As a creator of industrial solutions, GROUPE LEDOUX uses the expertise of its different companies in order to design, manufacture and retrofit the machines dedicated to your particular activity.

**YOUR solutions arise from OUR know-how**

**01 STUDY, DESIGN AND MANUFACTURING OF AUTOMATED ROBOTIC SPECIAL MACHINES**

CYBERMÉCA is specialized in the design of special machines for different industry sectors. We use the performance of our design offices to meet the needs of your industrial process: consulting, machine vision, 800 mechanical, robotic, hydraulic and electrical engineering, assembly, electrical wiring, programming and software development, adjustment, assembly installation and training, after-sales service, maintenance.

From the production of small and large-scale single parts to small and medium production runs, HERMÉS TECHNOLOGIES can offer you its expertise in mechanical precision machining. Thanks to HERMÉS TECHNOLOGIES, GROUPE LEDOUX is self-reliant as to the machining of parts and can count on the quality necessary to mechanical part of special machines.

**02 MECHANICAL PRECISION MACHINING**

From the production of small and large-scale single parts to small and medium production runs, HERMÉS TECHNOLOGIES can offer you its expertise in mechanical precision machining. Thanks to HERMÉS TECHNOLOGIES, GROUPE LEDOUX is self-reliant as to the machining of parts and can count on the quality necessary to mechanical part of special machines.

**03 MACHINE TOOL MAINTENANCE AND REBUILDING**

S.R.M.O. works for the automotive, aeronautics, aerospace and railway industries to renovate, upgrade and modernise machine tools and other complex systems of production. S.R.M.O.’s areas of expertise include automation, numerical control replacement, geometry adjustment and certified mechanical retrofitting. This company also ensures programming and commissioning.

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**OUR DIFFERENT PROCESSES**

**LYNX DUO PROCESS**

- Electro pneumatic system
- Cycle time (clamping/unclamping): 4.5s
- Maximum drilling speed: 18,000 RPM
- 4 position carriage
- Clamping force: 50 to 2,000 daN
- Bucking force: 500 to 15,000 daN
- Thickness measurement
- Punch head measurement
- Automatic tool change
- Automatic coupon
- Robot option for:
  - Automatic tool change
  - Automatic coupon

**LYNX F.E.S PROCESS**

- Full electric system
- Cycle time (clamping/unclamping): 3.4s
- Maximum drilling speed: 20,000 RPM
- Multi-position carriage
- Clamping force: 50 to 2,000 daN
- Bucking force: 500 to 15,000 daN
- Thickness measurement
- Punch head measurement
- Robot option for:
  - Automatic tool change
  - Automatic coupon

**FRAMER PROCESS**

- Riveting on frame/assembly or floor/panel
- Max rivet capacity: Ø 6.35 Aluminum
- Riveting on frame/assembly or floor/panel
- Max rivet capacity: Ø 6.35 Aluminum
- Clamping force: 50 to 7,000 daN
- Thickness measurement
- Punch head measurement
- Robot option for:
  - Automatic tool change
  - Automatic coupon

Find our achievement on [www.groupe-ledoux.com](http://www.groupe-ledoux.com)
Description: Semi-automatic riveting machine for aero structure panels. Study and manufacturing of panel support jig on request. Study and manufacturing of suspension crane for manual handling of jig.

PRODUCTS
- Rivet type: Bucked up to Ø6.35
- Countersunk or round head
- LGP & HL insertion up to Ø6.35
- Countersunk or round head

WEIGHT
- Machine weight: 10 tons
- Minimum depth (without iron): 250mm

CYCLE TIME
Standard reference cycle for bucked riveting:
- Clamping/ Drilling / Sealant application / Rivet insertion / Rivet bucking / Unclamping
- 4.5 seconds

LOWER TOOLS
Straight or offset lower tool with integrated clamping plate:
- Manual or automatic clamping (Option)

UPPER TOOLS
- Upper tool equipped with gripper for rivet handling:
  - Manual or automatic clamping (Option)

CONTROL STATION
Combines all the functions necessary for monitoring and controlling the machine:
- NC & Process keyboard and monitors.
- Process & monitoring camera.

SEALANT APPLICATION
System for applying sealant on counersink:
- Cycle 1 application. Adjustment by pressure and pushing time.

PLATFORM
Adjustable platform in order to raise / lower the operator to suitable height.

SIGHT
Camera and reticule generator on monitor + laser pointer in order to aim at riveting points.

OPTIONS (detail p. 22):
- Flushness measurement

Options:
- Height: 0 to 800
- Speed: 1.65 to 6.25
- Torque: 2.0 to 6.5Nm
- Accuracy: +/- 0.01
- Repeatability: +/- 0.005

Electrospindle
- Power: 6 ou 7Kw
- Speed: 18,000 or 20,000RPM
- Torque: 3,8 ou 5Nm
- Chuck: HSKA32 or HSKA40
- Concentricity: 2µm
- Peck drilling for chip shearing (Option)

Rivet injector
Ensures automatic evacuation of a rivet when loaded on grippers of upper tool:
- Evacuation into collecting bin (No ejection onto panel)

Sealant application
System for applying sealant on counersink:
- Cycle 1 application. Adjustment by pressure and pushing time.

Vacuuming device
Vacuuming of drilling chips:
- Retractable 50l container mounted on wheels.
- Dust Filter

Rivet ejection
Ensures automatic evacuation of a rivet when loaded on grippers of upper tool:
- Evacuation into collecting bin (No ejection onto panel)

Rivet ejection
Ensures automatic evacuation of a rivet when loaded on grippers of upper tool:
- Evacuation into collecting bin (No ejection onto panel)

Rivet distribution
By bowl or cartridge:
- 1 rivet/s max distribution
- Regrouping of lengths for same rivet standard for distribution on 1 injector

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- Cycle 1 application. Adjustment by pressure and pushing time.

Platform
Adjustable platform in order to raise / lower the operator to suitable height.

Sight
Camera and reticule generator on monitor + laser pointer in order to aim at riveting points.

Options (detail p. 22):
- Repeatability measurement

Options:
- Height: 0 to 800
- Speed: 1.65 to 6.25
- Torque: 2.0 to 6.5Nm
- Accuracy: +/- 0.01
- Repeatability: +/- 0.005

Electrospindle
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Sealant application
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- Cycle 1 application. Adjustment by pressure and pushing time.

Platform
Adjustable platform in order to raise / lower the operator to suitable height.

Sight
Camera and reticule generator on monitor + laser pointer in order to aim at riveting points.

Options (detail p. 22):
- Repeatability measurement
**RIVET INJECTOR**

**12** CONTROL STATION

**11** SEALANT APPLICATION

**LOWER TOOLS**

**JIG**

**Reorganizing view**

**UPPER TOOLS**

**RELOCATING VIEW**

**LOWE R TOOLS**

**VACUUMING DEVICE**
## C-TYPE DOOR

### ELECTRO PNEUMATIC SYSTEM

**Description:** Automatic riveting machine for 7 positioning axis zero structure panels. Solution for offset clamping before drilling. Allows for a maximum of drillings on door or panel. Use: Ideal for door or small panel. Simple or double curved panels.

**Characteristics:**
- **Weight:** max 70Kg
- **Radius:** max 2,000mm
- **Width:** max 1,260mm
- **Length:** max 2,300mm
- **Door or panel:** Use: Ideal for door or small panel. Simple or double curved panels. Allows for a maximum of drillings on door or panel. Solution for offset clamping before drilling. Description: Automatic riveting machine for 7 positioning axis aero structure panels.
- **Countersunk or round head:**
- **Chip vacuuming:**
- **Vacuuming of drilling chips:**
- **Dust filter:**
- **Retractable 50 l container mounted on wheels:**
- **From 1 to 6 injectors on head simultaneously:**
- **Reliability rate:** 99%.
- **Specially adapted to rivet standard.**
- **Manual or automatic clamping (Option).**
- **Fast fitting / removal.**
- **Straight or offset lower tool with integrated clamping plane.**
- **Upper tool equipped with gripper for rivet handling.**

### PROCESS

**DUO C-TYPE DOOR**

<table>
<thead>
<tr>
<th>RAM are buried</th>
<th>Civil engineering work is necessary (Axis X and Y)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum depth (without iron): 250mm</td>
<td>Floor resistance: 2t/m²</td>
</tr>
<tr>
<td>Machine weight: 25 tons</td>
<td>WEIGHT</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CYCLE TIME</th>
<th>Standard reference cycle for backed riveting: Clamping / Drilling / PB Application / Rivet setting / Two setting / Encasing</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.7 seconds</td>
<td>Work cycle: Standard cycle / Shift 25mm. 5.7 seconds</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WEIGHT</th>
<th>Platen weight: 25 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.2 m</td>
<td>Rivet residence: 20Kg</td>
</tr>
<tr>
<td>3.6 m</td>
<td>Drilling depth (burr less) 250mm</td>
</tr>
<tr>
<td>1.2 m</td>
<td>Civil engineering work is necessary (Axes X and Y) are basically</td>
</tr>
</tbody>
</table>

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### ELECTROSPINDLE

- **Torque:** 6 ou 7Kw
- **Speed:** 18,000 ou 20,000RPM
- **Power:** 6 ou 7Kw
- **Chuck:** HSKA32 ou HSKA40
- **Torque:** 3,8 ou 5Nm
- **Speed:** 18,000 ou 20,000RPM

### OPTIONS

**Options (detail p. 22):**
- **Toll Storage**
- **Loading Arm**
- **VACUUMING DEVICE**
- **DUST FILTER**

---

### CYCLE TIME

**Standard reference cycle for backed riveting:**

**Clamping / Drilling / PB Application / Rivet setting / Two setting / Encasing**

- **6.5 seconds**
- **Work cycle:**
  - Standard cycle / Shift 25mm. 5.7 seconds

---

### WEIGHT

**Platen weight:** 25 mm

**Rivet residence:** 20Kg

**Drilling depth (burr less):** 250mm

Civil engineering work is necessary (Axes X and Y) are basically necessary.
**C-TYPE RK POSITIONER**

**FULL ELECTRIC SYSTEM**

Description: Automatic riveting machine for 6 positioning axis structure panels. Use: Ideal for flow-line production of simple or double curved panels (6Axis: +/- 35°).

**PRODUCTS**
- Panel
  - Length: max 3,650 mm
  - Width: max 2,000 mm
  - Height: 2,000 mm
  - Weight: max 500 kg
- Rivet type
  - HL insertion up to Ø 6.35
  - Rivet type
  - Weight: max 500 Kg
  - Width: max 2,800 mm
  - Length: max 3,450 mm

**PRODUCTS**
- Description: Automatic riveting machine for 6 positioning axis aero structure panels.
- Countersunk or round head
- Countersunk or round head
- Countersunk or round head
- Countersunk or round head

**F.E.S**
- FULL ELECTRIC SYSTEM
- 5,5 m
- 4,4 seconds
- Standard cycle / Shift 25 mm.
- Work cycle:
  - 3,4 seconds
  - Insertion / Rivet bucking / Unclamping

**Standard reference cycle for bucked riveting:**
- Minimum depth (without iron): 250 mm

**WEIGHT**
- Machine weight: 35 tons
- Flare resistance: 55°C
- Minimum depth (without iron): 250 mm

**CYCLE TIME**
- Standard reference cycle for bucked riveting
  - Clamping / Drilling / sealant application / Rivet positioning / Rivet bucking / Unclamping
  - 3.1 seconds

**MAX CYCLE TIME**
- Standard cycle
  - 30.25 seconds

**UPPER TOOLS**
- Upper tool equipped with gripper for rivet handling.
- Functional: Automatic clamping (Option).

**LOWER TOOLS**
- Slotted out offset lower tool with integrated clamping plates.
- Functional: Automatic clamping (Option).

**RIVET INJECTOR**
- Specially adapted to rivet standard.
- Reliability rate: 99%.
- From 6 to 16 injectors on head simultaneously.

**VACUUMING DEVICE**
- Durability in handling rivets.
- Detachable 551 container mounted on wheels.
- Size (length):
  - 0.8 m
  - 1.0 m
  - 1.2 m

**LOWER RAM**
- Resatility for panel clamping and rivet bucking.
- Two main axes:
  - « R » axis
  - Upward/Downward
  - Speed: 110 rpm
  - Accuracy: +/- 0.01
  - Repeatability: +/- 0.0005
  - Lower tool rotation
  - Clamping force: 50 to 500 daN
  - Bucking force: 500 to 7,000 daN
  - Real time monitoring:
  - Bucking force
  - Hole measurement
  - Sheet metal measurement

**UPPER TOOLS**
- Upper tool equipped with gripper for rivet handling.
- Functional: Automatic clamping (Option).

**DELOCATING VIEW**
- Camera and lighting to automatic relocating (C & T) on panel reference points.
- Accuracy: +/- 4 mm

**CONTROL STATION**
- Controls all the functions necessary for monitoring and controlling the machine.
- NC & Process keyboard and monitors.
- Process 0 & monitoring camera.

**RIVET DISTRIBUTION**
- By drill in cartridge:
  - 1 rivets/c. max distribution
  - Beginning of lengths for same rivet standard for distribution 1 injector.

**ELECTROSPINDLE**
- Power: 11 kW
  - Speed: 16,000 to 18,000 rpm
  - Torque: 4,5 + 5 Nm
  - Chuck: SK 40/50 & HSK A100
  - Geometric: 2 min.
  - Drilling for chip shearing (Option).

**RIVET EJECTOR**
- Ensures automatic evacuation of a rivet when loaded on grippers of upper tool.
- Evacuation into collecting bin (No ejection onto panel).
- Can be used for preparation or finishing station.
- System for applying sealant on countersink
  - Cycle 1 application. Adjustment by pressure and pushing time.
- Chip vacuuming
- With drill bit breakage detection

**SEALANT APPLICATION**
- System for applying sealant on counterpart.
- Cycle 1 application. Adjustment by pressure and pushing time.
- Measurement and tolerances control of panel position (Option) in relation to the riveting point.
- Accuracy: +/- 0.1 mm

**NORMALITY COMPENSATION**
- 3 point measurement to ensure automatic normally compensation of panel on riveting point.

**DIMENSIONS**
- Code: R40R50R60R70R80R90R100R110R120R130R140R150
- Code: R40R50R60R70R80R90R100R110R120R130R140R150

**OPTIONS**
- Toll Storage
- 2nd electro spindle
- Multi injector version
- With drill bit breakage detection
- Full stroke
- With drill bit breakage detection
- Tool injection into upper tool
- Multi tool version
- Tool insertion
- Tool insertion (recovery)
- Chip evacuation
- Drill bit lubrication
- Positioning view (Option)
- Cycle view
- Atlantic measurement (Option)
- Normality measurement (Option)
- Tool change (Option)
- Tool change (Option)
- Mechanical Business measurement (Option)
- Optical Business measurement (Option)
- Push away + adjustment via HMI

**Options (detail p. 22):**
- 2nd electro spindle
- Tool change robust
**C-TYPE FLOW LINE**

**FULL ELECTRIC SYSTEM**

Description: Automatic riveting machine for 16 positioning axes on 1 NC and double process with automatic jigg feeder for zero structure panels.

**Use:** Ideal for flow-line production of simple or double curved upper shell or bottom sections (8 Axis: +/-15°).

**PRODUCTS**
- Panel
  - Length: max 5,000 mm
  - Width: max 3,000 mm
  - Radius: 2,000 mm
  - Weight: max 500 Kg
- Rivet type:
  - Weight: max 500 Kg
  - Radius: 2,000 mm
  - Width: max 3,800 mm
  - Length: max 5,900 mm
- Pannel:
  - PRODUCTS bottom sections (B Axis: +/-15°)

**USE**
- Ideal for flow-line production of simple or double curved upper shell or double process with automatic jigg feeder for aero structure panels.
- Countersunk or round head

**DIMENSIONS**
- 13,6 m
- X1 & X2 axis
- • Max Acceleration: 400 mm.s²
- • Max Speed: 10 m/min
- • Repeatability: +/- 0.01
- • Accuracy: +/- 0.016
- • Range: 200°/max
- • Max Acceleration: 4°.s²
- Z1 & Z2 axis
- • Max Acceleration: 10°.s²
- • Max Speed: 3,600°/min
- • Repeatability: +/-0.01°
- • Accuracy: +/- 0.016
- • Range: 200°
- • Max Acceleration: 400 mm.s²
- • Max Speed: 10 m/min
- • Repeatability: +/- 0.005
- • Accuracy: +/- 0.01
- • Range: 50°
- • Max Acceleration: 4°.s²
- • Max Speed: 360°/max
- • Max Acceleration: 10°.s²

**OPTIONS (detail p. 22):**
- 2nd electro spindle
- Tool changing robot
- Flushness measurement
- Normality measurement
- Tool monitoring

**11. ALTIMETER**
Measurement and instantaneous correction of panel position (plus 2 axes) in relation to the riveting point.
- Accuracy: +/- 0.5 mm

**12. NORMALITY COMPENSATION**
3 point measurement to ensure automatic normality compensation of panel on riveting point.

**2. FES RIVETING HEAD**
- 01. Upper clamping plate
- 02. Drilling 1
  - • With drill bit breakage detection
- 03. Drilling 2 (Option)
  - • With drill bit breakage detection
- 04. Jig (Option)
  - • With drill bit breakage detection
- 05. Rivet insertion into upper tool
  - • Manual operation
- 06. Rivet insertion
- 07. Rivet ejection (recycling)
  - • Chip vacuuming
- 08. Drill bit fabrication
- 10. Replacing nozzles (Option)
- 11. Cycle time
- 12. Altimeter measurement (Option)
- 13. Normality measurement (Option)
- 14. Tool change (Option)
- 15. Tool storage (Option)
- 16. Mechanical flushness measurement (Option)
- 17. Optical flushness measurement (Option)
- 18. Push away ± adjustment via HMI

Three main axes in head:
- « S » axis (Electrical Linear Motor)
  - • Upward/downward movement of slider
  - • Max speed: 10,000 or 20,000 BPM
- « U » axis (Electrical)
  - • Upward/downward movement of drilling spindle
  - • Max speed: 10,000 BPM

**3. LOWER RAM**
Ensemble for panel clamping and rivet bucking
- Two main axes:
  - • B ± axis
    - • Upward/Downward
      - • Speed: 400, 600 or 800 mm
      - • Speed: 110 m/min
      - • Accuracy: +/- 0.005
    - • ± 0.5°
  - • C ± axis
    - • Lower tool rotation
      - • Clamping head: 10° to 60°
      - • Backing force: 500 to 7,000 kgf
      - • Clamping force: (USR) up to 1,000 kgf
      - • Real time monitoring
    - • Backing force
    - • Hole measurement
    - • Sheet metal measurement

**4. LOWER TOOLS**
Upper tool equipped with gripper for rivet handling.
- Possible automatic clamping (Option).

**5. CONTROL STATION**
Comprises all the functions necessary for monitoring and controlling the machine.
- NC Process keyboard and monitors.
- Process & monitoring camera.
- NC & Process keyboard and monitors.

**6. RIVET DISTRIBUTION**
By head or carcades:
- • 1 rivet/s max.
- • Regrouping of lengths for same rivet standard for 1 injector.

**7. RIVET INJECTOR**
Specially adapted to rivet standard.
- • Reliability rate: 99%
- • Specially adapted to rivet standard.

**8. RIVET EJECTOR**
Ensures automatic ejection of a rivet when loaded on grippers of upper head.
- Evacuation into collecting box (No ejection into panel).

**9. JIG**
Jig on standard frame suitable to accept your panels.
- Can be used for preparation or finishing station.

**10. SEALANT APPLICATION**
System for applying sealant on countersink.
- Cycle 1 application: Adjustment by pressure and pushing time.

**12. ELECTROSPINDLE**
Breezes automatic ejection of a rivet when loaded on grippers of upper head.
- Evacuation into collecting box (No ejection into panel).

**13. TOOLS**
Standard reference cave for backed clamping:
- Clamping: driller / sealant application / rivet
- Injector: Sheet bucking / Fiducial mark:
- Work cycle:
  - Standard cycle: Shaft 295mm. 4,6 seconds

**14. WEIGHT**
Machine weight: 65 tons
- Sheet measuring: 80 cm
- Minimum depth (without tool): 250 mm

**15. SYSTEM UNIT**
Standard center frame for backed clamping:
- Drilling / Fiducial / MA72
- Sheet bucking / Fiducial mark
- Work cycle:
  - Standard cycle: Shaft 295mm. 4,6 seconds

**16. SURELINE**
Standard center frame for backed clamping:
- Drilling / Fiducial / MA72
- Sheet bucking / Fiducial mark
- Work cycle:
  - Standard cycle: Shaft 295mm. 4,6 seconds

**17. ALTIMETER**
Measurement and instantaneous correction of panel position (plus 2 axes) in relation to the riveting point.
- Accuracy: +/- 0.5 mm

**18. NORMALITY COMPENSATION**
3 point measurement to ensure automatic normality compensation of panel on riveting point.
**Full Electric System**

**Description:** Automatic riveting machine for 5 positioning axis zero structure panels. Use: Ideal for panel seams of upper or lower sections.

**F.E.S Riveting Head**

- **Upper Tools:**
  - Drill bit lubrication
  - Chip vacuuming
  - Drill bit breakage detection

- **Lower Tools:**
  - Straight or offset lower tool with integrated clamping plate
  - Tool change (Option)

**Riveting Device**

- **Vacuuming:**
  - Vacuuming of drilling chips
  - Retractable 50 l container mounted on wheels
  - Dust filter

**Process**

- **Cycle Time:**
  - Minimum depth (without iron): 250 mm
  - Standard cycle/shift: 25 mm

**Control Station**

- **Components:**
  - NC & Process keyboard and monitors
  - Process monitoring camera

**Relocating View**

- **System:**
  - Camera and lighting for automatic relocating (X & Y) on panel reference points.
  - Possible automatic clamping (Option).

**Lower Ram**

- **Subassembly for panel clamping and rivet bucking:**
  - Two main axes:
    - « V » axis
    - « S » axis (Electrical Linear Motor)

**Rivet Ejector**

- **Drum:**
  - Max Speed: 110 mm/s
  - Upward/downward

**Upper Tools**

- **Drill bit:**
  - Accuracy: +/- 0.01
  - Repeatability: +/- 0.001
  - Speed: 110 mm/s
  - Upward/downward

**Electrosindle**

- **Power:**
  - 6 or 7 Kw
  - Speed: 18,000 or 20,000 RPM

**Sealant Application**

- **System:**
  - For applying sealant on counterburr cycle 1 application. Adjustment by pressure and pushing tool

**Personnel Elevator**

- **Personnel Elevator:**
  - To access riveting head.

**Electrosindle**

- **Power:**
  - 6 or 7Kw
  - Speed: 18,000 or 20,000 RPM

**Personnel Elevator**

- **Personnel Elevator:**
  - To access riveting head.

**Control Station**

- **Components:**
  - NC & Process keyboard and monitors
  - Process monitoring camera

**Relocating View**

- **System:**
  - Camera and lighting for automatic relocating (X & Y) on panel reference points.

**Altitude Compensation**

- **Measurement and instantaneous correction of panel position along Z axis in relation to the riveting point.**
  - Accuracy: +/- 0.1 mm
FRAMER

Description: Drilling/riveting process for internal panel riveting. Use: Ideal for cleat/frame or door assembly.

PRODUCTS

- Rivet type: Bucketed up to Ø5
- Positioning: By Siemens 840D-s controlled Robot
- Robot: KUKA KR600-R2830
- Max robot range: 2,826 mm
- Repeatability: ±0.16 mm
- Robot controller: KRC4
- Without bay controller

CYCLE TIME

- Standard reference cycle for bucketed riveting:
  - Clamping / Drilling / Sealant application / Rivet insertion / Rivet bucking / Unclamping
  - 5.5 seconds
- Work cycle:
  - Standard cycle / Shift 25 mm
  - 7 seconds

WEIGHT

- Robot weight: 2300 kg
- Rivet weight: 0.3 kg
- Sheet resistance: 2.0 mm
- Minimum depth (without iron): 250 mm

01. Rivet injector

- Specially adapted to rivet standard.
- Reliability rate: 99%
- From 1 to 6 injectors on head simultaneously

02. Vaccumming device

- Vacuuming of drilling chips
- Retractable 50 l container mounted on wheels.
- Dust filter

03. Upper tools

- Upper tool equipped with grippers for rivet handling.
- Fuel filter / removal
- Possible automatic clamping (Option)

04. ReLocating view

- Camera and lighting for automatic relocating (X & Y) on panel reference points
- Accuracy: ±0.1 mm

05. Control station

- Centering point for automatic relocating (X & Y) on panel reference points
- Accuracy: ±0.1 mm

06. Rivet distribution

- By bowl or cartridge
- 1 rivet/s max distribution
- Regrouping of lengths for same rivet standard for distribution on 1 injector

07. Rivet ejector

- Ensures automatic evacuation of a rivet when loaded on grippers of upper tool
- Evacuation into collecting bin (No ejection onto panel)

08. Altitude compensation

- Measurement and instantaneous correction of panel position
- ±0.1 mm

09. Normality compensation

- 3 point measurement to ensure automatic normality compensation of panel on riveting point

10. Upper part

- Upper part
- 01. Upper clamping plate
- 02. Drilling
- 03. Rivet injection into upper tool
- 04. Rivet insertion
- 05. Rivet ejection (recovery)
- 06. Chip vacuuming
- 07. Drill bit lubrication
- 08. ReLocating view
- 09. Tool rotation
- 10. Clamping force
- 11. Bucking force
- 12. Sheet metal measurement

11. Spindle

- 13. Spindle: 15 000 RPM
- 14. Torque: 2 Nm
- 16. Peck drilling for chip shearing (Option)

12. Lower part

- Lower part
- 17. Lower clamping plate
- 18. Gripper with integrated lower tool
- 19. Tool rotation
- Two main axes in upper part:
  - R axis (Electrical)
    - Range: 90°
    - Speed: 300 mm/s
    - Repeatability: ±0.05°
- T axis (Electrical)
  - Range: 90°
  - Speed: 300 mm/s
  - Repeatability: ±0.05°
- C axis (Electrical)
  - Range: 90°
  - Speed: 10 tr/min
  - Repeatability: ±0.016°

13. Spindle

- Spindle: 75 000 RPM
- Torque: 2 Nm
- Holder: Ø6.35
- Concentricity: ±2 µm
- Peck drilling for chip shearing (Option)
Description: Drilling/rivetting process for internal panel riveting. Space saving version. Use: Ideal for cleat/frame or door assembly.

PRODUCTS

Rivet type:
- Bucked Ø3.2 or Ø4 Alu
- Round head

POSITIONING

- Positioning by CT Siemens 840D-sl controlled Robot
- Kuka KR360-FORTEC
- Max robot range: 2,826mm
- Repeatability: 0.16mm
- Robot controller KRC4
- Robot Comau NJ-370-2.7
- Max robot range: 2,703mm
- Repeatability: 0.15mm
- Without bay controller

CYCLE TIME

Standard reference cycle for bucked riveting:
- Clamping / Drilling / Sealant application / Rivet insertion / Rivet bucking / Unclamping
- 5.5 seconds

Work cycle:
- Standard cycle / Shift 25mm / 7 seconds

WEIGHT

- Operator weight: 250 kg
- Robot weight: 2,100 kg
- Pivot mechanism: 2,000 kg
- Minimum height (reduced iron): 250 mm

FRAMER 2.0

Description: Drilling/riveting process for internal panel riveting. Space saving version. Use: Ideal for cleat/frame or door assembly.

Riveting process for internal panel riveting.

SPACE SAVING VERSION.

PRODUCTS

Rivet type:
- Bucked Ø3.2 or Ø4 Alu
- Round head

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ELECTROSPINDLE
Power: 6 ou 7 Kw
Speed: 18,000 ou 20,000 RPM
Torque: 3,8 ou 5 Nm
Chuck: HSKA32 ou HSKA40
Concentricity: 2 µm
Peck drilling for chip shearing (Option)

NORMALITY COMPENSATION
3 point measurement to ensure automatic normality compensation of panel on riveting point.

LOADING ARM
Loading arm with suspension crane to ensure loading and unloading of panel or door on machine frame.

TOOL CHANGING ROBOT
Tool changing robot (drilling tools and upper tools) on riveting head.
Robot can process coupons automatically.

FLUSHNESS MEASUREMENT
Automatic measurement of distance between rivet and panel after riveting.
2 possible versions: mechanical or optical.
WE OPERATE IN ...

BRAZIL, CANADA, CHINA, FRANCE, GERMANY, JAPAN, MOROCCO, ROMANIA, RUSSIA, SPAIN, THE C.I.S., THE UNITED STATES OF AMERICA, TUNISIA...