

Bholanath Drill Tap Vertical Machining Centre (Mini -VMC)

Bholanath precision has designed and developed low cost Drill Tap Mini-VMC which will give you very quick return on your investments.

90 % of simple operations of drilling, tapping, reaming are now being done on costly VMC and requiring skilled CNC operator. **This is a low cost single spindle VMC, costing around 5 lakhs. At the cost of a full fledged VMC , 4 nos of these can be installed giving 4 times the productivity.**

This consists of 32 mm capacity drill machine with automated Z axis movement, 300 x 300 mm servo controlled ball screw XY movement and 4 axis motion controller. The programming is very simple and is based on teach pendant and entering the movement values in a hand held tab or mobile, then transferring the same to the HMI. It is very simple to operate and no programming knowledge is required. **No need of a CNC operator to run this machine.**

All kinds of PCD and non PCD drilling and tapping can be performed with a very high production rate. The repeated accuracy is within 20 microns. Simple Milling operations can also be done on BH-DMA-06 machine.

This gives ease of operation and high productivity rates. The operator has to just load and unload the job. A single operator can operate multiple machines depending upon the time cycle.

Features of BH-DMA-06 machine -

1. Drilling size and depth as per data sheet
2. Peck drilling is very simple by programming
3. Drilling Feed speeds settable by programming
4. High speed Reaming
5. Proximity switch for homing
6. Direct Tapping with controller (No attachment needed)
7. High feed rates of XY slide
8. Fourth axis Rotary table available on request.
9. Very less power consumption
10. Single phase 230 vac supply

Add on features -

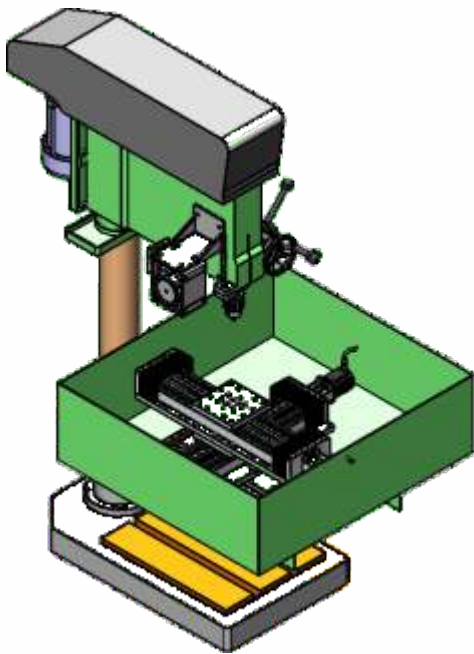
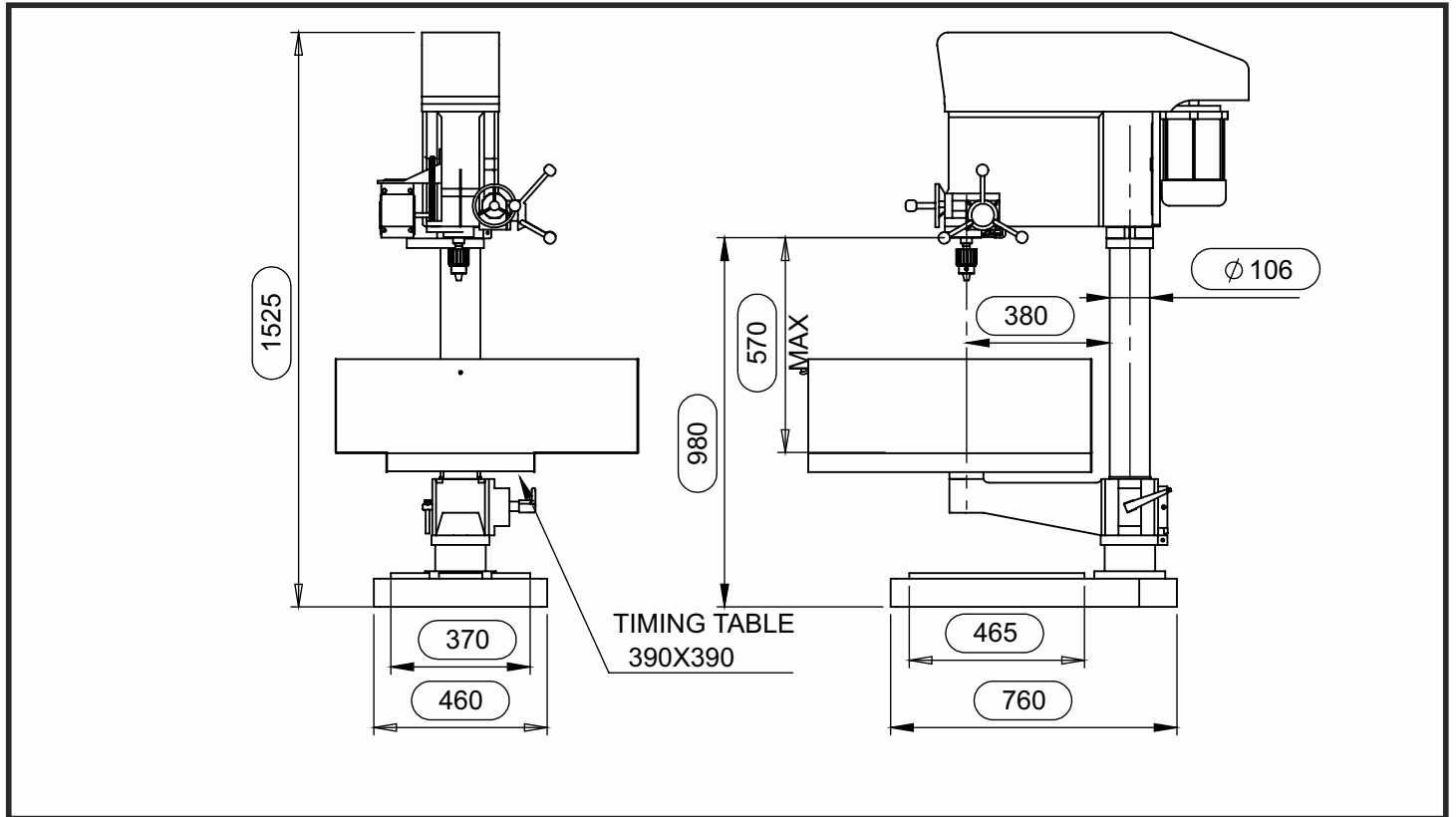
Complete ready to use machines with fixtures and tooling is also provided so that you can start production as soon as you install the machine. Standard warranty term is one year and afterwards machine is covered under AMC. Training at factory or at site(At cost) is provided.

To watch videos kindly click on below you tube links.

Youtube link-

<https://www.youtube.com/watch?v=Mb4Whrx8xYE>

<https://www.youtube.com/watch?v=6iFbdLeJ7qw>



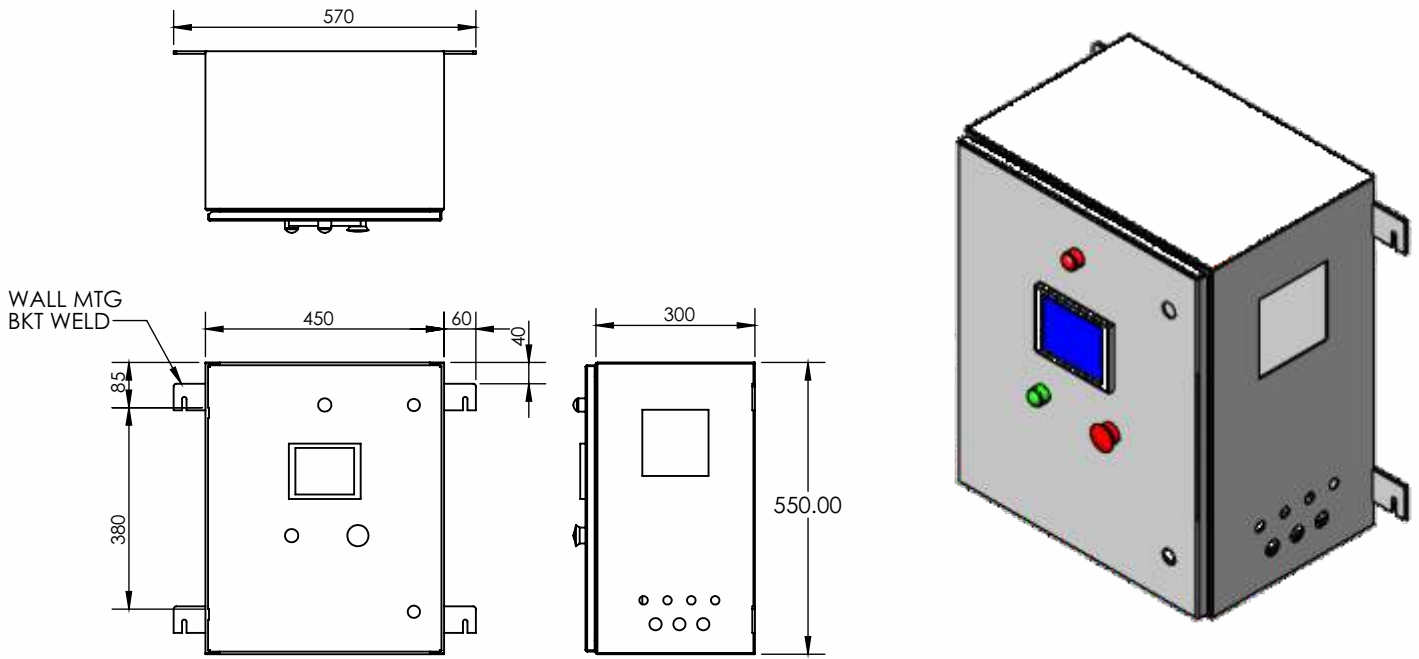
DRILL MACHINE TECHNICAL SPECIFICATION

SR NO.	DESCRIPTION	CAPACITY & SIZE
1	DRILLING CAPACITY IN STEEL	32 MM
2	SPINDLE TRAVEL MAXIMUM	250 MM
3	SPINDLE TAPER	MT-3
4	NO OF SPINDLE SPEED	73 TO 1800 RPM
5	COLUMN DIAMETER	106 MM
6	MAX DISTANCE BETWEEN SPINDLE CENTRE TO COLUME FACE	380 MM
7	MAX DISTANCE BETWEEN SPINDLE NOSE TO WORKING TABLE	570 MM
8	MAX DISTANCE BETWEEN SPINDLE NOSE TO BASE PATE	980 MM
9	WORKING TABLE SIZE	345X345
10	NO OF SPEED	8
11	V -BELT SECTION	B-63
12	SIZE OF BASE PLATE	760X460 MM
13	BASE SIZE (MACHINE AREA)	465 X 370 MM
14	ELECTRICAL MOTOR	1 HP,50 CYCLE,1440 RPM (LUBI BRAND)

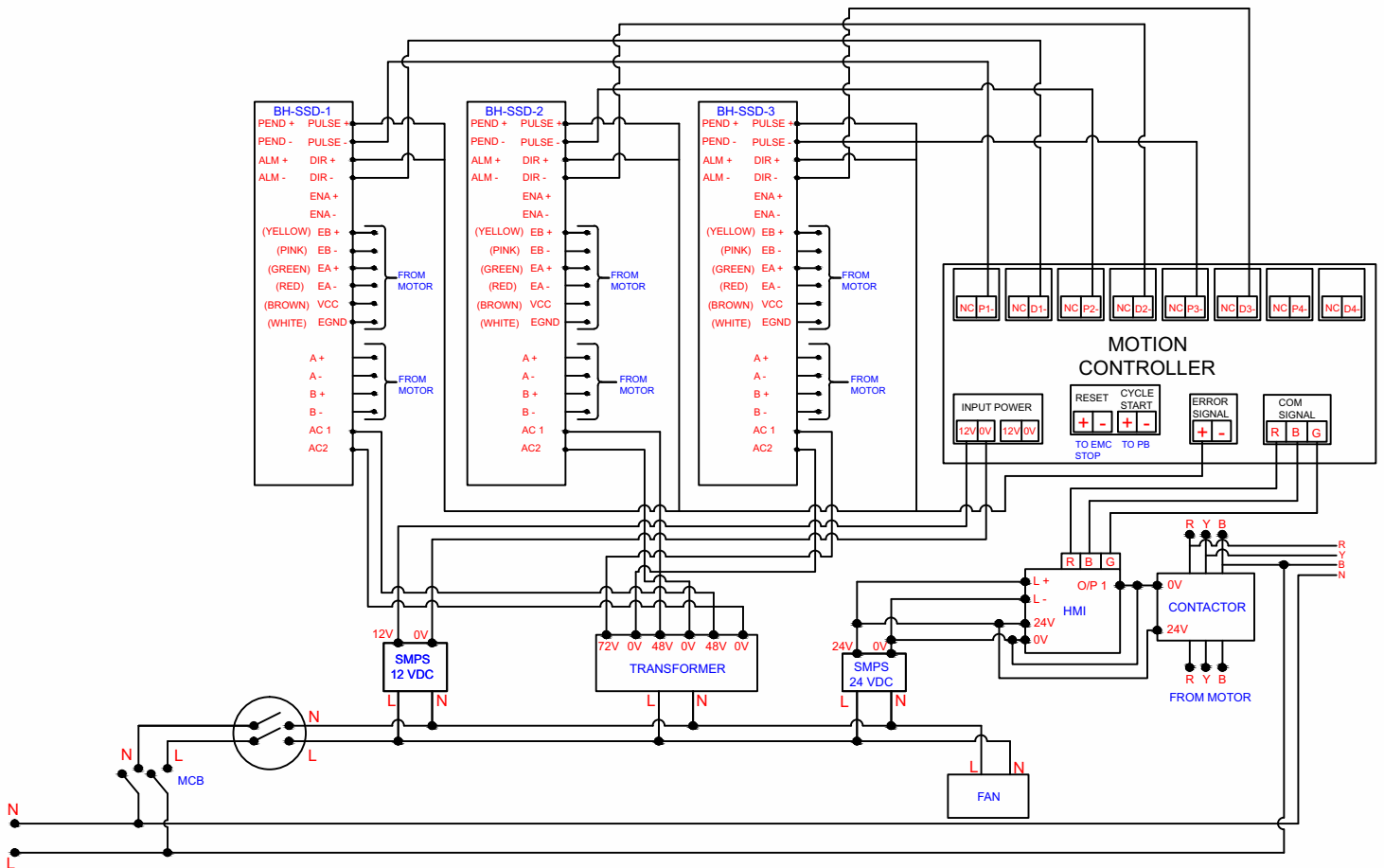
BALL SCREW X-Y SLIDE SPECIFICATION

1	TRAVEL LENGTH OF X-Y SLIDE	300x300
2	Maximum Load Carrying Capacity On X-Y Slide (KG)	0 to 130
3	MAX Permissible Feed Speed of X-Y	0 to 240
4	Positioning Accuracy(Mm)	0.02
5	Power Consumption (w)	1500

Mechanical Dimension for Control Panel



Circuit Diagram for control panel.



4 Axis Drilling machine

User manual.

Introduction :-

Bholanath Precision Engineering Pvt Ltd has developed a new android based 4-axis drill machine automation. In this Automation we have used stepper motors for X, Y and Z axis movement. To control these movements control panel including Motion Controller, HMI, Stepper drives, Power supply etc. is given. Refer Fig a for drill machine and Fig b for Control panel. Using this motion controller it is possible to drill any type of job as per user requirement.



Fig a. Drill Machine



Fig b. Control panel

Motion Controller

The motion controller is able to run 4 axis at time. It is controlled by touchscreen HMI and programmable by Mobile phone Android Application. The program is so simple that can be done by anyone. No need of special training to program this controller. The controller is as shown in Fig c.



Fig c. Motion Controller

Operating procedure :

Android Application(Turn control)

This application is used to program motion controller. It connects to controller via mobile hotspot. Follow the steps below to connect and download program via mobile to controller.

1. Switch on the mobile Hotspot and rename the device name as “Cnc” and password as “turning1” as shown in Fig e.



2. Open the android application “Turn Control” the screen will show as per Fig f. Select existing project from the list or press on + sign to create new program.



Fig f. Selection of program

3. After creating new program following screen will appear as shown in fig g. Create program as per requirement of drills. Our machine will work as per path given by user. User can delete any line at any time by entering mode as in fig.h

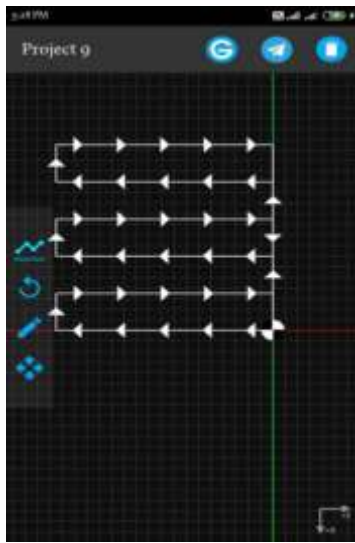


Fig.g Path of program

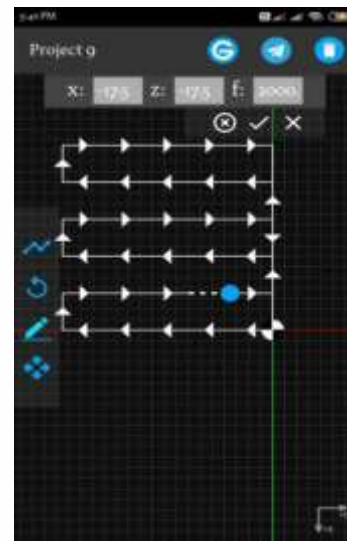
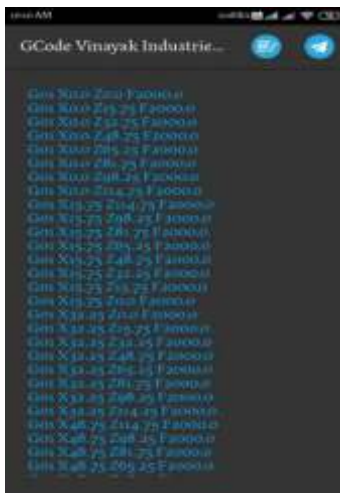


Fig.h Edit path

4. The program can also edited by entering G-code mode by pressing top right symbol G as shown in Fig.i and j



1. To download this program to the machine press top right send symbol as in fig.i

The server ip displayed in the screen of Fig.k should be matched with the server ip of the controller which is given in Parameter section of controller.



Fig. k Server ip

6. Press and hold CONNECT button in auto mode for connection of mobile and controller as shown In Fig. 1.

The name of machine will appear on mobile screen as shown in Fig. M.



Fig. 1 connection of machine with mobile app

Fig m. Display of machine name



1. Send program to machine. SUCCESS.....

2. Now let us see the HMI screens for understanding of all the settings.

3. There are 5 modes of operations in HMI.As shown in Fig. n



Fig.n Menu

We will see all of them one by one.

In auto mode we can see the exact position of X, Y and Z axis. We can also go to zero position by pressing go to zero button.

You can also see the Program number and can set Feed override. Start line is the option given for user to start the cycle from any line he want to. Please refer Fig.o



Fig. o. Auto mode

JOG MODE :

In Jog mode we can manually run any of the X Y and Z axis by entering jog steps value. We can also set zero of each axis. Spindle and coolant motor can be ON/OFF manually. Please refer fig. p



Fig. p Jog mode

Home :

This mode is used to home each axis after power failure to safely start with same program. The each axis will go to its machine home position and will stop at limit switches. Ref fig q

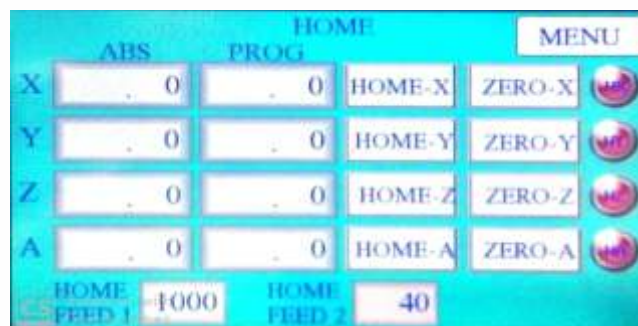


Fig q Home mode

Parameter mode :

Parameter mode is given to set the steps per mm for each axis. The calculation is:

$$\text{Step /mm} = \text{driver Micro step} / \text{Pitch of Ball screw in mm}$$

Acceleration value can also be set to smoothly start of the steppers.

Refer fig r

Drill Settings :

For drilling operation as per program we have made, we need to set some parameters like below :

1. Drill feed for maximum speed of z axis while drilling
2. Retract feed for maximum speed of z axis while returning
3. Hole depth for total length of drill to be done
4. Rapid height for upto which distance the z axis will be retract for safety purpose
5. Peck drill for drilling in up down manner for smooth drilling of deep jobs.

6. Position -I and Position -II for 1st and last position of drill we want to do.

For Example:

If we have total 36 nos of holes to be done then P-I will be 1 and P-II will be 36.
(If you don't have hole on zero position) Ref fig s.

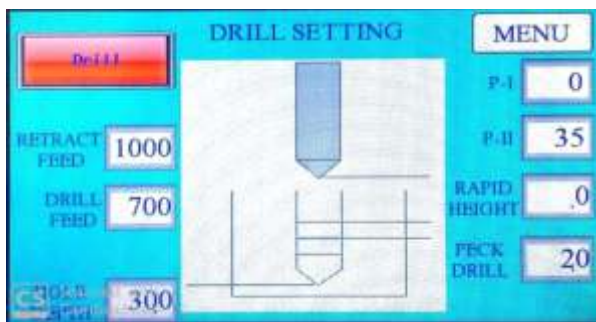


Fig s. Drill setting

There are 3 types in drill setting

- 1) **Drill** : To do normal drilling operation with hole depth and feed.
- 2) **Deep hole** : In deep hole the z-axis will come back to its zero position after every drilling cycle completes (provided with peck drill distance). The will goes the distance enter in peck drill option as a deep and come back to zero position every time to clear the burr of job.
- 3) **Peck drill** : In peck drill the drill will goes the distance entered in peck drill option as a deep and come back upwards same distance as peck drill value.

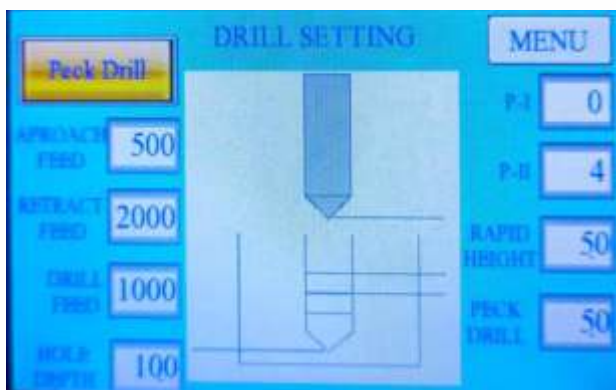


Fig t. Peck drill setting

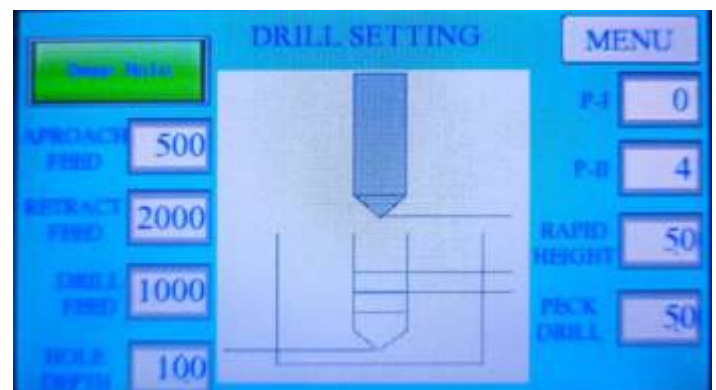


Fig u. Deep hole setting