SIEMENS

MICROMASTER 410

Parameter List **Issue A1**

User Documentation

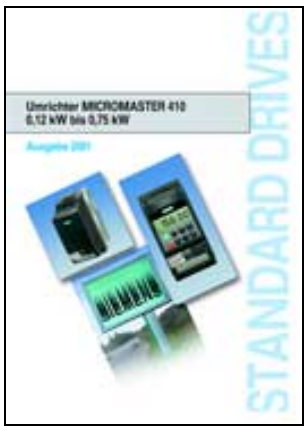
Documentation to MICROMASTER 410

Getting Started Guide
Is for quick commissioning.

Operating Instructions
Gives information about features of the MICROMASTER 410, Installation, Commissioning, Control modes, System Parameter structure, Troubleshooting, Specifications and available options of the MICROMASTER 410.

Parameter List
The Parameterlist contains the description of all Parameters structured in functional order and a detailed description.

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



SIEMENS

MICROMASTER 410

Parameter List
User Documentation

Valid for **Issue A1**

Converter Type
MICROMASTER 410

Warning

Please refer to all Definitiones and Warnings contained in the Operating Instructions.
The operating instrucions can be ordered via your local Siemens sales office under the Order No. 6SE6400-5EA00-0BP0.

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

Approved Siemens Quality for Software and Training
is to DIN ISO 9001, Reg. No. 2160-01

Other functions not described in this document may be available. However, this fact shall not constitute an obligation to supply such functions with a new control, or when servicing.

We have checked that the contents of this document correspond to the hardware and software described. There may be discrepancies nevertheless, and no guarantee can be given that they are completely identical. The information contained in this document is reviewed regularly and any necessary changes will be included in the next edition. We welcome suggestions for improvement.

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Parameters MICROMASTER 410

This Parameter List must only be used together with the Operating Instructions of the MICROMASTER 410. Please pay special attention to the Warnings, Cautions, Notices and Notes contained in these manuals.

Table of Contents

1 Parameters

1.1 Introduction to MICROMASTER 410 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

   The BiCo system is not available with the MM410. To be unique with the names of the other inverter types the Parameter names did not change.

3. **CStat**
   Commissioning status of the parameter. Three states are possible:

Commissioning	C
Run	U
Ready to 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
   - First confirm the “P” button on the operator panel (OP) 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 three access levels: Standard, Extended and Expert. 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
    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 observed 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.

1.2 Quick commissioning (P0010=1)

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

No	Name	Access level	Cstat
P0100	Europe / North America	1	C
P0300	Select motor type	3	C
P0304	Rated motor voltage	1	C
P0305	Rated motor current	1	C
P0307	Rated motor power	1	C
P0308	Rated motor cosPhi	3	C
P0309	Rated motor efficiency	3	C
P0310	Rated motor frequency	1	C
P0311	Rated motor speed	1	C
P0335	Motor cooling	3	CT
P0640	Motor overload factor [%]	3	CUT
P0700	Selection of command source	1	CT
P1000	Selection of frequency setpoint	1	CT
P1080	Min. Frequency	1	CUT
P1082	Max. Frequency	1	CT
P1120	Ramp-up time	1	CUT
P1121	Ramp-down time	1	CUT
P1135	OFF3 ramp-down time	3	CUT
P1300	Control mode	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:

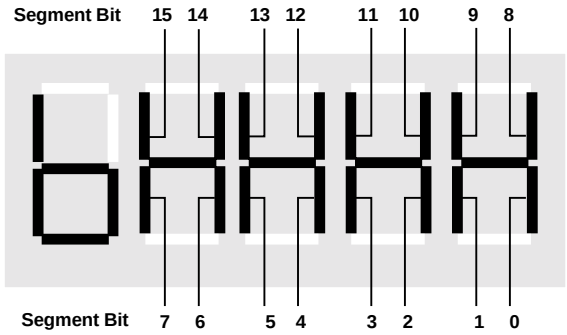
Set P0010=30.

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.

1.3 Parameter Description

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 frequency, output voltage, and chosen r0000 setting (defined in P0005).

r0002 **Drive state** Level: **3**

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.

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

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

P-Group: ALWAYS **Active:** First confirm **QuickComm.** No

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

Enum:

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 Reserved

P0004 **Parameter filter** Level: **3**

CStat: CUT **Datatype:** U16 **Unit:** - **Min:** 0 **Def:** 0 **Max:** 21

P-Group: ALWAYS **Active:** First confirm **QuickComm.** No

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

Example:

P0004 = 8 specifies that only ADC parameters will be visible.

Enum:

0 All parameters
2 Inverter
3 Motor
7 Commands, binary I/O
8 ADC
10 Setpoint channel / RFG
12 Drive features
13 Motor control
20 Communication
21 Alarms / warnings / monitoring

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 **Display selection** Level: **2**

CStat: CUT **Datatype:** U16 **Unit:** - **Min:** 2 **Def:** 21 **Max:** 2294

P-Group: FUNC **Active:** First confirm **QuickComm.** No

Selects display for parameter r0000 (drive display).

Settings:

21 Actual frequency
25 Output voltage
26 DC link voltage

Notice:

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

Details:

See relevant "rxxxx" parameter descriptions.

P0010 **Commissioning parameter filter** Level: **1**

CStat: CT **Datatype:** U16 **Unit:** - **Min:** 0
P-Group: ALWAYS **Active:** First confirm **QuickComm.** No **Def:** 0
Max: 30

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.

r0018 **Firmware version** Level: **3**

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

Displays version number of installed firmware.

r0019 **CO/BO: BOP control word** Level: **3**

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

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
Bit08	JOG right	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** Level: **2**

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

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: **3**

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.

r0034 **CO: Motor temperature (i2t)** Level: **3**

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

P-Group: MOTOR

Displays calculated motor temperature (I2t model) as [%] of the maximum permissible value.

Note:

A value of 100 % means that the motor has reached its maximum permissible operating temperature. In this case, the converter will attempt to reduce the motor loading as defined in P0610 (motor I2t temperature reaction).

r0052 **CO/BO: Act. status word 1** Level: **2**

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

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 410 System Parameters".

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**

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

Level: **2**

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
Bit 05	Reserved		
Bit06	Act. freq. r0024 >= setpoint	0	NO
		1	YES
Bit 07	Reserved		

Details:

See description of seven-segment display given in the "Introduction to MICROMASTER 410 System Parameters" in this manual.

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

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

Level: **3**

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	Local / Remote	0	NO
		1	YES

Details:

See description of seven-segment display given in the "Introduction to MICROMASTER System Parameters" in this manual.

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
Bit09	DC brake enabled	0	NO
		1	YES
Bit13	External fault 1	0	YES
		1	NO

Details:

See description of seven-segment display given in the "Introduction to MICROMASTER System Parameters" in this handbook.

r0056 **CO/BO: Status of motor control** Level: **2**

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

P-Group: CONTROL

Displays status of motor control (MM410: 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
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
Bit13	I-max controller active	0	NO
		1	YES
Bit14	Vdc-max controller active	0	NO
		1	YES

Details:

See description of seven-segment display given in the introduction

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 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.

P0100 **Europe / North America** **Min:** 0 Level: **1**
CStat: C **Datatype:** U16 **Unit:** - **Def:** 0
P-Group: QUICK **Active:** First confirm **QuickComm.** Yes **Max:** 2

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 wire link for the frequency range can also be used to select the default frequency:

wire link	Meaning		P0100 setting	Meaning
Uncut	[kW], frequency default 50 [Hz]	**Can be overridden**	1	[hp], frequency default 60 [Hz]
Cut	[hp], frequency default 60 [Hz]	**Can be overridden**	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).

r0200 **Act. power stack code number** **Min:** - Level: **3**
Datatype: U32 **Unit:** - **Def:** -
P-Group: INVERTER **Max:** -

Identifies hardware variant as shown in table below.

Code	Order number	Code	Order number
2001	6SE6410-2UB11-2AA0	2011	6SE6410-2UA11-2AA0
2002	6SE6410-2UB12-5AA0	2012	6SE6410-2UA12-5AA0
2003	6SE6410-2UB13-7AA0	2013	6SE6410-2UA13-7AA0
2004	6SE6410-2UB15-5BA0	2014	6SE6410-2UA15-5BA0
2005	6SE6410-2UB17-5BA0		
2006	6SE6410-2BB11-2AA0		
2007	6SE6410-2BB12-5AA0		
2008	6SE6410-2BB13-7AA0		
2009	6SE6410-2BB15-5BA0		
2010	6SE6410-2BB17-5BA0		

Notice:

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

P0201 **Power stack code number** **Min:** 0 Level: **3**
CStat: C **Datatype:** U16 **Unit:** - **Def:** 0
P-Group: INVERTER **Active:** First confirm **QuickComm.** No **Max:** 65535

Confirms actual power stack identified.

r0206 **Rated inverter power [kW] / [hp]** **Min:** - Level: **3**
Datatype: Float **Unit:** - **Def:** -
P-Group: INVERTER **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** **Min:** - Level: **3**
Datatype: Float **Unit:** A **Def:** -
P-Group: INVERTER **Max:** -

Displays maximum continuous output current of inverter.

r0209 **Maximum inverter current** **Min:** - Level: **3**
Datatype: Float **Unit:** A **Def:** -
P-Group: INVERTER **Max:** -

Displays maximum output current of inverter.

P0210 **Supply voltage** Level: **3**

CStat:	CT	**Datatype:** U16	**Unit:** V	**Min:**	0
P-Group:	INVERTER	**Active:** Immediately	**QuickComm.** No	**Def:**	230
				Max:	1000

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:

Cut-in levels for Vdc-controller and compound braking are derived directly from P0210 (supply voltage).

230 V version

Vdc_max switch-on level = $1.15 * \sqrt{2} * V_{mains}$

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

115 V version

Vdc_max_on = $1.15 * \sqrt{2} * V_{mains * 2}$

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

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).

P0290 **Inverter overload reaction** Level: **3**

CStat:	CT	**Datatype:** U16	**Unit:** -	**Min:**	0
P-Group:	INVERTER	**Active:** First confirm	**QuickComm.** No	**Def:**	2
				Max:	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.

P0300 **Select motor type** Level: **3**

CStat:	C	**Datatype:** U16	**Unit:** -	**Min:**	1
P-Group:	MOTOR	**Active:** First confirm	**QuickComm.** Yes	**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 motor
2 Synchronous motor

Dependency:

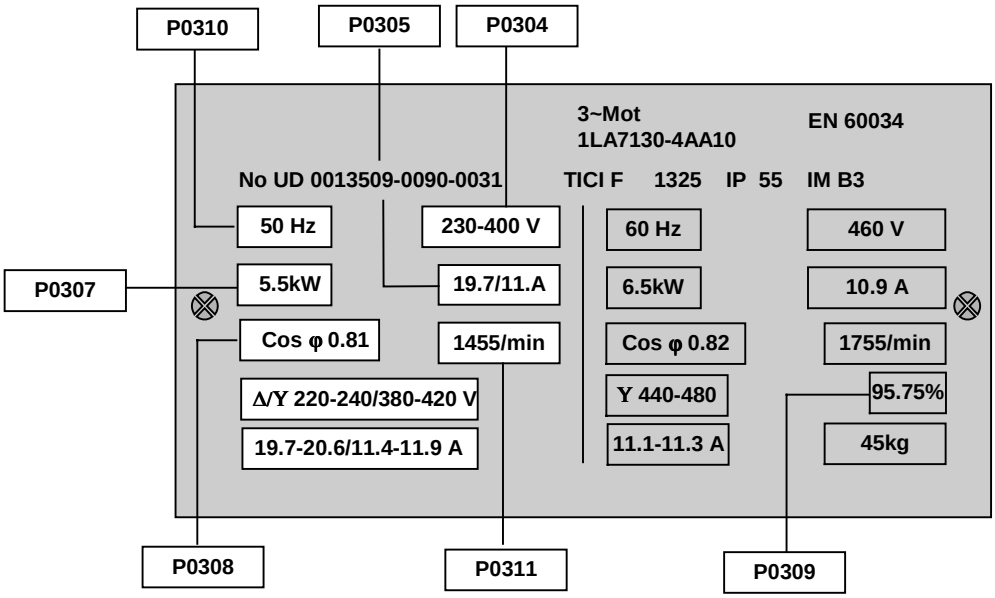
Changeable only when P0010 = 1 (quick commissioning).

If synchronous motor is selected, the following functions are not available:
Power factor (P0308)
Motor efficiency (P0309)
Flying start (P1200, P1202, P1203)
DC braking, P1232, P1233)
Slip compensation (P1335)

P0304 **Rated motor voltage** Level: **1**

CStat:	C	**Datatype:** U16	**Unit:** V	**Min:**	10
P-Group:	MOTOR	**Active:** First confirm	**QuickComm.** Yes	**Def:**	230
				Max:	2000

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



Dependency:
Changeable only when P0010 = 1 (quick commissioning).

P0305 **Rated motor current** Level: **1**

CStat:	C	**Datatype:** Float	**Unit:** A	**Min:**	0.01
P-Group:	MOTOR	**Active:** First confirm	**QuickComm.** Yes	**Def:**	3.25
				Max:	10000.00

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

Dependency:
Changeable only when P0010 = 1 (quick commissioning).

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 **Rated motor power** Level: **1**

CStat:	C	**Datatype:** Float	**Unit:** -	**Min:**	0.01
P-Group:	MOTOR	**Active:** First confirm	**QuickComm.** Yes	**Def:**	0.75
				Max:	2000.00

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

Dependency:
If P0100 = 1, values will be in [hp] - see diagram P0304 (rating plate).

Changeable only when P0010 = 1 (quick commissioning).

P0308 **Rated motor cosPhi** Level: **3**

CStat:	C	**Datatype:** Float	**Unit:** -	**Min:**	0.000
P-Group:	MOTOR	**Active:** First confirm	**QuickComm.** Yes	**Def:**	0.000
				Max:	1.000

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

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.

P0309 **Rated motor efficiency** Level: **3**

CStat:	C	**Datatype:** Float	**Unit:** %	**Min:**	0.0
P-Group:	MOTOR	**Active:** First confirm	**QuickComm.** Yes	**Def:**	0.0
				Max:	99.9

Nominal motor efficiency in [%] from rating plate.

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.

Details:

See diagram in P0304 (rating plate)

P0310 **Rated motor frequency** Level: **1**

CStat:	C	**Datatype:** Float	**Unit:** Hz	**Min:**	12.00
P-Group:	MOTOR	**Active:** First confirm	**QuickComm.** Yes	**Def:**	50.00
				Max:	650.00

Nominal motor frequency [Hz] from rating plate.

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 **Rated motor speed** Level: **1**

CStat:	C	**Datatype:** U16	**Unit:** 1/min	**Min:**	0
P-Group:	MOTOR	**Active:** First confirm	**QuickComm.** Yes	**Def:**	0
				Max:	40000

Nominal motor speed [rpm] from rating plate.

Dependency:

Changeable only when P0010 = 1 (quick commissioning).

Setting 0 causes internal calculation of value.

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)

P0335 **Motor cooling** Level: **3**

CStat:	CT	**Datatype:** U16	**Unit:** -	**Min:**	0
P-Group:	MOTOR	**Active:** First confirm	**QuickComm.** Yes	**Def:**	0
				Max:	1

Selects motor cooling system used.

Enum:

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

P0340 **Calculation of motor parameters** Level: **3**

CStat:	CT	**Datatype:** U16	**Unit:** -	**Min:**	0
P-Group:	MOTOR	**Active:** First confirm	**QuickComm.** No	**Def:**	0
				Max:	1

Calculates various motor parameters, including:

Reference frequency P2000

Enum:

0 No calculation
1 Complete parameterization

Note:

This parameter is required during commissioning to optimize inverter performance.

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

CStat:	CUT	**Datatype:** Float	**Unit:** Ohm	**Min:**	0.00001
P-Group:	MOTOR	**Active:** Immediately	**QuickComm.** 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 manually using an Ohmmeter.

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.

P0610 **Motor I2t temperature reaction** Level: **3**

CStat:	CT	**Datatype:** U16	**Unit:** -	**Min:**	0
P-Group:	MOTOR	**Active:** First confirm	**QuickComm.** No	**Def:**	2
				Max:	2

Defines reaction when motor I2t reaches warning threshold.

Enum:

0 No reaction, warning only
1 Warning and Imax reduction (results in reduced output freq.)
2 Warning and trip (F0011)

Dependency:

Trip level = P0614 (motor I2t overload warning level) * 110 %

P0611 **Motor I2t time constant** Level: **3**

CStat:	CT	**Datatype:** U16	**Unit:** s	**Min:**	0
P-Group:	MOTOR	**Active:** Immediately	**QuickComm.** No	**Def:**	100
				Max:	16000

Defines motor thermal time constant and is calculated automatically from the motor data (see P0340). Calculation of r0034 is switched off, if P0611 is set lower than 100

Notice:

A larger number increases the time taken for the calculated motor temperature to change.

P0614 **Motor I2t overload warning level** Level: **3**

CStat:	CUT	**Datatype:** Float	**Unit:** %	**Min:**	0.0
P-Group:	MOTOR	**Active:** First confirm	**QuickComm.** No	**Def:**	100.0
				Max:	400.0

Defines the [%] value at which alarm A0511 (motor overtemperature) is generated.

Motor I2t calculation is used to estimate a maximum tolerable period (i.e. without overheating) for motor overload. The I2t calculation value is deemed = 100 % when this maximum tolerable period is reached (see r0034).

Dependency:

A motor over-temperature trip (F0011) is produced at 110 % of this level.

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

CStat:	CUT	**Datatype:** Float	**Unit:** %	**Min:**	10.0
P-Group:	MOTOR	**Active:** Immediately	**QuickComm.** Yes	**Def:**	150.0
				Max:	400.0

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

Dependency:

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

P0700 **Selection of command source** Level: **1**

CStat:	CT	**Datatype:** U16	**Unit:** -	**Min:**	0
P-Group:	COMMANDS	**Active:** First confirm	**QuickComm.** Yes	**Def:**	2
				Max:	5

Selects digital command source.

Enum:

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

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 **Function of digital input 1** Level: **2**

CStat:	CT	**Datatype:** U16	**Unit:** -	**Min:**	0
P-Group:	COMMANDS	**Active:** First confirm	**QuickComm.** No	**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)
21 Local/remote
25 DC brake enable
29 External trip
33 Disable additional freq setpoint
99 Service

Dependency:

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

Notice:

Setting 99 for service use only.

P0702 **Function of digital input 2** Level: **2**

CStat:	CT	**Datatype:** U16	**Unit:** -	**Min:**	0
P-Group:	COMMANDS	**Active:** First confirm	**QuickComm.** No	**Def:**	12
				Max:	99

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)
21 Local/remote
25 DC brake enable
29 External trip
33 Disable additional freq setpoint
99 Service

Details:

See P0701 (function of digital input1).

P0703 **Function of digital input 3**

CStat:	CT	**Datatype:** U16	**Unit:** -	**Min:**	0
P-Group:	COMMANDS	**Active:** First confirm	**QuickComm.** No	**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)
21 Local/remote
25 DC brake enable
29 External trip
33 Disable additional freq setpoint
99 Service

Details:

See P0701 (function of digital input 1).

P0704 **Function of digital input 4**

CStat:	CT	**Datatype:** U16	**Unit:** -	**Min:**	0
P-Group:	COMMANDS	**Active:** First confirm	**QuickComm.** No	**Def:**	0
				Max:	99

Level: **2**

Selects function of digital input 4 (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.)
21 Local/remote
25 DC brake enable
29 External trip
33 Disable additional freq setpoint
99 Service

Details:

See P0701 (function of digital input 1).

P0719[2] **Selection of cmd. & freq. setp.** Level: **3**

CStat: CT **Datatype:** U16 **Unit:** - **Min:** 0 **Def:** 0 **Max:** 55

P-Group: COMMANDS **Active:** First confirm **QuickComm.** No

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.

The two indices of this parameter are used for local/remote switching. The local/remote signal switches between these settings.

The default setting is 0 for the first index (i.e. normal parameterization is active).
The second index is for control via BOP (i.e. activating the local/remote signal will then switch to BOP).

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
10	Cmd = BOP	Setpoint = BICO parameter
11	Cmd = BOP	Setpoint = MOP setpoint
12	Cmd = BOP	Setpoint = Analog setpoint
13	Cmd = BOP	Setpoint = Fixed frequency
15	Cmd = BOP	Setpoint = USS 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
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

Index:

P0719[0] : 1st Control source (Remote)
P0719[1] : 2nd Control source (Local)

Note:

BICO connections made previously remain unchanged.

r0722 **CO/BO: Binary input values** Level: **3**

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 (via ADC)	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:** Immediately **QuickComm.** 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

P0731 **BI: Function of digital output 1**

CStat:	CUT	**Datatype:** U32	**Unit:** -	**Min:**	0:0
P-Group:	COMMANDS	**Active:** First confirm	**QuickComm.** No	**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
53.6	Act. freq. greater/equal setpoint	0	Closed

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

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

Level: **3**

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

Bitfields:

Bit00	Digital output 1 energized	0	NO
		1	YES

Dependency:

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

P0748 **Invert digital outputs**

CStat:	CUT	**Datatype:** U16	**Unit:** -	**Min:**	0
P-Group:	COMMANDS	**Active:** First confirm	**QuickComm.** No	**Def:**	0
				Max:	1

Level: **3**

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

Bitfields:

Bit00	Invert digital output 1	0	NO
		1	YES

r0752 **Act. input of ADC [V]**

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

Level: **3**

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

P0753 **Smooth time ADC**

CStat:	CUT	**Datatype:** U16	**Unit:** ms	**Min:**	0
P-Group:	TERMINAL	**Active:** First confirm	**QuickComm.** No	**Def:**	3
				Max:	10000

Level: **3**

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

Note:

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

P0753 = 0 : No filtering

r0754 **Act. ADC value after scaling [%]**

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

Level: **2**

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

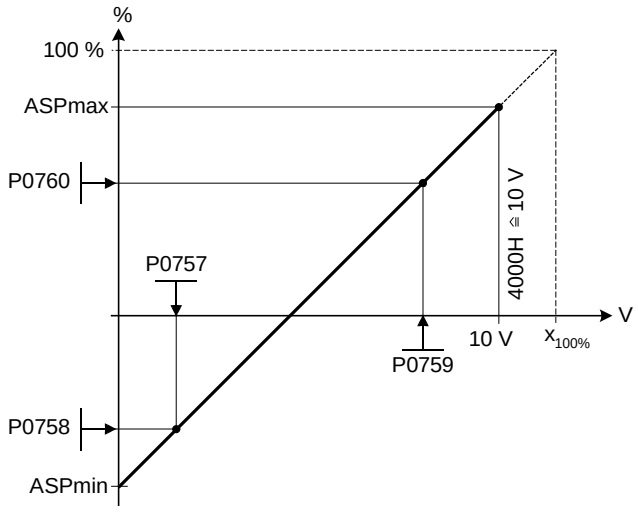
Dependency:

P0757 to P0760 define range (ADC scaling)

P0757	**Value x1 of ADC scaling [V]**			**Min:**	0	Level:
	CStat: CUT	**Datatype:** Float	**Unit:** V	**Def:**	0	**3**
	P-Group: TERMINAL	**Active:** First confirm	**QuickComm.** No	**Max:**	10	

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

P0761 = 0



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 %.

P0758	**Value y1 of ADC scaling**			**Min:**	-99999.9	Level:
	CStat: CUT	**Datatype:** Float	**Unit:** %	**Def:**	0.0	**3**
	P-Group: TERMINAL	**Active:** First confirm	**QuickComm.** No	**Max:**	99999.9	

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

Dependency:

Affects P2000 (reference frequency).

P0759	**Value x2 of ADC scaling [V]**			**Min:**	0	Level:
	CStat: CUT	**Datatype:** Float	**Unit:** V	**Def:**	10	**3**
	P-Group: TERMINAL	**Active:** First confirm	**QuickComm.** No	**Max:**	10	

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

P0760	**Value y2 of ADC scaling**			**Min:**	-99999.9	Level:
	CStat: CUT	**Datatype:** Float	**Unit:** %	**Def:**	100.0	**3**
	P-Group: TERMINAL	**Active:** First confirm	**QuickComm.** No	**Max:**	99999.9	

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

Dependency:

Affects P2000 (reference frequency).

P0761	**Width of ADC deadband [V]**			**Min:**	0	Level:
	CStat: CUT	**Datatype:** Float	**Unit:** V	**Def:**	0	**3**
	P-Group: TERMINAL	**Active:** First confirm	**QuickComm.** No	**Max:**	10	

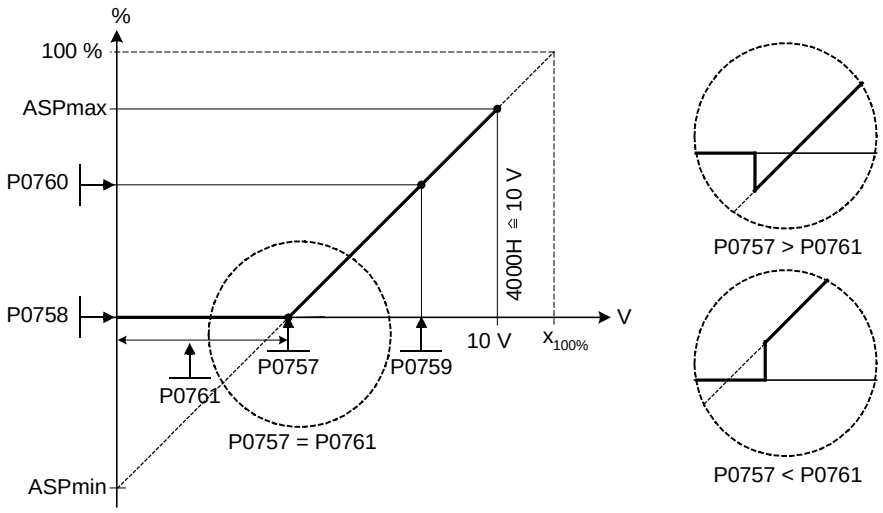
Defines width of deadband on analog input. The diagrams below explain its use

Example:

ADC value 2 to 10 V (0 to 50 Hz)
The below example produces a 2 to 10 V analog input (0 to 50 Hz)
P2000 = 50 Hz
P0759 = 8 V P0760 = 75 %
P0757 = 2 V P0758 = 0 %
P0761 = 2 V

P0761 > 0

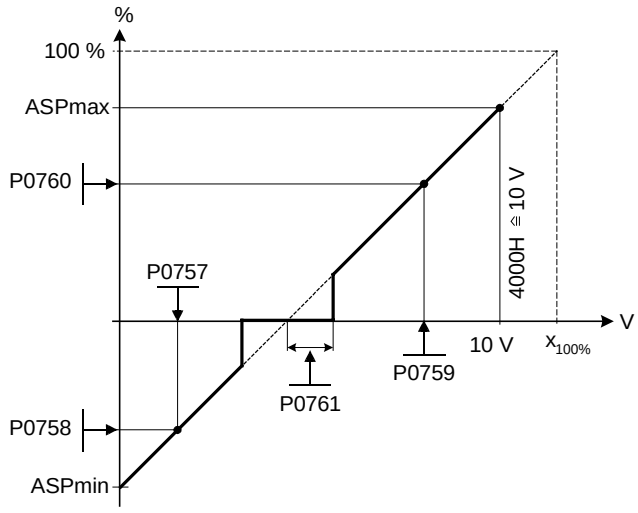
0 < P0758 < P0760 || 0 > P0758 > P0760



ADC value 0 to 10 V (-50 to +50 Hz)
The below example produces a 0 to 10 V analog input (-50 to +50 Hz) with center zero and a "holding point" 0.2 V wide (0.1 V to each side of center).
P2000 = 50 Hz
P0759 = 8 V P0760 = 75 %
P0757 = 2 V P0758 = -75 %
P0761 = 0.1 V

P0761 > 0

P0758 < 0 < P0760



Note:

P0761= 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.

P0810 **BI: CDS bit 0 (Local / Remote)** Level: **3**

CStat:	CUT	**Datatype:** U32	**Unit:** -	**Min:**	0:0
P-Group:	COMMANDS	**Active:** First confirm	**QuickComm.** No	**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.

P0927 **Parameter changeable via** Level: **3**

CStat:	CUT	**Datatype:** U16	**Unit:** -	**Min:**	0
P-Group:	COMM	**Active:** First confirm	**QuickComm.** No	**Def:**	15
				Max:	15

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 BOP and USS on COM link but not via USS on BOP link.

Bitfields:

Bit00	Not used	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:

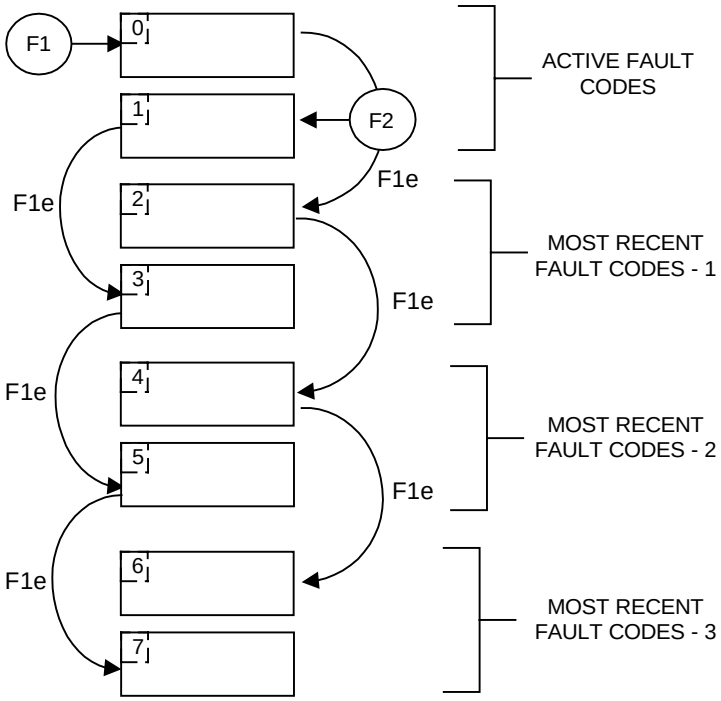
The seven-segment display is explained in the "Introduction to MICROMASTER 410 System Parameters" in this handbook.

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 "Faults and Warnings".

r0949[8] **Fault value**

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

Level: **3**

P-Group: ALARMS

Displays drive fault values. It is for service purposes and indicate the type of fault reported. The values are not documented. They are listed in the code where faults are reported.

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

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)

P0970 **Factory reset**

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

Level: **1**

P-Group: PAR_RESET **Active:** First confirm **QuickComm.** No

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:

P2010 (USS baud rate) and
P2011 (USS address)

P0971 **Transfer data from RAM to EEPROM**

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

Level: **3**

P-Group: COMM **Active:** First confirm **QuickComm.** No

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	**Selection of frequency setpoint**			**Min:**	0	Level:
	CStat: CT	**Datatype:** U16	**Unit:** -	**Def:**	2	**1**
	P-Group: SETPOINT	**Active:** First confirm	**QuickComm.** Yes	**Max:**	55	

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 5) and any additional setpoint from the most significant digit (i.e., x0 through to x5).

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

Other settings including an additional setpoint can be selected using the table below.

Enum:

0	No main setpoint		
1	MOP setpoint		
2	Analog setpoint		
3	Fixed frequency		
4	USS on BOP link		
5	USS on COM link		
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
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
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
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
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

Note:

Single digits denote main setpoints that have no additional setpoint.

P1001 **Fixed frequency 1** Level: **2**

CStat:	CUT	**Datatype:** Float	**Unit:** Hz	**Min:**	-650.00
P-Group:	SETPOINT	**Active:** Immediately	**QuickComm.** No	**Def:**	0.00
				Max:	650.00

Defines fixed frequency setpoint 1.

There are 2 types of fixed frequencies:
1. Direct selection
2. Direct selection + ON command

1. Direct selection (P0701 - P0703 = 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
2. Direct selection + ON command (P0701 - P0703 = 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

Dependency:
Select fixed frequency operation (using P1000).

Inverter requires ON command to start in the case of direct selection (P0701 - P0703 = 15)

Note:
Fixed frequencies can be selected using the digital inputs, and can also be combined with an ON command.

P1002 **Fixed frequency 2** Level: **2**

CStat:	CUT	**Datatype:** Float	**Unit:** Hz	**Min:**	-650.00
P-Group:	SETPOINT	**Active:** Immediately	**QuickComm.** No	**Def:**	5.00
				Max:	650.00

Defines fixed frequency setpoint 2.

Details:
See parameter P1001 (fixed frequency 1).

P1003 **Fixed frequency 3** Level: **2**

CStat:	CUT	**Datatype:** Float	**Unit:** Hz	**Min:**	-650.00
P-Group:	SETPOINT	**Active:** Immediately	**QuickComm.** No	**Def:**	10.00
				Max:	650.00

Defines fixed frequency setpoint 3.

Details:
See parameter P1001 (fixed frequency 1).

r1024 **CO: Act. fixed frequency** Level: **3**

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

Displays sum total of selected fixed frequencies.

P1031 **Setpoint memory of the MOP** Level: **2**

CStat:	CUT	**Datatype:** U16	**Unit:** -	**Min:**	0
P-Group:	SETPOINT	**Active:** Immediately	**QuickComm.** No	**Def:**	0
				Max:	1

Saves last motor potentiometer setpoint (MOP) that was active before OFF command or power down.

Enum:
0 MOP setpoint will not be stored
1 MOP setpoint will be stored (P2240 is updated)

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: **3**

CStat:	CT	**Datatype:** U16	**Unit:** -	**Min:**	0
P-Group:	SETPOINT	**Active:** First confirm	**QuickComm.** No	**Def:**	1
				Max:	1

Inhibits reverse setpoint selection

Enum:
0 Reverse direction is allowed
1 Reverse 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).

P1040 **Setpoint of the MOP**

CStat:	CUT	**Datatype:** Float	**Unit:** Hz	**Min:**	-650.00
P-Group:	SETPOINT	**Active:** Immediately	**QuickComm.** No	**Def:**	5.00
				Max:	650.00

Level: **3**

Determines setpoint for motor potentiometer control (P1000 = 1).

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.

P1058 **JOG frequency right**

CStat:	CUT	**Datatype:** Float	**Unit:** Hz	**Min:**	0.00
P-Group:	SETPOINT	**Active:** Immediately	**QuickComm.** No	**Def:**	5.00
				Max:	650.00

Level: **3**

Jogging increases 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.

Dependency:

P1060 and P1061 set up and down ramp times respectively for jogging.

P1059 **JOG frequency left**

CStat:	CUT	**Datatype:** Float	**Unit:** Hz	**Min:**	0.00
P-Group:	SETPOINT	**Active:** Immediately	**QuickComm.** No	**Def:**	5.00
				Max:	650.00

Level: **3**

While JOG left is selected, this parameter determines the frequency at which the inverter will run.

Dependency:

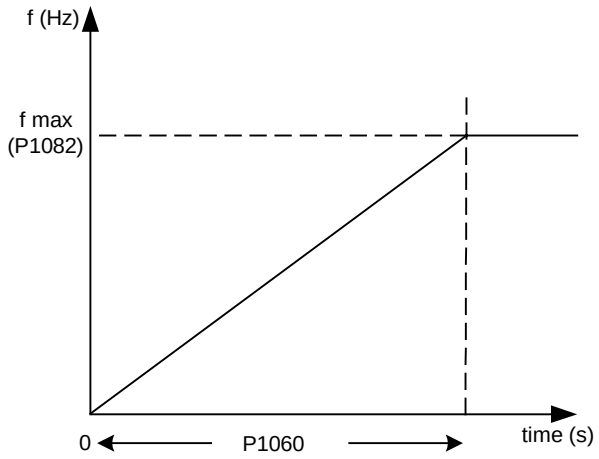
P1060 and P1061 set up and down ramp times respectively for jogging.

P1060 **JOG ramp-up time**

CStat:	CUT	**Datatype:** Float	**Unit:** s	**Min:**	0.00
P-Group:	SETPOINT	**Active:** First confirm	**QuickComm.** No	**Def:**	10.00
				Max:	650.00

Level: **3**

Sets jog ramp-up time. This is the time used while jogging is active.



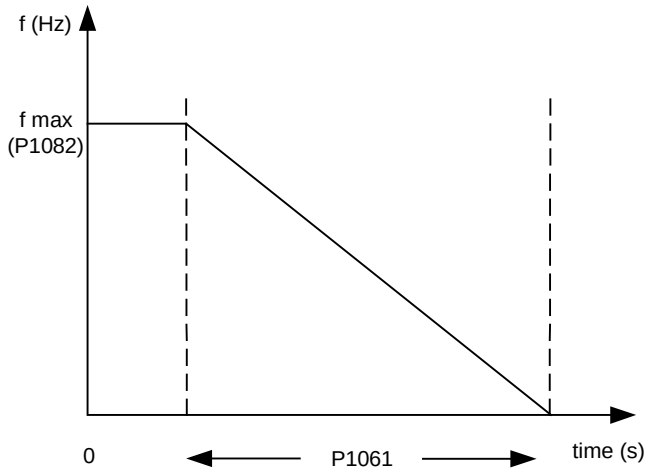
Notice:

Ramp times will be used as follows:
P1060 / P1061 : JOG mode is active
P1120 / P1121 : Normal mode (ON/OFF) is active

P1061 **JOG ramp-down time** Level: **3**

CStat:	CUT	**Datatype:** Float	**Unit:** s	**Min:**	0.00
P-Group:	SETPOINT	**Active:** First confirm	**QuickComm.** No	**Def:**	10.00
				Max:	650.00

Sets ramp-down time. This is the time used while jogging is active.



Notice:

Ramp times will be used as follows:
P1060 / P1061 : JOG mode is active
P1120 / P1121 : Normal mode (ON/OFF) is active

P1070 **CI: Main setpoint** Level: **3**

CStat:	CT	**Datatype:** U32	**Unit:** -	**Min:**	0.00
P-Group:	SETPOINT	**Active:** First confirm	**QuickComm.** No	**Def:**	755:0
				Max:	4000:0

Defines source of main setpoint.

Settings:

755 = Analog input 1 setpoint
1024 = Fixed frequency setpoint
1050 = Motor potentiometer (MOP) setpoint

P1075 **CI: Additional setpoint** Level: **3**

CStat:	CT	**Datatype:** U32	**Unit:** -	**Min:**	0:0
P-Group:	SETPOINT	**Active:** First confirm	**QuickComm.** No	**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

r1078 **CO: Total frequency setpoint** Level: **3**

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

Displays sum of main and additional setpoints in [Hz].

P1080 **Min. frequency** Level: **1**

CStat:	CUT	**Datatype:** Float	**Unit:** Hz	**Min:**	0.00
P-Group:	SETPOINT	**Active:** Immediately	**QuickComm.** Yes	**Def:**	0.00
				Max:	650.00

Sets minimum motor frequency [Hz] at which motor will run irrespective of frequency setpoint.

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	**Max. frequency**			**Min:**	0.00	Level:
	CStat: CT	**Datatype:** Float	**Unit:** Hz	**Def:**	50.00	**1**
	P-Group: SETPOINT	**Active:** First confirm	**QuickComm.** Yes	**Max:**	650.00	

Sets maximum motor frequency [Hz] at which motor will run irrespective of the frequency setpoint.

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:

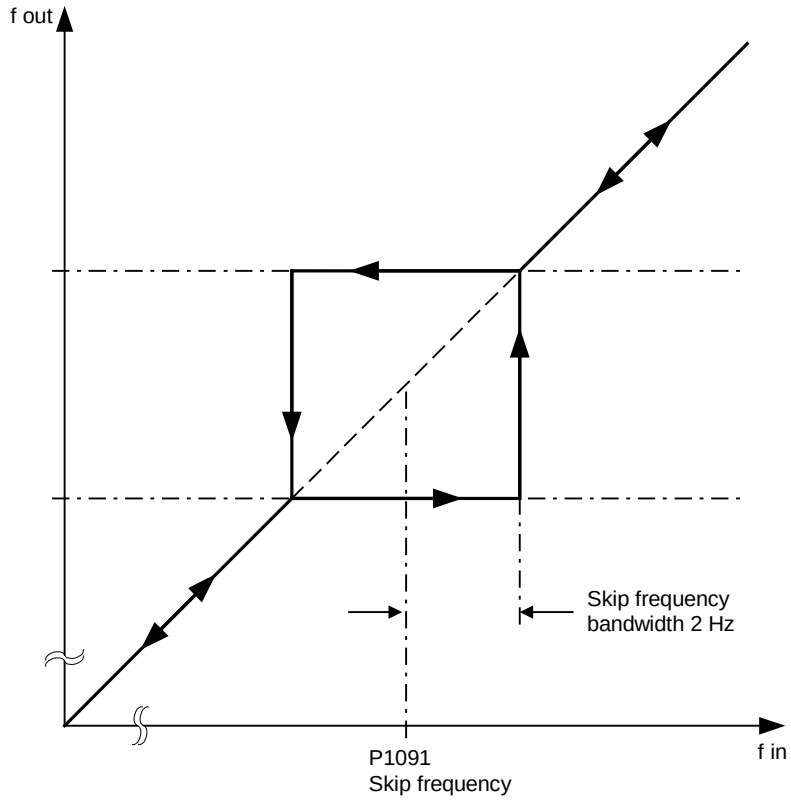
Slip compensation = $f_{max} + f_{slipcompmax}$
or
Flying restart = $f_{max} + f_{slipnom}$

Notice:

Maximum motor speed is subject to mechanical limitations.

P1091	**Skip frequency 1**			**Min:**	0.00	Level:
	CStat: CUT	**Datatype:** Float	**Unit:** Hz	**Def:**	0.00	**3**
	P-Group: SETPOINT	**Active:** Immediately	**QuickComm.** No	**Max:**	650.00	

Defines skip frequency 1 which avoids effects of mechanical resonance and suppresses frequencies within +/- 2Hz (skip frequency bandwidth).



Notice:

Stationary operation is not possible within the suppressed frequency range; the range is merely passed through (on the ramp).

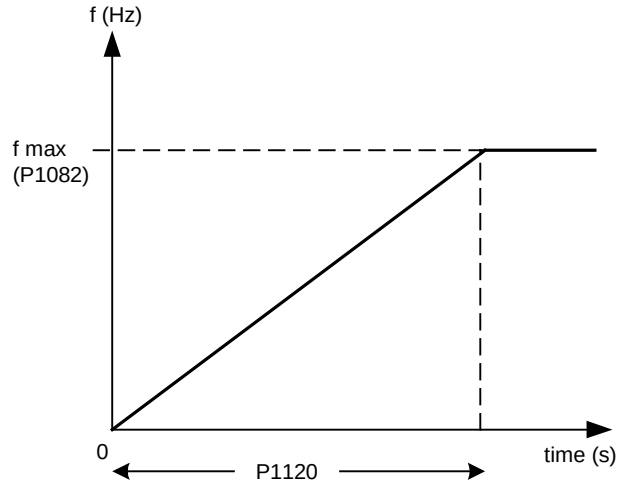
For example, if P1091 = 10 Hz it is not possible to operate continuously between 10 Hz +/- 2 Hz (i.e. between 8 and 12 Hz).

P1120 **Ramp-up time**

CStat:	CUT	**Datatype:** Float	**Unit:** s	**Min:**	0.00
P-Group:	SETPOINT	**Active:** First confirm	**QuickComm.** Yes	**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).

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.

Notice:

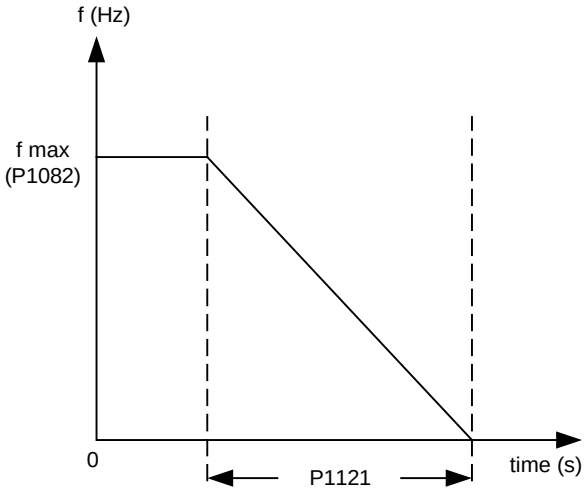
Ramp times will be used as follows:
P1060 / P1061 : JOG mode is active
P1120 / P1121 : Normal mode (ON/OFF) is active

P1121 **Ramp-down time**

CStat:	CUT	**Datatype:** Float	**Unit:** s	**Min:**	0.00
P-Group:	SETPOINT	**Active:** First confirm	**QuickComm.** Yes	**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.



Notice:

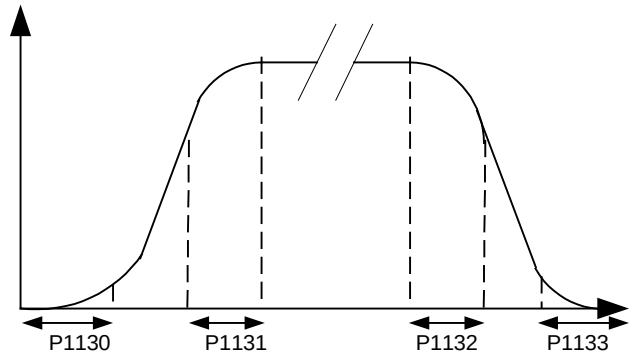
Setting the ramp-down time too short can cause the inverter to trip (overcurrent (F0001) / overvoltage (F0002)).

Ramp times will be used as follows:
P1060 / P1061 : JOG mode is active
P1120 / P1121 : Normal mode (ON/OFF) is active

P1130 **Ramp-up initial rounding time** Level: **3**

CStat:	CUT	**Datatype:** Float	**Unit:** s	**Min:**	0.00
P-Group:	SETPOINT	**Active:** First confirm	**QuickComm.** No	**Def:**	0.00
				Max:	40.00

Defines initial rounding time in seconds as shown on the diagram below.



where:

$$T_{up\ total} = \frac{1}{2}P1130 + X * P1120 + \frac{1}{2}P1131$$

$$T_{down\ total} = \frac{1}{2}P1130 + X * P1121 + \frac{1}{2}P1133$$

X is defined as: X = Δf / fmax

i.e. X is the ratio between the frequency step and fmax

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 **Ramp-up final rounding time** Level: **3**

CStat:	CUT	**Datatype:** Float	**Unit:** s	**Min:**	0.00
P-Group:	SETPOINT	**Active:** First confirm	**QuickComm.** No	**Def:**	0.00
				Max:	40.00

Defines rounding time at end of ramp-up as shown in P1130 (ramp-up initial rounding time).

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 **Ramp-down initial rounding time** Level: **3**

CStat:	CUT	**Datatype:** Float	**Unit:** s	**Min:**	0.00
P-Group:	SETPOINT	**Active:** First confirm	**QuickComm.** No	**Def:**	0.00
				Max:	40.00

Defines rounding time at start of ramp-down as shown in P1130 (ramp-up initial rounding time).

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 **Ramp-down final rounding time** Level: **3**

CStat:	CUT	**Datatype:** Float	**Unit:** s	**Min:**	0.00
P-Group:	SETPOINT	**Active:** First confirm	**QuickComm.** No	**Def:**	0.00
				Max:	40.00

Defines rounding time at end of ramp-down as shown in P1130 (ramp-up initial rounding time).

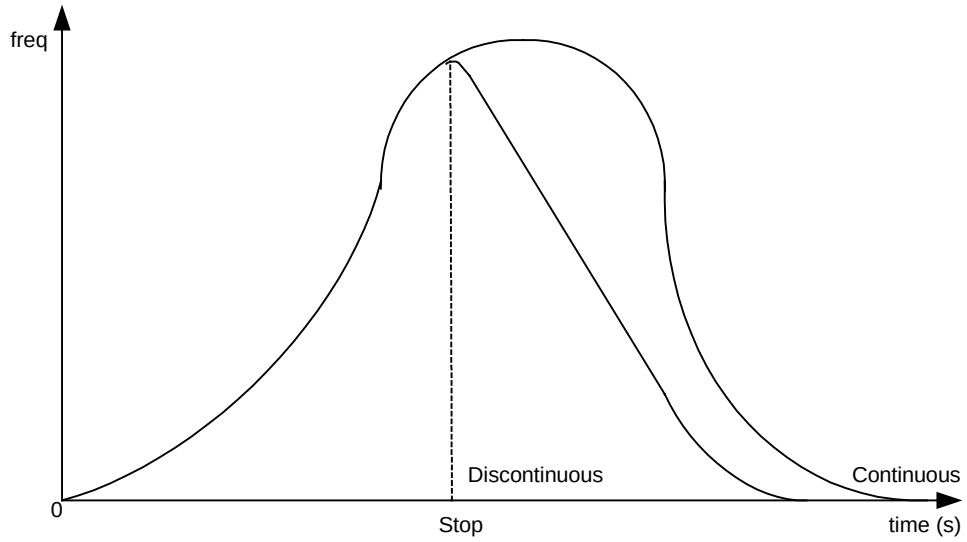
Note:
Rounding times are recommended, since they prevent an abrupt response, thus avoiding detrimental effects on the mechanics.

Notice:
Rounding times are not recommended when analog inputs are used, since they would result in overshoot/undershoot in the inverter response.

P1134 **Rounding type** Level: **3**

CStat:	CUT	**Datatype:** U16	**Unit:** -	**Min:**	0
P-Group:	SETPOINT	**Active:** Immediately	**QuickComm.** No	**Def:**	0
				Max:	1

Defines smoothing response to OFF commands or setpoint reduction.



Enum:

0 Continuous smoothing
1 Discontinuous smoothing

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 **OFF3 ramp-down time** Level: **3**

CStat:	CUT	**Datatype:** Float	**Unit:** s	**Min:**	0.00
P-Group:	SETPOINT	**Active:** First confirm	**QuickComm.** Yes	**Def:**	5.00
				Max:	650.00

Defines ramp-down time from maximum frequency to standstill for OFF3 command.

Note:

This time may be exceeded if the VDC_max. level is reached.

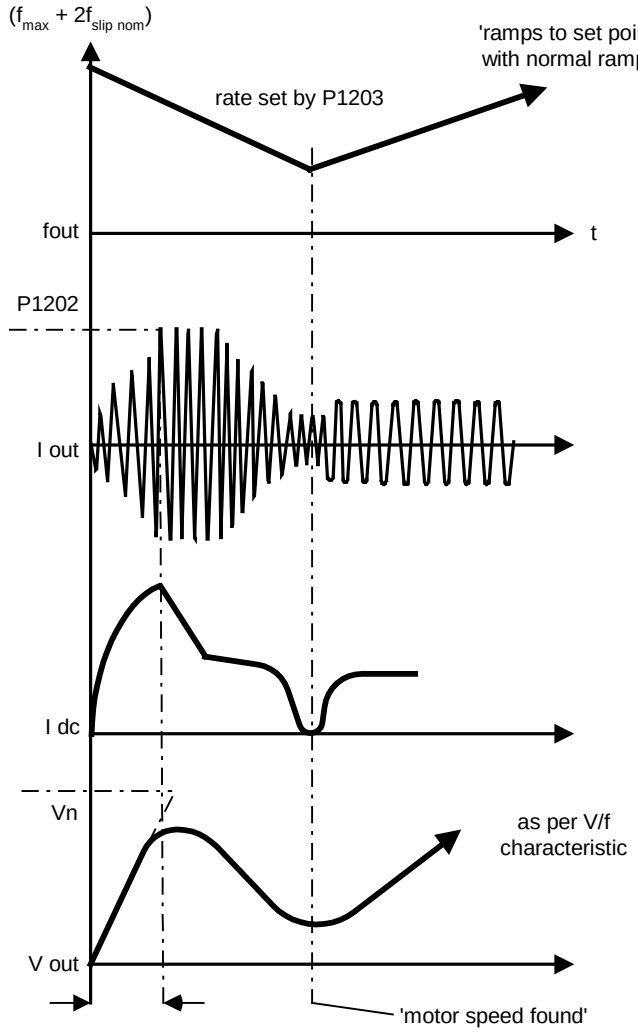
r1170 **CO: Frequency setpoint after RFG** Level: **3**

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

Displays overall frequency setpoint after ramp generator.

P1200	**Flying start**			**Min:**	0	Level:
	CStat: CUT	**Datatype:** U16	**Unit:** -	**Def:**	0	**3**
	P-Group: FUNC	**Active:** Immediately	**QuickComm.** No	**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	**Motor-current: Flying start**			**Min:**	10	Level:
	CStat: CUT	**Datatype:** U16	**Unit:** %	**Def:**	100	**3**
	P-Group: FUNC	**Active:** Immediately	**QuickComm.** No	**Max:**	200	

Defines search current used for flying start.

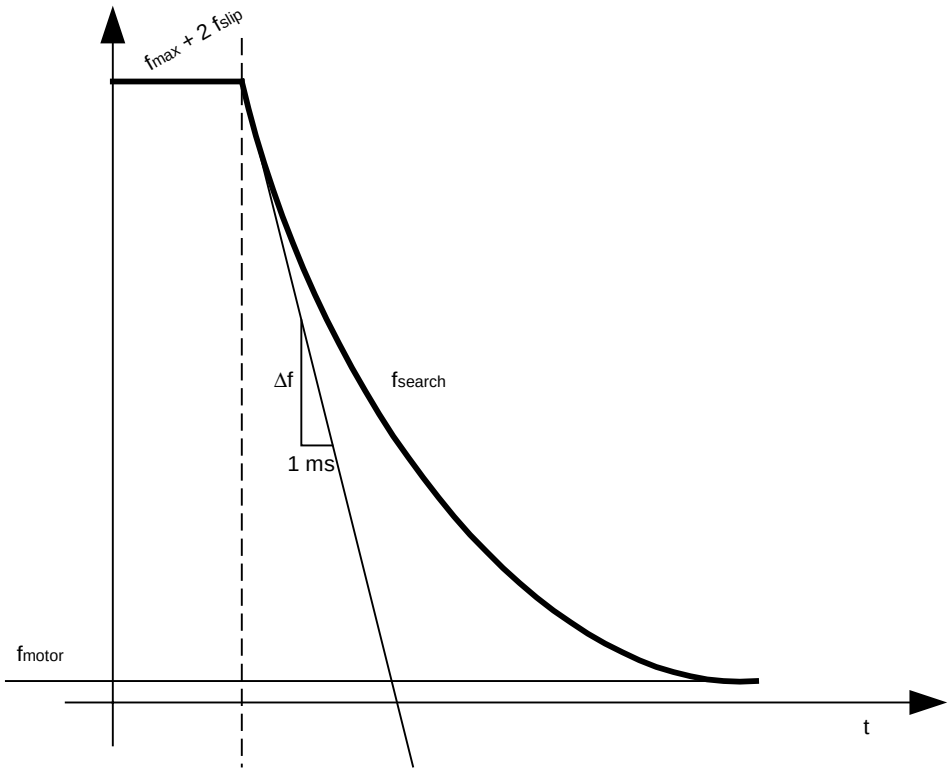
Value is in [%] based on rated motor current (P0305).

Note:

Reducing the search current may improve performance for flying start if the inertia of the system is not very high.

P1203	**Search rate: Flying start**			**Min:**	10	Level:
	CStat: CUT	**Datatype:** U16	**Unit:** %	**Def:**	100	**3**
	P-Group: FUNC	**Active:** Immediately	**QuickComm.** No	**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):



$$\Delta f = \frac{100\%}{P1203} * 2\% f_{slip}$$

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.

Note:

A higher value produces a flatter gradient and thus a longer search time.
A lower value has the opposite effect.

P1210	**Automatic restart**			**Min:**	0	Level:
	CStat: CUT	**Datatype:** U16	**Unit:** -	**Def:**	1	**2**
	P-Group: FUNC	**Active:** Immediately	**QuickComm.** No	**Max:**	5	

Enables restart after a mains break or after a fault.

Enum:

0	Disabled
1	Trip reset after power on
2	Restart mains break; power on
3	Restart after fault/mains break
4	Restart after mains break
5	Restart mains break/fault/power on

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).

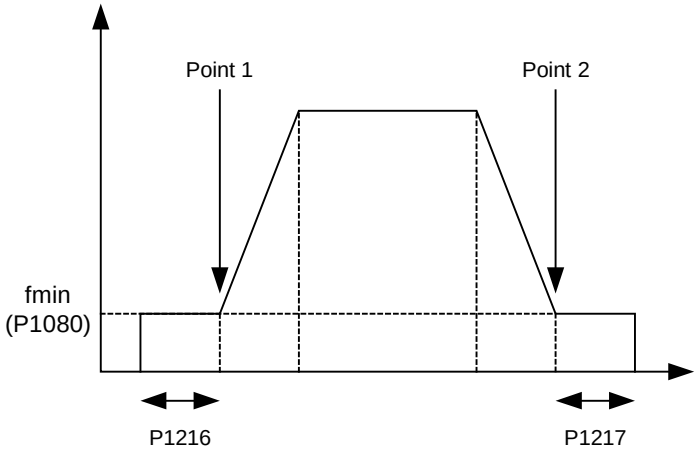
P1215 **Holding brake enable**

CStat:	T	**Datatype:** U16	**Unit:** -	**Min:**	0
P-Group:	FUNC	**Active:** Immediately	**QuickComm.** No	**Def:**	0
				Max:	1

Level: **3**

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**

CStat:	T	**Datatype:** Float	**Unit:** s	**Min:**	0
P-Group:	FUNC	**Active:** Immediately	**QuickComm.** No	**Def:**	1.0
				Max:	20.0

Level: **3**

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:

$$\frac{n_{syn} - n_n}{n_{syn}} * f_n$$

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**

CStat:	T	**Datatype:** Float	**Unit:** s	**Min:**	0
P-Group:	FUNC	**Active:** Immediately	**QuickComm.** No	**Def:**	1.0
				Max:	20.0

Level: **3**

Defines time for which inverter runs at minimum frequency (P1080) after ramping down at point 2.

Details:

See diagram P1215 (holding brake enable)

P1232 **DC braking current**

CStat:	CUT	**Datatype:** U16	**Unit:** %	**Min:**	0
P-Group:	FUNC	**Active:** Immediately	**QuickComm.** No	**Def:**	100
				Max:	250

Level: **3**

Defines level of DC current in [%] relative to rated motor current (P0305).

P1233 **Duration of DC braking**

CStat:	CUT	**Datatype:** U16	**Unit:** s	**Min:**	0
P-Group:	FUNC	**Active:** Immediately	**QuickComm.** No	**Def:**	0
				Max:	250

Level: **3**

Defines duration for which DC injection braking is to be active following an OFF1 command.

Value:

P1233 = 0 : Not active following OFF1.
P1233 = 1 - 250 : Active for the specified duration.

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).

P1236 **Compound braking current** Level: **3**

CStat:	CUT	**Datatype:** U16	**Unit:** %	**Min:**	0
P-Group:	FUNC	**Active:** Immediately	**QuickComm.** No	**Def:**	0
				Max:	250

Defines DC level superimposed on AC waveform after OFF1 / OFF3 command. The value is entered in [%] relative to rated motor current (P0305).

230V type:

Compound braking switch - on level $= 1.13 * \sqrt{2} * V_{mains} = 1{,}13 * \sqrt{2} * P0210$

115V type:

Compound braking switch - on level $= 1.13 * \sqrt{2} * V_{mains} * 2 = 1{,}13 * \sqrt{2} * P0210 * 2$

Value:

P1236 = 0 : Compound braking disabled.
P1236 = 1 - 250 : Level of DC braking current defined as a [%] of rated motor current (P0305).

Dependency:

Active after OFF1 / OFF3 command.

Notice:

Increasing the value will generally improve braking performance; however, if you set the value too high, an overcurrent trip may result.

P1240 **Configuration of Vdc controller** Level: **3**

CStat:	CT	**Datatype:** U16	**Unit:** -	**Min:**	0
P-Group:	FUNC	**Active:** Immediately	**QuickComm.** No	**Def:**	1
				Max:	1

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

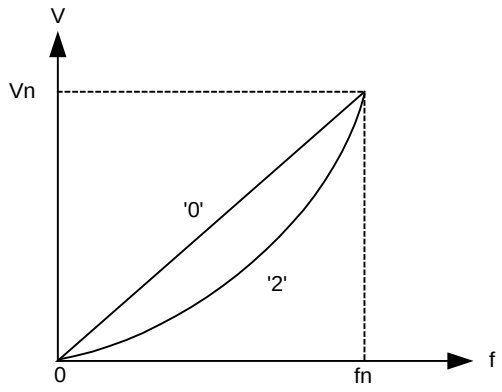
Note:

Vdc max automatically increases ramp-down times to keep the DC-link voltage (r0026) within limits.

P1300 **Control mode** Level: **2**

CStat:	CT	**Datatype:** U16	**Unit:** -	**Min:**	0
P-Group:	CONTROL	**Active:** Immediately	**QuickComm.** Yes	**Def:**	0
				Max:	3

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.

Note:

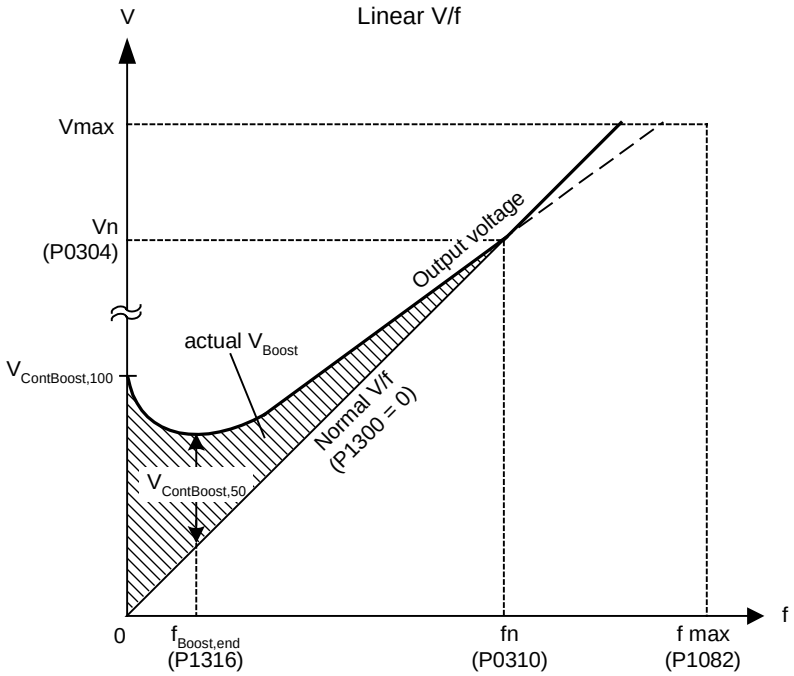
P1300 = 1 : V/f with FCC
* Maintains motor flux current for improved efficiency
* If FCC is chosen, linear V/f is active at low frequencies.

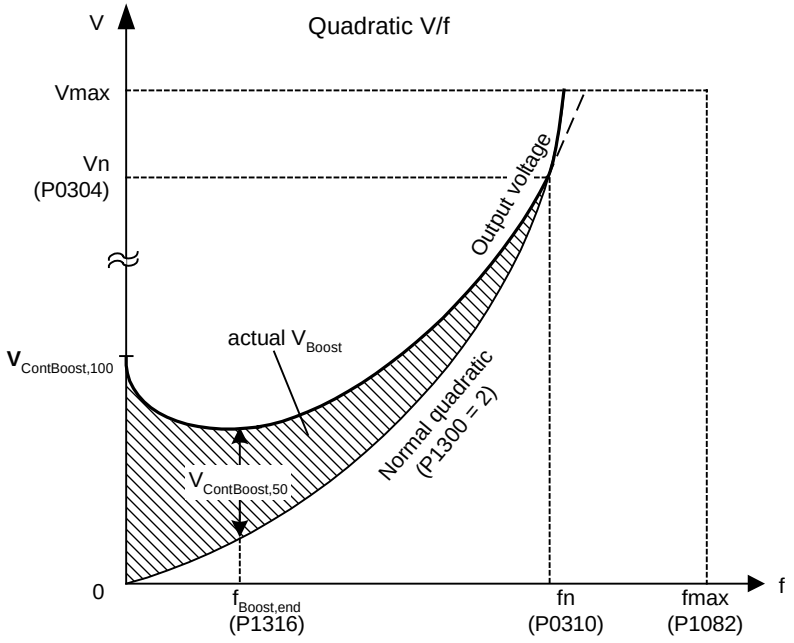
P1300 = 2 : V/f with a quadratic curve
* Suitable for centrifugal fans / pumps

P1310	**Continuous boost**			**Min:**	0.0	Level:
	CStat: CUT	**Datatype:** Float	**Unit:** %	**Def:**	50.0	**2**
	P-Group: CONTROL	**Active:** Immediately	**QuickComm.** No	**Max:**	250.0	

At low output frequencies the output voltage is low to keep the flux level constant. However, the output voltage may be too low
- for magnetisation the asynchronous motor
- to hold the load
- to overcome losses in the system. The output voltage can be increased using parameter P1310.

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 voltage values are given

V_ConBoost,100 = rated motor current (P0305) * Stator resistance * Continous boost (P1310)
V_ConBoost,50 = V_ConBoost,100 / 2

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).

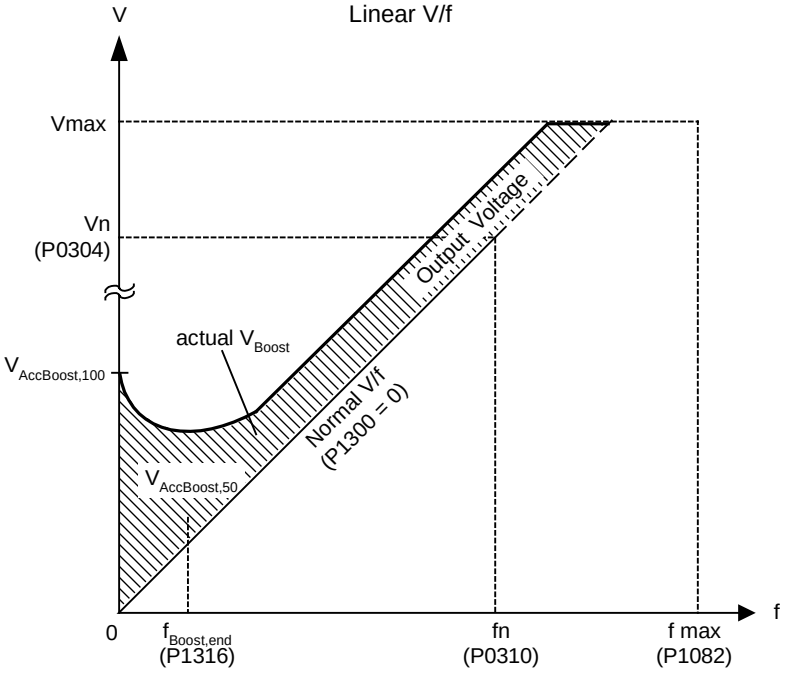
$$\sum \text{Boosts} \leq \frac{300}{I_{mot}} * R_S$$

P1311 Acceleration boost

						Level:
CStat:	CUT	**Datatype:** Float	**Unit:** %	**Min:**	0.0	**3**
P-Group:	CONTROL	**Active:** Immediately	**QuickComm.** No	**Def:**	0.0	
				Max:	250.0	

P1311 will only produce boost during ramping, and is therefore useful for additional torque during acceleration.

Applies boost in [%] relative to P0305 (rated motor current) following a positive setpoint change and drops back out once the setpoint is reached.



where voltage values are given

V_AccBoost,100 = rated motor current (P0305) * Stator resistance * Acceleration boost (P1311)
V_AccBoost,50 = V_AccBoost,100 / 2

Dependency:

Setting in P0640 (motor overload factor [%]) limits boost.

Note:

Acceleration boost can help to improve response to small positive setpoint changes.

$$\sum \text{Boosts} \leq \frac{300}{I_{mot}} * R_S$$

Notice:

Increasing the boost level increases motor heating.

Details:

See note in P1310 for boost priorities.

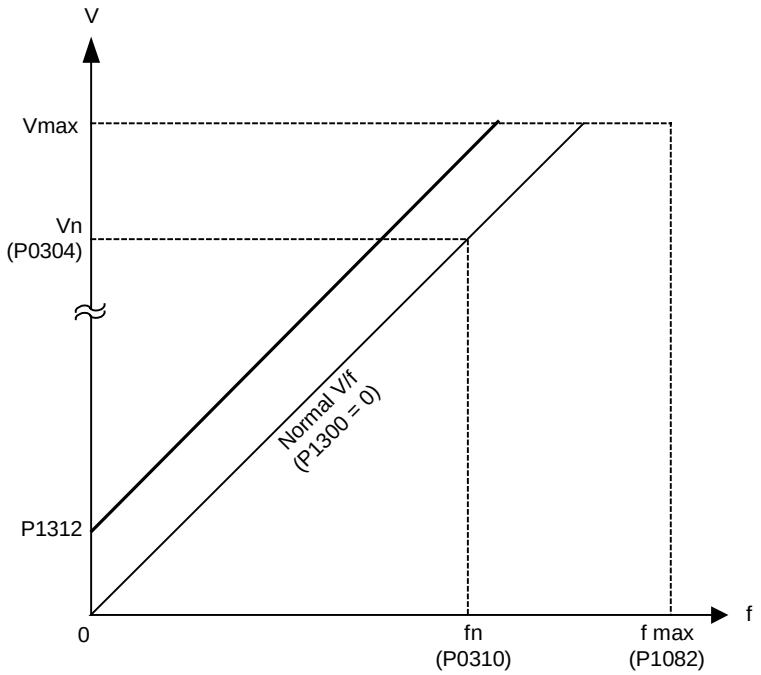
P1312 **Starting boost**

CStat:	CUT	**Datatype:** Float	**Unit:** %	**Min:**	0.0
P-Group:	CONTROL	**Active:** Immediately	**QuickComm.** No	**Def:**	0.0
				Max:	250.0

Level: **2**

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.



Dependency:

Setting in P0640 (motor overload factor [%]) limits boost.

Notice:

Increasing the boost levels increases motor heating.

$$\sum \text{Boosts} \leq \frac{300}{I_{mot}} * R_S$$

Details:

See note in P1310 for boost priorities.

P1316 **Boost end frequency**

CStat:	CUT	**Datatype:** Float	**Unit:** %	**Min:**	0.0
P-Group:	CONTROL	**Active:** Immediately	**QuickComm.** No	**Def:**	20.0
				Max:	100.0

Level: **3**

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:

$$f_{Boost\ min} = 2 * \left(\frac{153}{\sqrt{P_{motor}}} + 3 \right)$$

Note:

The expert user may change this value to alter the shape of the curve, e.g. to increase torque at a particular frequency.

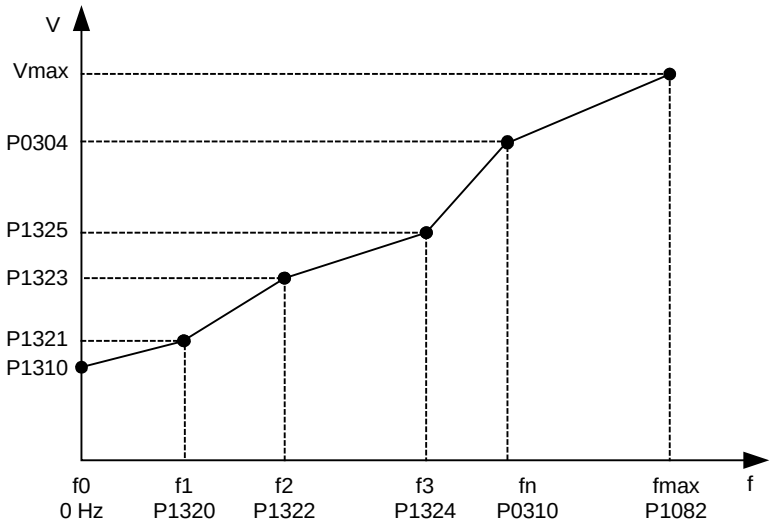
Details:

See diagram in P1310 (continuous boost)

P1320 **Programmable V/f freq. coord. 1** Level: **3**

CStat:	CT	**Datatype:** Float	**Unit:** Hz	**Min:**	0.00
P-Group:	CONTROL	**Active:** Immediately	**QuickComm.** 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.

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:
Continuous boost P1310 at 0 Hz
Rated motor voltage P0304 at rated motor frequency P0310

The acceleration boost and starting boost defined in P1311 and P1312 are applied to V/f with programmable characteristic.

P1321 **Programmable V/f volt. coord. 1** Level: **3**

CStat:	CUT	**Datatype:** Float	**Unit:** V	**Min:**	0.0
P-Group:	CONTROL	**Active:** Immediately	**QuickComm.** No	**Def:**	0.0
				Max:	3000.0

See P1320 (programmable V/f freq. coord. 1).

P1322 **Programmable V/f freq. coord. 2** Level: **3**

CStat:	CT	**Datatype:** Float	**Unit:** Hz	**Min:**	0.00
P-Group:	CONTROL	**Active:** Immediately	**QuickComm.** No	**Def:**	0.00
				Max:	650.00

See P1320 (programmable V/f freq. coord. 1).

P1323 **Programmable V/f volt. coord. 2** Level: **3**

CStat:	CUT	**Datatype:** Float	**Unit:** V	**Min:**	0.0
P-Group:	CONTROL	**Active:** Immediately	**QuickComm.** No	**Def:**	0.0
				Max:	3000.0

See P1320 (programmable V/f freq. coord. 1).

P1324 **Programmable V/f freq. coord. 3** Level: **3**

CStat:	CT	**Datatype:** Float	**Unit:** Hz	**Min:**	0.00
P-Group:	CONTROL	**Active:** Immediately	**QuickComm.** No	**Def:**	0.00
				Max:	650.00

See P1320 (programmable V/f freq. coord. 1).

P1325 **Programmable V/f volt. coord. 3** Level: **3**

CStat:	CUT	**Datatype:** Float	**Unit:** V	**Min:**	0.0
P-Group:	CONTROL	**Active:** Immediately	**QuickComm.** No	**Def:**	0.0
				Max:	3000.0

See P1320 (programmable V/f freq. coord. 1).

P1333 **Start frequency for FCC**

CStat:	CUT	**Datatype:** Float	**Unit:** %	**Min:**	0.0
P-Group:	CONTROL	**Active:** Immediately	**QuickComm.** No	**Def:**	10.0
				Max:	100.0

Level: **3**

Defines start frequency at which FCC (flux current control) is enabled as [%] of rated motor frequency (P0310).

Notice:

If this value is too low, the system may become unstable.

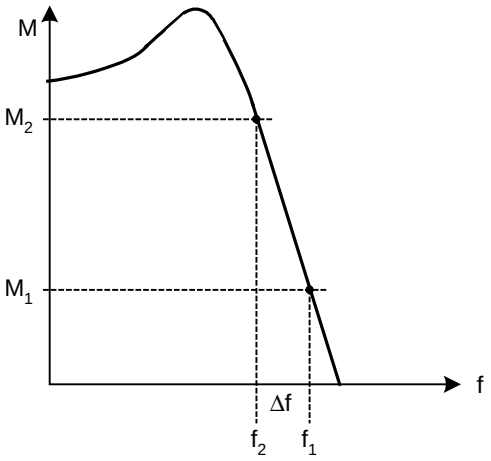
P1335 **Slip compensation**

CStat:	CUT	**Datatype:** Float	**Unit:** %	**Min:**	0.0
P-Group:	CONTROL	**Active:** Immediately	**QuickComm.** No	**Def:**	0.0
				Max:	600.0

Level: **3**

Dynamically adjusts output frequency of inverter so that motor speed is kept constant independent of motor load.

Increasing the load from M1 to M2 (see diagram) will decrease the motor speed from f1 to f2, due to the slip. The inverter can compensate for this by increasing the output frequency slightly as the load increases. The inverter measures the current and increases the output frequency to compensate for the expected slip.



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.

P1340 **Imax controller prop. gain**

CStat:	CUT	**Datatype:** Float	**Unit:** -	**Min:**	0.000
P-Group:	CONTROL	**Active:** Immediately	**QuickComm.** No	**Def:**	0.000
				Max:	0.499

Level: **3**

Proportional gain of the I_max controller.

Dynamically controls the inverter if the output current exceeds the maximum motor current (r0067). It does this by first limiting the inverter output frequency (to a possible minimum of the nominal slip frequency). If this action does not successfully remove the overcurrent condition, the inverter output voltage is reduced. When the overcurrent condition has been removed successfully, frequency limiting is removed using the ramp-up time set in P1120.

P1800 **Pulse frequency**

CStat:	CUT	**Datatype:** U16	**Unit:** kHz	**Min:**	2
P-Group:	INVERTER	**Active:** Immediately	**QuickComm.** No	**Def:**	4
				Max:	16

Level: **3**

Sets pulse frequency of power switches in inverter. The frequency can be changed in steps of 2 kHz.

Pulse frequencies > 8 kHz 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).

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).

P2000 **Reference frequency**

CStat: CT **Datatype:** Float **Unit:** Hz **Min:** 1.00 **Def:** 50.00

P-Group: COMM **Active:** Immediately **QuickComm.** No **Max:** 650.00

Full-scale frequency setting used by serial link (corresponds to 4000H) and analog I/O.

P2009[2] **USS normalization** Level: **3**

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

P-Group: COMM **Active:** Immediately **QuickComm.** No **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: **3**

CStat: CUT **Datatype:** U16 **Unit:** - **Min:** 3 **Def:** 6

P-Group: COMM **Active:** Immediately **QuickComm.** No **Max:** 9

Sets baud rate for USS communication.

Enum:

3 1200 baud
4 2400 baud
5 4800 baud
6 9600 baud
7 19200 baud
8 38400 baud
9 57600 baud

Index:

P2010[0] : Serial interface COM link
P2010[1] : Serial interface BOP link

P2011[2] **USS address** Level: **3**

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

P-Group: COMM **Active:** Immediately **QuickComm.** No **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 **Def:** 2

P-Group: COMM **Active:** Immediately **QuickComm.** No **Max:** 4

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** Level: **3**

CStat: CUT **Datatype:** U16 **Unit:** - **Min:** 0
P-Group: COMM **Active:** Immediately **QuickComm.** No **Def:** 127
Max: 127

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
127 Variable

Index:

P2013[0] : Serial interface COM link
P2013[1] : Serial interface BOP link

Notice:

Setting P2013 has implications for the PKW word order.

P2014[2] **USS telegram off time** Level: **3**

CStat: CT **Datatype:** U16 **Unit:** ms **Min:** 0
P-Group: COMM **Active:** Immediately **QuickComm.** No **Def:** 0
Max: 65535

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[4] **CO: PZD from BOP link (USS)** Level: **3**

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

Displays process data received via USS on BOP link.

Index:

r2015[0] : Received word 0
r2015[1] : Received word 1
r2015[2] : Received word 2
r2015[3] : Received word 3

Note:

The control words can be viewed as bit parameters r2032 and r2033.

P2016[4] **CI: PZD to BOP link (USS)** Level: **3**

CStat: CT **Datatype:** U32 **Unit:** - **Min:** 0:0
P-Group: COMM **Active:** Immediately **QuickComm.** No **Def:** 52:0
Max: 4000:0

Selects signals to be transmitted to serial interface via BOP link

Example:

P2016[0] = 52.0 (default). In this case, the value of r0052 (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

r2018[4] **CO: PZD from COM link (USS)** Level: **3**

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

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

Note:

The control words can be viewed as bit parameters r2036 and r2037.

P2019[4] **CI: PZD to COM link (USS)** Level: 3

CStat:	CT	**Datatype:** U32	**Unit:** -	**Min:**	0:0
P-Group:	COMM	**Active:** Immediately	**QuickComm.** No	**Def:**	52:0
				Max:	4000:0

Index:
P2019[0] : Transmitted word 0
P2019[1] : Transmitted word 1
P2019[2] : Transmitted word 2
P2019[3] : Transmitted word 3

Details:
See r2016 (PZD to BOP link)

r2024[2] **USS error-free telegrams** Level: 3

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

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:**	-
P-Group:	COMM			**Def:**	-
				Max:	-

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:**	-
P-Group:	COMM			**Def:**	-
				Max:	-

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:**	-
P-Group:	COMM			**Def:**	-
				Max:	-

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:**	-
P-Group:	COMM			**Def:**	-
				Max:	-

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:**	-
P-Group:	COMM			**Def:**	-
				Max:	-

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:**	-
P-Group:	COMM			**Def:**	-
				Max:	-

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**

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

Level: **3**

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)**

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

Level: **3**

P-Group: COMM

Displays control word 1 from BOP link (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	Local / Remote	0	NO
		1	YES

r2033 **BO: CtrlWrd2 from BOP link (USS)**

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

Level: **3**

P-Group: COMM

Displays control word 2 from BOP link (i.e. 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
Bit09	DC brake enabled	0	NO
		1	YES
Bit13	External fault 1	0	YES
		1	NO

Dependency:

P0700 = 4 (USS on BOP 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. 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	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. 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
Bit09	DC brake enabled	0	NO
		1	YES
Bit13	External fault 1	0	YES
		1	NO

Details:

See r2033 (control word 2 from BOP link)

r2110[4] **Warning number** Level: **3**

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

P-Group: ALARMS

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 operator panel display will flash while a warning is active. The LED indicates the warning status in this case.

Notice:

Indices 0 and 1 are not stored.

r2114[2] **Run time counter**

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

Level: **3**

P-Group: ALARMS

Displays run time counter. It is the total time the drive has been powered up. Every time you do power cycle, it will save the value then restore it and the counter carries on ticking.

Index:

r2114[0] : System Time, Seconds, Upper Word
r2114[1] : System Time, Seconds, Lower Word

P2167 **Switch-off frequency f_off**

CStat: CUT **Datatype:** Float **Unit:** Hz **Min:** 0.00 **Def:** 1.00 **Max:** 10.00

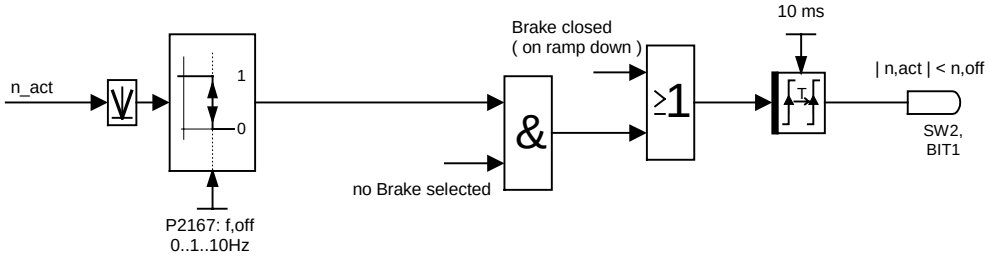
Level: **3**

P-Group: ALARMS **Active:** Immediately **QuickComm.** No

Sets frequency threshold below which inverter switches off.

If the frequency falls below this threshold, bit 1 in status word 2 (r0053)is set.

| n,act | < n,off



Dependency:

Switched off only if OFF1 or OFF3 active.

P3900 **End of quick commissioning**

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

Level: **1**

P-Group: QUICK **Active:** Immediately **QuickComm.** Yes

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).

End of quick comissioning calculates a variety of motor parameters, overwriting previous values including P2000 (reference frequency).

2 Faults and Alarms

2.1 Fault Messages

Fault	Possible Causes	Diagnose & Remedy	Reac-tion
F0001 OverCurrent	➢ Motor power (P0307) does not correspond to the inverter power (r0206) ➢ Motor lead short circuit ➢ Earth faults	Check the following: 1. Motor power (P0307) must correspond to inverter power (r0206). 2. Cable length limits must not be exceeded. 3. Motor cable and motor must have no short-circuits or earth faults 4. Motor parameters must match the motor in use 5. Motor must not be obstructed or overloaded. ➢ Increase the ramp time ➢ Reduce the boost level	Off2
F0002 OverVoltage	➢ Overvoltage can be caused either by too high main supply voltage or if motor is in regenerative mode. ➢ Regenerative mode can be caused by fast ramp downs or if the motor is driven from an active load.	Check the following: 1. Supply voltage (P0210) must lie within limits indicated on inverter rating plate . 2. DC-link voltage controller must be enabled (P1240) and parameterized properly. 3. Ramp-down time (P1121) must match inertia of load. NOTE Higher inertia requires longer ramp times	Off2
F0003 UnderVoltage	➢ Main supply failed. ➢ Shock load outside specified limits.	Check the following: 1. Supply voltage (P0210) must lie within limits indicated on inverter rating plate. 2. Supply must not be susceptible to temporary failures or voltage reductions.	Off2
F0004 Inverter Over Temperature	➢ Ventilation inadequate ➢ Ambient temperature is too high.	Check the following: 1. Pulse frequency must be set to default value 2. Ambient temperature could be higher than specified for the inverter	Off2
F0005 Inverter I^2t	➢ Inverter overloaded. ➢ Duty cycle too demanding. ➢ Motor power (P0307) exceeds inverter power capability (r0206).	Check the following: 1. Load duty cycle must lie within specified limits. 2. Motor power (P0307) must match inverter power (r0206)	Off2
F0011 Motor Over Temperature I^2t	Motor overloaded	Check the following: 1. Load duty cycle must be correct 2. Motor temperatur warning level (P0604) must match.	Off1
F0041	Stator resistance measurement failure	➢ Check if the motor is connected to the inverter. ➢ Check that the motor data have been entered correctly.	Off2
F0051 Parameter EEPROM Fault	Read or write failure while saving non-volatile parameter.	Factory Reset and new parameterization Change drive	Off2
F0052 power stack Fault	Read failure for power stack information or invalid data.	Change drive	Off2
F0060 Asic Timeout	Internal communications failure	If fault persists, change inverter Contact Service Department	Off2

Fault	Possible Causes	Diagnose & Remedy	Reac-tion
F0071 USS (BOP-link) setpoint fault	No setpoint values from USS during telegram off time	Check USS master	Off2
F0072 USS (COMM link) setpoint fault	No setpoint values from USS during telegram off time	Check USS master	Off2
F0085 External Fault	External fault triggered via terminal inputs	Disable terminal input for fault trigger.	Off2
F0101 Stack Overflow	Software error or processor failure	➢ Cycle through power (on/off). ➢ Replace drive if fault is not corrected.	Off2
F0450 BIST Tests Failure **(Service Mode Only)**	Selftest failed	➢ Drive may run but some features will not work properly. ➢ Replace drive.	Off2

2.2 Alarms

Alarm	Possible Causes	Diagnose & Remedy	Reac-tion
A0501 Current Limit	➢ Motor power does not correspond to the inverter power ➢ Motor leads are too long ➢ Earth faults	Check the following: 1. Motor power (P0307) must correspond to inverter power (r0206). 2. Cable length limits must not be exceeded. 3. Motor cable and motor must have no short-circuits or earth faults 4. Motor parameters must match the motor in use 5. Motor must not be obstructed or overloaded ➢ Increase the ramp-up-time. ➢ Reduce the boost.	--
A0502 Overvoltage limit	➢ Overvoltage limit is reached. ➢ This warning can occur during ramp down, if the dc-link con-troller is disabled (P1240 = 0).	If this warning is displayed permanently, check drive input voltage .	--
A0503 UnderVoltage Limit	Main supply failed	Check main supply voltage (P0210).	--
A0504 Inverter Over Temperature	Warning level of inverter heat-sink temperature (P0614) is exceeded, resulting in pulse frequency reduction and/or output frequency reduction (depending on parametrization in (P0610)	Check the following: 1. Ambient temperature must lie within specified limits 2. Load conditions and duty cycle must be appropriate	--
A0505 Inverter I^2t	Warning level exceeded, current will be reduced if parameterized (P0610 = 1)	Check that duty cycle lies within specified limits	--
A0506 Inverter duty cycle	Difference between heatsink and IGBT junction temperature exceeds warning limits	Check that duty cycle and shock loads lie within specified limits	--
A0511 Motor Over Temperature I^2t	➢ Motor overloaded. ➢ Load duty cycle too high.	Check the following: 1. P0611 (motor I^2t time constant) should be set to appropriate value 2. P0614 (Motor I^2t overload warning level) should be set to suitable level	--
A0600 RTOS Overrun Warning	Software problem	Contact Service Department	--

Alarm	Possible Causes	Diagnose & Remedy	Reac-tion
A0910 Vdc-max controller de-activated	➢ Vdc max controller has been de-activated ➢ Occurs if main supply voltage is permanently too high. ➢ Occurs if motor is driven by an active load, causing motor to go into regenerative mode. ➢ Occurs at very high load inertias, when ramping down.	Check the following: 1. Input voltage must lie within range. 2. Load must be matched. 3. In certain cases apply braking resistor.	--
A0911 Vdc-max controller active	Vdc max controller is active; so ramp-down times will be increased automatically to keep DC-link voltage (r0026) within limits	Check the inverter input voltage (P0210)	--
A0920 ADC parameters not set properly.	ADC parameters should not be set to identical values, since this would produce illogical results.	Check P0757, P0758, P0759 and P0760	--
A0922 No load applied to inverter	No Load is applied to the inverter. As a result, some functions may not work as under normal load conditions.	Check that a load has been applied to the inverter.	--

Suggestions and/or Corrections

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Suggestions for technical documentation

Suggestions
Corrections

For Publication/Manual:
MICROMASTER 410
Parameter List

User Documentation

From
Name:

Company/Service Department
Address: _____

_____

Phone: _____ / _____
Fax: _____ / _____

Order number: 6SE6400-5EB00-0BP0
Date of Issue: 10/01

Should you come across any printing errors when reading this publication, please notify us on this sheet.

Suggestions for improvement are also welcome.

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