Altivar 610Variable Speed Drives

Programming Manual

10/2015





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All pertinent state, regional, and local safety regulations must be observed when installing and using this product. For reasons of safety and to help ensure compliance with documented system data, only the manufacturer should perform repairs to components.

When devices are used for applications with technical safety requirements, the relevant instructions must be followed.

Failure to use Schneider Electric software or approved software with our hardware products may result in injury, harm, or improper operating results.

Failure to observe this information can result in injury or equipment damage.

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Safety Information



Important Information

NOTICE

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a "Danger" or "Warning" safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death

A DANGER

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

A CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result** in minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

PLEASE NOTE

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material

A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

Qualification Of Personnel

Only appropriately trained persons who are familiar with and understand the contents of this manual and all other pertinent product documentation are authorized to work on and with this product. In addition, these persons must have received safety training to recognize and avoid hazards involved. These persons must have sufficient technical training, knowledge and experience and be able to foresee and detect potential hazards that may be caused by using the product, by changing the settings and by the mechanical, electrical and electronic equipment of the entire system in which the product is used. All persons working on and with the product must be fully familiar with all applicable standards, directives, and accident prevention regulations when performing such work.

Intended Use

This product is a drive for three-phase asynchronous motors and intended for industrial use according to this manual. The product may only be used in compliance with all applicable safety regulations and directives, the specified requirements and the technical data. Prior to using the product, you must perform a risk assessment in view of the planned application. Based on the results, the appropriate safety measures must be implemented. Since the product is used as a component in an entire system, you must ensure the safety of persons by means of the design of this entire system (for example, machine design). Any use other than the use explicitly permitted is prohibited and can result in hazards. Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel.

Product Related Information

Read and understand these instructions before performing any procedure with this drive.

A A DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Only appropriately trained persons who are familiar with and understand the contents of this manual and all other pertinent product documentation and who have received safety training to recognize and avoid hazards involved are authorized to work on and with this drive system. Installation, adjustment, repair and maintenance must be performed by qualified personnel.
- The system integrator is responsible for compliance with all local and national electrical code requirements as well as all other applicable regulations with respect to grounding of all equipment.
- Many components of the product, including the printed circuit boards, operate with mains voltage. Do not touch. Use only electrically insulated tools.
- Do not touch unshielded components or terminals with voltage present.
- Motors can generate voltage when the shaft is rotated. Prior to performing any type of work on the drive system, block the motor shaft to prevent rotation.
- AC voltage can couple voltage to unused conductors in the motor cable. Insulate both ends of unused conductors of the motor cable.
- Do not short across the DC bus terminals or the DC bus capacitors or the braking resistor terminals.
- Before performing work on the drive system:
 - O Disconnect all power, including external control power that may be present.
 - O Place a **Do Not Turn On** label on all power switches.
 - O Lock all power switches in the open position.
 - Wait 15 minutes to allow the DC bus capacitors to discharge. The DC bus LED is not an indicator
 of the absence of DC bus voltage that can exceed 800 Vdc.
 Measure the voltage on the DC bus between the DC bus terminals (PA/+, PC/-) using a properly
 - rated voltmeter to verify that the voltage is <42 Vdc

 If the DC bus capacitors do not discharge properly, contact your local Schneider Electric representative. Do not repair or operate the product.
- Install and close all covers before applying voltage.

Failure to follow these instructions will result in death or serious injury.

A WARNING

UNEXPECTED MOVEMENT

Drive systems may perform unexpected movements because of incorrect wiring, incorrect settings, incorrect data or other errors.

- Carefully install the wiring in accordance with the EMC requirements.
- Do not operate the product with unknown or unsuitable settings or data.
- Perform a comprehensive commissioning test.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Damaged products or accessories may cause electric shock or unanticipated equipment operation.

A A DANGER

ELECTRIC SHOCK OR UNANTICIPATED EQUIPMENT OPERATION

Do not use damaged products or accessories.

Failure to follow these instructions will result in death or serious injury.

Contact your local Schneider Electric sales office if you detect any damage whatsoever.

A WARNING

LOSS OF CONTROL

- The designer of any control scheme must consider the potential failure modes of control paths and, for critical control functions, provide a means to achieve a safe state during and after a path failure. Examples of critical control functions are emergency stop, overtravel stop, power outage and restart.
- Separate or redundant control paths must be provided for critical control functions.
- System control paths may include communication links. Consideration must be given to the implications of unanticipated transmission delays or failures of the link.
- Observe all accident prevention regulations and local safety guidelines (1).
- Each implementation of the product must be individually and thoroughly tested for proper operation before being placed into service.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

(1) For USA: Additional information, refer to NEMA ICS 1.1 (latest edition), Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control and to NEMA ICS 7.1 (latest edition), Safety Standards for Construction and Guide for Selection, Installation and Operation of Adjustable-Speed Drive Systems.

NOTICE

DESTRUCTION DUE TO INCORRECT MAINS VOLTAGE

Before switching on and configuring the product, verify that it is approved for the mains voltage Failure to follow these instructions can result in equipment damage.

The metal surfaces of the product may exceed 100 °C (212 °F) during operation.

A WARNING

HOT SURFACES

- Ensure that any contact with hot surfaces is avoided.
- Do not allow flammable or heat-sensitive parts in the immediate vicinity of hot surfaces.
- Verify that the heat dissipation is sufficient by performing a test run under maximum load conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

About the Book



At a Glance

Document Scope

The purpose of this document is to:

- help you to set up the drive,
- show you how to program the drive,
- show you the different menus, modes, and parameters,
- help you in maintenance and diagnostics.

Validity Note

NOTE: The products listed in the document are not all available at the time of publication of this document online. The data, illustrations and product specifications listed in the guide will be completed and updated as the product availabilities evolve. Updates to the guide will be available for download once products are released on the market.

This documentation is valid for the Altivar 610 drives.

The technical characteristics of the devices described in this document also appear online. To access this information online:

Step	Action	
1	Go to the Schneider Electric home page <u>www.schneider-electric.com</u> .	
2	 In the Search box type the reference of a product or the name of a product range. Do not include blank spaces in the reference or product range. To get information on grouping similar modules, use asterisks (*). 	
3	If you entered a reference, go to the Product Datasheets search results and click on the reference that interests you. If you entered the name of a product range, go to the Product Ranges search results and click on the product range that interests you.	
4	If more than one reference appears in the Products search results, click on the reference that interests you.	
5	Depending on the size of your screen, you may need to scroll down to see the data sheet.	
6	To save or print a data sheet as a .pdf file, click Download XXX product datasheet .	

The characteristics that are presented in this manual should be the same as those characteristics that appear online. In line with our policy of constant improvement, we may revise content over time to improve clarity and accuracy. If you see a difference between the manual and online information, use the online information as your reference.

Related Documents

Use your tablet or your PC to quickly access detailed and comprehensive information on all our products on www.schneider-electric.com.

The internet site provides the information you need for products and solutions:

- The whole catalog for detailed characteristics and selection guides,
- The CAD files to help design your installation, available in over 20 different file formats,
- All software and firmware to maintain your installation up to date,
- A large quantity of White Papers, Environment documents, Application solutions, Specifications... to gain a better understanding of our electrical systems and equipment or automation,
- And finally all the User Guides related to your drive, listed below:

(Other option manuals and Instruction sheets are available on www.schneider-electric.com)

Title of Documentation	Reference Number
ATV610 Getting Started	EAV64374 (ENG) EAV64379 (CHI)
ATV610 Installation Manual	EAV64381 (ENG) EAV64386 (CHI)
ATV610 Communication Parameters File	EAV64387 (ENG)
ATV610 Modbus Manual	EAV64395 (ENG)
ATV610 PROFIBUS DP manual	EAV64396 (ENG)

You can download these technical publications and other technical information from our website at http://download.schneider-electric.com

Terminology

The technical terms, terminology, and the corresponding descriptions in this manual normally use the terms or definitions in the relevant standards.

In the area of drive systems this includes, but is not limited to, terms such as error, error message, failure, fault, fault reset, protection, safe state, safety function, warning, warning message, and so on.

Among others, these standards include:

- IEC 61800 series: Adjustable speed electrical power drive systems
- IEC 61508 Ed.2 series: Functional safety of electrical/electronic/programmable electronic safety-related
- EN 954-1 Safety of machinery Safety related parts of control systems
- EN ISO 13849-1 & 2 Safety of machinery Safety related parts of control systems.
- IEC 61158 series: Industrial communication networks Fieldbus specifications
- IEC 61784 series: Industrial communication networks Profiles
- IEC 60204-1: Safety of machinery Electrical equipment of machines Part 1: General requirements

In addition, the term **zone of operation** is used in conjunction with the description of specific hazards, and is defined as it is for a **hazard zone** or **danger zone** in the EC Machinery Directive (2006/42/EC) and in ISO 12100-1.

Also see the glossary at the end of this manual.

Part I

Introduction

What Is in This Part?

This part contains the following chapters:

Chapter	Chapter Name	Page
1	Setup	17
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Chapter 1 Setup

What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Steps for Setting-Up the Drive	18
Preliminary Recommendations	19

Steps for Setting-Up the Drive



A WARNING

UNEXPECTED MOVEMENT

Drive systems may perform unexpected movements because of incorrect wiring, incorrect settings, incorrect data or other errors.

- Carefully install the wiring in accordance with the EMC requirements.
- Do not operate the product with unknown or unsuitable settings or data.
- Perform a comprehensive commissioning test.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Tips

Use the [Config. Source] F [5 , parameter (see page 299) to restore the factory settings at any time.

NOTE: The following operations must be performed for optimum drive performance in terms of accuracy and response time:

- Enter the values indicated on the motor nameplate in the [Motor parameters] ΠΡΑ menu.
- Perform autotuning with the motor cold and connected using the [Autotuning] L u n parameter.

Preliminary Recommendations

Before Powering up the Drive

A WARNING

UNANTICIPATED EQUIPMENT OPERATION

Before switching on the device, verify that no unintended signals can be applied to the digital inputs that could cause unintended movements.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

If the drive was not connected to mains for an extended period of time, the capacitors must be restored to their full performance before the motor is started.

NOTICE

REDUCED CAPACITOR PERFORMANCE

- Apply mains voltage to the drive for one hour before starting the motor if the drive has not been connected to mains for the following periods of time:
 - 12 months at a maximum storage temperature of +50°C (+122°F)
 - 24 months at a maximum storage temperature of +45°C (+113°F)
 - 36 months at a maximum storage temperature of +40°C (+104°F)
- Verify that no Run command can be applied before the period of one hour has elapsed.
- Verify the date of manufacture if the drive is commissioned for the first time and run the specified procedure if the date of manufacture is more than 12 months in the past.

Failure to follow these instructions can result in equipment damage.

If the specified procedure cannot be performed without a Run command because of internal mains contactor control, perform this procedure with the power stage enabled, but the motor being at standstill so that there is no appreciable mains current in the capacitors.

Start-up

NOTE:

If a Run command such as Run forward, Run reverse, DC injection is still active during:

- · A product reset to the factory settings,
- A manual "Fault Reset" using [Fault Reset Assign] 5 F,
- A manual "Fault reset" by applying a product switched off and on again,
- A stop command given by a channel that is not the active channel command (such as Stop key of the display terminal in 2/3 wires control),

The drive is in a blocking state and displays [Freewheel Stop] a 5 b. It will be necessary to deactivate all active Run commands prior to authorizing a new Run command.

Mains Contactor

NOTICE

RISK OF DAMAGE TO THE DRIVE

Do not switch on the drive at intervals of less than 60 s.

Failure to follow these instructions can result in equipment damage.

Using a Motor with a Lower Rating or Dispensing with a Motor Altogether

In factory settings, the motor output phase loss detection is active: [OutPhaseLoss Assign] $_a$ $_P$ $_L$ is set to [OPF Error Triggered] $_S$ $_E$ 5. For details, refer to the parameter description (see page 265). For commissioning tests or maintenance phase, the drive could be connected to a small motor power size and thus trigger an error [Output Phase Loss] $_a$ $_B$ $_L$ $_B$ or [Single output phase loss] $_a$ $_B$ $_L$ $_B$ when a Run command is applied. For that purpose, the function can be disabled by setting [OutPhaseLossAssign] $_a$ $_B$ $_L$ to [Function Inactive] $_B$ $_B$.

Set also [Motor control type] L E to [U/F VC Standard] 5 E d in [Motor parameters] $\Pi P H - E$. For details, refer to the parameter description (see page 94).

NOTICE

MOTOR OVERHEATING

Install external thermal monitoring equipment under the following conditions:

- If a motor with a nominal current of less than 20% of the nominal current of the drive is connected.
- If you use the function Motor Switching.

Failure to follow these instructions can result in equipment damage.

A A DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

If output phase monitoring is disabled, phase loss and, by implication, accidental disconnection of cables, are not detected.

• Verify that the setting of this parameter does not result in unsafe conditions.

Failure to follow these instructions will result in death or serious injury.

Chapter 2

Overview

What Is in This Chapter?

This chapter contains the following topics:

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Factory Configuration	
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Basic Functions	25
Plain Text Display Terminal	
Structure of the Parameter Table	
Finding a Parameter in This Document	

Factory Configuration

Factory Settings

The drive is factory-set for common operating conditions:

- Display: drive ready [Ref Frequency] L F r when motor is ready to run and motor frequency when motor is running.
- The DI3 and DI5 to DI6 digital inputs, AI2 and AI3 analog inputs, R2 and R3 relays are unassigned.
- Stop mode when error detected: freewheel.

This table presents the basic parameters of the drive and their factory setting values:

Code	Name	Factory setting values
b F r	[Motor Standard]	[50Hz IEC] 5 D
רוח	[Reverse Disable]	[Yes] 4 E 5
FCC	[2/3-Wire Control]	[2-Wire Control] 2 C: 2-wire control
CFF	[Motor control type]	[U/F VC Quad.] u F 9: U/F for quadratics loads
ACC	[Acceleration]	30.0 s
d E C	[Deceleration]	30.0 s
LSP	[Low Speed]	0.0 Hz
H S P	[High Speed]	50.0 Hz
ı E H	[Motor Th Current]	Nominal motor current (value depending on drive rating)
Frd	[Forward]	[DI1] d , I: Digital input DI1
FrI	[Ref Freq 1 Config]	[Al1] F , I: Analog input Al1
r 1	[R1 Assignment]	[Operating State Fault] F L L: the contact opens when the drive has detected error or when the drive has been switched off
ЬгЯ	[Dec.Ramp Adapt]	[Yes] 4 E 5: function active (automatic adaptation of deceleration ramp)
Atr	[Auto Fault Reset]	[No] ¬ ¬ : function inactive
5 Ł Ł	[Type of stop]	[On Ramp] г ПР: on ramp
A o I	[AQ1 assignment]	[Motor Frequency] a F r: Motor frequency
A o 2	[AQ2 assignment]	[Motor Current] a [r : Motor current

Verify whether the above values are compatible with the application and modify them if required.

Macro Configuration

Introduction

The drive offers quick programming using macro configurations that correspond to different applications or uses:

- Start/Stop
- Automatic/Manual control
- PID controller usage
- Preset speeds
- Connection to Modbus fieldbus
- Multi Pump control

Each of these configurations is still configurable.

Macro Configuration Presets

	[Start/Stop] b 5 b 5 (Factory setting)	[Auto/Manual] ΒΠΠ	[PID Controller] <i>bP i d</i>	[Preset speeds]	[Modbus] 6 П 6 С	[Multi-pump 1]	[Multi-pump 2]
[R1 Assignment]	[Operating State Fault] F L E	[Operating State Fault] F L E	[Operating State Fault] F L E	[Operating State Fault] F L E	[Operating State Fault] F L E	[Operating State Fault] F L E	[Operating State Fault] F L E
[R2 Assignment]	[Drive Running]	[Drive Running]	[Drive Running] - u n	[Drive Running]	[Drive Running]	[Pump 2 Cmd] ПР □ 2	[[Pump 1 Cmd]] <i>П Р 。 I</i>
[R3 Assignment]	[Ready] r d 또	[Ready] r d 또	[Ready] r d Y	[Ready] r d ᠑	[Ready] r d 성	[Pump 3 Cmd]	[[Pump 2 Cmd]] <i>ПР a 2</i>
[AQ1 assignment]	[Motor Frequency]	[Motor Frequency]	[Motor Frequency]	[Motor Frequency]	[Motor Frequency]	[Motor Frequency]	[Motor Frequency]
[AQ1 Type]	[Current] [] A	[Current] [] A	[Current] [] A	[Current] [] A	[Current] [] A	[Current] [] A	[Current] [] A
[AQ1 min output] Fall	4 mA	4 mA	4 mA	4 mA	4 mA	4 mA	4 mA
[AQ1 max output] F = H I	20 mA	20 mA	20 mA	20 mA	20 mA	20 mA	20 mA
[AQ2 assignment] H o 2	[Motor Current] a [r	[Motor Current]	[Motor Current]	[Motor Current]	[Motor Current] a [r	[Motor Current] a [r	[Motor Current] a [r
[AQ2 Type]	[Current] [] A	[Current] [] A	[Current] [] A	[Current] [] A	[Current] [] A	[Current] [] A	[Current] [] FI
[AQ2 min output] fl o L c	4 mA	4 mA	4 mA	4 mA	4 mA	4 mA	4 mA
[AQ2 max output] fl a H 2	20 mA	20 mA	20 mA	20 mA	20 mA	20 mA	20 mA
[Al1 Type] H , L	[Voltage] / 🛭 u	[Voltage] / 🛭 u	[Voltage] 🛭 u	[Voltage]	[Voltage]	[Voltage]	[Voltage]
[Al1 min value]	0 V	0 V	0 V	0 V	0 V	0 V	0 V
[Al1 max value]	10 V	10 V	10 V	10 V	10 V	10 V	10 V
[Al2 Type]	[Current] D R	[Current] D A	[Current] [] A	[Current] [] A	[Current] [] A	[Current] [] A	[Current] D A

	[Start/Stop] b 5 b 5 (Factory setting)	[Auto/Manual] 日 月 日 日	[PID Controller] <i>bP id</i>	[Preset speeds]	[Modbus]	[Multi-pump 1]	[Multi-pump 2] ЬПР∂
[Al2 min. value] [r L 2	4 mA	4 mA	4 mA	4 mA	4 mA	4 mA	4 mA
[Al2 max. value] ℂ r H ट	20 mA	20 mA	20 mA	20 mA	20 mA	20 mA	20 mA
[Control Mode] EHEF	[Not separ.] 5 ₁ Π	[Not separ.] 5 , //	[Not separ.] 5 ιΠ	[Not separ.] 5 ₁ Π	[Separate] 5 E P	[Not separ.] 5 ₁ Π	[Not separ.] 5 ₁ Π
[Command Switching] £ £ 5	[Cmd Channel 1] [d	[Cmd Channel 1]	[Cmd Channel 1] [d	[Cmd Channel 1] [d	[Cmd Channel 1] [d	[Cmd Channel 1] [d	[Cmd Channel 1] [d
[Cmd channel 1] [d	[Terminals]	[Terminals]	[Terminals]	[Terminals]	[Terminals]	[Terminals]	[Terminals]
[Cmd channel 2] [d d	[Modbus] П d ь	[Modbus] П d b	[Modbus] П d ь	[Modbus] П d b	[Modbus] П d b	[Modbus] П d b	[Modbus] П d b
[Freq Switch Assign] r F [[Ref Freq Channel 1] Fr I	[DI4 Configuration]	[Ref Freq Channel 1]	[Ref Freq Channel 1] F r I	[DI3 Configuration]	[Ref Freq Channel 1] Fr I	[Ref Freq Channel 1] Fr I
[Ref Freq 1 Config] F r I	[Al1] # , I	[Al1] # 1	[Al1] # 1	[Al1] # , I	[Modbus]	[Al1] <i>A , I</i>	[Al1] <i>H , I</i>
[Ref Freq 2 Config] F r 2	[Not Configured]	[AI2] # 12	[Not Configured]	[Not Configured]	[Al1] # , I	[Not Configured]	[Not Configured]
[2/3-Wire Control] £ [[[2-Wire Control] <i>≥ [</i>	[2-Wire Control]	[2-Wire Control] 2 [[2-Wire Control] 2 [[2-Wire Control] 2 [[2-Wire Control] 2 [[2-Wire Control] 2 [
[Reverse Assign] 5	[Not Assigned]	[DI2 Configuration] d , ご	[Not Assigned]	[Not Assigned]	[Not Assigned] n a	[Not Assigned] n a	[Not Assigned] n a
[Fault Reset Assign] - 5 F	[DI2 Configuration] d ィご	[No] n a	[No] n a	[DI2 Configuration	[DI2 Configuration] d ・ご	[No] n a	[No] n a
[PID feedback] P , F	[No] n a	[No] n a	[Al2] <i>∏</i> ₁ ≥	[No] n a	[No] n a	[Al2] <i>∏ ₁2</i>	[Al2] <i>∏ ₁2</i>
[2 Preset Freq] P 5 2	[Not Assigned]	[Not Assigned]	[Not Assigned]	[DI3 Configuration] d · 3	[Not Assigned] n a	[Not Assigned] n a	[Not Assigned] n a
[4 Preset Freq] P 5 4	[Not Assigned]	[Not Assigned]	[Not Assigned]	[DI4 Configuration] d , 4	[Not Assigned] n a	[Not Assigned] n a	[Not Assigned] a a
[Preset speed 2] 5 P 2	10	10	10	10	10	10	10
[Preset speed 3] 5 P 3	20	20	20	20	20	20	20
[Preset speed 4] 5 P 4	30	30	30	30	30	30	30

Basic Functions

Drive Ventilation

If **[Fan mode]** $F F \Pi$ is set to:

- [Standard] 5 Ł d, the fan is activated during the all run time of the motor. According to drive rating, this could be the only available setting.
- [Always] r u n, the fan is always activated.

Fan speed and [Fan Operation Time] FPbE are monitored values:

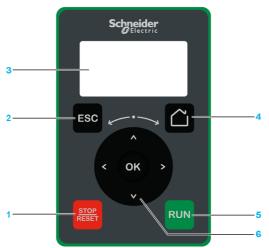
- An abnormal low speed of the fan triggers a warning [Fan Feedback Warning] F F d R.
- As soon as **[Fan Operation Time]** F P b E reach the predefined value of 45,000 hours, a warning **[Fan Counter Warning]** F E E R is triggered.

[Fan Operation Time] FPbE counter can be set to 0 by using the [Time Counter Reset] r Pr parameter.

Plain Text Display Terminal

Description of the Plain Text Display Terminal

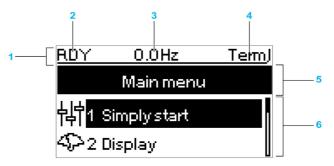
This Plain Text Display Terminal is a local control unit which can be either plugged on the drive or mounted on the door of the wall-mounted or floor-standing enclosure. It has a cable with connectors, which is connected to the drive front Modbus serial link.



- 1 STOP / RESET: Stop command / apply a Fault Reset.
- 2 ESC: used to quit a menu/parameter or remove the currently displayed value in order to revert to the previous value retained in the memory
- 3 Graphic display.
- 4 Home: access directly the home page.
- **5 RUN**: executes the function assuming it has been configured.
- 6 Touch wheel / OK: used to save the current value or access the selected menu/parameter. The touch wheel is used to scroll fast into the menus. Up/down arrows are used for precise selections, right/left arrows are used to select digits when setting a numerical value of a parameter.

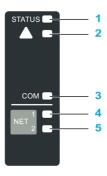
NOTE: Keys 1, 5 and 6 can be used to control the drive, if control via the Plain Text Display Terminal is activated. To activate the keys on the Plain Text Display Terminal, you first need to set **[Config Ref Freq 1]** Fr I to **[Ref.Frequency via Rmt.Term]** L E E.

Description of the Graphic Display



Key	
1	Display line: its content can be configured
2	Drive state
3	Active control channel TERM: terminals HMI: Plain Text Display Terminal MDB: integrated Modbus serial NET: fieldbus module
4	Customer defined
5	Menu line: indicates the name of the current menu or submenu
6	Menus, submenus, parameters, values, bar charts, and so on, are displayed in drop-down window format on a maximum of 2 lines. The line or value selected by the navigation button is displayed in reverse video

Description of the Product Front LEDs



Key	LED color	LED status	Drive status
1	Green	Blinking	Ready
		Flickering	Acceleration or deceleration
		On	Running
2	Red	Blinking	Warning
		On	Operating state fault
3	Yellow	Blinking	Modbus communication active
4	Green	On	Fieldbus module: communication active
5	Red	On	Fieldbus module: communication detected error
		Blinking	Fieldbus module: incorrect settings

Structure of the Parameter Table

General Legend

Pictogram	Description
*	These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.
O	Setting of this parameter can be done during operation or when stopped.
	NOTE: It is recommended to stop the motor before modifying any of the settings.
Ī	To change the assignment of the parameter, reinforced validation is required.

Parameter Presentation

Below is an example of a parameter presentation:

[Sample Menu] [a d E - Menu

Access

Parameters described below can be accessed by:

[Path]
[Sub-path]

About this menu

Description of the menu or function

[Parameter1] [o d E | Description of the parameter

Example of a table with a setting range:

Setting ()	Description
0.0 10,000.0	Setting range Factory setting: 50.0

[Parameter2] [a d E 2

Description of the parameter

Example of a table with a list of choices:

Setting ()	Code / Value	Description
[50 Hz IEC]	5 <i>0</i>	IEC Factory setting
[60 Hz NEMA]	6 0	NEMA

Finding a Parameter in This Document

With the Manual

It is possible to use either the parameter name or the parameter code to search in the manual the page giving details of the selected parameter.

Difference Between Menu and Parameter

A dash after menu and submenu codes is used to differentiate menu commands from parameter codes. Example:

Level	Name	Code
Menu	[Ramp]	rANP-
Parameter	[Acceleration]	ЯСС

Part II

Programming

What Is in This Part?

This part contains the following chapters:

Chapter	Chapter Name	Page
3	[Simply start] 5 4 5 -	33
4	[Display] $\Pi \circ n$ -	41
5	[Diagnostics] d , R -	77
6	[Complete settings] [5 L -	91
7	[Communication] [a 7 -	291
8	[File management] F Π E -	297
9	[My preferences] П Ч Р -	303

Chapter 3

[Simply start] 5 4 5 -

Introduction

[Simply start] 5 4 5 - menu contains 3 tabs for quick access to mains features:

• Macro Configuration tab

Out the which gives a quick access to basic parameters to set.

- Simply Start tab which gives a quick access to basic parameters to set.Modified Parameters tab which gives a quick access to the last modified parameters.

What Is in This Chapter?

This chapter contains the following topics:

Торіс	Page
[Macro-configuration] [F [- Menu	34
[Simply start] 5 , Π - Menu	
[Modified parameters] L П d - Menu	

[Macro-configuration] [F [- Menu

Access

[Simply start] → [Macro-configuration]

About This Menu

A WARNING

UNANTICIPATED EQUIPMENT OPERATION

Verify that the selected macro configuration is compatible with the type of wiring used.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

[Macro Config] [F [

Macro configuration.

Setting	Code / Value	Description
[Start/Stop]	65£5	Start / Stop Factory setting
[Auto/Manual]	ьяпп	Auto / Manual
[PID Controller]	bP id	PID controller
[Preset speeds]	6 <i>P</i> 5 <i>P</i>	Preset speeds
[Modbus]	ьпьс	Modbus
[Multi-pump 1]	ьпр і	Multi- pump 1
[Multi-pump 2]	ьпрг	Multi- pump 2

For more information, refer to the macro configuration presets table (see page 23).

[Simply start] 5 , // - Menu

Access

[Simply start] → [Simply start]

About This Menu

This menu provides a quick access to the basic parameters to set.

A WARNING

LOSS OF CONTROL

- Fully read and understand the manual of the connected motor.
- Verify that all motor parameters are correctly set by referring to the nameplate and the manual of the connected motor.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

[Nominal motor power] ¬P¬ *

Nominal motor power.

This parameter can be accessed if:

• [Motor param choice] $\Pi P \Gamma$ is set to [Mot Power] $\Pi P \Gamma$.

Rated motor power given on the nameplate, in kW if [Basic Frequency] $b F_r$ is set to [50Hz IEC] 5 \square , in HP if [Basic Frequency] $b F_r$ is set to [60Hz NEMA] $b \square$.

Setting	Description
According to drive rating	_
	Factory setting: according to the drive rating

[Nom Motor Current] n c r

The rated motor current is given on the motor nameplate.

Setting ()	Description
0.251.5 ln ⁽¹⁾	Setting range Factory setting: According to drive rating and [Basic Frequency] b F r.
(1) Corresponding to the rated drive current indicated in the installation manual and on the drive nameplate.	

[Motor Th Current] , E H

Motor thermal monitoring current to be set to the rated current indicated on the nameplate.

Setting ()	Description
0.21.1 In ⁽¹⁾	Setting range Factory setting: According to drive rating
(1) Corresponding to the rated drive current indicated in the installation manual and on the drive nameplate.	

[Acceleration] A [

Time to accelerate from 0 to the **[Rated Motor Freq]** $F \sim 5$. To have a repeatability in the ramps, the value of this parameter must be set according to the possibility of the application.

Setting ()	Description
0.06,000.0 s ⁽¹⁾	Setting range Factory setting: 30.0 s
(1) Range 0.01 to 99.99 s or 0.1 to 999.9 s or 16,000 s according to [Ramp increment] .nr.	

[Deceleration] d E [

Time to decelerate from the **[Rated Motor Freq]** $F \sim 5$ to 0. To have a repeatability in the ramps, the value of this parameter must be set according to the possibility of the application.

Setting ()	Description
0.06,000.0 s ⁽¹⁾	Setting range Factory setting: 30.0 s
(1) Range 0.01 to 99.99 s or 0.1 to 999.9 s or 16,000 s according to [Ramp increment] ID.	

[Low Speed] L 5 P

Low speed.

Motor frequency at minimum reference, can be set between 0 and [High Speed] H 5 P.

Setting ()	Description
0.0 [High Speed] H 5 P Hz	Setting range Factory setting: 0.0 Hz

[High Speed] H 5 P

High speed.

Motor frequency at maximum reference, can be set between [Low Speed] L 5 P and [Max Frequency] L F r. The factory setting changes to 60 Hz if [Basic Frequency] L F r. is set to [60Hz NEMA] L D.

Setting ()	Description
0.0[Max Frequency] £ F r Hz	Setting range Factory setting: 50.0 Hz

[Output Ph Rotation] PHr

The modification of this parameter has the same consequence as an inversion of two phases of the motor wiring. It allows you to follow color standards for wiring or to adapt the rotation of the motor to the intended forward direction without any electrical wiring modification.

Setting	Code / Value	Description
[ABC]	ЯЬС	Standard rotation Factory Setting
[ACB]	<i>АС</i> Ь	Opposite rotation

[Config Ref Freq 1] F r /

Configuration reference frequency 1.

Setting	Code / Value	Description
[Not Configured]	no	Not assigned
[Al1]	A , I	Analog input Al1 Factory Setting
[AI2][AI3]	A '5A '3	Analog input Al2Al3
[AI4][AI5]	A 14A 15	Analog input Al4Al5 if VW3A3203 I/O extension module has been inserted
[Ref Frequency via DI]	uPdE	Up/Down function is assigned by DIx
[Ref Frequency via Rmt. Term]	LCC	Display terminal source
[Ref Frequency via Modbus]	ПЧР	Modbus source
[Ref Frequency via Com. Module]	n E Ł	Fieldbus module source
[PulseInput Assignment On DI5][PulseInput Assignment On DI6]	P :5P :6	Digital input DI5DI6 used as pulse input

[OutPhaseLoss Assign] a P L

Output phase loss assignment.

A A DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

If output phase monitoring is disabled, phase loss and, by implication, accidental disconnection of cables, are not detected.

• Verify that the setting of this parameter does not result in unsafe conditions.

Failure to follow these instructions will result in death or serious injury.

Setting	Code / Value	Description
[Function Inactive]	no	Function inactive
[OPF Error Triggered]	<i>Y E 5</i>	Tripping on [OutPhaseLoss Assign] • P L with freewheel stop Factory setting
[No Error Triggered]	o A C	No detected error triggered, but management of the output voltage in order to avoid an overcurrent when the link with the motor is re-established and catch on the fly performed (even if this function has not been configured). The drive switches to [Output cut] 5 $_{\it D}$ $_{\it C}$ state after [OutPhL Time] $_{\it D}$ $_{\it C}$ $_{\it C}$ time. Catch on fly is possible as soon as the drive is in stand by output cut [Output cut] 5 $_{\it D}$ $_{\it C}$ state.

[2/3-wire control] Ł [[

2-wire or 3-wire control.

A WARNING

UNANTICIPATED EQUIPMENT OPERATION

If this parameter is changed, the parameters [Reverse Assign] r r 5 and [2-wire type] t t and the assignments of the digital inputs are reset to the factory setting.

Verify that this change is compatible with the type of wiring used.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Setting	Code / Value	Description
[2-Wire Control]	2.0	2-wire control (level commands): This is the input state (0 or 1) or edge (0 to 1 or 1 to 0), which controls running or stopping. Example of source wiring: ATVeee +24 DI1 DIX DI1 Forward DIx Reverse Factory setting
[3-Wire Control]	∃ C	3-wire control (pulse commands) [3 wire]: A forward or reverse pulse is sufficient to command starting, a stop pulse is sufficient to command stopping. Example of source wiring: ATVeee +24 DI1 DI2 DIX DI1 Stop DI2 Forward DIx Reverse

[Dual rating] dr E

Dual rating state

Settings	Code / Value	Description
[Normal Duty]	norNAL	Normal duty
[Heavy Duty]	H . G H	High duty

[Modified parameters] L ∏ d - Menu

Access

[Simply start] → [Modified parameters]

About This Menu

This menu gives a quick access to the 10 last modified parameters

Chapter 4

[Display] Поп-

Introduction



[Display] $\Pi = \pi$ - menu shows monitoring data related to the drive and the application.

It offers an application-oriented display in terms of energy, cost, cycle, efficiency, \dots

This is available with customized units and graphics view.

What Is in This Chapter?

This chapter contains the following sections:

Section	Topic	Page
4.1	[Motor parameters]	42
4.2	[Drive parameters]	44
4.3	[I/O map]	47
4.4	[Communication map]	61
4.5	[Application parameters]	71

Section 4.1[Motor parameters]

[Motor parameters] ∏ □ - Menu

Access

[Display] → [Motor parameters]

About This Menu

This menu shows the motor-related parameters.

[Motor Speed] 5 P d

Motor speed.

Setting	Description
065,535 rpm	Setting range
	Factory setting:-

[Motor Voltage] u a P

Motor voltage.

Setting	Description
065,535 V	Setting range Factory setting:-

[Motor Power] • Pr

Motor power.

Output power in % (100% = nominal motor power).

Setting	Description
-300300%	Setting range
	Factory setting: –

[Motor Torque] a E r

Motor torque.

Output torque value (100% = nominal motor torque).

NOTE: The displayed value is always positive in motor mode and negative in generator mode whatever the direction.

Setting	Description
-300.0 300.0	Setting range Factory setting: —

[Motor Current] L [r

Motor current.

Setting	Description
0.00655.35 A	Setting range Factory setting: —

[Motor Therm state] <code>EHr</code>

Motor thermal state.

The normal motor thermal state is 100%, the [Motor Overload] a L F is set to 118%.

Setting	Description
0200%	Setting range Factory setting: —

Section 4.2

[Drive parameters]

[Drive parameters] ΠP , - Menu

Access

[Display] → [Drive parameters]

About This Menu

This menu shows the drive-related parameters.

[Ref Frequency] F r H

Frequency reference before ramp.

This parameter is read-only. It enables you to display the speed reference applied to the motor, regardless of which reference channel has been selected.

Setting	Description
-500.0500.0 Hz	Setting range Factory setting: _

[Ref Frequency] L F r

Reference frequency.

This parameter only appears if the function has been enabled. It is used to change the speed reference from the remote control. OK does not have to be pressed to enable a change of reference.

Setting ()	Description
-500.0500.0 Hz	Setting range Factory setting: 0.0 Hz

[Motor Frequency] r F r

Motor frequency.

Setting	Description
-3,276.83,276.7 Hz	Setting range
	Factory setting: 0.0 Hz

[Mains Voltage] u L n

Mains voltage.

Line voltage based on DC bus measurement, motor running or stopped.

Setting	Description
1.0860.0 V	Setting range
	Factory setting: _

[DC Bus Voltage] $_{\it U}$ $_{\it U}$ $_{\it U}$ 5

DC bus voltage.

Setting	Description
065,535	Setting range Factory setting: _

[Drive Therm State] L H d

Drive thermal state.

The normal drive thermal state is 100%, the [Motor Overload] \Box L F is set to 118%.

Setting	Description
0200%	Setting range Factory setting: _

[Used Param. Set] [FP5*

Used parameter set.

Configuration parameter status (can be accessed if parameter switching has been enabled).

Setting	Code / Value	Description
[None]	ne	Not assigned
[Set N°1]	CFPI	Parameter set 1 active
[Set N°2]	CFP2	Parameter set 2 active
[Set N°3]	CFP3	Parameter set 3 active

[Motor Run Time] r E H

Motor run time.

Run elapsed time display (resettable) in seconds, minutes, or hours (length of time the motor has been switched on).

Setting	Description
04,294,967,295 s	Setting range Factory setting: _

[Power-on Time] P L H

Power on time.

Setting	Description
04,294,967,295 s	Setting range
	Factory setting: _

[IGBT Warning Counter] L FI [*

IGBT Warning counter.

This parameter can be accessed if [Access Level] L R [is set to [Expert] E P r

Setting	Description
065,535 s	Setting range
	Factory setting: _

[PID Reference] r P [★

PID reference

This parameter can be accessed if [PID Feedback] P , F is not set to [Not Configured] n a.

Setting	Description
065,535%	Setting range
	Factory setting: –

[PID feedback] r P F ★

PID feedback value.

This parameter can be accessed if [PID Feedback] P , F is not set to [Not Configured] n a

Setting	Description
065,535	Setting range
	Factory setting: 0

[PID Error] ← P E ★

PID error value.

This parameter can be accessed if [PID Feedback] P , F is not set to [Not Configured] n a

Setting	Description
-32,76832,767	Setting range Factory setting: _

[PID Output] r P a *

PID output value.

Output value with limitation.

This parameter can be accessed if [PID Feedback] P , F is not set to [Not Configured] n a

Setting	Description
-3,276.83,276.7 Hz	Setting range
	Factory setting: _

Section 4.3 [I/O map]

What Is in This Section?

This section contains the following topics:

Topic	Page
[Digital input map] L , H - Menu	48
[Al1] # , IC - Menu	49
[AI2] # , 2 C - Menu	51
[AI3] # , 3 C - Menu	52
[AI4] F , 4 C - Menu	53
[AI5] F , 5 C - Menu	54
[AQ1] Roll-Menu	55
[AQ2] F a 2 C - Menu	59
[Digital output map] L a H - Menu	60

[Digital input map] L , H - Menu

Access

$[Display] \rightarrow [I/O map] \rightarrow [Digital input map]$

About This Menu

This menu presents the state and assignment of digital inputs.

Read-only parameters, cannot be configured.

It is used to visualize the state of the digital inputs.

It displays all the functions that are assigned to the digital input in order to verify for multiple assignments.

If no functions have been assigned, **[No]** n = 1 is displayed. Use the touch wheel to scroll through the functions.

[Al1] A , I C - Menu

Access

[Display] \rightarrow [I/O map] \rightarrow [Analog inputs image] \rightarrow [Al1]

About This Menu

This menu presents the characteristics of the analog input.

[AI1] A , IC

Physical value Al1.

Al1 customer image: value of analog input 1.

Setting	Description
-32,76732,767	Setting range Factory setting: _

NOTE: The parameters [Al1 Assignment] $H \cap H$, [Al1 min value] $u \cap L \cap H$, [Al1 max value] $u \cap H \cap H$ and [Al1 filter] $H \cap H$ can be accessed on the Plain Text Display Terminal by pressing the **OK** key on the [Al1] $H \cap H$ parameter.

[All Assignment] F , IF

Analog input Al1 functions assignment.

Read-only parameter, cannot be configured. It displays all the functions associated with input Al1 in order to verify, for example, for compatibility problems.

If no functions have been assigned, [No] n a is displayed.

Setting	Code / Value	Description
[No]	no	Not assigned
[AQ1 assignment]	Ao I	Analog output AQ1
[AQ2 assignment]	A - 5	Analog output AQ2
[Ref Freq Channel 1]	FrI	Reference frequency channel 1 Factory Setting
[Ref Freq Channel 2]	Fr2	Reference frequency channel 2
[Ref Frequency 2 Summing]	5 A 2	Reference frequency 2 summing
[PID Feedback]	PıF	PI controller feedback
[Subtract Ref Freq 2]	4 A S	Subtract reference frequency 2
[Manual PID Ref.]	РіП	Manual speed reference of the PID controller (auto-man)
[PID Ref Frequency]	FP,	PID reference frequency
[Ref Frequency 3 Summing]	5 A 3	Reference frequency 3 summing
[Ref Frequency 1B]	Frlb	Reference frequency 1B
[Subtract Ref Freq 3]	4 A 3	Subtract reference frequency 3
[Forced local]	FLoC	Forced local reference source1
[Ref Frequency 2 multiplier]	пяг	Reference frequency 2 multiplier
[Ref Frequency 3 multiplier]	ПЯЭ	Reference frequency 3 multiplier
[Virtual Al1 Channel]	A , C I	Virtual Al1 channel selector function
[InletPres Assign]	PS IA	Select the source of inlet pressure sensor
[OutletPres Assign]	P 5 2 A	Select the source of outlet pressure sensor
[Inst Flow Assign]	F S I A	Select the source of installation flow sensor
[Pump Flow Assign]	F52A	Select the source of pump flow sensor

[Al1 min value] u , L /*

Al1 minimum value.

Al1 voltage scaling parameter of 0%.

This parameter can be accessed if [Al1 Type] H , IE is set to [Voltage] IDu.

Setting	Description
0.010.0 Vdc	Setting range Factory setting: 0.0 Vdc

[Al1 max value] u , H /*

Al1 maximum value.

Al1 voltage scaling parameter of 100%.

This parameter can be accessed if [Al1 Type] A , I L is set to [Voltage] I D u.

Setting	Description
0.010.0 Vdc	Setting range Factory setting: 10.0 Vdc

[Al1 min. value] [r L /*

Al1 minimum value.

Al1 current scaling parameter of 0%.

This parameter can be accessed if [Al1 Type] A , I L is set to [Current] DA.

Setting	Description
0.020.0 mA	Setting range
	Factory setting: 0.0 mA

[Al1 max. value] [r H I *

Al1 maximum value.

Al1 current scaling parameter of 100%.

This parameter can be accessed if [Al1 Type] $H \cap IE$ is set to [Current] $\square H$.

Setting	Description
0.020.0 mA	Setting range Factory setting: 20.0 mA

[Al1 filter] A , IF

Interference filtering cutoff time of the low-filter.

Setting	Description
0.0010.00 s	Setting range
	Factory setting: 0.00 s

[Al2] A , 2 C - Menu

Access

[Display] → [I/O map] → [Analog inputs image] → [Al2]

About This Menu

This menu presents the characteristics of the analog input.

[AI2] A . 2 C

Physical value Al2.

Al2 customer image: value of analog input 2.

Identical to [AI1] A , I [(see page 49).

[Al2 Assignment] A . 2 A

Analog input Al2 functions assignment. If no function has been assigned, **[No]** n = 1 is displayed. Identical to **[Al1 Assignment]** $H \cap H$ (see page 49).

[Al2 min value] u , L 2 *

Al2 voltage scaling parameter of 0%.

This parameter can be accessed if [Al2 type] $H \cap 2L$ is set to [Voltage] $I \cap L$.

Identical to [Al1 min value] u , L I (see page 50).

[Al2 max value] ☐ 1H 2 ★

Al2 maximum value.

This parameter can be accessed if [Al2 type] $H \cap 2L$ is set to [Voltage] $I \cap L$.

Identical to [Al1 max value] u , H I (see page 50).

[Al2 min. value] [r L 2 *

Al2 current scaling parameter of 0%.

This parameter can be accessed if [Al2 type] $H \cap 2L$ is set to [Current] $\square H$.

Identical to [Al1 min. value] [r L I (see page 50) with factory setting 4.0 mA.

[Al2 max. value] [r H 2 *

Al2 maximum value.

This parameter can be accessed if [Al2 type] $H \cap 2L$ is set to [Current] DH.

Al2 current scaling parameter of 100%.

Identical to [Al1 max. value] [r H I (see page 50).

[Al2 filter] A ₁ ≥ F

Interference filtering.

Identical to [Al1 filter] # . IF (see page 50).

[AI3] F , 3 [- Menu

Access

[Display] → [I/O map] → [Analog inputs image] → [Al3]

About This Menu

This menu presents the characteristics of the analog input.

[AI3] A , 3 C

Physical value Al3.

Al3 customer image: value of analog input 3.

Identical to [AI1] A , IE (see page 49).

[Al3 Assignment] F . 3 F

Analog input Al3 functions assignment. If no function has been assigned, **[No]** n = 1 is displayed. Identical to **[Al1 Assignment]** n = 1 (see page 49).

[Al3 min value] u , L 3 *

Al3 voltage scaling parameter of 0%.

This parameter can be accessed if [Al3 type] $H \cap \exists L$ is set to [Voltage] $I \square \sqcup$.

Identical to [Al1 min value] u , L I (see page 50).

[Al3 max value] u , H 3 *

Al3 voltage scaling parameter of 100%.

This parameter can be accessed if [Al3 type] $H \cap \exists L$ is set to [Voltage] $I \square \sqcup$.

Identical to [Al1 max value] u , H I (see page 50).

[Al3 min. value] [r L 3 *

Al3 current scaling parameter of 0%.

This parameter can be accessed if [Al3 type] $H \cap J E$ is set to [Current] $\square H$.

Identical to [Al1 min. value] [r L I (see page 50).

[Al3 max. value] [r H 3 *

Al3 current scaling parameter of 100%.

This parameter can be accessed if [Al3 type] $H \cap J E$ is set to [Current] D H.

Identical to [Al1 max. value] [r H I (see page 50).

[Al3 filter] A , 3 F

AI3 filter.

Interference filtering.

Identical to [Al1 filter] # . IF (see page 50).

[AI4] F , Y [- Menu

Access

[Display] \rightarrow [I/O map] \rightarrow [Analog inputs image] \rightarrow [Al4]

About This Menu

This menu presents the characteristics of the analog input.

It can be accessed if VW3A3203 I/O extension module has been inserted.

[AI4] A , 4 C ★

Physical value Al4.

Al4 customer image: value of analog input 4.

Identical to [AI1] A , I [(see page 49).

[Al4 Assignment] A , 4 A ★

Analog input Al4 functions assignment. If no function has been assigned, [No] $_{\it n}$ $_{\it a}$ is displayed.

Identical to [Al1 Assignment] H , IH (see page 49).

[Al4 min value] ⊔ , L 4 ★

Al4 voltage scaling parameter of 0%.

This parameter can be accessed if [Al4 type] $H \cup H E$ is set to [Voltage] $I \cup U$.

Identical to [Al1 min value] u , L I (see page 50).

[Al4 max value] ⊔ ₁H 4 ★

Al3 voltage scaling parameter of 100%.

This parameter can be accessed if [Al4 type] $H \cup H E$ is set to [Voltage] $I \cup I \cup I$.

Identical to [Al1 max value] u , H I (see page 50).

[Al4 min. value] [r L 4*

Al4 current scaling parameter of 0%.

This parameter can be accessed if [Al4 type] H , 4 E is set to [Current] [] H.

Identical to [Al1 min. value] [r L I (see page 50).

[Al4 max. value] [r H 4 *

Al4 current scaling parameter of 100%.

This parameter can be accessed if [Al4 type] $H \cap H$ is set to [Current] $\square H$.

Identical to [Al1 max. value] [r H I (see page 50).

[Al4 filter] A , 4 F ★

Interference filtering cut-off time of the low-filter.

This parameter can be accessed if [Al4 type] $H \cap H$ is set to [Current] ΠH .

Identical to [Al1 filter] H , IF (see page 50).

[AI5] A , 5 [- Menu

Access

[Display] → [I/O map] → [Analog inputs image] → [Al5]

About This Menu

This menu presents the characteristics of the analog input. It can be accessed if VW3A3203 I/O extension module has been inserted.

[AI5] H 15 [*

Al5 customer image: value of analog input 5.

Identical to [AI1] A , I [(see page 49).

[Al5 Assignment] A 15 A *

Al5 functions assignment. If no functions have been assigned, **[No]** n = 1 is displayed. Identical to **[Al1 Assignment]** n = 1 if n = 1 (see page 49).

[Al5 min value] u , L 5 🖈

Al5 voltage scaling parameter of 0%.

This parameter can be accessed if [Al5 type] H imes 5 imes 1 imes 10 imes 10

Identical to [Al1 min value] u , L I (see page 50).

[Al5 max value] u , H 5 *

Al3 voltage scaling parameter of 100%.

This parameter can be accessed if [Al5 type] H ildot S ildot E is set to [Voltage] I ildot U ildot U.

Identical to [Al1 max value] יו וו H I (see page 50).

[Al5 min. value] [r L 5 *

Al5 current scaling parameter of 0%.

This parameter can be accessed if [Al5 type] $H \rightarrow 5 L$ is set to [Current] D H.

Identical to [Al1 min. value] [r L I (see page 50).

[Al5 max. value] [r H 5 *

Al5 current scaling parameter of 100%.

This parameter can be accessed if [Al5 type] $H \rightarrow 5 E$ is set to [Current] $\Box H$.

Identical to [Al1 max. value] [r H I (see page 50).

[Al5 filter] *A* → 5 *F* ★

Interference filtering cut-off time of the low-filter.

Identical to [Al1 filter] R , IF (see page 50).

[AQ1] F = I [- Menu

Access

 $[Display] \rightarrow [I/O map] \rightarrow [Analog outputs image] \rightarrow [AQ1]$

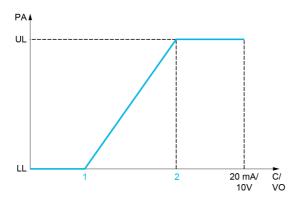
About This Menu

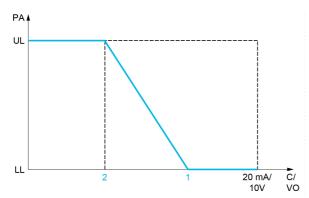
Analogic output functions.

Following parameters can be accessed on the Plain Text Display Terminal by pressing the **OK** key on the **[AQ1]** $\mathbf{R}_{\mathbf{D}}$ $\mathbf{I}_{\mathbf{C}}$ parameter.

Minimum and Maximum Output Values

The minimum output value, in volts, corresponds to the lower limit of the assigned parameter and the maximum value corresponds to its upper limit. The minimum value may be greater than the maximum value.





PA Parameter assigned

C / VO Current or voltage output

UL Upper limit

LL Lower limit

1 [Min Output] # L X or L X

2 [Max Output] A a H X or u a H X

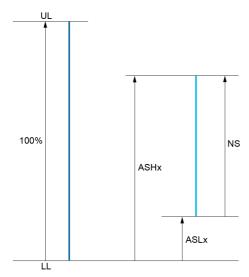
Scaling of the Assigned Parameter

The scale of the assigned parameter can be adapted in accordance with requirements by modifying the values of the lower and upper limits with 2 parameters for each analog output.

These parameters are given in %. 100% corresponds to the total variation range of the configured parameter, so: 100% = upper limit - lower limit.

For example, **[Sign. torque]** 5 *L* **9** which varies between -3 and +3 times the rated torque, 100% corresponds to 6 times the rated torque.

- The [Scaling AQx min] # 5 L X parameter modifies the lower limit: new value = lower limit + (range x # 5 L X). The value 0% (factory setting) does not modify the lower limit.
- The [Scaling AQx max] # 5 H X parameter modifies the upper limit: new value = lower limit + (range x # 5 L X). The value 100% (factory setting) does not modify the upper limit.
- [Scaling AQx min] # 5 L X must always be lower than [Scaling AQx max] # 5 H X.



UL Upper limit of the assigned parameter

LL Lower limit of the assigned parameter

NS New scale

- 1 *A5HX*
- 2 ASLX

Application Example

The value of the motor current at the AQ1 output is to be transferred with 0...20 mA, range 2 In motor, In motor being the equivalent of a 0.8 In drive.

- The [Motor Current] a [r] parameter varies from 0 to 2 times the rated drive current, or a range of 2.5 times the rated drive current.
- [Scaling AQ1 min] # 5 L / must not modify the lower limit, which therefore remains at its factory setting of 0%.
- [Scaling AQ1 max] # 5 H I must modify the upper limit by 0.5x the rated motor torque, or 100 100/5 = 80% (new value = lower limit + (range x ASH1).

[AQ1] A - I C

AQ1 customer image: value of analog output 1.

Setting ()	Description
-32,76732,767	Setting range Factory setting: _

[AQ1 Assignment] F a /

AQ1 assignment.

Setting	Code / Value	Description
[Not Configured]	no	Not assigned
[Motor Current]	a C r	Current in the motor, from 0 to 2 In (In = rated drive current indicated in the Installation manual and on the drive nameplate)
[Motor Frequency]	a Fr	Output frequency, from 0 to [Max Frequency] & F r Factory Setting
[Ramp out.]	or P	From 0 to [Max Frequency] £ F r
[Motor torq.]	tr9	Motor torque, from 0 to 3 times the rated motor torque
[Sign. torque]	5 6 9	Signed motor torque, between –3 and +3 times the rated motor torque. The + sign corresponds to the motor mode and the – sign to the generator mode (braking).
[sign ramp]	ar S	Signed ramp output, between –[Max Frequency] £ F r and +[Max Frequency] £ F r
[PID ref.]	a P S	PID controller reference between [Min PID reference] P , P I and [Max PID reference] P , P 2
[PID feedbk]	a P F	PID controller feedback between [Min PID feedback] P , F I and [Max PID feedback] P , F 2
[PID error]	a P E	PID controller detected error between –5% and +5% of [Max PID feedback] P , F 2 – [Min PID feedback] P , F I
[PID output]	aP,	PID controller output between [Low speed] L 5 P and [High speed] H 5 P
[Drive power]	o P r	Motor power, between 0 and 2.5 times [Nominal Motor Power] n P r
[Mot thermal]	E H r	Motor thermal state, from 0 to 200% of the rated thermal state
[Drv thermal]	t H d	Drive thermal state, from 0 to 200% of the rated thermal state
[Sig. o/p frq.]	o F 5	Signed output frequency, between – [Max Frequency] £ F r and + [Max Frequency] £ F r
[Motor volt.]	u o P	Voltage applied to the motor, between 0 and [Nom Motor Voltage]
[Inlet Pressure Value]	PS Iu	Inlet pressure value
[Outlet Pressure Value]	P52u	Outlet pressure value
[Installation Flow]	F 5 I u	Installation flow value

[AQ1 min Output] u a L 1*

AQ1 minimum output.

This parameter can be accessed if [AQ1 Type] $H \circ IE$ is set to [Voltage] $I \circ U$.

Setting	Description
0.010.0 Vdc	Setting range
	Factory setting: 0.0 Vdc

[AQ1 max Output] u B H 1*

AQ1 maximum output.

This parameter can be accessed if [AQ1 Type] H_{\Box} 1 E is set to [Voltage] I_{\Box} U_{\Box} .

Setting	Description
0.010.0 Vdc	Setting range Factory setting: 10.0 Vdc

[AQ1 min output] H□L /★

AQ1 minimum output.

This parameter can be accessed if [AQ1 Type] H = I L is set to [Current] $\square H$.

Setting	Description
0.020.0 mA	Setting range Factory setting: 4.0 mA

[AQ1 Max Output] F = H / *

AQ1 maximum output.

This parameter can be accessed if [AQ1 Type] $H \circ IE$ is set to [Current] $\square H$.

Setting	Description
0.020.0 mA	Setting range Factory setting: 20.0 mA

[Scaling AQ1 min] #5L /

Scaling of the lower limit of the assigned parameter, as a % of the maximum possible variation.

Setting	Description
0.0100.0%	Setting range
	Factory setting: 0.0%

[Scaling AQ1 max] FI 5 H I

Scaling of the upper limit of the assigned parameter, as a % of the maximum possible variation.

Setting	Description
0.0100.0%	Setting range
	Factory setting: 100.0%

[AQ1 Filter] F o IF

Interference filtering.

This parameter is forced to 0 if [AQ1 Assignment] $H \circ I$ is set to [DQ1] $d \circ I$.

Setting	Description
0.0010.00 s	Setting range Factory setting: 0.00 s

[AQ2] F - 2 C - Menu

Access

[Display] → [I/O map] → [Analog outputs image] → [AQ2]

About This Menu

Analog output functions.

Following parameters are visible on the Plain Text Display Terminal by pressing the ΔK key on the [AQ2] $R \Delta C$ parameter.

[AQ2] A - 2 C

AQ2 customer image: value of analog output 2.

Identical to [AQ1] # a I [(see page 56).

[AQ2 assignment] # a 2

AQ2 assignment.

Identical to [AQ1 Assignment] H . I (see page 57).

[AQ2 min Output] 🔟 🗈 L 🗁 🖈

AQ2 minimum output.

This parameter can be accessed if [AQ2 Type] $H \cap 2L$ is set to [Voltage] $I \cap U$.

Identical to [AQ1 min Output] u a L I (see page 57).

[AQ2 max Output] □ □ H 2 ★

AQ2 maximum output.

This parameter can be accessed if [AQ2 Type] H 2 L is set to [Voltage] I 0 L.

Identical to [AQ1 max Output] _ _ H I (see page 57).

[AQ2 min output] A □ L 2 ★

AQ2 minimum output.

This parameter can be accessed if [AQ2 Type] H = 2 L is set to [Current] $\square H$.

Identical to [AQ1 min Output] F a L I (see page 58).

[AQ2 max output] A □ H ≥ ★

AQ2 maximum output.

This parameter can be accessed if [AQ2 Type] $H \square \supseteq E$ is set to [Current] $\square H$.

Identical to [AQ1 max Output] # a H I (see page 58).

[Scaling AQ2 min] #5 L 2

Scaling of the lower limit of the assigned parameter, as a % of the maximum possible variation.

Identical to [Scaling AQ1 Min] # 5 L I (see page 58).

[Scaling AQ2 max] F 5 H 2

Scaling of the upper limit of the assigned parameter, as a % of the maximum possible variation.

Identical to [Scaling AQ1 max] # 5 H I (see page 58).

[AQ2 Filter] F - 2 F

Interference filtering.

This parameter is forced to 0 if [AQ2 assignment] $H \circ Z$ is set to [DQ2] $d \circ Z$.

Identical to [AQ1 Filter] # a IF (see page 58).

[Digital output map] L \square \square - Menu

Access

[Display] → [I/O map] → [Digital output map]

About This Menu

This menu presents the state and assignment of digital outputs.

Section 4.4

[Communication map]

What Is in This Section?

This section contains the following topics:

Topic	
[Communication map]	62
[Modbus network diag] Ind - Menu	65
[Com. scanner input map] , 5 R - Menu	66
[Com scan output map] a 5 R - Menu	67
[Modbus HMI Diag] П d H - Menu	
[Command word image] [W , - Menu	
[Freq. ref. word map] r W , - Menu	

[Communication map] [□ □ □ - Menu

Access

[Display] → [Communication map]

[Command Channel] [$\Pi \sqcup \Gamma$

Command channel.

Setting	Code / Value	Description
[Terminals]	£ E r	Terminal block source Factory Setting
[НМІ]	LCC	Reference Frequency via remote terminal
[Modbus]	ПЧР	Reference frequency via Modbus
[Com. Module]	n E E	Reference frequency via fieldbus module if a fieldbus module has been inserted

[Cmd Register] [П d

Command register.

[Control Mode] [H[F] is not set to [I/O profile] , a

Possible values in CiA402 profile, separate, or not separate mode:

Bit	Description, Value
0	Set to 1: "Switch on"/Contactor command
1	Set to 0: "Disable voltage"/Authorization to supply AC power
2	Set to 0: "Quick stop"
3	Set to 1: "Enable operation"/Run command
4 to 6	Reserved (= 0)
7	"Fault reset" acknowledgment active on 0 to 1 rising edge
8	Set to 1: Halt stop according to the [Type Of Stop] 5 L L parameter without leaving the operation enabled state
9 and 10	Reserved (= 0)
11 to 15	Can be assigned to commands

Possible values in the I/O profile. On state command [2-Wire Control] 2 [:

Bit	Description, Value	
0	Forward (on state) command: 0: No forward command 1: Forward command	
	NOTE: The assignment of bit 0 cannot be modified. It corresponds to the assignment of the terminals. It can be switched. Bit 0 $\mathcal{L} \dashv \mathcal{D} \mathcal{D}$ is only active if the channel of this control word is active.	
1 to 15	Can be assigned to commands	

Possible values in the I/O profile. On edge command [3-Wire Control] 3 [:

Bit	Description, Value
0	Stop (run authorization): 0: Stop 1: Run is authorized on a forward or reverse command
1	Forward (on 0 to 1 rising edge) command
2 to 15	Can be assigned to commands
NOTE: The assignment of hits 0 and 1 cannot be madified. It corresponds to the assignment of the terminals. It can	

NOTE: The assignment of bits 0 and 1 cannot be modified. It corresponds to the assignment of the terminals. It can be switched. Bits 0 $\mathcal{L} + \mathcal{L} + \mathcal{L}$

[Ref Freq Channel] $\vdash F \vdash \sqsubseteq \sqsubseteq$

Channel of reference frequency.

[Pre-Ramp Ref Freq] F r H

Frequency reference before ramp.

Setting	Description
-599.0599.0 Hz	Setting range Factory setting: _

[CIA402 State Reg] E L FI

CIA402 State Register.

Possible values in CiA402 profile, separate, or not separate mode:

Bit	Description, Value
0	"Ready to switch on", awaiting power section line supply
1	"Switched on", ready
2	"Operation enabled", running
3	Operating detected error state: 0: Inactive 1: Active
4	"Voltage enabled", power section line supply present: 0: Power section line supply absent 1: Power section line supply present NOTE: When the drive is powered by the power section only, this bit is always at 1.
5	Quick stop
6	"Switched on disabled", power section line supply locked
7	Warning: 0: No warning 1: Warning
8	Reserved (= 0)
9	Remote: command or reference via the network 0: Command or reference via the Plain Text Display Terminal 1: Command or reference via the network
10	Targets reference reached: 0: The reference is not reached 1: The reference has been reached
	NOTE: When the drive is in speed mode, this is the speed reference.
11	"Internal limit active", reference outside limits: 0: The reference is within the limits 1: The reference is not within the limits
	NOTE: When the drive is in speed mode, the limits are defined by the [Low speed] L 5 P and [High speed] H 5 P parameters.
12	Reserved
13	Reserved
14	"Stop key", STOP via stop key: 0: STOP key not pressed 1: Stop triggered by the STOP key on the Plain Text Display Terminal
15	"Direction", direction of rotation: 0: Forward rotation at output 1: Reverse rotation at output
NOTE: The combin	nation of bits 0, 1, 2, 4, 5 and 6 defines the state in the DSP 402 state chart (see the communication

NOTE: The combination of bits 0, 1, 2, 4, 5 and 6 defines the state in the DSP 402 state chart (see the communication manuals).

Possible values in the I/O profile:

Bit	Description, Value
0	Reserved (= 0 or 1)
1	Ready: 0: Not ready 1: Ready
2	Running: 0: The drive does not start if a reference other than zero is applied 1: Running, if a reference other than zero is applied, the drive can start
3	Operating detected error state: 0: Inactive 1: Active
4	Power section line supply present: 0: Power section line supply absent 1: Power section line supply present
5	Reserved (= 1)
6	Reserved (= 0 or 1)
7	Warning 0: No warning 1: Warning
8	Reserved (= 0)
9	Command via a network: 0: Command via the terminals or the Plain Text Display Terminal 1: Command via a network
10	Reference reached: 0: The reference is not reached 1: The reference has been reached
11	Reference outside limits: 0: The reference is within the limits 1: The reference is not within the limits
	NOTE: When the drive is in speed mode, the limits are defined by LSP and HSP parameters.
12	Reserved (= 0)
13	Reserved (= 0)
14	Stop via STOP key: 0: STOP key not pressed 1: Stop triggered by the STOP key on the Plain Text Display Terminal
15	Direction of rotation: 0: Forward rotation at output 1: Reverse rotation at output

NOTE: The value is identical in the CiA402 profile and the I/O profile. In the I/O profile, the description of the values is simplified and does not refer to the CiA402 (Drivecom) state chart.

[Modbus network diag] $\sqcap \sqcap \dashv$ - Menu

Access

[Display] → [Communication map] → [Modbus network diag]

About This Menu

Used for the Modbus serial communication port at the bottom of the control block. Refer to the Modbus serial embedded communication manual for a complete description.

[COM LED] П d b I

View of the Modbus communication LED.

[Mdb Frame Nb] // / L Ł

Modbus network frames counter: number of processed frames.

Setting	Description
065,535	Setting range Factory setting: _

[Mb NET CRC errors] ∏ /E [

Modbus network CRC error countered: number of CRC errors

Setting	Description
065,535	Setting range Factory setting: _

[Com. scanner input map] , 5 A - Menu

Access

[Display] → [Communication map] → [Modbus network diag] → [Com. scanner input map]

About This Menu

Used for Modbus network.

[Com Scan In1 val.] n // /

Com scanner input 1 value. Value of the first input word.

Setting	Description
065,535	Setting range Factory setting: _

[Com Scan In2 val.] ¬ П ≥

Com scanner input 2 value. Value of the second input word.

Identical to [Com Scan In1 val.] n II (see page 66).

[Com Scan In3 val.] n [] 3

Com scanner input 3 value. Value of the third input word.

Identical to [Com Scan In1 val.] n II (see page 66).

[Com Scan In4 val.] n II 4

Com scanner input 4 value. Value of the fourth input word.

Identical to [Com Scan In1 val.] n II (see page 66).

[Com Scan In5 val.] $_{\sqcap}$ Π 5

Com scanner input 5 value. Value of the fifth input word.

Identical to [Com Scan In1 val.] n II (see page 66).

[Com Scan In6 val.] n П Б

Com scanner input 6 value. Value of the sixth input word.

Identical to [Com Scan In1 val.] $\Pi \Pi I$ (see page 66).

[Com Scan In7 val.] n // 7

Com scanner input 7 value. Value of the seventh input word.

Identical to [Com Scan In1 val.] $_{\Pi}\Pi$ I (see page 66).

[Com Scan In8 val.] ¬ П В

Com scanner input 8 value. Value of the eighth input word.

Identical to [Com Scan In1 val.] Π I (see page 66).

[Com scan output map] _ 5 A - Menu

Access

[Display] → [Communication map] → [Com scan output map]

About This Menu

Used for Modbus networks.

[Com Scan Out1 val.] n [/

Com scanner output 1 value. Value of the first output word.

Setting ()	Description
065,535	Setting range Factory setting: _

[Com Scan Out2 val.] n [2

Com scanner output 2 value. Value of the second output word.

Identical to [Com Scan Out1 val.] n [I (see page 67).

[Com Scan Out3 val.] n [3

Com scanner output 3 value. Value of the third output word.

Identical to [Com Scan Out1 val.] n [I (see page 67).

[Com Scan Out4 val.] n [4

Com scanner output 4 value. Value of the fourth output word.

Identical to [Com Scan Out1 val.] n [I (see page 67).

[Com Scan Out5 val.] n [5

Com scanner output 5 value. Value of the fifth output word.

Identical to [Com Scan Out1 val.] n [I (see page 67).

[Com Scan Out6 val.] n [5

Com scanner output 6 value. Value of the sixth output word.

Identical to [Com Scan Out1 val.] n [I (see page 67).

[Com Scan Out7 val.] n [7

Com scanner output 7 value. Value of the seventh output word.

Identical to [Com Scan Out1 val.] n [I (see page 67).

[Com Scan Out8 val.] n [B

Com scanner output 8 value. Value of the eighth output word.

Identical to [Com Scan Out1 val.] n [I (see page 67).

[Modbus HMI Diag] ☐ ☐ H - Menu

Access

[Display] → [Communication map] → [Modbus HMI Diag]

About This Menu

Used for the Modbus serial communication port at the front of the control block (used by the Plain Text Display Terminal)

[COM LED] Паьг

View of the Modbus HMI communication LED.

[Mdb NET frames] П ≥ С Ł

Terminal Modbus 2: number of processed frames.

Setting ()	Description
065,535	Setting range

[Mdb NET CRC errors] П ≥ E [

Terminal Modbus 2: number of CRC errors.

Setting ()	Description
065,535	Setting range

[Command word image] [W , - Menu

Access

[Display] → [Communication map] → [Command word image]

About This Menu

Command word image.

[Modbus Cmd] [П d I

 $\label{lem:command} \mbox{Command word image built with Modbus port source.}$

Identical to [CMD Value] [Π d (see page 62).

[COM. Module Cmd.] [П d 3

Command word image built with fieldbus module source.

Identical to [CMD Value] [Π d (see page 62).

[Freq. ref. word map] r W , - Menu

Access

[Display] \rightarrow [Communication map] \rightarrow [Freq. ref. word map]

About This Menu

Frequency reference image.

[Modbus Ref Freq] L F r I

Frequency reference image built with Modbus port source (LFR_MDB).

Setting ()	Description
-32,76732,767 Hz	Setting range Factory setting: 0.0 Hz

[Com Module Ref Freq] L F r 3

Frequency reference image built with fieldbus module source (LFR_COM).

Setting ()	Description
-32,76732,767 Hz	Setting range Factory setting: 0.0 Hz

Section 4.5

[Application parameters]

What Is in This Section?

This section contains the following topics:

Topic	Page
[Variable Speed Pump] $\Pi P P$ - Menu	72
[Booster Control Pump] & [P - Menu	76

[Variable Speed Pump] *∏ P P* - Menu

Access

[Display] → [Application parameters] → [Variable Speed Pump]

[Available Pumps] $\Pi P \Pi \cap$

Number of available pumps.

Setting	Description
065,535	Setting range
	Factory setting: –

[Nb of Staged Pumps] $\Pi P 5 \pi$

Number of staged pumps.

Setting	Description
065,535	Setting range
	Factory setting: –

[Lead Pump] PL 1d

Lead pump.

Setting	Code / Value	Description
[None]	nonE	None
[Pump 1]	PO I	Pump number 1
[Pump 2]	P 0 2	Pump number 2
[Pump 3]	P	Pump number 3
[Pump 4]	P O Y	Pump number 4
[Pump 5]	P 0 5	Pump number 5
[Pump 6]	P 0 6	Pump number 6

[Next Staged Pump] Pn E 5

Next pump to stage.

Identical to [Lead Pump] P L , d (see page 72).

[Next Destaged Pump] Pn Ed

Next pump to destage.

Identical to [Lead Pump] P L , d (see page 72).

[Pump 1 State] P 15 *

Pump 1 state.

This parameter can be accessed if [Nb Of Pumps] ΠPPn is not set 1 or higher.

Setting	Code / Value	Description
[None]	nonE	Not configured
[Not Available]	n A u L	Unavailable
[Ready]	r d Y	Ready
[Running]	run	Running

[Pump 1 Type] P | E *

Pump 1 type.

This parameter can be accessed if [Nb Of Pumps] $\Pi PP \pi$ is not set 1 or higher.

Setting	Code / Value	Description
[None]	nonE	Undefined
[Lead]	LEAd	Lead pump
[Lead or Auxiliary]	LAF	Lead or auxiliary fixed speed pump
[Lead or Auxiliary Variable]	LAV	Lead or auxiliary variable speed pump
[Auxiliary]	Я⊔ХF	Auxiliary fixed speed pump
[Auxiliary Variable]	Я⊔ХV	Auxiliary variable speed pump
[Error]	Err	Error

[Pump 1 Runtime] Plat *

Pump 1 running time.

This parameter can be accessed if [Nb Of Pumps] $\Pi PP \pi$ is not set 1 or higher.

Setting	Description
04,294,967,295 s	Setting range
	Factory setting: –

[Pump 1 Nb Starts] P In 5 *

Pump 1 number of starts.

This parameter can be accessed if [Nb Of Pumps] $\Pi PP n$ is not set 1 or higher.

Setting	Description
04,294,967,295 s	Setting range
	Factory setting: –

[Pump 2 State] P ≥ 5 *

Pump 2 state.

This parameter can be accessed if [Nb Of Pumps] $\Pi PP \pi$ is not set 2 or higher.

Identical to [Pump 1 State] P 15 (see page 72).

[Pump 2 Type] P ≥ Ł *

Pump 2 type.

This parameter can be accessed if [Nb Of Pumps] $\Pi P P_n$ is not set 2 or higher.

Identical to [Pump 1 Type] P IE (see page 73).

[Pump 2 Runtime] P 2 a E 🖈

Pump 2 running time.

This parameter can be accessed if [Nb Of Pumps] ΠPPn is not set 2 or higher.

Identical to [Pump 1 Runtime] P Ia L (see page 73).

[Pump 2 Nb Starts] P 2 n 5 *

Pump 2 number of starts.

This parameter can be accessed if [Nb Of Pumps] $\Pi P P n$ is not set 2 or higher.

Identical to [Pump 1 Nb Starts] P In 5 (see page 73).

[Pump 3 State] P 3 5 *

Pump 3 state.

This parameter can be accessed if [Nb Of Pumps] $\Pi P P n$ is not set 3 or higher. Identical to [Pump 1 State] P I S (see page 72).

[Pump 3 Type] P 3 E *

Pump 3 type.

This parameter can be accessed if [Nb Of Pumps] $\Pi P P n$ is not set 3 or higher. Identical to [Pump 1 Type] P I E (see page 73).

[Pump 3 Runtime] P 3 a L *

Pump 3 running time.

This parameter can be accessed if **[Nb Of Pumps]** $\Pi P P n$ is not set 3 or higher. Identical to **[Pump 1 Runtime]** P I n E (see page 73).

[Pump 3 Nb Starts] P 3 n 5 *

Pump 3 number of starts.

This parameter can be accessed if [Nb Of Pumps] $\Pi P P n$ is not set 3 or higher. Identical to [Pump 1 Nb Starts] P I n 5 (see page 73).

[Pump 4 State] P 4 5 *

Pump 4 state.

This parameter can be accessed if [Nb Of Pumps] $\Pi P P n$ is not set 4 or higher. Identical to [Pump 1 State] P I S (see page 72).

[Pump 4 Type] P4E *

Pump 4 type.

This parameter can be accessed if [Nb Of Pumps] ΠPPn is not set 4 or higher. Identical to [Pump 1 Type] PIE (see page 73).

[Pump 4 Runtime] P4a L *

Pump 4 running time.

This parameter can be accessed if [Nb Of Pumps] $\Pi P P n$ is not set 4 or higher. Identical to [Pump 1 Runtime] P I n E (see page 73).

[Pump 4 Nb Starts] P4n5 *

Pump 4 number of starts.

This parameter can be accessed if [Nb Of Pumps] ΠPPn is not set 4 or higher. Identical to [Pump 1 Nb Starts] PIn 5 (see page 73).

[Pump 5 State] P 5 5 *

Pump 5 state.

This parameter can be accessed if [Nb Of Pumps] ΠPPn is not set 5 or higher. Identical to [Pump 1 State] P / 5 (see page 72).

[Pump 5 Type] P 5 L *

Pump 5 type.

This parameter can be accessed if **[Nb Of Pumps]** ΠPPn is not set 5 or higher. Identical to **[Pump 1 Type]** PIE (see page 73).

[Pump 5 Runtime] P5ab

Pump 5 running time.

This parameter can be accessed if **[Nb Of Pumps]** $\Pi P P n$ is not set 5 or higher. Identical to **[Pump 1 Runtime]** P I n E (see page 73).

[Pump 5 Nb Starts] P 5 n 5 *

Pump 5 number of starts.

This parameter can be accessed if [Nb Of Pumps] $\Pi P P n$ is not set 5 or higher. Identical to [Pump 1 Nb Starts] P I n 5 (see page 73).

[Pump 6 State] P 5 5

Pump 6 state.

This parameter can be accessed if [Nb Of Pumps] $\Pi P P n$ is not set 6 or higher. Identical to [Pump 1 State] P I S (see page 72).

[Pump 6 Type] P 6 L *

Pump 6 type.

This parameter can be accessed if [Nb Of Pumps] ΠPPn is not set 6 or higher. Identical to [Pump 1 Type] PIE (see page 73).

[Pump 6 Runtime] P 6 a L

Pump 6 running time.

This parameter can be accessed if **[Nb Of Pumps]** $\Pi P P n$ is not set 6 or higher. Identical to **[Pump 1 Runtime]** P I n E (see page 73).

[Pump 6 Nb Starts] P 6 n 5 *

Pump 6 number of starts.

This parameter can be accessed if [Nb Of Pumps] ΠPPn is not set 6 or higher. Identical to [Pump 1 Nb Starts] PIn 5 (see page 73).

[Booster Control Pump] b [P - Menu

Access

[Display] → [Application parameters] → [Booster Control Pump]

[Booster Status] & [5

Booster status.

Setting	Code / Value	Description
[None]	nonE	Not configured
[Inactive]	nAct	Inactive
[Running]	רטח	Running
[Stage Pending]	S E G P	Stage pending
[Destage Pending]	45 E G P	Destage pending
[Staging]	5 £ G	Staging
[Destaging]	45 E G	Destage in progress

Chapter 5

[Diagnostics] d , A -

Introduction

[Diagnostics] d, R - menu presents drive and application data useful when diagnostics is required.

What Is in This Chapter?

This chapter contains the following sections:

Section	Торіс	Page
5.1	[Diag. data]	78
5.2	[Error history]	85
5.3	[Warnings]	88

Section 5.1 [Diag. data]

What Is in This Section?

This section contains the following topics:

Торіс	Page
[Diag. data] dd E - Menu	79
[Other State] 5 5 £ - Menu	83
[Identification] a , d - Menu	84

[Diag. data] ddE - Menu

Access

[Diagnostics] → [Diag. data]

About This Menu

This menu presents the actual warning and detected error in addition to drive data.

[Last Warning] L A L r

Last warning which occurred.

Setting	Code / Value	ode / Value Description	
[No Warning Stored]	n o A	No warning stored	
[Fallback speed]	FrF	Reaction on event / fallback speed	
[Speed Maintained]	r L 5	Reaction on event / maintain speed	
[Type of Stop]	5 Ł Ł	Reaction on event / stop on [Type of stop] 5 £ £ without tripping in error	
[Ref Frequency Warning]	5 r A	Frequency reference reached	
[Life Cycle Warn 1]	LEAI	Life cycle warning 1	
[Life Cycle Warn 2]	L C A 2	Life cycle warning 2	
[PID Error Warning]	PEE	Warning on PID error	
[PID Feedback Warning]	PFA	Warning on PID feedback	
[PID High Fdbck Warning]	PFAH	PID feedback high threshold reached	
[PID Low Fdbck Warning]	PFAL	PID feedback low threshold reached	
[Al3 Th Warning]	£P3A	Temperature monitoring AI3 warning	
[Al4 Th Warning]	L P Y A	Temperature monitoring AI4 warning	
[Al5 Th Warning]	Ł P S A	Temperature monitoring AI5 warning	
[Al1 4-20 Loss Warning]	AP I	Al1 4-20 loss warning on Al1	
[Al3 4-20 Loss Warning]	AP3	Al3 4-20 loss warning on Al3	
[Al4 4-20 Loss Warning]	ЯРЧ	Al4 4-20 loss warning on Al4	
[Al5 4-20 Loss Warning]	AP5	Al5 4-20 loss warning on Al5	
[IGBT Thermal Warning]	FJA	Warning on IGBT thermal state	
[Fan Counter Warning]	F L L R Fan counter speed warning		
[Fan Feedback Warning]	FF d R Fan feedback warning is raised		
[Ext. Error Warning]	EFA	External error warning	
[Undervoltage Warning]	υ 5 A	Undervoltage warning is raised	
[Preventive UnderV Active]	u P A	Controlled stop on power loss threshold id reached	
[Motor Freq High Thd]	FEA	Motor frequency high threshold 1 reached	
[Motor Freq Low Thd]	FEAL	Motor frequency low threshold 1 reached	
[Motor Freq Low Thd 2]	F 2 A L	Motor frequency low threshold 2 reached	
[High Speed Reached]	FLA	High speed reached function result	
[Ref Freq High Thd Reached]	rEAH	Reference frequency high threshold reached	
[Ref Freq High Thd Reached]	rEAL	Reference frequency low threshold reached	
[2nd Freq Thd Reached]	F 2 A	Frequency level reached (frequency meter)	
[Current Thd Reached]	ГĿЯ	Motor current high threshold reached	
[Low I Thd Reached]	CEAL	Motor current low threshold reached	
[Process Undld Warning]	uLЯ	Underload is detected	
[Process Overload Warning]	o L A	Overload is detected	
[Torque Limit Reached]	5 5 A	Timeout on current or torque limitation is reached	
[Drv Therm Thd Reached]	Ŀ A d	Drive thermal threshold reached function result	
[Motor Therm Thd Reached]	£ 5 A	Motor thermal threshold reached function result (motor 1)	
[Power High Threshold]	PEHA	Power high threshold reached	

Setting	Code / Value Description	
[Power Low Threshold]	PEHL	Power low threshold reached
[Cust Warning 1]	CAS I	Customer warning 1 active
[Cust Warning 2]	C A S 2	Customer warning 2 active
[Cust Warning 3]	C R 5 3 Customer warning 3 active	
[Cust Warning 4]	C # 5 4 Customer warning 4 active	
[Cust Warning 5]	C # 5 5 Customer warning 5 active	

[Last Error] L F Ł

Last error which occurred.

Setting	Code / Value	Description
[No Error]	n o F	No error detected
[EEPROM Control]	EEFI	EEPROM control
[Incorrect Configuration]	CFF	Invalid configuration at power-on
[Invalid Configuration]	CF,	Incorrect parameter configuration
[Modbus Com Interruption]	SLF I	Modbus local serial communication error
[Internal Link Error]	, L F	Option internal link error
[Fieldbus Com Interrupt]	C n F	Communication interruption on fieldbus module
[External Error]	EPF I	External error from LI or local link
[Overcurrent]	o C F	Over current error
[Precharge Capacitor]	C r F	Load relay error
[Al2 4-20 mA Loss]	LFF2	Al2 4-20 mA Loss
[Drive Overheating]	o H F	Drive over heating error
[Motor Overload]	o L F	Motor overload error
[DC Bus Overvoltage]	о Ь F	DC bus overvoltage
[Supply Mains Overvoltage]	o 5 F	Over supply error
[Single Output Phase Loss]	oPF I	Motor 1-phase loss
[Input Phase Loss]	PHF	Main input 1-phase loss
[Supply Mains UnderV]	ы 5 F	Under voltage error
[Motor Short Circuit]	SCF I	Motor short circuit error (hard detection)
[Motor Overspeed]	5 o F	Instability or driving load too high
[Autotuning Error]	Ł n F	Tune error
[Internal Error 1]	ınF l	Unknown drive rating
[Internal Error 2]	ın F 2	Unknown or incompatible power board
[Internal Error 3]	ın F 3	Internal communication error
[Internal Error 4]	10 F 4	Internal data inconsistent
[EEprom Power]	EEF2	Internal memory error
[Ground Short Circuit]	5 <i>CF 3</i>	Direct ground short-circuit error (hard detection)
[Output Phase Loss]	o P F 2	Motor 3-phases loss
[Internal Error 7]	ın F 7	CPLD communication error
[Fieldbus Error]	EPF2	External error from fieldbus module
[Internal Error 8]	10 F B	Power switching supply error
[HMI Com Interruption]	5 L F 3	Plain Text Display Terminal communication error
[Internal Error 9]	, n F 9	Current measurement circuit failure
[Internal Error 10]	ın F A	Customer supply error
[Internal Error 11]	ınFb	Thermal sensor error (OC or SC)
[IGBT Overheating]	Ł J F	IGBT over heating error
[IGBT Short Circuit]	5 C F 4	IGBT short-circuit error (hard detection)
[Motor Short Circuit]	5 C F S	Load short-circuit error during long load sequence (hard detection)
1 This feature is not supported by the current firmware version		

Setting	Code / Value	Description
[Internal Error 12]	ınFc	Internal error 12 (internal current supply)
[Input Contactor]	LEF	Line contactor failure
[Internal Error 6]	ın F G	Unknown or incompatible option module
[Internal Error 14]	ınFE	CPU error (ram, flash, task)
[Al3 4-20 mA Loss]	LFF3	Al3 4-20 mA loss
[Al4 4-20 mA Loss]	LFF4	Al4 4-20 mA loss
[Boards Compatibility]	HEF	Hardware configuration error
[Conf Transfer Error]	CF 12	Configuration transfer error
[Al5 4-20 mA Loss]	LFF5	Al5 4-20 mA loss
[Channel Switch Error]	C 5 F	Channel switching error
[Process Underload]	υLF	Torque underload error
[Process Overload]	οLC	Torque overload error
[Al1 4-20 mA loss]	LFFI	Al1 4-20 mA loss
[Al3 Th Detected Error]	Ŀ H ∃ F	Al3 thermal sensor detected error
[Al3 Thermal Sensor Error]	£ 3 C F	Thermal sensor error on Al3
[Al4 Th Detected Error]	Ł H Y F	Al4 thermal sensor detected error
[Al4 Thermal Sensor Error]	Ł 4 C F	Thermal sensor error on Al4
[Al5 Th Detected Error]	Ł H S F	Al5 thermal sensor detected error
[Al5 Thermal Sensor Error]	Ł 5 C F	Thermal sensor error on AI5
[PID FeedBack Error]	PFNF	PID feedBack detected error
[Program Loading Error]	PGLF	Program loading detected error
[Program Running Error]	PGrF	Program running detected error
[Lead Pump Error]	ПРЬБ	The selected lead pump is not available
[Low Level Error]	LCLF	The minimum level switch is active during emptying process
[High Level Error]	LCHF	The maximum level switch is active during filling process
[Internal Error 16]	ın F G	Internal error 16
[Internal Error 17]	ın F H	Internal error 17
[Internal Error 0]	ın F O	Internal error 0 (IPC)
[Internal Error 13]	ınFd	Internal error 13 (different current)
[Motor Stall Error]	5 <i>E F</i>	Motor stall detected error
[Internal Error 21]	ınFL	Internal error 21 (RTC)
[Internal Error 15]	ınFF	Internal error 15 (flash)
[Internal Error 25]	in F P	Internal error 25
[Internal Error 20]	ınFK	Internal error 20
[Internal Error 27]	ınfr	Internal error 27
[Pre-settings Transfer Error]	c F 13	Pre-settings Transfer Error
[Empty Configuration Error]	c F , 4	Empty configuration error
[Internal Error 30]	ınFW	Internal error 30 (firmware update)
1 This feature is not supported by the current firmware version		

[Nb Of Start] n 5 Π

Number of motor starts (resettable).

Setting	Description
04,294,967,295	Setting range
	Factory setting: 0

[Motor Run Time] r L H

Motor run time.

Run elapsed time display (resettable) in seconds (length of time the motor has been switched on).

Setting	Description
04,294,967,295 s	Setting range Factory setting: _

[Other State] 55 L - Menu

Access

[Diagnostics] → [Diag. data] → [Other State]

About This Menu

List of secondary states.

List

[Sleep Active] 5 L Π

[Sleep Boost active] 5 L P b

[Sleep Checking activated] #5 L [

[Set 1 active] [FP |

[Set 2 active] [FP2

[Set 3 active] [FP]

[PID Active] Auto

[DC Bus Charged] dbL

[Fast stop Active] F 5 Ł

[Fallback Frequency] F r F

[Speed Maintained] r L 5

[Type of stop] 5 £ £

[Frequency ref. att.] 5 - A

[Forward] ∏ F r d

[Reverse] $\Pi r r 5$

[In motor fluxing] F L X

[Autotuning] Lun

[Identification] _ , _ - Menu

Access

[Diagnostics] → [Diag. data] → [Identification]

About This Menu

This is a read-only menu that cannot be configured. It enables the following information to be displayed:

- Drive reference, power rating, and voltage
- Drive software version
- Drive serial number
- Type of option modules present, with their software version
- Plain Text Display Terminal type and version

Section 5.2

[Error history]

[Error history] PFH - Menu

Access

[Diagnostics] → [Error history]

About This Menu

This menu shows the 8 last detected errors (dP I to dPB).

Pressing OK key on the selected error code in the Error history list displays the drive data recorded when the error has been detected.

NOTE: Same content for [Last Error 1] dP I to [Last Error 8] dP B.

[Last Error 1] dP |

Last error 1.

Identical to [Last Error] L F L (see page 80).

[Drive State] H 5 I

HMI status.

Setting	Code / Value	Description
[Autotuning]	t u n	Autotuning
[In DC inject.]	dСР	Injection braking
[Ready]	r d Y	Drive ready
[Freewheel]	n S Ł	Freewheel stop
[Drive Running]	run	Motor in steady state or run command present and zero reference
[Accelerating]	ACC	Accelerating
[Decelerating]	4 E C	Decelerating
[Current lim.]	CL,	Current limit
[Fast stop]	FSE	Fast stop
[Motor fluxing]	FLu	Fluxing function is activated
[no mains V.]	nLP	Control is powered on but the DC bus is not loaded
[control.stop]	ΓŁL	Controlled stop

[Last Error 1 Status] EP I

Status of last error 1.

DRIVECOM status register (same as **[ETA state word]** *E L FI*).

[ETI state word] , P /

ETI state word.

ETI status register (see the communication parameter file).

[Cmd word] [$\Pi P I$

Cmd word.

Command register (same as [Cmd word] [[]].

[Motor current] L E P I

Motor current (same as [Motor Current] L [r).

Setting	Description
-3,276.73,276.7 A	Setting range
	Factory setting: _

[Output frequency] r F P I

Output frequency (same as [Output frequency] r F r).

Setting	Description
-3,276.73,276.7 Hz	Setting range Factory setting: _

[Elapsed Time] r E P I

Elapsed time.

Setting	Description
065,535 h	Setting range Factory setting: _

[DC bus voltage] u L P I

DC bus voltage (same as **[DC bus voltage]** __ L P __I).

Setting	Description
06,553.5 Vac	Setting range: [No meas.] is displayed if no value is measured. Factory setting: _

[Motor therm state] *EHP I*

Motor thermal state (same as [Motor Therm state] & Hr).

Setting	Description
065,535%	Setting range
	Factory setting: _

[Command Channel] d [[|

Command channel (same as [Command channel] $\Gamma \sqcap d\Gamma$).

Setting	Code / Value	Description
[Terminals]	ŁΕrΠ	Terminal block
[НМІ]	нп ,	Plain Text Display Terminal
[Modbus]	ПЧЬ	Modbus serial
[Com. Module]	n E Ł	Fieldbus module

[Ref Freq Channel] dr [|

Channel for reference frequency (same as [Ref Freq Channel] r $F \ \ \Box$).

Identical to [Command channel] d [I (see page 86).

[Motor Torque] a E P I

Estimated motor torque value (same as [Motor Torque] a £ r).

Setting	Description
-3,276.73,276.7%	Setting range Factory setting: _

[Drive Thermal State] <code>E d P I</code>

Measured drive thermal state (same as [Drive Therm State] E H d).

Setting	Description
0255%	Setting range
	Factory setting: _

[IGBT Junction Temp] Ł JP I

Estimated junction temperature value.

Setting	Description
0255°C	Setting range
	Factory setting: _

[Switching Frequency] 5 F P I

Switching frequency applied (related to [Switching Frequency] $5 F_r$).

Setting	Description
065,535 Hz	Setting range Factory setting: _

[Last Error 2] dP2 to [Last Error 8] dP8

Last error 2... Last error 8

Identical to [Last Error1] dP I (see page 85).

Section 5.3 [Warnings]

What Is in This Section?

This section contains the following topics:

Topic	Page
[Actual warnings] FL r d - Menu	
[Warnings] FL r - Menu	90

[Actual warnings] FL r d - Menu

Access

[Diagnostics] → [Warnings] → [Actual warnings]

About This Menu

List of current warnings.

If a warning is active, ✓ and ■ appears on the Plain Text Display Terminal.

List of Available Warnings

Identical to [Last warning] L R L r (see page 79).

[Warnings] FL - Menu

Access

[Diagnostics] → [Warnings]

About This Menu

This menu presents the warning history (30 past warnings).

[Warning History] ALH

Identical to [Last warning] L AL r (see page 79).

Chapter 6

[Complete settings] [5 L -

Introduction

[Complete settings] [5] - menu presents all the settings related to drive functions for:

• Motor and drive configuration

- Application functions
- Monitoring functions

What Is in This Chapter?

This chapter contains the following sections:

Section	Topic	Page
6.1	[Motor parameters]	92
6.2	[Input/Output]	102
6.3	[Command and Reference]	146
6.4	[Generic functions] - [Ramp]	154
6.5	[Generic functions] - [+/- speed]	158
6.6	[Generic functions] - [Stop configuration]	161
6.7	[Generic functions] - [Auto DC injection]	166
6.8	[Generic functions] - [Jog]	169
6.9	[Generic functions] - [Preset speeds]	171
6.10	[Generic functions] - [Jump frequency]	175
6.11	[Generic functions] - [Define system units]	176
6.12	[Generic functions] - [PID controller]	180
6.13	[Generic functions] - [Sleep/wakeup]	199
6.14	[Generic functions] - [Threshold reached]	223
6.15	[Generic functions] - [Mains contactor command]	225
6.16	[Generic functions] - [Parameters switching]	227
6.17	[Generic functions] - [Stop on prolonged spd]	234
6.18	[Generic functions] - [Advanced sleep check]	236
6.19	[Pump functions] - [Booster control]	238
6.20	[Generic monitoring]	250
6.21	[Error/Warning handling]	259
6.22	[Maintenance]	287

Section 6.1 [Motor parameters]

[Motor parameters] ☐ P A - Menu

Access

[Complete settings] → [Motor parameters]

About This Menu

A WARNING

LOSS OF CONTROL

- Fully read and understand the manual of the connected motor.
- Verify that all motor parameters are correctly set by referring to the nameplate and the manual of the connected motor.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

[Basic Frequency] b F r *

Basic frequency.

This parameter modifies the presets of the following parameters:

- [High Speed] H 5 P
- [Motor Freq Thd] F Ł d
- [Nom Motor Voltage] ப л 5
- [Nominal Motor Freq] F ← 5
- [Max Frequency] Ł F r

Setting	Code / Value	Description
[50 Hz IEC]	50	IEC Factory setting
[60 Hz NEMA]	60	NEMA

[Nominal motor Power] n P r *

Nominal motor power.

Rated motor power given on the nameplate, in kW if [Basic Frequency] b F r is set to [50Hz IEC] 5 \square , in HP if [Basic Frequency] b F r is set to [60Hz NEMA] $b \square$.

Setting	Description
According to drive rating	_
	Factory setting: according to the drive rating

[Nom Motor Voltage] 🗓 ת 5 🖈

Nominal motor voltage.

Rated motor voltage given on the nameplate.

Setting	Description
100690 V	Setting range Factory setting: according to drive rating and [Basic Frequency] b F r

[Nom Motor Current] n [r *

Rated motor current given on the nameplate.

Setting	Description
0.251.5 In ⁽¹⁾	Setting range Factory setting: according to drive rating and [Basic Frequency] b F r
(1) Corresponding to the rated drive current indicated in the installation manual and on the drive nameplate.	

[Nominal Motor Freq] F - 5 *

Nominal motor frequency.

The factory setting is 50 Hz, or preset to 60 Hz if [Basic Frequency] b F r is set to 60 Hz.

Setting	Description
40.0500.0 Hz	Setting range Factory setting: 50 Hz

[Nominal Motor Speed] n 5 P *

Nominal motor speed.

If the nameplate indicates the synchronous speed and the slip in Hz or as a %, use any 1 of the formulas to calculate the rated speed:

• Nominal speed = Synchronous speed x
$$\frac{100 - \text{slip as a \%}}{100}$$

• Nominal speed = Synchronous speed x
$$\frac{60 - \text{slip in Hz}}{60}$$
 (60 Hz motors)

• Nominal speed = Synchronous speed x
$$\frac{50 - \text{slip in Hz}}{50}$$
 (50 Hz motors).

Setting	Description
065,535 rpm	Setting range
	Factory setting: according to drive rating

[Max Frequency] EF r

Maximum output frequency.

The factory setting is 60 Hz, or preset to 72 Hz if [Basic Frequency] b F r is set to 60 Hz.

Setting	Description
10.0500.0 Hz	Setting range Factory setting: 60 Hz

[Motor Th Current] , E H

Motor thermal monitoring current to be set to the rated current indicated on the nameplate.

Setting ()	Description
0.21.1_ln ⁽¹⁾	Setting range Factory setting: According to drive rating
(1) Corresponding to the rated drive current indicated in the installation manual and on the drive nameplate.	

[Output Ph Rotation] PHr

Output phase rotation.

Modifying this parameter operates as an inversion of 2 of the 3 motor phases. This results in changing the direction of rotation of the motor.

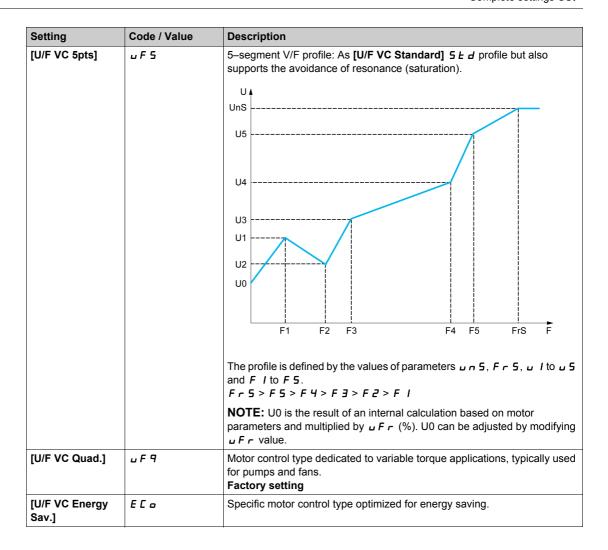
Setting	Code / Value	Description
[ABC]	Я Ь С	Standard rotation Factory setting
[ACB]	АСЬ	Opposite rotation

[Motor Control Type] [L L L

Motor control type.

NOTE: Select the motor control type before entering parameter values.

Setting	Code / Value	Description
[U/F VC Standard]	S E d	Standard motor control type. For applications that require torque at low speed. Simple motor control type keeping a constant Voltage Frequency ratio, with a possible adjustment of the curve bottom. This motor control type is used for motors connected in parallel.
		NOTE: U0 is the result of an internal calculation based on motor parameters and multiplied by $u F r$ (%). U0 can be adjusted by modifying $u F r$ value.



[U/F Profile] PFL *

U/F profile.

This parameter can be accessed if [Motor Control Type] [L L is set to [U/F VC Quad.] u F 9.

This parameter is used to adjust the fluxing current level at zero speed, in % of nominal motor current at nominal speed.

Setting ()	Description
0100%	Setting range Factory setting: 30%

[U1] *⊔* /★

Voltage point 1 on 5 points V/F.

This parameter can be accessed if [Motor Control Type] [E E E is set to [V/F 5pts] u F 5.

Setting ()	Description
0800 V	Setting range according to rating Factory setting: 0 V

[F1] *F I*★

Frequency point 1 on 5 points V/F.

V/F profile setting.

This parameter can be accessed if [Motor Control Type] [L L is set to [V/F 5pts] u F 5.

Setting ()	Description
0.0500.0 Hz	Setting range Factory setting: 0.0 Hz

[U2] *□* 2 ★

Voltage point 2 on 5 points V/F.

V/F profile setting.

This parameter can be accessed if [Motor Control Type] [L L is set to [V/F 5pts] u F 5.

Setting ()	Description
0800 V	Setting range according to rating
	Factory setting: 0 V

[F2] *F* ≥ ★

Frequency point 2 on 5 points V/F.

V/F profile setting.

This parameter can be accessed if [Motor Control Type] [E] E is set to [V/F 5pts] [U] F 5.

Setting ()	Description
0.0500.0 Hz	Setting range Factory setting: 0.0 Hz

[U3] → 3 ★

Voltage point 3 on 5 points V/F.

V/F profile setting.

This parameter can be accessed if [Motor Control Type] [E, E] is set to [V/F 5pts] [u, F, S].

Setting ()	Description
0800 V	Setting range according to rating Factory setting: 0 V

[F3] F ∃★

Frequency point 3 on 5 points V/F.

V/F profile setting.

This parameter can be accessed if [Motor Control Type] [L L is set to [V/F 5pts] u F 5.

Setting ()	Description
0.0500.0 Hz	Setting range Factory setting: 0.0 Hz

[U4] ⊔ 4★

Voltage point on 4 points V/F.

V/F profile setting.

This parameter can be accessed if [Motor Control Type] [L L is set to [V/F 5pts] [F 5.

Setting ()	Description
0800 V	Setting range according to rating Factory setting: 0 V

[F4] F 4★

Frequency point 4 on 5 points V/F.

V/F profile setting.

This parameter can be accessed if [Motor Control Type] [L L L is set to [V/F 5pts] [F 5.

Setting ()	Description
0.0500.0 Hz	Setting range Factory setting: 0.0 Hz

[U5] 🔟 5 ★

Voltage point 5 on 5 points V/F.

V/F profile setting.

This parameter can be accessed if [Motor Control Type] [L L L is set to [V/F 5pts] [F 5.

Setting ()	Description
0800 V	Setting range according to rating Factory setting: 0 V

[F5] F 5 ★

Frequency point 5 on 5 points V/F.

V/F profile setting.

This parameter can be accessed if [Motor Control Type] [L L is set to [V/F 5pts] u F 5.

Setting ()	Description
0.0500.0 Hz	Setting range
	Factory setting: 0.0 Hz

[IR compensation] uFr

This parameter is used to optimize torque at low speed, or to adapt to special cases (for example: for motors connected in parallel, decrease **[IR compensation]** u F r). If there is insufficient torque at low speed, increase **[IR compensation]** u F r. A too high value can avoid the motor to start (locking) or change the current limiting mode.

Setting ()	Description
0200%	Setting range Factory setting: 100%

[Slip compensation] 5 L P *

Slip compensation.

This parameter is set to 0% when [Motor Control Type] [L L is set to [U/F VC Quad.] u F 9.

The speeds given on motor nameplates are not necessarily exact.

If the slip setting is lower than the actual slip, the motor is not rotating at the correct speed in steady state, but at a lower speed than the reference.

If the slip setting is higher than the actual slip, the motor is overcompensated and the speed is unstable.

Setting ()	Description
0300%	Setting range Factory setting: 100%

[Switching frequency] 5 F r

Drive switching frequency.

NOTICE

DAMAGE TO THE DRIVE

Verify that the switching frequency of the drive does not exceed 4 kHz if the EMC filter is disconnected for operation of the drive in an IT mains.

Failure to follow these instructions can result in equipment damage.

Adjustment range: The maximum value is limited to 4 kHz if **[Motor surge limit.]** 5 μ L parameter is configured.

If [Sinus Filter Activation] $_{\Box}F$, is set to [Yes] $_{\Box}F$, the minimum value is 2 kHz and the maximum value is limited to 6 kHz or 8 kHz according to drive rating.

NOTE: In the event of excessive temperature rise, the drive automatically reduces the switching frequency and reset it once the temperature returns to normal.

In case of high-speed motor, it is advised to increase the PWM frequency [Switching frequency] 5 F r at 8, 12 kHz

Setting ()	Description
212 kHz according to drive rating	Setting range Factory setting: 4.0 kHz or 2.5 kHz according to the drive rating

[Switch Freq Type] 5 F L

Switching frequency type.

This parameter can be accessed if [Access Level] L A C is set to [Expert] E P r.

The motor switching frequency is modified (reduced) when the internal temperature of the drive is too high.

Setting ()	Code / Value	Description
[SFR type 1]	HF I	Heating optimization Allows the system to adapt the switching frequency according to the motor frequency. This setting optimizes the heating loss of the drive in order to improve the drive efficiency. Factory setting
[SFR type 2]	HF 2	Allows the system to keep a constant chosen switching frequency [Switching frequency] 5 F r whatever the motor frequency [Output frequency] r F r. With this setting, the motor noise is kept as low as possible for a high switching frequency. In the event of overheating, the drive automatically decreases the switching frequency. It is restored to its original value when the temperature returns to normal.

[Noise Reduction] nrd

Motor noise reduction.

Random frequency modulation helps to prevent any resonance, which may occur at a fixed frequency.

Setting	Code / Value	Description
[No]	no	Fixed frequency Factory setting
[Yes]	4 E S	Frequency with random modulation

[Motor Surge Limit.] 5 u L

Surge voltage limitation.

This function limits motor over voltages and is useful in the following applications:

- NEMA motors
- · Old or poor quality motors
- · Spindle motors
- · Rewound motors

This parameter can remain set to **[No]** n = 1 for 230/400 Vac motors used at 230 Vac, or if the length of cable between the drive and the motor does not exceed:

- 4 m with unshielded cables
- 10 m with shielded cables

NOTE: When **[Motor Surge Limit.]** $5 \ \square L$ is set to **[Yes]** $9 \ E$ 5, the maximum switching frequency **[Switching freq.]** $9 \ F$ r is modified.

Setting	Code / Value	Description
[No]	no	Function inactive Factory setting
[Yes]	<i>Y E S</i>	Function active

[Attenuation Time] 5 a P *

Attenuation time.

The value of the **[Volt surge limit. opt]** 5 \Box P parameter corresponds to the attenuation time of the cable used. It has been defined to prevent the superimposition of voltage wave reflections resulting from long cable lengths. It limits over voltages to twice the DC bus rated voltage.

As surge voltage depends on many parameters such as types of cable, different motor powers in parallel, different cable lengths in parallel, etc., we recommend using an oscilloscope to check the over voltage values obtained at the motor terminals.

For long cable lengths, an output of the filter or a dV/dt filter must be used.

To retain the overall drive performance, do not increase the 5 a P value unnecessarily.

Setting	Code / Value	Description
[6]	6	6 µs
[8]	8	8 μs Factory setting
[10]	10	10 μs

[Current Limitation] [L , *

Internal current limit.

NOTICE

OVERHEATING AND DAMAGE TO THE MOTOR

- Verify that the motor is properly rated for the maximum current to be applied to the motor.
- Consider the duty cycle of the motor and all factors of your application including derating requirements in determining the current limit.

Failure to follow these instructions can result in equipment damage.

NOTE: If the setting is less than 0.25. In, the drive may lock in **[OutPhaseLoss Assign]** \Box *PL* if this has been enabled. If it is less than the no-load motor current, the motor cannot run.

Setting ()	Description
01.2 ln ⁽¹⁾	Setting range Factory setting: 1.2 ln ⁽¹⁾
(1) Corresponding to the rated drive current indicated in the installation manual and on the drive nameplate.	

[Autotuning] E u n

A WARNING

UNEXPECTED MOVEMENT

Autotuning moves the motor in order to tune the control loops.

- Only start the system if there are no persons or obstructions in the zone of operation.
- During autotuning, the motor makes small movements. Noise development and mechanical oscillations of the system are normal.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

In any case, the motor has to be stopped before performing a tune operation. Verify that the application does not make the motor turn during the tune operation.

The tune operation optimizes:

- The motor performances at low speed.
- The estimation of the motor torque.
- The accuracy of the estimation of the process values in sensorless operation and monitoring.

Autotuning is only performed if no stop command has been activated. If a "freewheel stop" or "fast stop" function has been assigned to a digital input, this input must be set to 1 (active at 0).

Autotuning takes priority over any run or prefluxing commands, which will be taken into account after the autotuning sequence.

If autotuning has detected error, the drive always displays [No action] $\sigma \sigma$ and, depending on the configuration of [Tuning Error Resp] $E \sigma L$, may switch to [Autotuning] $E \sigma \sigma$ detected error mode.

Autotuning may last for several seconds. Do not interrupt the process. Wait for the Plain Text Display Terminal to change to **[No action]** $n \, a$.

NOTE: The motor thermal state has a significant influence on the tuning result. Always perform a motor tuning with the motor stopped and cold. Verify that the application does not have the motor operate during a tuning operation.

To redo a motor tuning, wait that it is stopped and cold. Set first [Autotuning] $E \sqcup n$ to [Erase Autotuning] $E \sqcup n$, then redo the motor tuning.

The use of the motor tuning without doing a **[Erase Autotuning]** *LLr* first is used to get the thermal state estimation of the motor.

The cable length has an influence on the tune result. If the wiring is modified, it is necessary to redo the tune operation.

Setting ()	Code / Value	Description
[No action]	no	Autotuning not in progress Factory setting
[Apply Autotuning]	Y E S	Autotuning is performed immediately if possible, then the parameter automatically changes to [No action] $n \cdot a$. If the drive state does not allow the tune operation immediately, the parameter changes to [No] $n \cdot a$ and the operation must be done again.
[Erase Autotuning]	[Lr	The motor parameters measured by the autotuning function are reset. The default motor parameter values are used to control the motor. [Autotuning Status] $E \ \omega \ S$ is set to [Not done] $E \ R \ B$.

[Autotuning Status] L u 5

Autotuning status.

(for information only, cannot be modified)

This parameter is not saved at drive power-off. It shows the autotuning status since the last power-on.

Setting ()	Code / Value	Description
[Not done]	Ŀ A P	The autotuning is not done Factory setting
[Pending]	PEnd	The autotuning has been requested but not yet performed
[In Progress]	ProG	The autotuning is in progress
[Failed]	FA .L	The autotuning has detected an error
[Done]	donE	The motor parameters measured by the autotuning function are used to control the motor

[Dual rating] dr E

Dual rating state

Settings	Code / Value	Description
[Normal Duty]	погПЯL	Normal duty
[Heavy Duty]	H . G H	High duty

Section 6.2 [Input/Output]

What Is in This Section?

This section contains the following topics:

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[DI1 Assignment] L , I C - Menu	105
[DI2 Assignment] L , 2 C - Menu	108
[DI3 Assignment] L , 3 E - Menu	109
[DI4 Assignment] L , 4 E - Menu	110
[DI5 Assignment] L , 5 C - Menu	111
[DI6 Assignment] L , E C - Menu	112
[DI11 Assignment] d , / / - Menu	113
[DI12 Assignment] d , I 2 - Menu	114
[DI13 Assignment] d , I 3 - Menu	115
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[DI16 Assignment] d , I E - Menu	118
[DQ11 Configuration] d a / / - Menu	119
[DQ12 Configuration] d a 12 - Menu	120
[Input/Output] , a - Menu	121
[Al1 configuration] # I - Menu	123
[Al2 configuration] # , 2 - Menu	126
[Al3 configuration] F , 3 - Menu	128
[Al4 configuration] # , 4 - Menu	129
[Al5 configuration] # ,5 - Menu	131
[Virtual Al1] F u I - Menu	132
[R1 configuration] r / - Menu	133
[R2 configuration] r 2 - Menu	135
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[R4 configuration] - 4 - Menu	137
[R5 configuration] r 5 - Menu	138
[R6 configuration] r E - Menu	139
[AQ1 configuration] # p I - Menu	140
[AQ2 configuration] F a 2 - Menu	144

[Input/Output] , - Menu

Access

[Complete settings] → [Input/Output]

[2/3-wire control] Ł [[]

2-wire or 3-wire control.

A WARNING

UNANTICIPATED EQUIPMENT OPERATION

If this parameter is changed, the parameters [Reverse Assign] r r 5 and [2-wire type] t t and the assignments of the digital inputs are reset to the factory setting.

Verify that this change is compatible with the type of wiring used.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Setting	Code / Value	Description
[2-Wire Control]	2.0	2-wire control (level commands): This is the input state (0 or 1) or edge (0 to 1 or 1 to 0), which controls running or stopping. Example of source wiring: ATVeee +24 DI1 DIx DI1 Forward DIx Reverse Factory setting
[3-Wire Control]	30	3-wire control (pulse commands) [3 wire]: A forward or reverse pulse is sufficient to command starting, a stop pulse is sufficient to command stopping. Example of source wiring: ATVeee +24 DI1 DI2 DIx DI1 Stop DI2 Forward DIx Reverse

[2-wire type] *E E E* ★ 🗓

Type of 2-wire control.

This parameter can be accessed if [2/3-wire control] <code>E [[]</code> is set to [2-Wire Control] <code>2 [.]</code>

A WARNING

UNANTICIPATED EQUIPMENT OPERATION

Verify that the parameter setting is compatible with the type of wiring used.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Setting	Code / Value	Description
[Level]	LEL	State 0 or 1 is taken into account for run (1) or stop (0)
[Transition]	trn	A change of state (transition or edge) is necessary to initiate operation in order to avoid accidental restarts after a break in the supply mains Factory setting
[Level With Fwd Priority]	PF a	State 0 or 1 is taken into account for run or stop, but the "forward" input takes priority over the "reverse" input

[Reverse Assign] r r 5

Reverse assignment.

Setting	Code / Value	Description
[Not Assigned]	no	Not assigned Factory setting
[DI1][DI6]	L 1 1L 16	Digital input DI1DI6
[DI11][DI16]	L 1 1 1L 1 1 1 5	Digital input DI11DI16 if VW3A3203 I/O extension module has been inserted
[CD00][CD10]	C 4 0 0 C 4 1 0	Virtual digital input CMD.0CMD.10 in [I/O profile] , a configuration
[CD11][CD15]	C d I IC d I 5	Virtual digital input CMD.11CMD.15 regardless of configuration
[C101][C110]	C 10 1C 1 10	Virtual digital input CMD1.01CMD1.10 with integrated Modbus Serial in [I/O profile] , p configuration
[C111][C115]	C	Virtual digital input CMD1.11CMD1.15 with integrated Modbus Serial regardless of configuration
[C301][C310]	C 3 0 1 C 3 1 0	Virtual digital input CMD3.01CMD3.10 with a fieldbus module in [I/O profile] , p configuration
[C311][C315]	C 3 I I C 3 I S	Virtual digital input CMD3.11CMD3.15 with a fieldbus module regardless of configuration

[DI1 Assignment] L , / [- Menu

Access

[Complete settings] → [Input/Output] → [DI1 Assignment]

[DI1 Low Assignment] L /L

DI1 low assignment.

Setting	Code / Value	Description
[No]	ne	Not assigned
[Run]	רטח	Run enable
[Forward]	Frd	Forward operation
[Reverse]	rr5	Reverse operation
[Ramp switching]	r P 5	Ramp switching
[Jog]	JoG	Jog
[+Speed]	ы 5 <i>Р</i>	+ speed
[- speed]	d 5 P	- Speed
[2 preset speeds]	P 5 2	2 preset speeds
[4 preset speeds]	P 5 4	4 preset speeds
[8 preset speeds]	PS8	8 preset speeds
[Ref Freq 2 switching]	rFC	Reference switching
[Freewheel stop]	n 5 E	Freewheel stop
[DC injection]	dC ,	Injection DC stop
[Fast stop]	FSE	Fast stop
[Forced local]	FLo	Forced local mode
[Fault reset]	r S F	Fault reset
[Autotuning]	E u L	Autotuning assignment
[Auto / manual]	PAu	PID auto-manu
[PID integral Disabled]	P .5	Integral shunting PID
[2 preset PID ref].	Pr2	2 preset PID references
[4 preset PID ref.]	Pr4	4 preset PID references
[Torque limitation]	E L A	Permanent torque limitation
[External Error]	ELF	External error
[2 parameter sets]	СНЯ І	Parameter switching 1
[3 parameter sets]	CHA5	Parameter switching 2
[Cmd switching]	C C 5	Command channel switching
[ErrorDetect Disable]	ın H	Error detection disable
[16 preset speeds]	PS 16	16 preset speeds
[Ref 1B switching]	гСЬ	Reference channel switching (1 to 1B)
[Drive Lock]	L E S	Drive lock assignment
[ProductRestart Assign]	r P A	Restart product

Setting	Code / Value	Description
[Idle]	1 d L S	Stop and go : idle mode enable condition
[R1][R3]	r 1r 3	Relay output R1R3
[R4][R6]	r 4r 6	Relay output R4R6, if VW3A3204 relay output option module has been inserted
[DQ11 digital output][DQ12 digital output]	do do	Digital output DQ11DQ12, if VW3A3203 I/O extension module has been inserted
[Preset spd2]	FPS I	Function key preset speed 1 assignment
[Preset spd3]	FPS2	Function key preset speed 2 assignment
[PID ref. 2]	FPr I	Function key preset PI 1 assignment
[PID ref. 3]	FP-2	Function key preset PI 2 assignment
[+Speed]	F u S P	Function key faster assignment
[-Speed]	F d S P	Function key slower assignment
[Switch Source]	5 L PW	Select an external condition to enter in sleep mode (for example. Flow switch)

[DI1 High Assignment] L IH

DI1 high assignment.

Setting	Code / Value	Description	
[No]	no	Not assigned	
[Run]	רטח	Run enable	
[Forward]	Frd	Forward operation	
[Reverse]	rr5	Reverse operation	
[Ramp switching]	r P S	Ramp switching	
[+Speed]	и 5 P	+ speed	
[- speed]	d 5 P	- Speed	
[2 preset speeds]	P S 2	2 preset speeds	
[4 preset speeds]	P 5 4	4 preset speeds	
[8 preset speeds]	P 5 8	8 preset speeds	
[Ref. 2 switching]	rFC	Reference switching	
[DC injection]	dC ,	Injection DC stop	
[Forced local]	FLo	Forced local mode	
[Fault reset]	r 5 F	Fault reset	
[Autotuning Assign]	E u L	Autotuning assignment	
[Auto / manual]	PAu	PID auto-manu	
[PID integral reset]	P .5	Integral shunting PID	
[2 preset PID ref].	Pr2	2 preset PID references	
[4 preset PID ref.]	Pr4	4 preset PID references	
[Torque limitation]	E L A	Permanent torque limitation	
[External Error]	ELF	External error	
[2 parameter sets]	СНЯ І	Parameter switching 1	
[3 parameter sets]	CHAS	Parameter switching 2	
[Cmd switching]	C C 5	Command channel switching	
[ErrorDetect Disable]	ın H	Error detection disable	
[16 preset speeds]	P5 16	16 preset speeds	
[Ref 1B switching]	г[Ь	Reference channel switching (1 to 1B)	
[Drive Lock]	L E S	Drive lock assignment	
[ProductRestart Assign]	r P A	Restart product	
[Idle]	1 d L 5	Stop and go : idle mode enable condition	
1 Because, in this case, the detected error does not trigger a stop, it is recommended to assign a relay or logic output			

Because, in this case, the detected error does not trigger a stop, it is recommended to assign a relay or logic output to its indication.

Setting	Code / Value	Description
[R1][R3]	r 1r 3	Relay output R1R3
[R4][R6]	r 4r 6	Relay output R4R6, if VW3A3204 relay output option module has been inserted
[DQ11 digital output][DQ12 digital output]	do do 2	Digital output DQ11DQ12, if VW3A3203 I/O extension module has been inserted
[Preset spd2]	FPS I	Function key preset speed 1 assignment
[Preset spd3]	FP52	Function key preset speed 2 assignment
[PID ref. 2]	FPr I	Function key preset PI 1 assignment
[PID ref. 3]	FPr2	Function key preset PI 2 assignment
[+Speed]	F u 5 P	Function key faster assignment
[-Speed]	F d S P	Function key slower assignment
[Switch Source]	5 L PW	Select an external condition to enter in sleep mode (for example. Flow switch)

¹ Because, in this case, the detected error does not trigger a stop, it is recommended to assign a relay or logic output to its indication.

[D1 Delay] L Id

DI1 delay.

NOTE: Commands received via this digital input are processed once the delay time set via this parameter has elapsed.

Setting	Description
0200 ms	Setting range Factory setting: 0 ms

[DI2 Assignment] L , 2 [- Menu

Access

[Complete settings] → [Input/Output] → [DI2 Assignment]

About This Menu

Identical to [DI1 Assignment] L , I C - menu (see page 105).

[DI2 Low Assignment] L 2 L

DI2 low assignment.

[DI2 High Assignment] L ≥ H

DI2 high assignment.

[DI2 Delay] L 2 d

DI2 delay.

[DI3 Assignment] L , 3 [- Menu

Access

[Complete settings] → [Input/Output] → [DI3 Assignment]

About This Menu

Identical to [DI1 Assignment] L , I L - menu (see page 105).

[DI3 Low Assignment] L 3 L

DI3 low assignment.

[DI3 High Assignment] L 3 H

DI3 high assignment.

[DI3 Delay] L 3 d

DI3 delay.

[DI4 Assignment] L , 4 [- Menu

Access

[Complete settings] → [Input/Output] → [DI4 Assignment]

About This Menu

Identical to [DI1 Assignment] L , I C - menu (see page 105).

[DI4 Low Assignment] L 4 L

DI4 low assignment.

[DI4 High Assignment] L 4 H

DI4 high assignment.

[DI4 Delay] L 4 d

DI4 delay.

[DI5 Assignment] L , 5 [- Menu

Access

[Complete settings] → [Input/Output] → [DI5 Assignment]

About This Menu

Identical to [DI1 Assignment] L , I L - menu (see page 105).

[DI5 Low Assignment] L 5 L

DI5 low assignment.

[DI5 High Assignment] L 5 H

DI5 high assignment.

[DI5 Delay] L 5 d

DI5 delay.

[DI6 Assignment] L , E [- Menu

Access

[Complete settings] → [Input/Output] → [DI6 Assignment]

About This Menu

Identical to [DI1 Assignment] L , I C - menu (see page 105).

[DI6 Low Assignment] L & L

DI6 low assignment.

[DI6 High Assignment] L & H

DI6 high assignment.

[DI6 Delay] L & d

DI6 delay.

[DI11 Assignment] d , / / - Menu

```
Access
```

[Complete settings] → [Input/Output] → [DI11 Assignment]

About This Menu

Identical to [DI1 Assignment] L , IC - menu (see page 105).

[DI11 Low Assignment] L / / L *

DI11 low assignment.

[DI11 High Assignment] L / / H *

DI11 high assignment.

[DI11 Delay] L I I d★

DI11 delay.

[DI12 Assignment] d , I 2 - Menu

Access

[Complete settings] → [Input/Output] → [DI12 Assignment]

About This Menu

Identical to [DI1 Assignment] L , IC - menu (see page 105).

[DI12 Low Assignment] L I 2 L *

DI12 low assignment.

[DI12 High Assignment] L I ≥ H ★

DI12 high assignment.

[DI12 Delay] L I ≥ d★

DI12 delay.

[DI13 Assignment] d , I 3 - Menu

```
Access
```

[Complete settings] → [Input/Output] → [DI13 Assignment]

About This Menu

Identical to [DI1 Assignment] L , IC - menu (see page 105).

[DI13 Low Assignment] L / 3 L *

DI13 low assignment.

[DI13 High Assignment] L / 3 H *

DI13 high assignment.

[DI13 Delay] L I∃ d ★

DI13 delay.

[DI14 Assignment] d , 14 - Menu

Access

[Complete settings] → [Input/Output] → [DI14 Assignment]

About This Menu

Identical to [DI1 Assignment] L , IC - menu (see page 105).

[DI14 Low Assignment] L 14L *

DI14 low assignment.

[DI14 High Assignment] L I 4 H *

DI14 high assignment.

[DI14 Delay] L 14 d★

DI14 delay.

[DI15 Assignment] d , 15 - Menu

```
Access
```

[Complete settings] → [Input/Output] → [DI15 Assignment]

About This Menu

Identical to [DI1 Assignment] L , IC - menu (see page 105).

[DI15 Low Assignment] L /5 L *

DI15 low assignment.

[DI15 High Assignment] L /5 H *

DI15 high assignment.

[DI15 Delay] L 15 d★

DI15 delay.

[DI16 Assignment] d , I 6 - Menu

```
Access
```

[Complete settings] → [Input/Output] → [DI16 Assignment]

About This Menu

Identical to [DI1 Assignment] L , IC - menu (see page 105).

[DI16 Low Assignment] L I 6 L *

DI16 low assignment.

[DI16 High Assignment] L I 6 H *

DI16 high assignment.

[DI16 Delay] L 16 d *

DI16 delay.

[DQ11 Configuration] d a / / - Menu

Access

[Complete settings] → [Input/Output] → [DQ11 Configuration]

About This Menu

Following parameters can be accessed if VW3A3203 I/O extension module has been inserted.

[DQ11 Assignment] d a / /*

Digital output 11 assignment.

Identical to [R2 Assignment] r 2 (see page 135)

[DQ11 actv delay] d I I d★

DQ11 activation delay time.

The delay cannot be set for the **[Operating State "Fault"]** F L E and **[Mains Contactor]** L L C assignments, and remains at 0.

The change in state only takes effect once the configured time has elapsed when the information becomes true.

Setting	Description
060,000 ms	Setting range 09,999 ms then 10.0060.00 s on the Plain Text Display Terminal Factory setting: 0 ms

[DQ11 status] d | | | 5 *

DQ11 status (output active level).

Setting	Code / Value	Description
[1]	P o S	State 1 when the information is true Factory Setting
[0]	n E G	State 0 when the information is true

[DQ11 hold delay] d I IH*

DQ11 holding delay time.

The holding time cannot be set for the [Operating State "Fault"] F L E, [Brake Sequence] E L E, and [Mains Contactor] E L E assignments, and remains at 0.

The change in state only takes effect once the configured time has elapsed when the information becomes false.

Setting	Description
09,999 ms	Setting range Factory setting: 0 ms

[DQ12 Configuration] d a 12 - Menu

Access

[Complete settings] → [Input/Output] → [DQ12 Configuration]

About This Menu

Identical to [DQ11 Configuration] d a I I - Menu (see page 119).

Following parameters can be accessed if VW3A3203 I/O extension module has been inserted.

[DQ12 Assignment] d a 12*

Digital output 12 assignment.

[DQ12 actv delay] ⊿ / 2 d ★

DQ12 activation delay time.

[DQ12 status] *d* 1 ≥ 5 ★

DQ12 status (output active level).

[DQ12 hold delay] ⊿ I ≥ H ★

DQ12 holding delay time.

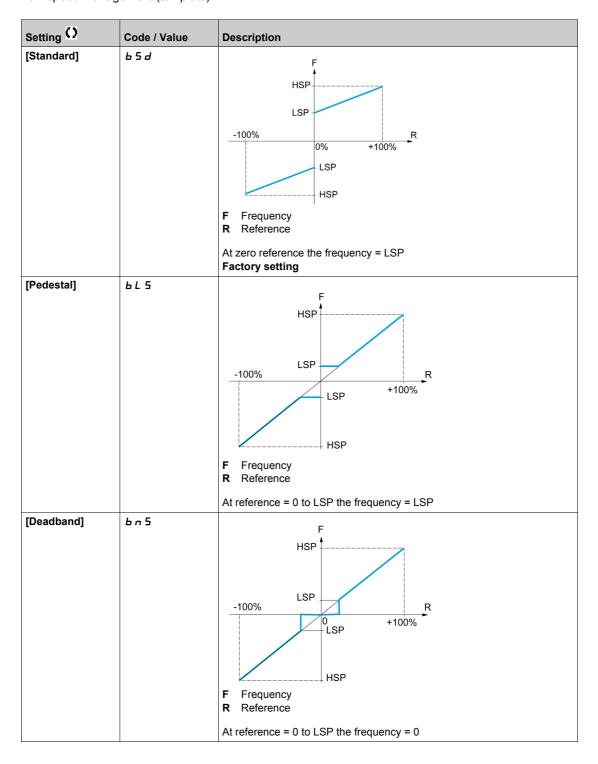
[Input/Output] , - Menu

Access

[Complete settings] → [Input/Output]

[Ref Freq Template] 65P

Low speed management (template).



Setting ()	Code / Value	Description
[Deadband 0]	b n 5 D	F Frequency R Reference This operation is the same as [Standard] b 5 d, except that in the following cases at zero reference, the frequency = 0: The signal is less than [Min nvalue], which is greater than 0 (example: 1 V on a 2–10 V input) The signal is greater than [Min nvalue], which is greater than [Min nvalue] (example: 11 V on a 10–0 V input). If the input range is configured as "bidirectional", operation remains identical to [Standard] b 5 d. This parameter defines how the speed reference is taken into account, for analog inputs and pulse input only. In the case of the PID regulator, this is the PID output reference. The limits are set by the [Low speed] L 5 P and [High speed] H 5 P parameters

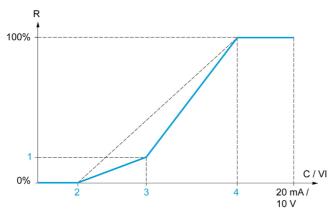
[Al1 configuration] A , / - Menu

Access

[Complete settings] → [Input/Output] → [Al1 configuration]

About This Menu

The input can be delinearized by configuring an intermediate point on the input/output curve of this input:



- R Reference
- C / VI Current or Voltage Input
- 1 [Y Interm. point]
- 2 [Min value] (0%)
- 3 [X Interm. point]
- 4 [Max value] (100%)

NOTE: For [X Interm. point], 0% corresponds to [Min value] and 100% to [Max value].

[All Assignment] H , I H

Analog input Al1 functions assignment.

Read-only parameter, cannot be configured. It displays all the functions associated with input Al1 in order to verify, for example, for compatibility problems.

If no functions have been assigned, [No] n a is displayed.

Setting	Code / Value	Description
[No]	no	Not assigned
[AQ1 assignment]	Ao I	Analog output AQ1
[AQ2 assignment]	A □ 5	Analog output AQ2
[Ref Freq Channel 1]	FrI	Reference frequency channel 1 Factory Setting
[Ref Freq Channel 2]	Fr2	Reference frequency channel 2
[Ref Frequency 2 Summing]	5 A 2	Reference frequency 2 summing
[PID Feedback]	PıF	PI controller feedback
[Subtract Ref Freq 2]	4 A S	Subtract reference frequency 2
[Manual PID Ref.]	РіП	Manual speed reference of the PID controller (auto-man)
[PID Ref Frequency]	FP,	PID reference frequency
[Ref Frequency 3 Summing]	5 A 3	Reference frequency 3 summing
[Ref Frequency 1B]	FrIb	Reference frequency 1B
[Subtract Ref Freq 3]	4 A 3	Subtract reference frequency 3
[Forced local]	FLoC	Forced local reference source1
[Ref Frequency 2 multiplier]	пяг	Reference frequency 2 multiplier
[Ref Frequency 3 multiplier]	ПЯЭ	Reference frequency 3 multiplier
[Virtual Al1 Channel]	A 'C I	Virtual Al1 channel selector function
[InletPres Assign]	PS IA	Select the source of inlet pressure sensor
[OutletPres Assign]	P 5 2 A	Select the source of outlet pressure sensor
[Inst Flow Assign]	F5 IA	Select the source of installation flow sensor
[Pump Flow Assign]	FS2A	Select the source of pump flow sensor

[Al1 Type] A , I Ł

Configuration of analog input AI1.

Setting	Code / Value	Description
[Voltage]	100	0-10 Vdc Factory setting
[Current]	O A	0-20 mA

[Al1 min value] u ı L /*

Al1 voltage scaling parameter of 0%.

This parameter can be accessed if [Al1 Type] A , I L is set to [Voltage] I D u.

Setting	Description
0.010.0 Vdc	Setting range
	Factory setting: 0.0 Vdc

[Al1 max value] ☐ 1H I★

Al1 voltage scaling parameter of 100%.

This parameter can be accessed if [Al1 Type] # , I E is set to [Voltage] I D u.

Setting	Description
0.010.0 Vdc	Setting range Factory setting: 10.0 Vdc

[Al1 min. value] [rll/*

Al1 current scaling parameter of 0%.

This parameter can be accessed if [Al1 Type] A , I E is set to [Current] [] A.

Setting	Description
0.020.0 mA	Setting range
	Factory setting: 0.0 mA

[Al1 max. value] [r H | *

Al1 current scaling parameter of 100%.

This parameter can be accessed if [Al1 Type] $H \cap IE$ is set to [Current] $\square H$.

Setting	Description
0.020.0 mA	Setting range Factory setting: 20.0 mA

[Al1 filter] A , IF

Al1 cutoff time of the low filter.

Setting	Description
0.0010.00 s	Setting range Factory setting: 0.00 s

[Al1 X Interm. point] H , IE

Input delinearization point coordinate. Percentage of the physical input signal.

100% corresponds to [Al1 max value] (u I H ı)

Setting	Description
0100%	Setting range Factory setting: 0%

[Al1 Y Interm. point] H , 15

Input delinearization point coordinate (frequency reference).

Percentage of the internal frequency reference corresponding to the [Al1 X Interm. point] ($R \cdot IE$) percentage of physical input signal.

Setting	Description
0100%	Setting range
	Factory setting: 0%

[Al2 configuration] A . 2 - Menu

Access

[Complete settings] → [Input/Output] → [Al2 configuration]

[Al2 Assignment] A . 2 A

Al2 functions assignment.

Identical to [Al1 Assignment] A , IA (see page 124).

[Al2 Type] A ₁2 Ł

Configuration of analog input AI2.

Setting	Code / Value	Description
[Voltage]	100	0-10 Vdc
[Current]	0 A	0-20 mA Factory setting
[PTC Management]	PEC	1 to 6 PTC (in serial)
[KTY]	KEY	1 KTY84
[PT1000]	IPE 3	1 PT1000 connected with 2 wires
[PT100]	IPE2	1 PT100 connected with 2 wires
[Water Prob]	LEuEL	Water level
[3PT1000]	3P £ 3	3 PT1000 connected with 2 wires
[3PT100]	3P L 2	3 PT100 connected with 2 wires

[Al2 min value] u , L 2 *

Al2 voltage scaling parameter of 0%.

This parameter can be accessed if [Al2 Type] $H \cap 2L$ is set to [Voltage] $I \cap u$.

Identical to [Al1 min value] u , L I (see page 124).

[Al2 max value] ☐ 1H 2★

Al2 voltage scaling parameter of 100%.

This parameter can be accessed if [Al2 Type] $H \cap 2E$ is set to [Voltage] $I \cap u$.

Identical to [Al1 max value] _ , H I (see page 124).

[Al2 min. value] [r L 2 *

Al2 current scaling parameter of 0%.

This parameter can be accessed if [Al2 Type] $H \cap 2E$ is set to [Current] $\square H$.

Identical to [Al1 min. value] [r L I (see page 125) with factory setting: 4.0 mA.

[Al2 max. value] [r H 2 *

Al2 current scaling parameter of 100%.

This parameter can be accessed if [Al2 Type] $H \cap 2L$ is set to [Current] DH.

Identical to [Al1 max. value] [r H I (see page 125).

[Al2 filter] A . 2 F

AI2 filter.

Identical to [Al1 filter] F , IF (see page 125).

[Al2 X Interm. point] A ₁ ≥ E

Al2 delinearization input level.

Identical to [Al1 X Interm. point] A , IE (see page 125).

[Al2 Y Interm. point] H : 25

Al2 delinearization output level.

Identical to [Al1 Y Interm. point] R , I5 (see page 125).

[Al3 configuration] A , 3 - Menu

Access

[Complete settings] → [Input/Output] → [Al3 configuration]

[Al3 Assignment] A , 3 A

Al3 functions assignment.

Identical to [Al1 Assignment] H , IH (see page 124).

[Al3 Type] A . 3 Ł

Configuration of analog input AI3.

Identical to [Al2 Type] A , 2 L (see page 126).

[Al3 min value] ו ו ג L 3 *

AI3 voltage scaling parameter of 0%.

Identical to [Al1 min value] u , L I (see page 124).

This parameter can be accessed if [Al3 Type] $H \cap J L$ is set to [Voltage] $I \square \sqcup$.

[Al3 max value] u , H 3 *

Al3 voltage scaling parameter of 100%.

Identical to [Al1 max value] u , H I (see page 124).

This parameter can be accessed if [Al3 Type] $H \cap \exists L$ is set to [Voltage] $I \square \sqcup$.

[Al3 min. value] [r L 3 *

Al3 current scaling parameter of 0%.

Identical to [Al1 min. value] [r L I (see page 125).

This parameter can be accessed if [Al3 Type] $H \cap J E$ is set to [Current] $\square H$.

[Al3 max. value] [r H 3 *

Al3 current scaling parameter of 100%.

Identical to [Al1 max. value] [r H I (see page 125).

This parameter can be accessed if [Al3 Type] $H \cap \exists E$ is set to [Current] $\square H$.

[Al3 filter] A . 3 F

AI3 cutoff time of the low filter.

Identical to [Al1 filter] FI , IF (see page 125).

[Al3 X Interm. point] A , 3 E

Al3 delinearization input level.

Identical to [Al1 X Interm. point] A , IE (see page 125).

[Al3 Y Interm. point] A , 35

Al3 delinearization output level.

Identical to [Al1 Y Interm. point] # , 15 (see page 125).

[Al4 configuration] F , 4 - Menu

Access

[Complete settings] → [Input/Output] → [Al4 configuration]

[Al4 Assignment] A , 4 A ★

Al4 functions assignment.

This parameter can be accessed if VW3A3203 I/O extension module has been inserted.

Identical to [Al1 Assignment] A , IA (see page 124).

[Al4 Type] A 14 ± ★

Configuration of analog input AI4.

This parameter can be accessed if VW3A3203 I/O extension module has been inserted.

Setting	Code / Value	Description
[Voltage]	100	0-10 Vdc
[Current]	OA	0-20 mA Factory setting
[Voltage +/-]	n 10 u	-10/+10 Vdc
[PTC Management]	PEC	1 to 6 PTC (in serial)
[KTY]	KEY	1 KTY84
[PT1000]	IPE 3	1 PT1000 connected with 2 wires
[PT100]	IPE2	1 PT100 connected with 2 wires
[3 PT1000]	3P	3 PT1000 connected with 2 wires
[3 PT100]	3P & 2	3 PT100 connected with 2 wires
[PT1000 in 3 wires]	IPE 33	1 PT1000 connected with 3 wires (Al4 & Al5 only)
[PT100 in 3 wires]	IPE23	1 PT100 connected with 3 wires (Al4 & Al5 only)
[3 PT1000 in 3 wires]	3Pt 33	3 PT1000 connected with 3 wires (Al4 & Al5 only)
[3 PT100 in 3 wires]	3P	3 PT100 connected with 3 wires (Al4 & Al5 only)

[Al4 min value] u 1 L 4 *

Al4 voltage scaling parameter of 0%.

Identical to [Al1 min value] u , L I (see page 124).

[Al4 max value] ⊔ ₁H 4 ★

Al4 voltage scaling parameter of 100%.

Identical to [Al1 max value] u , H I (see page 124).

[Al4 min. value] [r L 4*

Al4 current scaling parameter of 0%.

Identical to [Al1 min. value] [r L I (see page 125).

[Al4 max. value] [r H 4 *

Al4 current scaling parameter of 100%.

Identical to [Al1 max. value] [r H I (see page 125).

[Al4 filter] F 14F ★

Al4 cutoff time of the low filter.

This parameter can be accessed if VW3A3203 I/O extension module has been inserted.

Identical to [Al1 filter] H , IF (see page 125).

[Al4 X Interm. point] H , 4 E 🖈

Al4 delinearization input level.

This parameter can be accessed if VW3A3203 I/O extension module has been inserted. Identical to **[Al1 X Interm. point]** *H* , *IE* (see page 125).

[Al4 Y Interm. point] A , 45 *

Al4 delinearization output level.

This parameter can be accessed if VW3A3203 I/O extension module has been inserted. Identical to **[Al1 Y Interm. point]** *H* , *I* 5 (see page 125).

[Al5 configuration] H , 5 - Menu

Access

[Complete settings] → [Input/Output] → [Al5 configuration]

[Al5 Assignment] A , 5 A ★

Al5 functions assignment.

This parameter can be accessed if VW3A3203 I/O extension module has been inserted. Identical to **[Al1 Assignment]** *H* , *I H* (see page 124).

[Al5 Type] *H* ⋅ 5 Ł ★

Configuration of analog input AI5.

This parameter can be accessed if VW3A3203 I/O extension module has been inserted.

Identical to [Al4 Type] F , 4 L. (see page 129)

[Al5 min value] u 1 L 5 🖈

Al5 voltage scaling parameter of 0%.

Identical to [Al1 min value] u , L I (see page 124).

[Al5 max value] u 1 H 5 *

Al5 voltage scaling parameter of 100%.

Identical to [Al1 max value] u , H I (see page 124).

[Al5 min. value] [r L 5 *

AI5 current scaling parameter of 0%.

Identical to [Al1 min. value] [r L I (see page 125).

[Al5 max. value] [r H 5 *

Al5 current scaling parameter of 100%.

Identical to [Al1 max. value] [r H I (see page 125).

[Al5 filter] # .5 F *

AI5 cutoff time of the low filter.

This parameter can be accessed if VW3A3203 I/O extension module has been inserted. Identical to **[Al1 filter]** *H* , *IF* (see page 125).

[Al5 X Interm. point] H ₁5 E ★

Al5 delinearization input level.

This parameter can be accessed if VW3A3203 I/O extension module has been inserted.

Identical to [Al1 X Interm. point] A , IE (see page 125).

[Al5 Y Interm. point] H , 5 5 *

Al5 delinearization output level.

This parameter can be accessed if VW3A3203 I/O extension module has been inserted.

Identical to [Al1 Y Interm. point] A , 15 (see page 125).

[Virtual Al1] A u / - Menu

Access

[Complete settings] → [Input/Output] → [Virtual Al1]

[AIV1 Assignment] AV IA

Virtual Al1 function assignment.

Setting	Code / Value	Description
[No]	no	Not assigned
[Ref Frequency 2 Summing]	5 A 2	Reference frequency 2 summing
[PID Feedback]	PIF	PI controller feedback
[Subtract Ref Freq 2]	4 A S	Subtract reference frequency 2
[Ref Frequency 3 Summing]	5 A 3	Reference frequency 3 summing
[Subtract Ref Freq 3]	4 A 3	Subtract reference frequency 3
[Ref Frequency 2 multiplier]	пяг	Reference frequency 2 multiplier
[Ref Frequency 3 multiplier]	ПЯЭ	Reference frequency 3 multiplier
[InletPres Assign]	PS IA	Select the source of inlet pressure sensor
[OutletPres Assign]	P 5 2 A	Select the source of outlet pressure sensor
[Inst Flow Assign]	FS IA	Select the source of installation flow sensor
[Pump Flow Assign]	F52A	Select the source of pump flow sensor

[R1 configuration] _ / - Menu

Access

[Complete settings] → [Input/Output] → [R1 configuration]

[R1 Assignment] r /

R1 assignment.

Setting	Code / Value	Description
[No]	no	Not assigned
[Operating State Fault]	FLE	Operating state fault Factory setting
[Drive Running]	run	Drive running
[Mot Freq High Thd]	FEA	Motor frequency threshold ([Motor Freq Thd] F & d) reached
[High Speed Reached]	FLA	High speed reached
[Current Thd Reached]	CEA	Motor current threshold ([High Current Thd] [L d) reached
[Ref Freq Reached]	5 r A	Frequency reference reached
[Motor Therm Thd Reached]	£ 5 A	Motor thermal threshold ([Motor Therm Thd] £ £ d) reached
[PID Error Warning]	PEE	PID error warning
[PID Feedback Warning]	PFA	PID feedback warning
[Al2 4-20 Loss Warning]	AP2	Al2 4-20 mA loss warning
[Mot Freq High Thd 2]	FZA	Second frequency threshold ([Freq. threshold 2] F 2 d) reached
[Drv Therm Thd Reached]	E A d	Drive thermal threshold reached
[Ref Freq High Thd Reached]	rEAH	Frequency reference high threshold reached
[Ref Freq Low Thd Reached]	rEAL	Frequency reference low threshold reached
[Mot Freq Low Thd]	FEAL	Frequency low threshold ([Low Freq.Threshold] F Ł d L) reached
[Motor Freq Low Thd 2]	FZAL	Second frequency low threshold ([2 Freq. Threshold] F 2 d L) reached
[Low Current Reached]	CEAL	Current low threshold ([Low I Threshold] [E d L) reached
[Process Undld Warning]	υL用	Underload warning
[Process Overload Warning]	o L A	Overload warning
[Forward]	NFrd	Run forward
[Reverse]	Пгг5	Run reverse
[set 1 active]	CFPI	Parameter set 1 active
[set 2 active]	C F P 2	Parameter set 2 active
[set 3 active]	CFP3	Parameter set 3 active
[DC Bus Charged]	4 b L	DC bus charged
[In braking]	br5	In braking sequence
[I present]	ПСР	Motor current present
[Warning Grp 1]	AC I	Warning group 1
[Warning Grp 2]	A C S	Warning group 2
[Warning Grp 3]	A C 3	Warning group 3
[Warning Grp 4]	A C 4	Warning group 4
[Warning Grp 5]	A G S	Warning group 5
[External Error Warning]	EFA	External error warning
[Undervoltage Warning]	ы S Я	Undervoltage warning
[Preventive UnderV Active]	u P A	Undervoltage prevention warning
[IGBT Thermal Warning]	FJA	Thermal junction warning
[Al3 4-20 Loss Warning]	AP3	Al3 4-20 mA loss warning
[Ready]	rdy	Ready to start
[Al1 4-20 Loss Warning]	API	Al1 4-20 mA loss warning

[R1 Delay time] r Id

R1 activation delay time.

The change in state takes effect once the configured time has elapsed when the information becomes true. The delay cannot be set for the **[Operating State Fault]** *F L L* assignment; and remains at 0.

Setting	Description
060,000 ms	Setting range
	Factory setting: 0 ms

[R1 Active at] r 15

R1 status (output active level).

Setting	Code / Value	Description
1	P = 5	State 1 when the information is true Factory setting
0	n E G	State 0 when the information is true

Configuration [1] P 5 cannot be modified for the [Operating State "Fault"] F L E assignment.

[R1 Holding time] r IH

R1 holding delay time.

The change in state takes effect once the configured time has elapsed when the information becomes false.

The holding time cannot be set for the [Operating State "Fault"] F L L assignment, and remains at 0.

Setting	Description
09,999 ms	Setting range
	Factory setting: 0 ms

[R2 configuration] r 2 - Menu

Access

[Complete settings] → [Input/Output] → [R2 configuration]

About This Menu

Identical to [R1 configuration] r I - Menu (see page 133).

[R2 Assignment] r ≥

R2 assignment.

Factory setting: [Drive Running] r u n

Identical to [R1 Assignment] r I (see page 133) in addition to:

Setting	Code / Value	Description
[No]	no	Not assigned Factory setting
[Mains Contactor]	LLC	Mains contactor control
[Pump 1 Cmd]	NP a I	Pump 1 command
[Pump 2 Cmd]	ПРог	Pump 2 command
[Pump 3 Cmd]	ПРоЭ	Pump 3 command
[Pump 4 Cmd]	ПРаЧ	Pump 4 command
[Pump 5 Cmd]	ПР о 5	Pump 5 command
[Pump 6 Cmd]	ПР о Б	Pump 6 command

[R2 Delay time] r 2 d

R2 activation delay time.

[R2 Active at] r ≥ 5

R2 status (output active level).

[R2 Holding time] r ≥ H

R2 holding delay time.

[R3 configuration] _ 3 - Menu

Access

[Complete settings] → [Input/Output] → [R3 configuration]

About This Menu

Identical to [R1 configuration] r I - Menu (see page 133).

[R3 Assignment] r 3

R3 assignment.

Factory setting: [Ready] r d 4

Identical to [R2 Assignment] r 2 (see page 135).

[R3 Delay time] r 3 d

R3 activation delay time.

[R3 Active at] r 35

R3 status (output active level).

[R3 Holding time] r 3 H

R3 holding delay time.

[R4 configuration] - 4 - Menu

Access

[Complete settings] → [Input/Output] → [R4 configuration]

About This Menu

Identical to [R1 configuration] r I - Menu (see page 133).

Following parameters can be accessed if VW3A3204 relay output option module has been inserted.

[R4 Assignment] r 4★

R4 assignment.

Identical to [R2 Assignment] r 2 (see page 135).

[R4 Delay time] - 4 d★

R4 activation delay time.

[R4 Active at] r 45 ★

R4 status (output active level).

[R4 Holding time] - 4 H★

R4 holding delay time.

[R5 configuration] r 5 - Menu

Access

[Complete settings] → [Input/Output] → [R5 configuration]

About This Menu

Identical to [R1 configuration] r I - Menu (see page 133).

Following parameters can be accessed if VW3A3204 relay output option module has been inserted.

[R5 Assignment] r 5 ★

R5 assignment.

Identical to [R2 Assignment] r 2 (see page 135).

[R5 Delay time] - 5 d *

R5 activation delay time.

[R5 Active at] - 5 5 ★

R5 status (output active level).

[R5 Holding time] r 5 H★

R5 holding delay time.

[R6 configuration] r 5 - Menu

Access

[Complete settings] → [Input/Output] → [R6 configuration]

About This Menu

Identical to [R1 configuration] r I - Menu (see page 133).

Following parameters can be accessed if VW3A3204 relay output option module has been inserted.

[R6 Assignment] r 5 *

R6 assignment.

Identical to [R2 Assignment] r 2 (see page 135).

[R6 Delay time] - 5 d *

R6 activation delay time.

[R6 Active at] - 5 5 ★

R6 status (output active level).

[R6 Holding time] r B H★

R6 holding delay time.

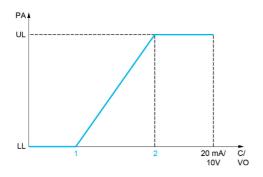
[AQ1 configuration] Fig. / - Menu

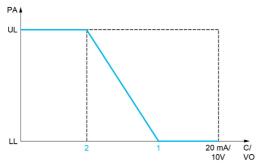
Access

[Complete settings] → [Input/Output] → [AQ1 configuration]

Minimum and Maximum Output Values

The minimum output value, in volts, corresponds to the lower limit of the assigned parameter and the maximum value corresponds to its upper limit. The minimum value may be greater than the maximum value.





PA Parameter assigned

C / VO Current or voltage output

UL Upper limit

LL Lower limit

1 [Min Output] # a L X or u a L X

2 [Max Output] HaHX or uaHX

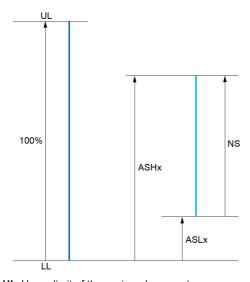
Scaling of the Assigned Parameter

The scale of the assigned parameter can be adapted in accordance with the requirements by modifying the values of the lower and upper limits with two parameters for each analog output.

These parameters are given in %. 100% corresponds to the total variation range of the configured parameter, so: 100% = upper limit - lower limit.

For example, **[Sign. torque]** 5 *L* **9** which varies between –3 and +3 times the rated torque, 100% corresponds to 6 times the rated torque.

- The [Scaling AQx min] # 5 L X parameter modifies the lower limit: new value = lower limit + (range x # 5 L X). The value 0% (factory setting) does not modify the lower limit.
- The [Scaling AQx max] # 5 H X) parameter modifies the upper limit: new value = lower limit + (range x # 5 L X). The value 100% (factory setting) does not modify the upper limit.
- [Scaling AQx min] # 5 L X must always be lower than [Scaling AQx max] # 5 H X.



UL Upper limit of the assigned parameter

LL Lower limit of the assigned parameter

NS New scale

1 *A5HX*

2 **H5LX**

Application Example

The value of the motor current at the AQ1 output is to be transferred with 0...20 mA, range 2 in motor, In motor being the equivalent of a 0.8 In drive.

- The [Motor Current] a [r parameter varies from 0 to 2 times the rated drive current, or a range of 2.5 times the rated drive current.
- [Scaling AQ1 min] # 5 L I must not modify the lower limit, which therefore remains at its factory setting of 0%.
- [Scaling AQ1 max] # 5 H / must modify the upper limit by 0.5x the rated motor torque, or 100 100/5 = 80% (new value = lower limit + (range x [Scaling AQ1 max] # 5 H /).

[AQ1 Assignment] F . I

AQ1 assignment.

Setting	Code / Value	Description
[Not Configured]	no	Not assigned
[Motor Current]	o C r	Current in the motor, from 0 to 2 In (In = rated drive current indicated in the Installation manual and on the drive nameplate)
[Motor Frequency]	o Fr	Output frequency, from 0 to [Max Frequency] & F r Factory Setting
[Ramp out.]	or P	From 0 to [Max Frequency] Ł F r
[Motor torq.]	tr9	Motor torque, from 0 to 3 times the rated motor torque
[Sign. torque]	5 6 9	Signed motor torque, between –3 and +3 times the rated motor torque. The + sign corresponds to the motor mode and the – sign to the generator mode (braking).
[sign ramp]	or 5	Signed ramp output, between –[Max Frequency] £ F r and +[Max Frequency] £ F r
[PID ref.]	a P S	PID controller reference between [Min PID reference] P, P, I and [Max PID reference] P, P, 2
[PID feedbk]	o P F	PID controller feedback between [Min PID feedback] P, F, I and [Max PID feedback] P, F, E
[PID error]	o P E	PID controller detected error between –5% and +5% of [Max PID feedback] P , F Z – [Min PID feedback] P , F I
[PID output]	aP,	PID controller output between [Low speed] L 5 P and [High speed] H 5 P
[Drive power]	o P r	Motor power, between 0 and 2.5 times [Nominal Motor Power] ¬P¬
[Mot thermal]	E H r	Motor thermal state, from 0 to 200% of the rated thermal state
[Drv thermal]	E H d	Drive thermal state, from 0 to 200% of the rated thermal state
[Sig. o/p frq.]	o F 5	Signed output frequency, between –[Max Frequency] £ F r and +[Max Frequency] £ F r
[Motor volt.]	u o P	Voltage applied to the motor, between 0 and [Nom Motor Voltage] u n 5
[Inlet Pressure Value]	P5 Iu	Inlet pressure value
[Outlet Pressure Value]	P52u	Outlet pressure value
[Installation Flow]	F5 Iu	Installation flow value

[AQ1 Type] A o I E

AQ1 type.

Setting	Code / Value	Description
[Voltage]	1 D u	0-10 Vdc
[Current]	ОЯ	0-20 mA Factory setting

[AQ1 min output] # a L /*

AQ1 current scaling parameter of 0%.

This parameter can be accessed if [AQ1 Type] H = I E is set to [Current] $\square H$.

Setting	Description
0.020.0 mA	Setting range Factory setting: 4.0 mA

[AQ1 max output] H □ H I ★

AQ1 current scaling parameter of 100%.

This parameter can be accessed if [AQ1 Type] H = I E is set to [Current] $\square H$.

Setting	Description
0.020.0 mA	Setting range
	Factory setting: 20.0 mA

[AQ1 min Output] u a L 1*

AQ1 voltage scaling parameter of 0%.

This parameter can be accessed if [AQ1 Type] H = I E is set to [Voltage] I = I E.

Setting	Description
0.010.0 Vdc	Setting range Factory setting: 0.0 Vdc

[AQ1 max Output] u a H /*

AQ1 voltage scaling parameter of 100%.

This parameter can be accessed if [AQ1 Type] H = I E is set to [Voltage] I = I E.

Setting	Description
0.010.0 Vdc	Setting range Factory setting: 10.0 Vdc

[Scaling AQ1 min] #5L /

AQ1 scaling parameter of 0%.

Scaling of the lower limit of the assigned parameter, as a % of the maximum possible variation.

Setting	Description
0.0100.0%	Setting range
	Factory setting: 0.0%

[Scaling AQ1 max] H 5 H I

AQ1 scaling parameter of 100%.

Scaling of the upper limit of the assigned parameter, as a % of the maximum possible variation.

Setting	Description
0.0100.0%	Setting range
	Factory setting: 100.0%

[AQ1 Filter] # - IF

AQ1 cutoff time of the low-filter.

Setting	Description
0.0010.00 s	Setting range Factory setting: 0.00 s

[AQ2 configuration] $H \square \supseteq -$ Menu

Access

[Complete settings] → [Input/Output] → [AQ2 configuration]

[AQ2 assignment] $H \square \supseteq$

AQ2 assignment.

Setting	Code / Value	Description
[Not Configured]	ne	Not assigned
[Motor Current]	a[r	Current in the motor, from 0 to 2 In (In = rated drive current indicated in the Installation manual and on the drive nameplate) Factory Setting
[Motor Frequency]	o Fr	Output frequency, from 0 to [Max Frequency] £ F r
[Ramp out.]	or P	From 0 to [Max Frequency] & Fr
[Motor torq.]	Er9	Motor torque, from 0 to 3 times the rated motor torque
[Sign. torque]	5 6 9	Signed motor torque, between –3 and +3 times the rated motor torque. The + sign corresponds to the motor mode and the – sign to the generator mode (braking).
[sign ramp]	or 5	Signed ramp output, between –[Max Frequency] £ F r and +[Max Frequency] £ F r
[PID ref.]	oP5	PID controller reference between [Min PID reference] P , P I and [Max PID reference] P , P 2
[PID feedbk]	o P F	PID controller feedback between [Min PID feedback] P , F I and [Max PID feedback] P , F 2
[PID error]	a P E	PID controller detected error between –5% and +5% of [Max PID feedback] P , F Z – [Min PID feedback] P , F I
[PID output]	oP,	PID controller output between [Low speed] L 5 P and [High speed] H 5 P
[Drive power]	o P r	Motor power, between 0 and 2.5 times [Nominal Motor Power] n P r
[Mot thermal]	E H r	Motor thermal state, from 0 to 200% of the rated thermal state
[Drv thermal]	E H d	Drive thermal state, from 0 to 200% of the rated thermal state
[Sig. o/p frq.]	o F 5	Signed output frequency, between –[Max Frequency] <i>E F r</i> and +[Max Frequency] <i>E F r</i>
[Motor volt.]	u o P	Voltage applied to the motor, between 0 and [Nom Motor Voltage] u n 5

[AQ2 Type] A □ 2 Ł

AQ2 type.

Setting	Code / Value	Description
[Voltage]	100	0-10 Vdc
[Current]	OA	0-20 mA Factory setting

[AQ2 min output] H □ L 2 ★

AQ2 current scaling parameter of 0%.

This parameter can be accessed if [AQ2 Type] $H \circ 2 E$ is set to [Current] D H.

Identical to [AQ1 min output] # a L I (see page 142).

[AQ2 max output] A □ H ≥ ★

AQ2 current scaling parameter of 100%.

This parameter can be accessed if [AQ2 Type] $H \circ 2 E$ is set to [Current] $\square H$.

Identical to [AQ1 max output] # a H I (see page 143).

[AQ2 min Output] u a L 2 *

AQ2 voltage scaling parameter of 0%.

This parameter can be accessed if [AQ2 Type] $A \cup B \subseteq E$ is set to [Voltage] $A \cup B \subseteq E$.

Identical to [AQ1 min Output] u a L I (see page 143).

[AQ2 max Output] 🔟 🛭 H 🛭 🖈

AQ2 voltage scaling parameter of 100%.

This parameter can be accessed if [AQ2 Type] $H \circ 2 E$ is set to [Voltage] $I \circ u$.

Identical to [AQ1 max Output] u = H I (see page 143).

[Scaling AQ2 min] A 5 L ≥

AQ2 scaling parameter of 0%.

Identical to [Scaling AQ1 min] # 5 L I (see page 143).

[Scaling AQ2 max] F 5 H ≥

AQ2 scaling parameter of 100%.

Identical to [Scaling AQ1 max] # 5 H I (see page 143).

[AQ2 Filter] A □ 2 F

AQ2 cutoff time of the low-filter.

Identical to [AQ1 Filter] F . IF (see page 143).

[Command and Reference]

[Command and Reference] [r P - Menu

Access

[Complete settings] → [Command and Reference]

Command and Reference Channels Parameter Can Be Accessed

Run commands (forward, reverse, stop, and so on) and references can be sent using the following channels:

Command	Reference
Terminals: Digital inputs DI	Terminals: Analog inputs AI, pulse input
Plain Text Display Terminal	Plain Text Display Terminal
Integrated Modbus	Integrated Modbus
Fieldbus module	Fieldbus module
-	+/- speed via the Plain Text Display Terminal

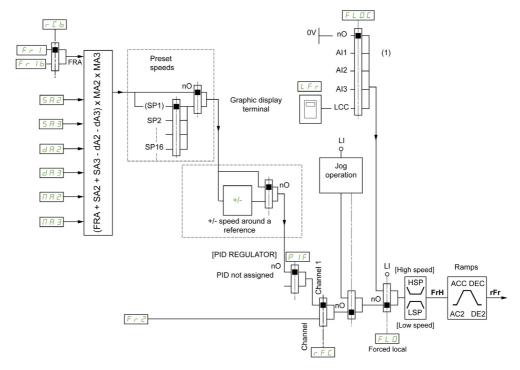
NOTE: The stop keys on the Plain Text Display Terminal can be programmed as non-priority keys. A stop key can only have priority if the **[Stop Key Enable]** *P 5 L* parameter menu is set to **[Yes]** *9 E 5*.

The behavior of the drive can be adapted according to requirements:

- [Not separ.] 5 , Π: Command and reference are sent via the same channel.
- [Separate] 5 E P: Command and reference may be sent via different channels. In these configurations, control via the communication bus is performed in accordance with the DRIVECOM standard with only 5 freely assignable bits (see communication parameter manual). The application functions cannot be accessed via the communication interface.
- [I/O profile] In: The command and the reference can come from different channels. This configuration both simplify and extends use via the communication interface. Commands may be sent via the digital inputs on the terminals or via the communication bus. When commands are sent via a bus, they are available on a word, which acts as virtual terminals containing only digital inputs. Application functions can be assigned to the bits in this word. More than one function can be assigned to the same bit.

NOTE: Stop commands from the Plain Text Display Terminal remain active even if the terminals are not the active command channel.

Reference Channel for [Not separ.] 5 , Π , [Separate] 5 E P and [I/O profile] , Π Configurations, PID Not Configured



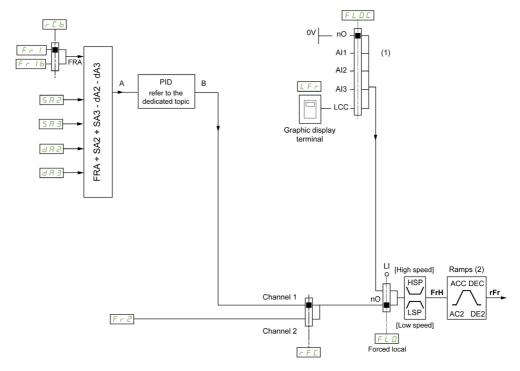
(1) Note: Forced local is not active in [I/O].



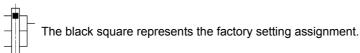
The black square represents the factory setting assignment.

- *F r I*: terminals (including I/O extension module), Plain Text Display Terminal, integrated Modbus, communication card, and fieldbus module.
- Fr Ib, for 5 EP and ID: terminals (including I/O extension module), Plain Text Display Terminal, integrated Modbus, and fieldbus module.
- F_r 16, for 5, Π : Plain Text Display Terminal, only accessible if F_r 1 = terminals.
- 5 R 2, 5 R 3, d R 2, d R 3, Π R 2, Π R 3: terminals (including I/O extension module), Plain Text Display Terminal, integrated Modbus, communication card, and fieldbus module.
- Fr 2: terminals (including I/O extension module), Plain Text Display Terminal, integrated Modbus, +/– speed, and fieldbus module.

Reference Channel for [Not separ.] 5 , Π , [Separate] 5 E P and [I/O profile] , Π Configurations, PID Configured with PID References at the Terminals



- (1) Note: Forced local is not active in [I/O profile].
- (2) Ramps not active if the PID function is active in automatic mode.



F r I: terminals (including I/O extension module), Plain Text Display Terminal, integrated Modbus, communication card, and fieldbus module.

F r I b, for 5 E P and I a: terminals (including I/O extension module), Plain Text Display Terminal, integrated Modbus, and fieldbus module.

 F_r 1b, for 5 I_r : Plain Text Display Terminal, only accessible if F_r I_r = terminals.

5 R 2, 5 R 3, d R 2, d R 3: terminals (including I/O extension module), Plain Text Display Terminal, integrated Modbus, communication card, and fieldbus module.

F r 2: terminals (including I/O extension module), Plain Text Display Terminal, integrated Modbus, +/– speed, and fieldbus module.

[Low Speed] L 5 P

Motor frequency at low speed.

Setting ()	Description
0500 Hz	Setting range
	Factory setting: 0 Hz

[High Speed] H 5 P

Motor frequency at high speed.

Setting ()	Description
0500 Hz	Setting range Factory setting: 500 Hz

[Ref Freq 1 Config] Fr /

Configuration reference frequency 1.

Setting	Code / Value	Description
[Not Configured]	no	Not assigned
[Al1]	A . I	Analog input Al1 Factory Setting
[AI2][AI3]	A 12A 13	Analog input Al2Al3
[AI4][AI5]	A 14A 15	Analog input Al4Al5 if VW3A3203 I/O extension module has been inserted
[Ref Frequency via DI]	uPdE	Up/Down function is assigned by DIx
[HMI]	LCC	Reference Frequency via remote terminal
[Modbus]	ПЧЬ	Reference frequency via Modbus
[Com. Module]	n E Ł	Reference frequency via fieldbus module if a fieldbus module has been inserted
[DI5 PulseInput Assignment][DI6 PulseInput Assignment]	P 15P 16	Digital input DI5DI6 used as pulse input

[Reverse Disable] r in

Reverse directions disable.

Lock of movement in reverse direction does not apply to direction requests sent by digital inputs.

Reverse direction requests sent by digital inputs are taken into account.

Reverse direction requests sent by the Plain Text Display Terminal or sent by the line are not taken into account.

Any reverse speed reference originating from the PID, summing input, and so on, is interpreted as a zero reference (0 Hz).

Setting	Code / Value	Description
[No]	no	No
[Yes]	9 E 5	Yes
		Factory Setting

[Stop Key Enable] P 5 L

Stop key enable.

A WARNING

LOSS OF CONTROL

This function disables the Stop key of the Display Terminal if the setting of the parameter [Command Channel] $\mathcal{L} \Pi d \mathcal{L}$ is not $H \Pi$.

Only set this parameter to n = 1 if you have implemented appropriate alternative stop functions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

This is a freewheel stop. If the active command channel is the Plain Text Display Terminal, the stop is performed according to the **[Type of stop]** 5 *E E* irrespective of the configuration of **[Stop Key Enable]** *P* 5 *E* .

Setting	Code / Value	Description
[No]	no	-
[Yes]	4 E S	Gives priority to the STOP key on the Plain Text Display Terminal when the Plain Text Display Terminal is not enabled as the command channel Factory Setting

[Control Mode] [H[F]

Mixed mode configuration.

A WARNING

UNANTICIPATED EQUIPMENT OPERATION

Disabling [I/O profile] , a resets the drive to the factory settings.

• Verify that restoring the factory settings is compatible with the type of wiring used.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Setting	Code / Value	Description
[Not separ.]	5 , П	Reference and command, not separate Factory Setting
[Separate]	SEP	Separate reference and command. This assignment cannot be accessed in [I/O profile] , p
[I/O profile]	10	I/O profile

[Command Switching] [5 *

Control channel switch.

This parameter can be accessed if [Control Mode] \mathcal{L} \mathcal{H} \mathcal{L} \mathcal{F} is set to [Separate] 5 \mathcal{E} \mathcal{P} or to [I/O profile]

If the assigned input or bit is at 0, channel [Cmd channel 1] $\mathcal{L} d \mathcal{I}$ is active. If the assigned input or bit is at 1, channel [Cmd channel 2] $\mathcal{L} d \mathcal{I}$ is active.

A WARNING

UNANTICIPATED EQUIPMENT OPERATION

This parameter can cause unintended movements, for example an inversion of the direction of the rotation of the motor, a sudden acceleration or a stop.

- Verify that the setting of this parameter does not cause unintended movements.
- Verify that the setting of this parameter does not result in unsafe conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Setting	Code / Value	Description
[Command channel 1]	САІ	Command channel = channel 1 (for CCS) Factory setting
[Command channel 2]	C 4 5	Command channel = channel 2 (for CCS)
[DI11][DI16]	L , I IL , 16	Digital input DI11DI16 if VW3A3203 I/O extension module has been inserted
[C101][C110]	C 10 1C 1 10	Virtual digital input CMD1.01CMD1.10 with integrated Modbus Serial in [I/O profile] . p configuration
[C111][C115]	C	Virtual digital input CMD1.11CMD1.15 with integrated Modbus Serial regardless of configuration
[C301][C310]	C 3 0 1 C 3 1 0	Virtual digital input CMD3.01CMD3.10 with a fieldbus module in [I/O profile] , p configuration
[C311][C315]	C 3 I I C 3 I S	Virtual digital input CMD3.11CMD3.15 with a fieldbus module regardless of configuration

[Cmd channel 1] [d | *

Command channel 1 assignment.

This parameter can be accessed if [Control Mode] [H [F is set to [Separate] 5 E P or [I/O profile] , a.

Setting	Code / Value	Description
[Terminals]	t E r	Terminal block source Factory Setting
[HMI]	LCC	Reference Frequency via remote terminal
[Modbus]	ПЧЬ	Reference frequency via Modbus
[Com. Module]	n E Ł	Reference frequency via fieldbus module if a fieldbus module has been inserted

[Cmd channel 2] [d 2 *

Command channel 2 assignment.

This parameter can be accessed if [Control Mode] $\mathcal{L} H \mathcal{L} F$ is set to [Separate] 5 $\mathcal{E} P$ or [I/O profile] $\mathcal{L} \mathcal{L}$. Identical to [Cmd channel 1] $\mathcal{L} \mathcal{L} \mathcal{L} \mathcal{L}$ with factory setting [Modbus] $\mathcal{L} \mathcal{L} \mathcal{L} \mathcal{L}$.

[Freq Switch Assign] r F [

A WARNING

UNANTICIPATED EQUIPMENT OPERATION

This parameter can cause unintended movements, for example an inversion of the direction of the rotation of the motor, a sudden acceleration or a stop.

- Verify that the setting of this parameter does not cause unintended movements.
- Verify that the setting of this parameter does not result in unsafe conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

frequency switching assignment.

If the assigned input or bit is at 0, channel [Ref Freq Channel 1] Fr I is active.

If the assigned input or bit is at 1, channel [Ref Freq Channel 2] Fr 2 is active.

Setting	Code / Value	Description
[Ref Freq Channel 1]	FrI	Reference channel = channel 1 (for RFC)
[Ref Freq Channel 2]	Fr2	Reference channel = channel 2 (for RFC)
[DI1][DI6]	L 1 1L 16	Digital input DI1DI6
[DI11][DI16]	L 1 1 1L 1 1 1 5	Digital input DI11DI16 if VW3A3203 I/O extension module has been inserted
[C101][C110]	C 10 1C 110	Virtual digital input CMD1.01CMD1.10 with integrated Modbus Serial in [I/O profile] , p configuration
[C111][C115]	C	Virtual digital input CMD1.11CMD1.15 with integrated Modbus Serial regardless of configuration
[C301][C310]	C 3 0 1 C 3 1 0	Virtual digital input CMD3.01CMD3.10 with a fieldbus module in [I/O profile] , a configuration
[C311][C315]	C 3 I IC 3 IS	Virtual digital input CMD3.11CMD3.15 with a fieldbus module regardless of configuration

[Ref Freq 2 Config] F r 2

Configuration reference frequency 2.

Setting	Code / Value	Description
[Not Configured]	no	Not assigned. If [Control Mode] $EHEF$ is set to [Not separ.] 5 IR , the command is at the terminals with a zero reference. If [Control Mode] $EHEF$ is set to [Separate] EF or [I/O profile] IR , the reference is zero. Factory Setting
[AI1][AI3]	A , IA , 3	Analog input Al1Al3
[AI4][AI5]	A 14A 15	Analog input Al4Al5 if VW3A3203 I/O extension module has been inserted
[Ref Frequency via DI]	uPdE	+/- speed command assigned to DIx
[Ref.Freq- Rmt.Term]	LCC	Display terminal source
[Ref. Freq-Modbus]	ПЧЬ	Reference frequency via Modbus
[Ref. Freq-Com. Module]	n E Ł	Reference frequency via fieldbus module if a fieldbus module has been inserted
[PulseInput Assignment On DI5][PulseInput Assignment On DI6]	P :5P :6	Digital input DI5DI6 used as pulse input

[Copy Ch1-Ch2] [a P

Copy channel 1 reference frequency to channel 2.

A WARNING

UNANTICIPATED EQUIPMENT OPERATION

This parameter can cause unintended movements, for example an inversion of the direction of the rotation of the motor, a sudden acceleration or a stop.

- Verify that the setting of this parameter does not cause unintended movements.
- Verify that the setting of this parameter does not result in unsafe conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Can be used to copy the current reference and/or the command with switching in order to avoid speed surges, for example.

If [Control Mode] Γ H Γ F (see page 150) is set to [Not separ.] 5 Γ or [Separate] 5 Γ P, copying is possible only from channel 1 to channel 2.

Setting	Code / Value	Description
[No]	ne	No copy Factory Setting
[Reference Frequency]	5 P	Copy reference
[Command]	СА	Copy command
[Cmd + Ref Frequency]	ALL	Copy reference and command

As the Plain Text Display Terminal may be selected as the command and/or reference channel, its action modes can be configured.

Comments:

- The Plain Text Display Terminal command/reference is only active if the command and/or reference channels from the terminal are active except for BMP with Local/ Remote key (command via the Plain Text Display Terminal), which takes priority over these channels. Press Local/ Remote key again to revert control to the selected channel.
- Command and reference via the Plain Text Display Terminal are impossible if the latter is connected to more than one drive.
- The preset PID reference functions can only be accessed if [Control Mode] [H [F is set to [Not separ.] 5 , Π or [Separate] 5 E P.
- The command via the Plain Text Display Terminal can be accessed regardless of the [Control Mode]
 C H C F.

[Forced Local Freq] F L a [

Forced local reference source assignment.

Setting	Code / Value	Description
[Not Configured]	no	Not assigned (control via the terminals with zero reference) Factory Setting
[AI1][AI3]	A , IA , 3	Analog input Al1Al3
[AI4][AI5]	Я 14Я 15	Analog input Al4Al5 if VW3A3203 I/O extension module has been inserted
[Ref.Freq-Rmt.Term]	LCC	Display terminal source
[PulseInput Assignment On DI5][PulseInput Assignment On DI6]	P 15P 16	Digital input DI5DI6 used as pulse input

[Time-out Forc. Local] F L = E

Time for channel confirmation after forced local.

This parameter can be accessed if [Forced Local Assign] F L a is not set to [No] n a.

Setting ()	Description	
0.130.0 s	Setting range Factory setting: 10.0 s	

[Forced Local Assign] F L a

Forced local assignment.

Forced local mode is active when the input is at state 1.

[Forced Local Assign] F L a is forced to [No] n a if [Control Mode] [H[F] is set to [I/O profile] .a.

Setting	Code / Value	Description
[Not Assigned]	no	Not assigned Factory setting
[DI1][DI6]	L , 1L , 5	Digital input DI1DI6
[DI11][DI16]	L 1 1 1 L 1 1 1 6	Digital input DI11DI16 if VW3A3203 I/O extension module has been inserted

[Generic functions] - [Ramp]

[Ramp] r H П P - Menu

Access

[Complete settings] → [Generic functions] → [Ramp]

[Ramp Type] r P E

Type of ramp.

Setting	Code / Value	Description
[Linear]	Lin	Linear ramp Factory setting
[S-Ramp]	5	S ramp
[U-Ramp]	u	U ramp
[Customized]	C u 5	Customer ramp

[Ramp increment] Inc

This parameter is valid for [Acceleration] A E C, [Deceleration 2] A E C, [Acceleration 2] A E C and [Deceleration 2] A E C.

This table presents the parameter settings:

Setting ()	Code / Value	Description
[0.01]	O.O I	Ramp up to 99.99 seconds
[0.1]	O. 1	Ramp up to 999.9 seconds Factory setting
[1]	1	Ramp up to 6,000 seconds

[Acceleration] A [[

Time to accelerate from 0 to the [Rated Motor Freq] F r 5.

To have repeatability in ramps, the value of this parameter must be set according to the possibility of the application.

Setting ()	Description	
0.006,000.00 s ⁽¹⁾	Setting range Factory setting: 30.0 s	
(1) Range 0.01 to 99.99 s or 0.1 to 999.9 s or 1 to 6,000 according to [Ramp increment] .nr		

[Deceleration] d E [

Time to decelerate from the [Rated Motor Freq] F r 5 to 0.

To have repeatability in ramps, the value of this parameter must be set according to the possibility of the application.

Setting ()	Description
0.006,000.00 s ⁽¹⁾	Setting range Factory setting: 30.0 s
(1) Range 0.01 to 99.99 s or 0.1 to 999.9 s or 1 to 6,000 according to [Ramp increment]	

[Begin Acc round] Ł R /★

Rounding of start of acceleration ramp as a % of the [Acceleration] # [or [Acceleration 2] # [2 ramp time

Can be set from 0 to 100%.

This parameter can be accessed if the [Ramp type] r P L is set to [Customized] [u 5.

Setting ()	Description
0100%	Setting range Factory setting: 10%

[End Acc round] Ł 用 ≥ ★

Rounding of end of acceleration ramp as a % of the [Acceleration] $H \ \mathcal{L}$ or [Acceleration 2] $H \ \mathcal{L}$ ramp time.

Can be set between 0 and (100% - [Begin Acc round] *E FI 1*).

This parameter can be accessed if the [Ramp type] r P E is set to [Customized] $E \sqcup S$.

Setting ()	Description
0100%	Setting range Factory setting: 10%

[Begin Dec round] Ł A 3★

Rounding of start of deceleration ramp as a % of the [Deceleration] $d E \mathcal{L}$ or [Deceleration 2] $d E \mathcal{L}$ ramp time.

Can be set from 0 to 100%.

This parameter can be accessed if the [Ramp type] r P E is set to [Customized] E u S.

Setting ()	Description
0100%	Setting range Factory setting: 10%

[End Dec round] *E R 4* ★

Rounding of end of deceleration ramp as a % of the [Deceleration] d E C or [Deceleration 2] d E C ramp time.

Can be set between 0 and (100% - [Begin Dec round] & A 3).

This parameter can be accessed if the [Ramp type] r P L is [Customized] [u 5.

Setting ()	Description
0100%	Setting range Factory setting: 10%

[SwitchRamp2] FrE

Ramp switching threshold

The second ramp is switched if the value of [SwitchRamp2] F r E is not 0 (0 deactivates the function) and the output frequency is greater than [SwitchRamp2] F r E.

Threshold ramp switching can be combined with [Ramp switch ass.] r P 5 switching as follows:

DI or Bit	Frequency	Ramp
0	< Frt	ACC, dEC
0	> Frt	ACC, dE2
1	< Frt	ACC, dE2
1	> Frt	ACC, dE2

Setting ()	Description
0.0500.0 Hz	Setting range Factory setting: 0.0 Hz

[Ramp switch ass.] r P 5

Ramp switching.

Setting	Code / Value	Description
[Not Assigned]	ne	Not assigned Factory setting
[DI1][DI6]	L , IL , 6	Digital input DI1DI6
[DI11][DI16]	L , I IL , 16	Digital input DI11DI16 if VW3A3203 I/O extension module has been inserted
[CD00][CD10]	C 4 0 0 C 4 1 0	Virtual digital input CMD.0CMD.10 in [I/O profile] , a configuration
[CD11][CD15]	C d I IC d IS	Virtual digital input CMD.11CMD.15 regardless of configuration
[C101][C110]	C 10 1C 1 10	Virtual digital input CMD1.01CMD1.10 with integrated Modbus Serial in [I/O profile] , a configuration
[C111][C115]	C	Virtual digital input CMD1.11CMD1.15 with integrated Modbus Serial regardless of configuration
[C301][C310]	C 3 O I C 3 I O	Virtual digital input CMD3.01CMD3.10 with a fieldbus module in [I/O profile] , a configuration
[C311][C315]	C 3 I IC 3 IS	Virtual digital input CMD3.11CMD3.15 with a fieldbus module regardless of configuration

[Acceleration 2] F [2 *

Time to accelerate from 0 to the **[Rated motor freq.]** $F \sim 5$. To have repeatability in ramps, the value of this parameter must be set according to the possibility of the application.

This parameter can be accessed if **[SwitchRamp2]** F r E is greater than 0 or if **[Ramp switch ass.]** r P 5 is assigned.

Setting ()	Description
0.06,000 s ⁽¹⁾	Setting range Factory setting: 5.0 s
(1) Range 0.01 to 99.99 s or 0.1 to 999.9 s or 16,000 s according to [Ramp increment] .nr.	

[Deceleration 2] d E 2 ★

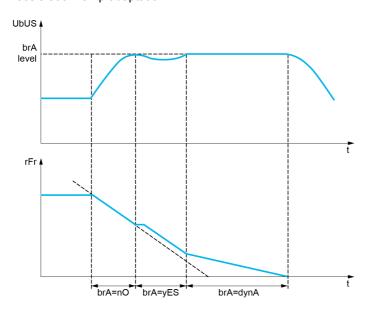
Time to decelerate from the **[Rated motor freq.]** F r 5 to 0. To have repeatability in ramps, the value of this parameter must be set according to the possibility of the application.

This parameter can be accessed if [SwitchRamp2] F r E is greater than 0 or if [Ramp switch ass.] r P 5 is assigned.

Setting ()	Description
0.06,000 s ⁽¹⁾	Setting range Factory setting: 5.0 s
(1) Range 0.01 to 99.99 s or 0.1 to 999.9 s or 16,000 s according to [Ramp increment]	

[Dec.Ramp Adapt] br A

Deceleration ramp adaptation.



Activating this function automatically adapts the deceleration ramp, if this has been set at a too low value according to the inertia of the load, which can cause an overvoltage detected error.

The function is incompatible with applications requiring:

- Positioning on a ramp
- The use of a braking resistor (the resistor would not operate correctly).

Setting	Code / Value	Description
[No]	no	Function inactive
[Yes]	4 E S	Function active, for applications that do not require strong deceleration Factory setting
[High torq. A]	d Y n A	Addition of a constant current flow component. The [High torq. A] d y n R selection appears depending on the rating of the drive and [Motor control type] [E E . It enables stronger deceleration to be obtained than with [Yes] y E 5. Use comparative testing to determine your selection When [Dec.Ramp Adapt] b r R is configured on [High torq. x] d y n X, the dynamic performances for braking are improved by the addition of a current flow component. The aim is to increase the iron loss and magnetic energy stored in the motor.

[Generic functions] - [+/- speed]

[+/- speed] u P d - Menu

Access

[Complete settings] → [Generic functions] → [+/- speed]

About This Menu

This function can be accessed if reference channel [Ref Freq 2 Config] $F r \ge$ is set to [Ref Frequency via DI] u P d E

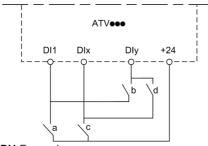
NOTE: This function cannot be used with some other functions.

2 types of operations are available:

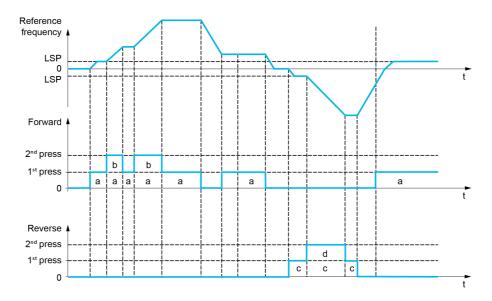
- **Use of single action keys:** 2 digital inputs are required in addition to the operating directions. The input assigned to the "+ speed" command increases the speed, the input assigned to the "- speed" command decreases the speed.
- Use of double action keys: Only one digital input assigned to "+ speed" is required.
- +/- speed with double-press buttons:

Description: 1 button pressed twice (2 steps) for each direction of rotation. A contact closes each time the button is pressed.

Setting	Released (- Speed)	First Press (Speed Maintained)	Second Press (Faster)
Forward button	_	а	a and b
Reverse button	-	С	c and d



DI1 Forward DIx Reverse DIy + speed



Do not use this +/- speed type with a 3-wire control.

Whichever type of operation is selected, the max. speed is set by [High speed] H 5 P.

NOTE: If the reference is switched via [Freq Switch Assign] r F Γ from any reference channel to another reference channel with "+/- speed", the value of reference [Motor Frequency] r Γ Γ (after ramp) may be copied at the same time in accordance with the [Copy Ch1-Ch2] Γ Γ P parameter.

If the reference is switched via **[Freq Switch Assign]** r F r from one reference channel to any other reference channel with "+/- speed", the value of reference **[Motor Frequency]** r r (after ramp) is copied at the same time.

This helps to prevent the speed from being incorrectly reset to zero when switching takes place.

[+ Speed Assign] u 5 P

Increase speed input assignment.

Function active if the assigned input or bit is at 1.

Setting	Code / Value	Description
[Not Assigned]	na	Not assigned Factory setting
[DI1][DI6]	L , 1L , 6	Digital input DI1DI6
[DI11][DI16]	L 1 1 1L 1 16	Digital input DI11DI16 if VW3A3203 I/O extension module has been inserted
[CD00][CD10]	C d O O C d I O	Virtual digital input CMD.0CMD.10 in [I/O profile] , a configuration
[CD11][CD15]	[d [d 5	Virtual digital input CMD.11CMD.15 regardless of configuration
[C101][C110]	C 10 1C 1 10	Virtual digital input CMD1.01CMD1.10 with integrated Modbus Serial in [I/O profile] , p configuration
[C111][C115]	C	Virtual digital input CMD1.11CMD1.15 with integrated Modbus Serial regardless of configuration
[C301][C310]	C 3 0 1 C 3 1 0	Virtual digital input CMD3.01CMD3.10 with a fieldbus module in [I/O profile] , p configuration
[C311][C315]	C 3 I I C 3 IS	Virtual digital input CMD3.11CMD3.15 with a fieldbus module regardless of configuration

[- Speed Assign] d 5 P

Down speed input assignment. See the assignment conditions.

Function active if the assigned input or bit is at 1.

[Ref Frequency Save] 5 £ r *

Reference frequency saves. This parameter can be accessed if **[+ Speed Assign]** $u \in P$ is not set to **[Not Assigned]** $n \in B$.

Associated with the "+/- speed" function, this parameter can be used to save the reference:

- When the run commands disappear (saved to RAM).
- When the supply mains or the run commands disappear (saved to EEPROM).

Therefore, next time the drive starts up, the speed reference is the last reference frequency saved.

Setting	Code / Value	Description
[No save]	no	Not saved Factory setting
[Save to RAM]	гЯП	+/- speed with saving of the reference frequency in RAM
[Save to EEprom]	EEP	+/- speed with saving of the reference frequency in EEPROM

[Generic functions] - [Stop configuration]

[Stop configuration] 5 Ł Ł - Menu

Access

[Complete settings] → [Generic functions] → [Stop configuration]

About This Menu

NOTE: This function cannot be used with some other functions.

[Type of stop] 5 L L

Normal stop mode.

Stop mode on disappearance of the run command or appearance of a stop command.

Setting	Code / Value	Description
[On Ramp]	rNP	Stop on ramp, f [Brake assignment] $b L C$ or [Low speed time out] $b L C$ are configured, only a [On Ramp] $c R P$ is possible. Factory setting
[Fast stop]	FSE	Fast stop Available if [Motor fluxing] F L u is set to [Continuous] F L L,
[Freewheel]	n 5 E	Freewheel stop
[DC injection]	dC ,	DC injection stop.

[Freewheel stop ass.] n 5 Ł

Freewheel stop.

The stop is activated when the input or the bit changes to 0. If the input returns to state 1 and the run command is still active, the motor will only restart if [2/3-wire control] $E \ E$ is set to [2-Wire Control] $E \ E$ and if [2-wire type] $E \ E$ is set to [Level] $E \ E$ or [Fwd priority] $P \ F \ D$. If not, a new run command must be sent.

Setting	Code / Value	Description
[Not Assigned]	no	Not assigned Factory setting
[CD00][CD10]	C 4 0 0 C 4 1 0	Virtual digital input CMD.0CMD.10 in [I/O profile] , a configuration
[CD11][CD15]	C d I IC d 15	Virtual digital input CMD.11CMD.15 regardless of configuration
[C101][C110]	C 10 1C 1 10	Virtual digital input CMD1.01CMD1.10 with integrated Modbus Serial in [I/O profile] , p configuration
[C111][C115]	C	Virtual digital input CMD1.11CMD1.15 with integrated Modbus Serial regardless of configuration
[C301][C310]	C 3 0 1 C 3 1 0	Virtual digital input CMD3.01CMD3.10 with a fieldbus module in [I/O profile] , configuration
[C311][C315]	C 3 I IC 3 IS	Virtual digital input CMD3.11CMD3.15 with a fieldbus module regardless of configuration
[DI1 (Low level)][DI6 (Low level)]	L ILL 6L	Digital input DI1DI6 used at low level
[DI11 (Low level)][DI16 (Low level)]	L I ILL I6L	Digital input DI11DI16 used at low level if VW3A3203 I/O extension module has been inserted

[Freewheel stop Thd] FFE*

Freewheel stop threshold.

Speed threshold below which the motor switches to freewheel stop.

This parameter supports switching from a ramp stop or a fast stop to a freewheel stop below a low speed threshold.

This parameter can be accessed if:

- [Type of stop] 5 £ £ is set to [Fast stop] F 5 £ or [Ramp stop] r \(\Price \text{P} \), and
- [Auto DC Injection] Fd C is configured.

Setting ()	Description
0.2500.0 Hz	Setting range Factory setting: 0.2 Hz

[Fast stop ass.] F 5 Ł

Fast stop.

The stop is activated when the input changes to 0 or the bit changes to 1 (bit in [I/O profile] , a at 0).

If the input returns to state 1 and the run command is still active, the motor will only restart if [2/3-wire control] $E \ E$ is set to [2-Wire Control] $E \ E$ and if [2-wire type] $E \ E$ is set to [Level] $E \ E$ or [Fwd priority] $P \ F \ B$.

If not, a new run command must be sent.

NOTE: This function cannot be used with some other functions.

Setting	Code / Value	Description
[Not Assigned]	no	Not assigned Factory setting
[CD00][CD10]	C 4 0 0 C 4 1 0	Virtual digital input CMD.0CMD.10 in [I/O profile] , a configuration
[CD11][CD15]	C d I IC d 15	Virtual digital input CMD.11CMD.15 regardless of configuration
[C101][C110]	C 10 1C 1 10	Virtual digital input CMD1.01CMD1.10 with integrated Modbus Serial in [I/O profile] , p configuration
[C111][C115]	C	Virtual digital input CMD1.11CMD1.15 with integrated Modbus Serial regardless of configuration
[C301][C310]	C 3 0 1 C 3 1 0	Virtual digital input CMD3.01CMD3.10 with a fieldbus module in [I/O profile] , p configuration
[C311][C315]	C 3 I I C 3 I S	Virtual digital input CMD3.11CMD3.15 with a fieldbus module regardless of configuration
[DI1 (Low level)][DI6 (Low level)]	L ILL 6L	Digital input DI1DI6 used at low level
[DI11 (Low level)][DI16 (Low level)]	L I ILL I6L	Digital input DI11DI16 used at low level if VW3A3203 I/O extension module has been inserted

[Ramp Divider] d [F ★

Fast Stop deceleration ramp reduction coefficient.

This parameter can be accessed if:

- [Type of stop] 5 L L is set to [Fast stop] F 5 L, or
- [Fast stop assign.] F 5 L is not set to [No] no

The ramp that is enabled ([Deceleration] d E C or [Deceleration 2] d E Z) is then divided by this coefficient when stop requests are sent.

Value 0 corresponds to a minimum ramp time.

Setting ()	Description
010	Setting range Factory setting: 4

[DC Injection Assign] d [,

DC injection brake assignment.

A WARNING

UNINTENDED MOVEMENT

- Do not use DC injection to generate holding torque when the motor is at a standstill.
- Use a holding brake to keep the motor in the standstill position.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

DC injection braking is initiated when the assigned input or bit changes to state 1.

If the input returns to state 0 and the run command is still active, the motor will only restart if [2/3-wire control] $E \ E$ is set to [2-Wire Control] $E \ E$ and if [2-wire type] $E \ E$ is set to [Level] $E \ E$ or [Fwd priority] $P \ F \ \Box$. If not, a new run command must be sent.

NOTE: This function cannot be used with some other functions.

Setting	Code / Value	Description
[Not Assigned]	no	Not assigned Factory setting
[DI1][DI6]	L 1 1L 16	Digital input DI1DI6
[DI11][DI16]	L 1 1 1L 1 1 1 5	Digital input DI11DI16 if VW3A3203 I/O extension module has been inserted
[CD00][CD10]	C 4 0 0 C 4 1 0	Virtual digital input CMD.0CMD.10 in [I/O profile] , a configuration
[CD11][CD15]	C d I IC d I5	Virtual digital input CMD.11CMD.15 regardless of configuration
[C101][C110]	C 10 1C 1 10	Virtual digital input CMD1.01CMD1.10 with integrated Modbus Serial in [I/O profile] , p configuration
[C111][C115]	C	Virtual digital input CMD1.11CMD1.15 with integrated Modbus Serial regardless of configuration
[C301][C310]	C 3 0 1 C 3 1 0	Virtual digital input CMD3.01CMD3.10 with a fieldbus module in [I/O profile] , p configuration
[C311][C315]	C 3 I I C 3 I S	Virtual digital input CMD3.11CMD3.15 with a fieldbus module regardless of configuration

[DC inject. level 1] , d [★

DC injection current.

NOTICE

OVERHEATING AND DAMAGE TO THE MOTOR

Verify that the connected motor is properly rated for the DC injection current to be applied in terms of amount and time in order to avoid overheating and damage to the motor.

Failure to follow these instructions can result in equipment damage.

Level of DC injection braking current activated via digital input or selected as stop mode.

This parameter can be accessed if:

- [Type of stop] 5 L L is set to [DC injection] d [1, or
- [DC.Brake DI] d[is not set to [No] na.

Setting ()	Description
0.11.41 ln ⁽¹⁾	Setting range This setting is independent of the [Auto DC Injection] $H d L$ - function. Factory setting: 0.7 ln ⁽¹⁾
(1) In corresponds to the rated drive current indicated in the Installation Manual and on the drive nameplate.	

[DC injection time 1] Ed , *

DC injection time 1.

NOTICE

OVERHEATING AND DAMAGE TO THE MOTOR

Verify that the connected motor is properly rated for the DC injection current to be applied in terms of amount and time in order to avoid overheating and damage to the motor.

Failure to follow these instructions can result in equipment damage.

Maximum current injection time [DC inject. level 1] , d [. After this time, the injection current becomes [DC inject. level 2] , d [. 2].

This parameter can be accessed if:

- [Type of stop] 5 £ £ is set to [DC injection] d [1, or
- [DC.Brake DI] d[, is not set to [No] n a.

Setting ()	Description
0.130 s	Setting range This setting is independent of the [Auto DC Injection] $H d E$ - function. Factory setting: 0.5 s

[DC inject. level 2] , d [≥ ★

DC injection current 2.

NOTICE

OVERHEATING AND DAMAGE TO THE MOTOR

Verify that the connected motor is properly rated for the DC injection current to be applied in terms of amount and time in order to avoid overheating and damage to the motor.

Failure to follow these instructions can result in equipment damage.

Injection current activated by digital input or selected as stop mode once period [DC injection time 1] $E d \cdot h$ has elapsed.

This parameter can be accessed if:

- [Type of stop] 5 £ £ is set to [DC injection] d [1, or
- [DC.Brake DI] d [is not set to [No] n a.

Setting ()	Description
0.1 In ⁽¹⁾ [DC inject. level 1] , d E	Setting range This setting is independent of the [Auto DC Injection] $H d L$ - function. Factory setting: 0.5 ln $^{(1)}$
(1) In corresponds to the rated drive current indicated in the Installation Manual and on the drive nameplate.	

[DC Inj Time 2] E d [*

2nd DC injection time.

NOTICE

OVERHEATING AND DAMAGE TO THE MOTOR

Verify that the connected motor is properly rated for the DC injection current to be applied in terms of amount and time in order to avoid overheating and damage to the motor.

Failure to follow these instructions can result in equipment damage.

Maximum injection time [DC inject. level 2] , d [2 for injection, selected as stop mode only.

This parameter can be accessed if [Type of stop] $5 \, E \, E$ is set to [DC injection] $d \, E$.

Setting ()	Description
0.130 s	Setting range This setting is independent of the [Auto DC Injection] $H d L$ - function. Factory setting: 0.5 s

[Generic functions] - [Auto DC injection]

[Auto DC injection] Ad [- Menu

Access

[Complete settings] → [Generic functions] → [Auto DC injection]

About This Menu

This menu presents the automatic injection of motor current function. This is used to hold the rotor of the motor at the end of the deceleration ramp.

[Auto DC Injection] Fac

Automatic DC Injection.

A A DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

If the parameter [Auto DC Injection] H d L is set to [Continuous] L L, DC injection is always active, even if the motor does not run.

· Verify that using this setting does not result in unsafe conditions.

Failure to follow these instructions will result in death or serious injury.

A WARNING

UNINTENDED MOVEMENT

- Do not use DC injection to generate holding torque when the motor is at a standstill.
- Use a holding brake to keep the motor in the standstill position.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Automatic current injection on stopping (at the end of the ramp).

NOTE: There is an interlock between this function and [Motor fluxing] F L u. If [Motor fluxing] F L u is set to [Continuous] F L L, [Auto DC Injection] H L L must be [No] L L L.

[Auto DC Injection] $H \perp L$ is forced to [No] r_{\perp} when [Brake assignment] $r_{\perp} L$ is not set to [No] r_{\perp} . This parameter gives rise to the injection of current even if a run command has not been sent.

Setting ()	Code / Value	Description
[No]	no	No injection
[Yes]	Y E S	Adjustable injection time Factory setting
[Continuous]	ΓĿ	Continuous standstill injection

[Auto DC inj Level 1] 5 d [/*

Auto DC injection level 1.

NOTICE

OVERHEATING AND DAMAGE TO THE MOTOR

Verify that the connected motor is properly rated for the DC injection current to be applied in terms of amount and time in order to avoid overheating and damage to the motor.

Failure to follow these instructions can result in equipment damage.

Level of standstill DC injection current [Auto DC Injection] # d [is not [No] n a.

Setting ()	Description
01.1 ln ⁽¹⁾	Setting range
	Factory setting: 0.7 ln ⁽¹⁾
(1) In corresponds to the rated drive current indicated in the Installation Manual and on the drive nameplate.	

[Auto DC Inj Time 1] Ł d [1★

Auto DC injection time 1.

NOTICE

OVERHEATING AND DAMAGE TO THE MOTOR

Verify that the connected motor is properly rated for the DC injection current to be applied in terms of amount and time in order to avoid overheating and damage to the motor.

Failure to follow these instructions can result in equipment damage.

This parameter can be accessed if [Auto DC Injection] H d L is not set to [No] n a.

Setting ()	Description
0.130.0 s	Setting range
	Factory setting: 0.5 s

[Auto DC inj Level 2] 5 d [2 *

Auto DC injection level 2.

NOTICE

OVERHEATING AND DAMAGE TO THE MOTOR

Verify that the connected motor is properly rated for the DC injection current to be applied in terms of amount and time in order to avoid overheating and damage to the motor.

Failure to follow these instructions can result in equipment damage.

Second level of standstill DC injection current.

This parameter can be accessed if [Auto DC Injection] Ad [is not set to [No] n a.

Setting ()	Description
01.1 In ⁽¹⁾	Setting range Factory setting: 0.5 ln (1)
(1) In corresponds to the rated drive current indicated in the Installation Manual and on the drive nameplate.	

[Auto DC Inj Time 2] L d [2*

Auto DC injection time 2.

NOTICE

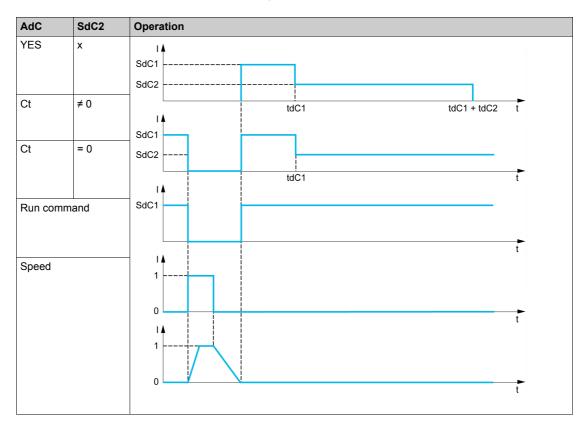
OVERHEATING AND DAMAGE TO THE MOTOR

Verify that the connected motor is properly rated for the DC injection current to be applied in terms of amount and time in order to avoid overheating and damage to the motor.

Failure to follow these instructions can result in equipment damage.

Second standstill injection time.

This parameter can be accessed if [Auto DC Injection] Ad [is set to [YES] 4 E 5.



Setting ()	Description
0.030.0 s	Setting range Factory setting: 0.0 s

[Generic functions] - [Jog]

[Jog] JaG - Menu

Access

[Complete settings] → [Generic functions] → [Jog]

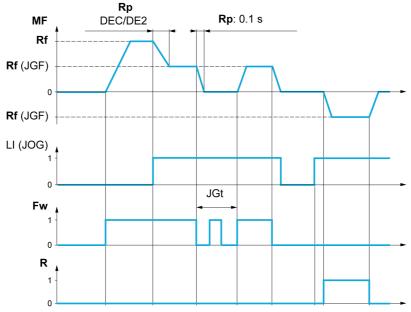
[Jog Assign] 🕹 🛭 🖟

Jog assignment.

The JOG function is only active if the command channel and the reference channels are on the terminals.

The function is active when the assigned input or bit is at 1.

Example: 2-wire control operation ([2/3-Wire Control] $E \ C = [2-Wire Control] \ 2 \ C$.



MF Motor frequency

Rf Reference

Rp Ramp

 $\ensuremath{\mathbf{Rp:0.1\ s}}$ Ramp forced to 0.1 S

Fw Forward **R** Reverse

Setting	Code / Value	Description
[Not Assigned]	no	Not assigned Factory setting
[DI1][DI6]	L , IL , 6	Digital input DI1DI6
[DI11][DI16]	L 1 1 1L 1 1 1 6	Digital input DI11DI16 if VW3A3203 I/O extension module has been inserted

[Jog frequency] (J □ F)★

This parameter can be accessed if [Jog Assign] ($J \circ E$) is not set to [No] ($n \circ D$).

Setting ()	Description
0.010.0 Hz	Setting range Factory setting: 10.0 Hz

[Jog Delay] (J □ Ł)★

This parameter can be accessed if [Jog Assign] ($J \square E$) is not set to [No] ($\square \square$).

Setting ()	Description
0.02.0 s	Setting range Factory setting: 0.5 s

[Generic functions] - [Preset speeds]

[Preset speeds] P 5 5 - Menu

Access

[Complete settings] → [Generic functions] → [Preset speeds]

About This Menu

NOTE: This function cannot be used with some other functions.

Combination Table for Preset Speed Inputs

2, 4, 8 or 16 speeds can be preset, requiring 1, 2, 3 or 4 digital inputs respectively.

It is necessary to configure:

- 2 and 4 speeds in order to obtain 4 speeds.
- 2, 4 and 8 speeds in order to obtain 8 speeds.
- 2, 4, 8 and 16 speeds in order to obtain 16 speeds.

16 Preset Freq (PS16)	8 Preset Freq (PS8)	4 Preset Freq (PS4)	2 Preset Freq (PS2)	Speed Reference
0	0	0	0	Reference 1 (1)
0	0	0	1	SP2
0	0	1	0	SP3
0	0	1	1	SP4
0	1	0	0	SP5
0	1	0	1	SP6
0	1	1	0	SP7
0	1	1	1	SP8
1	0	0	0	SP9
1	0	0	1	SP10
1	0	1	0	SP11
1	0	1	1	SP12
1	1	0	0	SP13
1	1	0	1	SP14
1	1	1	0	SP15
1	1	1	1	SP16

(1) Reference 1 = 5 P I, refer to diagram (see page 146)

[2 Preset Freq] P 5 2

2 preset freq assignment.

Setting	Code / Value	Description
[Not Assigned]	no	Not assigned Factory setting
[DI1][DI6]	L 1 1L 16	Digital input DI1DI6
[DI11][DI16]	L , I IL , 16	Digital input DI11DI16 if VW3A3203 I/O extension module has been inserted
[CD00][CD10]	C 4 0 0 C 4 1 0	Virtual digital input CMD.0CMD.10 in [I/O profile] , c configuration
[CD11][CD15]	C d I IC d IS	Virtual digital input CMD.11CMD.15 regardless of configuration
[C101][C110]	C 10 1C 1 10	Virtual digital input CMD1.01CMD1.10 with integrated Modbus Serial in [I/O profile] , p configuration
[C111][C115]	C	Virtual digital input CMD1.11CMD1.15 with integrated Modbus Serial regardless of configuration
[C301][C310]	C 3 0 1 C 3 1 0	Virtual digital input CMD3.01CMD3.10 with a fieldbus module in [I/O profile] , p configuration
[C311][C315]	C 3 I IC 3 IS	Virtual digital input CMD3.11CMD3.15 with a fieldbus module regardless of configuration

[4 Preset Freq] P 5 4

4 preset freq assignment.

Identical to [2 Preset Freq] P 5 2

To obtain 4 speeds, you must also configure 2 speeds.

[8 Preset Freq] P 5 B

8 preset freq assignment.

Identical to [2 Preset Freq] P 5 2

To obtain 8 speeds, you must also configure 2 and 4 speeds.

[16 Preset Freq] P 5 1 6

16 preset freq assignment.

Identical to [2 Preset Freq] P 5 2

To obtain 16 speeds, you must also configure 2, 4 and 8 speeds.

[Preset speed 2] 5 P 2 ★

Preset speed 2. See the combination table for preset speed inputs (see page 171).

Setting ()	Description
0.0599.0 Hz	Setting range
	Factory setting: 10.0 Hz

[Preset speed 3] 5 P 3 *

Preset speed 3. See the combination table for preset speed inputs (see page 171).

Setting ()	Description
0.0599.0 Hz	Setting range Factory setting: 20.0 Hz

[Preset speed 4] 5 P 4 *

Preset speed 4. See the combination table for preset speed inputs (see page 171).

Setting ()	Description
0.0599.0 Hz	Setting range Factory setting: 30.0 Hz

[Preset speed 5] 5 P 5 *

Preset speed 5. See the combination table for preset speed inputs (see page 171).

Setting ()	Description
0.0599.0 Hz	Setting range
	Factory setting: 25.0 Hz

[Preset speed 6] 5 P 6 *

Preset speed 6. See the combination table for preset speed inputs (see page 171).

Setting ()	Description
0.0599.0 Hz	Setting range Factory setting: 30.0 Hz

[Preset speed 7] 5 P 7★

Preset speed 7. See the combination table for preset speed inputs (see page 171).

Setting ()	Description
0.0599.0 Hz	Setting range Factory setting: 35.0 Hz

[Preset speed 8] 5 P B ★

Preset speed 8. See the combination table for preset speed inputs (see page 171).

Setting ()	Description
0.0599.0 Hz	Setting range Factory setting: 40.0 Hz

[Preset speed 9] 5 P 9 *

Preset speed 9. See the combination table for preset speed inputs (see page 171).

Setting ()	Description
0.0599.0 Hz	Setting range Factory setting: 45.0 Hz

[Preset speed 10] 5 P 1 🛚 🛨

Preset speed 10. See the combination table for preset speed inputs (see page 171).

Setting ()	Description
0.0599.0 Hz	Setting range Factory setting: 50.0 Hz

[Preset speed 11] 5 P I I *

Preset speed 11. See the combination table for preset speed inputs (see page 171).

Setting ()	Description	
0.0599.0 Hz	Setting range Factory setting: 55.0 Hz	

[Preset speed 12] 5 P 1 2 *

Preset speed 12. See the combination table for preset speed inputs (see page 171).

Description	
Setting range Factory setting: 60.0 Hz	
S	

[Preset speed 13] 5 P 1 3 *

Preset speed 13. See the combination table for preset speed inputs (see page 171).

Setting ()	Description	
0.0599.0 Hz	Setting range Factory setting: 70.0 Hz	

[Preset speed 14] 5 P 14★

Preset speed 14. See the combination table for preset speed inputs (see page 171).

Setting ()	Description	
0.0599.0 Hz	Setting range Factory setting: 80.0 Hz	

[Preset speed 15] 5 P 15 ★

Preset speed 15 See the combination table for preset speed inputs (see page 171).

Setting ()	Description	
0.0599.0 Hz	Setting range Factory setting: 90.0 Hz	

[Preset speed 16] 5 P 16 *

Preset speed 16. See the combination table for preset speed inputs (see page 171).

Setting ()	Description	
0.0599.0 Hz	Setting range Factory setting: 100.0 Hz	

[Generic functions] - [Jump frequency]

[Jump frequency] J u F - Menu

Access

[Complete settings] → [Jump frequency]

About This Menu

This function helps to prevent prolonged operation within an adjustable range around the regulated frequency.

This function can be used to help to prevent a speed, which could cause resonance, being reached. Setting the function to 0 renders it inactive.

[Skip Frequency] JPF

Jump frequency.

Setting ()	Description	
0.0599.0 Hz	Setting range Factory setting: 0.0 Hz	

[Skip Frequency 2] JF ≥

Jump frequency 2.

Setting ()	Description	
0.0599.0 Hz	Setting range	
	Factory setting: 0.0 Hz	

[3rd Skip Frequency] JF 3

Jump frequency 3.

Setting ()	Description	
0.0599.0 Hz	Setting range	
	Factory setting: 0.0 Hz	

[Skip.Freq.Hysteresis] JFH*

Jump frequency bandwidth.

This parameter can be accessed if at least one skip frequency JPF, JFZ, or JFZ is different from 0. Skip frequency range: between JPF - JFH and JPF + JFH for example.

This adjustment is common to the 3 frequencies JPF, JF2, JF3.

Setting ()

Description

0.1...10.0 Hz

Setting range
Factory setting: 1.0 Hz

[Generic functions] - [Define system units]

[Define system units] 5 u [- Menu

Access

[Complete settings] → [Generic functions] → [Define system units]

About This Menu

In order to be easy to configure, commission, operate, and maintain, the drive uses the application units.

The physicals that are concerned by application units are:

- Pressure values
- Flow rate values
- Temperature values
- Currency values

NOTE: Some other default system units are automatically deduced from configurable system units or from other parameters.

System unit applies by default to all communication parameters and HMI (Plain Text Display Terminal, Web server, DTM-based software).

When a system unit is changed, there is no rescaling of values. Numerical values are kept, but the meaning of these values is not the same:

- After a change, the behavior of the product will not change (the system stays numerically the same).
- If new values are written through communication or through HMI in new unit, then the behavior is impacted. In that case, all parameters should be reconfigured according to the new selected unit.
- In order to avoid issues due to a modification of system unit parameters, system units should be modified only during the installation of the product and before the commissioning of the functions.

The precision of the physical values is selected at the same time as the unit.

By default, values are signed.

Default range of values are:

16 bits values	32 bits values
-32,76832,767	-2,147,483,6482,147,483,648

[P sensor unit] 5 u P r

Default system application unit used for pressure.

Available pressure units:

Unit	Symbol	Conversion
Kilo Pascal	kPa	100 kPa = 1 bar
Millibar	mbar	
Bar	bar	
Pound / square inch (lb/in²)	psi psig	14.5 psi = 1 bar
Inch H2O Inch water gauge Inch water column	inH2O inWG inWC	1 inH2O 4°C = 0.0024908891 bar (0.036127292 psi)
Feet water gauge Feet water column Feet	ftWG ftWC ft	1 inH2O 4°C = 0.0298906692 bar (0.433527504 psi)
Meter water gauge Meter water column Meter	mWG mWC (mCE) m	1 mH2O(4°C) = 0.0980665 bar (1.42233433 psi)
Inch of mercury	inHg	1 inHg = 0.0338638864 bar (0.491154147 psi)
Percentage	%	-
w/o unit	_	_

Setting	Code / Value	Description
[1Kpa]	PA	1 kpa
[1mbar]	ІПЬЯг	1 mbar
[1Bar]	ЬЯr	1 bar
[0.1Bar]	O. 16Ar	0.1 bar Factory setting
[0.01Bar]	0.0 IbAr	0.01 bar
[1 PSI]	P5 ,	1 Psi
[0.1 PSI]	O. IP5 ,	0.1 psi
[1 PSIG]	P5 , G	1 Psig
[0.1 PSIG]	O. IP5 .G	0.1 Psig
[1inH20]	1 in H 2 0	1 inH20
[1inWg]	l inWG	1 inWg
[1inWC]	I inWE	1 inWc
[1 FtWg]	IFEWG	1 FtWg
[1 FtWC]	IFEWC	1 FtWC
[1 Ft]	IFE	1 Ft
[1 MWG]	INWG	1 mWg
[0.1 MWG]	0. INW G	0.1 mWg
[1 MWC]	INWE	1 mWC
[0.1 MWC]	O. INWC	0.1 mWC
[1m]	ΙΠ?	1 m
[0.1 m]	П. 1П?	0.1 m
[1 inHG]	l in H G	1 inHg
[0.1%]	O. 1??	0.1%
[0.1]	0. I?W?o?	0.1 w/o

[Flow rate unit] 5 $_{\it U}$ F $_{\it \Gamma}$

Default system application unit used for flow rate.

Available flow units:

Unit	Symbol	Conversion
Liter / second	I/s	-
Liter / minute	I/min	_
Liter / hour	I/h	-
Cubic decimeter / minute	dm3/min	-
Cubic meter / second	m3/s	_
Cubic meter / minute	m3/min	-
Cubic meter / hour	m3/h	-
Gallon per second	gal/s	1 usgal = 3,785411784 l
Gallon per minute	gal/min; GPM	-
Gallon per hour	gal/h	-
Cubic feet / second	ft3/s	1 ft3 = 28.317 l
Cubic feet / minute	ft3/min; CFM, SCFM	-
Cubic feet / hour	ft3/h	-
Percentage	%	-
w/o unit	_	-

Setting	Code / Value	Description
[1 L/s]	1L 5	L/s
[l/s]	0 IL 5	0.1 L/s
[1 L/m]	ILΠ	L/m
[1 L/h]	ILh	L/h
[1 dm3/mn]	IANBN	d3/m
[1 m3/s]	IN 35	M3/s
[0.1 m3/s]	0 1035	0.1 M3/s
[1m3/m]	ІПЭΠο	M3/min
[0.1 m3/m]	0 10300	0.1 M3/min
[1 m3/h]	ІПЭЬ	1 M3/h
[0.1m3/h]	о іпзь	0.1 M3/h
		Factory setting
[1 gal/s]	1GP5	1 Gal/s
[1 GPM]	IGPN	1 GPM
[1 gal/h]	IGPH	1 Gal/h
[1 ft3/s]	ICF5	1 ft3/s
[1CFM]	ICFN	1 CFM
[1SCFM]	ISCFN	1 SCFM
[1 Ft3/h]	ICFH	1 ft3/h
[1 Kg/s]	165	1 kg/s
[1 Kg/m]	16 П	1 kg/m
[1 Kg/h]	I G H	1 kg/h
[1 Lb/s]	1L 6 5	1 lb/s
[1 Lb/m]	ІГРЦ	1 lb/m
[1 Lb/h]	ILЬH	1 lb/h
[0.1%]	0 IPC	0.1%
[0.1]	0 IWa?	0.1 w/o

[Temperature unit] 5 \sqcup \vdash P

Default system application unit used for temperature.

Available temperature units:

Unit	Symbol	Conversion
Celsius Degree	°C	_
Fahrenheit Degree	°F	TF = 9/5*Tc+32
Percentage	%	-
w/o unit	_	_

Setting	Code / Value	Description
[0.1°C]	O. 1?C	0.1 °C
		Factory setting
[0.1°F]	0. I?F	0.1 °F
[0.1%]	O. 1?	0.1%
[0.1]	0. IW?a	0.1 w/o

[Currency unit list] 5 $_{\it U}$ $_{\it U}$

Default system application unit used for currency.

Setting	Code / Value	Description
[EURO]	Euro	Euro
[\$]	doLLAr	Dollar
[£]	Pound	Pound
[Krone]	Кг	Krone
[Renminbi]	- ПЬ	Renminbi Factory setting
[Other]	o Ł H E r	Other

[Liquid Density] r H a

Density of the fluid to be pumped.

This parameter can be accessed if [Access Level] L R L is not set to [Expert] E P r.

Setting	Description
10010,000 kg/m3	Setting range
	Factory setting: 1000 kg/m3

[Generic functions] - [PID controller]

What Is in This Section?

This section contains the following topics:

Topic	Page
[PID controller] P . d - Overview	181
[Feedback] F d b - Menu	184
[Reference frequency] r F - Menu	190
[PID preset references] Pr , - Menu	193
[Reference frequency] r F - Menu	195
[Settings] 5 L - Menu	196

[PID controller] P . d - Overview

About This Menu

NOTE: This function cannot be used with some other functions.

Block Diagram

The function is activated by assigning an analog input to the PID feedback (measurement).

The PID feedback needs to be assigned to one of the analog inputs AI1 to AI5 or a pulse input, according to whether any I/O extension module has been inserted.

The PID reference needs to be assigned to the following parameters:

- Preset references via digital inputs ([Ref PID Preset 2] r P 2, [Ref PID Preset 3] r P 3, [Ref PID Preset 4] r P 4).
- In accordance with the configuration of [Intern PID Ref] P , ,:
 - o [Internal PID ref] r P 1, or
 - O Reference A [Ref Freq 1 Config] Fr I or [Ref.1B channel] Fr Ib.

Combination Table for Preset PID References:

DI (P r 4)	DI (<i>P r 2</i>)	Pr2=no	Reference
			r P , or F r 1?6?
0	0		r P i or F r 1?6?
0	1		rP2
1	0		rP3
1	1		r P Y

A predictive speed reference can be used to initialize the speed on restarting the process.

Scaling of feedback and references:

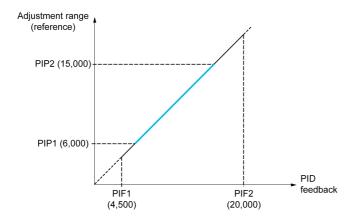
- [Min PID feedback] P , F I, [Max PID feedback] P , F 2 parameters can be used to scale the PID feedback (sensor range). This scale must be maintained for all other parameters.
- [Min PID Process] P : P I, [Max PID Process] P : P Z parameters can be used to scale the adjustment range, for example the reference. Check that the adjustment range remains within the sensor range.

The maximum value of the scaling parameters is 32,767. To facilitate the installation, it is recommended to use values as close as possible to this maximum level, while retaining powers of 10 in relation to the actual values. The scaling is without unit if [Type of control] $E \cap E$ is set to [NA] $\cap R$, in % if set to [OTHER] $\cap E \cap E$ in process unit if set to [PRESSURE] $P \cap E \cap E$ 5 or [FLOW] $P \cap E \cap E$.

Example

Adjustment of the volume in a tank, 6...15 m3.

- Probe used 4-20 mA, 4.5 m³ for 4 mA and 20 m³ for 20 mA, with the result that $P \cdot F I = 4,500$ and $P \cdot F Z = 20,000$.
- Adjustment range 6 to 15 m³, with the result that P , P I = 6,000 (min. reference) and P , P Z = 15,000 (max. reference).
- Example references:
 - o r P I (internal reference) = 9,500
 - o r P ≥ (preset reference) = 6,500
 - o r P 3 (preset reference) = 8,000
 - o r P 4 (preset reference) = 11,200



Other parameters:

- Reversal of the direction of correction [PID Inversion] $P \cdot \mathcal{L}$. If [PID Inversion] $P \cdot \mathcal{L}$ is set to [No] $P \cdot \mathcal{L}$ is speed of the motor increases when the detected error is positive (for example pressure control with a compressor). If [PID Inversion] $P \cdot \mathcal{L}$ is set to [Yes] $P \cdot \mathcal{L}$ is set to [Yes] $P \cdot \mathcal{L}$ is speed of the motor decreases when the detected error is positive (for example temperature control using a cooling fan).
- The integral gain may be short-circuited by a digital input.
- A warning on the [PID feedback] P , F may be configured.
- A warning on the [PID error] r P E may be configured.

"Manual - Automatic" Operation with PID

This function combines the PID controller, the preset speeds, and a manual reference. Depending on the state of the digital input, the speed reference is given by the preset speeds or by a manual reference input via the PID function.

Manual PID reference [Manual PID reference] P ιΠ:

- Analog inputs Al1 to Al5
- Pulse inputs

Predictive speed reference [Predictive Speed Ref] F P ::

- [Al1] # , I: analog input
- [Al2] A , ≥: analog input
- [Al3] F ₁ ∃: analog input
- [Al4] # , 4: analog input if VW3A3203 I/O extension module has been inserted
- [AI5] # , 5: analog input if VW3A3203 I/O extension module has been inserted
- [DI5 PulseInput Assignment] P , 5: pulse input
- [DI6 PulseInput Assignment] P , 5: pulse input
- [Ref.Freq-Rmt.Term] L []: Plain Text Display Terminal
- [Modbus] ∏ d b: integrated Modbus
- [Com. Module] n E L: fieldbus option module (if inserted)

Setting Up the PID Controller

1. Configuration in PID mode.

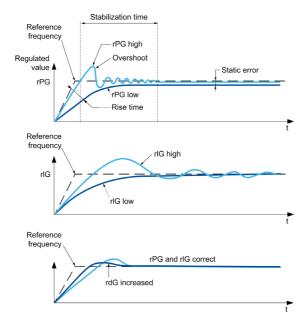
Refer to the Block Diagram (see page 181).

2. Perform a test in factory settings mode.

To optimize the drive, adjust **[PID Prop.Gain]** r P L or **[PID Intgl.Gain]** r r L gradually and independently, and observe the effect on the PID feedback in relation to the reference.

3. If the factory settings are unstable or the reference is incorrect.

Step	Action
1	Perform a test with a speed reference in Manual mode (without PID controller) and with the drive on load for the speed range of the system: In steady state, the speed must be stable and comply with the reference, and the PID feedback signal must be stable. In transient state, the speed must follow the ramp and stabilize quickly, and the PID feedback must follow the speed. If not, see the settings for the drive and/or sensor signal and wiring.
2	Switch to PID mode.
3	Set [PID ramp] PrP to the minimum permitted by the mechanism without triggering an [DC Bus Overvoltage] abF.
4	Set the integral gain [PID Intgl.Gain] r, L to minimum.
5	Leave the derivative gain [PID derivative gain] r d G at 0.
6	Observe the PID feedback and the reference.
7	Switch the drive ON/OFF a number of times or vary the load or reference rapidly a number of times.
8	Set the proportional gain [PID Prop.Gain] r P L in order to ascertain the compromise between response time and stability in transient phases (slight overshoot and 1 to 2 oscillations before stabilizing).
9	If the reference varies from the preset value in steady state, gradually increase the integral gain [PID Intgl.Gain] r I G, reduce the proportional gain [PID Prop.Gain] r P G in the event of instability (pump applications), find a compromise between response time and static precision (see diagram).
10	Lastly, the derivative gain may permit the overshoot to be reduced and the response time to be improved, although this is more difficult to obtain a compromise in terms of stability, as it depends on 3 gains.
11	Perform in-production tests over the whole reference range.



The oscillation frequency depends on the system kinematics:

Parameter	Rise time	Overshoot	Stabilization time	Static error
rPG +		+	=	-
rIG +	-	++	+	
rdG +	=	-	-	=

[Feedback] F d b - Menu

Access

[Complete settings] → [Generic functions] → [PID controller] → [Feedback]

About This Menu

NOTE: This function cannot be used with some other functions.

[Type of Control] $E \circ E$

Type of control for the PID = unit choice.

Setting	Code / Value	Description
[nA]	n A	Nothing special Factory setting
[Pressure]	Pr E 5 5	Pressure control and unit
[Flow]	FLoW	Flow control and unit
[Other]	othEr	Other control and unit

[PID Feedback] P , F

PID controller feedback.

Setting	Code / Value	Description
[No]	no	Not assigned Factory setting
[AI1][AI3]	A , IA , 3	Analog input Al1Al3
[AI4][AI5]	Я 14Я 15	Analog input Al4Al5 if VW3A3203 I/O extension module has been inserted
[Al Virtual 1]	A . V I	Virtual analogic input 1
[PulseInput Assignment On DI5][PulseInput Assignment On DI6]	P 15P 16	Digital input DI5DI6 used as pulse input

[All Type] H , I L *

Configuration of analog input Al1.

This parameter can be accessed if [PID Feedback] $P \cup F$ is set to [AI1] $H \cup I$.

Setting	Code / Value	Description
[Voltage]	100	0-10 Vdc Factory setting
[Current]	O A	0-20 mA

[Al1 min value] u , L /*

Al1 voltage scaling parameter of 0%.

This parameter can be accessed if:

- [PID Feedback] $P \cdot IF$ is set to [AI1] $H \cdot I$, and
- [All Type] A , I L is set to [Voltage] I□ □.

Setting	Description	
0.010.0 Vdc	Setting range	
	Factory setting: 0.0 Vdc	

[Al1 max value] u , H / *

Al1 voltage scaling parameter of 100%.

This parameter can be accessed if:

- [PID Feedback] P , F is set to [Al1] R , I, and
- [Al1 Type] FI , I L is set to [Voltage] I□ □.

Setting	Description	
0.010.0 Vdc	Setting range	
	Factory setting: 10.0 Vdc	

[Al1 min. value] [r L /*

Al1 current scaling parameter of 0%.

This parameter can be accessed if:

- [PID Feedback] P . F is set to [Al1] R . I, and
- [All Type] A , I L is set to [Current] DA.

Setting	Description
0.020.0 mA	Setting range
	Factory setting: 0.0 mA

[Al1 max. value] [r H I *

All current scaling parameter of 100%.

This parameter can be accessed if:

- [PID Feedback] P , F is set to [AI1] H , I, and
 [AI Type] H , I L is set to [Current] D H.

Description	
Setting range Factory setting: 20.0 mA	

[Al2 Type] *H* ₁ ≥ Ł ★

Configuration of analog input AI2.

This parameter can be accessed if [PID Feedback] P , F is set to [Al2] R , 2

Setting	Code / Value	Description
[Voltage]	100	0-10 Vdc
[Current]	OA	0-20 mA Factory setting
[PTC Management]	PEC	1 to 6 PTC (in serial)
[KTY]	KEY	1 KTY84
[PT1000]	IPE 3	1 PT1000 connected with 2 wires
[PT100]	IPE2	1 PT100 connected with 2 wires
[Water Prob]	LEuEL	Water level
[3PT1000]	3P	3 PT1000 connected with 2 wires
[3PT100]	3P	3 PT100 connected with 2 wires

[Al2 min value] u , L 2 *

Al2 voltage scaling parameter of 0%.

This parameter can be accessed if:

- [PID Feedback] P , F is set to [Al2] R , 2, and
- [Al2 Type] A ₁2 L is set to [Voltage] / □ □.

Identical to [Al1 min value] u . L I (see page 184).

[Al2 max value] ☐ 1H 2 ★

Al2 voltage scaling parameter of 100%.

This parameter can be accessed if:

- [PID Feedback] P , F is set to [Al2] R , 2, and
- [Al2 Type] A ₁2 L is set to [Voltage] / □ □.

Identical to [Al1 max value] u , H I (see page 185).

[Al2 min. value] [r L 2 *

Al2 current scaling parameter of 0%.

This parameter can be accessed if:

- [PID Feedback] P , F is set to [Al2] R , 2, and
- [Al2 Type] H ₁ 2 Ł is set to [Current] □ H.

Identical to [Al1 min. value] [r L I (see page 185) with factory setting: 0.4 mA.

[Al2 max. value] [r H ≥ ★

Al2 current scaling parameter of 100%.

This parameter can be accessed if:

- [PID Feedback] P , F is set to [Al2] R , ≥, and
- [Al2 Type] A . ≥ E is set to [Current] □ A.

Identical to [Al1 max. value] [r H I (see page 185).

[Al3 Type] A → 3 L ★

Configuration of analog input AI3.

This parameter can be accessed if [PID Feedback] P , F is set to [AI3] H , 3.

Identical to [Al2 Type] H , 2 L (see page 185).

[Al3 min value] u , L 3 *

Al3 voltage scaling parameter of 0%.

This parameter can be accessed if:

- [PID Feedback] P , F is set to [AI3] R , 3, and
- [Al3 Type] A , ∃ L is set to [Voltage] / □ □.

Identical to [Al1 min value] u , L I (see page 184).

[Al3 max value] u , H 3 *

Al3 voltage scaling parameter of 100%.

This parameter can be accessed if:

- [PID Feedback] P , F is set to [Al3] H , 3, and
- [Al3 Type] H ₁ ∃ Ł is set to [Voltage] I □ ⊔.

Identical to [Al1 max value] u , H I (see page 185).

[Al3 min. value] [r L 3 *

AI3 current scaling parameter of 0%.

This parameter can be accessed if:

- [PID Feedback] P , F is set to [AI3] F , 3, and
- [Al3 Type] A . 3 L is set to [Current] DA.

Identical to [Al1 min. value] [r L I (see page 185).

[Al3 max. value] [r H 3 *

Al3 current scaling parameter of 100%.

This parameter can be accessed if:

- [PID Feedback] P , F is set to [Al3] R , 3, and
- [Al3 Type] A , ∃ L is set to [Current] □ A.

Identical to [Al1 max. value] [r H I (see page 185).

[Al4 Type] A 14 L ★

Configuration of analog input AI4.

This parameter can be accessed if:

- VW3A3203 I/O extension module has been inserted, and
- [PID Feedback] P , F is set to [Al4] R , 4.

Setting	Code / Value	Description
[Voltage]	Ι 🛮 υ	0-10 Vdc
[Current]	OA	0-20 mA Factory setting
[Voltage +/-]	n 10u	-10/+10 Vdc
[PTC Management]	PEC	1 to 6 PTC (in serial)
[KTY]	KFA	1 KTY84
[PT1000]	IPE 3	1 PT1000 connected with 2 wires
[PT100]	IP E 2	1 PT100 connected with 2 wires
[3 PT1000]	3PL3	3 PT1000 connected with 2 wires
[3 PT100]	3P	3 PT100 connected with 2 wires
[PT1000 in 3 wires]	IPE 3 3	1 PT1000 connected with 3 wires (Al4 & Al5 only)
[PT100 in 3 wires]	IPE23	1 PT100 connected with 3 wires (Al4 & Al5 only)
[3 PT1000 in 3 wires]	3PL 33	3 PT1000 connected with 3 wires (Al4 & Al5 only)
[3 PT100 in 3 wires]	3P	3 PT100 connected with 3 wires (Al4 & Al5 only)

[Al4 min value] u , L 4 *

Al4 voltage scaling parameter of 0%.

This parameter can be accessed if:

- [PID Feedback] P , F is set to [AI4] R , 4, and
- [Al4 Type] A , 4 L is set to [Voltage] I□ u.

Identical to [Al1 min value] u , L I (see page 184).

[Al4 max value] 🗓 ، H 4 🖈

Al4 voltage scaling parameter of 100%.

This parameter can be accessed if:

- [PID Feedback] P , F is set to [AI4] F , 4, and
- [Al4 Type] A , 4 L is set to [Voltage] I□ u.

Identical to [Al1 max value] u , H I (see page 185).

[Al4 min. value] [r L 4 *

Al4 current scaling parameter of 0%.

This parameter can be accessed if:

- [PID Feedback] P , F is set to [AI4] R , 4, and
- [Al4 Type] A . 4 L is set to [Current] DA.

Identical to [Al1 min. value] [r L I (see page 185).

[Al4 max. value] [r H 4 *

Al4 current scaling parameter of 100%.

This parameter can be accessed if:

- [PID Feedback] P , F is set to [Al4] R , 4, and
- [Al4 Type] A , 4 L is set to [Current] DA.

Identical to [Al1 max. value] [r H I (see page 185).

[Al5 Type] *A* ⋅ 5 Ł ★

Configuration of analog input AI5.

This parameter can be accessed if:

- VW3A3203 I/O extension module has been inserted, and
- [PID Feedback] P , F is set to [AI5] R , 5.

Identical to [Al4 Type] A , 4 L.

[Al5 min value] u , L 5 🖈

AI5 voltage scaling parameter of 0%.

This parameter can be accessed if:

- [PID Feedback] P , F is set to [AI5] R , 5, and
- [Al4 Type] A , 5 L is set to [Voltage] I□ u.

Identical to [Al1 min value] u , L I (see page 184).

[Al5 max value] u , H 5 *

Al5 voltage scaling parameter of 100%.

This parameter can be accessed if:

- [PID Feedback] P , F is set to [Al5] R , 5, and
- [Al4 Type] A , 5 L is set to [Voltage] / □ □.

Identical to [Al1 max value] u , H I (see page 185).

[Al5 min. value] [r L 5 *

Al5 current scaling parameter of 0%.

This parameter can be accessed if:

- [PID Feedback] P .F is set to [AI5] H .5, and
- [Al5 Type] A , 5 L is set to [Current] DA.

Identical to [Al1 min. value] [r L I (see page 185).

[Al5 max. value] [r H 5 *

Al5 current scaling parameter of 100%.

This parameter can be accessed if:

- [PID Feedback] P , F is set to [AI5] H , 5, and
- [Al5 Type] A , 5 L is set to [Current] DA.

Identical to [Al1 max. value] [r H I (see page 185).

[Min PID feedback] P , F /*

Minimum PID feedback.

This parameter can be accessed if [PID Feedback] $P \cup F$ is not set to [Not Configured] $n \cdot a$.

Setting ()	Description
0[Max PID feedback] P + F 2	Setting range Factory setting: 100

[Max PID feedback] P , F ≥ *

Maximum PID feedback.

This parameter can be accessed if [PID Feedback] $P \cup F$ is not set to [Not Configured] n = 1.

Setting ()	Description
[Min PID feedback] P .F 132,767	Setting range Factory setting: 1,000

[PID feedback] r P F ★

Value for PID feedback, display only.

This parameter can be accessed if [PID Feedback] $P \cup F$ is not set to [Not Configured] $n \square$.

Setting	Description
065,535	Setting range Factory setting: 0

[Min Fbk Warning] PAL *

Minimum feedback level warning.

This parameter can be accessed if [PID Feedback] P , F is not set to [Not Configured] n a.

Setting ()	Description	
065,535	Setting range Factory setting: 100	

[Max Fbk Warning] P ₦ H ★

Maximum feedback level warning.

This parameter can be accessed if [PID Feedback] $P \cup F$ is not set to [Not Configured] $a \cdot a$.

Setting ()	Description	
065,535	Setting range	
	Factory setting: 1,000	

[Reference frequency] r F - Menu

Access

[Complete settings] → [Generic functions] → [PID controller] → [Reference frequency]

About This Menu

NOTE: This function cannot be used with some other functions.

[Intern PID Ref] P , , *

Internal PID reference.

This parameter can be accessed if [PID Feedback] P , F is not set to [Not Configured] n ...

Setting	Code / Value	Description
[No]	no	The PID controller reference is given by [Ref Freq 1 Config] Fr I or [Ref.1B channel] Fr I b with summing/subtraction/multiplication functions. Refer to the block diagram (see page 181). Factory setting
[Yes]	4 E 5	The PID controller reference is internal via [Internal PID ref] r P ı.

[Ref Freq 1 Config] Fr 1*

Configuration reference frequency 1.

This parameter can be accessed if:

- [PID Feedback] P , F is not set to [Not Configured] n a, and
 [Intern PID Ref] P , , is set to [No] n a.

Setting	Code / Value	Description
[Not Configured]	no	Not assigned
[Al1]	A , I	Analog input Al1 Factory Setting
[AI2][AI3]	A 12A 13	Analog input Al2Al3
[AI4][AI5]	A 14A 15	Analog input Al4Al5 if VW3A3203 I/O extension module has been inserted
[Ref Frequency via DI]	uPdt	Up/Down function is assigned by DIx
[HMI]	LCC	Reference Frequency via remote terminal
[Modbus]	ПАЬ	Reference frequency via Modbus
[Com. Module]	n E E	Reference frequency via fieldbus module if a fieldbus module has been inserted
[DI5 PulseInput Assignment][DI6 PulseInput Assignment]	P 15P 16	Digital input DI5DI6 used as pulse input

[Min PID reference] P P | **

Minimum PID reference.

This parameter can be accessed if [PID Feedback] $P \cap F$ is not set to [Not Configured] n = 1.

Setting ()	Description
[Min PID feedback] P , F I[Max PID reference] P , P 2	Setting range Factory setting: 150

[Max PID reference] P ₁ P ≥ ★

Maximum PID reference.

This parameter can be accessed if [PID Feedback] $P \cap F$ is not set to [Not Configured] $P \cap F$.

Setting ()	Description
[Min PID reference] P . P I[Max PID feedback] P . F 2	Setting range Factory setting: 900

[Internal PID ref] r P ₁★

Internal PID reference.

This parameter can be accessed if:

- [PID Feedback] P , F is not set to [Not Configured] n p, and
 [Intern PID Ref] P , is set to [Yes] 4 E 5.

Setting ()	Description
[Min PID reference] P .P I[Max PID reference] P .P 2	Setting range Factory setting: 150

[Auto/Manual assign.] P A u *

Auto/Manual select input.

This parameter can be accessed if [PID Feedback] P , F is not set to [Not Configured] n a.

Setting	Code / Value	Description
[Not Assigned]	no	Not assigned Factory setting
[DI1][DI6]	L , 1L , 6	Digital input DI1DI6
[DI11][DI16]	L 1 1 1L 1 1 1 5	Digital input DI11DI16 if VW3A3203 I/O extension module has been inserted
[CD00][CD10]	C d O O C d I O	Virtual digital input CMD.0CMD.10 in [I/O profile] , a configuration
[CD11][CD15]	C d I I C d 15	Virtual digital input CMD.11CMD.15 regardless of configuration
[C101][C110]	C 10 1C 1 10	Virtual digital input CMD1.01CMD1.10 with integrated Modbus Serial in [I/O profile] , p configuration
[C111][C115]	C	Virtual digital input CMD1.11CMD1.15 with integrated Modbus Serial regardless of configuration
[C301][C310]	C 3 0 1 C 3 1 0	Virtual digital input CMD3.01CMD3.10 with a fieldbus module in [I/O profile] , p configuration
[C311][C315]	C 3 I IC 3 IS	Virtual digital input CMD3.11CMD3.15 with a fieldbus module regardless of configuration

[Manual PID Reference] P → Π ★

Manual PID reference.

Reference input in manual mode.

This parameter can be accessed if:

- [PID Feedback] P , F is not set to [Not Configured] n a, and
 [Auto/Manual assign.] P R u is not set to [No] n a.

The preset speeds are active on the manual reference if they have been configured.

Setting	Code / Value	Description
[No]	no	Not assigned Factory setting
[AI1][AI3]	A , IA , 3	Analog input AI1AI3
[AI4][AI5]	A 14A 15	Analog input Al4Al5 if VW3A3203 I/O extension module has been inserted
[PulseInput Assignment On DI5][PulseInput Assignment On DI6]	P 15P 16	Digital input DI5DI6 used as pulse input

[PID preset references] Pr , - Menu

Access

[Complete settings] \rightarrow [Generic functions] \rightarrow [PID controller] \rightarrow [Reference frequency] \rightarrow [PID preset references]

About This Menu

The function can be accessed if **[PID feedback ass.]** *P* , *F* is assigned.

[2 PID Preset Assign] Pr 2

2 PID Preset assignment.

If the assigned input or bit is at 0, the function is inactive.

If the assigned input or bit is at 1, the function is active.

Setting	Code / Value	Description
[Not Assigned]	no	Not assigned Factory setting
[DI1][DI6]	L , 1L , 6	Digital input DI1DI6
[DI11][DI16]	L 1 1 1 L 1 1 1 6	Digital input DI11DI16 if VW3A3203 I/O extension module has been inserted
[CD00][CD10]	C d O O C d I O	Virtual digital input CMD.0CMD.10 in [I/O profile] , a configuration
[CD11][CD15]	C d I IC d I 5	Virtual digital input CMD.11CMD.15 regardless of configuration
[C101][C110]	C 10 1C 1 10	Virtual digital input CMD1.01CMD1.10 with integrated Modbus Serial in [I/O profile] . p configuration
[C111][C115]	C	Virtual digital input CMD1.11CMD1.15 with integrated Modbus Serial regardless of configuration
[C301][C310]	C 3 0 1 C 3 1 0	Virtual digital input CMD3.01CMD3.10 with a fieldbus module in [I/O profile] , p configuration
[C311][C315]	C 3 I I C 3 I S	Virtual digital input CMD3.11CMD3.15 with a fieldbus module regardless of configuration

[4 PID Preset Assign] Pr 4

4 PID Preset assignment.

Identical to [2 PID Preset Assign] Pr 2 (see page 193).

Verify that [2 PID Preset Assign] Pr 2 has been assigned before assigning this function.

[Ref PID Preset 2] r P ≥ ★

Second PID preset reference.

This parameter can be accessed only if [2 PID Preset Assign] Pr 2 is assigned.

Setting ()	Description
[Min PID reference] P , P I[Max PID reference] P , P 2	Setting range Factory setting: 300

[Ref PID Preset 3] r P 3 ★

Third PID preset reference.

This parameter can be accessed only if [4 PID Preset Assign] P r Y is assigned.

Setting ()	Description
[Min PID reference] P , P I[Max PID reference] P , P 2	Setting range Factory setting: 600

[Ref PID Preset 4] r P 4 *

Fourth PID preset reference.

This parameter can be accessed only if [4 PID Preset Assign] Pr4 and [2 PID Preset Assign] Pr2 are assigned.

Setting ()	Description
[Min PID reference] P , P I[Max PID reference] P , P 2	Setting range Factory setting: 900

[Reference frequency] r F - Menu

Access

[Complete settings] \rightarrow [Generic functions] \rightarrow [PID controller] \rightarrow [Reference frequency]

[Predictive Speed Ref] F P ,*

Predictive speed reference.

This parameter can be accessed if [Access Level] L R Γ is set to [Expert] E P Γ .

Setting	Code / Value	Description
[No]	no	Not assigned Factory setting
[AI1][AI3]	A , IA , 3	Analog input Al1Al3
[AI4][AI5]	A 14A 15	Analog input Al4Al5 if VW3A3203 I/O extension module has been inserted
[Ref.Freq-Rmt.Term]	LCC	Reference frequency via remote terminal
[Ref. Freq-Modbus]	ПЧЬ	Reference frequency via Modbus
[Ref. Freq-Com. Module]	n E Ł	Reference frequency via communication module
[PulseInput Assignment On DI5][PulseInput Assignment On DI6]	P :5P :6	Digital input DI5DI6 used as pulse input

[Speed Input %] P5 r *

PID speed input % reference.

This parameter can be accessed if [Access Level] L R Γ is set to [Expert] E P Γ .

Setting ()	Description
1100%	Setting range
	Factory setting: 100%

[Settings] 5 L - Menu

Access

[Complete settings] → [Generic functions] → [PID controller] → [Settings]

About This Menu

Following parameters can be accessed if [PID Feedback] $P \cup F$ is not set to [Not Configured] $n \cdot a$.

NOTE: This function cannot be used with some other functions.

[PID Prop.Gain] - P 🛚 🖈

PID proportional gain.

Setting ()	Description
0.01100.00	Setting range
	Factory setting: 1.00

[PI Intgl.Gain] r 15 🖈

Integral gain.

Setting ()	Description
0.01100.00	Setting range Factory setting: 1.00

[PID derivative gain] - d [*

Derivative gain.

Setting ()	Description
0.00100.00	Setting range Factory setting: 0.00

[PID ramp] P - P★

PID acceleration/deceleration ramp, defined to go from [Min PID reference] $P \cdot P I$ to [Max PID reference] $P \cdot P 2$ and conversely.

Setting ()	Description
0.099.9 s	Setting range Factory setting: 0.0 s

[PID Inversion] P ₁ [★

PID inversion.

Setting	Code / Value	Description
[No]	no	No Factory setting
[Yes]	9 E 5	Yes

[PID Min Output] P a L *

PID controller minimum output in Hz.

Setting ()	Description
0.0599.0 Hz	Setting range Factory setting: 0.0 Hz

[PID Max Output] P □ H ★

PID controller maximum output in Hz.

Setting ()	Description
0.0599.0 Hz	Setting range Factory setting: 60.0 Hz

[PID Error Warning] PEr*

PID error warning.

Setting ()	Description
065,535	Setting range
	Factory setting: 100

[PID Integral OFF] P , 5 *

Integral shunt.

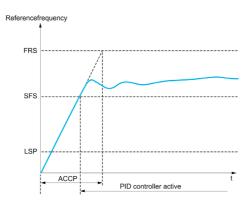
If the assigned input or bit is at 0, the function is inactive (the PID integral is enabled).

If the assigned input or bit is at 1, the function is active (the PID integral is disabled).

Setting	Code / Value	Description
[Not Assigned]	no	Not assigned Factory setting
[DI1][DI6]	L 1 1L 16	Digital input DI1DI6
[DI11][DI16]	L , I IL , 16	Digital input DI11DI16 if VW3A3203 I/O extension module has been inserted
[CD00][CD10]	C d O O C d I O	Virtual digital input CMD.0CMD.10 in [I/O profile] , a configuration
[CD11][CD15]	C d I IC d I S	Virtual digital input CMD.11CMD.15 regardless of configuration
[C101][C110]	C 10 1C 1 10	Virtual digital input CMD1.01CMD1.10 with integrated Modbus Serial in [I/O profile] , p configuration
[C111][C115]	C	Virtual digital input CMD1.11CMD1.15 with integrated Modbus Serial regardless of configuration
[C301][C310]	C 3 0 1 C 3 1 0	Virtual digital input CMD3.01CMD3.10 with a fieldbus module in [I/O profile] , p configuration
[C311][C315]	C 3 I IC 3 IS	Virtual digital input CMD3.11CMD3.15 with a fieldbus module regardless of configuration

[PID acceleration time] A □ □ P ★

PID: acceleration during start-up.



Setting ()	Description
0.0199,99 s	Setting range Factory setting: 0.50 s
(1) Range 0.01 to 99.99 s or 0.1 to 999.9 s or 1 to 6,000 according to [Ramp increment] .nc	

[PID Start Ref Freq] 5 F 5 *

PID start reference frequency.

Setting ()	Description
0.0599.0 Hz	Setting range If [PID Start Ref Freq] 5 F 5 is lower than [Low speed] L 5 P, this function has no effect. Factory setting: 0.0 Hz

Section 6.13

[Generic functions] - [Sleep/wakeup]

What Is in This Section?

This section contains the following topics:

Topic	Page	
[Sleep/Wakeup] 5 PW - Overview	200	
[Sleep menu] 5 L P - Menu	204	
[Al1 Sensor config.] 5 , F / - Menu	206	
[Al2 Sensor config.] 5 , F 2 - Menu	208	
[Al3 Sensor config.] 5 , F 3 - Menu	210	
[Al4 Sensor config.] 5 , F 4 - Menu	211	
[Al5 Sensor config.] 5 , F 5 - Menu	213	
[DI5 Sensor Configuration] 5 , F B - Menu		
[DI6 Sensor Configuration] 5 , F 9 - Menu		
[AIV1 Sensor config.] 5 , V / - Menu	216	
[Sleep menu] 5 L P - Menu	217	
[Boost] 5 b L - Menu	219	
[Advanced sleep check] # d 5 - Menu		
[Wake up menu] W K P - Menu	222	

[Sleep/Wakeup] 5 PW - Overview

About This Menu

Following parameters can be accessed if [PID feedback ass.] P , F is not set to [Not Configured] n ...

A WARNING

UNANTICIPATED EQUIPMENT OPERATION

Verify that activating this function does not result in unsafe conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

The purpose of the "Sleep / Wake-Up" function is to stop the motor in process standstill situations.

It allows you to save energy and helps to prevent premature aging of some equipment that cannot run for a long time at low speed because the greasing or cooling depends on the machine speed.

In a pressure-controlled pumping application:

- The purpose of the Sleep / Wake-Up function is to manage periods of the application where the water demand is low and where it is not needed to keep the main pumps running.
- It allows you to save energy in low demand periods. Then, when the demand is increasing, the application needs to wake up in order to meet the demand.
- Optionally, during a sleep period, a Jockey pump can be started to maintain an emergency service pressure or meet a low water demand.

Depending on user-defined wakeup conditions, the motor is restarted automatically.

Sleep/Wake-Up in PID Control Mode

When the drive is used in PID control, one of the following conditions is used to switch the application to the sleep state:

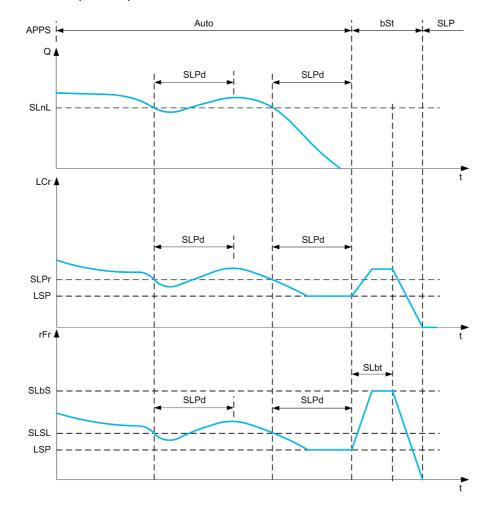
- Sleep on low speed(when all fixed pumps are Off in case of a multi-pump application).
- Sleep on low sleep sensor value (using flow sensor for monitoring).
- Sleep on low motor power (when all fixed pumps are Off in case of a multi-pump application).
- Sleep on external condition (using drive input).

The drive is in "PID control mode" when PID is active. Typically when:

- PID is configured, and
- · Channel 1 is selected, and
- PID is in automatic mode.

When the drive is in a sleep state, a wake-up condition is used to restart the application:

- Wake-up on PID Feedback level
- Wake-up on PID Error level
- · Wake-up on low-pressure condition



Sleep Conditions in PID Control Mode

If there is no valid wake-up condition, then the system switches to the sleep mode after one of the configured sleep conditions remains longer than [Sleep Delay] 5 L P d.

The sleep detection mode is selected by configuring [Sleep Detect Mode] 5 L $P\Pi$. Then the system switches to sleep mode if the selected condition is met:

Configuration	Condition
L F sleep on flow sensor value	Sensor value is below the sleep level
5 W sleep on switch or external condition	The switch input becomes active
5 P d sleep on speed	The output frequency is below the sleep speed and all auxiliary
PWr sleep on power level	The output power is below the sleep power
HP sleep on pressure sensor value	Sensor value is higher than the sleep level
□ r multiple conditions	At least 1 of the configured condition to enter in sleep mode is met

Wake-Up Conditions in PID Control Mode

The system wakes up according to **[Wake Up Mode]** W \sqcup $P \sqcap$ configuration:

- On PID Feedback level
- On PID Error level.
- On low-pressure condition.

If [Feedback] F b K is selected, then the system wakes up and goes back in PID control mode:

- When PID feedback drops below configured [Wake Up Process Level] W u P F if PID is configured in Direct mode, ([PID Inversion] P , [is set to n a).
- When PID feedback raises above configured [Wake Up Process Level] W u P F, if PID is configured in Reverse mode ([PID Inversion] P, E is set to Y E 5).

If [Error] Err is selected, then the system wakes up and goes back in PID control mode:

- When PID feedback drops below ([PID reference] $r P \mathcal{L}$ [Wake Up Process Error] $W \cup P \mathcal{E}$), if PID is configured in Direct mode ([PID Inversion] $P \cup \mathcal{L}$ is set to $p \in \mathcal{L}$).
- When PID feedback raises above ([PID reference] r P L + [Wake Up Process Error] W u P E), if PID is configured in Reverse mode ([PID Inversion] P , L is set to Y E 5).

If **[Pressure]** *LP* is selected, then the system wakes up and goes back in PID control mode when the pressure feedback drops below **[Wake Up Process Level]** W $_{\it LPF}$.

Boosting Phase in PID Control Mode

When entering the sleep mode, the motor accelerates to [Sleep Boost Speed] 5 L L 5 during [Sleep Boost Time] 5 L L L and then stops.

If [Sleep Boost Time] 5 L b E is set to 0, then the boost phase is ignored.

Initial State in PID Control Mode

Just after the system starts in automatic mode (a run order appears while in automatic mode - channel 1 already selected and PID auto):

- If a wake-up condition is met, the drive goes in PID control mode (PID started).
- If a wake-up condition is not met, the drive goes in sleep mode (PID stays stopped and motor is kept halted), and Boosting phase is ignored.

When the control is switched to automatic mode while the motor is running (switch to channel 1 or switch to PID auto mode for example), the drive stays in running state and switches to PID automatic mode.

Configuration of Sleep External Condition (Usage of a No Flow Switch for Example)

Sleep switch allows you to select the source of sleep external condition:

- no input selected for the sleep external condition.
- d , X: the sleep external condition (switch for example) is connected to DIx (the assignment is also possible on a control bit in I/O profile).

Configuration of Sleep Sensor (Flow or Pressure Sensor)

The assignment of a sleep sensor, the configuration of the selected physical input and the configuration of scaling to process value are performed.

A sleep sensor source is selected by [Inst. Flow Assign.] F 5 IR and [OutletPres Assign] P 5 2 R which allows to select the analog or pulse input on which the sensor is connected:

- n : no input selected for sleep sensor value.
- H , X: sleep sensor is connected to Alx.
- $H \cap X$: sleep sensor is connected to virtual AlUx.
- P, X: sleep sensor is connected to pulse input Plx.

The configuration of an analog input is performed.

The configuration of a pulse input is performed.

Depending on the selected source, the process range of the sensor is configured by:

- [Alx Lowest Process] # , X J, [Alx Highest Process] # , X K (without unit), when connected on an analog input.
- [Alv1 Lowest Process] # V , J, [Alv1 Highest Process] # V , K (without unit), when using the virtual analog input.
- [Dix PulseInput Low Freq] P , L X, [Dix PulseInput High Freq] P , H X (without unit), when connected on a pulse input configured in frequency.

[Sleep menu] 5 L P - Menu

Access

[Complete settings] \rightarrow [Generic functions] \rightarrow [Sleep/Wakeup] \rightarrow [Sleep menu]

About This Menu

[Sleep Detect Mode] 5 L P Π

Sleep detection mode.

Setting	Code / Value	Description
[No]	no	Not configured Factory setting
[Switch]	5W?	System enters in sleep mode on switch condition
[Flow]	LF	System enters in sleep mode on low flow condition
[Speed]	5 <i>P d</i>	System enters in sleep mode on speed condition
[Power]	PWr	System enters in sleep mode on power condition
[Pressure]	HP	System enters in sleep mode on high-pressure condition
[Multiple]	or	System enters in sleep mode on multiple-OR condition

[Sleep Switch Assign] 5 L PW

Sleep switch assignment.

This parameter can be accessed if [Sleep Detect Mode] $5 L P \Pi$ is set to [Switch] 5 W.

Select an external condition to enter in sleep mode (for example, flow switch).

Setting	Code / Value	Description
[Not Assigned]	no	Not assigned Factory setting
[DI1][DI6]	L , 1L , 6	Digital input DI1DI6
[DI11][DI16]	L ,	Digital input DI11DI16 if VW3A3203 I/O extension module has been inserted
[CD00][CD10]	[Virtual digital input CMD.0CMD.10 in [I/O profile] , a configuration
[CD11][CD15]	[d [d	Virtual digital input CMD.11CMD.15 regardless of configuration
[C101][C110]	C 10 1C 1	Virtual digital input CMD1.01CMD1.10 with integrated Modbus Serial in [I/O profile] . a configuration
[C111][C115]	[Virtual digital input CMD1.11CMD1.15 with integrated Modbus Serial regardless of configuration
[C301][C310]	C 3 0 1C 3	Virtual digital input CMD3.01CMD3.10 with a fieldbus module in [I/O profile] , p configuration
[C311][C315]	[] [] [] [] [] [] [] [] [] [] [] [] [] [Virtual digital input CMD3.11CMD3.15 with a fieldbus module regardless of configuration
[DI1 (Low level)][DI6 (Low level)]	L ILL 6 L	Digital input DI1DI6 used at low level
[DI11 (Low level)][DI16 (Low level)]	LIILLI 6L	Digital input DI11DI16 used at low level if VW3A3203 I/O extension module has been inserted

[Inst. Flow Assign.] F 5 I R★

Installation flow sensor assignment.

This parameter can be accessed if [Sleep Detect Mode] 5 L $P\Pi$ is set to [Sensor] 5 r 5 r .

Setting	Code / Value	Description
[Not Configured]	no	Not assigned Factory setting
[AI1][AI3]	A , IA , 3	Analog input Al1Al3
[AI4][AI5]	A 14A 15	Analog input Al4Al5 if VW3A3203 I/O extension module has been inserted
[Al Virtual 1]	A · V I	Virtual analogic input 1
[Di5 PulseInput Assignment][Di6 PulseInput Assignment]	P :5P :6	Digital input DI5DI6 used as pulse input

[Al1 Sensor config.] 5 , F / - Menu

Access

[Complete settings] \rightarrow [Generic functions] \rightarrow [Sleep/wakeup] \rightarrow [Sleep menu] \rightarrow [Al1 Sensor config.]

About This Menu

This menu can be accessed if:

- [Inst. Flow Assign.] F 5 I R is set to [AI1] R , I, and
- [Sleep Detect Mode] 5 L P ∏ is set to
 - **[Flow]** *L F*, or
 - [Multiple] □ r.

[Al1 Type] A . I Ł

Configuration of analog input AI1.

Setting	Code / Value	Description
[Voltage]	10 0	0-10 Vdc Factory setting
[Current]	O A	0-20 mA

[Al1 min value] u , L /*

Al1 voltage scaling parameter of 0%.

This parameter can be accessed if [Al1 Type] $H \cap IE$ is set to [Voltage] $I \cup U$.

Setting	Description
0.010.0 Vdc	Setting range Factory setting: 0.0 Vdc

[Al1 max value] u ,H /*

Al1 voltage scaling parameter of 100%.

This parameter can be accessed if [Al1 Type] A , I L is set to [Voltage] I D u.

Setting	Description
0.010.0 Vdc	Setting range
	Factory setting: 10.0 Vdc

[Al1 min. value] [rll*

Al1 current scaling parameter of 0%.

This parameter can be accessed if [Al1 Type] $H \cap IE$ is set to [Current] $\square H$.

Setting	Description
0.020.0 mA	Setting range
	Factory setting: 0.0 mA

[Al1 max. value] [r H | *

Al1 current scaling parameter of 100%.

This parameter can be accessed if [Al1 Type] $H \cap IE$ is set to [Current] $\square H$.

Setting	Description
0.020.0 mA	Setting range Factory setting: 20.0 mA

[Al1 Lowest Process] A , I J

Al1 lowest process.

Setting	Description
-32,76832,767	Setting range. Value in application customer unit.
	Factory setting: 0

[All Highest Process] A , IK

Al1 highest process.

Setting	Description
-32,76832,767	Setting range. Value in application customer unit. Factory setting: 0

[Al2 Sensor config.] 5 , F 2 - Menu

Access

[Complete settings] \rightarrow [Generic functions] \rightarrow [Sleep/wakeup] \rightarrow [Sleep menu] \rightarrow [Al2 Sensor config.]

About This Menu

This menu can be accessed if:

- [Inst. Flow Assign.] F 5 I R is set to [Al2] R ₁ ≥, and
- [Sleep Detect Mode] 5 L P ∏ is set to
 - o [Flow] *L F*, or
 - o [Multiple] ه ر .

[Al2 Type] A ₁2 Ł

Configuration of analog input AI2.

Setting	Code / Value	Description
[Voltage]	100	0-10 Vdc
[Current]	O A	0-20 mA Factory setting
[PTC Management]	PEC	1 to 6 PTC (in serial)
[KTY]	KFA	1 KTY84
[PT1000]	IPE 3	1 PT1000 connected with 2 wires
[PT100]	IP E 2	1 PT100 connected with 2 wires
[Water Prob]	LEuEL	Water level
[3PT1000]	3PL3	3 PT1000 connected with 2 wires
[3PT100]	3P	3 PT100 connected with 2 wires

[Al2 min value] u ı L 2 *

Al2 voltage scaling parameter of 0%.

This parameter can be accessed if [Al2 Type] A , 2 L is set to [Voltage] I D u.

Identical to [Al1 min value] u , L I (see page 206).

[Al2 max value] u , H 2 *

Al2 voltage scaling parameter of 100%.

This parameter can be accessed if [Al2 Type] R , 2 E is set to [Voltage] ID u.

Identical to [Al1 max value] u , H I (see page 206).

[Al2 min. value] [r L 2 *

Al2 current scaling parameter of 0%.

This parameter can be accessed if [Al2 Type] $H \cap Z E$ is set to [Current] $\square H$.

Identical to [Al1 min. value] [r L I (see page 206) with factory setting: 0.4 mA.

[Al2 max. value] [r H 2 *

Al2 current scaling parameter of 100%.

This parameter can be accessed if [Al2 Type] $H \cap 2 E$ is set to [Current] $\square H$.

Identical to [Al1 max. value] [r H I (see page 206).

[Al2 Lowest Process] A , 2 J

Al2 lowest process.

Identical to [Al1 Lowest Process] R , I J (see page 207).

[Al2 Highest Process] A ₁ ≥ K

Al2 highest process.

Identical to [Al1 Highest Process] $H \cap IK$ (see page 207).

[Al3 Sensor config.] 5 , F 3 - Menu

Access

[Complete settings] \rightarrow [Generic functions] \rightarrow [Sleep/wakeup] \rightarrow [Sleep menu] \rightarrow [Al3 Sensor config.]

About this menu

This menu can be accessed if:

- [Inst. Flow Assign.] F 5 I R is set to [Al3] R , 3, and
- [Sleep Detect Mode] 5 L P ∏ is set to
 - o [Flow] *L F*, or
 - [Multiple] □ r.

[Al3 Type] A . 3 Ł

Configuration of analog input AI3.

Identical to [Al2 Type] A . 2 L (see page 208).

[Al3 min value] u , L 3 *

Al3 voltage scaling parameter of 0%.

This parameter can be accessed if $\mathbf{H} \cdot \mathbf{J} \mathbf{E}$ is set to [Voltage] $\mathbf{I} \mathbf{D} \mathbf{u}$.

Identical to [Al1 min value] u , L I (see page 206).

[Al3 max value] □ 1H 3 ★

Al3 voltage scaling parameter of 100%.

This parameter can be accessed if $H \cap \exists L$ is set to [Voltage] $I \square \sqcup$.

Identical to [Al1 max value] u , H I (see page 206).

[Al3 min. value] [r L 3 *

Al3 current scaling parameter of 0%.

This parameter can be accessed if $\mathbf{R} \cdot \mathbf{J} \mathbf{E}$ is set to [Current] $\mathbf{D} \mathbf{R}$.

Identical to [Al1 min. value] [r L I (see page 206).

[Al3 max. value] [r H 3 *

Al3 current scaling parameter of 100%.

This parameter can be accessed if $H \cap \exists E$ is set to [Current] $\square H$.

Identical to [Al1 max. value] [r H I (see page 206).

[Al3 Lowest Process] A , 3 J

Al3 lowest process.

Identical to [Al1 Lowest Process] H + I J (see page 207).

[Al3 Highest Process] F , 3K

Al3 highest process.

Identical to [Al1 Highest Process] FI , IK (see page 207).

[Al4 Sensor config.] 5 , F 4 - Menu

Access

[Complete settings] \rightarrow [Pump functions] \rightarrow [Sleep/wakeup] \rightarrow [Sleep menu] \rightarrow [Al4 Sensor config.]

About This Menu

This menu can be accessed if:

- [Inst. Flow Assign.] F 5 I R is set to [AI4] R , 4, and
- [Sleep Detect Mode] 5 L P Π is set to
 - o **[Flow]** *L F*, or
 - [Multiple] ܩ ┏ .

[Al4 Type] A , 4 L ★

Configuration of analog input AI4.

This parameter can be accessed if VW3A3203 I/O extension module has been inserted.

Setting	Code / Value	Description
[Voltage]	100	0-10 Vdc
[Current]	0 A	0-20 mA
		Factory setting
[Voltage +/-]	n 10 u	-10/+10 Vdc
[PTC Management]	PEC	1 to 6 PTC (in serial)
[KTY]	KEY	1 KTY84
[PT1000]	IPE 3	1 PT1000 connected with 2 wires
[PT100]	IPE2	1 PT100 connected with 2 wires
[3 PT1000]	3P	3 PT1000 connected with 2 wires
[3 PT100]	3P	3 PT100 connected with 2 wires
[PT1000 in 3 wires]	IPE 33	1 PT1000 connected with 3 wires (Al4 & Al5 only)
[PT100 in 3 wires]	IPE23	1 PT100 connected with 3 wires (Al4 & Al5 only)
[3 PT1000 in 3 wires]	3PL 33	3 PT1000 connected with 3 wires (Al4 & Al5 only)
[3 PT100 in 3 wires]	3P	3 PT100 connected with 3 wires (Al4 & Al5 only)

[Al4 min value] ⊔ , L 4★

Al4 voltage scaling parameter of 0%.

Identical to [Al1 min value] u , L I (see page 206).

[Al4 max value] ⊔ ₁H 4 ★

Al4 voltage scaling parameter of 100%.

Identical to [Al1 max value] u , H I (see page 206).

[Al4 min. value] [r L 4 *

Al4 current scaling parameter of 0%.

Identical to [Al1 min. value] [r L I (see page 206).

[Al4 max. value] [r H 4 *

Al4 current scaling parameter of 100%.

Identical to [Al1 max. value] [r H I (see page 206).

[Al4 Lowest Process] R , 4 J

Al4 lowest process.

Identical to [Al1 Lowest Process] H , I J (see page 207).

[Al4 Highest Process] A , 4 K

Al4 highest process.

Identical to [Al1 Highest Process] H . IK (see page 207).

[Al5 Sensor config.] 5 , F 5 - Menu

Access

[Complete settings] \rightarrow [Generic functions] \rightarrow [Sleep/wakeup] \rightarrow [Sleep menu] \rightarrow [Al5 Sensor config.]

About This Menu

This menu can be accessed if:

- [Inst. Flow Assign.] F 5 I R is set to [AI5] R , 5, and
- [Sleep Detect Mode] 5 L P Π is set to
 - o [Flow] L F, or
 - o [Multiple] or.

[Al5 Type] *H* ⋅ 5 Ł ★

Configuration of analog input AI5.

This parameter can be accessed if VW3A3203 I/O extension module has been inserted.

Identical to [Al4 Type] H , 4 L (see page 211).

[Al5 min value] u , L 5 *

Al5 voltage scaling parameter of 0%.

Identical to [Al1 min value] u , L I (see page 206).

[Al5 max value] 🗓 ₁H5 🖈

Al5 voltage scaling parameter of 100%.

Identical to [Al1 max value] u , H I (see page 206).

[Al5 min. value] [r L 5 *

Al5 current scaling parameter of 0%.

Identical to [Al1 min. value] [r L I (see page 206).

[Al5 max. value] [r H 5 *

Al5 current scaling parameter of 100%.

Identical to [Al1 max. value] [r H I (see page 206).

[Al5 Lowest Process] F , 5 J

Al5 lowest process.

Identical to [Al1 Lowest Process] R , I J (see page 207).

[Al5 Highest Process] A , 5 K

AI5 highest process.

Identical to [Al1 Highest Process] # , IK (see page 207).

[DI5 Sensor Configuration] 5 , F B - Menu

Access

[Complete settings] \rightarrow [Generic functions] \rightarrow [Sleep/wakeup] \rightarrow [Sleep menu] \rightarrow [DI5 Sensor Configuration]

About This Menu

This menu can be accessed if:

- [Inst. Flow Assign.] F 5 I F is set to [DI5 PulseInput Assignment] P , 5, and
- [Sleep Detect Mode] 5 L P Π is set to
 - \circ [Flow] LF, or
 - [Multiple] □ r.

[DI5 PulseInput Low Freq] P , L 5

DI5 pulse input low frequency.

Setting	Description
0.0030,000.00 Hz	Setting range
	Factory setting: 0.00 Hz

[DI5 PulseInput High Freq] P , H 5

DI5 pulse input high frequency.

Setting	Description
0.0030.00 kHz	Setting range
	Factory setting: 30.00 kHz

[DI5 Min Process] P , 5 J

Minimum process value for selected input.

Setting	Description
-32,76732,767	Setting range
	Factory setting: 0

[DI5 Max Process] P , 5 K

Maximum process value for selected input.

Setting	Description
-32,76732,767	Setting range Factory setting: 0

[DI6 Sensor Configuration] 5 , F 9 - Menu

Access

[Complete settings] \Rightarrow [Generic functions] \Rightarrow [Sleep/wakeup] \Rightarrow [Sleep menu] \Rightarrow [Dl6 Sensor Configuration]

About This Menu

Identical to [DI5 Sensor Configuration] 5 , F B - Menu (see page 214).

This menu can be accessed if:

- [Inst. Flow Assign.] F 5 I R is set to [DI6 PulseInput Assignment] P , 6, and
- [Sleep Detect Mode] 5 L P ∏ is set to
 - o **[Flow]** *L F*, or
 - o [Multiple] or.

[DI6 PulseInput Low Freq] P , L 5

DI6 pulse input low frequency.

[DI6 PulseInput High Freq] P , H 6

DI6 pulse input high frequency.

[DI6 Min Process] P , 6 J

Minimum process value for selected input.

[DI6 Max Process] P , E K

Maximum process value for selected input.

[AIV1 Sensor config.] 5 , V / - Menu

Access

[Complete settings] \rightarrow [Pump functions] \rightarrow [Sleep/wakeup] \rightarrow [Sleep menu] \rightarrow [AIV1 Sensor config.]

About This Menu

This menu can be accessed if:

- [Inst. Flow Assign.] F 5 I A is set to [Al Virtual 1] A i I I, and
- [Sleep Detect Mode] 5 L P Π is set to
 - o **[Flow]** *L F*, or
 - [Multiple] ܩ ┏ .

[AIV1 Channel Assignment] A , [|

Channel assignment for virtual analog input AIV1.

Setting	Code / Value	Description
[Not Configured]	no	Not assigned Factory setting
[Modbus]	ПЧЬ	Reference frequency via Modbus
[Com. Module]	u E F	Reference frequency via fieldbus module if a fieldbus module has been inserted

[AIV1 Lowest Process] Full J

Al virtual x: minimum process value.

Setting	Description
-32,76732,767	Setting range
	Factory setting: 0

[AIV1 Highest Process] Au IK

Al virtual x: maximum process value.

Setting	Description
-32,76732,767	Setting range Factory setting: 0

[Sleep menu] 5 L P - Menu

Access

[Complete settings] → [Generic functions] → [Sleep/wakeup] → [Sleep menu]

[Sleep Flow Level] 5 L n L *

Sleep flow level.

Sensor level under which the system should enter the sleep mode (Zero value to deactivate).

This parameter can be accessed if:

- [Inst. Flow Assign.] F 5 I R is not set to [Not Configured] n a, and
- [Sleep Detect Mode] 5 L P Π is set to
 - **[Flow]** *L F*, or
 - [Multiple] □ r.

Setting ()	Description
[No] n a to 32,767	Setting range Unit: [Flow rate unit] 5 u F r (for example, %, l/s; m3/h)
	Factory setting: [No] n a

[OutletPres Assign] P 5 2 R ★

Outlet pressure sensor assignment.

This parameter can be accessed if:

- [Sleep Detect Mode] 5 L P Π is set to [Pressure] HP, or
- [Sleep Detect Mode] 5 L P ∏ is set to [Multiple] □ r.

Setting	Code / Value	Description
[Not Configured]	no	Not assigned
		Factory setting

[Sleep Min Speed] 5 L 5 L *

Sleep flow level.

Speed level under which the system should enter the sleep mode.

This parameter can be accessed if:

- [Sleep Detect Mode] 5 L P Π is set to [Speed] 5 P d, or
- [Sleep Detect Mode] 5 L P ∏ is set to [Multiple] □ r.

Setting ()	Description
0500.0 Hz	Setting range Factory setting: [No] n a

[Sleep Power Level] 5 L P r *

Sleep power level.

Power level under which the system should enter the sleep mode.

This parameter can be accessed if:

- [Sleep Detect Mode] 5 L PΠ is set to [Power] PWr, or
- [Sleep Detect Mode] 5 L P ∏ is set to [Multiple] □ r.

Setting ()	Description
0[Nominal Motor Power] n P r	Setting range Factory setting: [No] n p

[Sleep Delay] 5 L P d★

Sleep delay.

This parameter can be accessed if [Sleep Detect Mode] 5 L $P\Pi$ is not set to [Not Configured] πa .

Setting ()	Description
03,600 s	Setting range Factory setting: 20 s

[Boost] 5 b L - Menu

Access

[Complete settings] \rightarrow [Generic functions] \rightarrow [Sleep/wakeup] \rightarrow [Sleep menu] \rightarrow [Boost]

About This Menu

Following parameters can be accessed if [Sleep Detect Mode] 5 L $P\Pi$ is not set to [No] n a.

[Sleep Boost Speed] 5 L b 5 *

Sleep boost speed.

Setting ()	Description
0599.0 Hz	Setting range
	Factory setting: n a

[Sleep Boost Time] 5 L b Ł *

Sleep boost time.

This parameter can be accessed if [Sleep Boost Speed] 5 L L 5 is not set to 0.

Setting ()	Description
03,600 s	Setting range
	Factory setting: n a

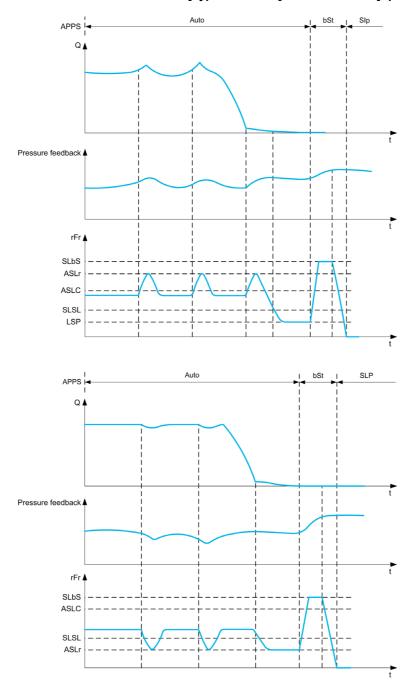
[Advanced sleep check] A d 5 - Menu

Access

[Complete settings] \rightarrow [Generic functions] \rightarrow [Sleep/wakeup] \rightarrow [Sleep menu] \rightarrow [Advanced sleep check]

About This Menu

This function can be activated if [Type of control] $E \circ C E$ is set to [Speed] $S P \circ D$ or [Power] $P \lor D \circ D$.



[Sleep Mode] A 5 L Π

Advanced sleep mode.

Setting ()	Code / Value	Description
[No]	no	No Factory setting
[YES]	4 E S	Yes

[Sleep Condition] F 5 L [

Advanced sleep verifies speed condition.

This parameter can be accessed if [Sleep Mode] $H SL \Pi$ is not set to [No] n a.

Setting ()	Description
0[High Speed] H 5 P	Setting range Factory setting: 0.0 Hz

[Sleep Delay] A 5 L d★

Advanced sleep verifies delay.

This parameter can be accessed if [Sleep Mode] $H SL \Pi$ is not set to [No] $n \square$.

Setting ()	Description
09,999 s	Setting range Factory setting: 20 s

[Check Sleep Ref Spd] # 5 L r *

Advanced sleep verifies speed reference.

This parameter can be accessed if [Sleep Mode] $H S L \Pi$ is not set to [No] n a.

Setting ()	Description
0[High Speed] H 5 P	Setting range Factory setting: 0.0 Hz

[Wake up menu] W K P - Menu

Access

[Complete settings] → [Generic functions] → [Sleep/wakeup] → [Wake up menu]

About This Menu

This menu can be accessed if [Sleep Detect Mode] $5 L P \Pi$ is not set to [Not Configured] n a.

[Wake Up Mode] W ⊔ P П ★

Wake-up mode.

Setting	Code / Value	Description
[Feedback]	FЬK	Wake-up on PID feedback level Factory setting
[Error]	Err	Wake-up on PID error level
[Pressure]	L P	Wake-up on low-pressure condition

[Wake Up Process Level] W □ P F *

Wake-up process value level.

This parameter can be accessed if [Wake Up Mode] $W \sqcup P \Pi$ is set to [FeedBack] $F \sqcup K$.

Setting ()	Description
[Min PID feedback] P , F I[Max PID feedback] P , F 2	Setting range Factory setting:

[Wake Up Process Error] W u P E *

Wake-up process value error level.

This parameter can be accessed if [Wake Up Mode] $W \sqcup P \Pi$ is set to [Error] $E \vdash r$.

Setting ()	Description
0[Max PID feedback] P ₁ F ₽	Setting range Factory setting: 0,0 Hz

[OutletPres Assign] P 5 ≥ R ★

Outlet pressure sensor assignment.

This parameter can be accessed if [Wake Up Mode] $W \sqcup P \sqcap$ is set to [Pressure] L P.

Setting	Code / Value	Description
[Not Configured]	n o	Not assigned
		Factory setting

[Wake Up Press Level] W u P L *

Wake-up pressure level.

Pressure level over which the system should leave the sleep mode.

This parameter can be accessed if [Wake Up Mode] $W \sqcup P \Pi$ is set to [Pressure] L P.

Setting ()	Description
[No] n a to 32,767	Setting range Unit: [P sensor unit] 5 u Pr (for example, Pa, Bar, PSI, %) Factory setting: [No] n a

Section 6.14

[Generic functions] - [Threshold reached]

[Threshold reached] *E H r E - Menu*

Access

[Complete settings] → [Generic functions] → [Threshold reached]

[Low I Threshold] [E d L

Current low threshold value.

Setting ()	Description
065,535 A	Setting range
	Factory setting: 0 A

[High Current Thd] [L L d

Current high threshold value.

Setting ()	Description
065,535 A	Setting range Factory setting: Drive nominal current

[Low Freq. Threshold] F Ł d L

Motor low frequency threshold.

Setting ()	Description
0.0599.0 Hz	Setting range Factory setting: 0.0 Hz

[Motor Freq Thd] F L d

Motor frequency threshold.

Setting ()	Description
0.0599.0 Hz	Setting range Factory setting: 50.0 Hz

[2 Freq. Threshold] F 2 d L

Motor low frequency second threshold.

[Freq. threshold 2] F ≥ d

Motor frequency threshold 2.

Setting ()	Description
0.0599.0 Hz	Setting range Factory setting: 50.0 Hz

[Motor Thermal Thd] E E d

Motor thermal state threshold.

Setting ()	Description
0118%	Setting range Factory setting: 100%

[Reference high Thd] r + d

Reference frequency high threshold.

Setting ()	Description
0.0599.0 Hz	Setting range Factory setting: 0.0 Hz

[Reference low Thd] r E dL

Reference frequency low threshold.

Setting ()	Description
0.0599.0 Hz	Setting range Factory setting: 0.0 Hz

Section 6.15

[Generic functions] - [Mains contactor command]

[Mains contactor command] L L C - Menu

Access

[Complete settings] → [Generic functions] → [Mains contactor command]

About This Menu

The line contactor closes every time a run command (forward or reverse) is sent and opens after every stop, as soon as the drive is locked. For example, if the stop mode is stop on ramp, the contactor opens when the motor reaches zero speed.

NOTE: The drive control power supply must be provided via an external 24 Vdc source.

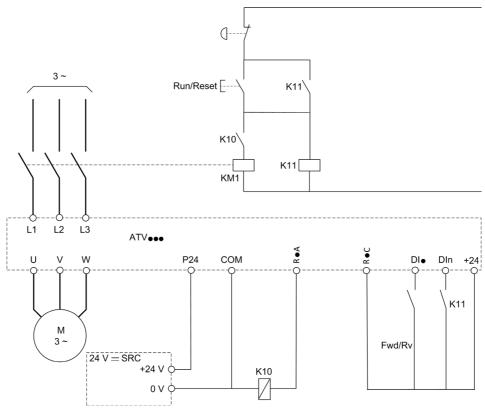
NOTICE

DAMAGE TO THE DRIVE

Do not use this function at intervals of less than 60 s.

Failure to follow these instructions can result in equipment damage.

Example circuit (24 Vdc power supply):



Dlï = Run command [Forward] F r d or [Reverse] r r 5

RïA/RïC = [Mains Contactor] L L C

Dln = [Drive Lock] L E 5

NOTE: The Run/Reset key must be pressed once the emergency stop key has been released.

[Mains Contactor] L L [

Mains contactor control.

Setting	Code / Value	Description	
[No]	no	Not assigned Factory setting	
[R2][R3]	r 2r 3	Relay output R2R3	
[R4][R6]	r 4r 6	Relay output R4R6 if VW3A3204 relay output option module has been inserted	
[DQ11 Digital Output][DQ12 Digital Output]	do do 2	Digital output DQ11DQ12 if VW3A3203 I/O extension module has been inserted	

[Drive Lock] L E 5 *

Drive lock assignment.

This parameter can be accessed if [Mains Contactor] L L L is not set to [No] n a.

Setting	Code / Value	Description	
[Not Assigned]	no	Not assigned Factory setting	
[CD00][CD10]	C 4 0 0 C 4 1 0	Virtual digital input CMD.0CMD.10 in [I/O profile] , a configuration	
[CD11][CD15]	C d I IC d IS	Virtual digital input CMD.11CMD.15 regardless of configuration	
[C101][C110]	C 10 1C 1 10	Virtual digital input CMD1.01CMD1.10 with integrated Modbus Serial in [I/O profile] , a configuration	
[C111][C115]	C	Virtual digital input CMD1.11CMD1.15 with integrated Modbus Serial regardless of configuration	
[C301][C310]	C 3 0 1 C 3 1 0	Virtual digital input CMD3.01CMD3.10 with a fieldbus module in [I/O profile] , _ configuration	
[C311][C315]	C 3 I I C 3 IS	Virtual digital input CMD3.11CMD3.15 with a fieldbus module regardless of configuration	
[DI1 (Low level)][DI6 (Low level)]	L ILL 6L	Digital input DI1DI6 used at low level	
[DI11 (Low level)][DI16 (Low level)]	L I ILL I6L	Digital input DI11DI16 used at low level if VW3A3203 I/O extension module has been inserted	

[Mains V. time out] L E E

Monitoring time for closing of line contactor.

Setting	Description
1999 s	Setting range
	Factory setting: 5 s

Section 6.16

[Generic functions] - [Parameters switching]

What Is in This Section?

This section contains the following topics:

Торіс	
[Parameters switching] IL P - Menu	228
[Set 1] P 5 I - Menu	231
[Set 2] P 5 2 - Menu	232
[Set 3] P 5 3 - Menu	233

[Parameters switching] *∏ L P* - Menu

Access

[Complete settings] → [Generic functions] → [Parameters switching]

About This Menu

A set of 1 to 15 parameters from the **[Parameter Selection]** 5 *P* 5 list (see page 229) can be selected and 2 or 3 different values assigned. These 2 or 3 sets of values can then be switched using 1 or 2 digital inputs or control word bits. This switching can be performed during operation (motor running). It can also be controlled based on 1 or 2 frequency thresholds, whereby each threshold acts as a digital input (0 = threshold not reached, 1 = threshold reached).

	Values 1	Values 2	Values 3
Parameter 1	Parameter 1	Parameter 1	Parameter 1
Parameter 15	 Parameter 15	 Parameter 15	 Parameter 15
Input DI or bit or frequency threshold 2 values	0	1	0 or 1
Input DI or bit or frequency threshold 3 values	0	0	1

NOTE: Do not modify the parameters in **[Parameter Selection]** 5 P 5 (see page 229), because any modifications made in this menu will be lost on the next power-up. The parameters can be adjusted during operation in the **[Parameters switching]** Π L P - menu, on the active configuration.

[2 Parameter sets] [H H I

Parameter switching assignment 1.

Setting	Code / Value	Description	
[Not Assigned]	no	Not assigned Factory setting	
[Mot Freq High Thd]	FEA	Motor frequency high threshold reached	
[2nd Freq Thd Reached]	F 2 A	Second frequency threshold reached	
[DI1][DI6]	L , IL , 6	Digital input DI1DI6	
[DI11][DI16]	L ,	Digital input DI11DI16 if VW3A3203 I/O extension module has been inserted	
[CD00][CD10]	C d O O C d I	Virtual digital input CMD.0CMD.10 in [I/O profile] , a configuration	
[CD11][CD15]	C d I IC d I 5	Virtual digital input CMD.11CMD.15 regardless of configuration	
[C101][C110]	C 10 1C 1 1	Virtual digital input CMD1.01CMD1.10 with integrated Modbus Serial in [I/O profile] , a configuration	
[C111][C115]	C	Virtual digital input CMD1.11CMD1.15 with integrated Modbus Serial regardless of configuration	
[C301][C310]	C 3 0 1C 3 1	Virtual digital input CMD3.01CMD3.10 with a fieldbus module in [I/O profile] , a configuration	
[C311][C315]	[]	Virtual digital input CMD3.11CMD3.15 with a fieldbus module regardless of configuration	

[3 Parameter sets] [HR2

Parameter switching assignment 2.

Identical to [2 Parameter sets] [HR I.

Switching 3 parameter sets.

NOTE: In order to obtain 3 parameter sets, it is necessary to configure first [2 Parameter sets] [HR I.

[Parameter Selection] 5 P 5

This parameter can be accessed if [2 Parameter sets] [HR I is not set to [No] n a.

Making an entry in this parameter opens a window containing all the adjustment parameters that can be accessed. Select 1 to 15 parameters using **OK** key. Parameter(s) can also be deselected using **OK** key. Available parameters for parameters switching function are:

Parameter	Code
[Ramp increment]	
[Acceleration]	ACC
[Deceleration]	dec
[Acceleration 2]	8C2
•	d E 2
[Deceleration 2]	
[Begin Acc round]	ER I
[End Acc round]	E R 2
[Begin Dec round]	ER3
[End Dec round]	ER4
[Low Speed]	L 5 P
[High Speed]	HSP
[Motor Th Current]	, E H
[IR compensation]	ufr
[Slip compensation]	5 L P
[K speed loop filter]	S F C
[Speed time integral]	5 :E
[Speed prop. gain]	5 P G
[Inertia Factor]	5 P G u
[Ramp Divider]	d ℂ F
[DC Inj Level 1]	, d [
[DC Inj Time 1]	Ed,
[DC Inj Level 2]	19C5
[DC Inj Time 2]	FGC
[Auto DC inj Level 1]	5 d C 1
[Auto DC Inj Time 1]	FACI
[Auto DC inj Level 2]	5 d C 2
[Auto DC Inj Time 2]	F q C 2
[Switching frequency]	5Fr
[Current Limitation]	EL ,
[Low Speed Timeout]	EL 5
[Sleep Offset Thres.]	SLE
[Preset speed 2][Preset speed 8]	5 P 2 5 P 8
[PID Prop.Gain]	r P G
[PID Intgl.Gain]	r 16
[PID derivative gain]	r d G
[PID ramp]	PrP
[PID Min Output]	PoL
[PID acceleration time]	ЯССР
[Min fbk Warning]	PAL
[Max fbk Warning]	РЯН
[PID error Warning]	PEr
[Speed input %]	P5r
[Ref PID Preset 2]	r P 2
[Ref PID Preset 3]	r P 3
[Ref PID Preset 4]	r P 4
<u></u>	1

Parameter	Code
[PID Fdbk Range]	PFNr
[PID Fdbk Error Delay]	PFNd
[High Current Thd]	C F d
[Low I Threshold]	C F d L
[Motor Freq Thd]	FEd
[Low Freq.Threshold]	FEdL
[Freq. threshold 2]	F2d
[2 Freq. Threshold]	F2dL
[Freewheel stop Thd]	FFL
[Motor Therm Thd]	FFG
[Reference high Thd]	rtd
[Reference low Thd]	rEdL
[Skip Frequency]	JPF
[Skip Frequency 2]	JF 2
[3rd Skip Frequency]	JF 3
[Skip Freq.Hysteresis]	JFH
[Unid.Thr.Nom.Speed]	Lun
[Unld.Thr.0.Speed]	LuL
[Unid. FreqThr. Det.]	rNud
[Hysteresis Freq]	5rb
[Underload T.B.Rest.]	FEU
[Ovld Detection Thr.]	LoC
[Overload T.B.Rest.]	FLo
[Fan mode]	FFΠ
[Stall Max Time]	SEPI
[Stall Current]	5 L P 2
[Stall Frequency]	5 L P 3
[Al2 Th Warn Level]	F H S B
[Al5 Th Warn Level]	E H S R
[Al2 Th Error Level]	E H 2 F
[Al5 Th Error Level]	E H S F
[Sleep Min Speed]	5 L 5 L
[Sleep Delay]	SLPd
[SLeep Boost Speed]	5165
[Sleep Boost Time]	SLBE

[Set 1] P 5 I - Menu

Access

[Complete settings] \rightarrow [Generic functions] \rightarrow [Parameters switching] \rightarrow [Set 1]

About This Menu

Making an entry in this menu opens a settings window containing the selected parameters in the order in which they were selected.

[Set 2] P 5 2 - Menu

Access

[Complete settings] \rightarrow [Generic functions] \rightarrow [Parameters switching] \rightarrow [Set 2]

About This Menu

Identical to [Set 1] P 5 I - (see page 232).

[Set 3] P 5 3 - Menu

Access

[Complete settings] \rightarrow [Generic functions] \rightarrow [Parameters switching] \rightarrow [Set 3]

About This Menu

Identical to [Set 1] P 5 I - (see page 232).

Section 6.17

[Generic functions] - [Stop on prolonged spd]

[Stop after speed timeout] Pr 5P - Menu

Access

[Complete settings] → [Generic functions] → [Stop after speed timeout]

Sleep/Wake-Up in Speed Control Mode

The drive is in Speed control mode, when PID is not active, typically when:

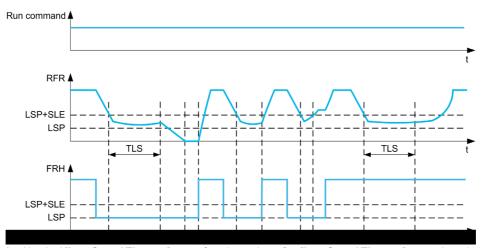
- PID is not configured (the motor speed setpoint is controlled by an external PLC, for example).
- PID is in manual mode (manual application mode, for example).
- PID is not active because Channel 1 is not selected (forced local mode enabled, for example).

When the drive is used in Speed Control (PID not used or not active), a speed condition is used to switch the application to the sleep state. When the drive is in sleep state, the motor is restarted if the sleep condition disappears.

This function avoids prolonged operation at low speeds when neither useful nor compliant with the system constraints. It stops the motor after a period of operation at reduced speed. This time and speed can be adjusted.

In Speed control mode, Sleep/Wake-up is managed according to the following rules:

- The motor is stopped when [Pre-Ramp Ref Freq] F r H and [Output frequency] r F r become and stay lower than [Low speed] L 5 P + [Sleep Offset Thres.] 5 L E during [Low Speed Timeout] E L 5.
- The motor is restarted when [Pre-Ramp Ref Freq] F r H > [Low speed] L 5 P + [Sleep Offset Thres.] 5 L E.



- Nominal [Low Speed Timeout] £ L 5 function action: after [Low Speed Timeout] £ L 5 time, the motor is stopped according to the current deceleration ramp
- 2 [Pre-Ramp Ref Freq] Fr H becomes greater than [Low speed] L 5 P + [Sleep Offset Thres.] 5 L E and run order still present [Low Speed Timeout] L L 5 function is deactivated
- 3 [Low Speed Timeout] *L L* 5 function is not activated because [Pre-Ramp Ref Freq] *F r H* becomes greater than [Low speed] *L* 5 *P* + [Sleep Offset Thres.] 5 *L E* before [Low Speed Timeout] *L L* 5 has expired
- 4 [Low Speed Timeout] *L L* 5 function is not activated because [Output frequency] ¬ F ¬ becomes greater than [Low speed] *L* 5 P + [Sleep Offset Thres.] 5 *L E* before [Low Speed Timeout] *L L* 5 has expired
- 5 [Low Speed Timeout] L L 5 function is not activated because [Pre-Ramp Ref Freq] F r H stays greater than [Low speed] L 5 P + [Sleep Offset Thres.] 5 L E

[Low Speed Timeout] *L L* 5

Time limited speed.

Setting ()	Description
0.0999.9 s	Setting range Factory setting: 0.0 s

[Sleep Offset Thres.] 5 L E *

Sleep offset threshold.

This parameter can be accessed if [Low Speed Timeout] £ L 5 is not set to 0.

Adjustable restart threshold (offset) following a stop after prolonged operation at **[Low speed]** L **5** P + **[Sleep Offset Thres.] 5** L E, in Hz. The motor restarts if the reference rises above (LSP + SLE) and if a run command is still present.

Setting ()	Description
1.0[Max Frequency] <i>E F r</i>	Setting range Factory setting: 1.0 Hz

Section 6.18

[Generic functions] - [Advanced sleep check]

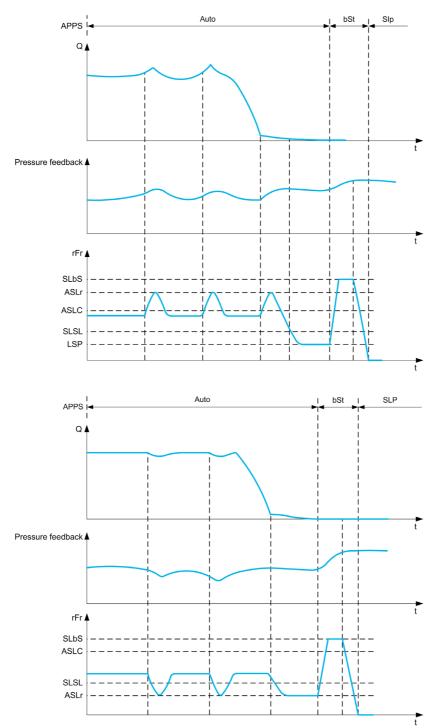
[Advanced sleep check] A d 5 - Menu

Access

[Complete settings] → [Generic functions] → [Advanced sleep check]

About This Menu

This function cannot be activated if [Type of control] $E \circ E$ is not set to [Pressure] $P \circ E \circ S$.



[Sleep Mode] A 5 L Π

Advanced sleep mode.

Setting ()	Code / Value	Description
[No]	no	No Factory setting
[YES]	4 E S	Yes

[Sleep Condition] F 5 L [

Advanced sleep verifies speed condition.

This parameter can be accessed if [Sleep Mode] $H SL \Pi$ is not set to [No] n a.

Setting ()	Description
0[High Speed] H 5 P	Setting range Factory setting: 0.0 Hz

[Sleep Delay] A 5 L d★

Advanced sleep verifies delay.

This parameter can be accessed if [Sleep Mode] $H SL \Pi$ is not set to [No] $n \square$.

Setting ()	Description
09,999 s	Setting range Factory setting: 20 s

[Check Sleep Ref Spd] # 5 L r *

Advanced sleep verifies speed reference.

This parameter can be accessed if [Sleep Mode] $H S L \Pi$ is not set to [No] n a.

Setting ()	Description
0599.0 Hz	Setting range Factory setting: 0.0 Hz

Section 6.19

[Pump functions] - [Booster control]

Introduction

The aim of the booster control function is to maintain the desired pressure at the outlet of the pumps according to the demand by:

- Managing the velocity of the variable speed pump connected to the drive.
- Staging/De-staging the auxiliary fixed speed pumps.

What Is in This Section?

This section contains the following topics:

Topic	Page
[System Architecture] ПРЯ - Menu	239
[Pumps configuration] P u П P - Menu	243
[System Architecture] ПРЯ - Menu	246
[Booster control] 6 5 C - Menu	247
[Stage/Destage condition] 5 d [Π - Menu	248
[Booster control] b 5 C - Menu	249

[System Architecture] $\Pi P 9$ - Menu

Access

[Complete settings] → [Pump functions] → [Booster control] → [System architecture]

About This Menu

This menu is used to define the equipment architecture.

The architecture is chosen by setting [Pump System Architecture] $\Pi P S R$ to [Single Drive] $u \cap d \circ L$: one variable speed pump and up to five fixed speed pumps.

The total number of pumps is set with [Nb Of Pumps] $\Pi P P n$:

- With lead pump alternation, using interlocked switching relays for all pumps to connect them on mains
 or on the drive.
- Without lead pump alternation, using digital outputs to command the auxiliary pumps (with soft starters for example). The lead pump is always connected to the drive.

Pump Cycling Mode

This functionality allows changing the start order of all available pumps in order to manage their wear. There are several ways to perform the pump cycling strategy by setting [Pump Cycling Mode] $\Pi PP E$:

- Cycling based on pump order:
 - [FIFO] F , F mode: pumps are started and stopped in ascending order
 - [LIFO] L , F □ mode: pumps are started in ascending order while they are stopped in descending order

Lead Pump Alternation

The lead pump alternation function allows permuting the available pumps in order that each pump can become the lead pump (variable speed pump) instead of an auxiliary pump (fixed speed pump).

The lead pump is the first pump to be started and the last pump to be stopped. It is always associated to the variable speed drive.

The function can be activated by setting [Lead Pump Alternation] ΠPL A:

- [No] n a: no lead pump alternation, the pump 1 is always the lead pump. The pump cycling is applied only on auxiliary pumps.
- **[Stage]** 5 *E R G E*: The lead pump is permuted between all available pumps at each stage. In this mode a pump cycling strategy is followed to stage or destage a pump.
 - When the needed pressure exceeds the already running pumps capability, the next pump is staged as lead pump and previous pumps becomes fixed speed pumps.
 - The time delay needed to switch between pumps can be adjust using [Altern Wait Time] ПРЯ Ł.
 - When the needed pressure becomes lower than the lead pump capability, the fixed speed pumps are destaged following the [Pump Cycling Mode] ΠΡΡΕ

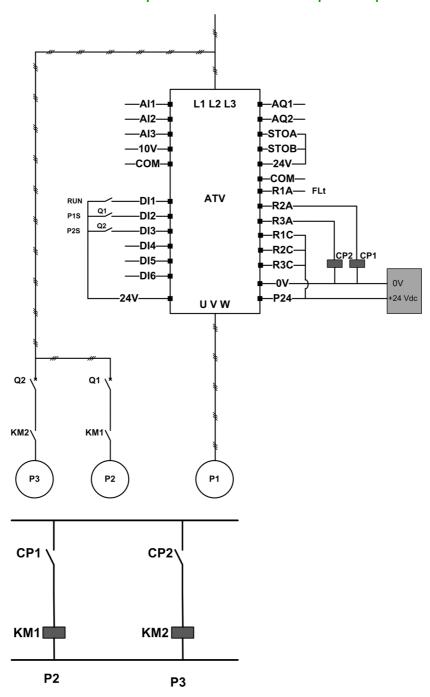
When lead pump alternation is activated, catch on fly function should be configured to reduce over current when a pump is started as the lead pump while it was running as auxiliary pump before. It is also possible to set **[Pump Ready Delay]** $\Pi P \cdot d$ to delay the availability of an auxiliary pump for a new start after it has been stopped.

Display Parameters

A set of parameters to display the system is available in [Display] $\Pi \square n$ - [Pump parameters] PPr - [Multipump System] $\Pi P S$ -:

- The state of the system [MultiPump State] ΠΡ5.
- The quantity of pumps available [Available Pumps] $\Pi P \Pi n$ and the quantity of pump already staged [Nb of Staged Pumps] $\Pi P \Pi n$.
- The number of the pump selected to be the lead pump [Lead Pump] PL .d.
- The number of the next pump to be staged [Next Staged Pump] P n E 5 and de-staged [Next Destaged Pump] P n E d.
- For each pump (pump 1 in the example):
 - o The state [Pump 1 State] P 15
 - O The type [Pump 1 Type] P I E
 - O The cumulated run time [Pump 1 Runtime] P I a E
 - O The cumulated number of starts [Pump 1 Nb Starts] P In 5

Example of Architecture Without Lead Pump Alternation and Two Fixed Speed Pumps



Pump 2 and pump 3 are controlled by relay outputs R2 and R3.

The state of each pump is provided to the drive via digital inputs DI2 and DI3:

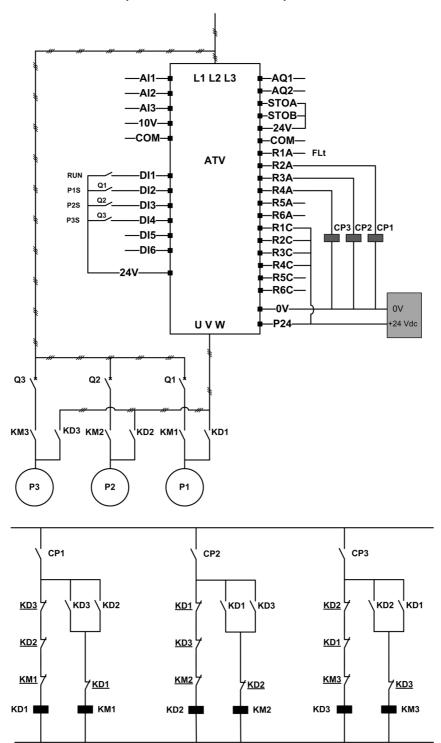
- 1 = the pump is ready to operate.
- 0 = the pump is not available.

KM1 is switched ON when CP1 is activated. CP1 is controlled via the relay output R2.

 $\mbox{KM2}$ is switched ON when CP2 is activated. CP2 is controlled via the relay output R3.

Q1 and Q2 must be switched ON to have both pump 2 and pump 3 ready to operate.

Example of Architecture with Lead Pump Alternation on Three Pumps



Each pump is controlled by a relay output:

- Pump 1 control via relay output R2.
- Pump 2 control via relay output R3.
- Pump 3 control via relay output R4.

The state of each pump is provided to the drive via digital inputs DI2, DI3, and DI4:

- 1 = the pump is ready to operate.
- 0 = the pump is not available.

If the relay output R2 is the first activated, the pump 1 becomes the lead pump. CP1 is switched ON via relay output R2, KD1 is switched ON and the pump 1 is connected to the drive.

The other pumps cannot be connected to the drive thanks to KD1 (switched OFF) which prevent KD2 and KD3 to be activated when CP2 and CP3 are switched ON. The other pumps become auxiliary pumps and they are connected to the supply mains trough KM2 and KM3 which are activated when, respectively, CP2 and CP3 are switched ON, that is, when R3 and R4 are activated.

When relay output R3 is the first activated, the pump 2 becomes the lead pump. The other pumps become auxiliary pumps which are connected to the supply mains via KM1 and KM3.

When relay output R4 is the first activated, the pump 3 becomes the lead pump. The other pumps become auxiliary pumps which are connected to the supply mains via KM1 and KM2.

Q1, Q2, and Q3 must be switched ON to have all pumps ready to operate.

To change the lead pump, it is necessary to deactivate all relay outputs which means that all pumps must be already stopped. It is then possible to decide which relay output to be activated first and so defining the new lead pump.

[Pump System Architecture] $\Pi P S R$

Pump system architecture selection.

Setting	Code / Value	Description
[No]	no	Multi-pump control deactivated Factory setting
[Single Drive]	VndaL	Single drive with or without auxiliary pumps

[Nb Of Pumps] ∏PPn ★

Number of pumps.

This parameter can be accessed if [Pump System Architecture] $\Pi P S R$ is set to [Single Drive] $V \cap d \cap L$.

Setting	Description
16	Setting range Factory setting: 1

[Pumps configuration] P u П P - Menu

Access

[Complete settings] \Rightarrow [Pump functions] \Rightarrow [Booster control] \Rightarrow [System architecture] \Rightarrow [Pumps configuration]

Input and Output Configuration for Each Pump

For each pump (pump 1 in the example), it is necessary to set:

- The drive digital output for the command: [Pump 1 Cmd Assign] ΠP_□ / if [Lead Pump Alternation]
 ΠPL R is not set to [No] n □.
- The drive digital input for the pump availability information: [Pump 1 Ready Assign] $\Pi P + I$. If not configured, the pump is considered as always available.

An internal configurable delay [Pump Ready Delay] $\Pi P \cdot d$ is available. When the digital input assigned to [Pump 1 Ready Assign] $\Pi P \cdot I$ switches to the active state or after de-staging, the related pump is considered as not available during [Pump Ready Delay] $\Pi P \cdot d$.

This is used to wait that the auxiliary pumps are stopped and that all contactors between the drive and the motor (if existing) are closed before staging.

Warnings and Errors Handling

If the available capacity of the systemis exceeded:

• [MultiPump Capacity Warn] ΠΡ [R warning is active if the number of pumps to be started is higher than the number of available pumps.

If the selected lead pump is not available:

- A [Lead Pump Warn] Π P L Π warning is active if the lead pump becomes not available while in run or if there is no lead pump available at run command.
- A [Lead Pump Error] $\Pi P L F$ error is active if the lead pump becomes not available while in run. If configured, the delay [Pump Ready Delay] $\Pi P \cdot d$ is applied on the error triggering if there is no lead pump available at run command.

This error is handled whatever the active command channel if booster control or level control function is configured.

The drive response to a [Lead Pump Error] $\Pi P L F$ is set with [MultiPump ErrorResp] $\Pi P F L F$ parameter.

[Pump 1 Cmd Assign] ПP□ / ★

Command assignment for pump 1.

This parameter can be accessed if [Nb Of Pumps] ΠPPn is set to [1] I or above.

Setting	Code / Value	Description
[No]	no	Not assigned Factory setting
[R2][R3]	r 2r 3	Relay output R2R3
[R4][R6]	r 4r 6	Relay output R4R6 if VW3A3204 relay output option module has been inserted
[DQ11 Digital Output][DQ12 Digital Output]	do do 2	Digital output DQ11DQ12 if VW3A3203 I/O extension module has been inserted

[Pump 1 Ready Assign] ∏P , I ★

Pump 1 ready to operate assignment.

This parameter can be accessed if [Nb Of Pumps] $\Pi P P_{\Pi}$ is set to [1] I or above.

Setting	Code / Value	Description
[Not Assigned]	no	Not assigned Factory setting
[DI1][DI6]	L , IL , 6	Digital input DI1DI6
[DI11][DI16]	L ,	Digital input DI11DI16 if VW3A3203 I/O extension module has been inserted
[CD00][CD10]	C d O O C d I	Virtual digital input CMD.0CMD.10 in [I/O profile] , a configuration
[CD11][CD15]	C d I IC d I 5	Virtual digital input CMD.11CMD.15 regardless of configuration
[C101][C110]	C 10 1C 1 1	Virtual digital input CMD1.01CMD1.10 with integrated Modbus Serial in [I/O profile] , c configuration
[C111][C115]	C	Virtual digital input CMD1.11CMD1.15 with integrated Modbus Serial regardless of configuration
[C301][C310]	C 3 0 1C 3 1	Virtual digital input CMD3.01CMD3.10 with a fieldbus module in [I/O profile] , p configuration
[C311][C315]	C 3 C 3 5	Virtual digital input CMD3.11CMD3.15 with a fieldbus module regardless of configuration
[DI1 (Low level)][DI6 (Low level)]	L ILL 6 L	Digital input DI1DI6 used at low level
[DI11 (Low level)][DI16 (Low level)]	L I ILL 16 L	Digital input DI11DI16 used at low level if VW3A3203 I/O extension module has been inserted

[Pump 2 Cmd Assign] ПP □ 2 *

Command assignment for pump 2.

This parameter can be accessed if [Nb Of Pumps] $\Pi PP \pi$ is set to [2] 2 or above.

Identical to [Pump 1 Cmd Assign] $\Pi P = I$ (see page 243).

[Pump 2 Ready Assign] ПР ₁ 2 ★

Pump 2 ready to operate assignment.

This parameter can be accessed if [Nb Of Pumps] ΠPPn is set to [2] 2 or above.

Identical to [Pump 1 Ready Assign] $\Pi P + I$ (see page 244).

[Pump 3 Cmd Assign] ПР□ 3 *

Command assignment for pump 3.

This parameter can be accessed if [Nb Of Pumps] ΠPPn is set to [3] \exists or above.

Identical to [Pump 1 Cmd Assign] $\Pi P = I$ (see page 243).

[Pump 3 Ready Assign] ПР ₁ 3 ★

Pump 3 ready to operate assignment.

This parameter can be accessed if [Nb Of Pumps] $\Pi P P \pi$ is set to [3] \exists or above.

Identical to [Pump 1 Ready Assign] $\Pi P + I$ (see page 244).

[Pump 4 Cmd Assign] ПР □ 4 🖈

Command assignment for pump 4.

This parameter can be accessed if [Nb Of Pumps] ΠPPn is set to [4] 4 or above.

Identical to [Pump 1 Cmd Assign] $\Pi P \circ I$ (see page 243).

[Pump 4 Ready Assign] ПР ₁ Ч ★

Pump 4 ready to operate assignment.

This parameter can be accessed if [Nb Of Pumps] ΠPPn is set to [4] 4 or above.

Identical to [Pump 1 Ready Assign] $\Pi P + I$ (see page 244).

[Pump 5 Cmd Assign] ПP □ 5 🖈

Command assignment for pump 5.

This parameter can be accessed if [Nb Of Pumps] ΠPPn is set to [5] 5 or above.

Identical to [Pump 1 Cmd Assign] $\Pi P = I$ (see page 243).

[Pump 5 Ready Assign] ПP ₁5 ★

Pump 5 ready to operate assignment.

This parameter can be accessed if [Nb Of Pumps] ΠPPn is set to [5] 5 or above.

Identical to [Pump 1 Ready Assign] $\Pi P + I$ (see page 244).

[Pump 6 Cmd Assign] ПР□Б *

Command assignment for pump 6.

This parameter can be accessed if [Nb Of Pumps] ΠPPn is set to [6] E or above.

Identical to [Pump 1 Cmd Assign] $\Pi P \square I$ (see page 243).

[Pump 6 Ready Assign] ПР ₁ Б *

Pump 6 ready to operate assignment.

This parameter can be accessed if [Nb Of Pumps] ΠPPn is set to [6] E or above.

Identical to [Pump 1 Ready Assign] $\Pi P + I$ (see page 244).

[System Architecture] $\Pi P \neg \neg$ Menu

Access

[Complete settings] → [Pump functions] → [Boost control] → [System architecture]

[Pump Cycling Mode] $\Pi P P \Gamma$

Pump cycling mode.

Setting	Code / Value	Description
[FIFO]	FıFo	First in first out
[LIFO]	LıFa	Last in first out Factory setting

[Lead Pump Alternation] $\Pi P L H$

Lead pump alternation.

Setting	Code / Value	Description
[No]	no	Deactivated Factory setting
[Stage]	SEAGE	Lead pump permutation at each stage

[Altern Wait Time] $\Pi P \Pi L$

Alternation wait time.

Setting	Description
0999 ms	Setting range Factory setting: 500 ms

[Pump Ready Delay] $\Pi P \cdot d$

Pump ready delay.

It corresponds to the stop time of the auxiliary pumps. The auxiliary pumps are considered as in running state and can not be staged during this delay, whatever the active command channel.

Setting	Description
03600 s	Setting range
	Factory setting: 0 s

[MultiPump ErrorResp] ПРГЬ

Response to multipump error.

Setting	Code / Value	Description
[Ignore]	no	Detected error ignored
[Freewheel Stop]	Y E S	Freewheel stop Factory setting
[Per STT]	5 t t	Stop according to [Type of stop] 5 L L parameter but without an error triggered after stop
[Ramp stop]	гПР	Stop on ramp

[Booster control] 65 [- Menu

Access

[Complete settings] \rightarrow [Pump functions] \rightarrow [Booster control] \rightarrow [Booster control]

About This Menu

This menu is used to set the booster control parameters.

[Booster Control] *b □ Π*

Booster control activation.

Setting	Code / Value	Description
[No]	no	Booster control function disabled Factory setting
[Yes]	<i>4 E 5</i>	Booster control function enabled

[Stage/Destage condition] 5 d [Π - Menu

Access

[Complete settings] → [Pump functions] → [Booster control] → [Booster control] → [Stage/Destage condition]

Staging/Destaging on Pressure Feedback Condition

- The working area [Booster Working Range] b [W A is expressed in a % of the reference value for the pressure.
- Staging occurs if PID error (taking into account [PID Inversion] P , L) stays below the working area while PID controller is at high limit speed for longer than [Booster Stg Delay] b 5 d.
 High limit speed corresponds to limitation speed of PID (minimum between [High Speed] H 5 P & [PID Max Output] P a H).
- De-staging occurs if PID error (taking into account [PID Inversion] P , L) stays above working area while PID controller is at low limit speed, for longer than [Booster Dstg Delay] b d d.
 Low limit speed corresponds to speed at which PID controller has no effect (maximum between [Low Speed] L 5 P & [PID Min Output] P a L).

Staging/Destaging on Override

The override area is used whatever the configuration of the system and the strategy used. If the pressure feedback is out of the **[Booster Override Range]** $b \ \Box \ \Box \ H$ range, expressed in % of the reference value for the pressure, a staging/de-staging is immediate. This increases the reactivity of the system in case of an important and rapid variation of the demand. It allows suppressing the staging/de-staging delay.

[Booster Working Range] b [W A *

Booster working area in % of the reference value for the pressure.

Setting ()	Description
1.0100.0%	Setting range in % of the reference value for the pressure Factory setting: 2.0%

[Booster Stg Delay] 65 d

Booster stage delay.

Setting ()	Description
0.0999.9 s	Setting range Factory setting: 10.0 s

[Booster Dstg Delay] bdd

Booster de-stage delay.

Setting ()	Description
0.0999.9 s	Setting range Factory setting: 10.0 s

[Booster Override Range] b [a R

Booster override range.

Setting ()	Code / Value	Description
[No]	no	Booster override range disabled Factory setting
0.1100.0%		Setting range

[Booster control] 65 [- Menu

Access

[Complete settings] \rightarrow [Pump functions] \rightarrow [Booster control] \rightarrow [Booster control]

[Booster S/D Interval] 65 d E

Booster stage/de-stage time interval.

Setting ()	Description
0.0999.9 s	Setting range Factory setting: 15.0 s

Section 6.20

[Generic monitoring]

What Is in This Section?

This section contains the following topics:

Topic	Page
[Stall monitoring] 5 L P r - Menu	251
[Therm sensor monit] TL 5 P - Menu	252

[Stall monitoring] 5 L P r - Menu

Access

[Complete settings] → [Generic monitoring] → [Stall monitoring]

About This Menu

This function helps to prevent a motor overload by monitoring the motor current and the speed rise time.

A stalling condition is when:

- An output frequency is smaller than the stalling frequency [Stall Frequency] 5 £ P 3
- And an output current is higher than the stalling current [Stall Current] 5 L P 2
- During a time longer than the stalling time [Stall Max Time] 5 L P I

When a stalling condition occurs, an [Motor Stall Error] 5 £ F error is triggered.

[Stall Monitoring] 5 L P C

Stall monitoring activation.

Setting	Code / Value	Description
[No]	no	Function disabled Factory setting
[Yes]	9 E S	Function enabled

[Stall Max Time] 5 L P 1*

Motor stall maximum time.

This parameter can be accessed if [Stall Monitoring] 5 L P L is not set to [No] n a.

Setting ()	Description
0.0200 s	Setting range Factory setting: 60.0 s

[Stall Current] 5 Ł P ≥ ★

Stall monitoring current level.

This parameter can be accessed if [Stall Monitoring] 5 E P E is not set to [No] n = 1.

The factory setting changes to 150.0% if [Dual rating] dr E is set to [Heavy Duty] H I G H

Setting ()	Description
0.0150.0%	Setting range
	Factory setting: 110.0%

[Stall Frequency] 5 L P 3 *

Stall monitoring frequency level.

This parameter can be accessed if [Stall Monitoring] 5 £ P L is not set to [No] n a.

Setting ()	Description
0.020.0 Hz	Setting range Factory setting: 0.0 Hz

[Therm sensor monit] *∏ L 5 P - Menu*

Access

[Complete settings] → [Generic monitoring] → [Therm sensor monit]

About This Menu

The thermal monitoring function helps to prevent against high temperature by monitoring the real temperature by the drive.

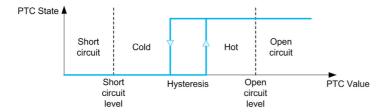
PTC, PT100, PT1000, and KTY84 thermal probes are supported by this function.

The function gives the possibility to manage 2 levels of monitoring:

- A Warning level: the drive triggers an event without stopping the application.
- An Error level: the drive triggers an event and stops the application.

The thermal probe is monitored for the following detected error:

- Overheating
- · Probe break (loss of signal)
- Probe short-circuit



Activation

[Alx Th Monitoring] L H X 5 allows you to activate the thermal monitoring on the related analog input:

- [No] n : the function is disabled
- [Yes] 4 E 5: the thermal monitoring is enabled on the related Alx.

Type of Thermal Probe Selection

[Alx Type] A , X L allows you to select the type of thermal sensor(s) connected on the related analog input:

- [No] ¬a: no sensor
- [PTC Management] P L c : one to six PTC (in serial) is used
- [KTY] K & 4: 1 KTY84 is used
- [PT100] IP L 2: 1 PT100 connected with two wires is used
- [PT1000] IP L 3: 1 PT1000 connected with two wires is used
- [PT100 in 3 wires] IPL 2 3: 1 PT100 connected with three wires is used (Al4 & Al5 only)
- [PT1000 in 3 wires] IPE 3 3: 1 PT1000 connected with three wires is used (Al4 & Al5 only)
- [3PT100] ∃P L 2: 3 PT100 connected with two wires is used
- [3PT1000] 3PL 3: 3 PT1000 connected with two wires is used
- [3PT100 in 3 wires] 3PL23: 3 PT100 connected with three wires is used (Al4 & Al5 only)
- [3PT1000 in 3 wires] 3PL 33: 3 PT1000 connected with three wires is used (Al4 & Al5 only)

2-wire thermal probes are supported on analog input 2 to analog input 5.

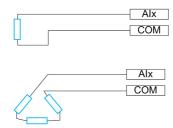
3-wire thermal probes are supported on analog input 4 and analog input 5. These inputs are available with the I/O extension option module.

If the probe is far from the drive, the 3-wire connection is recommended as compared to a 2-wire connection.

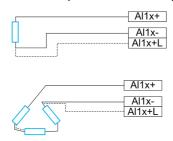
NOTE: In case of 3 serial probes, the drive monitors the average probe values.

Wiring for PT100 and PT1000 Probes

For 2-wire probes, the following wirings are possible:



For 3-wire probes, the following wirings are possible:



[Al2 Th Monitoring] *E H 2 5*

Activation of the thermal monitoring on AI2.

Setting	Code / Value	Description
[No]	no	No Factory setting
[YES]	4 E S	Yes

[Al2 Type] A ₁ ≥ Ł ★

Al2 assignment.

This parameter can be accessed if [Al2 Th Monitoring] $E H \ge 5$ is not set to [No] a.

Setting	Code / Value	Description
[Voltage]	Ι 🛮 υ	0-10 Vdc
[Current]	OA	0-20 mA Factory setting
[PTC Management]	PEC	1 to 6 PTC (in serial)
[KTY]	KEY	1 KTY84
[PT1000]	IPE 3	1 PT1000 connected with 2 wires
[PT100]	IP E 2	1 PT100 connected with 2 wires
[Water Prob]	LEuEL	Water level
[3PT1000]	3PL3	3 PT1000 connected with 2 wires
[3PT100]	3P	3 PT100 connected with 2 wires

[Al2 Th Error Resp] LH2b*

Thermal monitoring response to a detected error for Al2.

This parameter can be accessed if [Al2 Type] A , 2 L is not set to

- [Voltage] /□□, or
- [Current] □ A.

Setting	Code / Value	Description
[Ignore]	no	Detected error ignored
[Freewheel Stop]	9 E S	Freewheel stop
[Per STT]	5 Ł Ł	Stop according to [Type of stop] 5 <i>E b</i> parameter but without an error triggered after stop
[Ramp stop]	- ПР	Stop on ramp Factory setting

[Al2 Th Error Level] LH2F*

Error detection level for Al2.

This parameter can be accessed if [Al2 Type] # , 2 £ is not set to:

- [Voltage] / □ ⊔, or
- [Current] [] H, or
- [PTC Management] P L [.

Setting ()	Description
-15.0200.0°C	Setting range Factory setting: 110.0°C

[Al2 Th Warn Level] Ł H ≥ R ★

Warning level for Al2.

This parameter can be accessed if [Al2 Type] H , 2 L is not set to:

- [Voltage] /□ u, or
- [Current] ☐ H, or
- [PTC Management] P L C.

Setting ()	Description
-15.0200.0°C	Setting range Factory setting: 90.0°C

[Al2 Th Value] Ł H ≥ V *

Al2 thermal value.

This parameter can be accessed if [Al2 Type] $H \cap 2 E$ is not set to:

- [Voltage] / □ ⊔, or
- [Current] [] A, or
- [PTC Management] P L C.

Setting	Description
-15.0200.0°C	Setting range
	Factory setting: _

[Al3 Th Monitoring] *E H 3 5*

Activation of the thermal monitoring on AI3.

Setting	Code / Value	Description
[No]	no	No Factory setting
[YES]	9 E S	Yes

[Al3 Type] *H* ₁ ∃ Ł ★

Al3 assignment.

This parameter can be accessed if [Al3 Th Monitoring] E H 3 5 is not set to [No] n a.

Identical to [Al2 Type] A , 2 E (see page 253).

[Al3 Th Error Resp] L H 3 b *

Thermal monitoring response to a detected error for Al3.

This parameter can be accessed if [Al3 Type] $H \cap J E$ is not set to:

- [Voltage] / □ □, or
- [Current] D A, or

Setting	Code / Value	Description
[Ignore]	no	Detected error ignored
[Freewheel Stop]	4 E S	Freewheel stop
[Per STT]	5 E E	Stop according to [Type of stop] 5 <i>E b</i> parameter but without an error triggered after stop
[Ramp stop]	г П Р	Stop on ramp Factory setting

[Al3 Th Error Level] L H 3 F *

Error detection level for Al3.

This parameter can be accessed if [Al3 Type] $H \cap J E$ is not set to:

- [Voltage] / □ u, or
- [Current] [] H, or
- [PTC Management] P L C.

Setting ()	Description
-15.0200.0°C	Setting range Factory setting: 110.0°C

[Al3 Th Warn Level] Ł H ∃ F ★

Warning level for Al3.

This parameter can be accessed if [Al3 Type] $H \cap \exists E$ is not set to:

- [Voltage] / □ u, or
- [Current] □ H, or
- [PTC Management] P L C.

Setting ()	Description
-15.0200.0°C	Setting range Factory setting: 90.0°C

[Al3 Th Value] E H 3 V *

Al3 thermal value.

This parameter can be accessed if [Al3 Type] $H \cap J E$ is not set to:

- [Voltage] /□□, or
- [Current] [] A, or
- [PTC Management] P L C.

Setting	Description
-15.0200.0°C	Setting range
	Factory setting: _

[Al4 Th Monitoring] L H 4 5 🖈

Activation of the thermal monitoring on Al4.

This parameter can be accessed if VW3A3203 I/O extension module has been inserted.

Setting	Code / Value	Description
[No]	no	No Factory setting
[YES]	4 E S	Yes

[Al4 Type] H 14 E *

Al4 assignment.

This parameter can be accessed if [Al4 Th Monitoring] £ H 4 5 is not set to [No] n a.

Setting	Code / Value	Description
[Voltage]	100	0-10 Vdc
[Current]	OA	0-20 mA Factory setting
[Voltage +/-]	n 10 u	-10/+10 Vdc
[PTC Management]	PEC	1 to 6 PTC (in serial)
[KTY]	KEY	1 KTY84
[PT1000]	IPE 3	1 PT1000 connected with 2 wires
[PT100]	IPE2	1 PT100 connected with 2 wires
[3 PT1000]	3Pt 3	3 PT1000 connected with 2 wires
[3 PT100]	3P	3 PT100 connected with 2 wires
[PT1000 in 3 wires]	IPE 33	1 PT1000 connected with 3 wires (Al4 & Al5 only)
[PT100 in 3 wires]	IPE23	1 PT100 connected with 3 wires (Al4 & Al5 only)
[3 PT1000 in 3 wires]	3PL33	3 PT1000 connected with 3 wires (Al4 & Al5 only)
[3 PT100 in 3 wires]	3P	3 PT100 connected with 3 wires (Al4 & Al5 only)

[Al4 Th Error Resp] L H 4 b *

Thermal monitoring response to a detected error for Al4.

This parameter can be accessed if [Al4 Type] H , 4 E is not set to

- [Voltage] / □ ⊔, or
- [Current] □ A.

Setting	Code / Value	Description
[Ignore]	no	Detected error ignored
[Freewheel Stop]	9 E 5	Freewheel stop
[Per STT]	5 Ł Ł	Stop according to [Type of stop] 5 L L parameter but without an error triggered after stop
[Ramp stop]	- ПР	Stop on ramp Factory setting

[Al4 Th Error Level] EH4F*

Error detection level for Al4.

This parameter can be accessed if [Al4 Type] $H \cap H$ is not set to:

- [Voltage] / □ □, or
- [Current] □ H, or
- [PTC Management] P L [.

Setting ()	Description
-15.0200.0°C	Setting range Factory setting: 110.0°C

[Al4 Th Warn Level] Ł H 4 A ★

Warning level for Al4.

This parameter can be accessed if [Al4 Type] A , 4 E is not set to:

- [Voltage] / □ ⊔, or
- [Current] □ H, or
- [PTC Management] P L [.

Setting ()	Description
-15.0200.0°C	Setting range Factory setting: 90.0°C

[Al4 Th Value] L H 4 V *

Al4 thermal value.

This parameter can be accessed if [Al4 Type] A , 4 E is not set to:

- [Voltage] / □ ⊔, or
- [Current] □ H, or
- [PTC Management] P L C.

Setting	Description
-15.0200.0°C	Setting range Factory setting: _

[Al5 Th Monitoring] £ H 5 5 🖈

Activation of the thermal monitoring on AI5.

This parameter can be accessed if VW3A3203 I/O extension module has been inserted.

Setting	Code / Value	Description
[No]	no	No Factory setting
[YES]	<i>4 E S</i>	Yes

[Al5 Type] # 15 £ *

Al5 assignment.

This parameter can be accessed if [Al5 Th Monitoring] £ H 5 5 is not set to [No] n a.

Identical to [Al4 Type] H , 4 E (see page 256).

[Al5 Th Error Resp] L H 5 b *

Thermal monitoring response to a detected error for Al5.

This parameter can be accessed if [Al5 Type] H , 5 L is not set to

- [Voltage] /□□, or
- [Current] □ A.

Setting	Code / Value	Description
[Ignore]	no	Detected error ignored
[Freewheel Stop]	9 E S	Freewheel stop
[Per STT]	5 Ł Ł	Stop according to [Type of stop] 5 L L parameter but without an error triggered after stop
[Ramp stop]	r ПР	Stop on ramp Factory setting

[Al5 Th Error Level] L H 5 F *

Error detection level for AI5.

This parameter can be accessed if [Al5 Type] A , 5 L is not set to:

- [Voltage] /□□, or
- [Current] □ H, or
- [PTC Management] P L [.

Setting ()	Description
-15.0200.0°C	Setting range Factory setting: 110.0°C

[Al5 Th Warn Level] L H 5 A *

Warning level for AI5.

This parameter can be accessed if [Al5 Type] $H \rightarrow 5 E$ is not set to:

- [Voltage] /□ u, or
- [Current] [] H, or
- [PTC Management] P L C.

Setting ()	Description
-15.0200.0°C	Setting range Factory setting: 90.0°C

[Al5 Th Value] L H 5 V

Al5 thermal value.

This parameter can be accessed if [Al5 Type] $H \rightarrow 5 L$ is not set to:

- [Voltage] /□ u, or
- [Current] □ H, or
- [PTC Management] P L C.

Setting	Description
-15.0200.0°C	Setting range
	Factory setting: _

Section 6.21

[Error/Warning handling]

What Is in This Section?

This section contains the following topics:

Topic	Page
[Fault reset] r 5 L - Menu	260
[Auto fault reset] FLr - Menu	262
[Catch on the fly] F L r - Menu	263
[Motor thermal monit] Ł H Ł - Menu	264
[Output phase loss] a P L - Menu	265
[Input phase loss] , P L - Menu	266
[External error] E L F - Menu	267
[Undervoltage handling] u 5 b - Menu	269
[4-20mA loss] L F L - Menu	271
[Error detection disable] In H - Menu	272
[Fieldbus monitoring] L L L - Menu	274
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[Error/Warning handling] [SW [- Menu	276
[Process underload] u L d - Menu	277
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[Warn grp 1 definition] # I [- Menu	281
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[Warn grp 3 definition] F 3 C - Menu	
[Warn grp 4 definition] FIUC - Menu	
[Warn grp 5 definition] # 5 L - Menu	

[Fault reset] r 5 L - Menu

Access

[Complete settings] → [Error/Warning handling] → [Fault reset]

[Fault Reset Assign] r 5 F

Fault reset input assignment.

Detected errors are cleared manually when the assigned input or bit changes to 1 if the cause of the detected error has disappeared.

The **STOP/RESET** key on the Plain Text Display Terminal performs the same function.

Setting	Code / Value	Description
[Not Assigned]	no	Not assigned
[DI1][DI6]	L 1 1L 16	Digital input DI1DI6 Factory setting: [DI2] L , 2
[DI11][DI16]	L 1 1 1L 1 1 6	Digital input DI11DI16 if VW3A3203 I/O extension module has been inserted

[Prod Restart Assign] - PR*

Product restart assignment.

The Restart function performs a Fault Reset and then restarts the drive. During this Restart procedure, the drive goes through the same steps as if it had been switched off and on again. Depending on the wiring and the configuration of the drive, this may result in immediate and unanticipated operation. The Restart function can be assigned to a digital input

A WARNING

UNANTICIPATED EQUIPMENT OPERATION

The Restart function performs a Fault Reset and restarts the drive.

• Verify that activating this function does not result in unsafe conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

This parameter can be accessed if [Access Level] L R L is set to [Expert] E P r mode.

Setting	Code / Value	Description
[Not Assigned]	no	Not assigned Factory setting
[DI1][DI6]	L , IL , 6	Digital input DI1DI6
[DI11][DI16]	L 1 I IL 1 I I I	Digital input DI11DI16 if VW3A3203 I/O extension module has been inserted

[Product Restart] r P *

The Restart function performs a Fault Reset and then restarts the drive. During this Restart procedure, the drive goes through the same steps as if it had been switched off and on again. Depending on the wiring and the configuration of the drive, this may result in immediate and unanticipated operation.

A WARNING

UNANTICIPATED EQUIPMENT OPERATION

The Restart function performs a Fault Reset and restarts the drive.

• Verify that activating this function does not result in unsafe conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Product restart.

This parameter can be accessed if [Access Level] L R [is set to [Expert] E P r mode.

This parameter can be used to reset all detected errors without having to disconnect the drive from the supply mains.

Setting	Code / Value	Description
[No]	no	Function inactive Factory setting
[Yes]	¥ € 5	Reinitialization. Press and hold down the OK key for 2 s. The parameter changes back to [No] σ automatically as soon as the operation is complete. The drive can only be reinitialized when locked.

[Auto fault reset] FL - Menu

Access

[Complete settings] → [Error/Warning handling] → [Auto fault reset]

[Auto Fault Reset] FL -

Automatic fault reset.

This function can be used to automatically perform individual or multiple Fault Resets. If the cause of the error that has triggered the transition to the operating state Fault disappears within while this function is active, the drive resumes normal operation. While the Fault Reset attempts are performed automatically, the output signal **[Operating state Fault]** is not available. If the attempts to perform the Fault Reset are not successful, the drive remains in the operating state Fault and the output signal **[Operating state Fault]** becomes active.

A WARNING

UNANTICIPATED EQUIPMENT OPERATION

- Verify that activating this function does not result in unsafe conditions.
- Verify that the fact that the output signal "Operating state Fault" is not available while this function is active does not result in unsafe conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

The drive fault relay remains activated if this function is active. The speed reference and the operating direction must be maintained.

It is recommended to use 2-wire control ([2/3-wire control] $E \ E$ is set to [2 wire] $E \ E$ and [2-wire type] $E \ E$ is set to [Level] $E \ E$, refer to [2/3-wire control] $E \ E$.

If the restart has not taken place once the configurable time **[Fault Reset Time]** $E R_{\Gamma}$ has elapsed, the procedure is aborted and the drive remains locked until it is turned off and then on again.

The detected error codes, which permit this function, are listed in the Diagnostics part of the manual.

Setting	Code / Value	Description
[No]	no	Function inactive Factory setting
[Yes]	¥ E 5	Automatic restart, after locking in error state, if the detected error has disappeared and the other operating conditions permit the restart. The restart is performed by a series of automatic attempts separated by increasingly longer waiting periods: 1 s, 5 s, 10 s, then 1 minute for the following attempts.

[Fault Reset Time] L Ar *

Maximum time for automatic restart function.

This parameter appears if [Auto Fault Reset] # E r is set to [Yes] # E 5. It can be used to limit the number of consecutive restarts on a recurrent detected error.

Setting	Code / Value	Description
[5 minutes]	5	5 minutes Factory setting
[10 minutes]	10	10 minutes
[30 minutes]	30	30 minutes
[1 hour]	1h	1 hour
[2 hours]	2 h	2 hours
[3 hours]	3 h	3 hours
[Unlimited]	ΓĿ	Continuous

[Catch on the fly] F L r - Menu

Access

[Complete settings] → [Error/Warning handling] → [Catch on the fly]

[Catch On Fly] F L r

Catch on the fly.

Used to enable a smooth restart if the run command is maintained after the following events:

- Loss of line supply or disconnection.
- Clearance of current detected error or automatic restart.
- Freewheel stop.

The speed given by the drive resumes from the estimated or measured speed of the motor at the time of the restart, then follows the ramp to the reference speed.

This function requires 2-wire level control.

When the function is operational, it activates at each run command, resulting in a slight delay of the current (0.5 s max).

[Catch On Fly] F L r is forced to [No] n a if

- [Auto DC Injection] # d [is set to [Continuous] [E , or
- [Brake assignment] b L [is not set to [No] n a, or
- [BL Mode] b 9 11 is not set to [No] n a.

Setting	Code / Value	Description
[No]	no	Function inactive Factory setting
[Yes]	<i>4 E S</i>	Function active

[Catch on Fly Sensitivity] V [b *

Catch on fly sensitivity.

This parameter can only be accessed if [Access Level] L R C is set to [Expert] E P r.

Setting	Description
0.10100.00 V	Setting range
	Factory setting: 0.20 V

[Motor thermal monit] *E H E - Menu*

Access

[Complete settings] → [Error/Warning handling] → [Motor thermal monit]

[Motor Thermal Mode] Ł H Ł

Motor thermal monitoring mode.

NOTE: An error is detected when the thermal state reaches 118% of the rated state and reactivation occurs when the state falls back below 100%.

Setting	Code / Value	Description
[No]	no	No thermal protection
[Self cooled]	ACL	Self ventilated motor Factory setting
[Force-cool]	FCL	Fan-cooled motor

[Motor Thermal Thd] L L d

Motor thermal state threshold.

Setting ()	Description
0118%	Setting range Factory setting: 100%

[MotorTemp ErrorResp] a L L

Overload error response.

Setting	Code / Value	Description
[Ignore]	no	Detected error ignored
[Freewheel Stop]	<i>Y E S</i>	Free wheel Factory setting

[Output phase loss] _ P L - Menu

Access

[Complete settings] → [Error/Warning handling] → [Output phase loss]

[OutPhaseLoss Assign] ¬PL

Output phase loss assignment.

A A DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

If output phase monitoring is disabled, phase loss and, by implication, accidental disconnection of cables, are not detected.

• Verify that the setting of this parameter does not result in unsafe conditions.

Failure to follow these instructions will result in death or serious injury.

Setting	Code / Value	Description
[Function Inactive]	no	Function inactive
[OPF Error Triggered]	<i>4 E S</i>	Tripping on [OutPhaseLoss Assign] • PL with freewheel stop Factory setting
[No Error Triggered]	o A C	No detected error triggered, but management of the output voltage in order to avoid an overcurrent when the link with the motor is re-established and catch on the fly performed (even if this function has not been configured). The drive switches to [Output cut] 5 a C state after [OutPhL Time] a d E time. Catch on fly is possible as soon as the drive is in stand by output cut [Output cut] 5 a C state.

[OutPhaseLoss Delay] ad E

Output (motor) phase loss detection time.

Time delay for taking the [OutPhaseLoss Assign] _ P L detected error into account.

Setting ()	Description
0.510 s	Setting range Factory setting: 0.5 s

[Input phase loss] , P L - Menu

Access

[Complete settings] → [Error/Warning handling] → [Input phase loss]



Loss of input phase error response.

Setting	Code / Value	Description
[Ignore]	no	Detected error ignored
[Freewheel Stop]	Y E S	Freewheel stop Factory setting

[External error] E L F - Menu

Access

[Complete settings] → [Error/Warning handling] → [External error]

[Ext Error Assign] E & F

External error assignment.

If the assigned bit state is:

- 0: there is no external error.
- 1: there is an external error

Setting	Code / Value	Description
[Not Assigned]	no	Not assigned Factory setting
[DI1][DI6]	L , 1L , 6	Digital input DI1DI6
[DI11][DI16]	L ,	Digital input DI11DI16 if VW3A3203 I/O extension module has been inserted
[CD00][CD10]	[Virtual digital input CMD.0CMD.10 in [I/O profile] . a configuration
[CD11][CD15]	[d [d	Virtual digital input CMD.11CMD.15 regardless of configuration
[C101][C110]	C 10 1C 1	Virtual digital input CMD1.01CMD1.10 with integrated Modbus Serial in [I/O profile] , a configuration
[C111][C115]	[Virtual digital input CMD1.11CMD1.15 with integrated Modbus Serial regardless of configuration
[C301][C310]	C 3 0 1 C 3	Virtual digital input CMD3.01CMD3.10 with a fieldbus module in [I/O profile] , a configuration
[C311][C315]	[] [] [] [] [] [] [] [] [] [] [] [] [] [Virtual digital input CMD3.11CMD3.15 with a fieldbus module regardless of configuration
[DI1 (Low level)][DI6 (Low level)]	L ILL 6 L	Digital input DI1DI6 used at low level
[DI11 (Low level)][DI16 (Low level)]	L I ILL I	Digital input DI11DI16 used at low level if VW3A3203 I/O extension module has been inserted

[Ext Error Resp] EPL

Drive response to external error.

Type of stop in the event of an external detected error.

Setting	Code / Value	Description
[Ignore]	no	External detected error ignored
[Freewheel Stop]	<i>4 E S</i>	Freewheel stop Factory setting
[Per STT]	SEE	Stop according to configuration of [Type of stop] 5 £ £ (see page 161), without tripping. In this case, the detected error relay does not open and the drive is ready to restart as soon as the detected error disappears, according to the restart conditions of the active command channel (for example, according to [2/3-wire control] £ £ £ and [2-wire type] £ £ £ if control is via the terminals). Configuring a warning for this detected error is recommended (assigned to a digital output, for example) in order to indicate the cause of the stop.
[Fallback speed]	LFF	Change to fallback speed, maintained as long as the detected error persists and the run command has not been removed ⁽¹⁾
[Speed maintained]	r L 5	The drive maintains the speed being applied when the detected error occurred, as long as the detected error is active and the run command has not been removed ⁽¹⁾
[Ramp stop]	г ПР	Stop on ramp
[Fast stop]	F S Ł	Fast stop
[DC Injection]	d[,	DC injection stop. This type of stop cannot be used with some other functions.
(1) Because, in this case.	the detected err	or does not trigger a stop, it is recommended to assign a relay or digital output

⁽¹⁾ Because, in this case, the detected error does not trigger a stop, it is recommended to assign a relay or digital output to its indication.

[Undervoltage handling] _ 5 b - Menu

Access

[Complete settings] → [Error/Warning handling] → [Undervoltage handling]

[Undervoltage Resp] $_{\it U}$ 5 $_{\it b}$

Response to undervoltage.

Setting	Code / Value	Description
[Error Triggered]	0	The drive trips and the external detected error signal are triggered (the detected error relay assigned to [Operating State Fault] F L E will be opened) Factory setting
[Error Triggered w/o Relay]	I	The drive trips but the external detected error signal is not triggered (the detected error relay assigned to [Operating State Fault] F L E remains closed)
[Warning Triggered]	2	The warning and detected error relay remain closed. The warning can be assigned to a digital output or a relay

[Mains Voltage] u r E 5

Rated voltage of the mains supply in Vac.

Settings	Code / Value	Description
[380 Vac]	380	380 Vac
[400 Vac]	400	400 Vac
[415 Vac]	4 15	415 Vac Factory setting

[Undervoltage Level] u 5 L

Undervoltage level.

The factory setting is determined by the drive voltage rating.

Setting	Description
190212 V	Setting range,according to drive rating
	Factory setting: According to drive rating

[UnderVolt Timeout] u 5 Ł

Undervoltage timeout.

Setting	Description
0.2999.9 s	Setting range Factory setting: 0.2 s

[CtrlStopPLoss] 5 L P

Controlled stop on power loss.

Behavior in the event of the undervoltage prevention level being reached.

Setting	Code / Value	Description
[No]	no	No action Factory setting
[DC Maintain]	пп5	This stop mode uses the inertia of the application to maintain the control block powered, and thus to keep operational I/O state and fieldbus link as long as possible.
[Ramp stop]	- ПР	Stop following an adjustable deceleration ramp [Max stop time] 5 \pm Π in order to help to prevent from uncontrolled stop of the application.
[Freewheel Stop]	LnF	Lock (freewheel stop) without triggering an error

[UnderV. Restart Tm] £ 5 ∏ ★

Undervoltage restart time.

This parameter can be accessed if [CtrlStopPLoss] 5 EP is set to [Ramp stop] $r\Pi P$.

The time delay before authorizing the restart after a complete stop for [CtrlStopPLoss] 5 EP is set to [Ramp stop] P if the voltage has returned to normal.

Setting ()	Description
1.0999.9 s	Setting range Factory setting: 1.0 s

[Prevention Level] u P L *

Undervoltage prevention level.

This parameter can be accessed if [CtrlStopPLoss] 5 £ P is set to [No] n a.

The adjustment range and factory setting are determined by the drive voltage rating and the [Mains Voltage] u r E 5 value.

Setting	Description
212254 V	Setting range
	Factory setting: According to drive rating

[Max Stop Time] 5 Ł ∏★

Maximum stop time.

This parameter can be accessed if [CtrlStopPLoss] 5 EP is set to [Ramp stop] $r\Pi P$.

This parameter defines the deceleration ramp time in case of mains loss. During this controlled stop, the drive is powered thanks to the inertia of the application, the motor is in generator mode. It is recommended to verify that the deceleration set is compatible with the application inertia.

Setting ()	Description
0.0160.00 s	Setting range
	Factory setting: 1.00 s

[DC Bus Maintain Time] Ł b 5 *

DC bus maintain time.

This parameter can be accessed if [CtrlStopPLoss] 5 EP is set to [DC Maintain] $\Pi\Pi$ 5.

Setting ()	Description
19999 s	Setting range
	Factory setting: 9999 s

[4-20mA loss] L F L - Menu

Access

[Complete settings] → [Error/Warning handling] → [4-20mA loss]

[Al1 4-20mA Loss] L F L I

Response to 4-20mA loss on Al1.

Drive behavior on Al1 4-20 event.

Setting	Code / Value	Description
[ignore]	no	Detected error ignored. This is the only possible configuration if [Al1 min. value] <code>LrL</code> is not greater than 3 mA Factory setting
[Freewheel]	9 E S	Freewheel stop
[Per STT]	5 <i>E E</i>	Stop according to configuration of [Type of stop] 5 £ £, without tripping. In this case, the error relay does not open and the drive is ready to restart as soon as the detected error disappears, according to the restart conditions of the active command channel (for example, according to [2/3-wire control] £ £ £ and [2-wire type] £ £ £ if control is via the terminals). Configuring a warning for this detected error is recommended (assigned to a digital output, for example) in order to indicate the cause of the stop
[fallback spd]	LFF	Change to fallback speed, maintained as long as the detected error persists and the run command has not been removed ⁽¹⁾
[Spd maint.]	r L 5	The drive maintains the speed being applied when the detected error occurred, as long as the detected error is active and the run command has not been removed ⁽¹⁾
[Ramp stop]	г ПР	Stop on ramp
[Fast stop]	F 5 Ł	Fast stop
[DC injection]	4C ,	DC injection stop. This type of stop cannot be used with some other functions

⁽¹⁾ Because, in this case, the detected error does not trigger a stop, it is recommended to assign a relay or digital output to its indication.

[AI2 4-20mA loss] L F L 2

Response to 4-20mA loss on Al2.

Drive behavior on Al2 4-20 event.

Identical to [Al1 4-20mA Loss] L F L I

[AI3 4-20mA loss] L F L 3

Response to 4-20mA loss on Al3.

Drive behavior on Al3 4-20 event.

Identical to [AI1 4-20mA Loss] L F L I

[Al4 4-20mA loss] L F L 4 *

Response to 4-20mA loss on Al4.

Drive behavior on Al4 4-20 event.

Identical to [Al1 4-20mA Loss] L F L I

This parameter can be accessed if VW3A3203 I/O extension module has been inserted.

[Al5 4-20mA loss] L F L 5 *

Response to 4-20mA loss on AI5.

Drive behavior on AI5 4-20 event.

Identical to [Al1 4-20mA Loss] L F L I

This parameter can be accessed if VW3A3203 I/O extension module has been inserted.

[Error detection disable] In H - Menu

Access

[Complete settings] → [Error/Warning handling] → [Error detection disable]

[ErrorDetect Disabled] In H*

Disable error detection.

In rare cases, the monitoring functions of the drive may be unwanted because they impede the purpose of the application. A typical example is a smoke extractor fan operating as a part of a fire protection system. If a fire occurs, the smoke extractor fan should operate as long as possible, even if, for example, the permissible ambient temperature of the drive is exceeded. In such applications, damage to or destruction of the device may be acceptable as collateral damage, for example, to keep other damage from occurring whose hazard potential is assessed to be more severe.

A parameter is provided to disable certain monitoring functions in such applications so that automatic error detection and automatic error responses of the device are no longer active. You must implement alternative monitoring functions for disabled monitoring functions that allow operators and/or master control systems to adequately respond to conditions which correspond to detected errors. For example, if overtemperature monitoring of the drive is disabled, the drive of a smoke extractor fan may itself cause a fire if errors go undetected. An overtemperature condition can be, for example, signaled in a control room without the drive being stopped immediately and automatically by its internal monitoring functions.

A DANGER

MONITORING FUNCTIONS DISABLED, NO ERROR DETECTION

- Only use this parameter after a thorough risk assessment in compliance with all regulations and standards that apply to the device and to the application.
- Implement alternative monitoring functions for disabled monitoring functions that do not trigger automatic error responses of the drive, but allow for adequate, equivalent responses by other means in compliance with all applicable regulations and standards as well as the risk assessment.
- Commission and test the system with the monitoring functions enabled.
- During commissioning, verify that the drive and the system operate as intended by performing tests and simulations in a controlled environment under controlled conditions.

Failure to follow these instructions will result in death or serious injury.

This parameter can be accessed if [Access Level] L R [is set to [Expert] E P r.

If the assigned input or bit state is:

- 0: error detection is enabled.
- 1: error detection is disabled.

Current errors are cleared on a rising edge (change from 0 to 1) of the assigned input or bit.

Detection of following errors can be disabled: AnF, bOF, CnF, COF, dLF, EnF, EPF1, EPF2, FCF2, ETHF, InFA, InFB, InFV, LFF1, LFF3, ObF, OHF, OLC, OLF, OPF1, OPF2, OSF, PHF, SLF1, SLF2, SLF3, SOF, SPF, SSF, TFd, TJF, TnF, ULF, USF.

Setting	Code / Value	Description
[Not Assigned]	no	Not assigned Factory setting
[DI1][DI6]	L , 1L , 6	Digital input DI1DI6
[DI11][DI16]	L ,	Digital input DI11DI16 if VW3A3203 I/O extension module has been inserted
[CD00][CD10]	[Virtual digital input CMD.0CMD.10 in [I/O profile] , a configuration
[CD11][CD15]	[d [d	Virtual digital input CMD.11CMD.15 regardless of configuration
[C101][C110]	C 10 1C 1	Virtual digital input CMD1.01CMD1.10 with integrated Modbus Serial in [I/O profile] , p configuration
[C111][C115]	[Virtual digital input CMD1.11CMD1.15 with integrated Modbus Serial regardless of configuration
[C301][C310]	C 3 0 1 C 3	Virtual digital input CMD3.01CMD3.10 with a fieldbus module in [I/O profile] , p configuration
[C311][C315]	[]	Virtual digital input CMD3.11CMD3.15 with a fieldbus module regardless of configuration

[Fieldbus monitoring] [L L - Menu

Access

[Complete settings] → [Error/Warning handling] → [Fieldbus monitoring]

[Modbus Error Resp] 5 L L

Stop mode at Modbus SLF.

A WARNING

LOSS OF CONTROL

If this parameter is set to n = 0, Modbus communication monitoring is disabled.

- Only use this setting after a thorough risk assessment in compliance with all regulations and standards that apply to the device and to the application.
- Only use this setting for tests during commissioning.
- Verify that communication monitoring has been re-enabled before completing the commissioning procedure and performing the final commissioning test.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Behavior of the drive in the event of a communication interruption with integrated Modbus.

Setting	Code / Value	Description
[Ignore]	no	Detected error ignored
[Freewheel]	9 E S	Freewheel stop Factory setting
[Per STT]	5 £ £	Stop according to configuration of [Type of stop] 5 £ £, without tripping. In this case, the error relay does not open and the drive is ready to restart as soon as the detected error disappears, according to the restart conditions of the active command channel (for example, according to [2/3-wire control] £ £ £ and [2-wire type] £ £ £ if control is via the terminals) ⁽¹⁾
[fallback spd]	LFF	Change to fallback speed, maintained as long as the detected error persists and the run command has not been removed ⁽¹⁾
[Spd maint.]	r L 5	The drive maintains the speed being applied when the detected error occurred, as long as the detected error is active and the run command has not been removed ⁽¹⁾
[Ramp stop]	г ПР	Stop on ramp
[Fast stop]	F 5 Ł	Fast stop
[DC injection]	dC ,	DC injection stop. This type of stop cannot be used with some other functions

(1) Because, in this case, the detected error does not trigger a stop, it is recommended to assign a relay or digital output to its indication.

[Communication module] [- - Menu

Access

[Complete settings] → [Error/Warning handling] → [Communication module]

[Fieldbus Interrupt Resp] [L L

A WARNING

LOSS OF CONTROL

If this parameter is set to n = 1, fieldbus communication monitoring is disabled.

- Only use this setting after a thorough risk assessment in compliance with all regulations and standards that apply to the device and to the application.
- Only use this setting for tests during commissioning.
- Verify that communication monitoring has been re-enabled before completing the commissioning procedure and performing the final commissioning test.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Response to fieldbus module communication interruption.

Setting	Code / Value	Description
[Ignore]	no	Detected error ignored
[Freewheel]	<i>YE</i> 5	Freewheel stop Factory setting
[Per STT]	SEE	Stop according to configuration of [Type of stop] 5 E E , without tripping. In this case, the error relay does not open and the drive is ready to restart as soon as the detected error disappears, according to the restart conditions of the active command channel (for example, according to [2/3-wire control] E E and [2-wire type] E E if control is via the terminals) ⁽¹⁾
[fallback spd]	LFF	Change to fallback speed, maintained as long as the detected error persists and the run command has not been removed ⁽¹⁾
[Spd maint.]	r L 5	The drive maintains the speed being applied when the detected error occurred, as long as the detected error is active and the run command has not been removed ⁽¹⁾
[Ramp stop]	r N P	Stop on ramp
[Fast stop]	F5L	Fast stop
[DC injection]	dC ,	DC injection stop. This type of stop cannot be used with some other functions
(4) December 1- 451-	411-441	

(1) Because, in this case, the detected error does not trigger a stop, it is recommended to assign a relay or digital output to its indication.

[Error/Warning handling] □ 5 ⋈ □ - Menu

Access

[Complete settings] → [Error/Warning handling]

[Tuning Error Resp] E a L *

Response to autotune error.

This parameter can be accessed if [Access Level] L R L is set to [Expert] E P r.

Setting	Code / Value	Description
[Ignore]	no	Detected error ignored
[Freewheel]	<i>4 E S</i>	Freewheel stop Factory setting

[Process underload] _ L _ d - Menu

Access

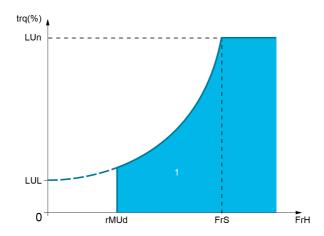
[Complete settings] → [Error/Warning handling] → [Process underload]

Process Underload Detected Error

A process underload is detected when the next event occurs and remains pending for a minimum time **[Unid T. Del. Detect]** u L E, which is configurable:

- The motor is in steady state and the torque is below the set underload limit ([Unld.Thr.0.Speed] L u L, [Unld.Thr.Nom.Speed] L u n, [Unld.FreqThr. Det.] r П u d parameters).
- The motor is in steady state when the offset between the frequency reference and motor frequency falls below the configurable threshold [Hysteresis Freq] 5 r b.

Between zero frequency and the rated frequency, the curve reflects the following equation: torque = $L \ \Box L$ + $(L \ \Box \ n - L \ \Box L) \times (frequency)^2 / (rated frequency)^2$ The underload function is not active for frequencies below $r \ \Pi \ \Box \ d$.



1 Underload zone.

A relay or a digital output can be assigned to the signaling of this detected error in the [Input/Output] $_{1D}$ - , [I/O assignment] $_{1D}$ R 5 - menus.

[Unid T. Del. Detect] u L E

Underload detection time delay.

A value of 0 deactivates the function and makes the other parameters inaccessible.

Setting	Description
0100 s	Setting range Factory setting: 0 s

[Unld.Thr.Nom.Speed] L u n *

Underload threshold at nominal motor speed [Nominal Motor Freq] F r 5, as a % of the rated motor torque.

This parameter can be accessed if [Unid T. Del. Detect] _ L _ E is not set to 0.

Setting ()	Description
20100%	Setting range Factory setting: 60%

[Unld.Thr.0.Speed] L u L *

Underload threshold at zero frequency as a % of the rated motor torque.

This parameter can be accessed if **[Unid T. Del. Detect]** u L E is not set to 0.

Setting ()	Description
0[Unld.Thr.Nom.Speed] L ப п	Setting range Factory setting: 0%

[Unid. FreqThr. Det.] - П u d 🖈

Minimum frequency underload detection threshold.

This parameter can be accessed if [Unid T. Del. Detect] u L E is not set to 0

.

Setting ()	Description
0.0599.0 Hz	Setting range Factory setting: 0.0 Hz

[Hysteresis Freq] 5 r b *

Maximum deviation between the frequency reference and the motor frequency, which defines a steady state operation.

This parameter can be accessed if [Unid T. Del. Detect] u L E or [Ovid Time Detect.] $E \cap L$ is not set to 0.

Setting ()	Description
0.3599.0 Hz	Setting range Factory setting: 0.3 Hz

[Underload Mangmt.] u d L 🖈

Underload management.

Behavior on switching to underload detection.

This parameter can be accessed if **[Unid T. Del. Detect]** u L E is not set to 0.

Setting	Code / Value	Description
[Ignore]	no	Detected error ignored
[Freewheel stop]	9 E S	Freewheel stop Factory setting
[Ramp stop]	- ПР	Stop on ramp
[Fast stop]	FSE	Fast stop

[Underload T.B.Rest.] F L 🛚 🖈

Minimum time permitted between an underload being detected and any automatic restart.

To allow an automatic restart, the value of **[Fault Reset Time]** *E H r* must exceed this parameter by at least 1 minute.

This parameter can be accessed if [Underload Mangmt.] u d L is not set to [Ignore] a = 0.

Setting ()	Description
06 min	Setting range Factory setting: 0 min

[Process overload] _ L _ d - Menu

Access

[Complete settings] → [Error/Warning handling] → [Process overload]

About This Menu

A process overload error is detected when the next event occurs and remains pending for a minimum time **[Ovld Time Detect.]** $E \cap L$, which is configurable:

- The drive is in current limitation mode.
- The motor is in steady state and the current is above the set overload threshold [Ovid Detection Thr.]
 L p C.

The motor is in steady state when the offset between the frequency reference and motor frequency falls below the configurable threshold **[Hysteresis Freq]** 5 r b.

A relay or a digital output can be assigned to the signaling of this detected error.

[Ovld Time Detect.] L a L

Overload reaction time.

A value of 0 deactivates the function and makes the other parameters inaccessible.

Setting	Description
0100 s	Setting range Factory setting: 0 s

[Ovld Detection Thr.] L 🗖 🛚 🛨

Overload threshold.

Overload detection threshold, as a % of the rated motor current [Nom Motor Current] $n \ \Gamma r$. This value must be less than the limit current in order for the function to work.

This parameter can be accessed if **[Ovid Time Detect.]** $E \circ L$ is not set to 0.

Setting ()	Description
70150%	Setting range
	Factory setting: 110%

[Hysteresis Freq] 5 r b *

Hysteresis for steady state.

Maximum deviation between the frequency reference and the motor frequency, which defines a steady state operation.

This parameter can be accessed if [Ovld Time Detect.] $E \circ L$ or [Unld T. Del. Detect.] $U \cap L$ is not set to 0.

Setting ()	Description
0.3599.0 Hz	Setting range Factory setting: 0.3 Hz

[Ovld.Proces.Mngmt] adL *

Behavior on switching to overload detection.

This parameter can be accessed if **[Ovid Time Detect.]** E = L is not set to 0.

Setting	Code / Value	Description
[Ignore]	no	Detected error ignored
[Freewheel stop]	Y E S	Freewheel stop Factory setting
[Ramp stop]	r ПР	Stop on ramp
[Fast stop]	F5Ł	Fast stop

[Overload T.B.Rest.] F L a *

Minimum time permitted between an overload being detected and any automatic restart.

In order to allow an automatic restart, the value of **[Fault Reset Time]** *L H r* must exceed this parameter by at least 1 minute.

This parameter can be accessed if [Ovld Time Detect.] $E \circ L$ or [Ovld.Process.Mngmt] $\circ dL$ is not set to 0.

Setting ()	Description
06 min	Setting range
	Factory setting: 0 min

[Warn grp 1 definition] F I [- Menu

Access

[Complete settings] → [Error/Warning handling] → [Warning groups config] → [Warn grp 1 definition]

About This Menu

The following submenus group the warnings into 1 to 5 groups, each of which can be assigned to a relay or a digital output for remote signaling.

When one or a number of warnings selected in a group occur, this warning group is activated.

List of Warnings

Setting	Code / Value	Description
[Fallback Frequency]	FrF	Fallback frequency
[Speed Maintained]	r L 5	Speed maintained
[Type of stop]	5 <i>E E</i>	Type of stop
[Ref Frequency Warning]	5 r A	Reference frequency warning
[PID Error Warning]	PEE	PID error warning
[PID Feedback Warning]	PFA	PID feedback warning
[PID High Fdbck Warning]	PFAH	PID high warning
[PID Low Fdbck Warning]	PFAL	PID low warning
[Al2 Th Warning]	LP2A	Al2 thermal sensor warning
[Al3 Th Warning]	LP3A	Al3 thermal sensor warning
[Al4 Th Warning]	L P 4 A	Al4 thermal sensor warning
[Al5 Th Warning]	<i>LPSA</i>	Al5 thermal sensor warning
[Al1 4-20 Loss Warning]	AP I	Al1 4-20 loss warning
[Al2 4-20 Loss Warning]	AP2	Al2 4-20 loss warning
[Al3 4-20 Loss Warning]	AP3	Al3 4-20 loss warning
[Al4 4-20 Loss Warning]	AP4	Al4 4-20 loss warning
[Al5 4-20 Loss Warning]	APS	AI5 4-20 loss warning
[IGBT Thermal Warning]	E J A	IGBT thermal warning
[Fan Counter Warning]	FCLA	Fan counter warning
[Fan Feedback Warning]	FFdA	Fan feedback warning
[Ext. Error Warning]	EFA	External error warning
[Undervoltage Warning]	υ 5 A	Undervoltage warning
[Preventive UnderV Active]	υPA	Preventive undervoltage active
[Mot Freq High Thd]	FER	Motor frequency high threshold reached
[Mot Freq Low Thd]	FEAL	Motor frequency low threshold reached
[Mot Freq Low Thd 2]	F2AL	Motor frequency low threshold 2 reached
[High speed reached]	FLA	High speed reached
[Ref Freq High Thd reached]	rEAH	Reference frequency high threshold reached
[Ref Freq Low Thd reached]	rEAL	Reference frequency low threshold reached
[2nd Frequency Thd Reached]	F 2 A	Second frequency threshold reached
[Current Thd Reached]	CEA	Current threshold reached
[Low Current Reached]	CEAL	Low Current Reached
[Process Undld Warning]	υLA	Process underload warning
[Process Overload Warning]	o L A	Process overload warning

Setting	Code / Value	Description
[Drv Therm Thd reached]	Ŀ A d	Drive thermal threshold reached
[Motor Therm Thd Reached]	Ł S A	Motor thermal threshold reached
[Power High Threshold]	PLHA	Power High Threshold
[Power Low Threshold]	PEHL	Power Low Threshold
[Cust Warning 1]	CAS I	Customer Warning 1
[Cust Warning 2]	C A S 2	Customer Warning 2
[Cust Warning 3]	C A S 3	Customer Warning 3
[Cust Warning 4]	C A 5 4	Customer Warning 4
[Cust Warning 5]	C A S S	Customer Warning 5

[Warn grp 2 definition] A ≥ [- Menu

Access

[Complete settings] → [Error/Warning handling] → [Warning groups config] → [Warn grp 2 definition]

About This Menu

Identical to [Warn grp 1 definition] # I [(see page 281)

[Warn grp 3 definition] 月 ∃ [- Menu

Access

[Complete settings] \rightarrow [Error/Warning handling] \rightarrow [Warning groups config] \rightarrow [Warn grp 3 definition]

About This Menu

Identical to [Warn grp 1 definition] # I [(see page 281)

[Warn grp 4 definition] ☐ ☐ ☐ - Menu

Access

[Complete settings] → [Error/Warning handling] → [Warning groups config] → [Warn grp 4 definition]

About This Menu

Identical to [Warn grp 1 definition] # I [(see page 281)

[Warn grp 5 definition] #5 [- Menu

Access

[Complete settings] → [Error/Warning handling] → [Warning groups config] → [Warn grp 5 definition]

About This Menu

Identical to [Warn grp 1 definition] # I [(see page 281)

Section 6.22 [Maintenance]

What Is in This Section?

This section contains the following topics:

Topic	Page
[Diagnostics] d R u - Menu	288
[Fan management] F A Π A - Menu	289
[Maintenance] L 5 Π H - Menu	290

[Diagnostics] d A u - Menu

Access

[Complete settings] → [Maintenance] → [Diagnostics]

About This Menu

This menu allows you to make simple test sequences for diagnostics.

[FAN Diagnostics] Fn E

Diagnostics of internal fan(s).

This starts a test sequence.

[LED Diagnostics] H L E

Diagnostics of product LED(s).

This starts a test sequence.

[IGBT Diag w motor] , W Ł

Diagnostics of internal fan(s).

This starts a test sequence with the motor (open circuit/short-circuit).

[IGBT Diag w/o motor] , W = E

Diagnostics of product IGBT(s).

This starts a test sequence without the motor (short-circuit).

[Fan management] F H ∏ H - Menu

Access

[Complete settings] → [Maintenance] → [Fan management]

About This Menu

Fan speed and [Fan Operation Time] FPbE are monitored values.

An abnormal low speed or the fan trigger a warning **[Fan Feedback Warning]** $F F \perp H$. As soon as **[Fan Operation Time]** $F P \perp E$ reach the predefined value of 45,000 hours, a warning **[Fan Counter Warning]** $F \perp E \perp H$ is triggered.

[Fan Operation Time] FPbE counter can be set to 0 by using the [Counter Reset] r Pr parameter.

[Fan Mode] F F ∏

Fan activation mode.

Setting ()	Code / Value	Description
[Standard]	5 E d	The fan is activated during the all run time of the motor. According to the drive rating, this could be the only available setting Factory setting
[Always]	רטח	The fan is always activated

[Maintenance] □ 5 П Я - Menu

Access

[Complete settings] → [Maintenance]

[Time Counter Reset] r Pr

Time counter reset.

NOTE: The list of possible values depends on the product size.

Setting ()	Code / Value	Description
[No]	no	No Factory setting
[Run Time Reset]	rEH	Run time reset
[Power ON Time Reset]	PEH	Power ON time reset
[Reset Fan Counter]	FLH	Reset fan counter
[Clear NSM]	n 5 П	Clear number of motor starts

Chapter 7

[Communication] [- | - |

Introduction



[Communication] $\Gamma \circ \Pi$ - menu presents the fieldbus submenus.

What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
[Modbus Fieldbus] П d I - Menu	292
[Com. scanner input] , £ 5 - Menu	293
[Com. scanner output] a [5 - Menu	294
[Profibus] P b C - Menu	

[Modbus Fieldbus] ☐ d / - Menu

Access

[Communication] → [Modbus Fieldbus]

About This Menu

This menu is related to the Modbus serial communication port on the bottom of the control block. Refer to the Modbus serial manual.

[Modbus Address] Add

Drive Modbus address.

Setting	Description
[OFF] • F F247	Setting range
	Factory setting: [OFF] DFF

[Bd.RateModbus] E b r

Baud rate Modbus.

Setting	Code / Value	Description
[4800 bps]	4 K B	4,800 Bauds
[9600 bps]	9 K G	9,600 Bauds
[19200 bps]	19K 2	19,200 Bauds Factory setting
[38.4 Kbps]	3 B K Y	38,400 Bauds

[Modbus Format] *L F a*

Modbus communication format.

Setting	Code / Value	Description
[8-O-1]	801	8 bits odd parity 1 stop bit
[8-E-1]	8 E I	8 bits even parity 1 stop bit Factory setting
[8-N-1]	8 n l	8 bits no parity 1 stop bit
[8-N-2]	8 n 2	8 bits no parity 2 stop bits

[Modbus Timeout] L L a

Modbus timeout.

Setting	Description
0.130.0 s	Setting range
	Factory setting: 10.s

[Com. scanner input] , [5 - Menu

Access

[Communication] → [Com. scanner input]

[Scan. IN1 address] n $\Pi H I$

Address of the first input word.

Setting	Description
065535	Setting range
	Factory setting: 3201 (E & A)

[Scan. IN2 address] ¬ П Я ≥

Address of the second input word.

Setting	Description
065535	Setting range
	Factory setting: 8604 (r F r d)

[Scan. IN3 address] ¬ П Я Э

Address of the third input word.

Setting	Description
065535	Setting range
	Factory setting: 0

[Scan. IN4 address] n П Я Ч

Address of the fourth input word.

Identical to [Scan. IN3 address] ¬ П Я Э.

[Scan. IN5 address] $\pi \Pi \Pi S$

Address of the fifth input word.

Identical to [Scan. IN3 address] $\neg \Pi H \exists$.

[Scan. IN6 address] n П Я Б

Address of the sixth input word.

Identical to [Scan. IN3 address] ¬ П Я Э.

[Scan. IN7 address] ¬ П Я Л

Address of the seventh input word.

Identical to [Scan. IN3 address] $\pi \Pi \Pi \exists$.

[Scan. IN8 address] ¬ П Я В

Address of the eighth input word.

Identical to [Scan. IN3 address] $\sqcap \Pi \Pi \exists$.

[Com. scanner output] a [5 - Menu

Access

[Communication] → [Com. scanner output]

[Scan.Out1 address] n [A I

Address of the first output word.

Setting	Description
065535	Setting range
	Factory setting: 8501([

[Scan.Out2 address] n [A 2

Address of the second output word.

Setting	Description
065535	Setting range
	Factory setting: 8602(L F r d)

[Scan.Out3 address] n [A 3

Address of the third output word.

Setting	Description
065535	Setting range
	Factory setting: 0

[Scan.Out4 address] n [A 4

Address of the fourth output word.

Identical to [Scan.Out3 address] n [A 3.

[Scan.Out5 address] n [R 5

Address of the fifth output word.

Identical to [Scan.Out3 address] n [H 3.

[Scan.Out6 address] n [A B

Address of the sixth output word.

Identical to [Scan.Out3 address] n [H 3.

[Scan.Out7 address] n [A 7

Address of the seventh output word.

Identical to [Scan.Out3 address] n [F 3.

[Scan.Out8 address] n [A B

Address of the eighth output word.

Identical to [Scan.Out3 address] $\neg \ \square \ H \ \exists$.

[Profibus] Pb[- Menu

Access

[Communication] → [Profibus]

About This Menu

Refer to the Profibus DP fieldbus module manual.

Chapter 8

[File management] F ∏ Ł -

Introduction



[File management] F II L - menu presents the management of drive configuration files.

What Is in This Chapter?

This chapter contains the following topics:

Торіс	
[Transfer config file] L [F - Menu	298
[Factory settings] F [5 - Menu	299
[Parameter group list] F - 4 - Menu	300
[Factory settings] F [5 - Menu	301

[Transfer config file] L [F - Menu

Access

[File management] → [Transfer config file]

[Copy to the drive] _ P F

This allows to select a previously saved drive configuration from the Plain Text Display Terminal memory and transfer it to the drive.

The drive needs to be restarted after a configuration file transfer.

[Copy from the drive] 5 RF

This allows to save the actual drive configuration into the Plain Text Display Terminal memory.

[Factory settings] F [5 - Menu

Access

[File management] → [Factory settings]

About This Menu

This parameter allows to select the configuration to restore in case of factory setting operation.

[Config. Source] F [5 , *

Setting	Code / Value	Description	
[Macro-Conf]	10 1	Factory setting parameter set Factory setting	
[Config 1]	C F G I	Customer parameter set 1	
[Config 2]	C F G 2	Customer parameter set 2	
[Config 3]	C F G 3	Customer parameter set 3	

[Parameter group list] F r y - Menu

Access

[File management] → [Factory settings] → [Parameter group list]

About This Menu

Selection of menus to be loaded.

NOTE: In factory configuration and after a return to "factory settings", **[Parameter group list]** *F* \vdash \lor will be empty.

[AII] ALL

All parameters in all menus.

[Drive Configuration] d r □

Load [Complete settings] [5 L - menu.

[Motor Param] $\Pi \circ E$

Load [Motor parameters] $\Pi P H$ - menu.

[Comm. Menu] [a [

Load [Communication] [... [... menu.

This parameter can be accessed if [Config. Source] F [5 , is set to [Macro-Conf] , n ,.

[Display Config.] d , 5 *

Load [Display screen type] Π 5 $\mathcal L$ - menu.

This parameter can be accessed if [Config. Source] F [5 , is set to [Macro-Conf] , n ,.

[Factory settings] F [5 - Menu

Access

[File management] → [Factory settings]

[Go to Factory settings] [GF 5]

A WARNING

UNANTICIPATED EQUIPMENT OPERATION

Verify that restoring the factory settings is compatible with the type of wiring used.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

It is only possible to revert to the factory settings if at least one group of parameters has previously been selected.

[Save Configuration] 5 £ 5 , *

Save configuration.

The active configuration to be saved does not appear for selection. For example, if it is **[Config 0]** $5 \, E \, r \, D$, only **[Config 1]** $5 \, E \, r \, D$, **[Config 2]** $5 \, E \, r \, D$ and **[Config 3]** $5 \, E \, r \, D$ appear. The parameter changes back to **[No]** $p \, D \, D$ as soon as the operation is complete.

Setting	Code / Value	Description
[No]	no	No Factory setting
[Config 0]	SEr O	Store customer parameter set 0
[Config 1]	SEr I	Store customer parameter set 1
[Config 2]	5 <i>L</i> r 2	Store customer parameter set 2
[Config 3]	5 <i>L</i> r 3	Store customer parameter set 3

Chapter 9

Introduction

[My preferences] $\Pi \, \Psi \, P$ - menu presents the possible settings for the user-defined HMI and parameter access.

What Is in This Chapter?

This chapter contains the following sections:

Section	Topic	Page
9.1	[Language]	304
9.2	[Password]	305
9.3	[Access level]	306
9.4	[LCD settings]	307

Section 9.1 [Language]

[Language] L n G - Menu

Access

[My preferences] → [Language]

About This Menu

This menu allows to select the Plain Text Display Terminal language.

Section 9.2 [Password]

[Password] [a d - Menu

Access

[My preferences] → [Password]

About This Menu

Enables the configuration to be protected with an access code or a password to be entered in order to access a protected configuration:

- The drive is unlocked when the password is set to [No password defined] ¬¬¬ or when the correct password has been entered. All menus can be accessed.
- Before protecting the configuration with a password, you must:
 - O Define the [Upload rights] u L r and [Download rights] d L r.
 - O Make a careful note of the password and keep it in a place where you are able to find it.

[Password status] P 5 5 E

Password status.

Setting	Code / Value	Description
[No password defined]	no	No password defined Factory setting
[Password is unlocked]	uL	Password is unlocked
[Password is locked]	LoC	Password is locked

[Password] PWd

6-digits password. The password must be entered in order to unlock the drive. Once the correct code has been entered, the drive is unlocked until the next time the supply mains is disconnected.

[Upload rights] u L r

Upload rights.

Setting()	Code / Value	Description
[Permitted]	uLr O	Commissioning tools or the Plain Text Display Terminal can save the whole configuration (password, monitoring, configuration) Factory setting
[Not allowed]	uLr I	Commissioning tools or the Plain Text Display Terminal cannot save the configuration

[Download rights] d L r

Download rights.

Setting()	Code / Value	Description
[Locked drv]	dLr0	Lock drive: the configuration can be downloaded only in a locked drive which configuration has the same password
[Unlock. drv]	dLrl	Unlock drive: the configuration can be downloaded only in a drive without active password Factory setting
[Not allowed]	dLr2	The configuration can never be downloaded
[Lock/unlock]	dLr3	Download is permitted according to case 0 or case 1

Section 9.3 [Access level]

[Access level] L A C - Menu

Access

[My preferences] → [Access level]

About This Menu

A WARNING

UNINTENDED EQUIPMENT OPERATION

A single input can activate several functions at the same time (reverse and 2nd ramp for example). Verify that activating a digital input to several functions does not result in unsafe conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

[Access Level] L R [

Level of access control.

Setting ()	Code / Value	Description
[Basic]	Ь Я S	Access to all menus. Factory setting
[Expert]	<i>EPr</i>	Access to all menus and to additional parameters.

Section 9.4 [LCD settings]

[LCD settings] [n L - Menu

Access

[My preferences] → [LCD settings]

About This Menu

This menu allows to set the Plain Text Display Terminal related parameters.

[Screen Contrast] [5 E

Screen contrast setting.

Setting	Description
0100%	Setting range
	Factory setting: 50%

[Standby] 5 b 4

Stand-by delay.

NOTE: Disabling the automatic standby function of the display terminal backlight will reduce the backlight service time.

Setting	Description
10 min	Automatic backlight OFF time
	Factory setting: 10 min

[Display Terminal locked] K L E K

Plain Text Display Terminal key locked. Press **ESC** and **Home** keys to Lock manually & unlock the Plain Text Display Terminal keys. The **Stop** key remains active when the Plain Text Display Terminal is locked.

Setting ()	Description
<i>n</i>	Setting range Factory setting: 5 min

Part III

Maintenance and diagnostics

What Is in This Part?

This part contains the following chapters:

Chapter	Chapter Name	Page
10	Maintenance	311
11	Diagnostics and Troubleshooting	

Chapter 10 Maintenance

Maintenance

Limitation of Warranty

The warranty does not apply if the product has been opened, except by Schneider Electric services.

Servicing

A A DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

Read and understand the instructions in **Safety Information** chapter before performing any procedure in this chapter.

Failure to follow these instructions will result in death or serious injury.

NOTICE

RISK OF DAMAGE TO THE DRIVE

Perform the following activities.

Failure to follow these instructions can result in equipment damage.

Environment	Part concerned	Action	Periodicity
Mechanical impact on the product	Housing - control block (led - display)	Verify the drive visual aspect	At least each year
Corrosion	Terminals - connector - screws - EMC plate	Inspect and clean if required	
Dust	Terminals - fans blowholes		
Temperature	Around the product	Verify and correct if required	
Cooling	Fan	Verify the fan operation	
		Replace the fan	After 3 to 5 years, depending on the operating conditions
Vibration	Terminal connections	Verify tightening at recommended torque	At least each year

Spares and Repairs

Serviceable product. Please contact your Schneider Electric representative.

Long Time Storage

If the drive was not connected to mains for an extended period of time, the capacitors must be restored to their full performance before the motor is started.

NOTICE

REDUCED CAPACITOR PERFORMANCE

- Apply mains voltage to the drive for one hour before starting the motor if the drive has not been connected to mains for the following periods of time:
 - o 12 months at a maximum storage temperature of +50°C (+122°F)
 - O 24 months at a maximum storage temperature of +45°C (+113°F)
 - 36 months at a maximum storage temperature of +40°C (+104°F)
- Verify that no Run command can be applied before the period of one hour has elapsed.
- Verify the date of manufacture if the drive is commissioned for the first time and run the specified procedure if the date of manufacture is more than 12 months in the past.

Failure to follow these instructions can result in equipment damage.

If the specified procedure cannot be performed without a Run command because of internal mains contactor control, perform this procedure with the power stage enabled, but the motor being at standstill so that there is no appreciable mains current in the capacitors.

Fan Replacement

It is possible to order a new fan for the drive maintenance, see the catalog numbers on <u>www.schneider-electric.com</u>.

Chapter 11

Diagnostics and Troubleshooting

Overview

This chapter describes the various types of diagnostics and provides troubleshooting assistance.

⚠ A DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

Read and understand the instructions in **Safety Information** chapter before performing any procedure in this chapter.

Failure to follow these instructions will result in death or serious injury.

What Is in This Chapter?

This chapter contains the following sections:

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11.2	Error Codes	316
11.3	FAQ	391

Section 11.1Warning Codes

Warning Codes

List of Available Warnings

Setting	Code / Value	Description
[Al1 4-20 Loss Warning]	RP I	4-20 loss warning on analog input Al1
[Al2 4-20 Loss Warning]	AP2	4-20 loss warning on analog input Al2
[Al3 4-20 Loss Warning]	RP3	4-20 loss warning on analog input Al3
[Al4 4-20 Loss Warning]	ЯРЧ	4-20 loss warning on analog input Al4
[Al5 4-20 Loss Warning]	APS	4-20 loss warning on analog input AI5
[Cust Warning 1]	CASI	Customer warning 1
[Cust Warning 2]	C A S 2	Customer warning 2
[Cust Warning 3]	C A S 3	Customer warning 3
[Cust Warning 4]	C A S 4	Customer warning 4
[Cust Warning 5]	C A S S	Customer warning 5
[Current Thd Reached]	C Ł A	Motor current high threshold reached
[Low Current Reached]	CEAL	Motor current low threshold reached
[Dry Run Warning]	dr AY	Dry run monitoring function warning
[Ext. Error Warning]	EFA	External error warning
[2nd Frequency Thd Reached]	F 2 A	Second frequency threshold reached
[Motor Freq Low Thd 2]	F 2 A L	Motor frequency low threshold 2 reached
[Fan Counter Warning]	FCLA	Fan counter warning
[Fan Feedback Warning]	FFdA	Fan feedback warning
[High Speed Reached]	FLA	High speed reached
[Fallback Frequency]	FrF	Fallback frequency reaction
[Flow Limit Activated]	FSA	Flow limitation monitoring function is active
[Motor Freq High Thd]	FLA	Motor frequency high threshold reached
[Motor Freq Low Thd]	FEAL	Motor frequency low threshold reached
[High Flow Warning]	нғря	High flow monitoring function warning
[InPress Warning]	, P P A	Inlet pressure monitoring function warning level reached
[Anti-Jam Warning]	JANA	Anti-Jam maximum cycle counter reached
[Life Cycle Warn 1]	LCAI	Life cycle warning 1
[Life Cycle Warn 2]	L C A 2	Life cycle warning 2
[Low Flow Warning]	LFA	Low flow monitoring function warning level reached
[LowPres Warning]	LPA	Low pressure monitoring function warning level reached
[No Warning stored]	n o A	No warning stored
[Process Overload Warning]	o L A	Process overload warning
[High OutPres Warning]	o P H A	High outlet pressure warning
[Low OutPress Warning]	o P L A	Low outlet pressure warning
[Switch OutPres Warning]	oP5A	High outlet pressure switch warning
[PumpCycle warning]	PCPA	Pumpcycle warning
[PID Error Warning]	PEE	PID error warning
[PID Feedback Warning]	PFA	PID feedback warning
[PID High Fdbck Warning]	PFAH	PID feedback high threshold warning
[PID Low Fdbck Warning]	PFAL	PID feedback low threshold warning
[Pump Low Flow]	PLFA	Pump low flow warning level reached

Setting	Code / Value	Description
[Power Cons Warning]	PoWd	Power consumption warning
[Power High Threshold]	PEHA	Power high threshold reached
[Power Low Threshold]	PEHL	Power low threshold reached
[Speed Maintained]	r L 5	Speed maintained function is active
[Ref Freq High Thd reached]	rEAH	Reference frequency high threshold reached
[Ref Freq Low Thd reached]	rEAL	Reference frequency low threshold reached
[Ref Frequency Warning]	5 r A	Reference frequency reached
[Type of stop]	5 <i>E E</i>	Detected error without stop according to [Type of stop] 5 £ £
[Drv Therm Thd Reached]	Ŀ A d	Drive thermal threshold reached
[IGBT Thermal Warning]	E JA	IGBT thermal state warning
[Al2 Th Warning]	£ P 2 A	Thermal sensor warning on analog input Al2
[Al3 Th Warning]	£ P 3 A	Thermal sensor warning on analog input Al3
[Al4 Th Warning]	£ P 4 A	Thermal sensor warning on analog input Al4
[Al5 Th Warning]	L P S A	Thermal sensor warning on analog input AI5
[Motor Therm Thd Reached]	Ŀ S A	Motor thermal threshold reached
[Process Undld Warning]	uLЯ	Process underload warning
[Preventive UnderV Active]	uРA	Preventive undervoltage active
[Undervoltage Warning]	⊔ 5 A	Undervoltage warning

Section 11.2 Error Codes

What Is in This Section?

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[Program Running Error] PGr F	369
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[Motor Short Circuit] 5 E F 5	374
[Modbus Com Interruption] 5 L F I	375
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[Motor Overspeed] 5 a F	377
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Overview

Clearing the Detected Error

This table presents the steps to follow if intervention on the drive system is required:

Step	Action
1	Disconnect all power, including external control power that may be present.
2	Lock that all power disconnects in the open position.
3	Wait 15 minutes to allow the DC bus capacitors to discharge (the drive LEDs are not indicators of the absence of DC bus voltage).
4	Measure the voltage of the DC bus between the PA/+ and PC/- terminals to ensure that the voltage is less than 42 Vdc.
5	If the DC bus capacitors do not discharge completely, contact your local Schneider Electric representative. Do not repair or operate the drive.
6	Find and correct the cause of the detected error.
7	Restore power to the drive to confirm that the detected error has been rectified.

After the cause has been removed, the detected error can be cleared by:

- Switching off the drive.
- Using the [Product Restart] r P parameter.
- Using the [Auto Fault Reset] # L r function.
- A digital input or control bit set to the **[Fault reset]** r 5 L function.
- Pressing the **STOP/RESET** key on the Plain Text Display Terminal if the active command channel is set to **[Ref. Freq-Rmt.Term]** *L L L* .

[Incorrect Configuration] [F F



Probable Cause

- Option module changed or removed.
- Control block replaced by a control block configured on a drive with a different rating.
- The current configuration is inconsistent.



- Verify that there is no detected error on the option module.
- In the event of the control block being changed deliberately, see the remarks below.
- Return to factory settings or retrieve the backup configuration if it is valid.



Clearing the Error Code

This detected error is cleared as soon as its cause disappears.

[Invalid Configuration] [F]



Probable Cause

Invalid configuration. The configuration loaded in the drive via the commissioning tool or fieldbus is inconsistent.



- Verify the previously loaded configuration.
- Load a compatible configuration.



Clearing the Error Code

This detected error is cleared as soon as its cause disappears.

[Conf Transfer Error] [F 12



Probable Cause

- The configuration has not been transferred properly.
- The configuration loaded is not compatible with the drive.



- Check the configuration loaded previously.
- Load a compatible configuration.



Clearing the Error Code

This detected error is cleared as soon as its cause disappears.

[Fieldbus Com Interrupt] [n F



Communication interruption on fieldbus module.



- Verify the environment (electromagnetic compatibility).
- Verify the wiring.
- Verify the timeout.
- Replace the option module.
- Contact your local Schneider Electric representative



Clearing the Error Code

This detected error can be cleared with the [Auto Fault Reset] $H \to r$ or manually with the [Fault Reset Assign] $r \to F$ parameter after the cause has disappeared.

[Precharge Capacitor] [r F



Probable Cause

Charging circuit control detected error or charging resistor damaged.



- Turn off the drive and then turn on again.
- Verify the internal connections.
- Contact your local Schneider Electric representative



Clearing the Error Code

This detected error requires a power reset.

[Channel Switch Error] [5 F



Switch to a not valid channel.



Verify the function parameters.



This detected error is cleared as soon as its cause disappears.

[EEPROM Control] E E F /



An error of the internal memory of the control block has been detected.



- Verify the environment (electromagnetic compatibility).
- Switch off the product.
- Return to factory settings.
- Contact your local Schneider Electric representative.



This detected error requires a power reset.

[EEPROM Power] E E F ≥



An error of the internal memory of the power board has been detected.



- Verify the environment (electromagnetic compatibility).
- Switch off the product.
- Return to factory settings.
- Contact your local Schneider Electric representative.



This detected error requires a power reset.

[External Error] EPF |



- Event triggered by an external device, depending on user.
- An external error has been triggered via Embedded Ethernet.



Remove the cause of the external error.



Clearing the Error Code

This detected error can be cleared with the [Auto Fault Reset] $H E_r$ or manually with the [Fault Reset Assign] r = 5 F parameter after the cause has disappeared.

[Fieldbus Error] EPF 2



An external error has been triggered via fieldbus.



Remove the cause of the external error.



This detected error can be cleared with the [Auto Fault Reset] $H E_r$ or manually with the [Fault Reset Assign] r = 5 F parameter after the cause has disappeared.

[Boards Compatibility] H [F



The [Pairing password] PP , parameter has been enabled and an option module has been changed.



- Refit the original option module.
- Confirm the configuration by entering the **[Pairing password]** *PP* , if the module was changed deliberately.



This detected error is cleared as soon as its cause disappears.

[Internal Link Error] , L F



Communication interruption between option module and the drive.



- Verify the environment (electromagnetic compatibility).
- Verify the connections.
- Replace the option module.
- Contact your local Schneider Electric representative.



This detected error requires a power reset.

[Internal Error 0] In F D



Communication interruption between microprocessors of the control board.



Contact your local Schneider Electric representative.



This detected error requires a power reset.

[Internal Error 1] In F |



The power board rating is not valid.



Contact your local Schneider Electric representative.



This detected error requires a power reset.

[Internal Error 2] In F ≥



The power board is incompatible with the control block software.



Contact your local Schneider Electric representative.



This detected error requires a power reset.

[Internal Error 3] In F 3



Internal communication detected error.



- Verify the wiring on drive control terminals (internal 10V supply for analog inputs overloaded).
- Contact your local Schneider Electric representative.



This detected error requires a power reset.

[Internal Error 4] In F 4



Internal data inconsistent.



Contact your local Schneider Electric representative.



[Internal Error 6] In F 5



Probable Cause

- The option module installed in the drive is not recognized.
- The removable control terminal modules (if existing) are not present or not recognized.
- The embedded Ethernet adapter is not recognized.



- Verify the catalog number and compatibility of the option module.
- Plug the removable control terminal modules after the drive has been switched off.
- Contact your local Schneider Electric representative.



Clearing the Error Code

This detected error requires a power reset.

[Internal Error 7] In F 7



Communication interruption with CPLD component of Control board.



Contact your local Schneider Electric representative.



This detected error requires a power reset.

[Internal Error 8] In F B



The internal power switching supply is not correct.



Contact your local Schneider Electric representative.



This detected error requires a power reset.

[Internal Error 9] In F 9



An error on the current circuit measurement has been detected.



Contact your local Schneider Electric representative.



This detected error can be cleared with the [Auto Fault Reset] $H E_r$ or manually with the [Fault Reset Assign] r = 5 F parameter after the cause has disappeared.

[Internal Error 10] In F R



The input stage is not operating correctly.



Contact your local Schneider Electric representative.



This detected error requires a power reset.

[Internal Error 11] In F b



The internal drive thermal sensor is not operating correctly.



Contact your local Schneider Electric representative.



This detected error can be cleared with the [Auto Fault Reset] $H E_r$ or manually with the [Fault Reset Assign] r = 5 F parameter after the cause has disappeared.

[Internal Error 12] INF [



Internal current supply error.



Contact your local Schneider Electric representative.



This detected error requires a power reset.

[Internal Error 13] In Fd



Probable Cause

Differential current deviation.



Contact your local Schneider Electric representative.



This detected error requires a power reset.

[Internal Error 14] In F E



Internal microprocessor detected error.



- Verify that the error code can be cleared.
- Contact your local Schneider Electric representative.



This detected error requires a power reset.

[Internal Error 15] In F F



Probable Cause

Serial memory flash format error.



Contact your local Schneider Electric representative.



This detected error requires a power reset.

[Internal Error 16] INF [



Communication interruption with the Extension module of output relays module or internal error of the Extension module of output relays



- Replace the option module.
- Contact your local Schneider Electric representative.



This detected error requires a power reset.

[Internal Error 17] In FH



Probable Cause

Communication interruption with the Extension module of digital & analog I/O or internal error of the Extension module of digital & analog I/O.



- Replace the option module.
- Contact your local Schneider Electric representative.



Clearing the Error Code

This detected error requires a power reset.

[Internal Error 18] In F



Communication interruption with Safety function module or internal error of the Safety function module.



- Replace the option module.
- Contact your local Schneider Electric representative.



This detected error requires a power reset.

[Internal Error 20] In F K



Option module interface board error.



Contact your local Schneider Electric representative.



This detected error requires a power reset.

[Internal Error 21] In F L



Internal Real Time Clock error.



Contact your local Schneider Electric representative.



This detected error requires a power reset.

[Internal Error 25] INFP



Incompatibility between Control Board hardware version and firmware version.



- Update the firmware package.
- Contact your local Schneider Electric representative.



This detected error requires a power reset.

[Internal Error 27] INF



Diagnostics in CPLD have detected an error.



Contact your local Schneider Electric representative.



This detected error requires a power reset.

[Input Contactor] L [F



The drive is not switched on even though [Mains V. time out] L E timeout has elapsed.



- Verify the input contactor and its wiring.
- Verify the [Mains V. time out] L E Ł timeout.
- Verify the supply mains/contactor/drive wiring.



This detected error can be cleared with the **[Auto Fault Reset]** *R L r* or manually with the **[Fault Reset Assign]** *r* 5 *F* parameter after the cause has disappeared.

[Al1 4-20mA loss] L F F /



Loss of the 4-20 mA on analog input AI1.



Verify the connection on the analog inputs.



This detected error can be cleared with the [Auto Fault Reset] $H E_r$ or manually with the [Fault Reset Assign] r = 5 F parameter after the cause has disappeared.

[Al2 4-20mA loss] L F F 2



Loss of the 4-20 mA on analog input Al2.



Verify the connection on the analog inputs.



This detected error can be cleared with the [Auto Fault Reset] $H E_r$ or manually with the [Fault Reset Assign] r = 5 F parameter after the cause has disappeared.

[Al3 4-20mA loss] L F F 3



Loss of the 4-20 mA on analog input AI3.



Verify the connection on the analog inputs.



This detected error can be cleared with the [Auto Fault Reset] $H E_r$ or manually with the [Fault Reset Assign] r = 5 F parameter after the cause has disappeared.

[Al4 4-20mA loss] L F F 4



Loss of the 4-20 mA on analog input Al4.



Verify the connection on the analog inputs.



This detected error can be cleared with the [Auto Fault Reset] $H E_r$ or manually with the [Fault Reset Assign] r = 5 F parameter after the cause has disappeared.

[AI5 4-20mA loss] L F F 5



Loss of the 4-20 mA on analog input AI5.



Verify the connection on the analog inputs.



This detected error can be cleared with the [Auto Fault Reset] $H E_r$ or manually with the [Fault Reset Assign] r = 5 F parameter after the cause has disappeared.

[DC Bus Overvoltage] _ b F



Probable Cause

- Deceleration time too short or driving load.
- Supply mains voltage too high.



- Increase the deceleration time.
- Configure the [Dec ramp adapt.] b r R function if it is compatible with the application.
- Verify the supply mains voltage.



Clearing the Error Code

This detected error can be cleared with the [Auto Fault Reset] $H E_{\Gamma}$ or manually with the [Fault Reset Assign] Γ 5 F parameter after the cause has disappeared.

[Overcurrent] _ [F



Probable Cause

- Parameters in the [Motor data] $\Pi \square R$ menu are not correct.
- Inertia or load too high.
- Mechanical locking.



- Verify the parameters.
- Verify the size of the motor/drive/load.
- Verify the state of the mechanism.
- Decrease [Current limitation] [L ...
- Increase the switching frequency.



Clearing the Error Code

This detected error requires a power reset.

[Drive Overheating] _ H F



Drive temperature too high.



Verify the motor load, the drive ventilation, and the ambient temperature. Wait for the drive to cool down before restarting.



This detected error can be cleared with the [Auto Fault Reset] $H E_r$ or manually with the [Fault Reset Assign] r = 5 F parameter after the cause has disappeared.

[Process Overload] a L [



Process overload.



- Verify and remove the cause of the overload.
- Verify the parameters of the **[Process overload]** a L d function.



This detected error can be cleared with the [Auto Fault Reset] $H E_r$ or manually with the [Fault Reset Assign] r = 5 F parameter after the cause has disappeared.

[Motor Overload] _ L F



Triggered by excessive motor current.



Verify the setting of the motor thermal monitoring, verify the motor load. Wait for the motor to cool down before restarting.



This detected error can be cleared with the [Auto Fault Reset] $H E_r$ or manually with the [Fault Reset Assign] r = 5 F parameter after the cause has disappeared.

[Single Output Phase Loss] PF |



Loss of one phase at drive output.



Verify the wiring from the drive to the motor.



This detected error can be cleared with the [Auto Fault Reset] $H E_r$ or manually with the [Fault Reset Assign] r = 5 F parameter after the cause has disappeared.

[Output Phase Loss] - PF -



Probable Cause

- Motor not connected or motor power too low.
- Output contactor opened.
- Instantaneous instability in the motor current.



- Verify the wiring from the drive to the motor.

- Verify and optimize the following parameters: [IR compensation] u F r, [Nom Motor Voltage] u r S and [Rated mot. current] r C r and perform [Autotuning] r C r C r and perform [Autotuning] r C r C r



Clearing the Error Code

This detected error can be cleared with the [Auto Fault Reset] $H E_r$ or manually with the [Fault Reset Assign] r = 5 F parameter after the cause has disappeared.

[Supply Mains Overvoltage] _ 5 F



Probable Cause

- Supply mains voltage too high.
- Disturbed supply mains.



Verify the supply mains voltage.



Clearing the Error Code

This detected error can be cleared with the [Auto Fault Reset] $H E_r$ or manually with the [Fault Reset Assign] r = 5 F parameter after the cause has disappeared.

[PID Feedback Error] P F ∏ F



The PID feedback error was out of the allowed range around the set point during the time window.



- Check for mechanical breakdown of pipes.
- Check for water leakage.
- Check for open discharge valve.
- Check for fire hydrant opened.
- Verify the settings of the monitoring function.



This detected error can be cleared with the [Auto Fault Reset] $H E_r$ or manually with the [Fault Reset Assign] r = 5 F parameter after the cause has disappeared.

[Program Loading Error] P [L F



Verify that the error code can be cleared.



Contact your local Schneider Electric representative.



This detected error is cleared as soon as its cause disappears.

[Program Running Error] P [r F



Verify that the error code can be cleared.



Contact your local Schneider Electric representative.



This detected error requires a power reset.

[Input phase loss] PHF



Probable Cause

- Drive incorrectly supplied or a tripped fused.
- One phase missing.
- 3-phase drive used on a single-phase supply mains.
- Unbalanced load.



- Check the power connection and the fuses.
- Use a 3-phase supply mains.
- Disable the detected error by [Input phase loss] IPL = [No] n a if single phase supply mains or DC bus supply is used.



Clearing the Error Code

This detected error can be cleared with the [Auto Fault Reset] $H E_r$ or manually with the [Fault Reset Assign] r = 5 F parameter after the cause has disappeared.

[Motor short circuit] 5 [F |



Short-circuit or grounding at the drive output.



- Verify the cables connecting the drive to the motor, and the motor insulation.
- Reduce the switching frequency.
- Connect chokes in series with the motor.
- Verify the adjustment of speed loop and brake.
- Increase the [Time to restart] L L r
- Increase the switching frequency.



This detected error requires a power reset.

[Ground Short Circuit] 5 [F 3



Significant ground leakage current at the drive output if several motors are connected in parallel.



- Verify the cables connecting the drive to the motor, and the motor insulation.
- Reduce the switching frequency.
- Connect chokes in series with the motor.
- Verify the adjustment of speed loop and brake.
- Increase the [Time to restart] L L r
- Increase the switching frequency.



This detected error requires a power reset.

[IGBT Short Circuit] 5 [F 4



Power component detected error.



Contact your local Schneider Electric representative.



This detected error can be cleared with the [Auto Fault Reset] $H E_r$ or manually with the [Fault Reset Assign] r = 5 F parameter after the cause has disappeared.

[Motor Short Circuit] 5 [F 5



Short-circuit at drive output.



- Verify the cables connecting the drive to the motor, and the motor's insulation.
- Contact your local Schneider Electric representative.



This detected error can be cleared with the [Auto Fault Reset] $H E_r$ or manually with the [Fault Reset Assign] r = 5 F parameter after the cause has disappeared.

[Modbus Com Interruption] 5 L F /



Communication interruption on the Modbus port.



- Verify the communication bus.
- Verify the timeout.
- Refer to the Modbus user manual.



This detected error can be cleared with the [Auto Fault Reset] $H E_r$ or manually with the [Fault Reset Assign] r = 5 F parameter after the cause has disappeared.

[HMI Com Interruption] 5 L F 3



Communication interruption with the Display Terminal.



- Verify the Display Terminal connection.
- Verify the timeout.



This detected error can be cleared with the [Auto Fault Reset] $H E_r$ or manually with the [Fault Reset Assign] r = 5 F parameter after the cause has disappeared.

[Motor Overspeed] 5 p F



Probable Cause

- Instability or driving load too high.
- If a downstream contactor is used, the contacts between the motor and the drive have not been closed before applying a Run command.



- Verify the motor parameter settings.
- Verify the size of the motor/drive/load.
- Verify and close the contacts between the motor and the drive before applying a Run command.



Clearing the Error Code

This detected error requires a power reset.

[Motor Stall Error] 5 L F



The stall monitoring function has detected an error.



- Search for a mechanical blocking of the motor.
- Search for a possible cause of motor overload.
- Verify the settings of the monitoring function.



Clearing the Error Code

This detected error can be cleared with the [Auto Fault Reset] $H E_r$ or manually with the [Fault Reset Assign] r = 5 F parameter after the cause has disappeared.

[Al2 Thermal Sensor Error] *E ≥ □ F*



Probable Cause

The thermal sensor monitoring function has detected a thermal sensor error on analog input AI2:

- Open circuit, or
- Short circuit.



- · Verify the sensor and its wiring.
- Replace the sensor.



Clearing the Error Code

This detected error can be cleared with the [Auto Fault Reset] $H E_r$ or manually with the [Fault Reset Assign] r = 5 F parameter after the cause has disappeared.

[Al3 Thermal Sensor Error] $E \ni E F$



Probable Cause

The thermal sensor monitoring function has detected a thermal sensor error on analog input Al3:

- Open circuit, or
- Short circuit.



- · Verify the sensor and its wiring.
- · Replace the sensor.



Clearing the Error Code

This detected error can be cleared with the [Auto Fault Reset] $H \to \Gamma$ or manually with the [Fault Reset Assign] $\Gamma \to F$ parameter after the cause has disappeared.

[Al4 Thermal Sensor Error] E 4 [F



Probable Cause

The thermal sensor monitoring function has detected a thermal sensor error on analog input AI4:

- Open circuit, or
- Short circuit.



- · Verify the sensor and its wiring.
- Replace the sensor.



Clearing the Error Code

This detected error can be cleared with the [Auto Fault Reset] $H E_r$ or manually with the [Fault Reset Assign] r = 5 F parameter after the cause has disappeared.

[Al5 Thermal Sensor Error] £ 5 [F



Probable Cause

The thermal sensor monitoring function has detected a thermal sensor error on analog input AI5:

- Open circuit, or
- Short circuit.



- Verify the sensor and its wiring.
- · Replace the sensor.



Clearing the Error Code

This detected error can be cleared with the [Auto Fault Reset] $H \to \Gamma$ or manually with the [Fault Reset Assign] $\Gamma \to F$ parameter after the cause has disappeared.

[Al2 Th Detected Error] *E H ≥ F*



The thermal sensor monitoring function has detected a high temperature error on analog input Al2.



- Search for a possible cause of overheating.
- Verify the settings of the monitoring function.



This detected error can be cleared with the [Auto Fault Reset] $H E_r$ or manually with the [Fault Reset Assign] r = 5 F parameter after the cause has disappeared.

[Al3 Th Detected Error] *E H 3 F*



The thermal sensor monitoring function has detected a high temperature error on analog input Al3.



- Search for a possible cause of overheating.
- Verify the settings of the monitoring function.



This detected error can be cleared with the [Auto Fault Reset] $H E_r$ or manually with the [Fault Reset Assign] r = 5 F parameter after the cause has disappeared.

[Al4 Th Detected Error] EHHF



The thermal sensor monitoring function has detected a high temperature error on analog input AI4.



- Search for a possible cause of overheating.
- Verify the settings of the monitoring function.



This detected error can be cleared with the [Auto Fault Reset] $H E_r$ or manually with the [Fault Reset Assign] r = 5 F parameter after the cause has disappeared.

[Al5 Th Detected Error] *E H 5 F*



The thermal sensor monitoring function has detected a high temperature error on analog input AI5.



- Search for a possible cause of overheating.
- Verify the settings of the monitoring function.



This detected error can be cleared with the [Auto Fault Reset] $H \vdash \Gamma$ or manually with the [Fault Reset Assign] $\Gamma \vdash S \vdash \Gamma$ parameter after the cause has disappeared.

[IGBT Overheating] *L J F*



Drive power stage overheating.



- Verify the size of the load/motor/drive according to environment conditions.
- Reduce the switching frequency.



This detected error can be cleared with the [Auto Fault Reset] $H E_r$ or manually with the [Fault Reset Assign] r = 5 F parameter after the cause has disappeared.

[Autotuning Error] *E* n *F*



Probable Cause

- Special motor or motor whose power is not suitable for the drive.
- Motor not connected to the drive.
- Motor not stopped.



- Verify that the motor/drive are compatible.
- Verify that the motor is connected to the drive during autotuning.
- If an output contactor is being used, verify that it is closed during autotuning.
- Verify that the motor is stopped during autotuning.



Clearing the Error Code

This detected error can be cleared manually with the **[Fault Reset Assign]** r 5 F parameter after the cause has disappeared.

[Process Underload] _ L F



Process underload.



- Verify and remove the cause of the underload.
- ullet Verify the parameters of the **[PROCESS UNDERLOAD]** u L d function



This detected error can be cleared with the [Auto Fault Reset] $H E_r$ or manually with the [Fault Reset Assign] r = 5 F parameter after the cause has disappeared.

[Supply Mains UnderV] _ _ 5 F



Probable Cause

- supply mains too low.
- Transient voltage dips.



Verify the voltage and the parameters of [Undervoltage handling] $\, {\it u} \, \, {\it 5} \, {\it b} \, .$



Clearing the Error Code

This detected error is cleared as soon as its cause disappears.

Section 11.3 FAQ

FAQ

Introduction

If the display does not light up, verify the supply mains to the drive.

The assignment of the fast stop or freewheel functions help to prevent the drive starting if the corresponding digital inputs are not switched on. The drive then displays [Freewheel] $n \ 5 \ L$ in freewheel stop and [Fast stop] $F \ 5 \ L$ in fast stop. This is a normal behavior since these functions are active at zero so that the drive is stopped if there is a wire break.

Verify that the run command input is activated in accordance with the selected control mode ([2/3-wire control] $E \ \Box C$ and [2-wire type] $E \ \Box C$ parameters).

If the reference channel or command channel is assigned to a fieldbus, when the supply mains is connected, the drive displays [Freewheel] $n \in E$. It remains in stop mode until the fieldbus gives a command.

Option Module Changed or Removed

When an option module is removed or replaced by another, the drive locks in **[Incorrect configuration]** \mathcal{L} F F error mode at power-on. If the option module has been deliberately changed or removed, the detected error can be cleared by pressing the **OK** key twice, which causes the factory settings to be restored for the parameter groups affected by the option module.

Control Block Changed

When a control block is replaced by a control block configured on a drive with a different rating, the drive locks in [Incorrect configuration] Γ F F fault mode at power-on. If the control block has been deliberately changed, the detected error can be cleared by pressing the **OK** key twice, which **causes all the factory settings to be restored.**