User’s Manual
BABK, CDC, CDK, HM, TM
UNILOG B2

Read this manual before using the control system and keep it in a place near the control system.
Caution! Caution! Caution! Caution!

Important information for commissioning!

For commissioning and operating the machine, passwords have been assigned ex works.

These passwords enable the operator of the machine or the person adjusting the machine to carry out the initial operation procedure.

**Customer password:** 1998

**Customer service password:** 1990

For information on the handling of the password protection please refer to the "The Control Unit UNILOG B2" chapter in the control unit’s manual.

To prevent the machine from interventions by non-authorised persons, the user should remove this page from the operating manual and keep it in a safe place.
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Preface

Who is this manual intended for?

This manual is intended for all persons who are to operate and to monitor the injection moulding machine.

Your task is to monitor the proper functioning of the machine. In case a malfunction occurs, you should be able to retrieve information as to the cause of malfunction as well as the essential machine data. To this end, you must be familiar with the operation of the control unit. This manual provides the knowledge by means of which you may safely operate the control unit.

What are the contents of this manual?

To keep this manual as short and as accessible as possible, only those operations are described which you can/ are permitted to carry out yourself. Functions and information relating to commissioning and special service measures are compiled in a separate service manual only available to those members of the Battenfeld staff who have been specially trained for this kind of work.

At first, an overview on the control elements of the control system will be provided. An example of the typical operational procedure will be given, followed by a detailed description of the individual display menus.

As a rule, the description will always follow the same pattern: After a short introduction to the respective function, the individual parameters will be described in detail.

Usage to the intended purpose

The control system UNILOG B2 is designed for the operation and control of injection moulding machines.

The operation of the control unit is reserved for trained personnel only (e.g. tool setters, service technicians). Other usage is not permitted.

Safety measures

This manual is part of the technical documentation on the injection moulding machine. Before operating the control system, make sure you are familiar with all the safety measures required for the operation of the injection moulding machine.
The Control Unit UNILOG B2

Function overview

The digital control unit UNILOG B2 has been developed from the control unit UNILOG 2040. All functions of the injection moulding machine may be controlled via the display menus and the keyboard. The functions are classified according to the subassemblies or the respective activities. To select a menu, you simply have to press the appropriate key. The symbols facilitate a quick access to the desired function.

For the manual operation, the machines disposes of 8 given keys operating the main functions of the machine (drive, heating, and operating mode). Another 16 keys are assigned other functions, depending on the machine type (e.g. opening / closing the mould).

The control system comes with a dust-proof easy to clean membrane keyboard. When pressing a key, you can feel a distinct action point which thus improves safety during input.
Control elements

1 Display
2 Function keys with graphic symbols
   Direct selection of a menu
3 Cursor keys
   Movements within the menus
4 "Back" key
   Page up within the menus
5 Other function keys with graphic symbols
   Information and data management
6 "EMERGENCY STOP" key
7 Control system type
8 Numeric keys
   Input of values
9 "ENTER" key
   Acceptance of input values
10 "C" key (Clear)
   Deletes entries
11 Function keys
   Main functions
12 Function keys
   Manual mode: assignment depending on the machine
Keyboard

The control unit has several keypads.

Function keys with graphic symbols

The function keys below the display are designed for the direct selection of a menu. The graphic symbols represent the functions compiled in the respective menu.

In case a menu consists of several pages, scroll to the next page by depressing the same function key several times. If you want to page down, hold down the “Back” key in the middle of the cursor keys and press the respective function key afterwards.

Cursor keys

Use the cursor keys arranged on the circle to select the individual fields of the display menu. The selected field will be presented reversely. You may only enter data in a selected and highlighted field. Always press the “ENTER” key to acknowledge the entries.

“Back” key

Use the “Back” key to page up the last 10 menus selected in reversed order.

Numeric keys

The numeric keys in the numerical keypad are designed for the input of numeric values.

“C” key (Clear)

Press the “C” (Clear) key to delete an entry and the “ENTER” key to accept it.

Other function keys with graphic symbols

The function keys below the cursor keys are designed for data management and for viewing the alarm messages. You may save and load data and have them printed.

The lower function keys are used for the direct control of the machine. The keys in the first row operate the main functions of the machine. Two or three keys cooperate like two-way switches. A light emitting diode integrated within the key signals the current switch position.

Depending on the machine type, the keys in the last two rows are assigned further functions. The integrated light emitting diodes signal the limit position of the respective function.
Key functions

- Machine in general F01
- Temperature control zones F02
- Close F03
- Injection unit F04
- Injection F05
- Holding pressure F06
- Metering, Decompression F07
- Open / Ejector / Air valves F08
- Core pullers F09
- Quality table F10

- Monitoring functions F11
- Service C12
- Machine overview F13
- Periphery F14
- Robot F15
- Reserve F16
- Data record management F17
- Not assigned F18
- Print F19
- Error messages F20
**Chapter - 0**

**Page - 6**

The Control Unit UNILOG B2

"Back" key

Numeric keys 0...9

Point, minus

"Clear" key (delete)

"ENTER" key (accept input)

Drive Stop (red LED)
Drive Start (green LED)

**Drive Stop**
The red LED will be lit up if the drive has been switched off manually (using the "Stop" key).

The red LED will flash if the drive has been switched off using either a monitoring program or the weekly time switch.

**Drive Start**
The green LED will flash if the drive is in the start-up phase and will be lit up if the drive runs.

The green LED is lit up when the oil heating starts or the drive is ready for operation.

Manual mode
Automatic mode
Setting mode

The activated operating mode will be indicated by the green LED.

---

Heater off (red LED)
Heater on (green LED)
Decrease temperature in heater (green LED)

Use the keys for the heating to activate the barrel heating, mould heating (option) and the heaters (option) activated.

**Note**
The mould heating and the heaters have to be activated in the respective displays (see chapter 2).

**Heater off**
The red LED will be lit up if the heater has been switched off manually (using the "Heater off" key).

The red LED will flash, if the heater has been switched off using either a monitoring program or the weekly time switch.

**Heater on**
The green LED will be lit up if the heater is switched on.

**Decrease temperature in heater**
The green LED is lit up if the temperature in the heater is either decreased manually or by using a monitoring program.

The green LED flashes during the Delay time Temperature decrease until the temperature decrease is activated.
The Control Unit UNILOG B2

Options

- **Air valve 1**
- **Air valve 2**

In the manual mode, the air valves are activated by pressing the function key.

- **Material conveyor**
- **On / Off**

Use this function key to switch the material conveyor on or off.

- **LC Robot**
- **Backward / forward**

All movements of the "Unipick P5" LC robot are performed forward and backward, depending on the program setting.

- **Parts removal robot**
- **Forward / Backward Clocking**

All movements of the parts removal robot will be carried out according to the program setting by pressing the right function key. Use the left function key to move back single movements of the parts removal robot to the initial position.

Open mould
Close mould

Ejector forward
Ejector backward

Injection unit forward
Injection unit back

Injection and holding pressure
Metering / Decompression

Reduce / increase mould mounting height (toggle machines only)
Move in core puller
Move out core puller
In the manual and the setting mode, these function keys on the operator panel are used to perform the movement.

Key-operated switch
Manual mode / Automatic mode
To prevent the machine from being changed over by unauthorised persons, the Manual mode / Automatic mode selection switch has been designed as key-operated switch. The key can be removed in any position.

Note
The Manual mode / Automatic mode function keys will then be assigned no function. Only the setting mode can be selected.

Key-operated switch
Alarm horn On / Off
Use this key-operated switch (CDC only) to switch off the function of the alarm horn. The key can be removed in any position.

Key-operated switch / Acknowledgement key
Manual moulded article removal
This option enables the operator to remove the injection moulding manually. To this end, the safety gate will already be opened during the core puller or the ejector movement (when opening the mould) (TM, HM machines).

Key-operated switch version
The function can be switched on or off using the key-operated switch. The key can be removed in any position.

Acknowledgment key version
The function is generally active. The acknowledgement key is designed to enable the core puller or the ejector movement.

Caution
If the acknowledgment key has been pressed during the closing movement, an error message will occur.
Display

Via the menus shown on the display, you may obtain all the information required for the operation of the machine.

At the lower edge of the display, the symbol of the selected function is shown on your left. To facilitate the orientation, the function is marked by a function number, e.g. F03. The number of pages contained in this menu as well as the current page (e.g. 1/2 = page 1 of 2 pages) are indicated below.

The field on the outer right of the lower edge is exclusively reserved for the malfunction indication. In case of an error, the flashing error symbol will be displayed within this field. On the left of the symbol, you can see the time set in the system. This time indication always has to correspond to the actual time to ensure that control functions are carried out properly.

In the main part of the display, the set and the actual values together with the selected functions are displayed within different fields. In general, the values are displayed in SI units, the parameters are assigned English or international abbreviations.

**Brightness setting**

You can use the keyboard to change the brightness of the LC display. To this end, press the "Back" key and one of the "Cursor" keys simultaneously. The settings will be saved automatically.

Set the brightness lower: "Back + Up Arrow"
Set the brightness higher: "Back + Down Arrow"
Handling of the control unit

In the following, an example shows you how you work with the control system.

Example: Setting the temperature control zones

- Press the “Temperature control zones” key. The first page (1/6) of the F02 menu will be displayed.

- When the page is displayed, the first field in the upper left will always be selected for set value input. (T0 = Temperature control zone 0)

- Enter the desired set temperature value using the “numeric keys”

- Press the “ENTER” key. The set value will be accepted

- Press the cursor keys until the next field is selected for the set value input (T1)

- Enter the set value via the numeric keys once again and press the “ENTER” key to accept the input

- Enter the other set values in the same way.

- Press the “Temperature control zones” key. The second page (2/6) of the F02 menu will be displayed. The input field for the upper set tolerance value is selected (L+).

- Enter the desired tolerance value using the numeric keys

- Press the “C” key in case you have entered an incorrect set value. The entered set value will be deleted

- Enter the new set value using the numeric keys

- Press the “ENTER” key. The set value will be accepted

- Enter the lower tolerance value in (L-) in the same way

- Hold down the “Back” key and press the “Temperature control zone” key. The first page (1/6) of the “F02” menu will be displayed again.
What happens in case of a maloperation?

The entire input will be entered in the selected field. When pressing the "ENTER" key, the control system only accepts those values which are valid, i.e. those being within the allowed value range or containing correct characters. In case the entered value is invalid, the original value will be displayed in the input field after pressing the "ENTER" key. For your information, the permitted limiting value of the respective parameter is displayed next to the function symbol at the lower edge of the display. You may now repeat the input, using a valid value.

Errors

In case an error occurs at the machine, the error symbol on the display will be flashing. Information on the incoming error may be retrieved immediately.

- Press the "Error messages" key. The F20 menu will be overlain. One or several incoming errors will be represented as symbols.
- Press the "Error messages" key several times to scroll down all pages, if appropriate.

If you are not able to remedy the cause of error yourself, call a service technician, stating the alarm message currently represented as symbol. On the third page of the menu, you obtain additional information on the incoming errors, if necessary. Note the additional information and have them ready for inquiries.

Note

A detailed description of the error messages may be found in the "Error messages F20" chapter in this manual.
Password protection

The access to the control system is protected on several levels by means of a password.

If no password has been entered, all user menus may be selected; however, the input of set values is not possible.

After entering the customer password, all user menus may be selected and the set values may be entered.

In addition to the user menus, the customer pages of the "Service C12" menu may also be accessed after entering the customer service password.

In addition to the user menus, all service menu pages will also be accessible after entering the service password. The service password is only available to members of the Battenfeld staff.

In order to disable the access after entering the password, the input of an incorrect password will be sufficient, e.g. 0.

**Note**
For further information on the password entry, please refer to chapter "Machine in general F01".
Three screen pages are available in the present menu. Page 1 is the start page which will always be displayed after starting up the control unit. On page 2/3 you can find a legend on how to handle the control unit and on page 3/3, a variety of program selections can be made.

**Password system F01 1/3**

**N1 Password**

After entering the correct password, the set values may be entered. Without a password, you may select all user menus and view data, but you are not allowed to change them. The menu for the entry of the password will be automatically displayed when switching on the machine.

**Enter the password**

- Select field "N1".
- Enter the password and press the "ENTER" key. The set values can now be entered.

**Disable set value input**

- Select field "N1".
- Enter an invalid password (e.g. 0) and press the "ENTER" key. The input of set values is no longer possible.

**N2 Character set**

- 0 Latin
- 1 Chinese

If required, you can change over the characters used to identify the functions and parameters in the menus. Either Latin or Chinese characters will be used.

- Select field "N2".
- Enter either 0 for Latin or 1 for Chinese characters and press the "ENTER" key. The menus will now be displayed in the selected language.

**Unit system:**

- metric
- spi

The settings for the units can be seen on the lower edge of the page. The software enables a change over between metric and SPI units (US units).
Information F01 2/3

On this page, an overview on the symbols and abbreviations predominantly used in the menus will be given. On the right, the current version of the visualisation master will be displayed.

Legend

- p - pressure
  Pressure [bar] / [psi]

- t - time
  Time [s / min]

- v - speed
  Speed [%]

- T - temp.
  Temperature [°C] / [°F]

- C - counter
  Counter [pieces]

- W - watch
  Cycle time [s / min]

- L - limit
  Temperature tolerance [°C] / [°F]

- P - performance
  Heating capacity [%]

- s - stroke
  Stroke [mm] / [inch]

- N - program
  Program

actual values
  Actual values
Program preselections F01 3/3

You may select and activate different programs for the machine operation.

**Automatic operating mode**

| 0  | Fully automatic mode |
| 1  | Semiautomatic mode 1  |
| 2  | Semiautomatic mode 2  |

Select one of the operating modes for the automatic mode.

0  Fully automatic mode

If the "Fully automatic mode" program has been switched on, the machine will be operated in the fully automatic mode. The "Automatic" key has to be pressed (LED on). Press the "Close" key to start the first cycle.

1  Semiautomatic mode 1

If the "Semiautomatic mode 1" program is switched on, only one of the machine cycles will be completed automatically. The "Automatic" key has to be pressed (LED on). The user must now open the safety gate, discharge the injection moulding and close the safety gate again. To start a new cycle press the "Close" or the "Close safety gate" key (option, up to size 2700 / -).

**Caution**

When removing the moulded articles manually (option), "Open mould" (TM / HM only), "Ejector forward and back", and "Move core puller in and out" can also be performed with the safety gate opened, the key-operated switch activated or the acknowledgement key held down.

2  Semiautomatic mode 2

The program "Semiautomatic mode 2" enables the user to discharge the injection moulding from the machine themselves. If the program is switched on, the cycle is carried out automatically up to the "Ejector front" stroke position. The "Automatic" key has to be pressed (LED on). The user must now open the safety gate, discharge the injection moulding and close the safety gate again.

**Note**

It is recommended to choose the stroke marker "Ejector front" so that the injection moulding is just prevented from falling down and may easily be discharged while the safety gate is opened.
To start a new cycle press the "Close" or the "Close safety gate" key (option, up to size 2700 / -). The cycle starts with the ejector moving backward.

**Caution**
When removing the moulded articles manually (option), "Open mould" (TM / HM only), "Ejector forward and back", and "Move core puller in and out" can also be performed with the safety gate opened, the key-operated switch activated or the acknowledgement key held down.

The operating steps in detail:

- Close safety gate
- Press "Close" or "Safety gate Close" (option; up to size 2700 / -). The cycle starts
- Open the safety gate after reaching "Ejector front" stroke marker
- Discharge injection moulding
- Close safety gate
- Press "Close" or "Safety gate Close" (option; up to size 2700 / -) The next cycle starts

### Motor Stop + Heater Stop

<table>
<thead>
<tr>
<th>N2</th>
<th>STOP</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>off</td>
</tr>
<tr>
<td>1</td>
<td>on</td>
</tr>
</tbody>
</table>

In case this program is switched on, the heater will also be switched off, if the drive motor has been switched off. This program may used as an alternative to "N3" - "Motor Stop and Temperature decrease".

### Motor Stop + Temperature decrease

<table>
<thead>
<tr>
<th>N3</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>off</td>
</tr>
<tr>
<td>1</td>
<td>on</td>
</tr>
</tbody>
</table>

If the present program is switched on, the heating will be decreased to the "lowered temperature" if the drive motor is switched off ("Temperature control zones F02" menu, page 2/6, parameter "N3").

If the drive motor is switched on again, the ordinary temperature settings are valid.
Cycle counter switch-off

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>off</td>
</tr>
<tr>
<td>1</td>
<td>on</td>
</tr>
</tbody>
</table>

In case this program is switched on, the control unit switches the drive motor off automatically at the end of the cycle when reaching the set “cycle number” (“Monitoring functions” menu F11, page 1/5, parameter “C2”).

After switching the machine to “Manual mode”, the drive motor may be switched on again. To be able to run the machine in the “Automatic mode” again, either the actual value of the cycle counter has to be reset (parameter “N7”) or the set value “C2” has to be increased. Otherwise the machine will immediately switch off at the end of the cycle.

Drop-out preventer (option)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>off</td>
</tr>
<tr>
<td>1</td>
<td>on</td>
</tr>
</tbody>
</table>

If the program is switched on, a new cycle will be disabled until the injection moulding has passed the photoelectric barrier. If the injection moulding does not pass the photoelectric barrier during the change over time (injection moulding will be ejected), the next cycle will not be started. The control system signals an error.

Caution
If the photoelectric barrier remains interrupted during the entire cycle (e.g. if ejected parts project into the drop-out area of the machine), the next closing procedure will also be disabled.

Mould heating (option)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>off</td>
</tr>
<tr>
<td>1</td>
<td>on</td>
</tr>
</tbody>
</table>

In addition to the barrel heating you may switch on the mould heating with its own tolerances and lowered temperature.
Automatic stop function for cooling water (option)

If the program is switched on, the valve for the automatic stop function for the cooling water (mounted at the cooling water distributor) will be closed for “Motor Stop” in the "Automatic mode". The valve is always opened in the manual mode or if the program is switched off.

Central lubrication (option)

Use this program to start a manual lubrication cycle, if required.

The lubricating time depends on the respective setting on the service menu page. (Each hour 2 lubrication cycles with 5 sec. each).

During normal operation, the control unit will carry out the lubricating interval automatically, in accordance with all machine cycles selected in the service menu.

Default setting:

<table>
<thead>
<tr>
<th>Setting</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TM 500 / :</td>
<td>10000</td>
</tr>
<tr>
<td>TM 750 / :</td>
<td>6000</td>
</tr>
<tr>
<td>TM 1000 / :</td>
<td>6000</td>
</tr>
<tr>
<td>from TM 1300 / :</td>
<td>125</td>
</tr>
</tbody>
</table>

Screw change (from size - / 1900)

To change the screw, it is necessary that the injection unit is completely back. If you have selected the screw change program, you move back the injection unit completely in the setting mode. To this end, it is necessary that the injection piston is in the front position.

Dry operation Clamp. unit (option)

In addition to the selected automatic mode, the follow selection options are available. If the program is active only the movements of the clamping unit, the ejector, the core pullers, and the unscrewing device will be used. The injection assembly will not be triggered.

Note

Note that the "Breathing" or "Compression" functions must not be activated in this operating mode. In addition, the injection assembly must be heated up to operating temperature.
Temperature control zones F02

This menu consists of 6 pages.

On page 1/6, you may specify the set values for a maximum of 8 temperature control zones of the screw barrel, on page 2/6 the respective tolerance values and the lowered temperature.

On page 3/6, you may specify the set values for a maximum of 5 temperature control zones of the mould, on page 4/5 the respective tolerance values.

Page 5/6 contains the parameters for the control optimisation.

On page 6/6, you can specify the set value for the feed zone and the respective tolerance values.

Enter the set values for the temperatures $T$ and the tolerances $L$ in $^\circ C / ^\circ F$, the set values of the heating capacity "$P$" in $\%$ of the maximum capacity, the time "$t$" in [min].

Temperature control zones Screw barrel F02 1/6

The set temperatures for a maximum of 8 screw barrel zones may be entered and the respective actual values may be retrieved.

T0 - T7 Set values Temperature control zones

Enter a set value for each used temperature probe of the screw barrel.

Caution

Inactive temperature sensor inputs have to be bridged.

T0 - T7 Actual values Temperature control zones

Display of the current temperature of the respective temperature control zone of the screw barrel.
Tolerances / Temperature decrease F02 2/6

L+  Upper Tolerance
You may specify by how many degrees the selected set value may be exceeded. The tolerance value is valid for all temperature control zones of the screw barrel. When exceeding the tolerance in the automatic mode, the control system disables the functions Injection, Metering, and Decompression.

L -  Lower Tolerance
You may specify by how many degrees the selected set value may be fallen short of. The tolerance value is valid for all temperature control zones of the screw barrel. When falling short of the tolerance in the automatic mode, the control system disables the functions Injection, Metering, and Decompression.

T10  Lowered temperature
Enter the set value for the lowered temperature. If the present program is switched on ("Program preselections F01" menu, page 3/3, parameter "N3"), the heating will be decreased to the "lowered temperature" if the drive motor is switched off.

The set value for the lowered temperature is also valid for the manual decrease of the temperature in the heater ("Decrease heater" key).

During the temperature decrease, the Injection, Metering, and Decompression functions are disabled.

P0 - 7  Actual value Heating capacity
For each temperature control zone of the screw barrel, the current heating capacity is indicated in per cent. If required, you may check the proper functioning of the heater by means of these values.
T12  Actual value Oil temperature

Display of the current hydraulic oil temperature within the oil tank. The respective set values are preset in the control system and cannot be changed here.

When undershooting 40 °C (104 °F), the hydraulic oil will be heated. While the oil is being heated, all movements of the machine will be disabled.

When reaching 45 °C (113 °F), the cooling water valve to the oil cooler opens. At 60 °C (140 °F), there will be a prewarning, at 65 °C (149 °F) the machine will be switched off. The machine can be switched on again, but will, however, change over to the rinsing mode to cool down and will disable all machine movements until 65 °C (149 °F) are undershot again.

T13  Actual value Switch cabinet temperature

Display of the current temperature in the switch cabinet. At 55 °C (131 °F) there will be a prewarning, at 60 °C (140 °F), the machine will be switched off and can only be switched on again after this limit value has been undershot.

T15  Maximum barrel temperature

Enter the maximum allowed temperatures for the barrel heating in this field (in most cases 500 °C / 932 °F). This entry limits the set values of the barrel zones. If one of the barrel zones exceeds this temperature, all heating zones will be switched off and a possibly available main contactor will cut off the power supply to the band heaters. At the same time, error message 041 "Barrel heating: Maximum temperature" will be displayed.

Temperature control zones Mould F02 3/6

You may enter the set temperatures for a maximum of 5 mould zones and retrieve the respective actual values.

T1 - T5 Set values Temperature control zones

Enter a set value for each used temperature probe of the mould.

Caution

Inactive temperature sensor inputs have to be bridged.

T1 - T5 Actual values Temperature control zones

Display of the current temperature of the respective temperature control zone of the mould.

P1 - 5 Actual value Heating capacity

For each temperature control zone of the mould, the current heating capacity is indicated in percent. If required, you may check the proper functioning of the heater by means of these values.
**Tolerances / Temperature decrease / Starting control F02 4/6**

Upper and lower tolerance values for the specified set temperatures and the set temperature for the temperature decrease program may be determined.

**L + Upper Tolerance**

You may specify by how many degrees the selected set value may be exceeded. The tolerance value is valid for all temperature control zones of the mould. When exceeding the tolerance, the control system disables the functions Injection, Metering, and Decompression in the automatic mode.

**Note**
In the manual mode, material may be injected despite exceeding the tolerance.

**L - Lower Tolerance**

You may specify by how many degrees the selected set value may be fallen short of. The tolerance value is valid for all temperature control zones of the mould. When falling short of the tolerance, the control system disables the functions Injection, Metering, and Decompression.

**Note**
In the manual mode, material may be injected despite falling short of the tolerance, if the injection unit has gone back.

**T10 Lowered temperature Mould heating**

Enter the set value for the lowered temperature of the mould heating in this field.

**N11 Starting control**

0 off  
1 on

By means of the starting control, you may heat up the mould heating first to a reduced temperature. During the start-up time, condensation water possibly occurring at this temperature will be evaporated. Due to slower evaporation, damage to the mould or to the heating element may be avoided.
**T11 Temperature Starting control**

Enter the set temperature for the starting control in this field.

**t11 Start-up time**

Enter the desired start-up time for the mould heating in minutes in this field.

**t11 Actual time Starting control**

Currently expired start-up time in minutes.

---

**P12 Heating power reduction**

It is recommended to run the starting control at a reduced maximum heating capacity. Enter the set value for the reduced heating capacity in per cent in this field.

**T15 Maximum mould temperature**

Enter the maximum allowed temperatures for the mould heating in this field (in most cases 500 °C / 931 °F). This entry limits the set values of the mould heating zones.

If one of the barrel zones exceeds this temperature, all heating zones will be switched off and a possibly available main contactor will cut off the power supply to the band heaters. At the same time, error message 042 "Barrel heating: Maximum temperature" error message will be displayed.
Control optimisation F02 5/6

Important information on the optimisation

After finishing the optimisation procedure, the controlling on the basis of the new set values starts automatically. If the parameters are not automatically transferred, undesirable actions (e.g. overshooting) might occur.

If you set the switches "N2" or "N4" to 1 during their optimisation, the optimised parameters will automatically be accepted at the end of the optimisation.

Select set values within the range of temperatures applied during normal operation.

Ensure that all sensors provide correct temperature values during optimisation.

In case a control zone does not reach the required temperature (set value minus 50 °C / 90 °F) despite heating up at a heating capacity of 100 % (refer to parameter "P" on pages 2/3 and 3/3), you will have to interrupt the procedure (Set switch "N1" or "N3" to "0"). Repeat the optimisation with lower set values after cooling down.

If one of the control zones heats up faster than the neighbouring zones, the control parameters are probably incorrect.

The control parameters

\( p = \) Proportional action factor %
\( i = \) Reset time [s]
\( d = \) Rate time [s]

are displayed in this field. You may enter your own values or those established and displayed after optimisation.

Note
Before starting the optimisation the heater has to be switched off.

The optimisation has to be carried out at once for all temperature control zones influencing each other.

For this reason, the temperature control zones of the screw barrel and those of the mould are combined in a single group and may only be optimised as a group.
To optimise the temperature control, proceed as follows:

- Switch off the heater ("Heater off" key)
- Enter the set values of the temperature control zones on page 1/5 or 3/5. The set values have to exceed the actual values by at least 70 °C / 158 °F
- Enter "1" in field "N1" or "N3" and press the "ENTER" key
- Switch on the heater ("Heater on" key)

The optimisation starts. Depending on the machine, this procedure may take an hour or even longer.

During this period, the optimisation status is displayed in the "St." fields. The status of the slowest zone will be displayed. The optimisation will be finished after all control zones of a group have been processed.

**Accept optimisation manually**

- Enter "1" in the fields "N2" or "N4" after finishing the optimisation (St. = 10) and press the "ENTER" key. The optimised parameters will be accepted

**Enter optimised values manually**

- Select the desired control zone in the field "C1". The current control parameters are displayed in the fields "p", "i", and "d"
- After having finished the optimisation (St. = 10), read the optimised parameters in the fields po, io, and do and enter them in the respective fields above as the new set values

C1  Control zone selection
0    Nozzle
1...7 Screw barrel
8...12 Mould

Select one of the control zones to have the control parameters displayed.

To facilitate orientation, a text is displayed after having selected a control zone:

**Nozzle**
Control zone Nozzle

**Cyl zone**
Control zone Screw barrel

**Mld zone**
Control zone Mould
Temperature control zones F02

- **p**: Set value Proportional action factor
- **po**: Optimised proportional action factor
- **i**: Set value Reset time
- **io**: Optimised reset time
- **d**: Set value Rate time
- **do**: Optimised rate time

**N1** Control zone optimisation Screw barrel

- 0: off
- 1: Start optimisation

Use this program to start the optimisation of the control zones of the screw barrel.

**N2** Accept optimised parameters

- 0: off
- 1: Accept

After entering 1, the control system accepts the optimised control parameters for the control zones of the screw barrel.

**N3** Control zone optimisation Mould

- 0: off
- 1: Start optimisation

Use this program to start the optimisation of the control zones of the mould.

**N4** Accept optimised parameters

- 0: off
- 1: Accept

After entering 1, the control system accepts the optimised control parameters for the control zones of the mould.

**St.** Status of the optimisation

- 0: Wait until a set value, exceeding the actual value by at least 70 °C / 158 °F, has been entered for all control zones
- 1: Initialisation of the optimisation algorithm
- 2: Heating procedure and determination of the steepest rise
- 3: Determination of the gradient for the steepest rise
- 4: Switch of the heater and wait for overshoots. The heating will be switched off if the set temperature is undershot by 50 °C / 90 °F, since generally overshoots of 30 - 50 °C / 86 - 140 °F are to be expected
- 7: Calculation of the control parameters
- 10: Optimisation finished
Temperature control zones F02

Temperature control Feed zone / Tolerances F02 6/6

The set temperature for the feed zone may be entered and the respective actual value can be retrieved.

T Set value Feed zone

Enter the set value for the feed zone.

Caution
Inactive temperature sensor inputs have to be bridged.

T Actual value Feed zone

Display of the current temperature of the feed zone.

L + Upper Tolerance

You may specify by how many degrees the selected set value may be exceeded. When exceeding the tolerance in the automatic mode, the control system disables the functions Injection, Metering, and Decompression.

Note
In the manual mode, material may be injected despite exceeding the tolerance.

L - Lower Tolerance

You may specify by how many degrees the selected set value may be fallen short of. When falling short of the tolerance, the control system disables the functions Injection, Metering, and Decompression.

p Set value Proportional action factor

i Set value Reset time

d Set value Rate time

You may set the control parameters.
In the Close menu, you specify the set values for the closing movement. You may define 4 stroke markers and assign separate speeds or pressures.

You enter the set values for the speeds \( v \) in \( \% \) of the maximum speed, the set values of the pressures "p" in \( \text{bar} \) / \( \text{psi} \), the set values for the strokes "s" in \( \text{mm} \) / \( \text{inch} \), the times "t" in \( \text{s} \).

### N1 Mould protection programs

The movement of the clamping platen is monitored between the stroke markers "s2" and "s3". In case the clamping platen stops between these stroke markers, the mould protection time "t3" expires. If the clamping plate does not move within this period, the mould protection program selected for "N1" will automatically be activated. 10 mould protection programs are available. Program 0 just interrupts the closing movement, the programs 1 through 9 carry out the respective number of strokes.

A maximum of 9 multiple strokes may be selected.

#### 0 Interrupt closing

When the mould safety device responds, the clamping procedure will be interrupted. The error symbol will be flashing on the display.

#### 1 Stroke

When the mould safety device responds, the clamping procedure will be interrupted. The mould opens and the ejector will be activated. Afterwards, the cycle will be interrupted.

#### 2 - 9 Multiple strokes

When the mould safety device responds, the clamping procedure will be interrupted. The mould opens and the ejector will be activated.

The clamping procedure will be restarted. In case the mould safety device responds again, the mould re-opens, the ejector will be activated and the clamping procedure will be started again afterwards. This procedure will be repeated until reaching the selected stroke rate or until the mould safety device does no longer respond during the clamping procedure.
s0  "Mould opened" stroke marker

"s0" is the stroke marker for Mould opened. This value will be automatically accepted from the "Open F08" menu and cannot be changed in this field. The stroke marker will always be exceeded when slowing down the clamping platen; the value by which the stroke marker has been exceeded depends on the speed.

v1  Speed Close 1

The machine moves to stroke marker "s1" at the speed set in this field.

s1  Stroke marker Close 1

Up to this stroke marker, the machine moves at the speed "v1".

v2  Speed Close 2

The machine moves to stroke marker "s2" at the speed set in this field.

s2  Stroke marker Mould safety device

Up to this stroke marker, the machine moves at the speed "v2". At this point, the mould protection program becomes effective.

v3  Speed Mould safety device

The machine moves to stroke marker "s3" at the speed set in this field.

t3  Mould protection time

The mould protection time will be started, if the clamping unit stops from stroke marker "s2" onwards. At the end of this time, one of the mould protection programs selected for "N1" starts, if appropriate.

p3  Mould protection pressure

Enter the desired (reduced) pressure for the mould safety stroke.

s3  Stroke marker "Mould closed"

The stroke marker "s3" is the end of the mould safety stroke. When reaching stroke marker "s3", high pressure will be activated.

To determine the set value for stroke marker "s3", proceed as follows:

- Select "Manual" operating mode
- Enter the set value s3 = 0
- Close mould
- Retrieve the actual value "s" and enter the new set value "s3", which exceeds the indicated actual value by approx. 0.2 - 0.4 mm (0.008 - 0.016 inch)
**v4  Speed High pressure build-up**

The high pressure is built up at the speed set in this field.

**p4  High pressure Close**

Enter the set value for the high pressure build-up.

**s  Actual value Closing stroke**

Current position of the clamping platen.

**t  Actual value Closing time**

Currently expiring time of the clamping procedure. The time starts with the start of the "Close mould" procedure and ends with the high pressure build-up.

**t3  Actual value Mould protection time**

Current mould protection time.

**F  Actual value Clamping force**

Current clamping force in [kN] / [shtn].

---

**Adjust mould height**

Using the two function keys "Increase mould height" and "Reduce mould height" on the operator panel, the mould height may be adapted to the mould:

Just jog the key for the desired direction, until the two LEDs above the function keys are lit up. It is only after pressing the desired function key again that the movement will be started to prevent the mould mounting height from being changed by accident. If neither of the two function keys is pressed within a certain time after the LEDs are lit up, the activation will automatically be deleted.

In case the function keys for "Increase mould height" and "Reduce mould height" are held down for a longer interval, the adjustment speed will automatically be increased.

See also section "Mould mounting" in chapter "Transport - Installation".
In the injection unit menu, you may determine the running characteristics of the injection unit. You may specify pressure and speed of the movement of the injection unit.

Page 1/2 contains the parameters for the forward movement of the injection unit, page 2/2 for the backward movement.

In case there are only two stroke transducers available at the machine, the menu consists of a single page, where the parameters for forward and backward movement may be set.

You enter the set values for the speeds "v" in [%] of the maximum speed, the set values of the pressures "p" in [bar] / [psi], the set values for the strokes "s" in [mm] / [inch], the times "t" in [s].

**s1 Stroke marker Injection unit backward**

"s1" is the stroke marker for the rear position of the injection unit.

**t1 Delay time Injection unit forward**

The delay time set in this field starts with the end of the pressure build-up of the clamping platen in the automatic mode. At the end of this time, the "Injection unit forward" movement starts.

**p1 Pressure Injection unit forward**

Enter the set pressure for the forward movement of the injection unit in this field.

**v1 Speed Injection unit forward**

This value specifies the set speed for the movement of the injection unit.
s2 Stroke marker Injection unit in front position

"s2" is the stroke marker for the front position of the injection unit at the closed mould. The value will also be displayed on the second page.

To set the set value for stroke marker "s2", proceed as follows:

- Select "Manual" mode
- Enter a reduced speed (v1=20)
- Enter set value s2=0 (zero)
- Move the injection unit to the closed mould
- Retrieve the actual value "s" and enter the new set value "s2", which exceeds the indicated actual value by approx. 0.5 - 2.0 mm (0.02 -0.08 inch)

s Actual value Distance

Current position of the injection unit.

t1 Actual value Delay time forward

Current delay time before the beginning of the forward movement of the injection unit.

Injection unit backward F04 2/2

"s2" is the stroke marker for the front position of the injection unit. This set value may be entered on both pages (1/2 and 2/2). For information on how to set the set value see above.

t2 Delay time Injection unit backward

The delay time set in this field starts when reaching the stroke marker "Decompression after metering" ("Metering / Decompression F07" menu, parameter "s3") if the "Decompression" function is switched on ("Metering / Decompression F07", parameter "N3"). For a switched-off decompression, the delay time starts at the stroke marker "Metering End" ("Metering / Decompression F07", parameter "s2"). At the end of this time, the "Injection unit backward" movement starts.
p2  Pressure Injection unit backward
Enter the set pressure for the backward movement of the injection unit in this field.

v2  Speed Injection unit backward
This value indicates the set speed for the backward movement of the injection unit.

s1 Stroke marker Injection unit backward
This set value may be entered on both pages (1/2 and 2/2).

s  Actual value Distance
Current position of the injection unit.

t2  Actual value Delay time Injection unit back
Currently expiring delay time before the backward movement of the injection unit.

N2  Program Injection unit backward
Select the program for the backward movement of the injection unit in this field.

0  Contacting nozzle
The injection unit remains at the mould during the entire cycle in the "Automatic" mode.

1  Injection unit back before metering
At the end of the holding pressure time and before the metering procedure, the injection unit will be moved backward in the "Automatic" mode.

2  Injection unit back after metering
After the metering procedure, the injection unit will be moved backward in the "Automatic" mode.
Injection F05

In this menu, you specify the set values for the injection stroke and the change over to the holding pressure on two pages.

You may specify separate speeds for 4 stroke sections. The running characteristics themselves will then be subject to linear interpolation by the control system, i.e., there is no sudden change between the different speeds, but a balanced adaptation to the appropriate set values (see diagram).

You enter the set values for the speeds "v" in [%] of the maximum speed, the set values of the pressures "p" in [bar] / [psi], the set values for the strokes "s" in [mm] / [inch], the times "t" in [s].

In this field you enter the maximum pressure during the entire injection stroke.

The speed set in this field will be reached at stroke marker "s1".

The set speed "v1" will be reached at stroke marker "s1".

The speed set in this field will be reached at stroke marker "s2".
s2 Stroke marker Injection 2
The set speed "v2" will be reached at stroke marker "s2".

v3 Speed Injection 3
The speed set in this field will be reached at stroke marker "s3".

s3 Stroke marker Injection 3
The set speed "v3" will be reached at stroke marker "s3". This is at the same time the release stroke for the pressure dependent change over.

v4 Speed Injection 4
The speed set in this field will be reached at stroke marker "s4".

s4 Stroke marker Start holding pressure
The set speed "v4" will be reached at stroke marker "s4". This is at the same time the stroke marker for the change over to holding pressure.

p4 Change over pressure
In case the change over to holding pressure mode has been selected pressure dependently, the change over occurs after reaching the change over pressure. The pressure dependent change over is not carried out unless the injection piston stroke is lesser than "s3".

t1 Injection time
The time entered in this field is valid for time, stroke, and pressure dependent change over to holding pressure.

If the start of the holding pressure is stroke or pressure dependent, the injection time will serve as monitoring time, i.e., the control system changes over to holding pressure, if the stroke or the pressure have not been reached at the end of this time.

If the change over to holding pressure has been selected time dependently, the holding pressure will be started at the end of the time "t1".

N2 Change over to holding pressure
0 Time dependent
1 Stroke dependent
2 Pressure dependent

Select the change over to holding pressure mode in this field.

s Actual value Screw stroke
Current position of the injection piston.

t1 Actual value Injection time
Current injection time. If the set value t1 "Start Start holding pressure" has been reached during the injection procedure, the control system will change over to holding pressure.
**Injection F05**

**p1  Actual value Injection pressure**

Current injection pressure.

**p4  Actual value Change over pressure**

Read off the pressure for which the change over to holding pressure has been carried out.

**Caution**

The pressure dependent change over to holding pressure as well as the actual values "p1" and "p4" will only be operable if the machine is equipped with a system pressure transducer (option).

---

**Injection delay / Pre-extrusion / Shut-off nozzle / Purging F05 2/2**

**t1  Delay time Injection**

In the automatic mode, the Injection delay time will be started after reaching the nozzle contact point, and in the manual mode when pressing the "Injection" key. At the end of the time, the injection procedure starts.

**t1  Actual value Delay time Injection**

Currently expiring delay time.

**N4  Pre-extrusion**

0  off
1  on

If the program "N4" is switched on, the control system activates the "Metering" function (Turn screw) at the end of the "t1 Delay time Injection" and before "Injection" to feed the material to the mould. The duration of the pre-extrusion may be set by means of the set value “t4 Time Pre-extrusion”. The actual injection procedure starts only after this function has been finished.

This program is only effective in the manual and the automatic mode.
**t4  Time Pre-extrusion**

The set value entered in this field determines the duration of the pre-extrusion, and becomes effective if the "Pre-extrusion" program "N4" is switched on.

**t4  Actual time Pre-extrusion**

Current value of the pre-extrusion time.

**N5  Shut-off nozzle (option)**

- 0  off
- 1  on

In case this program is switched off, the shut-off nozzle is opened permanently.

If the program is switched on, the shut-off nozzle will be opened for Start injection and closed again for Holding pressure end.

**N6  Purging Cold plug (option)**

- 0  off
- 1  on

Press N6 to select this program. The cold plug is purged from the nozzle point. Before the injection unit moves forward, the cold plug is purged at the speed "v6" and the pressure "p6" via the injection stroke "s6".

**p6  Pressure Purging**

Enter the pressure for purging in this field.

**v6  Speed Purging**

The injection piston will move at this speed during the purging procedure.

**s6  Stroke marker Purging**

Enter the screw stroke required for purging in this field.
In this menu, you establish a time profile for the holding pressure phase. Each point of time will then be assigned a set pressure (see diagram). Up to the point of time "t1", the pressure "p1" will be reached, up to "t2" the pressure "p2" and up to "t3" the pressure "p3". The time value "t3" signifies the entire holding pressure time.

Additionally, you may enter the set value "t4" for the secondary cooling time.

You enter the set values for the pressures "p" in [bar] / [psi], the times "t" in [s].

### p1  Holding pressure 1
The set value entered in this field is active during the time "t1" Holding pressure time 1.

### t1  Holding pressure time 1
Up to the point of time "t1" of the holding pressure time, the pressure "p1" is active (see diagram).

### p2  Holding pressure 2
The set value entered in this field will be reached for "t2" Holding pressure time 2.

### t2  Holding pressure time 2
At the point of time "t2" of the holding pressure time, the pressure "p2" will be reached (see diagram).

### p3  Holding pressure 3
The set value entered in this field will be reached for "t3" Holding pressure time 3.

### t3  Holding pressure time 3
At the point of time "t3" of the holding pressure time, the pressure "p3" will be reached (see diagram). The value of "t3" signifies the entire holding pressure time.

### N1  Program without holding pressure
0  off
1  on

By means of this program, you may deactivate the holding pressure. For a switched on program, the injection procedure will be finished when reaching the criteria for a change over to the holding pressure and the cooling time will be started.
Holding pressure F06

**t4**  **Cooling time**

The cooling time will be started at the end of "t3" Holding pressure time 3. At the end of the cooling time, the "Open mould" function will be started.

**t**  **Actual value Holding pressure time**

Currently expiring holding pressure time. The holding pressure time will be started when changing over to holding pressure (see "Injection F05" menu).

**t4**  **Actual value Cooling time**

Currently expiring cooling time.

**p**  **Actual value Holding pressure**

Current holding pressure value.

**Caution**

The holding pressure display is only possible if the machine is equipped with a system pressure transducer (option).
In this menu, you set the parameters for metering and decompression. You may activate three programs.

You enter the set values for the speeds v in [%] of the maximum speed, the set values of the pressures "p" in [bar] / [psi], the set values for the strokes "s" in [mm] / [inch], the times "t" in [s] and the speed in [rpm].

**Note**

The set values for the stroke markers "s1" and "s3" are not related to an absolute zero point, but to the actual position of the screw for holding pressure end (decisive for "s1") or to the set value "Metering End" (decisive for "s3").

The stroke marker "s2" Metering stroke is related to zero and independent of the stroke markers "s1" and "s3".

<table>
<thead>
<tr>
<th>N1</th>
<th>Decompression before metering</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>off</td>
</tr>
<tr>
<td>1</td>
<td>on</td>
</tr>
</tbody>
</table>

Via the program "N1", you may activate the "Decompression stroke before metering". If the program is switched on, the screw retracts at the speed set for "v1" at the end of the holding pressure time.

<table>
<thead>
<tr>
<th>v1</th>
<th>Speed Decompression before metering</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before the beginning of the metering stroke, the screw retracts at the entered speed, if the program &quot;N1&quot; has been switched on.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>t1</th>
<th>Delay time Metering / Decompression</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The delay time &quot;Metering / Decompression&quot; starts at the end of the holding pressure time. At the end of the delay time starts the &quot;Metering / Decompression&quot; phase.</td>
</tr>
</tbody>
</table>

**Note**

If the "Nozzle backward" movement starts before the end of the delay time, the "Metering / Decompression" phase will not start unless the nozzle has been moved back.
s1 Stroke marker Decompression before metering

The stroke marker "s1" will only be effective, if the program "N1" is switched on (N1 = 1). In the "Automatic mode", the "Decompression before metering" program is activated immediately after the end of the holding pressure phase, in the "Manual mode" by pressing the "Metering / Decompression" key.

Note
For this stroke, there is no absolute zero. The absolute zero is the actual position of the screw for holding pressure end.

N2 Back pressure

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No back pressure</td>
</tr>
<tr>
<td>1</td>
<td>Back pressure for Automatic mode on only</td>
</tr>
<tr>
<td>2</td>
<td>Back pressure for Manual and Automatic mode on</td>
</tr>
</tbody>
</table>

Via the program "N2", you may activate the back pressure. The back pressure is active during the metering phase and acts against the metering direction to compress the material in the barrel.

n2 Screw speed

Enter the desired screw speed in [rpm] for the metering phase.

p2 Back pressure

Enter the desired back pressure in this field.

N3 Decompression after metering

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>off</td>
</tr>
<tr>
<td>1</td>
<td>on</td>
</tr>
</tbody>
</table>

Via the program "N3", you may activate the Decompression stroke after metering. If the program is switched on, the screw retracts at the speed set for "v3" Speed after metering at the end of the metering phase.

v3 Speed Decompression after metering

After metering, the screw retracts at the speed entered in this field, if the program "N3" is switched on.

N4 Speed change over

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Low speed</td>
</tr>
<tr>
<td>1</td>
<td>High speed</td>
</tr>
</tbody>
</table>

The speed change over is only required for a two-speed drive (option).

If the machine is equipped with a two-speed drive, you can use program "N4" to change over between the higher and lower speed.
s2 Stroke marker Metering stroke

Enter the desired metering stroke in this field.

s3 Stroke marker Decompression after metering

Enter the desired stroke for Decompression after metering in this field.

Note
For this stroke, there is no absolute zero. The zero for this stroke is the stroke marker Metering stroke "s2".

t1 Actual value Delay time Metering / Decompression

Currently expiring delay time. At the end of the entire delay time, the "Metering / Decompression" phase will be started.

n2 Actual value Screw speed

Current screw speed in [rpm].

s Actual value Screw stroke

Current position of the screw.
Open / Ejector / Air valves F08

This menu consists of three pages. Page 1/3 contains the parameters for opening the mould, page 2/3 the parameters for the movement of the ejector. The third page contains the parameters and programs for the control of two air valves.

You enter the set values for the speeds v in [%] of the maximum speed, the set values of the pressures "p" in [bar] / [psi], the set values for the strokes "s" in [mm] / [inch], the times "t" in [s].

Open F08 1/3

- **v0** Speed Release toggle
  By means of the speed set on this page, the straight toggle will be released.

**Note**
These two entries are independent of the set clamping force and are only relevant for toggle machines.

- **s0** Stroke marker High pressure build-up
  The set value for the High pressure build-up stroke marker is a fixed value and cannot be changed.

This is where the opening procedure starts.

- **v1** Speed Open 1
  The clamping platen moves to the stroke marker "s1" at the speed set in this field.

- **p1** Pressure Open 1
  The machines opens the mould at the pressure set in this field and moves to the stroke marker "s1".

- **s1** Stroke marker Open 1
  The clamping platen moves up to this stroke marker at the speed "v1".
**v2  Speed Open 2**

The clamping platen moves to the stroke marker "s2" at the speed set in this field.

**s2  Stroke marker Open 2**

The clamping platen moves up to this stroke marker at the speed "v2".

**v3  Speed Open 3**

The clamping platen moves to the stroke marker "s3" Mould opened at the speed set in this field.

**s3  Stroke marker Mould opened**

The clamping platen moves up to this stroke marker at the speed "v3".

**Note**

The present stroke marker will always be exceeded when slowing down the clamping platen; the value by which the stroke marker has been exceeded depends on the speed.

**t1  Change over time**

In fully automatic mode the clamping platen remains in the open position during this time. This time will be started after the ejection.

**Note**

The set change over time should be selected sufficiently long so that ejected work pieces may pass the photoelectric barrier of the drop-out preventer (option), if necessary.

**s  Actual value Closing stroke**

Current position of the clamping platen.

**t1  Actual value Change over time**

Current change over time in the automatic mode. At the end of the change over time, the next cycle starts.

**t  Actual value Opening time**

Currently expiring time of the opening procedure. The time starts with the high pressure build-up and ends when reaching the "Mould opened" stroke marker.
**Ejector F08 2/3**

Select the program for the ejector movement in this field.

**N4 Program Ejector**

- **0 Ejector off**
  - The ejector will not be started.
- **1 Start Ejector for Mould opened**
  - The "Ejector forward" movement will not start unless the mould has been opened.
- **2 Start Ejector parallel to opening**
  - The "Ejector forward" movement will start during the opening procedure when reaching the stroke marker "s4 Start Ejector forward". Pressure as well as speed depend on the values of the opening procedure. After reaching the stroke marker "s3 Mould opened" (F08, page 1/3), the set values for pressure and speed set for the ejector motions will become effective.

**C1 Ejector strokes**

You may select the number of ejector strokes (maximum of 10). When entering the set value 0 (= Ejector off), the ejector will not be started. In the automatic mode, the closing movement will not be carried out unless all ejector strokes are finished.

**s4 Stroke marker Start Ejector forward**

Enter the set value for the start of the ejector motion during the opening movement. The set value refers to the position of the clamping unit. The control system only takes this stroke marker into account if the program is N4=2.

**v4 Speed Ejector forward**

Enter the set speed for the forward movement of the ejector in this field.

**p4 Pressure Ejector forward**

Enter the set pressure for the forward movement of the ejector in this field.

**s5 Stroke marker Ejector forward**

Enter the set value for the limit position of the "Ejector forward" movement.
t5  **Delay time Ejector backward**

The delay time will be started when reaching the stroke marker s5 "Ejector in front position". While the delay time expires, the ejector remains in this position. At the end of the delay time, the function "Ejector backward" will be carried out (applies also to multiple strokes).

v5  **Speed Ejector backward**

Enter the set speed for the backward movement of the ejector in this field.

p5  **Pressure Ejector backward**

Enter the set pressure for the backward movement of the ejector in this field.

s6  **Stroke marker Ejector backward**

If the ejector has not reached this stroke marker, the control system will disable the closing movement.

s4  **Actual value Closing stroke**

Current position of the clamping unit.

s  **Actual value Ejector stroke**

Current position of the ejector.

t5  **Actual value Delay time Ejector backward**

At the end of this time, the ejector is moved backward.

C1  **Stroke rate Ejector**

Display of the current ejector stroke.

*Caution*

When removing the moulded articles manually (option), "Ejector forward / back" can be performed in the "Semiautomatic 1" and "Semiautomatic 2" operating mode and with the key-operated switch activated or the acknowledgement key pressed even if the safety gate is opened.
Air valves F08 3/3 (option)

For each air valve, there are five programs available.

In the manual mode, the air valves are activated by pressing the function key.

The valves will remain active as long as the key is held down.

N5 Start Air valve 1
Select one of the following programs to control air valve 1.

N6 Start Air valve 2
Select one of the following programs to control air valve 2.

0 off
The air valve will not be triggered.

1 Stroke marker Close
As soon as the stroke marker "s5" has been reached during the closing movement, the delay time starts. At the end of the latter, the air valve is active according to the entered set time.

2 Injection
When the Injection function starts, the delay time starts as well. At the end of the latter, the air valve is active according to the entered set time.

3 Cooling time
When the cooling time starts ("Holding pressure F06" menu, parameter "t4"), the delay time starts as well. At the end of the latter, the air valve is active according to the entered set time.

4 Stroke marker Open
As soon as the stroke marker "s5" has been reached during the opening movement, the delay time starts. At the end of the latter, the air valve is active according to the entered set time.

5 External signal (option)
The air valve will be triggered externally. As soon as the external signal comes in, the delay time starts. At the end of the latter, the air valve is active according to the entered set time.

6 not assigned
7 not assigned
8 not assigned
9 not assigned
t5 Blowing time Air valve 1

The blowing time will be started at the end of the delay time. The air valve remains active until the end of the blowing time.

t7 Delay time Air valve 1

Depending on the selected program, the delay time will be activated. At the end of the delay time, the air valve is active according to the entered set time (t5 Blowing time Air valve 1).

s5 Stroke marker Start Air valve 1

Air valve 1 will be activated at this stroke marker, if program 1 or 4 is set for "N5". This stroke marker refers to the position of the clamping unit.

t6 Blowing time Air valve 2

The blowing time will be started at the end of the delay time. The air valve remains active until the end of the blowing time.

t8 Delay time Air valve 2

Depending on the selected program, the delay time will be activated. At the end of the delay time, the air valve is active according to the entered set time (t6 Blowing time Air valve 2).

s6 Stroke marker Start Air valve 2

Air valve 2 will be activated at this stroke marker, if program 1 or 4 is set for "N6". This stroke marker refers to the position of the clamping unit.

s Actual value Closing stroke

Current position of the clamping unit.

t5 Actual value Blowing time Air valve 1

Currently expiring blowing time of air valve 1.

t6 Actual value Blowing time Air valve 2

Currently expiring blowing time of air valve 2.

t7 Actual value Delay time Air valve 1

Currently expiring delay time of air valve 1.

t8 Actual value Delay time Air valve 2

Currently expiring delay time of air valve 2.
Core pullers F09 (option)

The Core puller menu consists of three pages, page 1/3 for core puller 1, page 2/3 for core puller 2 and page 3/3 for core puller 3. The programs and functions for the core puller 1 are analogously valid for core puller 2. For the move-out and the move-in motions, separate programs may be selected.

You enter the set values for the speeds “v” in [%] of the maximum speed, the set values of the pressures “p” in [bar] / [psi], the set values for the strokes “s” in [mm] / [inch], the times “t” in [s].

Core puller 1 F09 1/3

Select a program for the move-in and move-out-motion of core puller 1 and determine the desired parameters.

N1 Move in Core 1

Select a program for the move-in motion of core puller 1.

0 off

No moving in (operation without core puller).

1 before close

Move in the core while the mould is open.

2 Intermediate stop Close

Move in core for intermediate stop during closing after the stroke marker "s1 Start Move in core puller 1" has been reached.

3 before clamping force build-up

Move in the core while the mould is closed.

4 after clamping force build-up

Move in the core while the mould is closed.

5 before open and move out

Move in core while the mould is open; Move out will be activated immediately afterwards.

Note

This program is intended for the core puller, which, in combination with the circular disc, assumes the function of an ejector.

To this end, program "1" has to be selected in the program selection "N2".
Core pullers F09 (option)

### 6 parallel to closing

Move in core parallel to closing from stroke marker "s1 Start Move in core puller 1".

If the core has not yet been moved in when reaching the "Mould closed" stroke marker, "Close" will be interrupted and only after the core has been moved in will the high pressure build-up be continued.

**Note**
This program can only be used if the machine is designed for parallel movements.

### 7 before injection

Move in core before injection.

### N2 Move out Core 1

Select a program for the move-out motion of core puller 1.

### 0 off

No moving out (operation without core puller).

### 1 after open

Move out the core while the mould is open.

### 2 Intermediate stop Open

Move out the core while opening after the stroke marker "s2 Start Move out core puller 2" has been reached.

### 3 after clamping force reduction

Move out the core while the mould is closed.

### 4 before clamping force reduction

Move out the core while the mould is closed.

### 5 after Open Move in and move out

Move in core while the mould is open; Move out will be activated immediately afterwards.

**Note**
This program is intended for the core puller, which, in combination with the circular disc, assumes the function of an ejector.

To this end, program "1" has to be selected in the program selection "N1".

### 6 parallel to open

Move in core parallel to opening from stroke marker "s2 Start Move out core puller 2".

If the core has not yet been moved in when reaching the "Mould opened" stroke marker, the current cycle will be interrupted and only after the core has been moved in will the cycle be continued.

**Note**
This program can only be used if the machine is designed for parallel movements.
Core pullers F09 (option)

7 after Holding pressure End

Move out core after the holding pressure phase has been finished.

Caution

When removing the moulded articles manually (option), the "Move in / move out core puller" movements in Semiautomatic mode 1 and Semiautomatic mode 2 and with the key-operated switch activated or the acknowledgement key pressed are also possible if the operational safety gate is opened.

N3 Monitoring Core puller 1

There are 2 monitoring types for the core puller.

0 via limit switches

The core moves until reaching the connected limit switches (t1 and t2 without significance).

1 via time t1 and t2

The movements are triggered in accordance with the times "t1" and "t2".

N4 Move in core 1 without valve switch-off

0 off
1 on

If program 0 has been selected, the valve for "Move in core 1" will be switched off after the core has been moved in.

If program 1 has been selected, the valve for "Move in core 1" will remain activated after the core has been moved in.

N5 Move out core 1 without valve switch-off

0 off
1 on

If program 0 has been selected, the valve for "Move out core 1" will be switched off after the core has been moved out.

If program 1 has been selected, the valve for "Move out core 1" will remain activated after the core has been moved in.

s1 Stroke marker Start Move in core 1

Core 1 moves in at this stroke marker. The stroke marker refers to the position of the clamping unit.

v1 Speed Move in core 1

Enter the set value for the move-in speed in this field.

t1 Time Move in core puller 1

Enter the set value for the move-in time.

Note

This time will only be required if the program "Monitoring Core puller 1" N3=1 has been selected.

p1 Pressure Move in core 1

Enter the set pressure value for the move-in motion.
Core pullers F09 (option)

s2 Stroke marker Start Move out core 1
Core 1 moves out at this stroke marker. The stroke marker refers to the position of the clamping unit.

v2 Speed Move out core puller 1
Enter the set value for the move-out speed.

t2 Time Move out core puller 1
Enter the set value for the move-out time.

Note
This time will only be required if the program "Monitoring Core puller 1" N3=1 has been selected.

p2 Pressure Move out core puller 1
Enter the set pressure value for the move-out motion.

s Actual value Closing stroke
Current position of the clamping unit.

t1 Actual value Move-in time Core puller 1
Currently expiring move-in time.

t2 Actual value Move-out time Core puller 1
Currently expiring move-out time.

Caution
The control system is prepared for core puller programs, however, the programs can / may only be activated, if there are core pullers (option) installed.

Note
In the manual and the setting mode, the movement of the core pullers will be carried out by means of the switches for "Open mould" (Move out core puller) and "Close mould" (Move in core puller) functions depending on the program preselection settings.

If the core puller is switched off, the limit switches will not be checked and other movements will not be locked.

Caution
Changes of the core puller programs in the automatic mode are not recommended since these changes will not be accepted unless there is no active movement (e.g. during the change over or the cooling time).
Core puller 2 F09 2/3

Select a program for the move-in and move-out motion of core puller 2 and determine the desired parameters. Programs and parameters are the same as those of core puller 1 F09 1/3 (see above).

- N6: Move in Core 2
- N7: Move out Core 2
- N8: Monitoring Core puller 2
- N9: Move in core 2 without valve switch-off
- N10: Move out core 2 without valve switch-off
- S6: Stroke marker Start Move in core 2
- V6: Speed Move in core 2
- T6: Time Move in core 2
- P6: Pressure Move in core 2
- S7: Stroke marker Start Move out core 2
- V7: Speed Move out core 2
- T7: Time Move out core 2
- P7: Pressure Move out core 2
- S: Actual value Closing stroke
- T6: Actual value Move-in time Core puller 2
- T7: Actual value Move-out time Core puller 2

Core puller 3 F09 3/3

Select a program for the move-in and move-out motion of core puller 3 and determine the desired parameters. Programs and parameters are the same as those of core puller 1 F09 1/3 (see above).

- N11: Move in Core 3
- N12: Move out Core 3
- N13: Monitoring Core puller 3
- N14: Move in core 3 without valve switch-off
- N15: Move out core 3 without valve switch-off
- S11: Stroke marker Start Move in core 3
- V11: Speed Move in core 3
- T11: Time Move in core 3
- P11: Pressure Move in core 3
- S12: Stroke marker Start Move out core 3
- V12: Speed Move out core 3
- T12: Time Move out core 3
- P12: Pressure Move out core 3
- S: Actual value Closing stroke
- T11: Actual value Move-in time Core puller 3
- T12: Actual value Move-out time Core puller 3
Quality table F10

The quality table is designed for the evaluation of different machine parameters for quality assessment (Assessment of the injection mouldings as good or reject parts).

In the quality table, the actual values of the last 50 cycles of four selected parameters will be stored. In the lower edge of the menu, you can see the current values for minimum, maximum, mean value and the standard deviation for each of the four selected parameters.

The quality table menu consists of three pages. The pages 1/3 and 2/3 are used to display the quality assessment. On page 3/3, you may configure the quality table according to your specific needs by determining set values and tolerances.

Evaluation F10 1/3 and 2/3

<table>
<thead>
<tr>
<th>no. cycle</th>
<th>Param. 1</th>
<th>Param. 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>0.64</td>
<td>0.59</td>
</tr>
<tr>
<td>100</td>
<td>0.64</td>
<td>0.59</td>
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<td>100</td>
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<td>0.59</td>
</tr>
<tr>
<td>100</td>
<td>0.64</td>
<td>0.59</td>
</tr>
</tbody>
</table>

Page 1/3 shows the values for the first two selected parameters, page 2/3 the values for the third and the fourth parameter. The values taken from the last 50 cycles will be stored, the values of the last eight cycles are shown on the display. The most recent cycle has the cycle number 1. If you want to view older values, proceed as follows:

- Use the cursor keys to select the last cycle number in column no.
- Enter a new cycle number using the numeric keys (e.g. 43)
- Press the "ENTER" key. The selected cycle and the seven following cycles will be displayed (e.g. 43 - 50)

The asterisk (*) in front of an actual value indicates that this value is outside the tolerance. This does not necessarily mean that the respective injection moulding has been considered as reject part. Reject parts will only be counted if the monitoring function is active.
### Activating the monitoring function

- Select a field in the "mon." line and enter 1. In case an actual value of this parameter is currently outside the tolerance, the respective injection moulding will be considered as reject part.
- Activate the monitoring of other parameters for the assessment of reject parts in the same way.

### Stdv  Standard deviation

In this line, you can see the standard deviation from the actual values of the last 50 cycles for each parameter. The standard deviation is calculated as follows:

\[ s = \sqrt{\frac{\sum x_i}{(n - 1)}} \]

whereas \( x_{SQ} = \sqrt{(x_i - x_q)^2} \)

and \( x_q = \sum x_i / i \)

### min  Minimum value

In this line, you can see the minimum actual value for each parameter which have occurred since the parts counter has been reset.

### max  Maximum value

In this line, you can see the maximum actual value for each parameter which have occurred since the parts counter has been reset.

### mean  Mean value

In this line you can see the mean value of the actual values from the last 50 cycles for each parameter.

The mean value is calculated as follows:

\[ X_q = \frac{\sum X_i}{i} \]

Where:
- \( X_q \) = Mean value
- \( X_i \) = Actual value
- \( i \) = Number of stored actual values (1..50)
On the configuration page, you select the four parameters to be monitored according to the list below. To this end, proceed as follows:

- Select the field in the head of the first column and enter the identification number of the desired parameter (e.g. 01 for the closing time)

- Wait until the actual value is displayed in the "actual val." line. Some of the actual values will only be displayed after the respective function has been finished (e.g. the cycle time at the end of the entire cycle)

- Enter the desired set value for the monitoring in the "set value" line

- Enter the desired tolerance values in the "+tolerance" and "-tolerance" lines

- Configure the other three parameters in the same way

<table>
<thead>
<tr>
<th>Parameters for the quality table</th>
</tr>
</thead>
<tbody>
<tr>
<td>00 Total cycle time [s]</td>
</tr>
<tr>
<td>01 Closing time [s]</td>
</tr>
<tr>
<td>02 Opening time [s]</td>
</tr>
<tr>
<td>03 Clamping force [kN] / [shtn]</td>
</tr>
<tr>
<td>04 Time Ejector back [s]</td>
</tr>
<tr>
<td>05 Time Ejector forward [s]</td>
</tr>
<tr>
<td>06 Time Injection unit forward [s]</td>
</tr>
<tr>
<td>07 Time Injection unit back [s]</td>
</tr>
<tr>
<td>08 Filling time [s]</td>
</tr>
<tr>
<td>09 Metering time [s]</td>
</tr>
<tr>
<td>10 Time Decompression before metering [s]</td>
</tr>
<tr>
<td>11 Time Decompression after metering [s]</td>
</tr>
<tr>
<td>12 Screw stroke for change over to HP [mm] / [inch] (F05, N2=1)</td>
</tr>
<tr>
<td>13 Maximum injection pressure [bar] / [psi]</td>
</tr>
<tr>
<td>14 Injection pressure for change over to HP [mm] / [inch] (F05, N2=2)</td>
</tr>
<tr>
<td>15</td>
</tr>
<tr>
<td>16</td>
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<tr>
<td>17</td>
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<td>46</td>
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<tr>
<td>47</td>
</tr>
<tr>
<td>48</td>
</tr>
<tr>
<td>49</td>
</tr>
</tbody>
</table>

**Note**
Parameters 15 and 16 are only possible in connection with the "Change over to holding pressure pressure dependent" option.
Monitoring functions F11

Parts counter F11 1/5

On this page, separate parts counters for good parts (actual value C2) and for reject parts (actual value C3) may be found. The actual value "C4" indicates the total number of parts. You may enter the number of good parts required as set value. If the program "Cycle counter switch-off" ("Machine in general F01" menu, page 3/3, parameter "N4") is switched on, the control system will automatically switch off the drive at the end of the cycle if the set number of parts has been reached.

N7  Counter reset
0  off
1  on

Enter 1 to reset all counters to 0. After resetting the counter, the program will automatically be switched off.

C2  Set number of good parts
Enter the number of good parts required as set value.

Cx  Mould cavities
Enter the number of mould cavities of the mould. This figure multiplied by the number of cycles is the total number of parts.

C1  Actual value Cycle counter
Current number of cycles.

C2  Actual value Good parts
Current number of good parts.

C3  Actual value Reject parts
Current number of reject parts.

C4  Actual value Total number of parts
Current total number of injection moulds (good parts + reject parts).

C5  Set number of parts Start-up reject cycles
Enter the number of cycles the machine has to run until, by experience, the production will run optimally. These cycles will neither be recorded as reject shots series nor in the quality table.

Note
By means of this procedure, the quality table will be reset as well (refer to "Quality table F10" menu).
C5  Actual value Start-up reject cycles
Indicates the number of start-up cycles.

N8  Reject shot series
0  off
1  on
Use this program to select after how many reject shots in a row the machine is to switch off.

C8  Set number of parts Reject shot series
Enter the number of reject parts in series after which the motor is to be switched off.

C8  Actual value Reject shot series
Indicates the number of reject parts in series. After reaching the set value the motor will be switched off.

W2  Actual time Total cycle
The total time of the last complete cycle is displayed in this field. The first actual value will only be displayed at the end of the first cycle.

Note
The actual values "C5" and "C8" will be reset to "0" whenever changing over to the manual mode.

Time monitoring functions F11 2/5 and 3/5

You may monitor the times for the entire cycle and the movements "Close", "Open", "Injection" and "Metering". The monitoring starts with the switching on of the respective program in the automatic mode. You have to enter set values for the monitored procedures. When exceeding the set values, an error message will be triggered and the machine will be switched off.
Monitoring functions F11

N2 Monitoring Total cycle time
N3 Monitoring Closing time
N4 Monitoring Opening time
N5 Monitoring Injection time
N6 Monitoring Metering time

0 off
1 Switch-off for cycle end
2 Immediate switch-off

t2 Monitored total cycle time

t3 Monitored closing time

t4 Monitored opening time

t5 Monitored injection time

t6 Monitored metering time

The end of the respective working phase has to be reached within the monitored time, otherwise the control system will trigger an error alarm and switch off the machine.

Note
These monitoring functions are only effective in the automatic mode.

W2 Actual time Total cycle
The total time of the last complete cycle is displayed in this field. The first actual value will only be displayed at the end of the first cycle.

W3 Actual time Close
Currently expiring time of the closing procedure. The monitoring begins with the start of the "Close mould" procedure and ends with the end of the high pressure build-up.

W4 Actual time Open
Currently expiring time of the opening procedure. The monitoring begins with the start of the "Open mould" procedure and ends after reaching the "Mould opened" stroke marker.

W5 Actual time Injection
Currently expired time of the injection procedure. The monitoring begins with the start of the injection procedure and ends with Start Holding pressure.

W6 Actual time Metering
Currently expiring metering time. The monitoring begins with the start of the metering procedure and ends after reaching the "Metering End" stroke marker.
Weekly time switch (option)
F114/5

The control system includes a weekly time switch by means of which you may activate the automatic switching on and off of the heater and the hydraulic motor.

**Caution**

It is important for the proper functioning of the weekly time switch that the internal calendar clock of the control system corresponds to the actual date and the current time. Check the settings of the calendar clock before switching on the weekly time switch.

To set the weekly time switch, proceed as follows:

- Enter "1" in the field "N1" to switch on the weekly time switch
- Select the weekday for which the following settings are to be valid in the field "C1". The current settings will be displayed in the remaining fields
- Enter "1" in the field "N2" to activate the selected weekday
- Enter the time for the switching on (heater and hydraulics) in the field "t1" in hours and minutes
- Enter the time for the switching off (heater and hydraulics) in the field "t2" in hours and minutes
- Enter "1" in the field "N3", if the switching times are to be valid for the heater
- Enter "1" in the field "N4", if the switching times are to be valid for the hydraulic system
- Enter a delay time for switching on or off the heater in the fields "t3" and "t4", if appropriate. The switching of the heater differs by these values from the general time preselection "t1" and "t2"
- Enter a delay time for the switching of the hydraulics in the fields "t5" and "t6" in the same way, if appropriate

**N1  Weekly time switch**

0  off
1  on

Use this program to switch on the weekly time switch.
### Monitoring functions F11

**C1  Weekday**

1  Monday  
2  Tuesday  
3  Wednesday  
4  Thursday  
5  Friday  
6  Saturday  
7  Sunday  

Select the weekday in this field to have the current settings displayed and to change them, if appropriate.

**N2  Activate weekday**

0  off  
1  on  

Select "1" in this field, if the values of this weekday should also be valid for the weekly time switch.

**N3  Switch heater on / off**

0  off  
1  on  

Select "1" in this field, if the values of this weekday should also be valid for the heater.

**N4  Switch hydraulic drive on / off**

0  off  
1  on  

Select "1" in this field, if the values of this weekday should also be valid for the hydraulic drive.

**t3  Switch-on delay Heater**  
**t4  Switch-off delay Heater**  
**t5  Switch-on delay Hydraulic system**  
**t6  Switch-off delay Hydraulic system**  

00 ... 59 [minutes]

Enter a delay time in minutes in this field, if appropriate. The respective switching procedure will be delayed accordingly compared to the general switching times. Thus you may switch on the hydraulics later than the heater, for example.

**t1  Switch-on time**  
**t2  Switch-off time**  

00 ... 23 [hours]  
00 ... 59 [minutes]  

Specification of the general switch-on and switch-off times [hrs:min].
**Caution**

Before switching on (N1=1), make sure that the hydraulic motor and the heater are switched via the keyboard as desired after activating the weekly time switch.

Depending on the position of "N3", "N4", they will be switched off during activation until reaching the switch-on time "t1".

When deactivating (N1=0) the weekly time switch, only the heater changes over to its initial status; for reasons of safety, the hydraulic motor remains switched off.

In the automatic mode the weekly time switch can only be used for switching off. A time has to be entered as switch-on time "t1" which is already in the past. When reaching "t2" the motor will switch off for cycle end, the heater will not switch off unless changing over to the manual mode.

**Calendar clock F11 5/5**

The control system has an internal calendar clock. You may check time and date of the internal clock and reset them, if required.

In most menus, the set time is displayed in the lower edge.

- hh: 00 ... 23 [hours] in the 24 hour format
- mm: 00 ... 59 [minutes]
- ss: 00 ... 59 [seconds]
- dd: 01 ... 31 [day]
- mm: 01 ... 12 [month]
- yyyy: 0000 ... 9999 [year]
N1  Accept time and date

0  do not accept
1  accept

Enter "1" in this field after entering the correct data, to accept the data to the control system.

**Caution**

It is important that the internal calendar clock corresponds to the actual date and the current time, so that all functions having access to the internal clock may be carried out correctly.

The calendar clock of the control system does not have an automatic change over function for the daylight saving time. Ensure the setting of the correct time when changing over to and from the daylight saving time.
Service C12

This menu consists of three pages. On page 1/3 you determine the set values for the movements in the setting mode. The second and the third page can be used to calibrate the stroke transducers.

You enter the set values for the speeds "v" in [%] of the maximum speed, the set values of the pressures "p" in [bar] / [psi], the set values for the strokes "s" in [mm] / [inch].

Note
This menu can only be selected after entering the customer service password (Machine in general F01).

Setting parameters C12 1/3

<table>
<thead>
<tr>
<th>p1 50</th>
<th>p2 30</th>
</tr>
</thead>
<tbody>
<tr>
<td>v1 25</td>
<td>v2 30</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>p3 20</th>
<th>p4 40</th>
</tr>
</thead>
<tbody>
<tr>
<td>v3 15</td>
<td>v4 20</td>
</tr>
</tbody>
</table>

During the setting mode, there are no set value profiles of the manual or automatic mode effective. The clamping unit may only be opened up to the set opening stroke (menu "F08", parameter "s3"). If you want to open the clamping unit further, you have to set another value for the "s3 Mould opened" stroke marker in the menu "F08".

Injection unit, injection piston, and ejector may be moved up to max. or min. stroke. In the present operating mode, the axes move at constant speed and pressure. Setting speed and setting pressure may be entered separately for the four axes shown on this page. Almost all lockings of the manual and automatic mode are effective.

p1 Pressure Setting mode Clamping unit
p2 Pressure Setting mode Injection unit
p3 Pressure Setting mode Ejector
p4 Pressure Setting mode Injection piston

The set values entered in this field are valid for both moving directions.

v1 Speed Setting mode Clamping unit
v2 Speed Setting mode Injection unit
v3 Speed Setting mode Ejector
v4 Speed Setting mode Injection piston

The set values entered in this field are valid for both moving directions.
Stroke calibration F12 2/3 and 3/3

By means of the parameters on pages 2/3 and 3/3, you may calibrate the stroke transducers of the machine. This will be necessary after a defective stroke transducer has been exchanged.

To carry out the calibration of the stroke transducer, proceed as shown for the injection unit stroke (example) in the following.

- Select "Setting" operating mode
- Open the mould as far as possible
- Measure the opening stroke and enter the data in the field "Ss1" marked by the ruler (Accuracy +/- 0.5 mm / 0.02 inch)
- Read the actual value displayed in the field s and enter it in the field "As1"
- Close the mould as far as possible
- Measure the opening stroke and enter the data in the field "Ss2" marked by the ruler (Accuracy +/- 0.5 mm / 0.02 inch)
- Read the actual value displayed in the field s and enter it in the field "As2"
- Enter "1" in the field "N1" and press the "ENTER" key. The calibrated values will be accepted
- The other three movement axes can be calibrated in the same way

Note
The calibration can only be performed in the setting mode and if Ss1 does not equal "Ss2" and "As1" does not equal "As2". This applies in the same way to the remaining axes.

N1 Stroke calibration Clamping unit
N2 Stroke calibration Ejector
N5 Stroke calibration Injection unit
N7 Stroke calibration Injection piston

0 Do not accept calibration
1 Accept calibration
If you select program "1", the calibrated values for the respective movement will be accepted.

Ss1  Front position Clamping unit
s    Actual value Stroke Clamping unit
As1  Calibrated front position Clamping unit
Ss2  Rear position Clamping unit
As2  Calibrated rear position Clamping unit
Ss3  Front position Ejector
s    Actual value Stroke Ejector
As3  Calibrated front position Ejector
Ss4  Rear position Ejector
As4  Calibrated rear position Ejector
Ss5  Front position Injection unit
s    Actual value Stroke Injection unit
As5  Calibrated front position Injection unit
Ss6  Rear position Injection unit
As6  Calibrated rear position Injection unit
Ss7  Front position Injection piston
s    Actual value Stroke Injection piston
As7  Calibrated front position Injection piston
Ss8  Rear position Injection piston
As8  Calibrated rear position Injection piston
Machine overview F13

The menu Machine overview contains six pages providing information on the status of the different parameters of the machine and the control system.

*Note*
The called-up information is only intended for the Battenfeld service.

**Cycle overview F13 1/6**

The individual fields on this pages indicate the current status of a function.

**Automatic mode**
The symbols of functions which have not yet been activated are represented in their normal state. While a function is active, the respective symbol is flashing. After a function has been finished, the symbol is represented reversely. At the end of the complete cycle, all symbols will be represented in their normal state again.

**Manual mode**
The symbol of a function will be permanently represented in its reverse state, as soon as the limit position of the movement has been reached.

01 Close
Closing movement from Start Close to High pressure build-up End.

02 Nozzle forward
Nozzle forward until nozzle contact point is reached.

03 Injection
Start injection until reaching the change over to holding pressure point.

04 Change over to holding pressure
Change over from injection to holding pressure.

05 Holding pressure
Total holding pressure time.

06 Cooling time
Total cooling time.

07 Metering / Decompression
Procedure from Start Metering / Decompression to Home position Injection piston reached. The injection piston reaches the home position after Metering End or Decompression End.
08 Injection unit back
From "Start Injection unit backward" to "Injection unit is back" stroke marker.

09 Open
Start Open up to "Mould opened" stroke marker.

10 Movement Ejector forward
Start Ejector forward to "Ejector in front position" stroke marker.

11 Movement Ejector backward
Start Ejector backward to "Ejector is back" stroke marker.

12 Core puller in
Start Move in core until limit position or monitoring time reached.

13 Core puller out
Start Move out core until limit position or monitoring time reached.

14 Change over time
Total change over time.

Machine parameters F13 2/6

The most important machine parameters are shown on this page.

1 Stroke Ejector
Current position of the ejector.

2 Stroke Clamping unit
Current position of the clamping unit.

3 Stroke Injection unit
Current position of the injection unit.

4 Stroke Injection piston
Current position of the injection piston.
5 Screw speed
Current screw speed.

6 Temperatures Barrel control zones
Current temperature of the barrel control zones.

7 Oil temperature
Current hydraulic oil temperature within the oil tank.

8 Data record
Currently valid data record.

C2 Number of parts
Current number of good parts.

W2 Last cycle time
Cycle time of the last completed cycle.

---

Analog inputs and outputs F13 3/6

<table>
<thead>
<tr>
<th>Actual-Voltages [mV]</th>
<th>Uv</th>
<th>Up</th>
<th>Ap</th>
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<tbody>
<tr>
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<td>6512</td>
<td>3210</td>
<td>4117</td>
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<tr>
<td>Rs</td>
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<td>5423</td>
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<td>IP</td>
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<tr>
<td>INFO</td>
<td>F13</td>
<td>3/6</td>
<td>12:15</td>
</tr>
</tbody>
</table>

The indications on this diagnostic page may, if appropriate, help you during trouble-shooting. The current values of the analog inputs and outputs of the control system are displayed.

Current Voltages

Current voltages [mV].

Pump Pump
CU Clamping unit
EU Ejector
NU Injection unit
IP Injection piston
Uv Analog output Proportional or servo valve
Up Analog output Pressure control
Ap Analog input Pressure
As Analog input Stroke
Digital inputs and outputs F13 4/6

<table>
<thead>
<tr>
<th>Bit</th>
<th>1</th>
<th>3</th>
<th>5</th>
<th>?</th>
<th>9</th>
<th>11</th>
<th>13</th>
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<td>DO</td>
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</tbody>
</table>

The indications on this diagnostic page may, if appropriate, help you when checking the plug-in modules. The assignment of the digital inputs and outputs of the control system is displayed.

In the left column, the numbers of the plug-in modules are displayed. For a set function, an X is displayed in the column of the respective input or output (1 ... 16).

DI  Digital input
DO  Digital output

Axis status F13 5/6

The indications on this diagnostic page may, if appropriate, help you when looking for the causes of error. The status information of two movement axes is displayed.

You may select the desired movement axes and status numbers. The information called up via the status numbers is only intended for the Battenfeld service.

Number of movement axes:

1  CU = Clamping unit
2  NU = Injection unit
3  EU = Ejector
4  IP = Injection piston
5  MH = Mould height adjustment
6  CO = Core 1
7  CO = Core 2
Use the cursor key to select one of the "Axis" input fields

Enter the number of one of the movement axes and press the "ENTER" key. The appropriate information will be displayed.

Use the cursor keys to select one of the "Status [ ]" input fields

Enter the status number provided by the Battenfeld service and press the "ENTER" key.

The indications on this diagnostic page may, if appropriate, help you during trouble-shooting. The status information, the analog set value signals for the pressure and the quantity for the hydraulic pump will be displayed.
In this menu, you set the parameters for external devices at the machine on two pages.

You enter the set values for the speeds "v" in [%] of the maximum speed, the set values of the pressures "p" in [bar] / [psi], the set values for the strokes "s" in [mm] / [inch], the times "t" in [s].

Material conveyor / Airmould F14 1/2

Material conveyor (option)

The material conveyor is an additional option of the machine which is switched on and off using the function key on the control panel.

**t1** Conveying time

When undershooting the material level probe at the conveyor, the conveying of the material will be started. After the level probe has been reached, the conveying time "t1" starts and the conveying procedure will continue for the set time and will exceed the level.

**t2** Monitoring time

This time will start when the material conveying starts. If the material level probe has not been reached within the set monitoring time "t2", the conveying will be switched off and an error (error 237) will be signalled.

**t2** Actual value Monitoring time

Current monitoring time.

Airmould (option)

This is a digital interface for triggering an external Airmould unit.

The "Modular Airmould System" permits the production of high quality injection moulded parts by means of the "Airmould" (internal gas pressure) and the "Airmould Contour" (surface gas pressure) process. For this reason, the IMM, for example, may be operated with shorter cycle times and lower clamping forces.

**N3** Program Airmould

0 off
1 Start stroke dependent
2 Start time dependent
3 Start pressure dependent

Select the starting mode of the Airmould in this field.
s3 Stroke marker Start Airmould

After the screw has reached this stroke marker, the Airmould will be started.

s3 Actual value Screw stroke

Current position of the injection piston.

t3 Time Start Airmould

This is where you set the desired start-up time. The time starts to run for Start Injection. After the time has expired the Airmould will be started.

t3 Actual value Airmould Start Time

Current time until the Airmould is started.

p3 Pressure Start Airmould

Enter the desired injection pressure for which the Airmould is to be started in this field.

Caution
The pressure dependent start can only be performed if the screw stroke undershoots stroke marker "s3".

p3 Actual value Injection pressure

Current injection pressure.

Caution
The pressure dependent Airmould start as well as the pressure display "p3" will only be operable if the machine is equipped with a system pressure transducer (option).

Belt conveyor F14 2/2 (option)

N1 Belt conveyor

0 off
1 on

By means of this program the counter Belt conveyor "C1" will be increased by "1" after each clamping force build-up. After reaching the preset set counter value, the Delay time Belt conveyor "t1" starts. At the end of this time, the belt conveyor will be triggered for the time entered in Running time Belt conveyor "t2".

C1 Counter Belt conveyor

Enter the shot number (Counter Clamping force build-up) for which the delay time "t1" of the belt conveyor is to be started.

t1 Delay time Belt conveyor

The time will be started after reaching the "Number of parts Belt conveyor" set value. At the end of this time, the belt conveyor will start to move.

t2 Running time Belt conveyor

Enter the time during which the belt conveyor is to be triggered.
Robot interfaces F15 (option)

This menu consists of three pages. You can select the programs and the signals for different robot interfaces.

Robot interface F15 1/3

In this menu, you set the parameters for the external robot (UNIPICK PS5, UNIROB R..) via the "interface in accordance with Euromap / SPI".

N1 Robot interface

0 off
1 on

If the robot interface is switched off, no signals are sent to the robot. The signal "Monitoring Open / Close" (wiring diagram: X 67 or PL 67, pin 26) by the robot will, however, still be requested.

N2 Start Robot

0 for "Mould opened"
1 parallel to opening the clamping unit
2 for intermediate stop of the clamping unit

s1 Stroke marker Start Robot

Depending on the preselection of the parameter "N2" the robot will be started when reaching the stroke marker while the clamping unit is opening. If N2=0 has been entered in the parameter, parameter "s1" will be ignored.

s1 Actual value Closing stroke

Current position of the clamping unit.
LC Robot F15 2/3

N1  LC Robot
0  off
1  on

By means of the parameter "N1", the robot function will either be switched on or off. If this program is switched off, the Y-axis has to be in the home position to enable the interface signal for the machine ("Close mould", "Ejector forward and backward").

N2  Tilt / swing in home pos.
0  off
1  on

The selection of this program makes the gripper tilt or swing in the home position.

If this program is switched off, the tilting / swinging takes place in the Z-limit position.

N3  Y - Lowering Stacking
0  off
1  on

The selection of this program makes the Y-axis lower in the "Z-limit position" to stack the parts in the "Y-limit position". If this program is switched off, the parts in the "Z-limit position" and the "Y-home position" will be loosened.

N4  Tilt (C - axis)
0  off
1  on

The selection of this program makes the gripper tilt around the C-axis. For the preselected program, the lowering of the Y-axis for stacking is only possible if the gripper is tilted.

N5  Swing (B-axis)
0  off
1  on

The selection of this program makes the gripper swing around the B-axis.

For the preselected program, the lowering of the Y-axis is only possible if the gripper is swung.
N6  Parts clamping
0    off
1    on

When using a gripper finger, this program has to be switched on. Then the parts monitoring will also be effective. In case the parts monitoring is not desired, the inputs have to be bridged.

When using a vacuum gripper, this program has to be switched off. Then the vacuum monitoring will also be effective. In case no vacuum monitoring is desired, the adjusting screw "SET" at the venturi nozzle has to be turned, until the red LED is lit up.

N7  2nd Stacking position Z-axis
0    off
1    on

The selection of this program causes the parts to be stacked in turns on two different stacking positions.

N8  Parts removal stroke
0    after ejector

- Lower Y-axis
- Ejector forward
- X-axis forward
- Parts transfer

1    before Ejector

- Lower Y-axis
- X-axis forward
- Ejector forward
- Parts transfer

2    parallel Ejector

- Lower Y-axis
- Ejector and X-axis simultaneously forward
- Parts transfer

N9  Start from ejector position
0    off
1    on

Only one ejector stroke may be set. The ejector movement will only be performed up to the stroke marker Ejector position (intermediate stop). The ejector will be released after the parts removal routine has been completed.

s9  Stroke marker Ejector position

Enter the position for which the parts removal procedure is to be performed.

t1  Time Parts removal

The Time Parts removal will be started as soon as the ejector is forward and the X-axis in the limit position. At the end of the time, the part will be clamped or sucked. This will steady the gripper and the ejector before the transfer.
Chapter - 15

Robot interfaces F15 (option)

**t2  Time Parts clamping**

The Time "Parts clamping" starts when the part is clamped or sucked. At the end of the time, the X-axis moves to the home position and the ejector backward. This ensures a secure transfer of the part.

**t3  Time Stacking**

The Time Stacking will be started as soon as the Z-axis and the Y-axis of the robot are in the limit position. At the end of the time, the part will be loosened. This ensures that the gripper is steadied in the stacking position.

**Note**

If the "Y-Lowering Stacking" program is switched off, the Time "Stacking" in the "Y-home position" will be started when reaching the "Z-limit position" to loosen the part at the end of this time.

**t4  Time Parts loosening**

The Time "Parts loosening" starts when the part is loosened. At the end of the time the robot moves back to the home position. This ensures a secure stacking of the part.

**t5  Time Belt conveyor**

Enter the time during which the belt conveyor is to be triggered. The Time Belt conveyor will be started after the part has been stacked and the Y-axis has moved to the home position. By entering "0" for the set value, the belt conveyor will be deactivated.

**Manual mode**

Depending on the program setting, all movements of the "Unipick P5" LC robot are performed forward and backward by pressing the respective function key.

**Caution**

To ensure trouble-free operation, it is necessary that all programs in the "Parts removal robot F15" menu, page 3/3, are deactivated (N.=0).
Parts removal robot F15 3/3

N1  Parts removal robot
0    off
1    on

By means of the parameter "N1", the sprue picker function will either be switched on or off. For a switched off program only the positions of the parts removal robot will be checked. If the sprue picker has not been assembled, the inputs have to be bridged.

N2  Close tongs at nozzle platen
0    off
1    on

For an activated program, the sprue picker will be operated independently of the position of the ejector.

N3  Parts removal stroke
0    off
1    on

Operation of the sprue picker with "Parts removal stroke". For a switched off program there will only be move in- and move out - motions.

N4  P. rem. str. bef. mov. in
0    off
1    on

If this program has been started, the parts removal stroke will be carried out before moving in. For a deactivated program, the parts removal stroke will be carried out after moving in.

N5  P. rem. str. bef. mov. out
0    off
1    on

If this program has been started, the parts removal stroke will be carried out before moving out. For a deactivated program, the parts removal stroke will be carried out after moving out.
N9  Start from ejector position

0  off
1  on

The program preselection "Close tongs at nozzle platen" must not be activated and only one ejector stroke may be set. If this program preselection is activated the ejector movement is only carried out up to "Start from ejector position". The ejector will be released after the parts removal routine has been completed.

s8  Stroke marker Open tongs

If this stroke point is fallen short of during the closing movement, the tongs start to open.

s9  Stroke marker Ejector position

Enter the desired position of the ejector for which the parts removal movement is to be performed.

t1  Delay Close tongs

Delay from reaching the "Parts removal position" until "Start Close tongs"(safe reaching of the parts removal position).

t2  Time Parts clamping

During this time, the tongs may close, the next movement of the parts removal robot will only be started at the end of this time. By means of this time, a safe closing of the tongs will be guaranteed.

Manual mode

All movements of the parts removal robot will be carried out according to the program setting by pressing the right function key. Use the left function key to move back single movements of the parts removal robot to the initial position.

Parts monitoring

For the "Closed tong" position it will be monitored in the automatic mode whether the part has been properly removed. In case of an error the cycle will be interrupted and may be continued in the manual mode. There will be no parts monitoring in the manual mode. If the parts monitoring is not required or if there is no limit switch installed the input has to be bridged.
Robot interfaces F15 (option)

<table>
<thead>
<tr>
<th>Program setting</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
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<tbody>
<tr>
<td>Close tongs at nozzle platen</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
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<td>1</td>
</tr>
<tr>
<td>Parts removal stroke</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
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<tr>
<td>P. rem. str. bef. mov. in</td>
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<td>P. rem. str. bef. mov. out</td>
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</tbody>
</table>

**Program setting 1:**
- Move in
- Ejector forward
- Close tongs
- Move out

**Program setting 2:**
- Move in
- Close tongs
- Move out

**Program setting 3:**
- Move in
- Ejector forward
- Close tongs
- Parts removal stroke forward
- Move out
- Parts removal stroke backward

**Program setting 4:**
- Move in
- Parts removal stroke forward
- Close tongs
- Move out

**Program setting 5:**
- Move in
- Ejector forward
- Close tongs
- Parts removal stroke forward
- Parts removal stroke backward
- Move out

**Program setting 6:**
- Move in
- Parts removal stroke forward
- Close tongs
- Parts removal stroke backward
- Move out

**Program setting 7:**
- Parts removal stroke forward
- Move in
- Parts removal stroke backward
- Ejector forward
- Close tongs
- Parts removal stroke forward
- Move out
- Parts removal stroke backward
Program setting 8:
- Parts removal stroke forward
- Move in
- Close tongs
- Move out
- Parts removal stroke backward

Program setting 9:
- Parts removal stroke forward
- Move in
- Parts removal stroke backward
- Ejector forward
- Close tongs
- Move out

Program setting 10:
- Parts removal stroke forward
- Move in
- Close tongs
- Parts removal stroke backward
- Move out
You may store the current values of the control parameters as a data record on 3.5" disks. Each data record may be marked with a 9-digit data record number (Mould No). The machine number (Mach. No) has been preset and cannot be changed in this menu.

You may reload data records stored on disks at any time in order to work with the recorded control parameters.

A large amount of data may be stored on a single disk. Note however, that the larger the number of data records the slower the saving and reloading, since the contents of all stored data records will be read in first after having inserted a disk.

**Note**
Back up the data records from the disk on other data carriers, e.g. the hard disk of a PC, at regular intervals. Due to the back up you may possibly avoid data losses, e.g. in case of damage to the disk.

**Caution**
Never process the data records with other programs. The data records may be modified so that the control system may no longer be able to read them. Always save, load, delete data records only by means of the control system.

Always store disks in an absolutely dust-free environment and keep them away from intensive magnetic sources (e.g. electromagnetic switches). Note the information relating to their use on the packaging of the disks.

Always close the cover of the floppy-disk drive tightly to prevent dust from entering. Penetrating dust particles may cause serious damage to the floppy-drive and to inserted disks.
Load data record F17 1/4

If you want to load data records from disks, proceed as follows:

- Select "Manual" operating mode
- Open the cover of the floppy-disk drive and insert the disk until it locks into place. Close the cover
- If necessary, press the "Data record management" key several times until page 1/4 is displayed
- Wait until the control system has read the contents of the disk. This may take a few seconds. Then the numbers of all data records stored on disk will be listed in the Mould no column
- Press the cursor keys to select the desired data record number. When reaching the last indicated number, the list shifts automatically and other numbers will be displayed

If the desired data record number is known: Use the cursor keys to select the field for the input of the data record number and enter the number of the desired data record directly

- Press the "ENTER" key to confirm your choice

If the entered data record number is on the disk, the data record will now be loaded in the control system. If the control system is not able to find the entered data record number on the disk, the following message will be displayed on the screen: "File is not existing". Check the entered data record number and enter a new one, if required.

Note
It is not possible to load data records in the automatic mode.

To load external data records, you first have to enter parameter N2=1 (= ignore machine number) on page 4/4.
Save data record F17 2/4

To save data records, proceed as follows:

- Select "Manual" operating mode
- Open the cover of the floppy-disk drive and insert the disk until it locks into place. Close the cover
- If necessary, press the "Data record management" key several times, until page 2/4 is displayed
- Wait until the control system has read the contents of the disk. This may take a few seconds
- Use the cursor key to select the field for the input of the data record number
  - Enter a 9-digit data record number. For shorter numbers, the digits up to the ninth will automatically be filled in with zeros
  - Press the "ENTER" key to confirm your choice

If the entered data record number is already on the disk, you may overwrite the data record with the current values. In this case, a security prompt will be displayed on the screen: "Overwrite existing file?".

- If you want to overwrite the existing data record: Enter "1" in the field "N1" and press the "ENTER" key
- If you do not want to overwrite the existing data record: Enter "0" in the field "N1" and press the "ENTER" key

The control system updates the contents after saving. This may take a few seconds.
Delete data record F17 3/4

If you want to delete data records from disks, proceed as follows:

- Select "Manual" operating mode
- Open the cover of the floppy-disk drive and insert the disk until it locks into place. Close the cover
- If necessary, press the "Data record management" key several times until page 3/4 is displayed
- Wait until the control system has read the contents of the disk. This may take a few seconds. Then the numbers of all data records stored on disk will be listed in the Mould no column
- Press the cursor keys to select the desired data record number. When reaching the last indicated number, the list shifts automatically and other numbers will be displayed
- If the desired data record number is known: Use the cursor keys to select the field for the input of the data record number and enter the number of the desired data record directly
- Press the "ENTER" key to confirm your choice
- On the screen, the following message will be displayed: "Delete file ?". Check once again whether you want to delete the data record with the entered number
- Enter "1" in field "N1" and press the "ENTER" key to delete the selected data record
- If you do not want to delete the data record: Enter "0" in the field "N1" and press the "ENTER" key

The control system updates the contents after deleting. This may take a few seconds.
If data records have been stored on disk outside the control system (e.g. on a PC), the control system has to create a new table of contents to be able to process the data records.

You may decide whether all data records should be included in the contents (ignore machine number) or only those coming from the present machine.

To create a new table of contents, proceed as follows:

- Select "Manual" operating mode
- Open the cover of the floppy-disk drive and insert the disk until it locks into place. Close the cover
- If necessary, press the "Data record management" key several times until page 4/4 is displayed
- Select the desired programs "N2" and "N4" and switch them on, if appropriate

**N2 Ignore machine number**

0 off
1 on

If you enter "1" the control system will ignore the machine numbers when creating the contents and when loading the data records. All data records saved on the disk will be listed in the contents. The data record numbers will be displayed in the "Mould no." list on pages 1/4 through 3/4, the respective machine numbers will be displayed in the Mach. no. column.

If you enter "0", the control system will only include those data records in the contents whose machine numbers correspond to those of this machine. In this case, you will not be able to load external data records.

**N3 Contents**

0 not available
1 available

If there is "0" indicated in the status field, there are no contents available and a new table of contents may be created. If there is "1" indicated in the status field, a table of contents for this disk already exists.
N4 Create contents

0 off
1 on

If the program is switched on, the control system creates a new table of contents for the inserted disk. This may take a few seconds.

Status Contents .../...

This field shows the current status for the creation of a new table of contents:

- Tested data records
- Total number of data records on the disk)
You may print different types of data on the connected printer:

- Customer and customer service data
- Service data
- Quality table

At the parallel interface of the control system, any standard printer with parallel interface (Centronics) may be connected.

**N1 Print selection (mode)**

0 Setting data of the customer level
1 Setting data of the service level
2 Quality table

Enter the appropriate figure to select the desired data.

**N2 Print (start)**

0 off
1 on

If you switch on the program, the selected printout will be started. In case you have selected the automatic printout of the quality table (C2), the cycle counter will start as soon as the program is switched on.

**C1 Language**

01 English
49 German

There are two languages available for the printout. Enter the identification number of the desired language.

**C2 Printout start Quality table after cycle**

0 off
50 ... Printout after cycle

If you select 0, the printout of the quality table has to be started manually (N1 = 2 and N2 = 1). If the printout of the quality table is to start automatically, a value ≥ 50 has to be set for the number of cycles. At the end of the set cycle, the printout will be started automatically and the counter will be reset.
Error messages F20

This menu consists of three pages. In case an error occurs at the machine, the error symbol at the right lower margin of the screen is flashing. Call up the Error messages menu to retrieve information on the incoming error.

If you are not able to remedy the cause of error yourselves, call a service technician, stating the alarm message currently represented as symbol. On the third page of the menu, you obtain additional information on the incoming errors, if necessary. Take down the additional data and have them ready for inquiries.

The control system does not have a key for the acknowledgement of error messages. Most errors may be acknowledged by pressing the "Machine Stop" key or by trouble-shooting.

Error symbols F20 1/3 and 2/3

This symbol indicates that there is an incoming error. If there is no symbol indicated on pages 1/3 and 2/3, the error number may be retrieved from page 3/3, while a more detailed description can be found in this chapter.
Error messages F20

Hydraulic drive off
This symbol indicates that the hydraulic drive motor is not switched on.

Heater off
This symbol indicates that the heater is switched off.

Possible causes:
- Sensor breakage
- Short-circuit
- Temperature measuring card is defective or the relay does not switch
- Maximum temperature of a zone exceeded
- The heater has been switched off ("Heater off" key)

Acknowledgement:
Switch off heater and remedy cause of error. After having remedied the cause of error, the acknowledgement will be carried out automatically.

Temperature decrease
This symbol will be displayed if the temperature decrease is active. The temperatures will be decreased to a uniform set temperature value (see "Temperature control zones F02" menu, page 2/6, parameter "T10"). In case of a temperature decrease, the functions Injection, Metering, and Decompression will be disabled.

Acknowledgement:
Switch on temperature decrease ("Heater on" key).

Tolerance error Barrel
One or more barrel heating zones are outside the set temperature tolerance.

Acknowledgement:
The acknowledgement will be carried out automatically as soon as the temperatures of all barrel heating zones are within the tolerances again.

Tolerance error Mould
One or more mould heating zones are outside the set temperature tolerance.

Acknowledgement:
The acknowledgement will be carried out automatically as soon as the temperatures of all mould heating zones are within the tolerances again.

Oil heating
This symbol indicates that the oil temperature is below the given value. The operation of the machine is not possible unless this error message is extinguished.

Acknowledgement:
In the manual mode, the message will automatically be reset when reaching the proper oil temperature, in the automatic mode, the message will be stored until there is a change over to the manual mode.
**Error messages F20**

---

**Oil temperature**

This symbol indicates that the oil temperature has exceeded the set prewarning value. The red error lamp is flashing at the same time. Check the cooling water connection and the cooling water valve to prevent the oil temperature from rising any further.

When exceeding the given maximum temperature, the control system switches off the hydraulic drive motor.

**Acknowledgement:**
In the manual mode, the acknowledgement is carried out automatically, as soon as the oil temperature has fallen below the prewarning value again. In the automatic mode, the message will be stored until there is a change over to the "Manual mode".

---

**Change oil filter**

This symbol indicates that the backflow or the pressure filter have been contaminated. The error message is triggered by the pressure switch at the backflow filter or pressure filter. The program procedure of the machine will not be influenced.

**Acknowledgement:**
The acknowledgement will be carried out automatically after replacing the filter element.

---

**Low oil level**

This symbol indicates that the oil level either is too low or has been too low for a short time.

**Acknowledgement:**
Refill oil in accordance with the specifications in the operating manual. The acknowledgement will be carried out automatically after troubleshooting and pressing the "Hydraulics Stop" key.

---

**Cycle time monitoring**

This symbol indicates that the cycle time has been exceeded. The drive is switched off. This error message will also be displayed if the metering time monitoring responds.

The stroke marker Metering End has to be reached within the double cooling time. If the stroke marker Metering End has not been reached at the end of the double cooling time, the cycle will be finished. Then the drive will be stopped and this error message will be displayed.

**Acknowledgement:**
Change over machine to the "Manual mode".

---

**Switch cabinet temperature**

This symbol indicates that the switch cabinet has reached the given prewarning temperature.
Caution
Check what might have led to the overheating of the switch cabinet. Check the switch cabinet fans. Look for other causes, if necessary.

If the switch cabinet temperature exceeds the given maximum value, the control system will switch off the hydraulic drive as well as all heating units.

Acknowledgement:
The acknowledgement will be carried out automatically when undershooting the preselected temperature.

Possible causes:
• The change over time has been set too short
• In the drop-out shaft, there are too many parts

The error message "Drop-out preventer" may also be used for a check weigher (option).

Acknowledgement:
Change over machine to the "Manual mode".

Mould has been injected on
During the injection procedure, the mould has slightly been opened.

Possible cause:
Compared to the injection pressure, the clamping force has been set too low.

Acknowledgement:
Change over machine to the "Manual mode".

Cycle counter switch-off
This error message will be displayed if the preselected number of good parts has been reached and the "Cycle counter switch-off" program is active. The machine will switch off at the end of the cycle.
Error messages F20

Acknowledgement:
Change over machine to the manual mode and

- Enter number of good parts (F11:C2) again, or
- Reset parts counter (F11:N7), or
- Deactivate program (F01:N4)

Stroke overlap
If this error message is displayed, the hydraulic drive will be switched off.

Possible causes:
- Both core puller limit switches are activated at the same time (strokes too short, Error Limit switch)
- An error has occurred during the calibration of the stroke transducers (see also the description for error 308)

Acknowledgement:
Trouble-shooting and press "Stop" key.

No robot release
The closing movement of the machine has not been released by the robot.

Central lubrication
This error messages will occur if, during a lubricating interval, the switch for the pressure build-up does not switch within the set monitoring time or the oil level of the central lubrication is too low.

Acknowledgement:
Check storage tank of the central lubrication, check pressure switch. Start manual lubrication cycle.

Incorrect change over to holding pressure
This error message will occur if a stroke or pressure dependent change over to holding pressure has been preselected, the control system, however, has changed over time dependently (change over point not reached). After this message has occurred in the automatic mode, the started cycle will be finished. Then the control system switches off the machine.

Acknowledgement:
Change over machine to the "Manual mode".

EMERGENCY STOP
This symbol indicates that the "EMERGENCY STOP" key has been pressed, the "EMERGENCY STOP" circuit has been interrupted at a point, or that the Check Emergency stop function is active. A check of the emergency stop circuit has to be carried out once after switching on the machine by pressing the key and unlocking the same afterwards.

Acknowledgement:
The acknowledgement will be carried out automatically, if the "EMERGENCY STOP" key is no longer held down or the "EMERGENCY STOP" circuit has been closed.
Tolerance Quality table

This error message will occur when exceeding tolerance values in the quality table, if the monitoring has been activated for one or more parameters (Menu F10, parameter mon.). Change over to page 3/3, to read in the INFO column, which column (which parameter) has triggered the error.

Acknowledgement:
The acknowledgement will automatically be carried out with the next shot.

Tank cover closed

This error message will occur if the tank cover is closed.

Acknowledgement:
Automatically after opening the tank cover.

Delay Release Tolerance

After the first heating procedure, the injection cylinder will only be enabled at the end of an inchangeably set time (300 s).

Acknowledgement:
Automatically after reaching the delay time.

Note
This delay will only become effective for micromelt injection units (50).

Explanations:
To guarantee an optimum homogeneous heating of the material, the release of the injection piston is delayed.

Safety gate opened

This symbol indicates that the safety gate on the clamping unit is opened.

After switching on the main switch you have to test the function of the safety gate once again. The error message "Safety gate opened" will always be displayed, if the test has not been carried out after switching on the main switch, even if the safety gate is closed.

If this error message is displayed, all movements of the machine will be disabled.

Monitoring Safety gate:
When opening or closing the safety gate, the limit switches have to move to the proper position within certain intervals. If this is not the case, the drive will be switched off and the error message will also be displayed.

Contactor check:
When opening or closing the safety gate or the purge guard as well as when triggering the Emergency stop keys or the external emergency stop (robot interface), the contactors for the valve switch-off have to move to the proper position within two seconds. When exceeding this time the drive will be switched off and the present error message will be displayed.
Acknowledgement:
Close safety gate or purge guard, or check the limit switches. Open the safety gate and purge guard once after switching on the machine and close them again.

Acknowledgement:
After trouble-shooting, the acknowledgement will be carried out automatically

**Purge guard opened**
This symbol indicates that the purge guard is opened.

After switching on the main switch you have to test the function of the purge guard once again. The error message "Purge guard open" will always be displayed, if the check has not yet been carried out after switching on the machine, even for a closed purge guard.

If this error message is displayed, all movements of the machine will be disabled.

**Contactor check:**
See error message "Safety gate opened".

**Maintenance door opened**
This symbol indicates that one of the maintenance doors is opened.

In case this error message occurs the drive will be switched off by means of the emergency stop. The drive may not be started again until all maintenance doors are closed.

**Nozzle contact point lost**
This symbol indicates that the set nozzle contact point has been left during the injection / holding pressure procedure. In case this error message occurs, the injection cycle will be interrupted.

**Possible causes:**
- Nozzle contact point incorrectly set
- Melt delivery due to contaminated or not plainly contacting nozzle

Acknowledgement:
Automatically when changing over to the manual mode.
On the third page of the "Error messages" menu, you may obtain additional information on the incoming errors if appropriate. In case causes of error are not symbolically represented on the pages 1/3 and 2/3, you will find some information here.

001 Barrel heating: Switched off

This error occurs if the barrel heating is not activated. The red error lamp is lit up. This error may occur for the following reasons:

- Heating unit switch is not switched on
- Program "Motor stop + Heating stop" switched on and motor not switched on

002 Mould heating: Switched off

This error will occur if the mould heating is not activated. This error may occur for the following reasons:

- Heating switch (F01:3/3:N6) not switched on
- Program "Motor stop + Heating stop" (F01:3/3:N2) switched on and motor not switched on

011 Barrel heating: - Tolerance

This error will occur if one or more barrel heating zones are outside the set negative temperature tolerance. The Injection, Metering and Decompression functions are disabled.

Acknowledgement:
Automatically if all barrel heating zones are within the tolerance limit.

012 Mould heating: - Tolerance

This error will occur if one or more mould heating zones (hot runners) are outside the set negative temperature tolerance. In the automatic mode, the Injection, Metering and Decompression functions are disabled. In the manual mode, material may be injected despite falling short of the tolerance, if the injection unit has gone back.
Acknowledgement:
Automatically if all mould heating zones (hot runners) are within this tolerance limit.

013 Yoke temperature: - Tolerance
This error will occur if the yoke temperature is outside the set negative temperature tolerance.

Acknowledgement:
Automatically, if the yoke temperature is within the tolerance limit.

021 Barrel heating: + Tolerance
This error will occur if one or more barrel heating zones are outside the set positive temperature tolerance. The red error lamp is flashing. In the automatic mode, the Injection, Metering and Decompression functions are disabled. In the manual mode, material may be injected despite exceeding the tolerance.

Acknowledgement:
Automatically if all barrel heating zones are within the tolerance limit.

022 Mould heating: + Tolerance
This error will occur if one or more mould heating zones (hot runners) are outside the set positive temperature tolerance. The red error lamp is flashing. In the automatic mode, the Injection, Metering and Decompression functions are disabled. In the manual mode, material may be injected despite exceeding the tolerance.

Acknowledgement:
Automatically if all mould heating zones (hot runners) are within this tolerance limit.

023 Yoke temperature: + Tolerance
This error will occur if the yoke temperature is outside the set positive temperature tolerance.

Acknowledgement:
Automatically, if the yoke temperature is within the tolerance limit.

031 Barrel heating: Temperature decrease
This error will occur if the temperature decrease has been switched to active manually, or the program "Motor Stop + Temperature decrease" (F01:3/3:N3) is switched on and the motor is not switched on.

The temperatures are decreased to a new uniform set temperature value (F02:2/6:T10).

Acknowledgement:
Switch off temperature decrease.
032 Mould heating: Temperature decrease

This error will occur if the temperature decrease has been switched to active manually, or the program "Motor Stop + Temperature decrease" (F01:3/3:N3) is active and the motor is not switched on.

The temperatures are decreased to a new uniform set temperature value (F02:4/6:T10).

Acknowledgement:
Switch off temperature decrease.

041 Barrel heating: Maximum temperature

This error will occur if one of the barrel heating zones exceeds the maximum temperature. The heater is switched off in case such an error occurs.

Possible cause:
Band heater defective.

Additional information:
Value 2: Barrel heating Zone 0
Value 3: Barrel heating Zone 1
Value 4: Barrel heating Zone 2
Value 5: Barrel heating Zone 3

Acknowledgement:
Automatically when falling below the maximum temperature.

042 Mould heating: Maximum temperature

This error will occur if one of the mould heating zones (hot runners) exceeds the maximum temperature. The heater is switched off in case such an error occurs.

Possible cause:
Band heater defective.

Acknowledgement:
Automatically when falling below the maximum temperature.

043 Yoke temp.: Maximum temperature

This error will occur if the yoke heating exceeds the maximum temperature. The heater is switched off in case such an error occurs.

Possible cause:
Band heater defective.

Additional information:
Value 12: Barrel heating Zone 1
Value 13: Barrel heating Zone 2
Value 14: Barrel heating Zone 3
Value 15: Barrel heating Zone 4
Value 15: Barrel heating Zone 5

Acknowledgement:
Automatically when falling below the maximum temperature.
051   Barrel heating: Learning active

This error will occur if at least one of the barrel controlled systems is in the learning mode for the learning of the controlled parts.

Acknowledgement:
After the learning procedure has been terminated or by switching off the learning mode.

052   Mould heating: Learning active

This error will occur if at least one of the mould controlled systems is in the learning mode for the "Learning of the controlled parts".

Acknowledgement:
After the learning procedure has been terminated or by switching off the learning mode.

061   Barrel heating: Sensor breakage

This error will occur if one or more barrel heating zones signal a sensor breakage. The heater is switched off in case such an error occurs.

Acknowledgement:
After having Remedied the sensor breakage, switch off / on heating main switch.

062   Mould heating: Sensor breakage

This error will occur if one or more mould heating zones signal a sensor breakage. The heater is switched off in case such an error occurs.

Acknowledgement:
After having Remedied the sensor breakage, switch off / on heating main switch.

063   Yoke temperature: Sensor breakage

This error will occur if the yoke temperature zone (of injection unit A) signals a sensor breakage. The heater is switched off in case such an error occurs.

Acknowledgement:
After having Remedied the sensor breakage. Switch off / on heating main switch.

071   Barrel heating: Short-circuit

This error will occur if one or more barrel heating zones signal a short-circuit. The heater is switched off in case such an error occurs.

Acknowledgement:
Switch off / on heating main switch.

072   Mould heating: Short-circuit

This error will occur if one or more mould heating zones signal a short-circuit. The heater is switched off in case such an error occurs.

Additional information:
Value 20: Mould heating Zone 1
Value 21: Mould heating Zone 2
Value 22: Mould heating Zone 3
up to
Value 43: Mould heating Zone 24

Acknowledgement:
Switch off / on heating main switch.
073  **Yoke temperature: Short-circuit**

This error will occur if the yoke temperature zone signals a short-circuit. The heater is switched off in case such an error occurs.

**Acknowledgement:**
Switch off / on heating main switch.

082  **Hot runner: Starting control active**

This message will occur if the hot runner (mould heating) is in the starting control, i.e. the hot runner is heated up to the starting temperature at a reduced power rate.

**Acknowledgement:**
Automatically when reaching the starting temperature.

091  **Barrel heating: Set value error**

This error will occur if there is a difference in temperature between the set and the actual value of less than 70 °C / 126 °F in the learning mode.

**Acknowledgement:**
Increase set value.

092  **Mou. heat.: Set value error**

This error will occur if there is a difference in temperature between the set and the actual value of less than 70 °C / 126 °F in the learning mode of the mould heating.

**Acknowledgement:**
Increase set value.

121  **Oil temperature: + Tolerance**

This error will occur if the hydraulic oil exceeds the set maximum oil temperature of 60 °C / 140 °F (prewarning). The red error lamp is flashing. When reaching 65 °C / 149 °F, the motor will be switched off. To cool down, the motor can be started again (check cooling circuit).

**Acknowledgement:**
When reaching the appropriate oil temperature in the "Manual mode".

122  **Oil temperature: - Tolerance**

This error will occur if the hydraulic oil has not yet reached the set minimum oil temperature of 40 °C / 104 °F. All movements of the machine are disabled in case such an error occurs.

**Acknowledgement:**
Automatically when reaching the appropriate oil temperature.

123  **Oil temperature: Sensor breakage**

This error will occur if the oil level sensor signals a sensor breakage. The drive will be switched off in case such an error occurs.

**Acknowledgement:**
After having remedied the sensor breakage, switch off / on motor.
124 Oil temperature: Maximum temperature

This error will occur if the controlled system for the oil heating exceeds the maximum temperature of 70 °C / 158 °F. The drive will be switched off in case such an error occurs.

Acknowledgement:
Automatically when falling below the maximum temperature.

141 Switch cabinet temperature: too high

This error will occur if the switch cabinet temperature control is outside the set temperature tolerance of 60 °C / 140 °F. The drive will be switched off in case such an error occurs.

Acknowledgement:
Automatically when falling below the maximum temperature.

142 Switch cabinet temperature: Prewarning

This error will occur if the switch cabinet temperature control is outside the set prewarning range of 55 °C / 131 °F.

Acknowledgement:
Automatically when falling below the prewarning temperature.

145 Pressure monitoring Cooling water

This error will occur if the cooling water controller signals a falling water pressure for more than 5 seconds (to suppress short-term pressure variations). The active cycle will be terminated and the machine switches off.

The desired water pressure will be directly set at the cooling water controller.

Acknowledgement:
Change to the "Manual mode" and cooling water pressure ok.

150 Mould not closed

This error message will occur if the Tiebar pulling device program has been selected and the mould is not closed.

Acknowledgement:
The acknowledgement will be carried out automatically when reaching the Mould closed stroke marker.

151 Tiebar pulling active

This error message indicates that the Tiebar pulling device program has been selected.

Acknowledgement:
The acknowledgement will be carried out automatically if the program is either finished or deactivated.
152  Purge guard Tiebar opened

This error message will occur if the guard door of the tiebar pulling device is opened.

Acknowledgement:
The acknowledgement will be carried out automatically when closing the guard door.

153  Tiebar pulling not ready

This error message will occur if you exit the setting mode and the Tiebar pulling device program has not correctly been terminated.

Possible cause:
•  Tiebar pulling device is not in home position
•  Locking is latched
•  Moving platen unlatched
•  Unscrewing device fastened

Acknowledgement:
The acknowledgement will be carried out automatically when reaching the home position.

154  Limit switch monit. Tiebar pulling dev.

If this error message is displayed, the hydraulic drive will be switched off.

Possible cause:
Both limit switches are activated at once (strokes too short, Error Limit switches)

Acknowledgement:
Trouble-shooting and press "Hydraulics Stop" key.

155  Filling level Central grease lubrication

This error message will occur if the filling level either is too low or has been too low for a short time.

Acknowledgement:
Refill grease according to the specifications in the operating manual. The acknowledgement will be carried out automatically after trouble-shooting and pressing the "Hydraulics Stop" key.

156  Error Central grease lubrication

This error messages will occur if, during a lubricating interval, the switch for the pressure build-up does not switch within the set monitoring time or the grease level of the central lubrication is too low.

Additional information:
1  Pressure switch signal already available before the lubrication cycle started
2  Pressure build-up not within the pressure build-up time
3  Pressure switch did not change its status after the change over time (time between the lubrication cycles)

Acknowledgement:
Check storage tank of the central lubrication, check pressure switch. Start manual cycle.
157 Motor contactor Central grease lubrication

This error message will occur if the motor protection switch has been triggered.

Possible cause:
• Motor defective
• Incorrect motor protection switch setting

158 EMERGENCY STOP from external device

If this error message is displayed, the hydraulic drive will be switched off.

Possible cause:
• Emergency stop Robot activated
• Dummy plug Robot not available

Acknowledgement:
Automatically after trouble-shooting.

160 Motor contactor Gear oil motor

This error message will occur if the motor protection switch has been triggered.

Possible cause:
• Motor defective
• Incorrect motor protection switch setting

Acknowledgement:
The acknowledgement is carried out automatically after trouble-shooting.

161 Check gear oil pressure

This error message will occur if the gear oil pressure falls below the set pressure.

Possible cause:
• Gear oil motor defective
• Check gear oil level
• Pressure switch defective
• Pressure switch incorrectly set

Acknowledgement:
The acknowledgement is carried out automatically after trouble-shooting.

162 Error Fans Servo motor

This error message will occur if the motor protection switch has been triggered.

Possible cause:
• Motor defective
• Incorrect motor protection switch setting

Acknowledgement:
The acknowledgement is carried out automatically after trouble-shooting.

163 Error Fans Frequency converter

This error message will occur if the motor protection switch has been triggered.
Possible cause:
• Motor defective
• Incorrect motor protection switch setting

Acknowledgement:
The acknowledgement is carried out automatically after trouble-shooting.

164 Release Frequency converter is missing
This error message will occur if the frequency converter has not sent the release signal.

Possible cause:
• Voltage failure or parting of a cable at the frequency converter
• Check frequency converter

Acknowledgement:
The acknowledgement is carried out automatically after trouble-shooting.

175 Mould mounting height MF not reached
This error message will occur if, after the mould change, the current mould mounting height does not correspond to the value entered on the screen.

Trouble-shooting:
Enter the correct mould mounting height or use the mould mounting height adjustment to set the correct mould mounting height.

200 Mould not opened
This error occurs if the clamping unit is not opened when starting another movement.

Acknowledgement:
Move the clamping unit manually to the "Mould opened" position.

201 Ejector not back
This error occurs if the ejector is not moved back when starting another movement.

Acknowledgement:
Move the ejector manually to the "Ejector back" position.

202 Closing time outside tolerance
This error occurs when exceeding the given closing time and for an activated monitoring program. The drive is switched off. The set value and the monitoring program are to be found in the "Monitoring functions F11" menu.

203 Mould safety device has responded
This error will occur if a stopping of the clamping unit has been recognised from stroke marker Mould safety device "s2" onwards. The red error lamp is lit up.

Possible causes:
• Part stuck in the mould
• Mould defective
204 Filling time monitoring

This error occurs when exceeding a given filling time (injection time) and for an activated monitoring program. The drive is switched off. The set value and the monitoring program are to be found in the "Monitoring functions F11" menu.

205 Metering time monitoring

This error occurs when exceeding a given metering time and for an activated monitoring program. The drive is switched off. The set value and the monitoring program are to be found in the "Monitoring functions F11" menu.

206 Opening time monitoring

This error occurs when exceeding the given opening time and for an activated monitoring program. The drive is switched off. The set value and the monitoring program are to be found in the "Monitoring functions F11" menu.

207 1st EMERGENCY STOP triggered

This error occurs when pressing the "EMERGENCY STOP" key 1.

Acknowledgement:
Automatically, if the "EMERGENCY STOP" key is unlocked.

208 Front safety gate opened

The safety gate is opened. If this error message is displayed, all movements of the machine will be disabled.

Acknowledgement:
Close safety gate or check limit switches respectively.

209 Purge guard opened

The purge guard is not closed. If this error message is displayed, all movements of the machine will be disabled.

Acknowledgement:
Close purge guard or check limit switches respectively.

210 Purge guard Limit switch monitoring

When checking the limit switch positions, an error has been detected.

Possible causes:
• Limit switch defective,
• Cable breakage
211 Motor protection switch
This error message will occur if the motor protection switch has been triggered or switched off.

Possible causes:
- Motor defective
- Incorrect motor protection switch setting

212 Oil filter contaminated
This error will occur if the pressure switch at the backflow or pressure filter is triggered. The course of the machine program will not be influenced, only the contamination of the filter will be indicated.

Acknowledgement:
Clean or replace filter element.

213 Oil level undershot
This symbol indicates that the oil level either is too low or has been too low for a short time.

Acknowledgement:
Refill oil according to the specifications in the operating manual. The acknowledgement will be carried out automatically after trouble-shooting and pressing the "Machine Stop" key.

214 Cycle counter switch-off
This error message will be displayed if the preselected number of good parts has been reached and the "Cycle counter switch-off" program is active. The drive will switch off at the end of the cycle.

Acknowledgement:
Change over machine to the "Manual mode" and
- Enter number of good parts (F11:C2) again, or
- Reset parts counter (F11:N7), or
- Deactivate program (F01:N4)

215 Drive STOP
This error message will occur if the drive is not running.

216 Check all EMERGENCY STOP keys
This error message occurs when switching on the main switch of the machine.

Acknowledgement:
This error message will be reset when unlocking and pressing each "Emergency stop" key once if the emergency stop device is operational.

Additional information:
Bit 0, value 1: Check emergency stop 1
Bit 1, value 2: Check emergency stop 2
Bit 2, value 4: Check emergency stop 3
Bit 3, value 8: Check emergency stop 4
Bit 4, value 16: Check emergency stop 5

Example:
Additional information = 5 means that emergency stop 1 (value 1) and emergency stop 3 (value 4) have to be checked.
223  Cycle time monitoring

This error occurs when exceeding the given cycle time and for an activated monitoring program. The motor will be switched off. The set value and the monitoring program are to be found in the "Monitoring functions F11" menu.

224  Reject shot series

This error occurs when exceeding the given number for the "Reject shot series", i.e. it will be checked whether the set number for reject parts occurring in a row is reached (short-time process control). The set value and the monitoring program are to be found in the "Monitoring functions F11" menu.

229  Mould height Limit switch monitoring

Both limit switches of the mould height adjustment are being triggered. The drive is switched off.

Acknowledgement:
Check limit switch Minimum mould height and limit switch Maximum mould height. The acknowledgement is carried out automatically after trouble-shooting.

230  Minimum mould height reached

The minimum mould height has been reached. Further reductions of the mould height are not possible and will be disabled.

Acknowledgement:
Automatically after leaving the Minimum mould height limit switch.

231  Maximum mould height reached

The maximum mould height has been reached. Another increase in mould height is not possible and will be disabled.

Acknowledgement:
Automatically after leaving the limit switch Maximum mould height.

234  Metering time monitoring - material

This error will occur if the metering stroke has not been reached within the double cooling time.

If the metering stroke has not been reached within the set cooling time, the cooling time will be started a second time. If the shot volume has not yet been reached after the second time, the cycle will be run to the end. Then there will be a Motor Stop and this alarm will be displayed. If the metering stroke has been reached within the second cooling time, the cycle will be continued correctly.

236  Injection piston is not back

This error will occur if the injection piston is not in the "Injection piston is back" position (metered) when starting another movement. In case this error message is active, the automatic cycle will not be started.

Trouble-shooting:
Move the injection piston to the "Injection piston is back" position in the "Manual mode" (Metering).
237  Error Material conveyor

**Material conveyor Standard procedure:**
This error will occur if the monitoring time is exceeded from the start of the material output to reaching the limit switch. The material output will be switched off.

**Possible causes:**
- No material available
- No or a too low level of compressed air
- Material (wax) clots

**Acknowledgement:**
By switching off / on the material conveyor at the manual control panel.

239  Error Clamping force build-up

Will occur if the clamping force build-up has not been correctly performed within a set time (service). The clamping procedure will be stopped.

**Acknowledgement:**
Automatically when changing over to the manual mode, or after the clamping force build-up has been correctly performed.

**Possible causes:**
  a) Toggle machines:
     "Clamping force built up" limit switch defective or mould mounting height set too low
  b) Central hydraulic unit:
     Clamping force has not been reached

240  Core puller Limit switch monitoring

This error will occur if the limit switches for "Core puller is moved out" and "Core puller is moved in" of a core puller have been triggered at the same time. The motor will be switched off in case such an error occurs.

**Additional information:**
Bit 0, value 1: Core puller 1
Bit 1, value 2: Core puller 2
Bit 2, value 4: Core puller 3

**Example:**
Additional information = 5 means that an error is present at core puller 1 (value 1) and core puller 3 (value 4).

**Acknowledgement:**
Automatically after trouble-shooting.

242  Core puller locked

This error will occur if the start condition is not met when starting the respective core puller. The start condition depends on the set core puller program number.

**Additional information:**
The axis number of the respective core puller will be output as additional information. The core puller can be determined by entering this number on the "Axis status Page" ("Machine overview F13" menu, page 5/6).
243 Robot: Preselection not possible

This error will occur if a program setting has been selected which has not been defined. The possible program settings are described in chapter 15.

Acknowledgement:
Automatically after selecting a correct program setting.

244 Parts removal robot: Limit switch monitoring

This error will occur if the "Home position" and "Limit position" limit switches of an axis are triggered at the same time. In case this error occurs the motor will be switched off.

Trouble-shooting:
Check limit switch.

Acknowledgement:
Automatically after trouble-shooting.

245 Parts removal robot: Parts monitoring

This error will occur if the limit switch for the part monitoring signals not OK at the end of the "Time Parts clamping" (part has not been discharged). In case this error occurs the automatic cycle will be interrupted.

Acknowledgement:
Automatically after trouble-shooting.

246 Parts removal robot: No home position

This error will occur if the parts removal robot is not in the home position for "Start Close" (all axes have to be in the home position).

Trouble-shooting:
Move parts removal robot to home position.

247 Max. clamping force exceeded

This error will occur if the current clamping force exceeds the maximum clamping force 1.2 times during the injection procedure. The machine will be switched off at the end of the cycle.

Trouble-shooting:
In case of toggle machines, increase the mould mounting height. In case of a central hydraulic unit, increase the injection pressure.

248 Drive is locked

The drive is disabled by means of the key-operated switch at the manual control panel. This will prevent the motor from starting up.

249 LCH / LCL robot: No home position

This error will occur if the parts removal robot is not in the home position for "Start Close" (all axes have to be in the home position).

Acknowledgement:
Move robot to the home position.
250  Incorrect change over to holding pressure

This error message occurs in case a "stroke" or "pressure dependent" change over to holding pressure has been preselected; the control system, however, has changed over "time dependently" (change over point not reached within the "Monitoring time Change over to holding pressure"). After this message has occurred in the automatic mode, the started cycle will be terminated, the red error lamp is flashing and the current injection moulding will be considered as reject part. Then the control system switches off the machine.

Acknowledgement:
Change over machine to the "Manual mode".

252  Purging active

This error message will be active during the entire purging procedure.

254  Mould safety strokes reached

Will occur in the automatic mode if the number of mould safety strokes has been reached after several attempts to close the mould. The red error lamp is lit up and the machine remains in the home position.

Acknowledgement:
Automatically when changing over to the manual mode or after having triggered the "Cycle Start" (Close) key.

255  Barrel heating Stop Weekly time switch

If the weekly time switch (N1=1) is activated and the heating switch-off (N3=1) has been preselected, this error will be signalled until reaching the starting time and activating the barrel heating or the stop time switches off the barrel heating.

Acknowledgement:
Automatically if the barrel heating is activated or when switching off the weekly time switch or the heating switch-off (N3).

256  Mould heating Stop Weekly time switch

If the weekly time switch (N1=1) is activated and the heating switch-off (N3=1) has been preselected, this error will be signalled until reaching the starting time and activating the mould heating or the stop time switches off the barrel heating.

Acknowledgement:
Automatically if the mould heating is activated or when switching off the weekly time switch or the heating switch-off (N3).

257  Motor Stop Weekly time switch

If the weekly time switch (N1=1) is activated and the drive switch-off (N4=1) has been preselected, this error will be signalled until reaching the starting time and the drive starts.

Acknowledgement:
Automatically if the drive has been started or when switching off the weekly time switch or the drive switch-off (N4).
259  Mould not closed

This error will occur if the mould is not in the "Mould closed and high pressure built up" position when a movement starts (e.g. Nozzle forward).

Trouble-shooting:
Move the clamping unit to the "Mould closed and high pressure built up" position.

260  Only 1 robot program possible

This error message will occur if the "Robot Interface" and another "Parts removal robot" have been activated.

Acknowledgement:
Automatically after switching off one of the two programs.

261  Error Main drive Contactor

This error message will occur if the contactor of the main drive does not switch properly within a consistently set time.

Cause:
Contactor defective.

Trouble-shooting:
Replace contactor.

262  Check safety bar

This error message will be displayed after switching on the main switch. In case this error occurs all movements will be disabled.

Additional information:
Bit 0, value 1: Safety bar 1
Bit 1, value 2: Safety bar 2
Bit 2, value 4: Safety bar 3
Bit 3, value 8: Safety bar 4

Example:
Additional information = 5 means that an error is present at the safety bar 1 (value 1) and the safety bar 3 (value 4).

Acknowledgement:
The safety bar has to be triggered once. Only after this single triggering helping to check the safety bar will the error message be reset.

263  Service setting mode active

The service setting mode is only required for the commissioning of the machine and for reasons of service.

Caution
If this program is used to operate the machine, the machine may possibly be damaged.

Acknowledgement:
Switch off service setting mode.

267  Rinsing program active

Will occur (CDC only) when reaching the "Mould closed" point in the setting mode and if the key for "Close" is held down while the so-called "Rinsing program" (breathing of the clamping cylinder) will be activated for the clamping cylinder.

Acknowledgement:
Automatically if the key for "Close" is released.
268  Min. mould height undershot

The set stroke marker "Minimum mould mounting height" has been undershot, the closing movement switched off, another clamping procedure disabled. This switch-off is intended for the safety of the machine.

Acknowledgement:
Opening of the clamping unit followed by an inspection of the set stroke markers of the closing movement and the clamping profile.

269  Error Set time / data

This error will occur if the time or date format stated is invalid. Please contact the BATTENFELD customer service.

270  Compressed air too low

This error will occur if the compressed air supply has failed or if there is not enough pressure available.

Acknowledgement:
Automatically after reaching the set pressure level.

271  Safety bar triggered

This error will occur if the safety bar at the protecting cage has been triggered.

Additional information:
Bit 0, value 1: Safety bar 1
Bit 1, value 2: Safety bar 2
Bit 2, value 4: Safety bar 3
Bit 3, value 8: Safety bar 4

Example:
Additional information = 5 means that an error is present at safety bar 1 (value 1) and safety bar 3 (value 4).

Acknowledgement:
Automatically if the latter is no longer triggered.

273  Injection pressure Monitoring

This error will occur if the actual pressure value exceeds the permitted maximum set pressure value during the injection procedure.

Depending on the program preselection, either the machine will be switched off for "Cycle End" or the parts of the cycle will be considered as reject parts.

Possible causes:
• Pressure control curve is set too low
• if this is not possible (already set to maximum), check the injection speed
• Viscosity of the material

275  Delay Release-Tolerance Cylinder

After the first heating procedure, the injection cylinder will only be enabled at the end of an inchangeably set time (300 s).

Acknowledgement:
Automatically after reaching the delay time.
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Note:
This delay will only become effective for micromelt injection units (50).

Explanation:
To guarantee an optimum homogeneous heating of the material, the release of the injection piston is delayed.

280 Error Hydraulic safety valve

The hydraulic safety valve will have to switch correctly within a consistently set time, if the safety gate is opened or closed. If this is not the case, the drive will be switched off.

Acknowledgement:
Automatically by opening / closing the safety gate and switching the safety valve properly.

281 Drop-out preventer / Check weigher

Will be displayed if the "Drop-out preventer / Check weigher" program is activated, unless the injection moulding breaks through the photoelectric barrier during change over time. In addition, the photoelectric barrier has to be enabled again during the injection procedure. If this is not the case, this error message will also be output.

This error message is also used in combination with the check weigher.

Possible causes:
• Change over time is set too short
• Photoelectric barrier defective
• Too many parts in the drop-out shaft

Acknowledgement:
Automatically when changing over to the manual mode.

282 Mould has been injected on

Will occur if the mould has been opened during the injection procedure.

Possible causes:
• Too little or no clamping force
• Zerorising Clamping unit carried out unsatisfactorily

Acknowledgement:
Automatically when changing over to the manual mode.

284 Colour metering unit Error no.:

Will occur for an error of the colour metering unit.

Additional information:
Value 1: Error
Value 2: Material level

285 Transport system Error no.:

Will occur for an error of the transport system.

Additional information:
Value 1: Not in operation
Value 2: Motor contactor

287 Locking not moved out

This error will occur if the "Locking cylinders not in unlocking position" proximity switches are not triggered during opening or closing.
Possible cause:
Proximity switch defective.

Measure:
Check proximity switches.

The lockings are indeed not in the proper position.

Measure:
Move out lockings in the setting mode.

Acknowledgement:
Automatically when reaching the proper proximity switch status.

288 Lockings not moved in

This error will occur if the "Lockings not in locking position" proximity switches are not triggered during high pressure build-up.

Possible cause:
Proximity switch defective.

Measure:
Check proximity switches.
The lockings are indeed not in the proper position.

Measure:
Move in lockings in the setting mode.

Acknowledgement:
Automatically when reaching the proper proximity switch status.

289 Pressure box not in position

This error will occur if the pressure box (es) is (are) not in the proper position when moving in / out the lockings.

Acknowledgement:
Automatically when reaching the proper pressure box position.

290 Position monitoring Differential valve

This error will occur if the differential valve for triggering two pressure boxes has not switched properly.

Possible cause:
Defective valve.

Measure:
Check valve.

Acknowledgement:
Automatically for a properly switched valve.

291 Mould height exceeds max. mould height

This error will occur if a mould height is determined by means of the automatic mould height calculation, which is larger than the max. mould height permitted for this machine.

Possible cause:
Mould too large.

Acknowledgement:
Automatically when restarting the mould height calculation.
292 Maintenance door 1 open

This error message will occur if maintenance door 1 has been opened. The drive is switched off.

Acknowledgement:
Automatically after closing the maintenance door.

293 Maintenance door 2 open

Refer to error message 292

294 Maintenance door 3 open

Refer to error message 292

295 Maintenance door Switch monitoring

This error message will occur if an incorrect position of the limit switch / contactor relay has been recognised during the opening / or closing cycle. The drive may not be started.

Acknowledgement:
Check limit switch and limit switch fixing. The acknowledgement will be carried out automatically if the limit switch position is correct.

Additional information:
Bit 0, value 1: Error maintenance door 1 during closing cycle
Bit 1, value 2: Error maintenance door 2 during closing cycle
Bit 2, value 4: Error maintenance door 3 during closing cycle
Bit 3, value 8: Error maintenance door 1 during opening cycle
Bit 4, value 16: Error maintenance door 2 during opening cycle
Bit 5, value 32: Error maintenance door 3 during opening cycle

Example:
Additional information = 5 means that an "Error Maintenance door 1 during closing cycle" (value 1) and an "Error Maintenance door 3 during closing cycle" (value 4) is present.

298 Mechanical clamping safety device

This error message will become active if the mechanical clamping safety device does not move to the proper position within a certain time.

Additional information:
Bit 0, value 1: Error when locking
Bit 1, value 2: Error when unlocking

Acknowledgement:
The acknowledgement will be carried out automatically if the clamping safety device has moved to the proper position.

299 Hydraulic safety device

This error message will become active if the hydraulic safety device has not moved to the proper position within a certain time. The drive is switched off.
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**Additional information:**
Bit 0, value 1: Error when closing the safety valve
Bit 1, value 2: Error when opening the safety valve

**Acknowledgement:**
By pressing the "Stop" or "Start" key.

**300 Init error Core puller programs**

Please contact the BATTENFELD customer service.

**Note:**
An error has occurred during core puller data module interpretation.

**Additional information:**
Value = Group x 100 + Program
Value 60000: Incorrect program or set number
Value 60001: Axis does not exist

**301 Overflow Core puller programs**

Please contact the BATTENFELD customer service.

**Note:**
An error has occurred during core puller data interpretation.

**Additional information:**
Value 1: Too many intermediate stops per axis
Value 2: Too many "before"-type programs per axis
Value 3: Too many "after"-type programs per axis
Value 4: Too many "parallel"-type programs per axis
Value 5: Too many "serial with parallel handling"-type programs per axis
Value 10: Error Start condition
Value 11: Wrong bit number
Value 12: Too many monitoring functions per axis
Value 13: Too many external monitoring functions per axis
Value 14: Program number does not exist (data module entry is missing)
Value 15: Wrong locking condition
Value 16: Monitoring variable not found
Value 17: Program number not possible
Value 18: Too many program lines

**302 Monitoring Core puller program**

This error will occur if the core puller is not in the appropriate limit position when starting another movement and, as a consequence, the movement will be disabled.

**Additional information:**
Is the axis number of the core puller. The core puller can be determined by entering this axis number on the Axis Diagnosis Page.

**Example:**
Enter axis number 11 on the "Axis Diagnosis Page", indication "CP1", i.e. Core puller 1.

**Acknowledgement:**
Move core puller to limit position.
303  **Ejector chute opened**

This error will occur if the safety gate at the ejector chute is opened. The ejector movement is disabled.

**Acknowledgement:**
Automatically if the safety gate at the ejector chute is closed.

304  **Check safety gate in front position**

This error message will be displayed after switching on the main switch. In case this error occurs all movements will be disabled.

**Acknowledgement:**
The safety gate has to be opened and closed correctly once. Only after this single triggering helping to check the safety gate limit switches will the error message be reset.

The starting of this drive will only be enabled if the check has been carried out properly.

305  **Safety gate in front position Monitoring**

This error message will occur if the safety gate limit switches signal an error.

**Possible cause:**
Limit switch defective.

306  **Safety gate 2 Monitoring**

Refer to error message 305

307  **Safety gate monitoring Contactor relays**

This error message will occur if the contactor relays do not switch properly within a consistently set time.

**Possible cause:**
Contactor relay defective

308  **Stroke calibration not possible**

This error will occur if either the entries during the calibration procedure are identical, or if the newly calculated gain is not within the valid range. The calibration procedure has been aborted, the values have not been accepted.

**Acknowledgement:**
Automatically after successful calibration or after the main switch has been switched Off / On.

310  **Error EMERGENCY STOP**

Will occur if the switch position of the two EMERGENCY STOP contactor relays does not correspond to the electrical activation.

**Acknowledgement:**
By pressing the "Stop" key.

311  **2nd EMERGENCY STOP triggered**

Refer to error message 207
312 3rd EMERGENCY STOP triggered
Referring to error message 207

313 4th EMERGENCY STOP triggered
Referring to error message 207

316 Tolerance QT column 1
This error will occur if the respective column in the quality table signals that a tolerance has been exceeded. An evaluation for the reject parts will only be active if the program "Evaluation active" is switched on.

317 Tolerance QT column 2
Referring to error message 316

318 Tolerance QT column 3
Referring to error message 316

319 Tolerance QT column 4
Referring to error message 316

323 Oil level Central lubrication
This error message will be displayed if the oil level of the central lubrication is too low or if the oil level has been undershot for a short time. The clamping unit movements are disabled.

Acknowledgement:
Refill oil.

324 Error Central lubrication
This error message will occur if, during a lubricating interval, the switch for the pressure build-up does not switch within the set time limit or the oil level of the central lubrication is too low.

Additional information:
Value 1: Pressure switch signal already available before the lubrication cycle started.
Value 2: Pressure build-up not within the pressure build-up time (service).
Value 3: Pressure switch did not change its status after the change over time (time between the lubrication cycles).

Acknowledgement:
Check storage tank of the central lubrication, check pressure switch. Start manual lubrication cycle.

325 Check purge guard
This error message will occur after new main switch "Switching on the machine".

Acknowledgement:
The safety gate has to be opened and closed correctly once. Only after this single triggering helping to check the safety gate limit switches will the error message be reset.

The starting of this drive will only be enabled if the check has been carried out properly.
339  Check rear safety gate
339  Check safety gate 2

Refer to error message 304.

340  Rear safety gate opened
340  Safety gate 2 opened

Refer to error message 208.

350  Light curtain interrupted

Will occur if the light curtain has been interrupted at some point.

Additional information:
Bit 0, value 1: Light curtain 1
Bit 1, value 2: Light curtain 2
Bit 2, value 4: Light curtain 3

Example:
Additional information = 3 means that the light curtain 1 (value 1) and light curtain 2 (value 2) are interrupted.

Trouble-shooting:
By pressing "Cycle Start" or "Motor Start".

351  Core puller without lockings

This message will be displayed if the program preselection "Key mode without lockings (setting mode)" has been activated. Now there are no lockings active for the core puller.

357  Stop valve Pump closed

This error message will be displayed if the stop valve of the pump is not opened. In this case, the hydraulics may not be switched on.

Acknowledgement:
After opening the stop valve.

358  Stop valve Tank line closed

This error message will be displayed if the stop valve of the tank line is not opened. In this case, the hydraulics may not be switched on.

Acknowledgement:
After opening the stop valve.

359  Stop valve injection unit closed

This error message will be displayed if the stop valve of the injection unit is not opened. In this case, the hydraulics may not be switched on.

Acknowledgement:
After opening the stop valve.

367  Valve Lin. injection active

Will occur if the automatic valve linearisation has been activated.
**368 Maintenance door 4 open**
Refer to error message 292

**369 Maintenance door 5 open**
Refer to error message 292

**370 Maintenance door 6 open**
Refer to error message 292

**371 Ejector plate protection**
This error will occur if the ejector has reached its "Ejector back" position and the limit switch for the ejector plate protection has not been triggered.

**Possible causes:**
- Zerorising Ejector not correct
- Limit switch for ejector plate protection

**Acknowledgement:**
Automatically after the limit switch has been triggered.

**372 Airmould Error no.:**
The additional information displayed in this alarm message will be decoded as explained below.

**Additional information:**
Value 1: Release by the Airmould unit for opening the mould is missing
Value 2: Release by the Airmould unit for injection is missing

**Acknowledgement:**
Automatically, if the release signals from the Airmould unit are available.

**373 Init error FLEX I/O**
Please contact the BATTENFELD customer service.

**374 Motor contactor Filter cooling**
This error message will occur if the motor protection switch of the partial flow filtering has been triggered.

**375 Motor contactor Separate fan 1**
This error message will occur if the motor protection switch of the separate fan has been triggered.

**376 Motor contactor Separate fan 2**
Refer to error message 375

**378 Temperature relay Hydr. Motor**
This error message will occur if the PTC thermistor monitoring of the drive has triggered.
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Possible causes:
Overload of the drive.

Acknowledgement:
By pressing the "Drive Stop" key when the error is no longer present.

381  Suction filter 1 contaminated
This error will occur if the vacuum switch at suction filter 1 is triggered. The motor will be switched off in case such an error occurs.

Acknowledgement:
Automatically after the filter element has been replaced.

382  Suction filter 2 contaminated
Refer to error message 381

383  Change operating filter
This error will occur if the pressure switch at the high pressure filter is triggered. The program procedure of the machine will not be influenced, only the contamination of the high pressure filter will be indicated.

Acknowledgement:
Automatically after the filter element has been replaced.

384  Injection unit in service position
This error message will occur if, in the screw change program (F01:N9), the injection unit has been moved backward until exceeding the maximum stroke and if there are attempts to move the injection piston backward.

Acknowledgement:
Automatically after the filter element has been replaced.

385  Injection piston is not in front position
This error message will occur if the injection unit is to be moved entirely back via the screw change program (F01:N9) and the injection piston is not in front position.

Acknowledgement:
Automatically if the injection piston is in front position and there are again attempts to move the injection unit entirely backwards using the screw change program.

390  Stop valve Filtering pump closed
This error message will be displayed if the stop valve of the filter pump is not opened.

Acknowledgement:
After opening the stop valve.
391  Read error CAN1 node ->
The machine will be switched off immediately if this error occurs.
Please contact the BATTENFELD customer service.

392  Read error CAN2 node ->
Refer to error message 391

393  Read error CAN3 node ->
Refer to error message 391

394  Read error CAN4 node ->
Refer to error message 391

395  Read error CAN5 node ->
Refer to error message 391

396  Read error CAN6 node ->
Refer to error message 391

397  Read error CAN7 node ->
Refer to error message 391

398  Read error CAN8 node ->
Refer to error message 391

399  Read error CAN9 node ->
Refer to error message 391

400  Error during the memory allocation
Please contact the BATTENFELD customer service.

Further information may be gained from MEMSTATUS and MEM_ERR_STR variables in the Task 'err_new1'.

Additional information:
Digits 0 and 1: Axis number, task function
00 maintask, main_cp, main_clc, ex_128, etc.
01..80 Axis number for axis tasks (for get_axis-errors 0 will possibly be entered for axis tasks (if get_axis does not return an axis number))
81..90 Pump tasks
91..94 Reserve
95 act/ass Tasks
96 Heating system
97 Option tasks
98 QT, AG, EC ...
99 pan_clc, vwd_clc
Digit 2: Task type
1 clc-task
2 con-task
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3  org-task
4  other axis tasks (e.g. hp_xcon, cu_pof1...) 
5  General tasks

Digits 3 and 4: Consecutive number (starting with 1) (e.g. for the fault diagnosis for several memory allocations in the same INIT-UP).

For each error type, the consecutive numbers start with 1 (in case there are, for example, several IO errors and several MEM errors, the consecutive numbers start for IO errors as well as for MEM errors with 0).

**Example:**
Er_[402] = 01302 -> Error during memory allocation (Error 402), axis con -task assigned number 2, first place within the task where this error may occur (is to be directly retrieved from the source code).

401 Error when reading from the data module

Please contact the BATTENFELD customer service.

**Additional information:**
Refer to error 400.

402 Data module not found

Please contact the BATTENFELD customer service.

**Additional information:**
Refer to error 400.

403 Buffer battery empty

Please contact the BATTENFELD customer service.

When replacing the buffer battery, make sure that the control system is still supplied with power during that time to avoid possible data losses.

404 NET2000 error by RPS

Please contact the BATTENFELD customer service.

**Additional information:**
20000: No NET2000 manager installed
20001: Error in the linear comparison- GetOV
   Note: The actual length of the PV will be compared to the length contained in "pvlist"
20002: Object does not exist in the target station
20003: Communication error
20004: NET2000-Manager cannot be started./ Net2000.station is not defined
20005: Too many PVs/FUB (max. PV number/ FUB = 6)
20100: SPSSW version < V1.22 - Burn bugfix
   V1.22 or larger
20101: NET2000 configuration modification requires a new NET2000 administration memory configuration -Carry out Total INIT
20102: Physical medium is not supported - Check value of NET2000. medium.
20103: Interface number not supported by hardware - Check value of NET2000.interface.
20104: No connection module to the driver (CAN, Ethernet..) found - Program NET2000 driver connection module
20105: CAN initialisation error - Check values of NET2000.CAN.*
20106: No memory available
20107: Hardware is not supported
20108: Error during task class treatment - Check value of NET2000.task_class
20109: Configuration redundancy device and .interface, .medium defined
20110: Invalid device description string - Check string
20111: Device does not exist or no driver loaded - Check string, load frame base driver
20112: Invalid mode description string - Check string
20120: NET2000 management destroyed
20121: NET2000 management destroyed
20122: Error from the NET2000 event manager
20123: No L2 buffer
20124: Error from the CAN driver
20125: No L2 buffer
20126: L2 buffer error
20127: Error when transmitting a frame
20128: Initialisation error
20129: Frame length monitoring
20130: Initialisation error of the standard serial layer
20131: Error from the NET2000 buffer management
20132: Error from the NET2000 buffer management
20133: Error from the NET2000 buffer management
20134: Error from the initialisation of the network management
20135: Error when copying PV

405 Error CAN - communication

Please contact the BATTENFELD customer service.

406 System alarm 406

Please contact the BATTENFELD customer service.

407 System alarm 407

Please contact the BATTENFELD customer service.

408 System alarm 408

Please contact the BATTENFELD customer service.

409 System alarm 409

Please contact the BATTENFELD customer service.

410 System alarm 410

Please contact the BATTENFELD customer service.
414  Belt conveyor not connected

This error will occur if no belt conveyor has been recognised at the belt conveyor interface.

**Cause:**
Belt conveyor not connected or interface signals not compatible.

415  PVC fan error

This error message will occur if the motor protection switch has been triggered or switched off. The automatic cycle will be stopped for Cycle End.

**Caution**
The screw barrel will not be cooled.

**Possible causes:**
- One of the PVC fans defective
- Incorrect motor protection switch setting

416  Close valve-Y0->S134

This error will occur if the position of the electronically monitored valve "Y0 - Close, S 134", does not correspond to the electrical activation within the inchangeably set times.

**Acknowledgement:**
Checking of the hydraulic valve circuit, electrical wiring of the valve, limit switch monitoring included.

417  Open valve-Y0->S234

This error will occur if the position of the electronically monitored valve "Y0 - Open, S 234", does not correspond to the electrical activation within the inchangeably set times.

**Acknowledgement:**
Checking of the hydraulic valve circuit, electrical wiring of the valve, limit switch monitoring included.

418  Close valve-Y293->Y1->S34

This error will occur if the position of the electronically monitored valve "Y1 - Close / Open, S 34," does not correspond to the electrical activation within the inchangeably set times. To be able to switch the Y1 "Close / Open" valve through, the hydraulic safety valve Y 293 must also be activated for the clamping procedure.

**Acknowledgement:**
Checking of the hydraulic valve circuit, electrical wiring of the valve, limit switch monitoring included.

419  Open valve-Y0->Y1->S34

This error will occur if the position of the electronically monitored valve "Y1 - Close / Open, S 34," does not correspond to the electrical activation within the inchangeably set times. To be able to switch through the "Y1 - Close / Open" valve, the hydraulic control valve has also to be activated for the opening procedure. The triggering of the hydraulic safety valve Y293 is not relevant for the opening procedure.
Acknowledgement:
Checking of the hydraulic valve circuit, electrical wiring of the valve, limit switch monitoring included.

421 Safety gate 2 opened
Refer to error message 208

422 Nozzle contact point lost
This error will occur if the injection unit has lost the nozzle contact point during the injection procedure. The injection procedure will be stopped.

Possible causes:
• Nozzle contact point set too small
• Frozen sprue channel (Hot runner not switched on)

Acknowledgement:
Automatically when changing over to the manual mode.

423 Mech. cl. saf. dev. Y55->S615 (L)
This error will occur if the position of the clamping safety cylinder (left) does not correspond to the valve control within the inchangeably set times.

Acknowledgement:
Check pneumatic valve circuit, electrical wiring of the valve including limit switch monitoring at the clamping cylinder.

Note
The mechanical clamping safety device will lock if one of the following conditions is met:
• Main drive switched off
• Purge guard opened
• Safety gate opened
• Light curtain interrupted
• Emergency stop triggered

During the mould opening, the mechanical clamping safety device unlocks.

424 Mech. clamp. saf. dev. Y55->S616 (R)
This error will occur if the position of the clamping safety cylinder (right) does not correspond to the valve control within the inchangeably set times.

Acknowledgement and note:
Refer to error message 423.

425 Injection unit No limit position
This error will occur if the rear limit position of the injection unit has not been reached and one of the Close, Open, Turn rotary table movements is to be started.

Acknowledgement:
Move the injection unit manually to the rear limit position.
Error messages F20

426 Nozzle contact point not reached

This error will occur if the injection unit has not reached the nozzle contact point for Start Injection.

Acknowledgement:
Move the clamping unit manually to the "Nozzle contact point" position.

427 Contactor relay mon. Inj. unit

This error message will occur if the contactor relays of the purge guard do not switch properly within a consistently set time.

Possible cause:
Contactor relay defective.

428 Contactor relay mon. Clamp. unit

This error message will occur if the contactor relays of the purge guard do not switch properly within a consistently set time.

Possible cause:
Contactor relay defective.

429 Check safety gate 2

Refer to error message 304

437 Error Clamp. unit Intermediate stop

This error message will occur if the intermediate stop position is outside the movement profile. The movement is not started.

Verification:
Inspection of the intermediate stop positions (Start stroke Core puller, Intermediate stop stroke Robot).

Acknowledgement:
Automatically after correcting the intermediate stop position and starting the movement again.

438 Error Ejector Intermediate stop

Refer to error message 437

439 Error Injection unit Intermediate stop

Refer to error message 437

440 Error Injection pis. Intermediate stop

Refer to error message 437

445 Circular disc not in position

This error occurs if the circular disc has neither reached a right nor a left limit position for "Start Close", and the "Release Turning mould" (+24 V DC) by the interface is not available.

Acknowledgement:
Move the clamping unit manually to the "Nozzle contact point" position.
446  Shut-off valve Charge pump closed

This error will occur if the stop valve between the hydraulic pump of the accumulator hydraulic system and the hydraulic tank is not opened. The hydraulic motor is switched off.

Acknowledgement:
Open the stop valve and lock and unlock the Emergency Stop hit button or press "Hydraulics off"

448  Motor contactor Vacuum pump

This error message will occur if the motor protection switch has been triggered or switched off. The automatic cycle will be stopped for Cycle End and the main drive will be switched off.

Possible causes:
• Motor defective
• Incorrect motor protection switch setting

449  Motor contactor Switch cabinet cool.

This error message will occur if the motor protection switch has been triggered or switched off. The automatic cycle will be stopped for Cycle End and the main drive will be switched off.

Possible causes:
• Air conditioning unit defective
• Incorrect motor protection switch setting

450  Node number already exists!

When programming the node number, it has been discovered that the node number already exists. Please enter the number of a vacant node.

Please contact the BATTENFELD customer service.

451  Object data not ok, node no:

When checking the CAN OPEN stations, it has been discovered that the object data does not correspond to the data specified. There will be attempts to program the data to the appropriate parameters.

Please contact the BATTENFELD customer service.

452  Object data not ok, node no:

Refer to error message 451

453  Object data not ok, node no:

Refer to error message 451

454  Object data not ok, node no:

Refer to error message 451

455  Object data not ok, node no:

Refer to error message 451
456  Object data not ok, node no:
Refer to error message 451

457  Error Node no. Programming
Refer to error message 451

458  Mapping not correct
The mapping of the CAN OPEN station does not correspond to the data specified.
Please contact the BATTENFELD customer service.

459  Program node number?
Request whether the node number entered is to be programmed. Acknowledge the programming on the CAN OPEN page with "Program node number".
Please contact the BATTENFELD customer service.

460  Parts monitoring
This error message will occur if the signal for parts monitoring is not available. Turn rotary table will be disabled.

Acknowledgement:
Automatically if the signal for parts monitoring is present.

461  Material monitoring
This error message will occur if the "Material monitoring Time" of the injection unit has been exceeded.
The machine will be stopped for Cycle End.

Acknowledgement:
Automatically after the set number of injection strokes has been injected.

462  BDE Timeout Control command
This error message will occur if the transmission of orders or data records in connection with the host computer leads to a timeout or has failed.

Possible cause:
Problems arising from the network, the host computer or the network connection.

Acknowledgement:
Automatically after 10 sec.

Additional information:
Value 1: For Load order
Value 2: For Finish order
Value 3: For Save data record
Value 4: For Load data record
463 BDE transmission status
This error message will occur if the transmission of orders or data records in connection with the host computer has failed.

Possible cause:
Problems arising from the network, the host computer or the network connection.

Acknowledgement:
Automatically after 10 sec.

Additional information:
Value 1: Invalid control command
Value 2: Transmission error
Value 3: Order not available
Value 4: Order blocked
Value 5: No current order
Value 6: Data record available
Value 7: Data record not available
Value 8: Data record blocked
Value 97: Timeout NET2000 driver
Value 98: Timeout VIS Control command
Value 99: Timeout BDE Control command
>2000: Error when dealing with the temp. data record in the RPS (please refer to the burtrap-lib documentation)

464 BDE parameter is missing
This error message will occur if the parameters required have not been entered when loading or finishing orders or when loading or saving data records on the host computer.

Acknowledgement:
Automatically after 10 sec.

Additional information:
Value 101: Order number or staff ID is missing (for Loading or Finishing orders)
Value 102: Data record name or staff ID is missing (for Loading or saving data records in connection with the host computer)

466 Bypass filtration unit not ok
This error message will occur if the filter is contaminated. The course of the machine program will not be influenced, only the contamination of the filter will be indicated.

Acknowledgement:
Automatically after the filter element has been replaced.

467 Nozzle contact pressure not reached
This error message will occur if the nozzle unit has approached the nozzle contact point and the preselected nozzle contact pressure has not been reached within 5 sec.
**Possible cause:**
Check pressure setting Hydraulic pump.

**Acknowledgement:**
Automatically when reaching the nozzle contact pressure.

**470 Safety mat activated**
This error message will occur when stepping on the safety mat or if the monitoring inputs do not switch properly within a consistently set time.

**Possible cause:**
Check monitoring inputs.

**Acknowledgement:**
Automatically after trouble-shooting.

**471 Check SG clamping latch**
This error message will occur if the monitoring relay and the monitoring inputs do not switch properly within a consistently set time.

**Possible cause:**
• Check monitoring relay
• Check monitoring inputs

**Acknowledgement:**
Automatically after trouble-shooting.

**472 Error MOOG valve**
If this error message is displayed, the hydraulic drive will be switched off.

**Possible cause:**
• Check monitoring relay
• Check monitoring inputs
• Check Moog valves

**Acknowledgement:**
Automatically after trouble-shooting.

**473 Fail-Safe Valve Ejec. Cores**
If this error message is displayed, the hydraulic drive will be switched off.

**Possible cause:**
The monitoring relay and the monitoring input do not switch properly within a consistently set time.

• Check monitoring relay
• Check monitoring input

**Acknowledgement:**
Automatically after trouble-shooting.

**474 Monit. Safety relay SG**
This error message will occur, if, for the Movement for opened purge guard function, the relay and the input do not switch properly for a consistently set time.
Possible cause:
- Check monitoring relay
- Check monitoring input

Acknowledgement:
Automatically after trouble-shooting.

475 Relay Release Pressure box

This error message will occur, if, for the Position pressure box during Robot Parts removal function, the relay does not switch properly within a consistently set time.

Possible cause:
- Check relay
- Check monitoring input

Acknowledgement:
Automatically after trouble-shooting.

476 Check Limit switch Locking

If this error message is displayed, the hydraulic drive will be switched off.

Possible cause:
Both limit switches are activated at once (strokes too short, Error Limit switches).

Acknowledgement:
Trouble-shooting and press "Machine Stop" key.

477 Check Fuse Motor heating

This error message will occur if the motor protection switch has been triggered.

Possible cause:
- Motor defective
- Incorrect motor protection switch setting

478 Safety gate stop opened

In case this error occurs all movements of the clamping unit will be disabled.

Possible causes:
- Safety gate bar opened
- Limit switch defective
- Check relay

Acknowledgement:
Automatically after trouble-shooting and closing the safety gate.

479 Monitoring Acknowledgement key

In case this error occurs all movements of the clamping unit will be stopped.

Possible cause:
- Acknowledgement key defective or acknowledgement key held down during closing movement.
Other error messages

In case of system error message, the control system directly overlays an error message on the display.

<table>
<thead>
<tr>
<th>Error: Data handling:</th>
<th>PLC Setup:</th>
<th>Reset B2:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disk write protected</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Acknowledgement:
Press any function key to directly select a menu (e.g. F17).

Error:

Data handling:
No disk in floppy-drive
23002

No disk in floppy-drive or disk not properly inserted.

Disk write protected
0

Disk is write protected.