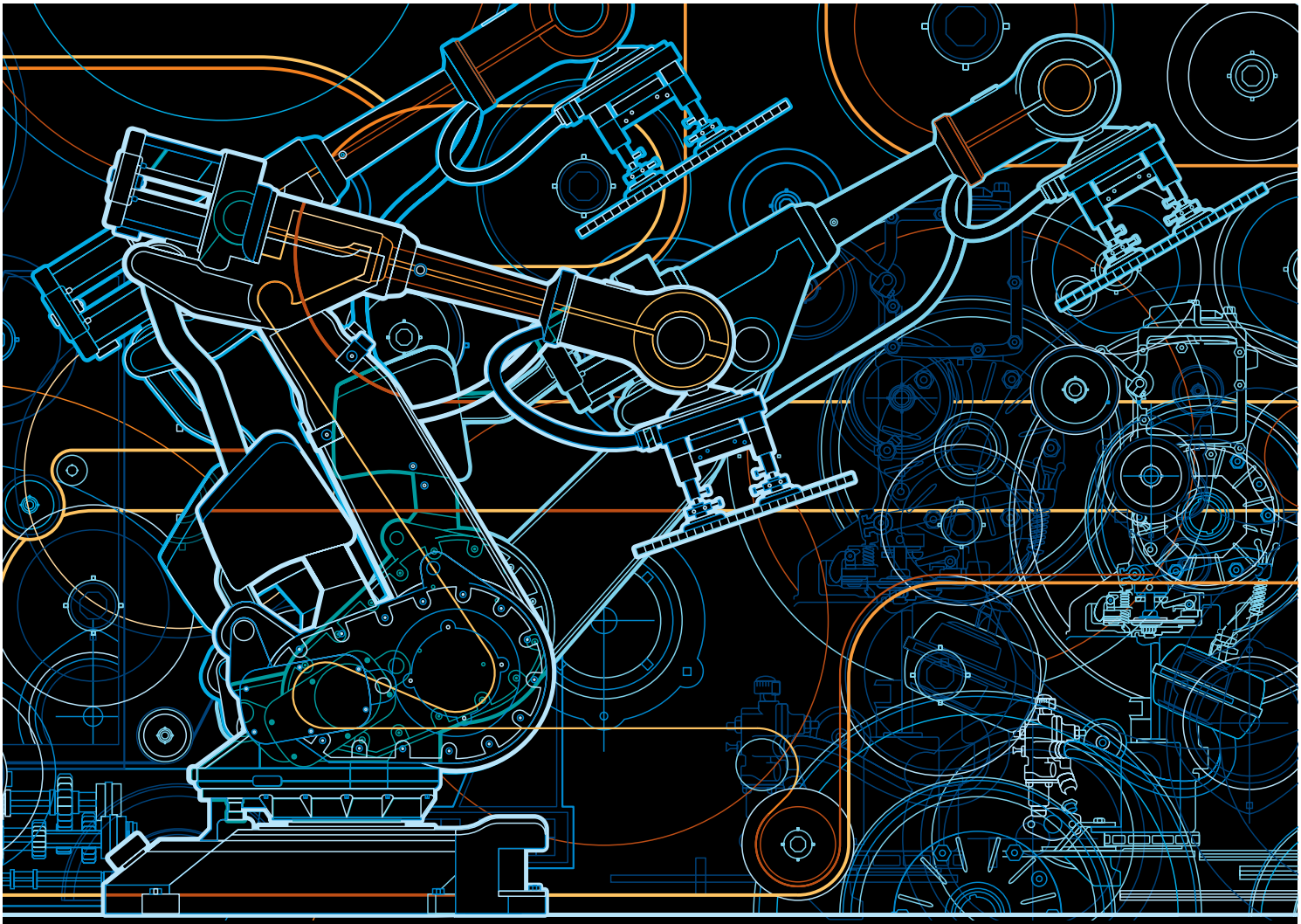
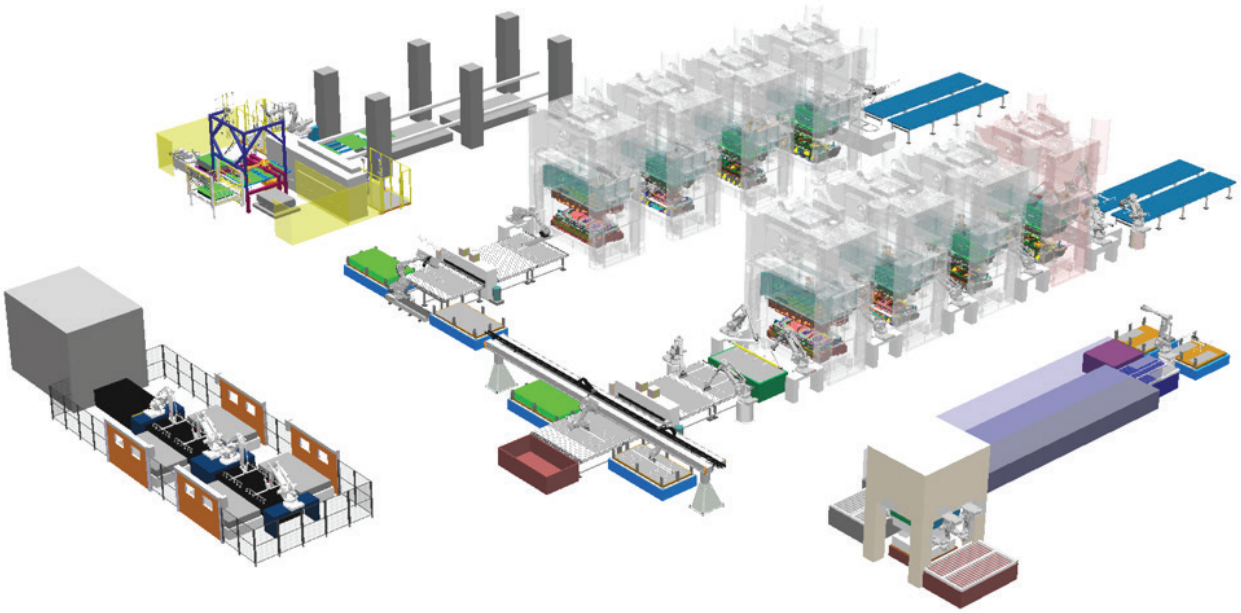


Robotics

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 automated the first linewith Doppin feeders in Sweden. ABB took over Volvo experience with its acquisition in 1998. The first robot automated 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 feeders and 3000 Robots.

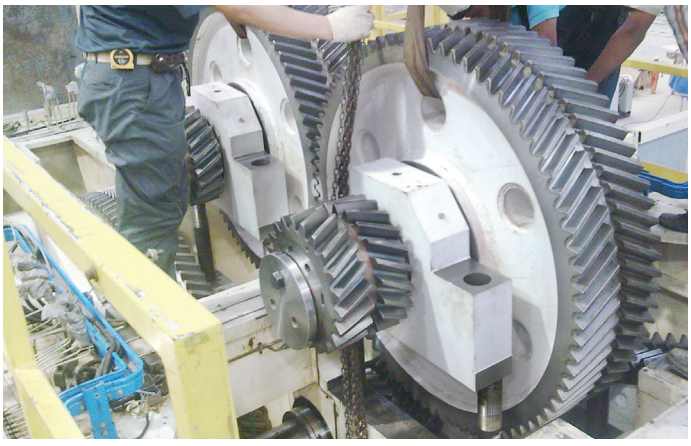
Turnkey projects based on proven products and solutions
ABB offers automation solutions for cold and hot stamping that follow market and technology drivers. They are based on products, pre-tested modular solutions.

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

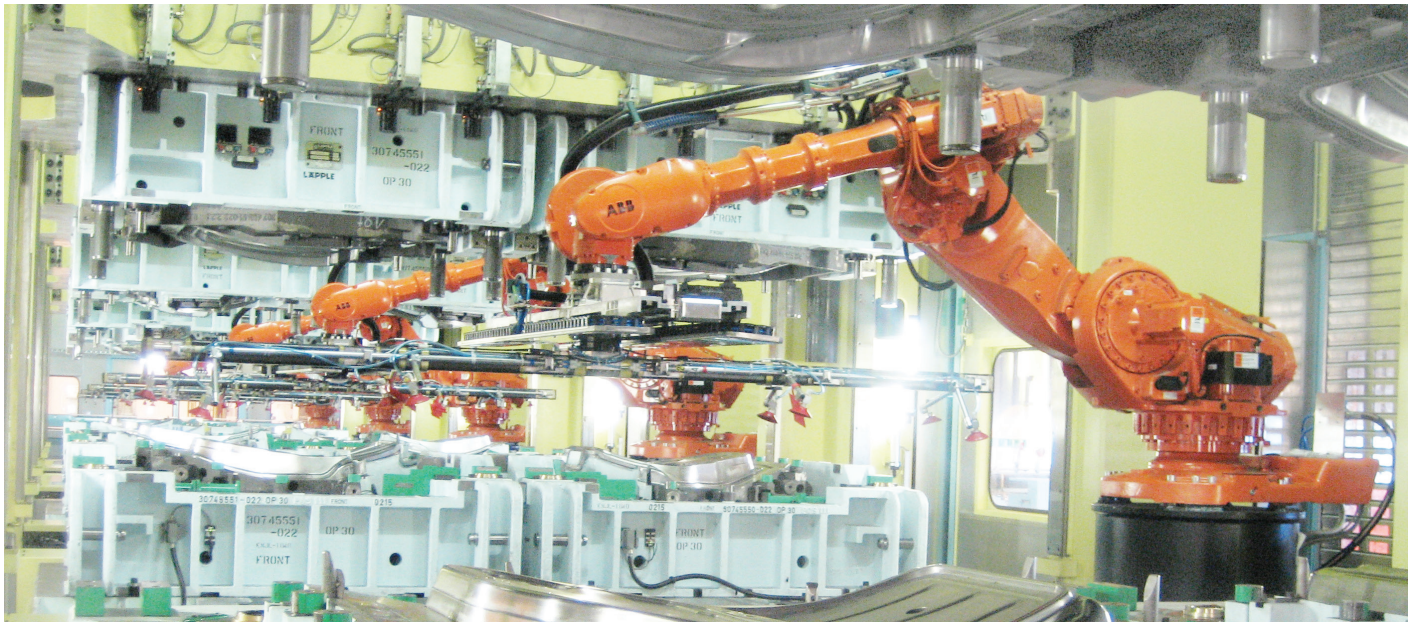
- Complete lines from Stack to Rack
- End-of-line including Quality Inspection and Racking Systems
- Hot stamping solutions
- Robotic stacking for blanking lines
- Press Motors and Drives, including servo-technology (DDC)
- Standard Package for automation of press cells (StampPack)

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

- Line control upgrades
- Press refurbishment and relocation
- Upgrade of presses to servo-technology (DDC)



The race for productivity
Looking at the complete cycle



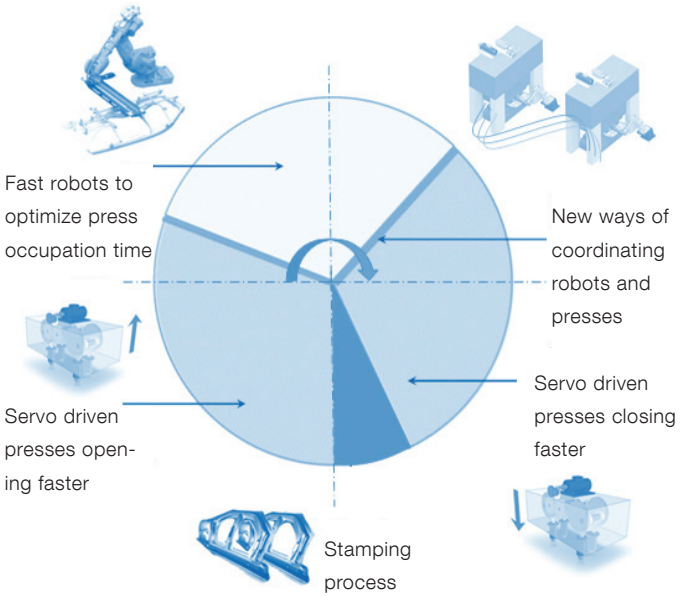
In order to obtain substantial improvements in press line productivity, we focus on every single factor of the production cycle: robots, presses and its coordination along the whole line.

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 axes distributed in two manipulators for a more efficient power distribution.

DDC -Dynamic Drive Chain
The DDC -Dynamic Drive Chain is a servodrive concept that allows new and exist presses to take full advanatges of servo-technology, obtaining significant reductions in press cycle times without compromising stamping quality.

Full line synchronization
Full line synchronization assures the optimum interaction of robot and press movements along the line.



Products and solutions

Since the Introduction of the worlds first commercially available electric robot in 1974, ABB has installed more than 200,000 robots. Robots are manufactured in America, Asia and Europe; sales & service operation centers are present in 53 countries and more than 100 locations.

6 axis robots

From the wide range of ABB portfolio, following models are specially well suited for press automation.




	IRB 4600	IRB 6650S	IRB 6660	IRB 7600
Load (Kg)	20 / 40 / 60	200 / 125 / 90	130 / 100	325 / 150
Reach (m)	2.50 / 2.55 / 2.05	3.00 / 3.50 / 3.90	3.10 / 3.35	3.10 / 3.50
Mounting	Floor, Tilted, Inverted	Shelf, Floor		

4 axis robots

4 axis robots provide fast cycles in case of limited re-orientation requirement



	IRB 460	IRB 660	IRB 760
Load (Kg)	110	180 / 250	450
Reach (m)		3.15	3.18

Products and solutions

7 axis robots

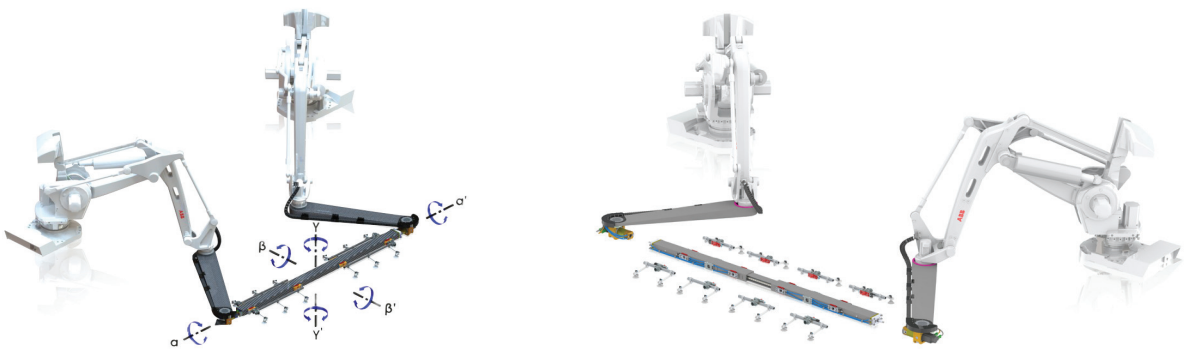
The benefits of traditional robot automation are enhanced by the addition of a 7th axis, specifically designed to provide a faster transfer as the parts are not rotated between presses.

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

	IRB 6660RX	IRB 6660FX	IRB 7600RX	IRB7600FX
Load (Kg)	75 / 70	50	85 / 80	100
Reach (m)	3.10 + 1.30 / 1.45	3.10 + 1.40	3.50 + 1.30 / 1.45	3.10 + 1.75
	Rotational 7th axis	Linear 7th axis	Rotational 7th axis	Linear 7th axis

TRX –Twin Robot Xbar

For 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)	150 (including part, crossbar and tooling)
Reach (m)	3.10 + 1.70

Products and solutions

Tooling

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

Carbon Fiber for structural components

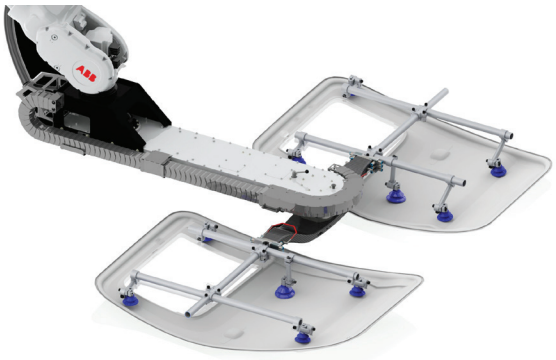
- Optimum stiffness/weight ratio
- Shape design: reduced tooling height to minimize press occupation
- Unified component for 6-axis and 7-axis robots
- Enabled for automatic tool change (ATC)
- Ergonomy: smaller tooling to be manipulated
- Less components and storage room
- For single and double parts

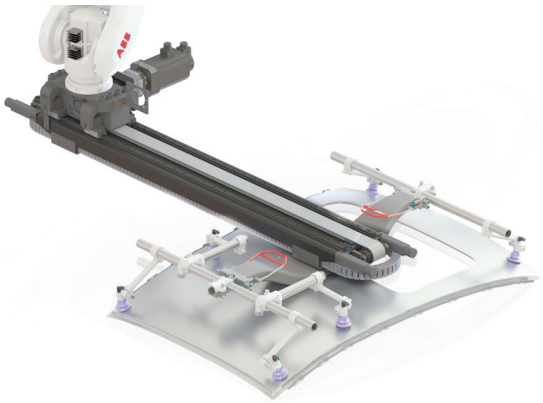
Software solutions -- Stampware

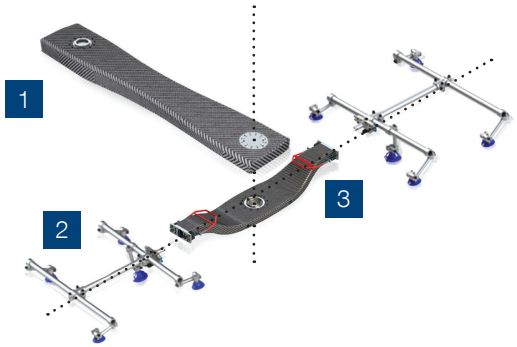
StampWare is a software package specifically designed for press robots and combines two powerful features:

- HMI (HumanMachineInterface) that allows control of the pressline for either a single robot to the complete line.
- Powerful and userfriendly programming wizard that makes the programming of new parts quick and easy.

Running in more than 1000 robots installed worldwide.







1. Carbon fiber Boom | 2. Aluminum branches | 3. Carbon Fiber “Gondola”

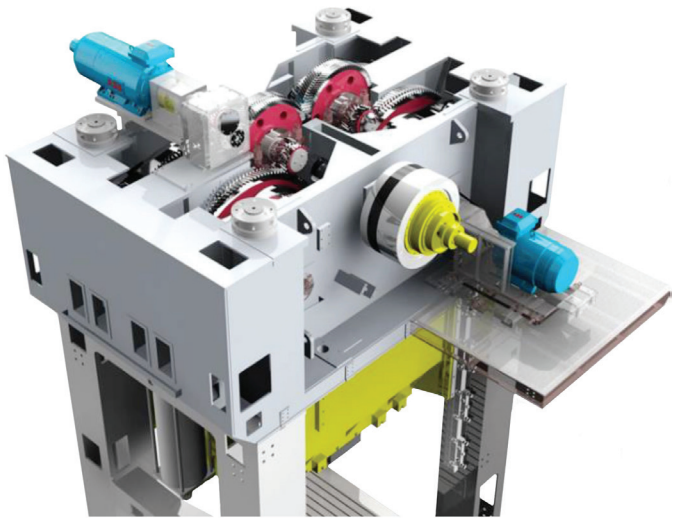
Graphical production window

Programming Wizard

Products and solutions

Press refurbishment
ABB covers both electrical and mechanical refurbishments, from simple repairs to complete turnkeys projects includes servo-technology with the DDC - Dynamic Drive Chain®.

DDC – Dynamic Drive Chain®
ABB capabilities in Press Motion include complete solutions on mechanical and electrical refurbishment from basic automation to complete turnkey projects as well as upgrading new and existing lines to servo-technology with the DDC – Dynamic Drive Chain®.
DDC is a 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 is a smart servo-technology that uses a servo-motor to open and close the press faster, while performing the stamping process with energy from the traditional flywheel. This reduces dramatically 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, the required power of servo-motor is minimized, respect the big powerful servo-motors required in traditional servo-technology.

Increased productivity
Production rate is increased by means of faster up and down movements, while the stamping speed is maintained. 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
DDC servo concept uses the traditional flywheel to store the stamping energy. This reduces dramatically the required power of the servomotor as well as the peak power demand from the power grid. The maximum power required is even further reduced by ABB‘s multi-drive plus DDC’s exclusive power limitation functionality, that enables 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 its kit concept. The kit consists of a drive, servomotor and gearbox allowing DDC to be installed during most planned factory shutdowns.

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