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voortman STEEL GROUP

V330-3000 PLATE PROCESSING MACHINE

TABLE OF CONTENTS

BASIC CONFIGURATION

- V330-3000 Plate processing machine (executed with drilling gantry, vertical drilling unit, automatic tool changer, swarf brush and cutting gantry)
- Drilling table (working length 6.100mm, working width 3.100mm, center distance support legs 190mm, incl. floor rails)
- Cutting & extraction table (working length 6.100mm, working width 3.100mm, support center distance 50mm, incl. floor rails)
- Electro-Magnets for plate transportation (four on each gantry)
- Plasma cutting unit HPR260XD including automatic height control system IHT M4000PCS
- Fume extraction unit Donaldson DFPRO8
- Oxy-fuel cutting unit including automatic height control system IHT M4000CAP (1 pcs)
- Layout marking tool (1 pcs)
- Hardware and software (includes VACAM 'Machine Edition', VACAM 'Office Edition', VACAD editor software module, VANEST nesting software, Layout marking software module, online support)
- Automatic Nesting Software, SigmaNest 'PowerPack' (including drilling module)
- Safety devices (light curtain, corner mirror, safety bumpers, jamming prevention)

V330-3000 PLATE PROCESSING MACHINE

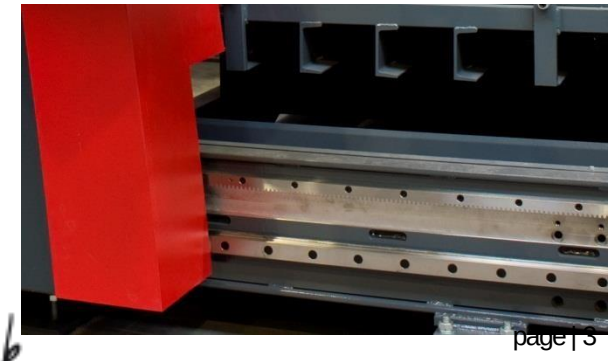
Voortman attaches great value to the quality, functionality and user friendliness of our machines. These key aspects are reflected in every Voortman machine on the market, resulting in uniformity and synergy amongst all Voortman machines.

The V330 is specially designed for drilling and cutting of plates in the most efficient way. It consists of a separate drilling- and cutting table, each provided with its own independent moving gantry. Both gantries can be equipped with electromagnets, to transport the plate from the drilling table to the cutting table after the drilling process is completed. The independently moving gantries allow the cutting unit to work on the drilled plate, while in the meantime a new plate is drilled on the drilling table.

This results in an 80% higher production capacity compared to combined systems, and much greater efficiency.

FLOOR RAILS

Both gantries move along double floor rails with a center distance of approx. 3.700 mm. The rails are manufactured from heavy machined profiles and mounted with adjustable legs to provide a stable platform. Heavy toothed gear racks and heavy duty linear guides are provided to ensure smooth and precise positioning of the gantries.

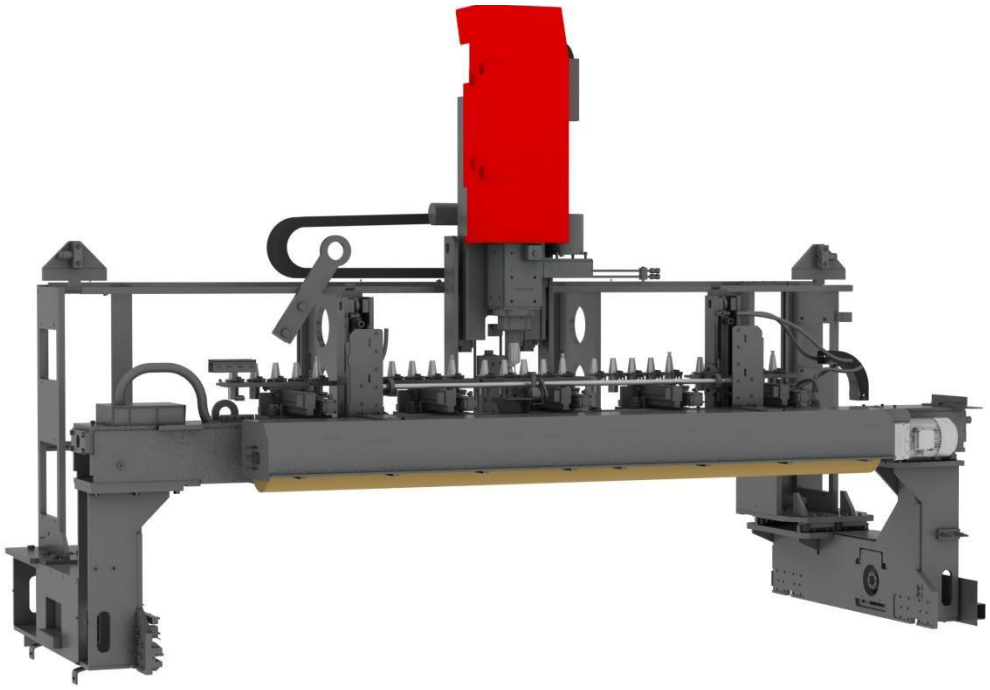


DRILLING GANTRY

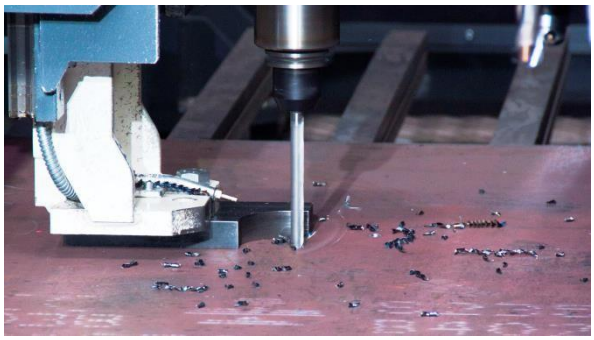
The drilling gantry is driven on both sides by double synchronized servo drives. Combined with a rack and pinion system and double linear guides, accurate and fully synchronized gantry movements are guaranteed.

Two heavy steel bridge frames form the base of the drilling gantry. Horizontal heavy duty double linear guides are mounted on the first bridge for the horizontal guidance of the servo driven drilling unit. Four magnets used for plate transportation (if installed) are also mounted on this bridge. The switch panel is mounted on the backside of the frame, to save precious floor space. Both the tool changer and the swarf brush are mounted on the second bridge frame.

Power for the drilling gantry is provided by a power rail mounted on the supports of the drilling table. A constant connection between the gantry and the power rail is assured by means of a busbar.



VD40 DRILLING UNIT



The machine is fitted with a VD40 drilling unit, which is mounted on double linear guides. Servo driven ball screws guarantee precise and fast drilling, with extremely high feed rates. To increase the speed of the drilling process, the feed rate will be maximal until the drill almost touches the plate. At this point it reduces to the required feed rate for the best drilling result. Hydraulic clamping prevents the plate from moving during the drilling process and eliminates vibrations resulting in more accurate drilling and extended tool life. The drills are cooled internally by a mixture of oil and air, for a long lifetime of the tools and to eliminate cleaning work after drilling.

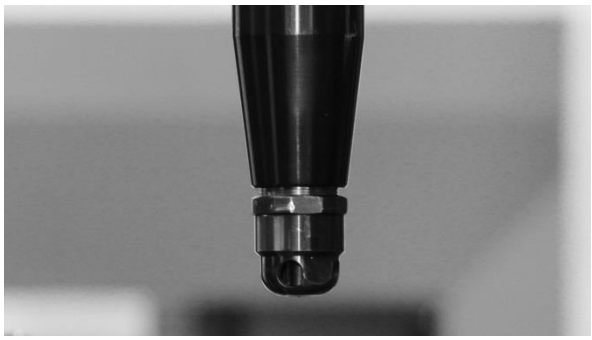
The drilling unit is suitable for HSS drills, carbide tipped drills, solid carbide drills, thread tapping, counter sinking and center point marking. Swarfs generated during the drilling process are collected in a swarf bin placed at the end of the drilling table.

AUTOMATIC TOOL CHANGER

A twenty-five-fold automatic tool changer enables fast changing of tools. Since no manual intervention is required, the downtime of the machine is strongly reduced. An infra red sensor automatically measures the tool length when a new tool is placed in the tool changer. This length determination enables the drilling unit to approach the plate at a high feed rate. Tools used for thread tapping, counter sinking and layout marking can also be placed in the tool changer, creating a versatile machine which is able to switch fast between different forms of processing.

LAYOUT MARKING TOOL

The layout marking tool is placed in the automatic tool changer, and will automatically be picked by the machine. A high air output motor in the marking tool runs at 20.000 rpm to rotate the carbide inside the milling tip, to mark with a depth of approximately 1 mm. The carbide milling tip has four useable sides and can easily be exchanged. Milling is the best type of marking and can be seen even after shot blasting, painting, powder coating and galvanizing.



DRILLING TABLE

The supports of the drilling table are provided with exchangeable polyamide strips, instead of steel strips as on most standard tables. These polyamide strips prevent unnecessary damage to the drill when drilling through the plate. Clamps installed at the side of the table provide extra stability and therefore accuracy during the drilling process. A swarf container is placed at the end of the drilling table to collect the swarfs created during the drilling process.

Working height	760 mm
Table capacity	max 1.200 kg/ m^2

SWARF BRUSH

A rotating swarf brush is integrated in the gantry of the machine to remove swarfs from the drilled plate before cutting. All swarfs are swiped off into a swarf bin, leaving nothing but a clean plate. The brush is electrically driven, and the operating height is automatically adjusted by an air cylinder for optimal surface cleaning.

ELECTRO MAGNETS

The support beams of each gantry are fitted with four electro-permanent magnets for automatic transportation of the plate from the drilling table onto the cutting table. Both gantries move to the drilling table in order to pick up the plate. Hydraulic cylinders are used for lowering and lifting of the magnets. Together the gantries transport the plate to the cutting table. During transportation, a new plate can already be placed onto the drilling table, which saves precious time and therefore lowers the production costs.

Min. plate size	1.000 x 1.000 mm
Max. plate size	6.100 x 3.050 mm
Max. weight	7.500 kg

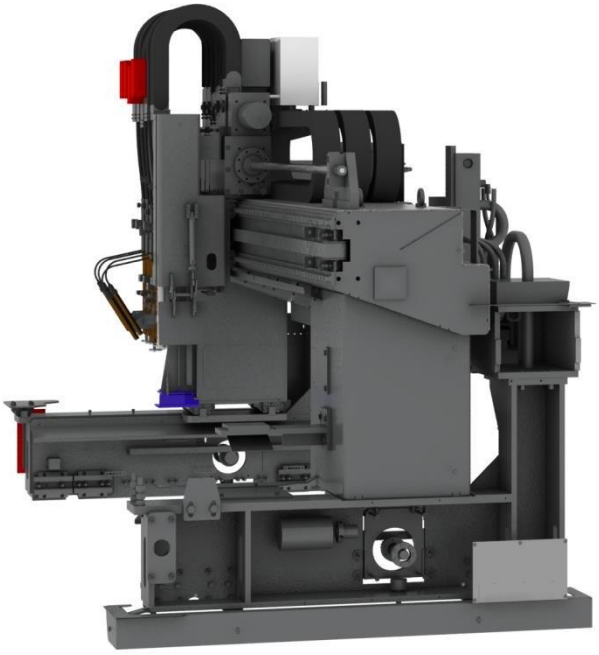
CUTTING GANTRY

The cutting gantry is also driven on both sides by double synchronized servo drives. Combined with a rack and pinion system and double linear guides, accurate and fully synchronized gantry movements are guaranteed.

Two heavy steel bridge frames form the base of the cutting gantry. Heavy duty double linear guides are mounted on the first bridge for the horizontal guidance of the cutting units. The electromagnetic plate lifting system (if installed) is mounted on the second bridge frame.

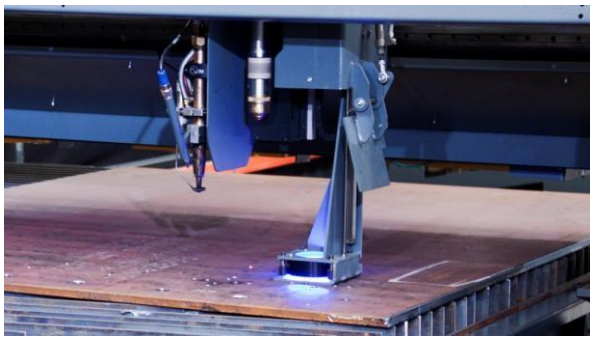
The gantry is equipped with a CCD vision system to detect deviations in the position of the plate after transportation from the drilling table to the cutting table.

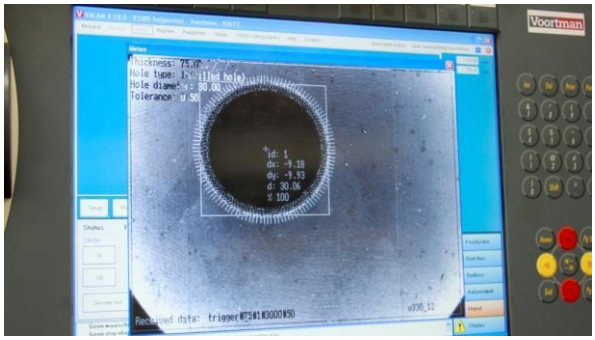
Power for the cutting gantry is provided by a power rail mounted on the supports of the cutting table. A constant connection between the gantry and the power rail is assured by means of a busbar.



VISION SYSTEM

By means of a unique vision system which is installed on the cutting gantry next to the torches, the machine is able to determine the plates' exact position. After the drilled plate is transported to the cutting table, its position will be determined according to the drilled holes, instead of the plates' outer dimensions. The CCD camera measures the exact position of several holes and uses these positions to set the zero reference of the plate. During automatic operation, the position of the drilling holes will repeatedly be measured to maintain accuracy during the entire process.





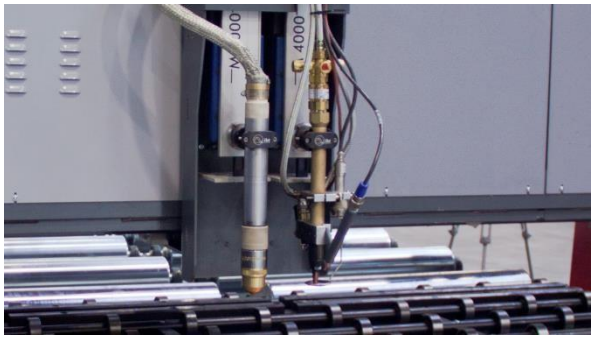
PLASMA CUTTING UNIT

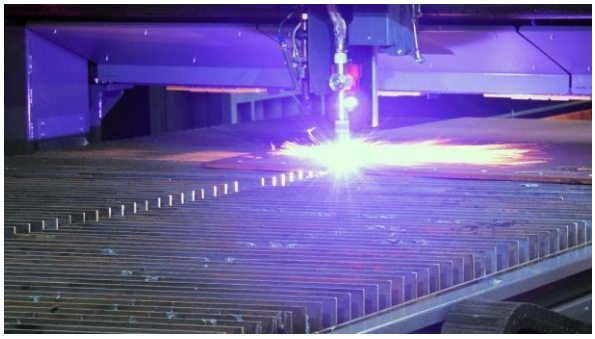
A Hypertherm HyPerformance plasma unit is installed to make the best plasma cuts possible. It cuts according to a HyDefinition principal, which gives the plasma arc more stability and energy, resulting in more powerful and precise cuts.

Cutting is possible by air plasma with variable current settings. Automatic gas flow control minimizes the formation of dross during the cutting process. For layout marking the system automatically switches to argon gas. Layout marking will ease further production process, creating a higher level of efficiency, less error and reduced man hours.

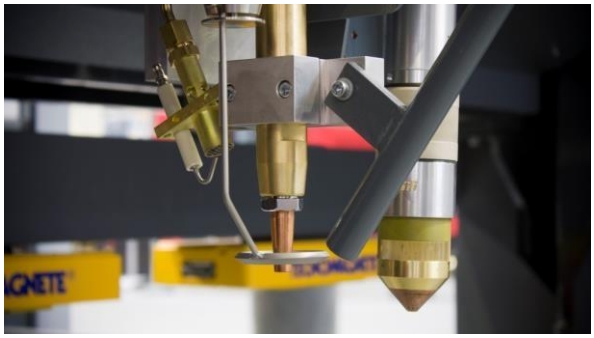
An IHT M4000 PCS automatic height adjustment system is part of the standard equipment. The distance between the torch and the material is constantly measured by an arc voltage sensor. When only the slightest deviation is sensed, the distance will immediately be adjusted, resulting in high quality cuts. Positioning of the torch along the bridge frame (Y–axis) is carried out by a precision ball screw combined with a servo drive. The system allows processing of several plates with various thicknesses at the same time, and is even capable of processing tread plates.

The Voortman software which controls the automatic height control system, is able to significantly reduce the time required for repositioning of the torch. The torch is not retracted all the way to the parking position during repositioning, but travels at the pierce height so it can immediately start cutting at the required position. If the travel distance is larger than 150 mm the torch will retract a little further, to prevent collisions with tilted products. The result is a faster production process, higher production output and reduced operator costs.





OXY-FUEL CUTTING UNIT



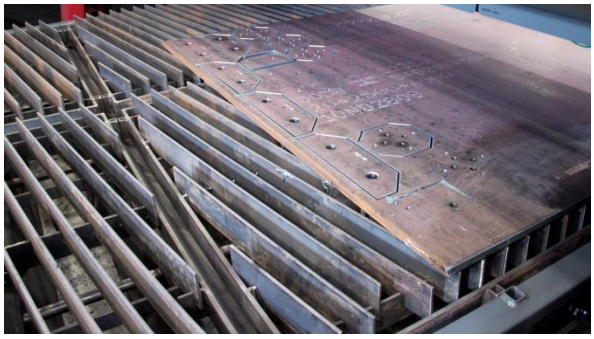
An oxy-fuel cutting system is delivered on the machine, which enables cutting up to 150 mm thick material. Gas required for cutting is fed through a magnetic valve with backfire protection. The system is provided with an automatic ignition system, so that manual proceedings are not required to start the cutting process. A pressure limiter on the burner unit prevents over pressurization of the system. Cutting is possible with different cutting gasses by the use of high speed external nozzles. These external nozzles can be disassembled easily, which enables fast changing or cleaning of the nozzles. A flame monitoring system is installed, to make sure that the machine stops as soon as the flame of one of the torches extinguishes.

The oxy-fuel cutting system allows for fully automatic piercing of the material. It is also possible to interrupt the pre-heating time and start immediate cutting for an even faster process. When necessary, the operator can change the pre-heating time according to the required value. The standard cutting speed is adjustable on the control panel.

An IHT M4000 CAP automatic height adjustment system is part of the standard equipment of every single oxy-fuel torch. It measures the height above the material by means of a touchless capacitive sensor. Actual values are constantly compared to the point values set by the Voortman controller, so it can exactly execute the specified cutting dimensions, resulting in high quality cuts.

A total of four oxy-fuel torches can be installed on the V330. When multiple torches are installed, one oxy-fuel torch is installed on the same carriage as the plasma torch. All other oxy-fuel torches are connected to this torch by means of a support belt with hydraulic clamps. The minimum distance between the torches is 130 mm.

CUTTING & EXTRACTION TABLE



The cutting table is divided into several sections, each provided with a partially integrated suction canal. These canals are used to extract the cutting fumes from the cutting zone. Fume extraction is controlled by pneumatic actuators which make sure that suction is only provided in the vicinity of the cutting torch, resulting in better suction on a smaller area. Easily removable slag collection bins are integrated into the table to collect the slag created by the cutting process.

Working height	760 mm
Max. material thickness	150 mm
Table capacity	max. 1.200 kg/m^2

FUME EXTRACTION UNIT

Fumes generated by the production process are extracted by a fume extraction unit, which is connected to the suction canals of the cutting table. The fumes are carried off to a Donaldson DFPRO8 dust collector. Consisting of 8 oval patented Ultra-Web filters, it provides the best solution for filtering dust and fumes. The dust is collected in a dust barrel with a capacity of 200 L.

HARDWARE & SOFTWARE

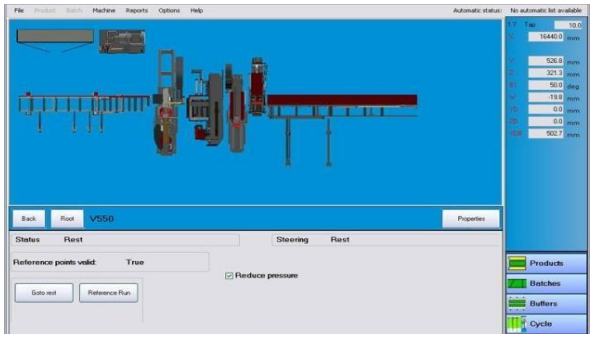
COMPUTER SYSTEM

The computer with Intel Core processor that controls the machine is situated at the main switch panel and has a Windows operating system. The communication between the various modules and the control system works with an EtherCAT interface and uses standard industrial Ethernet cable. Connection with the company's network is possible for downloading production data from the company's server. When necessary, an Uninterruptable Power Supply (UPS) ensures the machine shuts down normally and that no data will be lost. After restarting the machine, it will resume at exactly the same position as where it stopped.

The control panel is assembled in an operator panel. Consisting of a 15" Touch-screen TFT-colour display with complete industrial flat keyboard, it creates a pleasant and accessible working area. Two dust-proof USB ports at the front of the panel provide an additional possibility for the import of production data files.

CONTROL SOFTWARE 'VACAM MACHINE EDITION'

'VACAM Machine Edition' is the software installed on the control system. It is developed by Voortman's own software department, and capable of controlling all CNC controlled machines in our product range. Product data of DSTV-format can be imported in a clear and structured way. At the same time, input of data can be done manually. Authorized persons can retrieve real-time information about the production process and machine status. All operations and motions performed on the system are stored in a SQL database for sharing with any ERP, MRP and MIS software system.



VACAM has the option to send automatic e-mail notifications on upcoming events. This function can be useful when for example the machine stopped on a tool change, an error or any other message on the screen. The notifications are easy to configure, depending customer demands. For proper operation of the e-mail notifications, a broadband internet connection is required.

VACAM 'OFFICE EDITION'

The 'VACAM Office Edition' is developed in the same style, and works in a similar way as the 'VACAM Machine Edition'. It can be installed at the office to create products and monitor the production process in real-time. The 'VACAM Office Edition' has a reduced user interface, because it is not used for machine control.

VACAD EDITOR

VACAD Editor is a flexible drawing tool, integrated in VACAM. It can be used to create and modify contours, holes, imprints, marks etc. for drilling, cutting and layout marking processes. The VACAD module shows the actual dimensions and is a pleasant tool to work with. Created contours can be saved in templates, which can also be inserted in other products.

VANEST

The VANEST software module is integrated in the VACAD editor to nest products manually into a plate. VANEST offers multiple tools to nest products easy into a plate.

LAYOUT MARKING MODULE

Data files for layout marking can be created in 3D CAD systems, and imported in DSTV format by the VACAM software on the machine. This data can still be changed manually in VACAD if required. The data is added as KO bloc to the DSTV file, which is read-in and executed by the machine. The KO bloc does not have any limitations concerning the shape of the drawing. All types of contours and numbers can be drawn onto the product with remarkable accuracy, to ease further processing. Depending on the machine, either a milling tool or a plasma unit is used for fully automatic layout marking.

ONLINE SUPPORT

When necessary, a Voortman engineer can provide online support by means of a high secure connection. The engineer is able to monitor the machine, take over the machine control and to communicate with the operator from behind his desk. It is possible to analyze and edit production data online and to watch production by a webcam, which is included. This means that most problems can be solved fast and easy, keeping your machine up and running.

For proper operation of the online support, a broadband internet connection is required.
Online support is included during the warranty period, hereafter a contract will be offered.

'SIGMANEST POWERPACK' - NESTING SOFTWARE

The automatic nesting software 'Sigmanest PowerPack' is installed on an office pc (not included). It can be used to import products and nest them automatically into standard sized or remnant plates. Sigmanest software is able to read multiple standard file formats, including DXF, DWG and DSTV. A CAD-editor can be used for the creation of new parts, which can be nested into a plate manually or automatically. Remnants can be stored in a library for future use. Sigmanest generates specific CNC-outputs for the machine, which will be converted to all required operations via VACAM software. A drilling module which is used for the drilling process is included.

For proper usage of the software, the following system requirements shall be met: CPU minimum 64-bit Intel or AMD CPU with 2 or more cores. Minimal memory of 4 GB and a 250 GB hard disk (7200 rpm or higher), Windows 7 (64-bit) professional or higher. Absolute minimum screen resolution is 1024 x 768 with at least 512 MB video RAM and OpenGL support. The software requires a hardware key, which is delivered with the software.

SPECIFICATIONS 'SIGMANEST POWERPACK'

CAD/CAM system
Geometry Creation
File Conversion and Importing
Map layers to processes (for marking and cutting) or quality settings
Part Creation
Create multiple parts from a single file
Accurate cost and time estimation and Reporting
Easy-to-Use Manual Nesting
Drag, drop, and bump features in manual nesting
Powerful Automatic nesting
Multiple advanced nesting algorithms to choose from for maximum material yield
Advanced NC Programming Module and code generation
TrueShape Nesting Module
Remnant Nesting Module
Job Tracking and Scheduling Module
Inventory Control Module
Track remnants and material stock through a single interface
Strategic programming with tip-up crash avoidance
Automatic part pattern recognition
Adaptive nesting for multi-head machines
Bridge, chain, and common-line cutting
Automatic batch processing of Bill of Materials
Pierce reduction and pre-piercing

SAFETY

CE AND INTERNATIONAL STANDARDS

All Voortman machines are delivered in compliance with CE regulations and meet the following international safety standards. A CE certificate is provided with every Voortman machine.

Relevant EU directives:

- 2006/42/EC Machine directives
- 2004/108/EC Electromagnetic compatibility (EMC) directives

Harmonized international standards complied with:

- EN ISO 12100:2010
- EN ISO 13849-1:2008
- EN ISO 13850:2008
- EN ISO 13857:2008

SAFETY DEVICES

For personal protection Voortman offers various safety devices for their machinery. The safety devices are connected to the control system of a particular machine. When a protected area is entered, the relative machine(s) and / or handling system(s) will take appropriate actions immediately.

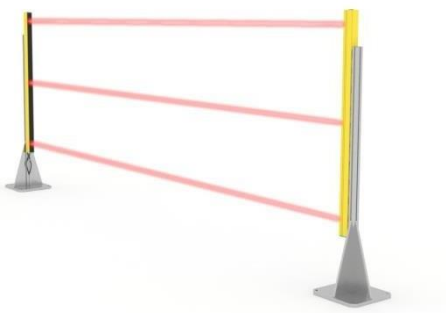
The system can be reset on both the control panels, placed outside the danger area.

Emergency stop buttons are provided on the control panels, and both ends of the gantry. Pushing these buttons, causes a total system stop. To reset the system, the emergency stop button has to be pulled out first, then the system can be restarted at one of the control panels.

LIGHT CURTAIN

Light curtains are used to detect persons who are approaching a dangerous area. The light curtains are placed all around the machine. A light curtain consists of three light beams, each placed at a different height of respectively 300 mm, 700 mm and 1.100 mm.

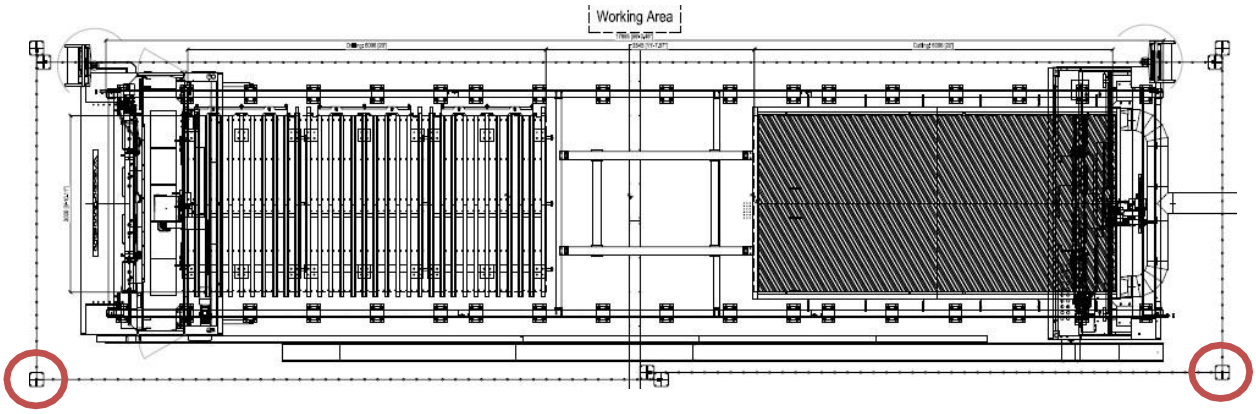
When a light curtain is crossed, the speed of both gantries reduces from 24 m/min to 8m/ min.



Trough beam operating distance	9 m – 70 m
Operating temperature	- 15°C – + 55°C

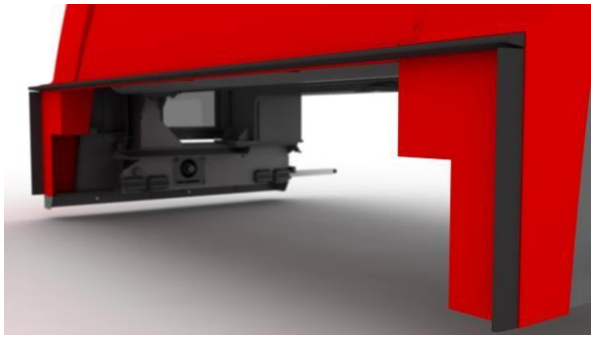
CORNER MIRROR

To reduce the amount of light curtains required on the V330, a set of corner mirrors is delivered in addition to the light curtain set. With the use of these corner mirrors, it is possible to reflect the infra red beam of the light curtains by 90°. This allows the light beam to travel around a corner, and eliminates the need of an additional light curtain.



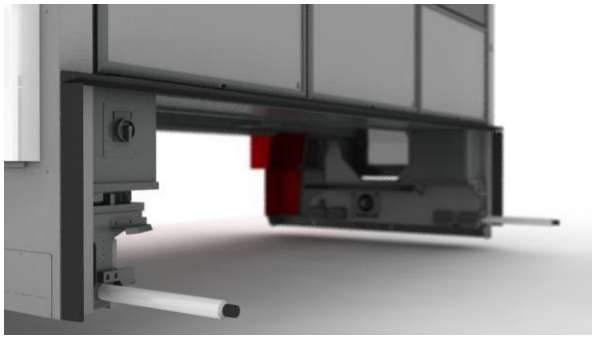
SAFETY BUMPER

Both gantries of the drilling and cutting system are equipped with safety bumpers, mounted at a height of 200mm above the cutting/drilling table. When contact is made with the safety bumpers, while for example walking on the tables, the machine immediately executes an emergency stop.



JAMMING PREVENTION

To prevent persons and parts from getting jammed between the drilling- and cutting gantries, a safety gap of 500mm between the gantries is maintained at all times. Two rods are installed at the lower side of the drilling gantry, each one provided with a rubber tip. When the gap between the gantries becomes too small, both gantries come to a stop, while the rods ensure a safe distance is maintained between the gantries.



TECHNICAL SPECIFICATIONS: BASIC CONFIGURATION

OPERATING RANGE	V330-3000
Min. / max. plate length	500 – 6.100 mm
Min. / max. plate width	150 – 3.050 mm
Min. / max. plate thickness	6 – 150 mm
Max. capacity	1.200 kg/ m^2
Min. plate weight	50 kg/ plate

DRILLING UNIT	VD40
Feed	Synchronous driven servo-motor, servo-inverter
Spindle rpm	Stepless 0 – 2.500 rpm (servo motor)
Nominal power	30 kW
Lubrication	Internal and external by mist of air / oil
Holder	SK 40
Drill diameter	5 – 40 mm
Thread tapping	M6 – M30
Centering possibility	Yes
Countersinking	Yes
Hydraulic clamping	Yes
Automatic tool changer	25 positions

OXY-FUEL CUTTING UNIT	
Type	Nozzle mix
Automatic height setting	Yes, IHT M4000 CAP
Gas supply	Magnetic valve with back-fire protection
Ignition	Automatically
Max. thickness	150 mm
Gas	Acetylene
Optional gas	Propane or methane, mapp, propylene
Consumption	1,2 m^3 / h (per torch)
System pressure	2 bar
Cutting gas	O^2
Consumption	18 m^3 / h
System pressure	9 bar

PLASMA CUTTING UNIT		HPR260XD	
Max. thickness		64 mm	
Max. pierce capacity		38 mm	
Virtually dross-free cutting max.		32 mm	
Automatic height setting		Yes, IHT M4000 PCS	
Marking		Yes, with same consumables	
Plasma gas mild steel	Cutting	O^2 (99,9% pure clean, dry, oil-free)	
	Marking	Argon gas	
Shield gas mild steel		O^2 / air (99,9% pure clean, dry, oil-free)	
Cutting speed	6 mm	Approx. 4.035 mm / min	130A
	12 mm	Approx. 3.060 mm / min	200A
	25 mm	Approx. 1.685 mm / min	260A
	38 mm	Approx. 895 mm / min	260A
	50 mm	Approx. 405 mm / min	260A
	64 mm	Approx. 195 mm / min	260A

OPERATIONAL DIRECTION

From left to right or from right to left	

COLOUR

Plates	RAL 3003 Red
Frames	RAL 7011 Grey

GENERAL INFORMATION

Working height	760 mm (+/ - 25 mm)
Voltage stabilizer	Not included
Ambient temperature	0 – 35°C max. 95% relative humidity