TECHNICAL DESCRIPTION
P4Xe-3125 PANEL BENDING MACHINE

HPT34: Feeder-Exhaust
P4Xe-3125: Panel Bender
LS: Upper Bending Blade
LI: Lower Bending Blade
U1: Programmable Hold-Down
NS: Standard Vice
SiX: System Control and Management
CLA-A: Asymmetric Control of Auxiliary Bending Tools for Positive Bends
UCE570G25: CLA Swan Neck Tool Set
PSE: Bending Blade Cleaning and Lubrication Device
T: Auxiliary Tool Device
R51E: Water-Air Cooler
JOB.CONSOLE.P4: Software for Production and P4 System Management
CUT.SPC27: Option for cutting and removing profiles

HPT34 - Feeder-Exhaust
Feeder-exhaust, located to the right of the P4 panel bender, on which the punched and notched sheet metal blank is positioned by the² operator against fixed references. The blank is gripped by the feed clamp, which automatically introduces it onto the panel bender's work surface. At the end of the bending cycle, this same clamp pushes the part to a higher level, equipped with idle rollers, of the feeder-exhaust.
The Z reference scale for correct blank positioning is motorized for automatic adjustment when the dimensions of the notched blank change.

Maximum sheet size: 3200 x 1500 mm
Maximum sheet weight: 110 kg

HPT34 Connection

P4Xe-3125 – Panel Forming Machine
Programmable and automatic panel forming machine for the production of sheet metal parts. It allows for multiple bends, both upward and downward, on each of the four sides (depending on the overall dimensions of the part and the machine's characteristics). The punched part is fed, centered, the bending cycle, and unloaded the finished part are all performed automatically.

System Features:
- "Flying" feed and positioning clamp that reduces cycle time by moving from the unloading area to the panel forming machine's loading area in parallel;
- blank centering references capable of positioning themselves automatically in hidden time;
- checks that the blank is correctly centered between the reference stops;
- can produce the first bend on each side at 180 degrees for thicknesses

up to 2.3 mm of mild steel (positive and negative clamped handguard bends);
- depending on the cycle range, the blank holder can stop at different heights between 0 and 254 mm from the work surface to obtain, for example, a non-crushed handguard bend;
- can bend upwards and downwards, but the last bend on each side must always be upwards; only the last bend on the last bent side can be downwards;
- can machine pre-painted sheet metal or stainless steel, protected by a plastic film (material quality must be verified or tested depending on the applications);
- increased energy savings thanks to a system capable of modulating the rpm, pressure and oil flow, according to the actual requirements of the system;

- Interpolated blade movement during bending, calculated based on the blank's characteristics and using the "Salvagnini bending formula," which reduces the possibility of marking the blank surface during bending;
- Continuous rotation unit to allow the programming of non-rectangular parts;
- Oil Heating system to ensure the system always operates at the optimal oil temperature;
- Hermetically insulated power cabinet with ventilation and internal temperature control.

Operating Characteristics
Maximum length of the notched blank at the inlet: 3200 mm
Maximum width of the notched blank at the inlet: 1500 mm
Maximum diagonal of the rotating notched blank: 3500 mm
Maximum folding length: 3100 mm
Maximum space for folding above the work surface: 254 mm

LS – Upper Folding Blade
Folding blade capable of making negative folds up to -135° in a single phase. Maximum sheet thickness with
Tensile breaking load of 410 N/mm2 (-90°) 3.00 mm
Tensile breaking load of 400 N/mm2 (-135°) 2.30 mm
Tensile breaking load of 580 N/mm2 (-90°) 2.30 mm
Tensile breaking load of 580 N/mm2 (-125°) 1.60 mm
Tensile breaking load of 265 N/mm2 (-90°) 3.00 mm
Tensile breaking load of 265 N/mm2 (-135°) 2.30 mm
Minimum blank thickness 0.50 mm

LI – Lower Bending Blade
Bending blade capable of making positive bends up to +135° in a single step.
Maximum sheet thickness with
Tensile breaking load of 410 N/mm2 (+90°) 3.00 mm
Tensile breaking load of 400 N/mm2 (+135°) 2.30 mm
Tensile breaking load of 580 N/mm2 (+90°) 2.30 mm
Tensile breaking load of 580 N/mm2 (+125°) 1.60 mm
Tensile breaking load of 265 N/mm2 (+90°) 3.00 mm
Tensile breaking load of 265 N/mm2 (+135°) 2.30 mm
Minimum blank thickness 0.50 mm

U1 – Programmable blank holder
It consists of:
- a device for automatically preparing the blank holder tool length
according to the instructions contained in the bending program;
- a series of segments for the blank holder tool, with front and side clearances to allow inward bends.
The blank holder tool can be adjusted in lengths of 5 mm increments.
Features:
Maximum bend length: 3100 mm
Maximum inward bend length on the long side of the hold-down clamp: 50 mm
Maximum inward bend length on the short side of the hold-down clamp: 50 mm
Minimum workpiece width without inward bends: approximately 160 mm
Minimum workpiece length: approximately 430 mm

NS – Standard Vice
Pair of vices for the panel bender operator with a smooth contact surface between the sheet metal and the vice.

SiX - System Control and Management
High-performance proprietary control system distributed over three levels.
- Processing unit for system management and supervision. The unit consists of a Dell Precision T1650 Workstation with Windows 7 Professional English (32-bit) operating system, equipped with a SATA hard drive, two Ethernet TCP/IP network cards, UTP ThinWire with RJ45 connector, and Teamviewer software for rapid information exchange between the system and various Salvagnini departments, such as After-Sales, Automation, Design, and Applications. The prerequisite for using Teamviewer software is enabling the HTTP protocol on port 80 or alternative port 5938 in the customer's LAN network (this does not include system access to the Internet). The Workstation is equipped with System Backup hardware and software, consisting of a removable hard drive (RHD) and management software that allows the customer to automatically perform a complete backup of the primary hard drive to the new RHD media.

The operator is automatically and periodically notified by on-screen alarms when the backup procedure is required.
The Workstation, an integral part of the SiX control system, is tested and configured according to precise Salvagnini specifications to communicate with the control unit and guarantee remote assistance. The hardware and software configurations cannot be modified by the customer.
- Control unit that communicates in real time with the interface section via a high-performance VME bus and one or more field buses (EtherCAT and CANopen).
- Input/output interface section for peripheral devices (actuators, solenoid valves, sensors, etc.).
The UPS, installed in the system's electrical cabinet, allows for the proper shutdown of the SiX control and processing unit in the event of unexpected power supply voltage drops.

SFE - Worktable with Ball Bearings
The panel bender's worktable is equipped with free-running ball bearings to allow easy movement of the workpiece.
CLA-A - Asymmetrical Control of Auxiliary Bending Tools for Positive Bends
This P4 panel bender option consists of two numerically controlled devices capable of independently and asymmetrically positioning auxiliary bending tools along the lower blade to perform bends with an interrupted bending edge (e.g., welding tabs).
The auxiliary bending tools (CLA tool set) are not included in the scope of supply.

Features:
Maximum length of the auxiliary bending tool pair: 1500 mm

UCE570G25 - CLA "Swan Neck" Tool Set
The set consists of 10 pairs of CLA tools with a "swan neck" profile, 25 mm high, for a total length of 670 mm.
The various combinations of these tools allow for the creation of tools from 50 mm to 570 mm in 2 mm increments.
The thickness values indicated below apply to standard blades (LI or LIA), counterblades, and hold-downs.
The CLA "Swan Neck" tool set cannot be installed in the right CLA carriage when using the CUT option.

Features:

Charge max.de rupture en traction [N/mm²]		Epaisseur max. [mm]	Angle de pliage max. [°]
	410	2,10	90
		1,60	125
	580	1,60	90
		1,25	125
	265	2,50	90
		2,10	125

PSE – Bending Blade Cleaning and Lubrication Device

Automatic device mounted/installed on the feed carriage of the P4 panel bender. It removes dust from the bending blades and applies a thin layer of lubricating oil. The combined effect of cleaning and lubrication reduces friction on the bending tools and prevents the accumulation of unwanted material such as zinc scrap or plastic material. The use of the device and the frequency of the cleaning-lubrication cycles can be programmed for each program.

T - Auxiliary Tool Device

Device consisting of a translation device for the automatic introduction of a special tool between the blank holder and the counterblade of the panel bender, according to the instructions contained in the program.

The system also allows the special tool to be automatically replaced in a work list with another with a different shape.

The tools are supplied as an option.

R51E - Water-to-Air Chiller

A self-contained, independent, closed-circuit refrigeration unit that maintains a constant temperature of the system's cooling circuit liquid.

Refrigerating capacity of 14.4 kW (50Hz) or 16 kW (60Hz) using environmentally friendly R407C gas.

JOB.CONSOLE.P4 - Software for Production and P4 System Management

JOB.CONSOLE is the Salvagnini software suite that is an integral part of the SiX control system and allows for easy graphical use, management, and supervision of the system, providing the operator with all the information necessary to carry out production.

In addition, information relating to the system's operation is stored and organized so that it can be used for proper system monitoring.

JOB.CONSOLE includes the following modules:

Salvagnini Console

Main control panel for intuitive system management that allows:

- easy identification and saving of programs using a graphical tree;

- use of an editor for simple corrective action;

- use of a graphical interface to perform semi-automatic movements

of system components, useful for easy use or access to the system.

JOBP4

Application for dynamically scheduling daily production: the operator

can create a sequence of programs called a "Job" (or list) on the screen. JOBP4 allows

queuing and modifying the sequence of multiple jobs without waiting for the current job

to complete. Production can be interrupted and eventually resumed from the point of interruption. Programs that require manual changes to

system equipment must be grouped into separate jobs.

Salvagnini Compiler

The Salvagnini compiler interprets programming instructions based on geometric concepts (e.g., the final dimension of the part, the length of the edge to be bent, and the angle to be

obtained on each bend) and defines the production cycle by calculating sheet metal handling and cycle time. The compiler provides the dimensions of the developed part, information on program integrity, and suggestions for erroneous information. It can also simultaneously compile groups of programs organized into working directories.

Maintenance Manager

A database that analyzes the movements and cycles of system components to facilitate maintenance and wear control of certain components; it includes a list of maintenance checks to be performed. The operator can enter other checks or alarms on system components.

EasyData

Diagnostic software integrated with the digital control for interactive browsing of documentation using web technology (photos, hyperlinks, part codes, and automatic filters).

EasyData provides information on each component managed by the Salvagnini digital control. The system's electrical and/or hydrodynamic diagrams are viewed by the operator directly on the screen and are automatically filtered based on the component being analyzed or through text searches in the documentation.

It is also possible to:

- enrich the image file with your own photos or notes;

- print one or more document diagrams on paper or export them as PDF or JPG files.

EasyData does not contain documentation for any components supplied by third parties

and integrated into Salvagnini systems.

CUT.SPC27: Option for cutting and removing profiles

Maximum profile/blank input length: 2700 mm

Maximum sheet thickness (tensile strength of 410 N/mm²): 2.30 mm

Maximum sheet thickness (tensile strength of 600 N/mm²): 1.60 mm

Minimum sheet thickness: 0.50 mm