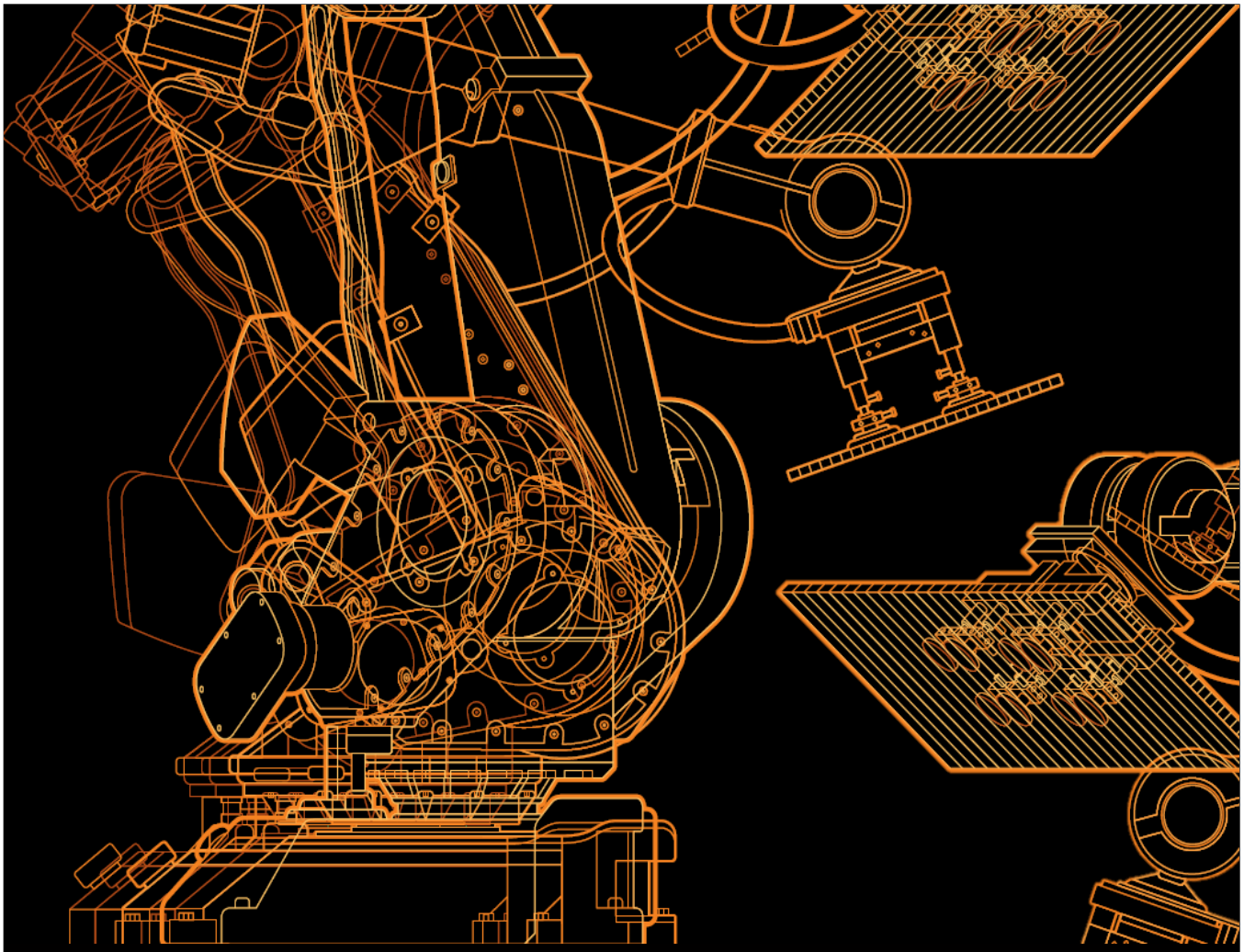
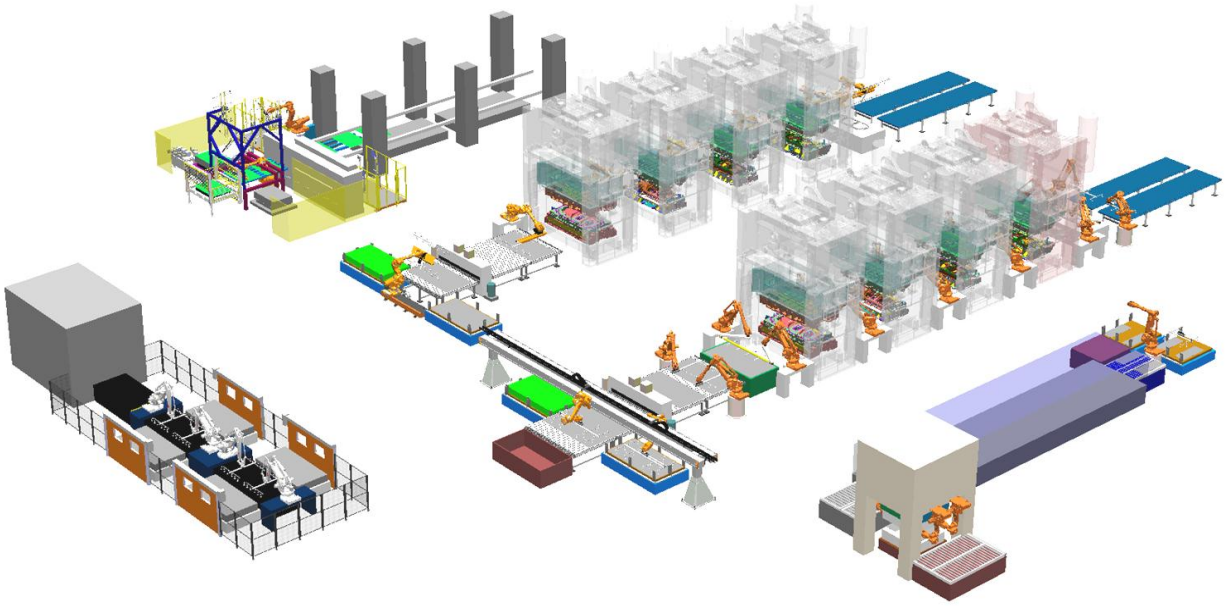


ABB StampWorld
From stack to rack

Power and productivity
for a better world™

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)

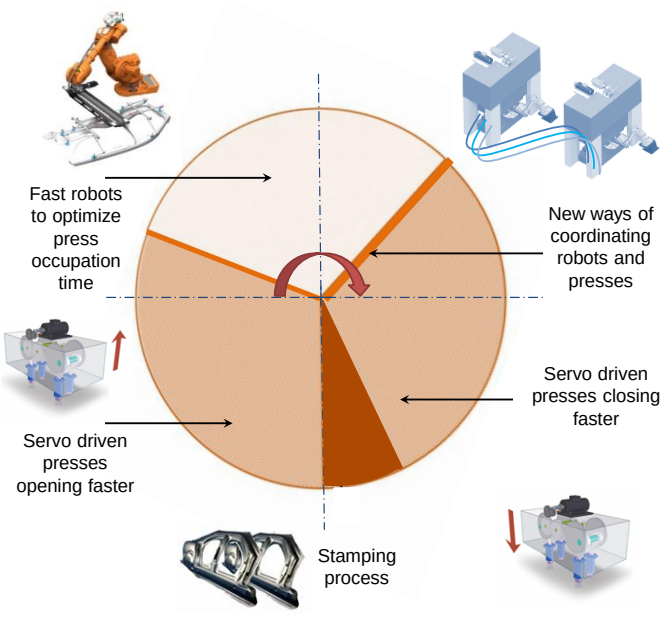
Service and upgrading of installed base

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 compromizing 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.

Products and solutions

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.

6 axis robots

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

IRB 4600

Load (Kg): 20 / 40 / 60
Reach (m): 2.50 / 2.55 / 2.05
Mounting: Floor, Tilted, Inverted

IRB 6660

Load (Kg): 130 / 100
Reach (m): 3.10 / 3.35

IRB 6650S

Load (Kg): 200 / 125 / 90
Reach (m): 3.00 / 3.50 / 3.90
Mounting: Shelf, Floor

IRB 7600

Load (Kg): 325 / 150
Reach (m): 3.10 / 3.50

4 axis robots

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

IRB 460

Load (Kg): 110
Reach (m): 2.40

IRB 660

Load (Kg): 180 / 250
Reach (m): 3.15

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.

IRB 6660RX

Load (Kg): 75 / 70

Reach (m): 3.10 + 1.30 / 1.45

IRB 7600RX

Load (Kg): 85 / 80

Reach (m): 3.50 + 1.30 / 1.45

IRB 6660FX

Load (Kg): 50

Reach (m): 3.10 + 1.40

IRB 7600FX

Load (Kg): 100

Reach (m): 3.10 + 1.75

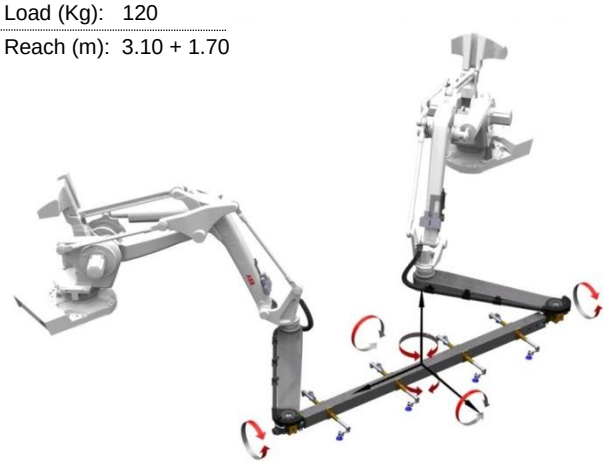
TRX – Twin Robot Xbar

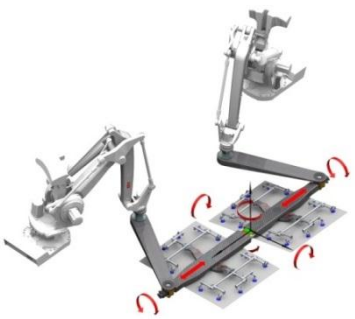
The TRX responds to the aim of using robot based technology in high speed press automation segment. The use of two manipulators (with only one controller) is an optimum way to provide an efficient distribution of the total power.

IRB 760 Twin XB

Load (Kg): 120

Reach (m): 3.10 + 1.70





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

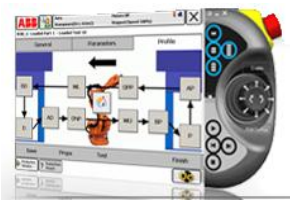
Stampware

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.

Graphical production window



Programming Wizard

Products and solutions

Press motion

ABB capabilities in Press Motion includes complete solutions on mechanical and electrical refurbishment from basic automation to complete turnkey projects as well as upgrading new and existing lines with the installation of the DDC - Dynamic Drive Chain®.

DDC – Dynamic Drive Chain®

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

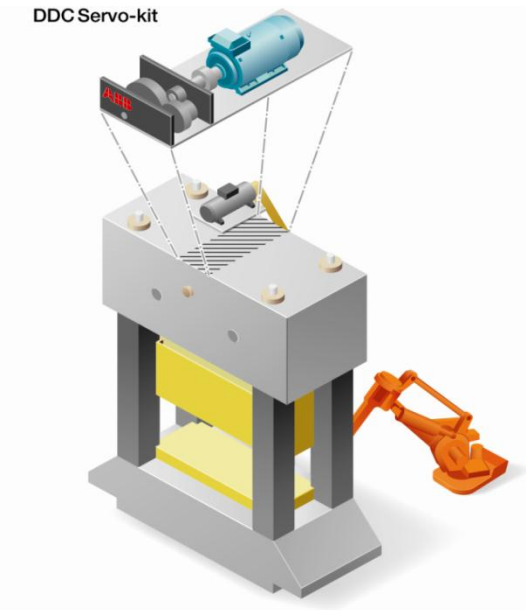
The servo drive accelerates the press with much smoother acceleration ramps than a clutch mechanism can provide. Hence resulting in less strain on the gears of the drive chain

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.



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

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

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Power and productivity
for a better world™