

SINAMICS G130

Basic Operator Panel 20 (BOP20)

Operating instructions · 03/2011

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Operating Instructions

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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
with a safety alert symbol, indicates that minor personal injury can result if proper precautions are not taken.
CAUTION
without a safety alert symbol, indicates that property damage can result if proper precautions are not taken.
NOTICE
indicates that an unintended result or situation can occur if the relevant information is not taken into account.


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.

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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.

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Safety information


1

1.1 Warnings



 WARNING
<p>Hazardous voltages are present when electrical equipment is in operation. Severe personal injury or substantial material damage may result if these warnings are not observed.</p> <p>Only qualified personnel are permitted to work on or around the equipment. This personnel must be thoroughly familiar with all the warnings and maintenance procedures described in these operating instructions.</p> <p>The successful and safe operation of this device is dependent on correct transport, proper storage and installation, as well as careful operation and maintenance.</p> <p>National safety guidelines must be observed.</p>



 DANGER
<p>Five safety rules</p> <p>When carrying out any kind of work on electrical devices, the "five safety rules" defined in EN 50110 must always be observed:</p> <ol style="list-style-type: none">1. Disconnect the system.2. Protect against reconnection.3. Make sure that the equipment is de-energized.4. Ground and short-circuit.5. Cover or enclose adjacent components that are still live.

NOTICE
For a UL-approved system use 60/75°C copper conductors only.

1.2 Safety and application instructions



DANGER

This equipment is used in industrial high-voltage installations. During operation, this equipment contains live, bare parts. For this reason, they could cause severe injury or significant material damage if the required covers are removed, if they are used or operated incorrectly, or have not been properly maintained.

When the machines are used in non-industrial areas, the installation location must be protected against unauthorized access (protective fencing, appropriate signs).

Prerequisites

Those responsible for protecting the plant must ensure the following:

- The basic planning work for the plant and the transport, assembly, installation, commissioning, maintenance, and repair work is carried out by qualified personnel and/or checked by experts responsible.
- The operating manual and machine documentation are always available.
- The technical specifications regarding the applicable installation, connection, environmental, and operating conditions are always observed.
- The plant-specific assembly and safety guidelines are observed and personal protection equipment is used.
- Unqualified personnel are forbidden from using these machines and working near them.


This operating manual is intended for qualified personnel and only contain information and notes relating to the intended purpose of the machines.

The operating manual and machine documentation are written in different languages as specified in the delivery contracts.

Note

We recommend engaging the support and services of your local Siemens service center for all planning, installation, commissioning and maintenance work.

1.3 Components that can be destroyed by electrostatic discharge (ESD)

 CAUTION
<p>The board contains components that can be destroyed by electrostatic discharge. These components can be easily destroyed if not handled properly. If you do have to use electronic boards, however, please observe the following:</p> <ul style="list-style-type: none"> • You should only touch electronic boards if absolutely necessary. • When you touch boards, however, your body must be electrically discharged beforehand. • Boards must not come into contact with highly insulating materials (such as plastic parts, insulated desktops, articles of clothing manufactured from man-made fibers). • Boards must only be placed on conductive surfaces. • Boards and components should only be stored and transported in conductive packaging (such as metalized plastic boxes or metal containers). • If the packaging material is not conductive, the boards must be wrapped with a conductive packaging material (such as conductive foam rubber or household aluminum foil).

The necessary ESD protective measures are clearly illustrated in the following diagram:

- a = conductive floor surface
- b = ESD table
- c = ESD shoes
- d = ESD overall
- e = ESD wristband
- f = cabinet ground connection
- g = contact with conductive flooring

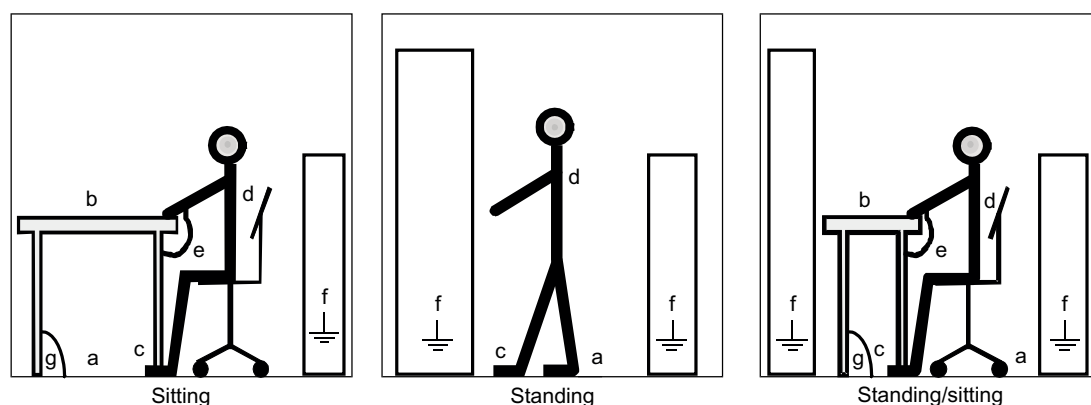


Figure 1-1 ESD protective measures

1.3 Components that can be destroyed by electrostatic discharge (ESD)

General

Description

The Basic Operator Panel 20 (BOP20) contains six keys and a backlit display unit.

The BOP20 can be plugged into and operated from the SINAMICS Control Unit. The blanking cover must be removed for this purpose.

The BOP20 supports the following functions:

- Entering parameters and activating functions
- Displaying operating modes, parameters, alarms, and faults
- Switch on/off during commissioning
- Acknowledging faults



Figure 2-1 BOP20

Installation

3

The following photos and captions explain how to assemble the Basic Operator Panel 20 (BOP20) on the Control Unit.



Control Unit and BOP20



Remove the cover by pressing the latching cams together



Insert the CompactFlash card before inserting the BOP20



Carefully insert the BOP20 until you hear it latch into position

3.1 Removal

Please note the following information when removing the BOP20 from the Control Unit:

1. The latching cams on the BOP20 must be pressed together simultaneously.
2. The BOP20 must be pulled out straight (i.e. not at an angle). The bottom edge of the BOP20 must never be pulled forwards to remove the device, as this could damage the interface on the rear.



Figure 3-1 Incorrect mounting of the BOP20

Setting parameters with the BOP20

4.1 BOP20 overview

Overview of displays/indicators and keys

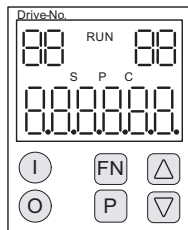








Figure 4-1 Overview of displays/indicators and keys

Table 4- 1 Displays/indicators

Display	Meaning
Top left, 2 chars.	The active drive object of the BOP is displayed here. The displays and key operations always refer to this drive object.
RUN	Lit if at least one drive in the drive line-up is in the RUN state (in operation). RUN is also displayed via bit r0899.2 of the drive.
Top right, 2 chars.	The following is displayed in this field: <ul style="list-style-type: none"> • More than 6 digits: Characters that are present but cannot be seen (e.g. "r2" → 2 characters to the right are invisible, "L1" → 1 character to the left is invisible) • Faults: Selects/displays other drives with faults • Designation of BICO inputs (bi, ci) • Designation of BICO outputs (bo, co) • Source object of a BICO interconnection to a drive object other than the active one.
S	Lit if at least one parameter was changed and the value was not transferred to the non-volatile memory.
P	Lit if the parameter value does not become effective until the P key is pressed.
C	Lit if at least one parameter was changed and the calculation for consistent data management has still not been initiated.
Bottom, 6 chars.	Displays parameters, indices, faults, and alarms.

4.1 BOP20 overview

Table 4-2 Keys

Key	Name	Meaning
	ON	Switches on the drives for which the command "ON/OFF1" is to be issued from the BOP. Binector output r0019.0 is set using this key.
	OFF	Switches off the drives for which the commands "ON/OFF1", "OFF2", and "OFF3" are to be issued from the BOP. The binector outputs r0019.0, .1 and .2 are reset simultaneously when this key is pressed. After the key has been released, binector outputs r0019.0, .1 and .2 are again set to a "1" signal.
		Note: The effectiveness of these keys can be defined by parameterizing the BICO (e.g. these keys can be used to control all of the existing drives simultaneously).
	Functions	The significance of this key depends on the current display. Note: The effectiveness of this key for acknowledging faults can be defined by parameterizing the BiCo accordingly.
	Parameters	The significance of this key depends on the current display. If this key is pressed for 3 s, the "Copy RAM to ROM" function is executed. The "S" displayed on the BOP disappears.
	Raise	The keys depend on the current display and are used to either raise or lower values.
	Lower	

BOP20 functions

Name	Meaning
Backlighting	The backlighting can be set using p0007 in such a way that it switches itself off automatically after the set time if no actions are carried out.
Changeover active drive	From the point of view of the BOP, the active drive is defined using p0008 or using the keys "Fn" and "Arrow up".
Units	The units are not displayed on the BOP.
Access level	The access level for the BOP is defined using p0003. The higher the access level, the more parameters can be selected via the BOP.
Parameter filter	The parameter filter in p0004 can be used to filter the available parameters in accordance with their particular function.
Selecting the status display	Actual values and setpoints are displayed on the status display. The status display can be set using p0006.
User parameter list	The user parameter list in p0013 can be used to select access parameters.
Unplug while voltage is present	The BOP can be unplugged and plugged in again while the device is live. The ON and OFF buttons function here. Unplugging the BOP causes the drives to coast to a standstill. When the BOP is plugged in again, the drives must be switched on again. The ON and OFF buttons have no function. Unplugging and plugging the BOP in again has no effect on the drives.
Actuating keys	The following applies to the "P" and "Fn" keys: When used in combination with another key, "P" or "Fn" must be pressed first and then the other key.

Parameters

All drive objects

- p0005 BOP status display selection
- p0006 BOP status display mode
- p0013 BOP user-defined list
- p0971 Save drive object parameters

Drive object, Control Unit

- r0000 BOP status display
- p0003 BOP access level
- p0004 BOP parameter menu
- p0007 Backlighting display delay time
- p0008 BOP drive object selection
- p0009 Device commissioning parameter filter
- p0011 BOP password input (p0013)
- p0012 BOP password confirmation (p0013)
- r0019 CO/BO: Control word, BOP
- p0977 Save all parameters

Other drive objects (e.g. VECTOR, TM31, ...)

- p0010 Commissioning parameter filter

4.2 Displays/indicators and using the BOP20

Status display

The status display for each drive object can be set using p0005 and p0006. Using the status display, you can switch to the parameter display or to a different drive object. The following functions are supported:

- Changing the active drive object
 - Press the "Fn" key and "Arrow up" -> the drive object number at the top left flashes.
 - Select the required drive object using the arrow keys.
 - Confirm with the "P" key.
- Parameter display
 - Press the "P" key.
 - The required parameter can be selected using the arrow keys.
 - Press the "Fn" key -> parameter r0000 is displayed.
 - Press the "P" key -> returns to the status display.

Parameter display

The parameters are selected in the BOP using their respective numbers. To call up the parameter display from the status display, press the "P" key. You can search for the parameters you require using the arrow keys. To display the parameter value, press the "P" key again. You can switch between the drive objects by simultaneously pressing the "Fn" key and the arrow keys. You can switch between r000 and the parameter that was last displayed by pressing the "Fn" key in the parameter display.

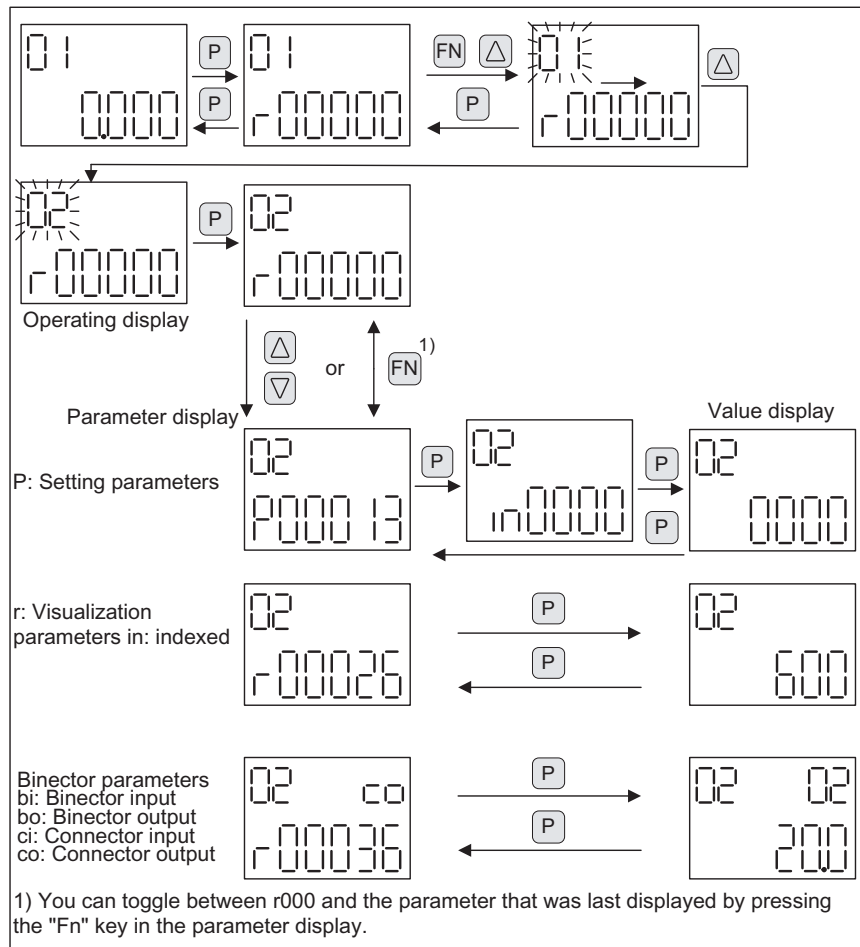


Figure 4-2 Parameter display

Value display

To switch from the parameter display to the value display, press the "P" key. In the value display, the values of the setting parameters can be increased and decreased using the arrow keys. The cursor can be selected using the "Fn" key.

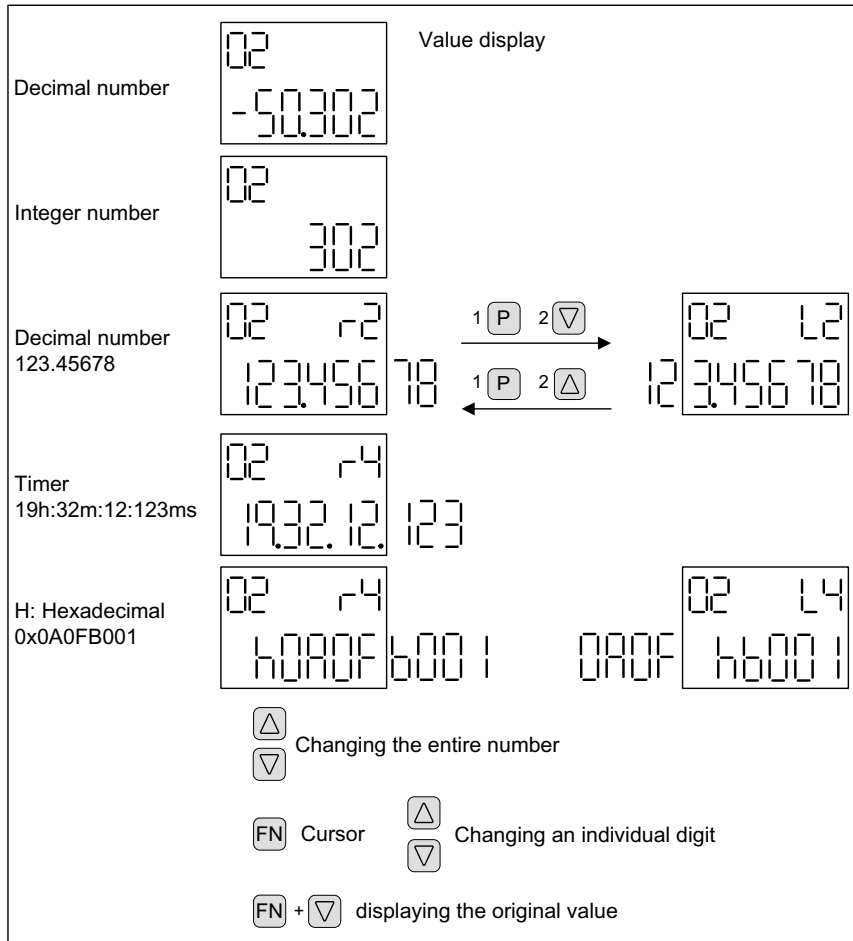


Figure 4-3 Value display

Examples

Example 1: Changing a parameter

Prerequisite: The appropriate access level is set (for this particular example, p0003 = 3).

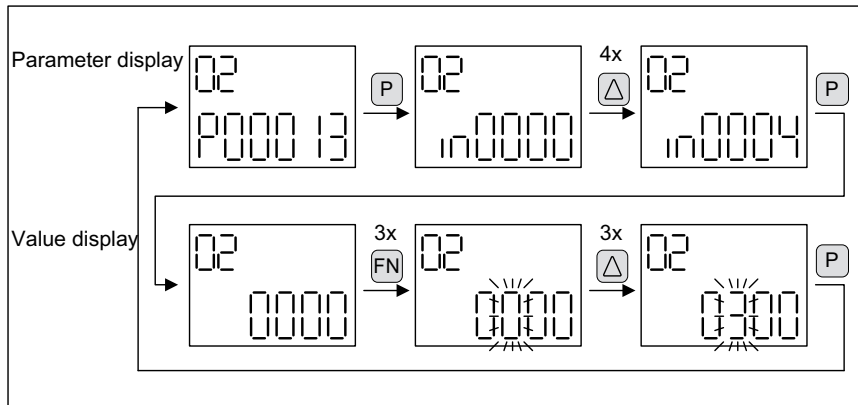


Figure 4-4 Example: Change p0013[4] from "0000" to "0300".

Example 2: Changing binector and connector input parameters

Binector output r0019.0 of the Control Unit (drive object 1) is connected to binector input p0840[0] (OFF1) of drive object 2.

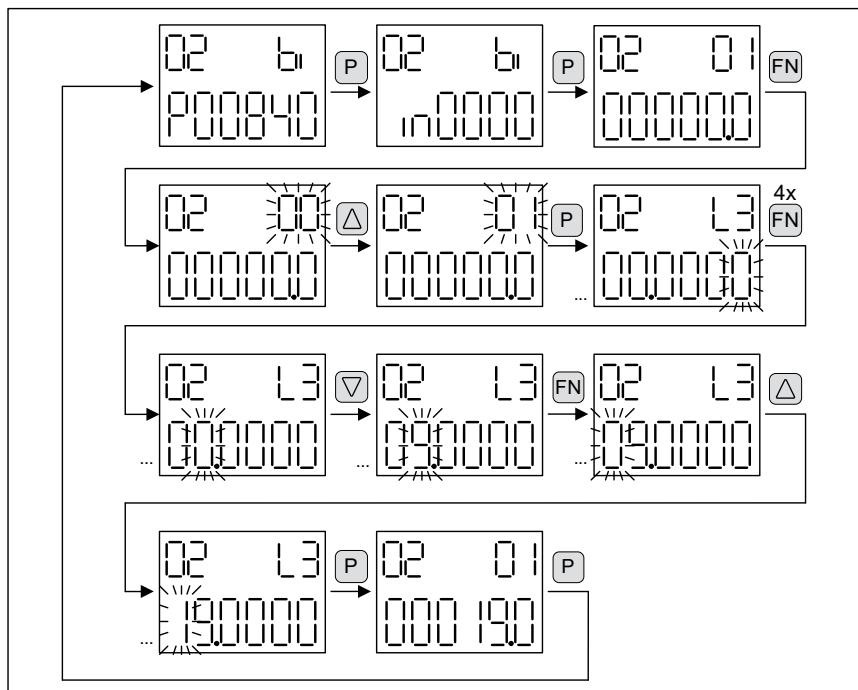


Figure 4-5 Example: Changing the indexed binector parameters

4.3 Fault and alarm displays

Displaying faults

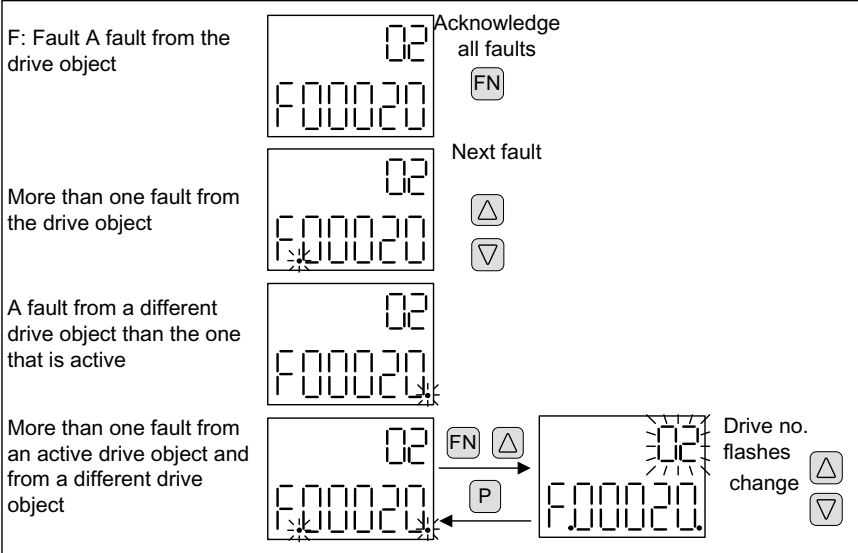


Figure 4-6 Displaying faults

Displaying alarms

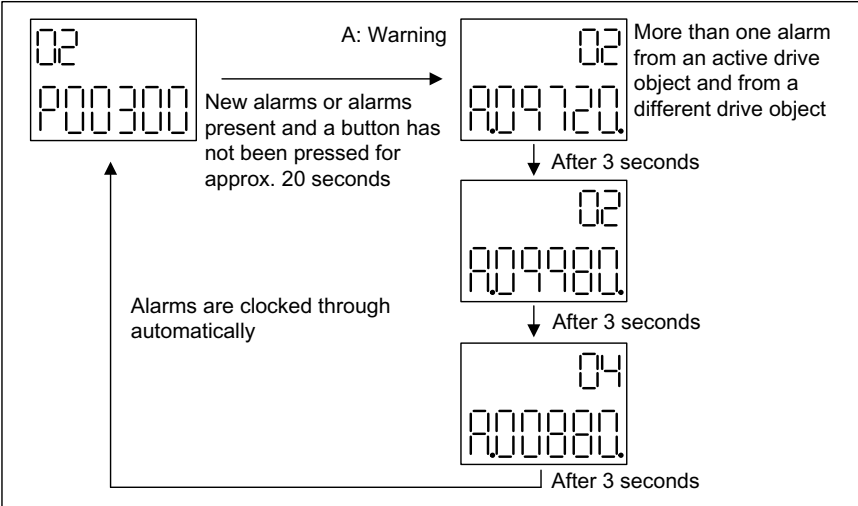


Figure 4-7 Displaying alarms

4.4 Controlling the drive using the BOP20

Description

When the drive is commissioned, it can be controlled via the BOP20. A control word is available on the Control Unit drive object (r0019) for this purpose, which can be interconnected with the appropriate binector inputs of the drive.

The interconnections do not function if a standard PROFIdrive telegram was selected as its interconnection cannot be disconnected.

Table 4- 3 BOP control word (r0019)

Bit (r0019)	Signal name	1 signal	0 signal	Example, interconnection parameters
00	ON / OFF (OFF1)	ON	OFF	p0840
01	No coast down/coast down (OFF2)	No coast down	Coast down (OFF2)	p0844
02	No fast stop/fast stop (OFF3)	No fast stop	Fast stop (OFF3)	p0848
07	Acknowledge fault (0 -> 1)	Yes	No	p2102
13	Motorized potentiometer, raise	Yes	No	p1035
14	Motorized potentiometer, lower	Yes	No	p1036

Note

For simple commissioning, only bit 0 should be interconnected. When bits 0 ... 2 are interconnected, the system is switched off according to the following priority: OFF2, OFF3, OFF1.

4.5 Important functions via BOP20

Description

The BOP20 can be used to execute the following functions (via parameters) that help you handle your projects more efficiently:

- Restore the factory settings
- Copy from RAM to ROM
- Identification via LED
- Acknowledge error

Restore the factory settings

The factory setting of the complete device can be restored in the CU drive object.

- p0009 = 30
- p0976 = 1

Copy from RAM to ROM

In the CU drive object, you can save all your parameters to the non-volatile memory (CompactFlash card):

- Press the "P" key for 3 seconds or
- p0977 = 1

NOTICE
This parameter is not accepted if an identification routine (e.g. motor identification routine) has been selected on a drive.

Identification via LED

The main component of a drive object (e.g. Motor Module) can be identified using the index of p0124. The ready LED on the module starts to flash. The index corresponds to the index in p0107; the drive object type can be identified using this parameter.

On the drive objects, the components can also be identified using the following parameters:

- p0124 power unit detection via LED
- p0144 Voltage Sensing Module detection via LED
- p0144 Sensor Module detection via LED
- p0154 DRIVE-CLiQ hub identification using LED
- p0154 Terminal Module detection via LED

Acknowledge error

All errors whose cause has been rectified can be acknowledged by pressing the Fn key.

Technical specifications

Table 5- 1 Technical specifications

Basic Operator Panel 20 (BOP20)	
Electronics power supply	3.3 V DC (provided by CU320)
Weight	0.02 kg

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