m a c
h i n
i s t

technical specifictions

v 0.0.1

frame

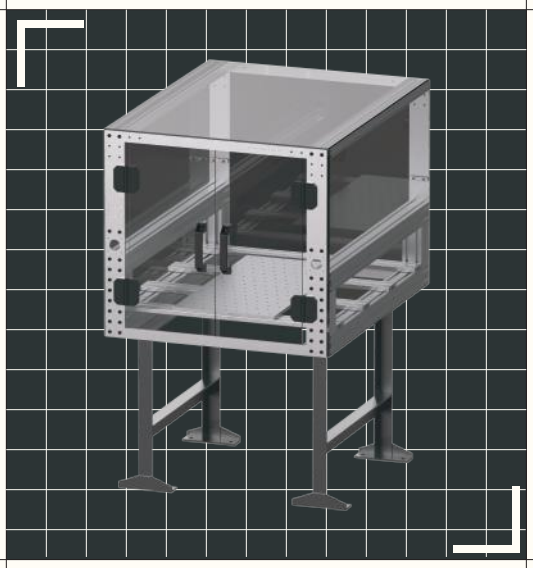
x-axis extrusion [x4]
36" quad extrusion

y-axis extrusion [x4]
18" quad extrusion

work surface [x1]
15" x 30" aluminum plate with threaded holes

steel legs [x1]

sand/concrete reinforcement [optional] [x1]



motion

x-axis

linear rail [x2]
HGR20 HGH rail

ballscrew [x2]
10mm pitch 1610 rolled ballscrew

stepper motors [x2]
NEMA 23 closed-loop stepper

y-axis

linear rail [x2]
HGR20 HGH rail

ballscrew [x1]
10mm pitch 1610 rolled ballscrew

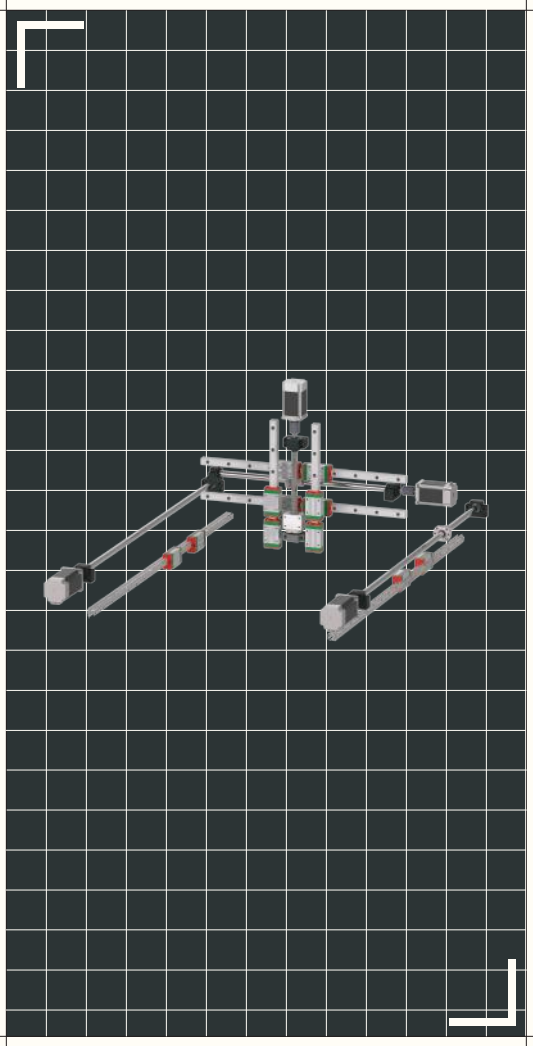
stepper motors [x1]
NEMA 23 closed-loop stepper

z-axis

linear rail [x2]
HGR20 HGH rail

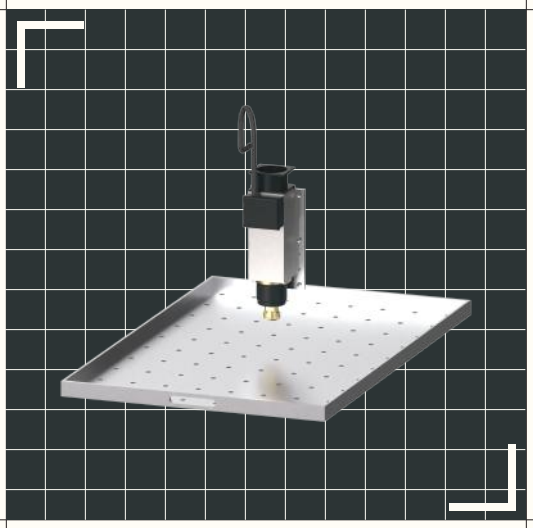
ballscrew [x2]
5mm pitch 1610 rolled ballscrew

stepper motors [x1]
NEMA 23 closed-loop stepper



includes

spindle + coolant



spindle [x1]
2.2kW Teknomotor HF spindle

tram plate [x1]
eccentric bearng, shim correction

coolant pump [x1]
Lorem ipsum doler 123

coolant resevoir [x1]
5 gallon capacity

chip collection system [x1]
pull-out tray with mesh filter

electrical

electrical box [x1]
air cooled plug-and-play box

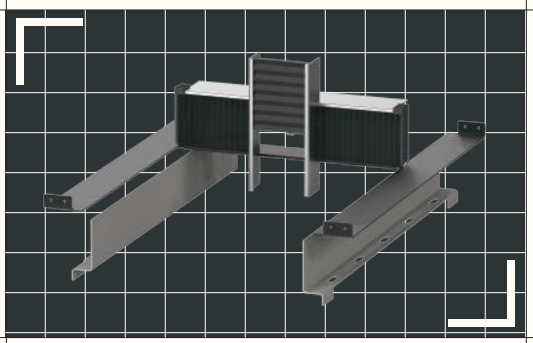
variable frequency drive [x1]
3hp, 1 to 3 phase, 220V

stepper drivers [x4]
closed-loop, 200-40000 microsteps

breakout board [x1]

power supply [x1]

shields + safety

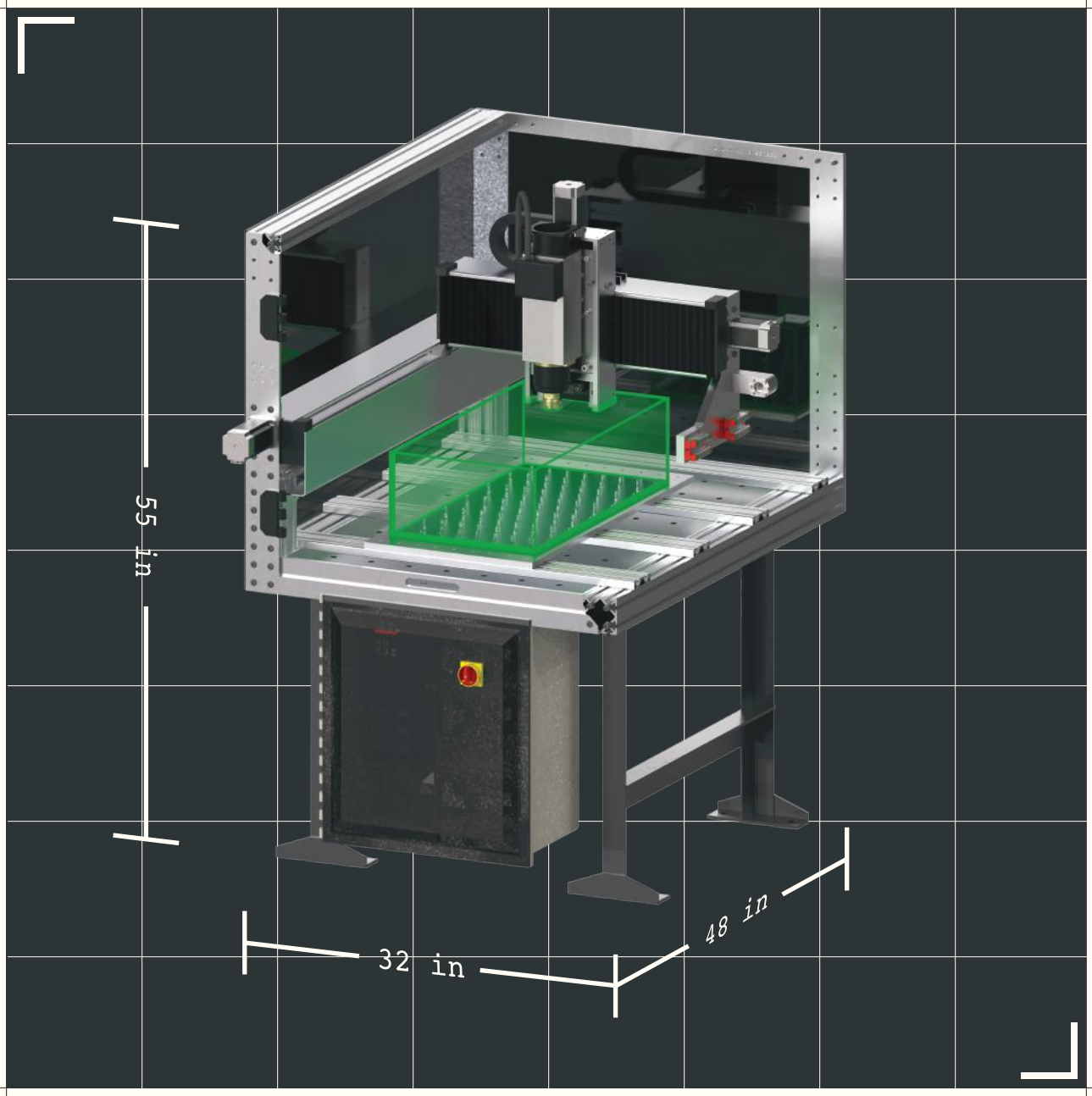


inductive limit switch [x6]
normally closed

hard stops [x6]

bellows/shields [x5]
shields[x] bellows[y][z]

includes



dimensions

	x	y	z	volume
work area	15 in	30 in	7 in	1.82 ft^3
foot-print	32 in	48 in	55 in	58.9 ft^3

spindle

power
2.2 kW

voltage
220V

normal speed
18000 RPM

max speed
24000 RPM

torque
0.29 Nm

additional info
phase: 3 phase
brand: Teknomotor

drive system

driving force
1.2 kW

downward force
2.4 kW

	x	y	z
guide-way	HGH 20 linear rail x2	HGH 20 linear rail x2	HGH 20 linear rail x2
drive	backlashless 1610 linear ballscrew x2	backlashless 1610 linear ballscrew x1	backlashless 1610 linear ballscrew x1

	x/y	z
ballscrew pitch	10mm 0.394 in	5mm 0.197 in
step size	1.8°	1.8°
min micro-step size	0.0141°	0.0141°
steps/inch	507.6	1015
step precision	0.05mm 1.97×10^{-3} in	0.025mm 9.84×10^{-4} in
microstep precision	3.91×10^{-4} mm 1.54×10^{-5} in	1.95×10^{-4} mm 7.69×10^{-6} in
max backlash	~0.0254 mm ~0.001 in	~0.0254 mm ~0.001 in
expected consistent precision	~0.0254 mm ~0.001 in	~0.0254 mm ~0.001 in

precision