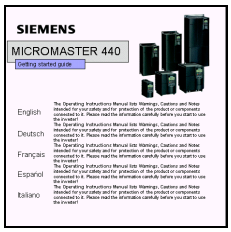
SIEMENS

# MICROMASTER 440

**Parameter List** **Issue A1**


**User Documentation**

**Getting Started Guide**
Is for quick commissioning with SDP and BOP.




**Operating Instructions**
Gives information about features of the MM440, Installation, Commissioning, Control modes, System Parameter structure, Troubleshooting, Specifications and available options of the MM440.


**Parameter List**
The Parameterlist containes the description of all Parameters structured in functional order and a detailed description. The Parameter list also includes a series of function plans.


**Reference Manual**
The reference Manual gives elaborate information about engineering communication troubleshooting and maintenance.


**Catalogues**
In the catalogue you will find all needs to select a certain inverter, as well as filters chokes, operator panels or communications options.

SIEMENS

# MICROMASTER 440

**Parameter List**
**User Documentation**

**Valid for** **Issue A1**

*Converter Type*
MICROMASTER 440




**Issue A1**

**Warning**

Please refer to all Definitiones and Warnings contained in the Operating Instructions. You will find the Operating Instructions on the Docu CD delivered with your inverter. If the CD is lost, it can be ordered via your local Siemens department under the Order No. 6SE6400-5FA00-1AG00.

Further information can be obtained from Internet website:
http://www.siemens.de/micromaster

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# Parameters MICROMASTER 440

This Parameter List must only be used together with the Operating Instructions or the Reference Manual of the MICROMASTER 440. Please pay special attention to the Warnings, Cautions, Notices and Notes contained in these manuals.

## Table of Contents

# 1 Introduction to MICROMASTER 440 System Parameters

The layout of the parameter description is as follows.

| | | | | | |
|---|---|---|---|---|---|
| **1 Par number [index]** | **2 Parameter name** | | | **9 Min:** | 12 Level: **2** |
| | **3 CStat**: | **5 Datatype** | **7 Unit:** | **10 Def:** | |
| | **4 P-Group:** | **6 active:** | **8 Quick Comm:** | **11 Max:** | |
| | 13 | Description: | | | |

1. **Parameter number**
   Indicates the relevant parameter number. The numbers used are 4-digit numbers in the range 0000 to 9999. Numbers prefixed with an “r” indicate that the parameter is a “read-only” parameter, which displays a particular value but cannot be changed directly by specifying a different value via this parameter number (in such cases, dashes “-“ are entered at the points “Unit”, “Min”, “Def” and “Max” in the header of the parameter description.
   All other parameters are prefixed with a “P”. The values of these parameters can be changed directly in the range indicated by the “Min” and “Max” settings in the header.

   **[index]** indicates that the parameter is an indexed parameter and specifies the number of indices available.

2. **Parameter name**
   Indicates the name of the relevant parameter. Certain parameter names include the following abbreviated prefixes: BI, BO, CI, and CO followed by a colon.

   These abbreviations have the following meanings:
   BI = Binector input, i.e. parameter selects the source of a binary signal
   BO = Binector output, i.e. parameter connects as a binary signal
   CI = Connector input, i.e. parameter selects the source of an analog signal
   CO = Connector output, i.e. parameter connects as an analog signal
   CO/BO = Connector/Binector output, i.e. parameter connects as an analog signal and/or as a binary signal

   To make use of BiCo you will need access to the full parameter list. At this level many new parameter settings are possible, including BiCo functionality. BiCo functionality is a different, more flexible way of setting and combining input and output functions. It can be used in most cases in conjunction with the simple, level 2 settings.

   The BiCo system allows complex functions to be programmed. Boolean and mathematical relationships can be set up between inputs (digital, analog, serial etc.) and outputs (inverter current, frequency, analog output, relays, etc.).

3. **CStat**
   Commissioning status of the parameter. Three states are possible:
   Commissioning C
   Ready to run U
   Run T
   This indicates when the parameter can be changed. One, two or all three states may be specified. If all three states are specified, this means that it is possible to change this parameter setting in all three inverter states

4. **P-Group**
   Indicates the functional group of the particular.

   **Note**
   Parameter P0004 (parameter filter) acts as a filter and focuses access to parameters according to the functional group selected.

5. **Datatype**
   The data types available are shown in the table below.

| Notation | Meaning |
|---|---|
| U16 | 16-bit unsigned |
| U32 | 32-bit unsigned |
| I16 | 16-bit integer |
| I32 | 32-bit integer |
| Float | Floating point |

6. **Active**
   Indicates whether
   - ♦ Immediately changes to the parameter values take effective immediately after they have been entered, or
   - ♦ Confirm the “P” button on the operator panel (BOP or AOP) must be pressed before the changes take effect.

7. **Unit**
   Indicates the unit of measure applicable to the parameter values
8. **QuickComm**
   Indicates whether or not (Yes or No) a parameter can only be changed during quick commissioning, i.e. when P0010 (parameter groups for commissioning) is set to 1 (quick commissioning).
9. **Min**
   Indicates the minimum value to which the parameter can be set.
10. **Def**
    Indicates the default value, i.e. the value which applies if the user does not specify a particular value for the parameter.
11. **Max**
    Indicates the maximum value to which the parameter can be set.
12. **Level**
    Indicates the level of user access. There are four access levels: Standard, Extended, Expert and Service. The number of parameters that appear in each functional group depends on the access level set in P0003 (user access level).
13. **Description**
    The parameter description consists of the sections and contents listed below. Some of these sections and contents are optional and will be omitted on a case-to-case basis if not applicable.

| | |
|---|---|
| **Description**: | Brief explanation of the parameter function. |
| **Diagram:** | Where applicable, diagram to illustrate the effects of parameters on a characteristic curve, for example |
| **Settings:** | List of applicable settings. These include<br>Possible settings, Most common settings, Index and Bitfields |
| **Example**: | Optional example of the effects of a particular parameter setting. |
| **Dependency**: | Any conditions that must be satisfied in connection with this parameter. Also any particular effects, which this parameter has on other parameter(s) or which other parameters have on this one. |
| **Warning / Caution / Notice / Note:** | Important information which must be heeded to prevent personal injury or damage to equipment / specific information which should be heeded in order to avoid problems / information which may be helpful to the user |
| **More details:** | Any sources of more detailed information concerning the particular parameter. |

## 1.1 Quick commissioning (P0010=1)

The following parameters are necesarry for quick commissioning (P0010=1).

| No | Name | Access level | Cstat |
|---|---|---|---|
| P0100 | Europe / North America | 1 | C |
| P0205 | Inverter application | 3 | C |
| P0300 | Select motor type | 2 | C |
| P0304 | Motor voltage rating | 1 | C |
| P0305 | Motor current rating | 1 | C |
| P0307 | Motor power rating | 1 | C |
| P0308 | Motor cosPhi rating | 2 | C |
| P0309 | Motor efficiency rating | 2 | C |
| P0310 | Motor frequency rating | 1 | C |
| P0311 | Motor speed rating | 1 | C |
| P0320 | Motor magnetizing current | 3 | CT |
| P0335 | Motor cooling | 2 | CT |
| P0640 | Motor overload factor [%] | 2 | CUT |
| P0700 | Selection of command source | 1 | CT |
| P1000 | Selection of frequency setpoint | 1 | CT |
| P1080 | Min. speed | 1 | CUT |
| P1082 | Max. speed | 1 | CT |
| P1120 | Ramp-up time | 1 | CUT |
| P1121 | Ramp-down time | 1 | CUT |
| P1135 | OFF3 ramp-down time | 2 | CUT |
| P1300 | Control mode | 2 | CT |
| P1500 | Selection of torque setpoint | 2 | CT |
| P1910 | Select motor data identification | 2 | CT |
| P3900 | End of quick commissioning | 1 | C |

When P0010=1 is chosen, P0003 (user access level) can be used to select the parameters to be accessed. This parameter also allows selection of a user-defined parameter list for quick commissioning.

At the end of the quick commissioning sequence, set P3900 = 1 to carry out the necessary motor calculations and clear all other parameters (not included in P0010=1) to their default settings.

**Note**
This applies only in Quick Commissioning mode.

### Reset to Factory default

To reset all parameters to the factory default settings; the following parameters should be set as follows:

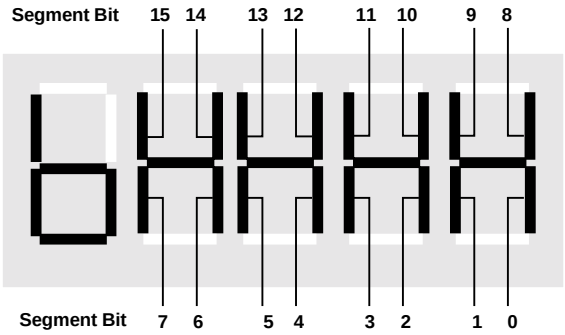
Set P0010=30.

Set P0970=1.

**Note**
The reset process takes approximately 10 seconds to complete. Reset to Factory default

## Seven-segment display

The seven-segment display is structured as follows:




The significance of the relevant bits in the display is described in the status and control word parameters.

## 1.2 Parameter Description

**Note:**

Level 4 Parameters are not visible with BOP or AOP.

**r0000** **Drive display** Level: **1**

**Datatype:** U16 **Unit:** - **Min:** - **Def:** - **Max:** -

**P-Group:** ALWAYS

Displays the user selected output as defined in P0005.

**Note:**

Pressing the "Fn" button for 2 seconds allows the user to view the values of DC link voltage, output current, output frequency, and chosen r0000 setting (defined in P0005).

**r0002** **Drive state** Level: **2**

**Datatype:** U16 **Unit:** - **Min:** - **Def:** - **Max:** -

**P-Group:** COMMANDS

Displays actual drive state.

**Enum:**

0 Commissioning mode (P0010 != 0)
1 Drive ready
2 Drive fault active
3 Drive starting (DC-link precharging)
4 Drive running
5 Stopping (ramping down)

**Dependency:**

State 3 visible only while precharging DC link, and when externally powered communications board is fitted.

**P0003** **User access level** Level: **1**

**CStat:** CUT **Datatype:** U16 **Unit:** - **Min:** 0 **Def:** 1 **Max:** 4

**P-Group:** ALWAYS **Active:** Immediately -

Defines user access level to parameter sets. The default setting (standard) is sufficient for most simple applications.

**Enum:**

0 User defined parameter list - see P0013 for details on use
1 Standard: Allows access into most frequently used parameters.
2 Extended: Allows extended access e.g. to inverter I/O functions.
3 Expert: For expert use only.
4 Service: Only for use by authorized service personal - password protected.

**P0004** **Parameter filter** Level: **1**

**CStat:** CUT **Datatype:** U16 **Unit:** - **Min:** 0 **Def:** 0 **Max:** 22

**P-Group:** ALWAYS **Active:** Immediately -

Filters available parameters according to functionality to enable a more focussed approach to commissioning.

**Example:**

P0004 = 22 specifies that only PID parameters will be visible.

**Enum:**

0 All parameters
2 Inverter
3 Motor
4 Speed sensor
5 Technol. application / units
7 Commands, binary I/O
8 ADC and DAC
10 Setpoint channel / RFG
12 Drive features
13 Motor control
20 Communication
21 Alarms / warnings / monitoring
22 Technology controller (e.g. PID)

**Dependency:**

Parameters marked "Quick Comm: Yes" in the parameter header can only be set when P0010 = 1 (Quick Commissioning).

**Note:**

The inverter will start with any setting of P0004.

**P0005[3] Display selection**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U16 | **Unit:** - | **Min:** | 2 |
| **P-Group:** | FUNC | **Active:** Immediately | - | **Def:** | 21 |
| | | | | **Max:** | 2294 |

Level: **2**

Selects display for parameter r0000 (drive display).

**Settings:**

21 Actual frequency
25 Output voltage
26 DC link voltage
27 Output current

**Index:**

P0005[0] : 1st. Drive data set (DDS)
P0005[1] : 2nd. Drive data set (DDS)
P0005[2] : 3rd. Drive data set (DDS)

**Notice:**

These settings refer to read only parameter numbers ("rxxxx").

**Details:**

See relevant "rxxxx" parameter descriptions.

**P0006 Display mode**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U16 | **Unit:** - | **Min:** | 0 |
| **P-Group:** | FUNC | **Active:** Immediately | - | **Def:** | 2 |
| | | | | **Max:** | 4 |

Level: **3**

Defines mode of display for r0000 (drive display).

**Enum:**

| | |
|---|---|
| 0 | In Ready state alternate between setpoint and output freq. In run display output freq. |
| 1 | In Ready state display setpoint. In run display output freq. |
| 2 | In Ready state alternate between P0005 value and r0020 value. In run display P0005 value |
| 3 | In Ready state alternate between r0002 value and r0020 value. In run display r0002 value |
| 4 | In all states just display P0005 |

**Note:**

When inverter is not running, the display alternates between the values for "Not Running" and "Running".

Per default, the setpoint and actual frequency values are displayed alternately.

**P0007 Backlight delay time**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U16 | **Unit:** - | **Min:** | 0 |
| **P-Group:** | FUNC | **Active:** Immediately | - | **Def:** | 0 |
| | | | | **Max:** | 2000 |

Level: **3**

Defines time period after which the backlight display turns off if no operator keys have been pressed.

**Value:**

P0007 = 0 : Backlight always on (default state)

P0007 = 1-2000 : Number of seconds after which the backlight will turn off

**P0010 Commissioning parameter filter**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U16 | **Unit:** - | **Min:** | 0 |
| **P-Group:** | ALWAYS | **Active:** Immediately | - | **Def:** | 0 |
| | | | | **Max:** | 30 |

Level: **1**

Filters parameters so that only those related to a particular functional group are selected.

**Enum:**

| | |
|---|---|
| 0 | Ready |
| 1 | Quick commissioning |
| 2 | Inverter |
| 29 | Download |
| 30 | Factory setting |

**Dependency:**

Reset to 0 for inverter to run.

P0003 (user access level) also determines access to parameters.

**Note:**

If P3900 is not 0 (0 is the default value), this parameter is automatically reset to 0.

**P0011 Lock for user defined parameter**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U16 | **Unit:** - | **Min:** | 0 |
| **P-Group:** | FUNC | **Active:** Immediately | - | **Def:** | 0 |
| | | | | **Max:** | 65535 |

Level: **3**

**Details:**

See parameter P0013 (user defined parameter)

**P0012 Key for user defined parameter**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U16 | **Unit:** - | **Min:** | 0 |
| **P-Group:** | FUNC | **Active:** Immediately | - | **Def:** | 0 |
| | | | | **Max:** | 65535 |

Level: **3**

**Details:**

See parameter P0013 (user defined parameter).

**P0013[20]** **User defined parameter**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U16 | **Unit:** - | **Min:** | 0 |
| **P-Group:** | FUNC | **Active:** Immediately | - | **Def:** | 0 |
| | | | | **Max:** | 65535 |

Level: **3**

Defines a limited set of parameters to which the end user will have access.

Instructions for use:
Step 1: Set P0003 = 3 (expert user)
Step 2: Go to P0013 indices 0 to 16 (user list)
Step 3: Enter into P0013 index 0 to 16 the parameters required to be visible in the user-defined list.
The following values are fixed and cannot be changed:
- P0013 index 19 = 12 (key for user defined parameter)
- P0013 index 18 = 10 (commissioning parameter filter)
- P0013 index 17 = 3 (user access level)

Step 4: Set P0003 = 0 to activate the user defined parameter.

**Dependency:**

First, set P0011 ("lock") to a different value than P0012 ("key") to prevent changes to user-defined parameter. Then, set P0003 to 0 to activate the user-defined list.

When locked and the user-defined parameter is activated, the only way to exit the user-defined parameter (and view other parameters) is to set P0012 ("key") to the value in P0011 ("lock").

**Note:**

Alternatively, set P0010 = 30 (commissioning parameter filter = factory setting) and P0970 = 1 (factory reset) to perform a complete factory reset.

The default values of P0011 ("lock") and P0012 ("key") are the same.

**r0018** **Firmware version**

| | | | | | |
|---|---|---|---|---|---|
| | | **Datatype:** Float | **Unit:** - | **Min:** | - |
| **P-Group:** | INVERTER | | | **Def:** | - |
| | | | | **Max:** | - |

Level: **1**

Displays version number of installed firmware.

**r0019** **CO/BO: BOP control word**

| | | | | | |
|---|---|---|---|---|---|
| | | **Datatype:** U16 | **Unit:** - | **Min:** | - |
| **P-Group:** | COMMANDS | | | **Def:** | - |
| | | | | **Max:** | - |

Level: **3**

Displays status of operator panel commands.

The settings below are used as the "source" codes for keypad control when connecting to BICO input parameters.

**Bitfields:**

| | | | |
|---|---|---|---|
| Bit00 | ON/OFF1 | 0 | NO |
| | | 1 | YES |
| Bit01 | OFF2: Electrical stop | 0 | YES |
| | | 1 | NO |
| Bit02 | OFF3: Fast stop | 0 | YES |
| | | 1 | NO |
| Bit08 | JOG right | 0 | NO |
| | | 1 | YES |
| Bit09 | JOG left | 0 | NO |
| | | 1 | YES |
| Bit11 | Reverse (setpoint inversion) | 0 | NO |
| | | 1 | YES |
| Bit13 | Motor potentiometer MOP up | 0 | NO |
| | | 1 | YES |
| Bit14 | Motor potentiometer MOP down | 0 | NO |
| | | 1 | YES |

**Note:**

When BICO technology is used to allocate functions to panel buttons, this parameter displays the actual status of the relevant command.

The following functions can be "connected" to individual buttons:
- ON/OFF1,
- OFF2,
- JOG,
- REVERSE,
- INCREASE,
- DECREASE

**r0020** **CO: Act. frequency setpoint**

| | | | | | |
|---|---|---|---|---|---|
| | | **Datatype:** Float | **Unit:** Hz | **Min:** | - |
| **P-Group:** | CONTROL | | | **Def:** | - |
| | | | | **Max:** | - |

Level: **3**

Displays actual frequency setpoint (output from ramp function generator).

**r0021** **CO: Act. frequency** Level: **2**

**Datatype:** Float **Unit:** Hz **Min:** - **Def:** - **Max:** -

**P-Group:** CONTROL

Displays actual inverter output frequency (r0024) excluding slip compensation, resonance damping and frequency limitation.

**r0022** **Act. rotor speed** Level: **3**

**Datatype:** Float **Unit:** 1/min **Min:** - **Def:** - **Max:** -

**P-Group:** CONTROL

Displays calculated rotor speed based on inverter output frequency [Hz] x 120 / number of poles.

**Note:**

This calculation makes no allowance for load-dependent slip.

**r0024** **CO: Act. output frequency** Level: **3**

**Datatype:** Float **Unit:** Hz **Min:** - **Def:** - **Max:** -

**P-Group:** CONTROL

Displays actual output frequency (slip compensation, resonance damping and frequency limitation are included).

**r0025** **CO: Act. output voltage** Level: **2**

**Datatype:** Float **Unit:** V **Min:** - **Def:** - **Max:** -

**P-Group:** CONTROL

Displays [rms] voltage applied to motor.

**r0026** **CO: Act. DC-link voltage** Level: **2**

**Datatype:** Float **Unit:** V **Min:** - **Def:** - **Max:** -

**P-Group:** INVERTER

Displays DC-link voltage.

**r0027** **CO: Act. output current** Level: **2**

**Datatype:** Float **Unit:** A **Min:** - **Def:** - **Max:** -

**P-Group:** CONTROL

Displays [rms] value of motor current [A].

**r0029** **CO: Flux gen. current** Level: **3**

**Datatype:** Float **Unit:** A **Min:** - **Def:** - **Max:** -

**P-Group:** CONTROL

Displays flux-generating current component.

The flux-generating current component is based on the nominal flux, which is calculated from the motor parameters (P0340 - Calculation of motor parameters).

**Dependency:**

Applies when vector control is selected in P1300 (control mode); otherwise, the display shows the value zero.

**Note:**

The flux-generating current component is generally constant up to the base speed of the motor; above base speed, this component is weakened (field weakening) thus enabling an increase in motor speed but at reduced torque.

**r0030** **CO: Torque gen. current** Level: **3**

**Datatype:** Float **Unit:** A **Min:** - **Def:** - **Max:** -

**P-Group:** CONTROL

Displays torque-generating current component.

The torque-generating current component is calculated from the torque setpoint values delivered by the speed regulator.

**Dependency:**

Applies when vector control is selected in P1300 (control mode); otherwise, the display shows the value zero.

**Note:**

For asynchronous motors, a limit is calculated for the torque generating current component (in conjunction with the maximum possible output voltage (r0071), motor leakage and current field weakening (r0377)) and this prevents motor stalling.

**r0031** **CO: Act. torque** Level: **2**

**Datatype:** Float **Unit:** Nm **Min:** - **Def:** - **Max:** -

**P-Group:** CONTROL

Displays motor torque.

**r0032** **CO: Act. power** Level: **2**

**Datatype:** Float **Unit:** - **Min:** - **Def:** - **Max:** -

**P-Group:** CONTROL

Displays motor power.

**Dependency:**

Value is displayed in [kW] or [hp] depending on setting for P0100 (operation for Europe / North America).

**r0035[3]** **CO: Act. motor temperature** Level: **2**

**Datatype:** Float **Unit:** °C **Min:** - **Def:** - **Max:** -

**P-Group:** MOTOR

Displays measured motor temperature.

**r0036** **CO:Inverter overload utilization** Level: **4**

**Datatype:** Float **Unit:** % **Min:** - **Def:** - **Max:** -

**P-Group:** INVERTER

Displays inverter overload utilization calculated via I2t model.

The actual I2t value relative to the max. possible I2t value supplies utilization in [%].

If the nominal current of the inverter is not exceed, 0 % utilization will be displayed.

If the current exceeds the threshold for P0294 (inverter I2t overload warning), warning A0504 (inverter overtemperature) is generated and the output current of the inverter reduced via P0290 (inverter overload reaction).

If 100 % utilization is exceeded, alarm F0005 (inverter I2T) is tripped.

**r0037[2]** **CO: Inverter temperature [°C]** Level: **3**

**Datatype:** Float **Unit:** °C **Min:** - **Def:** - **Max:** -

**P-Group:** INVERTER

Displays measured heatsink temperature and calculated junction temperature of IGBTs based on thermal model.

**Index:**

r0037[0] : Measured heat sink temperature
r0037[1] : Chip temperature

**r0038** **CO: Act. power factor** Level: **3**

**Datatype:** Float **Unit:** - **Min:** - **Def:** - **Max:** -

**P-Group:** CONTROL

Displays actual power factor.

**Dependency:**

Applies when V/f control is selected in P1300 (control mode); otherwise, the display shows the value zero.

**r0039** **CO: Energy consumpt. meter [kWh]** Level: **2**

**Datatype:** Float **Unit:** kWh **Min:** - **Def:** - **Max:** -

**P-Group:** INVERTER

Displays electrical energy used by inverter since display was last reset (see P0040 - reset energy consumption meter).

**Dependency:**

Value is reset when P3900 = 1 (end quick commissioning), P0970 = 1 (factory reset) or P0040 = 1 (reset energy consumption meter).

**P0040** **Reset energy consumption meter** Level: **2**

**CStat:** CT **Datatype:** U16 **Unit:** - **Min:** 0 **Def:** 0 **Max:** 1

**P-Group:** INVERTER **Active:** Immediately -

Resets value of parameter r0039 (energy consumption meter) to zero.

**Enum:**

0 No reset
1 Reset r0039 to 0

**Dependency:**

No reset until "P" is pressed.

**r0050** **CO: Active command data set** Level: **2**

**Datatype:** U16 **Unit:** - **Min:** - **Def:** - **Max:** -

**P-Group:** COMMANDS

Displays currently selected and active binector and connector (BICO) data set.

**Enum:**

0 1st. Command data set (CDS)
1 2nd. Command data set (CDS)
2 3rd. Command data set (CDS)

**r0051[2]** **CO: Active drive data set**

**Datatype:** U16 **Unit:** - **Min:** - **Def:** - **Max:** -

Level: **2**

**P-Group:** COMMANDS

Displays currently selected and active drive data set.

**Enum:**

0 1st. Drive data set (DDS)
1 2nd. Drive data set (DDS)
2 3rd. Drive data set (DDS)

**Index:**

r0051[0] : Selected drive data set
r0051[1] : Active drive data set

**r0052** **CO/BO: Act. status word 1**

**Datatype:** U16 **Unit:** - **Min:** - **Def:** - **Max:** -

Level: **2**

**P-Group:** COMMANDS

Displays first active status word of inverter (bit format) and can be used to diagnose inverter status. The display segments for the status word are shown in the "Introduction to MICROMASTER System Pamarameters".

**Bitfields:**

| | | | |
|---|---|---|---|
| Bit00 | Drive ready | 0 | NO |
| | | 1 | YES |
| Bit01 | Drive ready to run | 0 | NO |
| | | 1 | YES |
| Bit02 | Drive running | 0 | NO |
| | | 1 | YES |
| Bit03 | Drive fault active | 0 | NO |
| | | 1 | YES |
| Bit04 | OFF2 active | 0 | YES |
| | | 1 | NO |
| Bit05 | OFF3 active | 0 | YES |
| | | 1 | NO |
| Bit06 | ON inhibit active | 0 | NO |
| | | 1 | YES |
| Bit07 | Drive warning active | 0 | NO |
| | | 1 | YES |
| Bit08 | Deviation setp. / act. value | 0 | YES |
| | | 1 | NO |
| Bit09 | PZD control | 0 | NO |
| | | 1 | YES |
| Bit10 | Maximum frequency reached | 0 | NO |
| | | 1 | YES |
| Bit11 | Warning: Motor current limit | 0 | YES |
| | | 1 | NO |
| Bit12 | Motor holding brake active | 0 | NO |
| | | 1 | YES |
| Bit13 | Motor overload | 0 | YES |
| | | 1 | NO |
| Bit14 | Motor runs direction right | 0 | NO |
| | | 1 | YES |
| Bit15 | Inverter overload | 0 | YES |
| | | 1 | NO |

**Note:**

Output of Bit3 (Fault) will be inverted on digital output (Low = Fault, High = No Fault).

**r0053** **CO/BO: Act. status word 2** Level: **2**

**Datatype:** U16 **Unit:** - **Min:** - **Def:** - **Max:** -

**P-Group:** COMMANDS

Displays second status word of inverter (in bit format).

**Bitfields:**

| | | | |
|---|---|---|---|
| Bit00 | DC brake active | 0 | NO |
| | | 1 | YES |
| Bit01 | Act. freq. r0024 > P2167 | 0 | NO |
| | | 1 | YES |
| Bit02 | Act. freq. r0024 > P1080 | 0 | NO |
| | | 1 | YES |
| Bit03 | Act. current r0027 >= P2170 | 0 | NO |
| | | 1 | YES |
| Bit04 | Act. freq. r0024 > P2155 | 0 | NO |
| | | 1 | YES |
| Bit05 | Act. freq. r0024 <= P2155 | 0 | NO |
| | | 1 | YES |
| Bit06 | Act. freq. r0024 >= setpoint | 0 | NO |
| | | 1 | YES |
| Bit07 | Act. Vdc r0026 < P2172 | 0 | NO |
| | | 1 | YES |
| Bit08 | Act. Vdc r0026 > P2172 | 0 | NO |
| | | 1 | YES |
| Bit09 | Ramping finished | 0 | NO |
| | | 1 | YES |
| Bit10 | PID output r2294 < P2291 | 0 | NO |
| | | 1 | YES |
| Bit11 | PID output r2294 >= P2291 | 0 | NO |
| | | 1 | YES |
| Bit14 | Download data set 0 from AOP | 0 | NO |
| | | 1 | YES |
| Bit15 | Download data set 1 from AOP | 0 | NO |
| | | 1 | YES |

**Details:**

See description of seven-segment display given in the introduction

**r0054** **CO/BO: Act. control word 1** Level: **3**

**Datatype:** U16 **Unit:** - **Min:** - **Def:** - **Max:** -

**P-Group:** COMMANDS

Displays first control word of inverter and can be used to diagnose which commands are active.

**Bitfields:**

| | | | |
|---|---|---|---|
| Bit00 | ON/OFF1 | 0 | NO |
| | | 1 | YES |
| Bit01 | OFF2: Electrical stop | 0 | YES |
| | | 1 | NO |
| Bit02 | OFF3: Fast stop | 0 | YES |
| | | 1 | NO |
| Bit03 | Pulse enable | 0 | NO |
| | | 1 | YES |
| Bit04 | RFG enable | 0 | NO |
| | | 1 | YES |
| Bit05 | RFG start | 0 | NO |
| | | 1 | YES |
| Bit06 | Setpoint enable | 0 | NO |
| | | 1 | YES |
| Bit07 | Fault acknowledge | 0 | NO |
| | | 1 | YES |
| Bit08 | JOG right | 0 | NO |
| | | 1 | YES |
| Bit09 | JOG left | 0 | NO |
| | | 1 | YES |
| Bit10 | Control from PLC | 0 | NO |
| | | 1 | YES |
| Bit11 | Reverse (setpoint inversion) | 0 | NO |
| | | 1 | YES |
| Bit13 | Motor potentiometer MOP up | 0 | NO |
| | | 1 | YES |
| Bit14 | Motor potentiometer MOP down | 0 | NO |
| | | 1 | YES |
| Bit15 | CDS Bit 0 (Local/Remote) | 0 | NO |
| | | 1 | YES |

**Details:**

See description of seven-segment display given in the introduction

**r0055** **CO/BO: Add. act. control word** Level: **3**

**Datatype:** U16 **Unit:** - **Min:** - **Def:** - **Max:** -

**P-Group:** COMMANDS

Displays additional control word of inverter and can be used to diagnose which commands are active.

**Bitfields:**

| | | | |
|---|---|---|---|
| Bit00 | Fixed frequency Bit 0 | 0 | NO |
| | | 1 | YES |
| Bit01 | Fixed frequency Bit 1 | 0 | NO |
| | | 1 | YES |
| Bit02 | Fixed frequency Bit 2 | 0 | NO |
| | | 1 | YES |
| Bit03 | Fixed frequency Bit 3 | 0 | NO |
| | | 1 | YES |
| Bit04 | Drive data set (DDS) Bit 0 | 0 | NO |
| | | 1 | YES |
| Bit05 | Drive data set (DDS) Bit 1 | 0 | NO |
| | | 1 | YES |
| Bit08 | PID enabled | 0 | NO |
| | | 1 | YES |
| Bit09 | DC brake enabled | 0 | NO |
| | | 1 | YES |
| Bit11 | Droop | 0 | NO |
| | | 1 | YES |
| Bit12 | Torque control | 0 | NO |
| | | 1 | YES |
| Bit13 | External fault 1 | 0 | YES |
| | | 1 | NO |
| Bit15 | Command data set (CDS) Bit 1 | 0 | NO |
| | | 1 | YES |

**Details:**

See description of seven-segment display given in the introduction

**r0056** **CO/BO: Status of motor control** Level: **3**

**Datatype:** U16 **Unit:** - **Min:** - **Def:** - **Max:** -

**P-Group:** CONTROL

Displays status of motor control (MM420: V/f status), which can be used to diagnose inverter status.

**Bitfields:**

| | | | |
|---|---|---|---|
| Bit00 | Init. control finished | 0 | NO |
| | | 1 | YES |
| Bit01 | Motor demagnetizing finished | 0 | NO |
| | | 1 | YES |
| Bit02 | Pulses enabled | 0 | NO |
| | | 1 | YES |
| Bit03 | Voltage soft start select | 0 | NO |
| | | 1 | YES |
| Bit04 | Motor excitation finished | 0 | NO |
| | | 1 | YES |
| Bit05 | Starting boost active | 0 | NO |
| | | 1 | YES |
| Bit06 | Acceleration boost active | 0 | NO |
| | | 1 | YES |
| Bit07 | Frequency is negative | 0 | NO |
| | | 1 | YES |
| Bit08 | Field weakening active | 0 | NO |
| | | 1 | YES |
| Bit09 | Volts setpoint limited | 0 | NO |
| | | 1 | YES |
| Bit10 | Slip frequency limited | 0 | NO |
| | | 1 | YES |
| Bit11 | F_out > F_max Freq. limited | 0 | NO |
| | | 1 | YES |
| Bit12 | Phase reversal selected | 0 | NO |
| | | 1 | YES |
| Bit13 | I-max controller active | 0 | NO |
| | | 1 | YES |
| Bit14 | Vdc-max controller active | 0 | NO |
| | | 1 | YES |
| Bit15 | Vdc-min controller active | 0 | NO |
| | | 1 | YES |

**Details:**

See description of seven-segment display given in the introduction

**r0061** **CO: Act. rotor speed** Level: **4**

**Datatype:** Float **Unit:** Hz **Min:** - **Def:** - **Max:** -

**P-Group:** CONTROL

Displays current speed detected by encoder.

**r0062** **CO: Freq. setpoint** Level: **3**

**Datatype:** Float **Unit:** Hz **Min:** - **Def:** - **Max:** -

**P-Group:** CONTROL

Displays speed setpoint of vector controller.

**r0063** **CO: Act. frequency** Level: **3**

**Datatype:** Float **Unit:** Hz **Min:** - **Def:** - **Max:** -

**P-Group:** CONTROL

Displays actual speed.

**r0064** **CO: Dev. frequency controller** Level: **3**

**Datatype:** Float **Unit:** Hz **Min:** - **Def:** - **Max:** -

**P-Group:** CONTROL

Displays actual deviation of speed controller.

This value is calculated from the speed setpoint (r0062) and the actual speed (r0063).

**Dependency:**

Applies when vector control is selected in P1300 (control mode); otherwise, the display shows the value zero.

**r0065** **CO: Slip frequency** Level: **3**

**Datatype:** Float **Unit:** % **Min:** - **Def:** - **Max:** -

**P-Group:** CONTROL

Displays slip frequency of motor in [%] relative to the rated motor frequency (P0310).

**Details:**

For V/f control, see also P1335 (slip compensation)

**r0066** **CO: Act. output frequency** Level: **3**

**Datatype:** Float **Unit:** Hz **Min:** - **Def:** - **Max:** -

**P-Group:** CONTROL

Displays actual output frequency.

**Note:**

The output frequency is limited by the values entered in P1080 (min. frequency) and P1082 (max. frequency).

**r0067** **CO: Act. output current limit** Level: **3**

**Datatype:** Float **Unit:** A **Min:** - **Def:** - **Max:** -

**P-Group:** CONTROL

Displays valid maximum output current of drive.

This value is influenced by P0640 (max. output current), the derating characteristics and the thermal motor and inverter protection.

**Dependency:**

P0610 (motor I2t temperature reaction) defines reaction when limit is reached.

**Note:**

Normally, current limit = rated motor current (P0305) x motor current limit (P0640). It is less than or equal to maximum inverter current r0209.

The current limit may be reduced if the motor thermal model calculation indicates that overheating will occur.

**r0068** **CO: Output current** Level: **3**

**Datatype:** Float **Unit:** A **Min:** - **Def:** - **Max:** -

**P-Group:** CONTROL

Displays unfiltered [rms] value of motor current [A].

**Note:**

Used for process control purposes (in contrast to r0027 (output current), which is filtered and is used to display the value on the BOP/AOP).

**r0069[3]** **CO: Act. phase currents** Level: **4**

**Datatype:** Float **Unit:** A **Min:** - **Def:** - **Max:** -

**P-Group:** CONTROL

Displays phase currents.

**Index:**

r0069[0] : U_phase
r0069[1] : V_phase
r0069[2] : W_phase

**r0070** **CO: Act. DC-link voltage** Level: **3**
**Datatype:** Float **Unit:** V **Min:** - **Def:** - **Max:** -
**P-Group:** INVERTER

Displays (unfiltered) DC-link voltage.

**Note:**
Used for process control purposes (in contrast to r0026 (actual DC-link voltage), which is filtered and is used to display the value on the BOP/AOP).

**r0071** **CO: Max. output voltage** Level: **3**
**Datatype:** Float **Unit:** V **Min:** - **Def:** - **Max:** -
**P-Group:** CONTROL

Displays maximum output voltage.

**Dependency:**
Actual maximum output voltage depends on the actual input supply voltage.

**r0072** **CO: Act. output voltage** Level: **3**
**Datatype:** Float **Unit:** V **Min:** - **Def:** - **Max:** -
**P-Group:** CONTROL

Displays output voltage.

**r0074** **CO: Actual modulation** Level: **4**
**Datatype:** Float **Unit:** % **Min:** - **Def:** - **Max:** -
**P-Group:** CONTROL

Displays actual modulation index.

The modulation index is defined as ratio between the magnitude of the fundamental component in the inverter phase output voltage and half of the dc-link voltage.

**r0075** **CO: Current setpoint Isd** Level: **3**
**Datatype:** Float **Unit:** A **Min:** - **Def:** - **Max:** -
**P-Group:** CONTROL

Displays setpoint of flux generating current component.

**Dependency:**
Applies when vector control is selected in P1300 (control mode); otherwise, the display shows the value zero.

**r0076** **CO: Act. current Isd** Level: **3**
**Datatype:** Float **Unit:** A **Min:** - **Def:** - **Max:** -
**P-Group:** CONTROL

Displays flux generating current component.

**Dependency:**
Applies when vector control is selected in P1300 (control mode); otherwise, the display shows the value zero.

**r0077** **CO: Current setpoint Isq** Level: **3**
**Datatype:** Float **Unit:** A **Min:** - **Def:** - **Max:** -
**P-Group:** CONTROL

Displays setpoint for component of torque generating current.

**Dependency:**
Applies when vector control is selected in P1300 (control mode); otherwise, the display shows the value zero.

**r0078** **CO: Act. current Isq** Level: **3**
**Datatype:** Float **Unit:** A **Min:** - **Def:** - **Max:** -
**P-Group:** CONTROL

Displays component of torque generating current.

**r0079** **CO: Torque setpoint (total)** Level: **3**
**Datatype:** Float **Unit:** Nm **Min:** - **Def:** - **Max:** -
**P-Group:** CONTROL

Displays total torque setpoint.

**Dependency:**
Applies when vector control is selected in P1300 (control mode); otherwise, the display shows the value zero.

**r0080** **CO: Actual torque** Level: **4**
**Datatype:** Float **Unit:** Nm **Min:** - **Def:** - **Max:** -
**P-Group:** CONTROL

Displays actual torque.

| | | | | | |
|---|---|---|---|---|---|
| **r0084** | **CO: Act. air gap flux** | | | **Min:** - | Level: **4** |
| | | **Datatype:** Float | **Unit:** % | **Def:** - | |
| | **P-Group:** CONTROL | | | **Max:** - | |

Displays air gap flux in [%] relative to the rated motor flux.

| | | | | | |
|---|---|---|---|---|---|
| **r0086** | **CO: Act. active current** | | | **Min:** - | Level: **3** |
| | | **Datatype:** Float | **Unit:** A | **Def:** - | |
| | **P-Group:** CONTROL | | | **Max:** - | |

Displays active (real part) of motor current.

**Dependency:**

Applies when V/f control is selected in P1300 (control mode); otherwise, the display shows the value zero.

| | | | | | |
|---|---|---|---|---|---|
| **r0090** | **CO: Act. rotor angle** | | | **Min:** - | Level: **4** |
| | | **Datatype:** Float | **Unit:** ° | **Def:** - | |
| | **P-Group:** CONTROL | | | **Max:** - | |

Displays current position detected by encoder

| | | | | | |
|---|---|---|---|---|---|
| **P0095[10]** | **CI: Display PZD signals** | | | **Min:** 0:0 | Level: **3** |
| | **CStat:** CT | **Datatype:** U32 | **Unit:** - | **Def:** 0:0 | |
| | **P-Group:** CONTROL | **Active:** Immediately | - | **Max:** 4000:0 | |

Selects source of display for PZD signals.

**Index:**

P0095[0] : 1st. PZD signal
P0095[1] : 2nd. PZD signal
P0095[2] : 3rd. PZD signal
P0095[3] : 4th. PZD signal
P0095[4] : 5th. PZD signal
P0095[5] : 6th. PZD signal
P0095[6] : 7th. PZD signal
P0095[7] : 8th. PZD signal
P0095[8] : 9th. PZD signal
P0095[9] : 10th. PZD signal

| | | | | | |
|---|---|---|---|---|---|
| **r0096[10]** | **PZD signals** | | | **Min:** - | Level: **3** |
| | | **Datatype:** Float | **Unit:** % | **Def:** - | |
| | **P-Group:** CONTROL | | | **Max:** - | |

Displays PZD signals in [%].

**Index:**

r0096[0] : 1st. PZD signal
r0096[1] : 2nd. PZD signal
r0096[2] : 3rd. PZD signal
r0096[3] : 4th. PZD signal
r0096[4] : 5th. PZD signal
r0096[5] : 6th. PZD signal
r0096[6] : 7th. PZD signal
r0096[7] : 8th. PZD signal
r0096[8] : 9th. PZD signal
r0096[9] : 10th. PZD signal

**Note:**

r0096 = 100 % corresponds to 4000 hex

**P0100** **Europe / North America**

**CStat:** C **Datatype:** U16 **Unit:** - **Min:** 0
**P-Group:** QUICK **Active:** Immediately QuickCom **Def:** 0
**Max:** 2

Level: **1**

Determines whether power settings (e.g. nominal rating plate power - P0307) are expressed in [kW] or [hp]. The default settings for the nominal rating plate frequency (P0310) and maximum motor frequency (P1082) are also set automatically here, in addition to reference frequency (P2000).

**Enum:**

0 Europe [kW], frequency default 50 Hz
1 North America [hp], frequency default 60 Hz
2 North America [kW], frequency default 60 Hz

**Dependency:**

The setting of DIP switch 2 under the I/O board determines the validity of settings 0 and 1 for P0100 according to the table below:

| DIP 2 setting | Meaning | | P0100 setting | Meaning |
|---|---|---|---|---|
| OFF | [kW], frequency default 50 [Hz] | **overwrites** | 1 | [hp], frequency default 60 [Hz] |
| ON | [hp], frequency default 60 [Hz] | **overwrites** | 0 | [kW], frequency default 50 [Hz] |

Stop drive first (i.e. disable all pulses) before you change this parameter.

P0010 = 1 (commissioning mode) enables changes to be made.

Changing P0100 resets all rated motor parameters as well as other parameters that depend on the rated motor parameters (see P0340 - calculation of motor parameters).

**Notice:**

P0100 setting 2 (==> [kW], frequency default 60 [Hz]) is not overwritten by the setting of DIP switch 2 (see table above).

**r0200** **Act. power stack code number**

**Datatype:** U32 **Unit:** - **Min:** -
**P-Group:** INVERTER **Def:** -
**Max:** -

Level: **3**

Identifies hardware variant as shown in table below.

| Sort Number | MLFB |
|---|---|
| 41 | 6SE6440-2UC11-2AA0 |
| 42 | 6SE6440-2UC12-5AA0 |
| 43 | 6SE6440-2UC13-7AA0 |
| 44 | 6SE6440-2UC15-5AA0 |
| 45 | 6SE6440-2UC17-5AA0 |
| 46 | 6SE6440-2AB11-2AA0 |
| 47 | 6SE6440-2AB12-5AA0 |
| 48 | 6SE6440-2AB13-7AA0 |
| 49 | 6SE6440-2AB15-5AA0 |
| 50 | 6SE6440-2AB17-5AA0 |
| 51 | 6SE6440-2UC21-1BA0 |
| 52 | 6SE6440-2UC21-5BA0 |
| 53 | 6SE6440-2UC22-2BA0 |
| 54 | 6SE6440-2AB21-1BA0 |
| 55 | 6SE6440-2AB21-5BA0 |
| 56 | 6SE6440-2AB22-2BA0 |
| 57 | 6SE6440-2UC23-0CA0 |
| 58 | 6SE6440-2UC24-0CA0 |
| 59 | 6SE6440-2UC25-5CA0 |
| 60 | 6SE6440-2AB23-0CA0 |
| 61 | 6SE6440-2AC23-0CA0 |
| 62 | 6SE6440-2AC24-0CA0 |
| 63 | 6SE6440-2AC25-5CA0 |
| 64 | 6SE6440-2UC27-5DA0 |
| 65 | 6SE6440-2UC31-1DA0 |
| 66 | 6SE6440-2UC31-5DA0 |
| 70 | 6SE6440-2UC31-8EA0 |

| Sort Number | MLFB |
|---|---|
| 71 | 6SE6440-2UC32-2EA0 |
| 74 | 6SE6440-2UC33-0FA0 |
| 75 | 6SE6440-2UC33-7FA0 |
| 76 | 6SE6440-2UC34-5FA0 |
| 80 | 6SE6440-2UD13-7AA0 |
| 81 | 6SE6440-2UD15-5AA0 |
| 82 | 6SE6440-2UD17-5AA0 |
| 83 | 6SE6440-2UD21-1AA0 |
| 84 | 6SE6440-2UD21-5AA0 |
| 85 | 6SE6440-2UD22-2BA0 |
| 86 | 6SE6440-2UD23-0BA0 |
| 87 | 6SE6440-2UD24-0BA0 |
| 88 | 6SE6440-2AD22-2BA0 |
| 89 | 6SE6440-2AD23-0BA0 |
| 90 | 6SE6440-2AD24-0BA0 |
| 91 | 6SE6440-2UD25-5CA0 |
| 92 | 6SE6440-2UD27-5CA0 |
| 93 | 6SE6440-2UD31-1CA0 |
| 94 | 6SE6440-2AD25-5CA0 |
| 95 | 6SE6440-2AD27-5CA0 |
| 96 | 6SE6440-2AD31-1CA0 |
| 97 | 6SE6440-2UD31-5DA0 |
| 98 | 6SE6440-2UD31-8DA0 |
| 99 | 6SE6440-2UD32-2DA0 |
| 100 | 6SE6440-2AD31-5DA0 |
| 101 | 6SE6440-2AD31-8DA0 |
| 102 | 6SE6440-2AD32-2DA0 |

| Sort Number | MLFB |
|---|---|
| 103 | 6SE6440-2UD33-0EA0 |
| 104 | 6SE6440-2UD33-7EA0 |
| 105 | 6SE6440-2AD33-0EA0 |
| 106 | 6SE6440-2AD33-7EA0 |
| 107 | 6SE6440-2UD34-5FA0 |
| 108 | 6SE6440-2UD35-5FA0 |
| 109 | 6SE6440-2UD37-5FA0 |
| 110 | 6SE6440-2AD34-5FA0 |
| 111 | 6SE6440-2AD35-5FA0 |
| 112 | 6SE6440-2AD37-5FA0 |
| 113 | 6SE6440-2UE17-5CA0 |
| 114 | 6SE6440-2UE21-5CA0 |
| 115 | 6SE6440-2UE22-2CA0 |
| 116 | 6SE6440-2UE24-0CA0 |
| 117 | 6SE6440-2UE25-5CA0 |
| 118 | 6SE6440-2UE27-5CA0 |
| 119 | 6SE6440-2UE31-1CA0 |
| 120 | 6SE6440-2UE31-5DA0 |
| 121 | 6SE6440-2UE31-8DA0 |
| 122 | 6SE6440-2UE32-2DA0 |
| 123 | 6SE6440-2UE33-0EA0 |
| 124 | 6SE6440-2UE33-7EA0 |
| 125 | 6SE6440-2UE34-5FA0 |
| 126 | 6SE6440-2UE35-5FA0 |
| 127 | 6SE6440-2UE37-5FA0 |

**Notice:**
Parameter r0200 = 0 indicates that no power stack has been identified.

**P0201** **Power stack code number** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | C | **Datatype:** U16 | **Unit:** - | **Min:** | 0 |
| **P-Group:** | INVERTER | **Active:** Immediately | - | **Def:** | 0 |
| | | | | **Max:** | 65535 |

Confirms actual power stack identified.

**r0203** **Act. inverter type** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| | | **Datatype:** U16 | **Unit:** - | **Min:** | - |
| **P-Group:** | INVERTER | | | **Def:** | - |
| | | | | **Max:** | - |

Type number of actual power stack identified.

**Enum:**

| | |
|---|---|
| 1 | MICROMASTER 420 |
| 2 | MICROMASTER 440 |
| 3 | MICRO- / COMBIMASTER 411 |
| 4 | MICROMASTER 410 |
| 5 | Reserved |

**r0204** **Power stack features** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| | | **Datatype:** U32 | **Unit:** - | **Min:** | - |
| **P-Group:** | INVERTER | | | **Def:** | - |
| | | | | **Max:** | - |

Displays hardware features of power stack.

**Bitfields:**

| | | | |
|---|---|---|---|
| Bit00 | DC input voltage | 0 | NO |
| | | 1 | YES |
| Bit01 | RFI filter | 0 | NO |
| | | 1 | YES |

**Note:**
Parameter r0204 = 0 indicates that no power stack has been identified.

**P0205** **Inverter application** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | C | **Datatype:** U16 | **Unit:** - | **Min:** | 0 |
| **P-Group:** | INVERTER | **Active:** Immediately | QuickCom | **Def:** | 0 |
| | | | | **Max:** | 1 |

Selects inverter application.

Constant torque (CT):
CT is used if the application needs a constant torque on the whole frequency range.

Variable torque (VT):
VT is used if the application has a parabolic frequency-torque characteristic like many fans and pumps.
Variable torque allows with the same inverter:
* Higher rated inverter current r0207
* Higher rated inverter power r0206
* Higher threshold for I2t protection

If P0205 is modified in quick commissioning it immediately calculates various motor parameters

| | |
|---|---|
| 1. Rated motor current | P0305 (Level 2) |
| 2. Rated motorPower | P0307 (Level 2) |
| 3. Motor overload factor | P0640 (Level 2) |
| 4. Control mode | P1300 (Level 2) |

It is recommended to modify P0205 first. Afterwards motor parameter may be adapted. Motor parameter will be overridden by changing this sequence.

**Enum:**

| | |
|---|---|
| 0 | Constant torque |
| 1 | Variable torque |

**Note:**
The parameter value is not reset by the factory setting (see P970).

To set P0205 = 1 (variable torque) is not possible for all inverters.

**Notice:**
Use setting 1 (variable torque) only for variable-torque applications (e.g. pumps and fans). If used for constant-load applications, I2t warning will be produced too late, causing overheating in the motor.

**r0206** **Rated inverter power [kW] / [hp]** Level: **2**

| | | | | | |
|---|---|---|---|---|---|
| | | **Datatype:** Float | **Unit:** - | **Min:** | - |
| **P-Group:** | INVERTER | | | **Def:** | - |
| | | | | **Max:** | - |

Displays nominal rated motor power from inverter.

**Dependency:**
Value is displayed in [kW] or [hp] depending on setting for P0100 (operation for Europe / North America).

**r0207** **Rated inverter current**

**Datatype:** Float **Unit:** A **Min:** - **Def:** - **Max:** -

**P-Group:** INVERTER

Level: **2**

Displays maximum continuous output current of inverter.

**r0208** **Rated inverter voltage**

**Datatype:** U32 **Unit:** V **Min:** - **Def:** - **Max:** -

**P-Group:** INVERTER

Level: **2**

Displays nominal AC supply voltage of inverter.

**Value:**

r0208 = 230 : 200 - 240 V +/- 10 %
r0208 = 400 : 380 - 480 V +/- 10 %
r0208 = 575 : 500 - 600 V +/- 10 %

**r0209** **Maximum inverter current**

**Datatype:** Float **Unit:** A **Min:** - **Def:** - **Max:** -

**P-Group:** INVERTER

Level: **2**

Displays maximum output current of inverter.

**P0210** **Supply voltage**

**CStat:** CT **Datatype:** U16 **Unit:** V **Min:** 0 **Def:** 230 **Max:** 1000

**P-Group:** INVERTER **Active:** No -

Level: **3**

Optimizes Vdc controller, which extends the ramp-down time if regenerative energy from motor would otherwise cause DC link overvoltage trips.

Reducing the value enables controller to cut in earlier and reduce the risk of overvoltage.

**Dependency:**

Set P1254 ("Auto detect Vdc switch-on levels") = 0. Cut-in levels for Vdc-controller and compound braking are then derived directly from P0210 (supply voltage).

Vdc_max_on = $1.15 * \sqrt{2} * V_{mains}$
Compound braking switch-on level = $1.13 * \sqrt{2} * V_{mains}$

**Note:**

If mains voltage is higher than value entered, automatic deactivation of the Vdc controller may occur to avoid acceleration of the motor. An alarm will be issued in this case (A0910).

**r0231[2]** **Max. cable length**

**Datatype:** U16 **Unit:** m **Min:** - **Def:** - **Max:** -

**P-Group:** INVERTER

Level: **3**

Indexed parameter to display maximum allowable cable length between inverter and motor.

**Index:**

r0231[0] : Max. allowed unscreened cable length
r0231[1] : Max. allowed screened cable length

**Notice:**

For full EMC compliance, the screened cable must not exceed 25 m in length when an EMC filter is fitted.

**P0290** **Inverter overload reaction**

**CStat:** CT **Datatype:** U16 **Unit:** - **Min:** 0 **Def:** 2 **Max:** 3

**P-Group:** INVERTER **Active:** Immediately -

Level: **3**

Selects reaction of inverter to an internal over-temperature.

**Enum:**

0 Reduce output frequency (usually only effective on variable torque appl.)
1 Trip (F0004)
2 Reduce pulse frequency and output frequency
3 Reduce pulse frequency then trip (F0004)

**Notice:**

A trip will always result eventually, if the action taken does not sufficiently reduce internal temperature.

The pulse frequency is normally reduced only if higher than 2 kHz (see P0291 - configuration of inverter protection).

**P0291[3]** **Config. of inverter protection** Level: **4**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U16 | **Unit:** - | **Min:** | 0 |
| **P-Group:** | INVERTER | **Active:** No | - | **Def:** | 1 |
| | | | | **Max:** | 3 |

Control bit for enabling/disabling automatic pulse frequency reduction at output frequencies below 2 Hz.

**Bitfields:**

| | | | |
|---|---|---|---|
| Bit00 | Pulse freq reduced below 2Hz | 0 | NO |
| | | 1 | YES |
| Bit01 | Dead time compensation | 0 | NO |
| | | 1 | YES |

**Index:**

P0291[0] : 1st. Drive data set (DDS)
P0291[1] : 2nd. Drive data set (DDS)
P0291[2] : 3rd. Drive data set (DDS)

**Details:**

See P0290 (inverter overload reaction)

**P0292** **Inverter overload warning** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U16 | **Unit:** °C | **Min:** | 0 |
| **P-Group:** | INVERTER | **Active:** Immediately | - | **Def:** | 15 |
| | | | | **Max:** | 25 |

Defines temperature difference (in [°C]) between inverter over-temperature trip and warning thresholds.

**P0294** **Inverter I2t overload warning** Level: **4**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** % | **Min:** | 10.0 |
| **P-Group:** | INVERTER | **Active:** Immediately | - | **Def:** | 95.0 |
| | | | | **Max:** | 100.0 |

Defines the [%] value at which warning A0504 (inverter overtemperature) is generated.

Inverter I2t calculation is used to estimate a maximum tolerable period for inverter overload. The I2t calculation value is deemed = 100 % when this maximum tolerable period is reached.

**Dependency:**

Motor overload factor (P0640) reduced to 100 % at this point.

**Note:**

P0294 = 100 % corresponds to stationary nominal load.

**P0295** **Inverter fan off delay time** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U16 | **Unit:** s | **Min:** | 0 |
| **P-Group:** | TERMINAL | **Active:** Immediately | - | **Def:** | 0 |
| | | | | **Max:** | 3600 |

Defines inverter fan switch off delay time in seconds after drive has stopped.

**Note:**

Setting to 0, inverter fan will switch off when the drive stops, that is no delay.

**P0300[3]** **Select motor type** Level: **2**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | C | **Datatype:** U16 | **Unit:** - | **Min:** | 1 |
| **P-Group:** | MOTOR | **Active:** Immediately | QuickCom | **Def:** | 1 |
| | | | | **Max:** | 2 |

Selects motor type.

This parameter is required during commissioning to select motor type and optimize inverter performance.
Most motors are asynchronous; if in doubt, use the formula below.
(rated motor frequency (P0310) * 60) / rated motor speed (P0311)

If the result is a whole number, the motor is synchronous.

**Enum:**

1 Asynchronous rotational motor
2 Synchronous rotational motor

**Index:**

P0300[0] : 1st. Drive data set (DDS)
P0300[1] : 2nd. Drive data set (DDS)
P0300[2] : 3rd. Drive data set (DDS)

**Dependency:**

Changeable only when P0010 = 1 (quick commissioning).

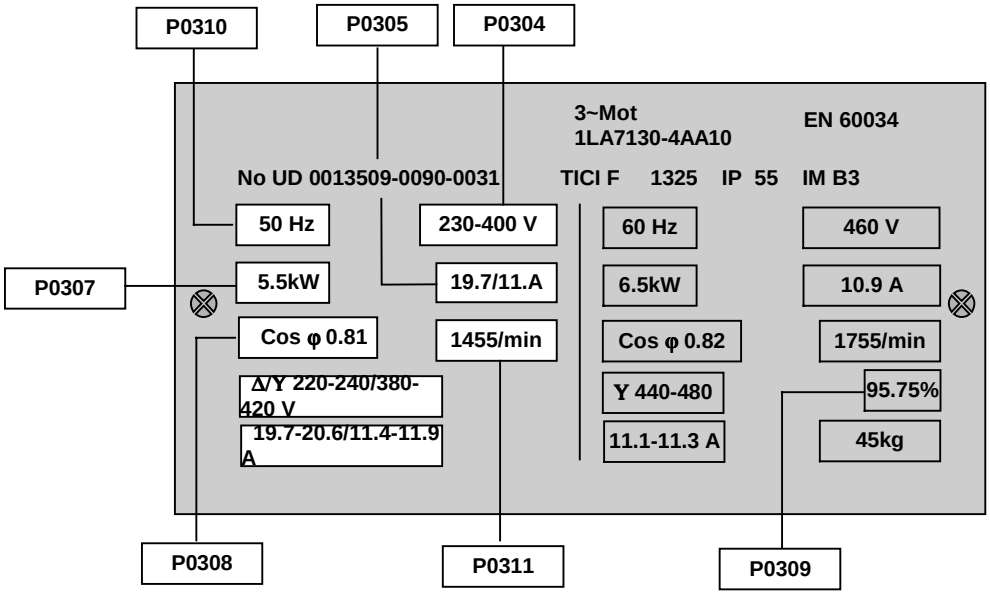
If synchronous motor is selected, the following functions are not available:
Power factor (P0308)
Motor efficiency (P0309)
Magnetization time (P0346 (Level 3)
Demagnetization time (P0347 (Level 3)
Flying start (P1200, P1202 (Level 3), P1203 (Level 3))
DC braking (P1230 (Level 3), P1232, P1233)
Slip compensation (P1335)
Slip limit (P1336)
Motor magnetizing current (P0320 (Level 3),
Rated motor slip (P0330),
Rated magnetization current (P0331),
Rated power factor (P0332),
Rotor time constant (P0384)

**P0304[3]** **Rated motor voltage**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | C | **Datatype:** U16 | **Unit:** V | **Min:** | 10 |
| **P-Group:** | MOTOR | **Active:** Immediately | QuickCom | **Def:** | 230 |
| | | | | **Max:** | 2000 |

Level: **1**

Nominal motor voltage [V] from rating plate. Following diagram shows a typical rating plate with the locations of the relevant motor data.




**Index:**

P0304[0] : 1st. Drive data set (DDS)
P0304[1] : 2nd. Drive data set (DDS)
P0304[2] : 3rd. Drive data set (DDS)

**Dependency:**

Changeable only when P0010 = 1 (quick commissioning).

**P0305[3]** **Rated motor current**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | C | **Datatype:** Float | **Unit:** A | **Min:** | 0.01 |
| **P-Group:** | MOTOR | **Active:** Immediately | QuickCom | **Def:** | 3.25 |
| | | | | **Max:** | 10000.00 |

Level: **1**

Nominal motor current [A] from rating plate - see diagram in P0304.

**Index:**

P0305[0] : 1st. Drive data set (DDS)
P0305[1] : 2nd. Drive data set (DDS)
P0305[2] : 3rd. Drive data set (DDS)

**Dependency:**

Changeable only when P0010 = 1 (quick commissioning).

Depends also on P0320 (motor magnetization current).

**Note:**

For asynchronous motors, the maximum value is defined as the maximum inverter current (r0209).

For synchronous motors, the maximum value is defined as twice the maximum inverter current (r0209)

The minimum value is defined as 1/32 times inverter rated current (r0207).

**P0307[3]** **Rated motor power**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | C | **Datatype:** Float | **Unit:** - | **Min:** | 0.01 |
| **P-Group:** | MOTOR | **Active:** Immediately | QuickCom | **Def:** | 0.75 |
| | | | | **Max:** | 2000.00 |

Level: **1**

Nominal motor power [kW/hp] from rating plate.

**Index:**

P0307[0] : 1st. Drive data set (DDS)
P0307[1] : 2nd. Drive data set (DDS)
P0307[2] : 3rd. Drive data set (DDS)

**Dependency:**

If P0100 = 1 ([kW],frequency default 50 Hz), values will be in [hp] - see diagram P0304 (rating plate).

Changeable only when P0010 = 1 (quick commissioning).

**P0308[3]** **Rated motor cosPhi**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | C | **Datatype:** Float | **Unit:** - | **Min:** | 0.000 |
| **P-Group:** | MOTOR | **Active:** Immediately | QuickCom | **Def:** | 0.000 |
| | | | | **Max:** | 1.000 |

Level: **2**

Nominal motor power factor (cosPhi) from rating plate - see diagram P0304.

**Index:**

P0308[0] : 1st. Drive data set (DDS)
P0308[1] : 2nd. Drive data set (DDS)
P0308[2] : 3rd. Drive data set (DDS)

**Dependency:**

Changeable only when P0010 = 1 (quick commissioning).

Visible only when P0100 = 0 or 2, (motor power entered in [kW]).

Setting 0 causes internal calculation of value (see r0332).

**P0309[3]** **Rated motor efficiency**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | C | **Datatype:** Float | **Unit:** % | **Min:** | 0.0 |
| **P-Group:** | MOTOR | **Active:** Immediately | QuickCom | **Def:** | 0.0 |
| | | | | **Max:** | 99.9 |

Level: **2**

Nominal motor efficiency in [%] from rating plate.

**Index:**

P0309[0] : 1st. Drive data set (DDS)
P0309[1] : 2nd. Drive data set (DDS)
P0309[2] : 3rd. Drive data set (DDS)

**Dependency:**

Changeable only when P0010 = 1 (quick commissioning).

Visible only when P0100 = 1, (i.e. motor power entered in [hp]).

Setting 0 causes internal calculation of value (see r0332).

**Note:**

P0309 = 100 % corresponds to superconducting.

**Details:**

See diagram in P0304 (rating plate)

**P0310[3]** **Rated motor frequency**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | C | **Datatype:** Float | **Unit:** Hz | **Min:** | 12.00 |
| **P-Group:** | MOTOR | **Active:** Immediately | QuickCom | **Def:** | 50.00 |
| | | | | **Max:** | 650.00 |

Level: **1**

Nominal motor frequency [Hz] from rating plate.

**Index:**

P0310[0] : 1st. Drive data set (DDS)
P0310[1] : 2nd. Drive data set (DDS)
P0310[2] : 3rd. Drive data set (DDS)

**Dependency:**

Changeable only when P0010 = 1 (quick commissioning).

Pole pair number recalculated automatically if parameter is changed.

**Details:**

See diagram in P0304 (rating plate)

**P0311[3]** **Rated motor speed**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | C | **Datatype:** U16 | **Unit:** 1/min | **Min:** | 0 |
| **P-Group:** | MOTOR | **Active:** Immediately | QuickCom | **Def:** | 0 |
| | | | | **Max:** | 40000 |

Level: **1**

Nominal motor speed [rpm] from rating plate.

**Index:**

P0311[0] : 1st. Drive data set (DDS)
P0311[1] : 2nd. Drive data set (DDS)
P0311[2] : 3rd. Drive data set (DDS)

**Dependency:**

Changeable only when P0010 = 1 (quick commissioning).

Setting 0 causes internal calculation of value.

Required for vector control and V/f control with speed controller.

Slip compensation in V/f control requires rated motor speed for correct operation.

Pole pair number recalculated automatically if parameter is changed.

**Details:**

See diagram in P0304 (rating plate)

**r0313[3]** **Motor pole pairs** Level: **3**

**Datatype:** U16 **Unit:** - **Min:** - **Def:** - **Max:** -

**P-Group:** MOTOR

Displays number of motor pole pairs that the inverter is currently using for internal calculations.

**Value:**

r0313 = 1 : 2-pole motor
r0313 = 2 : 4-pole motor
etc.

**Index:**

r0313[0] : 1st. Drive data set (DDS)
r0313[1] : 2nd. Drive data set (DDS)
r0313[2] : 3rd. Drive data set (DDS)

**Dependency:**

Recalculated automatically when P0310 (rated motor frequency) or P0311 (rated motor speed) is changed.

**P0314[3]** **Motor pole pair number** Level: **4**

**CStat:** C **Datatype:** U16 **Unit:** - **Min:** 0 **Def:** 0 **Max:** 99

**P-Group:** MOTOR **Active:** Immediately -

Specifies number of pole pairs of motor.

**Value:**

P0314 = 1 : 2-pole motor
P0314 = 2 : 4-pole motor
etc.

**Index:**

P0314[0] : 1st. Drive data set (DDS)
P0314[1] : 2nd. Drive data set (DDS)
P0314[2] : 3rd. Drive data set (DDS)

**Dependency:**

Recalculated automatically when P0310 (rated motor frequency) or P0311 (rated motor speed) is changed.

**P0320[3]** **Motor magnetizing current** Level: **3**

**CStat:** CT **Datatype:** Float **Unit:** % **Min:** 0.0 **Def:** 0.0 **Max:** 99.0

**P-Group:** MOTOR **Active:** No QuickCom

Defines motor magnetization current in [%] relative to P0305 (rated motor current).

**Index:**

P0320[0] : 1st. Drive data set (DDS)
P0320[1] : 2nd. Drive data set (DDS)
P0320[2] : 3rd. Drive data set (DDS)

**Dependency:**

Affected by P0366 - P0369 (magnetizing curve imag. 1 - 4) Setting 0 causes calculation by P0340 = 1 (data entered from rating plate) or by P3900 = 1 or 2 (end of quick commissioning).

**r0330[3]** **Rated motor slip** Level: **3**

**Datatype:** Float **Unit:** % **Min:** - **Def:** - **Max:** -

**P-Group:** MOTOR

Displays nominal motor slip in [%] relative to P0310 (rated motor frequency) and P0311 (rated motor speed).

**Index:**

r0330[0] : 1st. Drive data set (DDS)
r0330[1] : 2nd. Drive data set (DDS)
r0330[2] : 3rd. Drive data set (DDS)

**r0331[3]** **Rated magnetization current** Level: **3**

**Datatype:** Float **Unit:** A **Min:** - **Def:** - **Max:** -

**P-Group:** MOTOR

Displays calculated magnetizing current of motor in [A].

**Index:**

r0331[0] : 1st. Drive data set (DDS)
r0331[1] : 2nd. Drive data set (DDS)
r0331[2] : 3rd. Drive data set (DDS)

**r0332[3]** **Rated power factor** Level: **3**

**Datatype:** Float **Unit:** - **Min:** - **Def:** - **Max:** -

**P-Group:** MOTOR

Displays power factor for motor

**Index:**

r0332[0] : 1st. Drive data set (DDS)
r0332[1] : 2nd. Drive data set (DDS)
r0332[2] : 3rd. Drive data set (DDS)

**Dependency:**

Value is calculated internally if P0308 (rated motor cosPhi) set to 0; otherwise, value entered in P0308 is displayed.

**r0333[3]** **Rated motor torque** Level: **3**

**Datatype:** Float **Unit:** Nm **Min:** - **Def:** - **Max:** -

**P-Group:** MOTOR

Displays rated motor torque.

**Index:**

r0333[0] : 1st. Drive data set (DDS)
r0333[1] : 2nd. Drive data set (DDS)
r0333[2] : 3rd. Drive data set (DDS)

**Dependency:**

Value is calculated from P0310 (rated motor power) and P0311 (rated motor speed).

**P0335[3]** **Motor cooling** Level: **2**

**CStat:** CT **Datatype:** U16 **Unit:** - **Min:** 0 **Def:** 0 **Max:** 3

**P-Group:** MOTOR **Active:** Immediately QuickCom

Selects motor cooling system used.

**Enum:**

0 Self-cooled: Using shaft mounted fan attached to motor
1 Force-cooled: Using separately powered cooling fan
2 Self-cooled and internal fan
3 Force-cooled and internal fan

**Index:**

P0335[0] : 1st. Drive data set (DDS)
P0335[1] : 2nd. Drive data set (DDS)
P0335[2] : 3rd. Drive data set (DDS)

**Notice:**

Motors of series 1LA1 and 1LA8 have an internal fan. This internal motor fan must not be confused with the fan at the end of the motor shaft.

**P0340[3]** **Calculation of motor parameters** Level: **2**

**CStat:** CT **Datatype:** U16 **Unit:** - **Min:** 0 **Def:** 0 **Max:** 4

**P-Group:** MOTOR **Active:** Immediately -

Calculates various motor parameters, including:

| | |
|---|---|
| Motor weight | P0344 (Level 3) |
| Magnetization time | P0346 (Level 3) |
| Demagnetization time | P0347 (Level 3) |
| Stator resistance | P0350 (Level 2) |
| Reference frequency | P2000 (Level 2) |
| Reference current | P2002 (Level 3). |

**Enum:**

0 No calculation
1 Complete parameterization
2 Calc. equivalent circuit data
3 Calc. V/f and vector control
4 Calc. only controller setting

**Index:**

P0340[0] : 1st. Drive data set (DDS)
P0340[1] : 2nd. Drive data set (DDS)
P0340[2] : 3rd. Drive data set (DDS)

**Note:**

This parameter is required during commissioning to optimize inverter performance.

**P0341[3]** **Motor inertia [kg*m$^2$]** Level: **3**

**CStat:** CUT **Datatype:** Float **Unit:** - **Min:** 0.00010 **Def:** 0.00180 **Max:** 1000.0

**P-Group:** MOTOR **Active:** No -

Sets no-load inertia of motor.

Together with P0342 (inertia ratio total/motor) and P1496 (scaling factor acceleration), this value produces the acceleration torque (r1517), which can be added to any additional torque produced from a BICO source (P1511), and incorporated in the torque control function.

**Index:**

P0341[0] : 1st. Drive data set (DDS)
P0341[1] : 2nd. Drive data set (DDS)
P0341[2] : 3rd. Drive data set (DDS)

**Note:**

The result of
P0341 * P0342 (inertia ratio total/motor) = total motor inertia
and is included in the speed controller calculation.

P1496 (scaling factor acceleration) = 100 % activates acceleration pre-control for the speed controller and calculates the torque from P0341 (motor inertia) and P0342 (inertia ratio total/motor).

**P0342[3]** **Inertia ratio total/motor**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** - | **Min:** | 1.000 |
| **P-Group:** | MOTOR | **Active:** No | - | **Def:** | 1.000 |
| | | | | **Max:** | 400.000 |

Level: **3**

Specifies ratio between total inertia (load + motor) and motor inertia.

**Index:**

P0342[0] : 1st. Drive data set (DDS)
P0342[1] : 2nd. Drive data set (DDS)
P0342[2] : 3rd. Drive data set (DDS)

**P0344[3]** **Motor weight**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** kg | **Min:** | 1.0 |
| **P-Group:** | MOTOR | **Active:** No | - | **Def:** | 9.4 |
| | | | | **Max:** | 6500.0 |

Level: **3**

Specifies motor weight [kg].

**Index:**

P0344[0] : 1st. Drive data set (DDS)
P0344[1] : 2nd. Drive data set (DDS)
P0344[2] : 3rd. Drive data set (DDS)

**Note:**

This value is used in the motor thermal model.

It is normally calculated automatically from P0340 (motor parameters) but can also be entered manually.

**r0345[3]** **Motor start-up time**

| | | | | | |
|---|---|---|---|---|---|
| | | **Datatype:** Float | **Unit:** s | **Min:** | - |
| **P-Group:** | MOTOR | | | **Def:** | - |
| | | | | **Max:** | - |

Level: **3**

Displays motor start-up time. This time corresponds to the standardized motor inertia.

The start-up time is the time taken to reach rated motor speed from standstill at acceleration with rated motor torque (r0333).

**Index:**

r0345[0] : 1st. Drive data set (DDS)
r0345[1] : 2nd. Drive data set (DDS)
r0345[2] : 3rd. Drive data set (DDS)

**P0346[3]** **Magnetization time**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** s | **Min:** | 0.000 |
| **P-Group:** | MOTOR | **Active:** No | - | **Def:** | 1.000 |
| | | | | **Max:** | 20.000 |

Level: **3**

Sets magnetization time [s], i.e. waiting time between pulse enable and start of ramp-up. Motor magnetization builds up during this time.

Magnetization time is normally calculated automatically from the motor data and corresponds to the rotor time constant (r0384).

**Index:**

P0346[0] : 1st. Drive data set (DDS)
P0346[1] : 2nd. Drive data set (DDS)
P0346[2] : 3rd. Drive data set (DDS)

**Note:**

If boost settings are higher than 100 %, magnetization may be reduced.

**Notice:**

An excessive reduction of this time can result in insufficient motor magnetization.

**P0347[3]** **Demagnetization time**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** s | **Min:** | 0.000 |
| **P-Group:** | MOTOR | **Active:** No | - | **Def:** | 1.000 |
| | | | | **Max:** | 20.000 |

Level: **3**

Changes time allowed after OFF2 / fault condition, before pulses can be re-enabled.

**Index:**

P0347[0] : 1st. Drive data set (DDS)
P0347[1] : 2nd. Drive data set (DDS)
P0347[2] : 3rd. Drive data set (DDS)

**Note:**

The demagnetization time is approximately 2.5 x rotor time constant (r0384) in seconds.

**Notice:**

Not active following a normally completed ramp-down, e.g. after OFF1, OFF3 or JOG.

Overcurrent trips will occur if the time is decreased excessively.

**P0350[3]** **Stator resistance (line-to-line)** Level: **2**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Ohm | **Min:** | 0.00001 |
| **P-Group:** | MOTOR | **Active:** No | - | **Def:** | 4.0 |
| | | | | **Max:** | 2000.0 |

Stator resistance value in [Ohms] for connected motor (from line-to-line). The parameter value includes the cable resistance.

There are three ways to determine the value for this parameter:
1. Calculate using P0340 = 1 (data entered from rating plate) or
   P3900 = 1,2 or 3 (end of quick commissioning)
2. Measure using P1910 = 1 (motor data identification - value for stator resistance is overwritten)
3. Measure manually using an Ohmmeter.

**Index:**
P0350[0] : 1st. Drive data set (DDS)
P0350[1] : 2nd. Drive data set (DDS)
P0350[2] : 3rd. Drive data set (DDS)

**Note:**
Since measured line-to-line, this value may appear to be higher (up to 2 times higher) than expected.

The value entered in P0350 (stator resistance) is the one obtained by the method last used.

**P0352[3]** **Cable resistance** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Ohm | **Min:** | 0.0 |
| **P-Group:** | MOTOR | **Active:** No | - | **Def:** | 0.0 |
| | | | | **Max:** | 120.0 |

Describes cable resistance between inverter and motor for one phase.

The value corresponds to the resistance of the cable between the inverter and the motor, relative to the rated impedance.

**Index:**
P0352[0] : 1st. Drive data set (DDS)
P0352[1] : 2nd. Drive data set (DDS)
P0352[2] : 3rd. Drive data set (DDS)

**P0354[3]** **Rotor resistance** Level: **4**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Ohm | **Min:** | 0.0 |
| **P-Group:** | MOTOR | **Active:** No | - | **Def:** | 10.0 |
| | | | | **Max:** | 300.0 |

Sets rotor resistance of motor equivalent circuit (phase value).

**Index:**
P0354[0] : 1st. Drive data set (DDS)
P0354[1] : 2nd. Drive data set (DDS)
P0354[2] : 3rd. Drive data set (DDS)

**Dependency:**
Calculated automatically using the motor model or determined using P1910 (motor identification).

**P0356[3]** **Stator leakage inductance** Level: **4**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** - | **Min:** | 0.00001 |
| **P-Group:** | MOTOR | **Active:** No | - | **Def:** | 10.0 |
| | | | | **Max:** | 1000.0 |

Sets stator leakage inductance [mH] of motor equivalent circuit (phase value).

**Index:**
P0356[0] : 1st. Drive data set (DDS)
P0356[1] : 2nd. Drive data set (DDS)
P0356[2] : 3rd. Drive data set (DDS)

**Dependency:**
Calculated automatically using the motor model or determined using P1910 (motor identification).

**P0358[3]** **Rotor leakage inductance** Level: **4**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** - | **Min:** | 0.0 |
| **P-Group:** | MOTOR | **Active:** No | - | **Def:** | 10.0 |
| | | | | **Max:** | 1000.0 |

Sets rotor leakage inductance [mH] of motor equivalent circuit (phase value).

**Index:**
P0358[0] : 1st. Drive data set (DDS)
P0358[1] : 2nd. Drive data set (DDS)
P0358[2] : 3rd. Drive data set (DDS)

**Dependency:**
Calculated automatically using the motor model or determined using P1910 (motor identification).

**P0360[3]** **Main inductance** Level: **4**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** - | **Min:** | 0.0 |
| **P-Group:** | MOTOR | **Active:** No | - | **Def:** | 10.0 |
| | | | | **Max:** | 3000.0 |

Sets main inductance [mH] of the motor equivalent circuit (phase value).

**Index:**

P0360[0] : 1st. Drive data set (DDS)
P0360[1] : 2nd. Drive data set (DDS)
P0360[2] : 3rd. Drive data set (DDS)

**Dependency:**

Calculated automatically using the motor model or determined using P1910 (motor identification).

**P0362[3]** **Magnetizing curve flux 1** Level: **4**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** % | **Min:** | 0.0 |
| **P-Group:** | MOTOR | **Active:** No | - | **Def:** | 60.0 |
| | | | | **Max:** | 300.0 |

Specifies first (lowest) flux value of saturation characteristic in [%] relative to rated motor voltage (P0304).

**Index:**

P0362[0] : 1st. Drive data set (DDS)
P0362[1] : 2nd. Drive data set (DDS)
P0362[2] : 3rd. Drive data set (DDS)

**Note:**

P0362 = 100 % corresponds to rated motor flux

Rated flux = rated EMF

**Notice:**

The value belongs to the first magnetizing current value and must be smaller than or equal to magnetizing curve flux 2 (P0363).

**Details:**

See P0365 (magnetizing curve flux 4).

**P0363[3]** **Magnetizing curve flux 2** Level: **4**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** % | **Min:** | 0.0 |
| **P-Group:** | MOTOR | **Active:** No | - | **Def:** | 85.0 |
| | | | | **Max:** | 300.0 |

Specifies second flux value of saturation characteristic in [%] relative to rated motor voltage (P0304).

**Index:**

P0363[0] : 1st. Drive data set (DDS)
P0363[1] : 2nd. Drive data set (DDS)
P0363[2] : 3rd. Drive data set (DDS)

**Note:**

P0363 = 100 % corresponds to rated motor flux

Rated flux = rated EMF

**Notice:**

The value belongs to the second magnetizing current value and must be smaller than or equal to magnetizing curve flux 3 (P0364) and greater than or equal to magnetizing curve flux 1 (P0362).

**Details:**

See P0365 (magnetizing curve flux 4).

**P0364[3]** **Magnetizing curve flux 3** Level: **4**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** % | **Min:** | 0.0 |
| **P-Group:** | MOTOR | **Active:** No | - | **Def:** | 115.0 |
| | | | | **Max:** | 300.0 |

Specifies third (highest) flux value of saturation characteristic in [%] relative to rated motor voltage (P0304).

**Index:**

P0364[0] : 1st. Drive data set (DDS)
P0364[1] : 2nd. Drive data set (DDS)
P0364[2] : 3rd. Drive data set (DDS)

**Note:**

P0364 = 100 % corresponds to rated motor flux

Rated flux = rated EMF

**Notice:**

The value belongs to the third magnetizing current value and must be smaller than or equal to magnetizing curve flux 4 (P0365) and greater than or equal to magnetizing curve flux 2 (P0363).

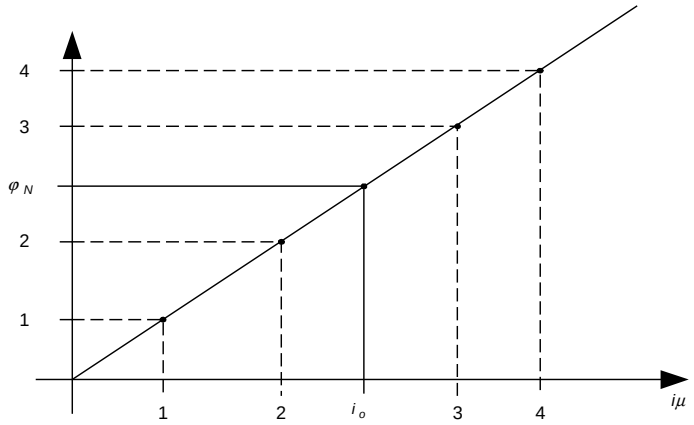
**Details:**

See P0365 (magnetizing curve flux 4).

| **P0365[3]** | **Magnetizing curve flux 4** | | | **Min:** | 0.0 | Level: |
|---|---|---|---|---|---|---|
| | **CStat:** CUT | **Datatype:** Float | **Unit:** % | **Def:** | 125.0 | **4** |
| | **P-Group:** MOTOR | **Active:** No | - | **Max:** | 300.0 | |

Specifies fourth (highest) flux value of saturation characteristic in [%] relative to rated motor voltage (P0304).

The parameter settings for the values of imag 1 to imag 4 are illustrated in the diagram below.




**Index:**

P0365[0] : 1st. Drive data set (DDS)
P0365[1] : 2nd. Drive data set (DDS)
P0365[2] : 3rd. Drive data set (DDS)

**Note:**

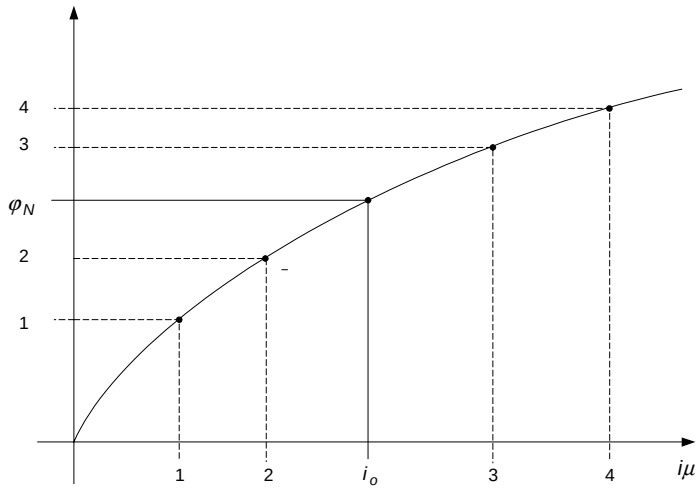
P0365 = 100 % corresponds to rated motor flux

Rated flux = rated EMF

**Notice:**

The value belongs to the third magnetizing current value and must be greater than or equal to magnetizing curve flux 3 (P0364).

If the magnetization values entered in P0362 to P0365 do not match, a linear characteristic is applied internally as shown in the following diagram:



**P0366[3]** **Magnetizing curve imag 1**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** % | **Min:** | 0.0 |
| **P-Group:** | MOTOR | **Active:** No | - | **Def:** | 50.0 |
| | | | | **Max:** | 500.0 |

Level: **4**

Specifies first (lowest) magnetizing current value of the saturation characteristic in [%] relative to the rated magnetizing current (P0331).

**Index:**

P0366[0] : 1st. Drive data set (DDS)
P0366[1] : 2nd. Drive data set (DDS)
P0366[2] : 3rd. Drive data set (DDS)

**Dependency:**

Affects P0320 (motor magnetizing current).

**Notice:**

The value belongs to the first flux value and must be less than or equal to magnetizing curve imag 2 (P0367).

**Details:**

See P0369 (magnetizing curve imag 4).

**P0367[3]** **Magnetizing curve imag 2**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** % | **Min:** | 0.0 |
| **P-Group:** | MOTOR | **Active:** No | - | **Def:** | 75.0 |
| | | | | **Max:** | 500.0 |

Level: **4**

Specifies second magnetizing current value of saturation characteristic in [%] relative to rated magnetizing current (P0331).

**Index:**

P0367[0] : 1st. Drive data set (DDS)
P0367[1] : 2nd. Drive data set (DDS)
P0367[2] : 3rd. Drive data set (DDS)

**Dependency:**

Affects P0320 (motor magnetizing current).

**Notice:**

The value belongs to the second flux value and must be less than or equal to magnetizing curve imag 3 (P0368) and greater than or equal to magnetizing curve imag 1 (P0366).

**Details:**

See diagram in P0369 (magnetizing curve imag 4).

**P0368[3]** **Magnetizing curve imag 3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** % | **Min:** | 0.0 |
| **P-Group:** | MOTOR | **Active:** No | - | **Def:** | 135.0 |
| | | | | **Max:** | 500.0 |

Level: **4**

Specifies third (lowest) magnetizing current value of saturation characteristic in [%] relative to rated magnetizing current (P0331).

**Index:**

P0368[0] : 1st. Drive data set (DDS)
P0368[1] : 2nd. Drive data set (DDS)
P0368[2] : 3rd. Drive data set (DDS)

**Dependency:**

Affects P0320 (motor magnetizing current).

**Notice:**

The value belongs to the third flux value and must be less than or equal to magnetizing curve imag 4 (P0369) and greater than or equal to magnetizing curve imag 2 (P0367).

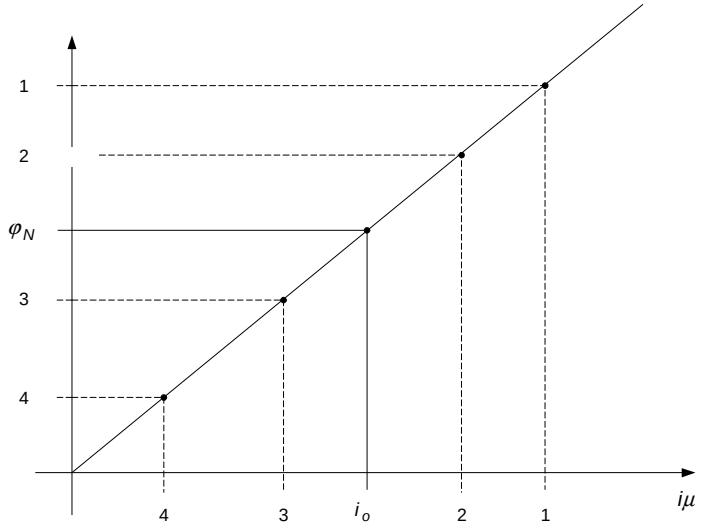
**Details:**

See P0369 (magnetizing curve imag 4).

| P0369[3] | **Magnetizing curve imag 4** | | | **Min:** 0.0 | Level: |
|---|---|---|---|---|---|
| | **CStat:** CUT | **Datatype:** Float | **Unit:** % | **Def:** 170.0 | **4** |
| | **P-Group:** MOTOR | **Active:** No | - | **Max:** 500.0 | |

Specifies fourth (lowest) magnetizing current value of saturation characteristic in [%] relative to rated magnetizing current (P0331).

The parameter settings for the values of imag 1 to imag 4 are illustrated in the diagram below.




**Index:**

P0369[0] : 1st. Drive data set (DDS)
P0369[1] : 2nd. Drive data set (DDS)
P0369[2] : 3rd. Drive data set (DDS)

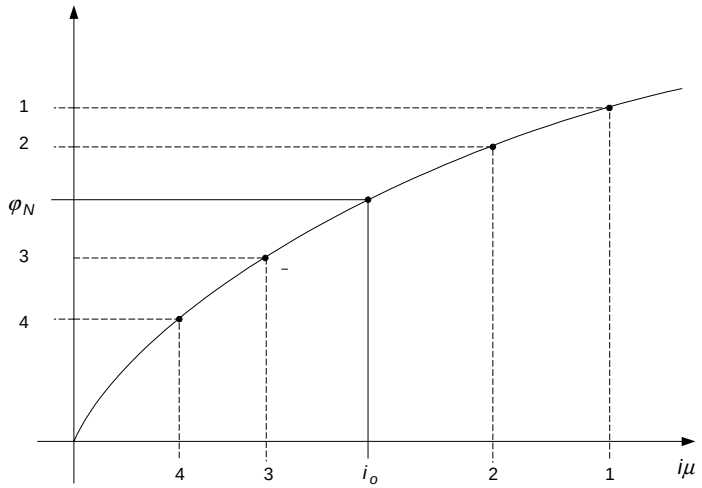
**Dependency:**

Affects P0320 (motor magnetizing current).

**Notice:**

The value belongs to the third flux value and must be less than or equal to magnetizing curve imag 3 (P0368).

If the magnetization values entered in P0366 to P0369 do not match, a linear characteristic is applied internally as shown in the following diagram:




| r0370[3] | **Stator resistance [%]** | | | **Min:** - | Level: |
|---|---|---|---|---|---|
| | | **Datatype:** Float | **Unit:** % | **Def:** - | **4** |
| | **P-Group:** MOTOR | | | **Max:** - | |

Displays standardized stator resistance of motor equivalent circuit (phase value) in [%].

**Index:**

r0370[0] : 1st. Drive data set (DDS)
r0370[1] : 2nd. Drive data set (DDS)
r0370[2] : 3rd. Drive data set (DDS)

**Note:**

100 % means : $Z_{ratedmot.} * \frac{P0304}{P0305}$ (rated motor voltage) / (rated motor current)

**r0372[3] Cable resistance [%]**

**Datatype:** Float **Unit:** % **Min:** - **Def:** - **Max:** -

Level: **4**

**P-Group:** MOTOR

Displays standardized cable resistance of motor equivalent circuit (phase value)in [%]. It is estimated to be 20 % of the stator resistance.

**Index:**

r0372[0] : 1st. Drive data set (DDS)
r0372[1] : 2nd. Drive data set (DDS)
r0372[2] : 3rd. Drive data set (DDS)

**Note:**

100 % means : $Z_{ratedmot.} * \frac{P0304 \text{ (rated motor voltage)}}{P0305 \text{ (rated motor current)}}$

**r0373[3] Rated stator resistance [%]**

**Datatype:** Float **Unit:** % **Min:** - **Def:** - **Max:** -

Level: **4**

**P-Group:** MOTOR

Displays rated stator resistance of the motor equivalent circuit (phase value) in [%].

**Index:**

r0373[0] : 1st. Drive data set (DDS)
r0373[1] : 2nd. Drive data set (DDS)
r0373[2] : 3rd. Drive data set (DDS)

**Note:**

100 % means : $Z_{ratedmot.} * \frac{P0304 \text{ (rated motor voltage)}}{P0305 \text{ (rated motor current)}}$

**r0374[3] Rotor resistance [%]**

**Datatype:** Float **Unit:** % **Min:** - **Def:** - **Max:** -

Level: **4**

**P-Group:** MOTOR

Displays standardized rotor resistance of the motor equivalent circuit (phase value) in [%].

**Index:**

r0374[0] : 1st. Drive data set (DDS)
r0374[1] : 2nd. Drive data set (DDS)
r0374[2] : 3rd. Drive data set (DDS)

**Note:**

100 % means : $Z_{ratedmot.} * \frac{P0304 \text{ (rated motor voltage)}}{P0305 \text{ (rated motor current)}}$

**r0376[3] Rated rotor resistance [%]**

**Datatype:** Float **Unit:** % **Min:** - **Def:** - **Max:** -

Level: **4**

**P-Group:** MOTOR

Displays rated rotor resistance of the motor equivalent circuit (phase value) in [%].

**Index:**

r0376[0] : 1st. Drive data set (DDS)
r0376[1] : 2nd. Drive data set (DDS)
r0376[2] : 3rd. Drive data set (DDS)

**Note:**

100 % means : $Z_{ratedmot.} * \frac{P0304 \text{ (rated motor voltage)}}{P0305 \text{ (rated motor current)}}$

**r0377[3] Total leakage reactance [%]**

**Datatype:** Float **Unit:** % **Min:** - **Def:** - **Max:** -

Level: **4**

**P-Group:** MOTOR

Displays standardized total leakage reactance of the motor equivalent circuit (phase value) in [%].

**Index:**

r0377[0] : 1st. Drive data set (DDS)
r0377[1] : 2nd. Drive data set (DDS)
r0377[2] : 3rd. Drive data set (DDS)

**Note:**

100 % means : $Z_{ratedmot.} * \frac{P0304 \text{ (rated motor voltage)}}{P0305 \text{ (rated motor current)}}$

**r0382[3] Main reactance [%]**

**Datatype:** Float **Unit:** % **Min:** - **Def:** - **Max:** -

Level: **4**

**P-Group:** MOTOR

Displays standardized main reactance of the motor equivalent circuit (phase value) in [%].

**Index:**

r0382[0] : 1st. Drive data set (DDS)
r0382[1] : 2nd. Drive data set (DDS)
r0382[2] : 3rd. Drive data set (DDS)

**Note:**

100 % means : $Z_{ratedmot.} * \frac{P0304 \text{ (rated motor voltage)}}{P0305 \text{ (rated motor current)}}$

**r0384[3]** **Rotor time constant**

**Datatype:** Float **Unit:** ms **Min:** - **Def:** - **Max:** -

**P-Group:** MOTOR

Level: **3**

Displays calculated rotor time constant [ms].

**Index:**

r0384[0] : 1st. Drive data set (DDS)
r0384[1] : 2nd. Drive data set (DDS)
r0384[2] : 3rd. Drive data set (DDS)

**r0386[3]** **Total leakage time constant**

**Datatype:** Float **Unit:** ms **Min:** - **Def:** - **Max:** -

**P-Group:** MOTOR

Level: **4**

Displays total leakage time constant of motor.

**Index:**

r0386[0] : 1st. Drive data set (DDS)
r0386[1] : 2nd. Drive data set (DDS)
r0386[2] : 3rd. Drive data set (DDS)

**r0394** **CO: Stator resistance IGBT [%]**

**Datatype:** Float **Unit:** % **Min:** - **Def:** - **Max:** -

**P-Group:** MOTOR

Level: **4**

Displays stator resistance calculated in [%] from IGBT ON voltage and current amplitude .

**Note:**

100 % means : $Z_{ratedmot.} * \frac{P0304 \text{ (rated motor voltage)}}{P0305 \text{ (rated motor current)}}$

**r0395** **CO: Total stator resistance [%]**

**Datatype:** Float **Unit:** % **Min:** - **Def:** - **Max:** -

**P-Group:** MOTOR

Level: **3**

Displays stator resistance of motor as [%] of combined stator/cable resistance.

**Note:**

100 % means : $Z_{ratedmot.} * \frac{P0304 \text{ (rated motor voltage)}}{P0305 \text{ (rated motor current)}}$

**r0396** **CO: Act. rotor resistance**

**Datatype:** Float **Unit:** % **Min:** - **Def:** - **Max:** -

**P-Group:** MOTOR

Level: **3**

Displays (adapted) rotor resistance of the motor equivalent circuit (phase value) in [%].

**Note:**

100 % means : $Z_{ratedmot.} * \frac{P0304 \text{ (rated motor voltage)}}{P0305 \text{ (rated motor current)}}$

**Notice:**

Values greater than 25 % tend to produce excessive motor slip. Check rated motor speed [rpm] value (P0311).

**P0400[3]** **Select encoder type**

**CStat:** CT **Datatype:** U16 **Unit:** - **Min:** 0 **Def:** 0 **Max:** 12

**P-Group:** ENCODER **Active:** No -

Level: **4**

Selects encoder type.

The term "quadrature" in settings 2 and 3 refers to two periodic functions separated by a quarter cycle or 90 degrees.

**Enum:**

0 Disabled
1 Single channel encoder
2 Quadrature encoder without zero pulse
3 External pulse train
" Quadrature encoder with zero pulse

**Index:**

P0400[0] : 1st. Drive data set (DDS)
P0400[1] : 2nd. Drive data set (DDS)
P0400[2] : 3rd. Drive data set (DDS)

**P0408[3]** **No. of encoder pulses**

**CStat:** CT **Datatype:** U16 **Unit:** - **Min:** 2 **Def:** 1024 **Max:** 20000

**P-Group:** ENCODER **Active:** No -

Level: **4**

Specifies the number of encoder pulses per revolution.

**Index:**

P0408[0] : 1st. Drive data set (DDS)
P0408[1] : 2nd. Drive data set (DDS)
P0408[2] : 3rd. Drive data set (DDS)

**P0500[3] Technological application**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U16 | **Unit:** - | **Min:** | 0 |
| **P-Group:** | TECH_APL | **Active:** Immediately | QuickCom | **Def:** | 0 |
| | | | | **Max:** | 1 |

Level: **4**

Selects technological application. Sets control mode (P1300 - Level 2).

**Enum:**

0 Constant torque
1 Pumps and fans

**Index:**

P0500[0] : 1st. Drive data set (DDS)
P0500[1] : 2nd. Drive data set (DDS)
P0500[2] : 3rd. Drive data set (DDS)

**P0601[3] Motor temperature sensor**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U16 | **Unit:** - | **Min:** | 0 |
| **P-Group:** | MOTOR | **Active:** Immediately | - | **Def:** | 0 |
| | | | | **Max:** | 2 |

Level: **2**

Selects motor temperature sensor.

**Enum:**

0 No sensor
1 PTC thermistor
2 KTY84

**Index:**

P0601[0] : 1st. Drive data set (DDS)
P0601[1] : 2nd. Drive data set (DDS)
P0601[2] : 3rd. Drive data set (DDS)

**Dependency:**

If "no sensor" is selected, the motor temperature monitoring will be done based on the estimated value of the thermal motor model.

**P0604[3] Threshold motor temperature**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** °C | **Min:** | 0.0 |
| **P-Group:** | MOTOR | **Active:** No | - | **Def:** | 130.0 |
| | | | | **Max:** | 200.0 |

Level: **2**

Enters warning threshold for motor temperature protection. The trip or Imax reduction temperature defined in the P0600 (reaction to motor temperature) is always 10 % higher than the warning level.

**Index:**

P0604[0] : 1st. Drive data set (DDS)
P0604[1] : 2nd. Drive data set (DDS)
P0604[2] : 3rd. Drive data set (DDS)

**Dependency:**

Warning effective only when "Temperature sensor" chosen (i.e., no PTC).

**Note:**

Default value depends on P0300 (select motor type).

**P0610[3] Motor I2t temperature reaction**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U16 | **Unit:** - | **Min:** | 0 |
| **P-Group:** | MOTOR | **Active:** Immediately | - | **Def:** | 2 |
| | | | | **Max:** | 2 |

Level: **3**

Defines reaction when motor temperature reaches warning threshold.

**Enum:**

0 No reaction, warning only
1 Warning and Imax reduction (results in reduced output freq.)
2 Warning and trip (F0010)

**Dependency:**

Trip level = P0604 (motor temperature warning level) * 105 %

**P0625[3] Ambient motor temperature**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** °C | **Min:** | -40.0 |
| **P-Group:** | MOTOR | **Active:** No | - | **Def:** | 20.0 |
| | | | | **Max:** | 80.0 |

Level: **3**

Measures ambient temperature of motor at time of motor data identification.

**Index:**

P0625[0] : 1st. Drive data set (DDS)
P0625[1] : 2nd. Drive data set (DDS)
P0625[2] : 3rd. Drive data set (DDS)

**P0626[3] Overtemperature stator iron**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** °C | **Min:** | 20.0 |
| **P-Group:** | MOTOR | **Active:** No | - | **Def:** | 50.0 |
| | | | | **Max:** | 200.0 |

Level: **4**

Measures overtemperature of stator iron.

**Index:**

P0626[0] : 1st. Drive data set (DDS)
P0626[1] : 2nd. Drive data set (DDS)
P0626[2] : 3rd. Drive data set (DDS)

**Note:**

Temperature rises are valid for sinusoidal operations (line supply temperature rises).

Temperature rises due to converter operation (modulation losses) and output filter are also considered.

**P0627[3]** **Overtemperature stator winding** Level: **4**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** °C | **Min:** | 20.0 |
| **P-Group:** | MOTOR | **Active:** No | - | **Def:** | 80.0 |
| | | | | **Max:** | 200.0 |

Measures overtemperature of the stator winding.

**Index:**

P0627[0] : 1st. Drive data set (DDS)
P0627[1] : 2nd. Drive data set (DDS)
P0627[2] : 3rd. Drive data set (DDS)

**Note:**

Temperature rises are valid for sinusoidal operations (line supply temperature rises).

Temperature rises due to converter operation (modulation losses) and output filter are also considered.

**P0628[3]** **Overtemperature rotor winding** Level: **4**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** °C | **Min:** | 20.0 |
| **P-Group:** | MOTOR | **Active:** No | - | **Def:** | 100.0 |
| | | | | **Max:** | 200.0 |

Measures overtemperature of the rotor winding.

**Index:**

P0628[0] : 1st. Drive data set (DDS)
P0628[1] : 2nd. Drive data set (DDS)
P0628[2] : 3rd. Drive data set (DDS)

**Note:**

Temperature rises are valid for sinusoidal operations (line supply temperature rises).

Temperature rises due to converter operation (modulation losses) and output filter are also considered.

**r0630[3]** **CO: Ambient temperature** Level: **4**

| | | | | | |
|---|---|---|---|---|---|
| | | **Datatype:** Float | **Unit:** °C | **Min:** | - |
| | | | | **Def:** | - |
| **P-Group:** | MOTOR | | | **Max:** | - |

Displays ambient temperature of motor mass model.

**Index:**

r0630[0] : 1st. Drive data set (DDS)
r0630[1] : 2nd. Drive data set (DDS)
r0630[2] : 3rd. Drive data set (DDS)

**r0631[3]** **CO: Stator iron temperature** Level: **4**

| | | | | | |
|---|---|---|---|---|---|
| | | **Datatype:** Float | **Unit:** °C | **Min:** | - |
| | | | | **Def:** | - |
| **P-Group:** | MOTOR | | | **Max:** | - |

Displays iron temperature of motor mass model.

**Index:**

r0631[0] : 1st. Drive data set (DDS)
r0631[1] : 2nd. Drive data set (DDS)
r0631[2] : 3rd. Drive data set (DDS)

**r0632[3]** **CO: Stator winding temperature** Level: **4**

| | | | | | |
|---|---|---|---|---|---|
| | | **Datatype:** Float | **Unit:** °C | **Min:** | - |
| | | | | **Def:** | - |
| **P-Group:** | MOTOR | | | **Max:** | - |

Displays stator winding temperature of motor mass model.

**Index:**

r0632[0] : 1st. Drive data set (DDS)
r0632[1] : 2nd. Drive data set (DDS)
r0632[2] : 3rd. Drive data set (DDS)

**r0633[3]** **CO: Rotor winding temperature** Level: **4**

| | | | | | |
|---|---|---|---|---|---|
| | | **Datatype:** Float | **Unit:** °C | **Min:** | - |
| | | | | **Def:** | - |
| **P-Group:** | MOTOR | | | **Max:** | - |

Displays rotor winding temperature of motor mass model.

**Index:**

r0633[0] : 1st. Drive data set (DDS)
r0633[1] : 2nd. Drive data set (DDS)
r0633[2] : 3rd. Drive data set (DDS)

**P0640[3]** **Motor overload factor [%]** Level: **2**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** % | **Min:** | 10.0 |
| **P-Group:** | MOTOR | **Active:** No | QuickCom | **Def:** | 150.0 |
| | | | | **Max:** | 400.0 |

Defines motor overload current limit in [%] relative to P0305 (rated motor current). current.

**Index:**

P0640[0] : 1st. Drive data set (DDS)
P0640[1] : 2nd. Drive data set (DDS)
P0640[2] : 3rd. Drive data set (DDS)

**Dependency:**

Limited to maximum inverter current or to 400 % of rated motor current (P0305), whichever is the lower.

**Details:**

See function diagram for current limitation.

**P0700[3]** **Selection of command source** Level: **1**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U16 | **Unit:** - | **Min:** | 0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | QuickCom | **Def:** | 2 |
| | | | | **Max:** | 6 |

Selects digital command source.

**Enum:**

| | |
|---|---|
| 0 | Factory default setting |
| 1 | BOP (keypad) |
| 2 | Terminal |
| 4 | USS on BOP link |
| 5 | USS on COM link |
| 6 | CB on COM link |

**Index:**

P0700[0] : 1st. Command data set (CDS)
P0700[1] : 2nd. Command data set (CDS)
P0700[2] : 3rd. Command data set (CDS)

**Note:**

Changing this parameter resets (to default) all settings on item selected. For example: Changing form 1 to 2 resets all digital inputs to default settings.

**P0701[3]** **Function of digital input 1** Level: **2**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U16 | **Unit:** - | **Min:** | 0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 1 |
| | | | | **Max:** | 99 |

Selects function of digital input 1.

**Enum:**

| | |
|---|---|
| 0 | Digital input disabled |
| 1 | ON/OFF1 |
| 2 | ON reverse /OFF1 |
| 3 | OFF2 - coast to standstill |
| 4 | OFF3 - quick ramp-down |
| 9 | Fault acknowledge |
| 10 | JOG right |
| 11 | JOG left |
| 12 | Reverse |
| 13 | MOP up (increase freq.) |
| 14 | MOP down (decrease freq.) |
| 15 | Fixed setpoint (Direct selection) |
| 16 | Fixed setpoint (Direct selection + ON) |
| 17 | Fixed setpoint (Binary coded selection + ON) |
| 25 | DC brake enable |
| 29 | External trip |
| 33 | Disable additional freq setpoint |
| 99 | Enable BICO parameterization |

**Index:**

P0701[0] : 1st. Command data set (CDS)
P0701[1] : 2nd. Command data set (CDS)
P0701[2] : 3rd. Command data set (CDS)

**Dependency:**

Setting 99 (enable BICO parameterization) requires P0700 (command source) or P3900 (end of quick commissioning) = 1, 2 or P0970 (factory reset) = 1 in order to reset.

**Notice:**

Setting 99 (BICO) for expert use only.

**P0702[3]** **Function of digital input 2**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U16 | **Unit:** - | **Min:** | 0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 12 |
| | | | | **Max:** | 99 |

Level: **2**

Selects function of digital input 2.

**Enum:**

| | |
|---|---|
| 0 | Digital input disabled |
| 1 | ON/OFF1 |
| 2 | ON reverse /OFF1 |
| 3 | OFF2 - coast to standstill |
| 4 | OFF3 - quick ramp-down |
| 9 | Fault acknowledge |
| 10 | JOG right |
| 11 | JOG left |
| 12 | Reverse |
| 13 | MOP up (increase freq.) |
| 14 | MOP down (decrease freq.) |
| 15 | Fixed setpoint (Direct selection) |
| 16 | Fixed setpoint (Direct selection + ON) |
| 17 | Fixed setpoint (Binary coded selection + ON) |
| 25 | DC brake enable |
| 29 | External trip |
| 33 | Disable additional freq setpoint |
| 99 | Enable BICO parameterization |

**Index:**

P0702[0] : 1st. Command data set (CDS)
P0702[1] : 2nd. Command data set (CDS)
P0702[2] : 3rd. Command data set (CDS)

**Details:**

See P0701 (function of digital input1).

**P0703[3]** **Function of digital input 3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U16 | **Unit:** - | **Min:** | 0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 9 |
| | | | | **Max:** | 99 |

Level: **2**

Selects function of digital input 3.

**Enum:**

| | |
|---|---|
| 0 | Digital input disabled |
| 1 | ON/OFF1 |
| 2 | ON reverse /OFF1 |
| 3 | OFF2 - coast to standstill |
| 4 | OFF3 - quick ramp-down |
| 9 | Fault acknowledge |
| 10 | JOG right |
| 11 | JOG left |
| 12 | Reverse |
| 13 | MOP up (increase freq.) |
| 14 | MOP down (decrease freq.) |
| 15 | Fixed setpoint (Direct selection) |
| 16 | Fixed setpoint (Direct selection + ON) |
| 17 | Fixed setpoint (Binary coded selection + ON) |
| 25 | DC brake enable |
| 29 | External trip |
| 33 | Disable additional freq setpoint |
| 99 | Enable BICO parameterization |

**Index:**

P0703[0] : 1st. Command data set (CDS)
P0703[1] : 2nd. Command data set (CDS)
P0703[2] : 3rd. Command data set (CDS)

**Details:**

See P0701 (function of digital input 1).

**P0704[3]** **Function of digital input 4**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U16 | **Unit:** - | **Min:** | 0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 15 |
| | | | | **Max:** | 99 |

Level: **2**

Selects function of digital input 4.

**Enum:**

0 Digital input disabled
1 ON/OFF1
2 ON reverse /OFF1
3 OFF2 - coast to standstill
4 OFF3 - quick ramp-down
9 Fault acknowledge
10 JOG right
11 JOG left
12 Reverse
13 MOP up (increase freq.)
14 MOP down (decrease freq.)
15 Fixed setpoint (Direct selection)
16 Fixed setpoint (Direct selection + ON)
17 Fixed setpoint (Binary coded selection + ON)
25 DC brake enable
29 External trip
33 Disable additional freq setpoint
99 Enable BICO parameterization

**Index:**

P0704[0] : 1st. Command data set (CDS)
P0704[1] : 2nd. Command data set (CDS)
P0704[2] : 3rd. Command data set (CDS)

**Details:**

See P0701 (function of digital input 1).

**P0705[3]** **Function of digital input 5**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U16 | **Unit:** - | **Min:** | 0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 15 |
| | | | | **Max:** | 99 |

Level: **2**

Selects function of digital input 5 (via analog input)

**Enum:**

0 Digital input disabled
1 ON/OFF1
2 ON reverse /OFF1
3 OFF2 - coast to standstill
4 OFF3 - quick ramp-down
9 Fault acknowledge
10 JOG right
11 JOG left
12 Reverse
13 MOP up (increase freq.)
14 MOP down (decrease freq.)
15 Fixed setpoint (Direct selection)
16 Fixed setpoint (Direct selection + ON)
17 Fixed setpoint (Binary coded selection + ON)
25 DC brake enable
29 External trip
33 Disable additional freq setpoint
99 Enable BICO parameterization

**Index:**

P0705[0] : 1st. Command data set (CDS)
P0705[1] : 2nd. Command data set (CDS)
P0705[2] : 3rd. Command data set (CDS)

**Details:**

See P0701 (function of digital input 1).

**P0706[3]** **Function of digital input 6**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U16 | **Unit:** - | **Min:** | 0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 15 |
| | | | | **Max:** | 99 |

Level: **2**

Selects function of digital input 6 ( via analog input)

**Enum:**

| | |
|---|---|
| 0 | Digital input disabled |
| 1 | ON/OFF1 |
| 2 | ON reverse /OFF1 |
| 3 | OFF2 - coast to standstill |
| 4 | OFF3 - quick ramp-down |
| 9 | Fault acknowledge |
| 10 | JOG right |
| 11 | JOG left |
| 12 | Reverse |
| 13 | MOP up (increase freq.) |
| 14 | MOP down (decrease freq.) |
| 15 | Fixed setpoint (Direct selection) |
| 16 | Fixed setpoint (Direct selection + ON) |
| 17 | Fixed setpoint (Binary coded selection + ON) |
| 25 | DC brake enable |
| 29 | External trip |
| 33 | Disable additional freq setpoint |
| 99 | Enable BICO parameterization |

**Index:**

P0706[0] : 1st. Command data set (CDS)
P0706[1] : 2nd. Command data set (CDS)
P0706[2] : 3rd. Command data set (CDS)

**Details:**

See P0701 (function of digital input 1).

**P0707[3]** **Function of digital input 7**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U16 | **Unit:** - | **Min:** | 0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 0 |
| | | | | **Max:** | 99 |

Level: **2**

Selects function of digital input 7 (via analog input)

**Enum:**

| | |
|---|---|
| 0 | Digital input disabled |
| 1 | ON/OFF1 |
| 2 | ON reverse /OFF1 |
| 3 | OFF2 - coast to standstill |
| 4 | OFF3 - quick ramp-down |
| 9 | Fault acknowledge |
| 10 | JOG right |
| 11 | JOG left |
| 12 | Reverse |
| 13 | MOP up (increase freq.) |
| 14 | MOP down (decrease freq.) |
| 25 | DC brake enable |
| 29 | External trip |
| 33 | Disable additional freq setpoint |
| 99 | Enable BICO parameterization |

**Index:**

P0707[0] : 1st. Command data set (CDS)
P0707[1] : 2nd. Command data set (CDS)
P0707[2] : 3rd. Command data set (CDS)

**Note:**

Signals above 4 V are active, signals below 1,6 V are inactive.

**Details:**

See P0701 (function of digital input 1).

| P0708[3] | **Function of digital input 8** | | | | **Min:** | 0 | Level: |
|---|---|---|---|---|---|---|---|
| | **CStat:** | CT | **Datatype:** U16 | **Unit:** - | **Def:** | 0 | **2** |
| | **P-Group:** | COMMANDS | **Active:** Immediately | - | **Max:** | 99 | |

Selects function of digital input 8 (via analog input)

**Enum:**

| | |
|---|---|
| 0 | Digital input disabled |
| 1 | ON/OFF1 |
| 2 | ON reverse /OFF1 |
| 3 | OFF2 - coast to standstill |
| 4 | OFF3 - quick ramp-down |
| 9 | Fault acknowledge |
| 10 | JOG right |
| 11 | JOG left |
| 12 | Reverse |
| 13 | MOP up (increase freq.) |
| 14 | MOP down (decrease freq.) |
| 25 | DC brake enable |
| 29 | External trip |
| 33 | Disable additional freq setpoint |
| 99 | Enable BICO parameterization |

**Index:**

P0708[0] : 1st. Command data set (CDS)
P0708[1] : 2nd. Command data set (CDS)
P0708[2] : 3rd. Command data set (CDS)

**Note:**

Signals above 4 V are active, signals below 1,6 V are inactive.

**Details:**

See P0701 (function of digital input 1).

**P0719[3]** **Selection of cmd. & freq. setp.** Level: **3**

**CStat:** CT **Datatype:** U16 **Unit:** - **Min:** 0
**P-Group:** COMMANDS **Active:** Immediately - **Def:** 0
**Max:** 66

Central switch to select control command source for inverter.

Switches command and setpoint source between freely programmable BICO parameters and fixed command/setpoint profiles. Command and setpoint sources can be changed independently.

The tens digit chooses the command source and the units digit chooses the setpoint source.

**Enum:**

| | | | | |
|---|---|---|---|---|
| 0 | Cmd | = BICO parameter | Setpoint | = BICO parameter |
| 1 | Cmd | = BICO parameter | Setpoint | = MOP setpoint |
| 2 | Cmd | = BICO parameter | Setpoint | = Analog setpoint |
| 3 | Cmd | = BICO parameter | Setpoint | = Fixed frequency |
| 4 | Cmd | = BICO parameter | Setpoint | = USS on BOP link |
| 5 | Cmd | = BICO parameter | Setpoint | = USS on COM link |
| 6 | Cmd | = BICO parameter | Setpoint | = CB on COM link |
| 10 | Cmd | = BOP | Setpoint | = BICO parameter |
| 11 | Cmd | = BOP | Setpoint | = MOP setpoint |
| 12 | Cmd | = BOP | Setpoint | = Analog setpoint |
| 13 | Cmd | = BOP | Setpoint | = Fixed frequency |
| 14 | Cmd | = BOP | Setpoint | = USS on BOP link |
| 15 | Cmd | = BOP | Setpoint | = USS on COM link |
| 16 | Cmd | = BOP | Setpoint | = CB on COM link |
| 40 | Cmd | = USS on BOP link | Setpoint | = BICO parameter |
| 41 | Cmd | = USS on BOP link | Setpoint | = MOP setpoint |
| 42 | Cmd | = USS on BOP link | Setpoint | = Analog setpoint |
| 43 | Cmd | = USS on BOP link | Setpoint | = Fixed frequency |
| 44 | Cmd | = USS on BOP link | Setpoint | = USS on BOP link |
| 45 | Cmd | = USS on BOP link | Setpoint | = USS on COM link |
| 46 | Cmd | = USS on BOP link | Setpoint | = CB on COM link |
| 50 | Cmd | = USS on COM link | Setpoint | = BICO parameter |
| 51 | Cmd | = USS on COM link | Setpoint | = MOP setpoint |
| 52 | Cmd | = USS on COM link | Setpoint | = Analog setpoint |
| 53 | Cmd | = USS on COM link | Setpoint | = Fixed frequency |
| 54 | Cmd | = USS on COM link | Setpoint | = USS on BOP link |
| 55 | Cmd | = USS on COM link | Setpoint | = USS on COM link |
| 56 | Cmd | = USS on COM link | Setpoint | = CB on COM link |
| 60 | Cmd | = CB on COM link | Setpoint | = BICO parameter |
| 61 | Cmd | = CB on COM link | Setpoint | = MOP setpoint |
| 62 | Cmd | = CB on COM link | Setpoint | = Analog setpoint |
| 63 | Cmd | = CB on COM link | Setpoint | = Fixed frequency |
| 64 | Cmd | = CB on COM link | Setpoint | = USS on BOP link |
| 65 | Cmd | = CB on COM link | Setpoint | = USS on COM link |
| 66 | Cmd | = CB on COM link | Setpoint | = CB on COM link |

**Index:**

P0719[0] : 1st. Command data set (CDS)
P0719[1] : 2nd. Command data set (CDS)
P0719[2] : 3rd. Command data set (CDS)

**Note:**

If set to a value other than 0 (i.e. BICO parameter is not the setpoint source), P0844 / P0848 (first source of OFF2 / OFF3) are not effective; instead, P 0845 / P0849 (second source of OFF2 / OFF3) apply and the OFF commands are obtained via the particular source defined.

BICO connections made previously remain unchanged.

**r0720** **Number of digital inputs** Level: **3**

**Datatype:** U16 **Unit:** - **Min:** -
**P-Group:** COMMANDS **Def:** -
**Max:** -

Displays number of digital inputs.

**r0722** **CO/BO: Binary input values** Level: **2**

**Datatype:** U16 **Unit:** - **Min:** - **Def:** - **Max:** -

**P-Group:** COMMANDS

Displays status of digital inputs.

**Bitfields:**

| | | | |
|---|---|---|---|
| Bit00 | Digital input 1 | 0 | OFF |
| | | 1 | ON |
| Bit01 | Digital input 2 | 0 | OFF |
| | | 1 | ON |
| Bit02 | Digital input 3 | 0 | OFF |
| | | 1 | ON |
| Bit03 | Digital input 4 | 0 | OFF |
| | | 1 | ON |
| Bit04 | Digital input 5 | 0 | OFF |
| | | 1 | ON |
| Bit05 | Digital input 6 | 0 | OFF |
| | | 1 | ON |
| Bit06 | Digital input 7 (via ADC 1) | 0 | OFF |
| | | 1 | ON |
| Bit07 | Digital input 8 (via ADC 2) | 0 | OFF |
| | | 1 | ON |

**Note:**

Segment is lit when signal is active.

**P0724** **Debounce time for digital inputs** Level: **3**

**CStat:** CT **Datatype:** U16 **Unit:** - **Min:** 0 **Def:** 3 **Max:** 3

**P-Group:** COMMANDS **Active:** No -

Defines debounce time (filtering time) used for digital inputs.

**Enum:**

0 No debounce time
1 2.5 ms debounce time
2 8.2 ms debounce time
3 12.3 ms debounce time

**P0725** **PNP / NPN digital inputs** Level: **3**

**CStat:** CT **Datatype:** U16 **Unit:** - **Min:** 0 **Def:** 1 **Max:** 1

**P-Group:** COMMANDS **Active:** No -

Switches between active high (PNP) and active low (NPN). This is valid for all digital inputs simultaneously.

The following is valid by using the internal supply:

**Value:**

NPN: Terminals 5/6/7/8/16/17 must be connected via terminal 28 ( O V).
PNP: Terminals 5/6/7/8/16/17 must be connected via terminal 9 (24 V).

**Enum:**

0 NPN mode ==> low active
1 PNP mode ==> high active

**r0730** **Number of digital outputs** Level: **3**

**Datatype:** U16 **Unit:** - **Min:** - **Def:** - **Max:** -

**P-Group:** COMMANDS

Displays number of digital outputs (relays).

**P0731[3]** **BI: Function of digital output 1**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 52:3 |
| | | | | **Max:** | 4000:0 |

Level: **2**

Defines source of digital output 1.

**Settings:**

| | | |
|---|---|---|
| 52.0 | Drive ready | 0 Closed |
| 52.1 | Drive ready to run | 0 Closed |
| 52.2 | Drive running | 0 Closed |
| 52.3 | Drive fault active | 0 Closed |
| 52.4 | OFF2 active | 1 Closed |
| 52.5 | OFF3 active | 1 Closed |
| 52.6 | Switch on inhibit active | 0 Closed |
| 52.7 | Drive warning active | 0 Closed |
| 52.8 | Deviation setpoint/actual value | 1 Closed |
| 52.9 | PZD control (Process Data Control) | 0 Closed |
| 52.A | Maximum frequency reached | 0 Closed |
| 52.B | Warning: Motor current limit | 1 Closed |
| 52.C | Motor holding brake (MHB) active | 0 Closed |
| 52.D | Motor overload | 1 Closed |
| 52.E | Motor running direction right | 0 Closed |
| 52.F | Inverter overload | 1 Closed |
| 53.0 | DC brake active | 0 Closed |
| 53.1 | Inverter freq. less switch off limit | 0 Closed |
| 53.2 | Inverter freq. less minimum freq. | 0 Closed |
| 53.3 | Current greater or equal than limit | 0 Closed |
| 53.4 | Act. freq. greater comparison freq. | 0 Closed |
| 53.5 | Act. freq. less comparison freq. | 0 Closed |
| 53.6 | Act. freq. greater/equal setpoint | 0 Closed |
| 53.7 | Voltage less than threshold | 0 Closed |
| 53.8 | Voltage greater than threshold | 0 Closed |
| 53.A | PID output at lower limit (P2292) | 0 Closed |
| 53.B | PID output at upper limit (P2291) | 0 Closed |

**Index:**

P0731[0] : 1st. Command data set (CDS)
P0731[1] : 2nd. Command data set (CDS)
P0731[2] : 3rd. Command data set (CDS)

**P0732[3]** **BI: Function of digital output 2**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 52:7 |
| | | | | **Max:** | 4000:0 |

Level: **2**

Defines source of digital output 2.

**Settings:**

| | | |
|---|---|---|
| 52.0 | Drive ready | 0 Closed |
| 52.1 | Drive ready to run | 0 Closed |
| 52.2 | Drive running | 0 Closed |
| 52.3 | Drive fault active | 0 Closed |
| 52.4 | OFF2 active | 1 Closed |
| 52.5 | OFF3 active | 1 Closed |
| 52.6 | Switch on inhibit active | 0 Closed |
| 52.7 | Drive warning active | 0 Closed |
| 52.8 | Deviation setpoint/actual value | 1 Closed |
| 52.9 | PZD control (Process Data Control) | 0 Closed |
| 52.A | Maximum frequency reached | 0 Closed |
| 52.B | Warning: Motor current limit | 1 Closed |
| 52.C | Motor holding brake (MHB) active | 0 Closed |
| 52.D | Motor overload | 1 Closed |
| 52.E | Motor running direction right | 0 Closed |
| 52.F | Inverter overload | 1 Closed |
| 53.0 | DC brake active | 0 Closed |
| 53.1 | Inverter freq. less switch off limit | 0 Closed |
| 53.2 | Inverter freq. less minimum freq. | 0 Closed |
| 53.3 | Current greater or equal than limit | 0 Closed |
| 53.4 | Act. freq. greater comparison freq. | 0 Closed |
| 53.5 | Act. freq. less comparison freq. | 0 Closed |
| 53.6 | Act. freq. greater/equal setpoint | 0 Closed |
| 53.7 | Voltage less than threshold | 0 Closed |
| 53.8 | Voltage greater than threshold | 0 Closed |
| 53.A | PID output at lower limit (P2292) | 0 Closed |
| 53.B | PID output at upper limit (P2291) | 0 Closed |

**Index:**

P0732[0] : 1st. Command data set (CDS)
P0732[1] : 2nd. Command data set (CDS)
P0732[2] : 3rd. Command data set (CDS)

**Note:**

Other settings are possible in "Expert" mode (see P0003 - user access level).

**P0733[3]** **BI: Function of digital output 3** Level: **2**

**CStat:** CUT **Datatype:** U32 **Unit:** - **Min:** 0:0
**P-Group:** COMMANDS **Active:** Immediately - **Def:** 0:0
**Max:** 4000:0

Defines source of digital output 3.

**Settings:**

| | | |
|---|---|---|
| 52.0 | Drive ready | 0 Closed |
| 52.1 | Drive ready to run | 0 Closed |
| 52.2 | Drive running | 0 Closed |
| 52.3 | Drive fault active | 0 Closed |
| 52.4 | OFF2 active | 1 Closed |
| 52.5 | OFF3 active | 1 Closed |
| 52.6 | Switch on inhibit active | 0 Closed |
| 52.7 | Drive warning active | 0 Closed |
| 52.8 | Deviation setpoint/actual value | 1 Closed |
| 52.9 | PZD control (Process Data Control) | 0 Closed |
| 52.A | Maximum frequency reached | 0 Closed |
| 52.B | Warning: Motor current limit | 1 Closed |
| 52.C | Motor holding brake (MHB) active | 0 Closed |
| 52.D | Motor overload | 1 Closed |
| 52.E | Motor running direction right | 0 Closed |
| 52.F | Inverter overload | 1 Closed |
| 53.0 | DC brake active | 0 Closed |
| 53.1 | Inverter freq. less switch off limit | 0 Closed |
| 53.2 | Inverter freq. less minimum freq. | 0 Closed |
| 53.3 | Current greater or equal than limit | 0 Closed |
| 53.4 | Act. freq. greater comparison freq. | 0 Closed |
| 53.5 | Act. freq. less comparison freq. | 0 Closed |
| 53.6 | Act. freq. greater/equal setpoint | 0 Closed |
| 53.7 | Voltage less than threshold | 0 Closed |
| 53.8 | Voltage greater than threshold | 0 Closed |
| 53.A | PID output at lower limit (P2292) | 0 Closed |
| 53.B | PID output at upper limit (P2291) | 0 Closed |

**Index:**

P0733[0] : 1st. Command data set (CDS)
P0733[1] : 2nd. Command data set (CDS)
P0733[2] : 3rd. Command data set (CDS)

**Note:**

Other settings are possible in "Expert" mode (see P0003 - user access level).

**r0747** **CO/BO: State of digital outputs** Level: **3**

**Datatype:** U16 **Unit:** - **Min:** -
**P-Group:** COMMANDS **Def:** -
**Max:** -

Displays status of digital outputs (also includes inversion of digital outputs via P0748).

**Bitfields:**

| | | | |
|---|---|---|---|
| Bit00 | Digital output 1 energized | 0 | NO |
| | | 1 | YES |
| Bit01 | Digital output 2 energized | 0 | NO |
| | | 1 | YES |
| Bit02 | Digital output 3 energized | 0 | NO |
| | | 1 | YES |

**Dependency:**

Bit 0 0 = relay de-energized / contacts open
1 = relay energized / contacts closed

**P0748** **Invert digital outputs** Level: **3**

**CStat:** CUT **Datatype:** U16 **Unit:** - **Min:** 0
**P-Group:** COMMANDS **Active:** Immediately - **Def:** 0
**Max:** 7

Defines high and low states of relay for a given function.

**Bitfields:**

| | | | |
|---|---|---|---|
| Bit00 | Invert digital output 1 | 0 | NO |
| | | 1 | YES |
| Bit01 | Invert digital output 2 | 0 | NO |
| | | 1 | YES |
| Bit02 | Invert digital output 3 | 0 | NO |
| | | 1 | YES |

**r0750** **Number of ADCs** Level: **3**

**Datatype:** U16 **Unit:** - **Min:** -
**P-Group:** TERMINAL **Def:** -
**Max:** -

Displays number of analog inputs available.

**r0751** **BO: Status word of ADC** Level: **4**

**Datatype:** U16 **Unit:** - **Min:** - **Def:** - **Max:** -

**P-Group:** TERMINAL

Displays status of analog input.

**Bitfields:**

| | | | |
|---|---|---|---|
| Bit00 | Signal lost on ADC 1 | 0 | NO |
| | | 1 | YES |
| Bit01 | Signal lost on ADC 2 | 0 | NO |
| | | 1 | YES |

**r0752[2]** **Act. input of ADC [V] or [mA]** Level: **2**

**Datatype:** Float **Unit:** - **Min:** - **Def:** - **Max:** -

**P-Group:** TERMINAL

Displays smoothed analog input value in volts before the characteristic block.

**Index:**

r0752[0] : Analog input 1 (ADC 1)
r0752[1] : Analog input 2 (ADC 2)

**P0753[2]** **Smooth time ADC** Level: **3**

**CStat:** CUT **Datatype:** U16 **Unit:** ms **Min:** 0 **Def:** 3 **Max:** 10000

**P-Group:** TERMINAL **Active:** Immediately -

Defines filter time (PT1 filter) in [ms] for analog input.

**Index:**

P0753[0] : Analog input 1 (ADC 1)
P0753[1] : Analog input 2 (ADC 2)

**Note:**

Increasing this time (smooth) reduces jitter but slows down response to the analog input.

P0753 = 0 : No filtering

**r0754[2]** **Act. ADC value after scaling [%]** Level: **2**

**Datatype:** Float **Unit:** % **Min:** - **Def:** - **Max:** -

**P-Group:** TERMINAL

Shows smoothed value of analog input in [%] after scaling block.

**Index:**

r0754[0] : Analog input 1 (ADC 1)
r0754[1] : Analog input 2 (ADC 2)

**Dependency:**

P0757 to P0760 define range (ADC scaling)

**r0755[2]** **CO: Act. ADC after scal. [4000h]** Level: **2**

**Datatype:** I16 **Unit:** - **Min:** - **Def:** - **Max:** -

**P-Group:** TERMINAL

Displays analog input, scaled using ASPmin and ASPmax.

Analog setpoint (ASP) from the analog scaling block can vary from min. analog setpoint (ASPmin) to a max. analog setpoint (ASPmax) as shown in P0757 (ADC scaling).

The largest magnitude (value without sign) of ASPmin and ASPmax defines the scaling of 16384.

**Example:**

ASPmin = 300 %, ASPmax = 100 % then 16384 represents 300 %.
This parameter will vary from 5461 to 16364

ASPmin = -200 %, ASPmax = 100 % then 16384 represents 200 %.
This parameter will vary from -16384 to +8192

**Index:**

r0755[0] : Analog input 1 (ADC 1)
r0755[1] : Analog input 2 (ADC 2)

**Note:**

This value is used as an input to analog BICO connectors.

ASPmax represents the highest analog setpoint (this may be at 10 V)

ASPmin represents the lowest analog setpoint (this may be at 0 V)

**Details:**

See parameters P0757 to P0760 (ADC scaling)

**P0756[2]** **Type of ADC**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U16 | **Unit:** - | **Min:** | 0 |
| **P-Group:** | TERMINAL | **Active:** Immediately | - | **Def:** | 0 |
| | | | | **Max:** | 4 |

Level: **2**

Defines type of analog input and also enables analog input monitoring.

To switch over from voltage to current analog input it is not sufficient to merely modify parameter P0756. Rather, the DIPs on the terminal board must also be set to the correct position. The DIP settings are as follows:
- OFF = voltage input (10 V)
- ON = current input (20 mA)

Allocation of DIPs to analog inputs is as follows:
- DIP on left (DIP 1) = Analog input 1
- DIP on right (DIP 2) = Analog input 2

**Enum:**

0 Unipolar voltage input (0 to +10 V)
1 Unipolar voltage input with monitoring (0 to 10 V)
2 Unipolar current input (0 to 20 mA)
3 Unipolar current input with monitoring (0 to 20 mA)
4 Bipolar voltage input (-10 V to +10 V)

**Index:**

P0756[0] : Analog input 1 (ADC 1)
P0756[1] : Analog input 2 (ADC 2)

**Dependency:**

Function disabled if analog scaling block programmed to output negative setpoints (see P0757 to P0760).

**Notice:**

When monitoring is enabled and a deadband defined (P0761), a fault condition will be generated (F0080) if the analog input voltage falls below 50 % of the deadband voltage.

On account of h/w restirction it is not possible to select the bipolar voltage (see Enum declaration) for analog input 1 (P0756[1] = 4).

**Details:**

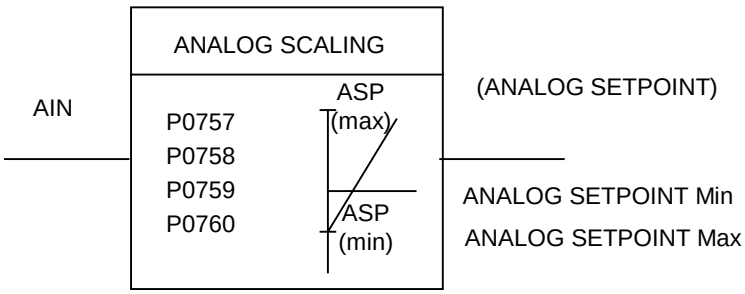
See P0757 to P0760 (ADC scaling).

**P0757[2]** **Value x1 of ADC scaling [V / mA]**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** - | **Min:** | -20 |
| **P-Group:** | TERMINAL | **Active:** Immediately | - | **Def:** | 0 |
| | | | | **Max:** | 20 |

Level: **2**

Parameters P0757 - P0760 configure the input scaling as shown in the diagram:




Where:
Analog setpoints represent a [%] of the normalized frequency in P2000.
Analog setpoints may be larger than 100 %
ASPmax represents highest analog setpoint (this may be at 10 V).
ASPmin represents lowest analog setpoint (this may be at 0 V).
Default values provide a scaling of 0 V = 0 %, and 10 V = 100 %.

**Index:**

P0757[0] : Analog input 1 (ADC 1)
P0757[1] : Analog input 2 (ADC 2)

**P0758[2]** **Value y1 of ADC scaling**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** % | **Min:** | -99999.9 |
| **P-Group:** | TERMINAL | **Active:** Immediately | - | **Def:** | 0.0 |
| | | | | **Max:** | 99999.9 |

Level: **2**

Sets value of Y1 in [%] as described in P0757 (ADC scaling)

**Index:**

P0758[0] : Analog input 1 (ADC 1)
P0758[1] : Analog input 2 (ADC 2)

**Dependency:**

Affects P2000 to P2003 (reference frequency, voltage, current or torque) depending on which setpoint is to be generated.

| **P0759[2]** | **Value x2 of ADC scaling [V / mA]** | | | **Min:** | -20 | Level: |
|---|---|---|---|---|---|---|
| | **CStat:** CUT | **Datatype:** Float | **Unit:** - | **Def:** | 10 | **2** |
| | **P-Group:** TERMINAL | **Active:** Immediately | - | **Max:** | 20 | |

Sets value of X2 as described in P0757 (ADC scaling)

**Index:**

P0759[0] : Analog input 1 (ADC 1)
P0759[1] : Analog input 2 (ADC 2)

| **P0760[2]** | **Value y2 of ADC scaling** | | | **Min:** | -99999.9 | Level: |
|---|---|---|---|---|---|---|
| | **CStat:** CUT | **Datatype:** Float | **Unit:** % | **Def:** | 100.0 | **2** |
| | **P-Group:** TERMINAL | **Active:** Immediately | - | **Max:** | 99999.9 | |

Sets value of Y2 in [%] as described in P0757 (ADC scaling)

**Index:**

P0760[0] : Analog input 1 (ADC 1)
P0760[1] : Analog input 2 (ADC 2)

**Dependency:**

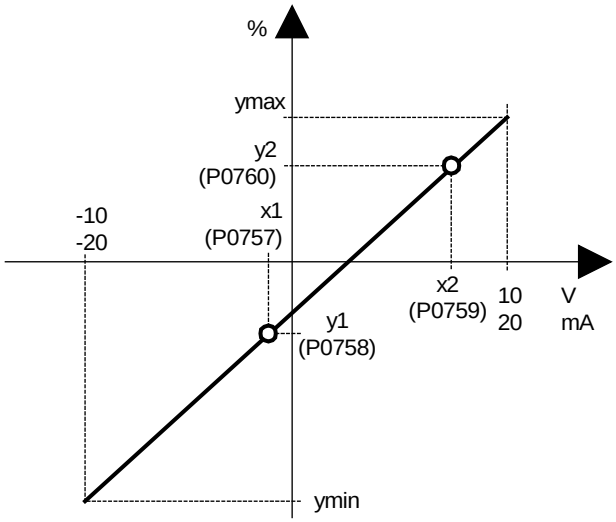
Affects P2000 to P2003 (reference frequency, voltage, current or torque) depending on which setpoint is to be generated.

| P0761[2] | **Width of ADC deadband [V / mA]** | | | **Min:** | 0 | Level: |
|---|---|---|---|---|---|---|
| | **CStat:** CUT | **Datatype:** Float | **Unit:** - | **Def:** | 0 | **2** |
| | **P-Group:** TERMINAL | **Active:** Immediately | - | **Max:** | 20 | |

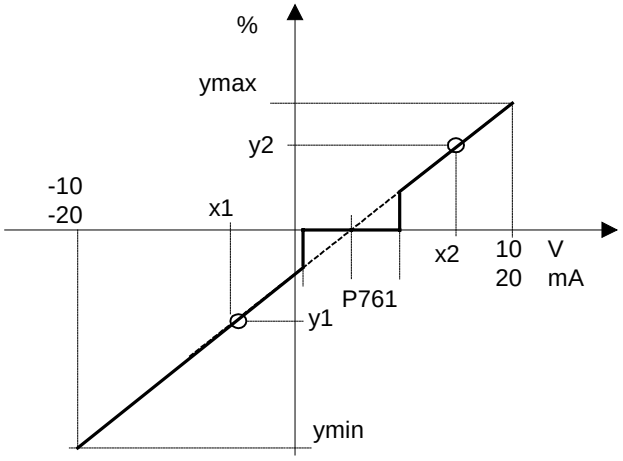
Defines width of deadband on analog input. The diagrams below explain its use

**Example:**

ADC value 2 to 10 V (0 to 50 Hz)
The above example produces a 2 to 10 V analog input (0 to 50 Hz)
P0757 = 2 V P0761 = 2 V P2000 = 50 Hz




ADC value 2 to 10 V (-50 to +50 Hz)
The above example produces a 2 to 10 V analog input (-50 to +50 Hz) with center zero and a "holding point" 0.2 V wide.
P0758 = -100 % P0761 = 0.1 (0.1 V to each side of center)




**Index:**

P0761[0] : Analog input 1 (ADC 1)
P0761[1] : Analog input 2 (ADC 2)

**Note:**

P0761[x] = 0 : No deadband active.

**Notice:**

Deadband starts from 0 V to value of P0761, if both values of P0758 and P0760 (y coordinates of ADC scaling) are positive or negative respectively. However, deadband is active in both directions from point of intersection (x axis with ADC scaling curve), if sign of P0758 and P0760 are opposite.

Fmin (P1080) should be zero when using center zero setup. There is no hysteresis at the end of the deadband.

**P0762[2]** **Delay for loss of signal action** Level: **3**

**CStat:** CUT **Datatype:** U16 **Unit:** ms **Min:** 0
**P-Group:** TERMINAL **Active:** No - **Def:** 10
**Max:** 10000

Defines time delay between loss of analog setpoint and appearance of fault code F0080.

**Index:**

P0762[0] : Analog input 1 (ADC 1)
P0762[1] : Analog input 2 (ADC 2)

**Note:**

Expert users can choose the desired reaction to F0080 (default is OFF2).

**r0770** **Number of DACs** Level: **3**

**Datatype:** U16 **Unit:** - **Min:** -
**P-Group:** TERMINAL **Def:** -
**Max:** -

Displays number of analog outputs available.

**P0771[2]** **CI: DAC** Level: **2**

**CStat:** CUT **Datatype:** U32 **Unit:** - **Min:** 0:0
**P-Group:** TERMINAL **Active:** Immediately - **Def:** 21:0
**Max:** 4000:0

Defines function of the 0 - 20 mA analog output.

**Settings:**

21 CO: Act. frequency (scaled to P2000)
24 CO: Act. output frequency (scaled to P2000)
25 CO: Act. output voltage (scaled to P2001)
26 CO: Act. DC-link voltage (scaled to P2001)
27 CO: Act. output current (scaled to P2002)

**Index:**

P0771[0] : Analog output 1 (DAC 1)
P0771[1] : Analog output 2 (DAC 2)

**P0773[2]** **Smooth time DAC** Level: **3**

**CStat:** CUT **Datatype:** U16 **Unit:** ms **Min:** 0
**P-Group:** TERMINAL **Active:** Immediately - **Def:** 2
**Max:** 1000

Defines smoothing time [ms] for analog output signal. This parameter enables smoothing for DAC input using a PT1 filter.

**Index:**

P0773[0] : Analog output 1 (DAC 1)
P0773[1] : Analog output 2 (DAC 2)

**Dependency:**

P0773 = 0: Deactivates filter.

**r0774[2]** **Act. DAC value [V] or [mA]** Level: **2**

**Datatype:** Float **Unit:** - **Min:** -
**P-Group:** TERMINAL **Def:** -
**Max:** -

Shows value of analog output in [V] or [mA] after filtering and scaling.

**Index:**

r0774[0] : Analog output 1 (DAC 1)
r0774[1] : Analog output 2 (DAC 2)

**P0776[2]** **Type of DAC** Level: **4**

**CStat:** CT **Datatype:** U16 **Unit:** - **Min:** 0
**P-Group:** TERMINAL **Active:** Immediately - **Def:** 0
**Max:** 1

Defines type of analog output.

**Enum:**

0 Current output
1 Voltage output

**Index:**

P0776[0] : Analog output 1 (DAC 1)
P0776[1] : Analog output 2 (DAC 2)

**Note:**

The analog output is designed as a current output with a range of 0...20 mA.

For a voltage output with a range of 0...10 V an external resistor of 500 Ohms has to be connected at the terminals

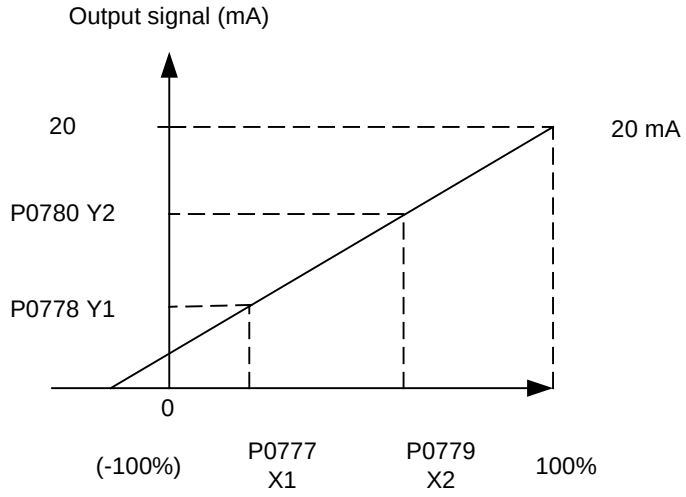
(12/13 or 26/27).

**P0777[2]** **Value x1 of DAC scaling** Level: **2**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** % | **Min:** | -99999.0 |
| **P-Group:** | TERMINAL | **Active:** Immediately | - | **Def:** | 0.0 |
| | | | | **Max:** | 99999.0 |

Defines x1 output characteristic in [%]. Scaling block is responsible for adjustment of output value defined in P0771 (DAC connector input).

Parameters of DAC scaling block (P0777 ... P0781) work as follows:




Where:
Points P1 (x1, y1) and P2 (x2, y2) can be chosen freely.

**Example:**
The default values of the scaling block provides a scaling of
P1: 0.0 %= 0 mA or 0 V and P2: 100.0 % = 20 mA or 20 V.

**Index:**
P0777[0] : Analog output 1 (DAC 1)
P0777[1] : Analog output 2 (DAC 2)

**Dependency:**
Affects P2000 to P2003 (referency frequency, voltage, current or torque) depending on which setpoint is to be generated.

**P0778[2]** **Value y1 of DAC scaling** Level: **2**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** - | **Min:** | 0 |
| **P-Group:** | TERMINAL | **Active:** Immediately | - | **Def:** | 0 |
| | | | | **Max:** | 20 |

Defines y1 of output characteristic.

**Index:**
P0778[0] : Analog output 1 (DAC 1)
P0778[1] : Analog output 2 (DAC 2)

**P0779[2]** **Value x2 of DAC scaling** Level: **2**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** % | **Min:** | -99999.0 |
| **P-Group:** | TERMINAL | **Active:** Immediately | - | **Def:** | 100.0 |
| | | | | **Max:** | 99999.0 |

Defines x2 of output characteristic in [%].

**Index:**
P0779[0] : Analog output 1 (DAC 1)
P0779[1] : Analog output 2 (DAC 2)

**Dependency:**
Affects P2000 to P2003 (referency frequency, voltage, current or torque) depending on which setpoint is to be generated.

**P0780[2]** **Value y2 of DAC scaling** Level: **2**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** - | **Min:** | 0 |
| **P-Group:** | TERMINAL | **Active:** Immediately | - | **Def:** | 20 |
| | | | | **Max:** | 20 |

Defines y2 of output characteristic.

**Index:**
P0780[0] : Analog output 1 (DAC 1)
P0780[1] : Analog output 2 (DAC 2)

**P0781[2]** **Width of DAC deadband** Level: **2**

**CStat:** CUT **Datatype:** Float **Unit:** - **Min:** 0
**P-Group:** TERMINAL **Active:** Immediately - **Def:** 0
**Max:** 20

Sets width of dead-band in [mA] for analog output.

**Index:**

P0781[0] : Analog output 1 (DAC 1)
P0781[1] : Analog output 2 (DAC 2)

**P0800[3]** **BI: Download parameter set 0** Level: **3**

**CStat:** CT **Datatype:** U32 **Unit:** - **Min:** 0:0
**P-Group:** COMMANDS **Active:** Immediately - **Def:** 0:0
**Max:** 4000:0

Defines source of command to start download of parameter set 0 from attached AOP. The first three digits describe the parameter number of the command source, the last digit refers to the bit setting for that parameter.

**Settings:**

722.0 = Digital input 1 (requires P0701 to be set to 99, BICO)
722.1 = Digital input 2 (requires P0702 to be set to 99, BICO)
722.2 = Digital input 3 (requires P0703 to be set to 99, BICO)
722.3 = Digital input 4 (requires P0704 to be set to 99, BICO)
722.4 = Digital input 5 (requires P0705 to be set to 99, BICO)
722.5 = Digital input 6 (requires P0706 to be set to 99, BICO)

**Index:**

P0800[0] : 1st. Command data set (CDS)
P0800[1] : 2nd. Command data set (CDS)
P0800[2] : 3rd. Command data set (CDS)

**Note:**

Signal of digital input:
0 = No download
1 = Start download parameter set 0 from AOP.

**P0801[3]** **BI: Download parameter set 1** Level: **3**

**CStat:** CT **Datatype:** U32 **Unit:** - **Min:** 0:0
**P-Group:** COMMANDS **Active:** Immediately - **Def:** 0:0
**Max:** 4000:0

Defines sources of command to start download of parameter set 1 from attached AOP. The first three digits describe the parameter number of the command source, the last digit refers to the bit setting for that parameter.

**Settings:**

722.0 = Digital input 1 (requires P0701 to be set to 99, BICO)
722.1 = Digital input 2 (requires P0702 to be set to 99, BICO)
722.2 = Digital input 3 (requires P0703 to be set to 99, BICO)
722.3 = Digital input 4 (requires P0704 to be set to 99, BICO)
722.4 = Digital input 5 (requires P0705 to be set to 99, BICO)
722.5 = Digital input 6 (requires P0706 to be set to 99, BICO)

**Index:**

P0801[0] : 1st. Command data set (CDS)
P0801[1] : 2nd. Command data set (CDS)
P0801[2] : 3rd. Command data set (CDS)

**Note:**

Signal of digital input:
0 = No download
1 = Start download parameter set 1 from AOP.

**P0809[3]** **Copy Command Data Set** Level: **2**

**CStat:** CT **Datatype:** U16 **Unit:** - **Min:** 0
**P-Group:** COMMANDS **Active:** Immediately - **Def:** 0
**Max:** 2

Calls 'Copy command data set' function.

**Index:**

P0809[0] : Copy from CDS
P0809[1] : Copy to DDS
P0809[2] : Start copy

**Note:**

Start value in index 2 is automatically reset to '0' after execution of function.

**P0810** **BI: CDS bit 0 (Local / Remote)** Level: **2**

**CStat:** CUT **Datatype:** U32 **Unit:** - **Min:** 0:0
**P-Group:** COMMANDS **Active:** Immediately - **Def:** 0:0
**Max:** 4095:0

Selects command source from which to read Bit 0 for selecting a BICO data set (see control word 1, Bit 15).

**Note:**

Bit 1 is also relevant for BICO data set selection.

**P0811** **BI: CDS bit 1**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 0:0 |
| | | | | **Max:** | 4095:0 |

Level: **2**

Selects command source from which to read Bit 1 for selecting a BICO data set (see control word 2, Bit 06 in P0055).

**Note:**

Bit 0 is also relevant for BICO data set selection.

**P0819[3]** **Copy Drive Data Set**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U16 | **Unit:** - | **Min:** | 0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 0 |
| | | | | **Max:** | 2 |

Level: **2**

Calls 'Copy drive data set' function.

**Index:**

P0819[0] : Copy from DDS
P0819[1] : Copy to DDS
P0819[2] : Start copy

**Note:**

Start value in index 2 is automatically reset to '0' after execution of function.

**P0820[3]** **BI: DDS bit 0**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 0:0 |
| | | | | **Max:** | 4095:0 |

Level: **3**

Selects command source from which to read Bit 0 for selecting a drive data set (see control word 2, Bit 15 in P0055).

**Index:**

P0820[0] : 1st. Command data set (CDS)
P0820[1] : 2nd. Command data set (CDS)
P0820[2] : 3rd. Command data set (CDS)

**Note:**

Bit 1 is also relevant for BICO data set selection.

**P0821[3]** **BI: DDS bit 1**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 0:0 |
| | | | | **Max:** | 4095:0 |

Level: **3**

Selects command source from which Bit 1 for selecting a drive data set is to be read in (see control word 2, Bit 15 in P0055).

**Settings:**

722.0 = Digital input 1 (requires P0701 to be set to 99, BICO)
722.1 = Digital input 2 (requires P0702 to be set to 99, BICO)
722.2 = Digital input 3 (requires P0703 to be set to 99, BICO)
722.3 = Digital input 4 (requires P0704 to be set to 99, BICO)
722.4 = Digital input 5 (requires P0705 to be set to 99, BICO)
722.5 = Digital input 6 (requires P0706 to be set to 99, BICO)
722.6 = Digital input 7 (via analog input 1, requires P0707 to be set to 99)
722.7 = Digital input 8 (via analog input 2, requires P0708 to be set to 99)

19.0 = ON/OFF1 via BOP/AOP

**Index:**

P0821[0] : 1st. Command data set (CDS)
P0821[1] : 2nd. Command data set (CDS)
P0821[2] : 3rd. Command data set (CDS)

**Note:**

Bit 0 is also relevant for BICO data set selection.

**P0840[3]** **BI: ON/OFF1**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 722:0 |
| | | | | **Max:** | 4000:0 |

Level: **3**

Allows ON/OFF1 command source to be selected using BICO. The first three digits describe the parameter number of the command source; the last digit denotes the bit setting for that parameter.

**Settings:**

722.0 = Digital input 1 (requires P0701 to be set to 99, BICO)
722.1 = Digital input 2 (requires P0702 to be set to 99, BICO)
722.2 = Digital input 3 (requires P0703 to be set to 99, BICO)
722.3 = Digital input 4 (requires P0704 to be set to 99, BICO)
722.4 = Digital input 5 (requires P0705 to be set to 99, BICO)
722.5 = Digital input 6 (requires P0706 to be set to 99, BICO)
722.6 = Digital input 7 (via analog input 1, requires P0707 to be set to 99)
722.7 = Digital input 8 (via analog input 2, requires P0708 to be set to 99)

19.0 = ON/OFF1 via BOP/AOP

**Index:**

P0840[0] : 1st. Command data set (CDS)
P0840[1] : 2nd. Command data set (CDS)
P0840[2] : 3rd. Command data set (CDS)

**Dependency:**

Active only when P0719 = 0 (remote selection of command/setpoint source).

BICO requires P0700 set to 2 (enable BICO).

The default setting (ON right) is digital input 1 (722.0). Alternative source possible only when function of digital input 1 is changed (via P0701) before changing value of P0840.

**P0842[3]** **BI: ON/OFF1 reverse**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 0:0 |
| | | | | **Max:** | 4000:0 |

Level: **3**

Allows ON/OFF1 reverse command source to be selected using BICO. The first three digits describe the parameter number of the command source and the last digit denotes the bit setting for that parameter.

**Settings:**

722.0 = Digital input 1 (requires P0701 to be set to 99, BICO)
722.1 = Digital input 2 (requires P0702 to be set to 99, BICO)
722.2 = Digital input 3 (requires P0703 to be set to 99, BICO)
722.3 = Digital input 4 (requires P0704 to be set to 99, BICO)
722.4 = Digital input 5 (requires P0705 to be set to 99, BICO)
722.5 = Digital input 6 (requires P0706 to be set to 99, BICO)
722.6 = Digital input 7 (via analog input 1, requires P0707 to be set to 99)
722.7 = Digital input 8 (via analog input 2, requires P0708 to be set to 99)

19.0 = ON/OFF1 via BOP/AOP

**Index:**

P0842[0] : 1st. Command data set (CDS)
P0842[1] : 2nd. Command data set (CDS)
P0842[2] : 3rd. Command data set (CDS)

**Dependency:**

Active only when P0719 = 0 (remote selection of command/setpoint source).

**P0844[3]** **BI: 1. OFF2**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 1:0 |
| | | | | **Max:** | 4000:0 |

Level: **3**

Defines first source of OFF2 when P0719 = 0 (BICO). The first three digits describe the parameter number of the command source and the last digit denotes the bit setting for that parameter.

**Settings:**

722.0 = Digital input 1 (requires P0701 to be set to 99, BICO)
722.1 = Digital input 2 (requires P0702 to be set to 99, BICO)
722.2 = Digital input 3 (requires P0703 to be set to 99, BICO)
722.3 = Digital input 4 (requires P0704 to be set to 99, BICO)
722.4 = Digital input 5 (requires P0705 to be set to 99, BICO)
722.5 = Digital input 6 (requires P0706 to be set to 99, BICO)
722.6 = Digital input 7 (via analog input 1, requires P0707 to be set to 99)
722.7 = Digital input 8 (via analog input 2, requires P0708 to be set to 99)

19.0 = ON/OFF1 via BOP/AOP
19.1 = OFF2: Electrical stop via BOP/AOP

**Index:**

P0844[0] : 1st. Command data set (CDS)
P0844[1] : 2nd. Command data set (CDS)
P0844[2] : 3rd. Command data set (CDS)

**Dependency:**

Active only when P0719 = 0 (remote selection of command/setpoint source).

If one of the digital inputs is selected for OFF2, the inverter will not run unless the digital input is active.

**Note:**

OFF2 means immediate pulse-disabling; the motor is coasting.

OFF2 is low-active, i.e. :
0 = Pulse disabling.
1 = Operating condition.

**P0845[3]** **BI: 2. OFF2**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 19:1 |
| | | | | **Max:** | 4000:0 |

Level: **3**

Defines second source of OFF2. The first three digits describe the parameter number of the command source and the last digit denotes the bit setting for that parameter.

**Settings:**

722.0 = Digital input 1 (requires P0701 to be set to 99, BICO)
722.1 = Digital input 2 (requires P0702 to be set to 99, BICO)
722.2 = Digital input 3 (requires P0703 to be set to 99, BICO)
722.3 = Digital input 4 (requires P0704 to be set to 99, BICO)
722.4 = Digital input 5 (requires P0705 to be set to 99, BICO)
722.5 = Digital input 6 (requires P0706 to be set to 99, BICO)
722.6 = Digital input 7 (via analog input 1, requires P0707 to be set to 99)
722.7 = Digital input 8 (via analog input 2, requires P0708 to be set to 99)

19.0 = ON/OFF1 via BOP/AOP

**Index:**

P0845[0] : 1st. Command data set (CDS)
P0845[1] : 2nd. Command data set (CDS)
P0845[2] : 3rd. Command data set (CDS)

**Dependency:**

In contrast to P0844 (first source of OFF2), this parameter is always active, independent of P0719 (selection of command and frequency setpoint).

If one of the digital inputs is selected for OFF2, the inverter will not run unless the digital input is active.

**Note:**

OFF2 means immediate pulse-disabling; the motor is coasting.

OFF2 is low-active, i.e. :
0 = Pulse disabling.
1 = Operating condition.

**P0848[3]** **BI: 1. OFF3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 1:0 |
| | | | | **Max:** | 4000:0 |

Level: **3**

Defines first source of OFF3 when P0719 = 0 (BICO). The first three digits describe the parameter number of the command source and the last digit denotes the bit setting for that parameter.

**Settings:**

722.0 = Digital input 1 (requires P0701 to be set to 99, BICO)
722.1 = Digital input 2 (requires P0702 to be set to 99, BICO)
722.2 = Digital input 3 (requires P0703 to be set to 99, BICO)
722.3 = Digital input 4 (requires P0704 to be set to 99, BICO)
722.4 = Digital input 5 (requires P0705 to be set to 99, BICO)
722.5 = Digital input 6 (requires P0706 to be set to 99, BICO)
722.6 = Digital input 7 (via analog input 1, requires P0707 to be set to 99)
722.7 = Digital input 8 (via analog input 2, requires P0708 to be set to 99)

19.0 = ON/OFF1 via BOP/AOP

**Index:**

P0848[0] : 1st. Command data set (CDS)
P0848[1] : 2nd. Command data set (CDS)
P0848[2] : 3rd. Command data set (CDS)

**Dependency:**

Active only when P0719 = 0 (remote selection of command/setpoint source).

If one of the digital inputs is selected for OFF3, the inverter will not run unless the digital input is active.

**Note:**

OFF3 means fast ramp-down to 0.

OFF3 is low-active, i.e.
0 = Ramp-down.
1 = Operating condition.

**P0849[3]** **BI: 2. OFF3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 1:0 |
| | | | | **Max:** | 4000:0 |

Level: **3**

Defines second source of OFF3. The first three digits describe the parameter number of the command source and the last digit denotes the bit setting for that parameter.

**Settings:**

722.0 = Digital input 1 (requires P0701 to be set to 99, BICO)
722.1 = Digital input 2 (requires P0702 to be set to 99, BICO)
722.2 = Digital input 3 (requires P0703 to be set to 99, BICO)
722.3 = Digital input 4 (requires P0704 to be set to 99, BICO)
722.4 = Digital input 5 (requires P0705 to be set to 99, BICO)
722.5 = Digital input 6 (requires P0706 to be set to 99, BICO)
722.6 = Digital input 7 (via analog input 1, requires P0707 to be set to 99)
722.7 = Digital input 8 (via analog input 2, requires P0708 to be set to 99)

19.0 = ON/OFF1 via BOP/AOP

**Index:**

P0849[0] : 1st. Command data set (CDS)
P0849[1] : 2nd. Command data set (CDS)
P0849[2] : 3rd. Command data set (CDS)

**Dependency:**

In contrast to P0848 (first source of OFF3), this parameter is always active, independent of P0719 (selection of command and frequency setpoint).

If one of the digital inputs is selected for OFF3, the inverter will not run unless the digital input is active.

**Note:**

OFF3 means fast ramp-down to 0.

OFF3 is low-active, i.e.
0 = Ramp-down.
1 = Operating condition.

**P0852[3]** **BI: Pulse enable**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 1:0 |
| | | | | **Max:** | 4000:0 |

Level: **3**

Defines source of pulse enable/disable signal.

**Settings:**

722.0 = Digital input 1 (requires P0701 to be set to 99, BICO)
722.1 = Digital input 2 (requires P0702 to be set to 99, BICO)
722.2 = Digital input 3 (requires P0703 to be set to 99, BICO)
722.3 = Digital input 4 (requires P0704 to be set to 99, BICO)
722.4 = Digital input 5 (requires P0705 to be set to 99, BICO)
722.5 = Digital input 6 (requires P0706 to be set to 99, BICO)
722.6 = Digital input 7 (via analog input 1, requires P0707 to be set to 99)
722.7 = Digital input 8 (via analog input 2, requires P0708 to be set to 99)

**Index:**

P0852[0] : 1st. Command data set (CDS)
P0852[1] : 2nd. Command data set (CDS)
P0852[2] : 3rd. Command data set (CDS)

**Dependency:**

Active only when P0719 = 0 (remote selection of command/setpoint source).

**P0918** **CB address**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U16 | **Unit:** - | **Min:** | 0 |
| **P-Group:** | COMM | **Active:** Immediately | - | **Def:** | 3 |
| | | | | **Max:** | 65535 |

Level: **2**

Defines address of CB (communication board) or address of the other option modules.

There are two ways to set the bus address:
1 via DIP switches on the PROFIBUS module
2 via a user-entered value

**Note:**

Possible PROFIBUS settings:
1 ... 125
0, 126, 127 are not allowed

The following applies when a PROFIBUS module is used:
DIP switch = 0 Address defined in P0918 (CB address) is valid
DIP switch not = 0 DIP switch setting has priority and P0918 indicates DIP switch setting.

**P0927** **Parameter changeable via**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U16 | **Unit:** - | **Min:** | 0 |
| **P-Group:** | COMM | **Active:** Immediately | - | **Def:** | 15 |
| | | | | **Max:** | 15 |

Level: **2**

Specifies the interfaces which can be used to change parameters.

**Example:**

"b - - n n" (bits 0, 1, 2 and 3 set) in the default setting means that parameters can be changed via any interface.
"b - - r n" (bits 0, 1 and 3 set) would specify that parameters can be changed via PROFIBUS/CB, BOP and USS on COM link (RS485 USS) but not via USS on BOP link (RS232)

**Bitfields:**

| | | | |
|---|---|---|---|
| Bit00 | PROFIBUS / CB | 0 | NO |
| | | 1 | YES |
| Bit01 | BOP | 0 | NO |
| | | 1 | YES |
| Bit02 | USS on BOP link | 0 | NO |
| | | 1 | YES |
| Bit03 | USS on COM link | 0 | NO |
| | | 1 | YES |

**Details:**

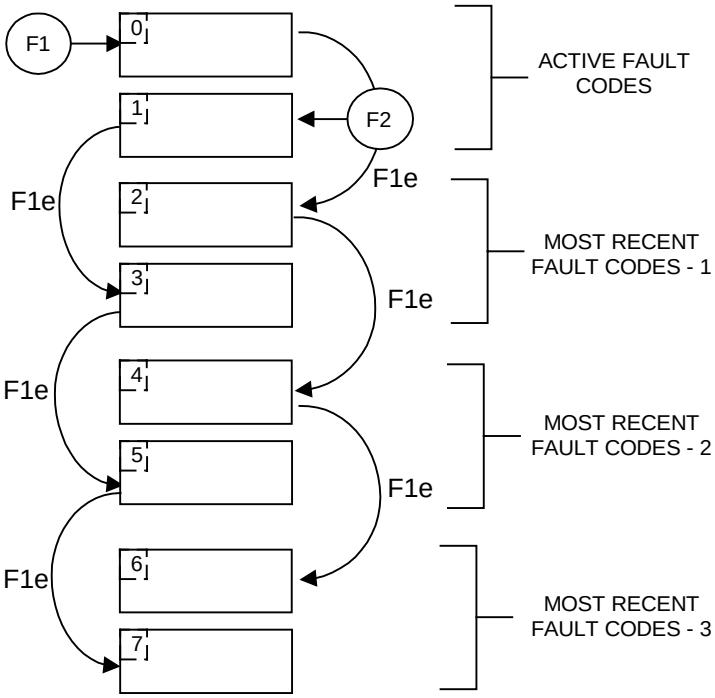
The seven-segment display is explained in the "Introduction to MICROMASTER System Parameters".

| **r0947[8]** | **Last fault code** | | | **Min:** - | Level: |
|---|---|---|---|---|---|
| | | **Datatype:** U16 | **Unit:** - | **Def:** - | **2** |
| | **P-Group:** ALARMS | | | **Max:** - | |

Displays fault history according to the diagram below

where:
"F1" is the first active fault (not yet acknowledged).
"F2" is the second active fault (not yet acknowledged).
"F1e" is the occurrence of the fault acknowledgement for F1 & F2.

This moves the value in the 2 indices down to the next pair of indices, where they are stored. Indices 0 & 1 contain the active faults. When faults are acknowledged, indices 0 & 1 are reset to 0.




**Example:**

If the inverter trips on undervoltage and then receives an external trip before the undervoltage is acknowledged, you will obtain:
Index 0 = 3 Undervoltage
Index 1 = 85 External trip

Whenever a fault in index 0 is acknowledged (F1e), the fault history shifts as indicated in the diagram above.

**Index:**

r0947[0] : Recent fault trip --, fault 1
r0947[1] : Recent fault trip --, fault 2
r0947[2] : Recent fault trip -1, fault 3
r0947[3] : Recent fault trip -1, fault 4
r0947[4] : Recent fault trip -2, fault 5
r0947[5] : Recent fault trip -2, fault 6
r0947[6] : Recent fault trip -3, fault 7
r0947[7] : Recent fault trip -3, fault 8

**Dependency:**

Index 2 used only if second fault occurs before first fault is acknowledged.

**Details:**

See fault codes in Operating Instructions Manual.

**r0948[12]** **Fault time**

**Datatype:** U16 **Unit:** - **Min:** - **Def:** - **Max:** -

Level: **3**

**P-Group:** ALARMS

Time stamp to indicate when the fault has occurred. P2114 (run-time counter) or P2115 (real time clock) are the possible sources of the time stamp.

**Example:**

The time is taken from P2115 if this parameter has been updated with the real time. If not, P2114 is used.

**Index:**

r0948[0] : Recent fault trip --, fault time seconds+minutes
r0948[1] : Recent fault trip --, fault time hours+days
r0948[2] : Recent fault trip --, fault time month+year
r0948[3] : Recent fault trip -1, fault time seconds+minutes
r0948[4] : Recent fault trip -1, fault time hours+days
r0948[5] : Recent fault trip -1, fault time month+year
r0948[6] : Recent fault trip -2, fault time seconds+minutes
r0948[7] : Recent fault trip -2, fault time hours+days
r0948[8] : Recent fault trip -2, fault time month+year
r0948[9] : Recent fault trip -3, fault time seconds+minutes
r0948[10] : Recent fault trip -3, fault time hours+days
r0948[11] : Recent fault trip -3, fault time month+year

**Note:**

P2115 can be updated via AOP, Starter, DriveMonitor, etc.

**r0949[8]** **Fault value**

**Datatype:** U16 **Unit:** - **Min:** - **Def:** - **Max:** -

Level: **4**

**P-Group:** ALARMS

Displays drive fault values.

**Index:**

r0949[0] : Recent fault trip --, fault value 1
r0949[1] : Recent fault trip --, fault value 2
r0949[2] : Recent fault trip -1, fault value 3
r0949[3] : Recent fault trip -1, fault value 4
r0949[4] : Recent fault trip -2, fault value 5
r0949[5] : Recent fault trip -2, fault value 6
r0949[6] : Recent fault trip -3, fault value 7
r0949[7] : Recent fault trip -3, fault value 8

**P0952** **Total number of faults**

**CStat:** CT **Datatype:** U16 **Unit:** - **Min:** 0 **Def:** 0 **Max:** 8

Level: **3**

**P-Group:** ALARMS **Active:** Immediately -

Displays number of faults stored in P0947 (last fault code).

**Dependency:**

Setting 0 resets fault history (changing to 0 also resets parameter P0948 - fault time).

**r0964[5]** **Firmware version data**

**Datatype:** U16 **Unit:** - **Min:** - **Def:** - **Max:** -

Level: **3**

**P-Group:** COMM

Firmware version data.

**Example:**

| | | | |
|---|---|---|---|
| r0964[0] | = | 42 | "SIEMENS" |
| r0964[1] | = | 1001 | "MICROMASTER 420" |
| | | 1002 | "MICROMASTER 440" |
| | | 1003 | "MICRO- / COMBIMASTER 411" |
| | | 1004 | "MICROMASTER 410" |
| | | 1005 | "Reserved" |
| r0964[4] | = | 507 | means 5th July. |

**Index:**

r0964[0] : Company (Siemens = 42)
r0964[1] : Product type
r0964[2] : Firmware version
r0964[3] : Firmware date (year)
r0964[4] : Firmware date (day/month)

**r0965** **Profibus profile**

**Datatype:** U16 **Unit:** - **Min:** - **Def:** - **Max:** -

Level: **3**

**P-Group:** COMM

Identification for PROFIDrive. Profile number and version.

**r0967** **Control word 1** Level: **3**

**Datatype:** U16 **Unit:** - **Min:** - **Def:** - **Max:** -

**P-Group:** COMM

Displays control word 1.

**Bitfields:**

| | | | |
|---|---|---|---|
| Bit00 | ON/OFF1 | 0 | NO |
| | | 1 | YES |
| Bit01 | OFF2: Electrical stop | 0 | YES |
| | | 1 | NO |
| Bit02 | OFF3: Fast stop | 0 | YES |
| | | 1 | NO |
| Bit03 | Pulse enable | 0 | NO |
| | | 1 | YES |
| Bit04 | RFG enable | 0 | NO |
| | | 1 | YES |
| Bit05 | RFG start | 0 | NO |
| | | 1 | YES |
| Bit06 | Setpoint enable | 0 | NO |
| | | 1 | YES |
| Bit07 | Fault acknowledge | 0 | NO |
| | | 1 | YES |
| Bit08 | JOG right | 0 | NO |
| | | 1 | YES |
| Bit09 | JOG left | 0 | NO |
| | | 1 | YES |
| Bit10 | Control from PLC | 0 | NO |
| | | 1 | YES |
| Bit11 | Reverse (setpoint inversion) | 0 | NO |
| | | 1 | YES |
| Bit13 | Motor potentiometer MOP up | 0 | NO |
| | | 1 | YES |
| Bit14 | Motor potentiometer MOP down | 0 | NO |
| | | 1 | YES |
| Bit15 | CDS Bit 0 (Local/Remote) | 0 | NO |
| | | 1 | YES |

**r0968** **Status word 1** Level: **3**

**Datatype:** U16 **Unit:** - **Min:** - **Def:** - **Max:** -

**P-Group:** COMM

Displays active status word of inverter (in binary) and can be used to diagnose which commands are active.

**Bitfields:**

| | | | |
|---|---|---|---|
| Bit00 | Drive ready | 0 | NO |
| | | 1 | YES |
| Bit01 | Drive ready to run | 0 | NO |
| | | 1 | YES |
| Bit02 | Drive running | 0 | NO |
| | | 1 | YES |
| Bit03 | Drive fault active | 0 | NO |
| | | 1 | YES |
| Bit04 | OFF2 active | 0 | YES |
| | | 1 | NO |
| Bit05 | OFF3 active | 0 | YES |
| | | 1 | NO |
| Bit06 | ON inhibit active | 0 | NO |
| | | 1 | YES |
| Bit07 | Drive warning active | 0 | NO |
| | | 1 | YES |
| Bit08 | Deviation setp. / act. value | 0 | YES |
| | | 1 | NO |
| Bit09 | PZD control | 0 | NO |
| | | 1 | YES |
| Bit10 | Maximum frequency reached | 0 | NO |
| | | 1 | YES |
| Bit11 | Warning: Motor current limit | 0 | YES |
| | | 1 | NO |
| Bit12 | Motor holding brake active | 0 | NO |
| | | 1 | YES |
| Bit13 | Motor overload | 0 | YES |
| | | 1 | NO |
| Bit14 | Motor runs direction right | 0 | NO |
| | | 1 | YES |
| Bit15 | Inverter overload | 0 | YES |
| | | 1 | NO |

**P0970** **Factory reset** Level: **1**

**CStat:** C **Datatype:** U16 **Unit:** - **Min:** 0
**P-Group:** PAR_RESET **Active:** Immediately - **Def:** 0
**Max:** 1

P0970 = 1 resets all parameters to their default values.

**Enum:**
0 Disabled
1 Parameter reset

**Dependency:**
First set P0010 = 30 (factory settings)

Stop drive (i.e. disable all pulses) before you can reset parameters to default values.

**Note:**
The following parameters retain their values after a factory reset:
P0918 (CB address),
P2010 (USS baud rate) and
P2011 (USS address)

**P0971** **Transfer data from RAM to EEPROM** Level: **3**

**CStat:** CUT **Datatype:** U16 **Unit:** - **Min:** 0
**P-Group:** COMM **Active:** Immediately - **Def:** 0
**Max:** 1

Transfers values from RAM to EEPROM when set to 1.

**Enum:**
0 Disabled
1 Start transfer

**Note:**
All values in RAM are transferred to EEPROM.

Parameter is automatically reset to 0 (default) after successful transfer.

| **P1000[3]** | **Selection of frequency setpoint** | | | **Min:** | 0 | Level: |
|---|---|---|---|---|---|---|
| | **CStat:** CT | **Datatype:** U16 | **Unit:** - | **Def:** | 2 | **1** |
| | **P-Group:** SETPOINT | **Active:** Immediately | QuickCom | **Max:** | 77 | |

Selects frequency setpoint source. In the table of possible settings below, the main setpoint is selected from the least significant digit (i.e., 0 to 6) and any additional setpoint from the most significant digit (i.e., x0 through to x6).

**Example:**

Setting 12 selects main setpoint (2) derived from analog input with additional setpoint (1) taken from the motor potentiometer.

**Settings:**

1 Motor potentiometer setpoint
2 Analog input
3 Fixed frequency setpoint
4 USS on BOP link
5 USS on COM link
6 Communication board (CB) on COM link

Other settings including an additional setpoint can be selected using the table above.

**Enum:**

| | | | |
|---|---|---|---|
| 0 | No main setpoint | | |
| 1 | MOP setpoint | | |
| 2 | Analog setpoint | | |
| 3 | Fixed frequency | | |
| 4 | USS on BOP link | | |
| 5 | USS on COM link | | |
| 6 | CB on COM link | | |
| 7 | Analog setpoint 2 | | |
| 10 | No main setpoint | + | MOP setpoint |
| 11 | MOP setpoint | + | MOP setpoint |
| 12 | Analog setpoint | + | MOP setpoint |
| 13 | Fixed frequency | + | MOP setpoint |
| 14 | USS on BOP link | + | MOP setpoint |
| 15 | USS on COM link | + | MOP setpoint |
| 16 | CB on COM link | + | MOP setpoint |
| 17 | Analog setpoint 2 | + | MOP setpoint |
| 20 | No main setpoint | + | Analog setpoint |
| 21 | MOP setpoint | + | Analog setpoint |
| 22 | Analog setpoint | + | Analog setpoint |
| 23 | Fixed frequency | + | Analog setpoint |
| 24 | USS on BOP link | + | Analog setpoint |
| 25 | USS on COM link | + | Analog setpoint |
| 26 | CB on COM link | + | Analog setpoint |
| 27 | Analog setpoint 2 | + | Analog setpoint |
| 30 | No main setpoint | + | Fixed frequency |
| 31 | MOP setpoint | + | Fixed frequency |
| 32 | Analog setpoint | + | Fixed frequency |
| 33 | Fixed frequency | + | Fixed frequency |
| 34 | USS on BOP link | + | Fixed frequency |
| 35 | USS on COM link | + | Fixed frequency |
| 36 | CB on COM link | + | Fixed frequency |
| 37 | Analog setpoint 2 | + | Fixed frequency |
| 40 | No main setpoint | + | USS on BOP link |
| 41 | MOP setpoint | + | USS on BOP link |
| 42 | Analog setpoint | + | USS on BOP link |
| 43 | Fixed frequency | + | USS on BOP link |
| 44 | USS on BOP link | + | USS on BOP link |
| 45 | USS on COM link | + | USS on BOP link |
| 46 | CB on COM link | + | USS on BOP link |
| 47 | Analog setpoint 2 | + | USS on BOP link |
| 50 | No main setpoint | + | USS on COM link |
| 51 | MOP setpoint | + | USS on COM link |
| 52 | Analog setpoint | + | USS on COM link |
| 53 | Fixed frequency | + | USS on COM link |
| 54 | USS on BOP link | + | USS on COM link |
| 55 | USS on COM link | + | USS on COM link |
| 56 | CB on COM link | + | USS on COM link |
| 57 | Analog setpoint 2 | + | USS on COM link |
| 60 | No main setpoint | + | CB on COM link |
| 61 | MOP setpoint | + | CB on COM link |
| 62 | Analog setpoint | + | CB on COM link |
| 63 | Fixed frequency | + | CB on COM link |
| 64 | USS on BOP link | + | CB on COM link |
| 65 | USS on COM link | + | CB on COM link |
| 66 | CB on COM link | + | CB on COM link |
| 67 | Analog setpoint 2 | + | CB on COM link |
| 70 | No main setpoint | + | Analog setpoint 2 |

| | | | |
|---|---|---|---|
| 71 | MOP setpoint | + | Analog setpoint 2 |
| 72 | Analog setpoint | + | Analog setpoint 2 |
| 73 | Fixed frequency | + | Analog setpoint 2 |
| 74 | USS on BOP link | + | Analog setpoint 2 |
| 75 | USS on COM link | + | Analog setpoint 2 |
| 76 | CB on COM link | + | Analog setpoint 2 |
| 77 | Analog setpoint 2 | + | Analog setpoint 2 |

**Index:**

P1000[0] : 1st. Command data set (CDS)
P1000[1] : 2nd. Command data set (CDS)
P1000[2] : 3rd. Command data set (CDS)

**Note:**

Single digits denote main setpoints that have no additional setpoint.

## P1001[3] Fixed frequency 1

| | | | | | | Level: |
|---|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Hz | **Min:** | -650.00 | **2** |
| **P-Group:** | SETPOINT | **Active:** No | - | **Def:** | 0.00 | |
| | | | | **Max:** | 650.00 | |

Defines fixed frequency setpoint 1.

There are 3 types of fixed frequencies:
1. Direct selection
2. Direct selection + ON command
3. Binary coded selection + ON command

1. Direct selection (P0701 - P0706 = 15)
   In this mode of operation 1 digital input selects 1 fixed frequency.
   If several inputs are active together, the selected frequencies are summed.
   E.g.: FF1 + FF2 + FF3 + FF4 + FF5 + FF6.
2. Direct selection + ON command (P0701 - P0706 = 16)
   The fixed frequency selection combines the fixed frequencies with an ON command.
   In this mode of operation 1 digital input selects 1 fixed frequency.
   If several inputs are active together, the selected frequencies are summed.
   E.g.: FF1 + FF2 + FF3 + FF4 + FF5 + FF6.
3. Binary coded selection + ON command (P0701 - P0706 = 17)
   Up to 16 fixed frequencies can be selected using this method. The fixed frequencies are selected according to the following table:

| | | DIN4 | DIN3 | DIN2 | DIN1 |
|---|---|---|---|---|---|
| | OFF | Inactive | Inactive | Inactive | Inactive |
| P1001 | FF1 | **Inactive** | **Inactive** | Inactive | Active |
| P1002 | FF2 | Inactive | Inactive | **Active** | Inactive |
| P1003 | FF3 | Inactive | Inactive | **Active** | **Active** |
| P1004 | FF4 | Inactive | **Active** | Inactive | Inactive |
| P1005 | FF5 | Inactive | **Active** | Inactive | **Active** |
| P1006 | FF6 | Inactive | **Active** | **Active** | Inactive |
| P1007 | FF7 | Inactive | **Active** | **Active** | **Active** |
| P1008 | FF8 | **Active** | Inactive | Inactive | Inactive |
| P1009 | FF9 | **Active** | Inactive | Inactive | **Active** |
| P1022 | FF10 | **Active** | Inactive | **Active** | Inactive |
| P1011 | FF11 | **Active** | Inactive | **Active** | **Active** |
| P1012 | FF12 | **Active** | **Active** | Inactive | Inactive |
| P1013 | FF13 | **Active** | **Active** | Inactive | **Active** |
| P1014 | FF14 | **Active** | **Active** | **Active** | Inactive |
| P1015 | FF15 | **Active** | **Active** | **Active** | **Active** |

**Index:**

P1001[0] : 1st. Drive data set (DDS)
P1001[1] : 2nd. Drive data set (DDS)
P1001[2] : 3rd. Drive data set (DDS)

**Dependency:**

Select fixed frequency operation (using P1000).

Inverter requires ON command to start in the case of direct selection (P0701 - P0706 = 15)

**Note:**

Fixed frequencies can be selected using the digital inputs, and can also be combined with an ON command.

**P1002[3]** **Fixed frequency 2**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Hz | **Min:** | -650.00 |
| **P-Group:** | SETPOINT | **Active:** No | - | **Def:** | 5.00 |
| | | | | **Max:** | 650.00 |

Level: **2**

Defines fixed frequency setpoint 2.

**Index:**

P1002[0] : 1st. Drive data set (DDS)
P1002[1] : 2nd. Drive data set (DDS)
P1002[2] : 3rd. Drive data set (DDS)

**Details:**

See parameter P1001 (fixed frequency 1).

**P1003[3]** **Fixed frequency 3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Hz | **Min:** | -650.00 |
| **P-Group:** | SETPOINT | **Active:** No | - | **Def:** | 10.00 |
| | | | | **Max:** | 650.00 |

Level: **2**

Defines fixed frequency setpoint 3.

**Index:**

P1003[0] : 1st. Drive data set (DDS)
P1003[1] : 2nd. Drive data set (DDS)
P1003[2] : 3rd. Drive data set (DDS)

**Details:**

See parameter P1001 (fixed frequency 1).

**P1004[3]** **Fixed frequency 4**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Hz | **Min:** | -650.00 |
| **P-Group:** | SETPOINT | **Active:** No | - | **Def:** | 15.00 |
| | | | | **Max:** | 650.00 |

Level: **2**

Defines fixed frequency setpoint 4.

**Index:**

P1004[0] : 1st. Drive data set (DDS)
P1004[1] : 2nd. Drive data set (DDS)
P1004[2] : 3rd. Drive data set (DDS)

**Details:**

See parameter P1001 (fixed frequency 1).

**P1005[3]** **Fixed frequency 5**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Hz | **Min:** | -650.00 |
| **P-Group:** | SETPOINT | **Active:** No | - | **Def:** | 20.00 |
| | | | | **Max:** | 650.00 |

Level: **2**

Defines fixed frequency setpoint 5.

**Index:**

P1005[0] : 1st. Drive data set (DDS)
P1005[1] : 2nd. Drive data set (DDS)
P1005[2] : 3rd. Drive data set (DDS)

**Details:**

See parameter P1001 (fixed frequency 1).

**P1006[3]** **Fixed frequency 6**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Hz | **Min:** | -650.00 |
| **P-Group:** | SETPOINT | **Active:** No | - | **Def:** | 25.00 |
| | | | | **Max:** | 650.00 |

Level: **2**

Defines fixed frequency setpoint 6.

**Index:**

P1006[0] : 1st. Drive data set (DDS)
P1006[1] : 2nd. Drive data set (DDS)
P1006[2] : 3rd. Drive data set (DDS)

**Details:**

See parameter P1001 (fixed frequency 1).

**P1007[3]** **Fixed frequency 7**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Hz | **Min:** | -650.00 |
| **P-Group:** | SETPOINT | **Active:** No | - | **Def:** | 30.00 |
| | | | | **Max:** | 650.00 |

Level: **2**

Defines fixed frequency setpoint 7.

**Index:**

P1007[0] : 1st. Drive data set (DDS)
P1007[1] : 2nd. Drive data set (DDS)
P1007[2] : 3rd. Drive data set (DDS)

**Details:**

See parameter P1001 (fixed frequency 1).

**P1008[3]** **Fixed frequency 8**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Hz | **Min:** | -650.00 |
| **P-Group:** | SETPOINT | **Active:** No | - | **Def:** | 35.00 |
| | | | | **Max:** | 650.00 |

Level: **2**

Defines fixed frequency setpoint 8.

**Index:**

P1008[0] : 1st. Drive data set (DDS)
P1008[1] : 2nd. Drive data set (DDS)
P1008[2] : 3rd. Drive data set (DDS)

**Details:**

See parameter P1001 (fixed frequency 1).

**P1009[3]** **Fixed frequency 9**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Hz | **Min:** | -650.00 |
| **P-Group:** | SETPOINT | **Active:** No | - | **Def:** | 40.00 |
| | | | | **Max:** | 650.00 |

Level: **2**

Defines fixed frequency setpoint 9.

**Index:**

P1009[0] : 1st. Drive data set (DDS)
P1009[1] : 2nd. Drive data set (DDS)
P1009[2] : 3rd. Drive data set (DDS)

**Details:**

See parameter P1001 (fixed frequency 1).

**P1010[3]** **Fixed frequency 10**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Hz | **Min:** | -650.00 |
| **P-Group:** | SETPOINT | **Active:** No | - | **Def:** | 45.00 |
| | | | | **Max:** | 650.00 |

Level: **2**

Defines fixed frequency setpoint 10.

**Index:**

P1010[0] : 1st. Drive data set (DDS)
P1010[1] : 2nd. Drive data set (DDS)
P1010[2] : 3rd. Drive data set (DDS)

**Details:**

See parameter P1001 (fixed frequency 1).

**P1011[3]** **Fixed frequency 11**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Hz | **Min:** | -650.00 |
| **P-Group:** | SETPOINT | **Active:** No | - | **Def:** | 50.00 |
| | | | | **Max:** | 650.00 |

Level: **2**

Defines fixed frequency setpoint 11.

**Index:**

P1011[0] : 1st. Drive data set (DDS)
P1011[1] : 2nd. Drive data set (DDS)
P1011[2] : 3rd. Drive data set (DDS)

**Details:**

See parameter P1001 (fixed frequency 1).

**P1012[3]** **Fixed frequency 12**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Hz | **Min:** | -650.00 |
| **P-Group:** | SETPOINT | **Active:** No | - | **Def:** | 55.00 |
| | | | | **Max:** | 650.00 |

Level: **2**

Defines fixed frequency setpoint 12.

**Index:**

P1012[0] : 1st. Drive data set (DDS)
P1012[1] : 2nd. Drive data set (DDS)
P1012[2] : 3rd. Drive data set (DDS)

**Details:**

See parameter P1001 (fixed frequency 1).

**P1013[3]** **Fixed frequency 13**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Hz | **Min:** | -650.00 |
| **P-Group:** | SETPOINT | **Active:** No | - | **Def:** | 60.00 |
| | | | | **Max:** | 650.00 |

Level: **2**

Defines fixed frequency setpoint 13.

**Index:**

P1013[0] : 1st. Drive data set (DDS)
P1013[1] : 2nd. Drive data set (DDS)
P1013[2] : 3rd. Drive data set (DDS)

**Details:**

See parameter P1001 (fixed frequency 1).

**P1014[3]** **Fixed frequency 14**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Hz | **Min:** | -650.00 |
| **P-Group:** | SETPOINT | **Active:** No | - | **Def:** | 65.00 |
| | | | | **Max:** | 650.00 |

Level: **2**

Defines fixed frequency setpoint 14.

**Index:**

P1014[0] : 1st. Drive data set (DDS)
P1014[1] : 2nd. Drive data set (DDS)
P1014[2] : 3rd. Drive data set (DDS)

**Details:**

See parameter P1001 (fixed frequency 1).

**P1015[3]** **Fixed frequency 15**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Hz | **Min:** | -650.00 |
| **P-Group:** | SETPOINT | **Active:** No | - | **Def:** | 65.00 |
| | | | | **Max:** | 650.00 |

Level: **2**

Defines fixed frequency setpoint 15.

**Index:**

P1015[0] : 1st. Drive data set (DDS)
P1015[1] : 2nd. Drive data set (DDS)
P1015[2] : 3rd. Drive data set (DDS)

**Details:**

See parameter P1001 (fixed frequency 1).

**P1016** **Fixed frequency mode - Bit 0**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U16 | **Unit:** - | **Min:** | 1 |
| **P-Group:** | SETPOINT | **Active:** Immediately | - | **Def:** | 1 |
| | | | | **Max:** | 3 |

Level: **3**

Fixed frequencies can be selected in three different modes. Parameter P1016 defines the mode of selection Bit 0.

**Enum:**

1 Direct selection
2 Direct selection + ON command
3 Binary coded selection + ON command

**Details:**

See table in P1001 (fixed frequency 1) for description of how to use fixed frequencies.

**P1017** **Fixed frequency mode - Bit 1**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U16 | **Unit:** - | **Min:** | 1 |
| **P-Group:** | SETPOINT | **Active:** Immediately | - | **Def:** | 1 |
| | | | | **Max:** | 3 |

Level: **3**

Fixed frequencies can be selected in three different modes. Parameter P1017 defines the mode of selection Bit 1.

**Enum:**

1 Direct selection
2 Direct selection + ON command
3 Binary coded selection + ON command

**Details:**

See table in P1001 (fixed frequency 1) for description of how to use fixed frequencies.

**P1018** **Fixed frequency mode - Bit 2**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U16 | **Unit:** - | **Min:** | 1 |
| **P-Group:** | SETPOINT | **Active:** Immediately | - | **Def:** | 1 |
| | | | | **Max:** | 3 |

Level: **3**

Fixed frequencies can be selected in three different modes. Parameter P1018 defines the mode of selection Bit 2.

**Enum:**

1 Direct selection
2 Direct selection + ON command
3 Binary coded selection + ON command

**Details:**

See table in P1001 (fixed frequency 1) for description of how to use fixed frequencies.

**P1019** **Fixed frequency mode - Bit 3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U16 | **Unit:** - | **Min:** | 1 |
| **P-Group:** | SETPOINT | **Active:** Immediately | - | **Def:** | 1 |
| | | | | **Max:** | 3 |

Level: **3**

Fixed frequencies can be selected in three different modes. Parameter P1019 defines the mode of selection Bit 3.

**Enum:**

1 Direct selection
2 Direct selection + ON command
3 Binary coded selection + ON command

**Details:**

See table in P1001 (fixed frequency 1) for description of how to use fixed frequencies.

**P1020[3]** **BI: Fixed freq. selection Bit 0**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 0:0 |
| | | | | **Max:** | 4000:0 |

Level: **3**

Defines origin of fixed frequency selection.

**Settings:**

| | | | |
|---|---|---|---|
| P1020 | = | 722.0 | ==> Digital input 1 |
| P1021 | = | 722.1 | ==> Digital input 2 |
| P1022 | = | 722.2 | ==> Digital input 3 |
| P1023 | = | 722.3 | ==> Digital input 4 |
| P1026 | = | 722.4 | ==> Digital input 5 |
| P1028 | = | 722.5 | ==> Digital input 6 |

**Index:**

P1020[0] : 1st. Command data set (CDS)
P1020[1] : 2nd. Command data set (CDS)
P1020[2] : 3rd. Command data set (CDS)

**Dependency:**

Accessible only if P0701 - P0706 = 99 (function of digital inputs = BICO)

**P1021[3]** **BI: Fixed freq. selection Bit 1**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 0:0 |
| | | | | **Max:** | 4000:0 |

Level: **3**

Defines origin of fixed frequency selection.

**Index:**

P1021[0] : 1st. Command data set (CDS)
P1021[1] : 2nd. Command data set (CDS)
P1021[2] : 3rd. Command data set (CDS)

**Dependency:**

Accessible only if P0701 - P0706 = 99 (function of digital inputs = BICO)

**Details:**

See P1020 (fixed frequency selection Bit 0) for most common settings

**P1022[3]** **BI: Fixed freq. selection Bit 2**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 0:0 |
| | | | | **Max:** | 4000:0 |

Level: **3**

Defines origin of fixed frequency selection.

**Index:**

P1022[0] : 1st. Command data set (CDS)
P1022[1] : 2nd. Command data set (CDS)
P1022[2] : 3rd. Command data set (CDS)

**Dependency:**

Accessible only if P0701 - P0706 = 99 (function of digital inputs = BICO)

**Details:**

See P1020 (fixed frequency selection Bit 0) for most common settings

**P1023[3]** **BI: Fixed freq. selection Bit 3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 722:3 |
| | | | | **Max:** | 4000:0 |

Level: **3**

Defines origin of fixed frequency selection.

**Index:**

P1023[0] : 1st. Command data set (CDS)
P1023[1] : 2nd. Command data set (CDS)
P1023[2] : 3rd. Command data set (CDS)

**Dependency:**

Accessible only if P0701 - P0706 = 99 (function of digital inputs = BICO)

**Details:**

See P1020 (fixed frequency selection Bit 0) for most common settings

**r1024** **CO: Act. fixed frequency**

| | | | | | |
|---|---|---|---|---|---|
| | | **Datatype:** Float | **Unit:** Hz | **Min:** | - |
| | | | | **Def:** | - |
| **P-Group:** | SETPOINT | | | **Max:** | - |

Level: **3**

Displays sum total of selected fixed frequencies.

**P1025** **Fixed frequency mode - Bit 4**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U16 | **Unit:** - | **Min:** | 1 |
| **P-Group:** | SETPOINT | **Active:** Immediately | - | **Def:** | 1 |
| | | | | **Max:** | 3 |

Level: **3**

Direct selection or direct selection + ON for bit 4

**Enum:**

| | |
|---|---|
| 1 | Direct selection |
| 2 | Direct selection + ON command |
| 3 | Binary coded selection + ON command |

**Details:**

See parameter P1001 for description of how to use fixed frequencies.

**P1026[3]** **BI: Fixed freq. selection Bit 4**

| | | | | | | Level: |
|---|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 | **3** |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 722:4 | |
| | | | | **Max:** | 4000:0 | |

Defines origin of fixed frequency selection.

**Index:**

P1026[0] : 1st. Command data set (CDS)
P1026[1] : 2nd. Command data set (CDS)
P1026[2] : 3rd. Command data set (CDS)

**Dependency:**

Accessible only if P0701 - P0706 = 99 (function of digital inputs = BICO)

**Details:**

See P1020 (fixed frequency selection Bit 0) for most common settings

**P1027** **Fixed frequency mode - Bit 5**

| | | | | | | Level: |
|---|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U16 | **Unit:** - | **Min:** | 1 | **3** |
| **P-Group:** | SETPOINT | **Active:** Immediately | - | **Def:** | 1 | |
| | | | | **Max:** | 3 | |

direct selection or direct selection + ON for bit 5

**Enum:**

1 Direct selection
2 Direct selection + ON command
3 Binary coded selection + ON command

**Details:**

See parameter P1001 for description of how to use fixed frequencies.

**P1028[3]** **BI: Fixed freq. selection Bit 5**

| | | | | | | Level: |
|---|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 | **3** |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 722:5 | |
| | | | | **Max:** | 4000:0 | |

Defines origin of fixed frequency selection.

**Index:**

P1028[0] : 1st. Command data set (CDS)
P1028[1] : 2nd. Command data set (CDS)
P1028[2] : 3rd. Command data set (CDS)

**Dependency:**

Accessible only if P0701 - P0706 = 99 (function of digital inputs = BICO)

**Details:**

See P1020 (fixed frequency selection Bit 0) for most common settings

**P1031[3]** **Setpoint memory of the MOP**

| | | | | | | Level: |
|---|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U16 | **Unit:** - | **Min:** | 0 | **2** |
| **P-Group:** | SETPOINT | **Active:** No | - | **Def:** | 0 | |
| | | | | **Max:** | 1 | |

Saves last motor potentiometer setpoint (MOP) that was active before OFF command or power down.

**Enum:**

0 PID-MOP setpoint will not be stored
1 PID-MOP setpoint will be stored (P2240 is updated)

**Index:**

P1031[0] : 1st. Drive data set (DDS)
P1031[1] : 2nd. Drive data set (DDS)
P1031[2] : 3rd. Drive data set (DDS)

**Note:**

On next ON command, motor potentiometer setpoint will be the saved value in parameter P1040 (setpoint of the MOP).

**P1032** **Inhibit reverse direction of MOP**

| | | | | | | Level: |
|---|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U16 | **Unit:** - | **Min:** | 0 | **2** |
| **P-Group:** | SETPOINT | **Active:** Immediately | - | **Def:** | 1 | |
| | | | | **Max:** | 1 | |

Inhibits reverse setpoint selection

**Enum:**

0 Reserve direction is allowed
1 Reserve direction inhibited

**Dependency:**

Motor potentiometer (P1040) must be chosen as main setpoint or additional setpoint (using P1000).

**Note:**

It is possible to change motor direction using the motor potentiometer setpoint (increase / decrease frequency either by using digital inputs or BOP/AOP keypad up / down).

**P1035[3]** **BI: Enable MOP (UP-command)** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 19:13 |
| | | | | **Max:** | 4000:0 |

Defines source for motor potentiometer setpoint increase frequency.

**Settings:**

722.0 = Digital input 1 (requires P0701 to be set to 99, BICO)
722.1 = Digital input 2 (requires P0702 to be set to 99, BICO)
722.2 = Digital input 3 (requires P0703 to be set to 99, BICO)
722.3 = Digital input 4 (requires P0704 to be set to 99, BICO)
722.4 = Digital input 5 (requires P0705 to be set to 99, BICO)
722.5 = Digital input 6 (requires P0706 to be set to 99, BICO)
722.6 = Digital input 7 (via analog input 1, requires P0707 to be set to 99)
722.7 = Digital input 8 (via analog input 2, requires P0708 to be set to 99)

19.D = MOP up via BOP/AOP

**Index:**

P1035[0] : 1st. Command data set (CDS)
P1035[1] : 2nd. Command data set (CDS)
P1035[2] : 3rd. Command data set (CDS)

**P1036[3]** **BI: Enable MOP (DOWN-command)** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 19:14 |
| | | | | **Max:** | 4000:0 |

Defines source for motor potentiometer setpoint decrease frequency.

**Settings:**

722.0 = Digital input 1 (requires P0701 to be set to 99, BICO)
722.1 = Digital input 2 (requires P0702 to be set to 99, BICO)
722.2 = Digital input 3 (requires P0703 to be set to 99, BICO)
722.3 = Digital input 4 (requires P0704 to be set to 99, BICO)
722.4 = Digital input 5 (requires P0705 to be set to 99, BICO)
722.5 = Digital input 6 (requires P0706 to be set to 99, BICO)
722.6 = Digital input 7 (via analog input 1, requires P0707 to be set to 99)
722.7 = Digital input 8 (via analog input 2, requires P0708 to be set to 99)

19.E = MOP down via BOP/AOP

**Index:**

P1036[0] : 1st. Command data set (CDS)
P1036[1] : 2nd. Command data set (CDS)
P1036[2] : 3rd. Command data set (CDS)

**P1040[3]** **Setpoint of the MOP** Level: **2**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Hz | **Min:** | -650.00 |
| **P-Group:** | SETPOINT | **Active:** No | - | **Def:** | 5.00 |
| | | | | **Max:** | 650.00 |

Determines setpoint for motor potentiometer control (P1000 = 1).

**Index:**

P1040[0] : 1st. Drive data set (DDS)
P1040[1] : 2nd. Drive data set (DDS)
P1040[2] : 3rd. Drive data set (DDS)

**Note:**

If motor potentiometer setpoint is selected either as main setpoint or additional setpoint, the reverse direction will be inhibited by default of P1032 (inhibit reverse direction of MOP).

To re-enable reverse direction, set P1032 = 0.

**r1050** **CO: Act. Output freq. of the MOP** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| | | **Datatype:** Float | **Unit:** Hz | **Min:** | - |
| | | | | **Def:** | - |
| **P-Group:** | SETPOINT | | | **Max:** | - |

Displays output frequency of motor potentiometer setpoint ([Hz]).

**P1055[3]** **BI: Enable JOG right** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 0:0 |
| | | | | **Max:** | 4000:0 |

Defines source of JOG right when P0719 = 0 (remote selection of command/setpoint source).

**Settings:**

722.0 = Digital input 1 (requires P0701 to be set to 99, BICO)
722.1 = Digital input 2 (requires P0702 to be set to 99, BICO)
722.2 = Digital input 3 (requires P0703 to be set to 99, BICO)
722.3 = Digital input 4 (requires P0704 to be set to 99, BICO)
722.4 = Digital input 5 (requires P0705 to be set to 99, BICO)
722.5 = Digital input 6 (requires P0706 to be set to 99, BICO)
722.6 = Digital input 7 (via analog input 1, requires P0707 to be set to 99)
722.7 = Digital input 8 (via analog input 2, requires P0708 to be set to 99)

19.8 = JOG right via BOP/AOP

**Index:**

P1055[0] : 1st. Command data set (CDS)
P1055[1] : 2nd. Command data set (CDS)
P1055[2] : 3rd. Command data set (CDS)

**P1056[3]** **BI: Enable JOG left** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 0:0 |
| | | | | **Max:** | 4000:0 |

Defines source of JOG left when P0719 = 0 (remote selection of command/setpoint source).

**Settings:**

722.0 = Digital input 1 (requires P0701 to be set to 99, BICO)
722.1 = Digital input 2 (requires P0702 to be set to 99, BICO)
722.2 = Digital input 3 (requires P0703 to be set to 99, BICO)
722.3 = Digital input 4 (requires P0704 to be set to 99, BICO)
722.4 = Digital input 5 (requires P0705 to be set to 99, BICO)
722.5 = Digital input 6 (requires P0706 to be set to 99, BICO)
722.6 = Digital input 7 (via analog input 1, requires P0707 to be set to 99)
722.7 = Digital input 8 (via analog input 2, requires P0708 to be set to 99)

19.9 = JOG left via BOP/AOP

**Index:**

P1056[0] : 1st. Command data set (CDS)
P1056[1] : 2nd. Command data set (CDS)
P1056[2] : 3rd. Command data set (CDS)

**P1058[3]** **JOG frequency right** Level: **2**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Hz | **Min:** | 0.00 |
| **P-Group:** | SETPOINT | **Active:** No | - | **Def:** | 5.00 |
| | | | | **Max:** | 650.00 |

Jogging advances the motor speed by small amounts. The JOG buttons uses a non-latching switch on one of the digital inputs to control the motor speed.

While JOG right is selected, this parameter determines the frequency at which the inverter will run.

**Index:**

P1058[0] : 1st. Drive data set (DDS)
P1058[1] : 2nd. Drive data set (DDS)
P1058[2] : 3rd. Drive data set (DDS)

**Dependency:**

P1060 and P1061 set up and down ramp times respectively for jogging.

**P1059[3]** **JOG frequency left** Level: **2**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Hz | **Min:** | 0.00 |
| **P-Group:** | SETPOINT | **Active:** No | - | **Def:** | 5.00 |
| | | | | **Max:** | 650.00 |

While JOG left is selected, this parameter determines the frequency at which the inverter will run.

**Index:**

P1059[0] : 1st. Drive data set (DDS)
P1059[1] : 2nd. Drive data set (DDS)
P1059[2] : 3rd. Drive data set (DDS)

**Dependency:**

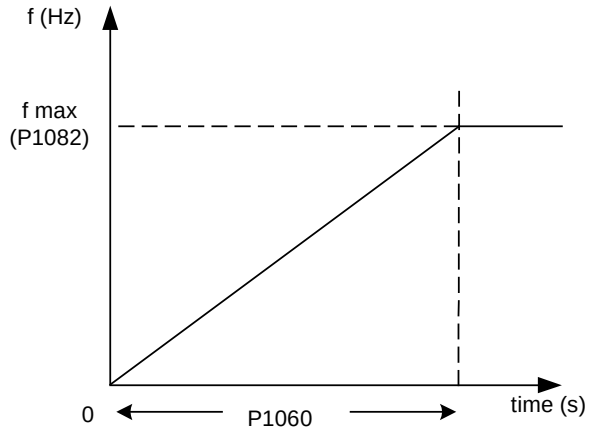
P1060 and P1061 set up and down ramp times respectively for jogging.

**P1060[3]** **JOG ramp-up time**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** s | **Min:** | 0.00 |
| **P-Group:** | SETPOINT | **Active:** Immediately | - | **Def:** | 10.00 |
| | | | | **Max:** | 650.00 |

Level: **2**

Sets ramp-up time. This is the time used while jogging or when P1124 (enable JOG ramp times) is active.




**Index:**

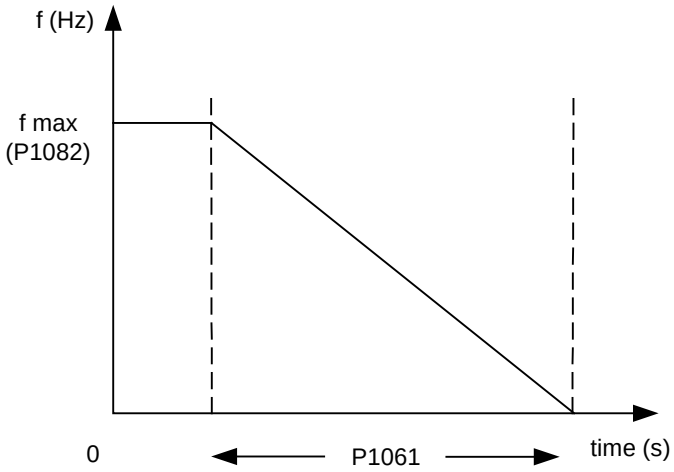
P1060[0] : 1st. Drive data set (DDS)
P1060[1] : 2nd. Drive data set (DDS)
P1060[2] : 3rd. Drive data set (DDS)

**P1061[3]** **JOG ramp-down time**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** s | **Min:** | 0.00 |
| **P-Group:** | SETPOINT | **Active:** Immediately | - | **Def:** | 10.00 |
| | | | | **Max:** | 650.00 |

Level: **2**

Sets ramp-down time. This is the time used while jogging or when P1124 (enable JOG ramp times) is active.




**Index:**

P1061[0] : 1st. Drive data set (DDS)
P1061[1] : 2nd. Drive data set (DDS)
P1061[2] : 3rd. Drive data set (DDS)

**P1070[3]** **CI: Main setpoint**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U32 | **Unit:** - | **Min:** | 0.00 |
| **P-Group:** | SETPOINT | **Active:** Immediately | - | **Def:** | 755:0 |
| | | | | **Max:** | 4000:0 |

Level: **3**

Defines source of main setpoint.

**Settings:**

755 = Analog input 1 setpoint
1024 = Fixed frequency setpoint
1050 = Motor potentiometer (MOP) setpoint

**Index:**

P1070[0] : 1st. Command data set (CDS)
P1070[1] : 2nd. Command data set (CDS)
P1070[2] : 3rd. Command data set (CDS)

**P1071[3]** **CI: Main setpoint scaling** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | SETPOINT | **Active:** Immediately | - | **Def:** | 1:0 |
| | | | | **Max:** | 4000:0 |

Defines source of the main setpoint scaling.

**Settings:**

755 = Analog input 1 setpoint
1024 = Fixed frequency setpoint
1050 = Motor potentiometer (MOP) setpoint

**Index:**

P1071[0] : 1st. Command data set (CDS)
P1071[1] : 2nd. Command data set (CDS)
P1071[2] : 3rd. Command data set (CDS)

**P1074[3]** **BI: Disable additional setpoint** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 0:0 |
| | | | | **Max:** | 4000:0 |

Disables additional setpoint

**Settings:**

722.0 = Digital input 1 (requires P0701 to be set to 99, BICO)
722.1 = Digital input 2 (requires P0702 to be set to 99, BICO)
722.2 = Digital input 3 (requires P0703 to be set to 99, BICO)
722.3 = Digital input 4 (requires P0704 to be set to 99, BICO)
722.4 = Digital input 5 (requires P0705 to be set to 99, BICO)
722.5 = Digital input 6 (requires P0706 to be set to 99, BICO)
722.6 = Digital input 7 (via analog input 1, requires P0707 to be set to 99)
722.7 = Digital input 8 (via analog input 2, requires P0708 to be set to 99))

**Index:**

P1074[0] : 1st. Command data set (CDS)
P1074[1] : 2nd. Command data set (CDS)
P1074[2] : 3rd. Command data set (CDS)

**P1075[3]** **CI: Additional setpoint** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | SETPOINT | **Active:** Immediately | - | **Def:** | 0:0 |
| | | | | **Max:** | 4000:0 |

Defines source of the additional setpoint (to be added to main setpoint).

**Settings:**

755 = Analog input 1 setpoint
1024 = Fixed frequency setpoint
1050 = Motor potentiometer (MOP) setpoint

**Index:**

P1075[0] : 1st. Command data set (CDS)
P1075[1] : 2nd. Command data set (CDS)
P1075[2] : 3rd. Command data set (CDS)

**P1076[3]** **CI: Additional setpoint scaling** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | SETPOINT | **Active:** Immediately | - | **Def:** | 1:0 |
| | | | | **Max:** | 4000:0 |

Defines source of scaling for additional setpoint (to be added to main setpoint).

**Settings:**

1 = Scaling of 1.0 (100%)
755 = Analog input 1 Setpoint
1024 = Fixed Frequency Setpoint
1050 = MOP Setpoint

**Index:**

P1076[0] : 1st. Command data set (CDS)
P1076[1] : 2nd. Command data set (CDS)
P1076[2] : 3rd. Command data set (CDS)

**r1078** **CO: Total frequency setpoint** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| | | **Datatype:** Float | **Unit:** Hz | **Min:** | - |
| **P-Group:** | SETPOINT | | | **Def:** | - |
| | | | | **Max:** | - |

Displays sum of main and additional setpoints in [Hz].

**r1079** **CO: Selected frequency setpoint** Level: **3**

**Datatype:** Float **Unit:** Hz **Min:** - **Def:** - **Max:** -

**P-Group:** SETPOINT

Displays selected frequency setpoint.

Following frequency setpoints are displayed:

| | |
|---|---|
| Total frequency setpoint | r1078 |
| JOG frequency right | P1058 |
| JOG frequency left | P1059 |

**Dependency:**

P1055 (BI: Enable JOG right) or P1056 (BI: Enable JOG left) define command source of JOG right or JOG left respectively.

**Note:**

P1055 = 0 and P1056 = 0 ==> Total frequency setpoint is selected.

**P1080[3]** **Min. frequency** Level: **1**

**CStat:** CUT **Datatype:** Float **Unit:** Hz **Min:** 0.00 **Def:** 0.00 **Max:** 650.00

**P-Group:** SETPOINT **Active:** No QuickCom

Sets minimum motor frequency [Hz] at which motor will run irrespective of frequency setpoint.

**Index:**

P1080[0] : 1st. Drive data set (DDS)
P1080[1] : 2nd. Drive data set (DDS)
P1080[2] : 3rd. Drive data set (DDS)

**Note:**

Value set here is valid both for clockwise and for anticlockwise rotation.

Under certain conditions (e.g. ramping, current limiting), motor can run below minimum frequency.

**P1082[3]** **Max. frequency** Level: **1**

**CStat:** CT **Datatype:** Float **Unit:** Hz **Min:** 0.00 **Def:** 50.00 **Max:** 650.00

**P-Group:** SETPOINT **Active:** Immediately QuickCom

Sets maximum motor frequency [Hz] at which motor will run irrespective of the frequency setpoint.

**Index:**

P1082[0] : 1st. Drive data set (DDS)
P1082[1] : 2nd. Drive data set (DDS)
P1082[2] : 3rd. Drive data set (DDS)

**Dependency:**

Limited internally to 200 Hz or 5 * rated motor frequency (P0305) when P1300 >= 20 (control mode = vector control). The value is displayed in r0209 (maximum frequency)

**Note:**

The value set here is valid for both clockwise and anticlockwise rotation.

The maximum output frequency of inverter can be exceeded if one of the following is active:

Slip compensation = $f_{max} + f_{slip\ comp\ max}$

or

Flying restart = $f_{max} + f_{slip\ nom}$

**Notice:**

Maximum motor speed is subject to mechanical limitations.

**r1084** **Max. frequency setpoint** Level: **3**

**Datatype:** Float **Unit:** Hz **Min:** - **Def:** - **Max:** -

**P-Group:** CONTROL

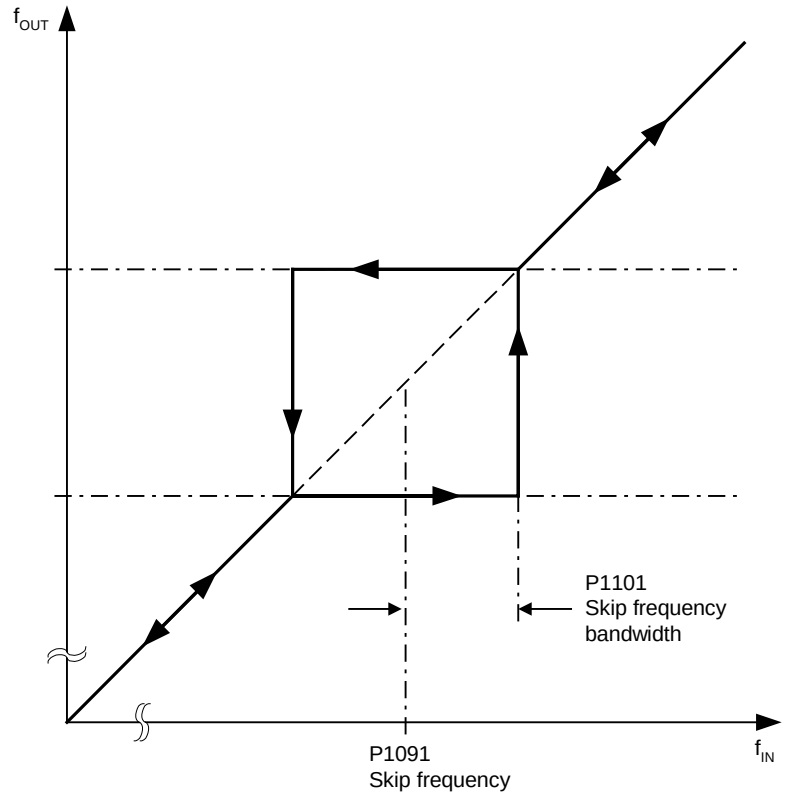
Displays maximum frequency. The maximum frequency for vector control is the minimum of 200.00Hz and 5*P310 (rated motor frequency).

**P1091[3]** **Skip frequency 1**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Hz | **Min:** | 0.00 |
| **P-Group:** | SETPOINT | **Active:** No | - | **Def:** | 0.00 |
| | | | | **Max:** | 650.00 |

Level: **3**

Defines skip frequency 1 which avoids effects of mechanical resonance and suppresses frequencies within +/- P1101 (skip frequency bandwidth).




**Index:**

P1091[0] : 1st. Drive data set (DDS)
P1091[1] : 2nd. Drive data set (DDS)
P1091[2] : 3rd. Drive data set (DDS)

**Notice:**

Stationary operation is not possible within the suppressed frequency range; the range is merely passed through (on the ramp).

For example, if P1091 = 10 Hz and P1101 = 2 Hz, it is not possible to operate continuously between 10 Hz +/- 2 Hz (i.e. between 8 and 12 Hz).

**P1092[3]** **Skip frequency 2**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Hz | **Min:** | 0.00 |
| **P-Group:** | SETPOINT | **Active:** No | - | **Def:** | 0.00 |
| | | | | **Max:** | 650.00 |

Level: **3**

Defines skip frequency 2 which avoids effects of mechanical resonance and suppresses frequencies within +/- P1101 (skip frequency bandwidth).

**Index:**

P1092[0] : 1st. Drive data set (DDS)
P1092[1] : 2nd. Drive data set (DDS)
P1092[2] : 3rd. Drive data set (DDS)

**Details:**

See P1091 (skip frequency 1).

**P1093[3]** **Skip frequency 3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Hz | **Min:** | 0.00 |
| **P-Group:** | SETPOINT | **Active:** No | - | **Def:** | 0.00 |
| | | | | **Max:** | 650.00 |

Level: **3**

Defines skip frequency 3 which avoids effects of mechanical resonance and suppresses frequencies within +/- P1101 (skip frequency bandwidth).

**Index:**

P1093[0] : 1st. Drive data set (DDS)
P1093[1] : 2nd. Drive data set (DDS)
P1093[2] : 3rd. Drive data set (DDS)

**Details:**

See P1091 (skip frequency 1).

**P1094[3] Skip frequency 4**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Hz | **Min:** | 0.00 |
| **P-Group:** | SETPOINT | **Active:** No | - | **Def:** | 0.00 |
| | | | | **Max:** | 650.00 |

Level: **3**

Defines skip frequency 4 which avoids effects of mechanical resonance and suppresses frequencies within +/- P1101 (skip frequency bandwidth).

**Index:**

P1094[0] : 1st. Drive data set (DDS)
P1094[1] : 2nd. Drive data set (DDS)
P1094[2] : 3rd. Drive data set (DDS)

**Details:**

See P1091 (skip frequency 1).

**P1101[3] Skip frequency bandwidth**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Hz | **Min:** | 0.00 |
| **P-Group:** | SETPOINT | **Active:** No | - | **Def:** | 2.00 |
| | | | | **Max:** | 10.00 |

Level: **3**

Delivers frequency bandwidth to be applied to skip frequencies (in [Hz]).

**Index:**

P1101[0] : 1st. Drive data set (DDS)
P1101[1] : 2nd. Drive data set (DDS)
P1101[2] : 3rd. Drive data set (DDS)

**Details:**

See P1091 (skip frequency 1).

**P1110[3] BI: Inhibit neg. freq. setpoint**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 0:0 |
| | | | | **Max:** | 4000:0 |

Level: **3**

Inhibits direction reversal, thus preventing a negative setpoint from causing motor from running in reverse. Instead, it will run at minimum frequency (P1080) in the normal direction.

**Settings:**

0 = Disabled
1 = Enabled

**Index:**

P1110[0] : 1st. Command data set (CDS)
P1110[1] : 2nd. Command data set (CDS)
P1110[2] : 3rd. Command data set (CDS)

**Note:**

It is possible to disable all reverse commands (i.e. the command is ignored). To do this, set P0719 = 0 (remote selection of command/setpoint source) and define the command sources (P1113) individually.

**Notice:**

This function does not disable the "reverse" command function; rather, a reverse command causes motor to run in the normal direction as described above.

**P1113[3] BI: Reverse**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 722:1 |
| | | | | **Max:** | 4000:0 |

Level: **3**

Defines source of reverse command used when P0719 = 0 (remote selection of command/setpoint source).

**Settings:**

722.0 = Digital input 1 (requires P0701 to be set to 99, BICO)
722.1 = Digital input 2 (requires P0702 to be set to 99, BICO)
722.2 = Digital input 3 (requires P0703 to be set to 99, BICO)
722.3 = Digital input 4 (requires P0704 to be set to 99, BICO)
722.4 = Digital input 5 (requires P0705 to be set to 99, BICO)
722.5 = Digital input 6 (requires P0706 to be set to 99, BICO)

19.B = Reverse via BOP/AOP

**Index:**

P1113[0] : 1st. Command data set (CDS)
P1113[1] : 2nd. Command data set (CDS)
P1113[2] : 3rd. Command data set (CDS)

**r1114 CO: Freq. setp. after dir. ctrl.**

| | | | | | |
|---|---|---|---|---|---|
| | | **Datatype:** Float | **Unit:** Hz | **Min:** | - |
| **P-Group:** | SETPOINT | | | **Def:** | - |
| | | | | **Max:** | - |

Level: **3**

Displays setpoint frequency after change of direction

**r1119 CO: Freq. setpoint before RFG**

| | | | | | |
|---|---|---|---|---|---|
| | | **Datatype:** Float | **Unit:** Hz | **Min:** | - |
| **P-Group:** | SETPOINT | | | **Def:** | - |
| | | | | **Max:** | - |

Level: **3**

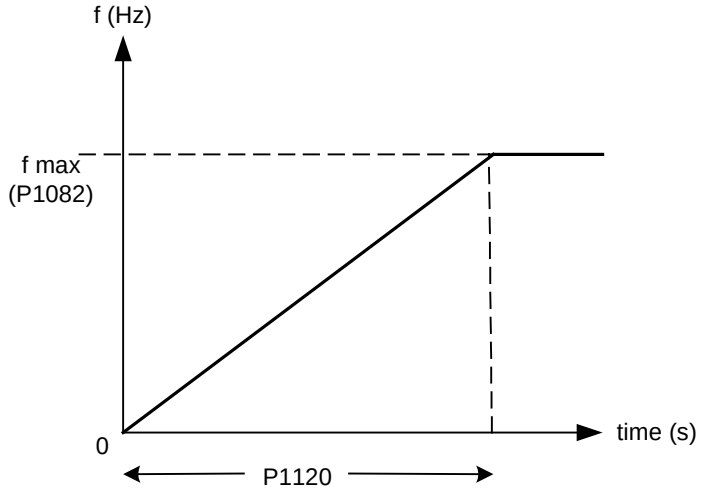
Displays output frequency after modification by other functions, e.g. BI: Inhibit neg. freq. setpoint (P1110) or skip frequencies, f_min, f_max, limitations, etc.

**P1120[3]** **Ramp-up time**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** s | **Min:** | 0.00 |
| **P-Group:** | SETPOINT | **Active:** Immediately | QuickCom | **Def:** | 10.00 |
| | | | | **Max:** | 650.00 |

Level: **1**

Time taken for motor to accelerate from standstill up to maximum motor frequency (P1082) when no rounding is used.




Setting the ramp-up time too short can cause the inverter to trip (overcurrent).

**Index:**

P1120[0] : 1st. Drive data set (DDS)
P1120[1] : 2nd. Drive data set (DDS)
P1120[2] : 3rd. Drive data set (DDS)

**Note:**

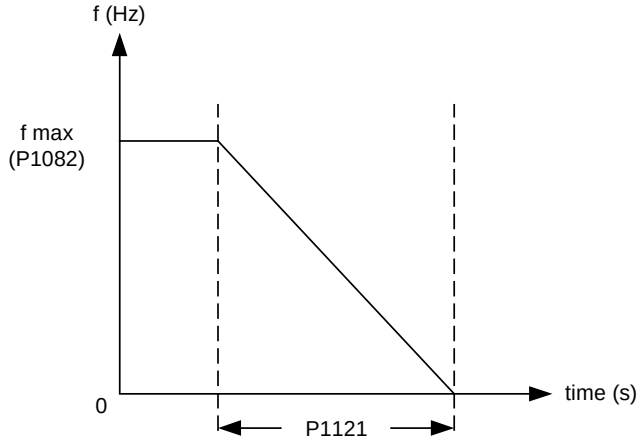
If an external frequency setpoint with set ramp rates is used (e.g. from a PLC), the best way to achieve optimum drive performance is to set ramp times in P1120 and P1121 slightly shorter than those of the PLC.

**P1121[3]** **Ramp-down time**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** s | **Min:** | 0.00 |
| **P-Group:** | SETPOINT | **Active:** Immediately | QuickCom | **Def:** | 10.00 |
| | | | | **Max:** | 650.00 |

Level: **1**

Time taken for motor to decelerate from maximum motor frequency (P1082) down to standstill when no rounding is used.




**Index:**

P1121[0] : 1st. Drive data set (DDS)
P1121[1] : 2nd. Drive data set (DDS)
P1121[2] : 3rd. Drive data set (DDS)

**Notice:**

Setting the ramp-down time too short can cause the inverter to trip (overcurrent (F0001) / overvoltage (F0002)).

**P1124[3]** **BI: Enable JOG ramp times**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 0:0 |
| | | | | **Max:** | 4000:0 |

Level: **3**

Defines source for switching between jog ramp times and normal ramp times as applied to the RFG.

**Settings:**

722.0 = Digital input 1 (requires P0701 to be set to 99, BICO)
722.1 = Digital input 2 (requires P0702 to be set to 99, BICO)
722.2 = Digital input 3 (requires P0703 to be set to 99, BICO)
722.3 = Digital input 4 (requires P0704 to be set to 99, BICO)
722.4 = Digital input 5 (requires P0705 to be set to 99, BICO)
722.5 = Digital input 6 (requires P0706 to be set to 99, BICO)

**Index:**

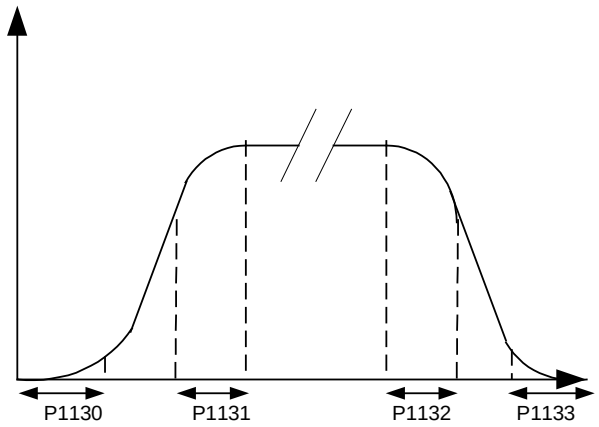
P1124[0] : 1st. Command data set (CDS)
P1124[1] : 2nd. Command data set (CDS)
P1124[2] : 3rd. Command data set (CDS)

**P1130[3]** **Ramp-up initial rounding time**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** s | **Min:** | 0.00 |
| **P-Group:** | SETPOINT | **Active:** Immediately | - | **Def:** | 0.00 |
| | | | | **Max:** | 40.00 |

Level: **2**

Defines initial rounding time in seconds as shown on the diagram below.




where:

$$T_{up\ total} = \tfrac{1}{2}P1130 + X * P1120 + \tfrac{1}{2}P1131$$

$$T_{down\ total} = \tfrac{1}{2}P1130 + X * P1121 + \tfrac{1}{2}P1133$$

$$X\ is\ defined\ as\ \Delta f = X * f_{\max}$$

i.e. X is the ratio between the frequency step and $f_{max}$

**Index:**

P1130[0] : 1st. Drive data set (DDS)
P1130[1] : 2nd. Drive data set (DDS)
P1130[2] : 3rd. Drive data set (DDS)

**Note:**

Rounding times are recommended, since they prevent an abrupt response, thus avoiding detrimental effects on the mechanics.

**Notice:**

Rounding times are not recommended when analog inputs are used, since they would result in overshoot/undershoot in the inverter response.

**P1131[3]** **Ramp-up final rounding time**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** s | **Min:** | 0.00 |
| **P-Group:** | SETPOINT | **Active:** Immediately | - | **Def:** | 0.00 |
| | | | | **Max:** | 40.00 |

Level: **2**

Defines rounding time at end of ramp-up as shown in P1130 (ramp-up initial rounding time).

**Index:**

P1131[0] : 1st. Drive data set (DDS)
P1131[1] : 2nd. Drive data set (DDS)
P1131[2] : 3rd. Drive data set (DDS)

**Note:**

Rounding times are recommended, since they prevent an abrupt response, thus avoiding detrimental effects on the mechanics.

**Notice:**

Rounding times are not recommended when analog inputs are used, since they would result in overshoot/undershoot in the inverter response.

**P1132[3]** **Ramp-down initial rounding time**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** s | **Min:** | 0.00 |
| **P-Group:** | SETPOINT | **Active:** Immediately | - | **Def:** | 0.00 |
| | | | | **Max:** | 40.00 |

Level: **2**

Defines rounding time at start of ramp-down as shown in P1130 (ramp-up initial rounding time).

**Index:**

P1132[0] : 1st. Drive data set (DDS)
P1132[1] : 2nd. Drive data set (DDS)
P1132[2] : 3rd. Drive data set (DDS)

**Note:**

Rounding times are recommended, since they prevent an abrupt response, thus avoiding detrimental effects on the mechanics.

**Notice:**

Rounding times are not recommended when analog inputs are used, since they would result in overshoot/undershoot in the inverter response.

**P1133[3]** **Ramp-down final rounding time**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** s | **Min:** | 0.00 |
| **P-Group:** | SETPOINT | **Active:** Immediately | - | **Def:** | 0.00 |
| | | | | **Max:** | 40.00 |

Level: **2**

Defines rounding time at end of ramp-down as shown in P1130 (ramp-up initial rounding time).

**Index:**

P1133[0] : 1st. Drive data set (DDS)
P1133[1] : 2nd. Drive data set (DDS)
P1133[2] : 3rd. Drive data set (DDS)

**Note:**

Rounding times are recommended, since they prevent an abrupt response, thus avoiding detrimental effects on the mechanics.

**Notice:**

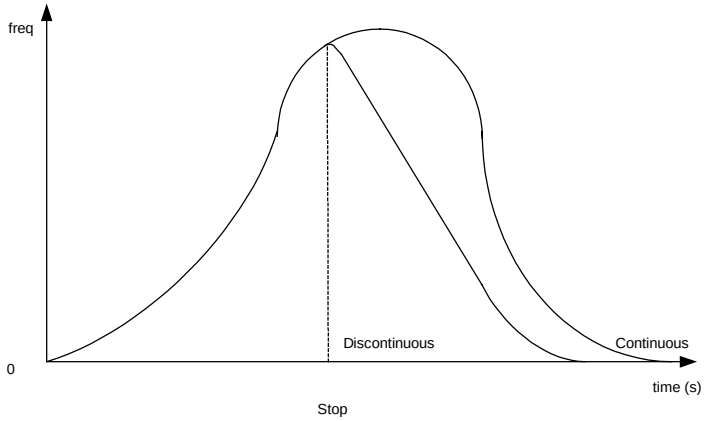
Rounding times are not recommended when analog inputs are used, since they would result in overshoot/undershoot in the inverter response.

**P1134[3]** **Rounding type**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U16 | **Unit:** - | **Min:** | 0 |
| **P-Group:** | SETPOINT | **Active:** No | - | **Def:** | 0 |
| | | | | **Max:** | 1 |

Level: **2**

Defines smoothing response to OFF commands or setpoint reduction.




**Enum:**

0 Continuous smoothing
1 Discontinuous smoothing

**Index:**

P1134[0] : 1st. Drive data set (DDS)
P1134[1] : 2nd. Drive data set (DDS)
P1134[2] : 3rd. Drive data set (DDS)

**Dependency:**

No effect until total rounding time (P1130) > 0 s.

**Notice:**

Rounding times are not recommended when analog inputs are used, since they would result in overshoot/undershoot in the inverter response.

**P1135[3]** **OFF3 ramp-down time** Level: **2**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** s | **Min:** | 0.00 |
| **P-Group:** | SETPOINT | **Active:** Immediately | QuickCom | **Def:** | 5.00 |
| | | | | **Max:** | 650.00 |

Defines ramp-down time from maximum frequency to standstill for OFF3 command.

**Index:**

P1135[0] : 1st. Drive data set (DDS)
P1135[1] : 2nd. Drive data set (DDS)
P1135[2] : 3rd. Drive data set (DDS)

**Note:**

This time may be exceeded if the VDC_max. level is reached.

**P1140[3]** **BI: RFG enable** Level: **4**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 1:0 |
| | | | | **Max:** | 4000:0 |

Defines command source of RFG enable command (RFG: ramp function generator).

**Index:**

P1140[0] : 1st. Command data set (CDS)
P1140[1] : 2nd. Command data set (CDS)
P1140[2] : 3rd. Command data set (CDS)

**P1141[3]** **BI: RFG start** Level: **4**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 1:0 |
| | | | | **Max:** | 4000:0 |

Defines command source of RFG start command (RFG: ramp function generator).

**Index:**

P1141[0] : 1st. Command data set (CDS)
P1141[1] : 2nd. Command data set (CDS)
P1141[2] : 3rd. Command data set (CDS)

**P1142[3]** **BI: RFG enable setpoint** Level: **4**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 1:0 |
| | | | | **Max:** | 4000:0 |

Defines command source of RFG enable setpoint command (RFG: ramp function generator).

**Index:**

P1142[0] : 1st. Command data set (CDS)
P1142[1] : 2nd. Command data set (CDS)
P1142[2] : 3rd. Command data set (CDS)

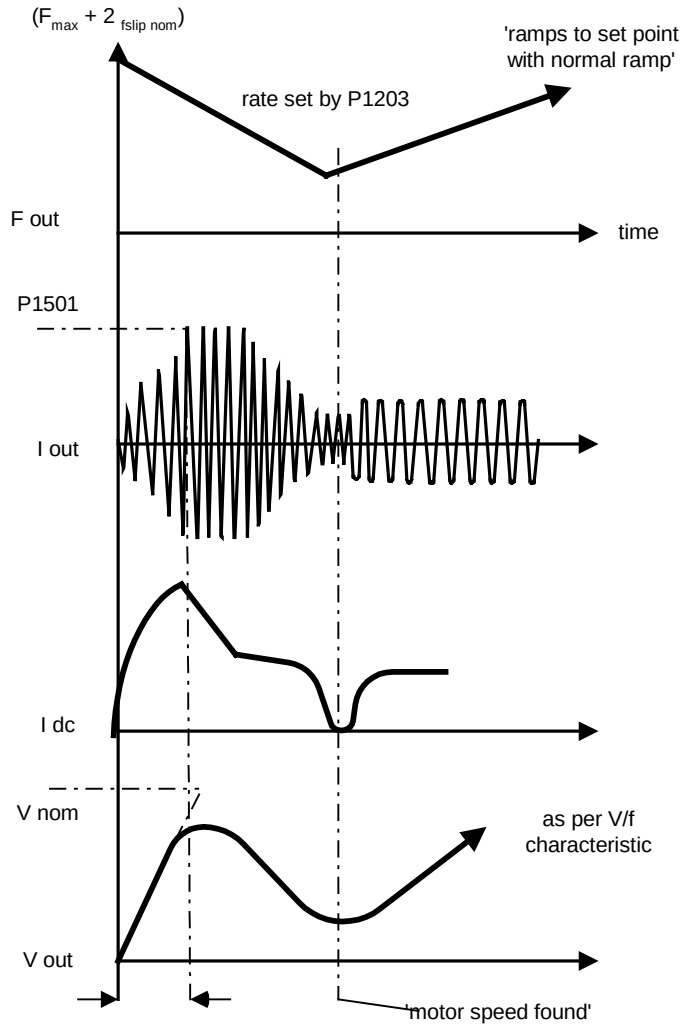
**r1170** **CO: Frequency setpoint after RFG** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| | | **Datatype:** Float | **Unit:** Hz | **Min:** | - |
| **P-Group:** | SETPOINT | | | **Def:** | - |
| | | | | **Max:** | - |

Displays overall frequency setpoint after ramp generator.

| **P1200** | **Flying start** | | | | Level: |
|---|---|---|---|---|---|
| | **CStat:** CUT | **Datatype:** U16 | **Unit:** - | **Min:** 0 | **2** |
| | **P-Group:** FUNC | **Active:** Immediately | - | **Def:** 0 | |
| | | | | **Max:** 6 | |

Starts inverter onto a spinning motor by rapidly changing the output frequency of the inverter until the actual motor speed has been found. Then, the motor runs up to setpoint using the normal ramp time.




**Enum:**

| | |
|---|---|
| 0 | Flying start disabled |
| 1 | Flying start is always active, start in direction of setpoint |
| 2 | Flying start is active if power on, fault, OFF2, start in direction of setpoint |
| 3 | Flying start is active if fault, OFF2, start in direction of setpoint |
| 4 | Flying start is always active, only in direction of setpoint |
| 5 | Flying start is active if power on, fault, OFF2, only in direction of setpoint |
| 6 | Flying start is active if fault, OFF2, only in direction of setpoint |

**Note:**

Useful for motors with high inertia loads.

Settings 1 to 3 search in both directions.
Settings 4 to 6 search only in direction of setpoint.

**Notice:**

Flying start must be used in cases where the motor may still be turning (e.g. after a short mains break) or can be driven by the load. Otherwise, overcurrent trips will occur.

| P1202[3] | **Motor-current: Flying start** | | | | **Min:** | 50 | Level: |
|---|---|---|---|---|---|---|---|
| | **CStat:** | CUT | **Datatype:** U16 | **Unit:** % | **Def:** | 100 | **3** |
| | **P-Group:** | FUNC | **Active:** Immediately | - | **Max:** | 200 | |

Defines search current used for flying start.

Value is in [%] based on rated motor current (P0305).

**Index:**

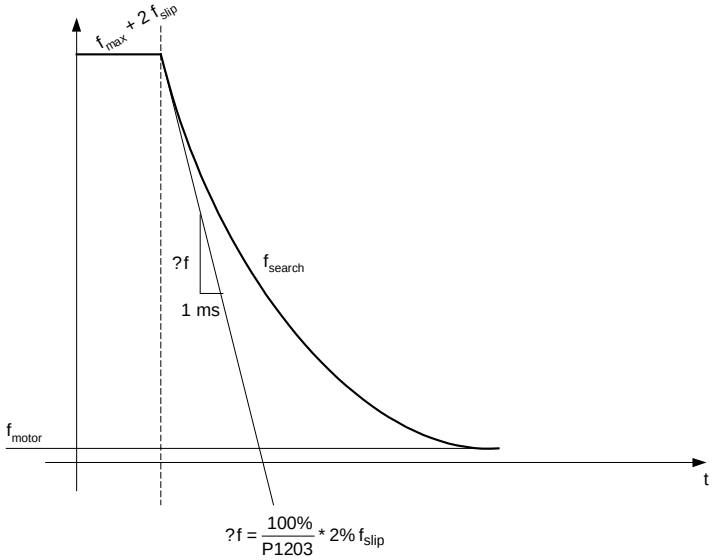
P1202[0] : 1st. Drive data set (DDS)
P1202[1] : 2nd. Drive data set (DDS)
P1202[2] : 3rd. Drive data set (DDS)

**Note:**

Reducing the search current may improve performance for flying start if the inertia of the system is not very high.

| P1203[3] | **Search rate: Flying start** | | | | **Min:** | 50 | Level: |
|---|---|---|---|---|---|---|---|
| | **CStat:** | CUT | **Datatype:** U16 | **Unit:** % | **Def:** | 100 | **3** |
| | **P-Group:** | FUNC | **Active:** Immediately | - | **Max:** | 200 | |

Sets factor by which the output frequency changes during flying start to synchronize with turning motor. This value is entered in [%] relative to the default time factor defines the initial gradient in the curve below (and thus influences the time taken to search for the motor frequency):




The search time is the time taken to search through all frequencies between f_max + 2 x f_slip to 0 Hz.

P1203 = 100 % is defined as giving a rate of 2 % of f_slip,nom / [ms]
P1203 = 200 % would result in a rate of frequency change of 1 % of f_slip,nom / [ms]

**Example:**

For a motor with 50 Hz, 1350 rpm, 100 % would produce a maximum search time of 600 ms. If the motor is turning, the motor frequency is found in a shorter time.

**Index:**

P1203[0] : 1st. Drive data set (DDS)
P1203[1] : 2nd. Drive data set (DDS)
P1203[2] : 3rd. Drive data set (DDS)

**Note:**

A higher value produces a flatter gradient and thus a longer search time.
A lower value has the opposite effect.

**r1204** **Status word: Flying start** Level: **4**

**Datatype:** U16 **Unit:** - **Min:** - **Def:** - **Max:** -

**P-Group:** FUNC

Bit parameter for checking and monitoring states during search.

**Bitfields:**

| | | | |
|---|---|---|---|
| Bit00 | Current applied | 0 | NO |
| | | 1 | YES |
| Bit01 | Current could not be applied | 0 | NO |
| | | 1 | YES |
| Bit02 | Voltage reduced | 0 | NO |
| | | 1 | YES |
| Bit03 | Slope-filter started | 0 | NO |
| | | 1 | YES |
| Bit04 | Current less threshold | 0 | NO |
| | | 1 | YES |
| Bit05 | Current-minimum | 0 | NO |
| | | 1 | YES |
| Bit07 | Speed could not be found | 0 | NO |
| | | 1 | YES |

**r1205** **Status flying-start on observer** Level: **3**

**Datatype:** U16 **Unit:** - **Min:** - **Def:** - **Max:** -

**P-Group:** FUNC

Bit parameter for checking status of flying start performed with n-adaption of observer.

**Bitfields:**

| | | | |
|---|---|---|---|
| Bit00 | Transformation active | 0 | NO |
| | | 1 | YES |
| Bit01 | Initialize n-adaption | 0 | NO |
| | | 1 | YES |
| Bit02 | Current applying | 0 | NO |
| | | 1 | YES |
| Bit03 | N-controller closed | 0 | NO |
| | | 1 | YES |
| Bit04 | Isd-controller open | 0 | NO |
| | | 1 | YES |
| Bit05 | RFG hold | 0 | NO |
| | | 1 | YES |
| Bit06 | N-adaption set to zero | 0 | NO |
| | | 1 | YES |
| Bit07 | Reserved | 0 | NO |
| | | 1 | YES |
| Bit08 | Reserved | 0 | NO |
| | | 1 | YES |
| Bit09 | Reserved | 0 | NO |
| | | 1 | YES |
| Bit10 | Direction Positive | 0 | NO |
| | | 1 | YES |
| Bit11 | Search is started | 0 | NO |
| | | 1 | YES |
| Bit12 | Current is applied | 0 | NO |
| | | 1 | YES |
| Bit13 | Search is aborted | 0 | NO |
| | | 1 | YES |
| Bit14 | Deviation is zero | 0 | NO |
| | | 1 | YES |
| Bit15 | N-controller is active | 0 | NO |
| | | 1 | YES |

**P1210** **Automatic restart** Level: **2**

**CStat:** CUT **Datatype:** U16 **Unit:** - **Min:** 0 **Def:** 1 **Max:** 5

**P-Group:** FUNC **Active:** Immediately -

Enables restart after a mains break or after a fault.

**Enum:**

0 Disabled
1 Trip reset after power on: P1211 disabled
2 Restart mains break; power on: P1211 disabled
3 Restart after fault/mains break: P1211 enabled
4 Restart after mains break: P1211 enabled
5 Restart mains break/fault/power on: P1211 disabled

**Dependency:**

Auto restart requires constant ON command (e.g. via a digital input wire link).

**Caution1:**

Settings 2 to 5 can cause the motor to restart unexpectedly !

**Notice:**

Flying start must be used in cases where the motor may still be turning (e.g. after a short mains break) or can be driven by the load (P1200).

**P1211** **Number of restart attempts** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U16 | **Unit:** - | **Min:** | 0 |
| **P-Group:** | FUNC | **Active:** Immediately | - | **Def:** | 3 |
| | | | | **Max:** | 10 |

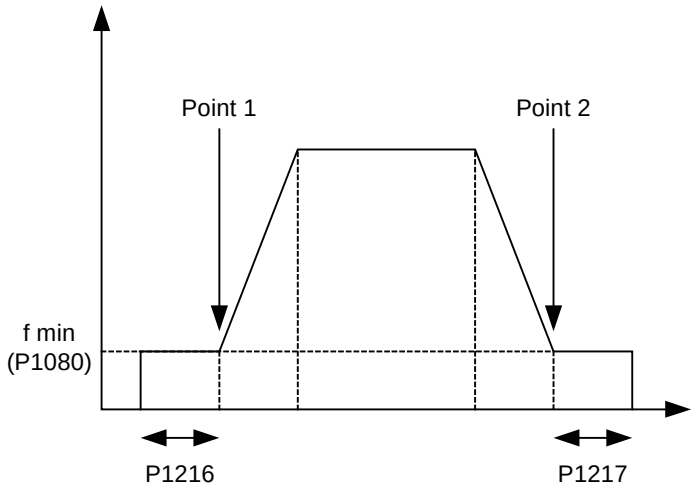
Specifies number of times inverter will attempt to restart if P1210 (flying start) is activated.

**P1215** **Holding brake enable** Level: **2**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | T | **Datatype:** U16 | **Unit:** - | **Min:** | 0 |
| **P-Group:** | FUNC | **Active:** Immediately | - | **Def:** | 0 |
| | | | | **Max:** | 1 |

Enables/disables holding brake function. This function applies the following profile to the inverter:

Relay switching is also possible at point 1 and point 2 (if programmed in P0731 = 52.C) to control a brake.




**Enum:**

0 Motor holding brake disabled
1 Motor holding brake enabled

**Note:**

The brake relay opens at point 1, if enabled using P0731 (function of digital output), and closes at point 2.

**P1216** **Holding brake release delay** Level: **2**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | T | **Datatype:** Float | **Unit:** s | **Min:** | 0 |
| **P-Group:** | FUNC | **Active:** Immediately | - | **Def:** | 1.0 |
| | | | | **Max:** | 20.0 |

Defines period during which inverter runs at f_min before ramping up at point 1 (as shown in P1215 - holding brake enable). Inverter starts at f_min on this profile, i.e. it does not use a ramp.

**Note:**

A typical value of f_min for this type of application is the slip frequency of the motor.

You can calculate the rated slip frequency by using the following formula:

$$\frac{N_{syn} - N_{rated}}{n_{syn}} * f_{rated}$$

**Notice:**

If used to hold the motor at a certain frequency against a mechanical brake (i.e. you are using a relay to control mechanical brake), it is important that f_min < 5 Hz; otherwise, the current drawn may be too high and the relay may not open.

**P1217** **Holding time after ramp down** Level: **2**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | T | **Datatype:** Float | **Unit:** s | **Min:** | 0 |
| **P-Group:** | FUNC | **Active:** Immediately | - | **Def:** | 1.0 |
| | | | | **Max:** | 20.0 |

Defines time for which inverter runs at minimum frequency (P1080) after ramping down at point 2.

**Details:**

See diagram P1215 (holding brake enable)

**P1230[3]** **BI: Enable DC braking**

| | | | | | | Level: |
|---|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 | **3** |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 0:0 | |
| | | | | **Max:** | 4000:0 | |

Enables DC braking via a signal applied from an external source. Function remains active while external input signal is active.

DC braking causes the motor to stop rapidly by applying a DC braking current (current applied also holds shaft stationary).

When the DC braking signal is applied, the inverter output pulses are blocked and the DC current is not applied until the motor has been sufficiently demagnetized.

**Settings:**

722.0 = Digital input 1 (requires P0701 to be set to 99, BICO)
722.1 = Digital input 2 (requires P0702 to be set to 99, BICO)
722.2 = Digital input 3 (requires P0703 to be set to 99, BICO)
722.3 = Digital input 4 (requires P0704 to be set to 99, BICO)
722.4 = Digital input 5 (requires P0705 to be set to 99, BICO)
722.5 = Digital input 6 (requires P0706 to be set to 99, BICO)
722.6 = Digital input 7 (via analog input 1, requires P0707 to be set to 99)
722.7 = Digital input 8 (via analog input 2, requires P0708 to be set to 99)

**Index:**

P1230[0] : 1st. Command data set (CDS)
P1230[1] : 2nd. Command data set (CDS)
P1230[2] : 3rd. Command data set (CDS)

**Caution2:**

Frequent use of long periods of DC braking can cause the motor to overheat.

**Notice:**

This delay time is set in P0347 (demagnetization time). If this delay is too short, overcurrent trips can occur.

**P1232[3]** **DC braking current**

| | | | | | | Level: |
|---|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U16 | **Unit:** % | **Min:** | 0 | **2** |
| **P-Group:** | FUNC | **Active:** No | - | **Def:** | 100 | |
| | | | | **Max:** | 250 | |

Defines level of DC current in [%] relative to rated motor current (P0305).

**Index:**

P1232[0] : 1st. Drive data set (DDS)
P1232[1] : 2nd. Drive data set (DDS)
P1232[2] : 3rd. Drive data set (DDS)

**P1233[3]** **Duration of DC braking**

| | | | | | | Level: |
|---|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U16 | **Unit:** s | **Min:** | 0 | **2** |
| **P-Group:** | FUNC | **Active:** No | - | **Def:** | 0 | |
| | | | | **Max:** | 250 | |

Defines duration for which DC injection braking is to be active following an OFF1 command. The inverter will not restart if an on-command is given during this period.

**Value:**

P1233 = 0 : Not active following OFF1.
P1233 = 1 - 250 : Active for the specified duration.

**Index:**

P1233[0] : 1st. Drive data set (DDS)
P1233[1] : 2nd. Drive data set (DDS)
P1233[2] : 3rd. Drive data set (DDS)

**Caution2:**

Frequent use of long periods of DC braking can cause the motor to overheat.

**Notice:**

The DC braking function causes the motor to stop rapidly by applying a DC braking current (the current applied also holds the shaft stationary). When the DC braking signal is applied, the inverter output pulses are blocked and the DC current not applied until the motor has been sufficiently demagnetized (demagnetization time is calculated automatically from motor data).

**P1234[3]** **DC braking start frequency**

| | | | | | | Level: |
|---|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Hz | **Min:** | 0 | **2** |
| **P-Group:** | FUNC | **Active:** No | - | **Def:** | 0 | |
| | | | | **Max:** | 650.00 | |

Sets start frequency for DC braking following an OFF command

**Index:**

P1234[0] : 1st. Drive data set (DDS)
P1234[1] : 2nd. Drive data set (DDS)
P1234[2] : 3rd. Drive data set (DDS)

**Details:**

See P1230 (enable DC braking) and P1233 (duration of DC braking)

**P1236[3]** **Compound braking current** Level: **2**

**CStat:** CUT **Datatype:** U16 **Unit:** % **Min:** 0
**P-Group:** FUNC **Active:** No - **Def:** 0
**Max:** 250

Defines DC level superimposed on AC waveform. The value is entered in [%] relative to rated motor current (P0305)..

**Value:**

P1236 = 0 : Compound braking disabled.
P1236 = 1 - 250 : Level of DC braking current defined as a [%] of rated motor current (P0305).

**Index:**

P1236[0] : 1st. Drive data set (DDS)
P1236[1] : 2nd. Drive data set (DDS)
P1236[2] : 3rd. Drive data set (DDS)

**Notice:**

Increasing the value will generally improve braking performance; however, if you set the value too high, an overcurrent trip may result.

**P1237** **Dynamic braking** Level: **2**

**CStat:** CUT **Datatype:** U16 **Unit:** - **Min:** 0
**P-Group:** FUNC **Active:** No - **Def:** 0
**Max:** 5

Dynamic braking absorbs the braking energy. This parameter defines the rated duty cycle of the braking resistor (chopper resistor).

**Enum:**

0 Disabled
1 5 % duty cycle
2 10 % duty cycle
3 20 % duty cycle
4 50 % duty cycle
5 100 % duty cycle

**Notice:**

Initially the brake will operate at a high duty cycle dependant on the DC link level until the thermal limit is approached. The duty cycle specified by this parameter will then be imposed. The resistor should be able to operate at this level indefinitely without overheating.

**P1240[3]** **Configuration of Vdc controller** Level: **3**

**CStat:** CT **Datatype:** U16 **Unit:** - **Min:** 0
**P-Group:** FUNC **Active:** No - **Def:** 1
**Max:** 3

Enables / disables Vdc controller.

The Vdc controller dynamically controls the DC link voltage to prevent overvoltage trips on high inertia systems.

**Enum:**

0 Vdc controller disabled
1 Vdc-max controller enabled
2 Vdc-min controller (Kinetic buffering) enabled
3 Vdc-max and Vdc-min controller enabled

**Index:**

P1240[0] : 1st. Drive data set (DDS)
P1240[1] : 2nd. Drive data set (DDS)
P1240[2] : 3rd. Drive data set (DDS)

**Note:**

Vdc max automatically increases ramp-down times to keep the DC-link voltage (r0026) within limits (P2172)

Vdc min is activated if DC-link voltage falls below minimum level. The kinetic energy of the motor is then used to buffer the DC-link voltage, thus causing deceleration of the drive.

**r1242** **CO: Switch-on level of Vdc-max** Level: **3**

**Datatype:** Float **Unit:** V **Min:** -
**P-Group:** FUNC **Def:** -
**Max:** -

Displays switch-on level of Vdc max controller.

**P1243[3]** **Dynamic factor of Vdc-max** Level: **3**

**CStat:** CUT **Datatype:** U16 **Unit:** % **Min:** 10
**P-Group:** FUNC **Active:** No - **Def:** 100
**Max:** 200

Defines dynamic factor for DC link controller in [%].

**Index:**

P1243[0] : 1st. Drive data set (DDS)
P1243[1] : 2nd. Drive data set (DDS)
P1243[2] : 3rd. Drive data set (DDS)

**Dependency:**

P1243 = 100 % means parameters P1250, P1251 and P1252 (integration time, differential time and output limitation) are used as set. Otherwise, these are multiplied by P1243 (dynamic factor of Vdc-max).

**Note:**

Vdc controller adjustment is calculated automatically from motor and inverter data.

**P1245[3]** **Switch on level kin. buffering** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U16 | **Unit:** % | **Min:** | 65 |
| **P-Group:** | FUNC | **Active:** No | - | **Def:** | 76 |
| | | | | **Max:** | 115 |

Enters switch-on level for kinetic buffering in [%] relative to supply voltage (P0210).

**Index:**

P1245[0] : 1st. Drive data set (DDS)
P1245[1] : 2nd. Drive data set (DDS)
P1245[2] : 3rd. Drive data set (DDS)

**Note:**

P1245 = 100 % = standard setting

**P1247[3]** **Dyn. factor of kinetic buffering** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U16 | **Unit:** % | **Min:** | 10 |
| **P-Group:** | FUNC | **Active:** No | - | **Def:** | 100 |
| | | | | **Max:** | 200 |

Enters dynamic factor for kinetic buffering controller (Vdc-min controller).

**Index:**

P1247[0] : 1st. Drive data set (DDS)
P1247[1] : 2nd. Drive data set (DDS)
P1247[2] : 3rd. Drive data set (DDS)

**Note:**

P1247 = 100 % = standard setting

**P1250[3]** **Gain of Vdc-controller** Level: **4**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** - | **Min:** | 0.00 |
| **P-Group:** | FUNC | **Active:** No | - | **Def:** | 1.00 |
| | | | | **Max:** | 10.00 |

Enters gain for Vdc controller.

**Index:**

P1250[0] : 1st. Drive data set (DDS)
P1250[1] : 2nd. Drive data set (DDS)
P1250[2] : 3rd. Drive data set (DDS)

**P1251[3]** **Integration time Vdc-controller** Level: **4**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** ms | **Min:** | 0.1 |
| **P-Group:** | FUNC | **Active:** No | - | **Def:** | 40.0 |
| | | | | **Max:** | 1000.0 |

Enters integral time constant for Vdc controller.

**Index:**

P1251[0] : 1st. Drive data set (DDS)
P1251[1] : 2nd. Drive data set (DDS)
P1251[2] : 3rd. Drive data set (DDS)

**P1252[3]** **Differential time Vdc-controller** Level: **4**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** ms | **Min:** | 0.0 |
| **P-Group:** | FUNC | **Active:** No | - | **Def:** | 1.0 |
| | | | | **Max:** | 1000.0 |

Enters differential time constant for Vdc controller.

**Index:**

P1252[0] : 1st. Drive data set (DDS)
P1252[1] : 2nd. Drive data set (DDS)
P1252[2] : 3rd. Drive data set (DDS)

**P1253[3]** **Vdc-controller output limitation** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Hz | **Min:** | 0 |
| **P-Group:** | FUNC | **Active:** No | - | **Def:** | 10 |
| | | | | **Max:** | 600 |

Limits maximum effect of Vdc max controller.

**Index:**

P1253[0] : 1st. Drive data set (DDS)
P1253[1] : 2nd. Drive data set (DDS)
P1253[2] : 3rd. Drive data set (DDS)

**P1254** **Auto detect Vdc switch-on levels** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U16 | **Unit:** - | **Min:** | 0 |
| **P-Group:** | FUNC | **Active:** No | - | **Def:** | 1 |
| | | | | **Max:** | 1 |

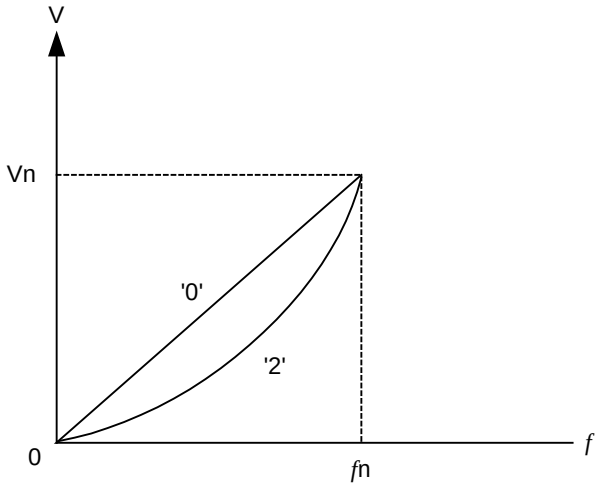
Enables/disables auto-detection of switch-on levels for Vdc max controller.

**Enum:**

0 Disabled
1 Enabled

| **P1300[3]** | **Control mode** | | | **Min:** | 0 | Level: |
|---|---|---|---|---|---|---|
| | **CStat:** CT | **Datatype:** U16 | **Unit:** - | **Def:** | 0 | **2** |
| | **P-Group:** CONTROL | **Active:** Immediately | QuickCom | **Max:** | 23 | |

Controls relationship between speed of motor and voltage supplied by inverter as illustrated in the diagram below




**Enum:**

| | |
|---|---|
| 0 | V/f with linear charac. |
| 1 | V/f with FCC |
| 2 | V/f with parabolic charac. |
| 3 | V/f with programmable charac. |
| 4 | V/f with ECO mode |
| 5 | V/f for textile applications |
| 6 | V/f with FCC for textile applications |
| 19 | V/f control with independent voltage setpoint |
| 20 | Sensorless vector control |
| 22 | Sensorless vector torque-control |

**Index:**

P1300[0] : 1st. Drive data set (DDS)
P1300[1] : 2nd. Drive data set (DDS)
P1300[2] : 3rd. Drive data set (DDS)

**Dependency:**

Limited internally to 200 Hz or 5 * rated motor frequency (P0310) when P1300 >= 20 (control mode = vector control). The value is displayed in r1084 (maximum frequency)

**Note:**

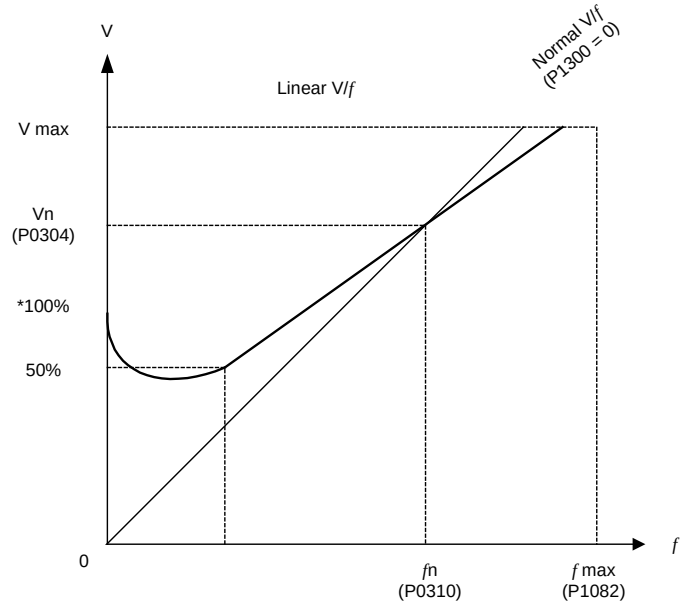
P1300 = 1 : V/f with FCC
* Maintains motor flux current for improved efficiency
* If FCC is chosen, linear V/f is active at low frequencies.

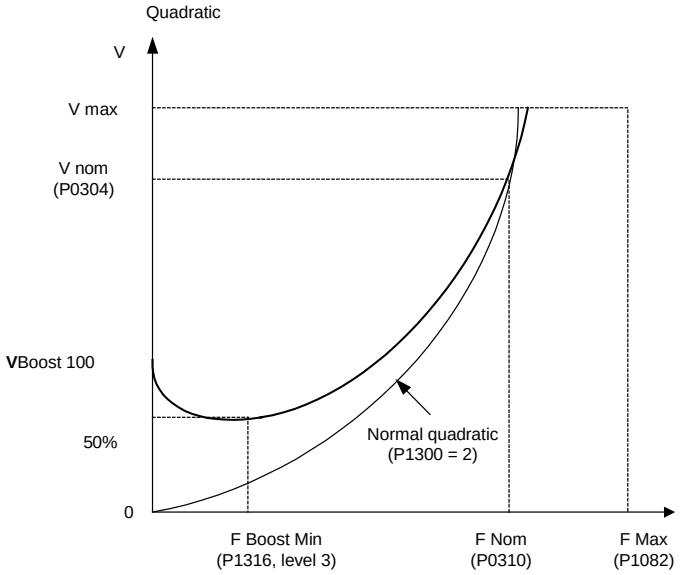
P1300 = 2 : V/f with a quadratic curve
* Suitable for centrifugal fans / pumps

P1500 defines the setpoint source for torque control.

| **P1310[3]** | **Continuous boost** | | | **Min:** | 0.0 | Level: |
|---|---|---|---|---|---|---|
| | **CStat:** CUT | **Datatype:** Float | **Unit:** % | **Def:** | 50.0 | **2** |
| | **P-Group:** CONTROL | **Active:** No | - | **Max:** | 250.0 | |

Defines boost level in [%] relative to P0305 (rated motor current) applicable to both linear and quadratic V/f curves according to the diagram below:




where
V_Boost,100 = voltage given by rated motor current (P0305) * Stator resistance (P0350)

**Index:**

P1310[0] : 1st. Drive data set (DDS)
P1310[1] : 2nd. Drive data set (DDS)
P1310[2] : 3rd. Drive data set (DDS)

**Dependency:**

Setting in P0640 (motor overload factor [%]) limits the boost.

**Note:**

The boost values are combined when continuous boost (P1310) used in conjunction with other boost parameters (acceleration boost P1311 and starting boost P1312). However priorities are allocated to these parameters as follows:
P1310 > P1311 > P1312

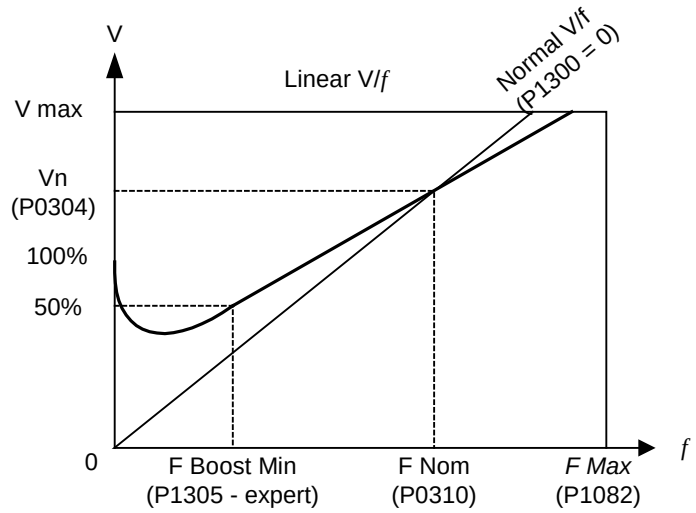
**Notice:**

Increasing the boost levels increases motor heating (especially at standstill).

$$Boosts \leq 300/I_{mot} * R_S$$

| P1311[3] | **Acceleration boost** | | | | **Min:** | 0.0 | Level: |
|---|---|---|---|---|---|---|---|
| | **CStat:** | CUT | **Datatype:** Float | **Unit:** % | **Def:** | 0.0 | **2** |
| | **P-Group:** | CONTROL | **Active:** No | - | **Max:** | 250.0 | |

Applies boost in [%] relative to P0305 (rated motor current) following a positive setpoint change and drops back out once the setpoint is reached.




**Index:**

P1311[0] : 1st. Drive data set (DDS)
P1311[1] : 2nd. Drive data set (DDS)
P1311[2] : 3rd. Drive data set (DDS)

**Dependency:**

Setting in P0640 (motor overload factor [%]) limits boost.

**Note:**

Acceleration boost can help to improve response to small positive setpoint changes.

$$Boosts \leq 300/I_{mot} * R_S$$

**Notice:**

Increasing the boost level increases motor heating.

**Details:**

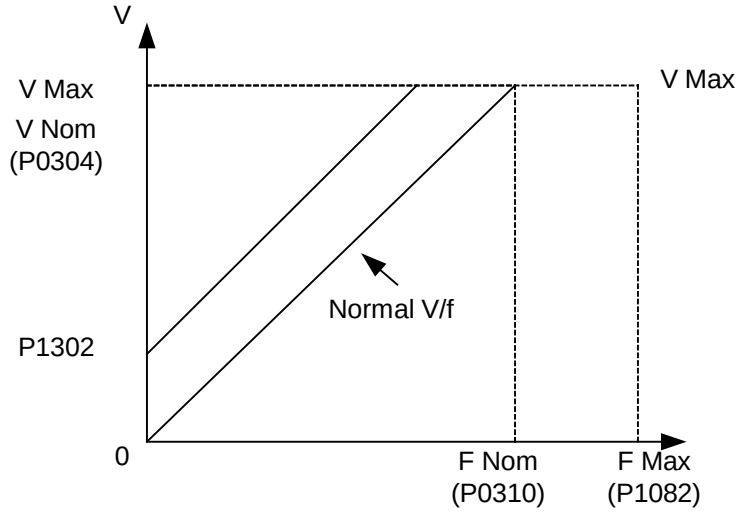
See note in P1310 for boost priorities.

**P1312[3] Starting boost** Level: **2**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** % | **Min:** | 0.0 |
| **P-Group:** | CONTROL | **Active:** No | - | **Def:** | 0.0 |
| | | | | **Max:** | 250.0 |

Applies a constant linear offset (in [%] relative to P0305 (rated motor current)) to active V/f curve (either linear or quadratic) after an ON command and is active until setpoint is reached for the first time. This is useful for starting loads with high inertia.

Setting the starting boost (P1312) too high will cause the inverter to limit the current, which will in turn restrict the output frequency to below the setpoint frequency.




**Index:**
P1312[0] : 1st. Drive data set (DDS)
P1312[1] : 2nd. Drive data set (DDS)
P1312[2] : 3rd. Drive data set (DDS)

**Dependency:**
Setting in P0640 (motor overload factor [%]) limits boost.

**Notice:**
Increasing the boost levels increases motor heating.

$$Boosts \leq 300 / I_{mot} * R_S$$

**Details:**
See note in P1310 for boost priorities.

**r1315 CO: Total boost voltage** Level: **4**

| | | | | | |
|---|---|---|---|---|---|
| | | **Datatype:** Float | **Unit:** V | **Min:** | - |
| **P-Group:** | CONTROL | | | **Def:** | - |
| | | | | **Max:** | - |

Displays total value of voltage boost (in volts).

**P1316[3] Boost end frequency** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** % | **Min:** | 0.0 |
| **P-Group:** | CONTROL | **Active:** No | - | **Def:** | 20.0 |
| | | | | **Max:** | 100.0 |

Defines point at which programmed boost reaches 50 % of its value.

This value is expressed in [%] relative to P0310 (rated motor frequency).

This frequency is defined as follows:

$$fboostmin = 2 * ((150 / \sqrt{Pmotor}) + 3)$$

It is displayed as [%] value of the f_nominal.

**Index:**
P1316[0] : 1st. Drive data set (DDS)
P1316[1] : 2nd. Drive data set (DDS)
P1316[2] : 3rd. Drive data set (DDS)

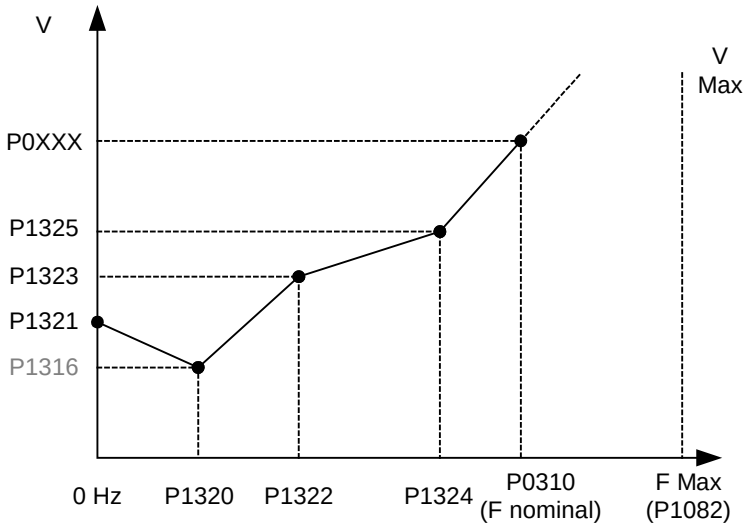
**Note:**
The expert user may change this value to alter the shape of the curve, e.g. to increase torque at a particular frequency.

**Details:**
See diagram in P1310 (continuous boost)

**P1320[3]** **Programmable V/f freq. coord. 1** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** Float | **Unit:** Hz | **Min:** | 0.00 |
| **P-Group:** | CONTROL | **Active:** No | - | **Def:** | 0.00 |
| | | | | **Max:** | 650.00 |

Sets V/f coordinates (P1320/1321 to P1324/1325) to define V/f characteristic.




**Example:**

This parameter can be used to provide correct torque at correct frequency and is useful when used with synchronous motors.

**Index:**

P1320[0] : 1st. Drive data set (DDS)
P1320[1] : 2nd. Drive data set (DDS)
P1320[2] : 3rd. Drive data set (DDS)

**Dependency:**

To set parameter, select P1300 = 3 (V/f with programmable characteristic)

**Note:**

Linear interpolation will be applied between points set from P1320/1321 to P1324/1325.

V/f with programmable characteristic (P1300 = 3) has 3 programmable points. The two non-programmable points are:
Boost voltage P1310 at zero 0 Hz
Nominal voltage at nominal frequency

The acceleration boost and starting boost defined in P1311 and P1312 are applied to V/f with programmable characteristic.

**P1321[3]** **Programmable V/f volt. coord. 1** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** V | **Min:** | 0.0 |
| **P-Group:** | CONTROL | **Active:** No | - | **Def:** | 0.0 |
| | | | | **Max:** | 3000.0 |

See P1320 (programmable V/f freq. coord. 1).

**Index:**

P1321[0] : 1st. Drive data set (DDS)
P1321[1] : 2nd. Drive data set (DDS)
P1321[2] : 3rd. Drive data set (DDS)

**P1322[3]** **Programmable V/f freq. coord. 2** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** Float | **Unit:** Hz | **Min:** | 0.00 |
| **P-Group:** | CONTROL | **Active:** No | - | **Def:** | 0.00 |
| | | | | **Max:** | 650.00 |

See P1320 (programmable V/f freq. coord. 1).

**Index:**

P1322[0] : 1st. Drive data set (DDS)
P1322[1] : 2nd. Drive data set (DDS)
P1322[2] : 3rd. Drive data set (DDS)

**P1323[3]** **Programmable V/f volt. coord. 2** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** V | **Min:** | 0.0 |
| **P-Group:** | CONTROL | **Active:** No | - | **Def:** | 0.0 |
| | | | | **Max:** | 3000.0 |

See P1320 (programmable V/f freq. coord. 1).

**Index:**

P1323[0] : 1st. Drive data set (DDS)
P1323[1] : 2nd. Drive data set (DDS)
P1323[2] : 3rd. Drive data set (DDS)

**P1324[3] Programmable V/f freq. coord. 3** Level: 3

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** Float | **Unit:** Hz | **Min:** | 0.00 |
| **P-Group:** | CONTROL | **Active:** No | - | **Def:** | 0.00 |
| | | | | **Max:** | 650.00 |

See P1320 (programmable V/f freq. coord. 1).

**Index:**

P1324[0] : 1st. Drive data set (DDS)
P1324[1] : 2nd. Drive data set (DDS)
P1324[2] : 3rd. Drive data set (DDS)

**P1325[3] Programmable V/f volt. coord. 3** Level: 3

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** V | **Min:** | 0.0 |
| **P-Group:** | CONTROL | **Active:** No | - | **Def:** | 0.0 |
| | | | | **Max:** | 3000.0 |

See P1320 (programmable V/f freq. coord. 1).

**Index:**

P1325[0] : 1st. Drive data set (DDS)
P1325[1] : 2nd. Drive data set (DDS)
P1325[2] : 3rd. Drive data set (DDS)

**P1330[3] CI: Voltage setpoint** Level: 3

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | T | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | CONTROL | **Active:** Immediately | - | **Def:** | 0:0 |
| | | | | **Max:** | 4000:0 |

BICO parameter for selecting source of voltage setpoint for independent V/f control.

**Index:**

P1330[0] : 1st. Command data set (CDS)
P1330[1] : 2nd. Command data set (CDS)
P1330[2] : 3rd. Command data set (CDS)

**P1333[3] Start frequency for FCC** Level: 3

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** % | **Min:** | 0.0 |
| **P-Group:** | CONTROL | **Active:** No | - | **Def:** | 10.0 |
| | | | | **Max:** | 100.0 |

Defines start frequency at which FCC (flux current control) is enabled as [%] of rated motor frequency (P0310).

**Index:**

P1333[0] : 1st. Drive data set (DDS)
P1333[1] : 2nd. Drive data set (DDS)
P1333[2] : 3rd. Drive data set (DDS)

**Notice:**

If this value is too low, the system may become unstable.

**P1335[3] Slip compensation** Level: 2

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** % | **Min:** | 0.0 |
| **P-Group:** | CONTROL | **Active:** No | - | **Def:** | 0.0 |
| | | | | **Max:** | 600.0 |

Dynamically adjusts output frequency of inverter so that motor speed is kept constant independent of motor load.

**Value:**

P1335 = 0 % : Slip compensation disabled.
P1335 = 100 % : This uses the motor data and motor model to add the rated slip frequency rated motor speed and rated motor current.

**Index:**

P1335[0] : 1st. Drive data set (DDS)
P1335[1] : 2nd. Drive data set (DDS)
P1335[2] : 3rd. Drive data set (DDS)

**Note:**

Gain adjustment enables fine-tuning of the actual motor speed (see P1460 - gain speed control).

100% = standard setting for warm stator

**P1336[3] Slip limit** Level: 2

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U16 | **Unit:** % | **Min:** | 0 |
| **P-Group:** | CONTROL | **Active:** No | - | **Def:** | 250 |
| | | | | **Max:** | 600 |

Compensation slip limit in [%] relative to r0330 (rated motor slip), which is added to frequency setpoint.

**Index:**

P1336[0] : 1st. Drive data set (DDS)
P1336[1] : 2nd. Drive data set (DDS)
P1336[2] : 3rd. Drive data set (DDS)

**Dependency:**

Slip compensation (P1335) active.

**r1337 CO: V/f slip frequency** Level: 3

| | | | | | |
|---|---|---|---|---|---|
| | | **Datatype:** Float | **Unit:** % | **Min:** | - |
| | | | | **Def:** | - |
| **P-Group:** | CONTROL | | | **Max:** | - |

Displays actual compensated motor slip as [%]

**Dependency:**

Slip compensation (P1335) active.

**P1338[3]** **Resonance damping gain V/f** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** - | **Min:** | 0.00 |
| **P-Group:** | CONTROL | **Active:** No | - | **Def:** | 0.00 |
| | | | | **Max:** | 10.00 |

Defines resonance damping gain for V/f.

**Index:**

P1338[0] : 1st. Drive data set (DDS)
P1338[1] : 2nd. Drive data set (DDS)
P1338[2] : 3rd. Drive data set (DDS)

**Note:**

The resonance circuit damps oscillations of the active current which frequently occur during no-load operation.

In V/f modes (see P1300), the resonant damping circuit is active in a range from approx. 5 % to 70 % of rated motor frequency (P0310).

**P1340[3]** **Imax controller prop. gain** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** - | **Min:** | 0.000 |
| **P-Group:** | CONTROL | **Active:** No | - | **Def:** | 0.000 |
| | | | | **Max:** | 0.499 |

Proportional gain of the I_max frequency controller.

The Imax controller reduces inverter current if the output current exceeds the maximum motor current (P0067).

In linear V/f, parabolic V/f, FCC, and programmable V/f modes the I_max controller uses both a frequency controller (see parameters P1340 and P1341) and a voltage controller (see parameters P1344 and P1345). The frequency controller seeks to reduce current by limiting the inverter output frequency (to a minimum of the two times nominal slip frequency). If this action does not successfully remove the overcurrent condition, the inverter output voltage is reduced using the I_max voltage controller. When the overcurrent condition has been removed successfully, frequency limiting is removed using the ramp-up time set in P1120.

In linear V/f for textiles, FCC for textiles, or external V/f modes only the I_max voltage controller is used to reduce current (See parameters P1345 and P1346).

**Index:**

P1340[0] : 1st. Drive data set (DDS)
P1340[1] : 2nd. Drive data set (DDS)
P1340[2] : 3rd. Drive data set (DDS)

**Note:**

The I_max controller can be disabled by setting the frequency controller integral time P1341 to zero. This disables both the frequency and voltage controllers. Note that when disabled, the I_max controller will take no action to reduce current but overcurrent warnings will still be generated, and the Drive will trip in excessive overcurrent or overload conditions.

**P1341[3]** **Imax controller integral time** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** s | **Min:** | 0.000 |
| **P-Group:** | CONTROL | **Active:** No | - | **Def:** | 0.300 |
| | | | | **Max:** | 50.000 |

Integral time constant of the I_max frequency controller.
P1341 = 0 : I_max frequency and voltage controllers disabled
P1340 = 0 and P1341 > 0 : frequency controller enhanced integral
P1340 > 0 and P1341 > 0 : frequency controller normal PI control

See description in parameter P1340 for further information.

**Index:**

P1341[0] : 1st. Drive data set (DDS)
P1341[1] : 2nd. Drive data set (DDS)
P1341[2] : 3rd. Drive data set (DDS)

**r1343** **CO: Imax controller freq. output** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| | | **Datatype:** Float | **Unit:** Hz | **Min:** | - |
| **P-Group:** | CONTROL | | | **Def:** | - |
| | | | | **Max:** | - |

Displays effective frequency limitation.

**Dependency:**

If I_max controller not in operation, parameter normally shows f_max (P1082).

**r1344** **CO: Imax controller volt. output** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| | | **Datatype:** Float | **Unit:** V | **Min:** | - |
| **P-Group:** | CONTROL | | | **Def:** | - |
| | | | | **Max:** | - |

Displays amount by which the I_max controller is reducing the inverter output voltage.

**P1345[3]** **Imax controller prop. gain** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** - | **Min:** | 0.000 |
| **P-Group:** | CONTROL | **Active:** No | - | **Def:** | 0.250 |
| | | | | **Max:** | 5.499 |

Proportional gain of the I_max voltage controller. See parameter P1340 for further information.

**Index:**

P1345[0] : 1st. Drive data set (DDS)
P1345[1] : 2nd. Drive data set (DDS)
P1345[2] : 3rd. Drive data set (DDS)

**P1346[3]** **Imax controller integral time** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** s | **Min:** | 0.000 |
| **P-Group:** | CONTROL | **Active:** No | - | **Def:** | 0.300 |
| | | | | **Max:** | 50.000 |

Integral time constant of the I_max voltage controller.
P1341 = 0 : I_max frequency and voltage controllers disabled
P1345 = 0 and P1346 > 0 : I_max voltage controller enhanced integral
P1345 > 0 and P1346 > 0 : I_max voltage controller normal PI control

See description in parameter P1340 for further information.

**Index:**

P1346[0] : 1st. Drive data set (DDS)
P1346[1] : 2nd. Drive data set (DDS)
P1346[2] : 3rd. Drive data set (DDS)

**P1350[3]** **Voltage soft start** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U16 | **Unit:** - | **Min:** | 0 |
| **P-Group:** | CONTROL | **Active:** Immediately | - | **Def:** | 0 |
| | | | | **Max:** | 1 |

Sets whether voltage is built up smoothly during magnetization time (ON) or whether it simply jumps to boost voltage (OFF)

**Enum:**

0 OFF
1 ON

**Index:**

P1350[0] : 1st. Drive data set (DDS)
P1350[1] : 2nd. Drive data set (DDS)
P1350[2] : 3rd. Drive data set (DDS)

**Note:**

The settings for this parameter bring benefits and drawbacks:
0 = OFF (jump to boost voltage)
Benefit: flux is built up quickly
Drawback: motor may move
1 = ON (smooth voltage build-up)
Benefit: motor less likely to move
Drawback: flux build-up takes longer

**P1400[3]** **Configuration of speed control** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U16 | **Unit:** - | **Min:** | 0 |
| **P-Group:** | CONTROL | **Active:** No | - | **Def:** | 1 |
| | | | | **Max:** | 3 |

Configuration for speed control.

**Bitfields:**

| | | | |
|---|---|---|---|
| Bit00 | Automatic Kp adaption | 0 | NO |
| | | 1 | YES |
| Bit01 | Integral freeze (SLVC) | 0 | NO |
| | | 1 | YES |

**Index:**

P1400[0] : 1st. Drive data set (DDS)
P1400[1] : 2nd. Drive data set (DDS)
P1400[2] : 3rd. Drive data set (DDS)

**r1407** **CO/BO: Status 2 of motor control** Level: **3**

**Datatype:** U16 **Unit:** - **Min:** - **Def:** - **Max:** -

**P-Group:** CONTROL

Displays status of motor control, which can be used to diagnose inverter status.

**Bitfields:**

| | | | |
|---|---|---|---|
| Bit00 | V/f control enable | 0 | NO |
| | | 1 | YES |
| Bit01 | SLVC enable | 0 | NO |
| | | 1 | YES |
| Bit02 | Torque control enable | 0 | NO |
| | | 1 | YES |
| Bit05 | Stop I-comp. speed control | 0 | NO |
| | | 1 | YES |
| Bit06 | Set I-comp. speed controller | 0 | NO |
| | | 1 | YES |
| Bit08 | Upper torque limit active | 0 | NO |
| | | 1 | YES |
| Bit09 | Lower torque limit active | 0 | NO |
| | | 1 | YES |
| Bit10 | Enable droop | 0 | NO |
| | | 1 | YES |
| Bit15 | DDS change active | 0 | NO |
| | | 1 | YES |

**Details:**

See P052 (CO/BO: Status word 1)

**r1438** **CO: Freq. setpoint to controller** Level: **3**

**Datatype:** Float **Unit:** Hz **Min:** - **Def:** - **Max:** -

**P-Group:** CONTROL

Displays setpoint of speed controller.

**P1442[3]** **Filter time for act. speed** Level: **4**

**CStat:** CUT **Datatype:** U16 **Unit:** ms **Min:** 0 **Def:** 4 **Max:** 32000

**P-Group:** CONTROL **Active:** No -

Sets time constant of PT1 filter to smooth speed deviation of speed controller.

**Index:**

P1442[0] : 1st. Drive data set (DDS)
P1442[1] : 2nd. Drive data set (DDS)
P1442[2] : 3rd. Drive data set (DDS)

**r1445** **CO: Act. filtered frequency** Level: **4**

**Datatype:** Float **Unit:** Hz **Min:** - **Def:** - **Max:** -

**P-Group:** CONTROL

Displays filtered actual speed at speed controller input.

**P1452[3]** **Filter time for act.speed (SLVC)** Level: **3**

**CStat:** CUT **Datatype:** U16 **Unit:** ms **Min:** 0 **Def:** 4 **Max:** 32000

**P-Group:** CONTROL **Active:** No -

Sets time constant of PT1 filter to filter the speed deviation of speed controller in operation mode SLVC (sensorless vector control).

**Index:**

P1452[0] : 1st. Drive data set (DDS)
P1452[1] : 2nd. Drive data set (DDS)
P1452[2] : 3rd. Drive data set (DDS)

**P1460[3]** **Gain speed controller** Level: **4**

**CStat:** CUT **Datatype:** Float **Unit:** - **Min:** 0.0 **Def:** 3.0 **Max:** 2000.0

**P-Group:** CONTROL **Active:** No -

Enters gain of speed controller.

**Index:**

P1460[0] : 1st. Drive data set (DDS)
P1460[1] : 2nd. Drive data set (DDS)
P1460[2] : 3rd. Drive data set (DDS)

**P1462[3]** **Integral time speed controller** Level: **4**

**CStat:** CUT **Datatype:** U16 **Unit:** ms **Min:** 25 **Def:** 400 **Max:** 32001

**P-Group:** CONTROL **Active:** No -

Enters integral time of speed controller.

**Index:**

P1462[0] : 1st. Drive data set (DDS)
P1462[1] : 2nd. Drive data set (DDS)
P1462[2] : 3rd. Drive data set (DDS)

**P1470[3]** **Gain speed controller (SLVC)** Level: **2**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** - | **Min:** | 0.0 |
| **P-Group:** | CONTROL | **Active:** No | - | **Def:** | 3.0 |
| | | | | **Max:** | 2000.0 |

Enters gain of speed controller for sensorless vector control (SLVC).

**Index:**

P1470[0] : 1st. Drive data set (DDS)
P1470[1] : 2nd. Drive data set (DDS)
P1470[2] : 3rd. Drive data set (DDS)

**P1472[3]** **Integral time n-ctrl. (SLVC)** Level: **2**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U16 | **Unit:** ms | **Min:** | 25 |
| **P-Group:** | CONTROL | **Active:** No | - | **Def:** | 400 |
| | | | | **Max:** | 32001 |

Enters integral time of speed controller for sensorless vector control (SLVC).

**Index:**

P1472[0] : 1st. Drive data set (DDS)
P1472[1] : 2nd. Drive data set (DDS)
P1472[2] : 3rd. Drive data set (DDS)

**P1477[3]** **BI: Set integrator of n-ctrl.** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | CONTROL | **Active:** Immediately | - | **Def:** | 0:0 |
| | | | | **Max:** | 4000:0 |

Selects source to read in command to enable speed controller.

**Index:**

P1477[0] : 1st. Command data set (CDS)
P1477[1] : 2nd. Command data set (CDS)
P1477[2] : 3rd. Command data set (CDS)

**P1478[3]** **CI: Set integrator value n-ctrl.** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | UT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | CONTROL | **Active:** Immediately | - | **Def:** | 0:0 |
| | | | | **Max:** | 4000:0 |

Selects source for integral part of speed controller.

**Index:**

P1478[0] : 1st. Command data set (CDS)
P1478[1] : 2nd. Command data set (CDS)
P1478[2] : 3rd. Command data set (CDS)

**Dependency:**

In case of sensorless vector control, integrator freezing must be selected (P1400=1) to save the integrator output.

**Note:**

If the setting command is not connected (P1477=0), a pending value is read in after pulse enable at the end of the excitation time (P0346) and the integral component of the speed controller is set once. If the P1482 (integral component of speed controller) is connected upon pulse enable, the integral component of the controller is set to the last value prior the pulse inhibit.

**Notice:**

Neither function works after flying start.

**r1482** **CO: Integral output of n-ctrl.** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| | | **Datatype:** Float | **Unit:** Nm | **Min:** | - |
| **P-Group:** | CONTROL | | | **Def:** | - |
| | | | | **Max:** | - |

Displays integral part of speed controller output.

**P1488[3]** **Droop input source** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U16 | **Unit:** - | **Min:** | 0 |
| **P-Group:** | CONTROL | **Active:** Immediately | - | **Def:** | 0 |
| | | | | **Max:** | 3 |

Selects source of droop input signal.

**Enum:**

0 Droop input disabled
1 Torque setpoint
2 Speed controller output
3 Speed controller integral output

**Index:**

P1488[0] : 1st. Drive data set (DDS)
P1488[1] : 2nd. Drive data set (DDS)
P1488[2] : 3rd. Drive data set (DDS)

**Dependency:**

Droop scaling (P1489) must be > 0 for droop to be effective.

**P1489[3]** **Droop scaling** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** - | **Min:** | 0.0 |
| **P-Group:** | CONTROL | **Active:** No | - | **Def:** | 0.05 |
| | | | | **Max:** | 0.50 |

Defines amount of droop in per unit at full load in [%].

**Index:**

P1489[0] : 1st. Drive data set (DDS)
P1489[1] : 2nd. Drive data set (DDS)
P1489[2] : 3rd. Drive data set (DDS)

**Note:**

If 0 is entered as value, no droop is applied.

**r1490** **CO: Droop frequency** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| | | **Datatype:** Float | **Unit:** Hz | **Min:** | - |
| | | | | **Def:** | - |
| **P-Group:** | CONTROL | | | **Max:** | - |

Displays output signal of droop function.

This result of droop calculation is subtracted from the speed controller setpoint.

**P1492[3]** **Enable droop** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U16 | **Unit:** - | **Min:** | 0 |
| **P-Group:** | CONTROL | **Active:** Immediately | - | **Def:** | 0 |
| | | | | **Max:** | 1 |

Enables droop.

**Enum:**

0 Disabled
1 Enabled

**Index:**

P1492[0] : 1st. Drive data set (DDS)
P1492[1] : 2nd. Drive data set (DDS)
P1492[2] : 3rd. Drive data set (DDS)

**Dependency:**

Effective only if droop scaling (P1489) > 0

**P1496[3]** **Scaling accel. precontrol** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** % | **Min:** | 0.0 |
| **P-Group:** | CONTROL | **Active:** No | - | **Def:** | 0.0 |
| | | | | **Max:** | 400.0 |

Enters scaling of acceleration in [%].

**Index:**

P1496[0] : 1st. Drive data set (DDS)
P1496[1] : 2nd. Drive data set (DDS)
P1496[2] : 3rd. Drive data set (DDS)

**Note:**

P1496 = 100 % = standard setting

**P1499[3]** **Scaling accel. torque control** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** % | **Min:** | 0.0 |
| **P-Group:** | CONTROL | **Active:** No | - | **Def:** | 100.0 |
| | | | | **Max:** | 400.0 |

Enters scaling of acceleration in [%] for sensorless torque control (SLVC) at low frequencies.

**Index:**

P1499[0] : 1st. Drive data set (DDS)
P1499[1] : 2nd. Drive data set (DDS)
P1499[2] : 3rd. Drive data set (DDS)

| **P1500[3]** | **Selection of torque setpoint** | | | **Min:** | 0 | Level: |
|---|---|---|---|---|---|---|
| | **CStat:** CT | **Datatype:** U16 | **Unit:** - | **Def:** | 0 | **2** |
| | **P-Group:** CONTROL | **Active:** Immediately | QuickCom | **Max:** | 77 | |

Selects torque setpoint source. In the table of possible settings below, the main setpoint is selected from the least significant digit (i.e., 0 to 7) and any additional setpoint from the most significant digit (i.e., x0 through to x6).

**Example:**

Setting 12 selects the main setpoint (2) derived from the analog input with the additional setpoint (1) coming form the keypad (motor potentiometer setpoint). Single digits are main setpoints only with no additional setpoint.

**Settings:**

Use table below to select other settings, including an additional setpoint.

0 No main setpoint
1 Motor potentiometer setpoint
2 Analog setpoint
3 Fixed frequnecy
4 USS on BOP link
5 USS on COM link
6 CB on COM link

**Enum:**

| | | |
|---|---|---|
| 0 | No main setpoint | |
| 1 | MOP setpoint | |
| 2 | Analog setpoint | |
| 3 | Fixed frequency | |
| 4 | USS on BOP link | |
| 5 | USS on COM link | |
| 6 | CB on COM link | |
| 7 | Analog setpoint 2 | |
| 10 | No main setpoint + | MOP setpoint |
| 11 | MOP setpoint + | MOP setpoint |
| 12 | Analog setpoint + | MOP setpoint |
| 13 | Fixed frequency + | MOP setpoint |
| 14 | USS on BOP link + | MOP setpoint |
| 15 | USS on COM link + | MOP setpoint |
| 16 | CB on COM link + | MOP setpoint |
| 17 | Analog setpoint 2 + | MOP setpoint |
| 20 | No main setpoint + | Analog setpoint |
| 21 | MOP setpoint + | Analog setpoint |
| 22 | Analog setpoint + | Analog setpoint |
| 23 | Fixed frequency + | Analog setpoint |
| 24 | USS on BOP link + | Analog setpoint |
| 25 | USS on COM link + | Analog setpoint |
| 26 | CB on COM link + | Analog setpoint |
| 27 | Analog setpoint 2 + | Analog setpoint |
| 30 | No main setpoint + | Fixed frequency |
| 31 | MOP setpoint + | Fixed frequency |
| 32 | Analog setpoint + | Fixed frequency |
| 33 | Fixed frequency + | Fixed frequency |
| 34 | USS on BOP link + | Fixed frequency |
| 35 | USS on COM link + | Fixed frequency |
| 36 | CB on COM link + | Fixed frequency |
| 37 | Analog setpoint 2 + | Fixed frequency |
| 40 | No main setpoint + | USS on BOP link |
| 41 | MOP setpoint + | USS on BOP link |
| 42 | Analog setpoint + | USS on BOP link |
| 43 | Fixed frequency + | USS on BOP link |
| 44 | USS on BOP link + | USS on BOP link |
| 45 | USS on COM link + | USS on BOP link |
| 46 | CB on COM link + | USS on BOP link |
| 47 | Analog setpoint 2 + | USS on BOP link |
| 50 | No main setpoint + | USS on COM link |
| 51 | MOP setpoint + | USS on COM link |
| 52 | Analog setpoint + | USS on COM link |
| 53 | Fixed frequency + | USS on COM link |
| 54 | USS on BOP link + | USS on COM link |
| 55 | USS on COM link + | USS on COM link |
| 56 | CB on COM link + | USS on COM link |
| 57 | Analog setpoint 2 + | USS on COM link |
| 60 | No main setpoint + | CB on COM link |
| 61 | MOP setpoint + | CB on COM link |
| 62 | Analog setpoint + | CB on COM link |
| 63 | Fixed frequency + | CB on COM link |
| 64 | USS on BOP link + | CB on COM link |
| 65 | USS on COM link + | CB on COM link |
| 66 | CB on COM link + | CB on COM link |
| 67 | Analog setpoint 2 + | CB on COM link |

| | | |
|---|---|---|
| 70 | No main setpoint + | Analog setpoint 2 |
| 71 | MOP setpoint + | Analog setpoint 2 |
| 72 | Analog setpoint + | Analog setpoint 2 |
| 73 | Fixed frequency + | Analog setpoint 2 |
| 74 | USS on BOP link + | Analog setpoint 2 |
| 75 | USS on COM link + | Analog setpoint 2 |
| 76 | CB on COM link + | Analog setpoint 2 |
| 77 | Analog setpoint 2 + | Analog setpoint 2 |

**Index:**

P1500[0] : 1st. Command data set (CDS)
P1500[1] : 2nd. Command data set (CDS)
P1500[2] : 3rd. Command data set (CDS)

---

**P1501[3]** **BI: Change to torque control**

**CStat:** CT **Datatype:** U32 **Unit:** - **Min:** 0:0 **Def:** 0:0 **Max:** 4000:0 Level: **3**

**P-Group:** CONTROL **Active:** Immediately -

Selects command source from which it is possible to change between master (speed control) and slave (torque control).

**Index:**

P1501[0] : 1st. Command data set (CDS)
P1501[1] : 2nd. Command data set (CDS)
P1501[2] : 3rd. Command data set (CDS)

---

**P1503[3]** **CI: Torque setpoint**

**CStat:** T **Datatype:** U32 **Unit:** - **Min:** 0:0 **Def:** 0:0 **Max:** 4000:0 Level: **3**

**P-Group:** CONTROL **Active:** Immediately -

Selects source of torque setpoint for torque control.

**Index:**

P1503[0] : 1st. Command data set (CDS)
P1503[1] : 2nd. Command data set (CDS)
P1503[2] : 3rd. Command data set (CDS)

---

**r1508** **CO: Torque setpoint**

**Datatype:** Float **Unit:** Nm **Min:** - **Def:** - **Max:** - Level: **2**

**P-Group:** CONTROL

Displays torque setpoint before limitation.

---

**P1511[3]** **CI: Additional torque setpoint**

**CStat:** T **Datatype:** U32 **Unit:** - **Min:** 0:0 **Def:** 0:0 **Max:** 4000:0 Level: **3**

**P-Group:** CONTROL **Active:** Immediately -

Selects source of additional torque setpoint for torque and speed control.

**Index:**

P1511[0] : 1st. Command data set (CDS)
P1511[1] : 2nd. Command data set (CDS)
P1511[2] : 3rd. Command data set (CDS)

---

**r1515** **CO: Additional torque setpoint**

**Datatype:** Float **Unit:** Nm **Min:** - **Def:** - **Max:** - Level: **2**

**P-Group:** CONTROL

Displays additional torque setpoint.

---

**r1518** **CO: Acceleration torque**

**Datatype:** Float **Unit:** Nm **Min:** - **Def:** - **Max:** - Level: **3**

**P-Group:** CONTROL

Displays acceleration torque.

---

**P1520[3]** **CO: Upper torque limit**

**CStat:** CUT **Datatype:** Float **Unit:** Nm **Min:** -99999.0 **Def:** 5.13 **Max:** 99999.0 Level: **2**

**P-Group:** CONTROL **Active:** No -

Specifies fixed value for upper torque limitation.

**Index:**

P1520[0] : 1st. Drive data set (DDS)
P1520[1] : 2nd. Drive data set (DDS)
P1520[2] : 3rd. Drive data set (DDS)

---

**P1521[3]** **CO: Lower torque limit**

**CStat:** CUT **Datatype:** Float **Unit:** Nm **Min:** -99999.0 **Def:** -5.13 **Max:** 99999.0 Level: **2**

**P-Group:** CONTROL **Active:** No -

Enters fixed value of lower torque limitation.

**Index:**

P1521[0] : 1st. Drive data set (DDS)
P1521[1] : 2nd. Drive data set (DDS)
P1521[2] : 3rd. Drive data set (DDS)

**P1522[3]** **CI: Upper torque limit** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | T | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | CONTROL | **Active:** Immediately | - | **Def:** | 1520:0 |
| | | | | **Max:** | 4000:0 |

Selects source of upper torque limitation.

**Index:**

P1522[0] : 1st. Command data set (CDS)
P1522[1] : 2nd. Command data set (CDS)
P1522[2] : 3rd. Command data set (CDS)

**P1523[3]** **CI: Lower torque limit** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | T | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | CONTROL | **Active:** Immediately | - | **Def:** | 1521:0 |
| | | | | **Max:** | 4000:0 |

Selects source of lower torque limitation.

**Index:**

P1523[0] : 1st. Command data set (CDS)
P1523[1] : 2nd. Command data set (CDS)
P1523[2] : 3rd. Command data set (CDS)

**P1525[3]** **Scaling lower torque limit** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** % | **Min:** | -400.0 |
| **P-Group:** | CONTROL | **Active:** No | - | **Def:** | 100.0 |
| | | | | **Max:** | 400.0 |

Enters scaling of lower torque limitation in [%].

**Index:**

P1525[0] : 1st. Drive data set (DDS)
P1525[1] : 2nd. Drive data set (DDS)
P1525[2] : 3rd. Drive data set (DDS)

**Note:**

P1525 = 100 % = standard setting

**r1526** **CO: Upper torque limitation** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| | | **Datatype:** Float | **Unit:** Nm | **Min:** | - |
| **P-Group:** | CONTROL | | | **Def:** | - |
| | | | | **Max:** | - |

Displays actual upper torque limitation.

**r1527** **CO: Lower torque limitation** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| | | **Datatype:** Float | **Unit:** Nm | **Min:** | - |
| **P-Group:** | CONTROL | | | **Def:** | - |
| | | | | **Max:** | - |

Displays actual lower torque limitation.

**P1530[3]** **Motoring power limitation** Level: **2**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** - | **Min:** | 0.0 |
| **P-Group:** | CONTROL | **Active:** No | - | **Def:** | 0.75 |
| | | | | **Max:** | 8000.0 |

Defines fixed value of motoring power limitation.

The value is relative to the rated motor power (P0310).

**Index:**

P1530[0] : 1st. Drive data set (DDS)
P1530[1] : 2nd. Drive data set (DDS)
P1530[2] : 3rd. Drive data set (DDS)

**P1531[3]** **Regenerative power limitation** Level: **2**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** - | **Min:** | -8000.0 |
| **P-Group:** | CONTROL | **Active:** No | - | **Def:** | -0.75 |
| | | | | **Max:** | 0.0 |

Enters fixed value of regenerative power limitation.

The value is relative to the rated motor power (P0310).

**Index:**

P1531[0] : 1st. Drive data set (DDS)
P1531[1] : 2nd. Drive data set (DDS)
P1531[2] : 3rd. Drive data set (DDS)

**r1536** **CO: Max. trq. motoring current** Level: **4**

| | | | | | |
|---|---|---|---|---|---|
| | | **Datatype:** Float | **Unit:** A | **Min:** | - |
| **P-Group:** | CONTROL | | | **Def:** | - |
| | | | | **Max:** | - |

Displays maximum torque motoring current component.

**r1537** **CO: Max trq regenerative current** Level: **4**

| | | | | | |
|---|---|---|---|---|---|
| | | **Datatype:** Float | **Unit:** A | **Min:** | - |
| **P-Group:** | CONTROL | | | **Def:** | - |
| | | | | **Max:** | - |

Displays maximum torque of the regenerative current component.

**r1538** **CO: Upper torque limit (total)**
**Datatype:** Float **Unit:** Nm
**P-Group:** CONTROL
**Min:** - **Def:** - **Max:** -
Level: **2**

Displays total upper torque limitation.

**r1539** **CO: Lower torque limit (total)**
**Datatype:** Float **Unit:** Nm
**P-Group:** CONTROL
**Min:** - **Def:** - **Max:** -
Level: **2**

Displays total lower torque limitation.

**P1570[3]** **CO: Fixed value flux setpoint**
**CStat:** CUT **Datatype:** Float **Unit:** %
**P-Group:** CONTROL **Active:** No -
**Min:** 50.0 **Def:** 110.0 **Max:** 200.0
Level: **2**

Defines fixed value of flux setpoint in [%] relative to rated motor flux.

**Index:**
P1570[0] : 1st. Drive data set (DDS)
P1570[1] : 2nd. Drive data set (DDS)
P1570[2] : 3rd. Drive data set (DDS)

**Note:**
If P1570 > 100%, the flux setpoint rises according to the load from 100 % to the value of P1570 between idling and nominal load.

**P1574[3]** **Dynamic voltage headroom**
**CStat:** CUT **Datatype:** U16 **Unit:** V
**P-Group:** CONTROL **Active:** No -
**Min:** 0 **Def:** 10 **Max:** 150
Level: **3**

Sets dynamic voltage headroom for vector control.

**Index:**
P1574[0] : 1st. Drive data set (DDS)
P1574[1] : 2nd. Drive data set (DDS)
P1574[2] : 3rd. Drive data set (DDS)

**P1580[3]** **Efficiency optimization**
**CStat:** CUT **Datatype:** U16 **Unit:** %
**P-Group:** CONTROL **Active:** No -
**Min:** 0 **Def:** 0 **Max:** 100
Level: **2**

Enters degree of efficiency optimization in [%].

**Index:**
P1580[0] : 1st. Drive data set (DDS)
P1580[1] : 2nd. Drive data set (DDS)
P1580[2] : 3rd. Drive data set (DDS)

**Note:**
If P1580 > 0, the dynamics for speed control (P1470, P1472) are restricted to prevent vibration.

When no load is applied, a value of 100 % produces full flux reduction (i.e. to 50 % of rated motor flux).

When using optimization, it is necessary to increase the smoothing time of the flux setpoint (P1582).

**P1582[3]** **Smooth time for flux setpoint**
**CStat:** CUT **Datatype:** U16 **Unit:** ms
**P-Group:** CONTROL **Active:** No -
**Min:** 4 **Def:** 15 **Max:** 500
Level: **3**

Sets time constant of PT1 filter to smooth flux setpoint.

**Index:**
P1582[0] : 1st. Drive data set (DDS)
P1582[1] : 2nd. Drive data set (DDS)
P1582[2] : 3rd. Drive data set (DDS)

**r1583** **CO: Flux setpoint (smoothed)**
**Datatype:** Float **Unit:** %
**P-Group:** CONTROL
**Min:** - **Def:** - **Max:** -
Level: **4**

Displays smoothed flux setpoint in [%] relative to rated motor flux.

**P1596[3]** **Int. time field weak. controller**
**CStat:** CUT **Datatype:** U16 **Unit:** ms
**P-Group:** CONTROL **Active:** No -
**Min:** 20 **Def:** 50 **Max:** 32001
Level: **3**

Sets integral time for field weakening controller.

**Index:**
P1596[0] : 1st. Drive data set (DDS)
P1596[1] : 2nd. Drive data set (DDS)
P1596[2] : 3rd. Drive data set (DDS)

**r1597** **CO: Outp. field weak. controller**
**Datatype:** Float **Unit:** %
**P-Group:** CONTROL
**Min:** - **Def:** - **Max:** -
Level: **4**

Displays output signal of field weakening controller in [%] relative to rated motor flux.

**r1598** **CO: Flux setpoint (total)** Level: **3**

**Datatype:** Float **Unit:** % **Min:** - **Def:** - **Max:** -

**P-Group:** CONTROL

Displays total flux setpoint in [%] relative to the rated motor flux.

**P1610[3]** **Continuous torque boost (SLVC)** Level: **2**

**CStat:** CUT **Datatype:** Float **Unit:** % **Min:** 0.0 **Def:** 50.0 **Max:** 200.0

**P-Group:** CONTROL **Active:** No -

Sets continuous torque boost in lower speed range of SLVC (sensorless vector control).

Value is entered in [%] relative to rated motor load.

**Index:**

P1610[0] : 1st. Drive data set (DDS)
P1610[1] : 2nd. Drive data set (DDS)
P1610[2] : 3rd. Drive data set (DDS)

**Note:**

P1610 = 100 % corresponds to rated motor load

**P1611[3]** **Acc. torque boost (SLVC)** Level: **2**

**CStat:** CUT **Datatype:** Float **Unit:** % **Min:** 0.0 **Def:** 0.0 **Max:** 200.0

**P-Group:** CONTROL **Active:** No -

Sets acceleration torque boost in lower speed range of SLVC (sensorless vector control).

Value is entered in [%] relative to rated motor load.

**Index:**

P1611[0] : 1st. Drive data set (DDS)
P1611[1] : 2nd. Drive data set (DDS)
P1611[2] : 3rd. Drive data set (DDS)

**Note:**

P1611 = 100 % corresponds to rated motor load

**P1654[3]** **Smooth time for Isq setpoint** Level: **4**

**CStat:** CUT **Datatype:** Float **Unit:** ms **Min:** 2.0 **Def:** 6.0 **Max:** 20.0

**P-Group:** CONTROL **Active:** No -

Sets time constant of PT1 filter to filter setpoint of torque generating current component in field weakening range.

**Index:**

P1654[0] : 1st. Drive data set (DDS)
P1654[1] : 2nd. Drive data set (DDS)
P1654[2] : 3rd. Drive data set (DDS)

**P1715[3]** **Gain current controller** Level: **4**

**CStat:** CUT **Datatype:** Float **Unit:** - **Min:** 0.0 **Def:** 0.25 **Max:** 5.0

**P-Group:** CONTROL **Active:** No -

Enters gain of current controller.

**Index:**

P1715[0] : 1st. Drive data set (DDS)
P1715[1] : 2nd. Drive data set (DDS)
P1715[2] : 3rd. Drive data set (DDS)

**P1717[3]** **Integral time current controller** Level: **4**

**CStat:** CUT **Datatype:** Float **Unit:** ms **Min:** 1.0 **Def:** 4.1 **Max:** 50.0

**P-Group:** CONTROL **Active:** No -

Enters integral time of current controller.

**Index:**

P1717[0] : 1st. Drive data set (DDS)
P1717[1] : 2nd. Drive data set (DDS)
P1717[2] : 3rd. Drive data set (DDS)

**r1718** **CO: Output of Isq controller** Level: **4**

**Datatype:** Float **Unit:** V **Min:** - **Def:** - **Max:** -

**P-Group:** CONTROL

Displays actual output of Isq current (torque current) controller (PI controller). It contains the proportional and integral part of the PI controller.

**r1719** **CO: Integral output of Isq ctrl.** Level: **4**

**Datatype:** Float **Unit:** V **Min:** - **Def:** - **Max:** -

**P-Group:** CONTROL

Displays integral output of Isq current (torque current) controller (PI controller).

**r1723** **CO: Output of Isd controller** Level: **4**

**Datatype:** Float **Unit:** V **Min:** - **Def:** - **Max:** -

**P-Group:** CONTROL

Displays actual output of Isd current (flux current) controller (PI controller). It contains the proportional and integral part of the PI controller.

**r1724** **CO: Integral output of Isd ctrl.** Level: **4**

**Datatype:** Float **Unit:** V **Min:** - **Def:** - **Max:** -

**P-Group:** CONTROL

Displays integral output of Isd current (flux current) controller (PI controller).

**r1725** **CO: Integral limit of Isd ctrl.** Level: **4**

**Datatype:** Float **Unit:** V **Min:** - **Def:** - **Max:** -

**P-Group:** CONTROL

Displays limit of integral output voltage setpoint of Isd current controller.

**r1728** **CO: Decoupling voltage** Level: **4**

**Datatype:** Float **Unit:** V **Min:** - **Def:** - **Max:** -

**P-Group:** CONTROL

Displays actual output voltage setpoint of cross channel decoupling.

**P1740** **Gain for oscillation damping** Level: **3**

**CStat:** CUT **Datatype:** Float **Unit:** - **Min:** 0.000 **Def:** 0.000 **Max:** 10.000

**P-Group:** CONTROL **Active:** No -

Sets oscillation damping gain for sensorless vector control at low frequencies.

**P1750[3]** **Control word of motor model** Level: **3**

**CStat:** CUT **Datatype:** U16 **Unit:** - **Min:** 0 **Def:** 0 **Max:** 3

**P-Group:** CONTROL **Active:** Immediately -

Control word of motor model.

**Bitfields:**

| | | | |
|---|---|---|---|
| Bit00 | Start open loop | 0 | NO |
| | | 1 | YES |
| Bit01 | Zero crossing open loop | 0 | NO |
| | | 1 | YES |

**Index:**

P1750[0] : 1st. Drive data set (DDS)
P1750[1] : 2nd. Drive data set (DDS)
P1750[2] : 3rd. Drive data set (DDS)

**r1751** **Status word of motor model** Level: **3**

**Datatype:** U16 **Unit:** - **Min:** - **Def:** - **Max:** -

**P-Group:** CONTROL

Displays status of transition from feed-forward to observer-control and vice versa.

**Bitfields:**

| | | | |
|---|---|---|---|
| Bit00 | Transit to open loop | 0 | NO |
| | | 1 | YES |
| Bit01 | N-adaption enabled | 0 | NO |
| | | 1 | YES |
| Bit02 | Switch freq. to observer | 0 | NO |
| | | 1 | YES |
| Bit03 | Speed controller enabled | 0 | NO |
| | | 1 | YES |
| Bit04 | Current injection | 0 | NO |
| | | 1 | YES |
| Bit05 | Start flux decrease | 0 | NO |
| | | 1 | YES |
| Bit14 | Rs adapted | 0 | NO |
| | | 1 | YES |
| Bit15 | Xh adapted | 0 | NO |
| | | 1 | YES |

**P1755[3]** **Stop-freq. motor model (SLVC)** Level: **4**

**CStat:** CUT **Datatype:** Float **Unit:** Hz **Min:** 0.1 **Def:** 2.5 **Max:** 250.0

**P-Group:** CONTROL **Active:** No -

Enters stop frequency of sensorless vector control (SLVC).

Value is entered in [%] relative to P0310 (rated motor frequency).

**Index:**

P1755[0] : 1st. Drive data set (DDS)
P1755[1] : 2nd. Drive data set (DDS)
P1755[2] : 3rd. Drive data set (DDS)

**P1756[3]** **Hyst.-freq. motor model (SLVC)** Level: **4**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** % | **Min:** | 10.0 |
| **P-Group:** | CONTROL | **Active:** No | - | **Def:** | 50.0 |
| | | | | **Max:** | 100.0 |

Enters hysteresis frequency (in percent of stop-frequency) to switch from open-loop to sensorless-vector-control (SLVC).

Value is entered in the range 0 % to 50 % relative to P1755 (SLVC stop frequency).

**Index:**
P1756[0] : 1st. Drive data set (DDS)
P1756[1] : 2nd. Drive data set (DDS)
P1756[2] : 3rd. Drive data set (DDS)

**P1758[3]** **T(wait) transit to feed-fwd-mode** Level: **4**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U16 | **Unit:** ms | **Min:** | 100 |
| **P-Group:** | CONTROL | **Active:** No | - | **Def:** | 1500 |
| | | | | **Max:** | 2000 |

Sets waiting time for change from observer-mode to feed-forward-mode

**Index:**
P1758[0] : 1st. Drive data set (DDS)
P1758[1] : 2nd. Drive data set (DDS)
P1758[2] : 3rd. Drive data set (DDS)

**P1759[3]** **T(wait) for n-adaption to settle** Level: **4**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U16 | **Unit:** ms | **Min:** | 50 |
| **P-Group:** | CONTROL | **Active:** No | - | **Def:** | 100 |
| | | | | **Max:** | 2000 |

Sets waiting time while transition is done from open-loop to close-loop operation

**Index:**
P1759[0] : 1st. Drive data set (DDS)
P1759[1] : 2nd. Drive data set (DDS)
P1759[2] : 3rd. Drive data set (DDS)

**P1764[3]** **Kp of n-adaption (SLVC)** Level: **4**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** - | **Min:** | 0.0 |
| **P-Group:** | CONTROL | **Active:** No | - | **Def:** | 0.2 |
| | | | | **Max:** | 2.5 |

Enters gain of speed adaptation controller for sensorless vector control.

**Index:**
P1764[0] : 1st. Drive data set (DDS)
P1764[1] : 2nd. Drive data set (DDS)
P1764[2] : 3rd. Drive data set (DDS)

**P1767[3]** **Tn of n-adaption (SLVC)** Level: **4**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** ms | **Min:** | 1.0 |
| **P-Group:** | CONTROL | **Active:** No | - | **Def:** | 4.0 |
| | | | | **Max:** | 200.0 |

Enters speed adaptation controller integral time.

**Index:**
P1767[0] : 1st. Drive data set (DDS)
P1767[1] : 2nd. Drive data set (DDS)
P1767[2] : 3rd. Drive data set (DDS)

**r1770** **CO: Prop. output of n-adaption** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| | | **Datatype:** Float | **Unit:** Hz | **Min:** | - |
| **P-Group:** | CONTROL | | | **Def:** | - |
| | | | | **Max:** | - |

Displays integral part of speed adaptation controller.

**r1771** **CO: Int. output of n-adaption** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| | | **Datatype:** Float | **Unit:** Hz | **Min:** | - |
| **P-Group:** | CONTROL | | | **Def:** | - |
| | | | | **Max:** | - |

Displays integral part of speed adaptation controller.

**r1778** **CO: Flux angle difference** Level: **4**

| | | | | | |
|---|---|---|---|---|---|
| | | **Datatype:** Float | **Unit:** ° | **Min:** | - |
| **P-Group:** | CONTROL | | | **Def:** | - |
| | | | | **Max:** | - |

Displays flux angle difference between motor model and current transformation before motor model is active.

**P1780[3]** **Control word of Rs/Rr-adaption** Level: **3**

**CStat:** CUT **Datatype:** U16 **Unit:** - **Min:** 0
**P-Group:** CONTROL **Active:** Immediately - **Def:** 3
**Max:** 3

Enables thermal adaptation of stator and rotor resistance to reduce torque errors in speed/torque regulation with speed sensor, or speed errors in speed/torque regulation without speed sensor.

**Bitfields:**

| | | | |
|---|---|---|---|
| Bit00 | Enable thermal Rs/Rr-adapt. | 0 | NO |
| | | 1 | YES |
| Bit01 | Enable observer Rs/Xm-adapt. | 0 | NO |
| | | 1 | YES |

**Index:**

P1780[0] : 1st. Drive data set (DDS)
P1780[1] : 2nd. Drive data set (DDS)
P1780[2] : 3rd. Drive data set (DDS)

**Note:**

Only stator resistance adaptation is carried out for synchronous motors.

**P1781[3]** **Tn of Rs-adaption** Level: **4**

**CStat:** CUT **Datatype:** U16 **Unit:** ms **Min:** 10
**P-Group:** CONTROL **Active:** No - **Def:** 500
**Max:** 2000

Enters Rs-adaptation controller integral time.

**Index:**

P1781[0] : 1st. Drive data set (DDS)
P1781[1] : 2nd. Drive data set (DDS)
P1781[2] : 3rd. Drive data set (DDS)

**r1782** **Output of Rs-adaptation** Level: **3**

**Datatype:** Float **Unit:** % **Min:** -
**P-Group:** CONTROL **Def:** -
**Max:** -

Displays stator resistance adaptation from controller in [%] relative to rated motor resistance.

**Note:**

The rated motor resistance is given by the formula:

$$\text{Rated motor resistance} = P0304\,(\text{rated motor voltage}) * \sqrt{3} * P0305\,(\text{rated motor voltage})$$

**P1786[3]** **Tn of Xm-adaption** Level: **4**

**CStat:** CUT **Datatype:** U16 **Unit:** ms **Min:** 10
**P-Group:** CONTROL **Active:** No - **Def:** 100
**Max:** 2000

Enters Xm-adaptation controller integral time.

**Index:**

P1786[0] : 1st. Drive data set (DDS)
P1786[1] : 2nd. Drive data set (DDS)
P1786[2] : 3rd. Drive data set (DDS)

**r1787** **Output of Xm-adaption** Level: **3**

**Datatype:** Float **Unit:** % **Min:** -
**P-Group:** CONTROL **Def:** -
**Max:** -

Displays main reactance adaptation from controller in [%] relative to rated impedance.

**Note:**

The rated motor resistance is given by the formula:

$$\text{Rated motor resistance} = P0304\,(\text{rated motor voltage}) * \sqrt{3} * P0305\,(\text{rated motor voltage})$$

**P1800** **Pulse frequency** Level: **2**

**CStat:** CUT **Datatype:** U16 **Unit:** kHz **Min:** 2
**P-Group:** INVERTER **Active:** No - **Def:** 4
**Max:** 16

Sets pulse frequency of power switches in inverter. The frequency can be changed in steps of 2 kHz.

Pulse frequencies > 4 kHz selected on 380-480 V units reduce the maximum continuous motor current.

**Dependency:**

Minimum pulse frequency depends on P1082 (maximum frequency) and P0310 (rated motor frequency).

**Note:**

If silent operation is not absolutely necessary, lower pulse frequencies may be selected to reduce inverter losses and radio-frequency emissions.

Under certain circumstances, the inverter may reduce the switching frequency to provide protection against over-temperature (see P0290, Level 3).

**r1801** **CO: Act. switching frequency** Level: **3**

**Datatype:** U16 **Unit:** kHz **Min:** - **Def:** - **Max:** -

**P-Group:** INVERTER

Actual pulse frequency of power switches in inverter.

**Notice:**

Under certain conditions (inverter overtemperature, see P0290), this can differ from the values selected in P1800 (pulse frequency).

**P1802** **Modulator mode** Level: **3**

**CStat:** CUT **Datatype:** U16 **Unit:** - **Min:** 0 **Def:** 0 **Max:** 2

**P-Group:** INVERTER **Active:** Immediately -

Selects inverter modulator mode.

**Enum:**

0 SVM/ASVM automatic mode
1 Asymmetric SVM
2 Space vector modulation

**Notice:**

Asymmetric space vector modulation (ASVM) produces lower switching losses than space vector modulation (SVM), but may cause irregular rotation at very low speeds.

Space vector modulation (SVM) with over-modulation may produce current waveform distortion at high output voltages.

Space vector modulation (SVM) without over-modulation will reduce maximum output voltage available to motor.

**P1803[3]** **Max. modulation** Level: **4**

**CStat:** CUT **Datatype:** Float **Unit:** % **Min:** 20.0 **Def:** 106.0 **Max:** 150.0

**P-Group:** INVERTER **Active:** No -

Sets maximum modulation index.

**Index:**

P1803[0] : 1st. Drive data set (DDS)
P1803[1] : 2nd. Drive data set (DDS)
P1803[2] : 3rd. Drive data set (DDS)

**Note:**

P1803 = 100 % = limit for over-control (for ideal inverter without switching delay). For vector control the modulation limit will be reduced automatically with 4 %.

**P1820[3]** **Reverse output phase sequence** Level: **2**

**CStat:** CT **Datatype:** U16 **Unit:** - **Min:** 0 **Def:** 0 **Max:** 1

**P-Group:** INVERTER **Active:** Immediately -

Changes direction of motor rotation without changing setpoint polarity.

**Enum:**

0 OFF
1 ON

**Index:**

P1820[0] : 1st. Drive data set (DDS)
P1820[1] : 2nd. Drive data set (DDS)
P1820[2] : 3rd. Drive data set (DDS)

**Dependency:**

If positive and negative revolution is enabled, frequency setpoint is directly used.
If both positive and negative revolution are disabled, reference value is set to zero.

**Details:**

See P1000 (select frequency setpoint)

**P1825** **On-state voltage of IGBT** Level: **4**

**CStat:** CUT **Datatype:** Float **Unit:** V **Min:** 0.0 **Def:** 1.4 **Max:** 20.0

**P-Group:** INVERTER **Active:** No -

Corrects on-state voltage of the IGBTs.

**P1828** **Gating unit dead time** Level: **4**

**CStat:** CUT **Datatype:** Float **Unit:** us **Min:** 0.00 **Def:** 0.50 **Max:** 3.50

**P-Group:** INVERTER **Active:** Immediately -

Sets compensation time of gating unit interlock.

**P1909[3]** **Ctrl. word of motor data ident.** Level: **4**

**CStat:** CUT **Datatype:** U16 **Unit:** - **Min:** 0
**P-Group:** CONTROL **Active:** Immediately - **Def:** 1
**Max:** 1

Control word of motor data identification.

**Bitfields:**

| | | | |
|---|---|---|---|
| Bit00 | Estimation of Xs | 0 | NO |
| | | 1 | YES |

**Index:**

P1909[0] : 1st. Drive data set (DDS)
P1909[1] : 2nd. Drive data set (DDS)
P1909[2] : 3rd. Drive data set (DDS)

**P1910** **Select motor data identification** Level: **2**

**CStat:** CT **Datatype:** U16 **Unit:** - **Min:** 0
**P-Group:** MOTOR **Active:** Immediately QuickCom **Def:** 0
**Max:** 20

Performs a motor data identification.

**Settings:**

P1910 = 1: All motor data
* P0350 stator resistance,
* P0354 rotor resistance,
* P0356 stator leakage reactance,
* P0358 rotor leakage reactance,
* P0360 main reactance

will be identified and parameter will be changed.

P1910 = 3: Saturation curve
* P0362 ... P0365 magnetizing curve flux 1 .. 4
* P0366 ... P0369 magnetizing curve imag 1 .. 4

will be identified and parameter will be changed.

**Enum:**

| | |
|---|---|
| 0 | Disabled |
| 1 | Identification of all parameters with parameter change |
| 2 | Identification of all parameters without parameter change |
| 3 | Identification of saturation curve with parameter change |
| 4 | Identification of saturation curve without parameter change |
| 5 | Identification of XsigDyn (r1920) without parameter change |
| 6 | Identification of Tdead (r1926) without parameter change |
| 7 | Identification of Rs (r1912 ) without parameter change |
| 8 | Identification of Xs (r1915) without parameter change |
| 9 | Identification of Tr (r1913) without parameter change |
| 10 | Identification of Xsigma (r1914) without parameter change |
| 20 | Set voltage vector |

**Note:**

Before selecting motor data identification, "Quick commissioning" has to be performed in advance.

Once enabled (P1910 = 1), A0541 generates a warning that the next ON command will initiate measurement of motor parameters.

**Notice:**

When choosing the setting for measurement, observe the following:
1. "with parameter change" means that the values are actually adopted as Pxxxx parameter settings (see common settings above) and applied to the controller as well as being shown in the read-only parameters below.
2. "without parameter change" means that the values are only displayed, i.e. shown for checking purposes in the read-only parameters r1912 (identified stator resistance), r1913 (identified rotor time constant), r1914 (ident. total leakage reactance), r1915/r1916/1917/1918/1919 (identified nominal stator reactance/identified stator reactance 1 to 4) and
1926 (identified gating unit dead time). The values are not applied to the controller.

**P1911** **No. of phase to be identified** Level: **2**

**CStat:** CT **Datatype:** U16 **Unit:** - **Min:** 1
**P-Group:** INVERTER **Active:** No - **Def:** 3
**Max:** 3

Selects maximum number of motor phases to be identified.

**r1912[3]** **Identified stator resistance** Level: **2**

**Datatype:** Float **Unit:** Ohm **Min:** -
**P-Group:** MOTOR **Def:** -
**Max:** -

Displays measured stator resistance value (line-to-line) in [Ohms]

**Index:**

r1912[0] : U_phase
r1912[1] : V_phase
r1912[2] : W_phase

**Note:**

This value is measured using P1910 = 1 or 2 , i.e., identification of all parameters with/without change.

**r1913[3] Identified rotor time constant**

**Datatype:** Float **Unit:** ms **P-Group:** MOTOR

**Min:** - **Def:** - **Max:** -

Level: **2**

Displays identified rotor time constant.

**Index:**

r1913[0] : U_phase
r1913[1] : V_phase
r1913[2] : W_phase

**r1914[3] Ident. total leakage inductance**

**Datatype:** Float **Unit:** - **P-Group:** MOTOR

**Min:** - **Def:** - **Max:** -

Level: **2**

Displays identified total leakage inductance.

**Index:**

r1914[0] : U_phase
r1914[1] : V_phase
r1914[2] : W_phase

**r1915[3] Ident. nom. stator inductance**

**Datatype:** Float **Unit:** - **P-Group:** MOTOR

**Min:** - **Def:** - **Max:** -

Level: **2**

Displays identified stator inductance.

**Index:**

r1915[0] : U_phase
r1915[1] : V_phase
r1915[2] : W_phase

**Notice:**

If the value identified (Ls = stator inductance) does not lie within the range
50 % < Xs [p. u.] < 500 %
fault message 41 (motor data identification failure) is issued.
P0949 provides further information (fault value = 4 in this case).

**r1916[3] Identified stator inductance 1**

**Datatype:** Float **Unit:** - **P-Group:** MOTOR

**Min:** - **Def:** - **Max:** -

Level: **2**

Displays identified stator inductance.

**Index:**

r1916[0] : U_phase
r1916[1] : V_phase
r1916[2] : W_phase

**Details:**

See P1915 (identified nominal stator inductance)

**r1917[3] Identified stator inductance 2**

**Datatype:** Float **Unit:** - **P-Group:** MOTOR

**Min:** - **Def:** - **Max:** -

Level: **2**

Displays identified stator inductance.

**Index:**

r1917[0] : U_phase
r1917[1] : V_phase
r1917[2] : W_phase

**Details:**

See P1915 (identified nominal stator inductance)

**r1918[3] Identified stator inductance 3**

**Datatype:** Float **Unit:** - **P-Group:** MOTOR

**Min:** - **Def:** - **Max:** -

Level: **2**

Displays identified stator inductance.

**Index:**

r1918[0] : U_phase
r1918[1] : V_phase
r1918[2] : W_phase

**Details:**

See P1915 (identified nominal stator reactance)

**r1919[3] Identified stator inductance 4**

**Datatype:** Float **Unit:** - **Min:** - **Def:** - **Max:** - Level: **2**

**P-Group:** MOTOR

Displays identified stator inductance.

**Index:**

r1919[0] : U_phase
r1919[1] : V_phase
r1919[2] : W_phase

**Details:**

See P1915 (identified nominal stator inductance)

**r1920[3] Identified dyn.leak.induct.**

**Datatype:** Float **Unit:** - **Min:** - **Def:** - **Max:** - Level: **2**

**P-Group:** MOTOR

Displays identified total dynamic leakage inductance.

**Index:**

r1920[0] : U_phase
r1920[1] : V_phase
r1920[2] : W_phase

**r1925 Identified on-state voltage**

**Datatype:** Float **Unit:** V **Min:** - **Def:** - **Max:** - Level: **2**

**P-Group:** INVERTER

Displays identified on-state voltage of IGBT.

**r1926 Ident. gating unit dead time**

**Datatype:** Float **Unit:** us **Min:** - **Def:** - **Max:** - Level: **2**

**P-Group:** INVERTER

Displays identified dead time of gating unit interlock.

**P1930 Voltage setpoint for calibration**

**CStat:** CUT **Datatype:** Float **Unit:** V **Min:** 0 **Def:** 0 **Max:** 1000 Level: **4**

**P-Group:** INVERTER **Active:** No -

Specifies reference voltage for generation of a test voltage vector (e.g. used for shunt calibration).

**P1931 Phase**

**CStat:** CUT **Datatype:** U16 **Unit:** - **Min:** 1 **Def:** 1 **Max:** 6 Level: **4**

**P-Group:** INVERTER **Active:** No -

Defines phase of voltage vector

**P2000[3] Reference frequency**

**CStat:** CT **Datatype:** Float **Unit:** Hz **Min:** 1.00 **Def:** 50.00 **Max:** 650.00 Level: **2**

**P-Group:** COMM **Active:** Immediately -

Full-scale frequency setting used by serial link (corresponds to 4000H), analog I/O and P/D controller.

**Index:**

P2000[0] : 1st. Drive data set (DDS)
P2000[1] : 2nd. Drive data set (DDS)
P2000[2] : 3rd. Drive data set (DDS)

**P2001[3] Reference voltage**

**CStat:** CT **Datatype:** U16 **Unit:** V **Min:** 10 **Def:** 1000 **Max:** 2000 Level: **3**

**P-Group:** COMM **Active:** Immediately -

Full-scale output voltage (i.e. 100 % ) used over serial link (corresponds to 4000H).

**Example:**

P0201 = 230 specifies that 4000H received via USS denotes 230 V.

**Index:**

P2001[0] : 1st. Drive data set (DDS)
P2001[1] : 2nd. Drive data set (DDS)
P2001[2] : 3rd. Drive data set (DDS)

**P2002[3] Reference current**

**CStat:** CT **Datatype:** Float **Unit:** A **Min:** 0.10 **Def:** 0.10 **Max:** 10000.00 Level: **3**

**P-Group:** COMM **Active:** Immediately -

Full-scale output current used over serial link (corresponds to 4000H).

**Index:**

P2002[0] : 1st. Drive data set (DDS)
P2002[1] : 2nd. Drive data set (DDS)
P2002[2] : 3rd. Drive data set (DDS)

**P2003[3] Reference torque** Level: **3**

**CStat:** CT **Datatype:** Float **Unit:** Nm **Min:** 0.10
**P-Group:** COMM **Active:** Immediately - **Def:** 0.75
**Max:** 99999.00

Full-scale reference torque used over the serial link (corresponds to 4000H).

**Index:**

P2003[0] : 1st. Drive data set (DDS)
P2003[1] : 2nd. Drive data set (DDS)
P2003[2] : 3rd. Drive data set (DDS)

**r2004[3] Reference power** Level: **3**

**Datatype:** Float **Unit:** - **Min:** -
**Def:** -
**P-Group:** COMM **Max:** -

Full-scale reference power used over the serial link (corresponds to 4000H).

**Index:**

r2004[0] : 1st. Drive data set (DDS)
r2004[1] : 2nd. Drive data set (DDS)
r2004[2] : 3rd. Drive data set (DDS)

**P2009[2] USS normalization** Level: **3**

**CStat:** CT **Datatype:** U16 **Unit:** - **Min:** 0
**P-Group:** COMM **Active:** Immediately - **Def:** 0
**Max:** 1

Enables special normalization for USS.

**Enum:**

0 Disabled
1 Enabled

**Index:**

P2009[0] : Serial interface COM link
P2009[1] : Serial interface BOP link

**Note:**

If enabled, the main setpoint (word 2 in PZD) is not interpreted as 100 % = 4000H, but as "absolute" instead (e.g. 4000H = 16384 means 163.84 Hz ).

**P2010[2] USS baudrate** Level: **2**

**CStat:** CUT **Datatype:** U16 **Unit:** - **Min:** 4
**P-Group:** COMM **Active:** Immediately - **Def:** 6
**Max:** 12

Sets baud rate for USS communication.

**Enum:**

4 2400 baud
5 4800 baud
6 9600 baud
7 19200 baud
8 38400 baud
9 57600 baud
10 76800 baud
11 93750 baud
12 115200 baud

**Index:**

P2010[0] : Serial interface COM link
P2010[1] : Serial interface BOP link

**P2011[2] USS address** Level: **2**

**CStat:** CUT **Datatype:** U16 **Unit:** - **Min:** 0
**P-Group:** COMM **Active:** Immediately - **Def:** 0
**Max:** 31

Sets unique address for inverter.

**Index:**

P2011[0] : Serial interface COM link
P2011[1] : Serial interface BOP link

**Note:**

You can connect up to a further 30 inverters via the serial link (i.e. 31 inverters in total) and control them with the USS serial bus protocol.

**P2012[2] USS PZD length** Level: **3**

**CStat:** CUT **Datatype:** U16 **Unit:** - **Min:** 0
**P-Group:** COMM **Active:** Immediately - **Def:** 2
**Max:** 8

Defines the number of 16-bit words in PZD part of USS telegram. The PZD part of the USS telegram is used for the main setpoint, and to control the inverter.

**Index:**

P2012[0] : Serial interface COM link
P2012[1] : Serial interface BOP link

**P2013[2]** **USS PKW length**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U16 | **Unit:** - | **Min:** | 0 |
| **P-Group:** | COMM | **Active:** Immediately | - | **Def:** | 127 |
| | | | | **Max:** | 127 |

Level: **3**

Defines the number of 16-bit words in PKW part of USS telegram. The PKW part of the USS telegram is used to read and write individual parameter values

**Enum:**

0 No words
3 3 words
4 4 words
27 Variable

**Index:**

P2013[0] : Serial interface COM link
P2013[1] : Serial interface BOP link

**Notice:**

Setting P2013 has implications for the PKW word order, please refer to the Reference Manual for details

**P2014[2]** **USS telegram off time**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U16 | **Unit:** ms | **Min:** | 0 |
| **P-Group:** | COMM | **Active:** No | - | **Def:** | 0 |
| | | | | **Max:** | 65535 |

Level: **3**

Defines a time T_off after which a fault will be generated (F0070) if no telegram is received via the USS channels.

**Index:**

P2014[0] : Serial interface COM link
P2014[1] : Serial interface BOP link

**Notice:**

By default (time set to 0), no fault is generated (i.e. watchdog disabled).

**r2015[8]** **CO: PZD from BOP link (USS)**

| | | | | | |
|---|---|---|---|---|---|
| | | **Datatype:** U16 | **Unit:** - | **Min:** | - |
| **P-Group:** | COMM | | | **Def:** | - |
| | | | | **Max:** | - |

Level: **3**

Displays process data received via USS on BOP link (RS232 USS).

**Index:**

r2015[0] : Received word 0
r2015[1] : Received word 1
r2015[2] : Received word 2
r2015[3] : Received word 3
r2015[4] : Received word 4
r2015[5] : Received word 5
r2015[6] : Received word 6
r2015[7] : Received word 7

**Note:**

The control words can be viewed as bit parameters r2032 and r2033.

**P2016[8]** **CI: PZD to BOP link (USS)**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | COMM | **Active:** No | - | **Def:** | 52:0 |
| | | | | **Max:** | 4000:0 |

Level: **3**

Selects signals to be transmitted to serial interface via BOP link

**Example:**

P2016[0] = 52.0 (default). In this case, the value of r0052[0] (CO/BO: Status word) is transmitted as 1st PZD to the BOP link.

**Index:**

P2016[0] : Transmitted word 0
P2016[1] : Transmitted word 1
P2016[2] : Transmitted word 2
P2016[3] : Transmitted word 3
P2016[4] : Transmitted word 4
P2016[5] : Transmitted word 5
P2016[6] : Transmitted word 6
P2016[7] : Transmitted word 7

**Note:**

If r0052 not indexed, display does not show an index (".0" ).

**r2018[8]** **CO: PZD from COM link (USS)** Level: **3**

**Datatype:** U16 **Unit:** - **Min:** - **Def:** - **Max:** -

**P-Group:** COMM

Displays process data received via USS on COM link

**Index:**

r2018[0] : Received word 0
r2018[1] : Received word 1
r2018[2] : Received word 2
r2018[3] : Received word 3
r2018[4] : Received word 4
r2018[5] : Received word 5
r2018[6] : Received word 6
r2018[7] : Received word 7

**Note:**

The control words can be viewed as bit parameters r2032 and r2033.

**P2019[8]** **CI: PZD to COM link (USS)** Level: **3**

**CStat:** CT **Datatype:** U32 **Unit:** - **Min:** 0:0 **Def:** 52:0 **Max:** 4000:0

**P-Group:** COMM **Active:** No -

**Index:**

P2019[0] : Transmitted word 0
P2019[1] : Transmitted word 1
P2019[2] : Transmitted word 2
P2019[3] : Transmitted word 3
P2019[4] : Transmitted word 4
P2019[5] : Transmitted word 5
P2019[6] : Transmitted word 6
P2019[7] : Transmitted word 7

**Details:**

See r2016 (PZD to BOP link)

**r2024[2]** **USS error-free telegrams** Level: **3**

**Datatype:** U16 **Unit:** - **Min:** - **Def:** - **Max:** -

**P-Group:** COMM

Displays number of error-free USS telegrams received.

**Index:**

r2024[0] : Serial interface COM link
r2024[1] : Serial interface BOP link

**r2025[2]** **USS rejected telegrams** Level: **3**

**Datatype:** U16 **Unit:** - **Min:** - **Def:** - **Max:** -

**P-Group:** COMM

Displays number of USS telegrams rejected.

**Index:**

r2025[0] : Serial interface COM link
r2025[1] : Serial interface BOP link

**r2026[2]** **USS character frame error** Level: **3**

**Datatype:** U16 **Unit:** - **Min:** - **Def:** - **Max:** -

**P-Group:** COMM

Displays number of USS character frame errors.

**Index:**

r2026[0] : Serial interface COM link
r2026[1] : Serial interface BOP link

**r2027[2]** **USS overrun error** Level: **3**

**Datatype:** U16 **Unit:** - **Min:** - **Def:** - **Max:** -

**P-Group:** COMM

Displays number of USS telegrams with overrun error.

**Index:**

r2027[0] : Serial interface COM link
r2027[1] : Serial interface BOP link

**r2028[2]** **USS parity error** Level: **3**

**Datatype:** U16 **Unit:** - **Min:** - **Def:** - **Max:** -

**P-Group:** COMM

Displays number of USS telegrams with parity error.

**Index:**

r2028[0] : Serial interface COM link
r2028[1] : Serial interface BOP link

**r2029[2]** **USS start not identified** Level: **3**

**Datatype:** U16 **Unit:** - **Min:** - **Def:** - **Max:** -

**P-Group:** COMM

Displays number of USS telegrams with unidentified start.

**Index:**
r2029[0] : Serial interface COM link
r2029[1] : Serial interface BOP link

**r2030[2]** **USS BCC error** Level: **3**

**Datatype:** U16 **Unit:** - **Min:** - **Def:** - **Max:** -

**P-Group:** COMM

Displays number of USS telegrams with BCC error.

**Index:**
r2030[0] : Serial interface COM link
r2030[1] : Serial interface BOP link

**r2031[2]** **USS length error** Level: **3**

**Datatype:** U16 **Unit:** - **Min:** - **Def:** - **Max:** -

**P-Group:** COMM

Displays number of USS telegrams with incorrect length.

**Index:**
r2031[0] : Serial interface COM link
r2031[1] : Serial interface BOP link

**r2032** **BO: CtrlWrd1 from BOP link (USS)** Level: **3**

**Datatype:** U16 **Unit:** - **Min:** - **Def:** - **Max:** -

**P-Group:** COMM

Displays control word 1 from BOP link (PZD word 1 within USS).

**Bitfields:**

| | | | |
|---|---|---|---|
| Bit00 | ON/OFF1 | 0 | NO |
| | | 1 | YES |
| Bit01 | OFF2: Electrical stop | 0 | YES |
| | | 1 | NO |
| Bit02 | OFF3: Fast stop | 0 | YES |
| | | 1 | NO |
| Bit03 | Pulse enable | 0 | NO |
| | | 1 | YES |
| Bit04 | RFG enable | 0 | NO |
| | | 1 | YES |
| Bit05 | RFG start | 0 | NO |
| | | 1 | YES |
| Bit06 | Setpoint enable | 0 | NO |
| | | 1 | YES |
| Bit07 | Fault acknowledge | 0 | NO |
| | | 1 | YES |
| Bit08 | JOG right | 0 | NO |
| | | 1 | YES |
| Bit09 | JOG left | 0 | NO |
| | | 1 | YES |
| Bit10 | Control from PLC | 0 | NO |
| | | 1 | YES |
| Bit11 | Reverse (setpoint inversion) | 0 | NO |
| | | 1 | YES |
| Bit13 | Motor potentiometer MOP up | 0 | NO |
| | | 1 | YES |
| Bit14 | Motor potentiometer MOP down | 0 | NO |
| | | 1 | YES |
| Bit15 | CDS Bit 0 (Local/Remote) | 0 | NO |
| | | 1 | YES |

**r2033** **BO: CtrlWrd2 from BOP link (USS)** Level: **3**

**Datatype:** U16 **Unit:** - **Min:** - **Def:** - **Max:** -

**P-Group:** COMM

Displays control word 2 from BOP link (i.e. PZD word 4 within USS)

**Bitfields:**

| | | | |
|---|---|---|---|
| Bit00 | Fixed frequency Bit 0 | 0 | NO |
| | | 1 | YES |
| Bit01 | Fixed frequency Bit 1 | 0 | NO |
| | | 1 | YES |
| Bit02 | Fixed frequency Bit 2 | 0 | NO |
| | | 1 | YES |
| Bit03 | Fixed frequency Bit 3 | 0 | NO |
| | | 1 | YES |
| Bit04 | Drive data set (DDS) Bit 0 | 0 | NO |
| | | 1 | YES |
| Bit05 | Drive data set (DDS) Bit 1 | 0 | NO |
| | | 1 | YES |
| Bit08 | PID enabled | 0 | NO |
| | | 1 | YES |
| Bit09 | DC brake enabled | 0 | NO |
| | | 1 | YES |
| Bit11 | Droop | 0 | NO |
| | | 1 | YES |
| Bit12 | Torque control | 0 | NO |
| | | 1 | YES |
| Bit13 | External fault 1 | 0 | YES |
| | | 1 | NO |
| Bit15 | Command data set (CDS) Bit 1 | 0 | NO |
| | | 1 | YES |

**Dependency:**

P0700 = 5 (USS on COM link) and P0719 = 0 (Cmd / Setpoint = BICO parameter).

**r2036** **BO: CtrlWrd1 from COM link (USS)** Level: **3**

**Datatype:** U16 **Unit:** - **Min:** - **Def:** - **Max:** -

**P-Group:** COMM

Displays control word 1 from COM link (i.e. PZD word 1 within USS)

**Bitfields:**

| | | | |
|---|---|---|---|
| Bit00 | ON/OFF1 | 0 | NO |
| | | 1 | YES |
| Bit01 | OFF2: Electrical stop | 0 | YES |
| | | 1 | NO |
| Bit02 | OFF3: Fast stop | 0 | YES |
| | | 1 | NO |
| Bit03 | Pulse enable | 0 | NO |
| | | 1 | YES |
| Bit04 | RFG enable | 0 | NO |
| | | 1 | YES |
| Bit05 | RFG start | 0 | NO |
| | | 1 | YES |
| Bit06 | Setpoint enable | 0 | NO |
| | | 1 | YES |
| Bit07 | Fault acknowledge | 0 | NO |
| | | 1 | YES |
| Bit08 | JOG right | 0 | NO |
| | | 1 | YES |
| Bit09 | JOG left | 0 | NO |
| | | 1 | YES |
| Bit10 | Control from PLC | 0 | NO |
| | | 1 | YES |
| Bit11 | Reverse (setpoint inversion) | 0 | NO |
| | | 1 | YES |
| Bit13 | Motor potentiometer MOP up | 0 | NO |
| | | 1 | YES |
| Bit14 | Motor potentiometer MOP down | 0 | NO |
| | | 1 | YES |
| Bit15 | CDS Bit 0 (Local/Remote) | 0 | NO |
| | | 1 | YES |

**Details:**

See r2033 (control word 2 from BOP link)

**r2037** **BO: CtrlWrd2 from COM link (USS)** Level: **3**

**Datatype:** U16 **Unit:** - **Min:** - **Def:** - **Max:** -

**P-Group:** COMM

Displays control word 2 from COM link (i.e. PZD word 4 within USS)

**Bitfields:**

| | | | |
|---|---|---|---|
| Bit00 | Fixed frequency Bit 0 | 0 | NO |
| | | 1 | YES |
| Bit01 | Fixed frequency Bit 1 | 0 | NO |
| | | 1 | YES |
| Bit02 | Fixed frequency Bit 2 | 0 | NO |
| | | 1 | YES |
| Bit03 | Fixed frequency Bit 3 | 0 | NO |
| | | 1 | YES |
| Bit04 | Drive data set (DDS) Bit 0 | 0 | NO |
| | | 1 | YES |
| Bit05 | Drive data set (DDS) Bit 1 | 0 | NO |
| | | 1 | YES |
| Bit08 | PID enabled | 0 | NO |
| | | 1 | YES |
| Bit09 | DC brake enabled | 0 | NO |
| | | 1 | YES |
| Bit11 | Droop | 0 | NO |
| | | 1 | YES |
| Bit12 | Torque control | 0 | NO |
| | | 1 | YES |
| Bit13 | External fault 1 | 0 | YES |
| | | 1 | NO |
| Bit15 | Command data set (CDS) Bit 1 | 0 | NO |
| | | 1 | YES |

**Details:**

See r2033 (control word 2 from BOP link)

**P2040** **CB telegram off time** Level: **3**

**CStat:** CT **Datatype:** U16 **Unit:** ms **Min:** 0 **Def:** 20 **Max:** 65535

**P-Group:** COMM **Active:** No -

Defines time after which a fault will be generated (F0070) if no telegram is received via the link (SOL).

**Dependency:**

Setting 0 = watchdog disabled

**P2041[5]** **CB parameter** Level: **3**

**CStat:** CT **Datatype:** U16 **Unit:** - **Min:** 0 **Def:** 0 **Max:** 65535

**P-Group:** COMM **Active:** Immediately -

Configures a communication board (CB).

**Index:**

P2041[0] : CB parameter 0
P2041[1] : CB parameter 1
P2041[2] : CB parameter 2
P2041[3] : CB parameter 3
P2041[4] : CB parameter 4

**Details:**

See relevant communication board manual for protocol definition and appropriate settings

**r2050[8]** **CO: PZD from CB** Level: **3**

**Datatype:** U16 **Unit:** - **Min:** - **Def:** - **Max:** -

**P-Group:** COMM

Displays PZD received from communication board (CB).

**Index:**

r2050[0] : Received word 0
r2050[1] : Received word 1
r2050[2] : Received word 2
r2050[3] : Received word 3
r2050[4] : Received word 4
r2050[5] : Received word 5
r2050[6] : Received word 6
r2050[7] : Received word 7

**Note:**

The control words can be viewed as bit parameters r2032 and r2033.

**P2051[8]** **CI: PZD to CB**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | COMM | **Active:** No | - | **Def:** | 52:0 |
| | | | | **Max:** | 4000:0 |

Level: **3**

Connects PZD to CB.

This parameter allows the user to define the source of status words and actual values for the reply PZD.

**Settings:**

Status word 1 = 52
CO/BO: Act. status word 1 (see r0052)
Actual value 1 = 21 inverter output frequency (see r0021)

Other BICO settings are possible

**Index:**

P2051[0] : Transmitted word 0
P2051[1] : Transmitted word 1
P2051[2] : Transmitted word 2
P2051[3] : Transmitted word 3
P2051[4] : Transmitted word 4
P2051[5] : Transmitted word 5
P2051[6] : Transmitted word 6
P2051[7] : Transmitted word 7

**r2053[5]** **CB identification**

| | | | | | |
|---|---|---|---|---|---|
| | | **Datatype:** U16 | **Unit:** - | **Min:** | - |
| | | | | **Def:** | - |
| **P-Group:** | COMM | | | **Max:** | - |

Level: **3**

Displays identification data of the communication board (CB). The different CB types (r2035[0]) are given in the Enum declaration.

**Enum:**

0 No CB option board
1 PROFIBUS DP
2 DeviceNet
56 not defined

**Index:**

r2053[0] : CB type (PROFIBUS = 1)
r2053[1] : Firmware version
r2053[2] : Firmware version detail
r2053[3] : Firmware date (year)
r2053[4] : Firmware date (day/month)

**r2054[7]** **CB diagnosis**

| | | | | | |
|---|---|---|---|---|---|
| | | **Datatype:** U16 | **Unit:** - | **Min:** | - |
| | | | | **Def:** | - |
| **P-Group:** | COMM | | | **Max:** | - |

Level: **3**

Displays diagnostic information of communication board (CB).

**Index:**

r2054[0] : CB diagnosis 0
r2054[1] : CB diagnosis 1
r2054[2] : CB diagnosis 2
r2054[3] : CB diagnosis 3
r2054[4] : CB diagnosis 4
r2054[5] : CB diagnosis 5
r2054[6] : CB diagnosis 6

**Details:**

See relevant communications board manual.

**r2090** **BO: Control word 1 from CB** Level: **3**

**Datatype:** U16 **Unit:** - **Min:** - **Def:** - **Max:** -

**P-Group:** COMM

Displays control word 1 received from communication board (CB).

**Bitfields:**

| | | | |
|---|---|---|---|
| Bit00 | ON/OFF1 | 0 | NO |
| | | 1 | YES |
| Bit01 | OFF2: Electrical stop | 0 | YES |
| | | 1 | NO |
| Bit02 | OFF3: Fast stop | 0 | YES |
| | | 1 | NO |
| Bit03 | Pulse enable | 0 | NO |
| | | 1 | YES |
| Bit04 | RFG enable | 0 | NO |
| | | 1 | YES |
| Bit05 | RFG start | 0 | NO |
| | | 1 | YES |
| Bit06 | Setpoint enable | 0 | NO |
| | | 1 | YES |
| Bit07 | Fault acknowledge | 0 | NO |
| | | 1 | YES |
| Bit08 | JOG right | 0 | NO |
| | | 1 | YES |
| Bit09 | JOG left | 0 | NO |
| | | 1 | YES |
| Bit10 | Control from PLC | 0 | NO |
| | | 1 | YES |
| Bit11 | Reverse (setpoint inversion) | 0 | NO |
| | | 1 | YES |
| Bit13 | Motor potentiometer MOP up | 0 | NO |
| | | 1 | YES |
| Bit14 | Motor potentiometer MOP down | 0 | NO |
| | | 1 | YES |
| Bit15 | CDS Bit 0 (Local/Remote) | 0 | NO |
| | | 1 | YES |

**Details:**

See relevant communication board manual for protocol definition and appropriate settings

**r2091** **BO: Control word 2 from CB** Level: **3**

**Datatype:** U16 **Unit:** - **Min:** - **Def:** - **Max:** -

**P-Group:** COMM

Displays control word 2 received from communication board (CB).

**Bitfields:**

| | | | |
|---|---|---|---|
| Bit00 | Fixed frequency Bit 0 | 0 | NO |
| | | 1 | YES |
| Bit01 | Fixed frequency Bit 1 | 0 | NO |
| | | 1 | YES |
| Bit02 | Fixed frequency Bit 2 | 0 | NO |
| | | 1 | YES |
| Bit03 | Fixed frequency Bit 3 | 0 | NO |
| | | 1 | YES |
| Bit04 | Drive data set (DDS) Bit 0 | 0 | NO |
| | | 1 | YES |
| Bit05 | Drive data set (DDS) Bit 1 | 0 | NO |
| | | 1 | YES |
| Bit08 | PID enabled | 0 | NO |
| | | 1 | YES |
| Bit09 | DC brake enabled | 0 | NO |
| | | 1 | YES |
| Bit11 | Droop | 0 | NO |
| | | 1 | YES |
| Bit12 | Torque control | 0 | NO |
| | | 1 | YES |
| Bit13 | External fault 1 | 0 | YES |
| | | 1 | NO |
| Bit15 | Command data set (CDS) Bit 1 | 0 | NO |
| | | 1 | YES |

**Details:**

See relevant communication board manual for protocol definition and appropriate settings

**P2100[3] Alarm number selection**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U16 | **Unit:** - | **Min:** | 0 |
| **P-Group:** | ALARMS | **Active:** Immediately | - | **Def:** | 0 |
| | | | | **Max:** | 65535 |

Level: **3**

Selects up to 3 faults or warnings for non-default reactions.

**Example:**

If you want F0005 to perform an OFF3 instead of an OFF2, set P2100[0] = 5, then select the desired reaction in P2101[0] (in this case, set P2101[0] = 3).

**Note:**

All fault codes have a default reaction to OFF2. Some fault codes caused by hardware trips (e.g. overcurrent) cannot be changed from the default reactions.

**P2101[3] Stop reaction value**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U16 | **Unit:** - | **Min:** | 0 |
| **P-Group:** | ALARMS | **Active:** Immediately | - | **Def:** | 0 |
| | | | | **Max:** | 4 |

Level: **3**

Sets drive stop reaction values for fault selected by P2100 (alarm number stop reaction).

This indexed parameter specifies the special reaction to the faults/warnings defined in P2100 indices 0 to 2.

**Enum:**

0 No reaction, no display
1 OFF1 stop reaction
2 OFF2 stop reaction
3 OFF3 stop reaction
4 No reaction warning only

**Note:**

Settings 0 - 3 only are available for fault codes

Settings 0 and 4 only are available for warnings

Index 0 (P2101) refers to fault/warning in index 0 (P2100)

**P2103[3] BI: 1. Faults acknowledgement**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 722:2 |
| | | | | **Max:** | 4000:0 |

Level: **3**

Defines source of fault acknowledgement, e.g. keypad/DIN, etc. (depending on setting).

**Settings:**

722.0 = Digital input 1 (requires P0701 to be set to 99, BICO)
722.1 = Digital input 2 (requires P0702 to be set to 99, BICO)
722.2 = Digital input 3 (requires P0703 to be set to 99, BICO)
722.3 = Digital input 4 (requires P0704 to be set to 99, BICO)
722.4 = Digital input 5 (requires P0705 to be set to 99, BICO)
722.5 = Digital input 6 (requires P0706 to be set to 99, BICO)
722.6 = Digital input 7 (via analog input 1, requires P0707 to be set to 99)
722.7 = Digital input 8 (via analog input 2, requires P0708 to be set to 99)

**Index:**

P2103[0] : 1st. Command data set (CDS)
P2103[1] : 2nd. Command data set (CDS)
P2103[2] : 3rd. Command data set (CDS)

**P2104[3] BI: 2. Faults acknowledgement**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 0:0 |
| | | | | **Max:** | 4000:0 |

Level: **3**

Selects second source of fault acknowledgement.

**Settings:**

722.0 = Digital input 1 (requires P0701 to be set to 99, BICO)
722.1 = Digital input 2 (requires P0702 to be set to 99, BICO)
722.2 = Digital input 3 (requires P0703 to be set to 99, BICO)
722.3 = Digital input 4 (requires P0704 to be set to 99, BICO)
722.4 = Digital input 5 (requires P0705 to be set to 99, BICO)
722.5 = Digital input 6 (requires P0706 to be set to 99, BICO)
722.6 = Digital input 7 (via analog input 1, requires P0707 to be set to 99)
722.7 = Digital input 8 (via analog input 2, requires P0708 to be set to 99)

**Index:**

P2104[0] : 1st. Command data set (CDS)
P2104[1] : 2nd. Command data set (CDS)
P2104[2] : 3rd. Command data set (CDS)

**P2106[3]** **BI: External fault**

**CStat:** CT **Datatype:** U32 **Unit:** - **Min:** 0:0
**P-Group:** COMMANDS **Active:** Immediately - **Def:** 1:0
**Max:** 4000:0

Level: **3**

Selects source of external faults.

**Settings:**

722.0 = Digital input 1 (requires P0701 to be set to 99, BICO)
722.1 = Digital input 2 (requires P0702 to be set to 99, BICO)
722.2 = Digital input 3 (requires P0703 to be set to 99, BICO)
722.3 = Digital input 4 (requires P0704 to be set to 99, BICO)
722.4 = Digital input 5 (requires P0705 to be set to 99, BICO)
722.5 = Digital input 6 (requires P0706 to be set to 99, BICO)
722.6 = Digital input 7 (via analog input 1, requires P0707 to be set to 99)
722.7 = Digital input 8 (via analog input 2, requires P0708 to be set to 99)

**Index:**

P2106[0] : 1st. Command data set (CDS)
P2106[1] : 2nd. Command data set (CDS)
P2106[2] : 3rd. Command data set (CDS)

**r2110[4]** **Warning number**

**Datatype:** U16 **Unit:** - **Min:** -
**P-Group:** ALARMS **Def:** -
**Max:** -

Level: **2**

Displays warning information.

A maximum of 2 active warnings (indices 0 and 1) and 2 historical warnings (indices 2 and 3) may be viewed.

**Index:**

r2110[0] : Recent Warnings --, warning 1
r2110[1] : Recent Warnings --, warning 2
r2110[2] : Recent Warnings -1, warning 3
r2110[3] : Recent Warnings -1, warning 4

**Note:**

The keypad will flash while a warning is active. The LEDs indicate the warning status in this case.

If an AOP is in use, the display will show number and text of the active warning.

**Notice:**

Indices 0 and 1 are not stored.

**P2111** **Total number of warnings**

**CStat:** CT **Datatype:** U16 **Unit:** - **Min:** 0
**P-Group:** ALARMS **Active:** Immediately - **Def:** 0
**Max:** 4

Level: **3**

Displays number of warning (up to 4) since last reset. Set to 0 to reset the warning history.

**r2114[2]** **Run time counter**

**Datatype:** U16 **Unit:** - **Min:** -
**P-Group:** ALARMS **Def:** -
**Max:** -

Level: **3**

Displays run time counter

**Details:**

See P0948 (fault time)

**P2115[3]** **AOP real time clock**

**CStat:** CT **Datatype:** U16 **Unit:** - **Min:** 0
**P-Group:** ALARMS **Active:** No - **Def:** 0
**Max:** 65535

Level: **3**

Displays AOP real time.

**Details:**

See P0948 (fault time)

**P2120** **Indication counter**

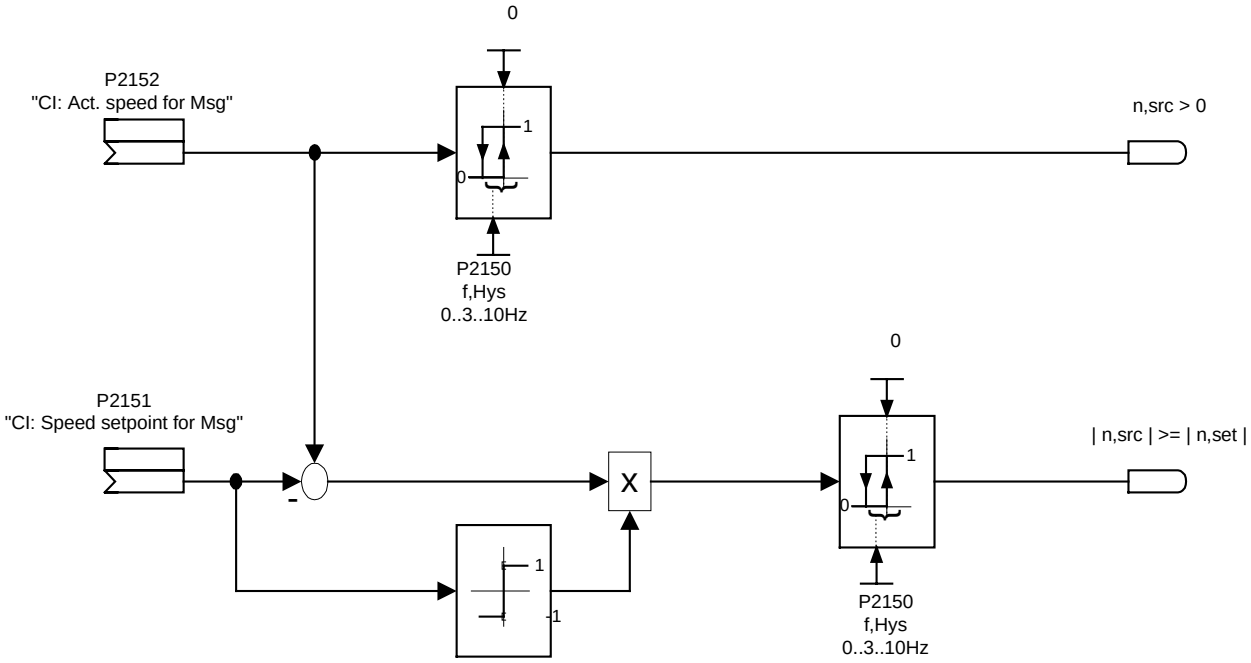
**CStat:** CUT **Datatype:** U16 **Unit:** - **Min:** 0
**P-Group:** ALARMS **Active:** No - **Def:** 0
**Max:** 65535

Level: **4**

Indicates total number of alarm events. This parameter is incremented whenever an alarm event occurs.

| **P2150[3]** | **Hysteresis frequency f_hys** | | | **Min:** | 0.00 | Level: |
|---|---|---|---|---|---|---|
| | **CStat:** CUT | **Datatype:** Float | **Unit:** Hz | **Def:** | 3.00 | **3** |
| | **P-Group:** ALARMS | **Active:** No | - | **Max:** | 10.00 | |

Defines hysteresis level applied for comparing frequency and speed to threshold as illustrated in the diagram below

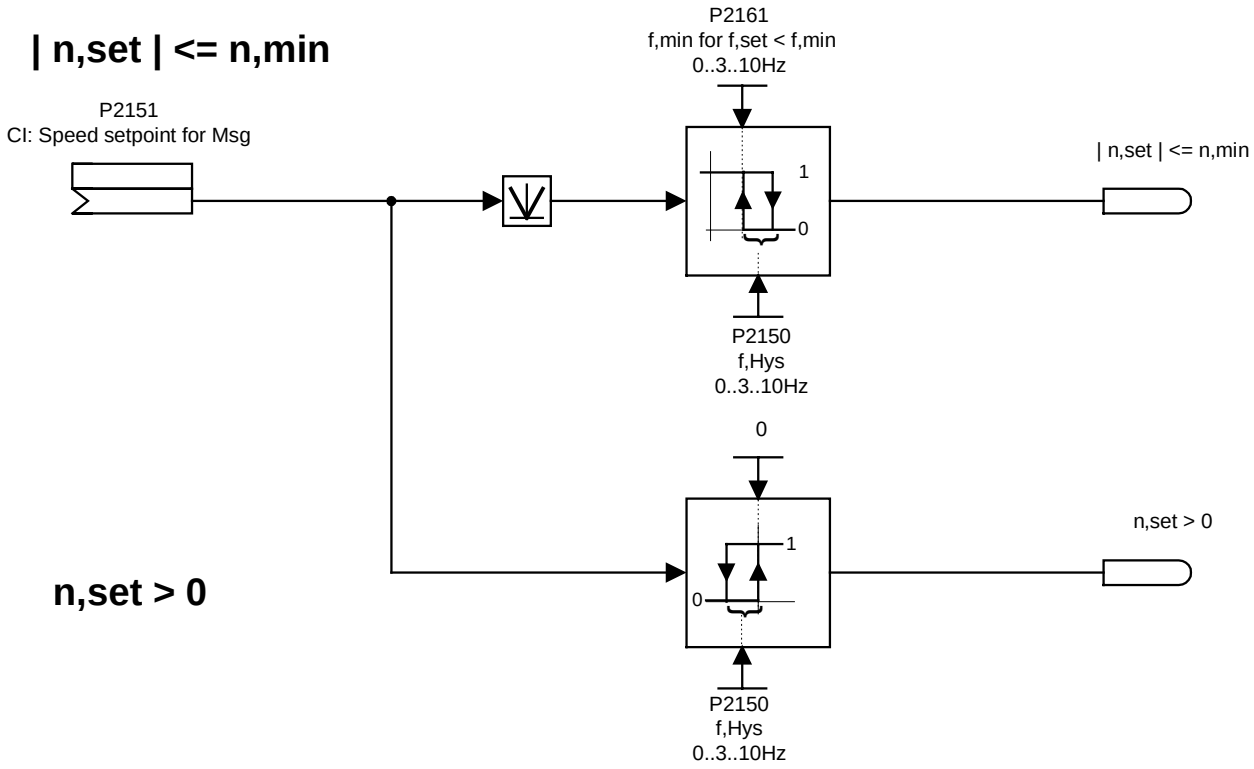



**Index:**

P2150[0] : 1st. Drive data set (DDS)
P2150[1] : 2nd. Drive data set (DDS)
P2150[2] : 3rd. Drive data set (DDS)

| P2151[3] | **CI: Monitoring speed setpoint** | | | | **Min:** | 0:0 | Level: |
|---|---|---|---|---|---|---|---|
| | **CStat:** | CUT | **Datatype:** U32 | **Unit:** - | **Def:** | 0:0 | **3** |
| | **P-Group:** | ALARMS | **Active:** No | - | **Max:** | 4000:0 | |

Selects (speed) setpoint signal to be compared to threshold as illustrated in the diagram below.




**Index:**

P2151[0] : 1st. Command data set (CDS)
P2151[1] : 2nd. Command data set (CDS)
P2151[2] : 3rd. Command data set (CDS)

**Details:**

See also diagram in P2150 (hysteresis frequency f_hys)

| P2152[3] | **CI: Act. monitoring speed** | | | | **Min:** | 0:0 | Level: |
|---|---|---|---|---|---|---|---|
| | **CStat:** | CUT | **Datatype:** U32 | **Unit:** - | **Def:** | 0:0 | **3** |
| | **P-Group:** | ALARMS | **Active:** No | - | **Max:** | 4000:0 | |

Selects (speed) signal to be compared to threshold.

**Index:**

P2152[0] : 1st. Command data set (CDS)
P2152[1] : 2nd. Command data set (CDS)
P2152[2] : 3rd. Command data set (CDS)

**Details:**

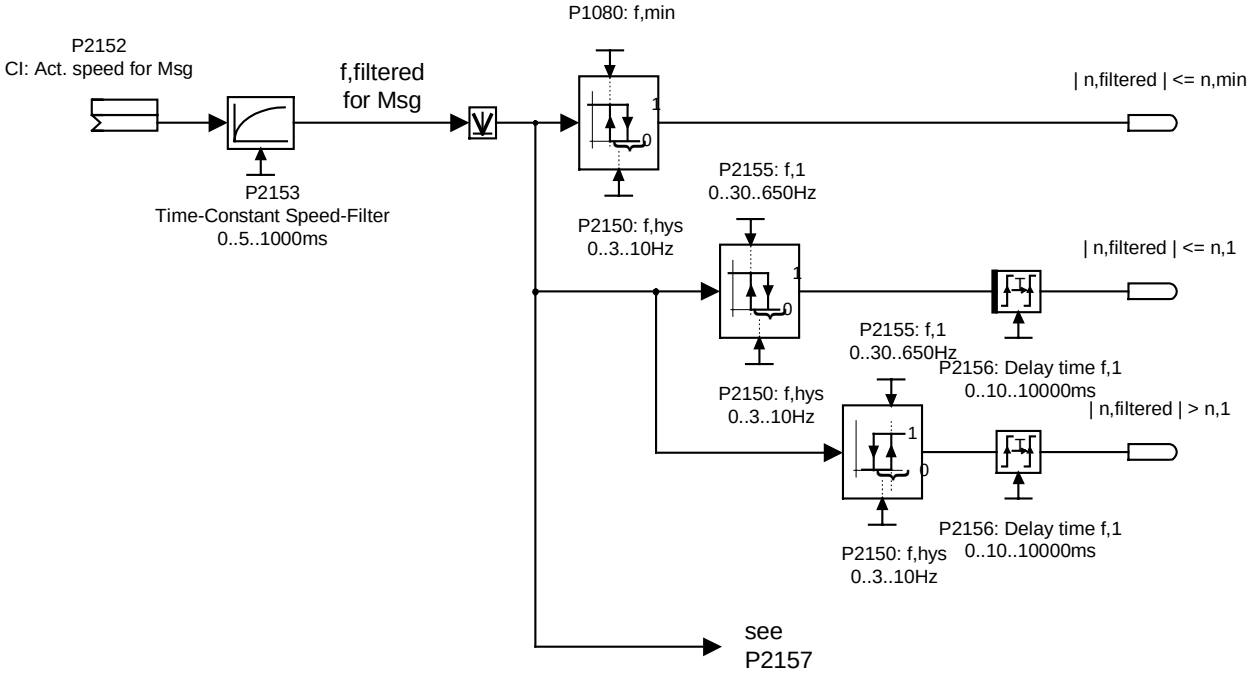
See diagrams in P2150 (hysteresis frequency f_hys) and P2151 (speed setpoint for monitoring)

**P2153[3]** **Time-constant speed filter**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U16 | **Unit:** ms | **Min:** | 0 |
| **P-Group:** | ALARMS | **Active:** No | - | **Def:** | 5 |
| | | | | **Max:** | 1000 |

Level: **2**

Specifies time constant of first-order speed filter. The filtered speed is then compared to the thresholds as illustrated in the diagram below.




**Index:**

P2153[0] : 1st. Drive data set (DDS)
P2153[1] : 2nd. Drive data set (DDS)
P2153[2] : 3rd. Drive data set (DDS)

**Details:**

See also diagram in P2157 (threshold frequency f_2)

**P2155[3]** **Threshold frequency f_1**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Hz | **Min:** | 0.00 |
| **P-Group:** | ALARMS | **Active:** No | - | **Def:** | 30.00 |
| | | | | **Max:** | 650.00 |

Level: **3**

Sets a threshold for comparing actual speed or frequency to threshold values f_1.
This threshold controls status bits 4 and 5 in status word 2 (r0053).

**Index:**

P2155[0] : 1st. Drive data set (DDS)
P2155[1] : 2nd. Drive data set (DDS)
P2155[2] : 3rd. Drive data set (DDS)

**Details:**

See diagram in P2153 (time-constant speed filter)

**P2156[3]** **Delay time of threshold freq f_1**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U16 | **Unit:** ms | **Min:** | 0 |
| **P-Group:** | ALARMS | **Active:** No | - | **Def:** | 10 |
| | | | | **Max:** | 10000 |

Level: **3**

Sets delay time prior to threshold frequency f_1 comparison (P2155).

**Index:**

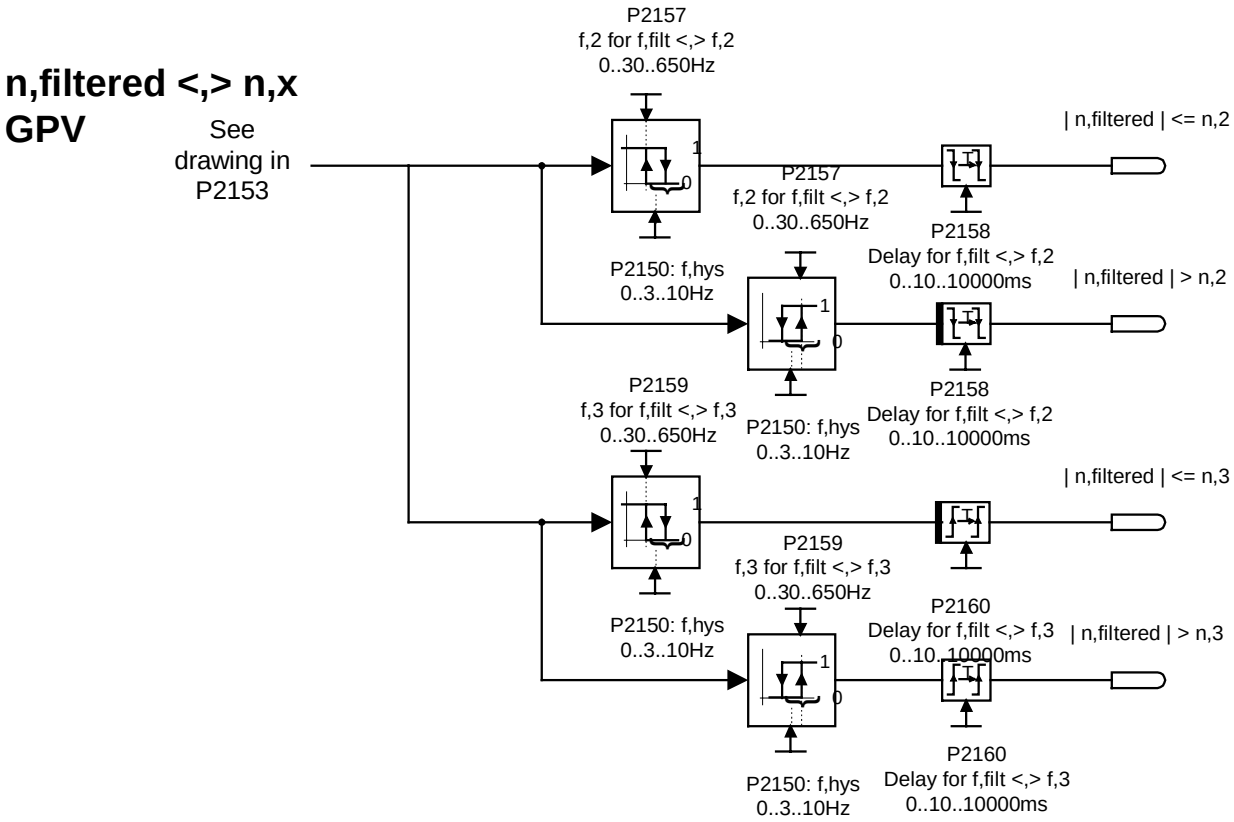
P2156[0] : 1st. Drive data set (DDS)
P2156[1] : 2nd. Drive data set (DDS)
P2156[2] : 3rd. Drive data set (DDS)

**Details:**

See diagram in P2153 (time-constant speed filter)

| P2157[3] | **Threshold frequency f_2** | | | | **Min:** | 0.00 | Level: |
|---|---|---|---|---|---|---|---|
| | **CStat:** | CUT | **Datatype:** Float | **Unit:** Hz | **Def:** | 30.00 | **2** |
| | **P-Group:** | ALARMS | **Active:** No | - | **Max:** | 650.00 | |

Threshold_2 for comparing speed or frequency to thresholds as illustrated in the diagram below.




**Index:**

P2157[0] : 1st. Drive data set (DDS)
P2157[1] : 2nd. Drive data set (DDS)
P2157[2] : 3rd. Drive data set (DDS)

**Details:**

See also diagram in P2153 (time-constant speed filter)

| P2158[3] | **Delay time of threshold freq f_2** | | | | **Min:** | 0 | Level: |
|---|---|---|---|---|---|---|---|
| | **CStat:** | CUT | **Datatype:** U16 | **Unit:** ms | **Def:** | 10 | **2** |
| | **P-Group:** | ALARMS | **Active:** No | - | **Max:** | 10000 | |

Delay time for comparing speed or frequency to threshold f_2 (P2157).

**Index:**

P2158[0] : 1st. Drive data set (DDS)
P2158[1] : 2nd. Drive data set (DDS)
P2158[2] : 3rd. Drive data set (DDS)

**Details:**

See diagram in P2157 (threshold frequency f_2)

| P2159[3] | **Threshold frequency f_3** | | | | **Min:** | 0.00 | Level: |
|---|---|---|---|---|---|---|---|
| | **CStat:** | CUT | **Datatype:** Float | **Unit:** Hz | **Def:** | 30.00 | **2** |
| | **P-Group:** | ALARMS | **Active:** No | - | **Max:** | 650.00 | |

Threshold_3 for comparing speed or frequency to thresholds.

**Index:**

P2159[0] : 1st. Drive data set (DDS)
P2159[1] : 2nd. Drive data set (DDS)
P2159[2] : 3rd. Drive data set (DDS)

**Details:**

See diagram in P2157 (threshold frequency f_2)

| **P2160[3]** | **Delay time of threshold freq f_3** | | | **Min:** | 0 | Level: |
|---|---|---|---|---|---|---|
| | **CStat:** CUT | **Datatype:** U16 | **Unit:** ms | **Def:** | 10 | **2** |
| | **P-Group:** ALARMS | **Active:** No | - | **Max:** | 10000 | |

Delay time for comparing speed or frequency to threshold f_3 (P2159).

**Index:**

P2160[0] : 1st. Drive data set (DDS)
P2160[1] : 2nd. Drive data set (DDS)
P2160[2] : 3rd. Drive data set (DDS)

**Details:**

See diagram in P2157 (threshold frequency f_2)

| **P2161[3]** | **Min. threshold for freq. setp.** | | | **Min:** | 0.00 | Level: |
|---|---|---|---|---|---|---|
| | **CStat:** CUT | **Datatype:** Float | **Unit:** Hz | **Def:** | 3.00 | **2** |
| | **P-Group:** ALARMS | **Active:** No | - | **Max:** | 10.00 | |

Minimum threshold value for comparing speed or frequency setpoint.

**Index:**

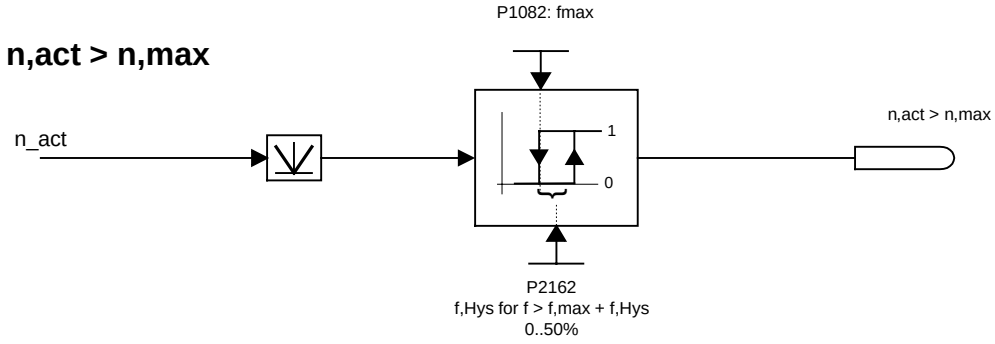
P2161[0] : 1st. Drive data set (DDS)
P2161[1] : 2nd. Drive data set (DDS)
P2161[2] : 3rd. Drive data set (DDS)

**Details:**

See diagram in P2151 (speed setpoint for monitoring)

| **P2162[3]** | **Hysteresis freq. for overspeed** | | | **Min:** | 0.00 | Level: |
|---|---|---|---|---|---|---|
| | **CStat:** CUT | **Datatype:** Float | **Unit:** Hz | **Def:** | 20.00 | **2** |
| | **P-Group:** ALARMS | **Active:** No | - | **Max:** | 650.00 | |

Hysteresis speed (or frequency) for overspeed-detection as illustrated in the diagram below.

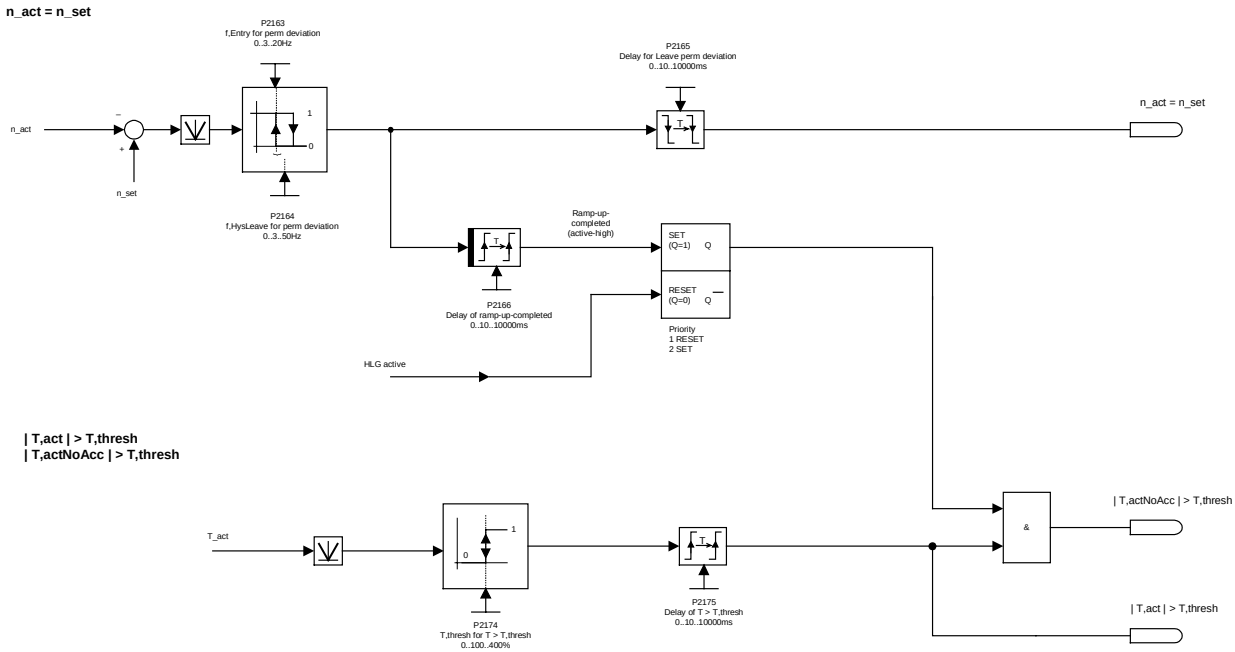



**Index:**

P2162[0] : 1st. Drive data set (DDS)
P2162[1] : 2nd. Drive data set (DDS)
P2162[2] : 3rd. Drive data set (DDS)

| P2163[3] | **Entry freq. for perm. deviation** | | | **Min:** | 0.00 | Level: |
|---|---|---|---|---|---|---|
| | **CStat:** CUT | **Datatype:** Float | **Unit:** Hz | **Def:** | 3.00 | **2** |
| | **P-Group:** ALARMS | **Active:** No | - | **Max:** | 20.00 | |

Threshold for detecting speed deviation from setpoint as illustrated in the diagram below.




**Index:**

P2163[0] : 1st. Drive data set (DDS)
P2163[1] : 2nd. Drive data set (DDS)
P2163[2] : 3rd. Drive data set (DDS)

| P2164[3] | **Hysteresis frequency deviation** | | | **Min:** | 0.00 | Level: |
|---|---|---|---|---|---|---|
| | **CStat:** CUT | **Datatype:** Float | **Unit:** Hz | **Def:** | 3.00 | **3** |
| | **P-Group:** ALARMS | **Active:** No | - | **Max:** | 10.00 | |

Hysteresis frequency for detecting permitted deviation (from setpoint) or frequency or speed. This frequency controls bit 8 in status word 1 (P0052) and bit 6 in status word 2 (P0053)

**Index:**

P2164[0] : 1st. Drive data set (DDS)
P2164[1] : 2nd. Drive data set (DDS)
P2164[2] : 3rd. Drive data set (DDS)

**Details:**

See diagram in P2163 (entry frequency for permissible deviation)

| P2165[3] | **Delay time permitted deviation** | | | **Min:** | 0 | Level: |
|---|---|---|---|---|---|---|
| | **CStat:** CUT | **Datatype:** U16 | **Unit:** ms | **Def:** | 10 | **2** |
| | **P-Group:** ALARMS | **Active:** No | - | **Max:** | 10000 | |

Delay time for detecting permitted deviation of speed or frequency from setpoint.

**Index:**

P2165[0] : 1st. Drive data set (DDS)
P2165[1] : 2nd. Drive data set (DDS)
P2165[2] : 3rd. Drive data set (DDS)

**Details:**

See diagram in P2163 (entry frequency for permissible deviation)

| P2166[3] | **Delay time ramp up completed** | | | **Min:** | 0 | Level: |
|---|---|---|---|---|---|---|
| | **CStat:** CUT | **Datatype:** U16 | **Unit:** ms | **Def:** | 10 | **2** |
| | **P-Group:** ALARMS | **Active:** No | - | **Max:** | 10000 | |

Delay time for signal that indicates completion of ramp-up.

**Index:**

P2166[0] : 1st. Drive data set (DDS)
P2166[1] : 2nd. Drive data set (DDS)
P2166[2] : 3rd. Drive data set (DDS)

**Details:**

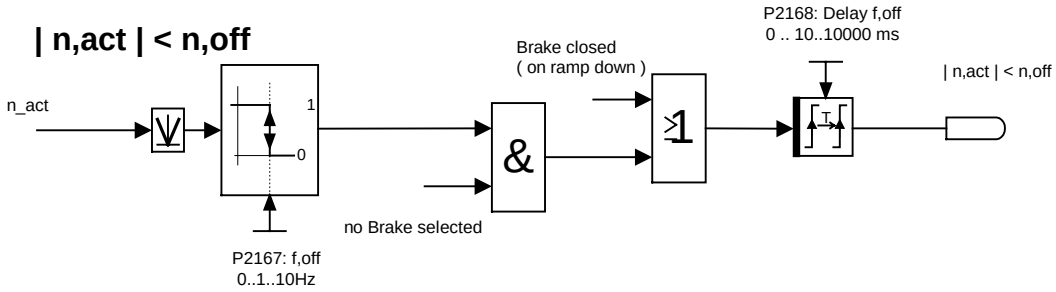
See diagram in P2163 (entry frequency for permissible deviation)

**P2167[3]** **Switch-off frequency f_off** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Hz | **Min:** | 0.00 |
| **P-Group:** | ALARMS | **Active:** No | - | **Def:** | 1.00 |
| | | | | **Max:** | 10.00 |

Sets frequency threshold below which inverter switches off.

If the frequency falls below this threshold, bit 1 in status word 2 (r0053)is set.




**Index:**
P2167[0] : 1st. Drive data set (DDS)
P2167[1] : 2nd. Drive data set (DDS)
P2167[2] : 3rd. Drive data set (DDS)

**Dependency:**
Switched off only if OFF1 or OFF3 active.

**P2168[3]** **Delay time T_off** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U16 | **Unit:** ms | **Min:** | 0 |
| **P-Group:** | ALARMS | **Active:** No | - | **Def:** | 10 |
| | | | | **Max:** | 10000 |

Defines time for which the inverter may operate below switch-off frequency (P2167) before switch off occurs.

**Index:**
P2168[0] : 1st. Drive data set (DDS)
P2168[1] : 2nd. Drive data set (DDS)
P2168[2] : 3rd. Drive data set (DDS)

**Dependency:**
Active if holding brake (P1215) not parameterized.

**Details:**
See diagram in P2167 (switch-off frequency)

**r2169** **CO: Act. filtered frequency** Level: **2**

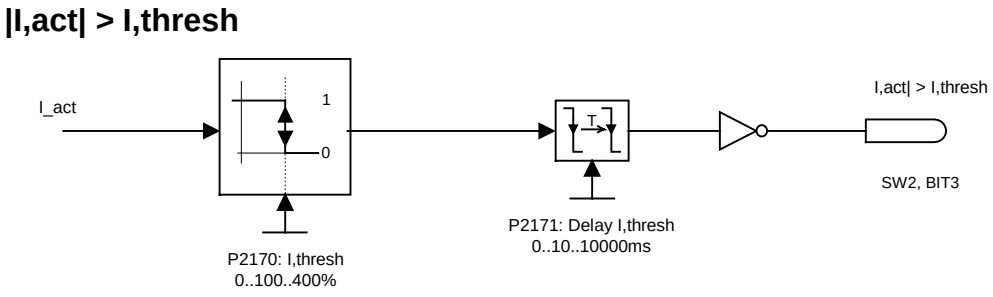
| | | | | | |
|---|---|---|---|---|---|
| | | **Datatype:** Float | **Unit:** Hz | **Min:** | - |
| | | | | **Def:** | - |
| **P-Group:** | ALARMS | | | **Max:** | - |

Filtered speed (or frequency) for monitoring behind first-order lowpass filter.

**P2170[3]** **Threshold current I_thresh** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** % | **Min:** | 0.0 |
| **P-Group:** | ALARMS | **Active:** No | - | **Def:** | 100.0 |
| | | | | **Max:** | 400.0 |

Defines threshold current in [%] relative to P0305 (rated motor current) to be used in comparisons of I_act and I_Thresh as illustrated in the diagram below.




**Index:**
P2170[0] : 1st. Drive data set (DDS)
P2170[1] : 2nd. Drive data set (DDS)
P2170[2] : 3rd. Drive data set (DDS)

**Note:**
This threshold controls bit 3 in status word 3 (P0053).

**P2171[3]** **Delay time current**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U16 | **Unit:** ms | **Min:** | 0 |
| **P-Group:** | ALARMS | **Active:** No | - | **Def:** | 10 |
| | | | | **Max:** | 10000 |

Level: **3**

Defines delay time prior to activation of current comparison.

**Index:**

P2171[0] : 1st. Drive data set (DDS)
P2171[1] : 2nd. Drive data set (DDS)
P2171[2] : 3rd. Drive data set (DDS)

**Details:**

See diagram in P2170 (threshold current I_thresh)

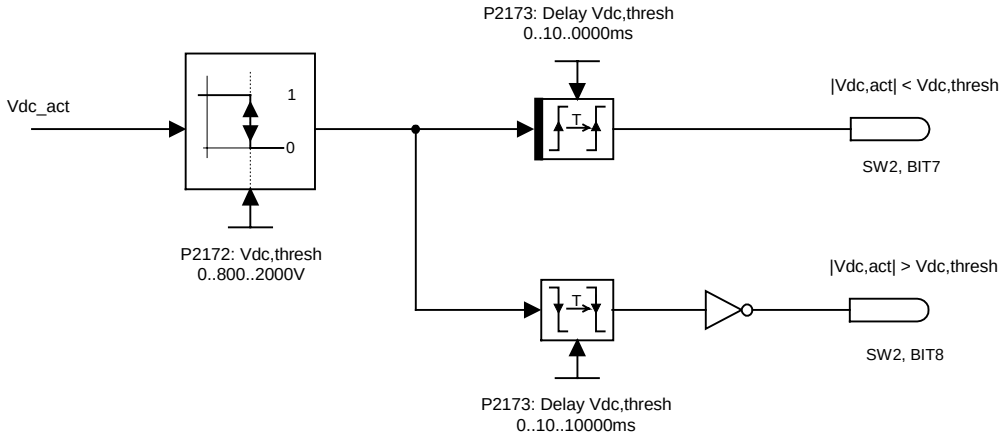
**P2172[3]** **Threshold DC-link voltage**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U16 | **Unit:** V | **Min:** | 0 |
| **P-Group:** | ALARMS | **Active:** No | - | **Def:** | 800 |
| | | | | **Max:** | 2000 |

Level: **3**

Defines DC link voltage to be compared to actual voltage as illustrated in the diagram below.

**|Vdc,act| <,> Vdc,thresh**




**Index:**

P2172[0] : 1st. Drive data set (DDS)
P2172[1] : 2nd. Drive data set (DDS)
P2172[2] : 3rd. Drive data set (DDS)

**Note:**

This voltage controls bits 7 and 8 in status word 3 (P0053).

**P2173[3]** **Delay time DC-link voltage**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U16 | **Unit:** ms | **Min:** | 0 |
| **P-Group:** | ALARMS | **Active:** No | - | **Def:** | 10 |
| | | | | **Max:** | 10000 |

Level: **3**

Defines delay time prior to activation of threshold comparison.

**Index:**

P2173[0] : 1st. Drive data set (DDS)
P2173[1] : 2nd. Drive data set (DDS)
P2173[2] : 3rd. Drive data set (DDS)

**Details:**

See diagram in P2172 (threshold DC-link voltage)

**P2174[3]** **Torque threshold T_thresh**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Nm | **Min:** | 0.0 |
| **P-Group:** | ALARMS | **Active:** No | - | **Def:** | 5.13 |
| | | | | **Max:** | 99999.0 |

Level: **2**

Defines torque threshold for comparing actual torque.

**Index:**

P2174[0] : 1st. Drive data set (DDS)
P2174[1] : 2nd. Drive data set (DDS)
P2174[2] : 3rd. Drive data set (DDS)

**P2176[3]** **Delay time for torque threshold**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U16 | **Unit:** ms | **Min:** | 0 |
| **P-Group:** | ALARMS | **Active:** No | - | **Def:** | 10 |
| | | | | **Max:** | 10000 |

Level: **2**

Delay time for comparing actual torque to threshold.

**Index:**

P2176[0] : 1st. Drive data set (DDS)
P2176[1] : 2nd. Drive data set (DDS)
P2176[2] : 3rd. Drive data set (DDS)

| **P2177[3]** | **Delay time for motor is blocked** | | | **Min:** | 0 | Level: |
|---|---|---|---|---|---|---|
| | **CStat:** CUT | **Datatype:** U16 | **Unit:** ms | **Def:** | 10 | **2** |
| | **P-Group:** ALARMS | **Active:** No | - | **Max:** | 10000 | |

Delay time for identification that motor is blocked.

**Index:**

P2177[0] : 1st. Drive data set (DDS)
P2177[1] : 2nd. Drive data set (DDS)
P2177[2] : 3rd. Drive data set (DDS)

| **P2178[3]** | **Delay time for motor is stalled** | | | **Min:** | 0 | Level: |
|---|---|---|---|---|---|---|
| | **CStat:** CUT | **Datatype:** U16 | **Unit:** ms | **Def:** | 10 | **2** |
| | **P-Group:** ALARMS | **Active:** No | - | **Max:** | 10000 | |

Delay time for identification that motor is stalled.

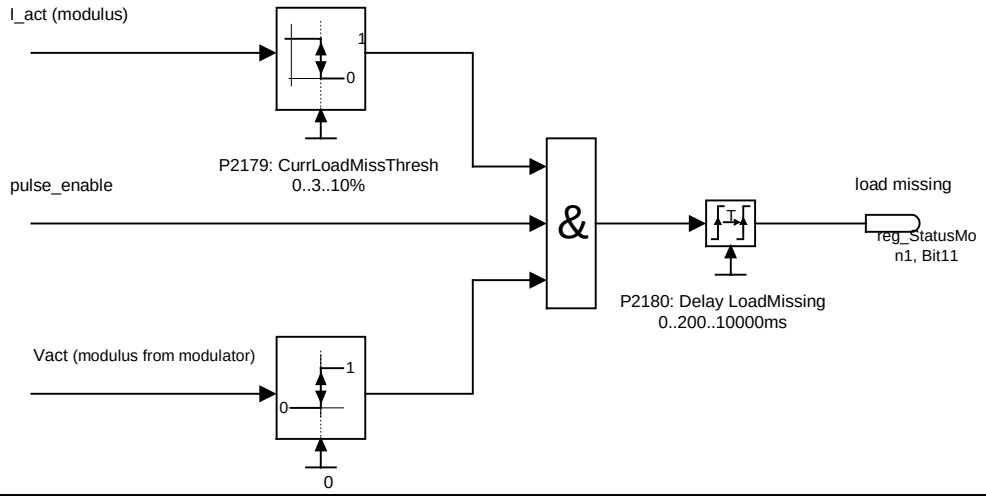
**Index:**

P2178[0] : 1st. Drive data set (DDS)
P2178[1] : 2nd. Drive data set (DDS)
P2178[2] : 3rd. Drive data set (DDS)

| **P2179** | **Current limit for no load ident.** | | | **Min:** | 0.0 | Level: |
|---|---|---|---|---|---|---|
| | **CStat:** CUT | **Datatype:** Float | **Unit:** % | **Def:** | 3.0 | **3** |
| | **P-Group:** ALARMS | **Active:** No | - | **Max:** | 10.0 | |

Threshold current for A0922 (load missing) in [%] relative to P0305 (rated motor current) as illustrated in the diagram below.

## load missing




**Note:**

It may be that the motor is not connected (load missing) or a phase could be missing.

**Notice:**

If a motor setpoint cannot be entered and the current limit (P2179) is not exceeded, Alarm A0922 (no load applied) is issued when delay time (P2180) expires.

| **P2180** | **Delay time for no load ident.** | | | **Min:** | 0 | Level: |
|---|---|---|---|---|---|---|
| | **CStat:** CUT | **Datatype:** U16 | **Unit:** ms | **Def:** | 2000 | **3** |
| | **P-Group:** ALARMS | **Active:** No | - | **Max:** | 10000 | |

Delay time load missing

**Note:**

It may be that the motor is not connected (load missing) or a phase could be missing.

**Notice:**

If a motor setpoint cannot be entered and the current limit (P2179) is not exceeded, Alarm A0922 (no load applied) is issued when delay time (P2180) expires.

**Details:**

See diagram in P2179 (current limit for no load identification)

**P2181[3] Belt failure detection mode**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U16 | **Unit:** - | **Min:** | 0 |
| **P-Group:** | ALARMS | **Active:** Immediately | - | **Def:** | 0 |
| | | | | **Max:** | 6 |

Level: **2**

Sets belt failure detection mode. This function allows detection of mechanical failure of the drive train, e.g. a broken drive belt. It can also detect conditions which cause an overload, such as a jam.

Two methods are provided of detecting the failure.

The fist is achieved by comparing the actual frequency/torque curve with a programmed envelope (see P2182 - P2190). If the curve falls outside the envelope, a warning or trip is generated.

The second uses a pulse train from a simple sensor on the driven machine connected to the encoder circuit within the drive ASIC via a digital input. The pulse train, normally detecting one pulse per revolution of the drive machine, is converted to a frequency reference and compared with the actual inverter output frequency.

**Enum:**

| | |
|---|---|
| 0 | Belt failure detection disabled |
| 1 | Warn low torque/speed |
| 2 | Warn high torque/speed |
| 3 | Warn high/low torque/speed |
| 4 | Trip low torque/speed |
| 5 | Trip high torque/speed |
| 6 | Trip high/low torque/speed |

**Index:**

P2181[0] : 1st. Command data set (CDS)
P2181[1] : 2nd. Command data set (CDS)
P2181[2] : 3rd. Command data set (CDS)

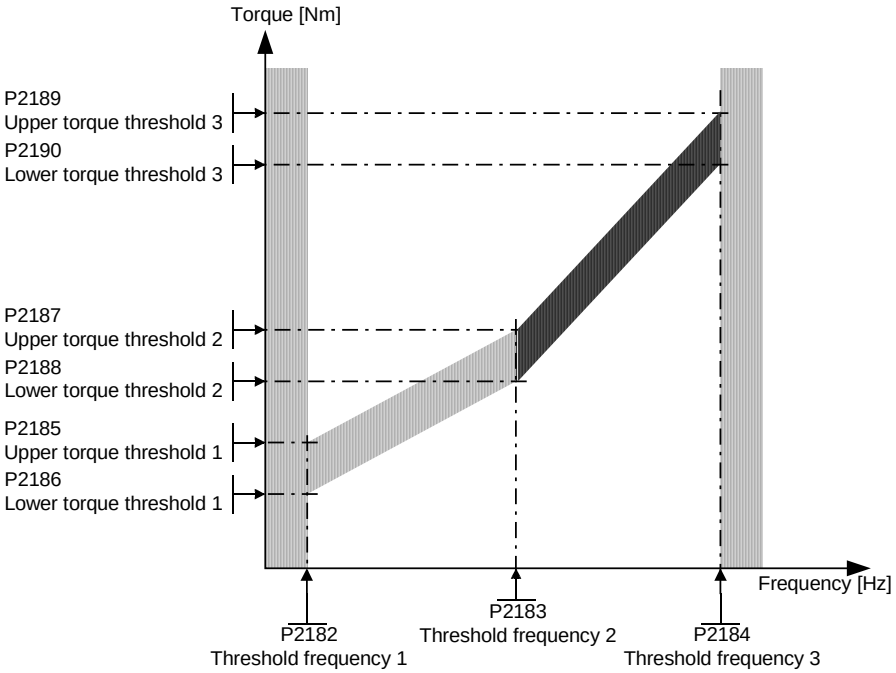
**P2182[3] Belt threshold frequency 1**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Hz | **Min:** | 0.00 |
| **P-Group:** | ALARMS | **Active:** No | - | **Def:** | 5.00 |
| | | | | **Max:** | 650.00 |

Level: **3**

Sets a frequency threshold 1 for comparing actual torque to torque the envelope for belt failure detection.

The frequency torque envelope is defined by 9 parameters - 3 are frequency parameters (P2182 - P2184), and the other 6 define the low and high torque limits (P2185 - P2190) for each frequency (see diagram below).




The allowed frequency/torque region is defined by the shaded area. When the torque falls outside the area shown, a trip or warning occurs (see parameter P2181).

**Index:**

P2182[0] : 1st. Drive data set (DDS)
P2182[1] : 2nd. Drive data set (DDS)
P2182[2] : 3rd. Drive data set (DDS)

**Note:**

The torque is unlimited below P2182, and above P2184. Normally P2182 <= lower torque limit (P1521), and P2184 > = upper torque limit (P1520).

**P2183[3]** **Belt threshold frequency 2**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Hz | **Min:** | 0.00 |
| **P-Group:** | ALARMS | **Active:** No | - | **Def:** | 30.00 |
| | | | | **Max:** | 650.00 |

Level: **2**

Sets a threshold F2 for comparing actual torque to torque the envelope for belt failure detection.

**Index:**

P2183[0] : 1st. Drive data set (DDS)
P2183[1] : 2nd. Drive data set (DDS)
P2183[2] : 3rd. Drive data set (DDS)

**Details:**

See P2182 (belt threshold frequency 1).

**P2184[3]** **Belt threshold frequency 3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Hz | **Min:** | 0.00 |
| **P-Group:** | ALARMS | **Active:** No | - | **Def:** | 50.00 |
| | | | | **Max:** | 650.00 |

Level: **2**

Sets a threshold F3 for comparing actual torque to torque the envelope for belt failure detection.

**Index:**

P2184[0] : 1st. Drive data set (DDS)
P2184[1] : 2nd. Drive data set (DDS)
P2184[2] : 3rd. Drive data set (DDS)

**Details:**

See P2182 (belt threshold frequency 1).

**P2185[3]** **Upper torque threshold 1**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Nm | **Min:** | 0.0 |
| **P-Group:** | ALARMS | **Active:** No | - | **Def:** | 99999.0 |
| | | | | **Max:** | 99999.0 |

Level: **2**

Upper limit threshold value 1 for comparing actual torque.

**Index:**

P2185[0] : 1st. Drive data set (DDS)
P2185[1] : 2nd. Drive data set (DDS)
P2185[2] : 3rd. Drive data set (DDS)

**Details:**

See P2182 (belt threshold frequency 1).

**P2186[3]** **Lower torque threshold 1**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Nm | **Min:** | 0.0 |
| **P-Group:** | ALARMS | **Active:** No | - | **Def:** | 0.0 |
| | | | | **Max:** | 99999.0 |

Level: **2**

Lower limit threshold value 1 for comparing actual torque.

**Index:**

P2186[0] : 1st. Drive data set (DDS)
P2186[1] : 2nd. Drive data set (DDS)
P2186[2] : 3rd. Drive data set (DDS)

**Details:**

See P2182 (belt threshold frequency 1).

**P2187[3]** **Upper torque threshold 2**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Nm | **Min:** | 0.0 |
| **P-Group:** | ALARMS | **Active:** No | - | **Def:** | 99999.0 |
| | | | | **Max:** | 99999.0 |

Level: **2**

Upper limit threshold value 2 for comparing actual torque.

**Index:**

P2187[0] : 1st. Drive data set (DDS)
P2187[1] : 2nd. Drive data set (DDS)
P2187[2] : 3rd. Drive data set (DDS)

**Details:**

See P2182 (belt threshold frequency 1).

**P2188[3]** **Lower torque threshold 2**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Nm | **Min:** | 0.0 |
| **P-Group:** | ALARMS | **Active:** No | - | **Def:** | 0.0 |
| | | | | **Max:** | 99999.0 |

Level: **2**

Lower limit threshold value 2 for comparing actual torque.

**Index:**

P2188[0] : 1st. Drive data set (DDS)
P2188[1] : 2nd. Drive data set (DDS)
P2188[2] : 3rd. Drive data set (DDS)

**Details:**

See P2182 (belt threshold frequency 1).

**P2189[3]** **Upper torque threshold 3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Nm | **Min:** | 0.0 |
| **P-Group:** | ALARMS | **Active:** No | - | **Def:** | 99999.0 |
| | | | | **Max:** | 99999.0 |

Level: **2**

Upper limit threshold value 3 for comparing actual torque.

**Index:**

P2189[0] : 1st. Drive data set (DDS)
P2189[1] : 2nd. Drive data set (DDS)
P2189[2] : 3rd. Drive data set (DDS)

**Details:**

See P2182 (belt threshold frequency 1).

**P2190[3]** **Lower torque threshold 3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Nm | **Min:** | 0.0 |
| **P-Group:** | ALARMS | **Active:** No | - | **Def:** | 0.0 |
| | | | | **Max:** | 99999.0 |

Level: **2**

Lower limit threshold value 3 for comparing actual torque.

**Index:**

P2190[0] : 1st. Drive data set (DDS)
P2190[1] : 2nd. Drive data set (DDS)
P2190[2] : 3rd. Drive data set (DDS)

**Details:**

See P2182 (belt threshold frequency 1).

**P2191[3]** **Belt failure speed tolerance**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** Hz | **Min:** | 0.00 |
| **P-Group:** | ALARMS | **Active:** No | - | **Def:** | 3.00 |
| | | | | **Max:** | 20.00 |

Level: **2**

P2191 defines the allowed speed variation bandwidth between the inverter frequency, and the speed reference from the pulse train. When the speed of the driven machine varies by more than this amount, a trip or warning is given.

**Index:**

P2191[0] : 1st. Drive data set (DDS)
P2191[1] : 2nd. Drive data set (DDS)
P2191[2] : 3rd. Drive data set (DDS)

**P2192[3]** **Time delay for belt failure**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U16 | **Unit:** s | **Min:** | 0 |
| **P-Group:** | ALARMS | **Active:** No | - | **Def:** | 10 |
| | | | | **Max:** | 65 |

Level: **2**

P2192 defines a delay before warning/trip becomes active. It is used to eliminate events caused by transient conditions. It is used for both methods of fault detection.

**Index:**

P2192[0] : 1st. Drive data set (DDS)
P2192[1] : 2nd. Drive data set (DDS)
P2192[2] : 3rd. Drive data set (DDS)

**r2197** **CO/BO: Monitoring word 1**

| | | | | | |
|---|---|---|---|---|---|
| | | **Datatype:** U16 | **Unit:** - | **Min:** | - |
| **P-Group:** | ALARMS | | | **Def:** | - |
| | | | | **Max:** | - |

Level: **2**

Monitoring word 1 which indicates the state of monitor functions. Each bit represents one monitor function.

**Bitfields:**

| | | | |
|---|---|---|---|
| Bit00 | Act. freq. r0024 <= P1080 | 0 | NO |
| | | 1 | YES |
| Bit01 | Act. freq. r0024 <= P2155 | 0 | NO |
| | | 1 | YES |
| Bit02 | Act. freq. r0024 > P2155 | 0 | NO |
| | | 1 | YES |
| Bit03 | Act. freq. r0024 > zero | 0 | NO |
| | | 1 | YES |
| Bit04 | Act. freq. r0024 >= setp. | 0 | NO |
| | | 1 | YES |
| Bit05 | Act. freq. r0024 <= P2167 | 0 | NO |
| | | 1 | YES |
| Bit06 | Act. freq. r0024 >= P1082 | 0 | NO |
| | | 1 | YES |
| Bit07 | Act. freq. r0024 == setp. | 0 | NO |
| | | 1 | YES |
| Bit08 | Act. current r0068 >= P2170 | 0 | NO |
| | | 1 | YES |
| Bit09 | Act. unfilt. Vdc < P2172 | 0 | NO |
| | | 1 | YES |
| Bit10 | Act. unfilt. Vdc > P2172 | 0 | NO |
| | | 1 | YES |
| Bit11 | No load condition | 0 | NO |
| | | 1 | YES |

**r2198** **CO/BO: Monitoring word 2** Level: **2**

**Datatype:** U16 **Unit:** - **Min:** - **Def:** - **Max:** -

**P-Group:** ALARMS

Monitoring word 2 which indicates the state of monitor functions. Each bit represents one monitor function.

**Bitfields:**

| | | | |
|---|---|---|---|
| Bit00 | \| n,filtered r2169 \| < P2157 | 0 | NO |
| | | 1 | YES |
| Bit01 | \| n,filtered r2169 \| > P2157 | 0 | NO |
| | | 1 | YES |
| Bit02 | \| n,filtered r2169 \| < P2159 | 0 | NO |
| | | 1 | YES |
| Bit03 | \| n,filtered r2169 \| > P2159 | 0 | NO |
| | | 1 | YES |
| Bit04 | \| n,set \| < P2161 | 0 | NO |
| | | 1 | YES |
| Bit05 | n,set > 0 | 0 | NO |
| | | 1 | YES |
| Bit06 | Motor blocked | 0 | NO |
| | | 1 | YES |
| Bit07 | Motor stalled | 0 | NO |
| | | 1 | YES |
| Bit08 | \| I,act r0068 \| < P2170 | 0 | NO |
| | | 1 | YES |
| Bit09 | \|T,act\| > P2174 & setpoint reached | 0 | NO |
| | | 1 | YES |
| Bit10 | \| T,act \| > P2174 | 0 | NO |
| | | 1 | YES |
| Bit11 | Belt failure warning | 0 | NO |
| | | 1 | YES |
| Bit12 | Belt failure trip | 0 | NO |
| | | 1 | YES |

**P2200[3]** **BI: Enable PID controller** Level: **2**

**CStat:** CT **Datatype:** U32 **Unit:** - **Min:** 0:0 **Def:** 0:0 **Max:** 4000:0

**P-Group:** TECH **Active:** Immediately -

PID mode Allows user to enable/disable the PID controller. Setting to 1 enables the PID closed-loop controller.

**Index:**

P2200[0] : 1st. Command data set (CDS)
P2200[1] : 2nd. Command data set (CDS)
P2200[2] : 3rd. Command data set (CDS)

**Dependency:**

Setting 1 automatically disables normal ramp times set in P1120 and P1121 and the normal frequency setpoints.

Following an OFF1 or OFF3 command, however, the inverter frequency will ramp down to zero using the ramp time set in P1121 (P1135 for OFF3).

**Note:**

The PID setpoint source is selected using P2253. The PID setpoint and the PID feedback signal are interpreted as [%] values (not [Hz]). The output of the PID controller is displayed as [%] and then normalized into [Hz] through P2000 (reference frequency) when PID is enabled.

In level 3, the PID controller source enable can also come from the digital inputs in settings 722.0 to 722.2 for DIN1 to DIN3 or from any other BiCo source

**Notice:**

The minimum and maximum motor frequencies (P1080 and P1082) as well as the skip frequencies (P1091 to P1094) remain active on the inverter output. However, enabling skip frequencies with PID control can produce instabilities.

**P2201[3]** **Fixed PID setpoint 1**

| | | | | | | Level: |
|---|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** % | **Min:** | -200.00 | **2** |
| **P-Group:** | TECH | **Active:** No | - | **Def:** | 0.00 | |
| | | | | **Max:** | 200.00 | |

Defines Fixed PID Setpoint 1

In addition, you can set any of the digital input parameters to Fixed PID Setpoint via the digital inputs (P0701 - P0706).

There are three selection modes for the PID fixed setpoint:
1 Direct selection (P0701 = 15 or P0702 = 15, etc)
In this mode of operation, 1 digital input selects one PID fixed setpoint.

2 Direct selection with ON command (P0701 = 16 or P0702 = 16, etc.)
Description as for 1), except that this type of selection issues an ON command concurrent with any setpoint selection.

3 Binary Coded Decimal selection (P0701 - P0706 = 17)
Using this method to select the PID Fixed Setpoint allows you to choose up to 16 different PID setpoints. The setpoints are selected according to the following table:

| | | DIN4 | DIN3 | DIN2 | DIN1 |
|---|---|---|---|---|---|
| | OFF | Inactive | Inactive | Inactive | Inactive |
| P2201 | FF1 | **Inactive** | **Inactive** | Inactive | Active |
| P2202 | FF2 | Inactive | Inactive | **Active** | Inactive |
| P2203 | FF3 | Inactive | Inactive | **Active** | **Active** |
| P2204 | FF4 | Inactive | **Active** | Inactive | Inactive |
| P2205 | FF5 | Inactive | **Active** | Inactive | **Active** |
| P2206 | FF6 | Inactive | **Active** | **Active** | Inactive |
| P2207 | FF7 | Inactive | **Active** | **Active** | **Active** |
| P2208 | FF8 | **Active** | Inactive | Inactive | Inactive |
| P2209 | FF9 | **Active** | Inactive | Inactive | **Active** |
| P2222 | FF10 | **Active** | Inactive | **Active** | Inactive |
| P2211 | FF11 | **Active** | Inactive | **Active** | **Active** |
| P2212 | FF12 | **Active** | **Active** | Inactive | Inactive |
| P2213 | FF13 | **Active** | **Active** | Inactive | **Active** |
| P2214 | FF14 | **Active** | **Active** | **Active** | Inactive |
| P2215 | FF15 | **Active** | **Active** | **Active** | **Active** |

**Index:**

P2201[0] : 1st. Drive data set (DDS)
P2201[1] : 2nd. Drive data set (DDS)
P2201[2] : 3rd. Drive data set (DDS)

**Dependency:**

P2000 = 1 required in user access level 2 to enable setpoint source.

In mode 1 (above):
ON command required to start motor (enable pulses).

In mode 2 (above):
If inputs programmed to PID fixed setpoint and selected together, the selected setpoints are summed.

**Note:**

You may mix different types of frequencies; however, remember that they will be summed if selected together.

P2201 = 100 % corresponds to 4000 hex

**P2202[3]** **Fixed PID setpoint 2**

| | | | | | | Level: |
|---|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** % | **Min:** | -200.00 | **2** |
| **P-Group:** | TECH | **Active:** No | - | **Def:** | 10.00 | |
| | | | | **Max:** | 200.00 | |

Defines Fixed PID Setpoint 2

**Index:**

P2202[0] : 1st. Drive data set (DDS)
P2202[1] : 2nd. Drive data set (DDS)
P2202[2] : 3rd. Drive data set (DDS)

**Details:**

See P2201 (Fixed PID Setpoint 1).

**P2203[3]** **Fixed PID setpoint 3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** % | **Min:** | -200.00 |
| **P-Group:** | TECH | **Active:** No | - | **Def:** | 20.00 |
| | | | | **Max:** | 200.00 |

Level: **2**

Defines Fixed PID Setpoint 3

**Index:**

P2203[0] : 1st. Drive data set (DDS)
P2203[1] : 2nd. Drive data set (DDS)
P2203[2] : 3rd. Drive data set (DDS)

**Details:**

See P2201 (Fixed PID Setpoint 1).

**P2204[3]** **Fixed PID setpoint 4**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** % | **Min:** | -200.00 |
| **P-Group:** | TECH | **Active:** No | - | **Def:** | 30.00 |
| | | | | **Max:** | 200.00 |

Level: **2**

Defines Fixed PID Setpoint 4

**Index:**

P2204[0] : 1st. Drive data set (DDS)
P2204[1] : 2nd. Drive data set (DDS)
P2204[2] : 3rd. Drive data set (DDS)

**Details:**

See P2201 (Fixed PID Setpoint 1).

**P2205[3]** **Fixed PID setpoint 5**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** % | **Min:** | -200.00 |
| **P-Group:** | TECH | **Active:** No | - | **Def:** | 40.00 |
| | | | | **Max:** | 200.00 |

Level: **2**

Defines Fixed PID Setpoint 5

**Index:**

P2205[0] : 1st. Drive data set (DDS)
P2205[1] : 2nd. Drive data set (DDS)
P2205[2] : 3rd. Drive data set (DDS)

**Details:**

See P2201 (Fixed PID Setpoint 1).

**P2206[3]** **Fixed PID setpoint 6**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** % | **Min:** | -200.00 |
| **P-Group:** | TECH | **Active:** No | - | **Def:** | 50.00 |
| | | | | **Max:** | 200.00 |

Level: **2**

Defines Fixed PID Setpoint 6

**Index:**

P2206[0] : 1st. Drive data set (DDS)
P2206[1] : 2nd. Drive data set (DDS)
P2206[2] : 3rd. Drive data set (DDS)

**Details:**

See P2201 (Fixed PID Setpoint 1).

**P2207[3]** **Fixed PID setpoint 7**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** % | **Min:** | -200.00 |
| **P-Group:** | TECH | **Active:** No | - | **Def:** | 60.00 |
| | | | | **Max:** | 200.00 |

Level: **2**

Defines Fixed PID Setpoint 7

**Index:**

P2207[0] : 1st. Drive data set (DDS)
P2207[1] : 2nd. Drive data set (DDS)
P2207[2] : 3rd. Drive data set (DDS)

**Details:**

See P2201 (Fixed PID Setpoint 1).

**P2208[3]** **Fixed PID setpoint 8**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** % | **Min:** | -200.00 |
| **P-Group:** | TECH | **Active:** No | - | **Def:** | 70.00 |
| | | | | **Max:** | 200.00 |

Level: **2**

Defines Fixed PID Setpoint 8

**Index:**

P2208[0] : 1st. Drive data set (DDS)
P2208[1] : 2nd. Drive data set (DDS)
P2208[2] : 3rd. Drive data set (DDS)

**Details:**

See P2201 (Fixed PID Setpoint 1).

**P2209[3]** **Fixed PID setpoint 9**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** % | **Min:** | -200.00 |
| **P-Group:** | TECH | **Active:** No | - | **Def:** | 80.00 |
| | | | | **Max:** | 200.00 |

Level: **2**

Defines Fixed PID Setpoint 9

**Index:**

P2209[0] : 1st. Drive data set (DDS)
P2209[1] : 2nd. Drive data set (DDS)
P2209[2] : 3rd. Drive data set (DDS)

**Details:**

See P2201 (Fixed PID Setpoint 1).

**P2210[3]** **Fixed PID setpoint 10**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** % | **Min:** | -200.00 |
| **P-Group:** | TECH | **Active:** No | - | **Def:** | 90.00 |
| | | | | **Max:** | 200.00 |

Level: **2**

Defines Fixed PID Setpoint 10

**Index:**

P2210[0] : 1st. Drive data set (DDS)
P2210[1] : 2nd. Drive data set (DDS)
P2210[2] : 3rd. Drive data set (DDS)

**Details:**

See P2201 (Fixed PID Setpoint 1).

**P2211[3]** **Fixed PID setpoint 11**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** % | **Min:** | -200.00 |
| **P-Group:** | TECH | **Active:** No | - | **Def:** | 100.00 |
| | | | | **Max:** | 200.00 |

Level: **2**

Defines Fixed PID Setpoint 11

**Index:**

P2211[0] : 1st. Drive data set (DDS)
P2211[1] : 2nd. Drive data set (DDS)
P2211[2] : 3rd. Drive data set (DDS)

**Details:**

See P2201 (Fixed PID Setpoint 1).

**P2212[3]** **Fixed PID setpoint 12**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** % | **Min:** | -200.00 |
| **P-Group:** | TECH | **Active:** No | - | **Def:** | 110.00 |
| | | | | **Max:** | 200.00 |

Level: **2**

Defines Fixed PID Setpoint 12

**Index:**

P2212[0] : 1st. Drive data set (DDS)
P2212[1] : 2nd. Drive data set (DDS)
P2212[2] : 3rd. Drive data set (DDS)

**Details:**

See P2201 (Fixed PID Setpoint 1).

**P2213[3]** **Fixed PID setpoint 13**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** % | **Min:** | -200.00 |
| **P-Group:** | TECH | **Active:** No | - | **Def:** | 120.00 |
| | | | | **Max:** | 200.00 |

Level: **2**

Defines Fixed PID Setpoint 13

**Index:**

P2213[0] : 1st. Drive data set (DDS)
P2213[1] : 2nd. Drive data set (DDS)
P2213[2] : 3rd. Drive data set (DDS)

**Details:**

See P2201 (Fixed PID Setpoint 1).

**P2214[3]** **Fixed PID setpoint 14**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** % | **Min:** | -200.00 |
| **P-Group:** | TECH | **Active:** No | - | **Def:** | 130.00 |
| | | | | **Max:** | 200.00 |

Level: **2**

Defines Fixed PID Setpoint 14

**Index:**

P2214[0] : 1st. Drive data set (DDS)
P2214[1] : 2nd. Drive data set (DDS)
P2214[2] : 3rd. Drive data set (DDS)

**Details:**

See P2201 (Fixed PID Setpoint 1).

**P2215[3]** **Fixed PID setpoint 15** Level: **2**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** % | **Min:** | -200.00 |
| **P-Group:** | TECH | **Active:** No | - | **Def:** | 130.00 |
| | | | | **Max:** | 200.00 |

Defines Fixed PID Setpoint 15

**Index:**

P2215[0] : 1st. Drive data set (DDS)
P2215[1] : 2nd. Drive data set (DDS)
P2215[2] : 3rd. Drive data set (DDS)

**Details:**

See P2201 (Fixed PID Setpoint 1).

**P2216** **Fixed PID setpoint mode - Bit 0** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U16 | **Unit:** - | **Min:** | 1 |
| **P-Group:** | TECH | **Active:** Immediately | - | **Def:** | 1 |
| | | | | **Max:** | 3 |

Fixed frequencies for PID setpoint can be selected in three different modes. Parameter P1016 defines the mode of selection Bit 0.

**Enum:**

1 Direct selection
2 Direct selection + ON command
3 Binary coded selection + ON command

**P2217** **Fixed PID setpoint mode - Bit 1** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U16 | **Unit:** - | **Min:** | 1 |
| **P-Group:** | TECH | **Active:** Immediately | - | **Def:** | 1 |
| | | | | **Max:** | 3 |

BCD or direct selection Bit 1 for PID setpoint.

**Enum:**

1 Direct selection
2 Direct selection + ON command
3 Binary coded selection + ON command

**P2218** **Fixed PID setpoint mode - Bit 2** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U16 | **Unit:** - | **Min:** | 1 |
| **P-Group:** | TECH | **Active:** Immediately | - | **Def:** | 1 |
| | | | | **Max:** | 3 |

BCD or direct selection Bit 2 for PID setpoint.

**Enum:**

1 Direct selection
2 Direct selection + ON command
3 Binary coded selection + ON command

**P2219** **Fixed PID setpoint mode - Bit 3** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U16 | **Unit:** - | **Min:** | 1 |
| **P-Group:** | TECH | **Active:** Immediately | - | **Def:** | 1 |
| | | | | **Max:** | 3 |

BCD or direct selection Bit 3 for PID setpoint.

**Enum:**

1 Direct selection
2 Direct selection + ON command
3 Binary coded selection + ON command

**P2220[3]** **BI: Fixed PID setp. select Bit 0** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 0:0 |
| | | | | **Max:** | 4000:0 |

Defines command source of fixed PID setpoint selection Bit 0

**Settings:**

722.0 = Digital input 1 (requires P0701 to be set to 99, BICO)
722.1 = Digital input 2 (requires P0702 to be set to 99, BICO)
722.2 = Digital input 3 (requires P0703 to be set to 99, BICO)
722.3 = Digital input 4 (requires P0704 to be set to 99, BICO)
722.4 = Digital input 5 (requires P0705 to be set to 99, BICO)
722.5 = Digital input 6 (requires P0706 to be set to 99, BICO)
722.6 = Digital input 7 (via analog input 1, requires P0707 to be set to 99)
722.7 = Digital input 8 (via analog input 2, requires P0708 to be set to 99)

**Index:**

P2220[0] : 1st. Command data set (CDS)
P2220[1] : 2nd. Command data set (CDS)
P2220[2] : 3rd. Command data set (CDS)

**P2221[3]** **BI: Fixed PID setp. select Bit 1**

**CStat:** CT **Datatype:** U32 **Unit:** - **Min:** 0:0
**P-Group:** COMMANDS **Active:** Immediately - **Def:** 0:0
**Max:** 4000:0

Level: **3**

Defines command source of fixed PID setpoint selection Bit 1.

**Settings:**

722.0 = Digital input 1 (requires P0701 to be set to 99, BICO)
722.1 = Digital input 2 (requires P0702 to be set to 99, BICO)
722.2 = Digital input 3 (requires P0703 to be set to 99, BICO)
722.3 = Digital input 4 (requires P0704 to be set to 99, BICO)
722.4 = Digital input 5 (requires P0705 to be set to 99, BICO)
722.5 = Digital input 6 (requires P0706 to be set to 99, BICO)

**Index:**

P2221[0] : 1st. Command data set (CDS)
P2221[1] : 2nd. Command data set (CDS)
P2221[2] : 3rd. Command data set (CDS)

**P2222[3]** **BI: Fixed PID setp. select Bit 2**

**CStat:** CT **Datatype:** U32 **Unit:** - **Min:** 0:0
**P-Group:** COMMANDS **Active:** Immediately - **Def:** 0:0
**Max:** 4000:0

Level: **3**

Defines command source of fixed PID setpoint selection Bit 2

**Settings:**

722.0 = Digital input 1 (requires P0701 to be set to 99, BICO)
722.1 = Digital input 2 (requires P0702 to be set to 99, BICO)
722.2 = Digital input 3 (requires P0703 to be set to 99, BICO)
722.3 = Digital input 4 (requires P0704 to be set to 99, BICO)
722.4 = Digital input 5 (requires P0705 to be set to 99, BICO)
722.5 = Digital input 6 (requires P0706 to be set to 99, BICO)

**Index:**

P2222[0] : 1st. Command data set (CDS)
P2222[1] : 2nd. Command data set (CDS)
P2222[2] : 3rd. Command data set (CDS)

**P2223[3]** **BI: Fixed PID setp. select Bit 3**

**CStat:** CT **Datatype:** U32 **Unit:** - **Min:** 0:0
**P-Group:** COMMANDS **Active:** Immediately - **Def:** 722:3
**Max:** 4000:0

Level: **3**

Defines command source of fixed PID setpoint selection Bit 3

**Settings:**

722.0 = Digital input 1 (requires P0701 to be set to 99, BICO)
722.1 = Digital input 2 (requires P0702 to be set to 99, BICO)
722.2 = Digital input 3 (requires P0703 to be set to 99, BICO)
722.3 = Digital input 4 (requires P0704 to be set to 99, BICO)
722.4 = Digital input 5 (requires P0705 to be set to 99, BICO)
722.5 = Digital input 6 (requires P0706 to be set to 99, BICO)

**Index:**

P2223[0] : 1st. Command data set (CDS)
P2223[1] : 2nd. Command data set (CDS)
P2223[2] : 3rd. Command data set (CDS)

**r2224** **CO: Act. fixed PID setpoint**

**Datatype:** Float **Unit:** % **Min:** -
**Def:** -
**P-Group:** TECH **Max:** -

Level: **2**

Displays total output of PID fixed setpoint selection.

**Note:**

r2224 = 100 % corresponds to 4000 hex

**P2225** **Fixed PID setpoint mode - Bit 4**

**CStat:** CT **Datatype:** U16 **Unit:** - **Min:** 1
**P-Group:** TECH **Active:** Immediately - **Def:** 1
**Max:** 3

Level: **3**

Direct selection or direct selection + ON Bit 4 for PID setpoint.

**Enum:**

1 Direct selection
2 Direct selection + ON command
3 Binary coded selection + ON command

**P2226[3]** **BI: Fixed PID setp. select Bit 4** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 722:4 |
| | | | | **Max:** | 4000:0 |

Defines command source of fixed PID setpoint selection Bit 4

**Settings:**

722.0 = Digital input 1 (requires P0701 to be set to 99, BICO)
722.1 = Digital input 2 (requires P0702 to be set to 99, BICO)
722.2 = Digital input 3 (requires P0703 to be set to 99, BICO)
722.3 = Digital input 4 (requires P0704 to be set to 99, BICO)
722.4 = Digital input 5 (requires P0705 to be set to 99, BICO)
722.5 = Digital input 6 (requires P0706 to be set to 99, BICO)

**Index:**

P2226[0] : 1st. Command data set (CDS)
P2226[1] : 2nd. Command data set (CDS)
P2226[2] : 3rd. Command data set (CDS)

**P2227** **Fixed PID setpoint mode - Bit 5** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U16 | **Unit:** - | **Min:** | 1 |
| **P-Group:** | TECH | **Active:** Immediately | - | **Def:** | 1 |
| | | | | **Max:** | 3 |

Direct selection / direct selection + ON Bit 5 for PID setpoint.

**Enum:**

1 Direct selection
2 Direct selection + ON command
3 Binary coded selection + ON command

**P2228[3]** **BI: Fixed PID setp. select Bit 5** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | COMMANDS | **Active:** Immediately | - | **Def:** | 722:5 |
| | | | | **Max:** | 4000:0 |

Defines command source of fixed PID setpoint selection Bit 5

**Settings:**

722.0 = Digital input 1 (requires P0701 to be set to 99, BICO)
722.1 = Digital input 2 (requires P0702 to be set to 99, BICO)
722.2 = Digital input 3 (requires P0703 to be set to 99, BICO)
722.3 = Digital input 4 (requires P0704 to be set to 99, BICO)
722.4 = Digital input 5 (requires P0705 to be set to 99, BICO)
722.5 = Digital input 6 (requires P0706 to be set to 99, BICO)

**Index:**

P2228[0] : 1st. Command data set (CDS)
P2228[1] : 2nd. Command data set (CDS)
P2228[2] : 3rd. Command data set (CDS)

**P2231[3]** **Setpoint memory of PID-MOP** Level: **2**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U16 | **Unit:** - | **Min:** | 0 |
| **P-Group:** | TECH | **Active:** No | - | **Def:** | 0 |
| | | | | **Max:** | 1 |

Setpoint memory

**Enum:**

0 PID-MOP setpoint will not be stored
1 PID-MOP setpoint will be stored (P2240 is updated)

**Index:**

P2231[0] : 1st. Drive data set (DDS)
P2231[1] : 2nd. Drive data set (DDS)
P2231[2] : 3rd. Drive data set (DDS)

**Dependency:**

If 0 selected, setpoint returns to value set in P2240 (setpoint of PID-MOP) after an OFF command

If 1 is selected, active setpoint is 'remembered' and P2240 updated with current value.

**Details:**

See P2240 (setpoint of PID-MOP)

**P2232** **Inhibit rev. direct. of PID-MOP** Level: **2**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CT | **Datatype:** U16 | **Unit:** - | **Min:** | 0 |
| **P-Group:** | TECH | **Active:** Immediately | - | **Def:** | 1 |
| | | | | **Max:** | 1 |

Inhibits reverse setpoint selection when PID motor potentiometer is chosen either as a main setpoint of additional setpoint (using P1000)

**Enum:**

0 Reserve direction is allowed
1 Reserve direction inhibited

**Note:**

Setting 0 enables a change of motor direction using the motor potentiometer setpoint (increase/decrease frequency either by using digital inputs or motor potentiometer up/down buttons.

**P2235[3]** **BI: Enable PID-MOP (UP-cmd)**

**CStat:** CT **Datatype:** U32 **Unit:** - **Min:** 0:0
**P-Group:** COMMANDS **Active:** Immediately - **Def:** 19:13
**Max:** 4000:0

Level: **3**

Defines source of UP command.

**Settings:**

722.0 = Digital input 1 (requires P0701 to be set to 99, BICO)
722.1 = Digital input 2 (requires P0702 to be set to 99, BICO)
722.2 = Digital input 3 (requires P0703 to be set to 99, BICO)
722.3 = Digital input 4 (requires P0704 to be set to 99, BICO)
722.4 = Digital input 5 (requires P0705 to be set to 99, BICO)
722.5 = Digital input 6 (requires P0706 to be set to 99, BICO)

19.D = Keypad UP cursor

**Index:**

P2235[0] : 1st. Command data set (CDS)
P2235[1] : 2nd. Command data set (CDS)
P2235[2] : 3rd. Command data set (CDS)

**P2236[3]** **BI: Enable PID-MOP (DOWN-cmd)**

**CStat:** CT **Datatype:** U32 **Unit:** - **Min:** 0:0
**P-Group:** COMMANDS **Active:** Immediately - **Def:** 19:14
**Max:** 4000:0

Level: **3**

Defines source of DOWN command.

**Settings:**

722.0 = Digital input 1 (requires P0701 to be set to 99, BICO)
722.1 = Digital input 2 (requires P0702 to be set to 99, BICO)
722.2 = Digital input 3 (requires P0703 to be set to 99, BICO)
722.3 = Digital input 4 (requires P0704 to be set to 99, BICO)
722.4 = Digital input 5 (requires P0705 to be set to 99, BICO)
722.5 = Digital input 6 (requires P0706 to be set to 99, BICO)
722.6 = Digital input 7 (via analog input 1, requires P0707 to be set to 99)
722.7 = Digital input 8 (via analog input 2, requires P0708 to be set to 99)

19.E = Keypad DOWN cursor

**Index:**

P2236[0] : 1st. Command data set (CDS)
P2236[1] : 2nd. Command data set (CDS)
P2236[2] : 3rd. Command data set (CDS)

**P2240[3]** **Setpoint of PID-MOP**

**CStat:** CUT **Datatype:** Float **Unit:** % **Min:** -200.00
**P-Group:** TECH **Active:** No - **Def:** 10.00
**Max:** 200.00

Level: **2**

Setpoint of the motor potentiometer.

Allows user to set a digital PID setpoint in [%].

**Settings:**

722.0 = Digital input 1 (requires P0701 to be set to 99, BICO)
722.1 = Digital input 2 (requires P0702 to be set to 99, BICO)
722.2 = Digital input 3 (requires P0703 to be set to 99, BICO)
722.3 = Digital input 4 (requires P0704 to be set to 99, BICO)
722.4 = Digital input 5 (requires P0705 to be set to 99, BICO)
722.5 = Digital input 6 (requires P0706 to be set to 99, BICO)
722.6 = Digital input 7 (via analog input 1, requires P0707 to be set to 99)
722.7 = Digital input 8 (via analog input 2, requires P0708 to be set to 99)

19.D = Keypad UP cursor

**Index:**

P2240[0] : 1st. Drive data set (DDS)
P2240[1] : 2nd. Drive data set (DDS)
P2240[2] : 3rd. Drive data set (DDS)

**Dependency:**

To change setpoint:
1. Use UP / DOWN key on BOP or
2. Set P0702/P0703 = 13/14 (function of digital inputs 2 and 3)

**Note:**

P2240 = 100 % corresponds to 4000 hex

**r2250** **CO: Output setpoint of PID-MOP**

**Datatype:** Float **Unit:** % **Min:** -
**P-Group:** TECH **Def:** -
**Max:** -

Level: **2**

Displays output setpoint of motor potentiometer in [%].

**Note:**

r2250 = 100 % corresponds to 4000 hex

**P2253[3]** **CI: PID setpoint**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | TECH | **Active:** Immediately | - | **Def:** | 0:0 |
| | | | | **Max:** | 4000:0 |

Level: **2**

Defines setpoint source for PID setpoint input.

This parameter allows the user to select the source of the PID setpoint. Normally, a digital setpoint is selected either using a fixed PID setpoint or an active setpoint.

**Settings:**

755 = Analog input 1
2224 = Fixed PI setpoint (see P2201 to P2207)
2250 = Active PI setpoint (see P2240)

**Index:**

P2253[0] : 1st. Command data set (CDS)
P2253[1] : 2nd. Command data set (CDS)
P2253[2] : 3rd. Command data set (CDS)

**P2254[3]** **CI: PID trim source**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | TECH | **Active:** Immediately | - | **Def:** | 0:0 |
| | | | | **Max:** | 4000:0 |

Level: **3**

Selects trim source for PID setpoint. This signal is multiplied by the trim gain and added to the PID setpoint.

**Settings:**

755 = Analog input 1
2224 = Fixed PI setpoint (see P2201 to P2207)
2250 = Active PI setpoint (see P2240)

**Index:**

P2254[0] : 1st. Command data set (CDS)
P2254[1] : 2nd. Command data set (CDS)
P2254[2] : 3rd. Command data set (CDS)

**P2255** **PID setpoint gain factor**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** - | **Min:** | 0.00 |
| **P-Group:** | TECH | **Active:** No | - | **Def:** | 100.00 |
| | | | | **Max:** | 100.00 |

Level: **3**

Gain factor for PID setpoint. The trim input is multiplied by this gain factor to produce a suitable ratio between setpoint and trim.

**P2256** **PID trim gain factor**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** - | **Min:** | 0.00 |
| **P-Group:** | TECH | **Active:** No | - | **Def:** | 100.00 |
| | | | | **Max:** | 100.00 |

Level: **3**

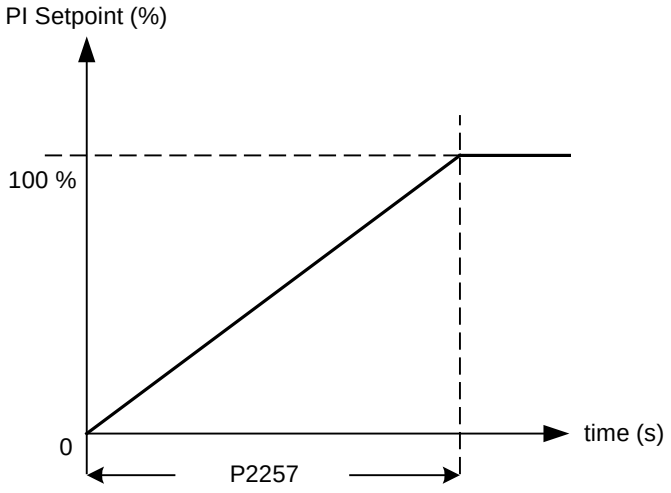
Gain factor for PID trim. This gain factor scales the trim signal, which is added to the main PID setpoint.

**P2257** **Ramp-up time for PID setpoint**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** s | **Min:** | 0.00 |
| **P-Group:** | TECH | **Active:** No | - | **Def:** | 1.00 |
| | | | | **Max:** | 650.00 |

Level: **2**

Sets the ramp-up time for the PID setpoint.




**Dependency:**

P2200 = 1 (PID control is enabled) disable normal ramp-up time (P1120).

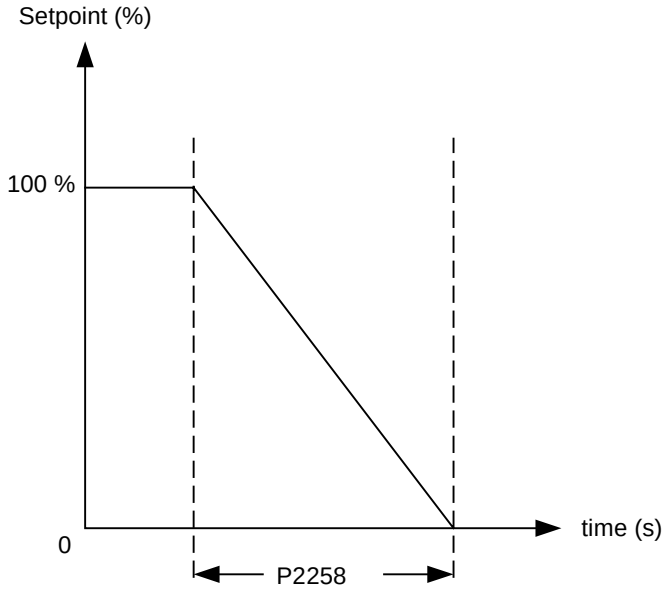
PID ramp time effective only on PID setpoint and only active when PID setpoint is changed or when RUN command is given (when PID uses this ramp to reach its value from 0 %).

**Notice:**

Setting the ramp-up time too short may cause the inverter to trip, on overcurrent for example.

| P2258 | **Ramp-down time for PID setpoint** | | | **Min:** | 0.00 | Level: |
|---|---|---|---|---|---|---|
| | **CStat:** CUT | **Datatype:** Float | **Unit:** s | **Def:** | 1.00 | **2** |
| | **P-Group:** TECH | **Active:** No | - | **Max:** | 650.00 | |

Sets ramp-down time for PID setpoint.




**Dependency:**

P2200 = 1 (PID control is enabled) disables normal ramp-up time (P1120).

PID setpoint ramp effective only on PID setpoint changes.

P1121 (ramp-down time) and P1135 (OFF3 ramp-down time) define the ramp times used after OFF1 and OFF2 respectively.

**Notice:**

Setting the ramp-down time too short can cause the inverter to trip on overvoltage (F0002) / overcurrent (F0001).

| r2260 | **CO: Act. PID setpoint** | | | **Min:** | - | Level: |
|---|---|---|---|---|---|---|
| | | **Datatype:** Float | **Unit:** % | **Def:** | - | **2** |
| | **P-Group:** TECH | | | **Max:** | - | |

Displays total active PID setpoint in [%].

**Note:**

r2260 = 100 % corresponds to 4000 hex

| P2261 | **PID setpoint filter timeconstant** | | | **Min:** | 0.00 | Level: |
|---|---|---|---|---|---|---|
| | **CStat:** CUT | **Datatype:** Float | **Unit:** s | **Def:** | 0.00 | **3** |
| | **P-Group:** TECH | **Active:** No | - | **Max:** | 60.00 | |

Sets a time constant for smoothing the PID setpoint.

**Note:**

0 = no smoothing

| r2262 | **CO: Act. PID filtered setpoint** | | | **Min:** | - | Level: |
|---|---|---|---|---|---|---|
| | | **Datatype:** Float | **Unit:** % | **Def:** | - | **3** |
| | **P-Group:** TECH | | | **Max:** | - | |

Displays PID setpoint in [%] after smoothing.

**Note:**

r2262 = 100 % corresponds to 4000 hex

| P2263 | **PID controller type** | | | **Min:** | 0 | Level: |
|---|---|---|---|---|---|---|
| | **CStat:** CT | **Datatype:** U16 | **Unit:** - | **Def:** | 0 | **3** |
| | **P-Group:** TECH | **Active:** No | - | **Max:** | 1 | |

Sets the PID controller type.

**Enum:**

0 D component on feedback signal
1 D component on error signal

**P2264[3]** **CI: PID feedback** Level: **2**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U32 | **Unit:** - | **Min:** | 0:0 |
| **P-Group:** | TECH | **Active:** Immediately | - | **Def:** | 755:0 |
| | | | | **Max:** | 4000:0 |

Selects the source of the PID feedback signal.

**Settings:**

755 = Analog input 1 setpoint
2224 = Fixed PID setpoint
2250 = Output setpoint of PID-MOP

**Index:**

P2264[0] : 1st. Command data set (CDS)
P2264[1] : 2nd. Command data set (CDS)
P2264[2] : 3rd. Command data set (CDS)

**Note:**

When analog input is selected, offset and gain can be implemented using parameters P0756 to P0760 (ADC scaling).

**P2265** **PID feedback filter timeconstant** Level: **2**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** s | **Min:** | 0.00 |
| **P-Group:** | TECH | **Active:** No | - | **Def:** | 0.00 |
| | | | | **Max:** | 60.00 |

Defines time constant for PID feedback filter.

**r2266** **CO: PID filtered feedback** Level: **2**

| | | | | | |
|---|---|---|---|---|---|
| | | **Datatype:** Float | **Unit:** % | **Min:** | - |
| **P-Group:** | TECH | | | **Def:** | - |
| | | | | **Max:** | - |

Displays PID feedback signal in [%].

**Note:**

r2266 = 100 % corresponds to 4000 hex

**P2267** **Max. value for PID feedback** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** % | **Min:** | -200.00 |
| **P-Group:** | TECH | **Active:** No | - | **Def:** | 100.00 |
| | | | | **Max:** | 200.00 |

Sets the upper limit for the value of the feedback signal in [%].

**Note:**

P2267 = 100 % corresponds to 4000 hex

**Notice:**

When PID is enabled (P2200 = 1) and the signal rises above this value, the inverter will trip with F0222 .

**P2268** **Min. value for PID feedback** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** % | **Min:** | -200.00 |
| **P-Group:** | TECH | **Active:** No | - | **Def:** | 0.00 |
| | | | | **Max:** | 200.00 |

Sets lower limit for value of feedback signal in [%].

**Note:**

P2268 = 100 % corresponds to 4000 hex

**Notice:**

When PID is enabled (P2200 = 1) and the signal rises above this value, the inverter will trip with F0221.

**P2269** **Gain applied to PID feedback** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** - | **Min:** | 0.00 |
| **P-Group:** | TECH | **Active:** No | - | **Def:** | 100.00 |
| | | | | **Max:** | 500.00 |

Allows the user to scale the PID feedback as a percentage value [%].

A gain of 100.0 % means that feedback signal has not changed from its default value.

**P2270** **PID feedback function selector** Level: **3**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U16 | **Unit:** - | **Min:** | 0 |
| **P-Group:** | TECH | **Active:** No | - | **Def:** | 0 |
| | | | | **Max:** | 3 |

Applies mathematical functions to the PID feedback signal, allowing multiplication of the result by P2269 (gain applied to PID feedback).

**Enum:**

0 Disabled
1 Square root (root(x))
2 Square (x*x)
3 Cube (x*x*x)

**P2271** **PID tranducer type** Level: **2**

**CStat:** CUT **Datatype:** U16 **Unit:** - **Min:** 0
**P-Group:** TECH **Active:** No - **Def:** 0
**Max:** 1

Allows the user to select the transducer type for the PID feedback signal.

**Value:**

0 : [default] If the feedback signal is less than the PID setpoint, the PID controller will increase motor speed to correct this.

1 : If the feedback signal is greater than the PID setpoint, the PID controller will reduce motor speed to correct this.

**Enum:**

0 Disabled
1 Inversion of PID feedback signal

**Notice:**

It is essential that you select the correct tranducer type.

If you are unsure whether 0 or 1 is applicable, you can determine the correct type as follows:
1 Disable the PID function (P2200 = 0).
2 Increase the motor frequency while measuring the feedback signal.
3 If the feedback signal increases with an increase in motor frequency, the PID transducer type should be 0.
4 If the feedback signal decreases with an increase in motor frequency the PID transducer type should be set to 1.

**r2272** **CO: PID scaled feedback** Level: **2**

**Datatype:** Float **Unit:** % **Min:** -
**P-Group:** TECH **Def:** -
**Max:** -

Displays PID scaled feedback signal in [%].

**Note:**

r2272 = 100 % corresponds to 4000 hex

**r2273** **CO: PID error** Level: **2**

**Datatype:** Float **Unit:** % **Min:** -
**P-Group:** TECH **Def:** -
**Max:** -

Displays PID error (difference) signal between setpoint and feedback signals in [%].

**Note:**

r2273 = 100 % corresponds to 4000 hex

**P2274** **PID derivative time** Level: **2**

**CStat:** CUT **Datatype:** Float **Unit:** s **Min:** 0.000
**P-Group:** TECH **Active:** No - **Def:** 0.000
**Max:** 60.000

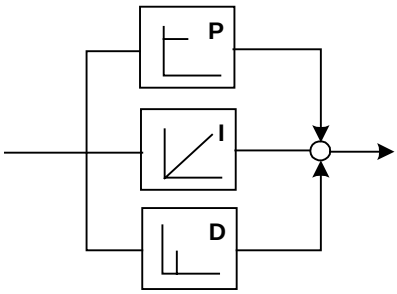
Sets PID derivative time.

**P2280** **PID proportional gain** Level: **2**

**CStat:** CUT **Datatype:** Float **Unit:** - **Min:** 0.000
**P-Group:** TECH **Active:** No - **Def:** 3.000
**Max:** 65.000

Allows user to set proportional gain for PID controller.

The PID controller is implemented using the standard model.




For best results, enable both P and I terms.

**Dependency:**

If P term = 0, I term acts on the square of the error signal.

**Note:**

If the system is prone to sudden step changes in the feedback signal, P term should normally be set to a small value (0.5) with a faster I term for optimum performance.

The D term (P2274) multiplies the difference between the present and previous feedback signal thus accelerating the controller reaction to an error that appears suddenly.

**Notice:**

The D term should be used carefully, since it can cause the controller output to fluctuate as every change in the feedback signal is amplified by the controller derivative action.

**P2285 PID integral time**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** s | **Min:** | 0.000 |
| **P-Group:** | TECH | **Active:** No | - | **Def:** | 0.000 |
| | | | | **Max:** | 60.000 |

Level: **2**

Sets integral time constant for PID controller.

**Details:**

See P2280 (PID proportional gain).

**P2291 PID output upper limit**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** % | **Min:** | -200.00 |
| **P-Group:** | TECH | **Active:** No | - | **Def:** | 100.00 |
| | | | | **Max:** | 200.00 |

Level: **2**

Sets upper limit for PID controller output in [%].

**Dependency:**

If F max (P1082) is greater than P2000 (reference frequency), either P2000 or P2291 (PID output upper limit) must be changed to achieve F max.

**Note:**

P2291 = 100 % corresponds to 4000 hex (as defined by P2000 (reference frequency)).

**P2292 PID output lower limit**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** % | **Min:** | -200.00 |
| **P-Group:** | TECH | **Active:** No | - | **Def:** | 0.00 |
| | | | | **Max:** | 200.00 |

Level: **2**

Sets lower limit for the PID controller output in [%].

**Dependency:**

A negative value allows bipolar operation of PID controller.

**Note:**

P2292 = 100 % corresponds to 4000 hex

**P2293 Ramp-up /-down time of PID limit**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** Float | **Unit:** s | **Min:** | 0.00 |
| **P-Group:** | TECH | **Active:** No | - | **Def:** | 1.00 |
| | | | | **Max:** | 100.00 |

Level: **3**

Sets maximum ramp rate on output of PID.

When PI is enabled, the output limits are ramped up from 0 to the limits set in P2291 (PID output upper limit) and P2292 (PID output lower limit). Limits prevent large step changes appearing on the output of the PID when the inverter is started. Once the limits have been reached, the PID controller output is instantaneous.

These ramp times are used whenever a RUN command is issued.

**Note:**

If an OFF1 or OFF 3 are issued, the inverter output frequency ramps down as set in P1121 (ramp-down time) or P1135 (OFF3 ramp-down time).

**r2294 CO: Act. PID output**

| | | | | | |
|---|---|---|---|---|---|
| | | **Datatype:** Float | **Unit:** % | **Min:** | - |
| | | | | **Def:** | - |
| **P-Group:** | TECH | | | **Max:** | - |

Level: **2**

Displays PID output in [%]

**Note:**

r2294 = 100 % corresponds to 4000 hex

**P2350 PID autotune enable**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U16 | **Unit:** - | **Min:** | 0 |
| **P-Group:** | TECH | **Active:** No | - | **Def:** | 0 |
| | | | | **Max:** | 4 |

Level: **2**

Enables autotune function of PID controller.

**Enum:**

0 PID Autotuning Disabled
1 PID Autotuning St. ZN
2 PID Autotuning Some O/S
3 PID Autotuning No O/S
4 PID Autotuning PI only

**Dependency:**

Active when PID loop is enabled (see P2200).

**Note:**

After autotune this parameter is set to zero (autotune completed).

**P2354 PID tuning timeout length**

| | | | | | |
|---|---|---|---|---|---|
| **CStat:** | CUT | **Datatype:** U16 | **Unit:** s | **Min:** | 60 |
| **P-Group:** | FUNC | **Active:** No | - | **Def:** | 240 |
| | | | | **Max:** | 65000 |

Level: **3**

**Notice:**

This parameter determines the time that the auto tuning code will wait before aborting a tuning run if no oscillation has been obtained

**P2355** **PID tuning offset** **Min:** 0.00 Level: **3**
**CStat:** CUT **Datatype:** Float **Unit:** % **Def:** 5.00
**P-Group:** TECH **Active:** No - **Max:** 20.00

Sets applied offset and deviation for PID autotuning.

**Note:**
This can be varied depending on plant conditions e.g. a very long system time constant might require a larger value.

**P3900** **End of quick commissioning** **Min:** 0 Level: **1**
**CStat:** C **Datatype:** U16 **Unit:** - **Def:** 0
**P-Group:** QUICK **Active:** Immediately QuickCom **Max:** 3

Performs calculations necessary for optimized motor operation.

After completion of calculation, P3900 and P0010 (parameter groups for commissioning) are automatically reset to their original value 0.

**Enum:**
0 No quick commissioning
1 Start quick commissioning with factory reset
2 Start quick commissioning
3 Start quick commissioning only for motor data

**Dependency:**
Changeable only when P0010 = 1 (quick commissioning)

**Note:**
When setting 1 is selected, only the parameter settings carried out via the commissioning menu "Quick commissioning", are retained; all other parameter changes, including the I/O settings, are lost. Motor calculations are also performed.

When setting 2 is selected, only those parameters, which depend on the parameters in the commissioning menu "Quick commissioning" (P0010 = 1) are calculated. The I/O settings are also reset to default and the motor calculations performed.

When setting 3 is selected, only the motor and controller calculations are performed. Exiting quick commissioning with this setting saves time (for example, if only motor rating plate data have been changed).

Calculates a variety of motor parameters, overwriting previous values. These include P0344 (Level 3, motor weight), P0350 (Level 3, demagnetization time), P2000 (reference frequency), P2002 (Level 3, reference current).

**P3950** **Access of hidden parameter** **Min:** 0 Level: **4**
**CStat:** CUT **Datatype:** U16 **Unit:** - **Def:** 0
**P-Group:** ALWAYS **Active:** Immediately - **Max:** 255

Accesses special parameters for development (expert only) and factory functionality (calibration parameter).

**r3954[13]** **CM version and GUI ID** **Min:** - Level: **4**
**Datatype:** U16 **Unit:** - **Def:** -
**P-Group:** - **Max:** -

Used to classify firmware (only for SIEMENS internal purposes).

**Index:**
r3954[0] : CM version (major release)
r3954[1] : CM version (minor release)
r3954[2] : CM version (baselevel or patch)
r3954[3] : GUI ID
r3954[4] : GUI ID
r3954[5] : GUI ID
r3954[6] : GUI ID
r3954[7] : GUI ID
r3954[8] : GUI ID
r3954[9] : GUI ID
r3954[10] : GUI ID
r3954[11] : GUI ID major release
r3954[12] : GUI ID minor release

**r3955** **Version for DriveMonitor** **Min:** - Level: **H**
**Datatype:** U16 **Unit:** - **Def:** -
**P-Group:** - **Max:** -

Displays the version for DriveMonitor.

**P3980** **Commissioning command selection** Level: **4**

**CStat:** T **Datatype:** U16 **Unit:** - **Min:** 0
**P-Group:** - **Active:** Immediately - **Def:** 0
**Max:** 66

Toggles command and setpoint sources between freely programmable BICO parameters and fixed command/setpoint profiles for commissioning.

The command and setpoint sources can be changed independently. The tens digit selects the command source, the ones digit the setpoint source.

**Enum:**

| | | | | | |
|---|---|---|---|---|---|
| 0 | Cmd | = BICO parameter | Setpoint | = | BICO parameter |
| 1 | Cmd | = BICO parameter | Setpoint | = | MOP setpoint |
| 2 | Cmd | = BICO parameter | Setpoint | = | Analog setpoint |
| 3 | Cmd | = BICO parameter | Setpoint | = | Fixed frequency |
| 4 | Cmd | = BICO parameter | Setpoint | = | USS on BOP link |
| 5 | Cmd | = BICO parameter | Setpoint | = | USS on COM link |
| 6 | Cmd | = BICO parameter | Setpoint | = | CB on COM link |
| 10 | Cmd | = BOP | Setpoint | = | BICO parameter |
| 11 | Cmd | = BOP | Setpoint | = | MOP setpoint |
| 12 | Cmd | = BOP | Setpoint | = | Analog setpoint |
| 13 | Cmd | = BOP | Setpoint | = | Fixed frequency |
| 14 | Cmd | = BOP | Setpoint | = | USS on BOP link |
| 15 | Cmd | = BOP | Setpoint | = | USS on COM link |
| 16 | Cmd | = BOP | Setpoint | = | CB on COM link |
| 40 | Cmd | = USS on BOP link | Setpoint | = | BICO parameter |
| 41 | Cmd | = USS on BOP link | Setpoint | = | MOP setpoint |
| 42 | Cmd | = USS on BOP link | Setpoint | = | Analog setpoint |
| 43 | Cmd | = USS on BOP link | Setpoint | = | Fixed frequency |
| 44 | Cmd | = USS on BOP link | Setpoint | = | USS on BOP link |
| 45 | Cmd | = USS on BOP link | Setpoint | = | USS on COM link |
| 46 | Cmd | = USS on BOP link | Setpoint | = | CB on COM link |
| 50 | Cmd | = USS on COM link | Setpoint | = | BICO parameter |
| 51 | Cmd | = USS on COM link | Setpoint | = | MOP setpoint |
| 52 | Cmd | = USS on COM link | Setpoint | = | Analog setpoint |
| 53 | Cmd | = USS on COM link | Setpoint | = | Fixed frequency |
| 54 | Cmd | = USS on COM link | Setpoint | = | USS on BOP link |
| 55 | Cmd | = USS on COM link | Setpoint | = | USS on COM link |
| 56 | Cmd | = USS on COM link | Setpoint | = | CB on COM link |
| 60 | Cmd | = CB on COM link | Setpoint | = | BICO parameter |
| 61 | Cmd | = CB on COM link | Setpoint | = | MOP setpoint |
| 62 | Cmd | = CB on COM link | Setpoint | = | Analog setpoint |
| 63 | Cmd | = CB on COM link | Setpoint | = | Fixed frequency |
| 64 | Cmd | = CB on COM link | Setpoint | = | USS on BOP link |
| 65 | Cmd | = CB on COM link | Setpoint | = | USS on COM link |
| 66 | Cmd | = CB on COM link | Setpoint | = | CB on COM link |

**P3981** **Reset active fault** Level: **4**

**CStat:** CT **Datatype:** U16 **Unit:** - **Min:** 0
**P-Group:** ALARMS **Active:** Immediately - **Def:** 0
**Max:** 1

Resets active faults when changed from 0 to 1.

**Enum:**

0 No fault reset
1 Reset fault

**Note:**

Automatically reset to 0.

**Details:**

See P0947 (last fault code)

**r3986[2]** **Number of parameters** Level: **4**

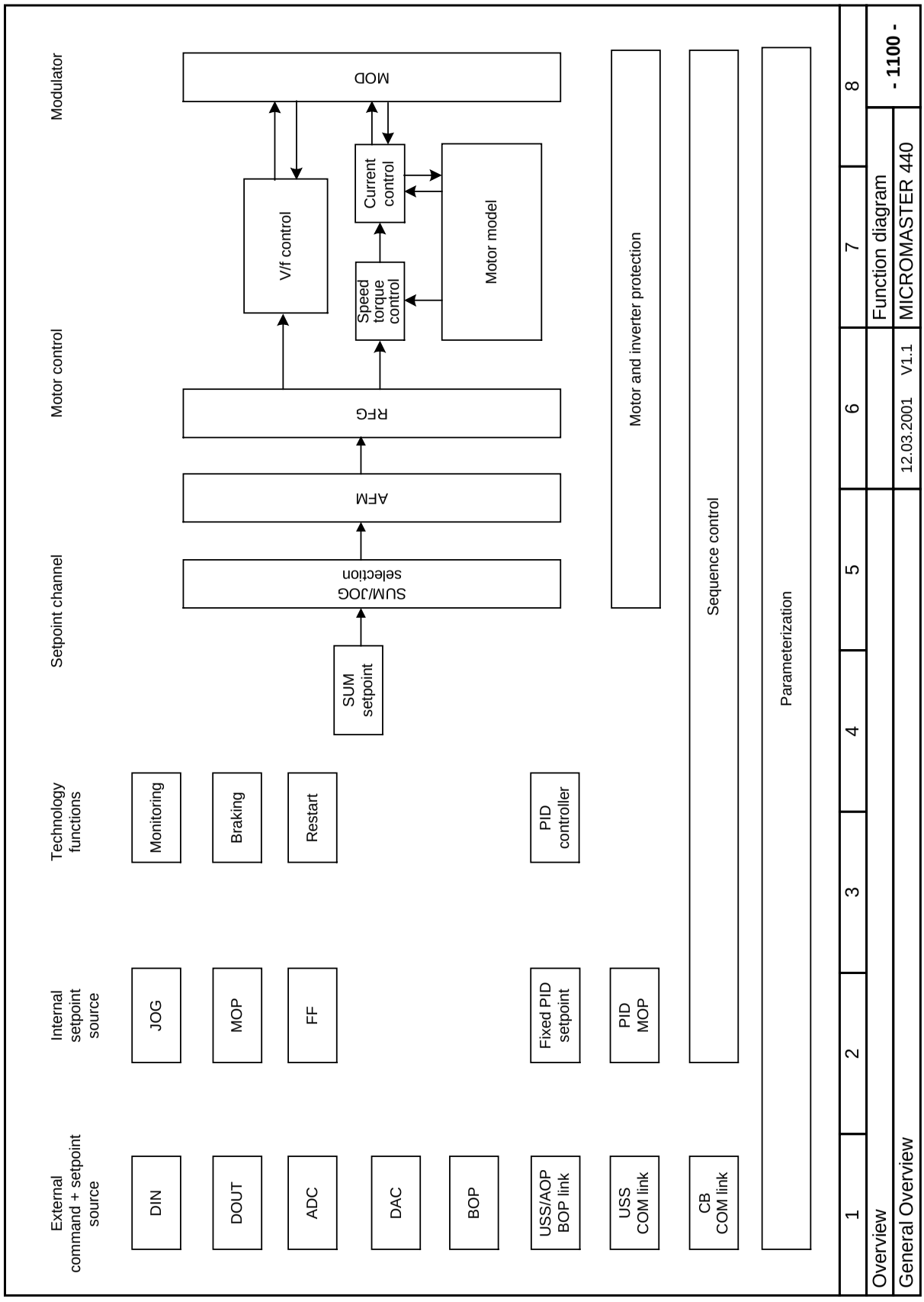
**Datatype:** U16 **Unit:** - **Min:** -
**Def:** -
**P-Group:** - **Max:** -

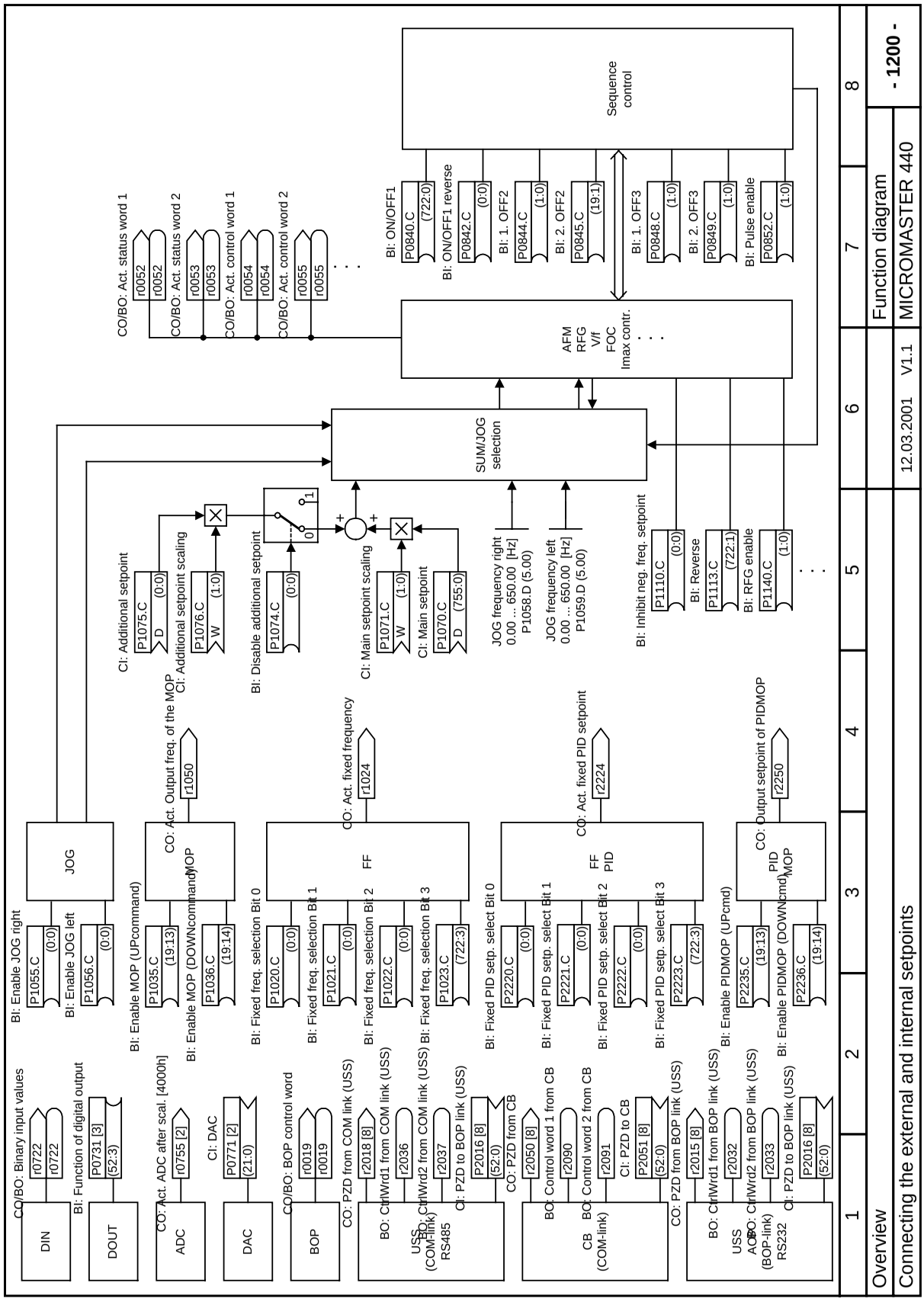
Number of parameters on the drive

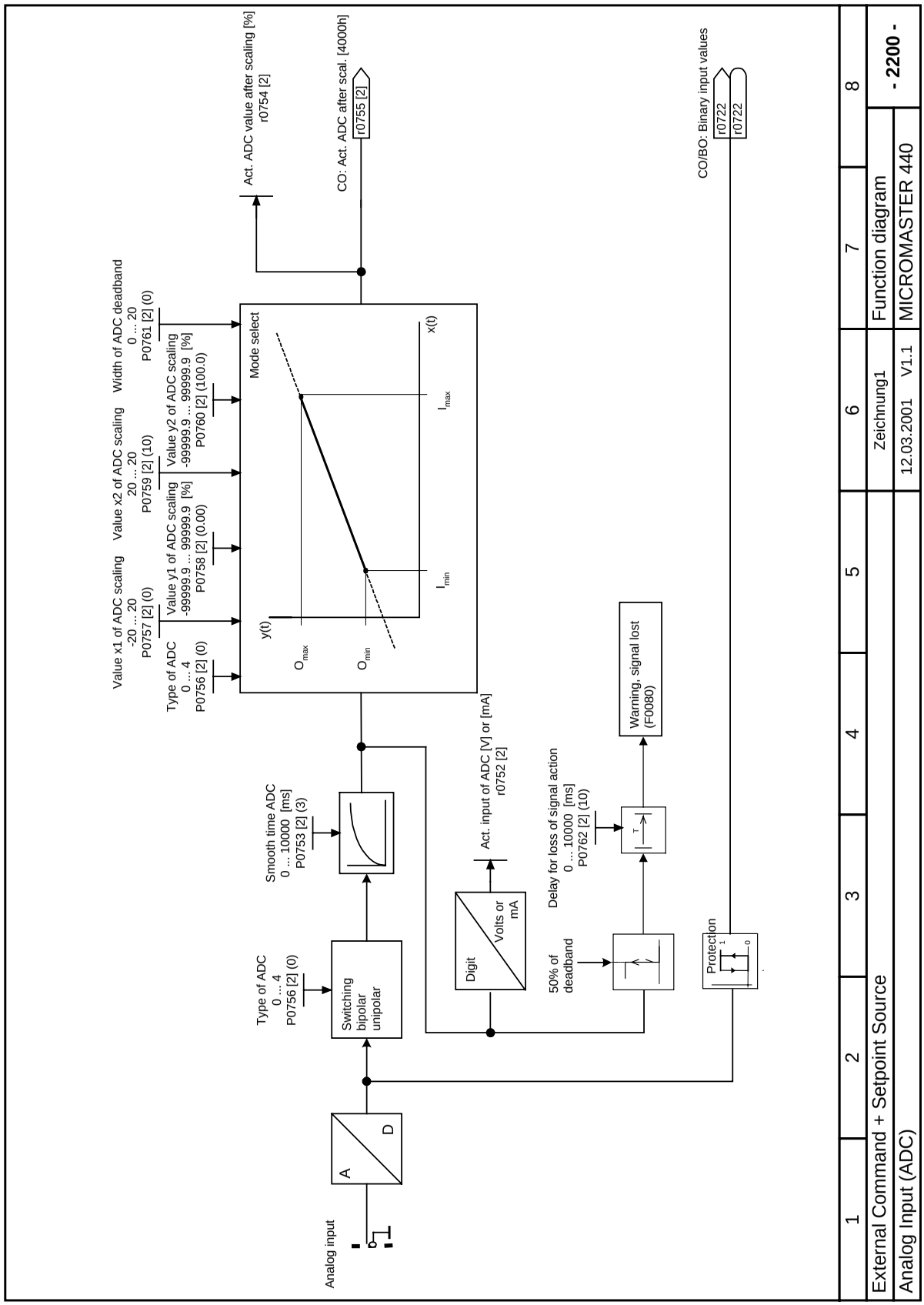
**Index:**

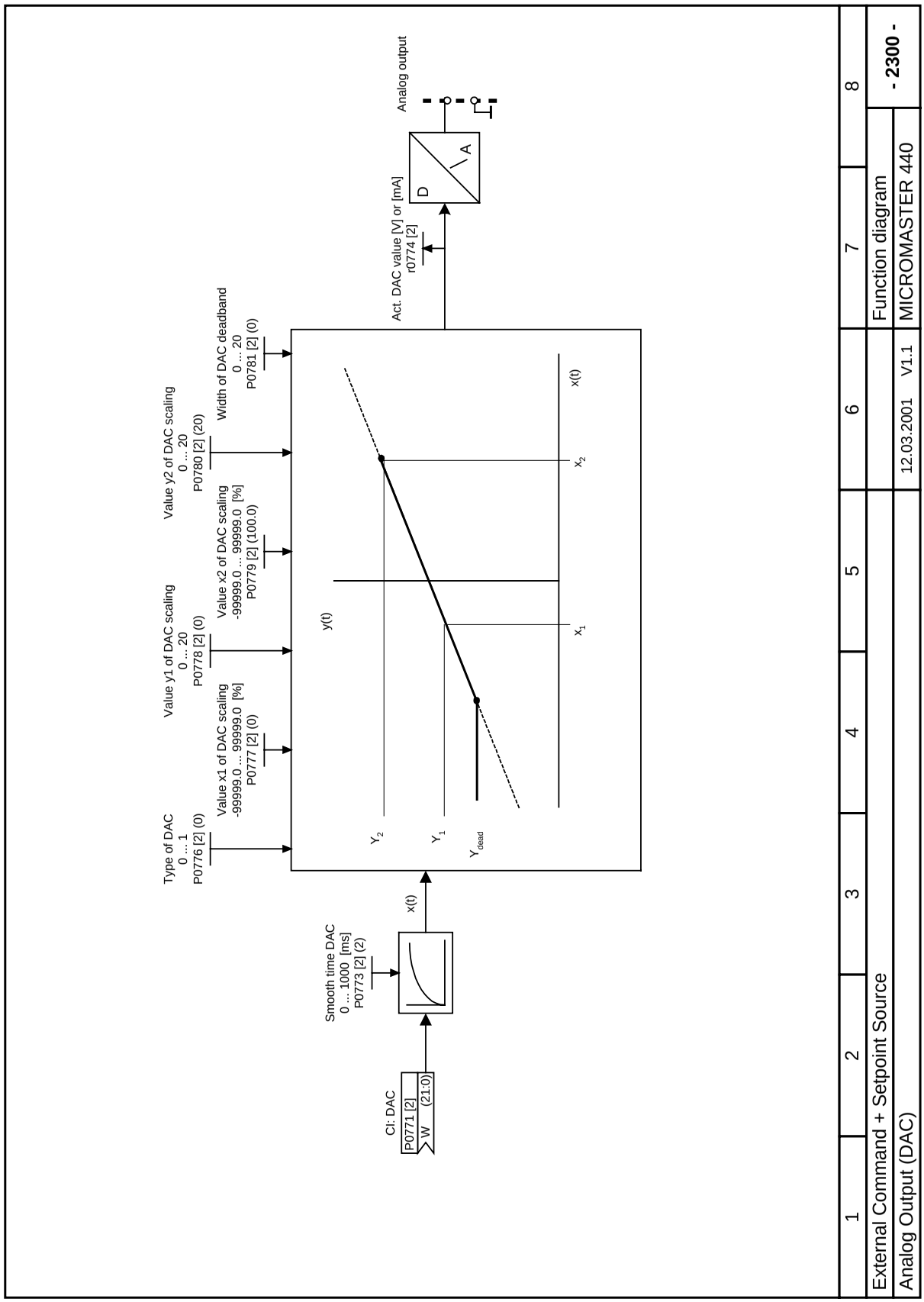
r3986[0] : Read only
r3986[1] : Read & write

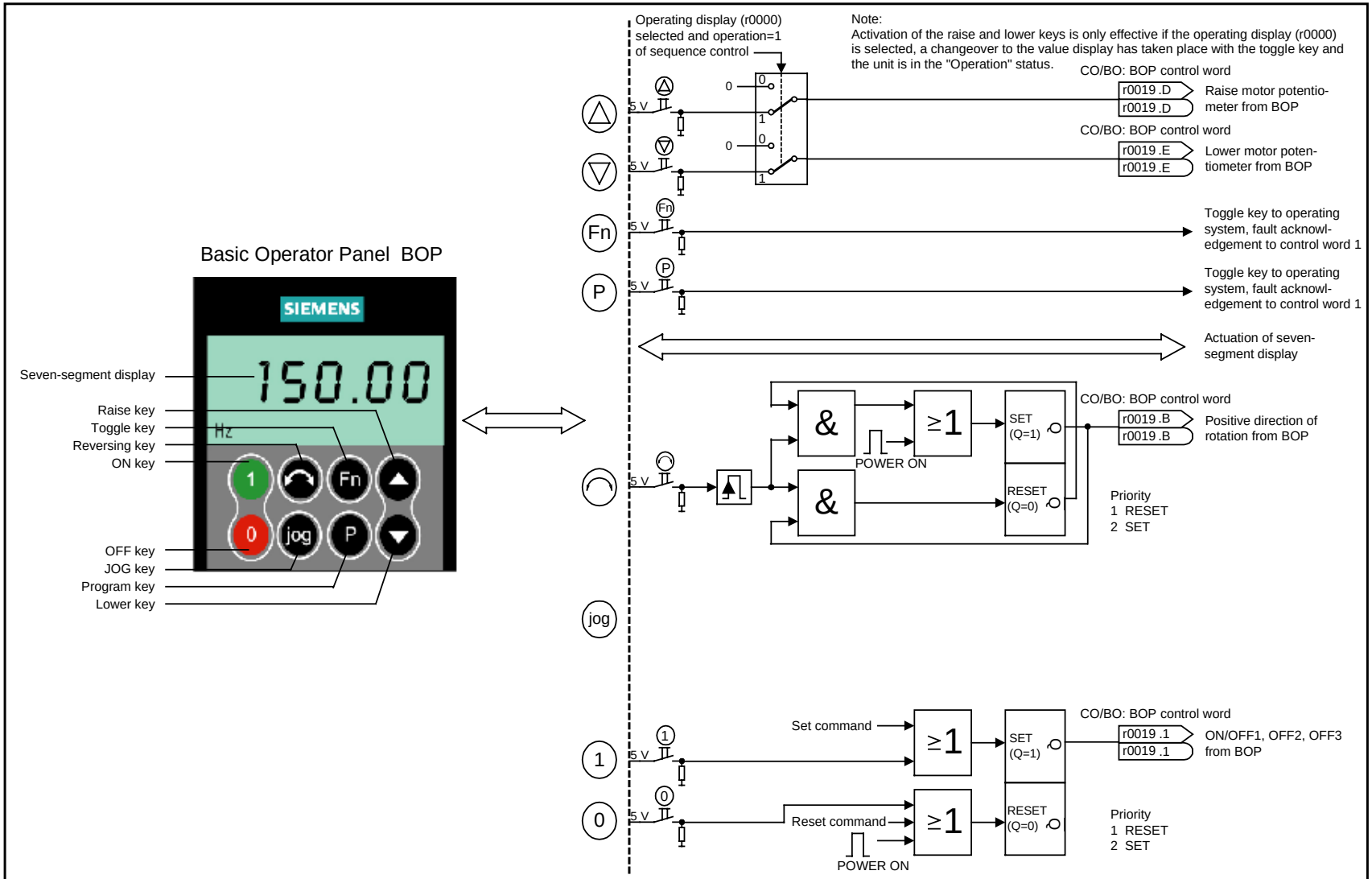
# 2 Function Diagrams



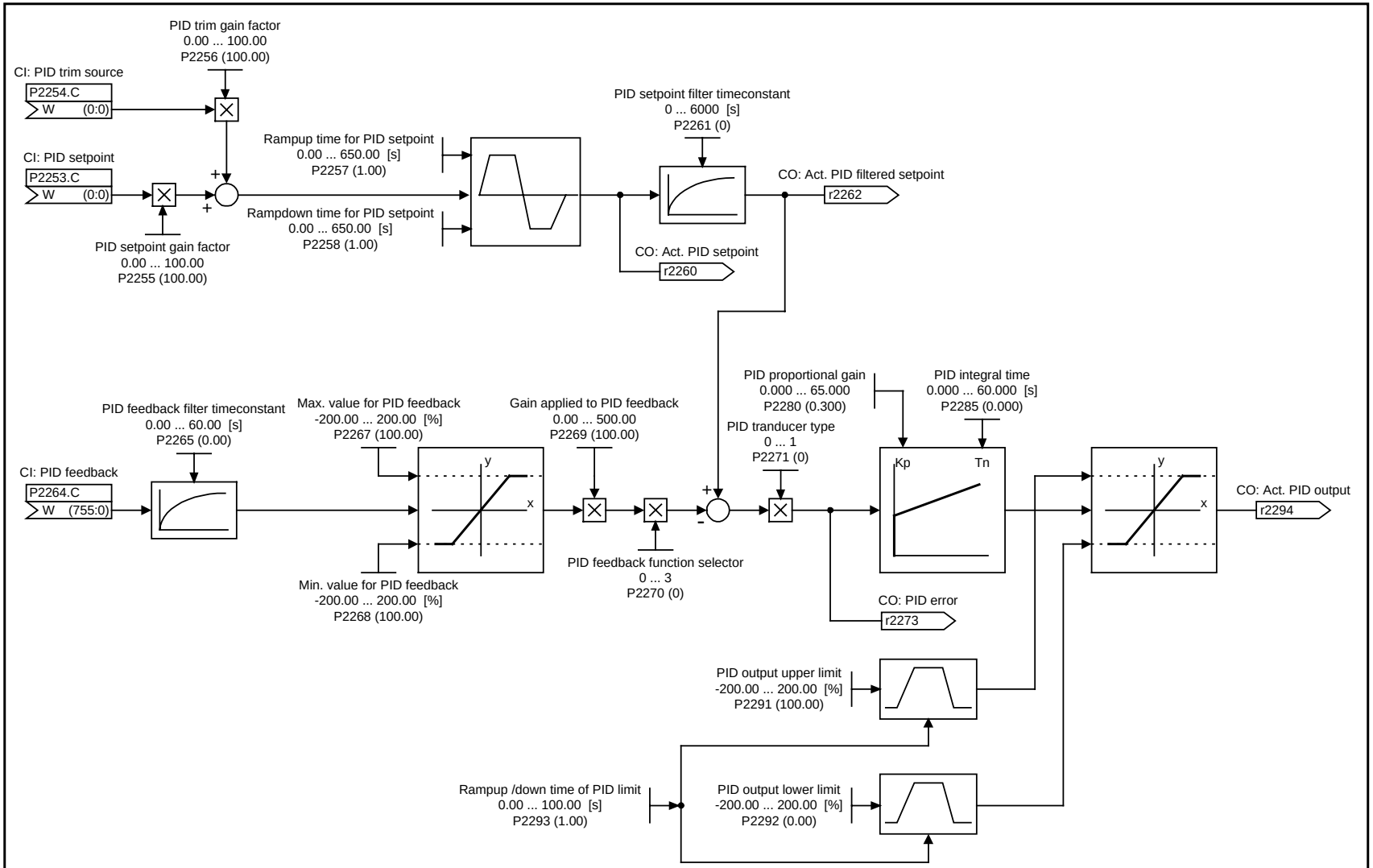

CO/BO: Act. status word 1
CO/BO: Act. status word 2
CO/BO: Act. control word 1
CO/BO: Act. control word 2
BI: ON/OFF1
BI: ON/OFF1 reverse
BI: 1. OFF2
BI: 2. OFF2
BI: 1. OFF3
BI: 2. OFF3
BI: Pulse enable
Sequence control
AFM
RFG
V/f
FOC
Imax contr.
SUM/JOG selection
CI: Additional setpoint
CI: Additional setpoint scaling
BI: Disable additional setpoint
CI: Main setpoint scaling
CI: Main setpoint
JOG frequency right 0.00 ... 650.00 [Hz] P1058.D (5.00)
JOG frequency left 0.00 ... 650.00 [Hz] P1059.D (5.00)
BI: Inhibit neg. freq. setpoint
BI: Reverse
BI: RFG enable
CO/BO: Binary input values
BI: Enable JOG right
BI: Enable JOG left
JOG
BI: Function of digital output
DIN
DOUT
CO: Act. ADC after scal. [4000h]
BI: Enable MOP (UPcommand)
BI: Enable MOP (DOWNcommand)
CO: Act. Output freq. of the MOP
MOP
ADC
CI: DAC
DAC
CO/BO: BOP control word
BI: Fixed freq. selection Bit 0
BI: Fixed freq. selection Bit 1
BI: Fixed freq. selection Bit 2
BI: Fixed freq. selection Bit 3
CO: Act. fixed frequency
FF
BOP
CO: PZD from COM link (USS)
BO: CtrlWrd1 from COM link (USS)
BO: CtrlWrd2 from COM link (USS)
CI: PZD to BOP link (USS)
USS (COM-link)
RS485
BI: Fixed PID setp. select Bit 0
BI: Fixed PID setp. select Bit 1
BI: Fixed PID setp. select Bit 2
BI: Fixed PID setp. select Bit 3
CO: Act. fixed PID setpoint
FF PID
CB (COM-link)
BO: Control word 1 from CB
BO: Control word 2 from CB
CI: PZD to CB
CO: PZD from CB
BI: Enable PIDMOP (UPcmd)
BI: Enable PIDMOP (DOWNcmd)
CO: Output setpoint of PIDMOP
PID MOP
USS (BOP-link)
ACB
RS232
Overview
Connecting the external and internal setpoints
Function diagram
MICROMASTER 440
12.03.2001 V1.1
- 1200 -


Act. ADC value after scaling [%]
r0754 [2]
CO: Act. ADC after scal. [4000h]
r0755 [2]
CO/BO: Binary input values
r0722
r0722
Width of ADC deadband
0 ... 20
P0761 [2] (0)
Value y2 of ADC scaling
-99999.9 ... 99999.9 [%]
P0760 [2] (100.0)
Value x2 of ADC scaling
20 ... 20
P0759 [2] (10)
Value y1 of ADC scaling
-99999.9 ... 99999.9 [%]
P0758 [2] (0.00)
Value x1 of ADC scaling
-20 ... 20
P0757 [2] (0)
Type of ADC
0 ... 4
P0756 [2] (0)
Mode select
y(t)
x(t)
$O_{max}$
$O_{min}$
$I_{max}$
$I_{min}$
Smooth time ADC
0 ... 10000 [ms]
P0753 [2] (3)
Act. input of ADC [V] or [mA]
r0752 [2]
Delay for loss of signal action
0 ... 10000 [ms]
P0762 [2] (10)
Warning, signal lost
(F0080)
Type of ADC
0 ... 4
P0756 [2] (0)
Switching
bipolar
unipolar
Digit
Volts or
mA
50% of
deadband
Protection
Analog input
A
D
1
2
3
4
5
6
7
8
External Command + Setpoint Source
Zeichnung1
Function diagram
- 2200 -
Analog Input (ADC)
12.03.2001 V1.1
MICROMASTER 440

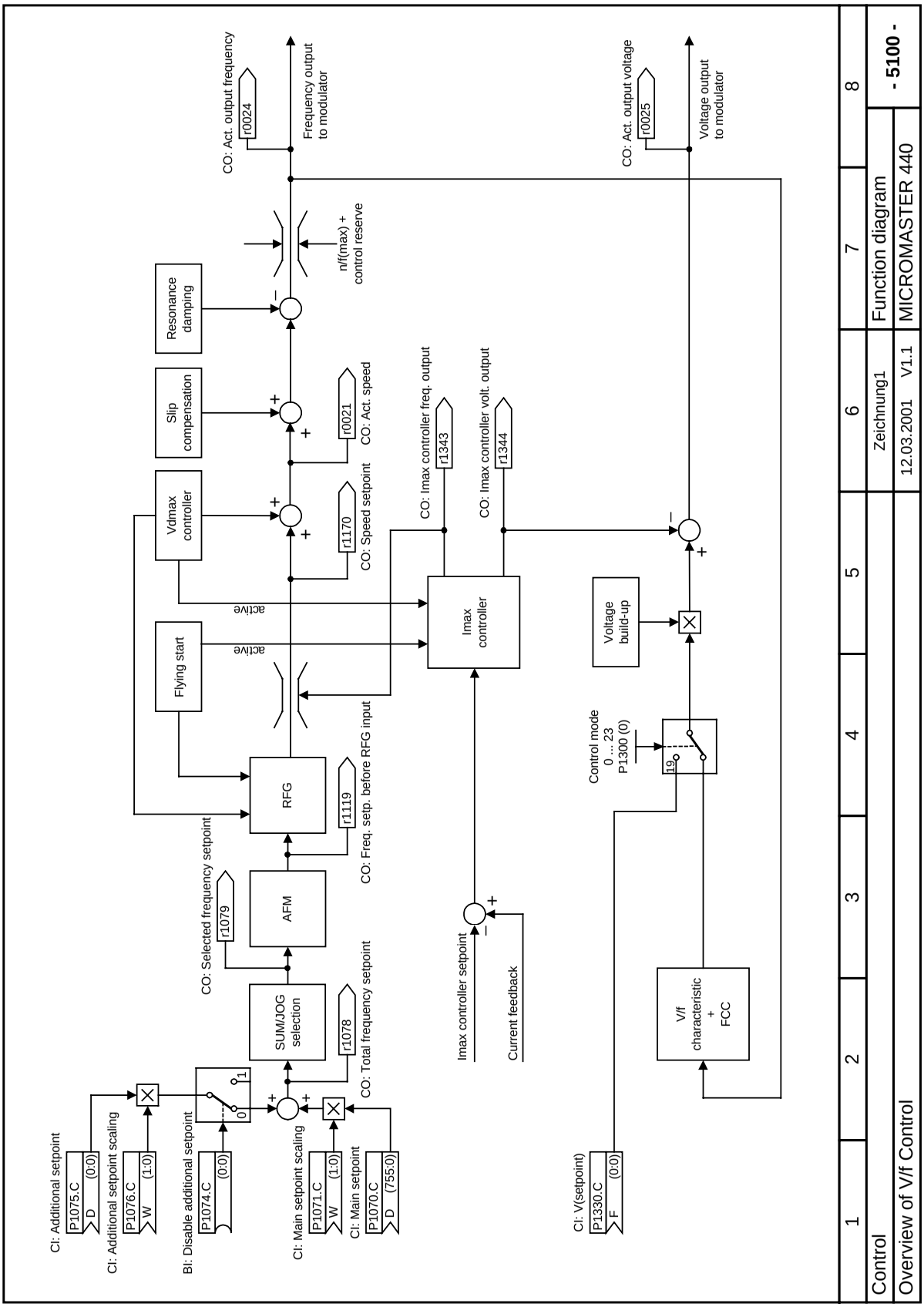

Analog output
Act. DAC value [V] or [mA]
r0774 [2]
D
A
Width of DAC deadband
0 ... 20
P0781 [2] (0)
Value y2 of DAC scaling
0 ... 20
P0780 [2] (20)
Value x2 of DAC scaling
-99999.0 ... 99999.0 [%]
P0779 [2] (100.0)
Value y1 of DAC scaling
0 ... 20
P0778 [2] (0)
Value x1 of DAC scaling
-99999.0 ... 99999.0 [%]
P0777 [2] (0)
Type of DAC
0 ... 1
P0776 [2] (0)
y(t)
x(t)
x2
x1
Y2
Y1
Ydead
Smooth time DAC
0 ... 1000 [ms]
P0773 [2] (2)
x(t)
CI: DAC
P0771 [2]
W (21:0)
1
2
3
4
5
6
7
8
External Command + Setpoint Source
Function diagram
- 2300 -
Analog Output (DAC)
12.03.2001 V1.1
MICROMASTER 440

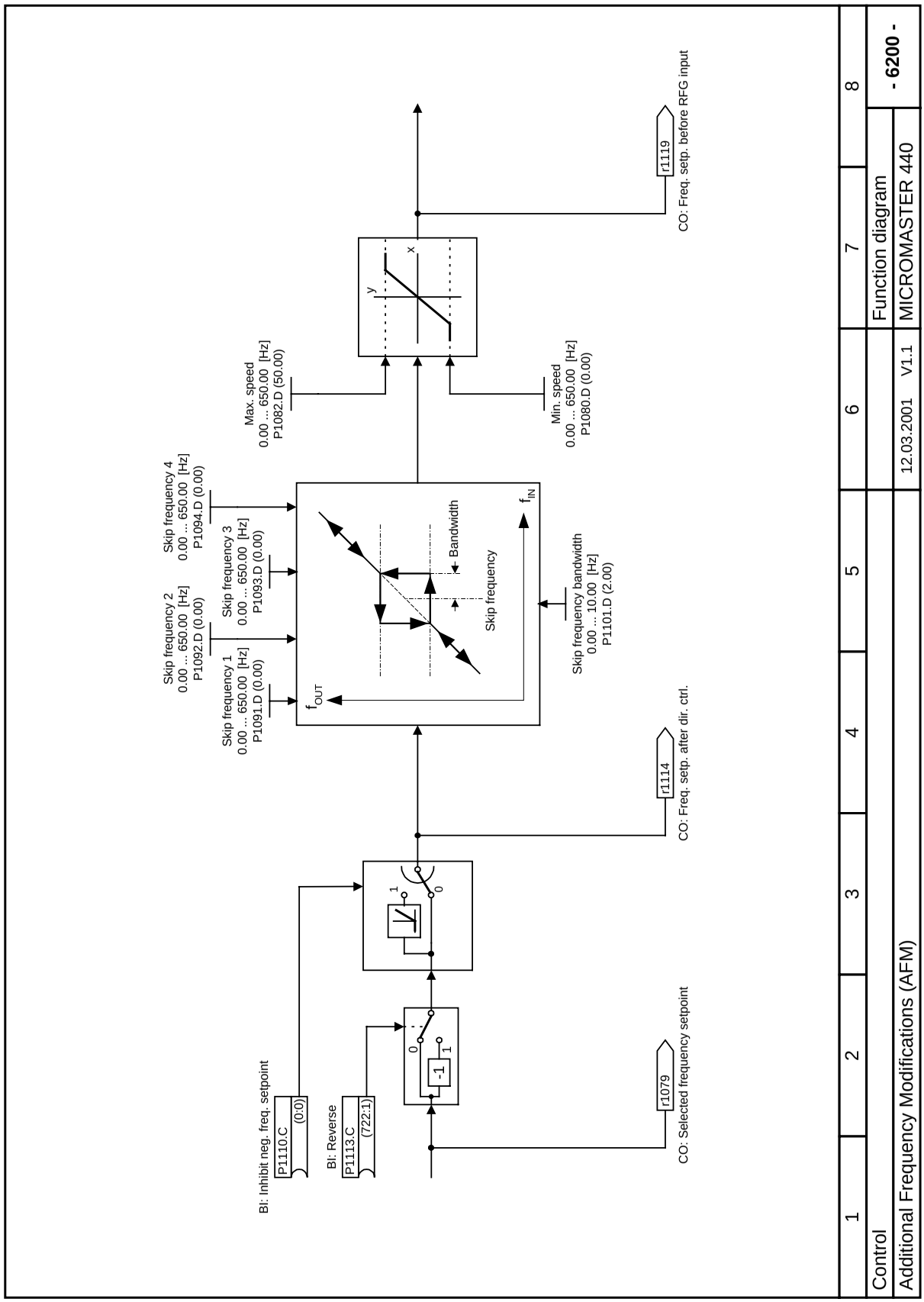



| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| External Command + Setpoint Source | | | | | | Function diagram | - 2400 - |
| Basic Operator Panel (BOP) | | | | | 14.03.2001 V1.1 | MICROMASTER 440 | |




| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Technology Functions | | | | | | Function diagram | - 4400 - |
| PID controller | | | | | 12.03.2001 V1.1 | MICROMASTER 440 | |


CO: Act. output frequency
r0024
Frequency output to modulator
CO: Act. output voltage
r0025
Voltage output to modulator
n/f(max) + control reserve
Resonance damping
Slip compensation
r0021
CO: Act. speed
Vdmax controller
r1170
CO: Speed setpoint
CO: Imax controller freq. output
r1343
CO: Imax controller volt. output
r1344
active
Flying start
active
Imax controller
Voltage build-up
RFG
r1119
CO: Freq. setp. before RFG input
Control mode 0 ... 23 P1300 (0)
i19
CO: Selected frequency setpoint
r1079
AFM
SUM/JOG selection
r1078
CO: Total frequency setpoint
Imax controller setpoint
Current feedback
V/f characteristic + FCC
CI: Additional setpoint
P1075.C D (0:0)
CI: Additional setpoint scaling
P1076.C W (1:0)
BI: Disable additional setpoint
P1074.C (0:0)
CI: Main setpoint scaling
P1071.C W (1:0)
CI: Main setpoint
P1070.C D (755:0)
CI: V(setpoint)
P1330.C F (0:0)
1 2 3 4 5 6 7 8
Control
Zeichnung1
Function diagram
- 5100 -
Overview of V/f Control
12.03.2001 V1.1
MICROMASTER 440


Bl: Inhibit neg. freq. setpoint
P1110.C (0:0)
Bl: Reverse
P1113.C (722:1)
CO: Selected frequency setpoint
r1079
CO: Freq. setp. after dir. ctrl.
r1114
Skip frequency 1
0.00 ... 650.00 [Hz]
P1091.D (0.00)
Skip frequency 2
0.00 ... 650.00 [Hz]
P1092.D (0.00)
Skip frequency 3
0.00 ... 650.00 [Hz]
P1093.D (0.00)
Skip frequency 4
0.00 ... 650.00 [Hz]
P1094.D (0.00)
Max. speed
0.00 ... 650.00 [Hz]
P1082.D (50.00)
Min. speed
0.00 ... 650.00 [Hz]
P1080.D (0.00)
Skip frequency bandwidth
0.00 ... 10.00 [Hz]
P1101.D (2.00)
Bandwidth
Skip frequency
CO: Freq. setp. before RFG input
r1119
Control
Function diagram
- 6200 -
Additional Frequency Modifications (AFM)
12.03.2001 V1.1
MICROMASTER 440

# 3 Alarms and Warnings

| Fault | Possible Causes | Diagnose & Remedy | Reac-tion |
|---|---|---|---|
| **F0001 OverCurrent** | ➢ Motor power (P0307) does not correspond to the inverter power (P0206)<br>➢ Motor lead short circuit<br>➢ Earth faults | Check the following:<br>1. Motor power (P0307) must correspond to inverter power (P0206).<br>2. Cable length limits must not be exceeded.<br>3. Motor cable and motor must have no short-circuits or earth faults<br>4. Motor parameters must match the motor in use<br>5. Value of stator resistance (P0350) must be correct<br>6. Motor must not be obstructed or overloaded<br>Increase the ramp time<br>Reduce the boost level | Off2 |
| **F0002 OverVoltage** | ➢ DC-link voltage (r0026) exceeds trip level (P2172)<br>➢ Overvoltage can be caused either by too high main supply voltage or if motor is in regenerative mode.<br>➢ Regenerative mode can be cause by fast ramp downs or if the motor is driven from an active load. | Check the following:<br>1. Supply voltage (P0210) must lie within limits indicated on rating plate .<br>2. DC-link voltage controller must be enabled (P1240) and parameterized properly.<br>3. Ramp-down time (P1121) must match inertia of load.<br>4. Required braking power must lie within specified limits.<br>**Note**<br>Higher inertia requires longer ramp times; otherwise, apply braking resistor. | Off2 |
| **F0003 UnderVoltage** | ➢ Main supply failed.<br>➢ Shock load outside specified limits. | Check the following:<br>1. Supply voltage (P0210) must lie within limits indicated on rating plate.<br>2. Supply must not be susceptible to temporary failures or voltage reductions. | Off2 |
| **F0004 Inverter Over Temperature** | ➢ Ventilation inadequate<br>➢ Fan inoperative<br>➢ Ambient temperature is too high. | Check the following:<br>1. Fan must turn when inverter is running<br>2. Pulse frequency must be set to default value<br>Ambient temperature could be higher than specified for the inverter | Off2 |
| **F0005 Inverter I2T** | ➢ Inverter overloaded.<br>➢ Duty cycle too demanding.<br>➢ Motor power (P0307) exceeds inverter power capability (P0206). | Check the following:<br>1. Load duty cycle must lie within specified limits.<br>2. Motor power (P0307) must match inverter power (P0206) | Off2 |
| **F0011 Motor Over Temperature** | ➢ Motor overloaded | Check the following:<br>1. Load duty cycle must be correct<br>2. Motor nominal overtemperatures (P0626-P0628) must be correct<br>3. Motor temperature warning level (P0604) must match | Off1 |
| **F0012 Inverter temp. signal lost** | ➢ Wire breakage of inverter temperature (heatsink) sensor | | Off2 |
| **F0021 Earth fault** | ➢ Fault occurs if the sum of the phase currents is higher than<br>➢ 5 % of the nominal inverter current.<br>**Note**<br>This fault only occurs on inverters hat have 3 current sensors. Framesizes D to F | | Off2 |
| **F0022 Powerstack fault** | ➢ Fault caused by the following events:<br>➢ (1) dc-link overcurrent = short circuit of IGBT<br>➢ (2) short circuit of chopper<br>➢ (3) earth fault<br>➢ Framesizes A to C (1),(2),(3)<br>➢ Framesizes D to E (1),(2)<br>➢ Framesize F(2)<br>➢ Since all these faults are assigned to one signal on the power stack, it is not<br>➢ possible to establish which one actually occurred. | | Off2 |
| **F0030 Fan has failed** | ➢ Fan no longer working | Fault cannot be masked while options module (AOP or BOP) is connected.Need a new fan. | Off2 |

| Fault | Possible Causes | Diagnose & Remedy | Reac-tion |
|---|---|---|---|
| **F0040**<br>**Automatic Calibration Failure** | ➢ MM 440 only | | Off2 |
| **F0041**<br>**Motor Data Identification Failure** | ➢ Motor data identification failed.<br>➢ Alarm value =0: Load missing<br>➢ Alarm value =1: Current limit level reached during identification.<br>➢ Alarm value =2: Identified stator resistance less than 0.1% or greater than 100%.<br>➢ Alarm value =3: Identified rotorresistance less than 0.1% or greater than 100%.<br>➢ Alarm value =4: Identified stator reactance less than 50% and greater than 500%<br>➢ Alarm value =5: Identified main reactance less than 50% and greater than 500%<br>➢ Alarm value =6: Identified rotor time constant less than 10ms or greater than 5s<br>➢ Alarm value =7: Identified total leakage reactance less than 5% and greater than 50%<br>➢ Alarm value =8: Identified stator leakage reactance less than 25% and greater than 250%<br>➢ Alarm value =9: Identified rotor leakage inductance less than 25% and greater than 250%<br>➢ Alarm value = 20: Identified IGBT on-voltage less than 0.5 or greater than 10V<br>➢ Alarm value = 30: Current controller at voltage limit<br>➢ Alarm value = 40: Inconsistence of identified data set, at least one identification failed<br>➢<br>➢ Percentage values based on the impedance Zb = Vmot,nom / sqrt(3) / Imot,nom | 0: Check that the motor is connected to the inverter.<br>1-40: Check if motor data in P304-311 are correct. Check what type of motor wiring is required (star, delta). | Off2 |
| **F0051**<br>**Parameter EEPROM Fault** | ➢ Read or write failure while saving non-volatile parameter. | Factory Reset and new parameterization<br>Change drive | Off2 |
| **F0052**<br>**power stack Fault** | ➢ Read failure for power stack information or invalid data. | Change drive | Off2 |
| **F0053**<br>**IO Eeprom Fault** | ➢ Read failure for IO EEPROM information or invalid data. | Check data<br><br>Change IO module | Off2 |
| **F0060**<br>**Asic Timeout** | ➢ Internal communications failure | If fault persists, change inverter<br>Contact Service Department | Off2 |
| **F0070**<br>**CB setpoint fault** | ➢ No setpoint values from CB (communication board) during telegram off time | Check CB and communication partner | Off2 |
| **F0071**<br>**USS (BOP-link) setpoint fault** | ➢ No setpoint values from USS during telegram off time | Check USS master | Off2 |
| **F0072**<br>**USS (COMM link) setpoint fault** | ➢ No setpoint values from USS during telegram off time | Check USS master | Off2 |
| **F0080**<br>**ADC lost input signal** | ➢ Broken wire<br>➢ Signal out of limits | | Off2 |
| **F0085**<br>**External Fault** | ➢ External fault triggered via terminal inputs | Disable terminal input for fault trigger. | Off2 |
| **F0101**<br>**Stack Overflow** | ➢ Software error or processor failure | Run self test routines | Off2 |
| **F0221**<br>**PID Feedback below min. value** | ➢ PID Feedback below min. value P545. | Change value of P545.Adjust feedback gain. | Off2 |
| **F0222**<br>**PID Feedback above max. value** | ➢ PID feedback above max. value P544. | Change value of P544.Adjust feedback gain. | Off2 |

| Fault | Possible Causes | Diagnose & Remedy | Reac-tion |
|---|---|---|---|
| **F0450**<br>**BIST Tests Failure** | ➢ Fault value:<br>➢ 1. Some power section tests have failed<br>➢ 2. Some control board tests have failed<br>➢ 4. Some functional tests have failed<br>➢ 8. Some IO module tests have failed. (MM 420 only)<br>➢ 16. Internal RAM failed on power-up check | Drive may run but some features will not work properly.<br>Replace drive. | Off2 |
| **F0452**<br>**Belt Failure Detected** | ➢ Load conditions on motor indicate belt failure or mechanical fault. | Check the following:<br>1. No breakage, seizure or obstruction of drive train.<br>2. Proper operation of external speed sensor, if in use.<br>3. P0402 (pulse per min at rated speed), P2164 (hysteresis freq. deviation) and P2165 (delay time for permitted deviation)must have correct values.<br>4. P2155 (threshold frequency f1), P2157 (threshold frequency f2)P2159 (threshold frequency f3)P2174 (upper torque threshold 1)P2175 (lower torque threshold 1)P2176 (delay T_Torque)P2182 (upper torque threshold 2)P2183 (lower torque threshold 2)P2184 (upper torque threshold 3) and P2185 (lower torque threshold 3) must have correct values.<br>Apply lubrication if required. | Off2 |
| **F0499**<br>**Fault Warning Separation** | ➢ | | Off2 |
| **A0501**<br>**Current Limit** | ➢ Motor power does not correspond to the inverter power<br>➢ Motor leads are too short<br>➢ Earth faults | Check the following:<br>1. Motor power (P0307) must correspond to inverter power (P0206).<br>2. Cable length limits must not be exceeded.<br>3. Motor cable and motor must have no short-circuits or earth faults<br>4. Motor parameters must match the motor in use<br>5. Value of stator resistance (P0350) must be correct<br>6. Motor must not be obstructed or overloaded<br>Increase the ramp-up-time.<br>Reduce the boost. | -- |
| **A0502**<br>**Overvoltage limit** | ➢ Overvoltage limit is reached.<br>➢ This warning can occur during ramp down, if the dc-link controller is disabled (P1240 = 0). | If this warning is displayed permanently, check drive input voltage . | -- |
| **A0503**<br>**UnderVoltage Limit** | ➢ Main supply failed<br>➢ Main supply (P0210) and consequently DC-link voltage (R0026) below specified limit (P2172). | Check main supply voltage (P0210). | -- |
| **A0504**<br>**Inverter OverTemperature** | ➢ Warning level of inverter heat-sink temperature (P0614) is exceeded, resulting in pulse frequency<br>➢ reduction and/or output frequency reduction (depending on parametrization in (P0610) | Check the following:<br>1. Ambient temperature must lie within specified limits<br>2. Load conditions and duty cycle must be appropriate<br>3. Fan must turn when drive is running | -- |
| **A0505**<br>**Inverter I2T** | ➢ Warning level exceeded, current will be reduced if parameterized (P0610 = 1) | Check that duty cycle lies within specified limits | -- |
| **A0506**<br>**Inverter duty cycle** | ➢ Difference between heatsink and IGBT junction temperature exceeds warning limits | Check that duty cycle and shock loads lie within specified limits | -- |
| **A0510**<br>**Motor OverTemperature** | ➢ | | -- |
| **A0511**<br>**Motor OverTemperature I2T** | ➢ Motor overloaded.<br>➢ Load duty cycle too high. | Check the following:<br>1. P0611 (motor I2t time constant) should be set to appropriate value<br>2. P0614 (Motor I2t overload warning level) should be set to suitable level | -- |
| **A0512**<br>**Motor temperature signal lost** | ➢ Wire break to motor temperature sensor. If a wire breakage is be detected,<br>➢ temperature monitoring switches over to monitoring with the motor thermal<br>➢ model. | | -- |

| Fault | Possible Causes | Diagnose & Remedy | Reac-tion |
|---|---|---|---|
| **A0535**<br>**Braking Resistor Hot** | | | -- |
| **A0541**<br>**Motor Data Identification Active** | ➢ Motor data identification (P1910) selected or running | | -- |
| **A0600**<br>**RTOS Overrun Warning** | | | -- |
| **A0700**<br>**CB warning 1 see CB manual for details.** | ➢ CB (communication board) specific | See CB user manual | -- |
| **A0701**<br>**CB warning 2 see CB manual for details.** | ➢ CB (communication board) specific | See CB user manual | -- |
| **A0702**<br>**CB warning 3 see CB manual for details.** | ➢ CB (communication board) specific | See CB user manual | -- |
| **A0703**<br>**CB warning 4 see CB manual for details.** | ➢ CB (communication board) specific | See CB user manual | -- |
| **A0704**<br>**CB warning 5 see CB manual for details.** | ➢ CB (communication board) specific | See CB user manual | -- |
| **A0705**<br>**CB warning 6 see CB manual for details.** | ➢ CB (communication board) specific | See CB user manual | -- |
| **A0706**<br>**CB warning 7 see CB manual for details.** | ➢ CB (communication board) specific | See CB user manual | -- |
| **A0707**<br>**CB warning 8 see CB manual for details.** | ➢ CB (communication board) specific | See CB user manual | -- |
| **A0708**<br>**CB warning 9 see CB manual for details.** | ➢ CB (communication board) specific | See CB user manual | -- |
| **A0709**<br>**CB warning 10 see CB manual for details.** | ➢ CB (communication board) specific | See CB user manual | -- |
| **A0710**<br>**CB communication error** | ➢ Communication with CB (communication board) is lost | Check CB hardware | -- |
| **A0711**<br>**CB configuration error** | ➢ CB (communication board) reports a configuration error. | Check CB parameters | -- |
| **A0910**<br>**Vdc-max controller de-activated** | ➢ Vdc max controller has been de-activated, since controller is not capable of<br>➢ keeping DC-link voltage (r0026) within limits (P2172).<br>➢ Occurs if main supply voltage (P0210) is permanently too high.<br>➢ Occurs if motor is driven by an active load, causing motor to goes into regenerative mode.<br>➢ Occurs at very high load inertias, when ramping down. | Check the following:<br>1. Input voltage (P0756) must lie within range.<br>2. Load must be match.<br>In certain cases apply braking resistor. | -- |
| **A0911**<br>**Vdc-max controller active** | ➢ Vdc max controller is active; so ramp-down times will be increased automatically to keep<br>➢ DC-link voltage (r0026) within limits (P2172). | | -- |

| Fault | Possible Causes | Diagnose & Remedy | Reac-tion |
|---|---|---|---|
| **A0912**<br>**Vdc-min controller active** | ➢ Vdc min controller will be activated if DC-link voltage (r0026) falls below minimum level (P2172).<br>➢ The kinetic energy of the motor is used to buffer the DC-link voltage, thus causing deceleration of the drive!<br>➢ So short mains failures do not necessarily lead to an undervoltage trip. | | -- |
| **A0920**<br>**ADC parameters not set properly.** | ➢ ADC parameters should not be set to identical values,<br>➢ since this would produce illogical results.<br>➢ Index 0: Parameter settings for output identical<br>➢ Index 1: Parameter settings for input identical<br>➢ Index 2: Parameter settings for input do not correspond to ADC type | | -- |
| **A0921**<br>**DAC parameters not set properly.** | ➢ DAC parameters should not be set to identical values,<br>➢ since this would produce illogical results.<br>➢ Index 0: Parameter settings for output identical<br>➢ Index 1: Parameter settings for input identical<br>➢ Index 2: Parameter settings for output do not correspond to DAC type | | -- |
| **A0922**<br>**No load applied to inverter** | ➢ No Load is applied to the inverter.<br>➢ As a result, some functions may not work as under normal load conditions. | | -- |
| **A0923**<br>**Both JOG Left and JOG Right are requested** | ➢ Both JOG right and JOG left (P1055/P1056) have been requested. This freezes the RFG output frequency at its current value. | | -- |
| **A0924**<br>**Belt Failure Detected** | ➢ Load conditions on motor indicate belt failure or mechanical fault. | Apply lubrication if required.<br>Check the following:<br>1. No breakage, seizure or obstruction of drive train.<br>2. Proper operation of external speed sensor, if in use.<br>3. P0402 (pulse per min at rated speed), P2164 (Hysteresis freq. deviation) and P2165 (delay time for permitted deviation) must have correct values.<br>4. P2155 (threshold frequency f1), P2157 (threshold frequency f2)P2159 (threshold frequency f3)P2174 (upper torque threshold 1)P2175 (lower torque threshold 1)P2176 (delay T_Torque)P2182 (upper torque threshold 2)P2183 (lower torque threshold 2)P2184 (upper torque threshold 3) and P2185 (lower torque threshold 3) must have correct values. | -- |

**Suggestions and/or Corrections**

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Suggestions for technical documentation

**Suggestions**
**Corrections**

For Publication/Manual:
MICROMASTER 440
Parameter List

User Documentation

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