

SIEMENS



SINAMICS BOP-2

SINAMICS G120

Basic Operator Panel 2

Operating Instructions

Edition

02/2016

Answers for industry.

SIEMENS

SINAMICS BOP-2

SINAMICS G Basic Operator Panel 2 (BOP-2)

Operating Instructions

<u>Changes in this manual</u>	1
<u>Fundamental safety instructions</u>	2
<u>Safety notes</u>	3
<u>Overview</u>	4
<u>Installation</u>	5
<u>Monitoring</u>	6
<u>Control</u>	7
<u>Diagnostics</u>	8
<u>Parameters</u>	9
<u>Setup</u>	10
<u>Extras</u>	11
<u>Technical data</u>	12

Edition 02/2016

02/2016

A5E37143404B AA

Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

 DANGER
indicates that death or severe personal injury will result if proper precautions are not taken.
 WARNING
indicates that death or severe personal injury may result if proper precautions are not taken.
 CAUTION
indicates that minor personal injury can result if proper precautions are not taken.
NOTICE
indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

 WARNING
Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks

All names identified by ® are registered trademarks of Siemens AG. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

Table of contents

1	Changes in this manual.....	7
2	Fundamental safety instructions	9
2.1	General safety instructions	9
2.2	Industrial security	10
3	Safety notes.....	11
4	Overview.....	13
5	Installation	19
6	Monitoring.....	21
7	Control.....	23
8	Diagnostics	27
9	Parameters	33
10	Setup	37
11	Extras	43
12	Technical data	49
	Index.....	51

Changes in this manual

Important changes with respect to the Manual, Edition 02/2016

Listed below are all the changes that have been implemented in this manual.

The BOP-2 commissioning process

- The commissioning process has been significantly enhanced to provide a more efficient and adaptable commissioning experience. A detailed explanation of the new commissioning process can be found at the following link:

-  New commissioning process
(<https://support.industry.siemens.com/cs/ww/en/view/109480663>)

Safety Notes

- The Warning notification and been upgraded to a Danger notification:
 Safety notes (Page 11)

Overview

- List of compatible products has been updated:
 Overview (Page 13)
- Menu structure has been updated with the new commissioning process:
 Overview (Page 13)

Setup Menu

- SINAMICS G120 firmware update information included with links to the Siemens Industry Online Support site giving detailed information to the nature and extent of the firmware changes.
- New standard commissioning process is explained.
 Setup (Page 37)

Fundamental safety instructions

2.1 General safety instructions

 WARNING
Danger to life if the safety instructions and residual risks are not observed If the safety instructions and residual risks in the associated hardware documentation are not observed, accidents involving severe injuries or death can occur. <ul style="list-style-type: none">• Observe the safety instructions given in the hardware documentation.• Consider the residual risks for the risk evaluation.

 WARNING
Danger to life or malfunctions of the machine as a result of incorrect or changed parameterization As a result of incorrect or changed parameterization, machines can malfunction, which in turn can lead to injuries or death. <ul style="list-style-type: none">• Protect the parameterization (parameter assignments) against unauthorized access.• Respond to possible malfunctions by applying suitable measures (e.g. EMERGENCY STOP or EMERGENCY OFF).

2.2 Industrial security

Note

Industrial security

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, solutions, machines, equipment and/or networks. They are important components in a holistic industrial security concept. With this in mind, Siemens' products and solutions undergo continuous development. Siemens recommends strongly that you regularly check for product updates.

For the secure operation of Siemens products and solutions, it is necessary to take suitable preventive action (e.g. cell protection concept) and integrate each component into a holistic, state-of-the-art industrial security concept. Third-party products that may be in use should also be considered. For more information about industrial security, visit this address (<http://www.siemens.com/industrialsecurity>).

To stay informed about product updates as they occur, sign up for a product-specific newsletter. For more information, visit this address (<http://support.automation.siemens.com>).

WARNING

Danger as a result of unsafe operating states resulting from software manipulation

Software manipulation (e.g. by viruses, Trojan horses, malware, worms) can cause unsafe operating states to develop in your installation which can result in death, severe injuries and/or material damage.

- Keep the software up to date.
You will find relevant information and newsletters at this address (<http://support.automation.siemens.com>).
- Incorporate the automation and drive components into a holistic, state-of-the-art industrial security concept for the installation or machine.
You will find further information at this address (<http://www.siemens.com/industrialsecurity>).
- Make sure that you include all installed products into the holistic industrial security concept.

WARNING

Danger to life due to software manipulation when using exchangeable storage media

Storing files onto exchangeable storage media amounts to an increased risk of infection, e.g. with viruses and malware. As a result of incorrect parameterization, machines can malfunction, which in turn can lead to injuries or death.

- Protect files stored on exchangeable storage media from malicious software by taking suitable protection measures, e.g. virus scanners.

Safety notes

Warnings and cautions

 DANGER
Ensuring a safe and stable state During commissioning of the Inverter, it is essential to ensure that the system is in a safe and stable state, as some commissioning processes have the potential to start the motor. Therefore it is important to secure any loads and ensure that should the motor start, no potentially dangerous conditions exist.
NOTICE
Fitting and removal of the Operator Panel The BOP-2 can be fitted to and removed from the inverter while power is applied.

Overview

Introduction

The Basic Operator Panel 2 (BOP-2) has been designed to enhance the interface and communications capabilities of SINAMICS Inverters.

The BOP-2 connects to the Inverter through an RS232 interface. The BOP-2 automatically recognize all variants of the following Control Units from the SINAMICS range:

- SINAMICS G120 CU230P-2
- SINAMICS G120 CU240B-2
- SINAMICS G120 CU240E-2
- SINAMICS G120 CU250S-2
- SINAMICS G120C

Note

BOP-2 functional support

The BOP-2 supports all of the previously listed Control Units with firmware version 4.3 Service Pack 2 (SP2) or later.

Layout and functions

The controls, display and connections of the BOP-2 are shown in the following figure:



Image 4-1 Layout of the BOP-2

Table 4- 1 Description of BOP-2 physical characteristics

Item	Description
①	Release catch
②	LCD screen
③	Door mounting screw recess
④	Interface to Inverter
⑤	Product rating label

The specific functions of the keys are shown in the following table.

Table 4- 2 Function of the BOP-2 controls

Key	Function
	<p>The OK key has the following functions:</p> <ul style="list-style-type: none"> • When navigating through the menus, pressing the OK key confirms selection of a menu item. • When working with parameters, pressing the OK key allows the parameter to be modified. Pressing the OK key again confirms the entered value and return you to the previous screen. • In the faults screen, the key is used to clear faults.
	<p>The UP key has the following functions:</p> <ul style="list-style-type: none"> • When navigating a menu, the key moves the cursor up through the displayed list. • When editing a parameter value, the displayed value is increased. • If HAND mode is active and the Jog function is active; a long press of the UP and DOWN key simultaneously has the following effects: <ul style="list-style-type: none"> – If reverse is ON the UP key switches the reverse function OFF. – If reverse is OFF the UP key switches the reverse function ON.
	<p>The DOWN key has the following functions:</p> <ul style="list-style-type: none"> • When navigating a menu, the key moves the cursor down through the displayed list. • When editing a parameter value, the displayed value is decreased.
	<p>The ESC key has the following functions:</p> <ul style="list-style-type: none"> • If pressed for less than 2 seconds the BOP-2 returns to the previous screen. When a displayed value has been edited, the new value is not saved. • If pressed longer than 3 seconds the BOP-2 returns to the status screen. <p>When using the ESC key in the parameter edit mode, no data is saved unless the OK key has been pressed.</p>
	<p>The ON key has the following functions:</p> <ul style="list-style-type: none"> • In AUTO mode, the ON key is not active and if pressed, the key is ignored. • In HAND mode the Inverter starts the motor; the operator panel screen displays the drive running icon.
	<p>The OFF key has the following functions:</p> <ul style="list-style-type: none"> • In AUTO mode the OFF key has no effect and the key press is ignored. • If pressed for longer than 2 seconds the Inverter performs an OFF2; the motor coasts down to a standstill. • If pressed for less than 3 seconds the following actions will be performed: <ul style="list-style-type: none"> – If the OFF key is press twice in less than 2 seconds on OFF2 is performed. – If in HAND mode, the Inverter performs an OFF1; the motor ramp-down to a standstill in the time set in parameter P1121.
	<p>The HAND/AUTO key switches the command source between the BOP-2 (HAND) and fieldbus (AUTO).</p> <ul style="list-style-type: none"> • If HAND mode is active, the HAND/AUTO key switches the Inverter to AUTO mode and disables the ON and OFF keys. • If AUTO mode is active, the HAND/AUTO key switches the Inverter to HAND mode and enables the ON and OFF keys. <p>Changing between HAND mode and AUTO mode is possible while the motor is still running.</p>

Note

Reaction to change between HAND and AUTO mode

When changing from HAND to AUTO mode the Inverter reacts in the following manner:

- If the ON signal is active, the new setpoint will become active, and the Inverter automatically ramps the motor to the new setpoint.

When changing from AUTO to HAND mode the Inverter reacts in the following way:

- The Inverter does not top the motor running. The Inverter runs the motor at the same speed that was set prior to the  key being pressed. Any ramp function that was in progress is stopped.

Locking and unlocking the keypad

To lock the BOP-2 keypad press  and  simultaneously for 3 seconds or more. To unlock the keypad press  and  simultaneously for 3 seconds or more.

Screen icons

The BOP-2 displays a number of icons at the left side of the display to indicate the actual state of the Inverter. These icons are explained in the following table.

Table 4- 3 Screen icons description

Function	Status	Icon	Remarks
Command source	Hand		When the HAND mode is active the icon is displayed. When AUTO mode is active, no icon is displayed.
Inverter status	Inverter and motor running		The icon is static and does not rotate.
Jog	Jog function is active	JOG	
Fault/alarm	Fault or alarm pending Flashing symbol = Fault Steady symbol = Alarm		If a fault is detected, the Inverter will be stopped and the user is required to take the necessary corrective actions to clear the fault. An alarm is a condition that will not stop the Inverter, for example, overtemperature.

Menu structure

The BOP-2 is a menu-driven device and has the following basic menu structure:

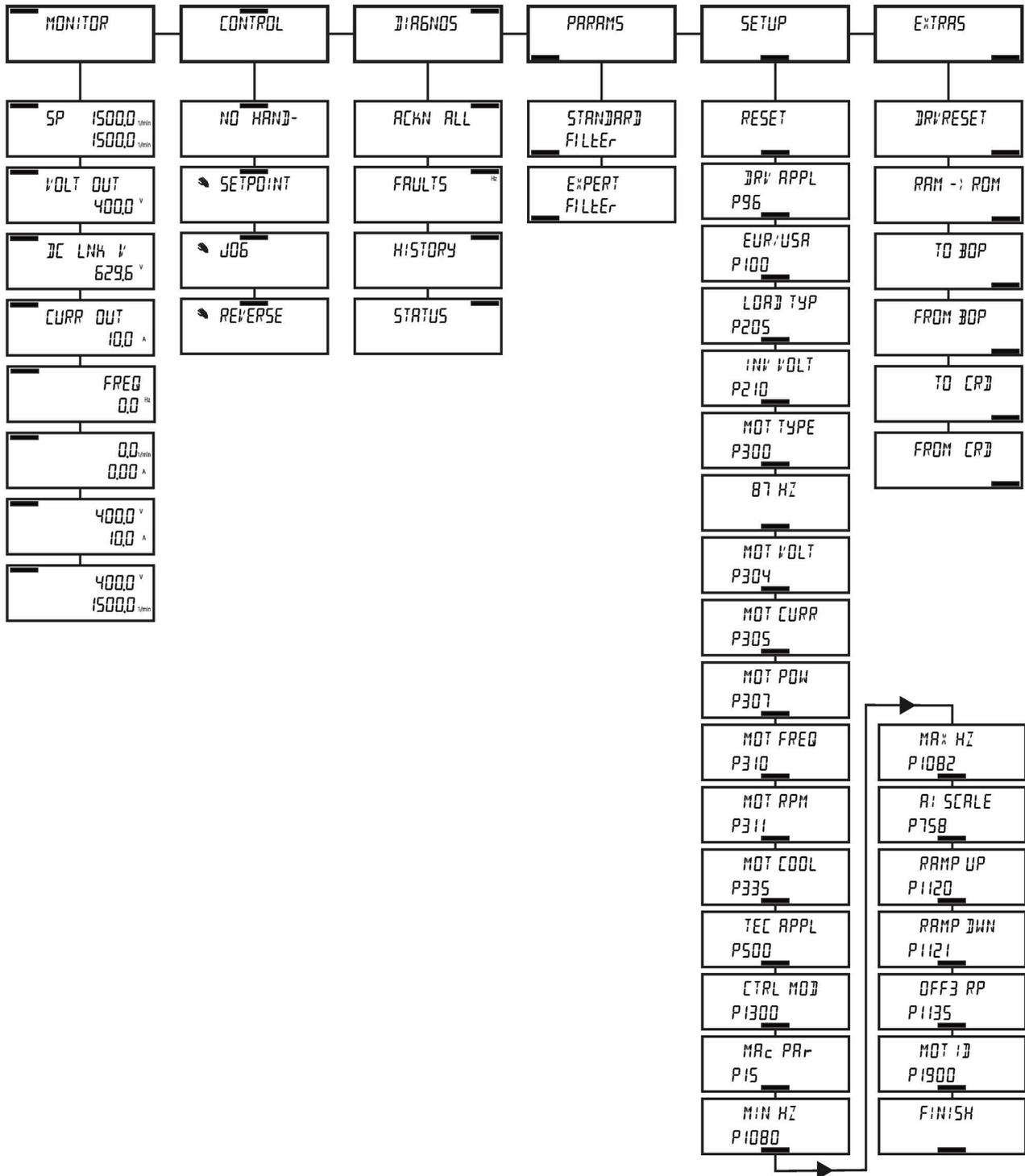


Image 4-2 BOP-2 Basic menu structure

Note

Menu structure and functionality

The actual menu structure and functionality of the BOP-2 is influenced by the following factors:

- The software version and type of Control Unit to which the BOP-2 has been fitted.
 - The firmware and software version of the BOP-2.
-

Fitting the BOP-2 to the Control Unit

Note

BOP-2 power supply

The BOP-2 has no internal power supply and derives its power directly from the Control Unit through the RS232 interface. Any cloned data stored on the BOP-2 is saved to its non-volatile memory which does not require power to retain the data.

To fit the BOP-2 to the Control Unit the following procedure should be performed:

1. Place the bottom edge of the BOP-2 casing into the lower recess of the Control Unit housing.
2. Push the BOP-2 towards the Control Unit until the release-catch clicks into place on the Control unit housing.



Image 5-1 Fitting the BOP-2 to the Control Unit

To remove the BOP-2 from the Control Unit, press down on the release-catch and pull the BOP-2 off the Control Unit.

Initial startup

After connection and power-up the BOP-2 automatically detects the type of Control Unit then attempts to establish communications.

On startup the BOP-2 will display the company name and the class of Operator Panel.

The BOP-2 will then display the current software version of the Operator Panel.

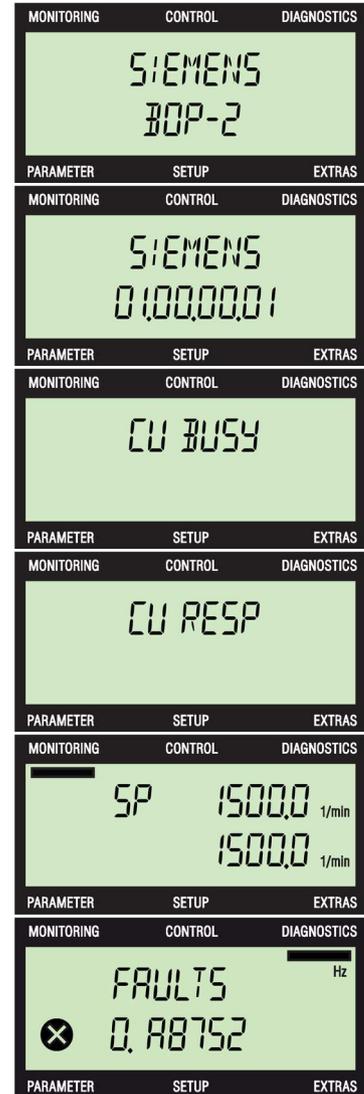
The BOP-2 will then establish communications between the Operator Panel and the Control Unit.

Once communications have been established, an internal check is performed to ensure that the Operator Panel is responding correctly.

Once all checks have been completed the BOP-2 will display the standard status screen. The BOP-2 is now ready for use.

After establishing communications, if a fault or alarm conditions is present, the BOP-2 displays the relevant fault or alarm number.

If more than one fault or alarm conditions exists, use the ▲ and ▼ keys to move through the list on the screen.



Monitoring

Overview

The Monitor menu allows the user to easily access a variety of screens which display the actual status of the system.

The menu is selected by using the ▲ and ▼ keys to move the menu bar to the required menu.

Pressing **OK** will confirm the selection and display the top level menu.



Use the ▲ and ▼ keys to scroll through the various screens.

The information displayed in the Monitoring screens is read-only and cannot be modified.

Monitoring screen information

The details of the information displayed by the various monitoring screens are described below.

The default screen shows the value set for the setpoint, below this value the actual speed of the motor is displayed.



The voltage output screen displays the actual voltage output from the Inverter that is being supplied to the connected motor.



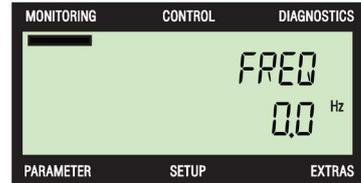
The DC Link screen displays the actual DC Link voltage DC.



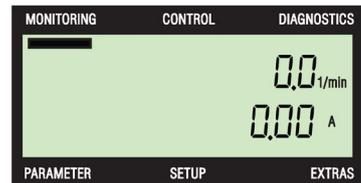
The current output screen shows the actual Inverter current output to the motor.



The frequency screen shows the actual frequency (in Hz) at which the motor is running.



The RPM and current screen displays the actual rotational speed of the motor in RPM and the actual output current from the Inverter to the motor.



The voltage and current screen displays the actual voltage being supplied by the Inverter to the motor and the actual current output from the Inverter to the motor.



The voltage and RPM screen display the actual voltage being supplied by the Inverter to the motor and the actual speed of the motor in RPM.



Control

Introduction

The control menu allows the user to access the following functions of the Inverter:

- Setpoint
- Jog
- Reverse

The menu is selected by using the ▲ and ▼ keys to move the menu bar to the required menu.

Pressing **OK** will confirm the selection and display the top level menu.



The Inverter must be in HAND mode before any functions can be accessed. If HAND mode is not selected a notice screen is displayed stating that the Inverter is not in HAND mode.

The HAND mode is selected by pressing the **HAND AUTO** key.



Note

Hand/Auto mode

If the **HAND AUTO** key is pressed when the Inverter is in AUTO mode, the user is taken directly to the Setpoint screen.

The individual functions are described below.

Setpoint

The setpoint value determines the speed at which the motor runs as a percentage of the nominal motor speed. It should be noted that this setpoint setting is only valid while HAND mode is active. When the Inverter is set back to AUTO mode, the setpoint previously used in AUTO mode becomes the valid setpoint.

Note

Torque setpoint

In HAND mode the torque setpoint (if the Inverter is in torque control mode) cannot be directly modified using the setpoint speed function of the BOP-2; although the motor can still be stopped and started using the  and  keys respectively.

To change or modify the value of the setpoint, the actions shown in the following figure should be performed:

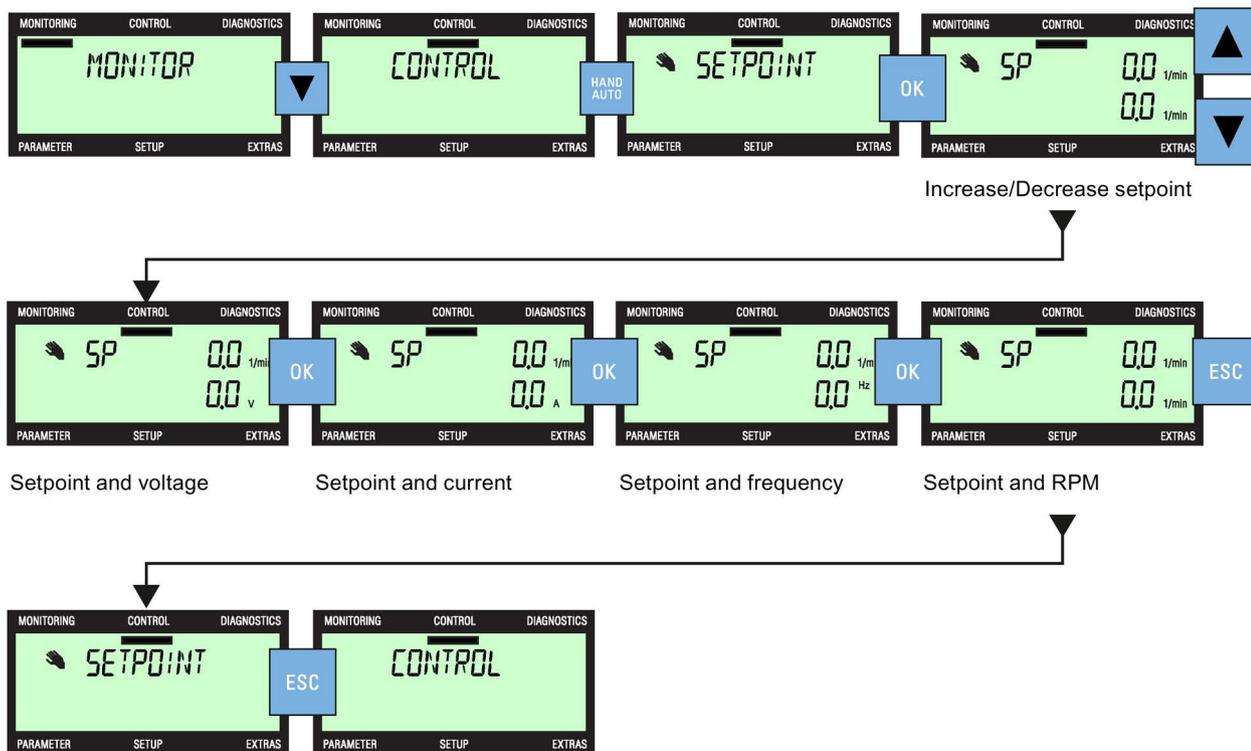


Image 7-1 Setpoint function

Editing single digits

It is possible to edit the individual digits of the setpoint screen. To enter the single digit editing mode, press **OK** until the "SP DIGIT" screen is displayed.

The process of editing the individual digits is shown in the following figure:

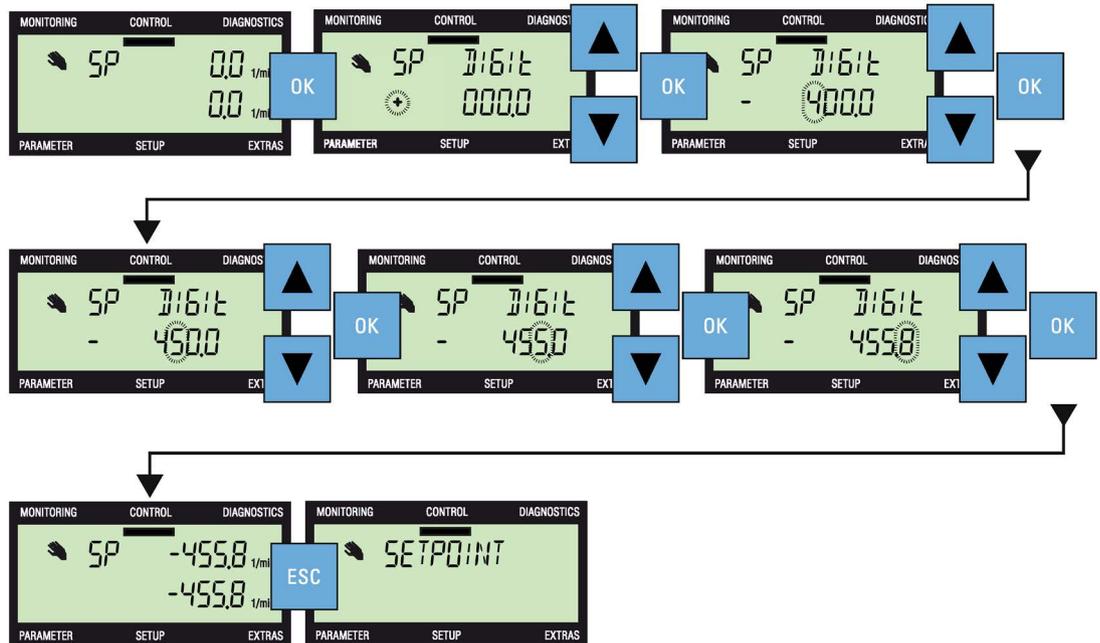


Image 7-2 Editing individual digits

Jog

The Jog function, when selected, will allow the motor to be manually rotated by a pre-determined value with each press of **I**. If **I** is pressed continuously, the motor will rotate continuously until **I** is released.

To enable or disable the Jog function, the actions shown in the following figure should be performed:

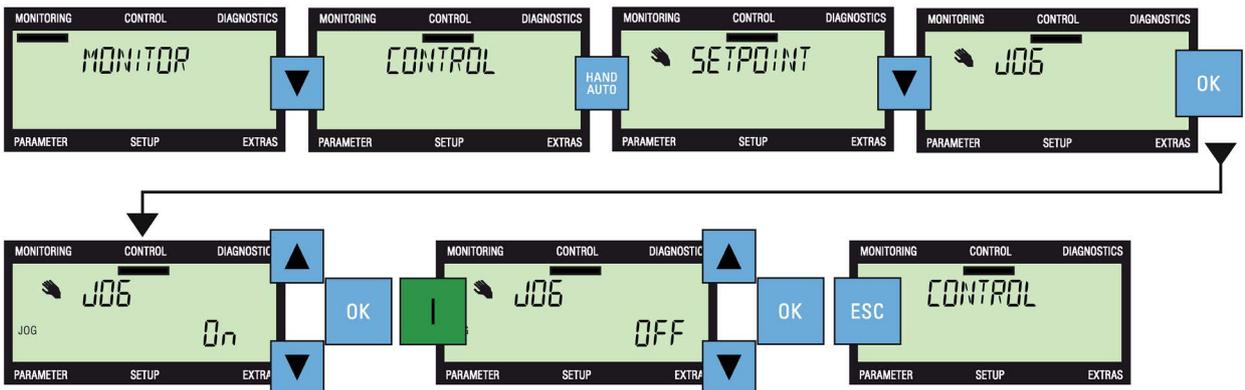


Image 7-3 Jog function

Note

Reverse function

When the JOG function is activate; pressing ▲ and ▼ simultaneously for more than 3 seconds toggles the REVERSE function.

Reverse

The Reverse function, when selected, will allow the motor to be manually rotated in the reverse direction from its normal forward motion with each press of I. If I is pressed continuously, the motor will rotate continuously in reverse until I is released.

To enable or disable the Reverse function, the actions shown in the following figure should be performed:

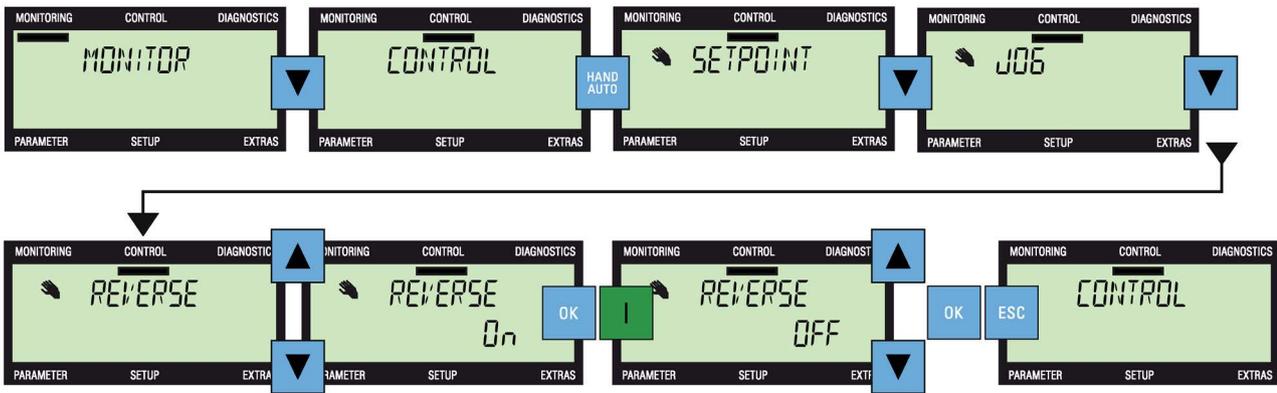


Image 7-4 Reverse function

Diagnostics

Diagnostic menu

The Diagnostics menu allows the user to access the following function:

- Acknowledge all faults
- Faults
- History
- Status

To access the Diagnostics menu, the following actions should be performed:

The individual functions are described in the following text, figures and tables.

Acknowledge faults

When a fault condition occurs, the system is stopped by the Inverter and requires that all faults are acknowledged before restarting the system.

To acknowledge all active faults, the actions shown in the following figure should be performed:

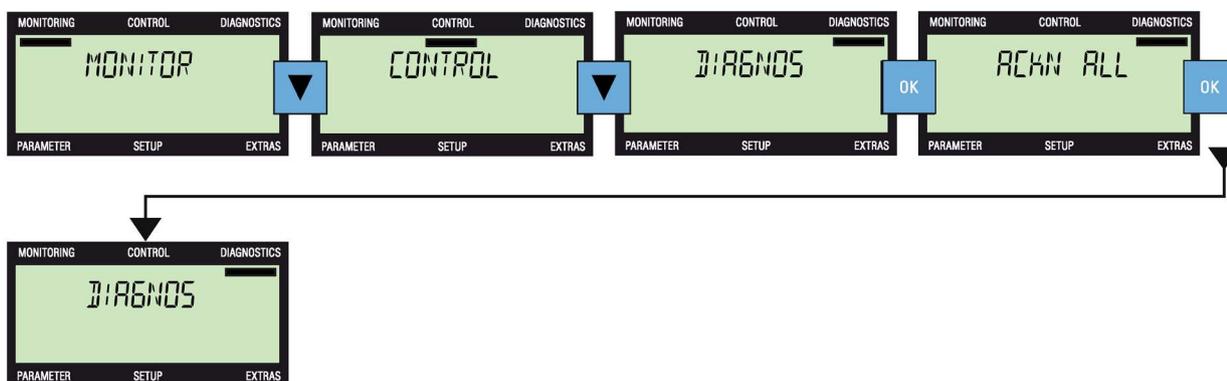


Image 8-1 Acknowledge faults sequence

Active faults and alarms

When the Inverter detects a fault or alarm condition, the Inverter maintains a list of all the currently active faults and alarms. For a detailed explanation of the displayed fault and alarm numbers, please refer to the relevant Parameter List.

To see which faults and alarms are currently active, the actions shown in the following figure should be performed (the ▷ symbol denotes where the display will automatically display a new screen on the completion of a process):

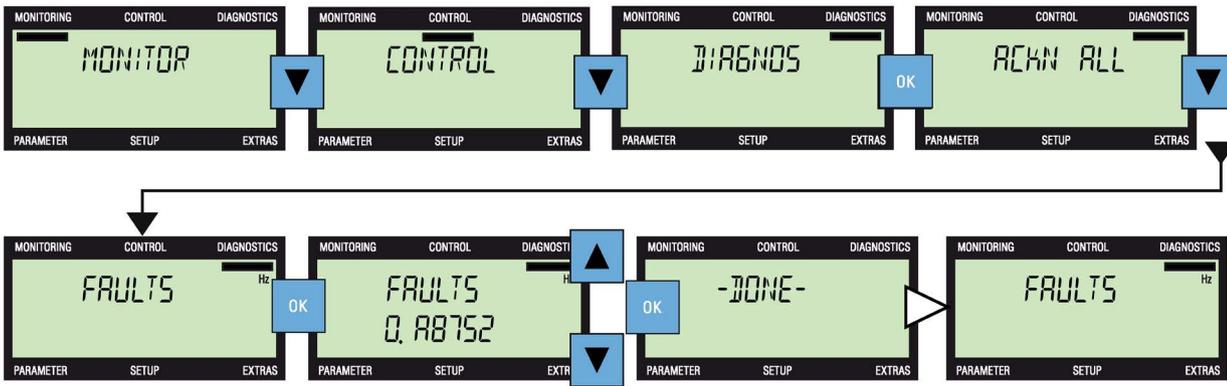


Image 8-2 Active faults and alarms sequence

Note

Dynamic fault screen

If a fault occurs, the dynamic fault screen is automatically displayed.

History

The History option within the Diagnostics menu maintains a list of the last 64 faults that have occurred within the Inverter/motor system. For a detailed explanation of the displayed fault and alarm numbers, please refer to the relevant Parameter List.

Pressing **ESC** for more than 3 seconds returns the BOP-2 display to the status screen.

To access the faults and alarm list, the actions shown in the following figure should be performed:

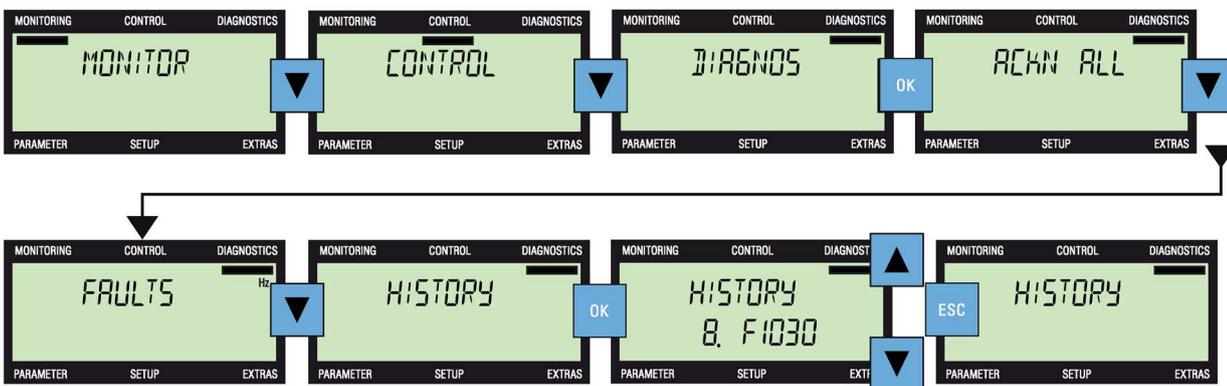


Image 8-3 History list sequence

Status

The Status option displays the actual state of the control words and status words that are used to control and monitor various functions of the Inverter. Information regarding the control words and the status words can help diagnose problems with the Inverter.

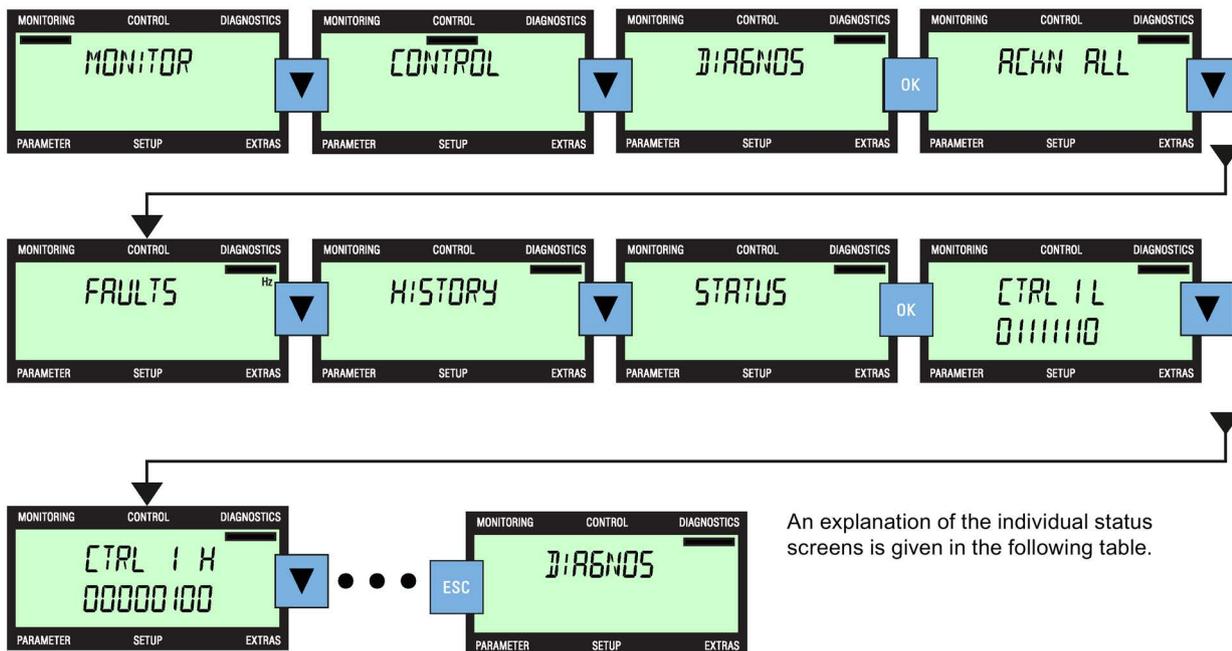
The status option displays the current state of the following control and status words:

- Control word 1
- Control word 2
- Status word 1
- Status word 2

The various screens displayed in this menu option are read-only and cannot be modified.

Pressing **ESC** for more than 3 seconds returns the BOP-2 display to the status screen.

To access the Status screens, the actions shown in the following figure should be performed:



An explanation of the individual status screens is given in the following table.

Image 8-4 Status Word sequence

The precise details of each bit of the status screens can be found in the parameter list under the associated parameter. The exact meaning of each bit on the display is dependent on the type of Control Unit and Power Module which is being monitored.

Description	Associated parameter	Screen example
<p>Control Word 1 (lower bits)</p> <p>The screen displays the lower eight bits of Control Word 1. The individual bits indicate the state of the ON/OFF commands, ramp-function generator, speed setpoint and fault acknowledge conditions.</p>	r0054.0 ... 15	
<p>Control Word 1 (higher bits)</p> <p>The screen displays the higher eight bits of Control Word 1. The individual bits indicate the state of the Jog function, directional setpoint, motorized potentiometer and command datasets.</p>	r0054.0 ... 15	
<p>Control Word 1 (hexidecimal)</p> <p>The screen displays the total hexidecimal value of all 16 bits of Control Word 1.</p>	-	
<p>Control Word 2 (lower bits)</p> <p>The screen displays the lower eight bits of Control Word 2. The individual bits indicate the state of the fixed frequency setpoint, Drive Datasets and the technology controller.</p> <p>In the Parameter Lists, Control Word 2 is known as "supplementary control word".</p>	r0055.0 ...15	
<p>Control Word 2 (higher bits)</p> <p>The screen displays the higher eight bits of Control Word 2. The individual bits indicate the state of the DC brake, droop control, torque control, external faults and Drive Datasets.</p> <p>In the Parameter Lists, Control Word 2 is known as "supplementary control word".</p>	r0050.0 ... 15	
<p>Control Word 2 (hexidecimal)</p> <p>The screen displays the total hexidecimal value of all 16 bits of Control Word 2.</p>	-	
<p>Status Word 1 (lower bits)</p> <p>The screen displays the lower eight bits of Status Word 1. The individual bits indicate the state of the ready signal, fault condition, OFF2/OFF1 signals, switching active and alarm conditions.</p>	r0052.0 ...15	
<p>Status Word 1 (higher bits)</p> <p>The screen displays the higher eight bits of Status Word 1. The individual bits indicate the state of the speed deviation, control request, maximum speed reached, motor holding brake open, motor over-temperature and alarm conditions.</p>	r0052.0 ... 15	
<p>Status Word 1 (hexidecimal)</p> <p>The screen displays the total hexidecimal value of all 16 bits of Status Word 1.</p>	-	

Description	Associated parameter	Screen example
<p>Status Word 2 (lower bits)</p> <p>The screen displays the lower eight bits of Status Word 2. The individual bits indicate the state of the DC brake, zero speed detection, minimum speed, current threshold, speed threshold, ramp-function generator and DC link threshold.</p>	r0053.0 ... 11	
<p>Status Word 2 (higher bits)</p> <p>The screen displays the higher eight bits of Status Word 2. The individual bits indicate the state of the DC link threshold (limit exceeded), ramp-up/ramp-down completion, technology controller output (lower limit), and technology controller output (higher limit).</p>	r0053.0 ... 11	
<p>Status Word 2 (hexadecimal)</p> <p>The screen displays the total hexadecimal value of all 16 bits of Status Word 2.</p>	-	

Parameters

Parameter menu

The Parameter menu allows access to view and change the parameters of the Inverter.

There are two filters available to assist in the selection and searching of all the Inverter parameters, these are:

- Standard filter - this filter gives access to the most commonly used parameters for the specific type of Control Unit to which the BOP-2 is fitted.
- Expert filter - this filter gives access to all the Inverter parameters.

The parameters can be addressed by the following methods:

- Parameter number
- Parameter number and index number
- Parameter number and bit number
- Parameter number, index number and bit number.

NOTICE

Action on fault during parameter editing

If a fault occurs during parameter editing, the fault screen must be exited by pressing **ESC** or **OK** in order to allow the editing cycle to be completed.

On a Safety Parameter Reset the Inverter **MUST** be power-cycled after the fault screen has been exited.

To access the standard or expert parameter filters, the actions in the following figure should be performed.

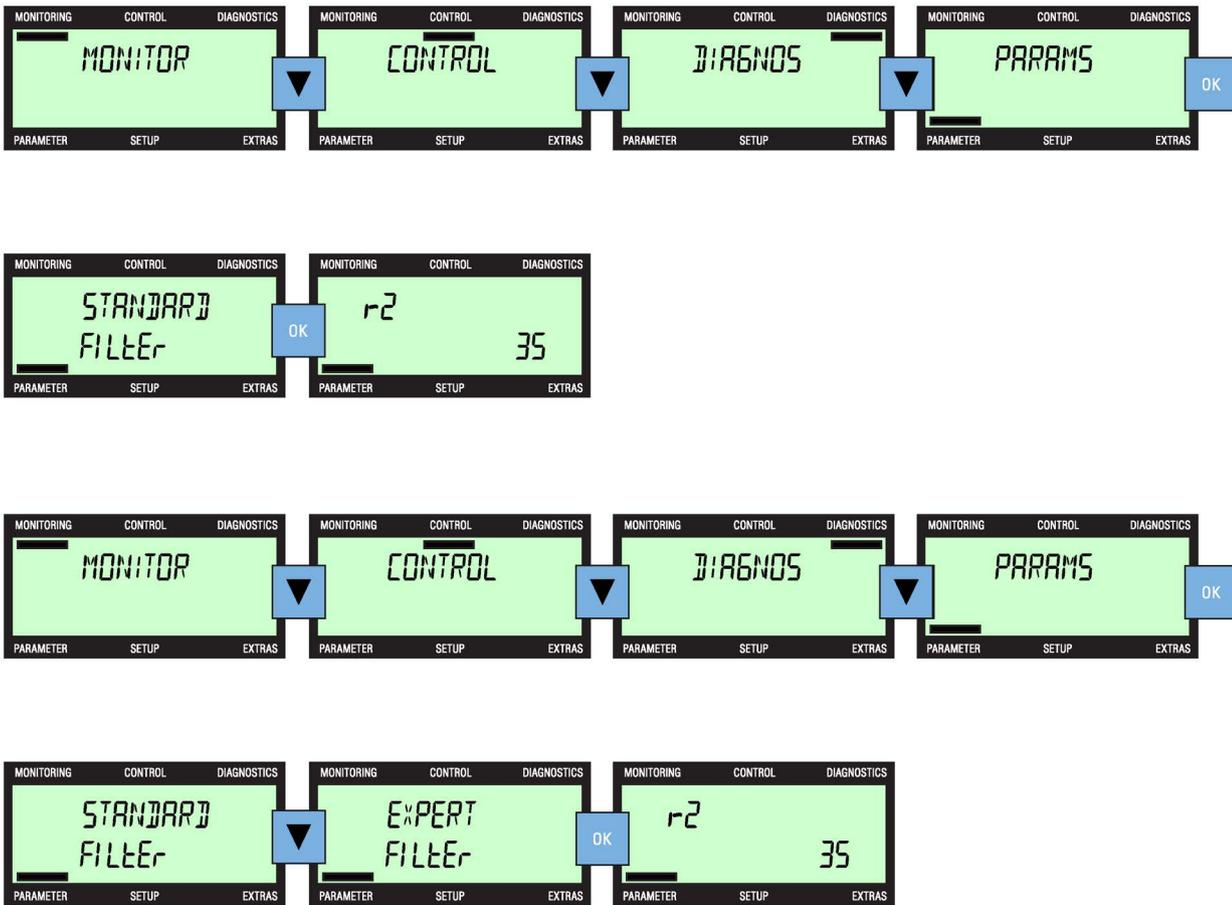


Image 9-1 Selecting standard or export parameter filters

Editing the parameters

There are two methods to edit and modify parameters, these are:

- Single digit
- Scrolling

Single digit editing of the parameters is accomplished by a long press of the **OK** key. Each individual digit of the parameter can be modified using the **▲** and **▼** keys and individual confirmed by a press of the **OK** key.

This method of editing the parameters are shown in the following figure (the **▷** symbol denotes where the display will automatically display a new screen on the completion of a process).

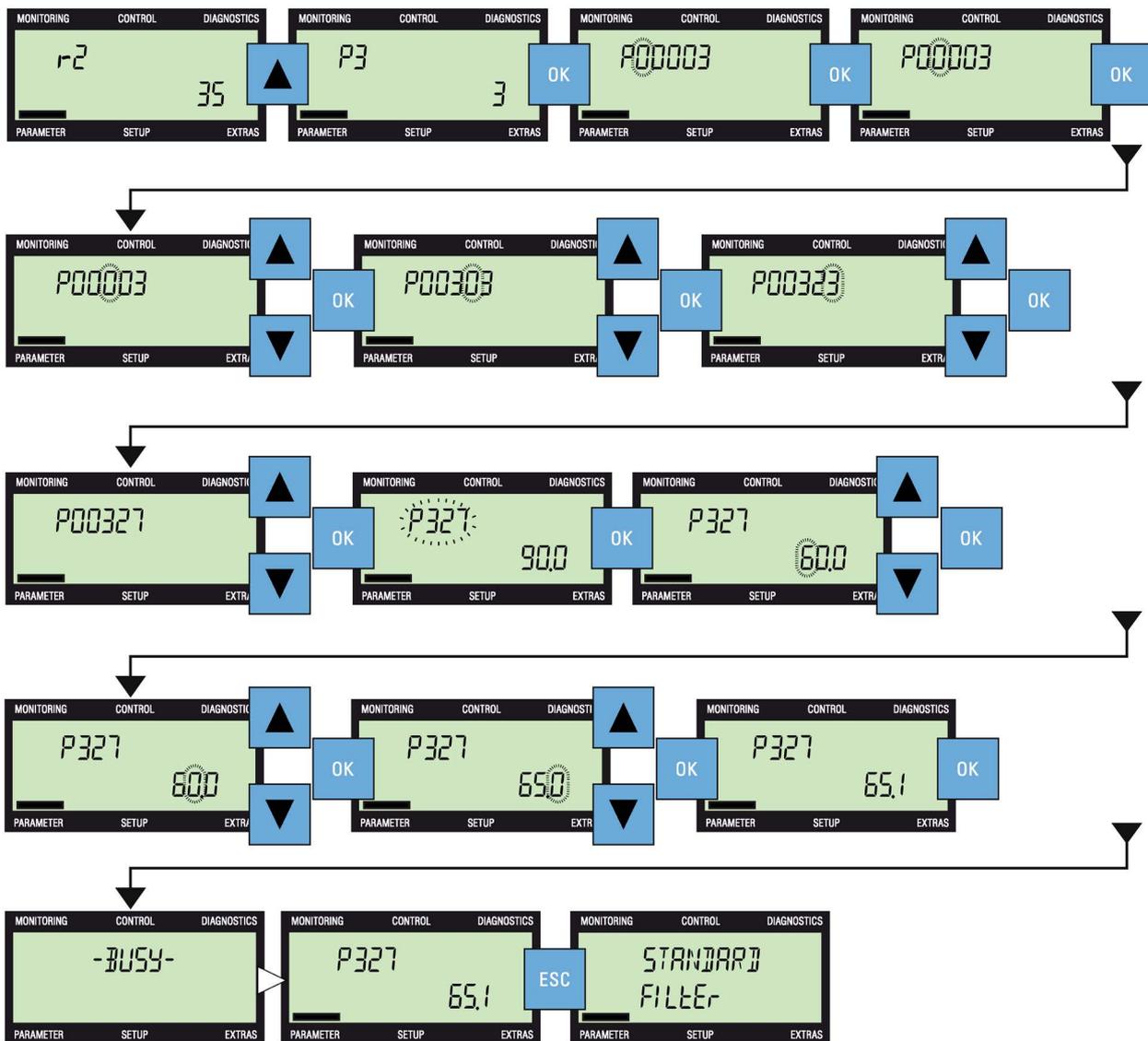


Image 9-2 Editing parameters (single digit method)

The scrolling editing is accomplished by scrolling through to the parameters until the required parameter is displayed. Press the **OK** key to confirm the parameter selection; the displayed parameter value starts to flash. Using the **▲** and **▼** keys increase or decrease the parameter value. Press the **OK** key to confirm the value.

The actions required to perform the editing of parameters by scrolling is shown in the following figure.



Image 9-3 Editing parameters (scrolling method)

Setup menu

The setup menu is a fixed sequence of screens that allow the user to perform the standard commissioning of the Inverter.

Once a parameter value has been modified, there is no possibility to cancel the standard commissioning process. In this case, the standard commissioning process must be completed. If no parameter value has been modified, then a short press of **ESC** returns to the previous screen and a long press (more than 3 seconds) of **ESC** returns to the top of the Monitor menu.

When a parameter value has been modified and the new value confirmed by pressing **OK**, then the next parameter in the standard commissioning sequence is automatically displayed.

Editing parameters

Parameters can be modified use two methods; scrolling through the parameter values or using the single digit methods. See Parameters (Page 33).

NOTICE

Important information on the latest changes to the firmware

There has been some major changes to the way that the commissioning software has been implemented and it is recommended that you read all the information given at the following links to the Siemens Industry Online Support (SIOS) site:

- SINAMICS G120 Firmware V4.7 SP3 - Modified commissioning behavior



Modified commissioning behavior

<https://support.industry.siemens.com/cs/ww/en/view/109480663>

Standard commissioning

The Standard commissioning process requires the input of data which is specific to the motor to which the Inverter is connected. The data regarding the attached motor can be gathered from the motor's rating plate. An example of a typical motor rating plate is shown in the following figure:

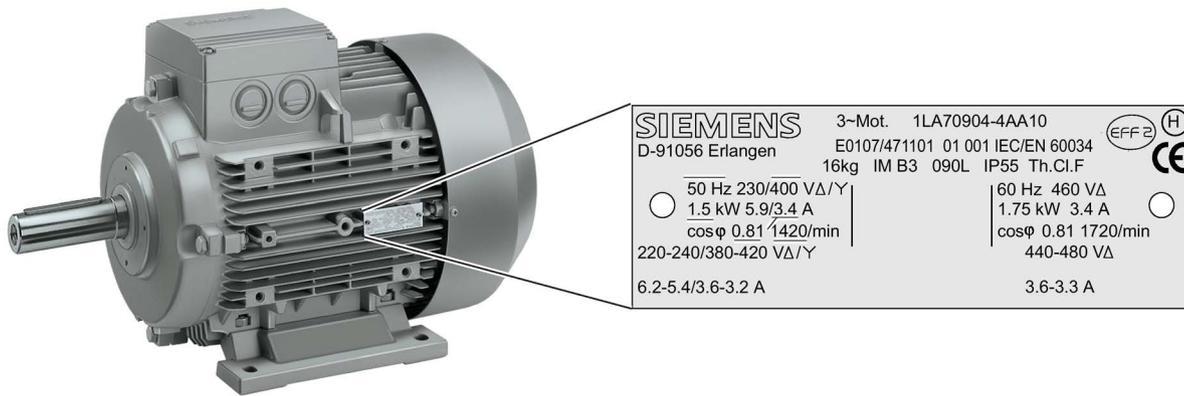


Image 10-1 Motor Plate Information, 1.5 kW

The basic commissioning procedure is shown in the following figures.

⚠ WARNING

Failure of the commissioning process

When the final step of the commissioning process is complete the operator panel screen displays "-DONE-" to indicate that the commissioning has been successful. If the commissioning process was not successfully completed, the operator panel screen displays "-FAILURE-". In this case, the system must be considered unstable and the reason for the failure should be investigated and the commissioning process restarted.

⚠ CAUTION

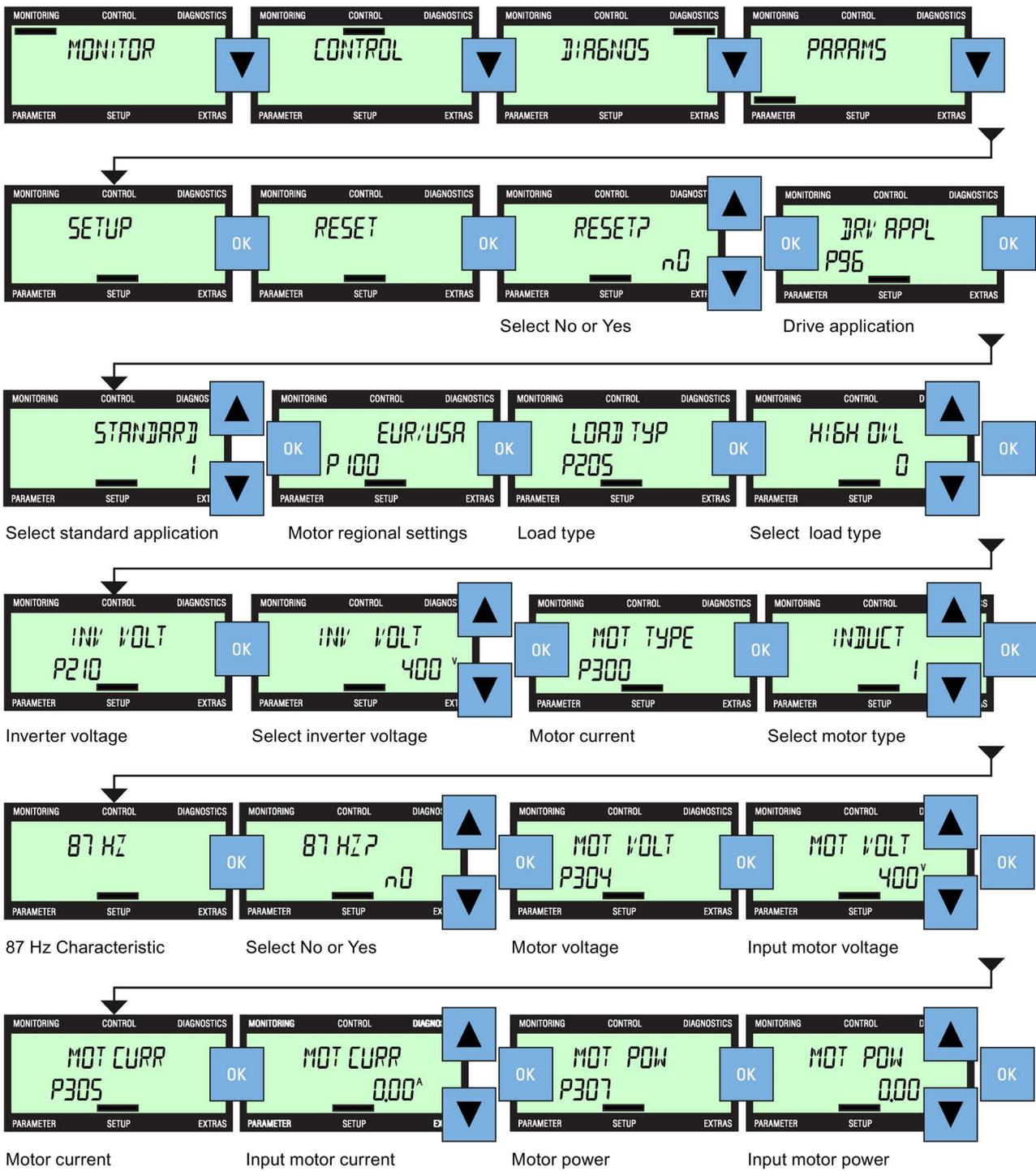
Macro selection

During the commissioning process, the user is prompted to select a "Macro" that automatically configures the input signals, output signals, command source and setpoint source for the system. Each Control Unit has their own unique functionality and therefore, each Control Unit has a different set of macros available for selection. Detailed wiring diagrams relating to the macros are contained in the relevant Operating Instructions for each specific Control Unit. The relevant Operating Instructions must be consulted regarding the selection of the correct macros, otherwise the system may configured in an unknown state.

Note

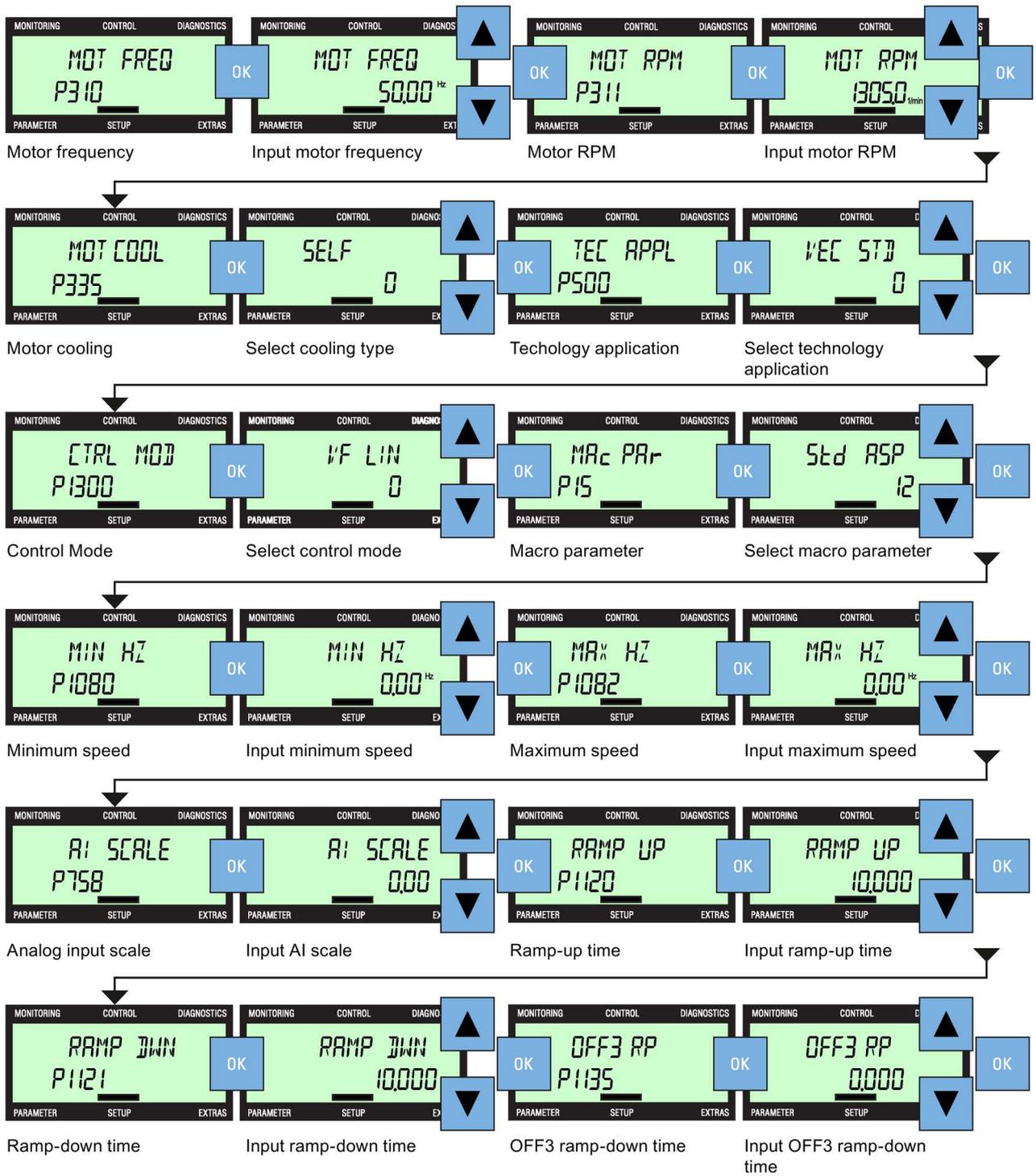
Standard commissioning example

The Standard commissioning example shown below is for illustration purposes only. The precise process depends on the specific type of Control Unit that is being used.



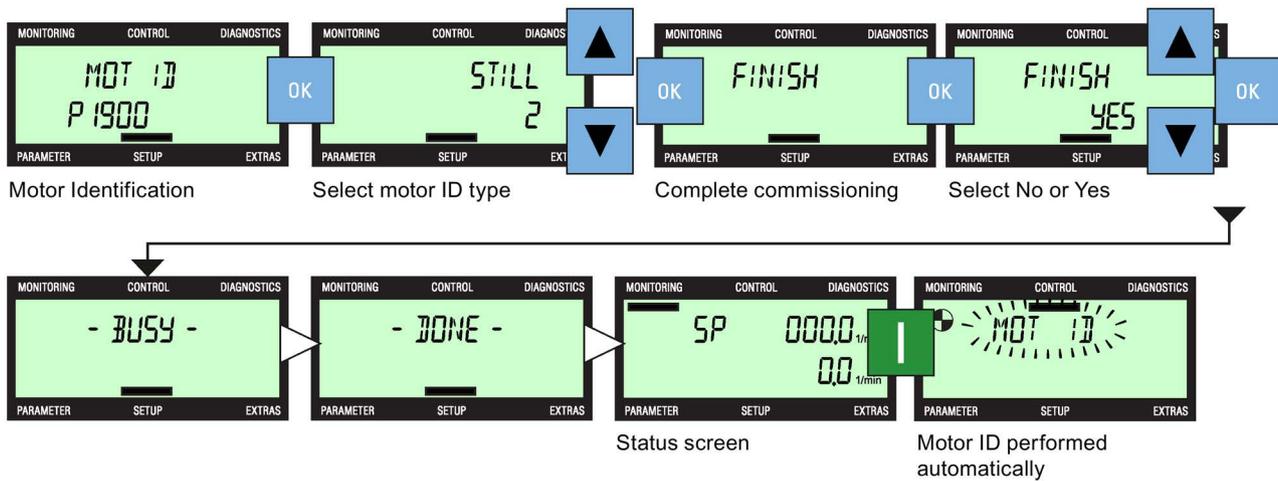
(Continued in part 2)

Image 10-2 Standard commissioning Part 1



(Continued in part 3)

Image 10-3 Standard commissioning Part 2



When the commissioning process is completed, the BOP-2 will display - DONE - and after a short pause will automatically display the status screen. If a problem has occurred or there has been an interruption to the final process then the BOP-2 will display - FAILURE -. Should this happen, the Inverter is to be considered unstable and the reason for the failure should be investigated and the commissioning process restarted.

With the first ON/Run command after a completed basic commissioning wizard, the Motor ID will be automatically activated. The BOP-2 will display a flashing "MOT ID" to inform the user that a Motor ID is being performed. Motor-ID (p1900: 1,2,3,11 or 12).

Image 10-4 Standard commissioning Part 3

Extras

Extras menu

The extras menu allows the user to perform the following functions:

- DRVRESET - reset the Inverter to the factory default settings.
- RAM → ROM - copies data from the Inverters RAM to the Inverters ROM.
- FROM CRD - reads parameter data from the memory card into the Inverter memory.
- TO CARD - writes parameter data from the Inverter memory on to the memory card.
- FROM BOP - reads parameter data from the BOP-2 to the Inverter memory.
- TO BOP - writes parameter data from the Inverter memory to the BOP-2.

The actions to perform the previously mentioned functions are shown in the following figures.

Drive reset

Resets the Inverter to the factory default settings.

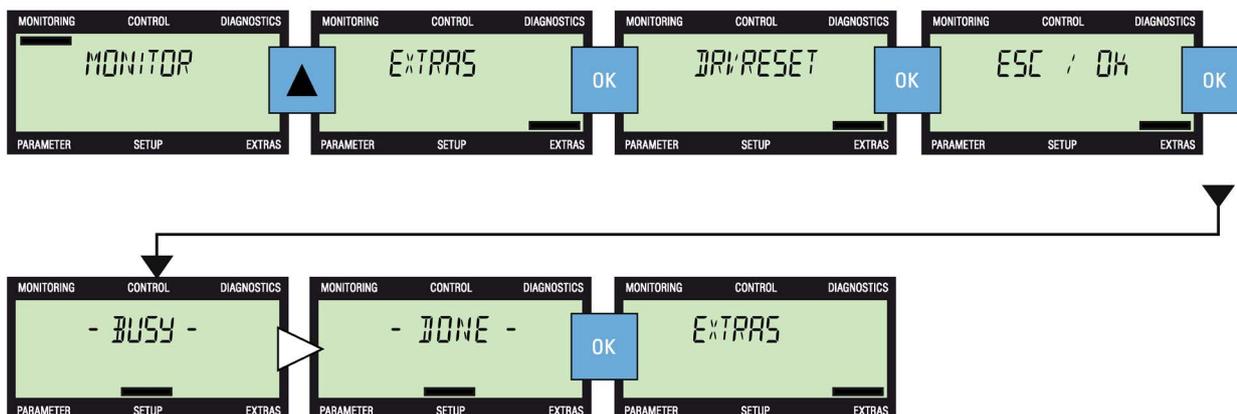


Image 11-1 Extras - drive reset

RAM ⇒ ROM

This functions allows the data stored in the Inverter's RAM to be saved to the Inverter's ROM. The data is stored permanently in the ROM until it is overwritten by another RAM to ROM command. The ▷ symbol denotes where the screen automatically displays a new screen on the completion of a process.

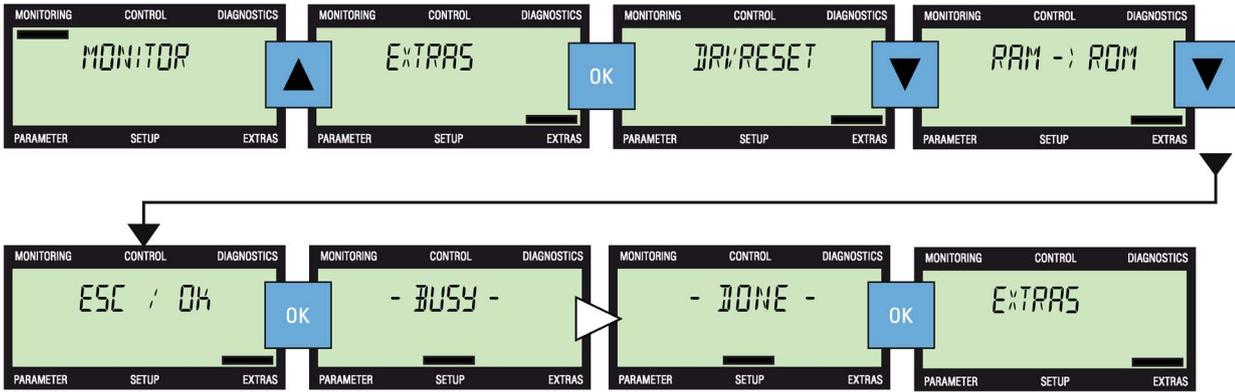


Image 11-2 Extras - save data from RAM to ROM

To BOP

This function writes the parameter data stored in the Inverter to be copied to the memory of the BOP-2. The memory in the BOP-2 is non-volatile, so data is retained until it is overwritten by another copy command. The ▷ symbol denotes where the screen automatically displays a new screen on the completion of a process.

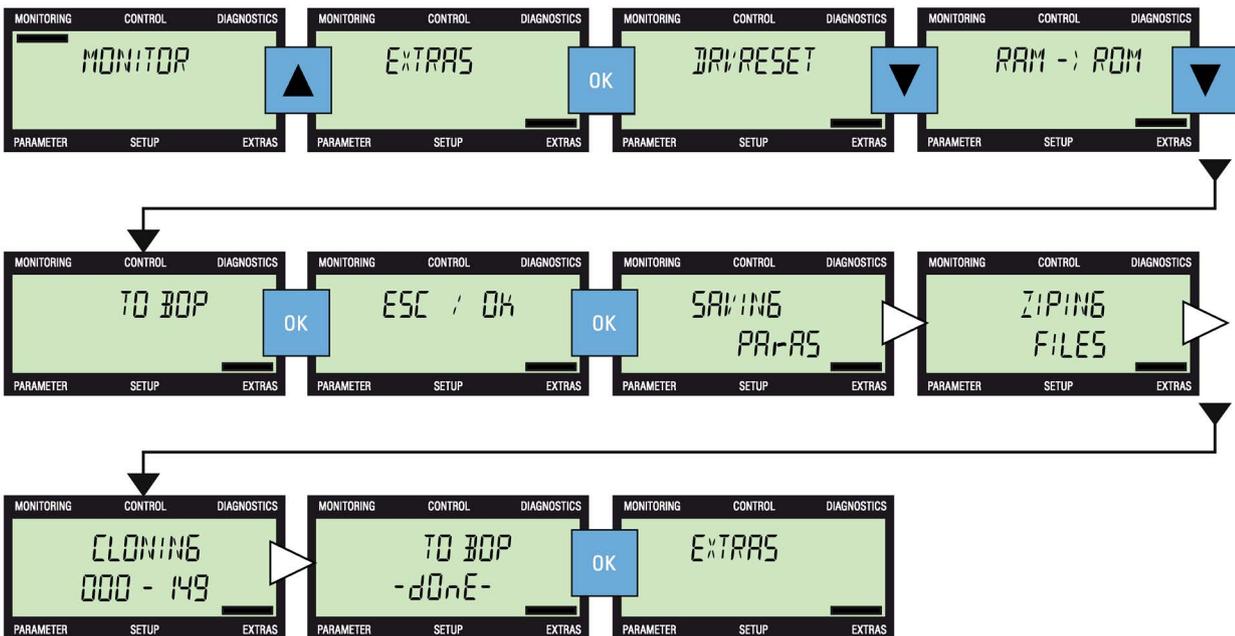


Image 11-3 Extras - saving data to the BOP

From BOP

This function writes parameter data stored in the BOP-2 memory to the Inverter memory. The ▷ symbol denotes where the screen automatically displays a new screen on the completion of a process.

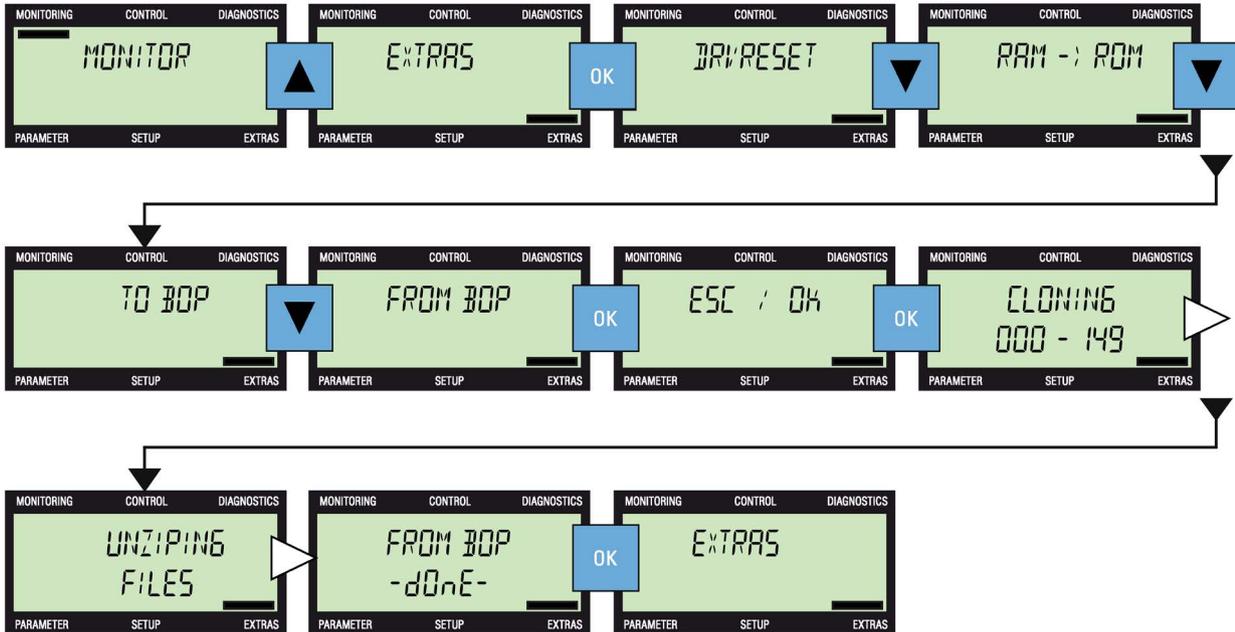


Image 11-4 Extras - reading data from the BOP

To card

This function writes parameter data from the Inverter's memory to the memory card in the Control Unit.

Note

Saving parameter sets to a memory card

When manually changing parameter settings using the BOP-2, all changes are automatically saved to the default parameter set (0) on the memory card (if a memory card is already inserted into the memory card reader). Therefore, parameter set (0) is not displayed as an option when saving parameter sets to a memory card with the BOP-2.

During the saving process, the user is given the option to selected a unique number between 1 and 99, under which the parameter set will be stored. Only parameters that have been modified will be stored on the memory card. When the parameter set is selected and confirmed, the saving process begins and automatically overwrite any previous data saved under the selected parameter set number.

The ▷ symbol denotes where the screen automatically displays a new screen on the completion of a process.

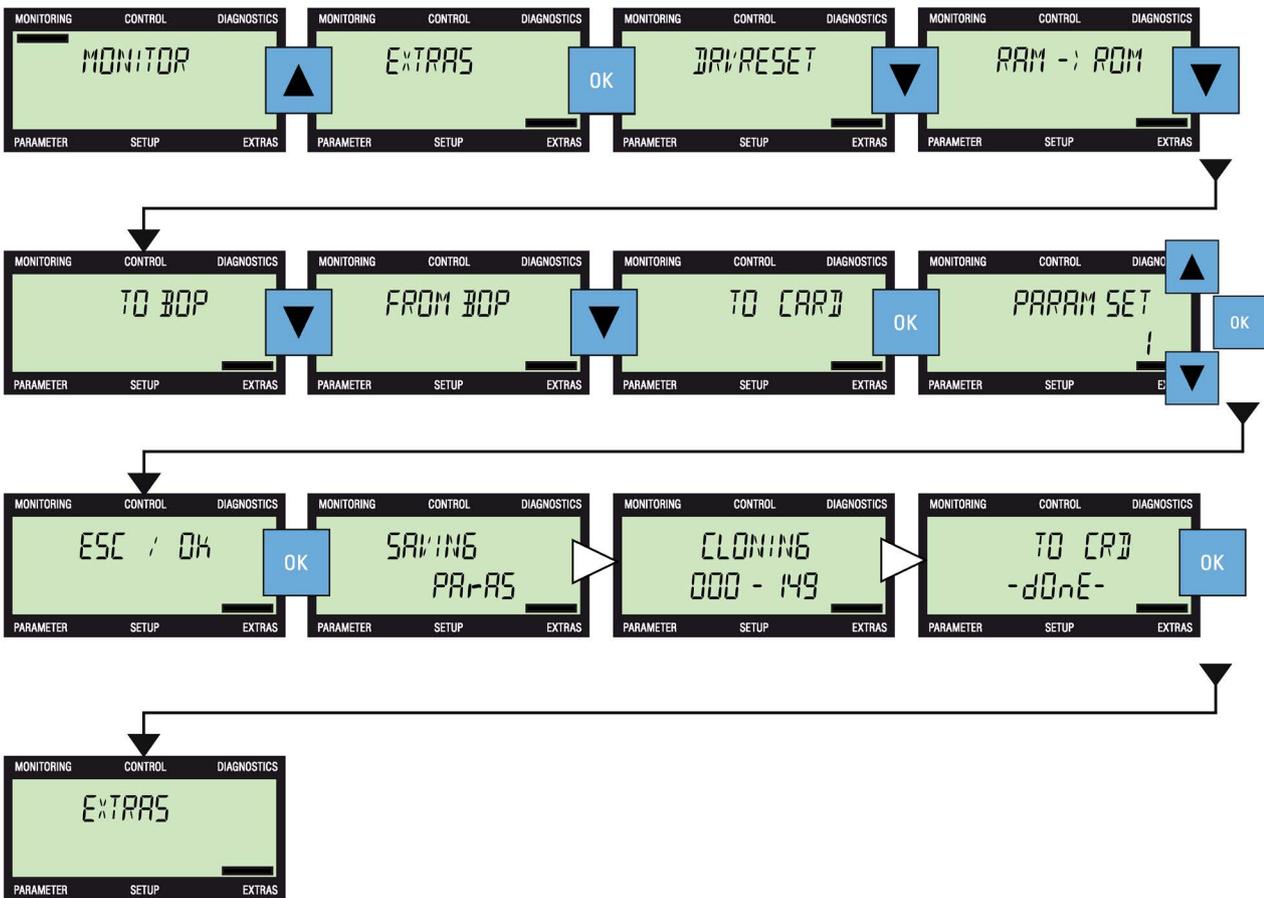


Image 11-5 Extras - writing data to the memory card

From card

This function reads parameter data from the memory card in the Control Unit to the Inverter's memory.

During the upload process, the user is given the option to selected a unique number between 0 and 99, which then loads the parameter set stored under that number on the memory card to the Inverter's memory. Should the user select a parameter set that does not actually exist on the memory card, the BOP-2 displays a cloning error.

The ▷ symbol denotes where the screen automatically displays a new screen on the completion of a process.

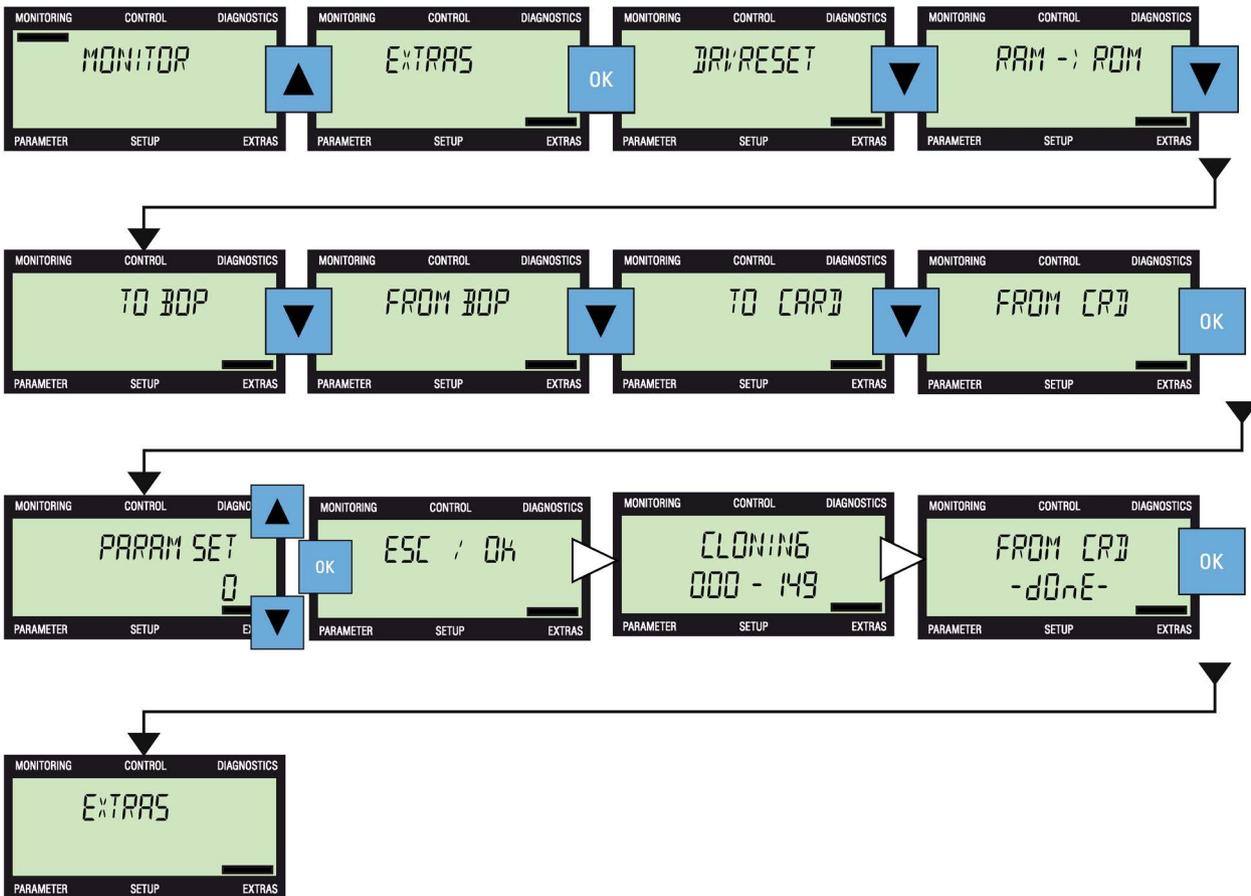


Image 11-6 Extras - reading data from the memory card

Technical data

BOP-2 specifications

Table 12- 1 BOP-2 specifications

Feature	Description
Protection	Depending upon the Control Unit IP rating to a max. of IP55
Dimensions (H x W x D)	106.86 mm x 70 mm x 19.6 mm
Net weight	0.10 Kg (0.22 lbs)
Gross weight	0.17 Kg (0.37 lbs)
Operating ambient temperature	0 - 50 °C (32 - 122 °F) under nominal conditions of the attached inverter.
Transport and storage ambient temperature	-40 - +70 °C (-40 - 158 °F)
Humidity	Maximum absolute humidity 25 g/m ³

Index

A

Acknowledge faults, 27
Active faults and alarms, 27

C

Control, 23
 Hand mode, 23
 jog, 25
 Jog, 23
 reverse, 23, 26
 setpoint, 23, 24

D

Description, 14
Diagnostics, 27
 Acknowledge faults, 27
 Active faults and alarms, 27
 History, 28
 Status, 29
Dimensions, 49
Drive reset, 43

E

Editing
 Single digits, 25
Expert filter, 33
Extras, 43
 RAM to ROM, 44
 reading data from BOP, 45
 reading data from memory card, 47
 Saving data to BOP, 44
 saving data to memory card, 45

F

From BOP, 45
Functional support, 13
Functions, 14

G

Gross weight, 49

H

HAND/AUTO, 16
History, 28
Humidity, 49

I

Icons, 16
Initial startup, 20
Installation, 19
 fitting the BOP-2, 19
 removing the BOP-2, 19

J

Jog, 25
 reverse function, 26

K

Keys, 15

L

Layout, 14
Locking keypad, 16

M

Macro selection, 38
Menu structure, 17
 compatibility, 18
 firmware version, 18
 functionality, 18
 software version, 18
Monitoring
 Current output, 22
 DC Link, 21
 default screen, 21

- frequency, 22
- output current, 22
- overview, 21
- RPM, 22
- voltage and current, 22
- voltage and RPM, 22
- voltage output, 21

N

- Net weight, 49

O

- Operating temperature, 49

P

- Parameters

- Edit scrolling method, 34
- Edit single digit, 34
- editing, 37
- Expert filter, 33
- menu, 33
- Standard filter, 33

- Power supply, 19

- Protection level, 49

R

- Reverse, 26

S

- Saving data

- from BOP, 45
- from memory card, 47
- RAM to ROM, 44
- To BOP, 44
- to memory card, 45

- Screen icons, 16

- Setpoint, 24

- Setup, 37

- Specifications, 49

- dimensions, 49
- gross weight, 49
- humidity, 49
- net weight, 49
- Operating temperature, 49
- protection level, 49

- storage temperature, 49
- Transport temperature, 49
- standard commissioning
- Macro selection, 38
- Standard commissioning, 37
- Maximum motor speed, 37
- Standard filter, 33
- Status, 29
- Storage temperature, 49

T

- Torque setpoint, 24

- Transport temperature, 49

U

- Unlocking keypad, 16

More information

SINAMICS inverter:
www.siemens.com/sinamics

Safety Integrated:
www.siemens.com/safety-integrated

PROFINET:
www.siemens.com/profinet

Siemens AG
Digital Factory
Motion Control
Postfach 3180
91050 ERLANGEN
GERMANY

Subject to change without prior notice
© Siemens AG 2013 - 2016

Industrial
Technologies
SINAMICS



www.siemens.com/drives