

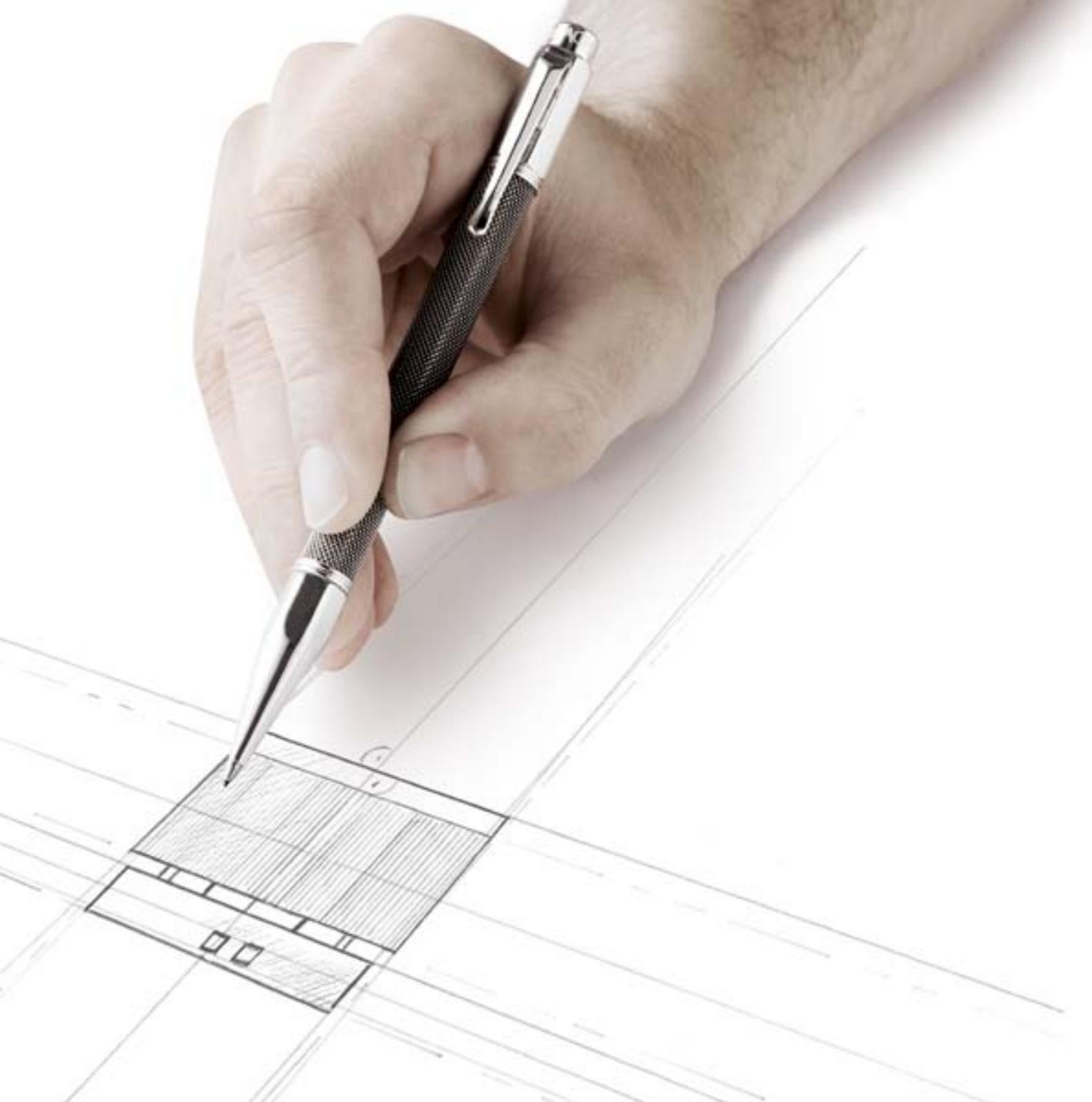
El-Exis SP

THE RACING MACHINE



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High speed sets the pace...

...because the trends that affect the production of packaging products are increasingly short-lived, complex and demanding. This applies to food and technical packaging, caps and closures as well as to technical high-precision components.

At Sumitomo (SHI) Demag we know that these requirements call for systematic evolution with a focus on ongoing improvement and with uncompromising reliability which will ultimately be more successful than revolution.

With El-Exis SP, we have written a new chapter in our success story of the El-Exis fast-cycling machine. Its unique drive concept has been tried and tested in more than one thousand high-performance machines all over the world. In close cooperation with our customers, we systematically advanced the El-Exis machine with a focus on those areas that really matter.

Hence, the El-Exis SP now offers higher filling dynamics, shorter injection times, maximum product quality and, last but not least, minimum cycle times. El-Exis SP stands for Speed Performance – because every millisecond counts!



El-Exis SP – Benefits at a glance

- Intuitive NCS control with colour touch screen; especially designed for injection moulding with unique functions for high-speed operation
- Maximum productivity through reliable machine engineering
- A position-controlled servo valve in combination with a high-resolution stroke measuring system on the stationary mould half delivers maximum dynamics and precision for maximum acceleration and precise process control.
- Rapid pressure reduction times thanks to the large, highly dynamic servo valves and active deceleration via a zero overlap valve (position control)
- Maximum plasticising capacity and melt homogeneity thanks to an independent electric screw drive
- Fast, more sensitive mould opening and closing because of the independent electric drive of the clamping unit
- Maximum flexibility thanks to a modular system for all fast-cycling, thin-wall and high-precision applications
- Low energy consumption thanks to parallel operation of hybrid drives and virtually loss-free force transmission
- Low-maintenance due to wear-free linear guidance even for high bearing loads
- Low noise level thanks to small-dimension, noise-insulated drive unit

El-Exis SP – The Racing Machine

Non-contact stroke measuring system
for maximum precision during injection, opening, closing and ejection

Active mould protection
detects malfunctions across the entire opening and closing stroke of the clamping unit, response times are reduced to a minimum thanks to active deceleration

Intuitive NC5 control
with a process-oriented user interface for comfortable setup, monitoring and documentation

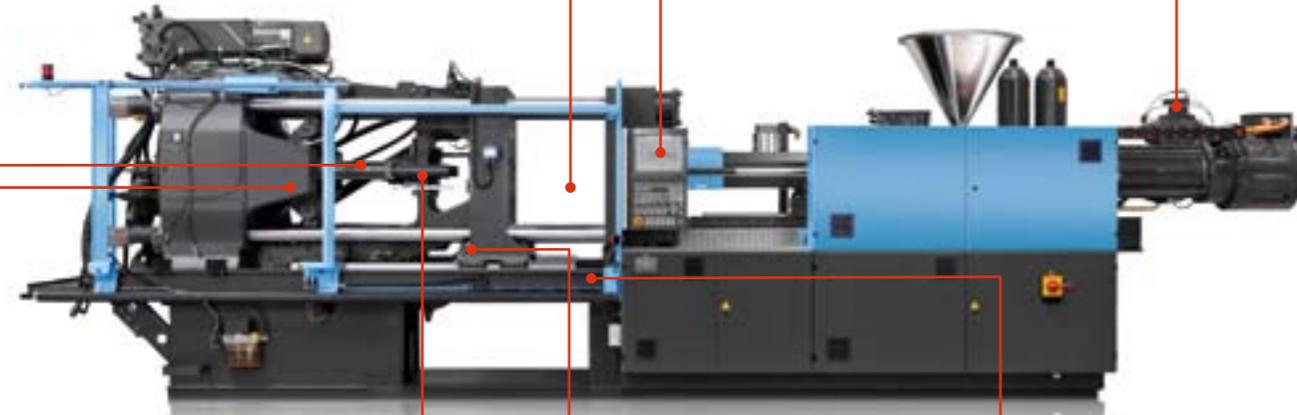
Servo valve
for highly dynamic injection

Independent electric screw drive
for parallel metering and a high metering capacity

Hydraulic central accumulator
bladder accumulator for high injection capacity

Cylinder changing system
with coded central connectors identifies the corresponding cylinder and adapts the process settings to the new screw diameter data

Independent servo drive
for independent clamping movement



Clamping unit
with frequency-controlled AC servo drive and hydrostatic transmission for dynamic acceleration of the 5-point double toggle

5-point double toggle
with optimized kinematics and computer-optimized deceleration and acceleration profiles provides maximum precision and energy efficiency

Linear guidance as standard
for the moving platen to ensure maximum precision, less mould wear and shorter cycle times

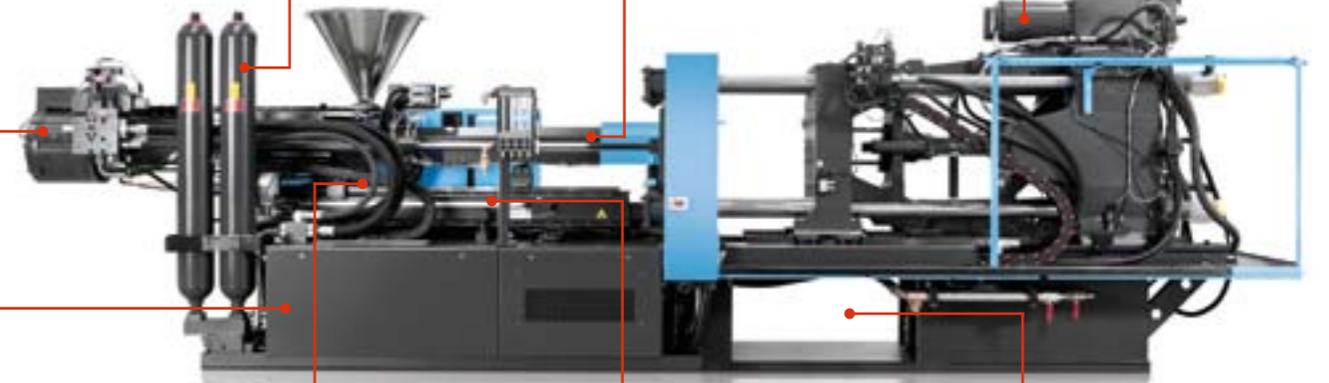
Reinforced machine base
Accuracy, stability and minimum deflection of the machine base

Smaller hydraulic pump
for loading the accumulator and for secondary movements, saves energy

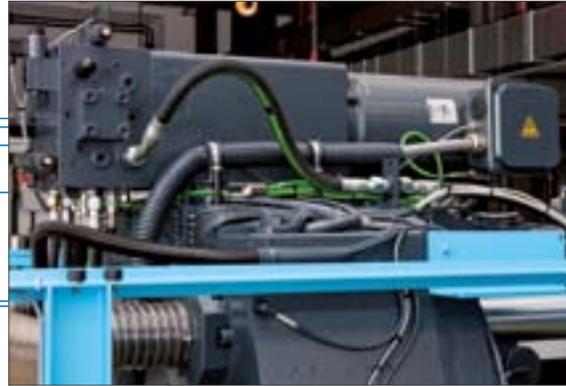
Proportional valve
for maximum dynamics and precision of secondary movements

Constant L/D ratio of the screw cylinder
(20:1 and 25:1) for even melt homogeneity, good colour dispersion and trouble-free changeover of injection cylinders

Wide delivery chute, open on three sides
for flexible material flow and easy integration of downstream components



Efficient production



Clamping unit of the EI-Exis SP

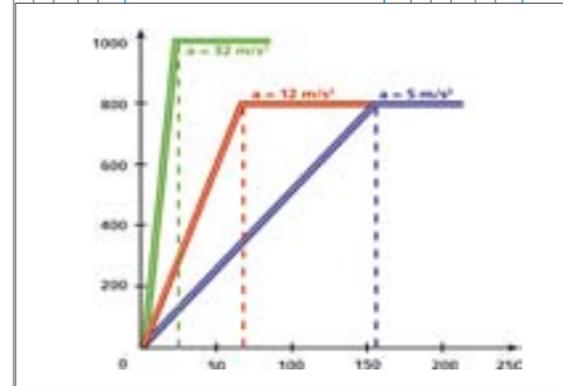


Figure Acceleration



Servo valve



Hydraulic accumulator and electric screw drive

Efficient and profitable

The hybrid drive concept

Velocity and dynamics are two essential factors that contribute to higher profitability with the EI-Exis SP. Its hybrid drive concept not only allows maximum movement speed on all driven axes, but the EI-Exis SP also achieves set velocities within minimum periods of time. This acceleration is the ultimate benchmark for thin-wall production because it is responsible for maintaining maximum velocity during the process, particularly during the injection phase.

Dynamics are not only important during acceleration, but deceleration also has to take place as quickly as possible. The large, highly dynamic servo valves of the EI-Exis SP lead to maximum performance: in order to achieve extreme injection times of 100 ms, the EI-Exis SP with 2,500 kN accelerates to 800 mm/s screw advance speed in about 25 ms. Switchover to hold pressure takes place in less than 35 ms. This way, minimum filling times can be achieved safely and with superior part quality.

In addition to its outstanding performance and reliability, the EI-Exis SP offers even more profitability thanks to low energy consumption. The direct electric drive is used in the high-capacity range and operates without loss of efficiency from intermediate gears or belts, and the clamping unit is moved by an electrically driven hydrostatic transmission and no additional control valves to avoid power loss. This approach saves energy.

In addition to this, the independent drive system provides maximum energy efficiency and allows the use of energy-efficient hydraulics to load the powerful hydraulic accumulator.

Efficient production



activeAdjust

activeAdjust

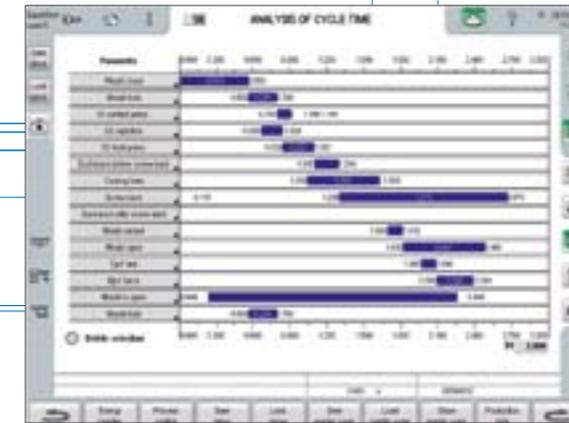
The new EI-Exis SP can provide customers with individual access to our control technology via activeAdjust. Machine operators can select the best controller profile via a simple slide control system without the need for external help. This approach is beneficial because the EI-Exis SP, which has been configured to cater to a wide variety of applications, can now be adapted to suit the product at hand. That means acceleration and deceleration ramps can be optimized to suit soft or hard machine operation, depending on the mould. This function reduces cycle times and increases the production capacity by between 3 – 5 %. Even the dynamics of the switchover from injection to holding pressure can be modified to meet the most exacting quality requirements.



Flexible machine operation

Flexible movements

With its independently driven axes, the new EI-Exis SP is ideal for parallel functions. This approach allows parallel metering during the clamping movement and nozzle approach. Injection prior to platen contact is part of the EI-Exis SP's optimized range of properties as well as ejector return just before platen contact. This way we save every last millisecond.



Cycle time analysis

Cycle time analysis

A well-structured cycle time analysis which is configured to cover all relevant machine functions helps optimize the overall process. In addition to machine availability, the cycle time is the most important criterion for the efficiency of packaging production processes. This function allows the analysis of production cycle time and its optimisation down to the last millisecond.



activeEcon

activeEcon

The activeEcon option is a tool for optimizing not only the cycle time but also the energy efficiency of the production process. The activeEcon option provides detailed measurements of the energy consumption of heating and drive systems and allows systematic improvements across all cycle phases. The system provides the actual energy values of the active production and displays them as reference values. An energetically optimized machine setting can be determined by means of a before-and-after comparison. The program automatically calculates the effects of the optimized settings on the overall production costs.

Efficient production



Active mould protection activeQ



Active mould protection activeQ+



Linear guidance

Precise and gentle on the mould

activeQ

The machine and mould are the most important investment factors in injection moulding. Damage to the mould is not only expensive, it frequently leads to production downtimes. We developed the activeQ and activeQ+ mould protection systems to eliminate this risk for our customers. Freely programmable monitoring of the envelope curve controls every individual point of the mould protection range.

With activeQ, machine operators can save a force curve (current state) for the ideal mould movement and superimpose it with a master curve. If the current force value exceeds the master force curve, which may be caused by a part that is stuck in the cavity, the clamping unit is actively stopped.

activeQ+

While activeQ is responsible for mould closing, activeQ+ offers an additional option for controlling mould opening. Stack moulds, slide moulds and others can be operated with maximum safety for all production equipment.

Linear guidance as standard

An extremely solid machine base is the cornerstone of all Sumitomo (SHI) Demag machines. Accuracy, stability and minimum deflection of the machine base under high load are our main objectives.

The linear guidance system of the moving mould platen has a wide guidance base and free guide pillars for minimum frictional loss and lubricant-free tie bars, platen parallelism is between 30 and 50 % lower than the recommended Euromap value. This technology reduces both the energy consumption and wear on the mould.

Modular system

Clamping force [kN]	Distance between tie bars [mm]	Injection units
2000	560 x 560	675 / 920 / 1600
2500	630 x 630	920 / 1600 / 2500
3000	720 x 720	920 / 1600 / 2500
3500	820 x 820	1600 / 2500 / 3000
4200	820 x 820	1600 / 2500 / 3000
5800	1020 x 1020	2500 / 3000 / 4200 / 6300

Modular options

Plasticizing systems

With its optimized design, the three-section screw is ideal for processing a wide variety of materials. Our tailor-made plasticizing range is comprised of screws with different L:D ratios with shearing and mixing sections, double-flighted screws and high-performance barrier screws which provides solutions for every customer requirement. Moreover, Sumitomo (SHI) Demag offers durable plasticizing systems for abrasive or corrosive materials. If required, we will also develop special customized solutions – our core competency.



Inmould-Labeling (IML)

The El-Exis SP can be upgraded with an optional in-mould labeling package. The machine has all the required interfaces for the integration of an IML line and supports machine operation with an open protection door on the side opposite the operator's side. A special IML production startup program allows machine startup without labels. All safety functions for IML operation such as safe signals for the activation of handling devices are provided. The air valves can be activated via IML automation.



Production of screw caps

A special package for screw cap production is also available as an option. A barrier screw with an L:D ratio of 25:1 provides the required metering capacity with sufficient back-up. A special non-return valve ensures safe processing and maximum repeat accuracy. The high reproducibility is supported by a cavity control function and an interface for optical inspection systems. A fast and powerful ejector ensures that shrunk caps are safely demoulded.

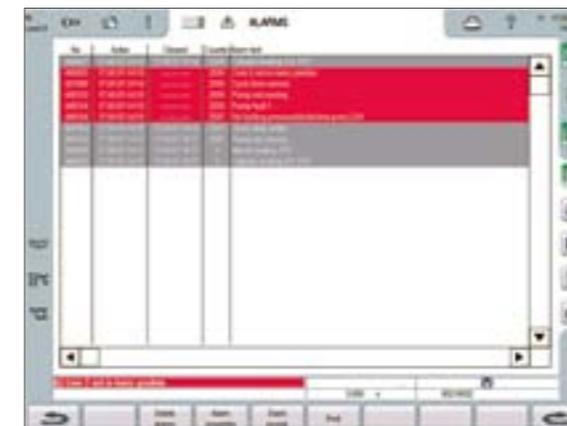


NC5 – The intuitive command centre

In all production process, the machine control is the most important HMI.

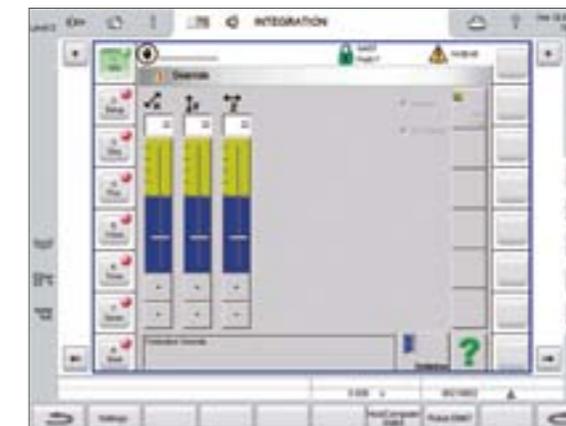
Hence, the standard NC5 control system for all machines is an essential part of Sumitomo (SHI) Demag's modular platform philosophy.

- The world connect remote maintenance module provides external access from trained experts.
- The optional module for connection to a central computer provides the connection to your production control centre.
- In "classic mode", the NC5 control system allows operators to change the screen back to the tabular mode of the former NC4 control. This way, operators can quickly familiarize themselves with the new system and save valuable time.
- The NC5 design's main objective is the visual display of the injection moulding process in an intuitive way, which allows easy touch screen control – this way, machine operation is made easy.
- User-defined screens, hot keys and the integrated control of peripheral equipment and special devices are additional highlights of the NC5 control system.
- Data and valuable process parameters are exchanged and stored via integrated USB interfaces.



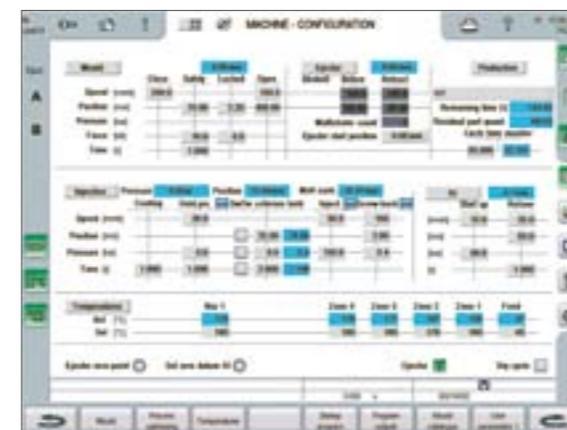
Extended alarm functions

Apart from listing alarms, additional information is provided on possible causes of malfunctions. In respect of certain alarm groups, the operator can define in what way the machine should react to the alarm.



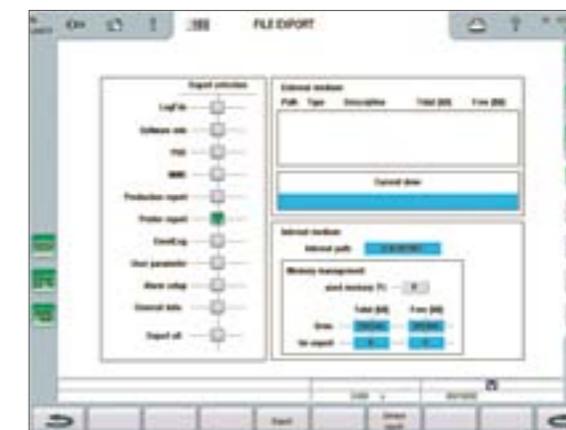
Connecting additional peripherals

The new VNC technology allows the integration and operation of a variety of peripheral devices into the NC5 control system. The control of the peripheral device only needs to be connected to the NC5 control.



Important process phases at a glance

The new page for machine settings provides a summary of important process phases and the specific parameters on one screen page. Any critical settings can be checked at a glance. Small graphic icons make it possible to transfer to the associated graphic operating screens.



Documenting, printing, storing

The NC5 permits convenient management of machine settings and data such as data from the mould and handling devices or complete machine setting data, and their storage on any data carrier via USB interface. Where frequent product changes occur, this will save time and money. All quality-related process parameters can also be stored locally or transmitted to a central computer.



*Cost-efficient and reproducible:
Screw cap production*



*Versatile multi-component production:
Ice cream tub*



*Precise and customized:
Bucket with handle and in-mould labeling*

The result counts...

...as much as the speed and efficiency with which this result is achieved. We have enhanced our unique hybrid drive technology with a focus on high performance and cost-efficiency. Maximum velocities, impressive dynamics and an increase of the plasticising capacity are only some of the performance enhancing characteristics of this new evolutionary stage. With this equipment, you are ready for fast, cost-efficient, energy-efficient and safe production.

Sumitomo (SHI) Demag has the expertise for all injection moulding projects: mould engineering, thin-wall, IML or multi-component techniques, machine configuration, production cells and complete lines. With our comprehensive end-to-end service, we will support you all over the world, from initial conception to large-scale production. In the end, your result counts.