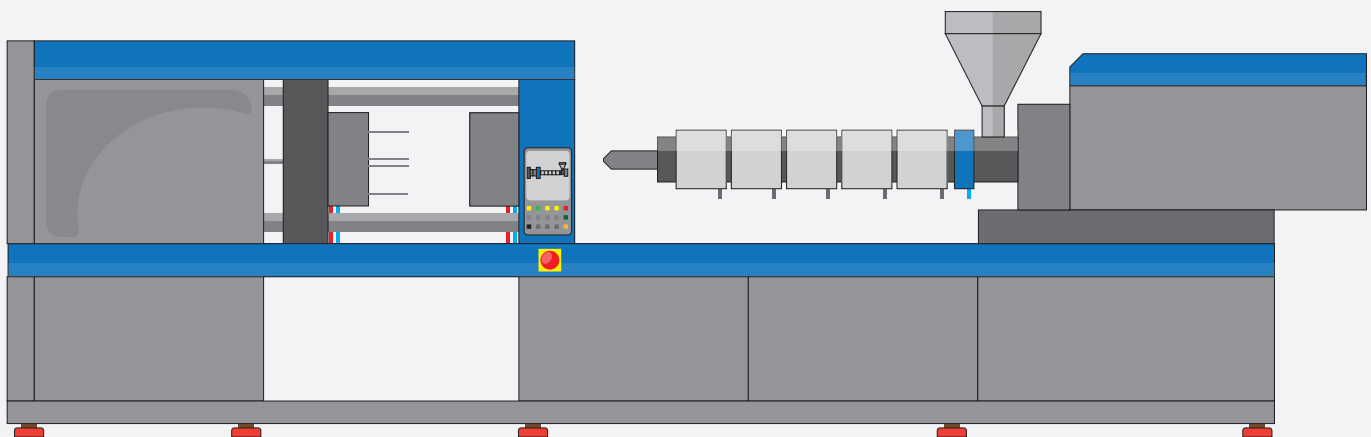
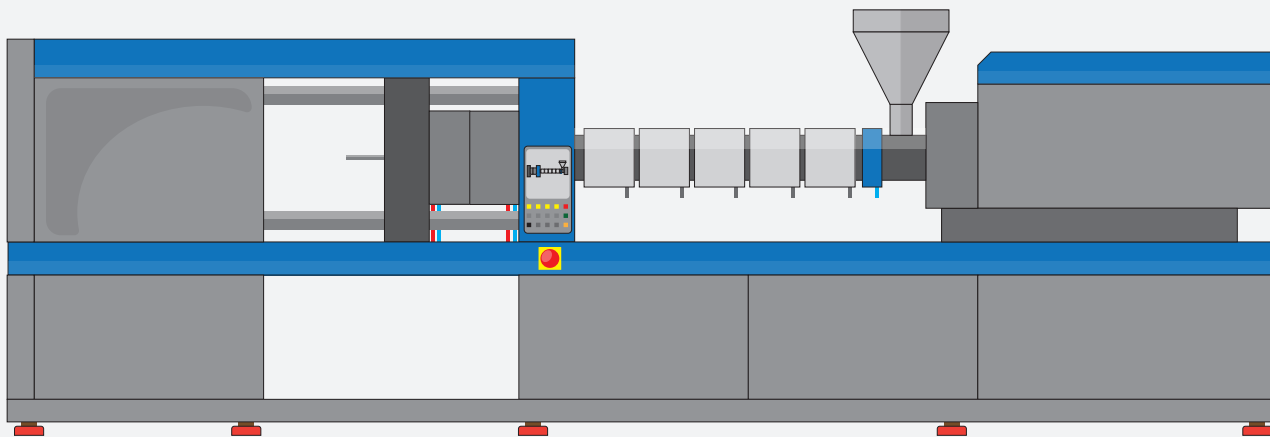


LOW VOLTAGE AC DRIVES

Maximize productivity of your plastic Injection Molding Machine IMM with ABB drives, motors and PLCs



- In addition to drives, we offer PLCs, HMIs and various motor solutions, making it easy to get all your machine needs from one supplier.

Plastic Injection Molding Machine (IMM)

Main motor screw movement and oil gear pump

No matter what type of injection molding machinery you use for building different kinds of products, you need the right automation system with efficient drives and motors that maximize reliability and output quality while meeting decarbonization and Net-Zero targets.

We supply a broad range of drives and motors that deliver excellent productivity and best-in-class energy efficiency. These systems enable fast machine setup and provide high torque down to zero speed, supporting high and long-term overload cycles throughout the process and in emergency situations. Our drives and motors are robustly designed

to withstand aggressive environments, such as those found in plastic processing plants, where dust and humidity are common. We support you throughout the automation and drive system design process to ensure the best solution for serviceability, with the lowest possible need for spare parts.





Reliable Starting

To overcome the friction of plastic material, especially when it is in a cold state, high torque from zero speed is needed during startup. SynRM motors, available in both air- and water-cooled types, can deliver full torque from zero speed thanks to our drives' DTC (Direct Torque Control) technology and best-in-class vector control.



Non-Stop Operation

You can rely on ABB drives and motors to keep your mixers, extruders, and all other plastic injection molding machinery running continuously, day after day. SynRM motors operate with lower bearing and winding temperatures, which increases reliability and extends maintenance intervals.



Superior Motor Control for Optimal Plastic Quality

SynRM technology motors, with encoderless open-loop control, provide highly accurate speed and torque control. This ensures that constant speeds are maintained, even under rapidly changing load torque requirements.



High Efficiency

The combination of SynRM technology with variable speed drive control offers superior efficiency across any speed range. Compared to a conventional AC motor and drive, this setup can reduce energy consumption by up to 2–4 percent. As a result, the payback time for the SynRM solution paired with ABB drives could be less than a year, while also helping meet decarbonization targets.



1 Main screw drive

Plastic injection molding machine

Advantages that our drives and motors bring to your plastic line:

1 2 Main screw drive and Oil gear pump

- Precise speed and torque
- High starting torque
- Drool/purge finishing mode
- Accurate current to torque ratio
- Load-sharing multi-motor co-blow-line mode
- Draw/pull ratio
- Torque limit
- Speed trim
- Load cell trim
- Load cell (line shaft)

Plastic Injection Molding Machine (IMM)

Cycling load during machine phases

The injection molding machine operates under high dynamic cycle loads, where repeatability and profile limits are essential for maintaining consistent product quality and optimal productivity. We offer a specialized plastic option designed for heavy and aggressive environments, featuring highly coated electronic boards.

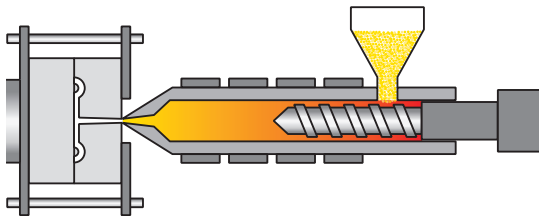
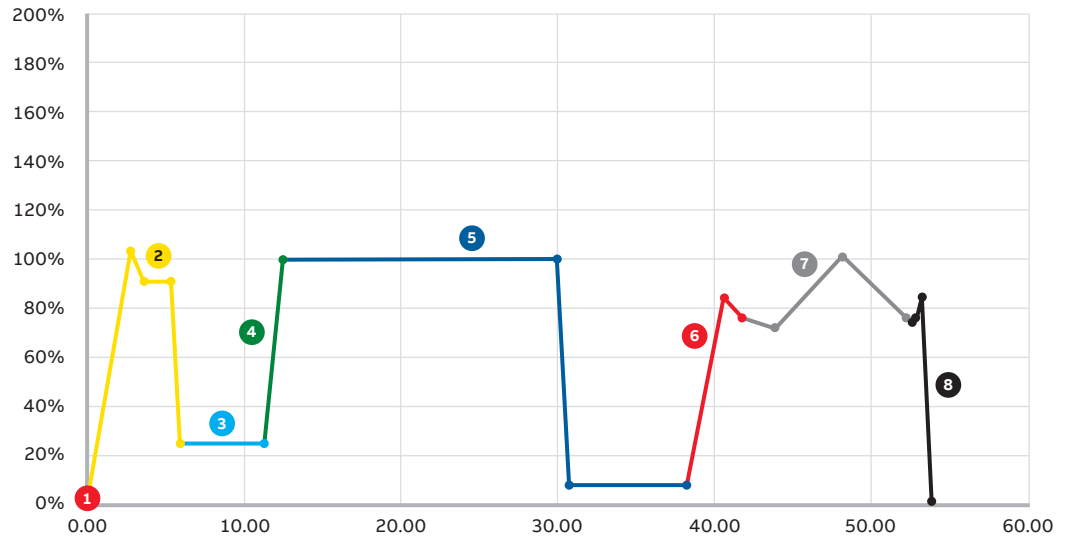
ABB Motion provides a wide range of drives, motors, and PLCs that offer the best flexibility in developing machine architecture. Safety functions can be integrated either into the drives themselves or into the automation system, compatible with all available fieldbuses.

At ABB, we are preparing to meet the latest energy efficiency demands and support decarbonization requirements from end-users. Our solutions help reduce energy bills and provide a rapid return on investment by meeting net-zero targets, contributing to a better customer environment.

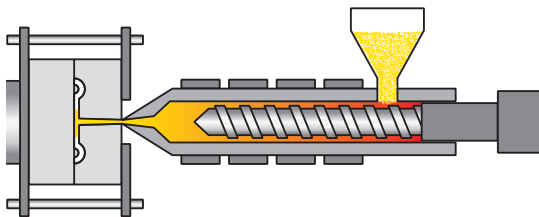


Machine phases:

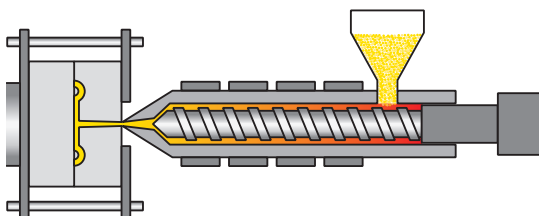
- 1 Mould close/clamping
- 2 Injection
- 3 Holding pressure
- 4 Charging/plasticising
- 5 Cooling
- 6 Mould open
- 7 Ejection
- 8 Ejector return and machine resumes to ready start. Idling time.

Actual 3rd party profiles**Stage 1 – Melting**

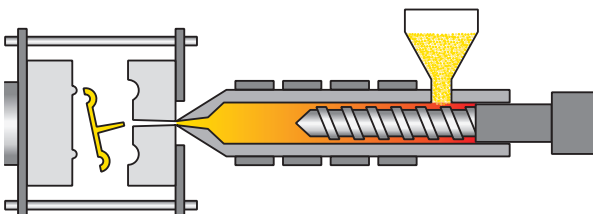
Material granules from the hopper feed into the heated barrel and rotating screw. The material is melted by heat, friction, and shear force, and then forced through a check valve to the front by the rotating screw.

**Stage 2 – Injection**

After being pushed backward by the shot of material at the front, the screw is forced forward by a hydraulic ram. This action injects material into the mold cavity within the closed mold tool.

**Stage 3 – Cooling**

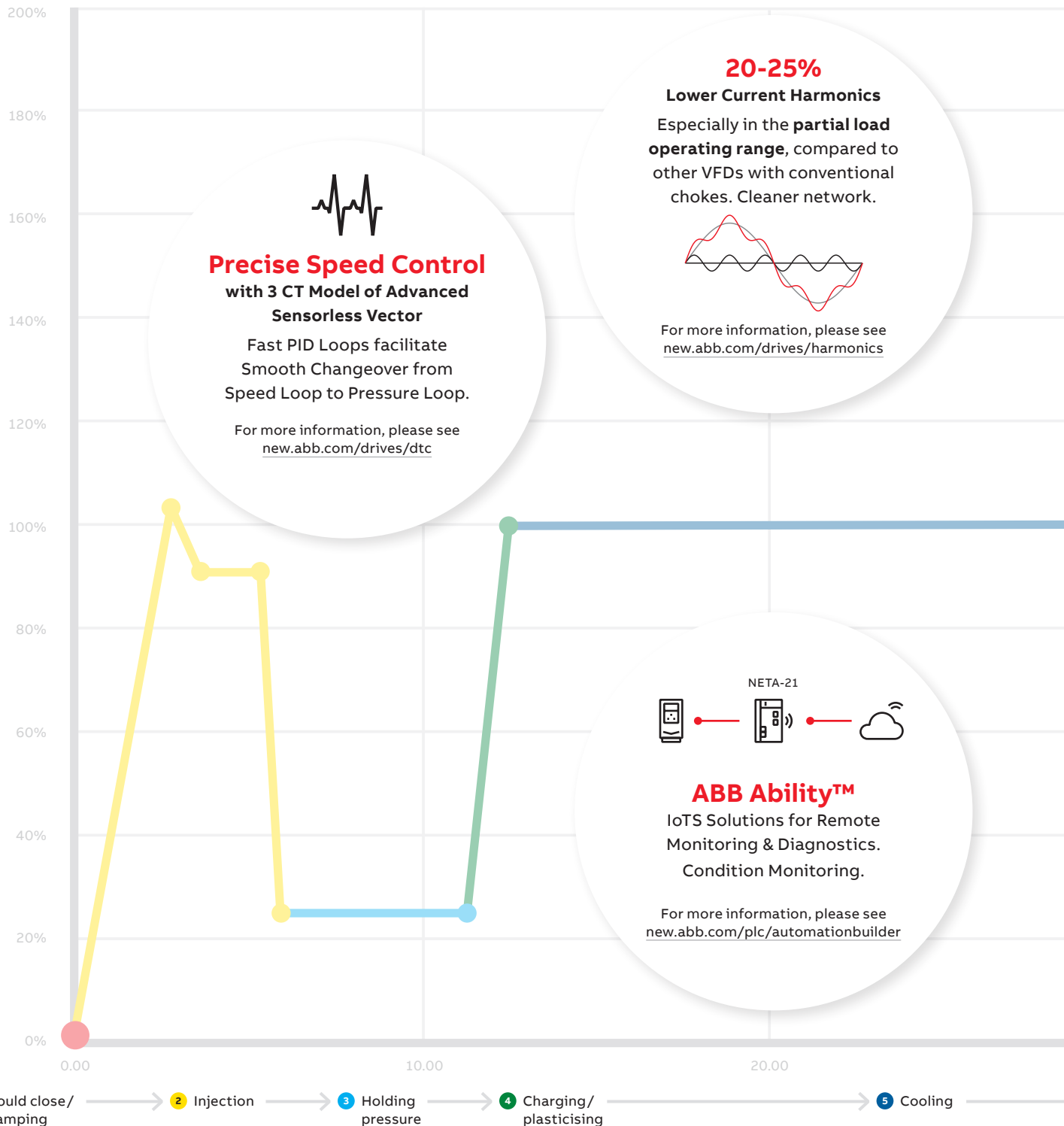
The tool is held closed under pressure until the plastic material cools and solidifies in the mold cavity. This is often the longest part of the injection molding process.

**Stage 4 – Ejection**

As the screw begins to move back for the next molding cycle, the tool opens and the finished plastic part is ejected. The tool then closes, and the injection molding process starts again at stage 1.

Unlock the full potential of your machines with ABB Products

Our drives series are "all compatible," meaning that once you learn to work with one series, you can work with them all from 0.25 kW up to 5 MW.



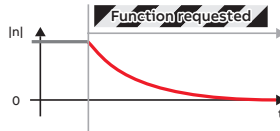


Simple automation
with ABB PLCs or integration
with most common fieldbuses

For more information, please see
new.abb.com/plc

Integrated STO

Safe Torque Off for implementing
safe machinery. **SIL 3, PL_e**



For more information, please see
new.abb.com/drives/functional-safety



**Drive Assistant
Control panels**

Easy commissioning
and operation.

For more information,
please see
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**ATEX certified
PTC Thermistor Support**

Optional CPTC-02 ATEX certified
PTC sensor.

For more information, please see
[new.abb.com/drives/segments/motors-
and-drives-in-potentially-explosive-
atmospheres/thermistor-protection-
modules-for-ac580-drives](http://new.abb.com/drives/segments/motors-and-drives-in-potentially-explosive-atmospheres/thermistor-protection-modules-for-ac580-drives)



Global Service Support

ABB Motion Services

We keep the world turning, while
saving energy every day.

For more information, please see
new.abb.com/contact-centers

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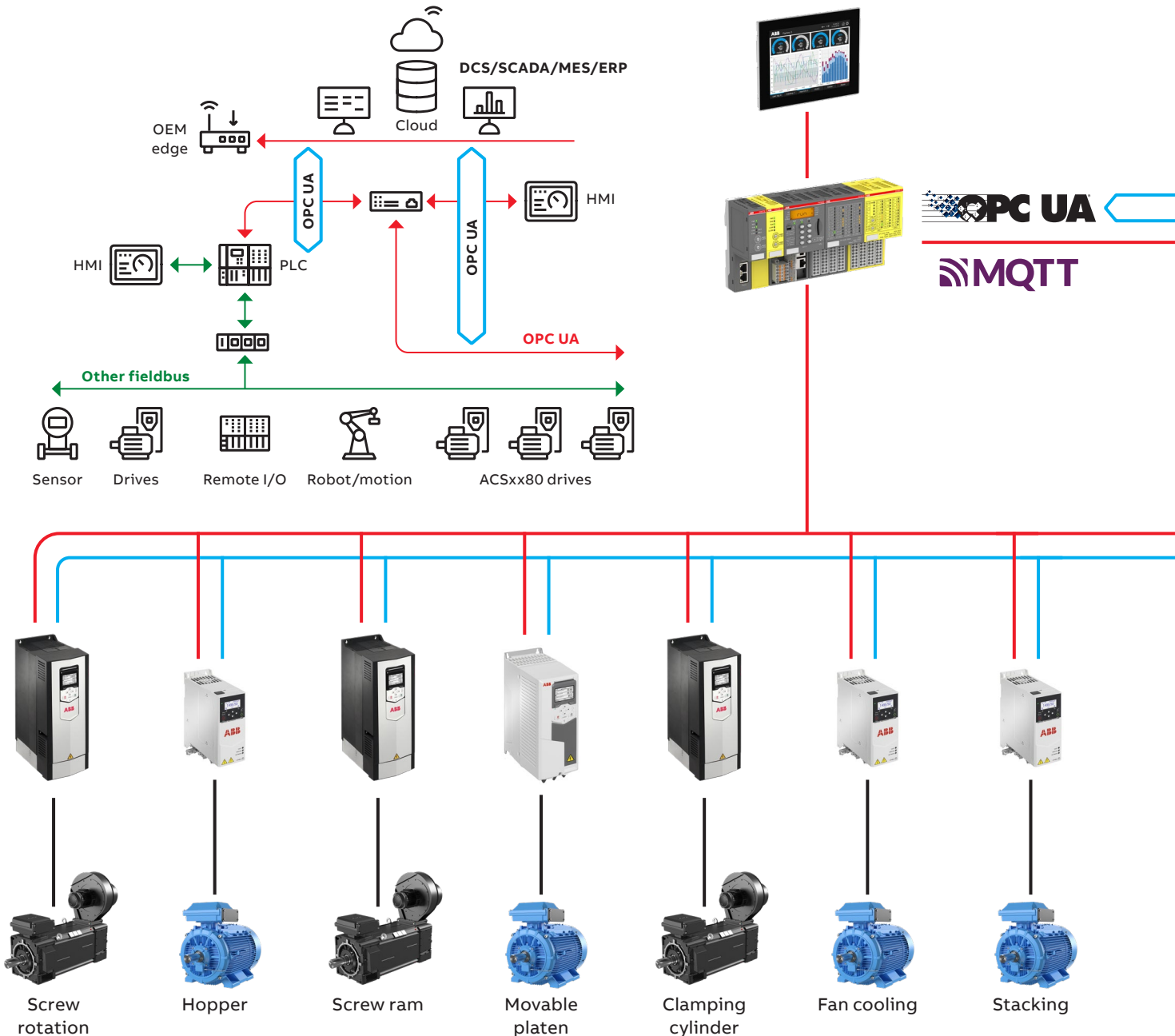


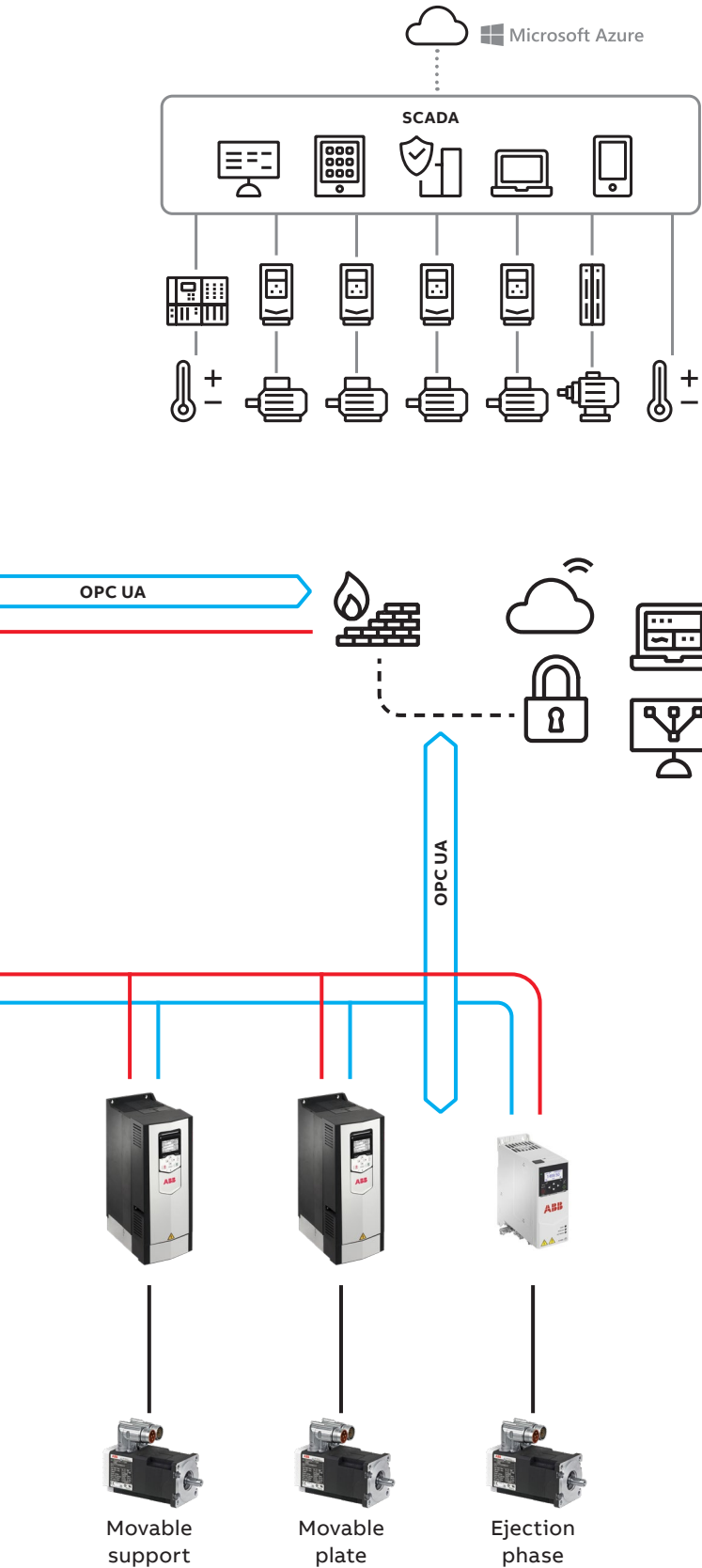
How everything is connected with IMM hybrid solution

Networked machinery for cloud-based services

Every motor, drive, and PLC in the woven sack and bag lines can be securely connected to cloud-based services, allowing easy access to component-level data. This helps detect component failures quickly and minimizes maintenance time, maximizing the productivity of your woven sack and bag lines.

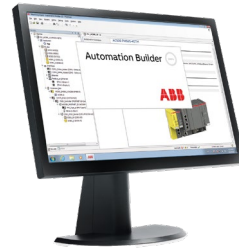
Direct connection between Drives and Cloud devices as DCS/SCADA/MES/ERP





Connecting the system to cloud-based services

All ABB motors and drives in the rubber line can be securely connected to ABB Ability™ cloud services according to cybersecurity standards. The connection can be established via our AC500 range of PLCs or by using third-party PLCs as a gateway to the cloud. ABB's all-compatible drives support all common fieldbus communications.



Automation Builder

ABB Automation Builder is an integrated software suite for machine builders and system integrators who want to automate their machines and systems efficiently. It combines the tools needed for configuring, programming, debugging, and maintaining automation projects in a common, intuitive interface. ABB Automation Builder covers the engineering of ABB PLCs, Safety PLCs, control panels, drives, motion, and robots.



PLC library for autotuning temperature control

The extruder's temperature regulation library can be programmed in our AC500 series PLCs or created with traditional solid-state relays.

- Direct connection OPC UA
- Trusted network
- - - - - Untrusted network
- Connection between devices

The motors and drives shown in this diagram are product samples for each application. Alternatives can be selected on a case-by-case basis, depending on the rubber line's requirements.

Selecting the right components

to maximize your plastic process productivity



ABB all-compatible drives for rubber line applications

- Our range of all-compatible drives shares the same user experience with similar software
- Motor control:
 - ACS880 drives with direct torque control (DTC) enable full motor torque across the speed range down to zero – no need for encoders or other feedback devices
 - ACS580 drives with the three-phase output current measurement ensure the best-in-class open loop motor control
 - ACS580 and ACS380 drives include scalar and vector control modes
- Wide range of fieldbus adapters enables connectivity with all major automation networks
- A wide range of drive control panels, from an easy-to-use Basic panel to the Connectivity panel that offers plug-and-play installation with secure and reliable wireless connection to the ABB Ability™ Digital Powertrain, the cloud-based condition monitoring portal for ABB drives
- Commission and troubleshoot drives remotely using smartphone or other mobile device with the Drivetune mobile app or Drive Composer PC tool for more comprehensive commissioning and maintenance Safety:
 - SIL 3 integrated safety, including safe torque off (STO) as standard
 - Optional plug-in module for ACS880 drives provides additional safety features
- Compact design for easy installation, commissioning and maintenance.



AC500 PLCs

Our AC500 range of PLCs allows you to develop even complex custom plastic line solutions with multiple inputs and outputs.



AC500-S safety PLCs

The AC500-S safety PLC offers a flexible platform for building plastic line safety. In plastic lines with several ABB drives, the AC500-S safety PLC can control the overall safety system, activating the drive-based safety functions over PROFINET/PROFIsafe.

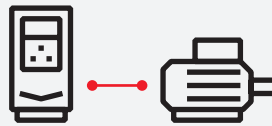


ABB drives and motors are even better together

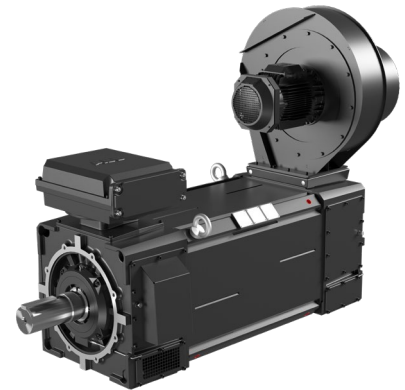
- Accurate motor and speed control, while maintaining superior safety and reliability. No need for additional certification testing of motor-drive combinations.
- One vendor standing behind its motor and drive package
- Optimized performance. No need to oversize. Designed to eliminate overheating concerns
- ABB software tools make selecting product combinations easy.

Large Power PM servo motors

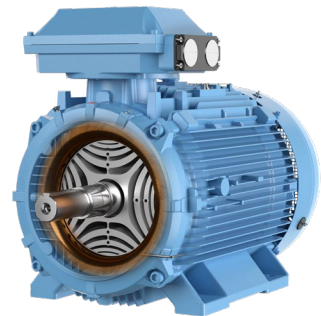
- High Efficiency: IE4 or IE5, Permanent Magnet servo motors
- Cooling method: water-cooled and fan-cooled
- Built-in position feedback: Resolver, Hiperface, Endat 2.1
- Compact design: high overload for high dynamic performance applications
- High constant torque: low current design to select smaller drives
- Power range: @400Vac – 8.8 to 141.4 kW – IEC frame sizes 90 to 132 – 1500...4500 rpm.

**High dynamic performance motors**

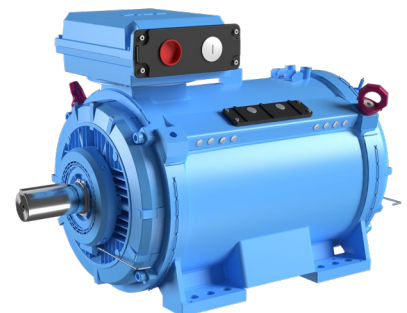
- Optimized for machine building
- Compact size with high power density
- Robust design for harsh environments
- Ideal for high-torque applications such as extruders
- Motors can be customized with a wide variety of options such as encoders, brakes and monitoring sensors
- Available in a power range from 2.2 to 2,000 kW, IEC frame sizes from 80 to 400 mm.

**Synchronous reluctance motors (SynRM)**

- Very high efficiency, up to IE5, reducing energy consumption and emissions
- Lower winding and bearing temperatures for improved reliability and extended lifespan
- Enhanced controllability for higher-quality extrusion with precise speed and torque control
- Quiet operation reduces noise in the plant, creating a better working environment
- Available in a power range from 5.5 to 350 kW, IEC frame sizes from 132 to 315 mm air- and water-cooled.

**Water-cooled motors**

- Completely noise-free solution for a location where cooling water is readily available
- Cooling efficiency is maintained throughout the speed range
- Compact size with high power density
- Available in a power range from 90 to 2,000 kW, IEC frame sizes from 280 to 500 mm.

**Process performance motors**

- High efficiency: IE class up to IE4
- Designed for durability in the most demanding environments and applications
- Can be individually designed to the exact demands of the application
- Available in a power range from 0.12 to 1,300 kW, IEC frame sizes from 71 to 500 mm with cast-iron body and IEC frame sizes from 56 to 250 mm with aluminum body.





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For more information, please contact
your local ABB representative or visit

new.abb.com/drives/segments/plastics-and-rubber

new.abb.com/drives

new.abb.com/motors-generators

new.abb.com/plc

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