The press shop at a glance
Innovating in the press shop since 1973

ABB’s experience in automation of press lines dates back to 1973 when Volvo installed the first line with Doppin automation in Sweden. ABB took over Volvo experience with its acquisition in 1998. The first fully automated robotic press line was installed in 1993. The vast experience of close to 40 years in the field has been integrated in all our products and standards, assuring proven, reliable and cost-effective solutions to our customers.

Today more than 900 press lines have been automated worldwide by ABB, with over 4000 Doppin and 3000 Robots.

Turnkey projects based on proven solutions and products

ABB offers automation solutions for cold and hot stamping that follow market and technology drivers. They are based on standards, products and pre-tested modular solutions reduce project risk, time and costs, ensuring also easy installation and maintenance.

Our automation solutions are conceived for new projects as well as existing press lines.

Standards, products and modular solutions

- Destacker systems including integration of Washers and Oilers
- Inter-press Automation
- End-of-line including Quality Inspection and Racking Systems
- Hot stamping solutions
- Robotic stacking for blanking lines
- Press Motors and Drives
- Noise-proof safety fences
- Standard Package for automation of press cells (StampPack)

Service and upgrading of installed base

ABB cares of existing press automation systems. Our experts are able to support customers auditing the lines to maintain and achieve productivity improvements.

- Addition and upgrade of subsystems:
  - Integration of automatic die and tool change systems.
  - Automatic racking at the end of line.
  - Destacker including addition of washer/oiler
  - …
- Line control upgrades
- Press refurbishment and relocation
- Upgrade of presses to servo-technology (DDC)
- …
The race for productivity
Looking at the complete cycle

In order to obtain substantial improvements in press line productivity, it is necessary to focus on every single component of the production cycle: robots, presses and its coordination along the whole line.

Fast Robots

ABB robots for press automation are in continuous evolution to become faster, with specific emphasis on reducing critical press occupation times.

The Press Automation robots portfolio includes 6 axis robots with specific enhancement of the key axes involved in the part transfer; 7 axis robots to maintain the part position while minimizing the press occupation and the Twin Robot, one single controller with distributed axes for a more efficient power distribution.

DDC - Dynamic Drive Chain

The DDC - Dynamic Drive Chain system converts mechanical presses into hybrid servo-presses, obtaining significant reductions in press cycle times without compromising stamping quality.

Full line synchronization

Full line synchronization assures not only the optimum interaction of robot and press movements within one cell. Continuously monitoring, controlling and optimizing the part flow between cells guarantees to run the press line always at its maximum speed and to keep it constant over time.
Since the Introduction of the worlds first commercially available electric robot in 1974, ABB has installed more than 190,000 robots. Today robots are manufactured in Europe & Asia and there are sales & service operations in 53 countries & more than 100 locations.

**5 axis robots**

From the extensive model range in the ABB catalogue, following models are specially well suited for press automation.

<table>
<thead>
<tr>
<th>IRB 4600</th>
<th>IRB 6660</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load (Kg): 20 / 40 / 60</td>
<td>Load (Kg): 130 / 100</td>
</tr>
<tr>
<td>Reach (m): 2.50 / 2.55 / 2.05</td>
<td>Reach (m): 3.10 / 3.35</td>
</tr>
<tr>
<td>Mounting: Floor, Tilted, Inverted</td>
<td></td>
</tr>
</tbody>
</table>

**IRB 6650S**

<table>
<thead>
<tr>
<th>Load (Kg): 200 / 125 / 90</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reach (m): 3.00 / 3.50 / 3.90</td>
</tr>
<tr>
<td>Mounting: Shelf, Floor</td>
</tr>
</tbody>
</table>

**IRB 7600**

<table>
<thead>
<tr>
<th>Load (Kg): 325 / 150</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reach (m): 3.10 / 3.50</td>
</tr>
</tbody>
</table>

**4 axis robots**

4 axis robots provide fast cycles for lower re-orientation requirement.

<table>
<thead>
<tr>
<th>IRB 460</th>
<th>IRB 660</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load (Kg): 110</td>
<td>Load (Kg): 180 / 250</td>
</tr>
<tr>
<td>Reach (m): 2.40</td>
<td>Reach (m): 3.15</td>
</tr>
</tbody>
</table>
Products and solutions

7 axis robots

The benefits of traditional robot automation are enhanced by the addition of a 7th axis, specifically designed to provide a faster transfer between presses.

ABB offers two variants of 7-axis robots, depending on the motion of the 7th axis. The rotational axis solution combines rotational movements to maintain the part orientation between presses. The linear axis offers the additional advantage of a compound linear acceleration while moving in and out of the press.

<table>
<thead>
<tr>
<th>IRB 6660RX</th>
<th>IRB 7600RX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load (Kg):</td>
<td>Load (Kg):</td>
</tr>
<tr>
<td>75 / 70</td>
<td>85 / 80</td>
</tr>
<tr>
<td>Reach (m):</td>
<td>Reach (m):</td>
</tr>
<tr>
<td>3.10 + 1.30 / 1.45</td>
<td>3.50 + 1.30 / 1.45</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IRB 6660FX</th>
<th>IRB 7600FX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load (Kg):</td>
<td>Load (Kg):</td>
</tr>
<tr>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>Reach (m):</td>
<td>Reach (m):</td>
</tr>
<tr>
<td>3.10 + 1.40</td>
<td>3.10 + 1.75</td>
</tr>
</tbody>
</table>

TRX – Twin Robot Xbar

The TRX responds to the aim of using robot based technology in high speed press automation segment. The use of two manipulators (with only one controller) is an optimum way to provide an efficient distribution of the total power.

<table>
<thead>
<tr>
<th>IRB 760 Twin XB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load (Kg): 120</td>
</tr>
<tr>
<td>Reach (m): 3.10 + 1.70</td>
</tr>
</tbody>
</table>
Products and solutions

Tooling

The ABB Tooling is focused on achieving the optimum performance of the automation processes. Its wide range of modular components to reduce project risks, time and set up costs.

Carbon Fiber Tooling

ABB has developed a new tooling product family based in carbon fiber to optimize the part transfer between presses by reducing weight, vibrations and improving flexibility. The main advantages of the new tooling are:

- Optimum stiffness/weight ratio
- Shape design: reduced tooling height to minimize press occupation
- Unified tooling for 6- and 7-axis robots
- Enabled for automatic tool change (ATC)
- Ergonomy: smaller tooling to be manipulated
- Less components and storage room
- For single and double parts

Software solutions

Stampware

StampWare is a software package specifically designed for press robots and combines some powerful features:

- HMI (Human Machine Interface) that allows control of every detail of the press line.
- Powerful and user friendly programming wizard that makes the programming of new parts quick & easy
- Single HMI point to operate either a single robot or the complete line.

Running in more than 1000 robots installed worldwide.
DDC – Dynamic Drive Chain® is a hybrid servo-drive concept that allows new and existing presses to take full advantage of servo technology without requiring any upgrade of the power grid of the press shop.

DDC uses a servo motor to open and close the press faster, while performing the stamping process with energy from the traditional flywheel. This dramatically reduces the cycle time of the press since the major part of the press cycle is performed at maximum speed. Because the stamping process is still performed by the flywheel, no significant additional power is required from the electrical grid.

Increased productivity
Increase production rate without compromising on part quality by means of faster up and down movements, while the stamping speed is maintained. The installation of DDC typically improve line output by around 1 to 3 strokes per minute. The dynamic drive control of the press can also be applied to increase the quality of the parts, by reducing the stamping speed while maintaining the line output rate. Minimizing the rejects results in higher production.

Limited peak power requirement
The hybrid servo concept uses the traditional flywheel for stamping. This eliminates unacceptably high peak power demands from the power grid. The required maximum power is even further reduced by ABB’s multi-drive plus DDC’s exclusive power limitation functionality, allowing for energy exchange between servo motor and flywheel motor.

Increased press life time
The servo drive accelerates the press with much smoother acceleration ramps than a clutch mechanism can provide. Hence resulting in less strain on the gears of the drive chain.

No clutch, no brake: less maintenance & energy saving
DDC eliminates the need for braking the press in every cycle and the clutch is used in a synchronized way; thus eliminating two major sources of maintenance needs and energy losses.

Short installation time
Installation of DDC is easy and fast thanks to the DDC-kit. The kit consists of a servomotor, gearbox and drive allowing DDC to be installed during most planned factory shutdowns. DDC does not tie-up the press: it enables the press for a new servo-mode while maintaining the existing traditional modes as well.
Contact us

Press Automation Application Centers:

ABB Inc.
201 Westcreek Boulevard
L6T 5S6 Brampton
CA
Tel: +1 905 460 3000
Fax: +1 905 460 3001

ABB Engineering Ltd
No. 5, Lane 369, Chuangye Rd
201319 Shanghai
CN
Tel: +86 21 6105 6666
Fax: +86 21 6105 6677

ABB Ltd
157-33, Samsung-Dong,
135-090 Seoul
KR
Tel: +82 2 528 3070
Fax: +82 2 554 8725

ABB S.A. DMRO Robotics
C/ de L’illa de Buda, 55
08192 St. Quirze del Vallès, Barcelona
ES
Tel: +34 93 728 8700
Fax: +34 93 728 8682
E-Mail: pas.support@es.abb.com

www.abb.com/robotics

Scan this QR code with your SmartPhone for a direct link to the Press Automation Portal. (Only for English language version.)

Scan this QR code with your SmartPhone for a direct link to the ABB Stampworld pdf. (Only for English language version.)