tederic

KePlast.HMI.KVB

Visualization

KEBA i1000

User's manual V2.1

Table of Contents

1. Introduction

1.1 Purpose of the document

This document describes all masks of the KePlast.KVB visualization and principal operating sequences.

1.2 Target groups, pre-conditions

This document addresses the following group of people with the relevant pre-qualifications:

Target group	Required pre-qualifications
Machine setter	●Basic technical training or in-house training ●Knowledge in: ●safety instructions, ●working mode of machine or plant, ●setting options at the operating installations.
Machine operator	●In-house training ●Knowledge in: ●safety instructions, ●production process.
Service technician	Basic technical education (technical college or corresponding pro- fessional experience). Required knowledge: ●functioning of a SPS, ●Safety instructions, ●functioning of the machine or plant, ●diagnosis functions, ●analyzing and resolving machine errors

1.3 Notes on this document

This manual is integral part of the product. It is to be retained over the entire life cycle of the product and should be forwarded to any subsequent owners or users of the product.

Due to the program upgrade,subject to change without notice.

1.3.1 Contents of document

●Description of all masks of the visualization.

●Description of the principal operating sequences during the production process.

●Description of the principal operating sequences during machine adjustment

1.3.2 Not contained in this document

- Does not supply setting values for the injection molding machine.
- Does not describe the installation and programming of the KePlast HMI KVB visualization.
- Does not describe sequence of injection molding process

2. Safety Notes

2.1 Representation

At various points in this manual you will see notes and precautionary warnings regarding possible hazards. The symbols used have the following meaning:

DANGER!

- **indicates an imminently hazardous situation which will result in death or serious bodily injury if the corresponding precautions are not taken.**

WARNING!

- **indicates a potentially hazardous situation which can result in death or se- rious bodily injury if the corresponding precautions are not taken.**

CAUTION!

- **means that if the corresponding safety measures are not taken, a potentially hazardous situation can occur that may result in property injury or slight bodily injury.**

CAUTION

- **CAUTION used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in damage to property.**

- **This symbol reminds you of the possible consequences of touching electrostatically sensitive components.**

Information

Useful practical tips and information on the use of equipment are identified by the "Information" symbol. They do not contain any information that warns about potentially dangerous or harmful functions.

2.2 General safety instructions

WARNING!

The system (hardware and software) only meets category B according to EN ISO 13849-1. Thus it is not intended for usage in safety-relevant control ap- plications in the field of personal safety (e.g. emergency stop).

To implement potentially necessary safety-relevants control tasks, always use additional external safety devices according to EN ISO 13849-1 that are intended for the particular purpose and meet the necessary functional safety.

For further information see EN ISO 13849-1 and refer to chapter "EC directives and standards" in the manuals for a list of norms applying to the product.

The safety notices for the installation and commissioning of the product can be found in the user manuals of the components or in the system manual and must be read and observed before installation or commissioning.

The user manual must be kept throughout the entire service life of the product.

WARNING!

- **This document serves as template for the machine manufacturer.**
- **Prior to transfer to the machine operator the contents of this document must be adjusted to the injection molding machine on which the system is used.**
- **The machine manufacturer must insert safety instructions at the relevant positions in the document.**

3. Operation and display

This chapter describes the following topics:

- Basic layout
- Mask hierarchy
- Key assignments on the panel
- Tabs
- Quick access panel
- Configuration of favourite masks

3.1 Basic layout

The basic layout represents the basic framework of the display and operation. It contains basic operating elements (e.g. navigation elements, status displays,...) and is permanently visible on the screen. The display of the operation masks occurs within the basic layout.

Fig.3-1: Basic layout of the HMI

... Status bar	... Display area for masks
... Operating masks	... Function keys of the operating

3.1.1 Status bar

A status bar is displayed at the top and bottom section of the basic layout. The representation of the status bar depends on the resolution of the operating panel that is used.

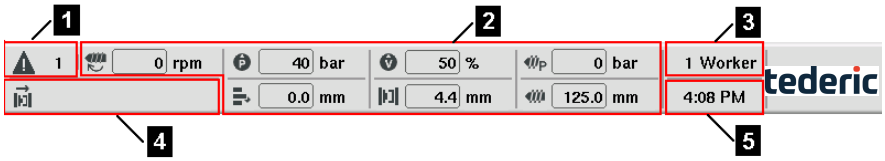


Fig.3-2: Top status bar for resolution 800x600

... Alarm information. If an alarm or warning appears an alarm line is fade in. The alarm line disappears by pressing the alarm button on the operation panel. After that an icon signalizes that an alarm or warning is currently acitve. The number next to the icon shows the number of warnings/alarms that are currently active. A grey icon signalizes a warning. A red icon signalizes an alarm. The number that is part of the icon shows the alarm class.	... Display of the actual system pressure, actual system velocity (% of the maximum pump ve- locity), actual inject pressure, acutal ejector position, acutal mold position. acutal screw position and acutal screw revolution.
... Current user / user level that is logged in.	... The currently active movements are displayed. There are two different modes how to display the active movements. Either just an icon or an icon
... Current time	

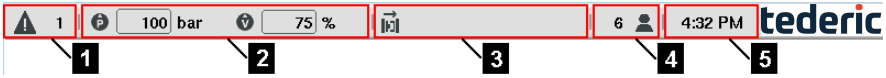


Fig.3-3: Top status bar for resolution 800x480

... Alarm information. If an alarm or warning appears an alarm line is fade in. The alarm line disappears by pressing the alarm button on the operation panel. After that an icon signalizes that an alarm or warning is currently acitve. The number next to the icon shows the number of warnings/alarms that are currently active. A grey icon signalizes a warning. A red icon signalizes an alarm.	... Display of the actual system pressure and actual system velocity (% of the maximum pump velocity).
... The currently active movements are displayed. There are two different modes how to display the active movements. Either just an icon or an icon + short text. The setting can be done in mask "**Display settings**"	... Current user level that is log- ged in.
... Current time	

At the bottom section of the basic layout, a second status bar is displayed. The following figure shows the information fields contained therein.

Fig.3-4: Bottom status bar

1	... Status icons (e.g. Heater on/off, Motor on/off, etc.).
2	... Plausibility limits for the actual selected input field.

3.1.2 Status Icons

The following table provides an overview of the possible status icons.

Icon	State
	Automatic cycle active
	Half automatic cycle active
	Manual mode active
	Setup mode active
	Motor on
	Nozzle heating on
	Lubrication active

	Mold heating on
	Control center (EasyNet or T.I.G. production control station) conneted
	Remote- HMI connection active

3.1.3 Active Movements

This section presents a graphic depiction of the currently executed movements of the machine.

The following table provides an overview of the possible movement icons.

Icon	State
	Mold close
	Mold open
	Mold close up to interposition
	Mold open up to interposition
	Air valve active including air valve number
	Cooling active
	Core in including core number
	Core out with display of core number
	Ejector backward
	Ejector forward
	Automatic mold height adjustment
	Mold height adjustment backward

	Mold height adjustment forward
	Mold height adjustment during production
	Nozzle backward
	Nozzle forward
	Shut-off nozzle close
	Shut-off nozzle open
	Close safety door
	Open safety door
	Screw forward, inject
	Screw backward, decompression
	Inject hold
	Screw forward up to interposition
	Screw backward up to interposition
	Rotate screw, plastisize
	Cold drop
	Intrusion

3.1.4 Mask navigation

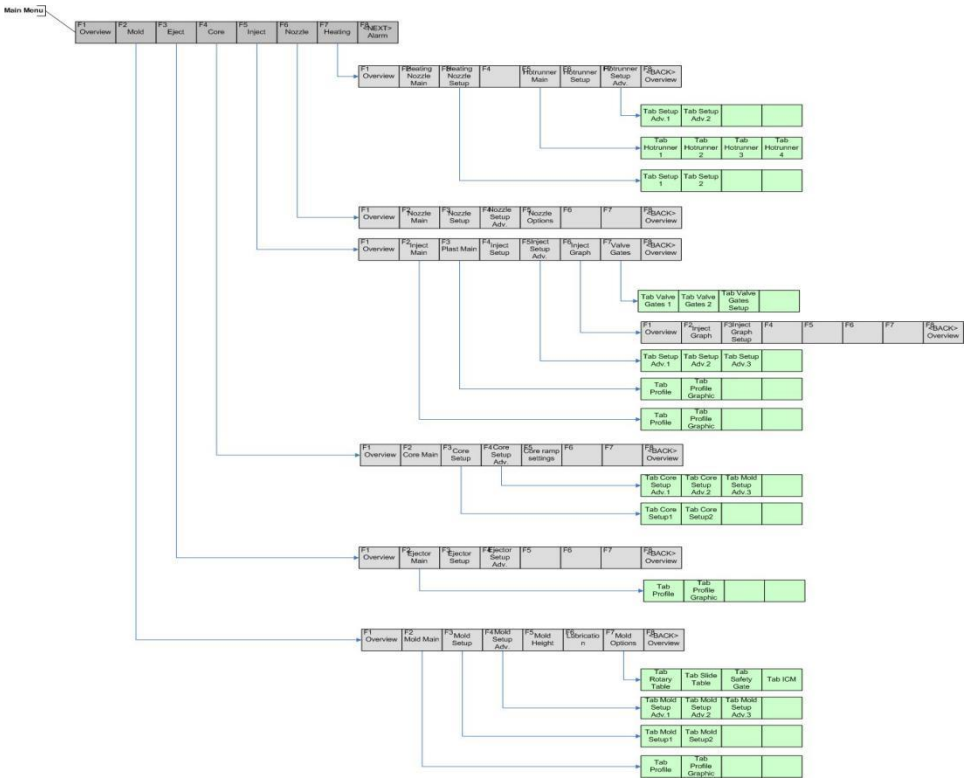
At the bottom of the basic layout, the mask navigation is located. Behind a mask, several other masks can exist which are in context with the superior mask. There are different styles for displaying the mask buttons available.

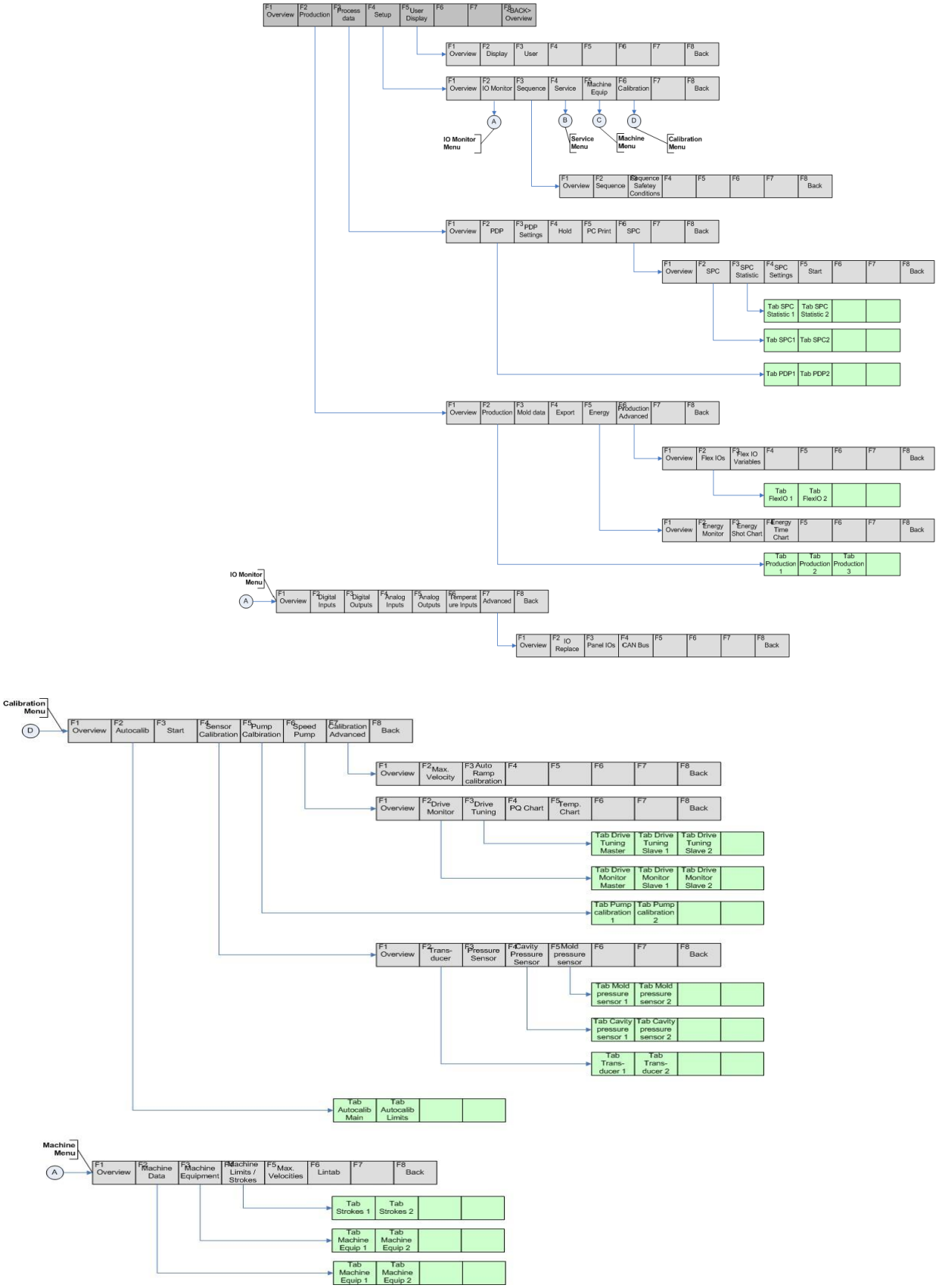
Icon	Description

Mold	Text
	Icon
	Icon before text
	Text before icon

The styles can configured in mask "**Display settings**"

3.2 Mask hierarchy




F1 Overview
F2 Production
F3 Process data
F4 Setup
F5 User Display
F8 BACK> Overview
F2 Display
F3 User
F2 IO Monitor
F3 Sequence
F4 Service
F5 Machine Equip
F6 Calibration
IO Monitor Menu
Service Menu
Machine Menu
Calibration Menu
F2 Sequence
F3 Sequence Safetey Conditions
F2 PDP
F3 PDP Settings
F4 Hold
F5 PC Print
F6 SPC
F2 SPC
F3 SPC Statistic
F4 SPC Settings
F5 Start
Tab SPC Statistic 1
Tab SPC Statistic 2
Tab SPC1
Tab SPC2
Tab PDP1
Tab PDP2
F2 Production
F3 Mold data
F4 Export
F5 Energy
F6 Production Advanced
F2 Flex IOs
F3 Flex IO Variables
Tab FlexIO 1
Tab FlexIO 2
F2 Energy Monitor
F3 Energy Shot Chart
F4 Energy Time Chart
Tab Production 1
Tab Production 2
Tab Production 3
IO Monitor Menu
F2 Digital Inputs
F3 Digital Outputs
F4 Analog Inputs
F5 Analog Outputs
F6 Temperature Inputs
F7 Advanced
F2 IO Replace
F3 Panel IOs
F4 CAN Bus
Calibration Menu
F2 Autocalib
F3 Start
F4 Sensor Calibration
F5 Pump Calibration
F6 Speed Pump
F7 Calibration Advanced
F2 Max. Velocity
F3 Auto Ramp calibration
F2 Drive Monitor
F3 Drive Tuning
F4 PQ Chart
F5 Temp. Chart
Tab Drive Tuning Master
Tab Drive Tuning Slave 1
Tab Drive Tuning Slave 2
Tab Drive Monitor Master
Tab Drive Monitor Slave 1
Tab Drive Monitor Slave 2
Tab Pump calibration 1
Tab Pump calibration 2
F2 Trans-ducer
F3 Pressure Sensor
F4 Cavity Pressure Sensor
F5 Mold pressure sensor
Tab Mold pressure sensor 1
Tab Mold pressure sensor 2
Tab Cavity pressure sensor 1
Tab Cavity pressure sensor 2
Tab Trans-ducer 1
Tab Trans-ducer 2
Tab Autocalib Main
Tab Autocalib Limits
Machine Menu
F2 Machine Data
F3 Machine Equipment
F4 Machine Limits / Strokes
F5 Max. Velocities
F6 Lintab
Tab Strokes 1
Tab Strokes 2
Tab Machine Equip 1
Tab Machine Equip 2
Tab Machine Equip 1
Tab Machine Equip 2

3.3 Key assignments on the panel

The following table provides an overview of the keys on the operating panel.

3.3.1 Function keys

Key	Description
F1 up to F8	Function keys used for operating the main menu in the mask.

3.3.2 Numerical /alpha-numerical keypad

With input fields for numbers these keys will return only numbers when acti- vated. With input fields for text they will first return the letter and then the number (A, B, C and 7).

Fig.3-5: Keypad 'Numerical /alpha-numerical keys'

Key	Description
←	Delete

3.3.3 Arrow key pad

The arrow keys are used to navigate to the required input fields in the masks:

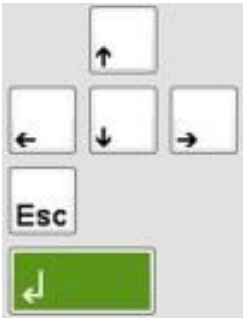


Fig.3-6: Keypad 'Numerical /alpha-numerical keys'

Key	Description
	Escape
	Enter

3.3.4 Keys for setting the operating mode

Key	Operating mode
	Manual mode (LED illuminates, if this operating mode is active)
	Set-up mode (LED illuminates, if this operating mode is active)
	Semi-automatic (LED illuminates, if this operating mode is active)
	Full automatic (LED illuminates, if this operating mode is active)

3.3.5 Further Keys operating the injection molding machine

Key	Description
	Open mold
	Close mold
	Move ejector backward
	Move ejector forward
	Move core1 out
	Move core1 in
	Activate sirvalve
	Close safety gate
	Open safety gate
	Inject
	Plasticize
	Decompression
	Move nozzle forward
	Move nozzle backward

Key	Description
	Activate heating (LED illuminates if heating is on)
	Activate motor (LED illuminates if motor is on)
	Confirm alarm (LED illuminates if an alarm is pending)

3.4 Tabs

Some masks contain tabs. Tabs are displayed in the right top corner of a mask. A mask can contain a maximum number of 4 tabs.

You can toggle between the tabs by pressing the corresponding function key (F1...F8) of the current displayed mask.

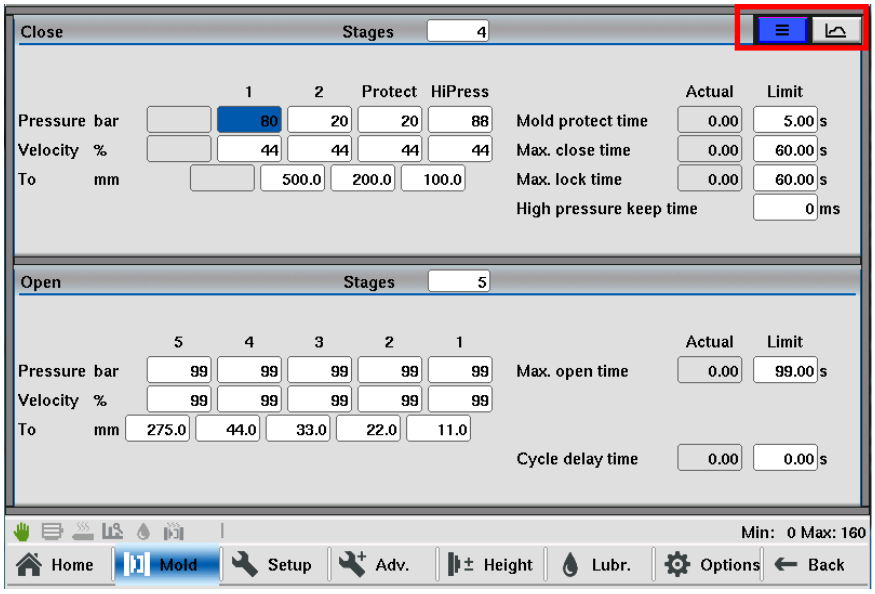


Fig.3-7: Tabs

3.5 Quick access panel and favourite masks

Key "**Esc**" 

opens a quick access panel at the bottom of the display area and shows the currently stored favourite buttons.

Information

Quick access panel only opens when no value entry is currently active.

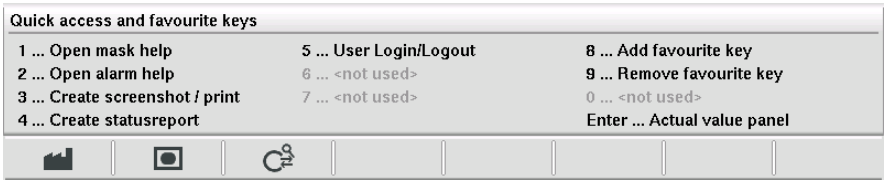


Fig.3-8: Quick Access Panel including favourite masks

1	...	Quick setting functions
2	...	Favourite bar including configured favourite masks

Information

A favourite mask is opened by pressing the function keys F1...F8.

Every user level has its own favourite bar. Only the favourite masks that have been configured for the current user are displayed.

The Quick access panel allows to execute following operations

Open actual value panel

Open mask help

Open alarm help

Creating a screenshot of the current mask resp. print current mask

Creating a status report

Open dialog for user login and logout

Adding and removing favourite masks

3.5.1 Actual value panel

Pressing key "**Enter**"  when quick access panel is visible, opens a panel at the top of the display area which shows the current actual values of the machine.

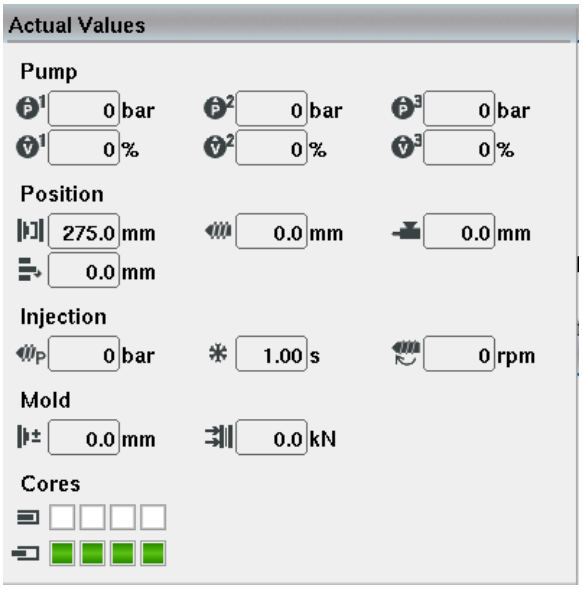


Fig.3-9: Actual value panel

Depending on the equipment of the machine, the actual value panel shows following values.

Icons	Description
	Actual system pressure
	Actual system velocity
	Actual oil temperature
	Actual mold position
	Actual screw position
	Actual nozzle position
	Actual ejector position
	Actual inject pressure
	Actual cooling time
	Actual plasticize revolution
	Actual mold height
	Actual clamp force
	Actual cavity pressure
	Shows if core is in
	Shows if core is out

3.5.2 Opening mask help

The visualization is equipped with a mask help which offers a description for every operating mask. Pressing key **1** when quick access panel is visible, opens the mask help for the current mask. In the mask help the buttons <Arrow up> and <Arrow down> are used for scrolling. Buttons <Arrow left> and <Arrow right> are used to scroll

through the help pages. Button <Back> is used to quit the mask hHelp and return to the mask that was open last.

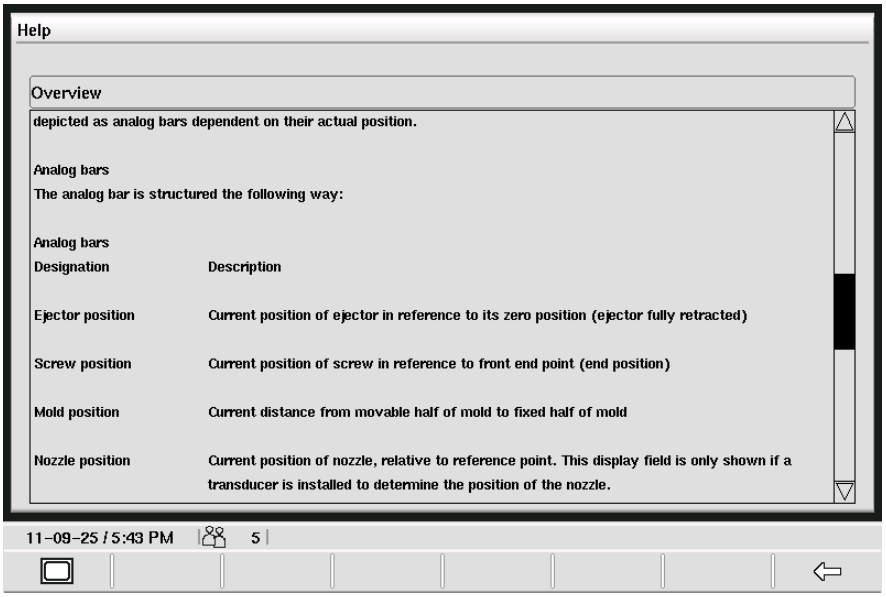


Fig.3-10: Online Help of a mask

3.5.3 Opening alarm help

Information

Precondition that alarm help gets displayed is that alarm mask is open. The alarm help refers always to the current selected alarm in alarm help mask.

The visualization is equipped with an alarm help which offers a description for most alarms. Pressing key **2** when quick access panel is visible, opens the alarm help for the current selected alarm. Buttons <Arrow up> and <Arrow down> are used for scrolling. Buttons <Arrow left> and <Arrow right> are used to scroll through the help pages. Button <Back> is used to quit the alarm help and returns to the mask that was open last.

3.5.4 Mask print / Create screenshot

Every mask can be either printed out on a local printer that is connected to the control via USB interface resp. for every mask a screenshot can be stored on the compact flash.

Prerequisites

- User level equal or higher than 5
- Only selected printers are supported (for a list of supported printers

please contact KEBA).

Procedure

1) Connect local printer to the USB interface
2) In mask Display settings select the desired option in input field 'Printer'. 0 ... - - -. Printing resp. creating a screenshot deactivated.

   1 ... File: Creates a screenshot of the current mask on the compact flash in directory \protocol\screenshots (Screenshot000.png) using png- for- mat.

   2 ... Local: Prints mask to local USB printer
3) Go to the mask you wish to print out resp. that you want to create a screenshot of and press key 3 while quick access panel is visible.

   The required mask will now be printed out on the local printer resp. a screenshot will be created on the compact flash.

Information

*The mask **Export** provides the entry 'Copy ScreenShot To USB' , which al- lows transferring all screen shoots that are stored in the root directory of the compact flash on to a connected USB memory media.*

3.5.5 Creating a status report

Pressing key **4** when quick access panel is visible, opens a dialog for creating a status report.

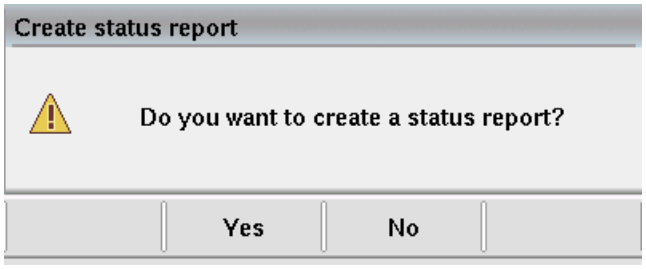


Fig.3-11: Dialog for creating status report

3.5.6 User login and logout

Pressing key **5** when quick access panel is visible, opens a dialog for user login and logout.

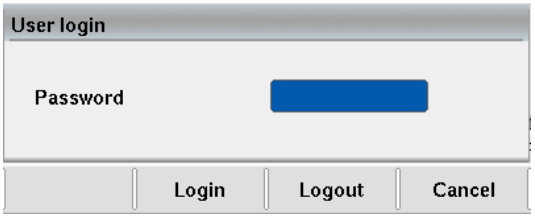


Fig.3-12: User login and logout dialog

The login password has to be entered via the numerical keypad. Key <Cancel> closes the dialog.

3.5.7 Favourite masks

The currently opened mask can be added to the favourite bar by pressing key **8** in quick access panel. With keys F1...F8 a mask is added to the favourite bar.

Configured favourite masks can be removed from favourite bar by pressing key **9** in quick access panel. With keys F1...F8 a mask is removed from the favourite bar.

Information

A favourite mask in only added and removed for the current user level.

4. Description of the operating masks

This chapter describes the masks, which are used predominantly during on- going production operation.

4.1 Overview mask

4.1.1 Purpose

This mask serves as standard display in ongoing production operation and provides the operating personnel with an overview of the machine's key data.

4.1.2 Description of the mask

The upper part of the mask provides a graphic display of the states of the nozzle heating zones. The central part of the mask shows the injection molding machine. The actual position of the machine axis is displayed below. Further actual overview data like pressure, velocity and production time of the current production process are displayed.

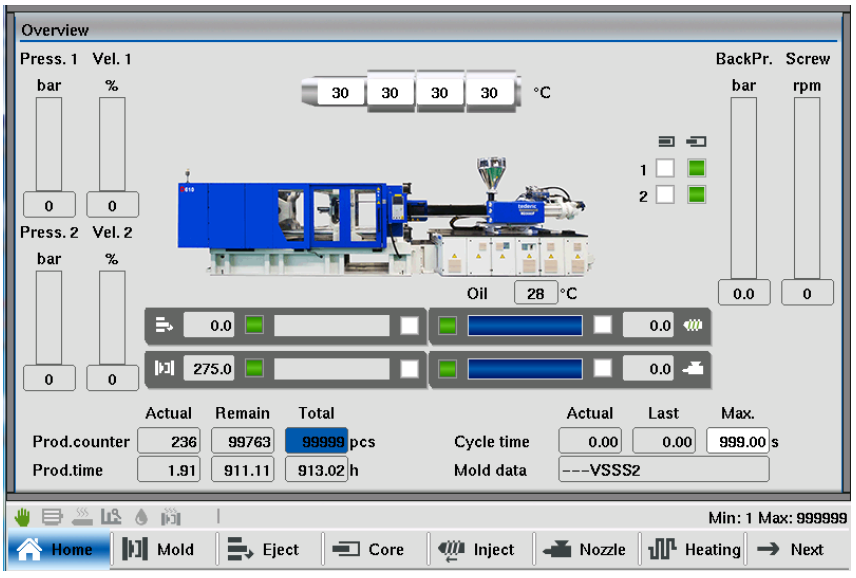


Fig.4-1: Mask "Overview"

4.1.3 Description of the elements

Heating zones

Up to 9 heating zones plus a hopper temperature status can be displayed here. The current temperature is shown in the middle of the respective heating zones. Error states of the heating zones are shown in the status bar along the upper border of the image.

Fig.4-2: Depiction of the heating zones

... Status of the heater (zone is heating / not heating, error of a heating zone)	... Status of the heater (grey....temperature out of tolerance, green...target temperature attained)
... %....displays a setter zone	... Actual temperature
... Displays a hopper zone for material en- trance	

Overview data

Designation	Description
Pressure	Actual system pressure
Velocity	Actual system velocity (displayed in percentage of maximum pump flow rate).
Screw rotation	Actual screw revolution
Back pressure	Actual back pressure
Ejector position	Actual position of ejector in reference to its zero position (ejector fully retracted. To the left and right of the analog bar, status marker show if the ejector has reached on of its end position.
Mold position	Actual distance from movable half of mold to fixed half of mold. To the left and right of the analog bar, status marker show if the molf has reached on of its end position.
Screw position	Actual position of screw in reference to front end point (end position). To the left and right of the analog bar, status marker show if the screw has reached on of its end position.
Nozzle position	Actual position of nozzle, relative to reference point.. To the left and right of the analog bar, status marker show if the screw has reached on of its end position. This display field is only shown if a transducer is installed to determine the position of the nozzle.
Core position	Actual position of the cores (core in / core out) displayed by status marker.

Cycle time	The current cycle time and last cycle time is displayed. In the right field the maximum allowed cycle time can be adjusted, which also can be done in mask "**Production**".
Production counter	The Actual number of shots (shot counter) is shown in the left field **Actual**. The remaining number of shots is shown in the center field **Remain**. The number of shots to be produced can be specified in the right field **Total**. Settings regarding the production counter (inclusively resetting), can be done in mask "**Production**".
Production time	The Actual production time is shown in the left field **Actual**. The remaining production time is shown in the center field **Remain**. The total production time is shown in the right field **Total**.
Oil	Actual oil temperature.
Mold data	Displays active mold data record.

4.2 Mold - Tab Profile

4.2.1 Purpose

The settings for the mold that is currently in operation can be adjusted in this mask.

4.2.2 Description of the mask

Pressure and velocity can be defined for specific sections of the mold's movement. The values for mold "Open" and "Close" are specified separately.

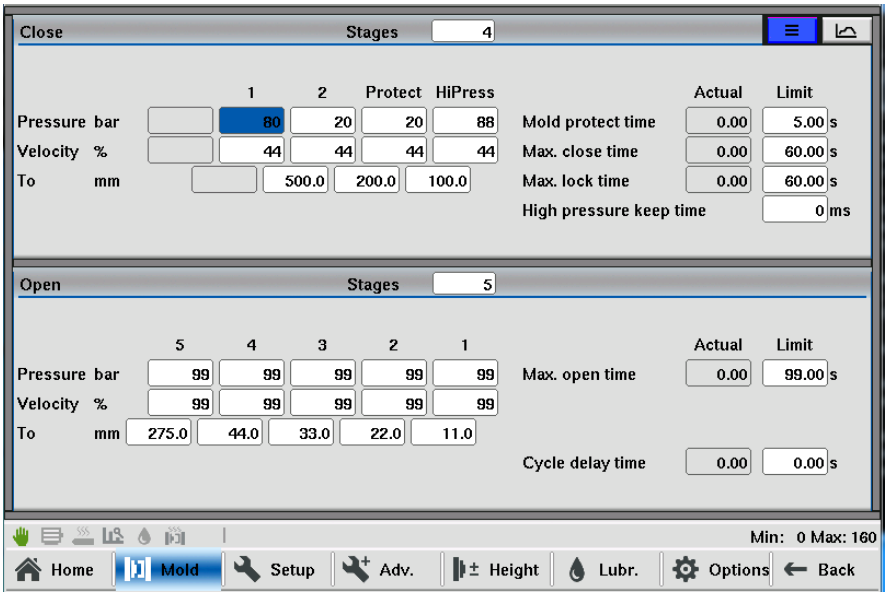


Fig.4-2: Mask "Mold profile"

4.2.3 Description of the elements

Mold close

Field	Description
Stages	Number of adjustable stages (maximum of 5).
Close 1..n	Setting of **Pressure** and **Velocity** between the position specified in field **to** and the position of the the previous stage during "Mold close" (in case of stage 1, the "Mold open" position).
Protect	Setting of **Pressure** and **Velocity** between the position specified in field **to** and the position of the the previous stage during "Mold close". Mold protect is active in this range.
High Pressure	Setting the **Pressure** and **Velocity** if the mold is closed.
Mold protect time	Setting of the maximum time of mold protect stage. If this period is exceeded an alarm is triggered.
Max. close time	The left field **Actual** displays the current time for mold close movement. The maximum permitted time until the mold is completely closed is specified in field **Limit**. If this time is exceeded an alarm will be triggered and the cycle is stopped.
Max. lock time	The duration of Mold High Pressure (last profile stage in mold pro- file) is shown in the left field **Actual**. The monitoring time is entered in field **Limit**.
High pressure keep time	After mold close movement has finished, high pressure stage stays active for this time.

Mold open

Field	Description
Stages	Number of adjustable stages (maximum of 5).
Open 1..n	Setting of **Pressure** and **Velocity** between the position specified in field **to** and the position of the the previous stage during "Mold open" (in case of stage 1, the "Mold close" position).
Max. open time	The left field **Actual** displays the current time for mold open movement. The maximum permitted time until the mold is completely opened is specified in field **Limit**. If this time is exceeded an alarm will be triggered and the cycle is stopped.
Cycle delay time	Defines a delay time between production cy- cles in automatic mode.

4.3 Mold - Tab Graphic

4.3.1 Purpose

This mask shows the pressure and velocity profile of the mold movement graphically.

4.3.2 Description of the mask

The upper section of the mask displays the mold close profile and the lower section of the mask the mold open profile. Arrows on top of the graphics display the direction of the profile. A red line in the graphics displays the actual position of the movement.

Further ramp settings for the respective movement can be set. Depending on the configured ramp setting the corresponding ramp duration for the movement is calculated.

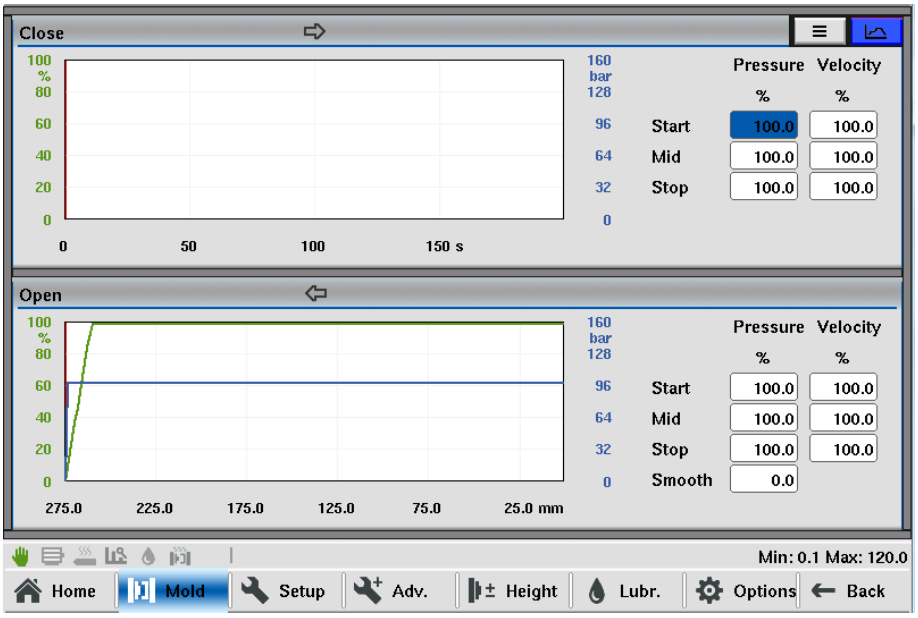


Fig.4-3: Mask "Mold profile graphic"

4.3.3 Description of the elements

Field	Description

Ramp	The ramps [%] for movement start, movement stop as well as for the inner profile of the movement can be specified. The %- value refers to the maximum ramp profile output settings that are configured in setup advanced mask. • **Start**: Defines start ramp value for movement. • **Stop**: Defines stop ramp value for movement. • **Mid**: Defines ramp for all inner profile ramps for movement. • **Smooth**: Smooth factor is used to allow a smooth ending of a movement. If smooth-factor = 0%, the ending of a movement will be detected when the target position has been reached. Thus the movement will be stopped abrupt (valves will be closed). If smooth- factor = 100%, first the standstill of a movement will be awaited and afterwards the valves will be closed. Reference value for the smooth factor is the maximum speed of the respective movement (see mask 'Max. Velocity').

4.4 Mold Setup - Tab1

4.4.1 Purpose

Additional parameters for the mold can be configured within this mask.

4.4.2 Description of the mask

Besides general settings for the mold, maximum movement and movement delay times as well as the constant outputs for the mold movement in setup mode can be set.

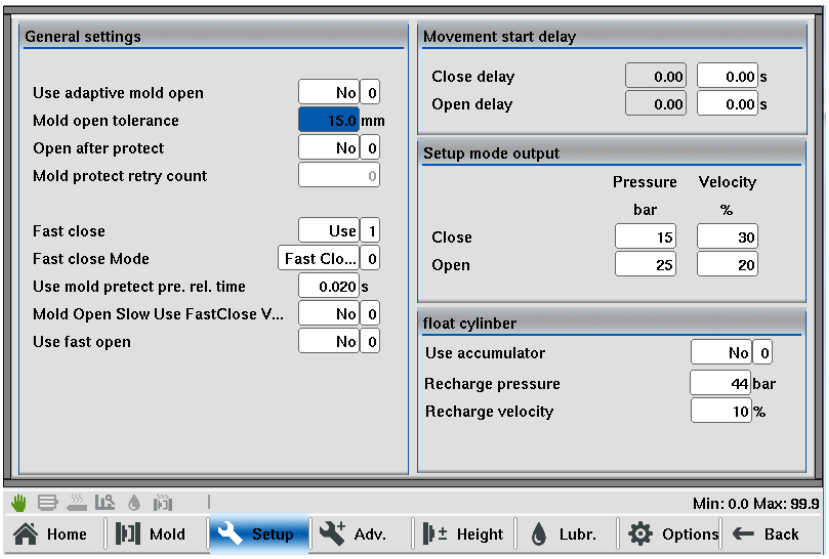


Fig.4-4: Mask "Mold setup tab 1"

4.4.3 Description of the elements

General settings

Field	Description
Use adaptive mold open	By selecting this option the mold open movement will be optimized. Thus a jerky stop of the mold when reaching mold open end position because of different hydraulic characteristics of machines can be avoided. To use this option, a minimal profile output and a valve delay time for "mold open" movement have to be set in mask "Mold setup advanced tab 1".
Mold open tolerance	Tolerance for detecting mold open end position. Tolerance is +/-. in the tolerance ,no alarm for ejector or core motion,
Open after protect	By selecting this option the mold opens automatically when a mold protect event occurs. Otherwise the machine stops when a mold protect event occurs.
Mold protect retry count	the mold open times when a mold protect event occurs
Fast close	Activates an additional valve in order to feed the return oil for the mold closing movement.This option is only available for hydraulic machines if an additional valve for fast close has been configured.
Fast close Mode	Fast close use fast close valve or open valve, due to the machine hydraulic system
Use mold protect pre.rel.time	A time of close pressure output 0 in the end of close fast step, after this time ,cutoff the fast valve ,in order to avoid the hydraulic shake.

Field	Description
Mold open slow use Fast close valve	Mold open slow step output the fast close valve
Use fast open	if choose yes, fast open valve will output in mold open fast step.

Movement start delay

Field	Description
Close delay	The delay time for the mold close movement is
Open delay	The delay time for the mold open movement is adjusted

Setup mode output

Field	Description
Setup mode output close	Pressure and velocity output for the mold close movement in setup mode.
Setup mode output open	Pressure and velocity output for the mold open movement in setup mode.

Float cylinder

Field	Description
Use accumulator	If machine equip the float cylinder to hold the platen, should use this function
Recharge pressure	The pressure set of recharge
Recharge velocity	The velocity set of recharge

4.5 Mold Setup Advanced

4.5.1 Purpose

Additional parameters for the mold can be configured within this mask.

4.5.2 Description of the mask

For the mold movement the minimum profile outputs, maximum ramp settings, pump and valve delay times and settings for mold height adjustment can be set.

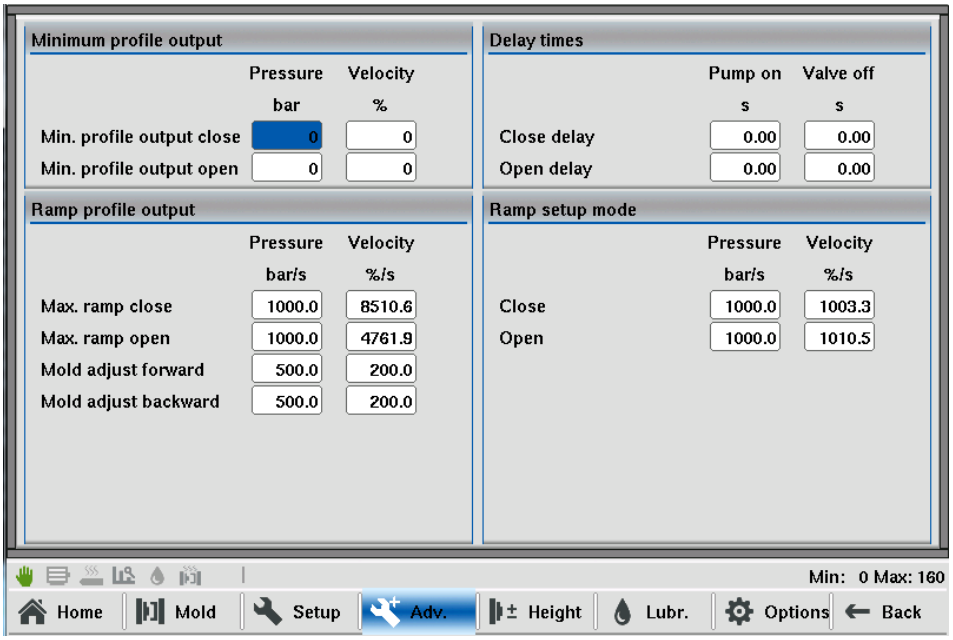


Fig.4-5: Mask "Mold setup advanced "

4.5.3 Description of the elements

Minimum profile output

Field	Description
Min. profile output close	The minimum profile output (pressure, velocity) for the mold close movementis adjusted here. The output in any section of the profile never falls below this value.

Min. profile output open	The minimum profile output (pressure, velocity) for the mold open movement is adjusted here. The output in any section of the profile never falls below this value.

Ramp profile output

Field	Description
Max. ramp close	The maximum ramp (pressure, velocity) for the mold close move- ment is adjusted here.
Max. ramp open	The maximum ramp (pressure, velocity) for the mold open move- ment is adjusted here.
Mold adjust forward	The maximum ramp (pressure, velocity) for the mold height adjust forward movement is adjusted here.
Mold adjust backward	The maximum ramp (pressure, velocity) for the mold height adjust backward movement is adjusted here.

Ramp setup mode

Field	Description
Ramp setup mode close	Ramp (pressure and velocity) in setup mode for mold close move- ment is adjusted here.
Ramp setup mode open	Ramp (pressure and velocity) in setup mode for mold open move- ment is adjusted here.

Delay times

Field	Description
Close delay	Field **Pump on** specifies the time that is waited between the start of the 'Mold close' movement and the activation of the hydraulic pump. Field **Valve off** determines the time that is waited between the end of the movement 'Mold close' and the closing of the control valve in order to release the
Open delay	Field **Pump on** specifies the time that is waited between the start of the 'Mold open' movement and the activation of the hydraulic pump. Field **Valve off** determines the time that is waited between the end of the movement 'Mold open' and the closing of the control valve in order to release the

4.6 Mold height adjust

4.6.1 Purpose

The settings for the mold height adjustment can be done in this mask.

4.6.2 Description of the mask

The mask is divided into the sections **General settings**, **Mold adjust out- put**, **Advanced settings** and **Clamp force monitoring**.

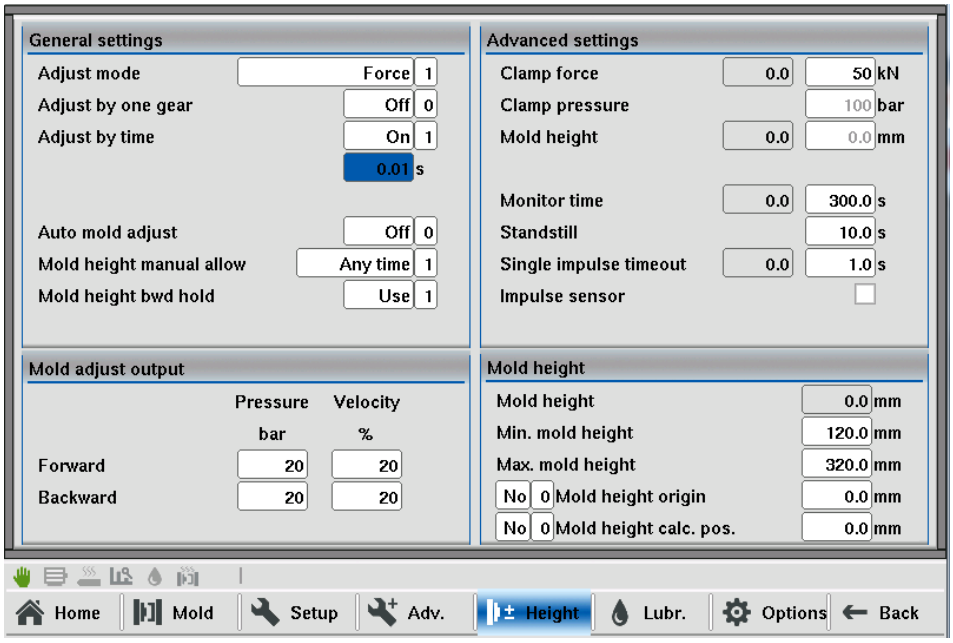


Fig.4-6: Maske "Mold height adjust"

4.6.3 Description of the elements

General settings

Field	Description
Adjust mode	Mode of mold height adjustment with the following selection op- tions: **Force:** The mold height is determined by the set clamp force in input field 'Clamp force' (specification of maximum clamping force and max. system pressure in the mask 'Machine limits' is required). **Position:** The mold height is set depending on the position. This requires specification of the minimum and maximum mold height and the origin of the mold height in the mask 'Machine limits'. **Pressure:** The mold height is determined by the set clamp
Adjust by one gear	When this function is activated the manual mold height adjustment is executed in setup mode via single steps. The mold always moves up to the next detected
Adjust by time	When this function is activated the mold height adjustment is exe- cuted over the configured period.
Auto mold adjust	Starts the automatic mold height adjustment.
Mold height manual allow	Mold height manual allowed any time or only in the mold open end condition
Mold height bwd hold	When release the button of mold height backward, you can select hold the motion or not

Mold adjust output

Field	Description
Mold adjust output forward	Specification of **Pressure** and **Velocity** for hydraulic mold height adjustment for mold height forward movement.
Mold adjust output back- ward	Specification of **Pressure** and **Velocity** for hydraulic mold height adjustment for mold height backward movement.

Advanced settings

This section is only shown, if a clamp force sensor is available.

Field	Description
Clamp force	The clamp force that is used for mold height adjustment when us- ing adjust mode 'Force' is specified in the right field.The left field displays the last determined clamp force during mold height ad- justment. This setting is only active in the Adjust mode "Force".
Clamp pressure	The pressure that is used for mold height adjustment when using adjust mode 'Pressure' is specified in the right field. This setting is only active in the Adjust mode "Pressure".
Mold height	The new mold height is specified in the right field. The left field displays the actual determined mold height.This setting is only active in adjust mode "Position".
Monitor time	Specification of the maximum duration for the procedure of auto- matic mold height adjustment. If this time is exceeded an alarm will be triggered.
Standstill	Time that passes until a standstill during mold height adjustment forward is detected.This field is only shown with hydraulic mold height adjustment.
Impulse sensor	Indicates the single impulses during mold height adjustment.
Single impulse timeout	Specification of the maximum duration between two impulses.

Mold height

Field	Description
Min. mold height	The specification of minimum mold height (minimum distance be- tween fixed and moving plate in closed state).
Max. mold height	The specification of maximum mold height (maximum distance between fixed and moving plate in closed state).
Mold height origin	Sets the current mold height.Once this check box has been selected, the value set is adopted as the new actual value.
Mold height calculate posi- tion	Specifies the second value for calculation (distance to position Mold height origin), which is required for the calibration of the au- tomatic mold adjust in pressure and position mode. The value for Mold height origin must have been set already.By selecting this check box the caclulation of distance/impulse for the mold height adjust is started. This step is necessary before automatic mold height adjust is executed.

4.7 Lubrication

4.7.1 Purpose

The lubrication settings for the machine can be configured within this mask.

4.7.2 Description of the mask

Lubrication interval, the lubrcation duration as well as on and off time of the lubrication can be set.

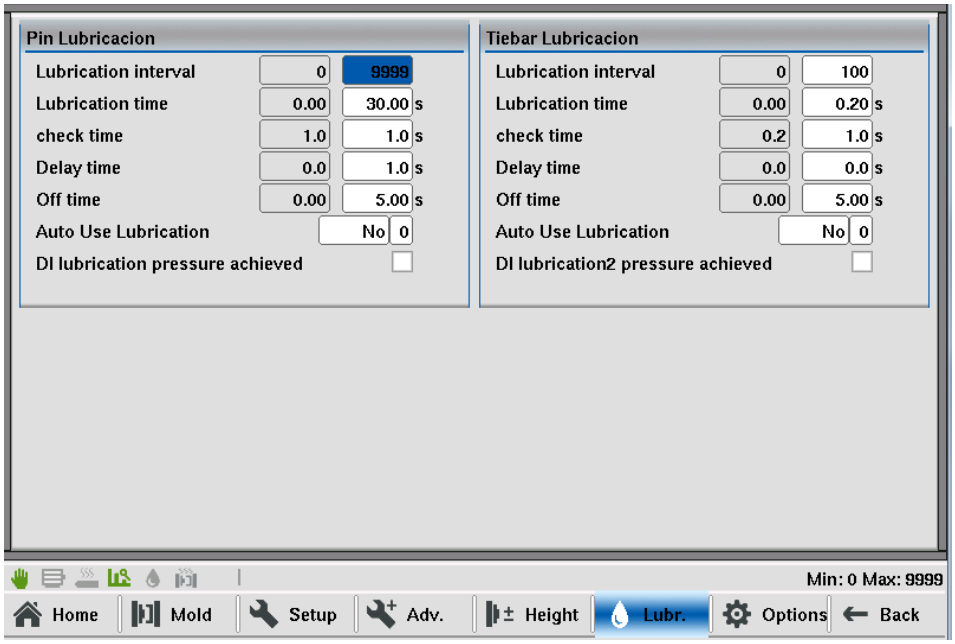


Fig.4-7: Mask "Lubrication"

4.7.3 Description of the elements

Field	Description
Lubrication interval	The left field displays the number of machine cycles since its last lubrication. In the right field the number of machine cycles after which a lubri- cation has to take place can be set.
Lubrication time	The left field displays the current lubrication time. In the right field the duration of a lubrication can be set.
Check time	Check the lubrication pressure sensor during the set time, if no sensor signal achieved, it will alarm.
Off time	The lubrication will be done pulsative. The left field displays the current inactive time of the lubrication pulse. In the right field the inactive time of the lubrication pulse can be set.

Delay time	When the lubrication pressure sensor achieved , continue lubricate the set time
Auto use lubrication	Lubricate when start auto cycle
DI lubrication pressure achieved	Digital input which indicates whether a specific lubrication pres- sure has been achieved. The digital input must be set at the beginning of the lubrication as well as between on time and off time. Otherwise an alarm will be triggered und the lubrication will be stopped.

4.8 Mold options - Tab Automatic safety gate

4.8.1 Purpose

The settings for an automatic safety gate can be adjusted on this mask.

4.8.2 Description of the mask

The mask contains the general settings, time settings and hydraulic settings for the automatic safety gate. The hydraulic settings are only displayed if the machine is equipped with an hydraulic safety gate. If the machine is equipped with an electric or pneumatic safety gate, this settings are not displayed.

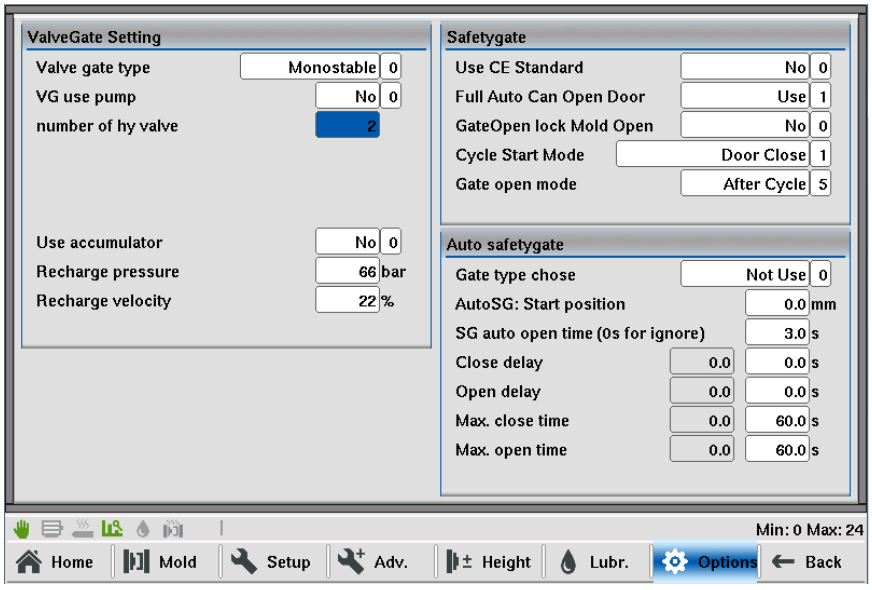


Fig.4-8: Mask "Mold options - Tab Automatic safety gate"

4.8.3 Description of the elements

WARNING!

The system (hardware and software) only meets category B according to

EN ISO 13849-1. Thus it is not intended for usage in safety-relevant control ap- plications in the field of personal safety (e.g. emergency stop).

To implement potentially necessary safety-relevants control tasks, always use additional external safety devices according to EN ISO 13849-1 that are intended for the particular purpose and meet the necessary functional safety.

For further information see EN ISO 13849-1 and refer to chapter "EC directives and standards" in the manuals for a list of norms applying to the product.

The safety notices for the installation and commissioning of the product can be found in the user manuals of the components or in the system manual and must be read and observed before installation or commissioning.

The user manual must be kept throughout the entire service life of the product.

Automatic safety gate

Field	Description
Safety gate auto open mode	The behaviour of the automatic safety gate during autocycle can be adjusted here. Following mode are possible: **Not open** Safety gate is not opened automatically. **After mold open** Safety gate is opened after end of mold opening sequence and closed before begin of closing sequence.
Safety Gate auto open time	If this time is expired, the safety gate open movement stopps. Set- ting the value to 0.0s deactivates this function.

Time settings

Field	Description
Max. close time	If this time is exceeded during safety gate close, the closing move- ment stopps and an alarm will be triggered.
Max. open time	If this time is exceeded during safety gate open, the opening movement stopps and an alarm will be triggered.
Close delay	The delay time for auto safety gate close is adjusted here.
Open delay	The delay time for auto safety gate open is adjusted here.

ValveGate settings

Field	Description

Valve gate type	The valve gate type can be adjusted here. ● **Monostable**: Valve gate with one digital output. The valve gate is opened by setting the digital output and closed by resetting the digital output. ● **Bistable**: Valve gate with two digital outputs. The valve gate is opened with the first digital output and closed with the sec- ond digital output.
Use accumulator	The power of gate valve by accumulator or not
Recharge pressure	Accumulator recharge pressure set
Recharge velocity	Accumulator recharge velocity set

4.9 Ejector and airvalves

4.9.1 Purpose

Settings for the ejector and the airvalves can be made in this mask.

4.9.2 Description of the mask

Besides the ejector's operating mode, this mask defines the force and velocity for the ejector movements within different sections. The lower part of the mask contains the settings for the arivalves.

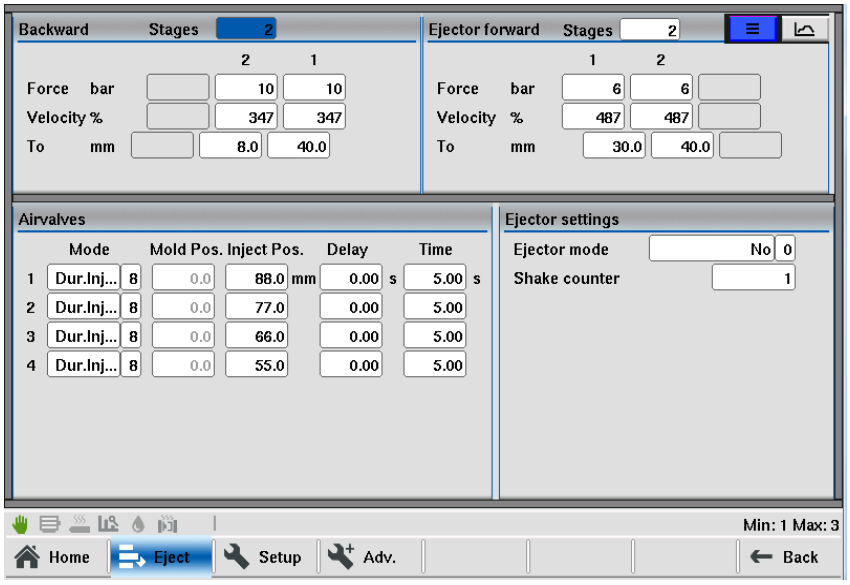


Fig.4-9: Mask "Ejector" with transducer

4.9.3 Description of the elements

Ejector forward

Field	Description
Stages	Number of adjustable stages.
Forward 1..Forward n	Setting of **Velocity** and **Force** between the position specified in field **to** and the position of the the previous stage during "Ejector forward" (in case of stage 1, the "Ejector backward" position).

Ejector backward

Field	Description
Stages	Number of adjustable stages.
Backward 1..Backward n	Setting of **Velocity** and **Force** between the position specified in field **to** and the position of the the previous stage during "Ejector backward" (in case of stage 1, the "Ejector forward" position).

Airvalves

Field	Description
Mode	Operating mode of an air valve with the following options: ● **No:** Air valve deactivated. ● **After charge:** Air valve becomes active after charging. ● **After mold open:** Air valve becomes active after mold open. ● **After ejector:** Air valve becomes active after ejection of fin- ished part.. ● **During mold open:** Air valve is active during mold open. ● **Before charge:** Air valve becomes active before charging.
Mold position	Once the position has been reached and the waiting time specified under "Delay Time" has passed, the corresponding air valve is activated. This setting is only active during operating modes 'During mold open' and 'Before charge.
Delay time	Time between the end of the step specified under "Mode" and the activation of the corresponding air valve.
Time	On time of the corresponding air valve. This setting is deactivated during 'Off' mode.

Ejector settings

Field	Description

Ejector mode	These modes are available: ● **No**: Ejector is deactivated ● **Hold**: This ejector mode is only available for operating mode 'semi-automatic'. The Ejector stays in front end position at the end of production cycle. The ejector has to be moved to rear end position man- ually before the next full automatic production cycle will be released. ● **Continous:** The ejector moves automatically between front and rear end position. The number of sequences (one se- quence equals a forward and backward movement) per pro- duction cycle can be set in field **Shake counter**. ● **Shake:** The ejector moves automatically to front end position and then backward for the time that is set in field **Shake back- ward time**. The number of sequences (one sequence equals a forward and backward movement) per production cycle can be set in field **Shake counter**.
Shake counter	Number of sequences (one sequence equals a forward and back- ward movement) for the ejector for each production cycle. This setting is only valid for the ejector modes "Continuous" and "Shake".

4.10 Ejector - Tab Graphic

4.10.1 Purpose

This mask shows the pressure and velocity profile of the ejector movement graphically.

4.10.2 Description of the mask

The upper section of the mask displays the ejector forward profile and the lower section of the mask the ejector backward profile. Arrows on top of the graphics display the direction of the profile. A red line in the graphics displays the actual position of the movement.

Further ramp settings for the respective movement can be set. Depending on the configured ramp setting the corresponding ramp duration for the movement is calculated.

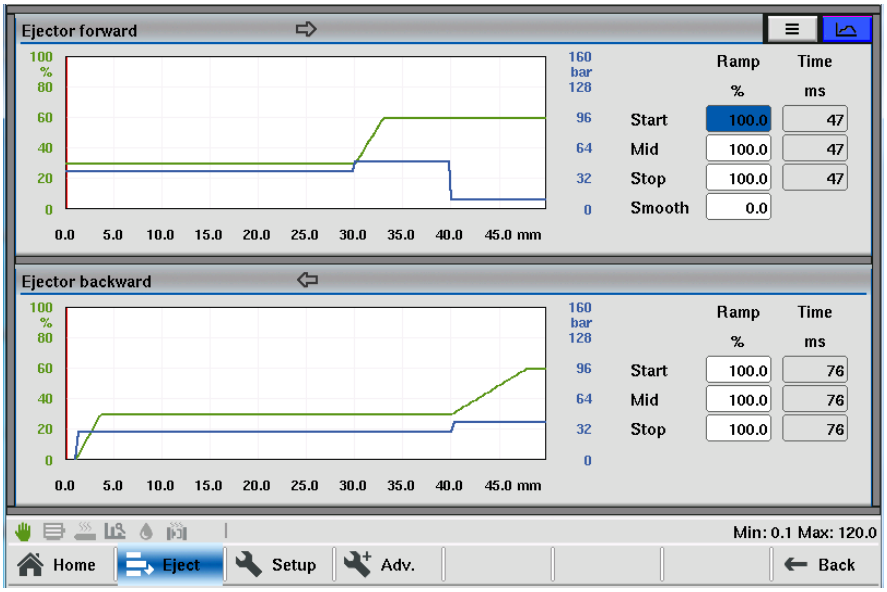


Fig.4-10: Mask "Ejector profile graphic"

4.10.3 Description of the elements

Field	Description
Ramp	The ramps [%] for movement start, movement stop as well as for the inner profile of the move- ment can be specified. The %- value refers to the maximum ramp profile output settings that are configured in setup advanced mask. • **Start**: Defines start ramp value for move- ment. • **Stop**: Defines stop ramp value for move- ment. • **Mid**: Defines ramp for all inner profile ramps for movement. • **Smooth**: Smooth factor is used to allow a smooth ending of a movement. If smooth- factor = 0%, the ending of a movement will be detected when the target position has been reached. Thus the movement will be stopped abrupt (valves will be closed). If smooth- factor = 100%, first the standstill of a movement will be awaited and afterwards the valves will be closed. Reference value for the smooth factor is the maximum speed of the respective movement (see mask 'Max. Velocity').
Time	Calculated duration for each ramp.

4.11 Ejector setup

4.11.1 Purpose

Additional parameters for the ejector can be set within this mask.

4.11.2 Description of the mask

Besides general settings for the ejector, maximum movement and movement delay times as well as the constant outputs for the ejector movement in setup mode can be set.

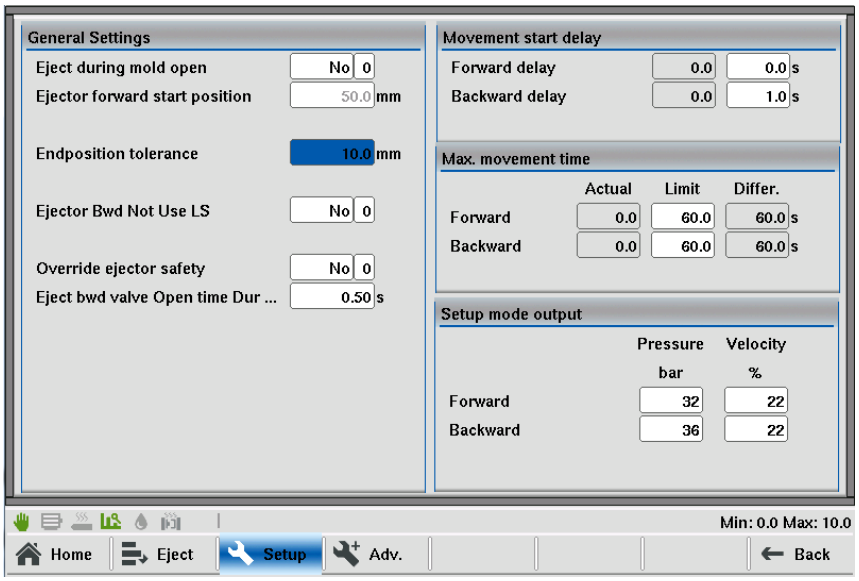


Fig.4-11: Mask "Ejector setup"

4.11.3 Description of the elements

General settings

Field	Description
Eject during mold open	If set, the ejector will be moved during mold open. If the machine is equipped with only one hydraulic pump for the mold- and ejector movement, both movements share the pump output. A pump output to the ejector only happens as long as the mold movement is active.
Ejector forward start posi-tion	Mold Position where ejector starts parallel to mold open move- ment.
End position tolerance	Tolerance for detecting ejector forward and backward end position. Tolerance is +/-.
Ejector Bwd Not Use LS	Ejector Bwd end by the limit switch and position.if use this function ,only check the position
Override ejector safety	Movement of ejector is even allowed, if mold, core and other ejec- tors are not in the correct position.

Eject bwd valve open time during open movement	The valve open time set of ejector backword when mold close .

Maximum movement time

Field	Description
Max. forward time	The left field **Actual** displays the current time for the ejector for- ward movement. The maximum permitted time until the ejector is forward is specified in field **Limit**. If this time is exceeded an alarm will be triggered and the cycle is stopped. The difference between the two values is shown in the right field **Differ.**
Max. backward time	The left field **Actual** displays the current time for the ejector for- ward movement. The maximum permitted time until the ejector is backward is specified in field **Limit**. If this time is exceeded an alarm will be triggered and the cycle is stopped. The difference between the two values is shown in the right field **Differ.**

Movement start delay

Field	Description
Forward delay	The delay time for the ejector forward movement is adjusted here.
Backward delay	The delay time for the ejector backward movement is adjusted here.

Setup mode output

Field	Description
Setup mode output forward	Pressure and velocity output for the ejector forward movement in setup mode.
Setup mode output back- ward	Pressure and velocity output for the ejector backward movement in setup mode.

4.12 Ejector Setup Advanced

4.12.1 Purpose

Additional parameters for the ejector can be configured within this mask.

4.12.2 Description of the mask

For the ejector movement the minimum profile outputs, maximum ramp set- tings and pump and valve delay times can be set.

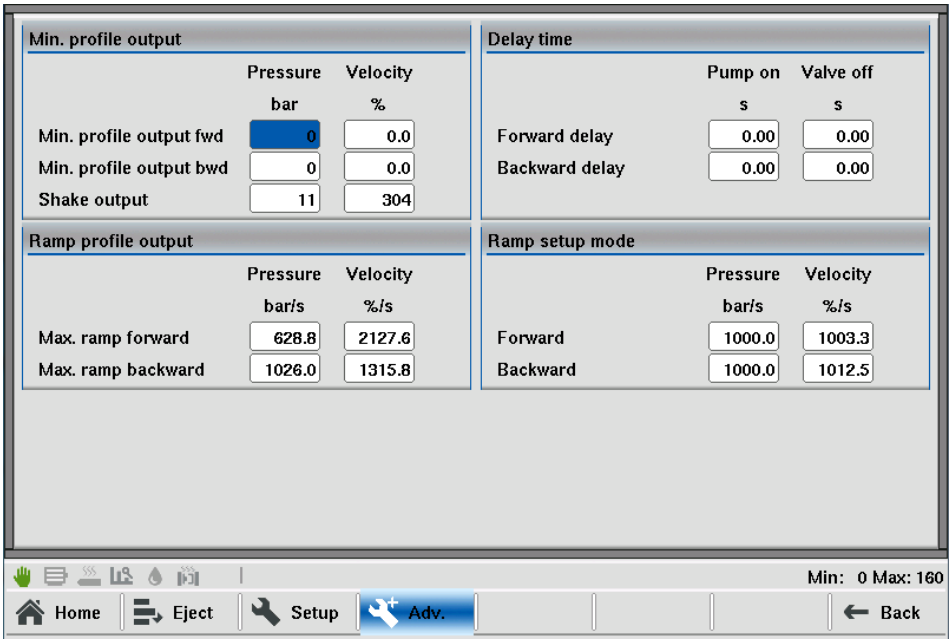


Fig.4-12: Mask "Ejector setup advanced"

4.12.3 Description of the elements

Minimum profile output

Field	Description
Min. profile output forward	The minimum profile output (pressure, velocity) for the ejector for- ward movement is adjusted here. The output in any section of the profile never falls below this value.
Min. profile output back- ward	The minimum profile output (pressure, velocity) for the ejector backward movement is adjusted here. The output in any section of the profile never falls below this value.
Shake output	At change in direction of ejector movement, the profile output (pressure, velocity) ramps down to this value. If the set value is greater than the last profile output of the 'Ejector forward' and 'Ejector backward'- movement, the last profile output of the 'Ejector forward' and 'Ejector backward'- movement is used.

Ramp profile output

Field	Description
Max. ramp forward	The maximum ramp (pressure, velocity) for the the ejector forward movement is adjusted here.
Max. ramp backward	The maximum ramp (pressure, velocity) for the the ejector back- ward movement is adjusted here.

Delay times

Field	Description

Forward delay	Field **Pump on** specifies the time that is waited between the start of the Ejector forward movement and the activation of the hydraulic pump. Field **Valve off** determines the time that is waited between the end of the Ejector forward movement and the closing of the control valve in order to release the remaining pressure.
Backward delay	Field **Pump on** specifies the time that is waited between the start of the Ejector backward movement and the activation of the hy- draulic pump. Field **Valve off** determines the time that is waited between the end of the Ejector backward movement and the closing of the control valve in order to release the remaining pressure.

Ramp setup mode

Field	Description
Ramp setup mode forward	Ramp (pressure and velocity) in setup mode for ejector forward movement is adjusted here.
Ramp setup mode back- ward	Ramp (pressure and velocity) in setup mode for ejector backward movement is adjusted here.

4.13 Cores

4.13.1 Purpose

Settings for the operating modes of the cores can be made in this mask.

4.13.2 Description of the mask

The activation and the operating mode of the core can be adjusted in the upper section of the mask. Settings for activated cores can be made in the lower section of the mask.

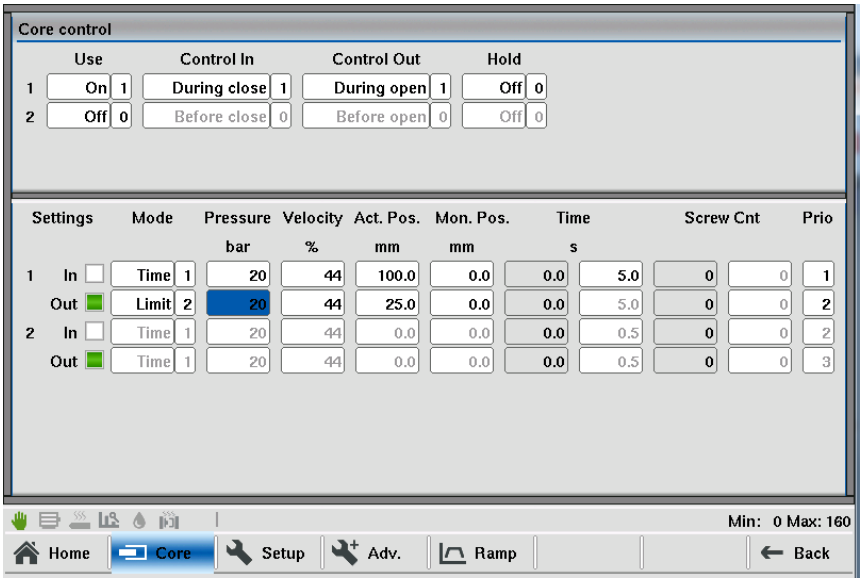


Fig.4-13: Mask "Cores"

4.13.3 Description of the elements

Core control

Field	Description
Use	Activates the core. **Off**: Core is inactive. **On:** Core is active. Editability of all elements within this mask depends on wether a core is active or inactive.
Control in	Operating mode of the core in movement with the following op- tions: ● **Before close:** Core enters prior to closure of the mold. ● **During close:** Core enters during closure of the mold. There- fore the mold is stopped, the core moves in and the mold closes afterwards to its end position. If option 'Cores parallel to mold' is set in Core setup mask, the mold is not stopped and the core moves parallel to closure of the mold. ● **After close:** Core enters after closure of the mold.
Control out	Operating mode of the core during 'Core out' with the following options: ● **Before open:** Core is extracted prior to the opening of the mold. ● **During open:** Core is extracted during opening of the mold. Therefore the mold is stopped, the core moves out and the mold closes afterwards to its end position. If option 'Cores par- allel to mold' is set in Core parameters mask, the mold is not stopped and the core moves parallel to the opening of the mold. ● **After open:** Core is extracted after opening of the mold.
Hold	The core is held forward with pressure after entering.
In / Out	Shows if the core is in front end position or rear end position.

Operation mode	These modes can be selected: ● **Count:** Core movement follows the number of **Screw counts** set for the core transducer. ● **Time:** Core movement follows the duration set under **Time**. ● **Limit:** Core monitoring is done by limit switch.
Pressure	Pressure of core movement.
Velocity	Velocity for core movement.
Act. pos (Core in)	Position of the mold at which the core enters. This setting becomes only active in the entry mode "During close".
Act. pos (Core out)	Position of the mold at which the core is extracted. This setting becomes only active in extraction mode 'During open'.
Mon. pos (Core in)	If the 'Core in' movement is executed parallel to a movement of the mold, the core movement must have concluded at the mold position here specified. Otherwise the cycle stops and an alarm will be triggered.
Mon. pos (Core out)	If the 'core out' movement is executed parallel to a movement of the mold, the core movement must have concluded at the mold position here specified. Otherwise the cycle stops and an alarm will be triggered.
Time	Core movement follows the time set for Core In resp. Core out movement. This setting is only acitve in the core's mode **Time**.
Screw count	Number of impulses of the core screw transducer during Core In resp. Core out movement. This setting is only active in the core's mode **Count**.
Priority (Core in)	If several core movements are executed at the same time (e.g. prior to closing), the sequence for core move-ment is set in this field. The core with the lowest value for Prio core in is moved in first.
Priority (Core out)	If several core movements are executed at the same time (e.g. prior to opening), the sequence for core move-ment is set in this field. The core with the lowest value for Prio core out is moved out first.

4.14 Core setup - Tab1

4.14.1 Purpose

Additional settings for core movement can be made in this mask.

4.14.2 Description of the mask

Besides general settings for the cores, maximum movement and movement delay times as well as the constant outputs for the core movement in setup mode can be set. Further overriding core safety and parallel movements for cores can be configured in this mask.

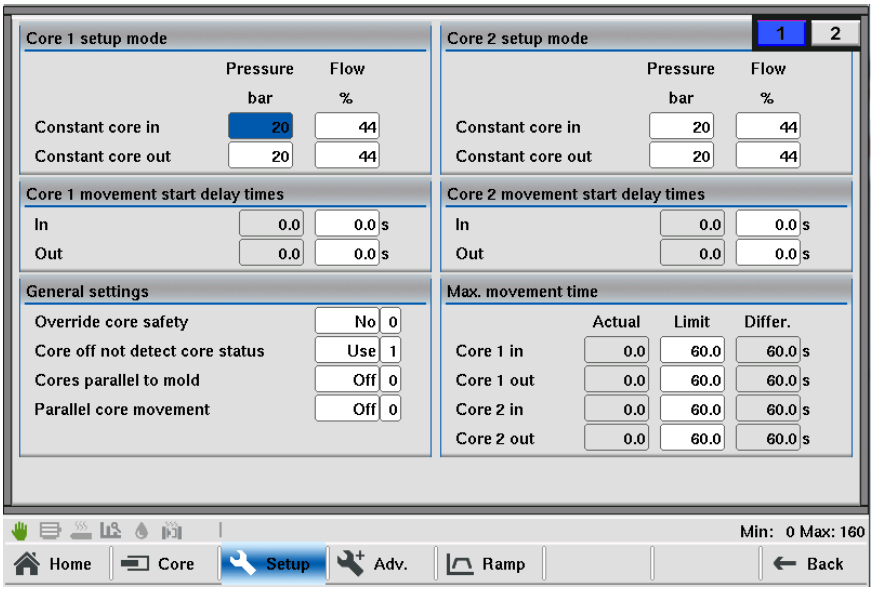


Fig.4-14: Mask "Core setup - Tab1"

4.14.3 Description of the elements

Core setup mode output

Field	Description
Constant core in	Pressure and velocity output for the core in movement in setup mode.
Constant core out	Pressure and velocity output for the core out movement in setup mode.

Core movement start delay times

Field	Description
Core in	The delay time for the core in movement is adjusted
Core Out	The delay time for the core out movement is adjusted

Core general settings

Field	Description
Override core safety	If this function is enabled, core movements can be made in setup mode at any time.
Cores parallel to mold	Cores move parallel to mold movements if core mode in core mask is set to 'During close' or 'During open'. If the machine is equipped with only one hydraulic pump for the mold- and core movement, both movements share the pump out- put. A pump output to the core only happens as long as the mold movement is active.
Parallel core movement	All cores that have the same mode in core mask move parallel to each other. Only for modes 'Before close', 'After close', 'Before open' and 'After open'. If the machine is equipped with only one hydraulic pump for the core movements, all parallel core movements share the pump output. A pump output to a core only happens as long as the core with the highest priority is active (see core priority settings on core mask).

Maximum movement time

Field	Description
Max. core 1 in time	The left field **Actual** displays the current time for core in move- ment. The maximum permitted time until the core is in is specified in field **Limit**. If this time is exceeded an alarm will be triggered and the cycle is stopped. The difference between the two values is shown in the right field **Differ.**
Max. core 1 out time	The left field **Actual** displays the current time for core out move- ment. The maximum permitted time until the core is out is specified in field **Limit**. If this time is exceeded an alarm will be triggered and the cycle is stopped. The difference between the two values is shown in the right field **Differ.**
Max. core 2 in time	The left field **Actual** displays the current time for core in move- ment. The maximum permitted time until the core is in is specified in field **Limit**. If this time is exceeded an alarm will be triggered and the cycle is stopped. The difference between the two values is shown in the right field **Differ.**
Max. core 2 out time	The left field **Actual** displays the current time for core out move- ment. The maximum permitted time until the core is out is specified in field **Limit**. If this time is exceeded an alarm will be triggered and the cycle is stopped. The difference between the two values is shown in the right field **Differ.**

4.15 Core setup - Tab2

4.15.1 Purpose

Additional settings for core movement can be made in this mask.

4.15.2 Description of the mask

Besides general settings for the cores, maximum movement and movement delay times as well as the constant outputs for the core movement in setup mode can be set. Further overriding core safety and parallel movements for cores can be configured in this mask.

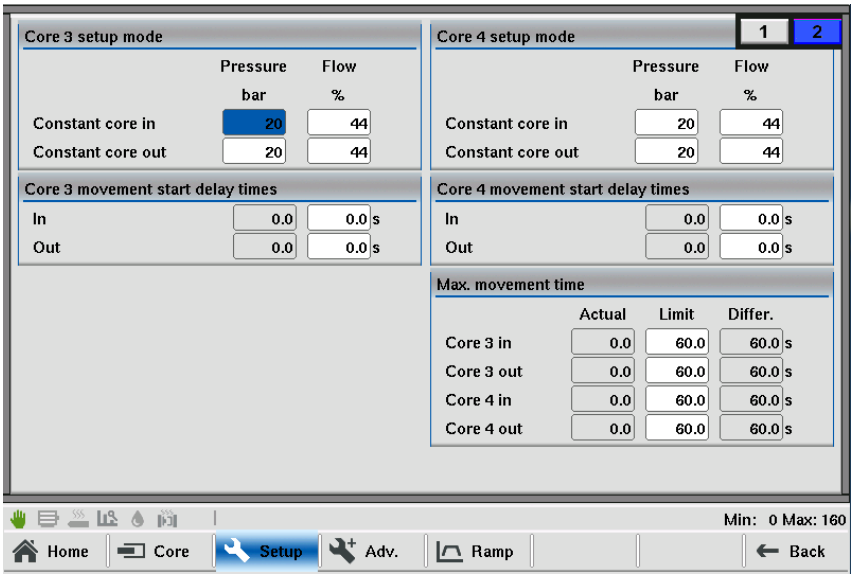


Fig.4-15: Mask "Core Setup - Tab2"

4.15.3 Description of the elements

Core setup mode output

Field	Description
Constant core in	Pressure and velocity output for the core in movement in setup mode.
Constant core out	Pressure and velocity output for the core out movement in setup mode.

Core movement start delay times

Field	Description
Core in	The delay time for the core in movement is adjusted
Core Out	The delay time for the core out movement is adjusted

Core general settings

Field	Description
Override core safety	If this function is enabled, core movements can be made in setup mode at any time.
Cores parallel to mold	Cores move parallel to mold movements if core mode in core mask is set to 'During close' or 'During open'. If the machine is equipped with only one hydraulic pump for the mold- and core movement, both movements share the pump out- put. A pump output to the core only happens as long as the mold movement is active.
Parallel core movement	All cores that have the same mode in core mask move parallel to each other. Only for modes 'Before close', 'After close', 'Before open' and 'After open'. If the machine is equipped with only one hydraulic pump for the core movements, all parallel core movements share the pump output. A pump output to a core only happens as long as the core with the highest priority is active (see core priority settings on core mask).

Maximum movement time

Field	Description
Max. core 1 in time	The left field **Actual** displays the current time for core in move- ment. The maximum permitted time until the core is in is specified in field **Limit**. If this time is exceeded an alarm will be triggered and the cycle is stopped. The difference between the two values is shown in the right field **Differ.**
Max. core 1 out time	The left field **Actual** displays the current time for core out move- ment. The maximum permitted time until the core is out is specified in field **Limit**. If this time is exceeded an alarm will be triggered and the cycle is stopped. The difference between the two values is shown in the right field **Differ.**
Max. core 2 in time	The left field **Actual** displays the current time for core in move- ment. The maximum permitted time until the core is in is specified in field **Limit**. If this time is exceeded an alarm will be triggered and the cycle is stopped. The difference between the two values is shown in the right field **Differ.**
Max. core 2 out time	The left field **Actual** displays the current time for core out move- ment. The maximum permitted time until the core is out is specified in field **Limit**. If this time is exceeded an alarm will be triggered and the cycle is stopped. The difference between the two values is shown in the right field **Differ.**

4.16 Core Setup Advanced - Tab1

4.16.1 Purpose

Additional parameters for the core can be configured within this mask.

4.16.2 Description of the mask

For the core movement the ramp settings and pump and valve delay times can be set.

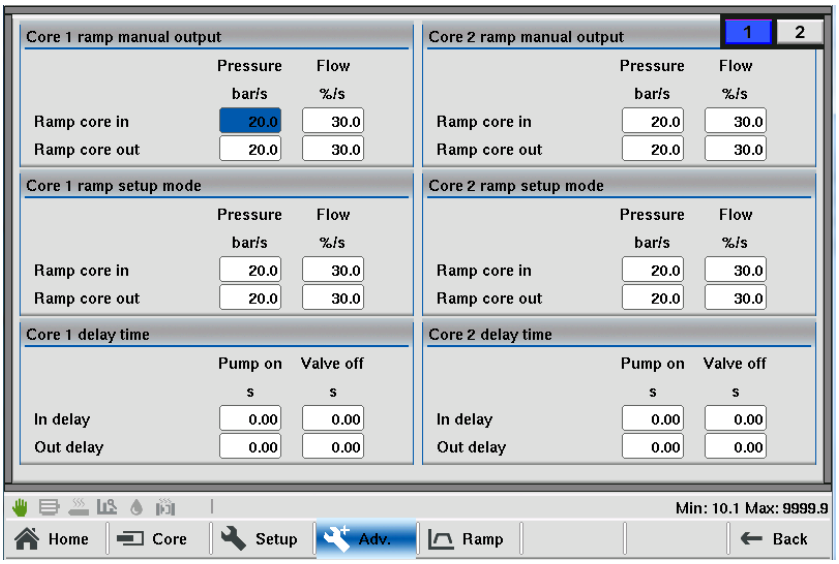


Fig.4-16: Mask "Kern setup advanced - Tab1"

4.16.3 Description of the elements

Core ramp manual output

Field	Description
Ramp core in	The maximum ramp (pressure, velocity) for the the core in move- ment is adjusted here.
Ramp core out	The maximum ramp (pressure, velocity) for the the core out move- ment is adjusted here.

Core ramp setup mode

Field	Description
Ramp core in	Ramp (pressure and velocity) in setup mode for core in movement is adjusted here.
Ramp core out	Ramp (pressure and velocity) in setup mode for core out move- ment is adjusted here.

Core delay times

Field	Description
Core in delay	Field **Pump on** specifies the time that is waited between the start of the core in movement and the activation of the hydraulic pump. Field **Valve off** determines the time that is waited between the end of the core in movement and the closing of the control valve in order to release the remaining pressure.
Core out delay	Field **Pump on** specifies the time that is waited between the start of the core out movement and the activation of the hydraulic pump. Field **Valve off** determines the time that is waited between the end of the core out movement and the closing of the control valve in order to release the remaining pressure.

4.17 Core Setup Advanced - Tab2

4.17.1 Purpose

Additional parameters for the core can be configured within this mask.

4.17.2 Description of the mask

For the core movement the ramp settings and pump and valve delay times can be set.

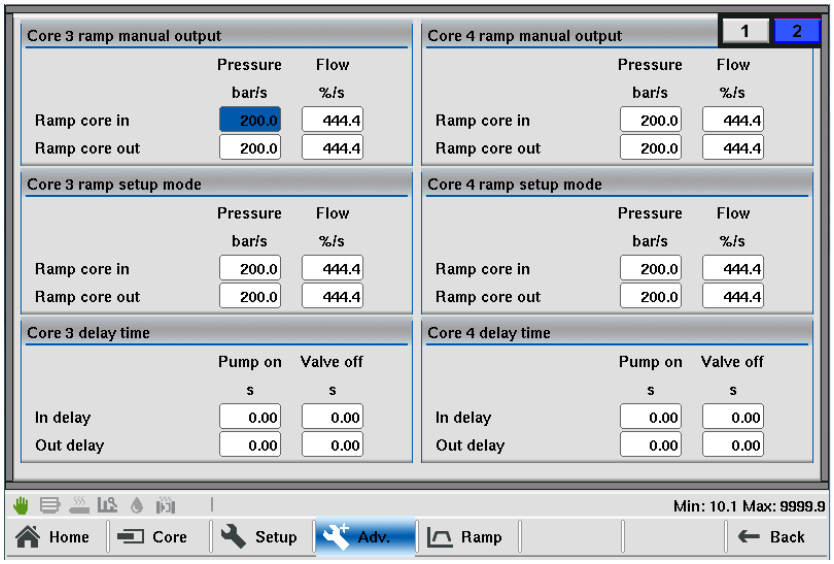


Fig.4-17: Mask "Kern setup advanced - Tab2"

4.17.3 Description of the elements

Core ramp manual output

Field	Description
Ramp core in	The maximum ramp (pressure, velocity) for the the core in move- ment is adjusted here.
Ramp core out	The maximum ramp (pressure, velocity) for the the core out move- ment is adjusted here.

Core ramp setup mode

Field	Description
Ramp core in	Ramp (pressure and velocity) in setup mode for core in movement is adjusted here.
Ramp core out	Ramp (pressure and velocity) in setup mode for core out move- ment is adjusted here.

Core delay times

Field	Description
Core in delay	Field **Pump on** specifies the time that is waited between the start of the core in movement and the activation of the hydraulic pump. Field **Valve off** determines the time that is waited between the end of the core in movement and the closing of the control valve in order to release the remaining pressure.
Core out delay	Field **Pump on** specifies the time that is waited between the start of the core out movement and the activation of the hydraulic pump. Field **Valve off** determines the time that is waited between the end of the core out movement and the closing of the control valve in order to release the remaining pressure.

4.18 Core Ramp Adjust

4.18.1 Purpose

This mask is used to adjust ramp values for the mold during cores are moving in and out.

4.18.2 Description of the mask

For every core, ramp values in % for the mold movement can be set. Depend- ing on the configured ramp setting the corresponding ramp duration for the movement is calculated.

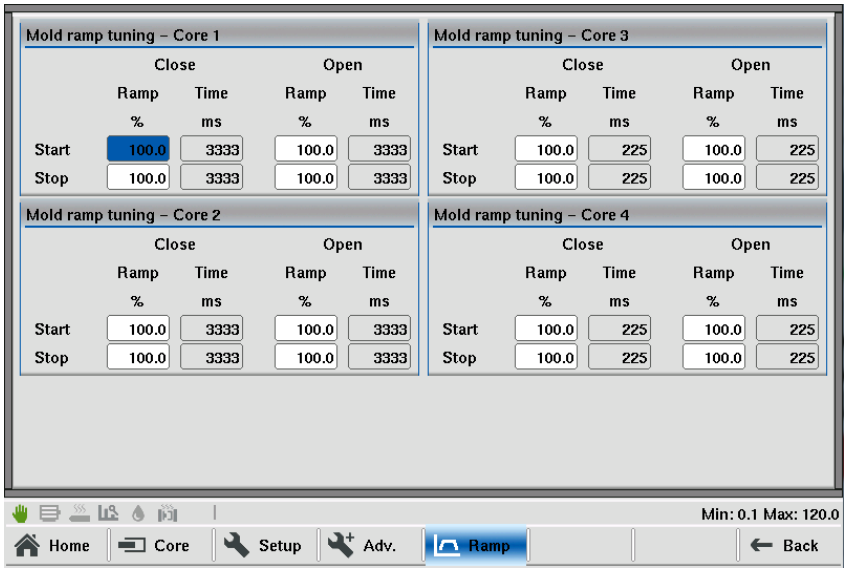


Fig.4-18: Maske "Core Ramp Adjust"'

4.18.3 Description of the elements

Mold ramp tuning

Field	Description
Ramp mold close	The ramps [%] for movement start and movement stop can be specified. The %-value refers to the maximum core ramp settings that are configured in setup advanced mask. • **Start**: Defines start ramp value before core moves in in for mold close movement. • **Stop**: Defines stop ramp value before core moves in in' for mold close movement.
Ramp mold open	The ramps [%] for movement start and movement stop can be specified. The %-value refers to the maximum ramp settings that are configured in setup advanced mask. • **Start**: Defines start ramp value before core moves in in' for mold open movement. • **Stop**: Defines stop ramp value before core moves in in' for mold open movement.
Time	Calculated duration for each ramp.

4.19 Injection - Tab Profile

4.19.1 Purpose

This mask is used to adjust the settings for the inject movement, cut off de- tection and hold movements.

4.19.2 Description of the mask

Pressure and velocity of the injection movement is specified in the upper sec- tion of the mask. Settings for the cut off detection are specified in the middle section of the mask. Settings for hold are specified in the lower section of the mask.

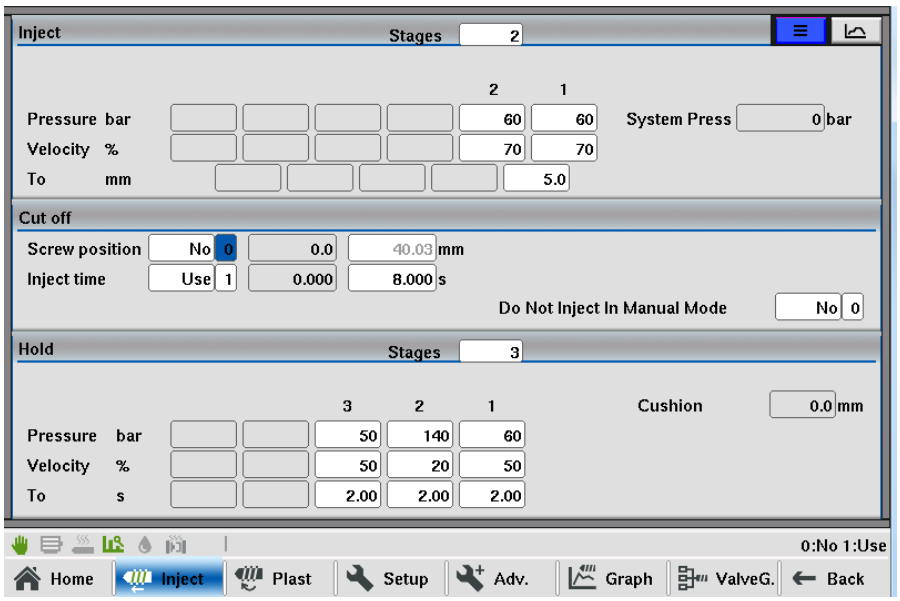


Fig.4-19: Mask "Injection Tab profile"

4.19.3 Description of the elements

Inject

Field	Description
Stages	Number of adjustable stages
Inject 1..Inject n	Setting of **Pressure** and **Velocity** between the end position of the previous stage (in case of stage 1, screw position "Rear end po- sition" when plasticizing) and the position specified under **to** during injection.

Cut off

The cutt off criterion, at which the system changes from injection to hold pres- sure, can be adjusted in this section. When selecting more than one criterion, the system changes over to hold pressure as soon as one condition is met.

Field	Description
Screw position	Specification of the screw position at which the system changes to hold pressure.
Inject time	Specification of the duration, measured from the start of the injec- tion process until the system changes to hold pressure.
Do Not inject in manual Mode	If use ,in manual mode can not inject

Field	Description
Inject pressure	Specification of the injection pressure at which the system changes to hold pressure. This field is only shown if a sensor for measuring injection pressure is available.
Cut off activation position	Screw position at which the changeover point detection is activa- ted. This function avoids the erroneous cut off detection at the start of the injection. This setting is only available when the criterion **inject pressure** is active.
Cavity pressure	Specification of the cavity pressure at which the system changes to hold pressure. This criterion is activated by selecting the adja- cent check box. This field is only shown if a sensor is available for measuring the cavity pressure and the option **Measure cavity pressure** is acti- vated in mask Production settings.
External DI	The cut off position is signalized by an external digital input. This field is only shown if an appropriate digital input is configured.

Hold

Specification of pressure and velocity of the hold movement. Further settings for the cooling time (duration of cooling after hold pressure) can be set here and different ineject parameters are displayed.

Field	Description
Stages	The number of adjustable stages.
Hold 1... Hold n	Setting the **Pressure** and **Velocity** for the duration specified under **To** at hold pressure. Depending on the number of stages, additional input fields are shown here to adjust the stages (**2,3**,....). These settings always apply for the time intervals between the end of the prior stage and the duration specified under **To**.

Inject pressure	Display of the current injection pressure. This field is only shown if a corresponding sensor is available.
Screw position	Display of the current screw position.
Cushion	Display of melt cushion at the end of injection.
Cooling Time	The current cooling time (actual value) is shown in the left field. The cooling time can be entered into the right field.

4.20 Inject - Tab Graphic

4.20.1 Purpose

This mask shows the pressure and velocity profile of the inject and hold movement graphically.

4.20.2 Description of the mask

The upper section of the mask displays the inject profile and the lower section of the mask the hold profile. Arrows on top of the graphics display the direction of the profile. A red line in the graphics displays the actual position of the movement.

Further ramp settings for the respective movement can be set. Depending on the configured ramp setting the corresponding ramp duration for the movement is calculated.

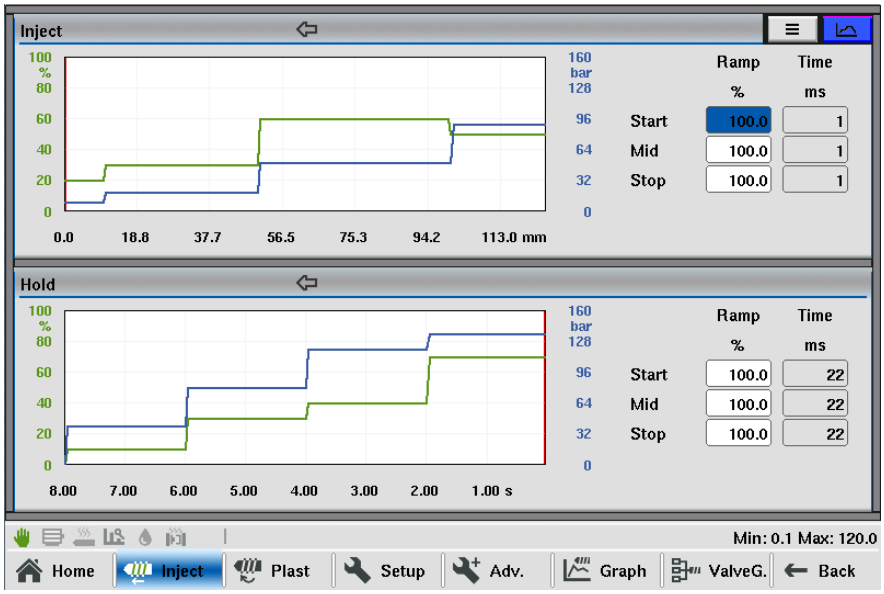


Fig.4-20: Mask "Inject profile graphic

4.20.3 Description of the elements

Field	Description

Ramp	The ramps [%] for movement start, movement stop as well as for the inner profile of the movement can be specified. The %- value refers to the maximum ramp profile output settings that are configured in setup advanced mask. • **Start**: Defines start ramp value for movement. • **Stop**: Defines stop ramp value for movement. • **Mid**: Defines ramp for all inner profile ramps for movement.
Time	Calculated duration for each ramp.

4.21 Plasticize and decompression - Tab Profile

4.21.1 Purpose

This mask is used to adjust the settings for plasticizing and decompression.

4.21.2 Description of the mask

The back pressure and screw velocity for specific screw positions can be en- tered in the section **Plasticize**.

In the section **Decompression**, settings for the processes Decompression before plasticize and Decompression after plasticize can be made.

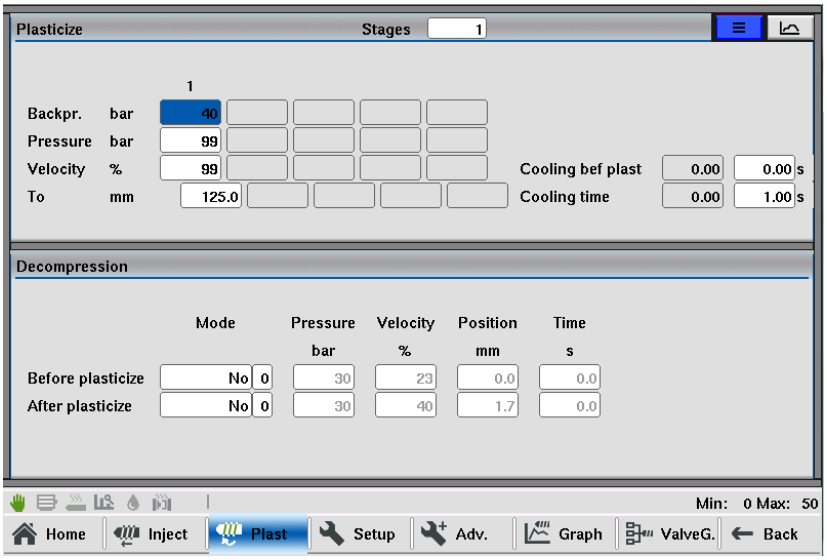


Fig.4-21: Mask "Plasticize and decompression profile"

4.21.3 Description of the elements

Plasticize

Field	Description

Stages	Number of adjustable stages.
Plasticize 1.. Plasticize n	Setting the **Back pressure** and **Screw velocity** between the end position of the previous stage (in case of stage 1, the screw posi- tions after hold movement) and the position specified under **To** when
Pressure	Set value for pump pressure (equal for all plasticizing

Decompression

These settings apply for both procedures, **Decompression before plasticiz- ing** and **Decompression after plasticizing**.

Information

In manual and adjustment mode the function ***Decompression after plasti- cize*** *will always be used.*

Field	Description
Mode	Mode of decompression, with the following selection options: ● **No**:no decompression. ● **Time**:decompression for a specified time duration. ● **Position**:decompression until a specified screw position.
Pressure	Specification of the pressure for the linear screw movement. This field can only be edited when 'Time' or 'Position' mode has been selected.
Velocity	Specification of the quantity for the linear screw movement. This field can only be edited when 'Time' or 'Position' mode has been selected.
Position / Time	Specification of the screw position or the duration of the decom- pression. The display is dependent on the selected mode.

4.22 Plasticize - Tab Graphic

4.22.1 Purpose

This mask shows the pressure and velocity profile of the plasticize movement graphically.

4.22.2 Description of the mask

The upper section of the mask displays the plasticize profile. Arrows on top of the graphics display the direction of the profile. A red line in the graphics dis- plays the actual position of the movement.

Further ramp settings for the respective movement can be set.

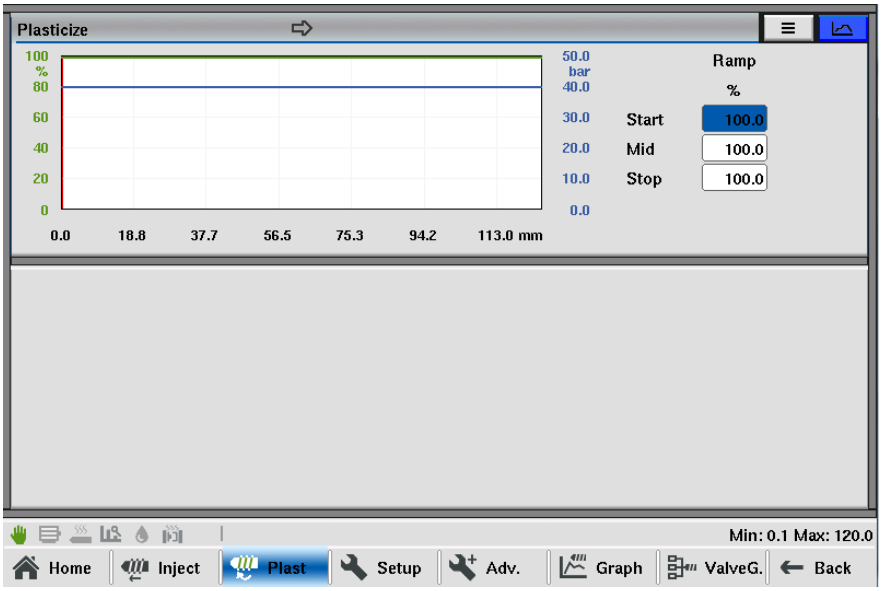


Fig.4-22: Mask "Plast profile graphic"

4.22.3 Description of the elements

Field	Description
Ramp	The ramps [%] for movement start, movement stop as well as for the inner profile of the movement can be specified. The %- value refers to the maximum ramp profile output settings that are configured in setup advanced mask. • **Start**: Defines start ramp value for movement. • **Stop**: Defines stop ramp value for movement. • **Mid**: Defines ramp for all inner profile ramps for movement.

4.23 Inject Setup

4.23.1 Purpose

Additional parameters for injection can be set within this mask.

4.23.2 Description of the mask

Within this mask, parameters for Intrusion, Cold slug eject, maximum move- ment and movement delay times as well as the constant outputs for the screw movements can be set.

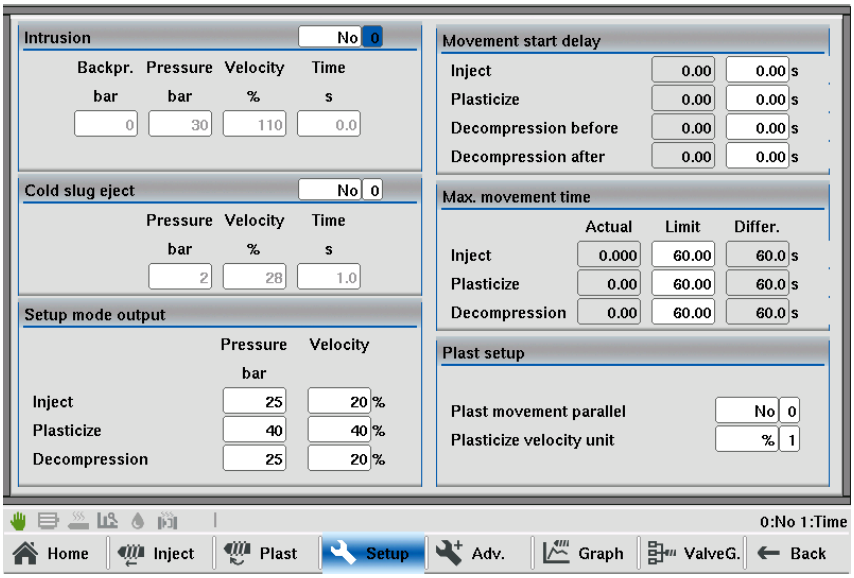


Fig.4-23: Mask "Inject Setup"

4.23.3 Description of the elements

Intrusion

Field	Description
Intrusion	If this function is activated, the input fields will be used for setting **Backpressure**, **Pressure**, **Velocity** and **Time** for the intrusion (permanent screw rotation before Inject).

Cold slug eject

Field	Description
Cold slug eject	If this function is activated, inject will be done time controlled before the movement 'nozzle forward' is executed. This option can be used for removing material from the nozzle that has grown stiff before the injection sequence will be started. The fields beneath will be used for setting **Pressure**, **Velocity** and **Time** for Cold slug eject.
Max. lock time	The duration of Mold HighPressure (last profile stage in mold profile) is shown in the left field **Actual**. The monitoring time is entered in field **Limit**. The difference between the two values is shown in the right field **Differ**.

Maximum movement time

Field	Description

Inject	The left field **Actual** displays the current time for the inject movement. The maximum permitted time for the incect movement specified in field **Limit**. If this time is exceeded an alarm will be triggered and the cycle is stopped. The difference between the two values is shown in the right field **Differ.**
Plasticize	The left field **Actual** displays the current time for the plasticize movement. The maximum permitted time for the plasticize movement specified in field **Limit**. If this time is exceeded an alarm will be triggered and the cycle is stopped. The difference between the two values is shown in the right field **Differ.**
Decompression	The left field **Actual** displays the current time for the decompression movement. The maximum permitted time for the decompression movement specified in field **Limit**. If this time is exceeded an alarm will be triggered and the cycle is stopped. The difference between the two values is shown in the right field **Differ.**

Movement start delay

Field	Description
Inject delay	The delay time for the inject movement is adjusted here.
Plasticize delay	The delay time for the plasticize movement is adjusted here.
Decompression	The delay time for the decompression movement is adjusted here.

Setup mode output

Field	Description
Setup mode output inject	Pressure and velocity output for the inject movement in setup mode.
Setup mode output plasti- cize	Pressure and velocity output for the plasticize movement in setup mode.
Setup mode output decom- pression	Pressure and velocity output for the decompression movement in setup mode.

4.24 Inject Setup Advanced - Tab1

4.24.1 Purpose

Additional parameters for injection can be configured within this mask.

4.24.2 Description of the mask

For the inject movement the minimum profile outputs, maximum ramp settings and pump and valve delay times can be set.

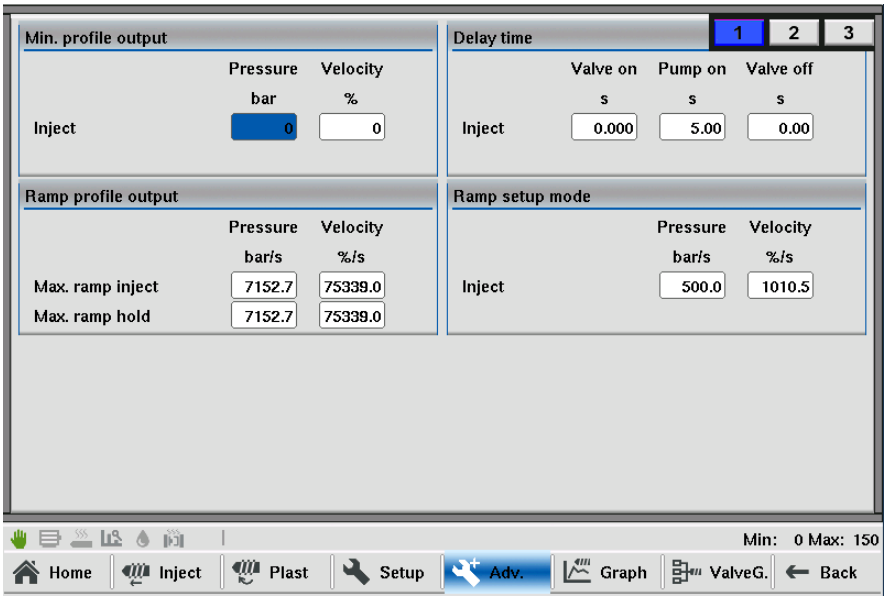


Fig.4-24: Mask "Inject setup advanced tab1"

4.24.3 Description of the elements

Minimum profile output

Field	Description
Min. profile output iniect	The minimum profile output (pressure, velocity) for the inject movement is adjusted here. The output in any section of the profile never falls below this value.

Ramp profile output

Field	Description
Max. ramp inject	The maximum ramp (pressure, velocity) for the the inject movement is adjusted here.
Max. ramp hold	The maximum ramp (pressure, velocity) for the the hold movement is adjusted here.

Delay times

Field	Description
Inject delay	Field **Pump on** specifies the time that is waited between the start of the inject movement and the activation of the hydraulic pump. Field **Valve off** determines the time that is waited between the end of the inject movement and the closing of the control valve in order to release the remaining pressure.

Ramp setup mode

Field	Description
Ramp setup mode inject	Ramp (pressure and velocity) in setup mode for inject movement is adjusted here.

4.25 Inject Setup Advanced - Tab2

4.25.1 Purpose

Additional parameters for plasticize and decompression can be configured within this mask.

4.25.2 Description of the mask

For plasticize and decompression the minimum profile outputs, maximum ramp settings and pump and valve delay times can be set.

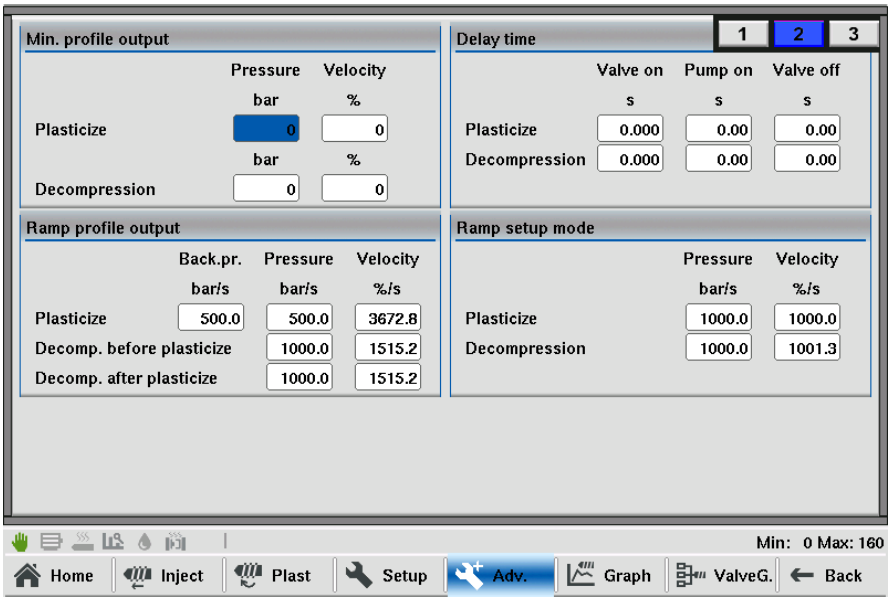


Fig.4-25: Mask "Inject setup advanced tab2"

4.25.3 Description of the elements

Minimum profile output

Field	Description
Min. profile output plasticize	The minimum profile output (pressure, velocity) for the plasticize movement is adjusted here. The output in any section of the profile never falls below this value.
Min. profile output decompression	The minimum profile output (pressure, velocity) for decompression is adjusted here. The output in any section of the profile never falls below this value.

Ramp profile output

Field	Description
Max. ramp Plasticize	The maximum ramp (backpressure, pressure, velocity) for the the plasticize movement is adjusted here.
Max. ramp decompression before plasticize	The maximum ramp (pressure, velocity) for the the decompression before plasticize movement is adjusted

Max. ramp decompression after plasticize	The maximum ramp (pressure, velocity) for the the decompression after plasticize movement is adjusted

Delay times

Field	Description
Plasticize delay	Field **Pump on** specifies the time that is waited between the start of the plasticize movement and the activation of the hydraulic pump. Field **Valve off** determines the time that is waited between the end of the plasticize movement and the closing of the control valve in order to release the
Decompression delay	Field **Pump on** specifies the time that is waited between the start of the decompression movement and the activation of the hy- draulic pump. Field **Valve off** determines the time that is waited between the end of the decompression movement and the closing of the control valve in order to release the

Ramp setup mode

Field	Description
Ramp setup mode plasti- cize	Ramp (pressure and velocity) in setup mode for plasticize move- ment is adjusted here.
Ramp setup mode decom- pression	Ramp (pressure and velocity) in setup mode for decompression movement is adjusted here.

4.26 Inject Setup Advanced - Tab Inject control

4.26.1 Purpose

This mask is used to set the regulator parameters for the injection unit.

4.26.2 Description of the mask

This mask is divided into the sections:

- Inject
- Inject pressure limit
- Hold
- Backpressure
- Plasticize
- Inject position control

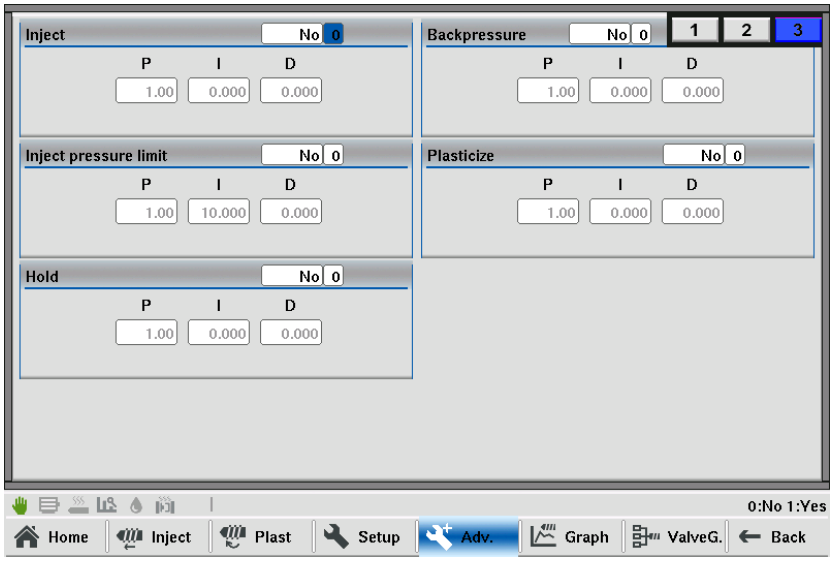


Fig.4-26: Mask "Inject Setup Advanced - Tab Inject control"

4.26.3 Description of the elements

Inject

Field	Description
Use PID	When this option is selected, the injection is regulated (PID), otherwise it will be controlled.
P	The proportional part for the injection regulator is adjusted here.
I	The integral part for the injection regulator is adjusted here.
D	The differential part for the injection regulator is adjusted here.

Inject Pressure limit

Field	Description
Use PID	When this option is selected, the pressure limit is regulated (PID), otherwise it will be controlled.
P	The proportional part for the pressure limit controller is adjusted here.
I	The integral part for the pressure limit controller is adjusted here.
D	The differential part for the pressure limit controller is adjusted here.

Hold

Field	Description
Use PID	When this option is selected, the hold pressure is regulated (PID), otherwise it will be controlled.

P	The proportional part for the hold pressure controller is adjusted here.
I	The integral part for the hold pressure controller is adjusted here.
D	The differential part for the hold pressure controller is adjusted here.
Filter time	The filter time for the set value of hold controller is adjusted here Decreasing the filter time leads to a faster control rise time. At the same time, a decreasing filter time can lead to undershoot resp. overshoot during hold process and furthermore to a degradation of the part quality.

Backpressure

Field	Description
Use PID	When this option is selected, the backpressure at plasticizing is regulated (PID), otherwise it will be controlled (precondition for control: Oil backflow at linear screw movement in backward direction must be throttled by an electro-magnetically activated proportional valve). This setting cannot be deactivated on electric machines.
P	The proportional part for the back pressure at plasticizing is adjusted here.
I	The integral part for the back pressure at plasticizing is adjusted here.
D	The differential part for the back pressure at plasticizing is adjusted here.

Plasticize

3	Description
Use PID	When this option is selected, the screw feed speed at plasticizing is regulated (PID), otherwise it will be controlled.
P	The proportional part for the torque controller at plasticizing is adjusted here.
I	The integral part for the torque controller at plasticizing is adjusted here.
D	The differential part for the torque controller at plasticizing is adjusted here.

Inject position control

Field	Description
Use PID	The position controller for the screw can be activated.
Max control time	Position controlling starts after a screw movement has finished and stopps after this time value. If this time is set to 0.0 s, the position controller keeps active until the next screw movement is started.
P	The proportional part for the screw position controller is adjusted here.

4.27 Inject graph

4.27.1 Purpose

The mask 'Inject graph' is used to record and display up to 6 process variables graphically.

4.27.2 Description of the mask

The measured values are represented in an y/t chart. Underneath the chart is a legend, which shows the current actual process values and their color-coded assignments.

The measurement can be started and stopped using the **Activate/Deacti- vate**- button in the main menu bar underneath the mask.

The mask shows the last 10 recorded curves. The latest one in displayed in colors. The previous curves are displayed in a gray color.

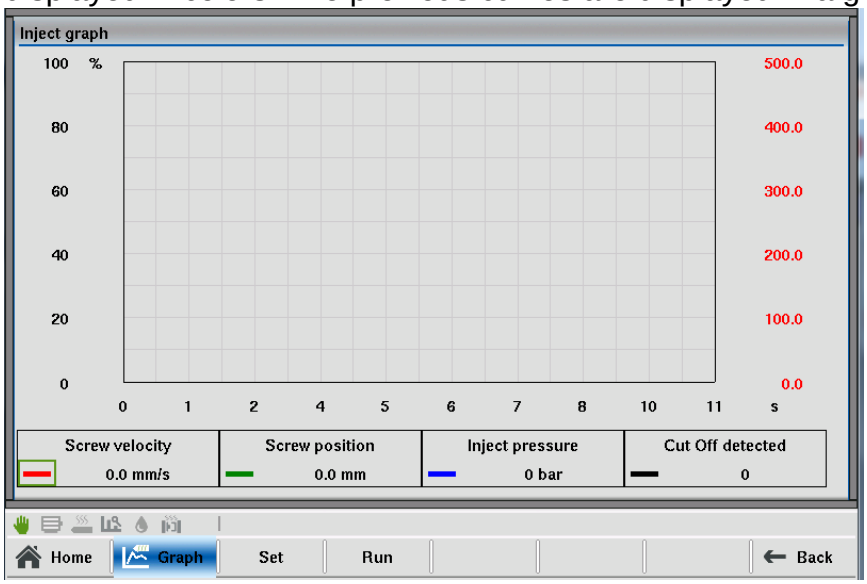


Fig.4-27: Mask "Inject graph"

4.27.3 Description of the elements

Field	Description
Screw velocity (configured inject graph parameter	Current screw velocity and color of the corresponding graph.
Screw position (configured inject graph parameter	Current position of the screw and color of the corresponding graph.
Inject Pressure (configured inject graph parameter	Current injection pressure and color of the corresponding graph.
Cut Off detected (configured inject graph parameter	Cut off detection displayed as vertical line.

Set	Settings for the injection graphic (see mask 'Set').
Run/Hold	By pressing the button **Run**, the recording starts. Pressing the button **Hold** stops the recording.

4.28 Inject graph settings

4.28.1 Purpose

In this mask, relevant parameters for the inject graph mask are defined.

4.28.2 Description of the mask

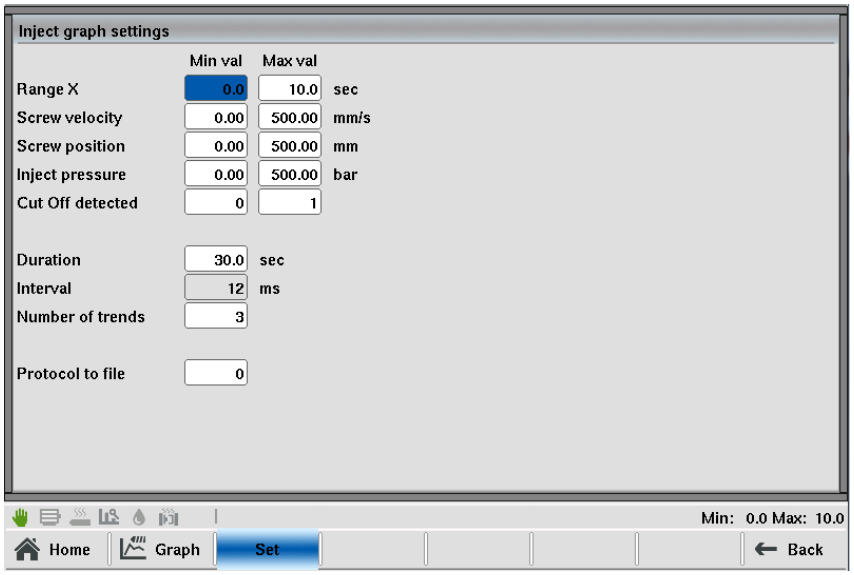


Fig.4-28: Mask "Inject graph settings"

4.28.3 Description of the elements

Field	Description
Range X	Range of the time axis on the inject graph mask.
Screw velocity (configured inject graph parameter	The graph for the screw velocity is scaled here.
Screw position (configured inject graph parameter	The graph for the screw position is scaled here.
Inject Pressure (configured inject graph parameter	The graph for the injection pressure is scaled here.
Cut Off detected (configured inject graph parameter	The graph for the cut off detection is scaled here.
Duration	Defines the measurement duration of the inject graph parameters.

Interval	Displays the measurement interval. Teh interval defines the duration between to points of a measurement.
Number of trends	Defines the number of trendcurves resp. recorded curves that are displayed.
Protocol to file	Activates the protocolling of the recorded curves. For each inject process, a protocol file is stored. The protocol files are stored on an attached USB storage device.

4.29 Valve gates

4.29.1 Purpose

This mask is used to adjust the settings for available valve gates.

Information

This mask is only visible if a valve gate is available and configured.

4.29.2 Description of the mask

The single valve gates can be activated and deactivated in this mask. Fur- thermore settings for opening and closing of a valve gate can be done.

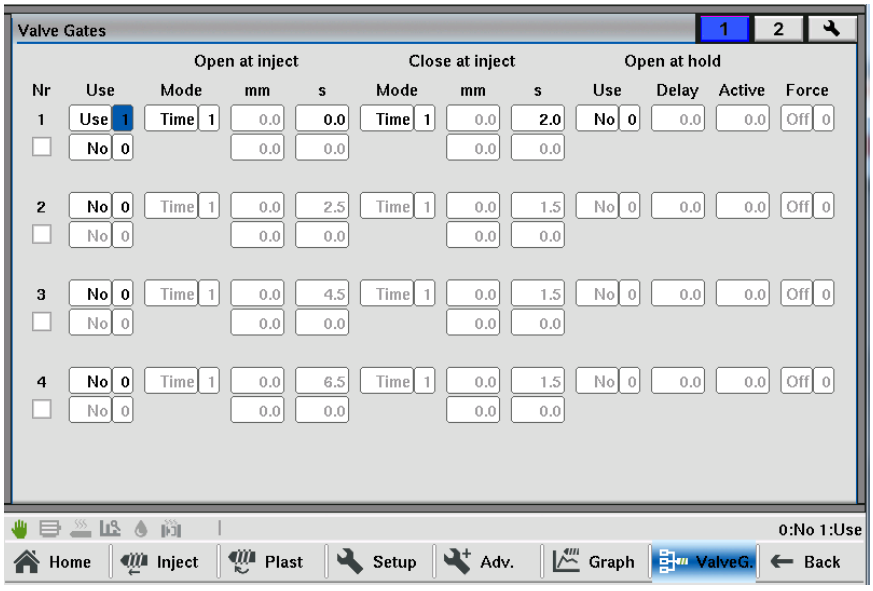


Fig.4-29: Mask "Valve gates "

4.29.3 Description of the elements

Information

During inject process (including hold) at least one valve gate must be open. Otherwise an alarm appears and the inject process will be

Below the valve gate number an icon shows if the corresponding valve gate is actually actuated.

Field	Description
Use	Activate/Deactivate a valve gate. Each valve gate has two input fields for using/not using. Thus during inject process (except hold process) a valve gate can be opened and closed twice. e.g. valve gate 1 opens at position 120mm, closes at position 80mm, opens again at position 60mm and closes again at position 30mm.
Mode (Open at inject)	Mode of opening a valve gate with the following options. ● **Pos:**Setting of a time and position is possible. Position defines at which screw position the valve gate opens. Set time value defines a delay time which has to elapse after reaching the set screw position before the valve gate opens. ● **Time:**Definition of a position is not possible. Set time value defines a delay time which has to elapse after inject starts before the valve gate opens. For the second time opening a valve gate, the modes are not selectable. The modes of the first opening and closing are taken.
Mode (Close at inject)	Mode of closing a valve gate with the following options. ● **Pos:**Setting of a time and position is possible. Position defines at which screw position the valve gate closes. Set time value defines a delay time which has to elapse after reaching the set screw position before the valve gate closes. ● **Time:** Definition of a position is not possible. Set time value defines a delay time which has to elapse before the valve gate closes. The delay time starts after the valve gate is open. For the second time closing a valve gate, the modes are not selectable. The modes of the first opening and closing are taken.
Hold	Mode of opening a valve gate during hold with the following options. ● **Use:**Activates the option, that a valve gate opens during hold with the defined parameters for 'Delay' and 'Time'. ● **Delay:** Definition of a delay time which has to elapse after reaching cut off before the valve gate opens. ● **Time:** Definition how long the valve gate is open during hold. ● **Force:** Only selectable in setup mode. This option forces a valve gate to open independent of the set time parameters.

4.31 Nozzle - Tab Profile

4.31.1 Purpose

Settings for the nozzle movement can be done in this mask.

4.31.2 Description of the mask

Within the sections **Nozzle forward** and **Nozzle backward**, the pressure and velocity for the nozzle forward movement and for the nozzle backward move- ment can be specified. The number of input fields depends if the the nozzle moves position depending (with limit switch or transducer) or time depending. The setting if the nozzle moves position or time depending, can be defined in

mask 'Machine equipment'. Further special settings for the forward movement of the nozzle and for contact force build up can be set here. The contact force build up after reaching the forward endposition is always executed. It can be deactivated by setting the Force build up time to 0 seconds.

The operating mode for the nozzle's backward movement can be selected via

Nozzle back mode.

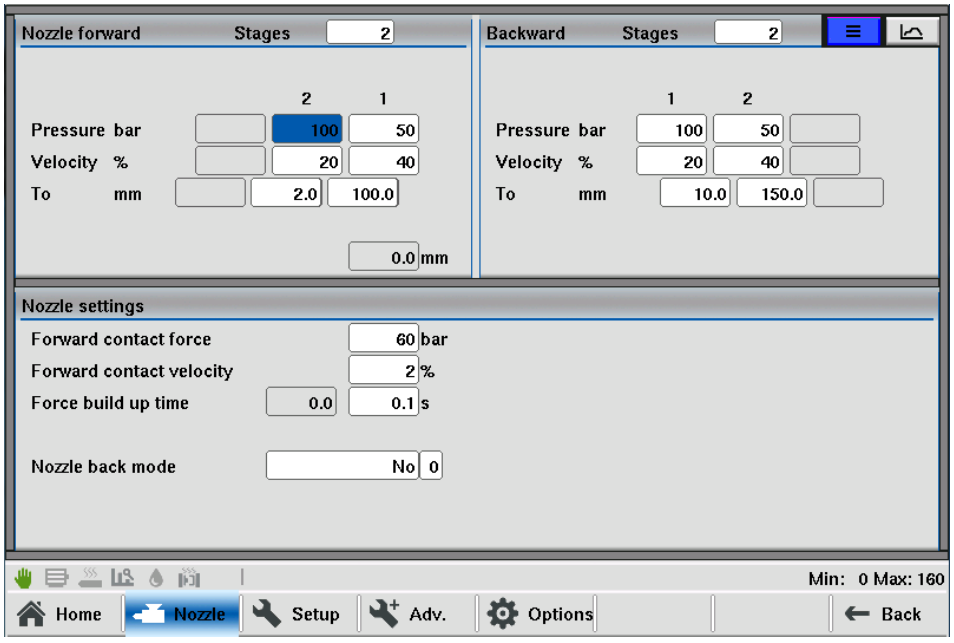


Fig.4-42: Mask "Nozzle - tab profile"

4.31.3 Description of the elements

Nozzle forward

Field	Description
Stages	Number of adjustable stages.

Forward 1.. Forward n	Setting of **Pressure** and **Velocity** between the end position of the previous stage (in case of stage 1, the "nozzle backward" position) and the position specified under **to** for nozzle forward movement.

Nozzle backward

Field	Description
Stages	Number of adjustable stages.
Backward 1.. Backward n	Setting of **Pressure** and **Velocity** between the end position of the previous stage (in case of stage 1, the "nozzle forward" position) and the position specified under **to** for nozzle backward movement.

Nozzle settings

Field	Description
Forward contact force	Defines the force which is used to press the nozzle against the mold.
Forward contact velocity	Defines the velocity which is used to press the nozzle against the mold.
Force build up time	Defines the time which is permitted for the pressure(force) build up of the nozzle. Pressure build up can be deactivated by setting this time to 0.0s.

Field	Description
Nozzle back mode	Selects a mode for the backward movement of the nozzle. ● **No**: Deactivate nozzle mode backward. If this is selected the nozzle remains in the injection position. ● **After Plasticize**: After plasticizing the nozzle moves back to rear end point and/or time-controlled backwards, depending of the selected nozzle movement mode. ● **Before mold open**: Before opening the mold the nozzle moves back to rear end point and/or time-controlled backwards, depending on the selected nozzle movement mode. ● **After inject**: After injection the nozzle moves back to rear end point and/or time-controlled backwards, depending of the selected nozzle movement mode.
Nozzle hold during plast	If set, the nozzle will be pressed against the mold actively while plasticizing.
Nozzle hold during inject	If set, the nozzle will be pressed against the mold actively while injecting.

4.32 Nozzle - Tab Graphic

4.32.1 Purpose

This mask shows the pressure and velocity profile of the nozzle movement graphically.

4.32.2 Description of the mask

The upper section of the mask displays the nozzle forward profile and the lower section of the mask the nozzle backward profile. Arrows on top of the graphics display the direction of the profile. A red line in the graphics displays the actual position of the movement.

Further ramp settings for the respective movement can be set. Depending on the configured ramp setting the corresponding ramp duration for the movement is calculated.

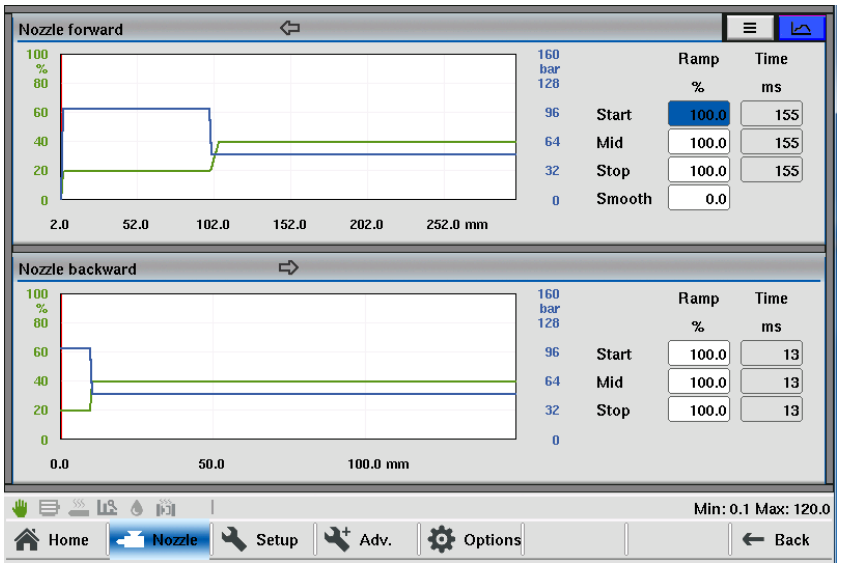


Fig.4-44: Mask "Nozzle profile graphic"

4.32.3 Description of the elements

Field	Description

Ramp	The ramps [%] for movement start, movement stop as well as for the inner profile of the movement can be specified. The %- value refers to the maximum ramp profile output settings that are configured in setup advanced mask. • **Start**: Defines start ramp value for movement. • **Stop**: Defines stop ramp value for movement. • **Mid**: Defines ramp for all inner profile ramps for movement. • **Smooth**: Smooth factor is used to allow a smooth ending of a movement. If smooth-factor = 0%, the ending of a movement will be detected when the target position has been reached. Thus the movement will be stopped abrupt (valves will be closed). If smooth- factor = 100%, first the standstill of a movement will be awaited and afterwards the valves will be closed. Reference value for the smooth factor is the maximum speed of the respective movement (see mask 'Max. Velocity').
Time	Calculated duration for each ramp.

4.33 Nozzle Setup

4.33.1 Purpose

Additional parameters for the nozzle can be configured within this mask.

4.33.2 Description of the mask

Besides general settings for the nozzle, maximum movement and movement delay times as well as the constant outputs for the nozzle movement in setup mode can be set.

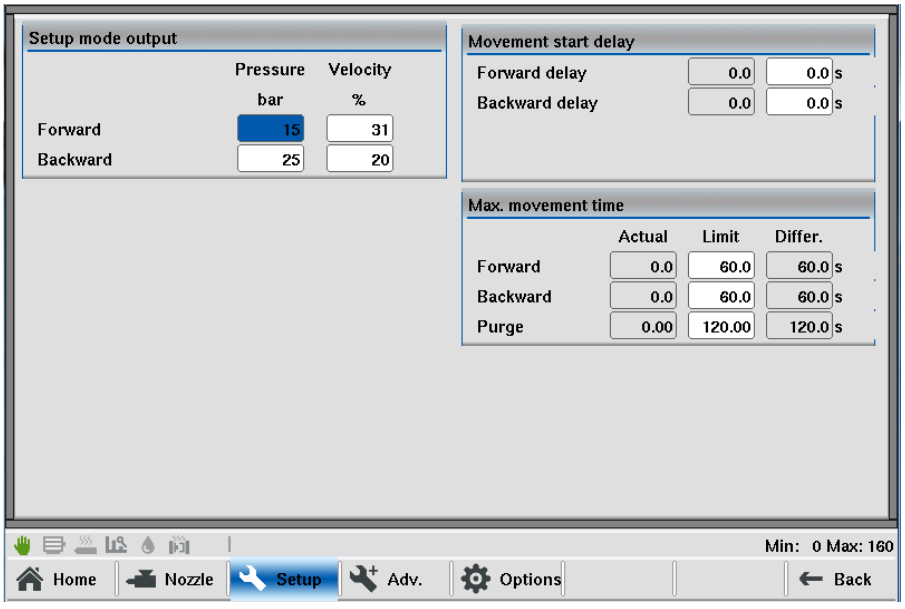


Fig.4-45: Mask "Nozzle setup"

4.33.3 Description of the elements

Setup mode output

Field	Description
Setup mode output forward	Pressure and velocity output for the nozzle forward movement in setup mode.
Setup mode output back- ward	Pressure and velocity output for the nozzle backward movement in setup mode.

Nozzle adjust

Field	Description
Monitor time	Maximum time which is permitted for automatic nozzle adjustment. If this time is exceeded an alarm will be raised.
Standstill	If the standstill time exceeds during automatic nozzle adjust without any movement of the nozzle, an alarm will be raised.
Auto nozzle adjust	This button starts or stops the automatic nozzle adjustment. Only allowed in Setup mode.

Maximum movement time

Field	Description
Max. forward time	The left field **Actual** displays the current time for nozzle forward movement. The maximum permitted time until the nozzle is forward is specified in field **Limit**. If this time is exceeded an alarm will be triggered and the cycle is stopped. The difference between the two values is shown in the right field **Differ.**
Max. backward time	The left field **Actual** displays the current time for nozzle backward movement. The maximum permitted time until the nozzle is back is specified in field **Limit**. If this time is exceeded an alarm will be triggered and the cycle is stopped. The difference between the two values is shown in the right field **Differ.**
Max. purge time	The left field **Actual** displays the current time for auto purge. The maximum permitted time for auto purge is specified in field **Limit**. If this time is exceeded an alarm will be triggered and the cycle is stopped. The difference between the two values is shown in the right field **Differ.**

Movement start delay

Field	Description
Forward delay	The delay time for the nozzle forward movement is adjusted here.
Backward delay	The delay time for the nozzle backward movement is adjusted here.

4.34 Nozzle Setup Advanced

4.34.1 Purpose

Additional parameters for the nozzle can be configured within this mask.

4.34.2 Description of the mask

For the nozzle movement the minimum profile outputs, maximum ramp set- tings, pump and valve delay times and settings for mold height adjustment can be set.

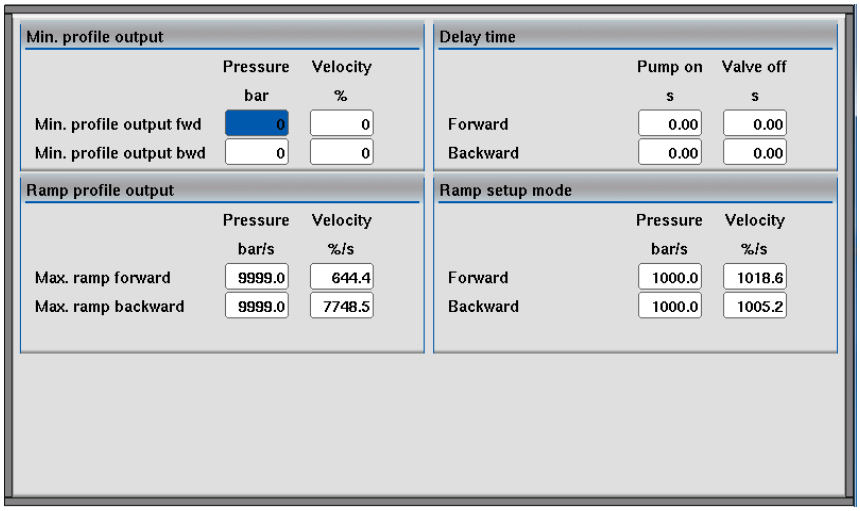


Fig.4-46: Mask "Nozzle setup advanced"

4.34.3 Description of the elements

Minimum profile output

Field	Description
Min. profile output forward	The minimum profile output (pressure, velocity) for the nozzle forward movementis adjusted here. The output in any section of the profile never falls below this value.
Min. profile output backward	The minimum profile output (pressure, velocity) for the nozzle backward movement is adjusted here. The output in any section of the profile never falls below this value.

Ramp profile output

Field	Description
Max. ramp forward	The maximum ramp (pressure, velocity) for the nozzle forward movement is adjusted here.
Max. ramp forward before limit	The maximum ramp (pressure, velocity) for the nozzle forward movement before reaching the limit switch is adjusted here. This setting option only exists if a limit switch is available.

Max. ramp forward after limit	The maximum ramp (pressure, velocity) for the nozzle forward movement after reaching the limit switch is adjusted here. This setting option only exists if a limit switch is available.
Max. ramp backward	The maximum ramp (pressure, velocity) for the nozzle backward movement is adjusted here.
Max. ramp contact force	The maximum ramp (pressure, velocity) for the contact force build up of the nozzle is adjusted here.

Delay times

Field	Description
Forward delay	Field **Pump on** specifies the time that is waited between the start of the 'Nozzle forward' movement and the activation of the hydraulic pump. Field **Valve off** determines the time that is waited between the end of the movement 'nozzle forward' and the closing of the control valve in order to release the remaining pressure.
Backward delay	Field **Pump on** specifies the time that is waited between the start of the 'Nozzle forward' movement and the activation of the hydraulic pump. Field **Valve off** determines the time that is waited between the end of the movement 'Nozzle forward' and the closing of the control valve in order to release the remaining pressure.

Ramp setup mode

Field	Description
Ramp setup mode forward	Ramp (pressure and velocity) in setup mode for nozzle forward movement is adjusted here.
Ramp setup mode back- ward	Ramp (pressure and velocity) in setup mode for nozzle backward movement is adjusted here.

4.35 Nozzle options

4.35.1 Purpose

The settings for auto purge as well as for the shut off nozzle can be adjusted on this mask.

4.35.2 Description of the mask

The procedure for auto purge follows the sequence of plasticizing - injection - decompressing (sequence depends on the start position of the screw).

Pressure, velocity and active time can be set for opening and closing the shut- off nozzle.

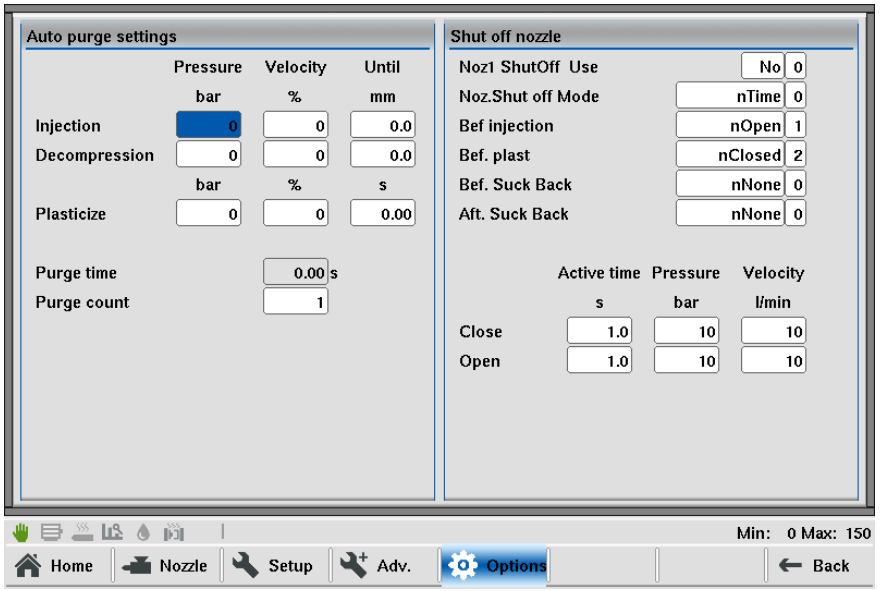


Fig.4-47: Mask "Nozzle options"

4.35.3 Description of the elements

Auto purge settings

Field	Description
Injection	Setting of **Pressure** and **Velocity** up to specified Position (**To**) for injection during auto purge.
Decompression	Setting of **Pressure** and **Velocity** up to specified Position (**To**) for descompression during auto purge.
Plasticize	Setting of **Pressure** and **rpm** up to specified **Time** for plasticizing during auto purge.
Purge time	Displays the elapsed time for purge.
Purge count	Specification of the cycles for purging at change of material.

Shut off nozzle

Field	Description
Close	Specifying **Pressure**, **Velocity** and **Active Time** for closing the shut-off nozzle. Shut-off nozzle will be closed with the specified parameters after injection has finished resp. after each process where material is carried out of the nozzle.
Open	Specifying **Pressure**, **Velocity** and **Active Time** for opening the shut-off nozzle. Shut-off nozzle will be opened with the specified parameters before injection starts resp. before each process where material is carried out of the nozzle.

4.36 Heating Nozzle

4.36.1 Purpose

This mask is used to adjust the settings for nozzle heater.

4.36.2 Description of the mask

The individual heating zones are graphically depicted in the section **Heating zones**. The current temperature is shown in the middle of each heating zone. The input fields for the set-point temperature and tolerance are located under- neath the heating zones.

General settings for the nozzle heater and the material entrance are configured in the lower section of the mask.

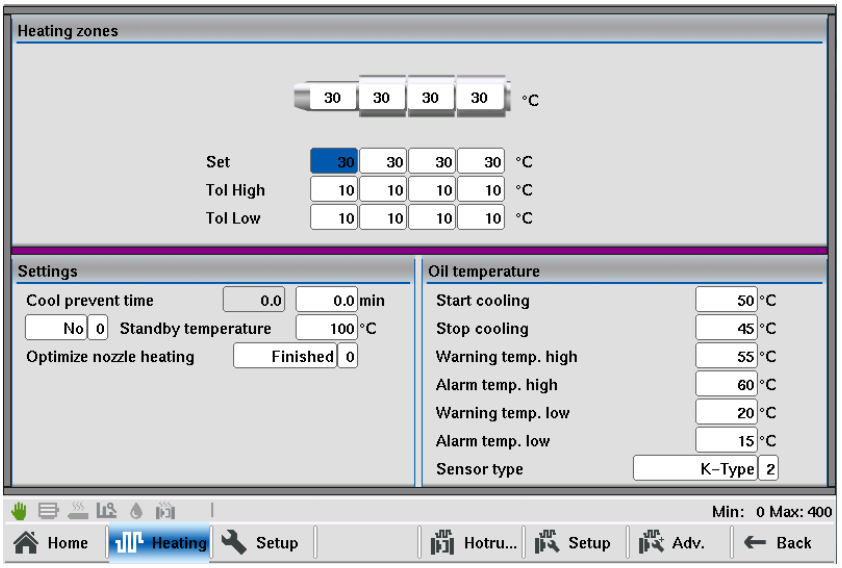


Fig.4-48: Mask "Heating Nozzle"

4.36.3 Description of the elements

Heating zones

Field	Description

Set	Specification of the temperature set-point value of the corresponding heating zone. If the operating mode is set to 'Setter', it is not possible to enter a temperature. The operating mode of the heater can be selected in the mask "Heating nozzle setup - tab2".
Tolerance high / Tolerance low	These fields specify the upper and lower tolerance temperature. If the current temperature of the heating zone is below Tol. low or above Tol. high an alarm will be raised. Screw movement is only possible if temperatures of all heating zones are within their tolerances.

Settings

Field	Description
Cool prevent time	Specification of the waiting period until release of the screw movement, measured as of the moment when the temperatures of all heating zones are within the specific tolerance.
Activate standby tempera- ture	Function is used to hold the temperature of the heating zones constantly above the standby temperature. If standby is activated, the standby temperature is adopted as the new set-point value and no screw movement is possible. **On:** Nozzle warming activated. The nozzle is kept at **standby temperature**. **Off:** The nozzle is not kept warm. This setting is only effective with the operating mode "PID" of the nozzle heater.

Material entrance

Field	Description
Start temperature cooling	The material entrance cooling will be activated if the temperature exceeds this value.
Stop temperature cooling	The material entrance cooling will be deactivated if the temperature falls below this value.
Warning temperature	If the value exceeds the warning temperature, an alarm will be triggered. The machine is not halted.
Alarm temperature	If the value exceeds the alarm temperature, an alarm will be triggered. The machine is halted.

4.37 Heating Nozzle Setup - Tab1

4.37.1 Purpose

This mask is used to specify general settings for the nozzle heater and settings for oil heating and oil cooling.

4.37.2 Description of the mask

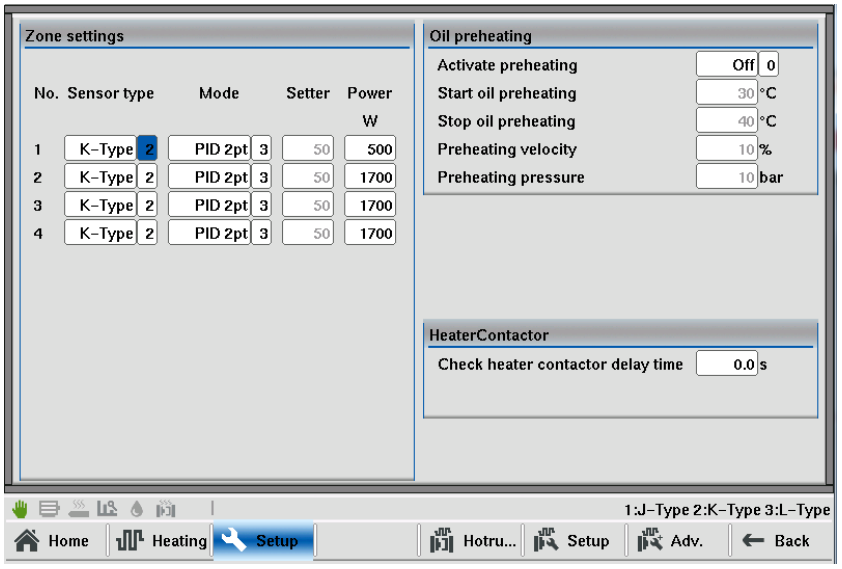


Fig.4-49: Mask "Heating nozzle setup - tab1"

4.37.3 Description of the elements

General settings

Field	Description
Group heating	Activates group heating. The single zones are heated within the set tolerance values.
Optimize nozzle heating	Pre-selection for optimizing all heating zones. • **Finished** • **Optimizing** The optimization itself is only started once this option has been selected and the heater has been switched on. After optimization has finished, the value will be set to 'Finished' automatically.
Undo change pid parame- ter	If this field is activated, the PID parameters of the previous optimization are restored
Max. preheat time	This value only takes effect if the machine is connected with Easy-Net Control Center and if the option "Heatup optimization" of EasyNet is used. This value defines how long the used material is allowed to be on operating temperature without any impairment of the material characteristics.

Oil temperature

Information

This fields are only shown if an oil temperature sensor is available.

Field	Description

Start cooling	If the temperature exceeds this limit, oil cooling will be activated.
Stop cooling	If the temperature falls below this limit, oil cooling will be deactivated.
Alarm temperature	If oil temperature exceeds this limit, an alarm will be raised and the motor will be turned off.
Warn temp low	If the oil temperature falls below this limit, a warning will be raised. The monitoring for this temperature is only active in full- and half automatic mode.
Warn temp high	If the oil temperature exceeds this limit, a warning will be raised. The monitoring for this temperature is only active in full- and half automatic mode.
Sensor type	Selection of the type of oil temperature sensor (none, J-, K- or L type).

Oil Pre Heating

Information

If no tank heating is available, the oil can be heated by circulation (pre heat- ing).

Field	Description
Activate pre-heating	The preheating function can be activated by this field.
Start oil pre heating	Specification of the minimum oil temperature. If this value is fallen below, the oil pre heating is activated.
Stop oil pre heating	Specification of the temperature at which the oil pre heating is deactivated again.
Pre heating velocity	Specification of the velocity for oil pre heating.
Pre heating pressure	Specification of the pressure for oil pre heating.

4.38 Heating Nozzle Setup - Tab2

4.38.1 Purpose

This mask is used to specify the sensor types for the nozzle heater and the hopper (material entrance).

4.38.2 Description of the mask

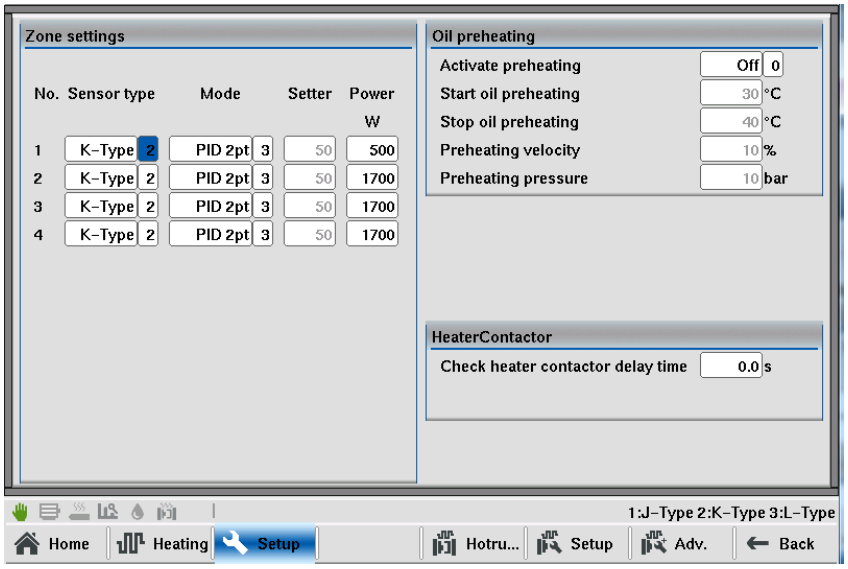


Fig.4-50: Mask "Heating nozzle setup - tab2"

4.38.3 Description of the elements

Zone settings

For each heating zone the following settings can be made:

Field	Description
Sensor type	Selection of the type of temperature sensor (J-, K- or L-type).
Mode	Operating mode of the heating zones: • **Off** = heating zone is switched off • **Measure** = only temperature measurement • **Setter** = Heating output is fixed (between 0 and 100% of maximum performance). If additional cooling of heating zones is possible, values between -100 to +100% can be entered in Setter input field. The negative %- value defines the cooling performance. -100% equals the maximum cooling performance. No monitoring via temperature sensor is done in Setter- mode. • **PID 2pt** = controlled • **PID 3pt** = controlled heating and cooling • **PID 2pt EM** = Emergency mode. If the referring zone signals an alarm (e.g. sensor break), the machine cycle continues compared to the normal operating modes. But the referring temperature zone won't be controlled anymore. • **PID 3pt EM** = Emergency mode. If the referring zone signals an alarm (e.g. sensor break), the machine cycle continues compared to the normal operating modes. But the referring temperature zone won't be controlled anymore.

Setter	Specification of the pulse width for triggering the heating zone in percent. This setting is only active in the mode **Setter**. The heating performance is determined by the pulse/pause ratio of the pulse width modulation.
Power	Specification of the effective power of the heating band. Based on this value the power consumption of the heating is calculated and displayed on the energy monitor mask.

Hopper settings

Field	Description
Sensor type	Selection of the type of temperature sensor for the hopper (J-, K- or L-type).

4.39 Heating Mold - Hot runner

4.39.1 Purpose

The settings for the individual hot runners of a heating system can be made in this mask.

4.39.2 Description of the mask

The individual hot runners can be activated/deactivated in this mask. Also set- tings for the **set temperature**, **tolerance limits** and **temperature increase** can be made. The mask is divided into several tabs. Up to six zone can be displayed in a mask. In sector **Quick Set** also values for the set temperature

and tolerance limits can be entered. After confirmation these are taken over for all hot runners of the mask displayed. The current state for each hot runner is additionally displayed by a graph. An analog bar shows the current temper- ature of a hot runner zone.

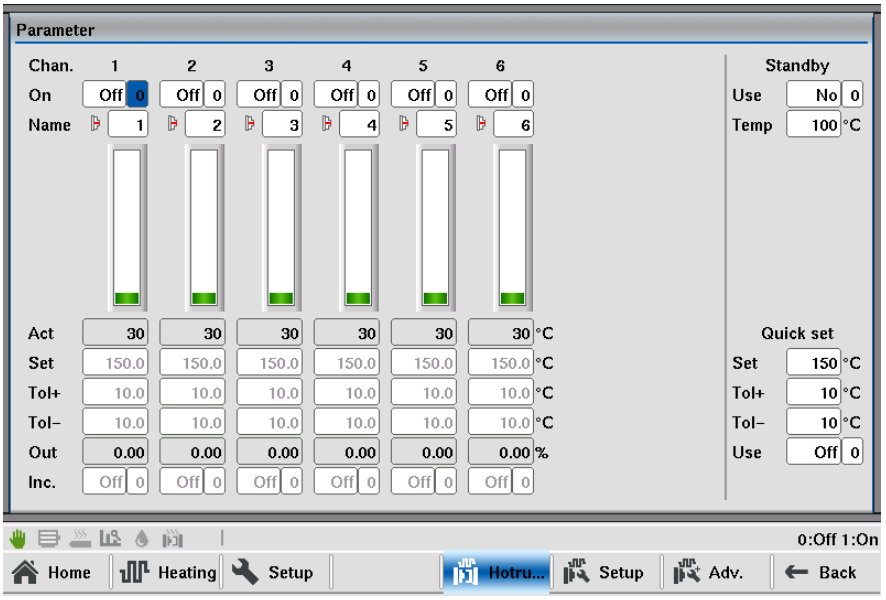


Fig.4-51: Mask "Hot runner parameter"

4.39.3 Description of the elements

Paramter

Field	Description
Channel	Display of the hot runner number.
On	Here the hot runner can be activated or deactivated.
Name	Allocation of hotrunner channel of the controller to plugged hotrunner of the mold. E.g. channel 1 of the controller can be connected to hotrunner 5 of the mold. In this case type 5 has to be defined for channel 1. In addtion, a symbol displays if the channel is used as hot runner zone or a block heating zone.
	Hot runner zone
	Block heating zone
Act. temperature	Display of the current temperature of the hot runner.
Set temperature	Specifies the hot runner's set temperature.
Tol+	Specifies the upper tolerance limit.
Tol-	Specifies the lower tolerance limit.
Output	Displays the current heating output (in % of maximum possible output).
Inc. temp	Here the temperature increase for fast heating of the zone can be activated. If this function is active the value under **Increase temperature** in mask "Hotrunner settings" is added to the value specified for the temperature of the zone.

Quick Set

In this sector the settings for the set temperature and tolerance limits can be made which take effect for all hot runners that are displayed on the current mask.

Field	Description
Set	Specifies the set temperature of the hot runners.
Tol+	Specifies the upper tolerance limit.
Tol-	Specifies the lower tolerance limit.
Use	Must be activated to copy the values for Set, Tol+ and Tol- to every hotrunner zone.

Standby temperature

In this sector the settings for the set temperature and tolerance limits can be made which take effect for all hot runners that are displayed on the current mask.

Field	Description
Use	This function is used to hold the temperatures of the heating zones constantly above the standby temperature. This setting is only effective with operating mode "PID" of the hot runners.
Temperature	Temperature which is hold when function **Standby** is active.

4.40 Hot runner Setup

4.40.1 Purpose

In this mask general settings for operating the hot runner system can be speci- fied.

4.40.2 Description of the mask

In area **Hotrunner settings**, the general settings for the hot runner are speci- fied.

Information

To ensure that the heater is switched on at the specified starting times, the machine itself must also be switched on.

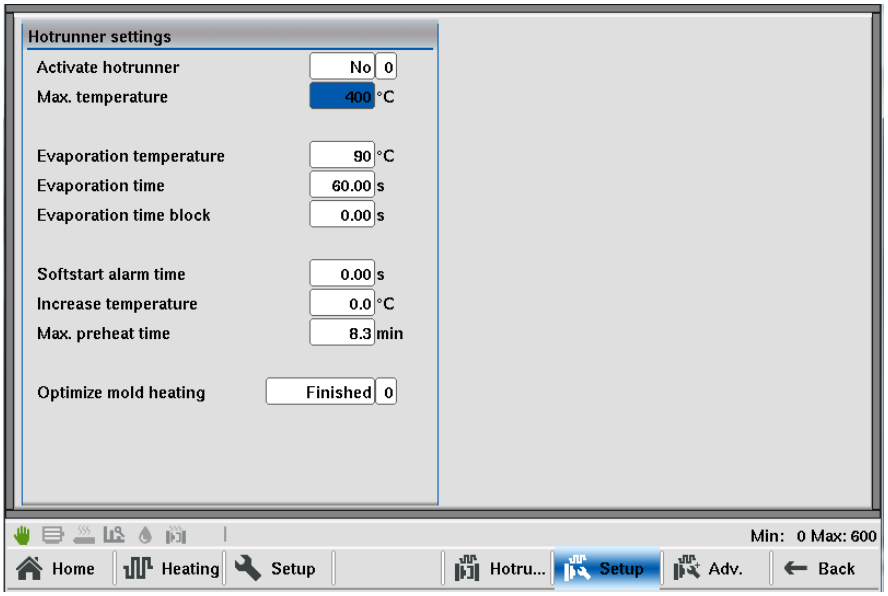


Fig.4-52: Mask "Hot runner setup"

4.40.3 Description of the elements

Field	Description
Mold heating enabled	Activates/deactivates hot runner funciton.
Max. temperature	Specification of hot runner maximum temperature.
Evaporation temperature	Temperature at which the moisture escapes from the hot runner through evaporation.
Evaporation time	Duration for evaporation of a hot runner zone.
Evaporation time block	Duration for evaporation of a block heating zone.
Softstart alarm time	If the evaporation temperature is not reached in this specified time, heating up will be aborted, mold heating will be deactivated and an appropriate alarm wil be triggered.
Increase temperature	With some nozzles it may be necessary to raise the temperature of the hot runners during certain processes (e.g. heating up or purging old material from the nozzle). In this field the increaseing temperature is entered.
Max. preheat time	This value only takes effect if the machine is connected with Easy- Net Control Center and if the option "Heatup optimization" of EasyNet is used. This value defines how long the used material is allowed to be on operating temperature without any impairment of the material characteristics.
Optimize mold heating	Optimizing of all hot runner zones. Function is used to balcance possible temperature fluctuations when changing set tempera- tures of different hot runner zones.

4.41 Hot runner Setup Advanced

4.41.1 Purpose

In this mask the settings for the single zones of the mold heating (hot runner) system are set.

4.41.2 Description of the mask

For **zones 1-n**, the mode, sensor type, mold heating type and the maximum evaporation power can be set.

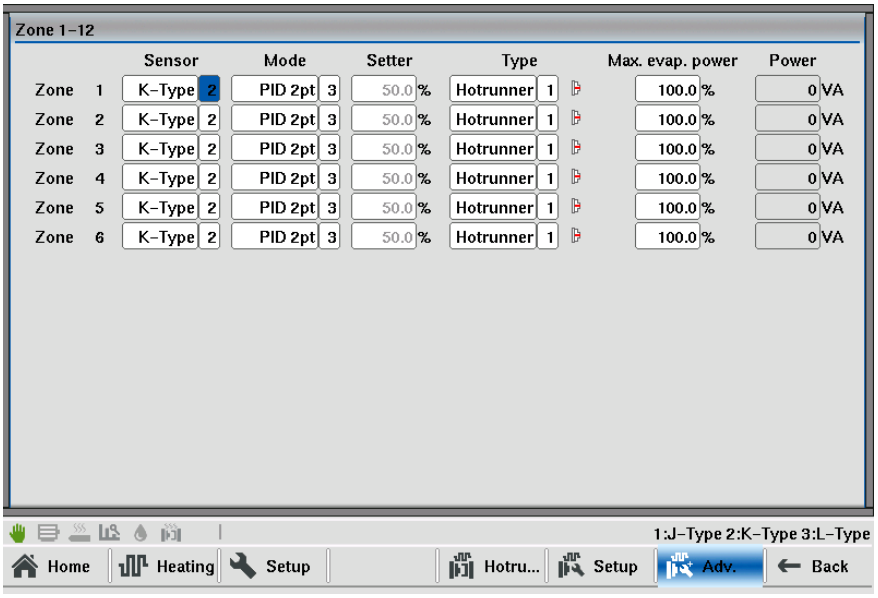


Fig.4-53: Mask "Hot runner Setup Advanced"

4.41.3 Description of the elements

Field	Description
Sensor	Selection of the type of temperature sensor (J-, K- or L-type). ● **J-Typ** ● **K-Typ** ● **L-Typ**
Mode	Operating mode of the hot runner zones: ● **Off** = heating zone is switched off ● **Measure** = only temperature measurement ● **Setter**= only available with block heating. Heating output is fixed (between 0-100% of maximum performance), no moni- toring via temperature sensor. ● **PID 2pt** = controlled ● **PID 3pt** = controlled heating and cooling ● **PID 2pt EM** = Emergency mode. If the referring zone signals an alarm (e.g. sensor break), the machine cycle continues compared to the normal operating modes. But the referring temperature zone won't be controlled anymore. ● **PID 3pt EM** = Emergency mode. If the referring zone signals an alarm (e.g. sensor break), the machine cycle continues compared to the normal operating modes. But the referring temperature zone won't be controlled anymore.
Setter	Specification of the pulse width for triggering the heating zone in percent. This setting is only active in the mode **Setter**. The heating performance is determined by the pulse/pause ratio of the pulse width modulation.
Type	● **0**= block heating zone ● **1**= hot runner zone
Max. evaporation power	During heating up to the set evaporation temperature, the heating power is limited by this value.
Power	Specification of the effective power of the hotrunner zone. Based on this value the power consumption of the heating is cal- culated and displayed on the energy monitor mask.

4.42 Alarms

4.42.1 Purpose

The alarm mask shows all active alarms in a list including the time stamp for each alarm.

4.42.2 Description of the mask

Texts which are too long, will be cut. A status bar in the lower section of the mask shows the complete text of the selected alarm.

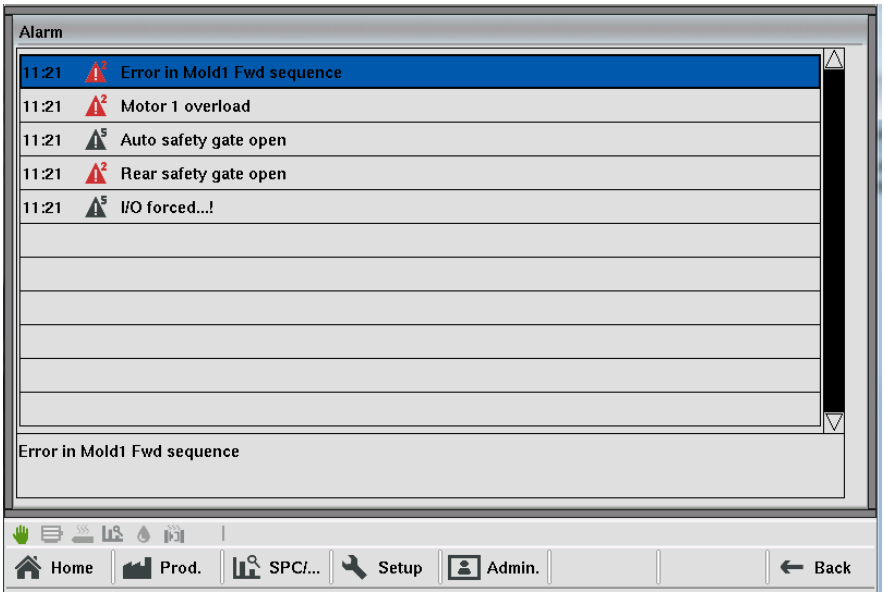


Fig.4-54: Mask "Alarms"

4.42.3 Description of the elements

Actual alarms can be confirmed on the operation panel.

Element	Description
Time stamp	Time at which the alarm appeared.
Alarm Icon	A grey icon signalizes a warning. A red icon signalizes an alarm. The number next to the icon shows the alarm class.
Description	Alarmtext

4.43 Production settings - Tab1

4.43.1 Purpose

Parameters for the production processs can be set in this mask.

4.43.2 Description of the mask

General production settings as well as settings for a photosensor and an eu- romap interface can be set in this mask. Further informations about the production values of the machine are displayed.

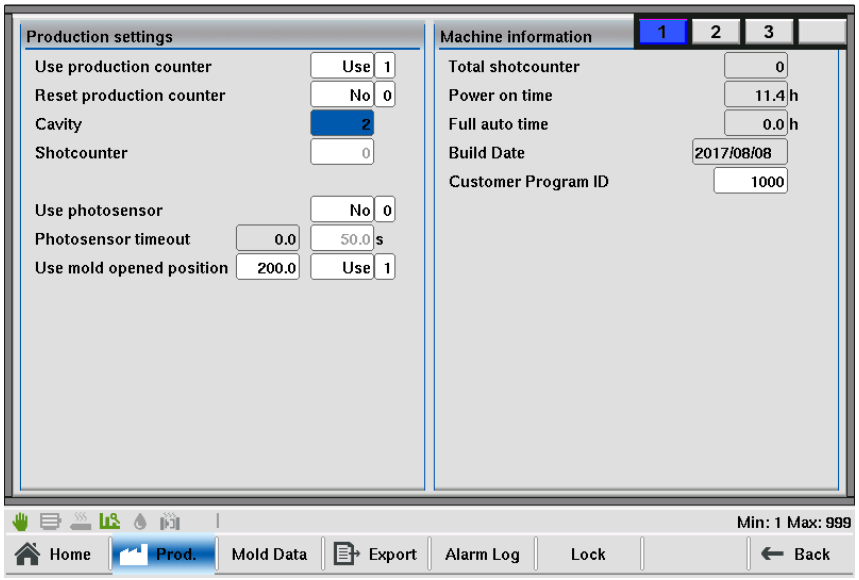


Fig.4-55: Mask "Production settings - Tab1"

4.43.3 Description of the elements

Production settings

Field	Description
Use Production counter	Activates/deactivates the use of production counter limit (see overview mask).
Reset shotcounter	Sets the shot counter (production counter) on 0.
Number of cavitites	Displays the number of cavities of the mold being
Use photo sensor	Activation of a photosensor for part detection.
Photosensor timeout	If the monitoring time is exceeded, an error is
Use mold opened position	The mold position set to start the robot

Machine information

Field	Description
Total shotcounter	Total shotcounter (not resettable).
Power on time	Display of the machine's total runtime.
Full auto time	Display of the machine's total runtime in automatic mode..
Build date	The programme build date
Customer programme ID	Customer special programme function ID

Photosensor

Field	Description
Use photo sensor	Activation of a photosensor for part detection.
Photosensor timeout	If the monitoring time is exceeded, an error is triggered.

4.44 Production settings - Tab2

4.44.1 Purpose

Parameters for the production processs can be set in this mask.

4.44.2 Description of the mask

For each weekday a starting time for auto heatup of the nozzle heating and the mold heating can be configured.

Information

In order to start the heater at the configured starting times the machine itself has to be turned on.

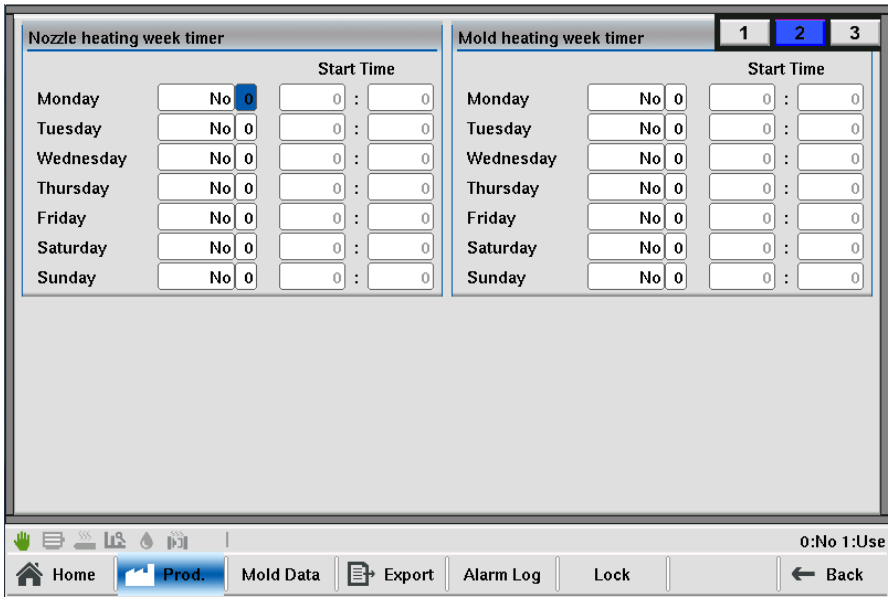


Fig.4-56: Mask "Production settings - Tab2"

4.44.3 Description of the elements

Nozzle/mold heating week timer

Field	Description
Monday, Tuesday, Wed- nesday, Thursday, Friday, Saturday, Sunday	Selection of the weekdays at which the heater shall be started at the given time.

4.45 Production settings - Tab3

4.45.1 Purpose

Parameters for the production processs can be set in this mask.

4.45.2 Description of the mask

Production seetings for an accumulator, a buzzer and cavity pressure sensors are specified.

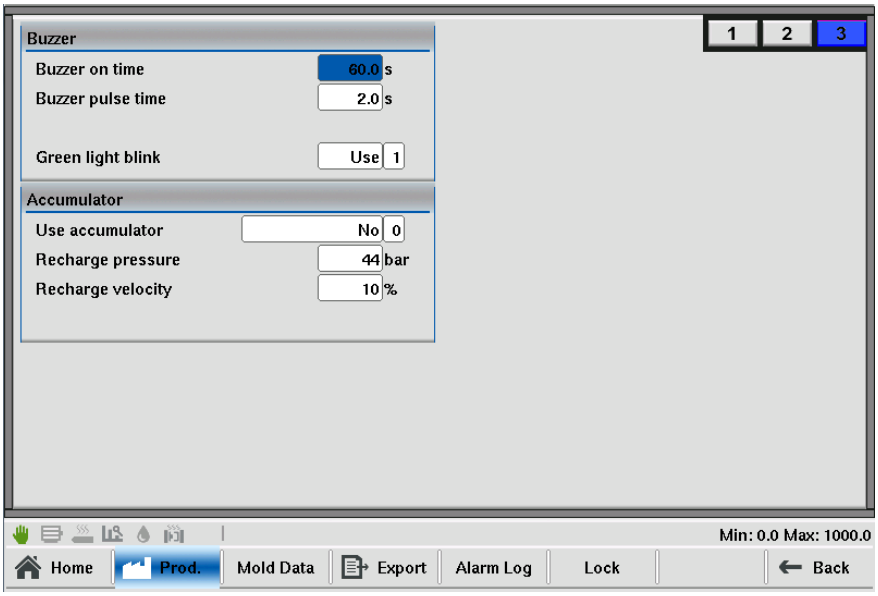


Fig.4-57: Mask "Production settings - Tab3"

4.45.3 Description of the elements

Accumulator

Field	Description
Use accumulator	Activates the accumulator.
Charging pressure	Pressure which is used for charing the accumulator.
Charging velocity	Velocity which is used for charging the accumulator.

Buzzer

Field	Description
Buzzer on time	The duration of the signal is specified here.
Buzzer pulse time	The pulse duration of the signal is specified here.

4.46 Mold data

4.46.1 Purpose

Mold-specific settings (e.g. all process data such as movement settings, pro- files, temperature set-points etc.) can be stored and uploaded again as mold data record in the mold data mask.

4.46.2 Description of the mask

On the left side, the name of the mold data record is listed. On the right side, the creation date of the mold data record is listed.

The progress bar in the lower section of the mask shows the actual progress of the loading- resp. saving- procedure.

New mold data records can be saved via the menu bar, while existing records can be loaded or deleted.

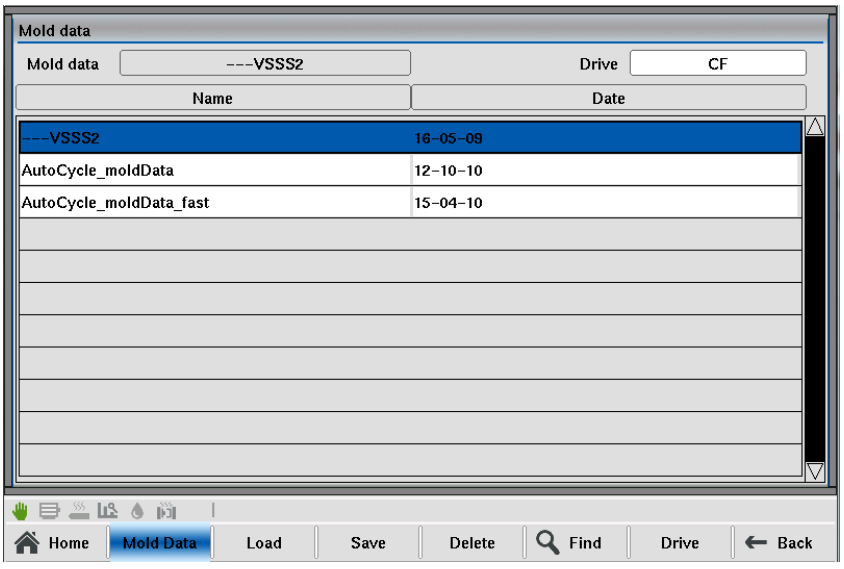


Fig.4-58: Mask "Mold data"

4.46.3 Description of the elements

Mold data record

Field	Description
Mold data	Name of the currently loaded mold data record.
Drive	Name of the currently selected drive. The list shows all available mold data records on the selected drive.

Buttons

Field	Description
Load	Loads the settings of the selected mold data record.
Save	Opens a dialog for saving the actual mold data.
Delete	Deletes the selected mold data record.
PC Print	The selected mold data record will be stored as CSV file on a USB stick if connected. Thus it is possible to print out a mold data record in a textual format on a PC. If there is no USB de- vice connected, an error will be displayed.
Drive	Selects the target for saving and loading (Com- pact Flash or USB storage medium, if connec- ted) the mold data. The current selection is displayed at the right upper corner of the mask.

4.47 Export

4.47.1 Purpose

This mask us used to load or delete status reports, screen shots and process data protocols (PDP) on or from an USB memory media.

4.47.2 Description of the mask

The upper part of the mask can be used to export status reports, screen shots and process data protocols to an USB storage medium.

The field below this offer the option of deleting status reports, screen shots and process data protocols.

The field **Progress** shows the progress of the current process.

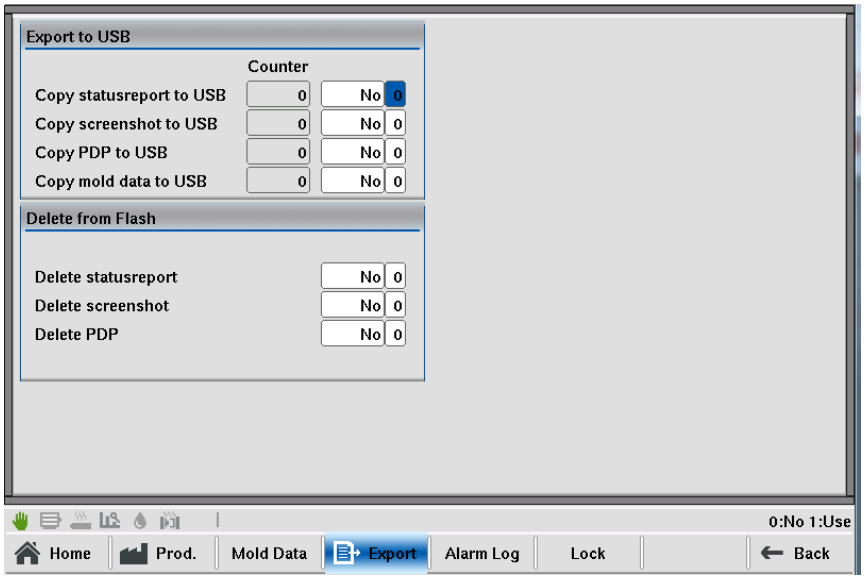


Fig.4-59: Mask "Exporti

4.47.3 Description of the elements

Name	Description
Copy Starep To USB	Selection whether the status report shall be copied on to the USB memory media.
Copy ScreenShot To USB	Selection whether the screen shot shall be cop- ied on to the USB memory media.
Copy PDP to USB	Selection whether the process data protocol (PDP) shall be copied on to the USB memory media.
Delete Starep	Selection whether the status report on the com- pact flash should be deleted.
Delete ScreenShot	Selection whether the mask screen shot on the compact flash should be deleted.
Delete PDP	Selection whether the process data protocol (PDP) on the compact flash should be deleted.
Status report Counter	Number of status reports that are available on the flash.
Screenshot Counter	Number of screenshots that are available on the flash.
PDP Export Counter	Number of PDP files that are available on the flash.

4.48 Process data protocol (PDP)

4.48.1 Purpose

The process data protocol (PDP) serves to show process data in tabular form. The recorded values can also be printed out during measurement or saved to a file

4.48.2 Description of the mask

The columns of the PDP table can be freely configured with any process data. Configuration is made via the corresponding configuration file (KVB.cfg) on the compact flash The process data are divided up into mask PDP1 and Mask PDP2. The process data cannot be changed during runtime (fixed configura- tion). The table can be scrolled vertically.

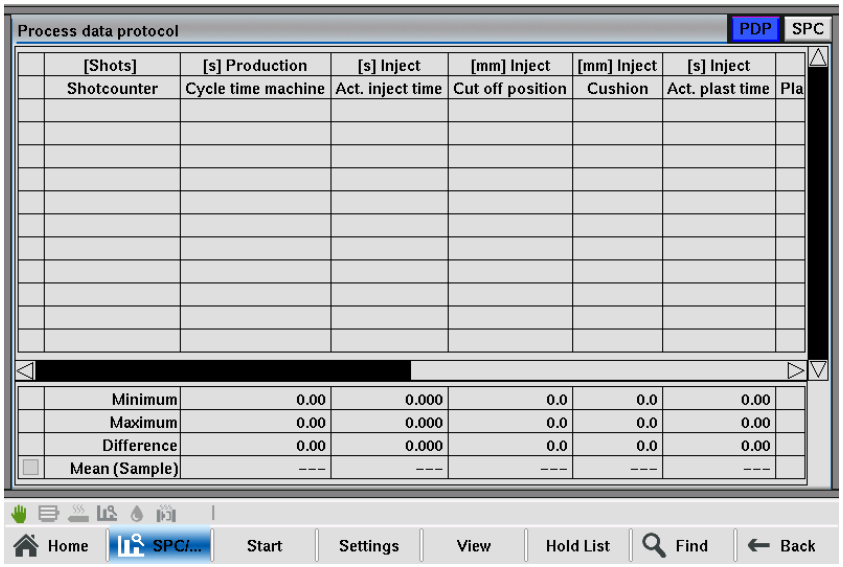


Fig.4-65: Mask "Prozess data protocol"

4.48.3 Description of the elements

Table

Field	Description
Minimum	Here the lowest value that was recorded for each respective variable is displayed.
Maximum	Here the highest value that was recorded for each respective variable is displayed.
Difference	Display of the difference between maximum and minimum value.
Mean	Here the mean value that was recorded for each respective variable is displayed.

Buttons

Name	Description
Set	Opens 'Process data settings' mask.

Hold/Run	Displaying the recorded data is stopped resp. activated.
PC-Print	The PDP data contained in the list, will be stor- ed as CSV file on a USB stick if connected. Thus it is possible to print out the data in a tex- tual format on a PC. If there is no USB device connected, an error will be displayed.
SPC	Opens SPC- mask.

4.49 Statistical Process Control (SPC)

4.49.1 Purpose

Serves to monitor process parameters via the Statistical Process Control (SPC).

4.49.2 Description of the mask

The display is in tabular form. Each column represents a configurable process variables of the SPC recording. Configuration is made in file Kvb.cfg on the Compact Flash.

The lines represent the respective values (**Act.value**, **Act.mean**, etc.)

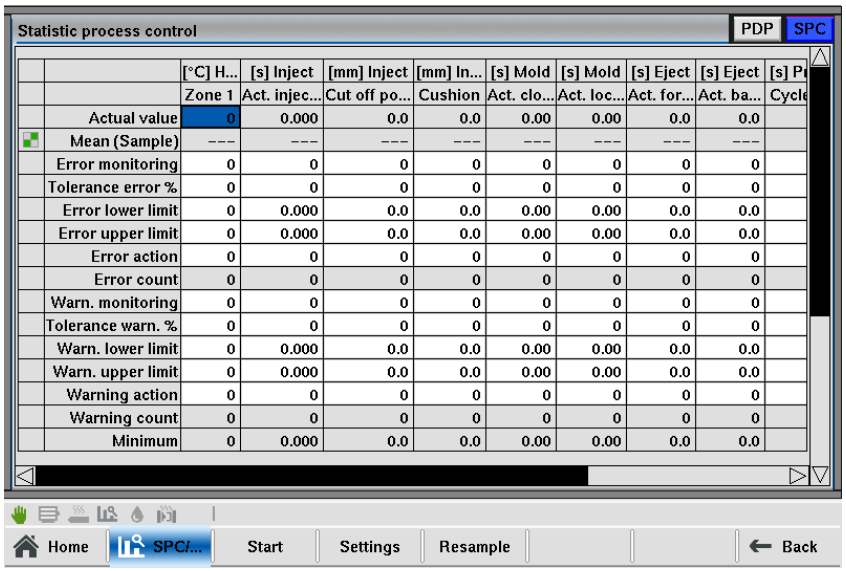


Fig.4-67: Mask "Statistical Process Control (SPC)"

4.49.3 Description of the elements

Table

Field	Description

Act. value	Shows the current value of the respective var- iables.
Act.mean	Shows the current mean value of the respec- tive variables.
Activate SPC	Here the recording of the SPC values for the respective variable can be activated or deacti- vated. During the first initialization of the mask all **Activate SPC** values are set on 0.
Low warn limit	Specification of the lower limit at which a warn- ing occurs.
Upp warn limit	Specification of the upper limit at which a warn- ing occurs..
Warn action	Here the action can be determined when the **Low warn limit** or **Upp warn limit** are excee- ded.
Low error limit	Specification of the lower limit at which an error occurs.
Upp error limit	Specification of the upper limit at which an error occurs.
Error action	Here the action can be determined when the **Low error limit**t or **Upp error limit** are excee- ded.
Tol counter Warning	If number of times a warning appears exceeds the tolerance defined, the Warn action will be executed.
Tol counter Error	If number of times an error appears, exceeds the tolerance defined, the Error action will be executed.

Buttons

Name	Description
Settings	Opens the settings mask for the statistical process control
Start / Stopp	Starts and/or stopps the recording.

4.50 SPC Settings

4.50.1 Purpose

This mask allows to do settings for the Statistical Process Control (SPC).

4.50.2 Description of the mask

This mask displays the start delay and recording interval for the Statistical Process Control (SPC).

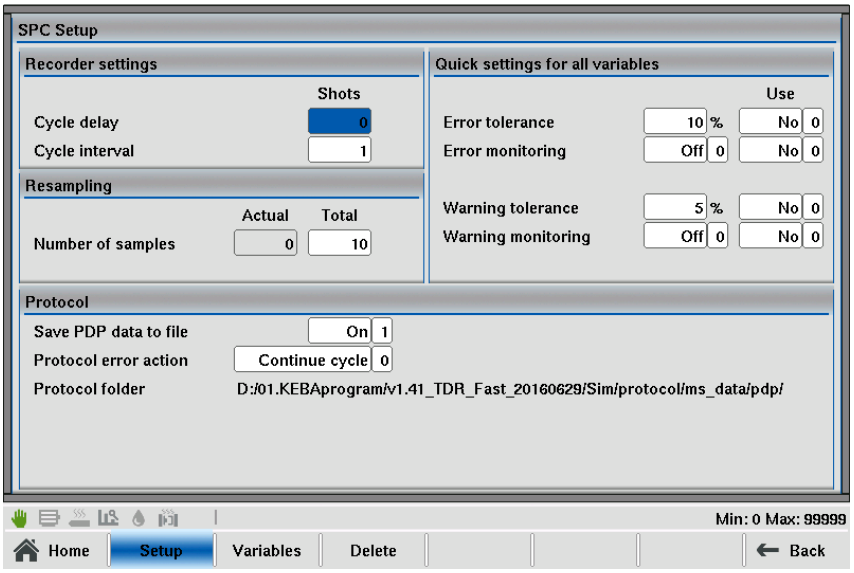


Fig.4-69: Mask "SPC Settings"

4.50.3 Description of the elements

Field	Description
Start Delay	Here the number of shots can be specified after which the recording starts (entry of 3, waiting period is 3 shots).
Interval	The interval between two recordings can be defined here. The specification is made in shots. At an interval of 1 every shot is recorded, at an interval of 2 only every second.
Delete	When this button is pressed the SPC is reset, which means that all recordings are deleted.

4.51 SPC Settings

4.51.1 Purpose

The IO- monitor mask displays the status of the inputs and outputs of the hard- ware modules.

4.51.2 Description of the mask

The overview mask displays all configured hardware modules. Additionally it is possible to cancel all forced IO states. Next to the listed module, a symbol displays if the module is working correct or if it is erroneous. If a single IO of a module is defective, the module is not displayed as defective on the overview mask.

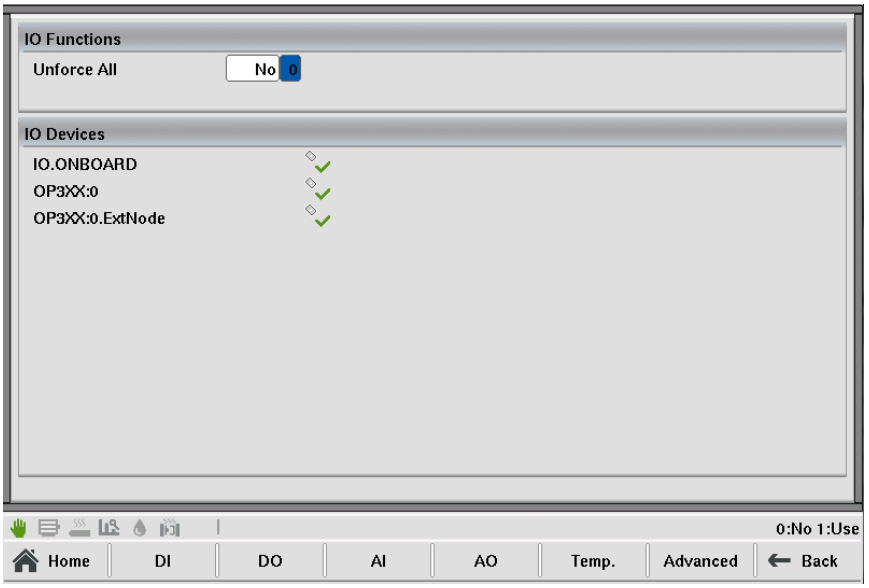


Fig.4-70: Mask "IO Monitor Overview"

4.51.3 Description of the elements

Field	Description
Unforce all	• **Use**= cancels all forced IO states.
IO devices	Displays the configured IO devices and their status.
	Device works correct.
	Device erroneous.

4.52 IO Monitor Digital Inputs

4.52.1 Purpose

This mask shows the values of the digital inputs of the controller.

Information

The IO Monitor masks for the digital inputs of the panel (PI1, PI2 and PI Ext) are working the same way.

4.52.2 Description of the mask

The state of all digital inputs is displayed. Further it is possible to force a digital input.

If an IO is physically available but no variable is allocated to the IO, only the IO- number is displayed. However it is possible to force the IO.

If an IO is physically available and allocated to a variable but no text is assigned to the variable, the name of the system variable is displayed.

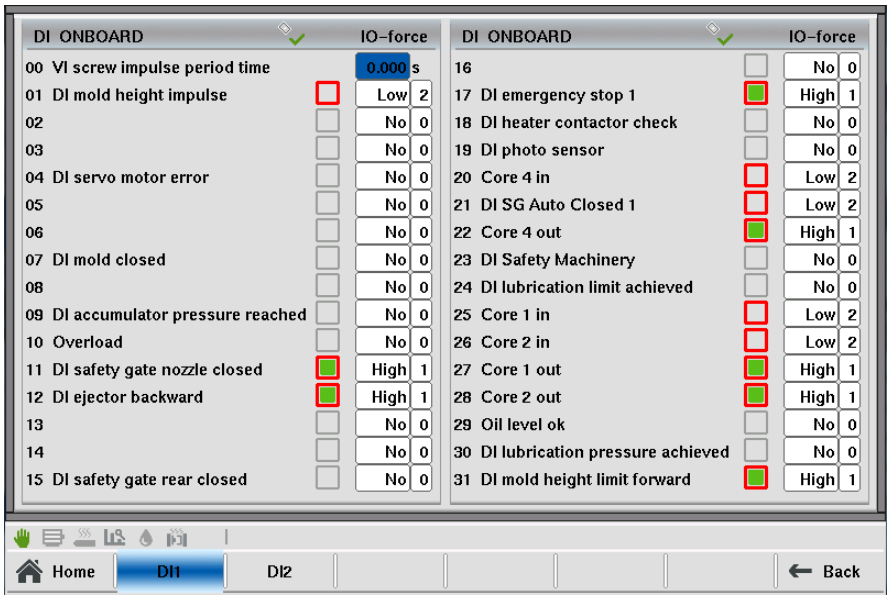


Fig.4-71: Mask 'IO Monitor Digital Inputs'

4.52.3 Description of the elements

Field	Description
DI 0...DI n	The descirption of the digital input is displayed. The left grey field indicates the current state of the digital input. The right input field activates the force of the digital input.
Icon filled green. 	Digital input state `High`
Icon not filled. 	Digital input state `Low`
Icon filled and red border. 	Digital input forced.
Icon not filled and red border. 	Digital input unforced.

Icon with red cross. 	Digital input erroneous.

4.53 IO Monitor Digital Outputs

4.53.1 Zweck

This mask shows the values of the digital outputs of the controller.

4.53.2 Description of the mask

The state of all digital outputs is displayed. Further it is possible to force a digital output.

If an IO is physically available but no variable is allocated to the IO, only the IO- number is displayed. However it is possible to force the IO.

If an IO is physically available and allocated to a variable but no text is assigned to the variable, the name of the system variable is displayed.

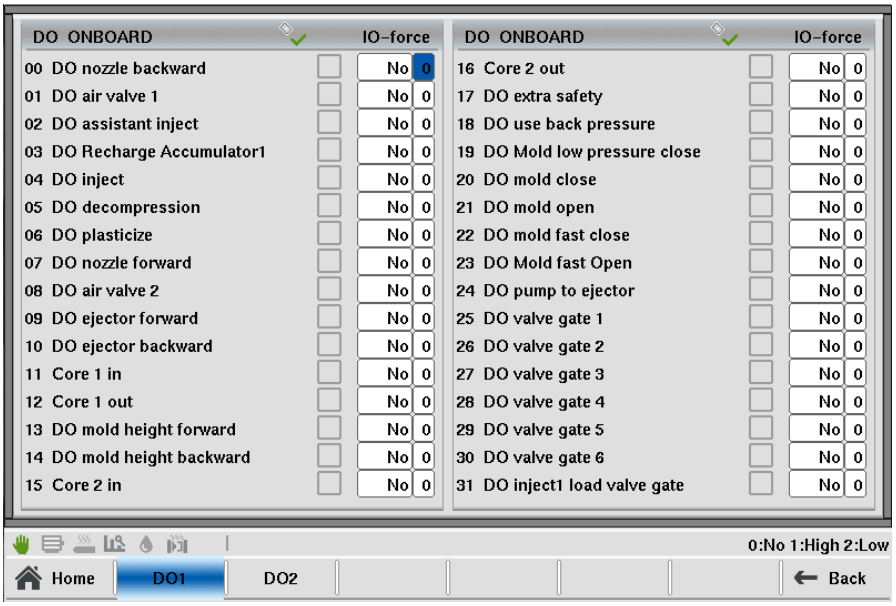


Fig.4-72: Mask 'IO Monitor Digital Outputs'

4.53.3 Description of the elements

Field	Description
DO 0...n	The descirption of the digital output is dis- played. The left grey field indicates the current state of the digital output. The right input field activates the force of the digital output.
Icon filled green. 	Digital output state `High`
Icon not filled. 	Digital output state `Low`
Icon filled and red border. 	Digital output forced.
Icon not filled and red border. 	Digital output unforced.
Icon with red cross. 	Digital output erroneous.

4.54 IO Monitor Analog inputs

4.54.1 Purpose

This mask shows the status of the analog inputs of the controller.

4.54.2 Description of the mask

The values of all analog inputs are displayed. Further it is possible to force an analog input.

If an IO is physically available but no variable is allocated to the IO, only the IO- number is displayed. However it is possible to force the IO.

If an IO is physically available and allocated to a variable but no text is assigned to the variable, the name of the system variable is displayed.

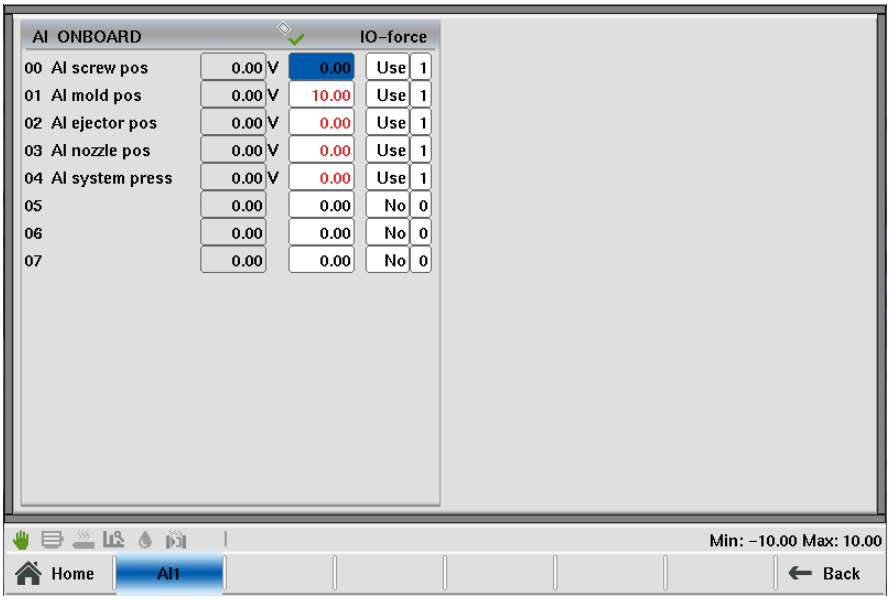


Fig.4-73: Mask 'IO Monitor analog Inputs'

4.54.3 Description of the elements

Field	Description
AI 0...n	The descirption of the analog input is dis- played. The left grey field indicates the current value of the analog input. The value "- - -" represents a sensor error. The input field in the middle configures the val- ue the analog input is forced to. If a force is acitve, the value is represented in red color. The right input field activates the force of the analog input.

4.55 IO Monitor Analog outputs

4.55.1 Purpose

This mask shows the values of the analog outputs of the controller.

4.55.2 Description of the mask

The values of all analog outputs are displayed. Further it is possible to force an analog output.

If an IO is physically available but no variable is allocated to the IO, only the IO- number is displayed. However it is possible to force the IO.

If an IO is physically available and allocated to a variable but no text is assigned to the variable, the name of the system variable is displayed.

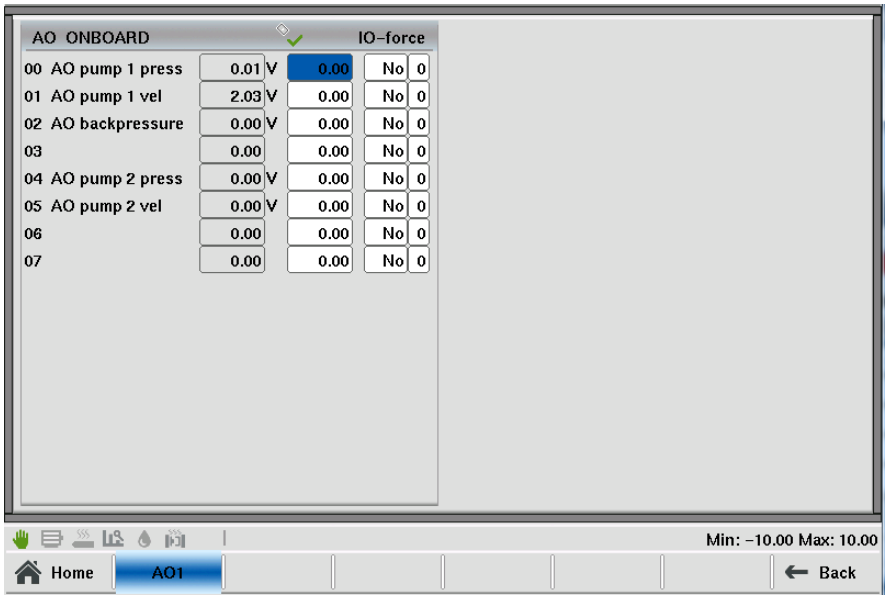


Fig.4-74: Mask 'IO Monitor Analog outputs'

4.55.3 Description of the elements

Field	Description
AO 0...n	The descirption of the analog output is dis- played.The left grey field indicates the current value of the analog output. The value "- - -" represents a sensor error.The input field in the middle configures the val- ue the analog output is forced to. If a force is acitve, the value is represented in red color.The right input field activates the force of the analog output.

4.56 IO Monitor Temperature Inputs

4.56.1 Purpose

This mask shows the status of the temperature inputs of the controller.

4.56.2 Description of the mask

The values of all temperature inputs are displayed. Further it is possible to force a temperature input.

If an IO is physically available but no variable is allocated to the IO, only the IO- number is displayed. However it is possible to force the IO.

If an IO is physically available and allocated to a variable but no text is assigned to the variable, the name of the system variable is displayed.

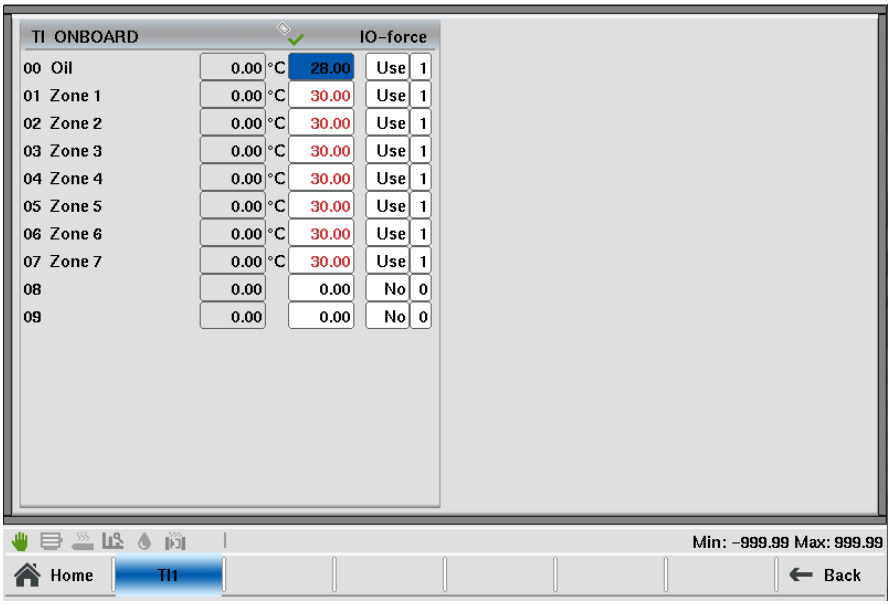


Fig.4-75: Mask 'IO Monitor Temperature Inputs'

4.56.3 Description of the elements

Field	Description
TI 0...n	The descirption of the temperature input is dis- played. The left grey field indicates the current value of the temperature input [°C]. The value "- - -" represents a sensor error. The input field in the middle configures the val- ue the temperature input is forced to. If a force is acitve, the value is represented in red color. The right input field activates the force of the temperature input.

4.57 IO Replace

4.57.1 Purpose

If an IO on a CPU- or IO-Module is defective, it is possible to allocate the de- fective IO to an other free IO. There is no modification in the software neces- sary. Afterwards the IO only has to be rewired.

4.57.2 Description of the mask

The mask shows all available Module. To perform an IO- allocation, it is nec- essary to select the desired IO-module and press button 'Select'.

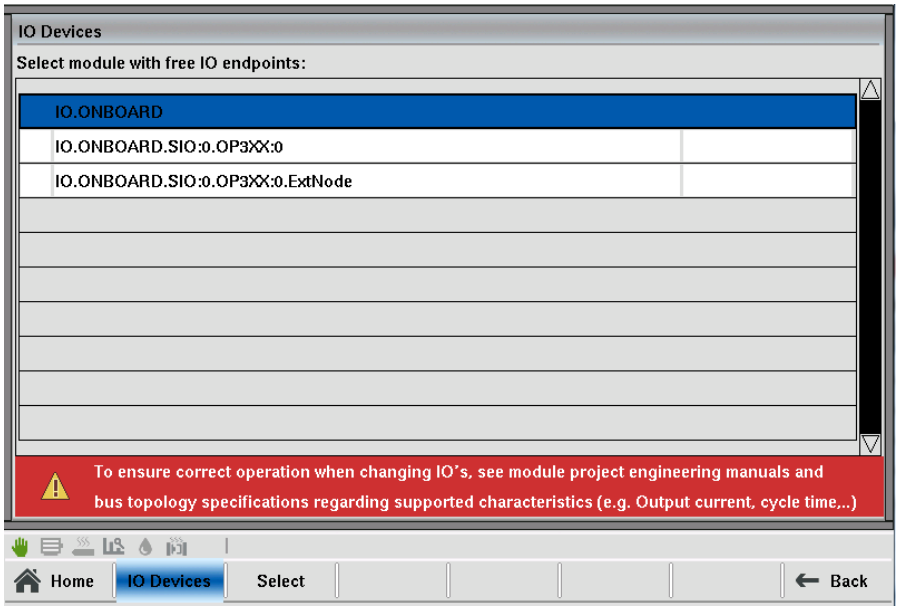


Fig.4-76: Mask "IO Replace

4.57.3 Description of the elements

Name	Description
Name	Name of the selectable modules.
Serial number	Serial number of the selectable IO modules.

4.58 IO Replace AI/AO

4.58.1 Purpose

The IO allocation of an analog output or analog input can be done in this mask

4.58.2 Description of the mask

The mask shows all free analog inputs and outputs that are available for the selected module.

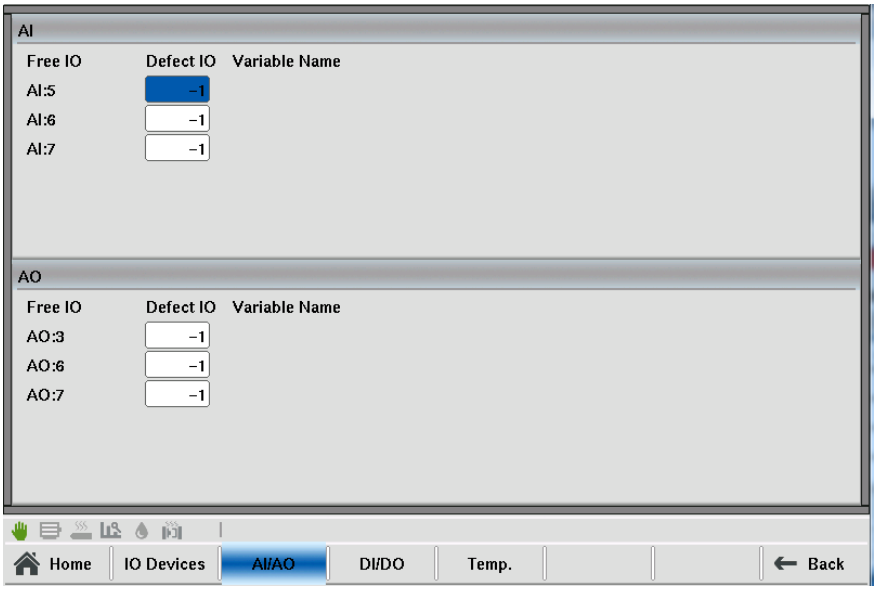


Fig.4-77: Mask "IIO Replace AI/AO'

4.58.3 Description of the elements

Name	Description
Free IO	Listing of all free IO's which can be used for allocation.
Defect IO	Declaration of the defective IO's which should be reallocated. In order to allocate an already replaced IO to the original IO (e.g. the defective IO has been fixed), value '-1' has to be entered.
Variable name	After the allocation, the short text of the alloca- ted IO appears.

4.59 IO Replace DI/DO

4.59.1 Purpose

The IO allocation of an digital output or digital input can be done in this mask

4.59.2 Description of the mask

The mask shows all free digital inputs and outputs that are available for the selected module.

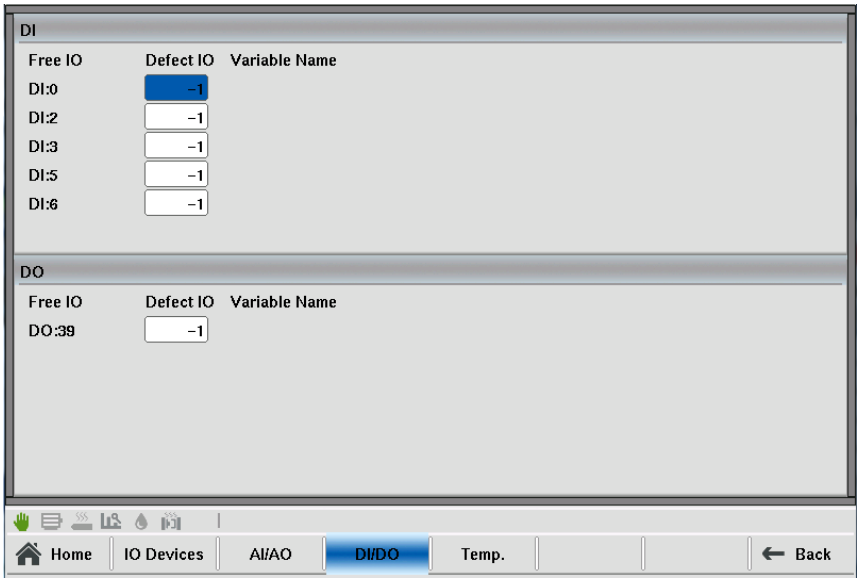


Fig.4-78: Mask "IO Replace DI/DO'

4.59.3 Description of the elements

Name	Description
Free IO	Listing of all free IO's which can be used for allocation.
Defect IO	Declaration of the defective IO's which should be reallocated. In order to allocate an already replaced IO to the original IO (e.g. the defective IO has been fixed), value '-1' has to be entered.
Variable name	After the allocation, the short text of the alloca- ted IO appears.

4.60 IO Replace TI

4.60.1 Purpose

The IO allocation of a temperature input can be done in this mask

4.60.2 Description of the mask

The mask shows all free temperature inputs that are available for the selected module.

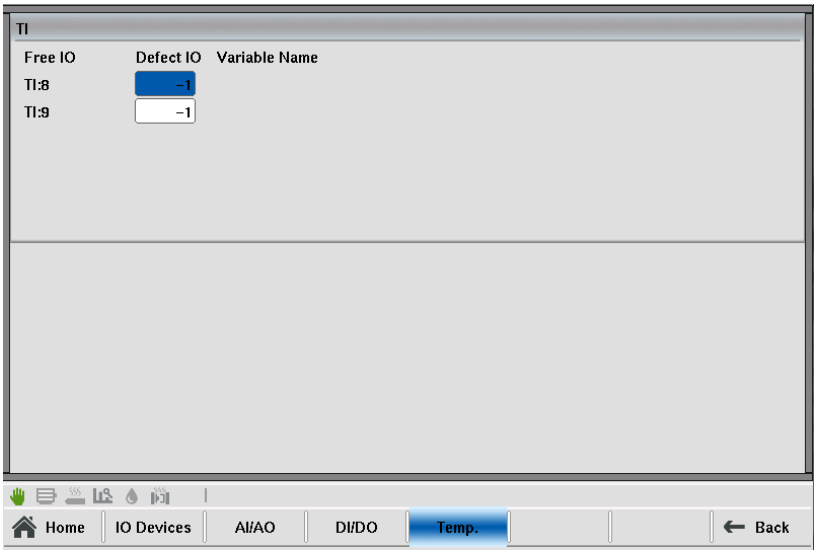


Fig.4-79: Mask "IO Replace TI'

4.60.3 Description of the elements

Name	Description
Free IO	Listing of all free IO's which can be used for allocation.
Defect IO	Declaration of the defective IO's which should be reallocated. In order to allocate an already replaced IO to the original IO (e.g. the defective IO has been fixed), value '-1' has to be entered.
Variable name	After the allocation, the short text of the alloca- ted IO appears.

4.61 Sequence mask

4.61.1 Purpose

This mask represents the machine sequence and its state.

4.61.2 Description of the mask

The following information about the machine sequence is shown in the sequence mask:

- the movements contained in the machine sequence,
- the actual movement duration,
- the sequence of the movements,
- if a movement is safety relevant,
- the state of movements and
- the sequences of the machine cycle

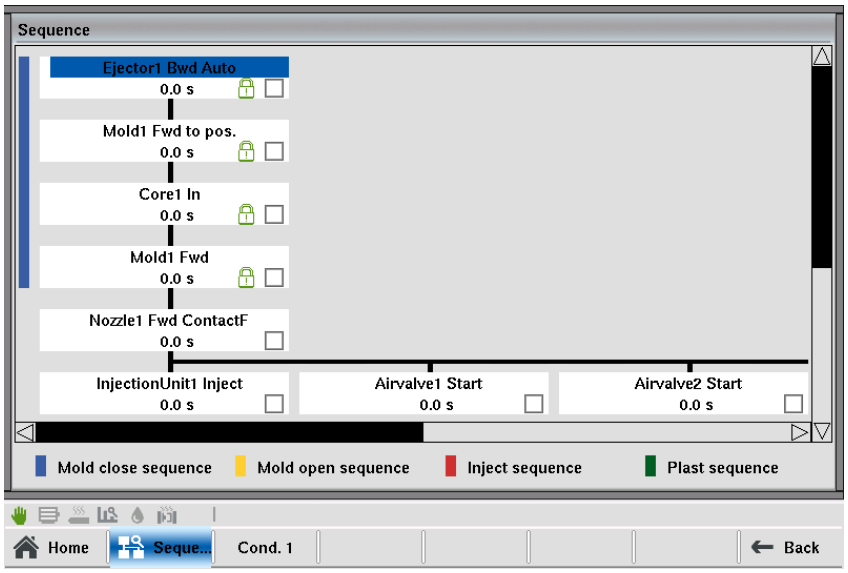


Fig.4-81: Mask 'Sequence mask

4.61.3 Description of the elements

Name	Description
Name	Name of movement (e.g. Mold1Fwd).
Movement duration	Display of the actual movement duration.
Safety relevant 	Safety-relevant movements are marked with an interlock symbol. A safety-relevant move- ment can be executed only when certain con- ditions are met. If a safety-relevant movement is marked, a button is activated in the menu. It can be used to show the necessary conditions for executing the movement Please consider, that the system (hardware and software) only meets category B according to EN ISO 13849-1. For detailled information see cahpter 'General safety instructions' of the KVB user manual.
Movement state  	Movements that already finisehd are marked with a tick. Movements that are currently active, are marked with a green bar next to the movement.

Name	Description
Connecting lines	Connections between the individual move- ments are shown by black lines.
Sequences	The machine sequence is divided into sequen- ces by colored bars on the left edge of the mask. A legend about the sequences is dis- played at the bottom edge of the mask.

4.62 Sequence - Safety conditions

WARNING!

The system (hardware and software) only meets category B according to

EN ISO 13849-1. Thus it is not intended for usage in safety-relevant control ap- plications in the field of personal safety (e.g. emergency stop).

To implement potentially necessary safety-relevants control tasks, always use additional external safety devices according to EN ISO 13849-1 that are intended for the particular purpose and meet the necessary functional safety.

For further information see EN ISO 13849-1 and refer to chapter "EC directives and standards" in the manuals for a list of norms applying to the product.

The safety notices for the installation and commissioning of the product can be found in the user manuals of the components or in the system manual and must be read and observed before installation or commissioning.

The user manual must be kept throughout the entire service life of the product.

4.62.1 Purpose

In this mask the necessary conditions for executing the movements of the ma- chine sequence and their current state are displayed

4.62.2 Description of the mask

The necessary conditions for executing the movements are displayed in tab- ular form. The left column displays the condition (e.g. "Core1Out"). The right column displays the current state of the condition (True: condition has been met, False: condition not met)

Only if all conditions have been fulfilled ('True'), the movement will be executed.

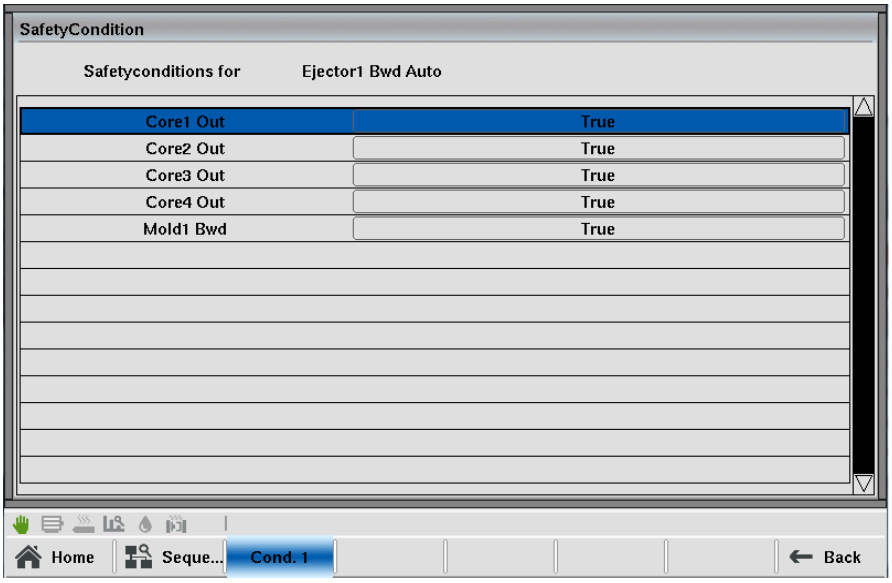


Fig.4-82: Mask 'Sequence - Safety conditions'

4.63 Software version

4.63.1 Purpose

Shows the actual used software versions.

4.63.2 Description of the mask

This mask is used to show the system and application versions for the control and the visualization- system.

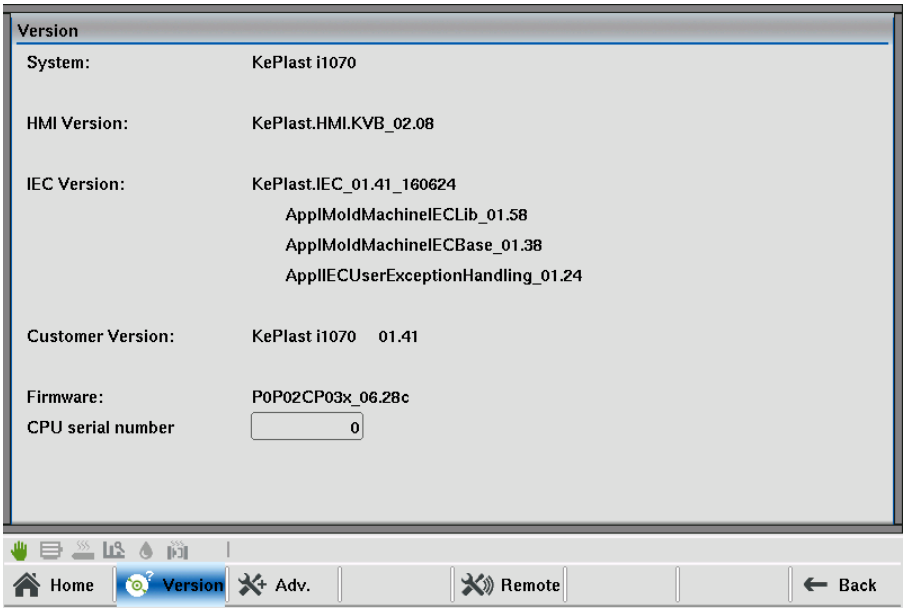


Fig.4-83: Mask "Software version"

4.63.3 Description of the elements

Field	Description
System	Display of the system used.
HMI Version	Display of the HMI version.
IEC Version	Display of the IEC version.
Firmware	Display of the firmware version.

4.64 Alarmlog / Infolog masks

4.64.1 Purpose

System events (alarms, user changes, system errors, etc.) are recorded and/ or logged in this masks. In this way a complete history is available.

The masks only display informations. Alarms cannot be confirmed here.

4.64.2 Description of the mask

All system events are shown in the table.

The left part of the table shows the date and time when the event occurred. The right part of the table contains the description of the event that is associated with the date and time.A status line underneath the table shows the entire text of the selected entry. Every log mask can be saved on an USB device using button "PC Print". The arrow key pad of the panel allows you to scroll vertically or page by page

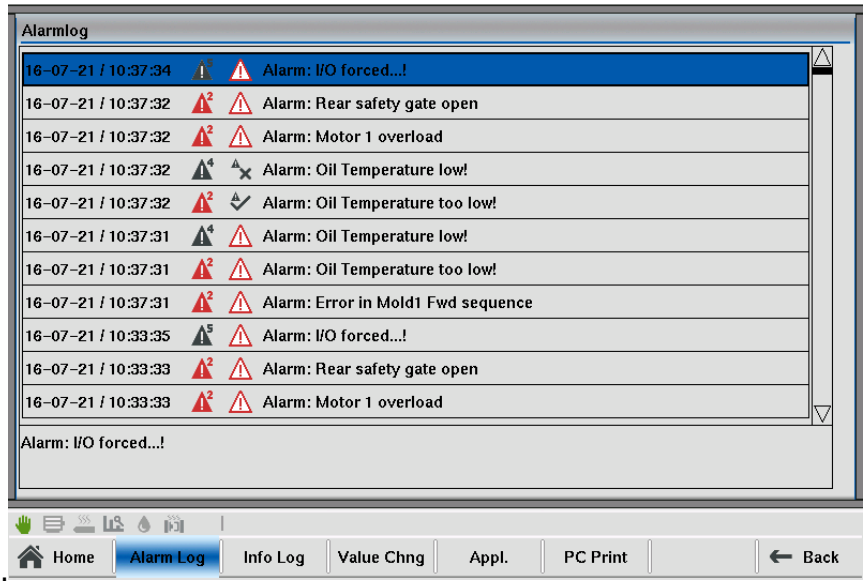


Fig.4-84: Mask "Alarmlog"

4.64.3 Description of the buttons

Name	Description
Alarmlog	Only the alarms that were triggered by the con- trol are depicted.
	A red filled alarm icon displays an alarm. The number next to the icon shows the alarm class.
	A grey filled alarm icon displays a warning. The number next to the icon shows the alarm class.
	A red non- filled alarm icon displays an active alarm respr. an active warning.
	A grey non- filled alarm icon displays an inac- tive alarm respr. an inactive warning.
	A grey alarm icon with a check mark displays an alarm resp. a warning that has been ac- knowledged automatically by the system.
	A grey alarm icon with a x- mark displays an alarm resp. a warning that has been acknowl- edged by the user by pressing the alarm button on the panel.
Infolog	Only messages from the system are displayed.
Value change	Only parameter changes are shown.
Application	Only messages from the application are dis- played.
PC Print	The registered data will be stored as CSV file on a USB stick if connected. Thus it is possible to print out the data in a textual format on a PC. If there is no USB device connected, an error will be displayed. Always the data of the currently opened mask will be stored.

4.65 Company information

4.65.1 Purpose

Display of a user-defined configurable graphic

4.65.2 Description of the mask

Fig.4-93: Mask "Company information"

4.66 Network settings

4.66.1 Purpose

This mask is used to set network parameters for the system.

4.66.2 Description of the mask

This mask contains settings about the IP-address, subnetmask and gateway of the system.

Information

Changed network settings require a restart of the system to become active.

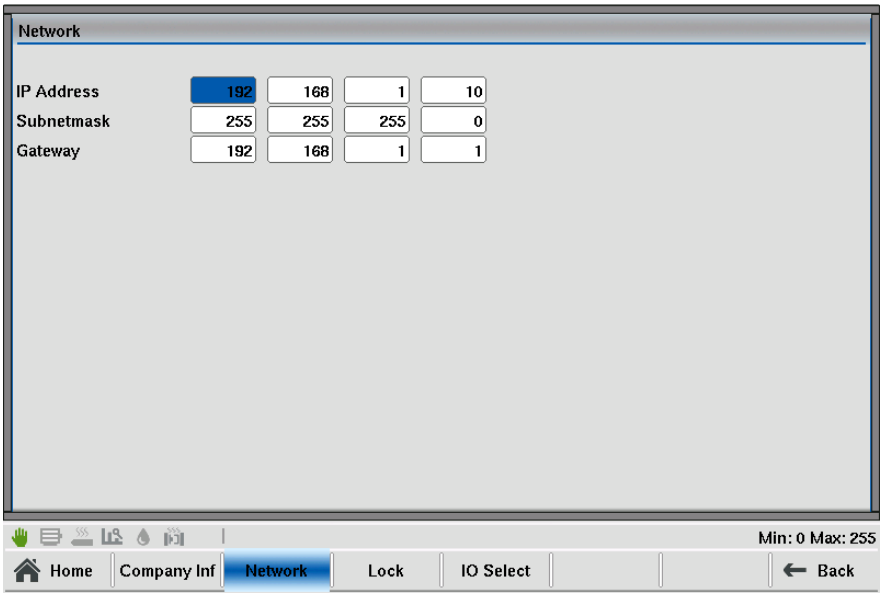


Fig.4-94: Mask "Network settings"

4.66.3 Description of the elements

Field	Description
IP-Adress	The IP-address of the system is set here.
Subnetzmask	The subnetmask is set here.
Gateway	The gateway is set here.

4.67 Maschine Lock/Unlock

4.67.1 Purpose

This mask serves for locking/unlocking the machine.

The machine producer can agree with the client upon a testing phase. If no valid unlock key has been entered until the end of the testing phase (e.g. 1 month), the machine will be locked, which means that the motor will be turned off and no further production is possible.

For unlocking the machine an unlock key has to be requested from the man- ufacturer of the injection molding machine and the key has to be entered into this mask.

Information

The lock status of the machine can also be changed with an USB device that contains a valid lock key or unlock key.

As soon as an USB device with valid machine lock or unlock data is detected, the machine lock status will be changed automatically.

A lock or unlock key can only be used for one time. After that the key becomes invalid.

If the USB device contains multiple lock keys, always the lock key with the expire date which lies the farthest in the future will be used. All other lock keys on the USB device also become invalid as soon as the lock key which lies the farthest in the future becomes active.

If the USB device contains a lock key and a unlock key, always the unlock key will be used.

4.67.2 Description of the mask

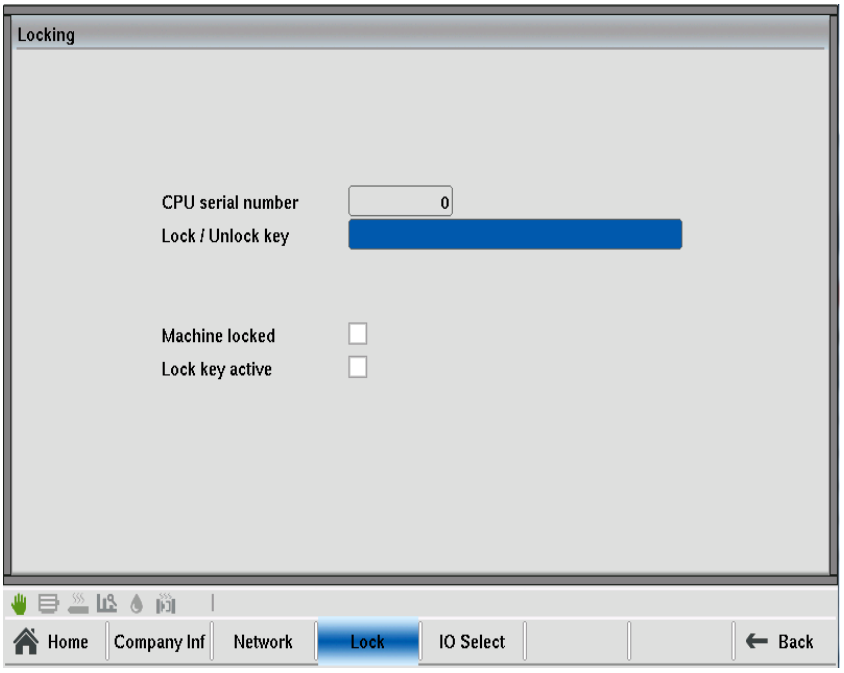


Fig.4-95: Maske 'Maschine Lock/Unlock'

4.67.3 Description of the elements

Field	Description
CPU serial number	Display of the control's serial number.

Lock / unlock key	Field for entering a lock or unlock key for locking/unlocking the machine.
Machine locked	Displays if the machine is already locked.
Lock key active	Displays if the machine lock function is active. The machine will be locked at the displayed expire date.
Expire date	Displays the date at which the machine will be locked. The expire date is related to the beginning of a day.

4.68 Machine data - Tab1

4.68.1 Purpose

Machine-specific settings, such as the number of heating zones, maximum injection velocity etc. can be loaded and saved in the Machine data mask.

4.68.2 Description of the mask

The upper part of the mask indicates whether machine data exist on the se- lected media (compact flash or a USB memory media).

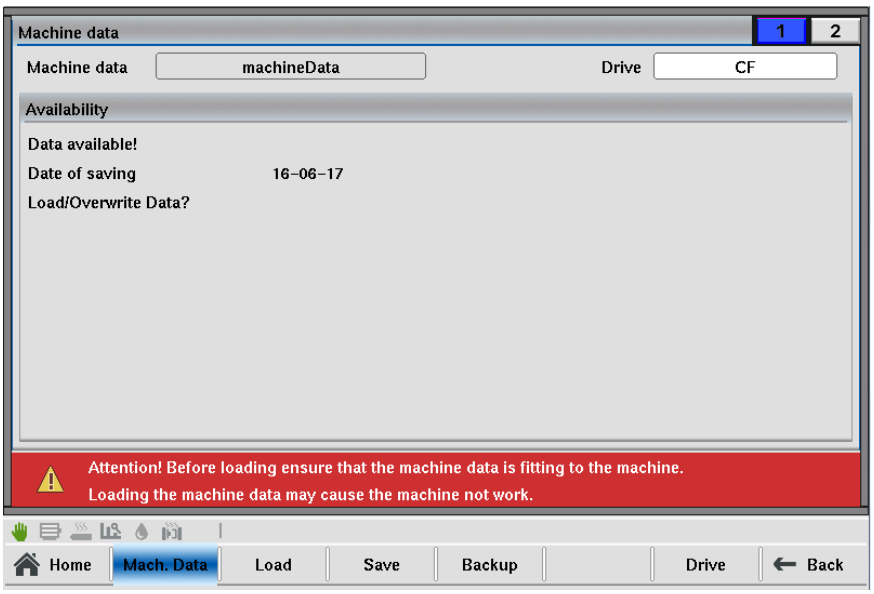


Fig.4-96: Mask "Machine data tab1"

4.68.3 Description of the buttons

Name	Description
Load	All machine-specific settings are uploaded from the USB-stick or the compact flash. In addition an advice will be displayed which has to be confirmed before loading the machine data.

Save	Current machine-specific settings are saved to the USB-stick or the compact flash. In addition an advice will be displayed which has to be confirmed before saving the machine data.
Backup	Opens the machine data backup mask. Therein a backup of the actual available machine data record can be created resp. an available backup can be restored.
PC Print	The actual machine data record will be stored as CSV file on a USB stick if connected. Thus it is possible to print out a machine data record in a textual format on a PC. If there is no USB device connected, an error will be displayed.
Drive	Allows the target to be selected for saving and loading (Compact Flash or USB storage medium, if connected). The current selection is displayed at the upper edge of the mask.

4.69 Machine data - Tab2

4.69.1 Purpose

Machine-specific settings, such as the number of heating zones, maximum injection velocity etc. can be loaded and saved in the Machine data mask.

4.69.2 Description of the mask

On the left side, the name of the machine data record is listed. On the right side, the creation date of the machine data record is listed.

New machine data records can be saved via the menu bar, while existing re- cords can be loaded or deleted.

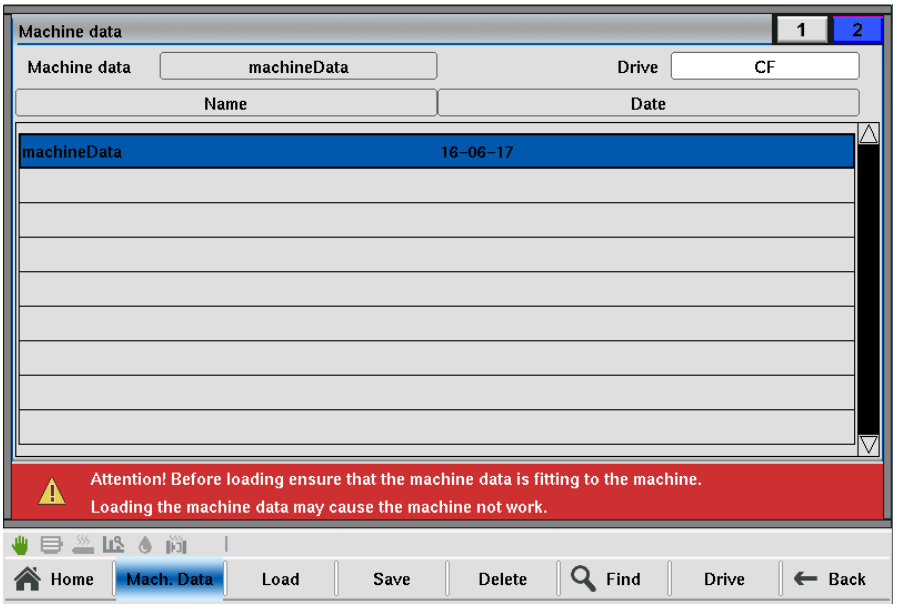


Fig.4-97: Mask "Machine data tab2"

4.69.3 Description of the elements

Machine data record

Field	Description
Machine data	Name of the currently loaded machine data record.
Drive	Name of the currently selected drive. The list shows all available machine data records on the selected drive.

Buttons

Field	Description
Load	Loads the settings of the selected machine data record.
Save	Opens a dialog for saving the actual machine data.
Delete	Deletes the selected machine data record.
PC Print	The selected machine data record will be stored as CSV file on a USB stick if connected. Thus it is possible to print out a machine data record in a textual format on a PC. If there is no USB device connected, an error will be displayed.
Drive	Selects the target for saving and loading (Compact Flash or USB storage medium, if connected) the machine data. The current selection is displayed at the right upper corner of the mask.

4.70 Machine data backup

4.70.1 Purpose

A backup of the actual available machine data record can be created within in the machine data backup mask. Further available backups can be restored.

4.70.2 Description of the mask

The upper part of the mask indicates whether machine data backup exist on the selected media (compact flash or a USB memory media) and displays its backup date.

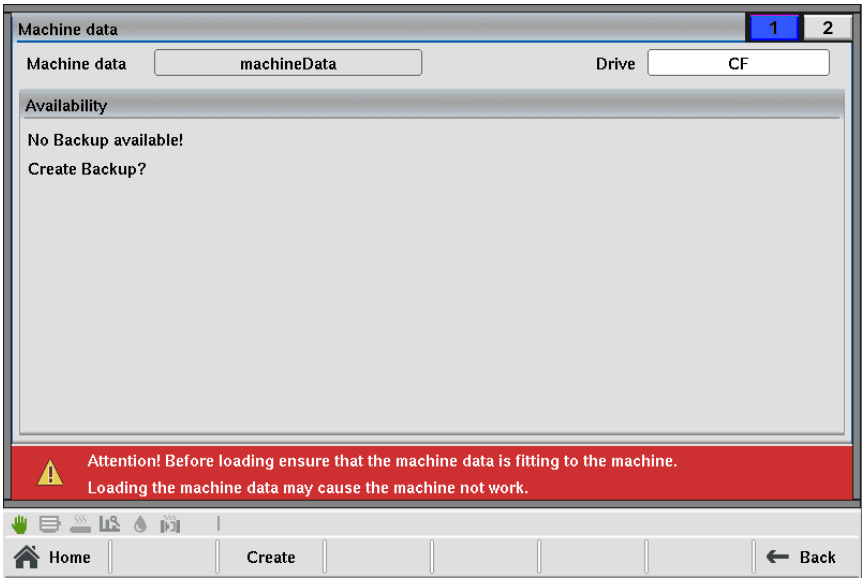


Fig.4-98: Mask "Maschine data backup"

4.70.3 Description of the buttons

Name	Description
Restore (only displaye if a machine data backup is available on the selected drive)	An available backup of the machine data re- cord will be restored. In order to use the re- stored machine data record, the record has to be loaded in machine data mask afterwards.
Create	A backup of the actual machine data record will be saved to the USB-stick or the compact flash. In addition an advice will be displayed which has to be confirmed before creating the ma- chine data backup.

4.71 Maschine equipment - Tab1

4.71.1 Purpose

This mask is used for the general specifications for the machine equipment.

4.71.2 Description of the mask

The mask is divided in following sections.

- Operation and movement settings
- Mold adjust
- Safety gates
- Light curtain
- Heat settings

●Motors

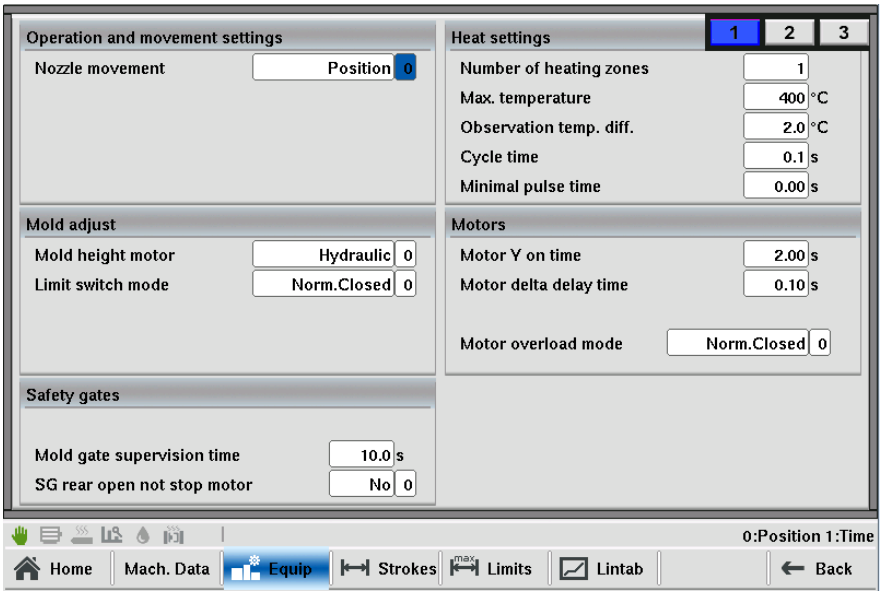


Fig.4-99: Mask "Maschine equipment tab1"

4.71.3 Description of the elements

Operation and movement settings

Field	Description
Nozzle movement mode	Following movement modes for the nozzle are available. ● **Position**: Nozzle position is determined by limit switches or transducer. ● **Time**: The nozzle movement is time-controlled (no limit switch or position sensor).
Two button mode	Following modes are possible: ● **Press to start**: Both start buttons must be pressed to start the autocycle. After starting the cycle, the buttons can be released. ● **Press till high pres.**: Both start buttons must be pressed to start the autocycle and must remain pressed until the beginning of high pressure phase. This option is only for vertical IMM´s with two start buttons available.

Mold adjust

Field	Description
Mold height motor	Specification of the type of drive for the mold height adjustment with the following selection options: ● **hydraulic:** Hydraulic drive. ● **electric:** Electric drive.
Limit switch mode	Type of limit switch for the mold height adjustment. ● **Norm. Closed**: If the end position has been reached, the con- tact is closed. ● **Norm. Open**: If the end position has been reached, the contact is opened.

Safety gates

WARNING!

The system (hardware and software) only meets category B according to EN ISO 13849-1. Thus it is not intended for usage in safety-relevant control ap- plications in the field of personal safety (e.g. emergency stop).

To implement potentially necessary safety-relevants control tasks, always use additional external safety devices according to EN ISO 13849-1 that are intended for the particular purpose and meet the necessary functional safety.

For further information see EN ISO 13849-1 and refer to chapter "EC directives and standards" in the manuals for a list of norms applying to the product.

The safety notices for the installation and commissioning of the product can be found in the user manuals of the components or in the system manual and must be read and observed before installation or commissioning.

The user manual must be kept throughout the entire service life of the product.

Field	Description
Mold gate supervision time	This input field is only visible if two digital inputs (safety gate open and safety gate closed) are configured. If both digital inputs have the same state for this set time, the application will trigger an alarm. This alarm can only be confirmed after the safety gate was detec- ted once as opened and once as closed.

Light curtain

WARNING!

The system (hardware and software) only meets category B according to EN ISO 13849-1. Thus it is not intended for usage in safety-relevant control ap- plications in the field of personal safety (e.g. emergency stop).

To implement potentially necessary safety-relevants control tasks, always use additional external safety devices according to EN ISO 13849-1 that are intended for the particular purpose and meet the necessary functional safety.

For further information see EN ISO 13849-1 and refer to chapter "EC directives and standards" in the manuals for a list of norms applying to the product.

The safety notices for the installation and commissioning of the product can be found in the user manuals of the components or in the system manual and must be read and observed before installation or commissioning.

The user manual must be kept throughout the entire service life of the product.

Field	Description
Interrupt reaction	This field is only available if the machien is equipped with a light curtain instead of a mold safety gate. The reaction to an interrupt of the light curtain can be set here. Following modes are possible: ● **Stop movements**: stop all movements ● **Stop movements and open mold**: stop all movements and then star tmold open
Light curtain active	This field is only available if the machine is equipped with a light curtain instead of a mold safety gate. This setting can be used to decide during which movements the light curtain should be checked. Following modes are possible: ● **always active**: Supervision of the light curtain is always active. ● **during table move**: Supervision is active during slide table or rotary table movement ● **during mold close**: Supervision is active during mold close movement ● **combined**: Supervision starts at the beginning of slide table or rotary table movement and ends after mold close.

Heat settings

Field	Description

Number of heating zones	The number of existing heating zones is specified here.
Max. temperature	The maximal accepted temperature of the heating zones can be specified here (applies for all heating zones). If one heating zone exeeds this temperature, the heating of all zones will be turned off. Only if the temperature of all zones is lower than the maximal accepted temperature, the heating can be activated again.

Field	Description
Observation temperature difference	Parameter is relevant for heating element supervervision. Within a defined time (default 180 seconds) the temperature of the heating element must increase at least for the configured obser-vation temperature difference when heating output is 100%. Otherwise an alarm will be raised.
Cycle time	Cycle duration of PWM-impulses for heating up every zone.
Minimal pulse time	Minimal pulse time which is used for heating up every zone.

Motors

Field	Description
Motor wye on time	The duration of the motor's wye operation at delta-wye start-up is specified here.
Motor delta-wye delay time	The duration specified here represents the time between the end of the wye operation and the start of the delta operation of the motor.
Motor overload mode	Defines whether a normally closed or normally open switch is used for detectring motor overload. ● **Normally closed**: Alarm will be raised if digital input becomes False. ● **Normal open**: Alarm will be raised if digital input becomes True.

4.72 Machine equipment - Tab2

4.72.1 Purpose

This mask allows additional specifying for machine equipment.

4.72.2 Description of the mask

This mask is divided into the following sections:

●Oil filter

●Oil level

●Servo valve inject

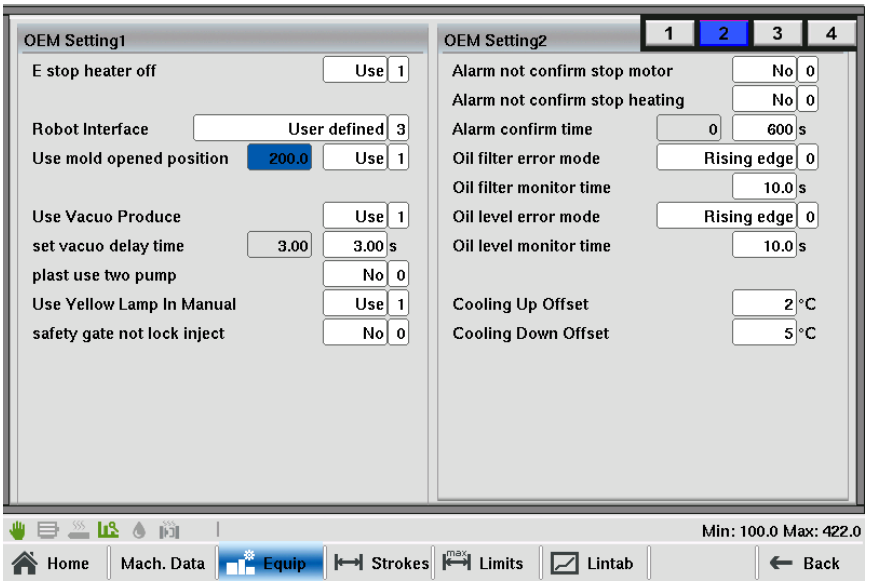


Fig.4-100: Mask "Maschine equipment tab2"

4.72.3 Description of the elements

Oil filter

Field	Description
Oil filter error mode	According to sensor type, this field defines when an oil filter error is triggered (rising or falling edge).
Oil filter monitor time	The monitoring time for the oil filter is specified here. If the oil filter signals an error for the time specified here, a corresponding alarm is triggered

Oil level

Field	Description
Oil level error mode	According to sensor type, this field defines when an oil level error is triggered (rising or falling edge).
Oil level monitor time	The monitoring time for the oil level is specified here. If an oil level error is signaled for the time specified here, a corresponding alarm is triggered.

Other

Field	Description
Use vacuo produce	Vacuum air valve function
Set vacuo delay time	The time set of Vacuum air valve
Plast use two pump	If use ,charging with two pumps
Use yellow lamp in manual	If use ,in manual mode ,yellow lamp ON.

Euromap

WARNING!

The system (hardware and software) only meets category B according to

EN ISO 13849-1. Thus it is not intended for usage in safety-relevant control ap- plications in the field of personal safety (e.g. emergency stop).

To implement potentially necessary safety-relevants control tasks, always use additional external safety devices according to EN ISO 13849-1 that are intended for the particular purpose and meet the necessary functional safety.

For further information see EN ISO 13849-1 and refer to chapter "EC directives and standards" in the manuals for a list of norms applying to the product.

The safety notices for the installation and commissioning of the product can be found in the user manuals of the components or in the system manual and must be read and observed before installation or commissioning.

The user manual must be kept throughout the entire service life of the product.

WARNING!

Following signals of the Euromap interface are not handled by the software.

- **Emergency stop of machine**
- **Safety devices of machine**

Field	Description
Robot interface	Here you can select the required Euromap robot interface. ● **Not used** ● **Euromap 12** ● **Euromap 67** ● **User defined:** all configured endpoints for Euromap will be used. Necessary enpoints according to Euromap specification which are not available will be ignored.
Imterm. mold open pos.	● **No** ● **Use**= the signal "Mold area free" is ignored for mold open movement after the configured intermediate position is reached. As long as the intermediate position is not reached during the mold open movement, the signal "Mold are free" must be TRUE.

Field	Description
Core signal 1 connection	Allocatation of a core of the machine to the euromap signal core1. Function is only displayed when Euromap 12 or Euromap 67 interface is selected.
Core signal 2 connection	Allocatation of a core of the machine to the euromap signal core2. Function is only displayed when Euromap 67 interface is selected.

4.73 Machine equipment – Tab3

4.73.1 Purpose

This mask allows additional specifying for machine equipment.

4.73.2 Description of the mask

This mask is divided into the following sections:

- Oil filter
- Oil level
- Servo valve inject

> ***Information***
>
> *These sectors are only displayed when the corresponding options are avail- able and have been configured.*

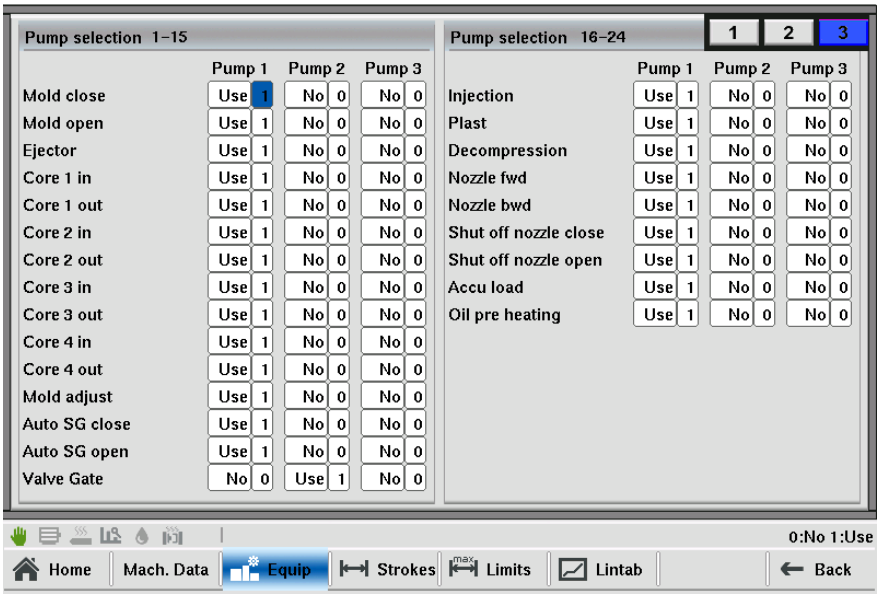


Fig.4-100: Mask "Maschine equipment tab3"

4.73.3 Description of the elements

Pump selection

Field	Description
1-24	Every movement can select pump 1,pump2 or pump3, lie on the machine hydraulic system

4.74 Strokes - Tab1

4.74.1 Purpose

This mask is used to set the principal characteristic values (stroke and diam- eter) for specific sections oft the machine.

4.74.2 Description of the mask

This mask is divided into the sections:

- Mold
- Ejector
- Inject
- Nozzle

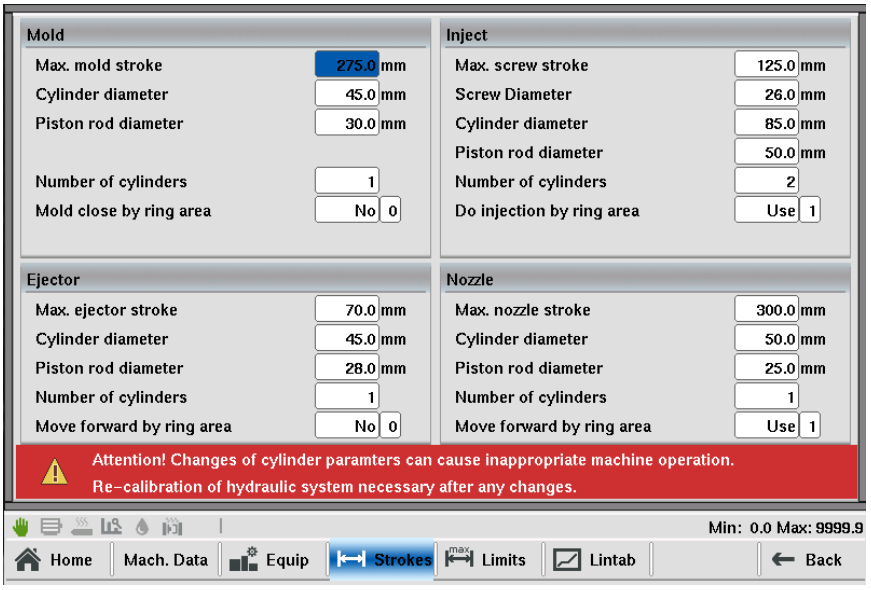


Fig.4-101: Mask "Strokes Tab1"

4.74.3 Description of the elements

Mold

Field	Description
Max. mold stroke	The maximum stroke of the moveable plate is adjusted here (distance between "Mold close" and "Mold open").
Cylinder diameter	The diameter of the cylinder(s) is specified here.
Piston rod diameter	The diameter of the piston rod(s) is specified here.
Number of cylinders	The number of cylinders is specified here.
Mold close by ring area	This field must be activated, if the mechanical integration of the hydraulic cylinder for this movement requires that the movement 'Mold close' is controlled by the ring area of the cylinder.

Ejector

Field	Description
Max. ejector stroke	This setting defines the maximum stroke of the ejector (distance between "Ejector Out" and "Ejector In").
Cylinder diameter	The diameter of the cylinder(s) is specified here.
Piston rod diameter	The diameter of the piston rod(s) is specified here.
Number of cylinders	The number of cylinders is specified here.
Move forward by ring area	This field must be activated, if the mechanical integration of the hydraulic cylinder for this movement requires that the movement 'Ejector forward' is controlled by the ring area of the cylinder.

Inject

Field	Description
Max. screw stroke	The maximum distance between front and rear end position of the screw is specified here.
Screw diameter	The diameter of the screw is specified here.
Cylinder diameter	The diameter of the cylinder(s) is specified here.
Piston rod diameter	The diameter of the piston rod(s) is specified here.
Number of cylinders	The number of cylinders is specified here.
Do injection by ring area	This field must be activated, if the mechanical integration of the hydraulic cylinder for this movement requires that the injection is controlled by the ring area of the cylinder.

Nozzle

Field	Description
Max. nozzle stroke	Specification of the maximum nozzle stroke possible. This setting is only shown if a position sensor for the nozzle is available.
Cylinder diameter	The diameter of the cylinder(s) is specified here.
Piston rod diameter	The diameter of the piston rod(s) is specified here.
Number of cylinders	The number of cylinders is specified here.

Move forward by ring area	This field must be activated, if the mechanical integration of the hydraulic cylinder for this movement requires that the movement 'Nozzle forward' is controlled by the ring area of the cylinder.

4.75 Machine limits

4.75.1 Purpose

This mask is used to set the principal limits of the machine.

4.75.2 Description of the mask

The mask is divided into the sections

- Flow
- Screw
- Injection speed
- Pressure and clamping force

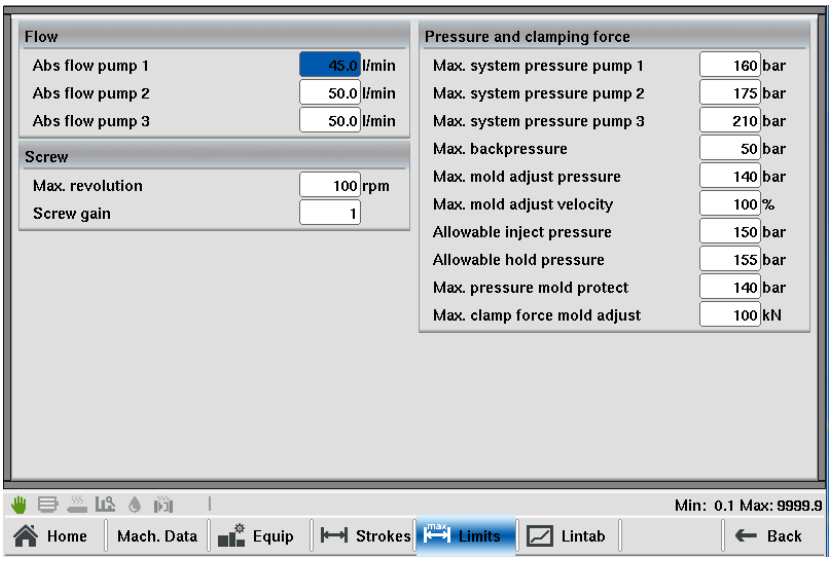


Fig.4-103: Mask "Maschine limits

4.75.3 Description of the elements

Flow

Field	Description
Absolute Flow	The maximum absolute flow can be specified here.

Screw

Field	Description

Max. screw revolution	Specification of the maximum screw feed speed.
Screw gain	Impulses per screw rotation.
Max. plast velocity	Specification of the maximum plasticize velocity.

Injection speed

Information

The maximum injection speeds are required for controlled injection.

Field	Description
Max speed forward	The maximum injection speed without the use of an accumulator is specified here.
With accumulator	The maximum injection speed with the use of an accumulator is specified here. This field is only shown if a corresponding accumulator is availa- ble.

Pressure and clamping force

Field	Description
Max. system pressure	Specification of the maximum system pressure.
Max. backpressure	Specification of the maximum backpressure.
Max. mold adjust pressure	Specification of the maximum mold adjust pressure.
Max. mold adjust velocity	Specification of the maximum mold adjust velocity.
Allowable inject pressure	The maximum allowable inject pressure is defined here.
Allowable hold pressure	The maximum allowable hold pressure is defined here.
Max. pressure mold protect	Entry of the maximum pressure for mold protect. If this pressure is exceeded during mold protect, an error is
Max. clamp force mold ad- just	Maximum value of the clamp force.

4.76 Lintab mask

4.76.1 Purpose

This mask is used to load the movement linearization table for the mold height adjustment of toggle clamp machines.

4.76.2 Description of the mask

The mask consists of the toggle lever characteristics curve which is displayed tabulated. The left area contains explanations on the linearization table as well as the number of interpolation points. The table itself is located in the right area.

A linearization table can be loaded from a file with **Select**.

The linearization table can neither be edited nor deleted in this mask.

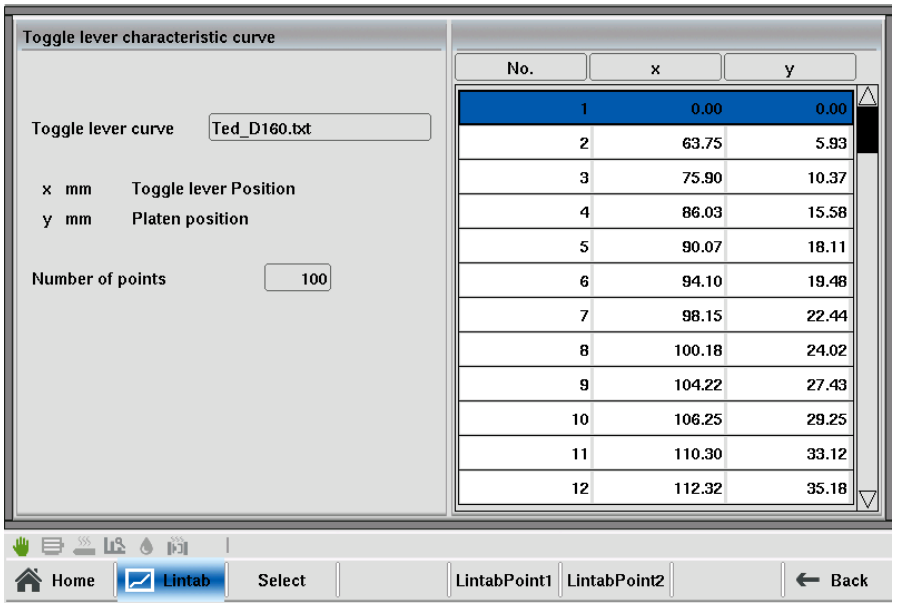


Fig.4-104: Mask "Lintab loading mask'

4.76.3 Description of the elements

Button	Description
Select	Opens the selection dialog for loading a linea- rization table from the file. The available data must be located in directory `<persistence-path>\workspace\DATA\lintab\tog- glelever`.

4.77 Lintab select mask

4.77.1 Purpose

This mask is used to load available movement linearization tables.

4.77.2 Description of the mask

Button **Load**, loads the selectied linearization table.

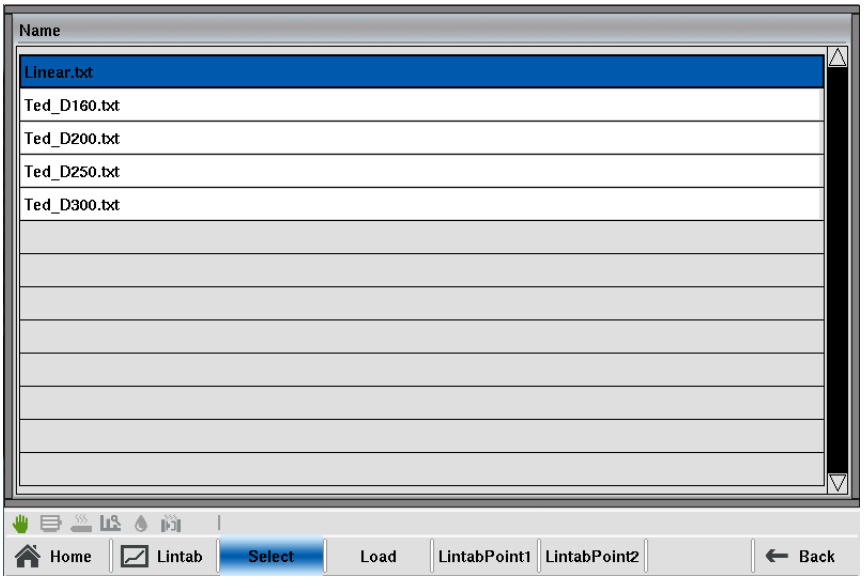


Fig.4-105: Mask 'Lintab select mask

4.77.3 Description of the elements

Button	Description
Load	Loads the selectied linearization table from a file. The available data must be located in di- rectory `<persistence-path>\workspace\DATA\lintab\togglelever`.

4.78 Calibration - Tab Auto calibration

4.78.1 Purpose

This mask is used for the calibration of transducers and valves automatically.

4.78.2 Description of the mask

Auto calibration can be either executed for each component manually or all necessary calibration steps can be triggered automatically.

The mask is divided into the sections **Auto calibration**, **Pressure**, **Transduc- er**, **Velocity** and **Closed loop**. The calibration for the single transducers and valves can be started by activating **Do Calibration**.

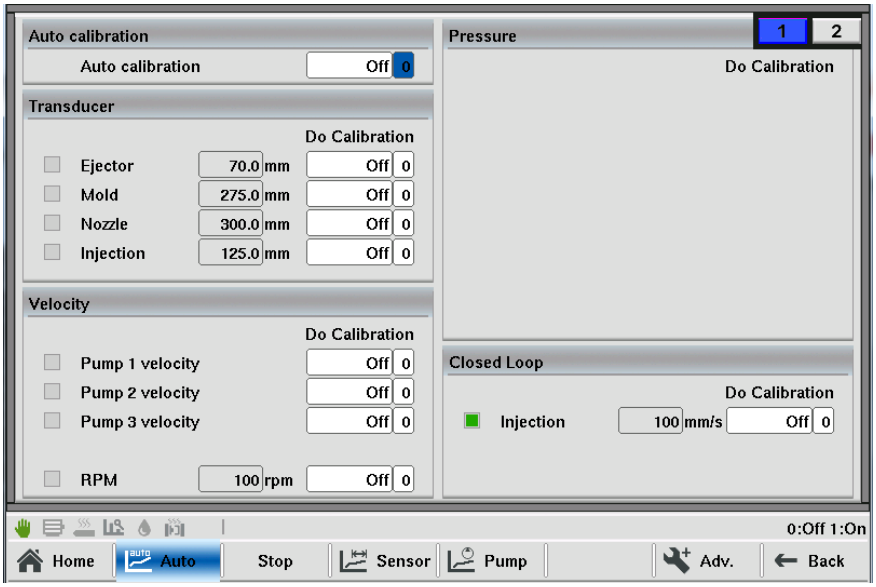


Fig.4-106: Mask 'Calibration - Auto calibration"

> ***Information***
>
> *If an automatic calibration step (e.g. ejector auto calibration) fails, the auto calibration is aborted and the next calibration step is not processed.*

The status display (to the left next to the labeling) shows the following states:

Green:	Calibration successfully completed.
Red:	Calibration failed.

4.78.3 Description of the elements

Auto calibration steps that are triggered automatically

Button	Description
Auto calibration	Starts the auto calibration and then processes the following steps one after another: 1) Ejector calibration 2) Mold calibration 3) Nozzle calibration (only if nozzle transducer is available) 4) Inject calibration 5) Pump pressure calibration 6) Pump velocity calibration 7) Servo pressure forward (only if servo valve is available) 8) Servo velocity forward (only if servo valve is available) 9) Screw rotation calibration RPM 10) Injection velocity calibration 11) Servo pressure release calibration (only if servo valve is available) 12) Hold pressure calibration (only if no servo valve is available)
Stop/Off	Abortion of the auto calibration

> ***Information***
>
> *If a servo valve is available, calibration group 'Closed loop' won't be executed automatically.*
>
> *Automatic calibration for closed loop components has to be triggered man- ually.*

Executing auto calibration step by step

Auto calibration for each component is triggered by activating the correspond- ing input field **Do calibration** which is available for each calibration step.

Information

In general, it is recommended to execute the single auto calibration steps in the same order as they are performed when executing all auto calibration steps automatically. For single auto calibration, following rules must be ad- hered.

- *Calibration of 'Injection' in group 'Transducer' has to be executed before calibration of 'Injection' in group 'Closed loop'.*
- *If a servo valve is available, 'Pump pressure' and 'Pump velocity' have to be calibrated before 'Servo press fwd' and 'Servo vel fwd'.*
- *Control system must not reboot between the calibration steps 'Servo press fwd' and 'Servo vel fwd'.*

Transducer

Field	Description
Ejector	Ejector calibration: Display of the ejector stroke.
Mold	Mold calibration: Display of the mold stroke
Nozzle	Nozzle calibration Display of the nozzle stroke.
Injection	Inject calibration: Display of injection velocity

Velocity

Field	Description
Pump velocity	Pump flow calibration
Servo velocity forward (optional)	Flow calibration servo valve. Only displayed if a servo valve is available.
RPM	Screw torque calibration: Display of the maximum possible torque. Input field is used to limit the maximum possible torque during calibration. If value is set to '0', the maximum torque will be detected automatically. If an other value is set, this value won't be exceeded during calibration.

Pressure

Field	Description

Pump pressure	Pump pressure calibration.
Servo pressure forward	Pressure calibration servo valve. Only displayed if a servo valve is available.

Closed loop

Field	Description
Servo press release (optional)	Calibration in order to get characteristic of servo valve when releasing pressure. Only displayed if a servo valve is available.
Injection	Injection speed calibration: Detection of the injection control parameters. Display of the maximum possible inject speed.
Hold controller	Hold calibration: Detection of the hold control parameters.

4.79 Calibration - Tab auto calibration settings

4.79.1 Purpose

This mask can be used for setting basic configurations for the auto calibration.

4.79.2 Description of the mask

The maximum and minimum voltage for the pressure and velocity output during the automatic calibration can be set in this mask. The maximum values are not applied to the output voltage on a servo valve. The delay time between pres- sure calibration steps can be set. Furthermore this delay time is effective for the pressure calibration of pump and servo valve. Besides these, the maximum voltage output for the velocity during pressure calibration and the maximum position relative to the screw stroke during velocity calibration can be set.

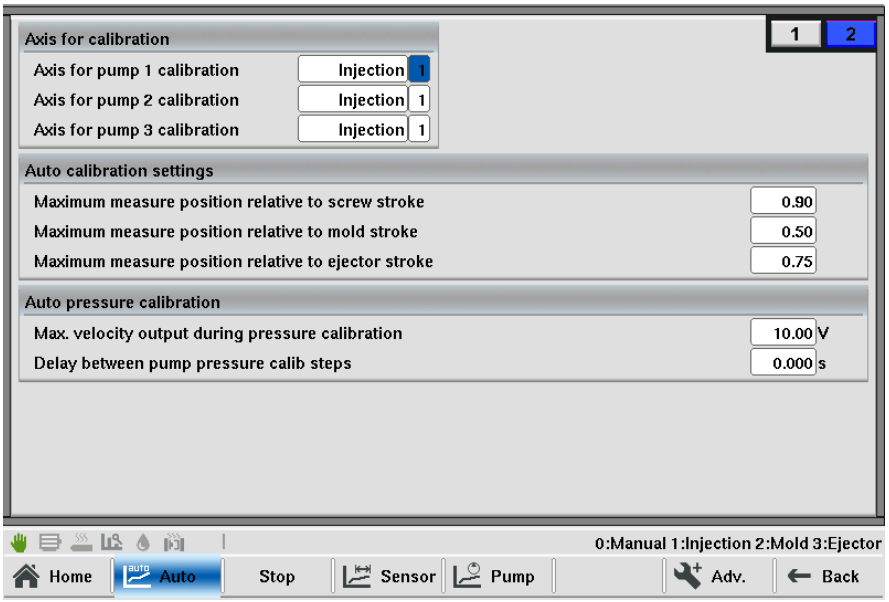


Fig.4-107: Mask "Auto calibration limitations"

4.79.3 Description of the elements

Limits

Field	Description
Max. voltage analog output	Maximum output voltage for pump velocity and pump pressure during autocalibration.
Min. voltage analog output	Minimum output voltage for pump velocity and pump pressure (also if no movement is active). In setup mode this value is not considered. The output voltage after the end of a movement is always 0.0 V in this case.
Min. voltage AO backpressure	Minimum output voltage for AO backpressure (also if no movement is active). In setup mode this value is not considered. The output voltage after the end of a movement is always 0.0 V in this case.

Screw

Field	Description
Maximum measure position relative to screw stroke	Maximum position relative to screw stroke dur- ing velocity calibration. It is displayed in per- cent of the cylinder length.

Auto pressure calibration

Field	Description
Max. velocity output during pressure calibra- tion	Maximum output voltage for velocity during pressure calibration.

Delay between pump pressure calib steps	Delay time between two following pressure cal- ibration steps. This delaytime is considered for pump pressure and servo pressure calibration.

Analog output dither settings

With this function. a small sinus signal can be added to the analog outputs for pump pressure, pump velocity and backpressure. Thus the actuated valve is minimally kept in motion in order to react faster when set values for the analog outputs change.

Field	Description
Pump pressure	Amplitude und frequency for the sinus singal of the pump pressure analog output. Amplitude = 0 deaktivates this function.
Pump velocity	Amplitude und frequency for the sinus singal of the pump velocity analog output. Amplitude = 0 deaktivates this function.
Backpressure	Amplitude und frequency for the sinus singal of the backpressure analog output. Amplitude = 0 deaktivates this function.

4.80 Calibration Trancducer - Tab1

4.80.1 Purpose

This mask is used to manually calibrate the transducers for the ejector, the mold and injection unit.

4.80.2 Description of the mask

The manual calibration of a sensor is done by entering values in a linearization table.

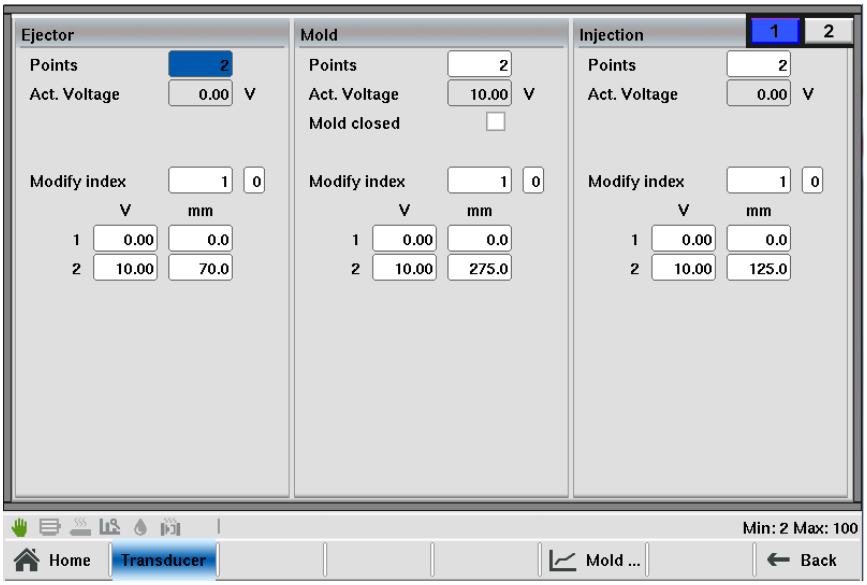


Fig.4-108: Mask "Calibration Trancducer - Tab1"

4.80.3 Description of the elements

Name	Description
Points	Number of points in the linearization table.
Actual Voltage	Displays the actual voltage of the transducer.
Start Index	Since only a maximum of 9 linearization points can be displayed on the mask, this field serves for navigation purposes. The input value al- ways corresponds to the index of the element displayed first. Example: Value 1: linearization points 1 to 9 are displayed. Value 17: linearization points 17 to 25 are displayed, etc.
Modify index	Linearization points can be deleted or added. The configured index defines which lineariza- tion point gets deleted resp. after which linea- rization point a new point gets added.
V / mm	Calibration of a transducer for **Mold**, **Inject** and **Ejector**. Calibration is done by entering the po- sition **[mm]** and the voltage **[V]** for each linea- rization point.

4.81 Calibration Trancducer - Tab2

4.81.1 Purpose

This mask is used to manually calibrate the transducers for the nozzle and the slide table (optional).

4.81.2 Description of the mask

The manual calibration of a sensor is done by entering values in a linearization table.

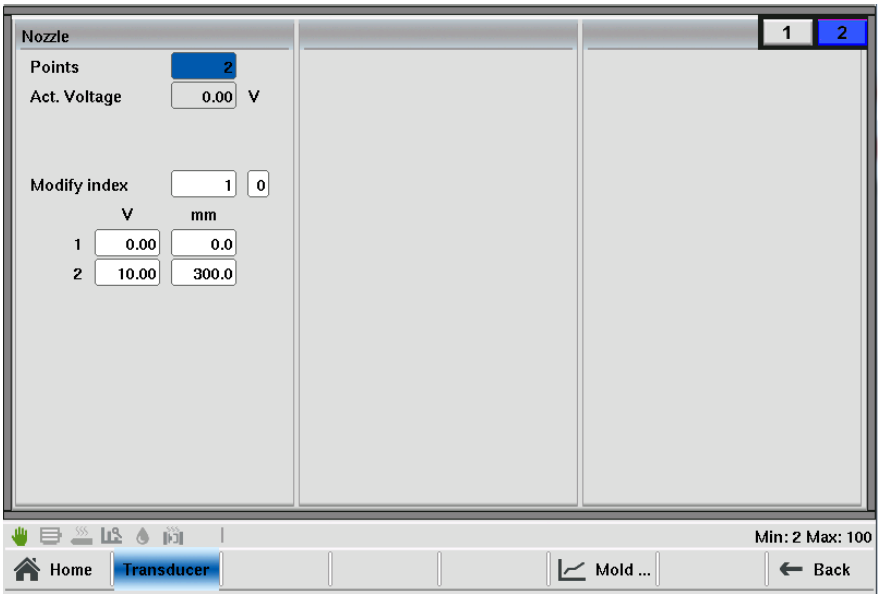


Fig.4-109: Mask "'Calibration Trancducer - Tab2"

4.81.3 Description of the elements

Name	Description
Points	Number of points in the linearization table.
Actual Voltage	Displays the actual voltage of the transducer.
Start Index	Since only a maximum of 9 linearization points can be displayed on the mask, this field serves for navigation purposes. The input value al- ways corresponds to the index of the element displayed first. Example: Value 1: linearization points 1 to 9 are displayed. Value 17: linearization points 17 to 25 are displayed, etc.
Modify index	Linearization points can be deleted or added. The configured index defines which lineariza- tion point gets deleted resp. after which linea- rization point a new point gets added.
V / mm	Calibration of a transducer for **Nozzle** and **Slide table**. Calibration is done by entering the position **[mm]** and the voltage **[V]** for each lin- earization point.

4.82 Calibration pump - Tab1

4.82.1 Purpose

This mask can be used to manually calibrate the pump pressure and pump velocity. Additionally the minimum and maximum output voltages for pressure and velocity during the calibration can be set.

4.82.2 Description of the mask

The manual calibration of a sensor is done by entering values in a linearization table.

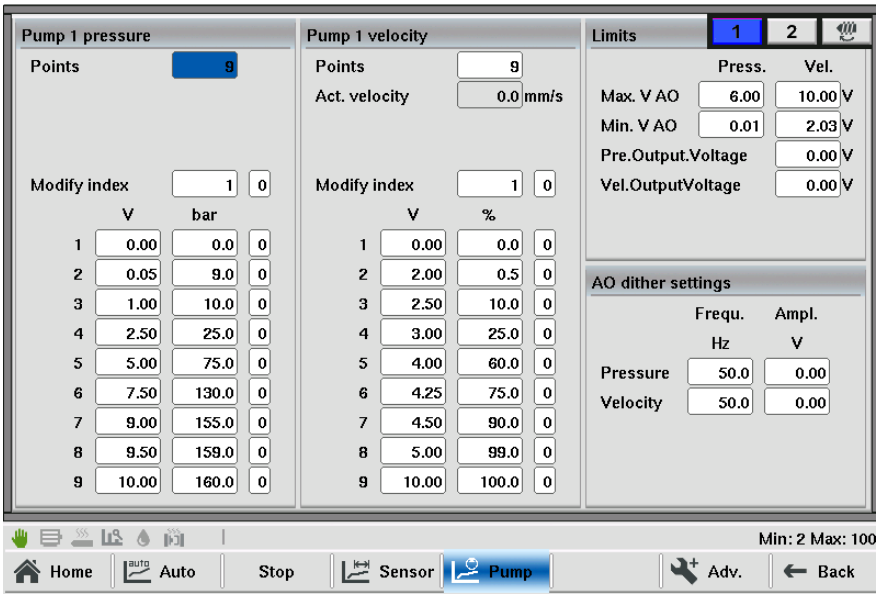


Fig.4-113: Mask "Calibration pump - Tab1"

4.82.3 Description of the elements

Pump pressure

Name	Description
Points	Number of points in the linearization table.
Actual pressure	Displays the actual pump pressure.
Start Index	Since only a maximum of 9 linearization points can be displayed on the mask, this field serves for navigation purposes. The input value al- ways corresponds to the index of the element displayed first. Example: Value 1: linearization points 1 to 9 are displayed. Value 17: linearization points 17 to 25 are displayed, etc.
Modify index	Linearization points can be deleted or added. The configured index defines which lineariza- tion point gets deleted resp. after which linea- rization point a new point gets added.
V / bar	Calibration of the pump pressure sensor is done by entering the pressure **[bar]** and the voltage **[V]** for each linearization point.
Set output voltage	Possibility to force the set-voltage for the ana- log output for pump pressure. For each linea- rization point, the forcing of the analog output voltage can be activated by entering '1'. The resulting pump pressure is shown in field 'Act. pressure' and can be entered for the cor- responding linearization point.

Pump velocity

Name	Description

Points	Number of points in the linearization table.
Actual velocity	Displays the actual pump velocity.
Start Index	Since only a maximum of 9 linearization points can be displayed on the mask, this field serves for navigation purposes. The input value al- ways corresponds to the index of the element displayed first. Example: Value 1: linearization points 1 to 9 are displayed. Value 17: linearization points 17 to 25 are displayed, etc.
Modify index	Linearization points can be deleted or added. The configured index defines which lineariza- tion point gets deleted resp. after which linea- rization point a new point gets added.
V / %	Calibration of pump velocity sensor is done by entering the velocity **[%]** and the voltage **[V]** for each linearization point.
Set output voltage	Possibility to force the set-voltage for the ana- log output for pump velocity. For each lineari- zation point, the forcing of the analog output voltage can be activated by entering '1'. The resulting pump velocity is shown in field 'Act. velocity' and can be entered for the cor- responding linearization point.

Limits

Field	Description
Max. voltage analog output	Maximum output voltage for pump velocity and pump pressure during calibration.
Min. voltage analog output	Minimum output voltage for pump velocity and pump pressure (also if no movement is active). In setup mode this value is not considered. The output voltage after the end of a movement is always 0.0 V in this case.

Analog output dither settings

With this function a small sinus signal can be added to the analog outputs for pump pressure and pump velocity. Thus the actuated valve is minimally kept in motion in order to react faster when set values for the analog outputs change.

Field	Description
Pump pressure	Amplitude und frequency for the sinus singal of the pump pressure analog output. Amplitude = 0 deaktivates this function.
Pump velocity	Amplitude und frequency for the sinus singal of the pump velocity analog output. Amplitude = 0 deaktivates this function.

4.83 Calibration pump – Tab3

4.83.1 Purpose

This mask can be used to manually calibrate the screw revolution and the back pressure. Additionally the minimum and maximum output voltages for pressure and velocity during the calibration can be set.

4.83.2 Description of the mask

The manual calibration of a sensor is done by entering values in a linearization table.

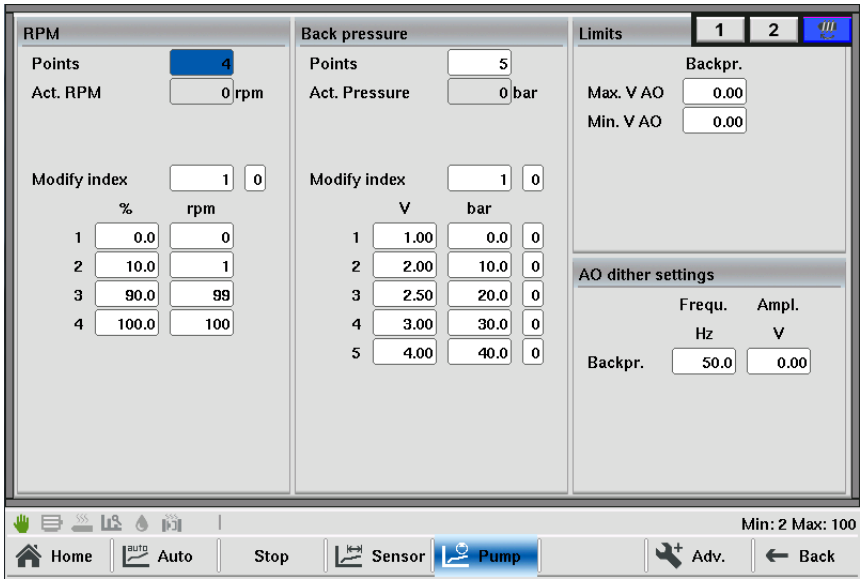


Fig.4-114: Mask "Calibration pump - Tab2"

4.83.3 Description of the elements

RPM

Name	Description
Points	Number of points in the linearization table.
Actual RPM	Displays the actual RPM (rotations per mi- nute).
Start Index	Since only a maximum of 9 linearization points can be displayed on the mask, this field serves for navigation purposes. The input value al- ways corresponds to the index of the element displayed first. Example: Value 1: linearization points 1 to 9 are displayed. Value 17: linearization points 17 to 25 are displayed, etc.

Modify index	Linearization points can be deleted or added. The configured index defines which lineariza- tion point gets deleted resp. after which linea- rization point a new point gets added.
% / rpm	Calibration is done by entering the velocity **[%]** and the rotations per minute **[rpm]** for each linearization point.

Back pressure

Name	Description
Points	Number of points in the linearization table.
Actual pressure	Displays the actual back pressure.
Start Index	Since only a maximum of 9 linearization points can be displayed on the mask, this field serves for navigation purposes. The input value al- ways corresponds to the index of the element displayed first. Example: Value 1: linearization points 1 to 9 are displayed. Value 17: linearization points 17 to 25 are displayed, etc.
Modify index	Linearization points can be deleted or added. The configured index defines which lineariza- tion point gets deleted resp. after which linea- rization point a new point gets added.
V / bar	Calibration is done by entering the pressure **[bar]** and the voltage **[V]** for each linearization point.
Set output voltage	Possibility to force the set-voltage for the ana- log output for pump pressure. For each linea- rization point, the forcing of the analog output voltage can be activated by entering '1'. The resulting pump pressure is shown in field 'Act. pressure' and can be entered for the cor- responding linearization point.

Limits

Field	Description
Max. voltage analog output	Maximum output voltage for pump velocity and pump pressure during calibration.
Min. voltage analog output	Minimum output voltage for pump velocity and pump pressure (also if no movement is active). In setup mode this value is not considered. The output voltage after the end of a movement is always 0.0 V in this case.

Analog output dither settings

With this function a small sinus signal can be added to the analog output for back pressure. Thus the actuated valve is minimally kept in motion in order to react faster when set values for the analog outputs change.

Field	Description
Backpressure	Amplitude und frequency for the sinus singal of the pump pressure analog output. Amplitude = 0 deaktivates this function.

4.84 Maximum Velocities

4.84.1 Purpose

This mask shows the maximum velocities of specific movements.

4.84.2 Description of the mask

The maximum velocities for ejector-, mold-, injection-, mold adjust-and nozzle movements will be displayed.

These values will be calculated automatically from the maximum set-values and the diameter of the cylinders.

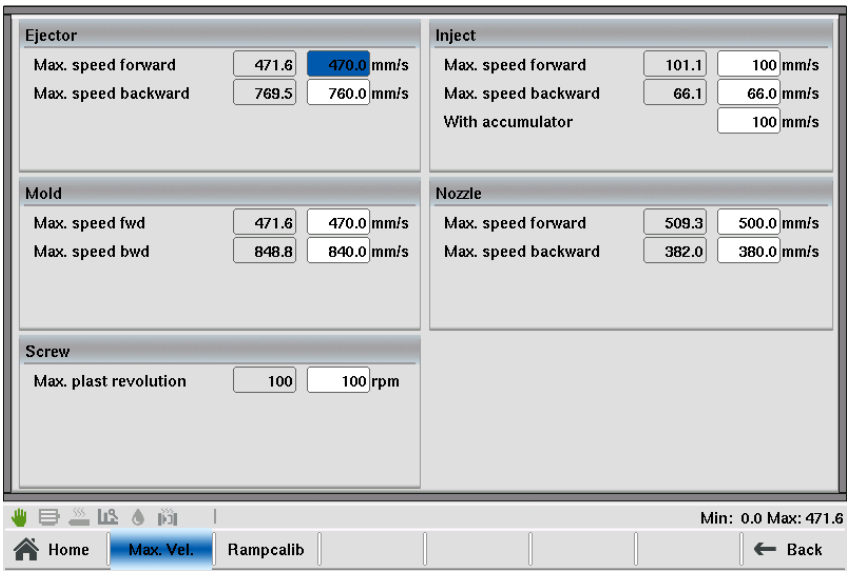


Fig.4-119: Mask "Max. Velocity"

4.84.3 Description of the elements

Mold

Field	Description
Max. speed forward	Display of the maximum velocity for the 'Mold close' movement.

Max. speed backward	Display of the maximum velocity for the 'Mold open' movement.

Ejector

Field	Description
Max. speed forward	Display of the maximum velocity for the 'Ejector forward' movement.
Max. speed backward	Display of the maximum velocity for the 'Ejector backward' movement.

Inject

Field	Description
Max. speed forward	Display of the maximum velocity forward for the injection.
Max. speed backward	Display of the maximum velocity backward for the injection.

Nozzle

Field	Description
Max. speed forward	Display of the maximum velocity for the 'Nozzle forward' movement.
Max. speed backward	Display of the maximum velocity for the 'Nozzle backward' movement.

Slide table

Only visible if a slide table with transducer is used.

Field	Description
Max. speed forward	Display of the maximum velocity for the 'Slide table in' movement.
Max. speed backward	Display of the maximum velocity for the 'Slide table out' movement.

4.85 Automatic ramp calibration

4.85.1 Purpose

In this mask the automatic ramp identification can be executed during ramp calibration.

4.85.2 Description of the mask

The maximum ramp and dead time can be identified during ramp calibration on this mask. The identified values for the ejector, mold, nozzle and inject are displayed.

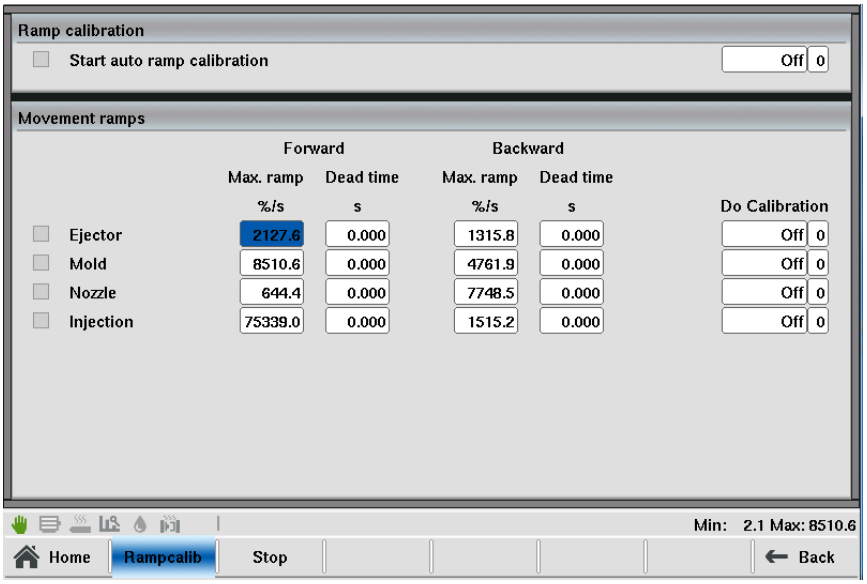


Fig.4-120: Mask "Automatic ramp calibration"

4.85.3 Description of the elements

Ramp calibration

Starts the automatic ramp calibration for all displayed movement ramps.

Movement ramps

Field	Description
Max.Ramp	Identified maximum ramp. This value equates the maximum velocity ramps in masks 'Profiles 1', 'Profiles 2' and 'Profiles 3'.
Dead time	Identified dead time of a ramp. This value is used for internal dead time com- pensation during execution of a movement. The dead time compensation is used to im- prove the positioning accuracy of a movement. If a movement doesn't reach its target position after optimization, the value of the dead time has to be reduced.
Do Calibration	Starts the ramp calibration for the desired movement.

4.86 Display and user settings

4.86.1 Purpose

This mask is used to set the display parameters as well as for user login and for changing user passwords.

4.86.2 Description of the mask

This mask contains all settings that are directly connected with the visualization (language, brightness, etc.). Also the system time can be set

For user login and logout as well as for changing user passwords the appro- priate softkeys have to be used.

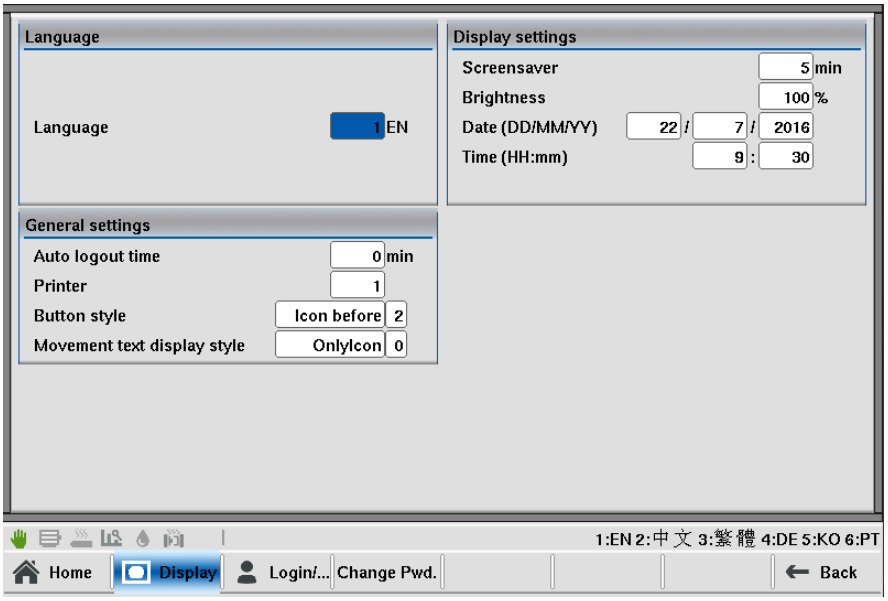


Fig.4-125: Mask "Display and user settings"

4.86.3 Description of the elements

Language

Field	Description
Language	The language selection for the masks is specified here. The se- lection of the possible languages is application-dependent.

General settings

Field	Description
Auto logout time	After this time has elapsed, the actual user gets logged off.

Printer	This element is optional and only appears if the functionality has been configured in configuration file 'kvb.cfg' on the compact flash. If a screenshot of a mask gets created, the screenshot will either be printed or saved on the compcact flash, depending on the seet- ings below. ● **0:** Printing resp. creating a screenshot deactivated. ● **1:** Creates a screenshot of the current mask on the compact flash using png- format. ● **2:** Prints mask to local USB printer
Button style	Specification of the softkey style. Possible selections are ● **0: Text:** only text is displayed for softkeys ● **1: Icon or text:** Either an icon or a text is displayed for a soft-key. If an icon and a text is available for the softkey, the icon will be displayed. ● **2: Icon before:** Icon and Text are displayed. Icon left and text on the right. ● **2: Icon after:** Icon and Text are displayed. Text left and icon on the right.
Movement icons	Specification of the movement icon style. Possible selections are ● **0: Icon only:** For every movement a movement icon will be displayed in the basic layout of the visualization. In this case up to six movement icons can be displayed at the same time in the basic layout. ● **1: Icon and Text:** A movement icon and a text are displayed for every movement. In this case up to three movement icons + text can be displayed at the same time in the basic layout.

Display settings

Field	Description
Screensaver	After this time the screensaver is switched on.
Brightness	The display's brightness is adjusted here.
Date	The system date is set here.
Time	The system time is set here.

User login/logout

Field	Description
Password	The password is entered via the keypad at the panel (see chapter Numerical /alphanumerical keypad). Confirm your entry by press- ing the "login" softkey. The top status bar displays the actual user level. Following users are available with following passwords by default. ● **Level 1: Worker:** no password. Level1 is used when user logs out. ● **Level 3: Mold Prepare:** Password "**Y**" ● **Level 4: Production:** Password "**J**" ● **Level 5: Quality:** Password "**M**" ● **Level 6: Process expert:** Password "**P**" ● **Level 8: Service technician:** Password "**91951**" ● **Level 12: Startup technician:** Password "**14789**" Passwords for all users can be changed with softkey button "Change password'.

Change password

Only the password of the user level that is actually logged in can be changed.

Field	Description
...for actual userlevel:	Shows the actual user level. The password of this user level can be changed.
New Password	Input field for the new password.
Confirm password	Confirmation of the new password.
OK	New password becomes active.