

KePlast.HMI.KVB

Visualization

KEBA i1000

User's manual V2.1



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

## **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.

<u>▲</u> 1		100 rpm	0	0 bar	0	0 %	P	0 bar	12 Startup	tederic
Ŵ		1		0.0 mm	[k]	275.0 m	m (*®)	66.6 mm	3:27 PM	
						2				
						2				
<b>*</b> E	- <u></u>	) jä				1			Mir	n: 1 Max: 999999
Â		[1]		• 3	-		ф.	-	մ	4
F1		F2	÷ F	-3	<b>F4</b>		F5	F6	F7	F8

#### 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.

/1		/2		/ 3	
🛕 1 🖤 🛛 rpm	6 40 bar	Ø <u>50</u> %	∉ 0 bar	1 Worker	Lodosis
<u>लि</u>	🖡 🛛 0.0 mm	1] 4.4 mm	🦇 125.0 mm	4:08 PM	cederic
4				5	
ig.3-2: Top statu:	s bar for resolu	tion 800x600			
6 Nozzle Heating1: Zor	ne 7 out of tolerand	e, check heating	and heating para	12 Startup	tederic
n  :	9.9 mm	0.0 mm		4:22 PM	cedenc
line is fade in. disappears by alarm button of panel. After that nalizes that an ing is currently number next to shows the num ings/alarms that active. A grey is a warning. A re izes an alarm. that is part of the the alarm class	The alarm line pressing the n the operatio at an icon sig- alarm or warr acitve. The o the icon her of warn- at are currentl icon signalize ed icon signal The number he icon shows s.	t ■ The	e maximum pu ect pressure, a ion, acutal mol rew position an volution.	tive mover	nents are
is logged in.	user level tria		splayed. There odes how to dis ovements. Eith	are two di splay the a ner just an	fferent ctive icon or an
Current time					
1 100 bar	0 75 % 2	<b>1</b> 3	6	4:32 PM	tederic 5

Fig.3-3:

Top status bar for resolution 800x480



<ul> <li>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 active. 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.</li> <li>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"</li> <li>Current time</li> </ul>		
<ul> <li>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</li> <li>"Display settings"</li> <li> Current time</li> </ul>	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).
Current time	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.

0	ヨ 🛎 💧 👸 🔦 — 1	<b>2</b> Min: 1 Max: 999999
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
۵	Setup mode active
₿	Motor on
	Nozzle heating on
6	Lubrication active



<b>j</b>	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.

lcon	State
i⊂ Ioi	Mold close
	Mold open
ia line line line line line line line line	Mold close up to interposition
10 10	Mold open up to interposition
ji €	Air valve active including air valve number
*	Cooling active
→1 ■	Core in including core number
€1 ■	Core out with display of core number
Ţ.	Ejector backward
Ť∎ <b>ľ</b>	Ejector forward
÷ ±4	Automatic mold height adjustment
→  ++	Mold height adjustment backward



-́4	Mold height adjustment forward
ļĨ≟	Mold height adjustment during production
	Nozzle backward
- <b>E</b>	Nozzle forward
<b>*</b>	Shut-off nozzle close
4	Shut-off nozzle open
Ē	Close safety door
Ē	Open safety door
-	Screw forward, inject
	Screw backward, decompression
- <del></del>	Inject hold
<b>₩</b>	Screw forward up to interposition
->i 4()))	Screw backward up to interposition
÷.	Rotate screw, plastisize
	Cold drop
ŵ	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
Mold	Icon before text
Mold	Text before icon

The styles can configured in mask "Display settings"

# 3.2 Mask hierarchy









#### 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

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

## 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).

7 ABC	8 DEF	9 GHI
<b>4</b> JKL	<b>5</b> MNO	6PQR
<b>1</b> STU	<b>2</b> vwx	3 yz
+/	0	. / 🖵

Fig.3-5:

Keypad 'Numerical /alpha-numerical keys'

Кеу	Description
<b>←</b>	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'

Кеу	Description
Esc	Escape
لع	Enter

# 3.3.4 Keys for setting the operating mode

Кеу	Operating mode
	Manual mode (LED illuminates, if this operat- ing mode is active)
	Set-up mode (LED illuminates, if this operating mode is active)
ť,	Semi-automatic (LED illuminates, if this oper- ating mode is active)
• <del>[]</del>	Full automatic (LED illuminates, if this operat- ing mode is active)



Кеу	Description
	Open mold
I)	Close mold
0p.	Move ejector backward
	Move ejector forward
	Move core1 out
	Move core1 in
$\square \in$	Activate sirvalve
	Close safety gate
	Open safety gate
<##	Inject
Æ	Plasticize
	Decompression
_\ ↓	Move nozzle forward
4	Move nozzle backward

# 3.3.5 Further Keys operating the injection molding machine



Кеу	Description
าณะ	Activate heating (LED illuminates if heating is on)
Û	Activate motor (LED illuminates if motor is on)
3	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.

Close	Stages 4
Pressure bar Velocity % To mm	1       2       Protect HiPress       Actual       Limit         80       20       20       88       Mold protect time       0.00       5.00 s         44       44       44       44       Max. close time       0.00       60.00 s         500.0       200.0       100.0       Max. lock time       0.00       60.00 s         High pressure keep time       0 ms
Open	Stages 5
Pressure bar Velocity % To mm 27:	4       3       2       1       Actual       Limit         99       90
ا ہ یا کے 🖶 🖶 🤚	Min: 0 Max: 16
A Home	id 🖌 🔧 Setup 💐 Adv. 🕸 Height 💧 Lubr. 🕸 Options 🗲 Back

Fig.3-7: Tabs



# 3.5 Quick access panel and favourite masks

Key "**Esc**" epens 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.

Quick access and favourite keys			
1 Open mask help	5 User Login/Logout	8 Add favourite key	
2 Open alarm help	6 <not used=""></not>	9 Remove favourite key	
3 Create screenshot / print	7 <not used=""></not>	0 <not used=""></not>	
4 Create statusreport		Enter Actual value panel	
	Cz		

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.

Pump		
() 0 bar	📴 🛛 🛛 🔂 🕼	🕑 🚺 🚺 🕑 bar
<b>℗¹</b> %	<b>⊘</b> ²0%	Ø <sup>3</sup> 0%
Position		
问 275.0 mm	0.0 mm	- <b></b> 0.0 mm
🖶 0.0 mm		
Injection		
@P0bar	<b>₩</b> 1.00 s	🖑 🚺 rpm
Mold		
+± 0.0 mm	<b>3∥</b> 0.0 kN	
Cores		

Fig.3-9: Actual value panel

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



Icons	Description	
Ø	Actual system pressure	
0	Actual system velocity	
m	Actual oil temperature	
101	Actual mold position	
	Actual screw position	
	Actual nozzle position	
E,	Actual ejector position	
₩P	Actual inject pressure	
*	Actual cooling time	
<u>@</u>	Actual plasticize revolution	
ļ)±	Actual mold height	
켸	Actual clamp force Actual cavity pressure	
<b>I</b> P1		
	Shows if core is in	
-2	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.

Overview				
depicted as analog b	ars dependent on their actual position.			
Analog bars				
The analog bar is str	uctured the following way:			
Analog bars				
Designation	Description			
Ejector position	Current position of ejector in reference to its zero position (ejector fully retracted)			
Screw position	Current position of screw in reference to front end point (end position)			
Mold position	Current distance from movable half of mold to fixed half of mold			
Nozzle position	Current position of nozzle, relative to reference point. This display field is only shown if a			
	transducer is installed to determine the position of the nozzle.			

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



OPERATION MANUAL

please contact KEBA).

### Procedure

- 1) Connect local printer to the USB interface
- 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.

Create s	tatus report	
	Do you want to c	reate a status report?
	Yes	No





## 3.5.6 User login and logout

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

User login			
Password			
	Login	Logout	Cancel

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

<ul> <li>Status of the heater (zone is heating / not heating, error of a heating zone )</li> </ul>	Status of the heater (greytemper- ature out of tolerance, greentarget 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 percent- age 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.
	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.
Nozzle position	This display field is only shown if a transducer is installed to determine the position of the noz- zle.
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 " <b>Production</b> ".
	The Actual number of shots (shot counter) is shown in the left field <b>Actual</b> . The remaining number of shots is shown in the center field <b>Remain</b> . The number of shots to be produced can be specified in the right field <b>Total</b> .
Production counter	Settings regarding the production counter (in- clusively resetting), can be done in mask " <b>Production</b> ".
Production time	The Actual production time is shown in the left field <b>Actual</b> . The remaining production time is shown in the center field <b>Remain</b> . The total production time is shown in the right field <b>To-</b> tal.
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.

Close				Sta	ges (	4				
Pressure b Velocity ୨ To n	oar % nm		1 80 44 50	2 P 20 44 0.0 20	Protect 20 44 0.0 1	HiPress 88 44 00.0	Mold pro Max. clo Max. loci High pre	otect time se time k time ssure kee	Actual 0.00 0.00 0.00 p time	Limit 5.00 s 60.00 s 60.00 s 0 ms
Open				Sta	ges	5				
Pressure b Velocity ୨ To n	bar % nm	5 99 99 275.0	4 99 99 44.0	3 99 99 33.0	2 99 99 22.0	1 99 99 11.0	Max. ope Cycle de	en time lay time	Actual 0.00 0.00	Limit 99.00 s 0.00 s
	118 (	) jõj							N	lin: 0 Max: 160
倄 Home	1	Mold	🔧 Setu	ip    🔧+	Adv.	₿± He	ight 💧 💧	Lubr.	Option	s 🗲 Back

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 1n	Setting of <b>Pressure</b> and <b>Velocity</b> between the position specified in field <b>to</b> and the position of the the previous stage during "Mold close" (in case of stage 1, the "Mold open" position).
Protect	Setting of <b>Pressure</b> and <b>Velocity</b> between the position specified in field <b>to</b> and the position of the the previous stage during "Mold close".
	Mold protect is active in this range.
High Pressure	Setting the <b>Pressure</b> and <b>Velocity</b> 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 <b>Actual</b> displays the current time for mold close movement. The maximum permitted time until the mold is completely closed is specified in field <b>Limit</b> . 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 <b>Actual</b> . The monitoring time is entered in field <b>Limit</b> .
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 1n	Setting of <b>Pressure</b> and <b>Velocity</b> between the position specified in field <b>to</b> 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 <b>Actual</b> displays the current time for mold open movement. The maximum permitted time until the mold is completely opened is specified in field <b>Limit</b> . 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



	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.
Ramp	<ul> <li>Start: Defines start ramp value for movement.</li> <li>Stop: Defines stop ramp value for movement.</li> <li>Mid: Defines ramp for all inner profile ramps for movement.</li> <li>Smooth: Smooth factor is used to allow a smooth ending of a movement. If smoothfactor = 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 closed. Reference value for the smooth factor is the maximum speed of the respective movement (see mask 'Max. Velocity').</li> </ul>

### 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.

General settings	Movement start delay
Use adaptive mold open No 0 Mold open tolerance 15.0 mm	Close delay         0.00         0.00 s           Open delay         0.00         0.00 s
Open after protect     No     0       Mold protect retry count     0	Setup mode output Pressure Velocity
Fast close     Use 1       Fast close Mode     Fast Clo 0       Use mold pretect pre. rel. time     0.020 s	bar%Close1530Open2520
Mold Open Slow Use FastClose V No 0 Use fast open No 0	float cylinber Use accumulator No 0 Recharge pressure 44 bar Becharge velocity 10 %
Home Mold Setup At Adv.	Min: 0.0 Max: 99.9 ↓± Height 💧 Lubr. 🛛 🍄 Options ← Back

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



# 4.4.3 Description of the elements

# **General settings**

Field	Description
	By selecting this option the mold open movement will be opti- mized. Thus a jerky stop of the mold when reaching mold open end position because of different hydraulic characteristics of machines can be avoided.
Use adaptive mold open	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.

Pressure	Velocity			
	velocity		Pump on	Valve off
bar	%		S	S
0	0	Close delay	0.00	0.00
0	0	Open delay	0.00	0.00
		Ramp setup mode		
Pressure	Velocity		Pressure	Velocity
bar/s	%/s		bar/s	%ls
1000.0	8510.6	Close	1000.0	1003.3
1000.0	4761.9	Open	1000.0	1010.5
500.0	200.0			
500.0	200.0			
				Min: 0 Max:
🔧 Setup	Adv.	🌓 ± Height 💧 Lubr.	🔅 Opt	tions 🗲 Bac
	0 0 Pressure bar/s 1000.0 500.0 500.0	0 0	0       0       0       Close delay         0       0       0       Open delay         Pressure       Velocity       Ramp setup mode         bar/s       %/s       Close         1000.0       8510.6       Close         1000.0       4761.9       Open         500.0       200.0       Open         500.0       200.0       Open         500.0       200.0       Lubr.	0       0       0       0.00         0       0       0       0.00         Open delay       0.00         Pressure       Velocity       bar/s         bar/s       %/s       bar/s         1000.0       8510.6       1000.0         1000.0       4761.9       Open         500.0       200.0       Open         500.0       200.0       Open

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.



	The minimum profile output (pressure, velocity) for the
Min. profile output open	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
	Field <b>Pump on</b> specifies the time that is waited between the start of the 'Mold close' movement and the activation of the hydraulic pump.
Close delay	Field <b>Valve off</b> 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
	Field <b>Pump on</b> specifies the time that is waited between the start of the 'Mold open' movement and the activation of the hydraulic pump.
Open delay	Field <b>Valve off</b> 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**.



General settings		Advanced settings		
Adjust mode	Force 1	Clamp force	0.0	50 kN
Adjust by one gear	Off 0	Clamp pressure		100 bar
Adjust by time	On 1	Mold height	0.0	0.0 mm
	0.01 s			
		Monitor time	0.0	300.0 s
Auto mold adjust	Off 0	Standstill		10.0 s
Mold height manual allo	w Any time 1	Single impulse timeout	0.0	1.0 s
Mold height bwd hold	Use 1	Impulse sensor		
Mold adjust output		Mold height		
	Pressure Velocity	Mold height	[	0.0 mm
	bar %	Min. mold height	[	120.0 mm
Forward	20 20	Max. mold height	[	320.0 mm
Backward	20 20	No 0 Mold height origin	(	0.0 mm
		No 0 Mold height calc. po	s. (	0.0 mm
🦉 🖶 🚨 🕰 💧 👸				
🕋 Home 🚺 Mold	🔾 Setup 斗 Adv.	🕨 🖢 Height 💧 Lubr.	🔅 Optio	ns 🗲 Back

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





# 4.6.3 Description of the elements

# **General settings**

Field	Description
	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:
Adjust mode	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 <b>Pressure</b> and <b>Velocity</b> for hydraulic mold height adjustment for mold height forward movement.
Mold adjust output back- ward	Specification of <b>Pressure</b> and <b>Velocity</b> 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.

Pin Lubricacion			Tiebar Lubricacion		
Lubrication interval	0	9999	Lubrication interval	0	100
Lubrication time	0.00	30.00 s	Lubrication time	0.00	0.20 s
check time	1.0	1.0 s	check time	0.2	1.0 s
Delay time	0.0	1.0 s	Delay time	0.0	0.0 s
Off time	0.00	5.00 s	Off time	0.00	5.00 s
Auto Use Lubrication		No 0	Auto Use Lubrication		No 0
DI lubrication pressure ach	ieved		DI lubrication2 pressure ac	hieved	
	_	0	0 - 0 - 0		Min: 0 Max: 9999
A Home Mold	Setup	Adv.	🜓 ± Height 💧 Lubr.	🔅 Optic	ons 🗲 Back

Fig.4-7: Mask "Lubrication"

# 4.7.3 Description of the elements

Field	Description
	The left field displays the number of machine cycles since its last lubrication.
Lubrication interval	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.
	The lubrication will be done pulsative.
Off time	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.

ValveGate Setting	Safetygate
Valve gate type Monostable 0	Use CE Standard No 0
VG use pump No 0	Full Auto Can Open Door Use 1
number of hy valve 2	GateOpen lock Mold Open No 0
	Cycle Start Mode Door Close 1
	Gate open mode After Cycle 5
Use accumulator No 0	Auto safetygate
Recharge pressure 66 bar	Gate type chose Not Use 0
Recharge velocity 22 %	AutoSG: Start position 0.0 mm
	SG auto open time (0s for ignore) 3.0 s
	Close delay 0.0 0.0 s
	Open delay 0.0 0.0 s
	Max. close time 0.0 60.0 s
	Max. open time 0.0 60.0 s
₩ 🖻 🛎 🕰 👌 🕅 🕴	Min: 0 Max: 24
🕋 Home 时 Mold 🔧 Setup 🔧 Adv.	🖡 🛨 Height 💧 Lubr. 🏠 Options 🗲 Back

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

### 4.8.3 Description of the elements

Δ	WARNING!		
A		35	



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
	The behaviour of the automatic safety gate during autocycle can be adjusted here. Following mode are possible:
Safety gate auto open mode	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
-------	-------------



	The valve gate type can be adjusted here.	
Valve gate type	<ul> <li>Monostable: Valve gate with one digital output. The valve gate is opened by setting the digital output and closed by resetting the digital output.</li> <li>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.</li> </ul>	
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.

Backward	Stages 2	Ejector forward Stages 2 = 🗠
Force bar Velocity % To mm	2 1 10 10 347 347 8.0 40.0	1         2           Force         bar         6         6           Velocity %         487         487         1           To         mm         30.0         40.0         1
Airvalves		Ejector settings
Mode	Mold Pos. Inject Pos. Delay	Time Ejector mode No 0
1 Dur.Inj 8	0.0 88.0 mm 0.00 s	5.00 s Shake counter 1
2 Dur.Inj 8	0.0 77.0 0.00	5.00
3 Dur.Inj 8	0.0 66.0 0.00	5.00
4 Dur.Inj 8	0.0 55.0 0.00	5.00
🦉 🖨 🚢 🕼 💧		Min: 1 Max
🔺 Home 📃	Eject 🔧 Setup 🔧 Adv.	- Back

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

### 4.9.3 Description of the elements

### **Ejector forward**



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

#### Airvalves

Field	Description		
	Operating mode of an air valve with the following options:		
Mode	<ul> <li>No: Air valve deactivated.</li> <li>After charge: Air valve becomes active after charging.</li> <li>After mold open: Air valve becomes active after mold open.</li> <li>After ejector: Air valve becomes active after ejection of fin- ished part</li> <li>During mold open: Air valve is active during mold open.</li> <li>Before charge: Air valve becomes active before charging.</li> </ul>		
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
-------------------



	These modes are available:
	<ul> <li>No: Ejector is deactivated</li> <li>Hold: This ejector mode is only available for operating mode 'semi-automatic'.</li> </ul>
	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.
Ejector mode	<ul> <li>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.</li> <li>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.</li> </ul>
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
	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.
Ramp	<ul> <li>Start: Defines start ramp value for move- ment.</li> <li>Stop: Defines stop ramp value for move- ment.</li> <li>Mid: Defines ramp for all inner profile ramps for movement.</li> <li>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').</li> </ul>
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.

General Settings	Movement start delay
Eject during mold open No 0	Forward delay 0.0 0.0 s
Ejector forward start position 50.0 mm	Backward delay 0.0 1.0 s
Endposition tolerance 10.0 mm	Max. movement time
Ejector Bwd Not Use LS No 0	Actual Limit Differ. Forward 0.0 60.0 60.0 s
Override ejector safety No 0	Backward 0.0 60.0 60.0 s
Eject bwd valve Open time Dur 0.50 s	Setup mode output
	Pressure Velocity
	bar %
	Forward 32 22
	Backward 36 22
u 🖞 🖉 🗳 🖞 🖉 🖉	 Min: 0.0 Max: 10.
Adv.	- Back

Fig.4-11: Mask "Ejector setup"

### 4.11.3 Description of the elements

### **General settings**

Field	Description
	If set, the ejector will be moved during mold open.
Eject 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 .
during open movement	mold close .

#### Maximum movement time

Field	Description
Max. forward time	The left field <b>Actual</b> displays the current time for the ejector for- ward movement. The maximum permitted time until the ejector is forward is specified in field <b>Limit</b> . 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 <b>Differ.</b>
Max. backward time	The left field <b>Actual</b> displays the current time for the ejector for- ward movement. The maximum permitted time until the ejector is backward is specified in field <b>Limit</b> . 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 <b>Differ.</b>

#### 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.

#### **OPERATION MANUAL**



Min. profile output			Delay time		
	Pressure	Velocity		Pump on	Valve off
	bar	%		S	s
Min. profile output fwd	0	0.0	Forward delay	0.00	0.00
Min. profile output bwd	0	0.0	Backward delay	0.00	0.00
Shake output	11	304			
Ramp profile output			Ramp setup mode		
	Pressure	Velocity		Pressure	Velocity
	bar/s	%/s		bar/s	%ls
Max. ramp forward	628.8	2127.6	Forward	1000.0	1003.3
Max. ramp backward	1026.0	1315.8	Backward	1000.0	1012.5
୲⊟≝ഥงต					Min: 0 Max
	0	l ant	0	0	1

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 <b>Pump on</b> specifies the time that is waited between the start of the Ejector forward movement and the activation of the hydraulic pump.
Forward delay	Field <b>Valve off</b> 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.
	Field <b>Pump on</b> specifies the time that is waited between the start of the Ejector backward movement and the activation of the hy- draulic pump.
Backward delay	Field <b>Valve off</b> 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.



L la s	~		~						
Use		ntrol In	Co	ntrol Out	Hold				
1 <u>On</u> 1	Duri	ng close 1	Du	iring open	1 Of	f 0			
2 Off C	Befo	ore close (	Be	fore open	0 Of	f O			
							_		
Settings	Mode	Pressure	velocity	Act. Pos.	Mon. Pos.	Time		Screw Cnt	Pric
		bar	%	mm	mm	s			
1 In 🗌 🗌	Time 1	20	44	100.0	0.0	0.0	5.0	0	0 [1
Out 📕	Limit 2	20	44	25.0	0.0	0.0	5.0	0	0 2
2 In 🗌	Time 1	20	44	0.0	0.0	0.0	0.5	0	0 2
Out 📕	Time 1	20	44			00	0.5		a Es
	A 13	1					_	Min: 0	May
			1		1.			Min: U	Max:
S	Coro	Sot Sot		Adv	A Bamp			6	Rack

Fig.4-13: Mask "Cores"

# 4.13.3 Description of the elements

# Core control

Field	Description
	Activates the core. Off: Core is
	inactive. <b>On:</b> Core is active.
Use	Editability of all elements within this mask depends on wether a core is active or inactive.
	Operating mode of the core in movement with the following op- tions:
Control in	<ul> <li>Before close: Core enters prior to closure of the mold.</li> <li>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.</li> <li>After close: Core enters after closure of the mold.</li> </ul>
	Operating mode of the core during 'Core out' with the following options:
Control out	<ul> <li>Before open: Core is extracted prior to the opening of the mold.</li> <li>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.</li> <li>After open: Core is extracted after opening of the mold.</li> </ul>
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.



	These modes can be selected:
	• <b>Count:</b> Core movement follows the number of <b>Screw counts</b> set for the core transducer.
Operation mode	<ul> <li>Time: Core movement follows the duration set under Time.</li> <li>Limit: Core monitoring is done by limit switch.</li> </ul>
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.
	Core movement follows the time set for Core In resp. Core out movement.
Time	This setting is only acitve in the core's mode <b>Time</b> .
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 <b>Count</b> .
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.

Core 1 setup mode			Core 2 setup mode			1	2
	Pressure	Flow		Р	ressure	Flow	
	bar	%			bar	%	
Constant core in	20	44	Constant core in		20	44	
Constant core out	20	44	Constant core out	t [	20	44	
Core 1 movement start de	lay times		Core 2 movement s	tart delay	times		
In	0.0	0.0 s	In		0.0	0.0 s	
Out	0.0	0.0 s	Out		0.0	0.0 s	
General settings			Max. movement tim	е			
Override core safety		No 0		Actual	Limit	Differ.	
Core off not detect core	status	Use 1	Core 1 in	0.0	60.0	60.0 s	
Cores parallel to mold		Off 0	Core 1 out	0.0	60.0	60.0 s	
Parallel core movement		Off 0	Core 2 in	0.0	60.0	60.0 s	
			Core 2 out	0.0	60.0	60.0 s	
							_
🏥 🗎 🚔 📭 🖉 🛄 👘						Min: 0 Ma	x: `
🖀 Home 🛛 🛋 Core	Setup	Adv.				← Ba	ack

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 <b>Actual</b> displays the current time for core in move- ment. The maximum permitted time until the core is in is specified in field <b>Limit</b> . 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 <b>Differ</b> .
Max. core 1 out time	The left field <b>Actual</b> displays the current time for core out move- ment. The maximum permitted time until the core is out is specified in field <b>Limit</b> . 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 <b>Differ</b> .
Max. core 2 in time	The left field <b>Actual</b> displays the current time for core in move- ment. The maximum permitted time until the core is in is specified in field <b>Limit</b> . 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 <b>Differ</b> .
Max. core 2 out time	The left field <b>Actual</b> displays the current time for core out move- ment. The maximum permitted time until the core is out is specified in field <b>Limit</b> . 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 <b>Differ</b> .



### 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.

Core 3 setup mode		Core 4 setup mode			1	2
	Pressure Flow		Р	ressure	Flow	
	bar %			bar	%	
Constant core in	20 44	Constant core in		20	44	
Constant core out	20 44	Constant core out	t [	20	44	
Core 3 movement start	delay times	Core 4 movement s	start delay	/ times		
In	0.0 0.0 s	In		0.0	0.0 s	
Out	0.0 0.0 s	Out		0.0	0.0 s	
-		Max. movement tim	ie			
			Actual	Limit	Differ.	
		Core 3 in	0.0	60.0	60.0 s	
		Core 3 out	0.0	60.0	60.0 s	
		Core 4 in	0.0	60.0	60.0 s	
		Core 4 out	0.0	60.0	60.0 s	
👋 🖶 🚢 🗳 🖄 👘					Min: 0 Ma	ix: 160
A Home Core	🔍 Setup 斗 Adv.	Ramp			← Ba	ack

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.
	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'.
Parallel core movement	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 <b>Actual</b> displays the current time for core in move- ment. The maximum permitted time until the core is in is specified in field <b>Limit</b> . 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 <b>Differ</b> .
Max. core 1 out time	The left field <b>Actual</b> displays the current time for core out move- ment. The maximum permitted time until the core is out is specified in field <b>Limit</b> . 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 <b>Differ</b> .
Max. core 2 in time	The left field <b>Actual</b> displays the current time for core in move- ment. The maximum permitted time until the core is in is specified in field <b>Limit</b> . 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 <b>Differ</b> .
Max. core 2 out time	The left field <b>Actual</b> displays the current time for core out move- ment. The maximum permitted time until the core is out is specified in field <b>Limit</b> . 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 <b>Differ</b> .



# 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.

Core 1 ramp manual out	put		Core 2 ramp manual outp	out	1 2
	Pressure	Flow		Pressure	Flow
	bar/s	%/s		bar/s	%/s
Ramp core in	20.0	30.0	Ramp core in	20.0	30.0
Ramp core out	20.0	30.0	Ramp core out	20.0	30.0
Core 1 ramp setup mode			Core 2 ramp setup mode		
	Pressure	Flow		Pressure	Flow
	bar/s	%/s		bar/s	%/s
Ramp core in	20.0	30.0	Ramp core in	20.0	30.0
Ramp core out	20.0	30.0	Ramp core out	20.0	30.0
Core 1 delay time			Core 2 delay time		
	Pump on	Valve off		Pump on	Valve off
	s	S		s	S
In delay	0.00	0.00	In delay	0.00	0.00
Out delay	0.00	0.00	Out delay	0.00	0.00
🤚 🖶 🚢 🗳 🐧 👘	1			Mi	n: 10.1 Max: 9999
倄 Home 🔳 Core	🔧 Setup	Adv.	🔼 Ramp		🗲 Back
•••	• • • • • • •			U	

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
	Field <b>Pump on</b> specifies the time that is waited between the start of the core in movement and the activation of the hydraulic pump.
Core in delay	Field <b>Valve off</b> 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.
	Field <b>Pump on</b> specifies the time that is waited between the start of the core out movement and the activation of the hydraulic pump.
Core out delay	Field <b>Valve off</b> 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.

Core 3 ramp manual out	out		Core 4 ramp manual outp	out	1	2
	Pressure	Flow		Pressure	Flow	
	bar/s	%/s		bar/s	%is	
Ramp core in	200.0	444.4	Ramp core in	200.0	444.4	
Ramp core out	200.0	444.4	Ramp core out	200.0	444.4	
Core 3 ramp setup mode			Core 4 ramp setup mode			
	Pressure	Flow		Pressure	Flow	
	bar/s	%/s		bar/s	%is	
Ramp core in	200.0	444.4	Ramp core in	200.0	444.4	
Ramp core out	200.0	444.4	Ramp core out	200.0	444.4	
Core 3 delay time			Core 4 delay time			
	Pump on	Valve off		Pump on	Valve off	
	s	s		s	s	
In delay	0.00	0.00	In delay	0.00	0.00	
Out delay	0.00	0.00	Out delay	0.00	0.00	
🍟 🖶 🚢 🕰 💧 🕅 👘				Mir	n: 10.1 Max:	9999.9
🕋 Home 🖃 Core	🔾 Setup	Adv.	C Ramp		← в	ack

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
	Field <b>Pump on</b> specifies the time that is waited between the start of the core in movement and the activation of the hydraulic pump.
Core in delay	Field <b>Valve off</b> 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.
	Field <b>Pump on</b> specifies the time that is waited between the start of the core out movement and the activation of the hydraulic pump.
Core out delay	Field <b>Valve off</b> 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.



Mold ram	p tuning – C	Core 1			Mold ram	p tuning – C	Core 3			
	Clo	se	Open			Clo	Close		en	
	Ramp	Time	Ramp	Time		Ramp	Time	Ramp	Time	
	%	ms	%	ms		%	ms	%	ms	
Start	100.0	3333	100.0	3333	Start	100.0	225	100.0	225	
Stop	100.0	3333	100.0	3333	Stop	100.0	225	100.0	225	
Mold ram	p tuning – C	Core 2			Mold ramp tuning – Core 4					
	Close		Оря	Open		Clo	se	Ор	Open	
	Ramp	Time	Ramp	Time		Ramp	Time	Ramp	Time	
	%	ms	%	ms		%	ms	%	ms	
Start	100.0	3333	100.0	3333	Start	100.0	225	100.0	225	
Stop	100.0	3333	100.0	3333	Stop	100.0	225	100.0	225	
😃 🖨 🚢	🕅 💧 🛍	I						Min: 0.1	Max: 120.	
倄 Home	👫 Home 🖃 Core 🔧 Setup 🔧 Adv. 🗖 Ramp									

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

# 4.18.3 Description of the elements

# Mold ramp tuning

Field	Description
	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.
Ramp mold close	<ul> <li>Start: Defines start ramp value before core moves in in for mold close movement.</li> <li>Stop: Defines stop ramp value before core moves in in' for mold close movement.</li> </ul>
	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.
Ramp mold open	<ul> <li>Start: Defines start ramp value before core moves in in' for mold open movement.</li> <li>Stop: Defines stop ramp value before core moves in in' for mold open movement.</li> </ul>
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.

Inject	Stages	2	= 🗠
Pressure bar Velocity % To mm		1 0 60 System Press 0 70 5.0	0bar
Cut off			
Screw position No 0 0.0 Inject time Use 1 0.000	40.03 mm   8.000 s	o Not Inject In Manual Mode	No 0
Hold	Stages	3	
Pressure bar Velocity % To s	3 2 1 50 140 6 50 20 5 2.00 2.00 2.0	Cushion [ b b	0.0 mm
₩ 🖶 🖄 🚾 💧 🕅 丨			0:No 1:Use
🕋 Home 🔍 Inject 🖤 Plast	🔧 Setup 🗳 Ad	v. ा 🖾 Graph 🛛 🗗 ValveG.	🗲 Back
			,

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

### 4.19.3 Description of the elements

#### Inject

Field	Description
Stages	Number of adjustable stages
Inject 1Inject n	Setting of <b>Pressure</b> and <b>Velocity</b> 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 <b>to</b> 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
	Specification of the injection pressure at which the system changes to hold pressure.
Inject pressure	This field is only shown if a sensor for measuring injection pressure is available.
	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.
Cut off activation position	This setting is only available when the criterion <b>inject pressure</b> is active.
	Specification of the cavity pressure at which the system changes to hold pressure. This criterion is activated by selecting the adja- cent check box.
Cavity pressure	This field is only shown if a sensor is available for measuring the cavity pressure and the option <b>Measure cavity pressure</b> is acti- vated in mask Production settings.
	The cut off position is signalized by an external digital input.
External DI	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.
	Setting the <b>Pressure</b> and <b>Velocity</b> for the duration specified under
	To at hold pressure.
Hold 1 Hold n	Depending on the number of stages, additional input fields are shown here to adjust the stages ( <b>2</b> , <b>3</b> ,). These settings always apply for the time intervals between the end of the prior stage and the duration specified under <b>To</b> .



	Display of the current injection pressure.			
Inject 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



	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.
Ramp	<ul> <li>Start: Defines start ramp value for movement.</li> <li>Stop: Defines stop ramp value for movement.</li> <li>Mid: Defines ramp for all inner profile ramps for movement.</li> </ul>
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.

Plasticize		S	Stages 🗌	1			L In
Backpr. bar Pressure bar Velocity % To mm	1 40 99 99 125.0				ooling bef pla ooling time	st 0.00	0.00 s 1.00 s
Decompression							
Before plasticize	Mode	Pressure bar	Velocity % 23	Position mm	Time s		
	NO U	30				Min:	0 Max: 50

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 <b>Back pressure</b> and <b>Screw velocity</b> 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 <b>To</b> 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 of decompression, with the following selection options:				
Mode	<ul> <li>No:no decompression.</li> <li>Time:decompression for a specified time duration.</li> <li>Position:decompression until a specified screw position.</li> </ul>				
Prossure	Specification of the pressure for the linear screw movement.				
Flessule	This field can only be edited when 'Time' or 'Position' mode has been selected.				
Velocity	Specification of the quantity for the linear screw movement.				
Velocity	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
	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.
Ramp	<ul> <li>Start: Defines start ramp value for movement.</li> <li>Stop: Defines stop ramp value for movement.</li> <li>Mid: Defines ramp for all inner profile ramps for movement.</li> </ul>

### 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.



Intrusion	No 0	Movement start delay
Backpr. Pressure Velocity	Time	Inject 0.00 0.00 s
bar bar %	s	Plasticize 0.00 0.00 s
0 30 110	0.0	Decompression before 0.00 0.00 s
		Decompression after 0.00 0.00 s
Cold slug eject	No 0	Max. movement time
Pressure Velocity	Time	Actual Limit Differ.
bar %	S	Inject 0.000 60.00 60.0 s
2 28	1.0	Plasticize 0.00 60.00 60.0 s
Setup mode output		Decompression 0.00 60.00 60.0 s
Pressure Velocity Plast setup		
bar Inject 25 Plasticize 40 Decompression 25	20 % 40 % 20 %	Plast movement parallel     No 0       Plasticize velocity unit     % 1
■ ■ <u>-                                 </u>		0:No 1:7
Ҟ Home 🛛 🖤 Inject 🛛 🖤 Plas	t 🛛 🔍 Setup	🛛 🔧 Adv. 🔹 🖾 Graph 🛛 🗄 🗤 ValveG. 🖌 🗲 Bac

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 <b>Backpressure</b> , <b>Pressure</b> , <b>Velocity</b> and <b>Time</b> for the intrusion (permanent screw rotation before Inject).			

# Cold slug eject

Field	Description				
	If this function is activated, inject will be done time controlled be- fore the movement 'nozzle forward' is executed.				
Cold slug eject	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 <b>Pressure</b> , <b>Velocity</b> and <b>Time</b> for Cold slug eject.				
Max. lock time	The duration of Mold HighPressure (last profile stage in mold pro- file) is shown in the left field <b>Actual</b> . The monitoring time is entered in field <b>Limit</b> . The difference between the two values is shown in the right field <b>Differ</b> .				

#### Maximum movement time

Field	Description



Inject	The left field <b>Actual</b> displays the current time for the inject move- ment. The maximum permitted time for the incect movement specified in field <b>Limit</b> . 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 <b>Differ</b> .
Plasticize	The left field <b>Actual</b> displays the current time for the plasticize movement. The maximum permitted time for the plasticize movement specified in field <b>Limit</b> . 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 <b>Differ</b> .
Decompression	The left field <b>Actual</b> displays the current time for the decompres- sion movement. The maximum permitted time for the decompres- sion movement specified in field <b>Limit</b> . 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 <b>Differ</b> .

### 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.



Min. profile output			Delay time			2	3
Inject	Pressure bar 0	Velocity % 0	Inject	Valve on s 0.000	Pump on s	Valve off s 0.00	
Ramp profile output			Ramp setup r	node			
Max. ramp inject Max. ramp hold	Pressure bar/s 7152.7 7152.7	Velocity %/s 75339.0 75339.0	Inject		Pressure bar/s 500.0	Velocity %/s 1010.5	
🖞 🖯 🕹 🗳 🚢 🖨					N	din: 0 Max:	15
inject 🖗 Home	🖤 Plast	🔌 Setup	💐 Adv.	Graph	₿‴ Valve	eG. 🗲 Ba	ck

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 move- ment is adjusted here.
Max. ramp hold	The maximum ramp (pressure, velocity) for the the hold movement is adjusted here.

# **Delay times**

Field	Description		
	Field <b>Pump on</b> specifies the time that is waited between the start of the inject movement and the activation of the hydraulic pump.		
Inject delay	Field <b>Valve off</b> 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.

Min. profile output			Delay time		1	23
	Pressure	Velocity		Valve on	Pump on	Valve off
	bar	%		s	s	s
Plasticize	0	0	Plasticize	0.000	0.00	0.00
	bar	%	Decompression	0.000	0.00	0.00
Decompression	0	0				
Ramp profile output Ramp setup mode						
Back	.pr. Pressu	re Velocity			Pressure	Velocity
bar	ls barls	%ls			bar/s	%/s
Plasticize 50	0.0 500.	0 3672.8	Plasticize		1000.0	1000.0
Decomp. before plastici	ze 1000.	0 1515.2	Decompression		1000.0	1001.3
Decomp. after plasticize	1000.	0 1515.2				
u 🖞 🖶 🚢 🕰 💧 👸 🕴 Min: 0 Max: 160						
🕋 Home 🛛 🐠 Inject	🖤 Plast	🔌 Setup	🕂 Adv. 🎽	Graph	計··· Valve	G. 🗲 Back

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

### 4.25.3 Description of the elements

## Minimum profile output

Field	Description
Min. profile output plasti- cize	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 decom- pression	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	The maximum ramp (pressure, velocity) for the the
after plasticize	decompression after plasticize movement is adjusted

#### **Delay times**

Field	Description
	Field <b>Pump on</b> specifies the time that is waited between the start of the plasticize movement and the activation of the hydraulic pump.
Plasticize delay	Field <b>Valve off</b> 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
	Field <b>Pump on</b> specifies the time that is waited between the start of the decompression movement and the activation of the hy- draulic pump.
Decompression delay	Field <b>Valve off</b> 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



Inject         No         O           P         I         D           1.00         0.000         0.000	Backpressure         No 0         1         2         3           P         I         D         1.00         0.000         0.000
Inject pressure limit         No         0           P         I         D           1.00         10.000         0.000	Plasticize         No         0           P         I         D           1.00         0.000         0.000
Hold No 0 P I D 1.00 0.000 0.000	
du == ··· 1.9 A .··-	
₩ 🗁 🕮 😳 🕅 🕺 🎢 Home 🛛 💯 Inject 🛛 🖤 Plast 🛛 🔧 Setup	0:No 1:Ye Adv. I Mar Graph Br ValveG. ← Back

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



Р	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.
	The filter time for the set value of hold controller is adjusted here Decreasing the filter time leads to a faster control rise time.
Filter 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.
Р	The proportional part for the back pressure at plasticizing is ad- justed 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.
Ρ	The proportional part for the torque controller at plasticizing is ad- justed 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.				
Р	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	Current screw velocity and color of the corre-				
(configured inject graph parameter	sponding graph.				
Screw position	Current position of the screw and color of the				
(configured inject graph parameter	corresponding graph.				
Inject Pressure	Current injection pressure and color of the cor-				
(configured inject graph parameter	responding 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 <b>Run</b> , the recording starts. Pressing the button <b>Hold</b> 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

Inject graph settings						
	Min val	Max val				
Range X	0.0	10.0	sec			
Screw velocity	0.00	500.00	mm/s			
Screw position	0.00	500.00	mm			
Inject pressure	0.00	500.00	bar			
Cut Off detected	0	1				
Duration	30.0	sec				
Interval	12	ms				
Number of trends	3					
Protocol to file	0					
<u>د م ۱۰۹ 🖉 بال</u>	2a	_	_	 	 h finne	0.014
		1			Min:	0.0 Max:
i Home 🛛 🚈 G	raph	Set				🗲 Ba

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	The graph for the injection pressure is scaled				
(configured inject graph parameter	here.				
Cut Off detected	The graph for the cut off detection is scaled				
(configured inject graph parameter	here.				
Duration	Defines the measurement duration of the inject graph parameters.				



	Displays the measurement interval.
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.

Valve (	Gates									1	2 🔧		
		Open at inject			Clos	Close at inject				Open at hold			
Nr	Use	Mode	mm	s	Mode	mm	s	Use	Delay	Active	Force		
1	Use 1 No 0	Time 1	0.0	<b>0.0</b>	Time 1	0.0	<b>2.0</b>	No 0	0.0	0.0	Off 0		
2	No 0 No 0	Time 1	0.0	2.5 0.0	Time 1	0.0	1.5 0.0	No 0	0.0	0.0	Off 0		
3	No 0	Time 1	0.0	4.5 0.0	Time 1	0.0	1.5 0.0	No 0	0.0	0.0	Off 0		
4	No 0	Time 1	0.0	6.5 0.0	Time 1	0.0	1.5 0.0	No O	0.0	0.0	Off 0		
) 📑	ية الع me إ	linject	🖤 Plast	<b>.</b>	Setup	💐 Adv.		Graph	B- ∨:	alveG.	0:No 1:U		



# 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						
	Activate/Deactivate a valve gate.						
	Each valve gate has two input fields for using/not using. Thus dur- ing inject process (except hold process) a valve gate can be opened and closed twice.						
Use	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 of opening a valve gate with the following options.						
Mode (Open at inject)	<ul> <li>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.</li> <li>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.</li> </ul>						
	For the second time opening a valve gate, the modes are not se- lectable. The modes of the first opening and closing are taken.						
	Mode of closing a valve gate with the following options.						
Mode (Close at inject)	<ul> <li>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.</li> <li>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.</li> </ul>						
	For the second time closing a valve gate, the modes are not se- lectable. The modes of the first opening and closing are taken.						
	Mode of opening a valve gate during hold with the following op- tions.						
Hold	<ul> <li>Use:Activates the option, that a valve gate opens during hold with the defined parameters for 'Delay' and 'Time'.</li> <li>Delay: Definition of a delay time which has to elapse after reaching cut off before the valve gate opens.</li> <li>Time: Definition how long the valve gate is open during hold.</li> <li>Force: Only selectable in setup mode. This option forces a valve gate to open independent of the set time parameters.</li> </ul>						

# 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.

Nozzle forward Stages 2	Backward Stages 2 = 🗠
2 1 Pressure bar 100 50 Velocity % 20 40 To mm 2.0 100.0 0.0 mm	1     2       Pressure bar     100     50       Velocity %     20     40       To     mm     10.0     150.0
Nozzle settings	
Forward contact force60 barForward contact velocity2%Force build up time0.00.1 s	
Nozzle back mode No 0	
	Min: 0 Max: 160
🖀 Home 📑 Nozzle 🔧 Setup 🔾 Adv.	🔅 Options 🗧 🗲 Back

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

# 4.31.3 Description of the elements

#### Nozzle forward

Field	Description
Stages	Number of adjustable stages.



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

### Nozzle settings

Field	Description
Forward contact	Defines the force which is used to press the nozzle against the mold.
Forward contact	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	<ul> <li>Selects a mode for the backward movement of the nozzle.</li> <li>No: Deactivate nozzle mode backward. If this is selected the nozzle remains in the injection position.</li> <li>After Plasticize: After plasticizing the nozzle moves back to rear end point and/or time-controlled backwards, depending of the selected nozzle movement mode.</li> <li>Before mold open: Before opening the mold the nozzle moves back to rear end point and/or time-controlled backwards, depending of the selected nozzle movement mode.</li> <li>After inject: After injection the nozzle moves back to rear end point and/or time-controlled backwards, depending of the selected nozzle moves back to rear end point and/or time-controlled backwards, depending of the selected nozzle moves back to rear end point and/or time-controlled backwards, depending of the selected nozzle movement mode.</li> </ul>		
Nozzle hold during	If set, the nozzle will be pressed against the mold actively while plasticizing.		
Nozzle hold during	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





	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.
Ramp	<ul> <li>Start: Defines start ramp value for movement.</li> <li>Stop: Defines stop ramp value for movement.</li> <li>Mid: Defines ramp for all inner profile ramps for movement.</li> <li>Smooth: Smooth factor is used to allow a smooth ending of a movement. If smoothfactor = 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 closed. Reference value for the smooth factor is the maximum speed of the respective movement (see mask</li> </ul>
	'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.

Setup mode output			Movement start delay			
Forward Backward	Pressure bar 15 25	Velocity % 31 20	Forward delay Backward delay	(	0.0	0.0 s
			Max. movement time	tual 0.0 ( 0.0 ( 0.00 (	Limit 60.0 60.0 120.00	Differ. 60.0 s 60.0 s 120.0 s
🍓 🖶 🚨 🗳 🍈	1					Min: 0 Max: 160
倄 Home 🛛 🛋 Nozzle	Setup	🗖 💐 Adv.	🔅 Options			🗲 Back



Fig.4-45: Mask "Nozzle setup"

# 4.33.3 Description of the elements

# Setup mode output

Field	Description
Setup mode output	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 with- out any movement of the nozzle, an alarm will be raised.
	This button starts or stops the automatic nozzle adjustment.
Auto nozzle adjust	Only allowed in Setup mode.

#### Maximum movement time

Field	Description
Max. forward time	The left field <b>Actual</b> displays the current time for nozzle forward movement. The maximum permitted time until the nozzle is for- ward is specified in field <b>Limit</b> . 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 <b>Differ</b> .
Max. backward time	The left field <b>Actual</b> displays the current time for nozzle backward movement. The maximum permitted time until the nozzle is back is specified in field <b>Limit</b> . 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 <b>Differ</b> .
Max. purge time	The left field <b>Actual</b> displays the current time for auto purge. The maximum permitted time for auto purge is specified in field <b>Limit</b> . 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 <b>Differ</b> .

# 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.

Min. profile output			Delay time		
	Pressure bar	Velocity %		Pumpon s	Val∨e off s
Min. profile output fwd Min. profile output bwd		0	Forward Backward	0.00	0.00
Ramp profile output			Ramp setup mode		
Max. ramp forward Max. ramp backward	Pressure bar/s 9999.0 9999.0	Velocity %/s 644.4 7748.5	Forward Backward	Pressure bar/s 1000.0 1000.0	Velocity %/s 1018.6 1005.2

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 for- ward movementis 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 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
	Field <b>Pump on</b> specifies the time that is waited between the start of the 'Nozzle forward' movement and the activation of the hydraulic pump.
Forward delay	Field <b>Valve off</b> 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.
	Field <b>Pump on</b> specifies the time that is waited between the start of the 'Nozzle forward' movement and the activation of the hydraulic pump.
Backward delay	Field <b>Valve off</b> 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.



Auto purge settings Shut off nozzle				
Pressure     Velocity     Un       bar     %     mm       Injection     0     0       Decompression     0     0       bar     %     ss       Plasticize     0     0       Purge time     0.00 s       Purge count     1	til Noz1 ShutOff Use No 0 m Noz.Shut off Mode nTime 0 0.0 Bef injection nOpen 1 0.0 Bef. plast nClosed 2 Bef. Suck Back nNone 0 0.00 Aft. Suck Back nNone 0 Active time Pressure Velocity s bar l/min Close 1.0 10 10 Open 1.0 10 10			
Win: 0 Max: 150 Min: 0 Max: 150 Mine ▲ Nozzle ▲ Setup ▲ Adv. Options				

Fig.4-47: Mask "Nozzle options"

# 4.35.3 Description of the elements

# Auto purge settings

Field	Description
Injection	Setting of <b>Pressure</b> and <b>Velocity</b> up to specified Position ( <b>To</b> ) for injection during auto purge.
Decompression	Setting of <b>Pressure</b> and <b>Velocity</b> up to specified Position ( <b>To</b> ) for descompression during auto purge.
Plasticize	Setting of <b>Pressure</b> and <b>rpm</b> up to specified <b>Time</b> 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
	Specifying <b>Pressure</b> , <b>Velocity</b> and <b>Active Time</b> for closing the shut-off nozzle.
Close	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.
	Specifying <b>Pressure</b> , <b>Velocity</b> and <b>Active Time</b> for opening the shut-off nozzle.
Open	Shut-off nozzle will be opened with the specified parameters be- fore 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.

Heating zones	30 30 °C	
Set         30         30           Tol High         10         10           Tol Low         10         10	30 30 °C 10 10 °C 10 10 °C	
Settings	Oil temperature	
Cool prevent time     0.0     0.0 min       No     0     Standby temperature     100 °C       Optimize nozzle heating     Finished     0	Start cooling Stop cooling Warning temp. high Alarm temp. high Warning temp. low Alarm temp. low Sensor type	50°C 45°C 555°C 60°C 20°C 15°C K−Type 2
🍟 🖶 🚢 🕰 💧 🕅 🕴 Min: 0 Max: 400		
🖀 Home 🕕 Heating 🔧 Setup	Hotru	🛱 Adv. 🗲 Back

Fig.4-48: Mask "Heating Nozzle"

# 4.36.3 Description of the elements

#### **Heating zones**

Field
-------



Sot	Specification of the temperature set-point value of the correspond- ing 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".
	These fields specify the upper and lower tolerance temperature.
Tolerance high / Tolerance low	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 toler- ances.

## Settings

Field	Description					
Cool prevent time	Specification of the waiting period until release of the screw move- ment, measured as of the moment when the temperatures of all heating zones are within the specific tolerance.					
	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.					
Activate standby	<b>On:</b> Nozzle warming activated. The nozzle is kept at <b>standby temperature</b> .					
tempera- ture	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	The material entrance cooling will be activated if the temperature exceeds this value.
Stop temperature	The material entrance cooling will be deactivated if the tempera- ture falls below this value.
Warning	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 trig- gered. 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



Zone	settings				Oil preheating
					Activate preheating Off 0
No.	Sensor type	Mode	Setter	Power	Start oil preheating 30 °C
				W	Stop oil preheating 40 °C
1	K-Type 2	PID 2pt 3	50	500	Preheating velocity 10%
2	K-Type 2	PID 2pt 3	50	1700	Preheating pressure 10 bar
3	K-Type 2	PID 2pt 3	50	1700	
4	K-Type 2	PID 2pt 3	50	1700	
					HeaterContactor
					Check heater contactor delay time 0.0 s
	<u></u> L& 🍐 🎉	ή I			
🙈 н	ome 101 He	eating 🔍 Set	tup		Hotru Setup
					The first the second second

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.
	Pre-selection for optimizing all heating zones.
	<ul><li>Finished</li><li>Optimizing</li></ul>
Optimize nozzle heating	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 opti- mization are restored
	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.
Max. preheat time	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 deacti- vated.
Alarm temperature	If oil temperature exceeds this limit, an alarm will be raised and the motor will be turned off.
	If the oil temperature falls below this limit, a warning will be raised.
Warn temp low	The monitoring for this temperature is only active in full- and half automatic mode.
	If the oil temperature exceeds this limit, a warning will be raised.
Warn temp high	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 de- activated 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



Zone settings				Oil preheating
No. Sensor type	Mode	Setter	Power	Activate preheating     Off o       Start oil preheating     30 °C
			W	Stop oil preheating 40 °C
1 K-Type 2	PID 2pt 3	50	500	Preheating velocity 10%
2 K-Type 2	PID 2pt 3	50	1700	Preheating pressure 10 bar
3 K-Type 2	PID 2pt 3	50	1700	
4 K-Type 2	PID 2pt 3	50	1700	
				Harden Cambridge
				HeaterContactor
				Check heater contactor delay time 0.0 s
		_		
👋 🖻 🚢 📭 🖉 🐘				1:J-Type 2:K-Type 3:L-Typ
倄 Home   🏦 Hea	ting 🔍 Set	up		Hotru Ketup 🙀 Adv. 🗲 Back

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).
	Operating mode of the heating zones:
	<ul> <li>Off = heating zone is switched off</li> <li>Measure = only temperature measurement</li> <li>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 performance100% equals the maximum cooling performance.</li> </ul>
Mode	<ul> <li>No monitoring via temperature sensor is done in Setter- mode.</li> <li>PID 2pt = controlled</li> <li>PID 3pt = controlled heating and cooling</li> <li>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.</li> <li>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 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.</li> </ul>



Setter	Specification of the pulse width for triggering the heating zone in percent. This setting is only active in the mode <b>Setter</b> . The heating performance is determined by the pulse/pause ratio of the pulse width modulation.
	Specification of the effective power of the heating band.
Power	Based on this value the power consumption of the heating is cal- culated 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.



Paramet	er								
Chan. On Name	1 Off 0 P 1	2 Off 0 P 2	3 Off 0 9 3	4 Off 0 4	5 Off 0 9 5	6 Off 0 P 6		Use Temp	Standby No 0 0 100 °C
Act	30	30	30	30	30	30°C		G	Quick set
Set Tol+	150.0	150.0	150.0	150.0	150.0	150.0°C		Set Tol+	150 °C
Tol- Out	10.0 0.00	0.00	10.0 0.00	10.0 0.00	10.0 0.00	10.0 °C		Tol- Use	10 °C Off 0
Inc.	Off 0	Off 0	Off 0	Off 0	Off 0	Off 0			
👋 🖨 🛓	ne <b>11</b> 2 10	Heating	🔪 Setup		1	Hotru	🙀 Setup	مَرْ Adv.	0:Off 1:On ← Back

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.				
	Allocation of hotrunner channel of the controller to plugged ho- trunner of the mold.				
Name	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 <b>Increase temperature</b> in mask "Hotrunner settings" is added to the value specified for the temperature of the zone.				



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 <b>Standby</b> 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.



Hotrunner settings	
Activate hotrunner No 0	
Max. temperature 400 °C	
Evaporation temperature90 °CEvaporation time60.00 sEvaporation time block0.00 s	
Softstart alarm time 0.00 s	
Increase temperature 0.0 °C	
Max. preheat time 8.3 min	
Optimize mold heating Finished 0	
👋 🖶 🚢 🗳 🔞 🛍 🔔 🖶	Min: 0 Max: 600
🕋 Home 🛛 🕂 Heating 🔧 Setup	🛱 Hotru 🔀 Setup 🙀 Adv. 🗲 Back
》 🖶 🚢 比 👌 前 斧 Home 🛛 🎹 Heating 🔧 Setup	Min: 0 Max: 600 IIII Hotru

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.
	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.
Max. preheat time	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.

Zone 1-1	2						
		Sensor	Mode	Setter	Туре	Max. evap. power	Power
Zone	1	K-Type 2	PID 2pt 3	50.0%	Hotrunner 1 🖡	100.0 %	0VA
Zone	2	K-Type 2	PID 2pt 3	50.0%	Hotrunner 1 🖡	100.0 %	0VA
Zone	3	K-Type 2	PID 2pt 3	50.0%	Hotrunner 1 🖡	100.0 %	0VA
Zone	4	K-Type 2	PID 2pt 3	50.0%	Hotrunner 1 🖡	100.0 %	0VA
Zone	5	K-Type 2	PID 2pt 3	50.0%	Hotrunner 1	100.0 %	0VA
Zone	6	K-Type 2	PID 2pt 3	50.0%	Hotrunner 1 🖡	100.0 %	0VA
👋 🖶 🚄	<u> 48</u>					1:J-Type 2:K	-Туре З:L-Туре
倄 Hom	•	<b>∭</b> Heating	🔧 Setup		Hotru	Setup 🔣 Adv.	🗲 Back

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	<ul> <li>Operating mode of the hot runner zones:</li> <li>Off = heating zone is switched off</li> <li>Measure = only temperature measurement</li> <li>Setter= only available with block heating. Heating output is fixed (between 0-100% of maximum performance), no moni- toring via temperature sensor.</li> <li>PID 2pt = controlled</li> <li>PID 3pt = controlled heating and cooling</li> <li>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.</li> <li>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.</li> </ul>
Setter	Specification of the pulse width for triggering the heating zone in percent. This setting is only active in the mode <b>Setter</b> . The heating performance is determined by the pulse/pause ratio of the pulse width modulation.
Туре	<ul> <li>0= block heating zone</li> <li>1= hot runner zone</li> </ul>
Max. evaporation power	During heating up to the set evaporation temperature, the heating power is limited by this value.
	Specification of the effective power of the hotrunner zone.
Power	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.



11:21       ▲         11:21       ▲         Motor 1 overload         11:21       ▲         Auto safety gate open         11:21       ▲         Rear safety gate open         11:21       ▲         Rear safety gate open         11:21       ▲         Beak       ▲         Interview       ▲	Alarm		
11:21       ▲ Motor 1 overload         11:21       ▲ State safety gate open         11:21       ▲ Rear safety gate open         11:21       ▲ Rear safety gate open         11:21       ▲ State safety gate safety gate open         11:21       ▲ State safety gate safety gate open         11:21       ▲ State safety gate safety ga	11:21		Error in Mold1 Fwd sequence
11:21       ▲ <sup>5</sup> Auto safety gate open         11:21       ▲ <sup>6</sup> Rear safety gate open         11:21       ▲ <sup>5</sup> I/O forced!         11:21       ▲ <sup>5</sup> I/O forced!         Error in Mold1 Fwd sequence       ✓         Fror in Mold1 Fwd sequence       ✓         Amount       Amount	11:21	<b>▲</b> <sup>2</sup>	Motor 1 overload
11:21       ▲ Rear safety gate open         11:21       ▲ VO forced!         II:21       ▲ VO forced!         Error in Mold1 Fwd sequence         II:21       ▲ Min         ← Back	11:21	<b>A</b> <sup>5</sup>	Auto safety gate open
11:21 ▲ UO forced! Error in Mold1 Fwd sequence	11:21	<b>A</b> <sup>2</sup>	Rear safety gate open
Error in Mold1 Fwd sequence	11:21	4	I/O forced!
Error in Mold1 Fwd sequence			
Error in Mold1 Fwd sequence			
Error in Mold1 Fwd sequence			
Error in Mold1 Fwd sequence			
Error in Mold1 Fwd sequence			
Error in Mold1 Fwd sequence			
<ul> <li>▶ ▲ 比 6 前</li> <li>▲ Prod.</li> <li>▲ SPCi</li> <li>▲ Setup</li> <li>▲ Admin.</li> </ul>	Error in	Mole	d1 Fwd sequence
🅋 Home  🏙 Prod. 🛛 🔛 SPCI 🛰 Setup 🔝 Admin. 🛛 🗲 Back	● ■ .	<sup>555</sup> L	
	🎢 Hor	ne	🖬 Prod. 🔢 SPCi 🔧 Setup 🗈 Admin. 🗲 Back

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.



Production settings	Machine information	1 2 3
Use production counter Use 1	Total shotcounter	0
Reset production counter No 0	Power on time	11.4 h
Cavity 2	Full auto time	0.0 h
Shotcounter 0	Build Date	2017/08/08
	Customer Program ID	1000
Use photosensor No 0		
Photosensor timeout 0.0 50.0 s		
Use mold opened position 200.0 Use 1		
		Min: 1 Max: 999
A Home Prod. Mold Data 🗗 Export	Alarm Log Lock	🗲 Back

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.

Nozzle heating w	veek timer		Mold heating we	ek timer	1 2 3
		Start Time			Start Time
Monday	No 0	0:0	Monday	No 0	0:0
Tuesday	No 0	0:0	Tuesday	<u>No</u>	0:0
Wednesday	No 0	<u> </u>	Wednesday	<u>No</u>	<u> </u>
Thursday	No 0	0:0	Thursday	No 0	0:0
Friday	No 0	0:0	Friday	No 0	0:00
Saturday	No 0	0:0	Saturday	No 0	0:00
Sunday	No 0	0:00	Sunday	No 0	0:0
ه ينا 🗳 🖶 🖕			0		0:No 1:Use
👚 Home 📶	Prod. Mold I	Data 📑 Export	Alarm Log	Lock	🗲 Back

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.

Buzzer			1 2 3
Buzzer on time	60.0 s		
Buzzer pulse time	2.0 s		
Green light blink	Use 1		
Accumulator			
Use accumulator	No 0		
Recharge pressure	44 bar		
Recharge velocity	10%		
≝⊜≝u&am			Min: 0.0 Max: 1000
Home Prod	Mold Data	Alarmilog	E Rack
	Mora Data	Lock Edek	Duck

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.

Mold data							
Mold data		VSSS2			Drive	c	F
	Name				Date		
VSSS2				16-05-09			
AutoCycle_m	oldData		·	12-10-10			
AutoCycle_m	oldData_fast			15-04-10			
							∇
🤚 🖶 🔛							
Home	Mold Data	Load Sa	ave	Delete	<b>Q</b> Find	Drive	🗲 Back



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.           Name of the currently selected drive. The list shows all available mold data records on the selected drive.			
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.

#### **OPERATION MANUAL**



Counter Copy statusreport to USB Copy screenshot to USB Copy PDP to USB Copy mold data to USB Delete from Flash Delete statusreport Delete screenshot Delete screenshot Delete PDP No No No No No No No No No No	Export to USB	
Copy statusreport to USB 0 No 0 Copy screenshot to USB 0 No 0 Copy PDP to USB 0 No 0 Copy mold data to USB 0 No 0 Delete from Flash Delete statusreport No 0 Delete screenshot No 0 Delete PDP No 0	Counter	
Copy screenshot to USB 0 No 0 Copy PDP to USB 0 No 0 Copy mold data to USB 0 No 0 Delete from Flash Delete statusreport No 0 Delete screenshot No 0 Delete PDP No 0	Copy statusreport to USB 0 No 0	
Copy PDP to USB 0 No 0 Copy mold data to USB 0 No 0 Delete from Flash Delete statusreport No 0 Delete screenshot No 0 Delete PDP No 0 We may also may a screen for the screen scre	Copy screenshot to USB 0 No 0	
Copy mold data to USB 0 No 0 Delete from Flash Delete statusreport No 0 Delete screenshot No 0 Delete PDP No 0	Copy PDP to USB 0 No 0	
Copy mod data to ODB     Image: Copy mod data to ODB       Delete from Flash       Delete statusreport       Delete screenshot       Delete PDP       No 0       Delete PDP       No 0       Mold Data       Export       Alarm Log       Lock	Copy mold data to USP	
Delete from Flash Delete statusreport Delete screenshot Delete PDP No 0 No		
Delete statusreport No 0 Delete screenshot No 0 Delete PDP No 0	Delete from Flash	
Delete statusreport No 0 Delete screenshot No 0 Delete PDP No 0		
Delete screenshot Delete PDP No 0 No	Delete statusreport No 0	
Delete PDP No 0	Delete screenshot No 0	
W □ 20 10 10 W □ 20 10 10 W □ 20 10 10 Mold Data Box Dort Alarm Log Lock	Delete PDP No 0	
₩ 😂 🖄 🖄 🕅 ở Home 🔐 Prod. Mold Data 🕞 Export Alarm Log Lock		
🖐 🗁 🗠 à 🕅		
₩ 😂 🖄 🕼 🕴 🖌 🍋 🕅 🖌		
₩ 😂 🚈 🕼 🍐 pia I ≪ Home 🚧 Prod. Mold Data 🕞 Export Alarm Log Lock		
₩ 🖶 🚈 🗠 è pin I ở Home 📶 Prod. Mold Data 📑 Export Alarm Log Lock		
₩ 🖶 🚢 🗠 👸 🕴 Alarm Log Lock 🕺		
🖀 Home 📶 Prod. Mold Data 🕞 Export Alarm Log Lock	🖕 🖻 🚢 🗳 & 👸 👘 👘	
	🖀 Home 🛛 🛀 Prod. 🔹 Mold Data 🖉 📑 🛛 Expor	Alarm Log Lock

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.

Proc	ess data protocol					PDP	SPC
	[Shots]	[s] Production	[s] Inject	[mm] Inject	[mm] Inject	[s] Inject	
	Shotcounter	Cycle time machine	Act. inject time	Cut off position	Cushion	Act. plast time	Pla
$\vdash$							
$\vdash$							
$\vdash$							
							_
$\vdash$							
$\triangleleft$							$\triangleright$
	Minimum	0.00	0.000	0.0	0.0	0.00	
	Maximum	0.00	0.000	0.0	0.0	0.00	
	Difference	0.00	0.000	0.0	0.0	0.00	
	Mean (Sample)						
<b>u</b> E	∄L& ≬ គ្រ						
	Home 📊 SPC	J Start	Settings	View Hol	d List 🛛 🔍	Find 🗲	Back

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.
	The PDP data contained in the list, will be stor- ed as CSV file on a USB stick if connected.
PC-Print	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.)

Stat	istic process conti	rol							PD	P SF
		[°C] H	[s] Inject	[mm] Inject	[mm] ln	[s] Mold	[s] Mold	[s] Eject	[s] Eject	[s] PI
		Zone 1	Act. injec	Cut off po	Cushion	Act. clo	Act. loc	Act. for	Act. ba	Cycle
	Actual value	0	0.000	0.0	0.0	0.00	0.00	0.0	0.0	
	Mean (Sample)									
	Error monitoring	0	0	0	0	0	0	0	0	
	Tolerance error %	0	0	0	0	0	0	0	0	
	Error lower limit	0	0.000	0.0	0.0	0.00	0.00	0.0	0.0	
	Error upper limit	0	0.000	0.0	0.0	0.00	0.00	0.0	0.0	
	Error action	0	0	0	0	0	0	0	0	
	Error count	0	0	0	0	0	0	0	0	
	Warn. monitoring	0	0	0	0	0	0	0	0	
	Tolerance warn. %	0	0	0	0	0	0	0	0	
	Warn. lower limit	0	0.000	0.0	0.0	0.00	0.00	0.0	0.0	
	Warn. upper limit	0	0.000	0.0	0.0	0.00	0.00	0.0	0.0	
	Warning action	0	0	0	0	0	0	0	0	
	Warning count	0	0	0	0	0	0	0	0	
	Minimum	0	0.000	0.0	0.0	0.00	0.00	0.0	0.0	
										$\triangleright$
U E	🕅 💧 🏭 🖳 🗧									
Â	Home	21	Start	Settings	Resam	nple			<b>+</b>	= Bac

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

### 4.49.3 Description of the elements

Table

|--|



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 <b>Activate SPC</b> 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 <b>Low warn limit</b> or <b>Upp warn limit</b> 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 <b>Low error limit</b> or <b>Upp error limit</b> 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).



SPC Setup		
Recorder settings		Quick settings for all variables
	Shots	Use
Cycle delay	0	Error tolerance 10 % No 0
Cycle interval	1	Error monitoring Off 0 No 0
Resampling		
Number of samples	Actual Total	Warning tolerance     5 %     No 0       Warning monitoring     Off 0     No 0
Protocol		
Save PDP data to file	On 1	
Protocol error action	Continue cycle 0	
Protocol folder	D:/01.KEBAprogram/v1.41	_TDR_Fast_20160629/Sim/protocol/ms_data/pdp/
		Min: 0 Max: 999
A Home Setup	Variables Delete	Back

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.



IO Functions Unforce All	No		
IO Devices			
IO.ONBOARD OP3XX:0 OP3XX:0.ExtNode	No.		
	·		
<mark>≝⊜us</mark> oiji I			0:No 1:Use
🕋 Home 🛛 DI	DO AI	AO Temp.	Advanced 🗲 Back

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.

DI ONBOARD	IO-force	DI ONBOARD	IO-force
00 VI screw impulse period time	0.000 s	16	No 0
01 DI mold height impulse	Low 2	17 DI emergency stop 1	High 1
02	No 0	18 DI heater contactor check	No 0
03	<u> </u>	19 DI photo sensor	No 0
04 DI servo motor error	No 0	20 Core 4 in	Low 2
05	<u> </u>	21 DI SG Auto Closed 1	Low 2
06	<u>No 0</u>	22 Core 4 out	High 1
07 DI mold closed	<u>No 0</u>	23 DI Safety Machinery	No 0
08	<u>No</u>	24 DI lubrication limit achieved	No 0
09 DI accumulator pressure reached	<u> </u>	25 Core 1 in	Low 2
10 Overload	No 0	26 Core 2 in	Low 2
11 DI safety gate nozzle closed	High 1	27 Core 1 out	High 1
12 DI ejector backward	High 1	28 Core 2 out	High 1
13 [	No 0	29 Oil level ok	No 0
14 [	No 0	30 DI lubrication pressure achieved	No 0
15 DI safety gate rear closed	No 0	31 DI mold height limit forward	High 1
🖕 🖶 🚢 📭 💧 🕅 🔤			
A Home DI1 DI2			🗲 Back

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

### 4.52.3 Description of the elements

Field	Description
	The descirption of the digital input is displayed.
	The left grey field indicates the current state of the digital input.
DI 0DI n	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.

DO ONBOARD	\$_	IO-force	DO ONBOARD	۰.	IO-force
00 DO nozzle backward		No 0	16 Core 2 out		No 0
01 DO air valve 1		No 0	17 DO extra safety		No 0
02 DO assistant inject		No 0	18 DO use back pressure		No 0
03 DO Recharge Accumulator1		No 0	19 DO Mold low pressure close		No 0
04 DO inject		No 0	20 DO mold close		No 0
05 DO decompression		No 0	21 DO mold open		No 0
06 DO plasticize		No 0	22 DO mold fast close		No 0
07 DO nozzle forward		No 0	23 DO Mold fast Open		No 0
08 DO air valve 2		No 0	24 DO pump to ejector		No 0
09 DO ejector forward		No 0	25 DO valve gate 1		No 0
10 DO ejector backward		No 0	26 DO valve gate 2		No 0
11 Core 1 in		No 0	27 DO valve gate 3		No 0
12 Core 1 out		No 0	28 DO valve gate 4		No 0
13 DO mold height forward		No 0	29 DO valve gate 5		No 0
14 DO mold height backward		No 0	30 DO valve gate 6		No 0
15 Core 2 in		No 0	31 DO inject1 load valve gate		No 0
👋 🖶 🚢 🕰 💧 👸 👘 👘				0:No	1:High 2:Lov
A Home DO1 [	002				🗲 Back

Fig.4-72:

Mask 'IO Monitor Digital Outputs'

### 4.53.3 Description of the elements



Field	Description		
	The descirption of the digital output is dis- played.		
	The left grey field indicates the current state of the digital output.		
DO 0n	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.			
$\mathbf{X}$	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.



l	AI ONBOARD	<b>~</b>		IO-force
0	00 Al screw pos	0.00V	0.00	Use 1
0	01 Almold pos	0.00V	10.00	Use 1
0	2 Al ejector pos	0.00V	0.00	Use 1
0	)3 Al nozzle pos	0.00 V	0.00	Use 1
0	04 Al system press	0.00V	0.00	Use 1
0	)5	0.00	0.00	No 0
0	)6	0.00	0.00	No 0
0	)7	0.00	0.00	No 0
L.				
L.				
L				
ىلەر.				
ſ	Thome All			

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

### 4.54.3 Description of the elements

Field	Description
	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.
AI 0n	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.



AO ONBOARD 00 AO pump 1 press 01 AO pump 1 vel 02 AO backpressure 03 04 AO pump 2 press 05 AO pump 2 vel 06 07	0.01 V 0.0 2.03 V 0.0 0.00 V 0.0 0.00 V 0.0 0.00 V 0.0 0.00 V 0.0 0.00 0.0 0.00 0.0	IO-force           No         0           No         0	
● ● _ L& ● 前			Min: -10.00 Max: 10.0

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

#### 4.55.3 Description of the elements

Field	Description
AO 0n	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.



TI ONBOARD	~	IO-force	
00 Oil	0.00°C 28.00	Use 1	
01 Zone 1	0.00°C 30.00	Use 1	
02 Zone 2	0.00 °C 30.00	Use 1	
03 Zone 3	0.00 °C 30.00	Use 1	
04 Zone 4	0.00 °C 30.00	Use 1	
05 Zone 5	0.00 °C 30.00	Use 1	
06 Zone 6	0.00 °C 30.00	Use 1	
07 Zone 7	0.00 °C 30.00	Use 1	
08	0.00 0.00	No 0	
09	0.00 0.00	No 0	
🖞 🖯 🚨 🗳 🖉			Min: -999.99 Max:

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

#### 4.56.3 Description of the elements

Field	Description
	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.
TI 0n	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'.



IO Devices
Select module with free IO endpoints:
IO.ONBOARD
IO.ONBOARD.SIO:0.OP3XX:0
IO.ONBOARD.SIO:0.OP3XX:0.ExtNode
To ensure correct operation when changing IO's, see module project engineering manuals and
bus topology specifications regarding supported characteristics (e.g. Output current, cycle time,)
i 👸 🜢 21 🖳 🖶
Home IO Devices Select - Back

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.



AI						
Free IO	Defect IO	Variable Name				
AI:5	-1					
AI:6	-1					
AI:7	-1					
AO						
Free IO	Defect IO	Variable Name				
AO:3	-1					
AO:6	-1					
AO:7	-1					
🤚 🖶 些 🔟	200 jii					
倄 Home	IO Devices	Al/AO	DI/DO	Temp.		🗲 Back

Fig.4-77: Mask "IIO Replace Al/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.



DI		
Free IO	Defect IO	Variable Name
DI:0	-1	
DI:2		
DI:3	-1	
DI:5	-1	
D1:6	-1	
DO		
Free IO	Defect IO	Variable Name
DO:39		
👋 🕀 🚢 L& ،		
A Home IC	) Devices	Al/AO DI/DO Temp. 🗲 Back

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.

TI			
Free IO	Defect IO	Variable Name	
TI:8			
TI:9	-1		
، کیا 🖳 🖨 🖐	l ma		
🖀 Home 🛛 IC	Devices	Al/AO DI/DO Temp. 🗲 Bad	ck

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

Sequence		
Ejector1 Bwd Auto		
0.0 s 🔒 🗌		
Mold1 Fwd to pos.		
0.0 s 📺 🛄		
Core1 In		
0.0 s 🕀 🗆		
Mold1 Fwd		
0.0 s 🕂 🗌		
Nozziel Fwd Contacti		
0.0 3		
InjectionUnit1 Inject	Airvalve1 Start	Airvalve2 Start
0.0 s	0.0 s	0.0 s
$\triangleleft$		
Mold close sequence Mold	open sequence 📕 Inject sequer	nce Plast sequence
u 👸 💧 🕰 🚔 🗒		
🖀 Home  👫 Seque Cond. 1		🗲 Back

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.



SafetyCondition			
Safetyconditions for	Ejector1 Bwd Auto		
Core1 Out		True	
Core2 Out		True	
Core3 Out		True	
Core4 Out		True	
Mold1 Bwd		True	
l			
🤚 🖶 🚢 🕰 💧 👸 🔡 🔛			
🔺 Home 🛛 👫 Seque 🔤 Con	d. 1		🗲 Back

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.

Version			
System:	KePlast i1070		
HMI Version:	KePlast.HMI.KVB_02.08		
IEC Version:	KePlast.IEC_01.41_160624		
	ApplMoldMachinelECLib_01.58		
	ApplMoldMachinelECBase_01.38		
	AppIIECUserExceptionHandling_01.24		
Customer Version:	KePlast i1070 01.41		
Firmware:	P0P02CP03x 06.28c		
CPU serial number			
🍈 🕘 🚢 🗳 🦓			
🔺 Home 🛛 💿 Versio	n 💥 Adv. 🗙 Remote 🗲 Back		

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

Alarmlog	
16-07-21 / 10:37:34 🕂 🔥 Alarm: I/O forced!	
16–07–21 / 10:37:32 🏾 🛕 🛆 Alarm: Rear safety gate open	
16-07-21 / 10:37:32 🔥 🛆 Alarm: Motor 1 overload	
16-07-21 / 10:37:32 🛛 🔺 🔭 Alarm: Oil Temperature low!	
16-07-21 / 10:37:32 🔥 🖌 Alarm: Oil Temperature too low!	
16–07–21 / 10:37:31 🛛 🛕 🚹 Alarm: Oil Temperature low!	
16–07–21 / 10:37:31 🛛 🛕 🛕 Alarm: Oil Temperature too low!	
16–07–21 / 10:37:31 🛛 🛕 🛕 Alarm: Error in Mold1 Fwd sequence	
16–07–21 / 10:33:35 🔥 🛆 Alarm: I/O forced!	
16-07-21 / 10:33:33 🔥 🛆 Alarm: Rear safety gate open	
16–07–21 / 10:33:33 🥂 🛕 Alarm: Motor 1 overload	
Alarm: I/O forced!	
Alarm Long Value Chon Appl PC Print	G Back
Addin Log and Cong Appl. PC Print	- Back

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.
<b>A</b> '	A red filled alarm icon displays an alarm. The number next to the icon shows the alarm class.
<b>▲</b> ⁴	A grey filled alarm icon displays a warning. The number next to the icon shows the alarm class.
$\wedge$	A red non- filled alarm icon displays an active alarm respr. an active warning.
$\wedge$	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.
	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.
PC Print	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.



Network				
IP Address Subnetmask Gateway	192 166 255 255 192 166	8     1     10       5     255     0       8     1     1		
ه علا 🖳 🖨 🖐	i i i i i i i i i i i i i i i i i i i			Min: 0 Max: 255
🕋 Home Com	pany Inf Network	Lock IO S	Select	🗲 Back

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

Locking		
CPU serial number Lock / Unlock key	0	-
Machine locked Lock key active		
A Home Company Inf Network	Lock IO Select	🗲 Back

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).

Machine data			1 2
Machine data	machineData	Drive	CF
Availability			
Data available!			
Date of saving	16-06-17		
Load/Overwrite D	ata?		
Attention	l! Before loading ensure that the ma	chine data is fitting to the machin	e.
Loading t	the machine data may cause the ma	chine not work.	
ه کیا 🛎 🖨 🖐	jä l		
A Home Mac	h. Data Load Save	Backup	Drive 🗲 Back

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.

				1 2
Machine data	machineData	Drive	CF	
	Name	Date	9	
machineData		16-06-17		
				▽
Attention! E	Before loading ensure that the ma e machine data may cause the ma	chine data is fitting to the mac chine not work.	hine.	
ة ه ينا 🗵 🖯 🖐				
A Home Mach.	Data Load Save	Delete 🔍 🤇 Find	Drive	🗲 Back

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.



Machine data				1 2
Machine data	machineData		Drive	CF
Availability				
No Backup availa	able!			
Create Backup?				
Attention	n! Before loading ensure that the	machine data is fitting	to the machine.	
Loading	the machine data may cause the	machine not work.		
اه 🔬 🚢 🖶 🌢				
倄 Home	Create			🗲 Back

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

Operation and movement settings	Heat settings 1 2 3
Nozzle movement Position 0	Number of heating zones 1
	Max. temperature 400 °C
	Observation temp. diff. 2.0 °C
	Cycle time 0.1 s
	Minimal pulse time 0.00 s
Mold adjust	Motors
Mold height motor Hydraulic 0	Motor Y on time 2.00 s
Limit switch mode Norm.Closed 0	Motor delta delay time 0.10 s
	Motor overload mode Norm.Closed 0
Safety gates	
Mold gate supervision time10.0 sSG rear open not stop motorNo	
🍟 🖻 🚢 📭 💧 🕅 👘	0:Position 1:Time
🖀 Home 🛛 Mach. Data 📑 Equip 🛏 Strokes	Himits Lintab

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

# 4.71.3 Description of the elements

### **Operation and movement settings**

Field	Description
Nozzle movement mode	<ul> <li>Following movement modes for the nozzle are available.</li> <li>Position: Nozzle position is determined by limit switches or transducer.</li> <li>Time: The nozzle movement is time-controlled (no limit switch or position sensor).</li> </ul>
Two button mode	<ul> <li>Following modes are possible:</li> <li>Press to start: Both start buttons must be pressed to start the autocycle. After starting the cycle, the buttons can be released.</li> <li>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.</li> <li>This option is only for vertical IMM's with two start buttons available.</li> </ul>



#### Mold adjust

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

#### 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
	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:
Interrupt reaction	<ul> <li>Stop movements: stop all movements</li> <li>Stop movements and open mold: stop all movements and then star tmold open</li> </ul>
	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:
Light curtain active	<ul> <li>always active: Supervision of the light curtain is always active.</li> <li>during table move: Supervision is active during slide table or rotary table movement</li> <li>during mold close: Supervision is active during mold close movement</li> <li>combined: Supervision starts at the beginning of slide table or rotary table movement and ends after mold close.</li> </ul>

#### **Heat settings**

Field Description



Number of heating zones	The number of existing heating zones is specified here.
	The maximal accepted temperature of the heating zones can be specified here (applies for all heating zones).
Max. temperature	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
	Parameter is relevant for heating element supervervision.
Observation temperature difference	Within a defined time (default 180 seconds) the temperature of the heating element must increase at least for the configured observation 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.
	Defines whether a normally closed or normally open switch is used for detectring motor overload.
Motor overload mode	<ul> <li>Normally closed: Alarm will be raised if digital input becomes False.</li> <li>Normal open: Alarm will be raised if digital input becomes True.</li> </ul>

# 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



OEM Setting1         E stop heater off       Use 1         Robot Interface       User defined 3         Use mold opened position       200.0       Use 1         Use Vacuo Produce       Use 1         set vacuo delay time       3.00       3.00 s         plast use two pump       No 0       Use 1         safety gate not lock inject       No 0	OEM Setting2     1     2     3     4       Alarm not confirm stop motor     No     0       Alarm not confirm stop heating     No     0       Alarm not confirm stop heating     No     0       Alarm confirm time     0     600 s       Oil filter error mode     Rising edge     0       Oil filter monitor time     10.0 s       Oil level error mode     Rising edge     0       Oil level monitor time     10.0 s       Cooling Up Offset     2 °C       Cooling Down Offset     5 °C
■ □ LS ● 前 ■ Home Mach. Data T <sup>*</sup> Equip I <sup>*</sup> Strokes	Min: 100.0 Max: 422.0

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
	Here you can select the required Euromap robot interface.
Robot interface	<ul> <li>Not used</li> <li>Euromap 12</li> <li>Euromap 67</li> <li>User defined: all configured endpoints for Euromap will be used. Necessary enpoints according to Euromap specification which are not available will be ignored.</li> </ul>
Imterm. mold open pos.	<ul> <li>No</li> <li>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.</li> </ul>



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

Pump selection 1-15				Pump selection 16-24		1	2 3
	Pump 1	Pump 2	Pump 3		Pump 1	Pump 2	Pump 3
Mold close	Use 1	No 0	No 0	Injection	Use 1	No 0	No 0
Mold open	Use 1	No 0	No 0	Plast	Use 1	No 0	No 0
Ejector	Use 1	No 0	No 0	Decompression	Use 1	No 0	No 0
Core 1 in	Use 1	No 0	No 0	Nozzle fwd	Use 1	No 0	No 0
Core 1 out	Use 1	No 0	No 0	Nozzle bwd	Use 1	No 0	No 0
Core 2 in	Use 1	No 0	No 0	Shut off nozzle close	Use 1	No 0	No 0
Core 2 out	Use 1	No 0	No 0	Shut off nozzle open	Use 1	No 0	No 0
Core 3 in	Use 1	No 0	No 0	Accu load	Use 1	No 0	No 0
Core 3 out	Use 1	No 0	No 0	Oil pre heating	Use 1	No 0	No 0
Core 4 in	Use 1	No 0	No 0				
Core 4 out	Use 1	No 0	No 0				
Mold adjust	Use 1	No 0	No 0				
Auto SG close	Use 1	No 0	No 0				
Auto SG open	Use 1	No 0	No 0				
Valve Gate	No 0	Use 1	No 0				
🤚 🖶 🚢 🗈 💧 👸 -							0:No 1:Use
A Home Mach. Dat	a 🔤 📫 E	quip 🛛 🕨	→ Strokes	Himits Limits Lint	ab		🗲 Back

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

Mold		Inject	
Max. mold stroke	275.0 mm	Max. screw stroke	125.0 mm
Cylinder diameter	45.0 mm	Screw Diameter	26.0 mm
Piston rod diameter	30.0 mm	Cylinder diameter	85.0 mm
		Piston rod diameter	50.0 mm
Number of cylinders	1	Number of cylinders	2
Mold close by ring area	No 0	Do injection by ring area	Use 1
Ejector		Nozzle	
Max. ejector stroke	70.0 mm	Max. nozzle stroke	300.0 mm
Cylinder diameter	45.0 mm	Cylinder diameter	50.0 mm
Piston rod diameter	28.0 mm	Piston rod diameter	25.0 mm
Number of cylinders	1	Number of cylinders	1
Move forward by ring area	No 0	Move forward by ring area	Use 1
Attention! Changes of cylinder paramters can cause inappropriate machine operation. Re-calibration of hydraulic system necessary after any changes.			
u 🖶 🖾 🕼 🕅 🕴 Min: 0.0 Max: 9999.9			
intab 🖌 Home Mach. Data 📲 Equip 🔚 Strokes 🎬 Limits 🗾 Lintab 🗲 Back			
		<u> </u>	

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 (dis- tance 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
	Specification of the maximum nozzle stroke possible.
Max. nozzle stroke	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

Flow	Pressure and clamping force
Flow Abs flow pump 1 Abs flow pump 2 50.0 l/min Abs flow pump 3 50.0 l/min Screw Max. revolution 100 rpm Screw gain 1	Pressure and clamping force         Max. system pressure pump 1       160 bar         Max. system pressure pump 2       175 bar         Max. system pressure pump 3       210 bar         Max. system pressure pump 3       210 bar         Max. backpressure       50 bar         Max. mold adjust pressure       140 bar         Max. mold adjust velocity       100 %         Allowable inject pressure       150 bar         Allowable hold pressure       155 bar         Max. pressure mold protect       140 bar         Max. clamp force mold adjust       100 kN
	Min: 0.1 Max: 9999.9

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



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.
	The maximum injection speed with the use of an accumulator is specified here.
With accumulator	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.

Toggle lever characteristic curve			
	No.	x	У
	1	0.00	0.00
Toggle lever curve Ted_D160.txt	2	63.75	5.93
x mm Togale lever Position	3	75.90	10.37
y mm Platen position	4	86.03	15.58
	5	90.07	18.11
Number of points 100	6	94.10	19.48
	7	98.15	22.44
	8	100.18	24.02
	9	104.22	27.43
	10	106.25	29.25
	11	110.30	33.12
	12	112.32	35.18
u 🖶 🖉 🕼 é 🕅 🛛			(V)
🖌 Home 🗾 Lintab Select	LintabPoint1 Lint	tabPoint2	🗲 Back

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

## 4.76.3 Description of the elements

Button	Description	
	Opens the selection dialog for loading a linea- rization table from the file. The available data must be located in directory <persistence-< td=""></persistence-<>	
Select	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.



Name
Linear.txt
Ted_D160.txt
Ted_D200.txt
Ted_D250.txt
Ted_D300.txt
Home     Initab     Select     Load     LintabPoint1     LintabPoint2          ← Back

Fig.4-105: Mask 'Lintab select mask



## 4.77.3 Description of the elements

Button	Description
	Loads the selectied linearization table from a file. The available data must be located in di- rectory <pre>cpersistence-path&gt;\workspace</pre>
Load	\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**.

Auto calibration	Pressure 1 2
Auto calibration Off	Do Calibration
Transducer	
Do Calibration	
Ejector 70.0 mm Off 0	
Mold 275.0 mm Off 0	
Nozzle         300.0 mm         Off         0	
Injection 125.0 mm Off 0	
Velocity	
Do Calibration	
Pump 1 velocity Off 0	Closed Loop
Pump 2 velocity Off 0	Do Calibration
Pump 3 velocity Off 0	Injection 100 mm/s Off 0
RPM 100 rpm Off 0	
I 👸 💧 🕰 些 😃	0:Off 1:On
🖌 Home 🛛 💆 Auto Stop 🛛 💆 Sensor	Pump 😽 Adv. 🗲 Back

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
	Starts the auto calibration and then processes the following steps one after another:
Auto calibration	<ol> <li>Ejector calibration</li> <li>Mold calibration</li> <li>Nozzle calibration (only if nozzle transducer is available)</li> <li>Inject calibration</li> <li>Pump pressure calibration</li> <li>Pump velocity calibration</li> <li>Servo pressure forward (only if servo valve is available)</li> <li>Servo velocity forward (only if servo valve is available)</li> <li>Servo velocity calibration RPM</li> <li>Injection velocity calibration</li> <li>Servo pressure release calibration (only if servo valve is available)</li> <li>Servo pressure release calibration (only if servo valve is available)</li> </ol>
Stop/Off	Abortion of the auto calibration

#### Information

If a servo value 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 calibration:
Ejector	Display of the ejector stroke.
	Mold calibration:
Mold	Display of the mold stroke
	Nozzle calibration
Nozzle	Display of the nozzle stroke.
	Inject calibration:
Injection	Display of injection velocity

#### Velocity

Field	Description	
Pump velocity	Pump flow calibration	
Servo velocity forward	Flow calibration servo valve.	
(optional)	Only displayed if a servo valve is available.	
	Screw torque calibration:	
	Display of the maximum possible torque.	
RPM	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

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



Axis for calibration       Axis for pump 1 calibration       Axis for pump 2 calibration	1 2
Axis for pump 3 calibration       Injection       1         Auto calibration settings       Injection       1         Maximum measure position relative to screw stroke       Injection       1         Maximum measure position relative to mold stroke       Injection       1         Maximum measure position relative to ejector stroke       Injection       1	0.90 0.50 0.75
Auto pressure calibration Max. velocity output during pressure calibration Delay between pump pressure calib steps	10.00 V 0.000 s
W B ≥ LA 6 Mil 0:Manual 1:Injecti Auto Stop E Sensor Pump Auto Ad	on 2:Mold 3:Ejector Iv. 🛛 🗲 Back

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.	
200.0.000010	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.



Ejector Points 2 Act. Voltage 0.00 V Modify index 1 0 V mm 1 0.00 0.0 2 10.00 70.0	Mold Points 2 Act. Voltage 10.00 V Mold closed 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	I         2           Points         2           Act. Voltage         0.00         V           Modify index         1         0           V         mm         1         0.00           2         10.00         125.0         V
₩ 🖶 🚢 🗠 🌢 🕅 A Home Transducer		Min: 2 Max: 100

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: lineari- zation 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 <b>Mold</b> , <b>Inject</b> and <b>Ejector</b> . Calibration is done by entering the po- sition <b>[mm]</b> and the voltage <b>[V]</b> 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.



Nozzle Points 2 Act. Voltage 0.00 V	1 2
Modify index 1 0 V mm 1 0.00 0.0 2 10.00 300.0	
الله الله الله الله الله الله الله الله	Min: 2 Max: 100 Mold

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: lineari- zation 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 <b>Nozzle</b> and <b>Slide table</b> . Calibration is done by entering the position <b>[mm]</b> and the voltage <b>[V]</b> 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.



Pump 1 pressure	Pump 1 velocity	Limits 1 2 🖤
Points 9	Points 9	Press. Vel.
	Act. velocity 0.0 mm/s	Max. V AO 6.00 10.00 V
		Min. V AO 0.01 2.03 V
		Pre.Output.Voltage 0.00 V
Modify index 10	Modify index 1 0	Vel.OutputVoltage 0.00 V
V bar	V %	
1 0.00 0.0 0	1 0.00 0.0 0	
2 0.05 9.0 0	2 2.00 0.5 0	AO dither settings
3 1.00 10.0 0	3 2.50 10.0 0	Erequi Ampl
4 2.50 25.0 0	4 3.00 25.0 0	Hz V
5 5.00 75.0 0	5 4.00 60.0 0	
6 7.50 130.0 0	6 4.25 75.0 0	Velocity 50.0 0.00
7 9.00 155.0 0	7 4.50 90.0 0	
8 9.50 159.0 0	8 5.00 99.0 0	
9 10.00 160.0 0	9 10.00 100.0 0	
👋 🖶 🚢 🗳 👘 👘		Min: 2 Max: 100
Auto Stop	Sensor 🔑 Pump	🔾 Adv. 🗲 Back

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: lineari- zation 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 <b>[bar]</b> and the voltage <b>[V]</b> for each linearization point.
	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'.
Set output voltage	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: lineari- zation 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 <b>[%]</b> and the voltage <b>[V]</b> 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: lineari- zation 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 <b>[%]</b> and the rotations per minute <b>[rpm]</b> 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: lineari- zation 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 <b>[bar]</b> and the voltage <b>[V]</b> for each linearization point.
	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'.
Set output voltage	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 setvalues and the diameter of the cylinders.

Ejector Max. speed forward 471.6 470.0 mm/s Max. speed backward 769.5 760.0 mm/s	Inject Max. speed forward 101.1 100 mm/s Max. speed backward 66.1 66.0 mm/s With accumulator 100 mm/s
Mold	Nozzle
Max. speed fwd 471.6 470.0 mm/s Max. speed bwd 848.8 840.0 mm/s	Max. speed forward509.3500.0mm/sMax. speed backward382.0380.0mm/s
Screw	
Max. plast revolution 100 100 rpm	
🖕 🖨 🔛 🕼 💧 🕅 🔢	Min: 0.0 Max: 471.6
A Home Max. Vel. Rampcalib	Back

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' move- ment.
Max. speed backward	Display of the maximum velocity for the 'Ejector backward' move- ment.

## 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' move- ment.
Max. speed backward	Display of the maximum velocity for the 'Nozzle backward' move- ment.

#### 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.



Ramp calibration Start auto ramp cal	ibration				Off 0
Movement ramps          Ejector         Mold         Nozzle         Injection	Forw Max. ramp %/s 2127.6 8510.6 644.4 75339.0	ard Dead time s 0.000 0.000 0.000 0.000	Back Max. ramp %/s 1315.8 4761.9 7748.5 1515.2	ward Dead time \$ 0.000 0.000 0.000 0.000	Do Calibration Off 0 Off 0 Off 0 Off 0 Off 0
₩ 🖶 🚢 比 👌 jõj 斧 Home 🛛 Rampcalib	Stop				Min: 2.1 Max: 8510.

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'.			
	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.			
Dead time	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.

Language	Display settings         Screensaver       5 min         Brightness       100 %         Date (DD/MM/YY)       22 / 7 / 2016         Time (HH:mm)       9 : 30
General settings         Auto logout time       0 min         Printer       1         Button style       Icon before         Movement text display style       OnlyIcon	
I 🛍 🜢 🕰 🛎 🖶 🖷	1:EN 2:中文 3:繁體 4:DE 5:KO 6:P
A Home Display Login/ Change Pwd.	← Back

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.



	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.
Printer	<ul> <li>0: Printing resp. creating a screenshot deactivated.</li> <li>1: Creates a screenshot of the current mask on the compact flash using png- format.</li> <li>2: Prints mask to local USB printer</li> </ul>
	Specification of the softkey style. Possible selections are
Button style	<ul> <li>0: Text: only text is displayed for softkeys</li> <li>1: Icon or text: Either an icon or a text is displayed for a softkey. If an icon and a text is available for the softkey, the icon will be displayed.</li> <li>2: Icon before: Icon and Text are displayed. Icon left and text on the right.</li> <li>2: Icon after: Icon and Text are displayed. Text left and icon on the right.</li> </ul>
	Specification of the movement icon style. Possible selections are
Movement icons	<ul> <li>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.</li> <li>1: Icon and Text: A movement icon and a text are displayed for every movement. In this case up to three movement icons <ul> <li>+ text can be displayed at the same time in the basic layout.</li> </ul> </li> </ul>

# **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
	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.
Password	<ul> <li>Level 1: Worker: no password. Level1 is used when user logs out.</li> <li>Level 3: Mold Prepare: Password "Y"</li> <li>Level 4: Production: Password "J"</li> <li>Level 5: Quality: Password "M"</li> <li>Level 6: Process expert: Password "P"</li> <li>Level 8: Service technician: Password "91951"</li> <li>Level 12: Startup technician: Password "14789"</li> <li>Passwords for all users can be changed with softkey button "Change password'.</li> </ul>

## 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.
ОК	New password becomes active.