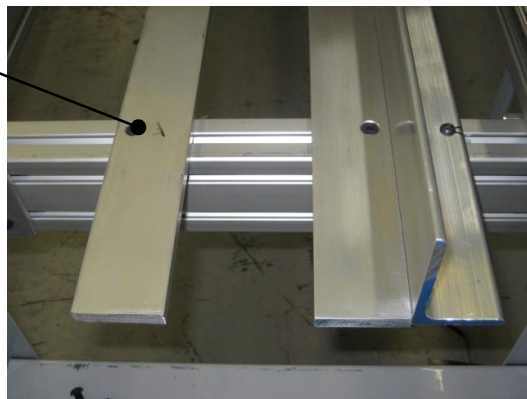
- ☞ The KDP has an adjustable back-fence to accommodate varying material sizes and centerlines. Adjust the back-fence to accommodate the desired hole line. Be sure to square the fence, fence setting out of square will cause unwanted offsets. The adjustment is done via loosening and tightening bolts / T-nut slot arrangements.

Adjustable by  
loosening & tightening



- ☞ KDP has adjustable pneumatic clamps accommodate varying material sizes and centerlines. Adjust the clamps to accommodate the desired hole line. Be sure to square the fence, fence setting out of square will cause unwanted offsets. The adjustment is done via loosening and tightening bolts / L-nut slot arrangements.

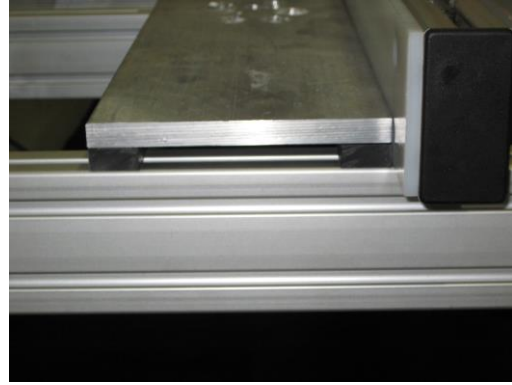
Adjustable by  
loosening & tightening



- ☞ The KDP has adjustable set blocks for material rest. The adjustment is done via loosening and tightening bolts / L-nut slot arrangements

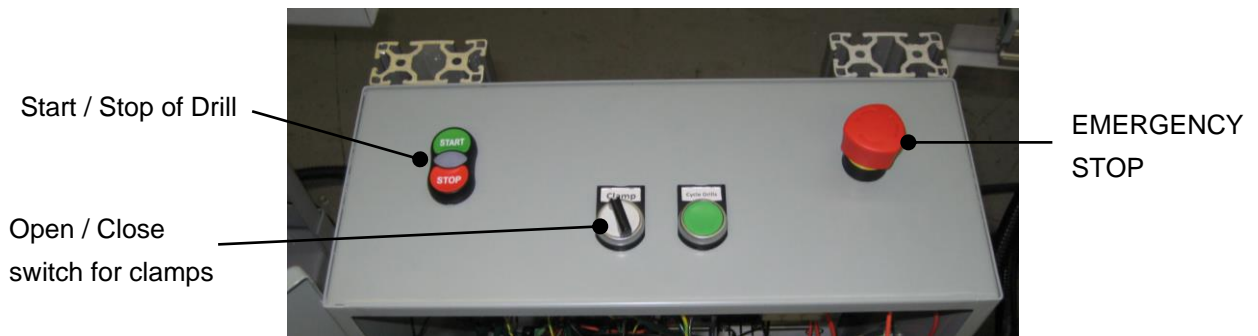


Tube application



Flat application

☞ Place the material against the back fence.

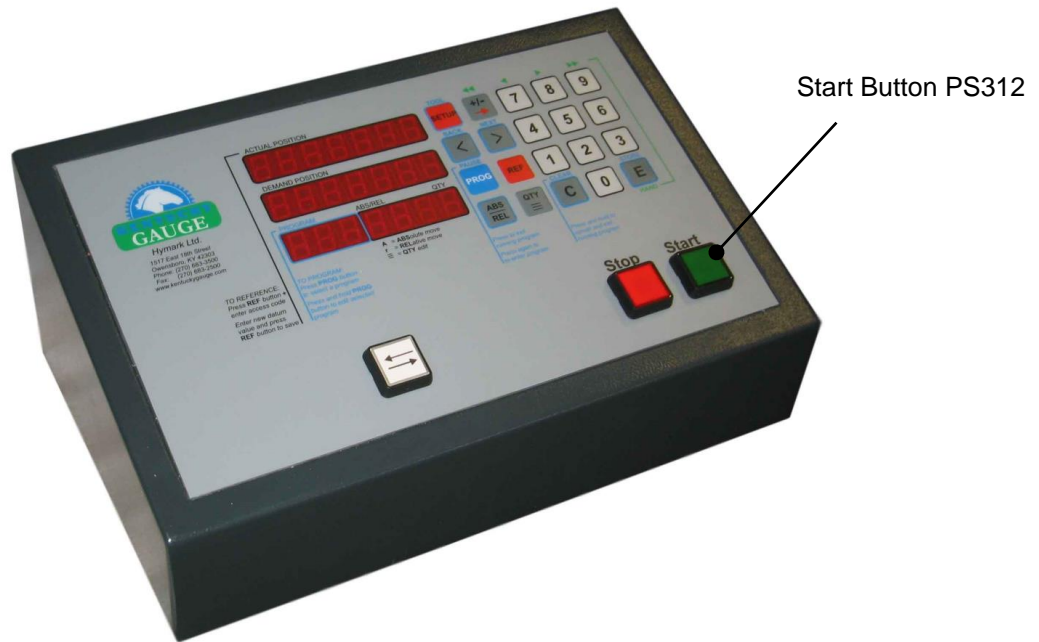


☞ Close the clamp switch on the gray control box (see above). material will now be held for drilling

☞ Press the "Start" button to begin the drill rotation. The drill in an idle mode until the PS312 controller is initiated via it's button.

☞ Note: at any time, pressing the EMERGENCY STOP button will stop all operations, including the controller function.





- ☞ With a pre-entered hole program loaded, select the program and press "Start" button. Please refer to the procedures inside PS312 position controller manual on how to enter a program for hole pattern.
- ☞ The drill will not move to each desired hole location and cycle the drill until program completion.
- ☞ At the end of the completion, remove the part by switching to "OPEN" on the gray control box and removing the finished part.

## 6. Intended Machine Use

### 6.1 Check before turning power on



#### **Danger!**

Danger caused by devices on top of the support table.  
Personal injury possibility such as bruise etc.

*It is not allowed to place any parts or devices on the table,  
other than the part to be drilled.*



#### **Danger!**

Danger caused by second or additional personal while running the drill. Immediate impending life threatening or personal injury possibility if caution is not taken.

While running the machine ensure that no other person is within the danger areas of the gauge



#### **Caution!**

Danger caused by wrong adjusted pneumatic device.

Personal injury possibility if air pressure is too high. Pneumatic cylinders might move faster and have more force

*Adjust air pressure to not more than 120psi before installation  
Check air pressure frequently before running the machine*

☞ Do not allow unauthorized personnel to operate the machine or stand nearby.

### 6.2 Power "ON"



#### **Danger!**

Danger caused by stroke of the drill.  
Personal injury possibility such as bruise or cuts.  
Reduce cylinder stroke speed by adjusting the valve.



#### **Danger!**

Danger caused by not wearing safety equipment like glasses and gloves.  
Immediate impending personal injury possibility if caution is not taken.

### 6.3 Power "OFF"

☞ Turn power off by pushing the power button on the rear side of the controller housing and side of gray control box.

- ☞ In any emergency situation push the red safety E stop button on the front side of the controller. Moving carrier and Drill will stop immediately.
- ☞ Pull the safety stop button to return to operating mode.

## 7. Troubleshooting

Malfunction	Possible reason	Possible corrective action
1. No display	<i>Power off</i> <i>Defect power cable</i> <i>Damaged fuse</i>	<i>Check power and power cable.</i> <i>Check fuse of main power supply at the machine or inside the cabinet</i> <i>Check fuse of the position controller on the rear side (next to power plug)</i>
2. Position controller is not accepting „Start“ anymore	<i>Position controller is in „Quantity decrementing“ mode or „program entering“ mode</i>	<i>Push [<b>Stop</b>] button</i> <i>Exit „program mode“ by pushing : [<b>P</b>]</i> <i>Erase entered quantity by pushing : [<b>QTY</b>] and [<b>0</b>]</i>

3. Length shown in the display of the controller and real measured length are different	<p><i>Operator has redatumed the controller unintentionally</i></p> <p><i>Reader head mounted to carriage and magnetic tape mounted to aluminum extrusion are misaligned</i></p>	<p><i>Datum the controller by pushing : <b>[R]</b>, datum value and <b>[R]</b></i></p> <p><i>Align reader head as shown below</i></p>
---	--	---

## 8. Maintenance

### 8.1 Safety Instructions



#### **Danger!**

Danger caused by devices on top of the roller table.  
Personal injury possibility such as bruise etc.

*It is not allowed to put any parts or devices on the roller table. Only the part to be worked with can be on top of the roller table located only between machine and gauge arm, never on the other side.*

### 8.2 Maintenance Requirements

Maintenance jobs as described in this chapter may only be done by authorized and trained personal.

### 8.3 Lubricants and Detergents

#### **Detergent**

- ☞ Use commercially available detergents.
- ☞ Don't use any acids or alkaline solutions
- ☞ Don't use any high pressure water jet cleaners

### 8.4 Maintenance Schedule

See chapter	Device	Cleaning	Lubricate	In addition	Frequency
8.5	Roller table	X	--	--	daily

8.6	Magnetic tape mounted to bottom side of aluminum extrusion	X			daily
8.7	Carriage	X	--	--	quarterly
8.8	Double steel rods on aluminum extrusion	X			

Legend: X has to be done -- Nothing to do

### 8.5 Cleaning the roller table

- ☞ Turn power off by pushing the power button on the rear side of the controller housing
- ☞ Remove chips and grease on the roller table.

### 8.6 Cleaning the magnetic tape

- ☞ Turn power off by pushing the power button on the rear side of the controller housing
- ☞ Remove chips and grease on the magnetic tape and between reader head and tape

### 8.7 Cleaning the carriage

- ☞ Do not remove any safety devices.
- ☞ Remove yellow cover hood
- ☞ Clean with compressed air along the double steel rods.

### 8.8 Cleaning the double steel rods on aluminum extrusion

- ☞ Do not remove any safety devices.
- ☞ Remove yellow cover hood