

# FINN-POWER

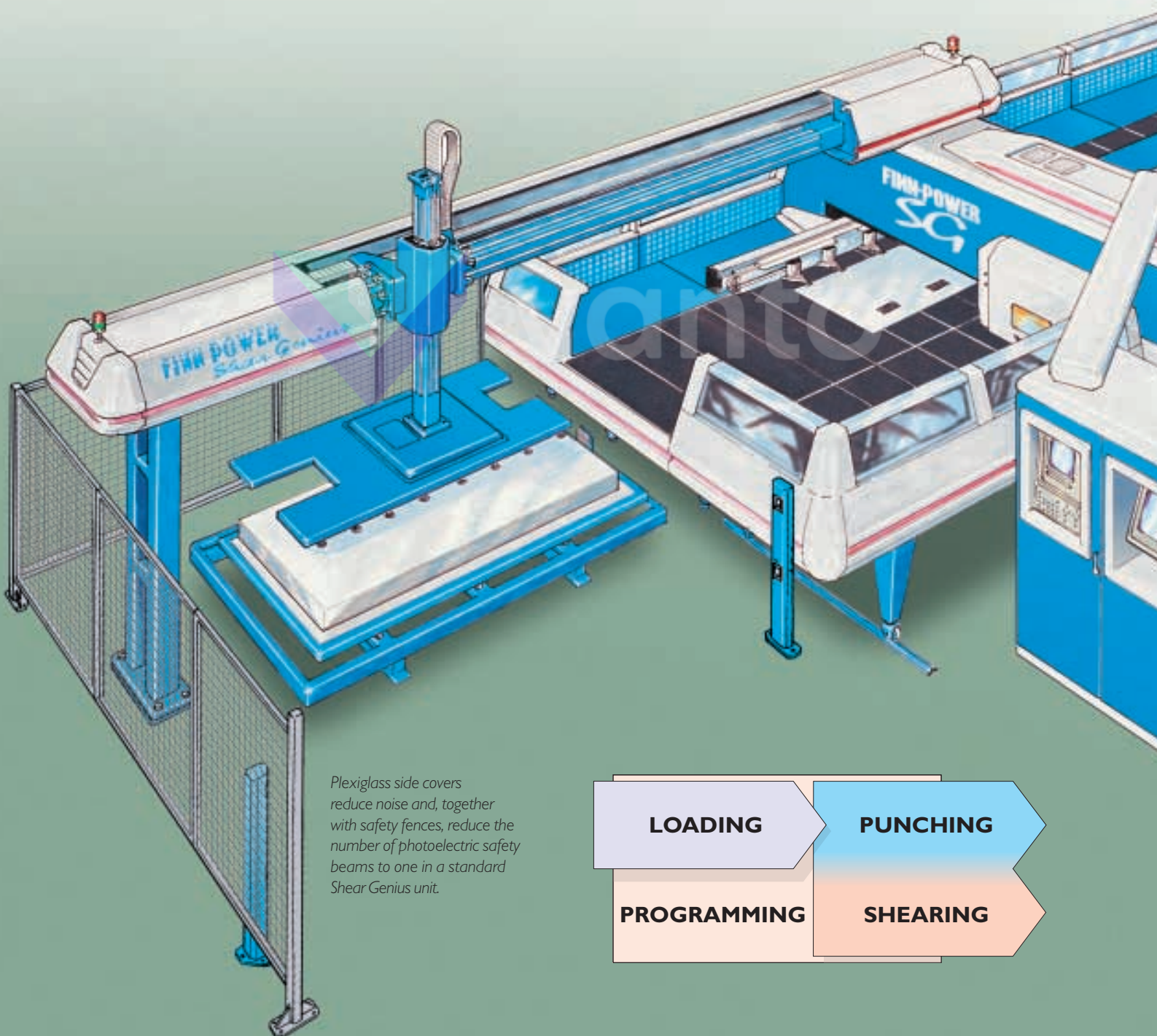


**THE CONCEPT OF INTEGRATED  
PUNCHING AND SHEARING**

# SHEAR GENIUS

## -AN INTEGRATED PUNCH/SHEAR UNIT WITH AUTOMATIC LOADING

*SHEAR GENIUS is based on the integration of right angle shearing into high-quality, high-performance punching, as mastered by FINN-POWER in stand-alone turret punch presses. This integration helps fully utilise the manufacturing economy offered by efficient nesting programs – also included in the standard Shear Genius packages. Further, SHEAR GENIUS systems feature automatic loading and workpiece removal from the system.*



*Plexiglass side covers reduce noise and, together with safety fences, reduce the number of photoelectric safety beams to one in a standard Shear Genius unit.*

**LOADING**

**PUNCHING**

**PROGRAMMING**

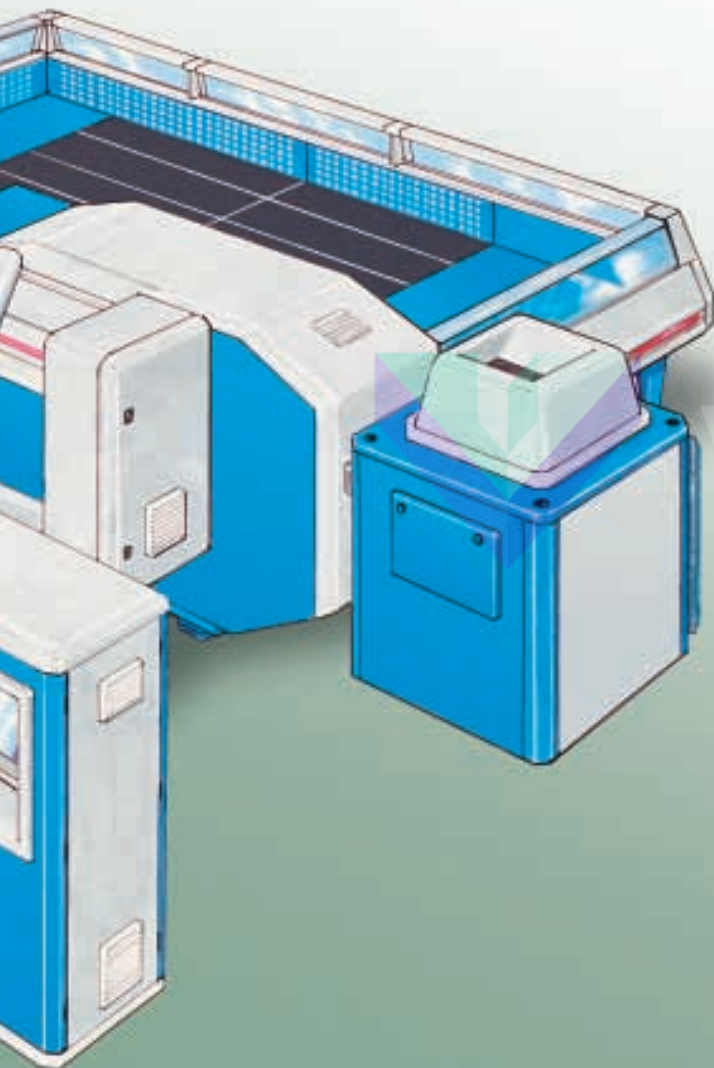
**SHEARING**

There are two basic Shear Genius models, SG5 series with a maximum sheet size of 1250 mm x 2500 mm and SG6 of 1500 mm x 3000 mm. They both offer:

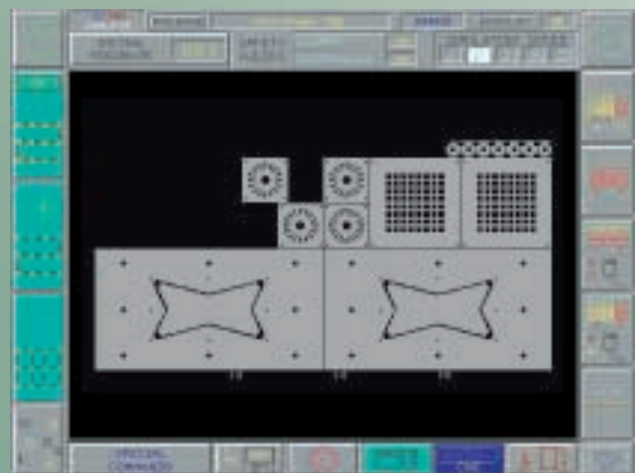
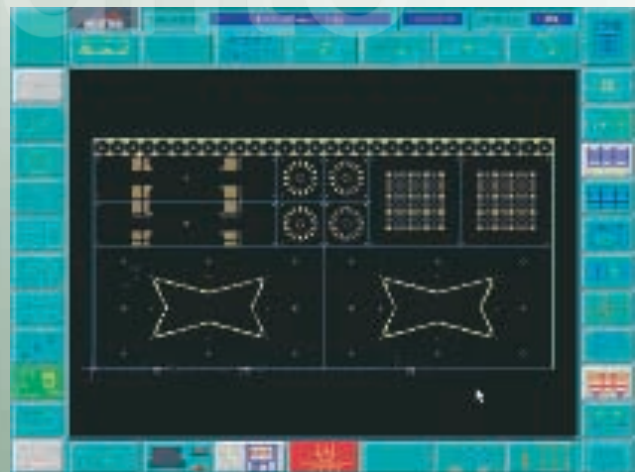
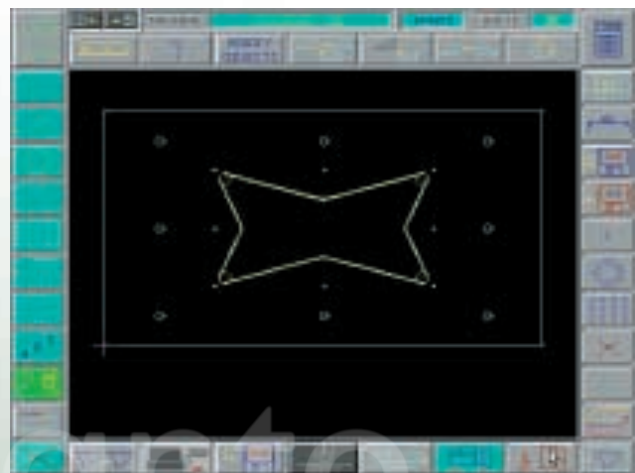
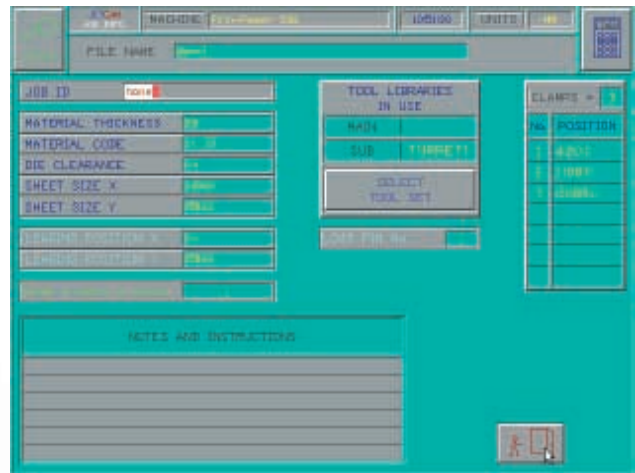
- \* A state-of-the-art manufacturing solution for today's demands.
- \* Reduced manufacturing costs through versatility, a reduction in

sheet material consumption and a dramatic decrease in total manufacturing time.

- \* Flexibility which allows you to prepare for the production challenges of the future through retrofits and expansions.

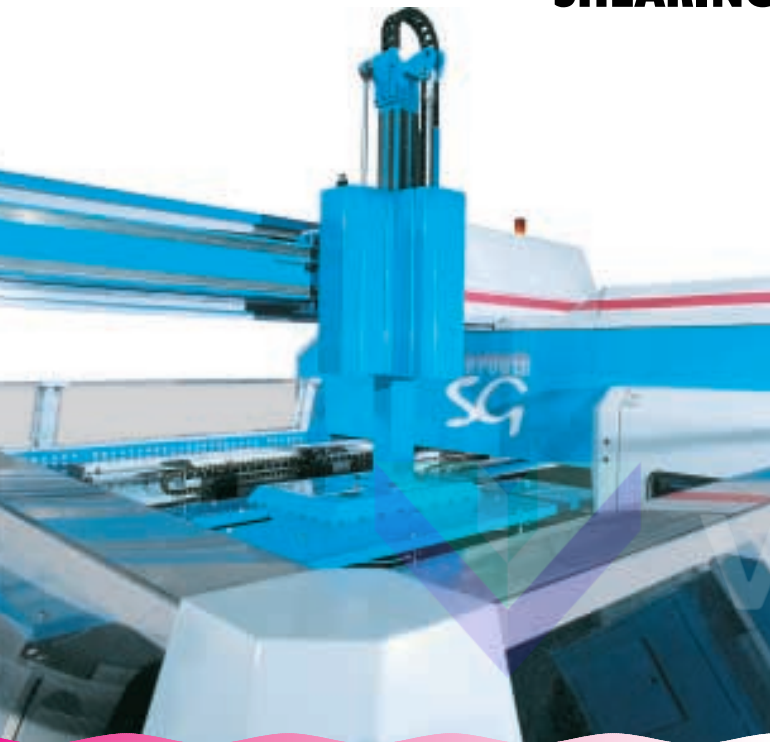


*Finn-Power Jetcam SG programming system is an integral part of the Shear Genius technology.*



# SHEAR GENIUS

## INTEGRATED PUNCHING, FORMING AND SHEARING



### Programming and numerical control

FINN-POWER JETCAM II is the most versatile programming system on the market. It efficiently links the engineering group to the manufacturing area via CAD/CAM. With its SG Autoneesting function, the system is used for programming both punching, the placing of workpieces on the sheet for minimum material waste, and the operation of the right angle shear.

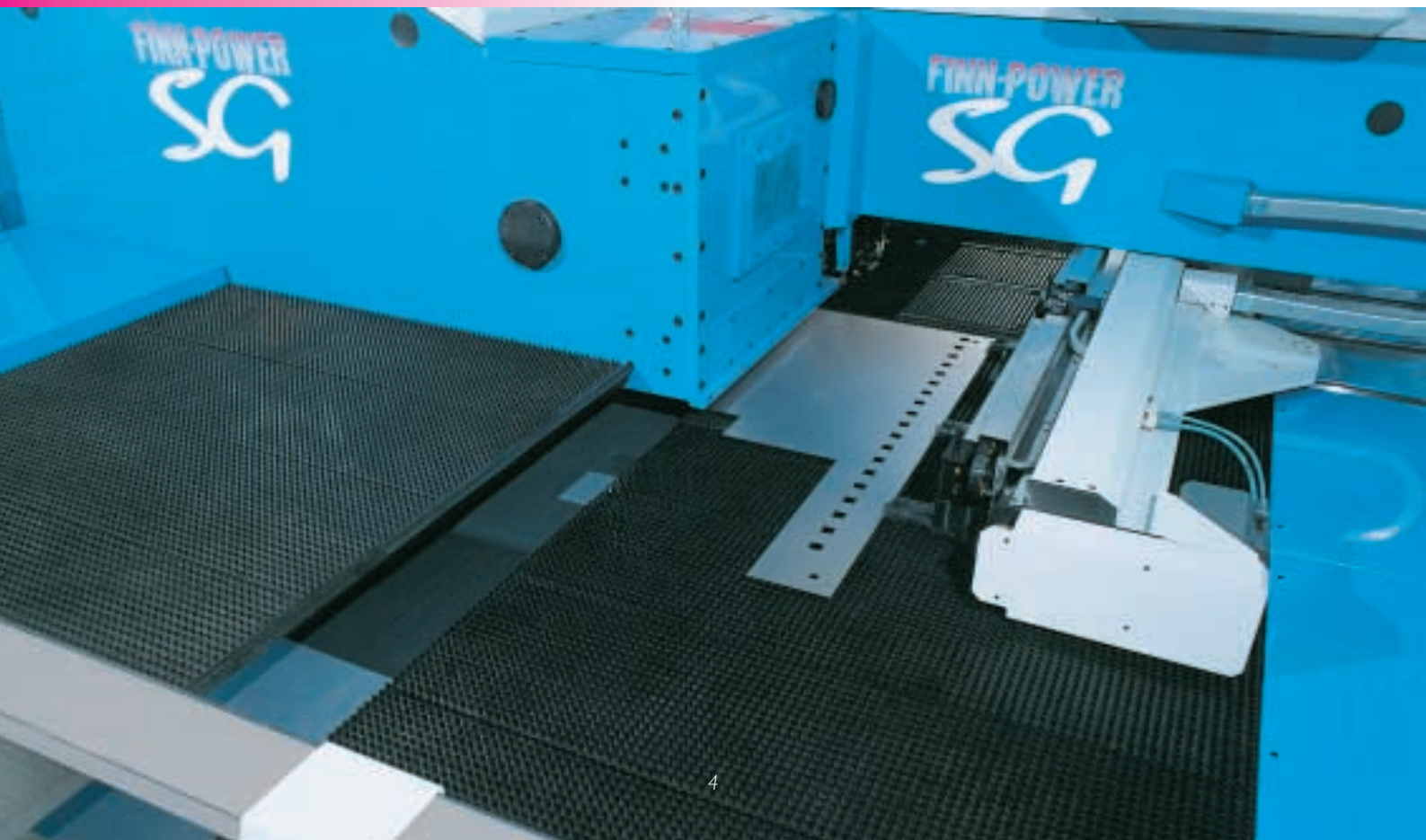
Both Siemens Sinumerik and Fanuc controls are available.

### Automatic loading

The loading of sheets onto the punch/shear unit is automated by a loading device. It detaches one sheet at a time from the stack and transfers it into the clamps of the unit.

A standard loading device includes:

- \* A stationary loading table equipped with magnetic sheet separator.
- \* A pneumatic suction cup gripper, divided into operationally independent zones. A separate mechanism applies extra pull to one corner of the sheet being lifted, thus ensuring sheet detachment.
- \* Pneumatically operated lifting and transfer.





### Fast, accurate punching capacity

FINN-POWER's development work on hydraulic punching has created the technology widely known for its combination of fast, accurate punching, minimal set-up and tool change times and robust O-frame construction.

Nibbling speeds up to 1000 strokes per minute are achieved through FINN-POWER's superfast F3 punching hydraulics. Also, the punching stroke becomes a true CNC axis, as stroke depth, stroke length and stroke speed are fully adjustable for individual tools.

When Multi-Tools® are used, the tooling capacity of the 20-station turret exceeds 100. Up to 10 Index Tool Stations can be installed. Several types of tooling can be used, which may create major savings through full use of existing tools.

*With the new forming option, forms up to 16 mm in height can be made.*

The result of this unique combination of properties is both outstanding capacity and the flexibility required by small batch manufacturing. These properties make for economical manufacturing of the variety of forms and punching patterns entailed in complex component families.

### Rugged production power

The construction withstands the forces involved in heavy duty punching and shearing in continuous operation. A closed design of rigid construction makes for excellent tool guiding and, consequently, excellent punching quality and long tool life.

### Thoroughly tested accuracy

FINN-POWER uses complementary testing procedures to ascertain that every unit delivered fulfils the extremely high demands set on punching accuracy.

All units undergo a punching accuracy testing programme specified in the FINN-POWER factory standard. The procedure involves punching a 1000 x 1000 mm sheet, after which hole location (X/Y) and angle are examined with co-ordinate measuring equipment. Test results are documented and filed also as part of the delivery certificates.

Optionally, the customer may have the VDI/DGQ testing procedure performed by an independent inspection company.

All punch presses meet the following criteria at 100 % speeds:

#### **Punching accuracy according to LKP-7100**

Hole location deviation (X/Y)	0.1 mm max
Hole-to-hole distance deviation (50 mm)	±0.05 mm max
Angular deviation (CNC Index Tool)	±0.1°

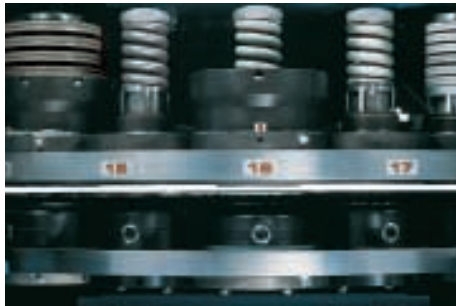
#### **Position accuracy according to VDI/DGQ 3441**

Positional deviation P <sub>a</sub>	0.08 mm max (±0.04 mm)
Positional scatter P <sub>s</sub>	0.04 mm max (±0.02 mm)



# SHEAR GENIUS

## INTEGRATED PUNCHING AND SHEARING SAVES MATERIAL AND MANUFACTURING TIME



### Benefits of integrated shearing

After punching has been completed on the full size sheet, the "X" slide moves the sheet to the right angle shear which has two blades mounted at an angle of 90 degrees and it is able to shear max. 800 x 1250 mm, or 800 mm x 1500 mm (X x Y) parts with one stroke. In the direction of the X axis, progressive cutting can be used for cutting lengths exceeding 800 mm. Operation is NC controlled and fully automatic.

As the sheet is held by the same clamps throughout the process, shearing accuracy is excellent. The finished parts are placed on a conveyor for transfer out of the unit. The standard SHEAR GENIUS package includes two conveyors, one for finished workpieces and one for scrap removal.

The Finn-Power machine can shear mild steel thicknesses up to 4 mm and aluminium up to 5 mm.



### Built to create savings

A system which integrates punching and shearing operations offers savings of material handling and manufacturing time. These savings are a direct result of FINN-POWER's:

- \* Powerful programming capacity for optimal nesting, tool placement etc.
- \* Fast, high-precision shearing.
- \* Elimination of skeletons, scallops, and pinch marks left by contouring parts out by punching.

On an average, total manufacturing time can be reduced by 60 % and one blank sheet in every 10 is saved by our integrated SHEAR GENIUS® system.

# T E C H N I C A L D A T A

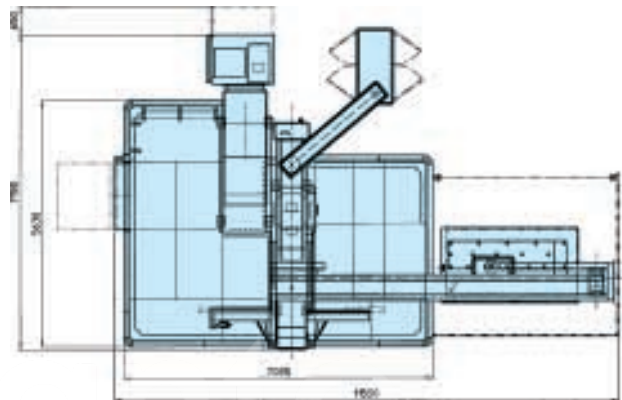
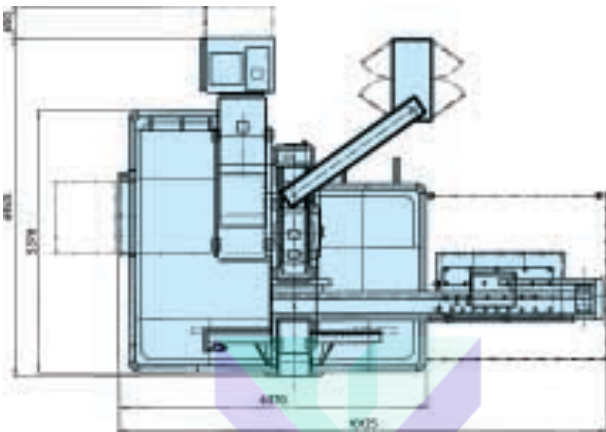
	SG5	SG6	
Punching force (kN)	300	300	<b>Options for machine and control</b> Ball tables Acoustic covers Upforming system Additional index stations (total 10 max) Clamp force control Lifting scrap conveyors Scrap conveyor (vacuum) Sheet lubricator (alcohol) Sheet lubricator (mineral oil) Sheet size measuring system Tool lubrication system Automatic clearance setting ACS for shear Photoelectric safety beams Safety fences Servo cabinet cooler Tapping unit TU4 Alarm message to GSM Multi-Tools: MT24-8 MT10-16 MT8-24 MT6-A
Number of turret stations (pcs)	20	20	
Number of tool stations with 2 Multi-Tools (pcs)	30 ... 66 (optionally more)	30 ... 66 (optionally more)	
Punch diameter, max. (mm)	89	89	
Material thickness (punching), max. (mm)	8	8	
<b>CNC Index Tool:</b>			
Number of index tool stations, max. (pcs)	10 (2 pcs included in delivery)	10 (2 pcs included in delivery)	
Tool rotation, max. (r/min)	58	58	
<b>Integrated right angle shear:</b>			
<b>Material thickness, max. (shearing)</b>			
aluminium (mm)	5	5	
steel Fe52 / Fe37 (mm)	4	4	
stainless steel (mm)	3	3	
Material thickness, min. (mm)	0.5	0.5	
Full stroke shear, X x Y, max. (mm)	800 x 1270	800 x 1528	
Blade clearance setting	manually by screws	manually by screws	
Blank weight, max. (kg) ①	200	200	
Sheet clamps with automatic positioning (pcs)	pneumatic, 3	pneumatic, 3	
Sheet size X x Y, max. (mm) ①	2530 x 1270	3061 x 1528	
X traverse (mm)	2584 (X-42...X2542)	2584 (X-42...X2542)	
Y traverse (mm)	1317 (Y-25...Y1292)	1560 (Y-25...Y1535)	
Axis speed (X axis), max. (m/min)	80	80	
Axis speed (Y axis), max. (m/min)	60	60	
Traversing speed, max. (m/min)	100	100	
Hit speed max. (l/min) ②			
1 mm between holes	1000	1000	
25 mm between holes	440	440	
250 mm between holes	150	150	
<b>Punching accuracy according to LKP-7100</b>			
Hole location deviation (X/Y axes), max. (mm)	0.1	0.1	
Hole-to-hole distance deviation (X/Y axes), max. (mm)	± 0.05	± 0.05	
Angular deviation (CNC Index Tool), max. (degrees)	± 0.1	± 0.1	
<b>Positioning accuracy according to VDI/DGQ 3441</b>			
Positional deviation Pa (X/Y axes) (mm)	0.08 (± 0.04)	0.08 (± 0.04)	
Positional scatter Ps (X/Y axes) (mm)	0.04 (± 0.02)	0.04 (± 0.02)	
Turret rotation (r/min)	30	30	
Tool change time (s)	1 ... 3	1 ... 3	
<b>NC program memory (kB)</b>			
Siemens Sinumerik 840 D	1000	1000	
Fanuc 16 P	256	256	
Machine weight (kg)	21,000	22,000	
Control unit weight (kg)	700	700	
Hydraulic unit weight (kg)	750	750	
Oil tank volume (l)	330	330	
Power supply (kVA)	50	50	
Power consumption, average (kW)	30	30	
Compressed air consumption, max. (l/s)	25	25	
Compressed air pressure, min. (bar)	6	6	
Oil cooler, cooling capacity, max. (kW)	30	30	
Automatic clamp setting	std	std	
3rd clamp and clamp move	std	std	
Scrap conveyor RS	std	std	
Loading device with loading station 1	LD 2500 / 1	LD 3000 / 1	
Cell control PowerLink MMC	std	std	
Finn-Power Jetcam SG Expert 3	std	std	

① Part accuracy depends on acceleration/deceleration rate, sheet size and sheet weight.

② Hit speed is dependent on programmed stroke length, ram speed, acceleration/deceleration rate and axis speed.

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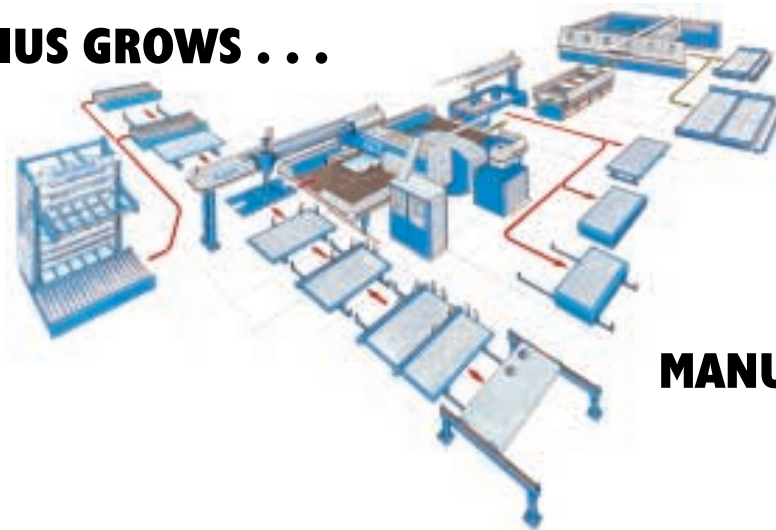
## DIMENSIONAL DRAWINGS



SG 5

SG 6

## SHEAR GENIUS GROWS . . .



## . . . INTO A FLEXIBLE MANUFACTURING SYSTEM

**FINN-POWER**  
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