Altivar 71

Programming manual

Retain for future use

Variable speed drives
for asynchronous motors

a brand of Schneider Electric

Telemecanique

Contents

Before you begin

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

⚠ DANGER

HAZARDOUS VOLTAGE

- Read and understand this manual before installing or operating the Altivar 71 drive. Installation, adjustment, repair, and maintenance must be performed by qualified personnel.
- The user is responsible for compliance with all international and national electrical standards in force concerning protective grounding of all equipment.
- Many parts in this variable speed drive, including printed wiring boards, operate at line voltage. DO NOT TOUCH. Use only electrically insulated tools.
- DO NOT touch unshielded components or terminal strip screw connections with voltage present.
- DO NOT short across terminals PA and PC or across the DC bus capacitors.
- Install and close all covers before applying power or starting and stopping the drive.
- Before servicing the variable speed drive
  - Disconnect all power.
  - Place a "DO NOT TURN ON" label on the variable speed drive disconnect.
  - Lock the disconnect in the open position.
- Disconnect all power including external control power that may be present before servicing the drive. WAIT 15 MINUTES for the DC bus capacitors to discharge. Then follow the DC bus voltage measurement procedure given in the installation manual to verify that the DC voltage is less than 45 Vdc. The drive LEDs are not accurate indicators of the absence of DC bus voltage.

Electric shock will result in death or serious injury.

CAUTION

DAMAGED EQUIPMENT

Do not operate or install any drive that appears damaged.
Failure to follow this instruction can result in equipment damage.

Documentation structure

Installation manual

This describes how to assemble and connect the drive.

Programming manual

This describes the functions, parameters and use of the drive terminal (integrated display terminal and graphic display terminal).
The communication functions are not described in this manual, but in the manual for the bus or network used.

Communication parameters manual

This manual describes:

- The drive parameters with specific information for use via a bus or communication network.
- The operating modes specific to communication (state chart).
- The interaction between communication and local control.

Manuals for Modbus, CANopen, Ethernet, Profibus, INTERBUS, Uni-Telway, FIPIO and Modbus Plus, etc

These manuals describe the assembly, connection to the bus or network, signaling, diagnostics, and configuration of the communication-specific parameters via the integrated display terminal or the graphic display terminal.
They also describe the communication services of the protocols.

ATV 58-58F/ATV 71 migration manual

This manual describes the differences between the Altivar 71 and the Altivar 58/58F and explains how to replace an Altivar 58 or 58F, including how to replace drives communicating on a bus or a network.

INSTALLATION

☐ 1 Consult the installation manual

Tips:

- Before you start programming, complete the user setting tables, page 245.
- Perform an auto-tuning operation to optimize performance, page 39.
- If you get lost, return to the factory settings, page 223.

☞ *Note: Check that the wiring of the drive is compatible with its configuration.*

PROGRAMMING

■ 2 Power up without run command

■ 3 Select the language, if the drive has a graphic display terminal

■ 4 Configure the menu [SIMPLY START] (5 IN -)

- ☐ 2-wire or 3-wire control
- ☐ Macro configuration
- ☐ Motor parameters
  - ☞ *Perform an auto-tuning operation*
- ☐ Motor thermal current
- ☐ Acceleration and deceleration ramps
- ☐ Speed variation range

■ 5 Start

Factory configuration

Drive factory settings

The Altivar 71 is factory-set for the most common operating conditions:

- Macro-configuration: Start/Stop
- **Motor** frequency: 50 Hz
- Constant torque application with sensorless flux vector control
- Normal stop mode on deceleration ramp
- Stop mode in the event of a fault: freewheel
- Linear, acceleration and deceleration ramps: 3 seconds
- Low speed: 0 Hz
- High speed: 50 Hz
- Motor thermal current = rated drive current
- Standstill injection braking current = 0.7 x rated drive current, for 0.5 seconds
- No automatic starts after a fault
- Switching frequency 2.5 kHz or 4 kHz depending on drive rating
- Logic inputs:
  - LI1: forward, LI2: reverse (2 operating directions), 2-wire control on transition
  - LI3, LI4, LI5, LI6: inactive (not assigned)
- Analog inputs:
  - AI1: speed reference 0 +/-10 V
  - AI2: 0-20 mA inactive (not assigned)
- Relay R1: The contact opens in the event of a fault (or drive off)
- Relay R2: inactive (not assigned)
- Analog output AO1: 0-20 mA, motor frequency

If the above values are compatible with the application, the drive can be used without changing the settings.

Option card factory settings

The option card inputs/outputs are not factory-set.

Your application functions

The tables on the following pages list the most common function/application combinations in order to assist you in making your selections. The applications listed in these tables concern the following machines in particular:

- **Hoisting:** cranes, overhead cranes, gantries (vertical hoisting, translation, slewing), lifting platforms
- **Elevators:** elevators in retrofit up to 1.2 m/s
- **Handling:** palletizers/depalletizers, conveyors, roller tables
- **Packing:** carton packers, labeling machines
- **Textiles:** weaving looms, carding frames, washing machines, spinners, drawing frames
- **Wood:** automatic lathes, saws, milling
- **High inertia:** centrifuges, mixers, unbalanced machines (beam pumps, presses)
- **Process**

The combinations listed are neither mandatory nor exhaustive. Every machine has its own particular features.

Some functions have been designed specifically for a given application. In this case, the application is identified by a tab in the margin on the relevant programming pages.

Motor control functions

Functions	Page	Applications							
		Hoisting	Elevators	Handling	Packing	Textiles	Wood	High inertia	Process
V/f ratio	67			■			■	■	
Sensorless flux vector control	67	■	■	■	■	■	■	■	■
Flux vector control with sensor	67	■	■	■	■	■	■	■	■
2-point Vector Control	67	■				■			
Open-loop synchronous motor	67					■			
Output frequency 1000 Hz	65					■	■		
Limiting motor overvoltage	76					■	■		
DC bus connection (see user's manual)	-					■			■
Motor fluxing via logic input	141	■		■	■				
Switching frequency up to 16 kHz	76		■			■	■		
Auto-tuning	66	■	■	■	■	■	■	■	■

Your application functions

Functions on speed references

Functions	Page	Applications							
		Hoisting	Elevators	Handling	Packing	Textiles	Wood	High inertia	Process
Differential bipolar reference	84	■		■	■				
Reference delinearization (magnifying glass effect)	86	■		■					
Frequency control input	113					■			■
Reference switching	114 - 123				■				
Reference summing	122				■				
Reference subtraction	122				■				
Reference multiplication	122				■				
S ramps	125	■	■	■					
Jog operation	132			■		■			■
Preset speeds	133	■	■	■	■			■	
+/- speed via single-action buttons (1 step)	136								■
+/- speed via double-action buttons (2 steps)	136	■							
+/- speed around a reference	138					■			■
Save reference	140								■

Your application functions

Specific application functions

Functions	Page	Applications							
		Hoisting	Elevators	Handling	Packing	Textiles	Wood	High inertia	Process
Fast stop	128						■	■	
Management of limit switches	142	■	■	■					
Brake control	144	■	■	■					
External weight measurement	153	■	■						
High-speed lifting	155	■							
PID regulator	159								■
Torque monitoring	167			■		■			■
Limitation of motor/generator torque	170			■		■		■	■
Load balancing	78	■		■					
Line contactor control	173	■		■			■		
Output contactor control	175		■						
Positioning by limit switches or sensors	177			■	■				
ENA system (mechanical with unbalanced load)	74							■	
Parameter switching	180	■	■	■	■	■	■	■	■
Motor or configuration switching	183	■		■	■				
Traverse control	186					■			
Configuration of stops	128			■		■	■	■	

Your application functions

Safety/fault management functions

Functions	Page	Applications							
		Hoisting	Elevators	Handling	Packing	Textiles	Wood	High inertia	Process
Power Removal (safety function, see user's manual)	-	■	■	■	■	■	■	■	■
Deferred stop on thermal alarm	203		■						
Alarm handling	103	■	■	■	■	■	■	■	■
Fault management	196 to 213	■	■	■	■	■	■	■	■
IGBT tests	206	■	■	■	■	■	■	■	■
Catch on the fly	199					■	■	■	
Thermal protection for braking resistors	211	■	■	■	■				
Motor protection with PTC probes	196	■	■	■	■	■	■	■	■
Undervoltage management	205					■	■	■	
4-20mA loss	207	■	■	■		■	■		■
Uncontrolled output cut (output phase loss)	201			■					
Automatic restart	198			■					

Turning on and configuring the drive

⚠ DANGER

UNINTENDED EQUIPMENT OPERATION

- Before turning on and configuring the Altivar 71, check that the PWR (POWER REMOVAL) input is deactivated (at state 0) in order to prevent unintended operation.
- Before turning on or on exiting the configuration menus, check that the inputs assigned to the run command are deactivated (at state 0) since they can cause the motor to start immediately.

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

CAUTION

INCOMPATIBLE LINE VOLTAGE

Before turning on and configuring the drive, ensure that the line voltage is compatible with the supply voltage range shown on the drive nameplate. The drive may be damaged if the line voltage is not compatible.

Failure to follow these instructions can result in equipment damage.

Power switching via line contactor

CAUTION

- **Avoid operating the contactor frequently (premature ageing of the filter capacitors).**
- **Cycle times < 60 s may result in damage to the pre-charge resistor.**

Failure to follow these instructions can result in equipment damage.

User adjustment and extension of functions

- The display unit and buttons can be used to modify the settings and to extend the functions described in the following pages.
- **Return to factory settings** is made easy by the [1.12 FACTORY SETTINGS] (FCS-) menu, see page 221.
- There are three types of parameter:
  - Display: Values displayed by the drive
  - Setting: Can be changed during operation or when stopped
  - Configuration: Can only be modified when stopped and no braking is taking place. Can be displayed during operation.

⚠ DANGER

UNINTENDED EQUIPMENT OPERATION

- Check that changes made to the settings during operation do not present any danger.
- We recommend stopping the drive before making any changes.

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

Setup - Preliminary recommendations

Starting

Important:

- In factory settings mode, the motor can only be supplied with power once the "forward", "reverse" and "DC injection stop" commands have been reset:
  - On power-up or a manual fault reset or after a stop command

  If they have not been reset, the drive will display "nSt" but will not start.
- If the automatic restart function has been configured ([Automatic restart] (Atr) parameter in the [1.8-FAULT MANAGEMENT] (FLt-) menu, see page 198), these commands are taken into account without a reset being necessary.

Test on a low power motor or without a motor

- In factory settings mode, [Output phase loss] detection (OPL) page 201 is active (OPL = YES). To check the drive in a test or maintenance environment without having to switch to a motor with the same rating as the drive (particularly useful in the case of high power drives), deactivate [Output phase loss] (OPL = no).
- Configure [Motor control type] (Ctt) = [V/F 2pts] (UF2) or [V/F 5pts] (UF5) ([1.4-MOTOR CONTROL] (drC-) menu, see page 67).

CAUTION

- Motor thermal protection will not be provided by the drive if the motor current is less than 0.2 times the rated drive current. Provide an alternative means of thermal protection.

Failure to follow these instructions can result in equipment damage.

Using motors in parallel

- Configure [Motor control type] (Ctt) = [V/F 2pts] (UF2) or [V/F 5pts] (UF5) ([1.4-MOTOR CONTROL] (drC-) menu, see page 67).

CAUTION

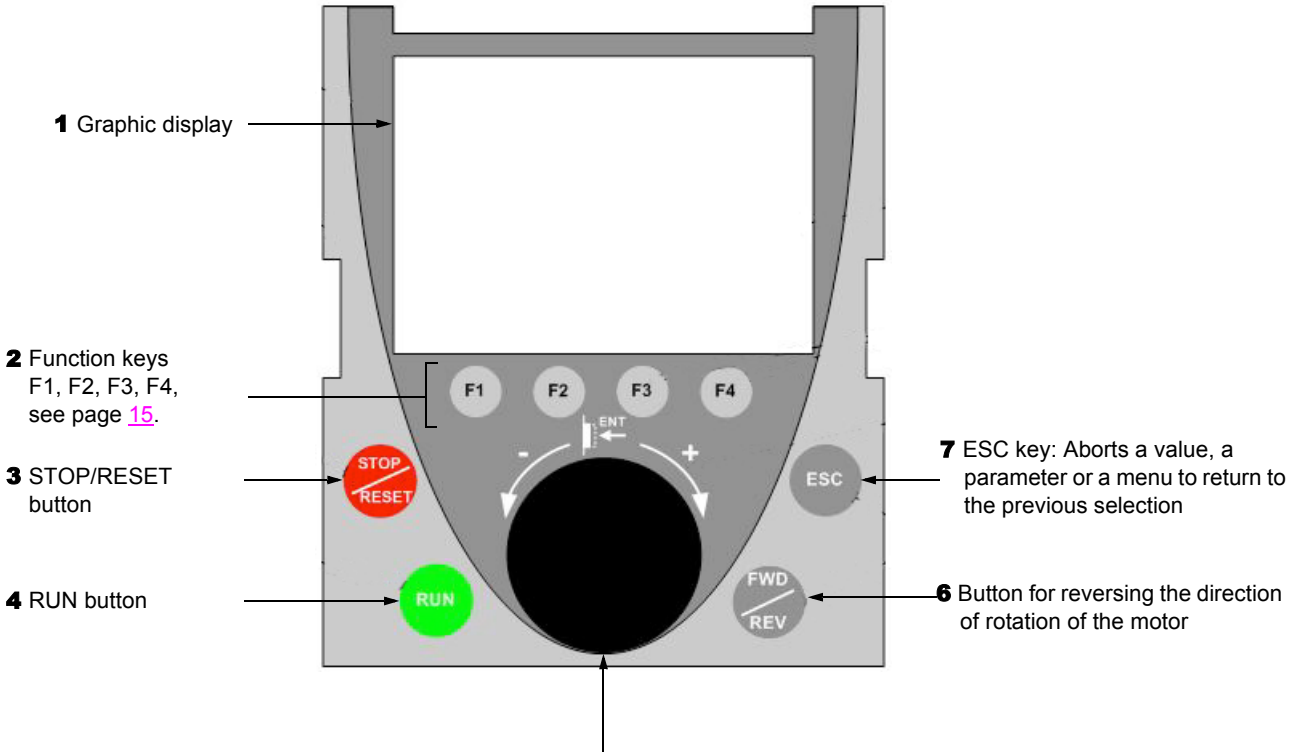
- Motor thermal protection is no longer provided by the drive. Provide an alternative means of thermal protection on every motor.

Failure to follow these instructions can result in equipment damage.

Graphic display terminal

Although the graphic display terminal is optional for low-power drives, it is a standard component on high-power drives (see catalog). The graphic display terminal can be disconnected and connected remotely (on the door of an enclosure for example) using the cables and accessories available as options (see catalog).

Description of the terminal



1 Graphic display

2 Function keys F1, F2, F3, F4, see page 15.

3 STOP/RESET button

4 RUN button

5 Navigation button:

- Press (ENT): - To save the current value
  - To enter the selected menu or parameter
- Turn CW/CCW: - To increment or decrement a value
  - To go to the next or previous line
  - To increase or decrease the reference if control via the terminal is activated

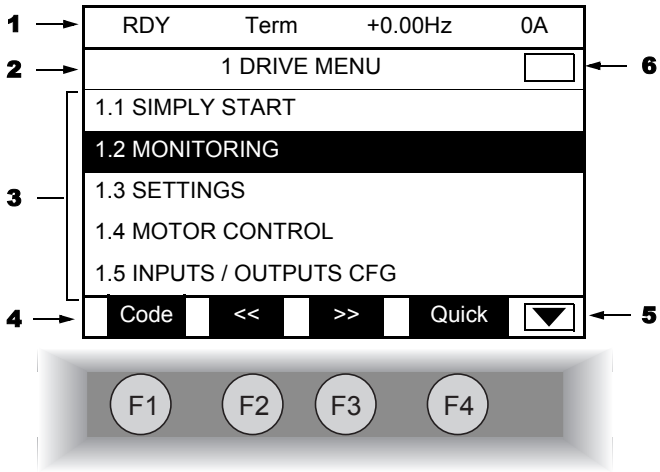
7 ESC key: Aborts a value, a parameter or a menu to return to the previous selection

6 Button for reversing the direction of rotation of the motor

Note: Buttons **3**, **4**, **5** and **6** can be used to control the drive directly, if control via the terminal is activated.

Graphic display terminal

Description of the graphic screen



1. Display line. Its content can be configured; the factory settings show:
- The drive state (see page 16)
- The active control channel:
  - Term: Terminals
  - HMI: Graphic display terminal
  - MDB: Integrated Modbus
  - CAN: Integrated CANopen
  - NET: Communication card
  - APP: Controller Inside card
- Frequency reference
- Current in the motor

2. Menu line. Indicates the name of the current menu or submenu.

3. Menus, submenus, parameters, values, bar charts, etc., are displayed in dropdown window format on a maximum of 5 lines. The line or value selected by the navigation button is displayed in reverse video.

4. Section displaying the functions assigned to the keys F1 to F4 and aligned with them, for example:

- Code F1 : Displays the code of the selected parameter, i.e., the code corresponding to the 7-segment display.
- HELP F1 : Contextual help.
- << F2 : Navigate horizontally to the left, or go to previous menu/submenu or, for a value, go to the next digit up, displayed in reverse video (see the example on page 17).
- >> F3 : Navigate horizontally to the right or go to next menu/submenu (going to the [2 ACCESS LEVEL] menu in this example) or, for a value, go to the next digit down, displayed in reverse video (see the example on page 17).
- Quick F4 : Quick navigation, see page 21.

The function keys are dynamic and contextual.
Other functions (application functions) can be assigned to these keys via the [1.6 COMMAND] menu.

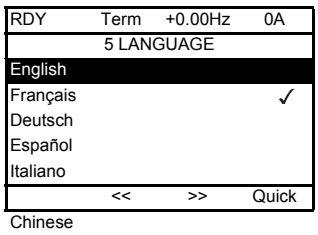
5. Indicates that there are no more levels below this display window.
Indicates that there are more levels below this display window.

6. Indicates that there are no more levels above this display window.
Indicates that there are more levels above this display window.

Drive state codes:

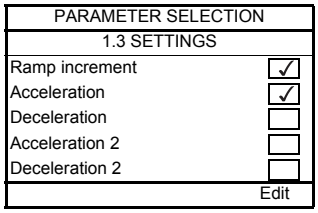
- ACC: Acceleration
- CLI: Current limit
- CTL: Controlled stop on input phase loss
- DCB: DC injection braking in progress
- DEC: Deceleration
- FLU: Motor fluxing in progress
- FST: Fast stop
- NLP: No line power (no line supply on L1, L2, L3)
- NST: Freewheel stop
- OBR: Auto-adapted deceleration
- PRA: Power Removal function active (drive locked)
- RDY: Drive ready
- RUN: Drive running
- SOC: Controlled output cut in progress
- TUN: Auto-tuning in progress
- USA: Undervoltage alarm

Example configuration windows:



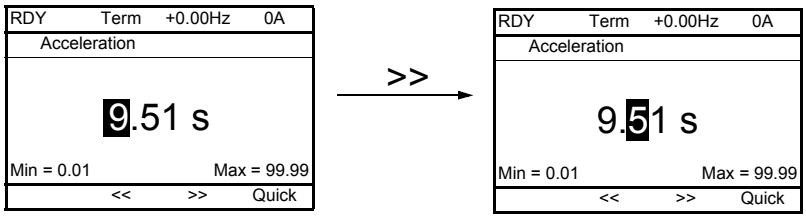
Chinese

When only one possible selection can be made, the selection made is indicated by ✓ .
Example: Only one language can be chosen.



When multiple selection is possible, the selections made are indicated by ☑ .
Example: A number of parameters can be chosen to form the [USER MENU].

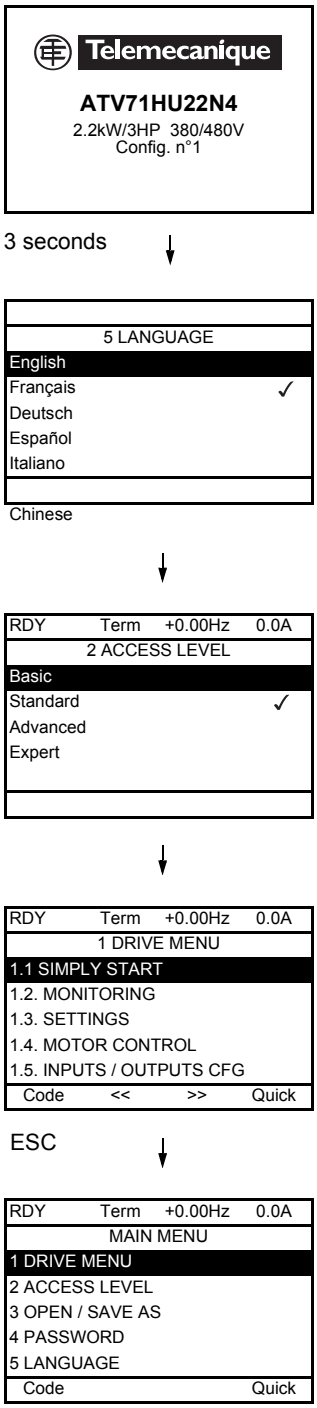
Example configuration window for one value:



The << and >> arrows (keys F2 and F3) are used to select the digit to be modified, and the navigation button is rotated to increase or decrease this number.

First power-up - [5. LANGUAGE] menu

The first time the drive is powered up, the user will automatically be guided through the menus as far as [1. DRIVE MENU].
The parameters in the [1.1 SIMPLY START] submenu must be configured and auto-tuning performed before the motor is started up.



Display for 3 seconds following power-up.

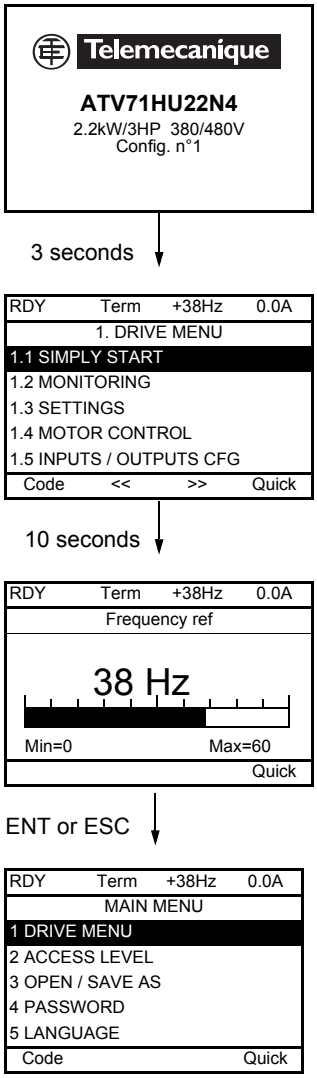
Switches to [5 LANGUAGE] menu automatically 3 seconds later.
Select the language and press ENT.

Switches to [2 ACCESS LEVEL] menu (see page 27).
Select the access level and press ENT.

Switches to [1 DRIVE MENU] (see page 23).

Press ESC to return to [MAIN MENU].

Subsequent power ups



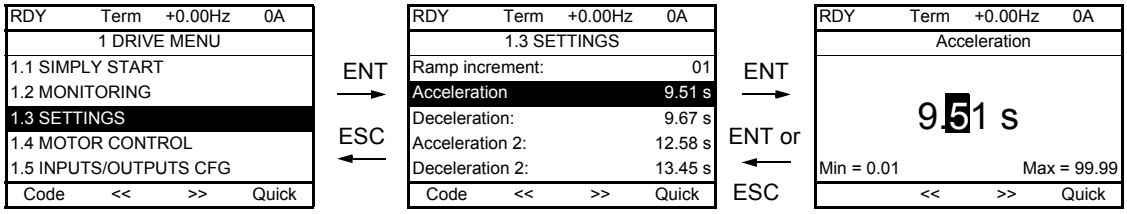
Switches to [1. DRIVE MENU] 3 seconds later.

If no operator inputs are made, switches to "Display" automatically 10 seconds later (the display will vary depending on the selected configuration).

Users can return to [MAIN MENU] by pressing ENT or ESC.

Programming: Example of accessing a parameter

Accessing the acceleration ramp



Note:

- To select a parameter:
  - Turn the navigation button to scroll vertically.
- To modify a parameter:
  - Use the << and >> keys (F2 and F3) to scroll horizontally and select the digit to be modified (the selected digit changes to white on a black background).
  - Turn the navigation button to modify the digit.
- To cancel the modification:
  - Press ESC.
- To save the modification:
  - Press the navigation button (ENT).

Quick navigation

If the "Quick" function is displayed above the F4 key, you can gain quick access to a parameter from any screen.

Example:

RDY	Term	+0.00Hz	0A
1.4 MOTOR CONTROL			
Standard mot. freq:			5 0Hz IEC
Rated motor power:			0.37 kW (50 HP)
Rated motor volt.:			206 V
Rated mot. current:			1.0 A
Rated motor freq.:			50.0 Hz
Code	<<	>>	Quick

Press F4 to access the Quick screen.
There are 4 options.

- [HOME]: return to [MAIN MENU].

RDY	Term	+0.00Hz	0A
QUICK NAVIGATION			
RETURN TO MAIN MENU			
DIRECT ACCESS TO...			
10 LAST MODIFICATIONS			
GOTO MULTIPOINT SCREEN			
Code			

ENT

RDY	Term	+0.00Hz	0A
MAIN MENU			
1 DRIVE MENU			
2 ACCESS LEVEL			
3 OPEN / SAVE AS			
4 PASSWORD			
5 LANGUAGE			
Code			Quick

See page 238

- [DIRECT ACCESS TO...]: Opens the direct access window, which will contain the text "1". The function keys << and >> (F2 and F3) can be used to select each of the numbers and the navigation button to increment or decrement the numbers: 1.3 in the example below.

RDY	Term	+0.00Hz	0A
DIRECT ACCESS TO...			
1.3			
<<	>>		

ENT

RDY	Term	+0.00Hz	0A
1.3 SETTINGS			
Ramp increment:			01
Acceleration			9.51 s
Deceleration:			9.67 s
Acceleration 2:			12.58 s
Deceleration 2:			13.45 s
Code	<<	>>	Quick

- [10 LAST MODIFICATIONS]: Opens a window in which the last 10 parameters modified can be accessed directly.

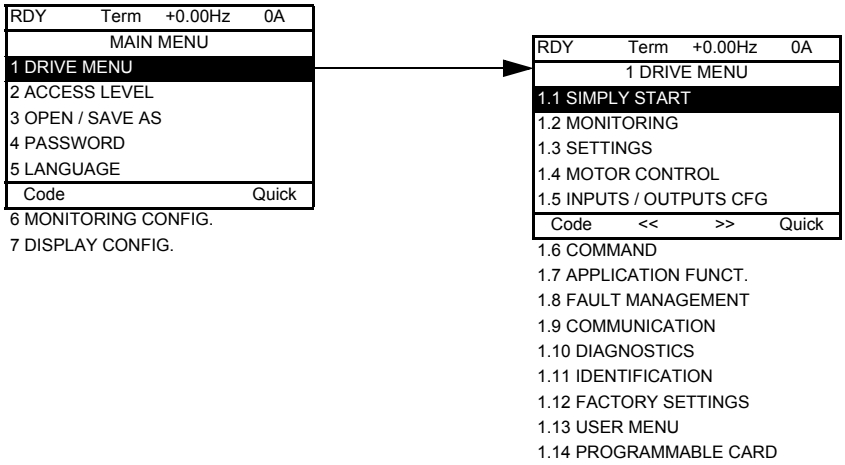
RDY	Term	+0.00Hz	0A
10 LAST MODIFICATIONS			
Acceleration:			10 s
ENA prop.gain:			1.2
Rated mot. current:			15 A
Preset speed 4:		20 Hz	
Preset speed 5:		30 Hz	
Code			

ENT

ESC

RDY	Term	+0.00Hz	0A
Rated mot. current			
15.0 A			
<<	>>		

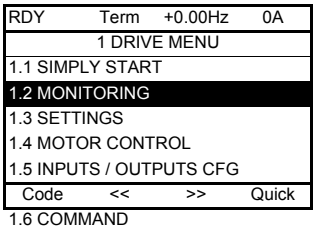
[MAIN MENU] - Menu mapping



Content of [MAIN MENU] menus

[1 DRIVE MENU]	See next page
[2 ACCESS LEVEL]	Defines which menus can be accessed (level of complexity)
[3 OPEN / SAVE AS]	Can be used to save and recover drive configuration files
[4 PASSWORD]	Provides password protection for the configuration
[5 LANGUAGE]	Language selection
[6 MONITORING CONFIG.]	Customization of information displayed on the graphic display terminal during operation
[7 DISPLAY CONFIG.]	• Customization of parameters • Creation of a customized user menu • Customization of the visibility and protection mechanisms for menus and parameters

[1 DRIVE MENU]



1.6 COMMAND
1.7 APPLICATION FUNCT.
1.8 FAULT MANAGEMENT
1.9 COMMUNICATION
1.10 DIAGNOSTICS
1.11 IDENTIFICATION
1.12 FACTORY SETTINGS
1.13 USER MENU
1.14 PROGRAMMABLE CARD

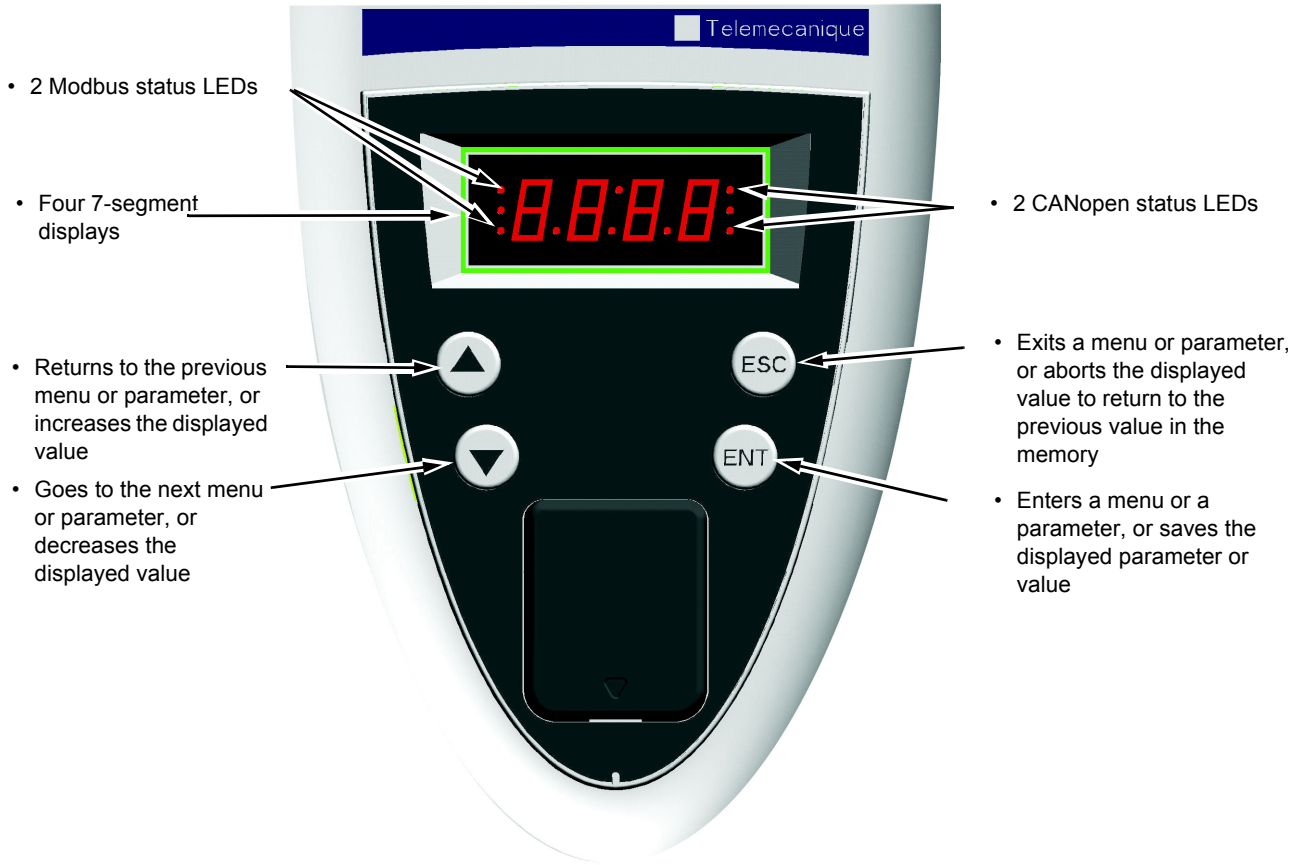
Content of [1. DRIVE MENU] menus:

[1.1 SIMPLY START]:	Simplified menu for fast startup
[1.2 MONITORING]:	Visualization of current, motor and input/output values
[1.3 SETTINGS]:	Accesses the adjustment parameters, which can be modified during operation
[1.4 MOTOR CONTROL]:	Motor parameters (motor nameplate, auto-tuning, switching frequency, control algorithms, etc.)
[1.5 INPUTS / OUTPUTS CFG]:	I/O configuration (scaling, filtering, 2-wire control, 3-wire control, etc.)
[1.6 COMMAND]:	Configuration of command and reference channels (graphic display terminal, terminals, bus, etc.)
[1.7 APPLICATION FUNCT.]:	Configuration of application functions (e.g., preset speeds, PID, brake logic control, etc.)
[1.8 FAULT MANAGEMENT]:	Configuration of fault management
[1.9 COMMUNICATION]:	Communication parameters (fieldbus)
[1.10 DIAGNOSTICS]:	Motor/drive diagnostics
[1.11 IDENTIFICATION]:	Identification of the drive and internal options
[1.12 FACTORY SETTINGS]:	Access to configuration files and return to factory settings
[1.13 USER MENU]:	Specific menu set up by the user in the [6. DISPLAY CONFIG.] menu
[1.14 PROGRAMMABLE CARD]:	Configuration of optional Controller Inside card

Integrated display terminal

Low-power Altivar 71 drives (see catalog) feature an integrated display terminal with a 7-segment 4-digit display. The graphic display terminal described on the previous pages can also be connected to these drives as an option.

Functions of the display and the keys



Note: **• Pressing ▲ or ▼ does not store the selection.**

• Press and hold down (>2 s) ▲ or ▼ to scroll through the data quickly.

Save and store the selection: ENT

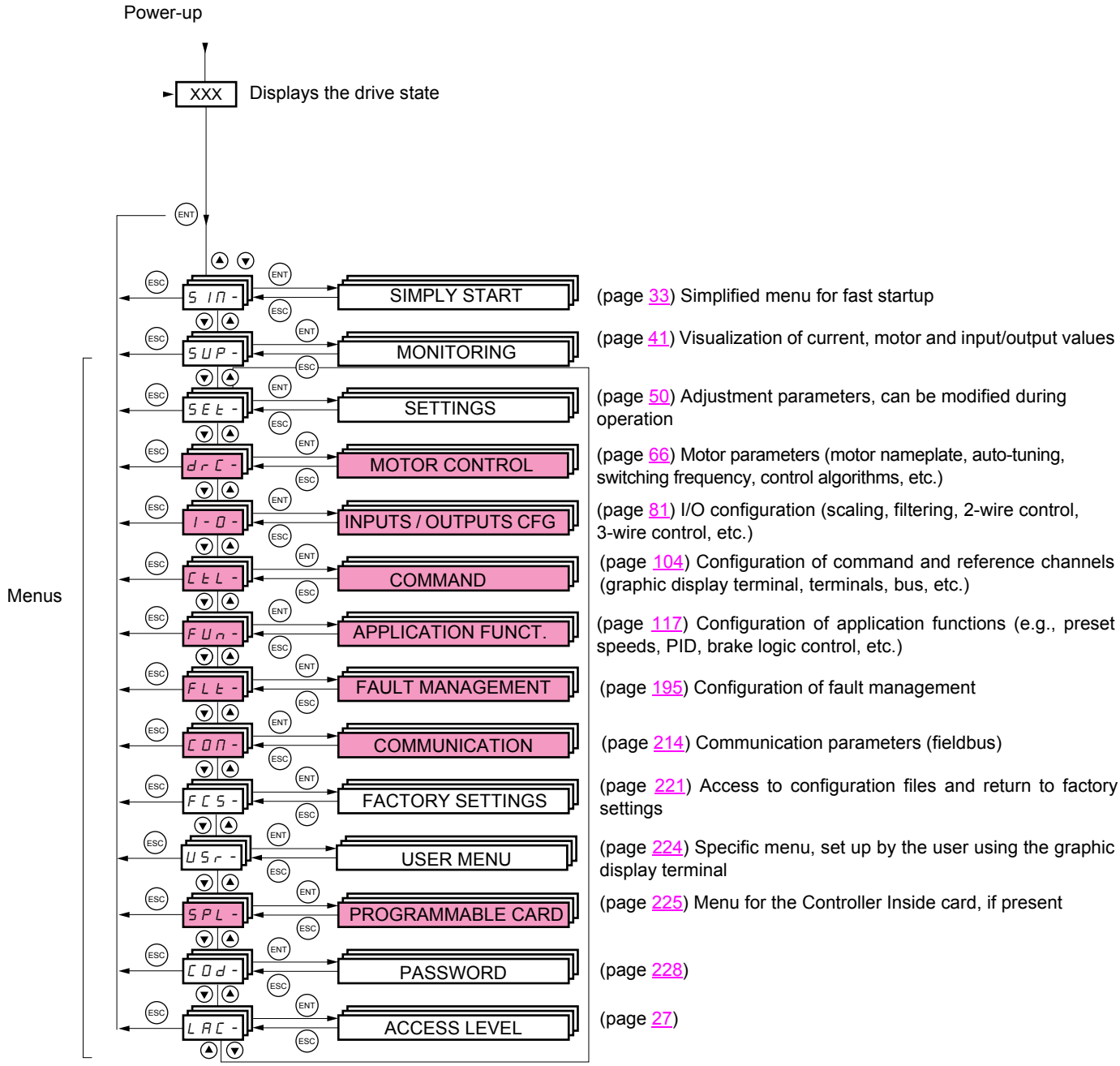
The display flashes when a value is stored.

Normal display, with no fault present and no startup:

- 43.0: Display of the parameter selected in the SUP menu (default selection: motor frequency)
- CLI: Current limit
- CtL: Controlled stop on input phase loss
- dCb: DC injection braking in progress
- FLU: Motor fluxing in progress
- FSt: Fast stop
- nLP: No line power (no line supply on L1, L2, L3)
- nSt: Freewheel stop
- Obr: Auto-adapted deceleration
- PrA: Power Removal function active (drive locked)
- rdY: Drive ready
- SOC: Controlled output cut in progress
- tUn: Auto-tuning in progress
- USA: Undervoltage alarm

The display flashes to indicate the presence of a fault.

Accessing menus



(page 33) Simplified menu for fast startup

(page 41) Visualization of current, motor and input/output values

(page 50) Adjustment parameters, can be modified during operation

(page 66) Motor parameters (motor nameplate, auto-tuning, switching frequency, control algorithms, etc.)

(page 81) I/O configuration (scaling, filtering, 2-wire control, 3-wire control, etc.)

(page 104) Configuration of command and reference channels (graphic display terminal, terminals, bus, etc.)

(page 117) Configuration of application functions (e.g., preset speeds, PID, brake logic control, etc.)

(page 195) Configuration of fault management

(page 214) Communication parameters (fieldbus)

(page 221) Access to configuration files and return to factory settings

(page 224) Specific menu, set up by the user using the graphic display terminal

(page 225) Menu for the Controller Inside card, if present

(page 228)

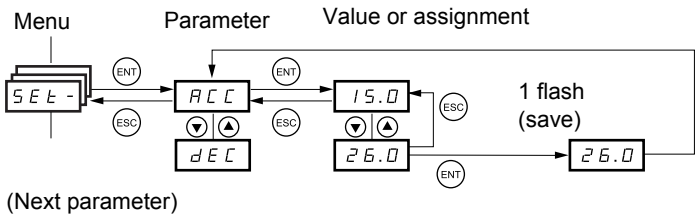
(page 27)

A dash appears after menu and submenu codes to differentiate them from parameter codes.
Examples: FUn- menu, ACC parameter.

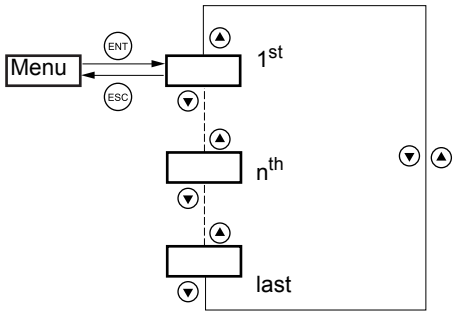
The grayed-out menus may not be accessible depending on the control access (LAC) configuration.

Accessing menu parameters

Save and store the displayed selection: ENT

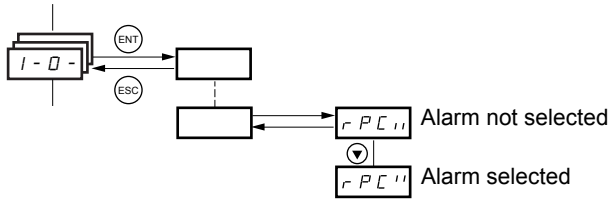


The display flashes when a value is stored.



All the menus are "drop-down" type menus, which means that after the last parameter, if you continue to press ▼ , you will return to the first parameter and, conversely, you can switch from the first parameter to the last parameter by pressing ▲ .

Selection of multiple assignments for one parameter



Example: List of group 1 alarms in [INPUTS / OUTPUTS CFG] menu (I-O-)
A number of alarms can be selected by "checking" them as follows.

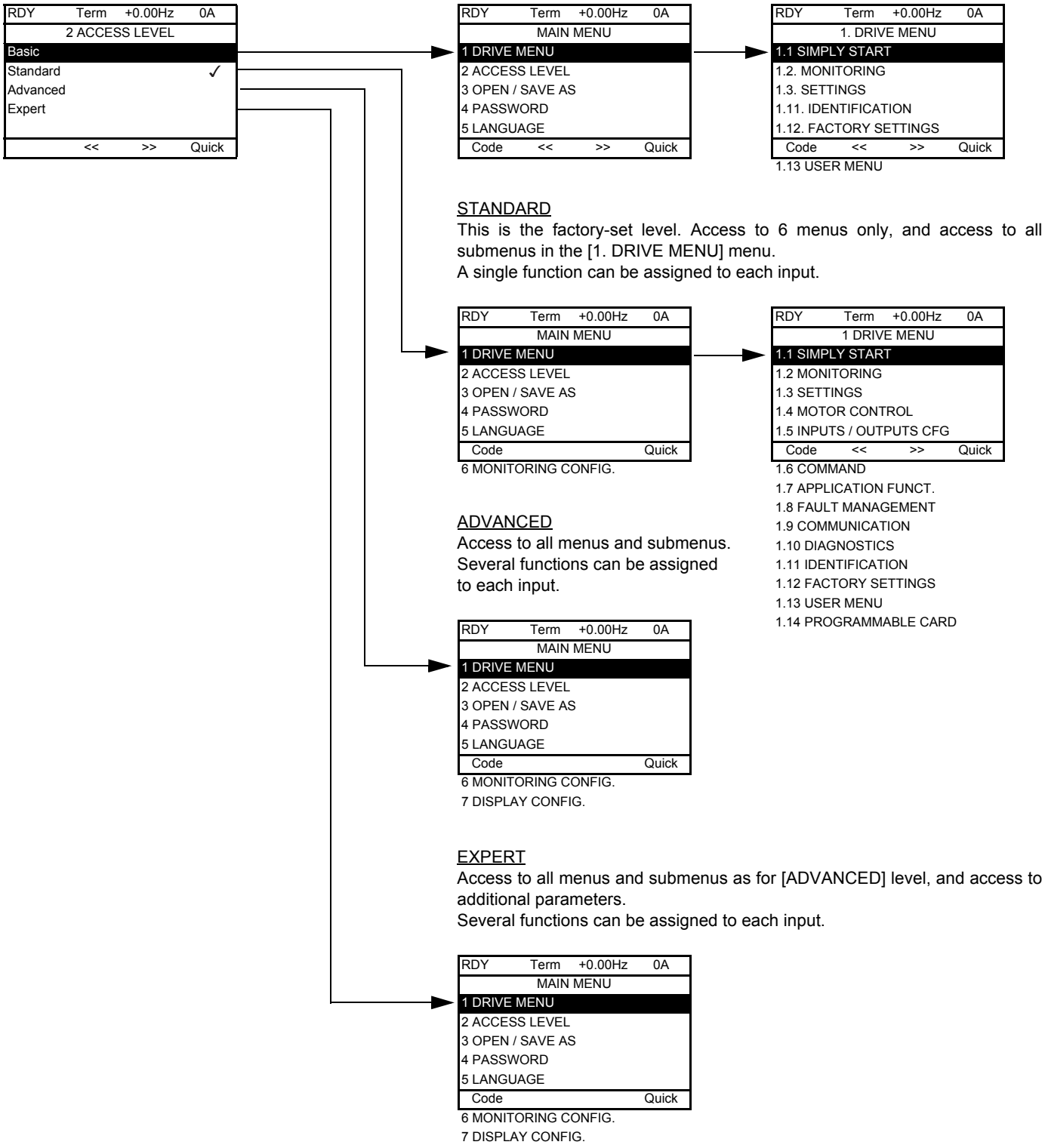
The digit on the right indicates: 8 selected

8 not selected

The same principle is used for all multiple selections.

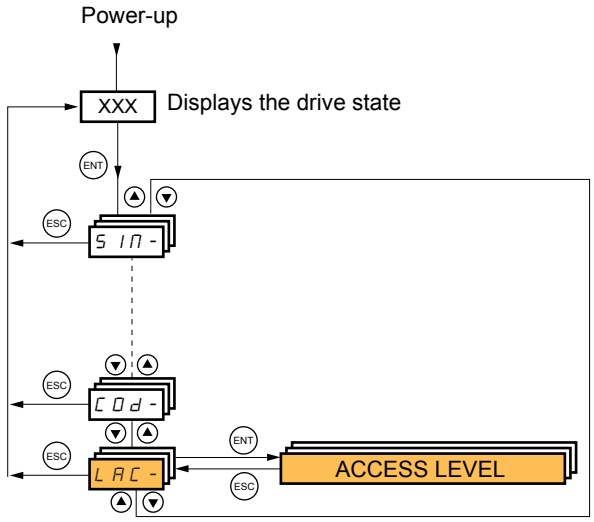
[2. ACCESS LEVEL] (LAC-)

With graphic display terminal



[2. ACCESS LEVEL] (LAC-)

With integrated display terminal:



Code	Name/Description	Factory setting
LAC-		Std
bAS Std AdU EPr	• bAS: Limited access to SIM, SUP, SEt, FCS, USr, COd and LAC menus. A single function can be assigned to each input. • Std: Access to all menus on the integrated display terminal. A single function can be assigned to each input. • AdU: Access to all menus on the integrated display terminal. Several functions can be assigned to each input. • EPr: Access to all menus on the integrated display terminal and access to additional parameters. Several functions can be assigned to each input.	

[2. ACCESS LEVEL] (LAC-)

Comparison of the menus that can be accessed on the graphic display terminal/ integrated display terminal

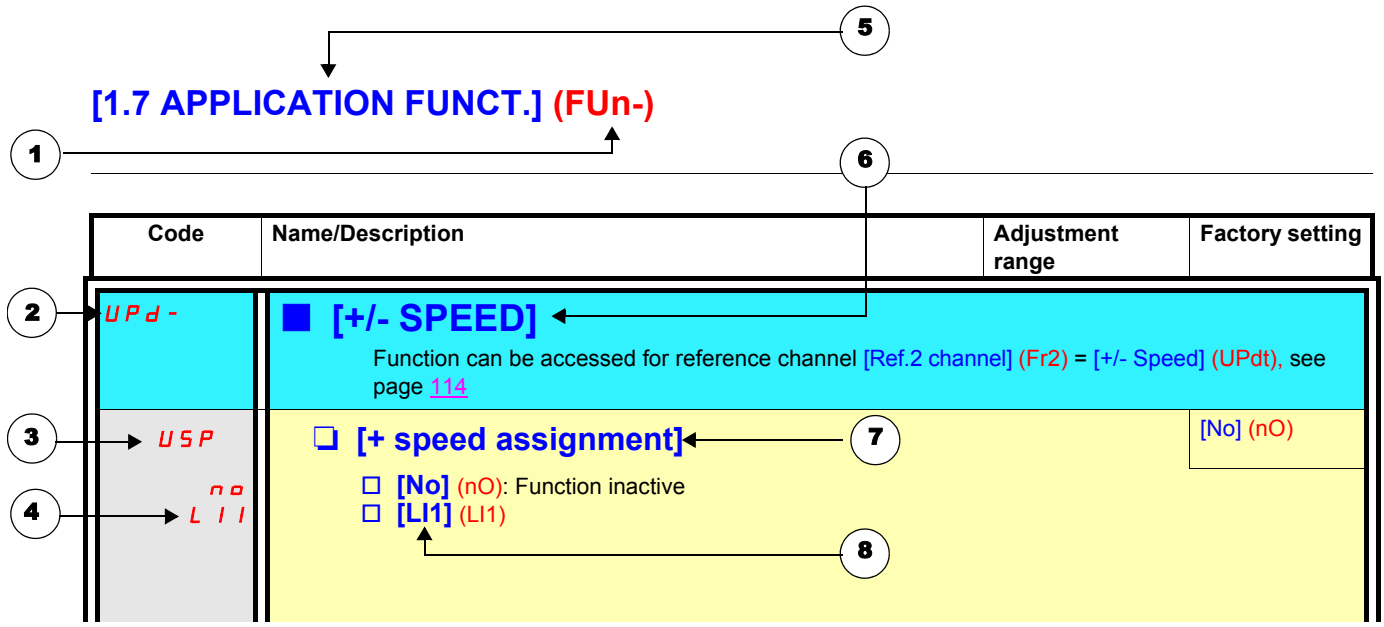
Graphic display terminal		Integrated display terminal	Access level			
[2 ACCESS LEVEL]		LAC - (Access level)	BASIC bAS	STANDARD Std (factory setting)	ADVANCED AdU	EXPERT EPr
[3 OPEN/SAVE AS]		-				
[4 PASSWORD]		COd - (Password)				
[5 LANGUAGE]		-				
[1 DRIVE MENU]	[1.1 SIMPLY START]	SIM - (Simply start)				
	[1.2 MONITORING]	SUP - (Monitoring)				
	[1.3 SETTINGS]	SEt - (Settings)				
	[1.11 IDENTIFICATION]	-				
	[1.12 FACTORY SETTINGS]	FCS - (Factory settings)				
	[1.13 USER MENU]	USr - (User menu)				
A single function can be assigned to each input.		A single function can be assigned to each input.				
	[1.4 MOTOR CONTROL]	drC - (Motor control)				
	[1.5 INPUTS / OUTPUTS CFG]	I-O - (I/O configuration)				
	[1.6 COMMAND]	CtL - (Command)				
	[1.7 APPLICATION FUNCT.]	FUn - (Application functions)				
	[1.8 FAULT MANAGEMENT]	FLt - (Fault management)				
	[1.9 COMMUNICATION]	COM - (Communication)				
	[1.10 DIAGNOSTICS]	-				
	[1.14 PROGRAMMABLE CARD] (1)	SPL - (Controller Inside card) (1)				
[6 MONITORING CONFIG.]		-				
A single function can be assigned to each input.		A single function can be assigned to each input.				
[7 DISPLAY CONFIG.]		-				
Several functions can be assigned to each input.		Several functions can be assigned to each input.				
Expert parameters		Expert parameters				
Several functions can be assigned to each input.		Several functions can be assigned to each input.				

(1) Can be accessed if the Controller Inside card is present.

Structure of parameter tables

The parameter tables in the descriptions of the various menus can be used with both the graphic display terminal and the integrated display terminal. They therefore contain information for these two terminals in accordance with the description below.

Example:



1. Name of menu on 4-digit 7-segment display
2. Submenu code on 4-digit 7-segment display
3. Parameter code on 4-digit 7-segment display
4. Parameter value on 4-digit 7-segment display
5. Name of menu on graphic display terminal
6. Name of submenu on graphic display terminal
7. Name of parameter on graphic display terminal
8. Value of parameter on graphic display terminal

Note:

- The text in square brackets [ ] indicates what you will see on the graphic display terminal.
- The factory settings correspond to [Macro configuration] (CFG) = [Start/Stop] (StS). This is the macro configuration set at the factory.

Interdependence of parameter values

The configuration of certain parameters modifies the adjustment range of other parameters, in order to reduce the risk of errors. **This may result in the modification of a factory setting or a value you have already selected.**

Example:

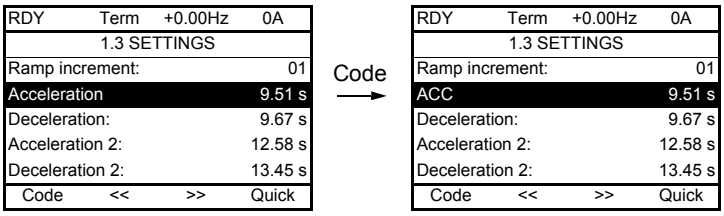
1. [Current Limitation] (CLI) page 57 set to 1.6 In or left at its factory setting, 1.5 In.
2. [Switching freq.] (SFr) page 57 set to 1 kHz (and confirmed with "ENT") restricts [Current Limitation] (CLI) to 1.36 In.
3. If [Switching freq.] (SFr) is increased to 4 kHz, [Current Limitation] (CLI) is no longer restricted, **but remains at 1.36 In**. If you require 1.6 In, you must **reset** [Current Limitation] (CLI).

Finding a parameter in this document

The following assistance with finding explanations on a parameter is provided:

- **With the integrated display terminal:** Direct use of the parameter code index, page 248, to find the page giving details of the displayed parameter.
- **With the graphic display terminal:** Select the required parameter and press F1 : [Code]. The parameter code is displayed instead of its name while the key is held down.

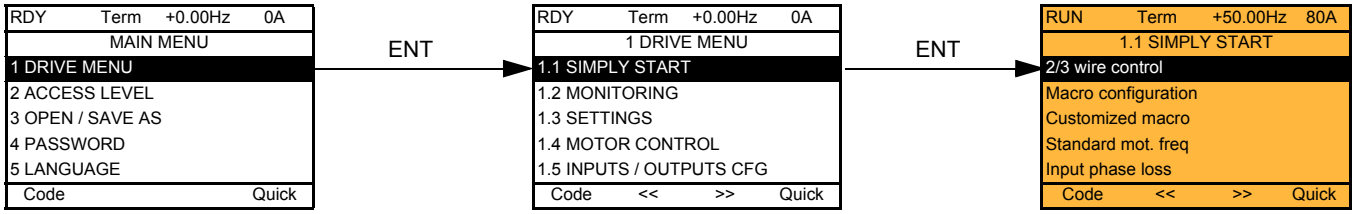
  Example: ACC



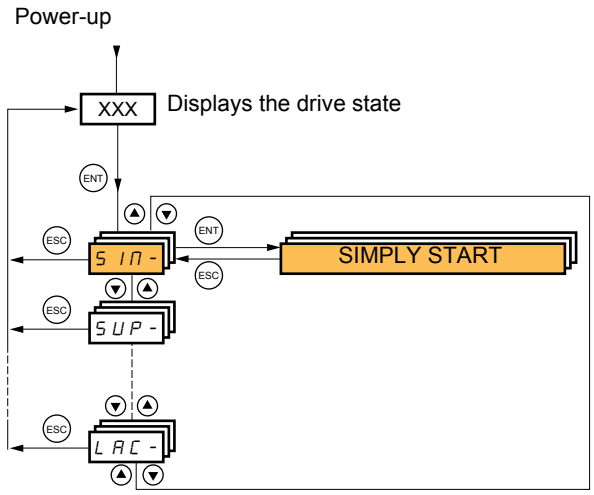
  Then use the parameter code index, page 248, to find the page giving details of the displayed parameter.

[1.1 SIMPLY START] (SIM-)

With graphic display terminal:



With integrated display terminal:



The [1.1-SIMPLY START] (SIM-) menu can be used for fast startup, which is sufficient for the majority of applications.

The parameters in this menu can only be modified when the drive is stopped and no run command is present, with the following exceptions:

- Auto-tuning, which causes the motor to start up
- The adjustment parameters on page 40

Note: The parameters of the [1.1 SIMPLY START] (SIM-) menu must be entered in the order in which they appear, as the later ones are dependent on the first ones.
For example [2/3 wire control] (tCC) must be configured before any other parameters.

The [1.1 SIMPLY START] (SIM-) menu should be configured **on its own or before the other drive configuration menus**. If a modification has previously been made to any of them, in particular in [1.4 MOTOR CONTROL] (drC-), some [1.1 SIMPLY START] (SIM-) parameters may be changed, for example, the motor parameters, if a synchronous motor has been selected. Returning to the [1.1 SIMPLY START] (SIM-) menu after modifying another drive configuration menu **is unnecessary** but does not pose any risk. Changes following modification of another configuration menu **are not described**, to avoid unnecessary complication in this section.

Macro configuration

Macro configuration provides a means of speeding up the configuration of functions for a specific field of application.
7 macro configurations are available:

- Start/stop (factory configuration)
- Materials handling
- General use
- Hoisting
- PID regulator
- Communication bus
- Master/slave

Selecting a macro configuration assigns the parameters in this macro configuration.

Each macro configuration can still be modified in the other menus.

Macro configuration parameters

Assignment of the inputs/outputs

Input/ output	[Start/Stop]	[M. handling]	[Gen. Use]	[Hoisting]	[PID regul.]	[Network C.]	[Mast./ slave]
AI1	[Ref.1 channel]	[Ref.1 channel]	[Ref.1 channel]	[Ref.1 channel]	[Ref.1 channel] (PID reference)	[Ref.2 channel] ([Ref.1 channel] = integrated Modbus) (1)	[Ref.1 channel]
AI2	[No]	[Summing ref. 2]	[Summing ref. 2]	[No]	[PID feedback]	[No]	[Torque ref. 1]
AO1	[Motor freq.]	[Motor freq.]	[Motor freq.]	[Motor freq.]	[Motor freq.]	[Motor freq.]	[Sign torque]
R1	[No drive flt]	[No drive flt]	[No drive flt]	[No drive flt]	[No drive flt]	[No drive flt]	[No drive flt]
R2	[No]	[No]	[No]	[Brk control]	[No]	[No]	[No]
LI1 (2-wire)	[Forward]	[Forward]	[Forward]	[Forward]	[Forward]	[Forward]	[Forward]
LI2 (2-wire)	[Reverse]	[Reverse]	[Reverse]	[Reverse]	[Reverse]	[Reverse]	[Reverse]
LI3 (2-wire)	[No]	[2 preset speeds]	[Jog]	[Fault reset]	[PID integral reset]	[Ref2 switching]	[Trq/spd switching]
LI4 (2-wire)	[No]	[4 preset speeds]	[Fault reset]	[External fault]	[2 preset PID ref.]	[Fault reset]	[Fault reset]
LI5 (2-wire)	[No]	[8 preset speeds]	[Torque limit]	[No]	[4 preset PID ref.]	[No]	[No]
LI6 (2-wire)	[No]	[Fault reset]	[No]	[No]	[No]	[No]	[No]
LI1 (3-wire)	Stop	Stop	Stop	Stop	Stop	Stop	Stop
LI2 (3-wire)	[Forward]	[Forward]	[Forward]	[Forward]	[Forward]	[Forward]	[Forward]
LI3 (3-wire)	[Reverse]	[Reverse]	[Reverse]	[Reverse]	[Reverse]	[Reverse]	[Reverse]
LI4 (3-wire)	[No]	[2 preset speeds]	[Jog]	[Fault reset]	[PID integral reset]	[Ref. 2 switching]	[Trq/spd switching]
LI5 (3-wire)	[No]	[4 preset speeds]	[Fault reset]	[External fault]	[2 preset PID ref.]	[Fault reset]	[Fault reset]
LI6 (3-wire)	[No]	[8 preset speeds]	[Torque limitation]	[No]	[4 preset PID ref.]	[No]	[No]
Option cards							
LI7 to LI14	[No]	[No]	[No]	[No]	[No]	[No]	[No]
LO1 to LO4	[No]	[No]	[No]	[No]	[No]	[No]	[No]
R3/R4	[No]	[No]	[No]	[No]	[No]	[No]	[No]
AI3, AI4	[No]	[No]	[No]	[No]	[No]	[No]	[No]
RP	[No]	[No]	[No]	[No]	[No]	[No]	[No]
AO2	[I motor]	[I motor]	[I motor]	[I motor]	[I motor]	[I motor]	[I motor]
AO3	[No]	[Sign. torque]	[No]	[Sign. torque]	[PID Output]	[No]	[Motor freq.]
Graphic display terminal keys							
F1 key	[No]	[No]	[No]	[No]	[No]	Control via graphic display terminal	[No]
Keys F2, F3, F4	[No]	[No]	[No]	[No]	[No]	[No]	[No]

In 3-wire control, the assignment of inputs LI1 to LI7 shifts.

(1) To start with integrated Modbus [Modbus Address] (Add) must first be configured, page 216.

Note: These assignments are reinitialized every time the macro configuration changes.

Macro configuration parameters

Other configurations and settings

In addition to the assignment of inputs/outputs, other parameters are assigned only in the Hoisting and Mast./slave macro configurations.

Hoisting:

- [Movement type] (bSt) = [Hoisting] (UEr) page 148
- [Brake contact] (bCI) = [No] (nO) page 148
- [Brake impulse] (bIP) = [No] (nO) page 148
- [Brake release I FW] (Ibr) = [Rated mot. current] (nCr) page 148
- [Brake Release time] (brt) = 0.5 s page 148
- [Brake release freq] (bIr) = [Auto] (AUtO) page 149
- [Brake engage freq] (bEn) = [Auto] (AUto) page 149
- [Brake engage time] (bEt) = 0.5 s page 149
- [Engage at reversal] (bEd) = [No] (nO) page 149
- [Jump at reversal] (JdC) = [Auto] (AUtO) page 150
- [Time to restart] (ttr) = 0 s page150
- [Current ramp time] (brr) = 0 s page 152
- [Low speed] (LSP) = Rated motor slip calculated by the drive, page 40
- [Output Phase Loss] (OPL) = [Yes] (YES) page 201. No further modifications can be made to this parameter.
- [Catch on the fly] (FLr) = [No] (nO) page 199. No further modifications can be made to this parameter.

Mast./slave:

- [Motor control type] (Ctt) = [SVC I] (CUC) page 67

Note: These assignments are forced every time the macro configuration changes, except for [Motor control type] (Ctt) for the Mast./slave macro configuration, if it is configured in [FVC] (FUC).

Return to factory settings:

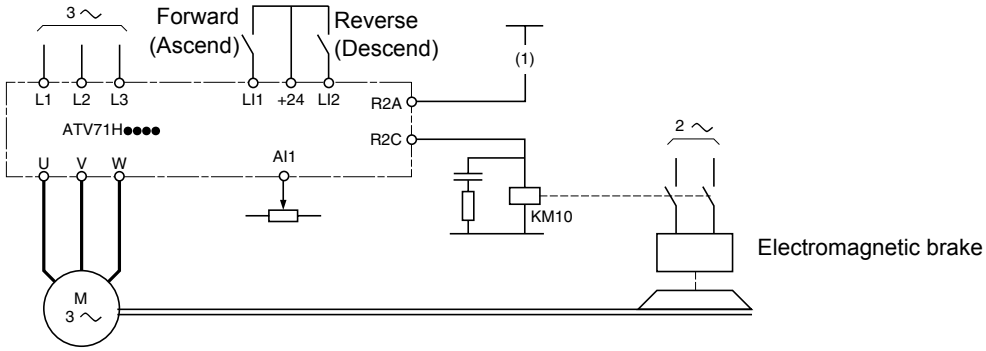
Returning to factory settings with [Config. Source] (FCSI) = [Macro-conf] (InI) page 223 will return the drive to the selected macro configuration. The [Macro configuration] (CFG) parameter does not change, although [Customized macro] (CCFG) disappears.

Note:

- The factory settings that appear in the parameter tables correspond to [Macro configuration] (CFG) = [Start/Stop] (StS). This is the macro configuration set at the factory.

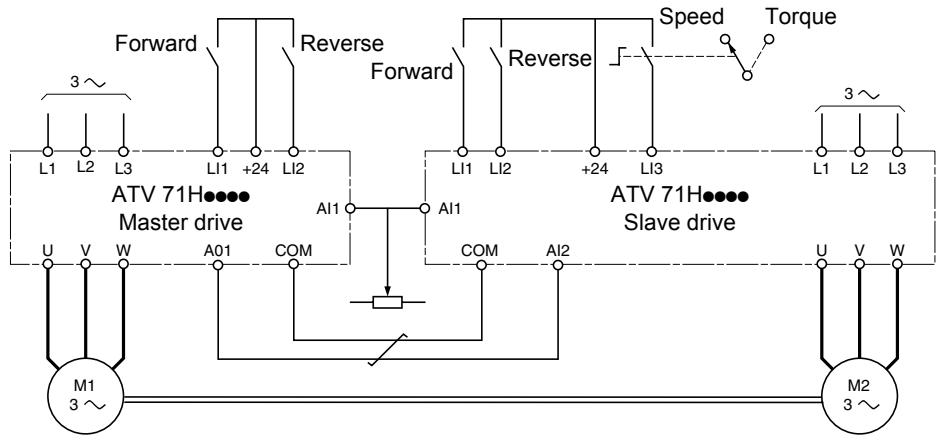
Example diagrams for use with the macro configurations

[Hoisting] (HSt) diagram



(1) A contact on the Preventa module must be inserted in the brake control circuit to engage it safely when the "Power Removal" safety function is activated (see connection diagrams in the installation manual).

[Mast./slave] (MSL) diagram

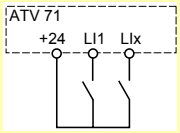


When the two motors are mechanically connected, the Speed/torque contact closing results in operation in Mast./slave mode. The master drive regulates the speed and controls the slave drive in torque mode to ensure distribution of the load.

Code	Name/Description	Adjustment range	Factory setting
tCC	❑ **[2/3 wire control]**		[2 wire] (2C)
2C	☐ **[2 wire]** (2C)		
3C	☐ **[3 wire]** (3C)		

2-wire control: This is the input state (0 or 1) or edge (0 to 1 or 1 to 0), which controls running or stopping.

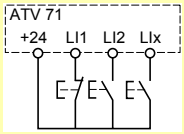
Example of "source" wiring:



LI1: forward
LIx: reverse

3-wire control (pulse control): A "forward" or "reverse" pulse is sufficient to command starting, a "stop" pulse is sufficient to command stopping.

Example of "source" wiring:



LI1: stop
LI2: forward
LIx: reverse

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

To change the assignment of [2/3 wire control] (tCC) press the "ENT" key for 2 s.
The following function will be returned to factory settings: [2 wire type] (tCt) page 82 as will all functions assigned with logic inputs.
The macro configuration selected will also be reset if it has been customized (loss of custom settings).
Check that this change is compatible with the wiring diagram used.
Failure to follow these instructions can result in death or serious injury.

Code	Name/Description	Adjustment range	Factory setting
CFG	❑ **[Macro configuration]**		[Start/Stop] (StS)
StS	☐ **[Start/Stop]** (StS): Start/stop		
HdG	☐ **[M. handling]** (HdG): Materials handling		
HSt	☐ **[Hoisting]** (HSt): Hoisting		
GEn	☐ **[Gen. Use]** (GEn): General use		
PId	☐ **[PID regul.]** (PId): PID regulation		
nEt	☐ **[Network C.]** (nEt): Communication bus		
MSL	☐ **[Mast./slave]** (MSL): Master/slave		

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

To change the assignment of [Macro configuration] (CFG) press the "ENT" key for 2 s.
Check that the selected macro configuration is compatible with the wiring diagram used.
Failure to follow these instructions can result in death or serious injury.

Code	Name/Description	Adjustment range	Factory setting
CCFG	❑ **[Customized macro]**		
	Read-only parameter, only visible if at least one macro configuration parameter has been modified.		
YES	☐ **[Yes]** (YES)		

Code	Name/Description	Adjustment range	Factory setting
bFr	❑ **[Standard mot. freq]**		[50 Hz IEC] (50)
50 60	☐ **[50 Hz IEC]** (50): IEC ☐ **[60 Hz NEMA]** (60): NEMA This parameter modifies the presets of the following parameters:[Rated motor volt.] (UnS) below, [High speed] (HSP) page 40, [Freq. threshold] (Ftd) page 62, [Rated motor freq.] (FrS) and [Max frequency] (tFr) below.		
IPL	❑ **[Input phase loss]**		According to drive rating
nO YES	☐ **[No]** (nO): Fault ignored, to be used when the drive is supplied via a single-phase supply or by the DC bus. ☐ **[Freewheel]** (YES): Fault, with freewheel stop. If one phase disappears, the drive switches to fault mode [Input phase loss] (IPL) but if 2 or 3 phases disappear, the drive continues to operate until it trips on an undervoltage fault. This parameter is only accessible in this menu on ATV71H037M3 to HU75M3 drives (used with a single phase supply).		
nPr	❑ **[Rated motor power]**	According to drive rating	According to drive rating
	Rated motor power given on the nameplate, in kW if [Standard mot. freq] (bFr) = [50 Hz IEC] (50), in HP if [Standard mot. freq] (bFr) = [60 Hz NEMA] (60).		
UnS	❑ **[Rated motor volt.]**	According to drive rating	According to drive rating and [Standard mot. freq] (bFr)
	Rated motor voltage given on the nameplate. ATV71●●●M3: 100 to 240 V ATV71●●●N4: 200 to 480 V		
nCr	❑ **[Rated mot. current]**	0.25 to 1.5 In (1)	According to drive rating and [Standard mot. freq] (bFr)
	Rated motor current given on the nameplate.		
FrS	❑ **[Rated motor freq.]**	10 to 500 Hz	50 Hz
	Rated motor frequency given on the nameplate. The factory setting is 50 Hz, or preset to 60 Hz if [Standard mot. freq] (bFr) is set to 60 Hz.		
nSP	❑ **[Rated motor speed]**	0 to 60000 rpm	According to drive rating
	Nominal motor speed given on the nameplate. 0 to 9999 rpm then 10.00 to 60.00 krpm on the integrated display terminal. If, rather than the rated speed, the nameplate indicates the synchronous speed and the slip in Hz or as a %, calculate the rated speed as follows: • Nominal speed = Synchronous speed x $\frac{100 - \text{slip as a \%}}{100}$ or • Nominal speed = Synchronous speed x $\frac{50 - \text{slip in Hz}}{50}$ (50 Hz motors) or • Nominal speed = Synchronous speed x $\frac{60 - \text{slip in Hz}}{60}$ (60 Hz motors)		
tFr	❑ **[Max frequency]**	10 to 1000 Hz	60 Hz
	The factory setting is 60 Hz, or preset to 72 Hz if [Standard mot. freq] (bFr) is set to 60 Hz. The maximum value is limited by the following conditions: • It must not exceed 10 times the value of [Rated motor freq.] (FrS). • It must not exceed 500 Hz if the drive rating is higher than ATV71HD37 (values of 500 Hz to 1000 Hz are only possible for powers limited to 37 kW).		

(1) In corresponds to the rated drive current indicated in the installation manual and on the drive nameplate.

Code	Name/Description	Factory setting
tUn	❑ **[Auto-tuning]**	[No] (nO)
nO	☐ **[No]** (nO): Auto-tuning not performed.	
YES	☐ **[Yes]** (YES): Auto-tuning is performed as soon as possible, then the parameter automatically changes to [Done] (dOnE).	
dOnE	☐ **[Done]** (dOnE): Use of the values given the last time auto-tuning was performed. **Caution:** • It is essential that all motor parameters ([Rated motor volt.] (UnS), [Rated motor freq.] (FrS), [Rated mot. current] (nCr), [Rated motor speed] (nSP), [Rated motor power] (nPr)) are correctly configured before starting auto-tuning. If at least one of these parameters is modified after auto-tuning has been performed, [Auto-tuning] (tUn) returns to [No] (nO) and must be performed again. • Auto-tuning is only performed if no stop command has been activated. If a "freewheel stop" or "fast stop" function has been assigned to a logic input, this input must be set to 1 (active at 0). • Auto-tuning takes priority over any run or prefluxing commands, which will be taken into account after the auto-tuning sequence. • If auto-tuning fails, the drive displays [No] (nO) and, depending on the configuration of [Autotune fault mgt] (tnL) page 211, may switch to [Auto-tuning] (tnF) fault mode. • Auto-tuning may last for 1 to 2 seconds. Do not interrupt the process. Wait for the display to change to "[Done] (dOnE)" or "[No] (nO)". ☞ **Note:** During auto-tuning the motor operates at rated current.	
tUS	❑ **[Auto tuning status]** (for information only, cannot be modified)	[Not done] (tAb)
tAb	☐ **[Not done]** (tAb): The default stator resistance value is used to control the motor.	
PEnd	☐ **[Pending]** (PEnd): Auto-tuning has been requested but not yet performed.	
PrOG	☐ **[In Progress]** (PrOG): Auto-tuning in progress.	
FAIL	☐ **[Failed]** (FAIL): Auto-tuning has failed.	
dOnE	☐ **[Done]** (dOnE): The stator resistance measured by the auto-tuning function is used to control the motor.	
PHr	❑ **[Output Ph rotation]**	[ABC] (AbC)
AbC	☐ **[ABC]** (AbC): Forward	
ACb	☐ **[ACB]** (ACb): Reverse This parameter can be used to reverse the direction of rotation of the motor without reversing the wiring.	

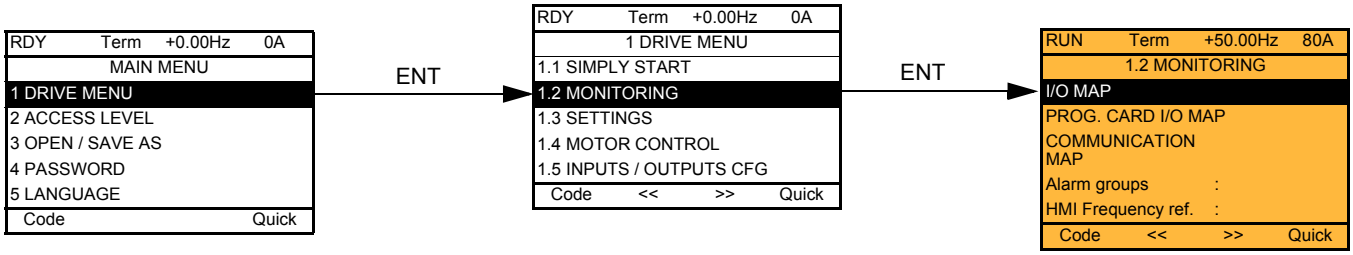
Parameters that can be changed during operation or when stopped

Code	Name/Description		Factory setting
ItH	❑ **[Mot. therm. current]**	0.2 to 1.5 In (1)	According to drive rating
	Motor thermal protection current, to be set to the rated current indicated on the nameplate.		
ACC	❑ **[Acceleration]**	0.1 to 999.9 s	3.0 s
	Time to accelerate from 0 to the [Rated motor freq.] (FrS) (page 38). Make sure that this value is compatible with the inertia being driven.		
dEC	❑ **[Deceleration]**	0.1 to 999.9 s	3.0 s
	Time to decelerate from the [Rated motor freq.] (FrS) (page 38) to 0. Make sure that this value is compatible with the inertia being driven.		
LSP	❑ **[Low speed]**		0
	Motor frequency at minimum reference, can be set between 0 and [High speed] (HSP).		
HSP	❑ **[High speed]**		50 Hz
	Motor frequency at maximum reference, can be set between [Low speed] (LSP) and [Max frequency] (tFr). The factory setting changes to 60 Hz if [Standard mot. freq] (bFr) = [60 Hz NEMA] (60).		

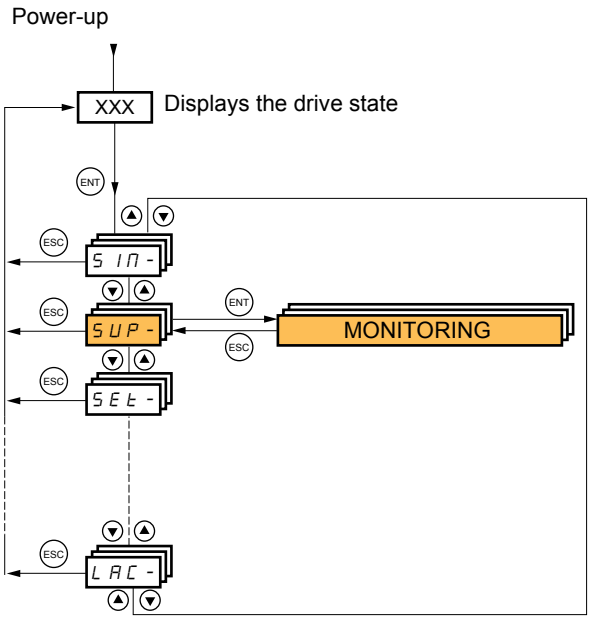
(1) In corresponds to the rated drive current indicated in the installation manual and on the drive nameplate.

[1.2 MONITORING] (SUP-)

With graphic display terminal:

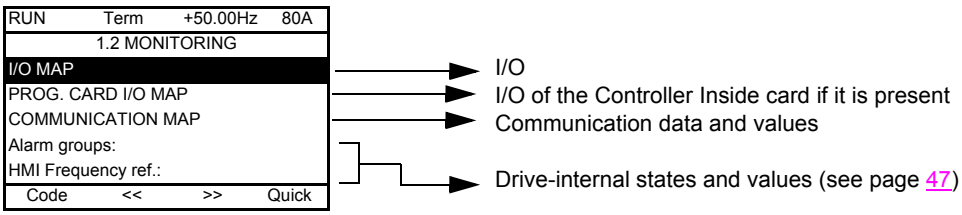


With integrated display terminal:

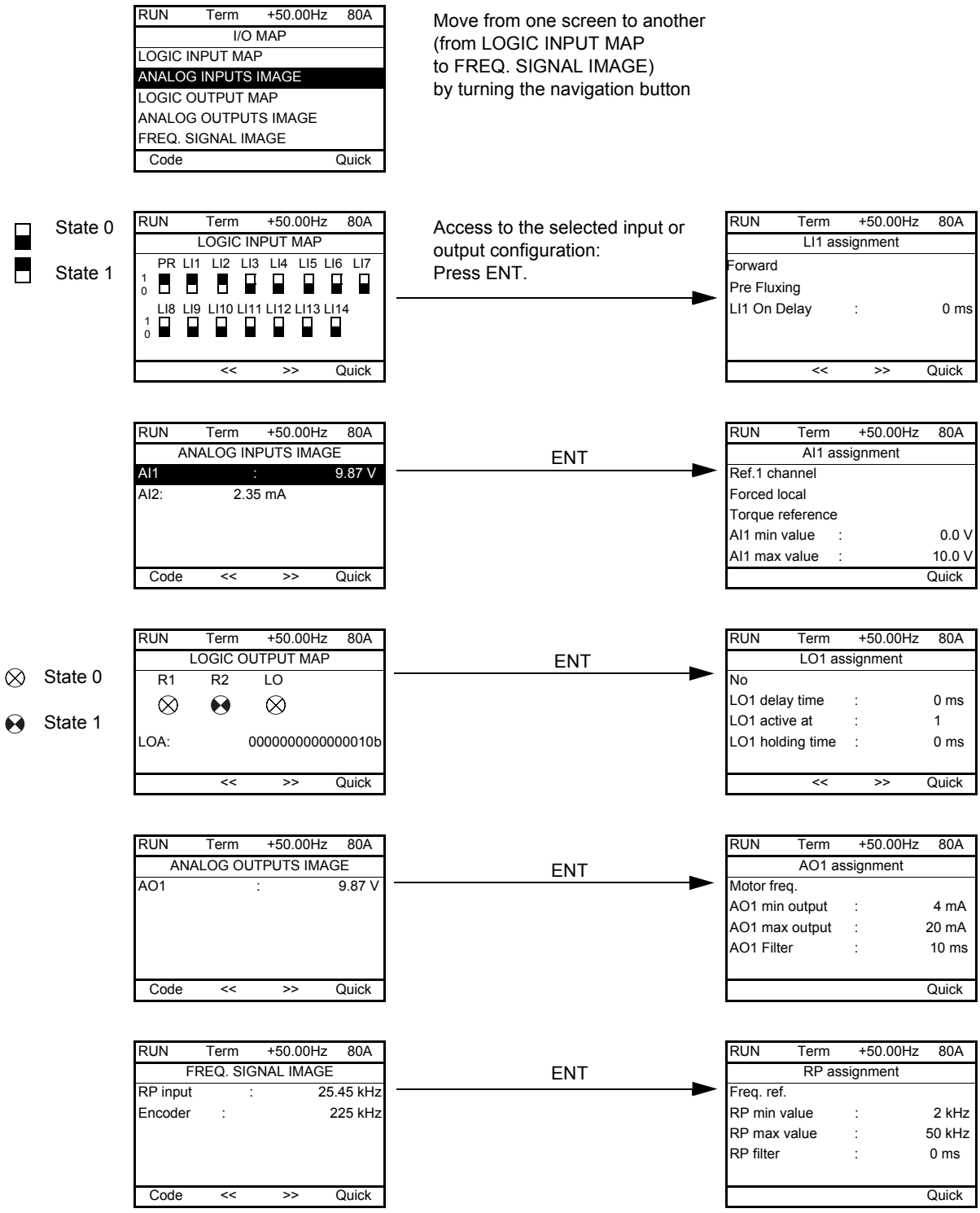


With graphic display terminal

This menu can be used to display the inputs/outputs, the drive internal states and values, and the communication data and values.

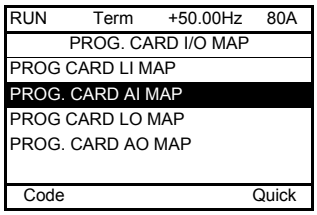


I/O

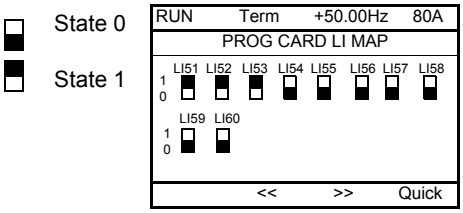


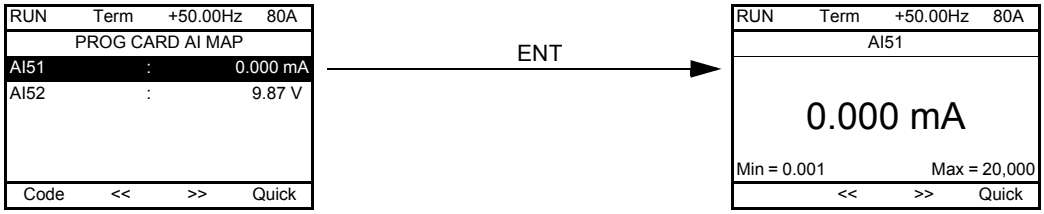
With graphic display terminal

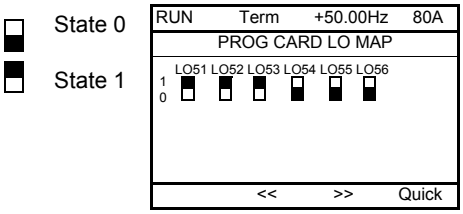
Controller Inside card I/O

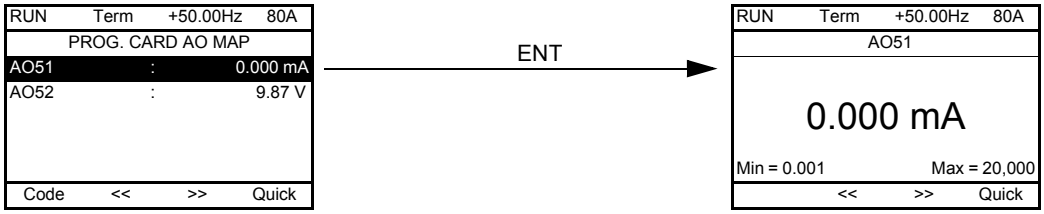


Move from one screen to another
(from PROG CARD LI MAP
to PROG. CARD AO MAP)
by turning the navigation button



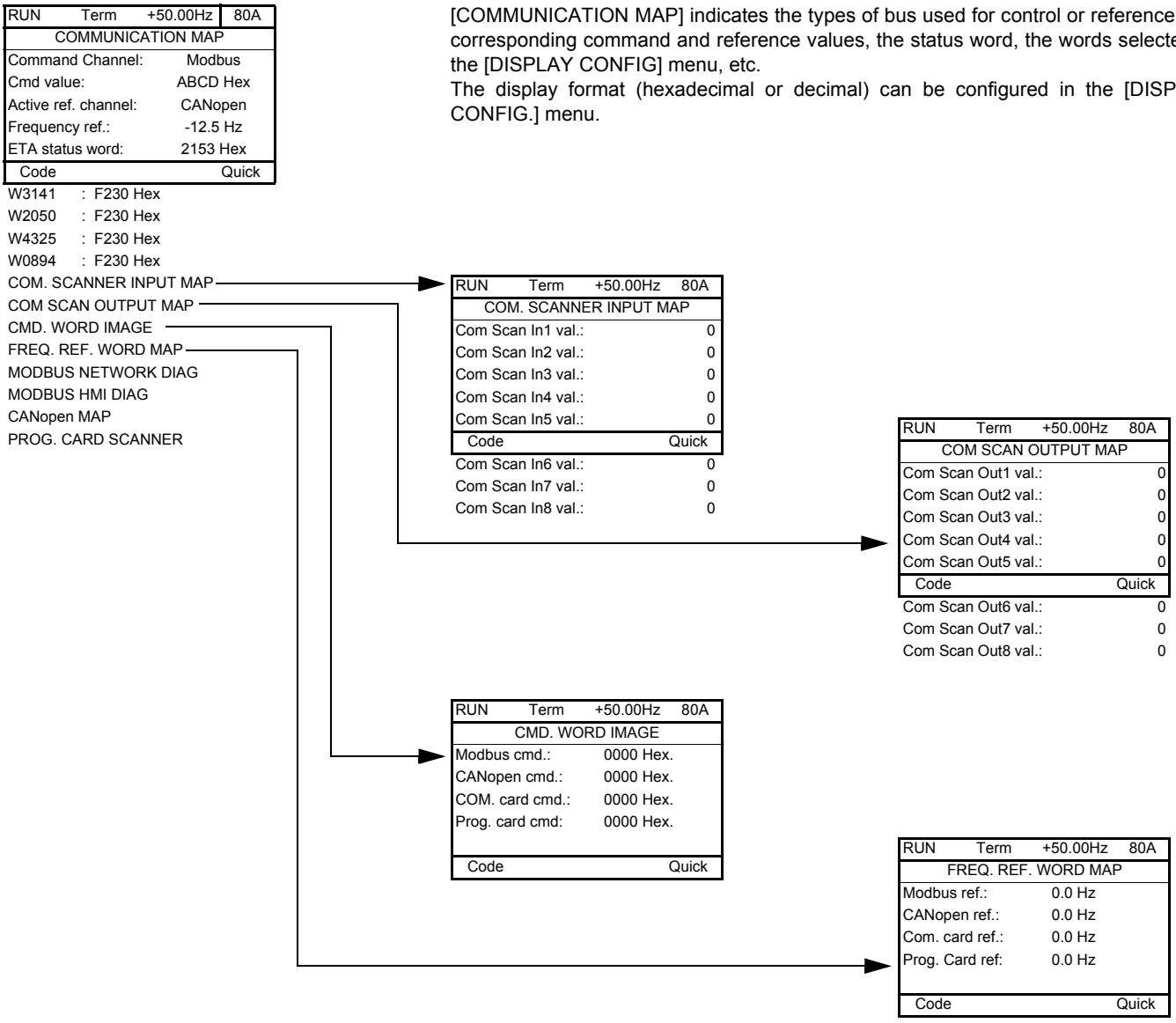






With graphic display terminal

Communication

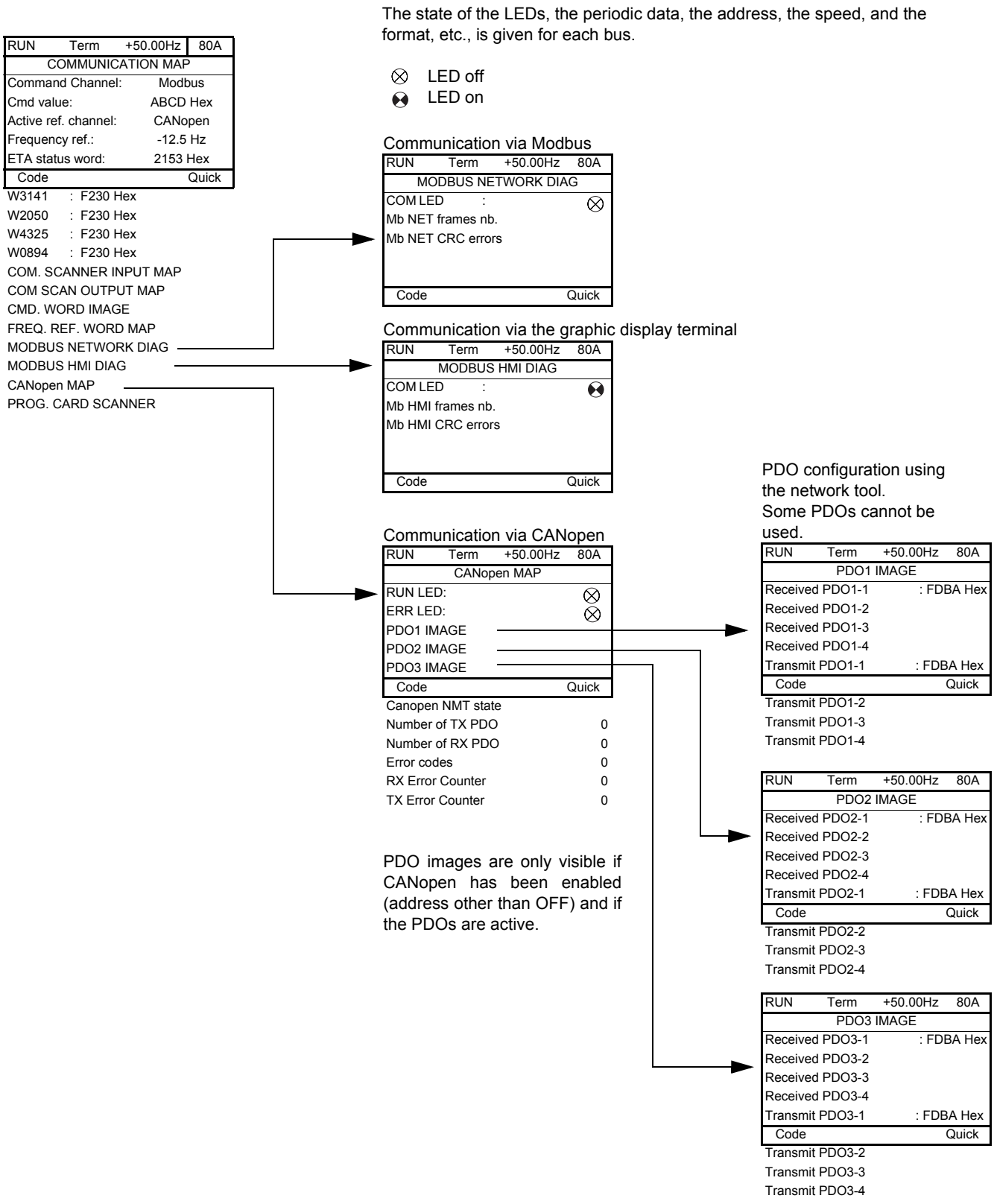


[COMMUNICATION MAP] indicates the types of bus used for control or reference, the corresponding command and reference values, the status word, the words selected in the [DISPLAY CONFIG] menu, etc.
The display format (hexadecimal or decimal) can be configured in the [DISPLAY CONFIG.] menu.

[COM. SCANNER INPUT MAP] and [COM SCAN OUTPUT MAP]:
Visualization of registers exchanged periodically (8 input and 8 output) for integrated Modbus and for fieldbus cards.

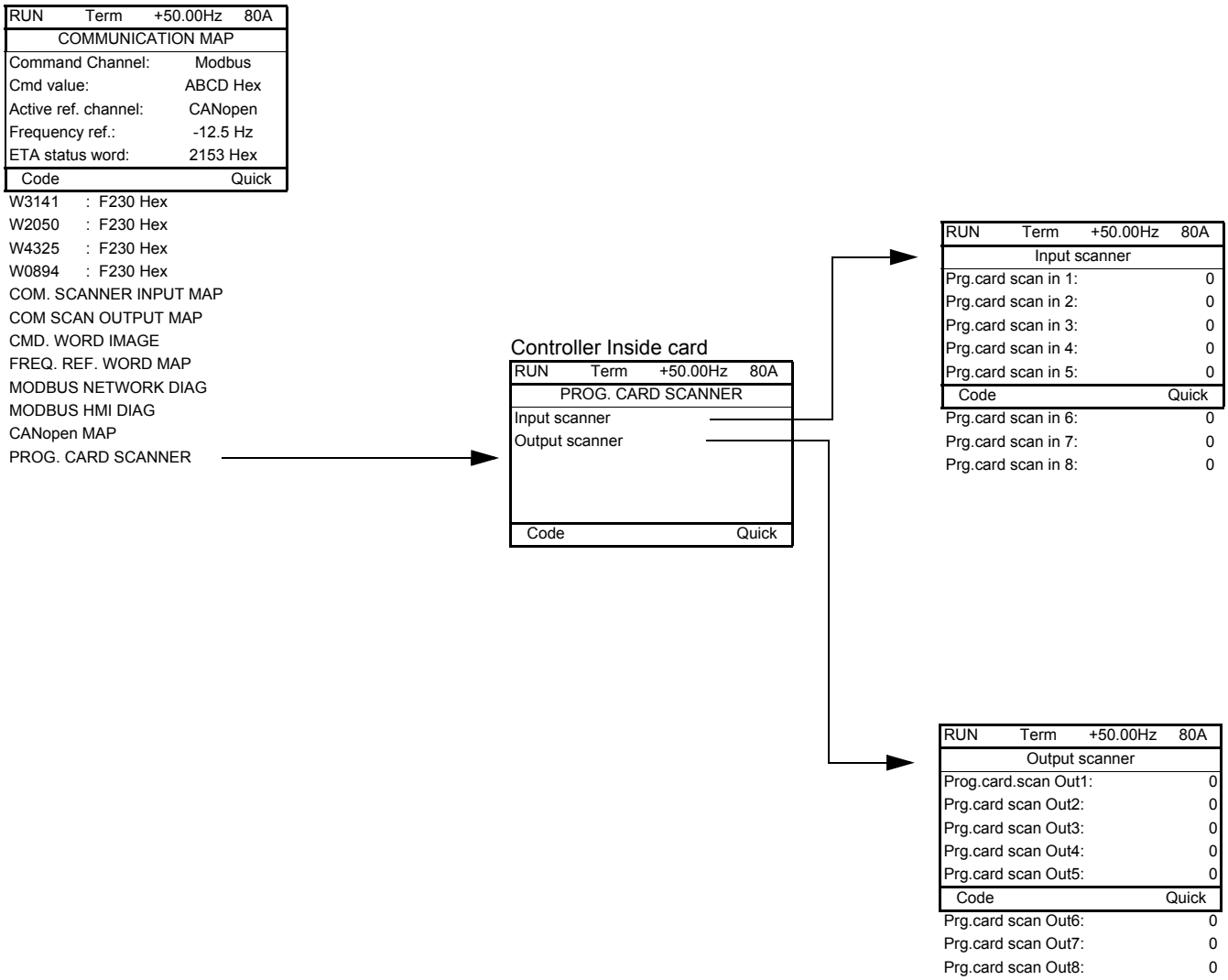
With graphic display terminal

Communication (continued)



With graphic display terminal

Communication (continued)



[Input scanner] and [Output scanner]:
Visualization of registers exchanged periodically (8 input and 8 output).

[1.2 MONITORING] (SUP-)

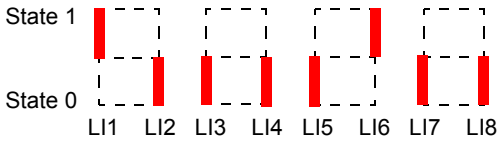
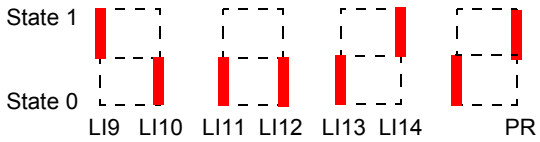
With graphic display terminal

Drive internal states and values

Name/Description	
[Alarm groups] (ALGr)	Current alarm group numbers
[HMI Frequency ref.] (LFr)	in Hz. Frequency reference via the graphic display terminal (can be accessed if the function has been configured).
[Internal PID ref.] (rPI)	as a process value. PID reference via graphic display terminal (can be accessed if the function has been configured).
[HMI torque ref.] (Ltr)	as a % of the rated torque. Torque reference via graphic display terminal.
[Multiplying coeff.] (MFr)	as a % (can be accessed if [Multiplier ref.-] (MA2,MA3) page 124 has been assigned)
[Frequency ref.] (FrH)	in Hz
[Torque reference] (trr)	as a % of the rated torque (can be accessed if the function has been configured)
[Output frequency] (rFr)	in Hz
[Motor current] (LCr)	in A
[ENA avg speed] (AVS)	in Hz: The parameter can be accessed if [ENA system] (EnA) = [Yes] (YES) (see page 75)
[Motor speed] (SPd)	in RPM
[Motor voltage] (UOP)	in V
[Motor power] (OPr)	as a % of the rated power
[Motor torque] (Otr)	as a % of the rated torque
[Mains voltage] (ULn)	in V. Line voltage from the point of view of the DC bus, motor running or stopped.
[Motor thermal state] (tHr)	as a %
[Drv. thermal state] (tHd)	as a %
[DBR thermal state] (tHb)	as a % (can only be accessed on high rating drives)
[Consumption] (APH)	in Wh, kWh or MWh (consumption accrued)
[Run time] (rtH)	in seconds, minutes, hours (length of time the motor has been turned on)
[Power on time] (PtH)	in seconds, minutes, hours (length of time the drive has been turned on)
[IGBT alarm counter] (tAC)	in seconds (length of time the "IGBT temperature" alarm has been active)
[PID reference] (rPC)	as a process value (can be accessed if the PID function has been configured)
[PID feedback] (rPF)	as a process value (can be accessed if the PID function has been configured)
[PID error] (rPE)	as a process value (can be accessed if the PID function has been configured)
[PID Output] (rPO)	in Hz (can be accessed if the PID function has been configured)
[Date/Time] (CLO)	Current date and time generated by the Controller Inside card (can be accessed if the card has been inserted)
[Applic card word 2] (o02)	Word generated by the Controller Inside card (can be accessed if the card has been inserted)
[Applic card word 3] (o03)	Word generated by the Controller Inside card (can be accessed if the card has been inserted)
[Applic card word 4] (o04)	Word generated by the Controller Inside card (can be accessed if the card has been inserted)
[Applic card word 5] (o05)	Word generated by the Controller Inside card (can be accessed if the card has been inserted)
[Applic card word 6] (o06)	Word generated by the Controller Inside card (can be accessed if the card has been inserted)
[Config. active] (CnFS)	Active configuration [Config. n°0, 1 or 2]
[Utilised param. set] (CFPS)	[Set n°1, 2 or 3] (can be accessed if parameter switching has been enabled, see page 181)
[ALARMS] (ALr-)	List of current alarms. If an alarm is present, a ✓ appears.
[OTHER STATUS] (SSt-)	List of secondary states: - [In motor fluxing] (FLX): In motor fluxing - [PTC1 alarm] (PtC1): Probe alarm 1 - [PTC2 alarm] (PtC2): Probe alarm 2 - [LI6=PTC alarm] (PtC3): LI6 = PTC probe alarms - [Fast stop in prog.] (FSt): Fast stop in progress - [Current Th. attained] (CtA): Current threshold reached - [Freq. Th. attained] (FtA): Frequency threshold reached - [Freq. Th. 2 attained] (F2A): 2nd frequency threshold reached - [Frequency ref. att.] (SrA): Frequency reference reached - [Motor th. state att.] (tSA): Motor 1 thermal state reached - [External fault alarm] (EtF): External fault alarm - [Auto restart] (AUtO): Automatic restart in progress - [Remote] (FtL): Line mode control - [Auto-tuning] (tUn): Performing auto-tuning - [Undervoltage] (USA): Undervoltage alarm - [Cnfg.1 act.] (CnF1): Configuration 1 active - [Cnfg.2 act.] (CnF2): Configuration 2 active - [HSP attained] (FLA): High speed reached - [Load slipping] (AnA): Slipping alarm - [Set1 active] (CFP1): Parameter set 1 active - [Set2 active] (CFP2): Parameter set 2 active - [Set 3 active] (CFP3): Parameter set 3 active - [In braking] (brS): Drive braking - [DC bus loading] (dbL): DC bus loading

With integrated display terminal

This menu can be used to display the drive inputs, states and internal values.

Code	Name/Description	Adjustment range	Factory setting
IOM-	**I/O MAP**		
LIA-	**■ Logic input functions**		
LIA to LI4A	Can be used to display the functions assigned to each input. If no functions have been assigned, nO is displayed. Use the ▲ and ▼ arrows to scroll through the functions. If a number of functions have been assigned to the same input, check that they are compatible.		
LIS1	**■ State of logic inputs LI1 to LI8**		
	Can be used to visualize the state of logic inputs LI1 to LI8 (display segment assignment: high = 1, low = 0)  Example above: LI1 and LI6 are at 1; LI2 to LI5, LI7 and LI8 are at 0.		
LIS2	**■ State of logic inputs LI9 to LI14 and Power Removal**		
	Can be used to visualize the state of logic inputs LI9 to LI14 and PR (Power Removal) (display segment assignment: high = 1, low = 0)  Example above: LI9 and LI14 are at 1, LI10 to LI13 are at 0 and PR (Power Removal) is at 1.		
AIA-	**■ Analog input functions**		
AI1A AI2A AI3A AI4A	Can be used to display the functions assigned to each input. If no functions have been assigned, nO is displayed. Use the ▲ and ▼ arrows to scroll through the functions. If a number of functions have been assigned to the same input, check that they are compatible.		

[1.2 MONITORING] (SUP-)

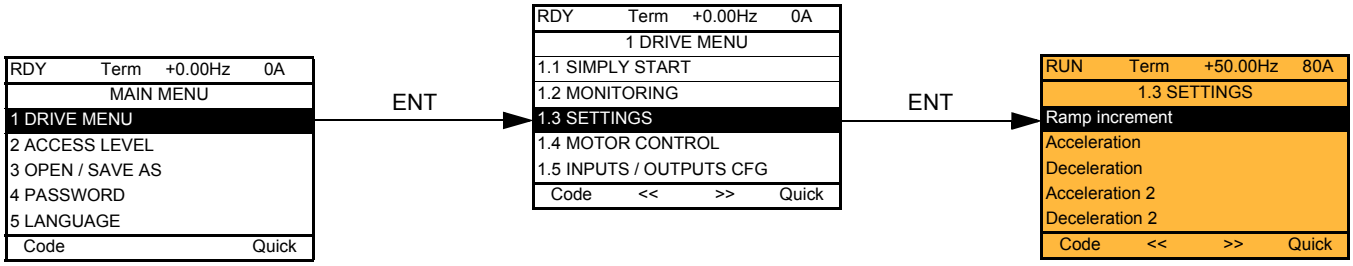
With integrated display terminal

Drive internal states and values

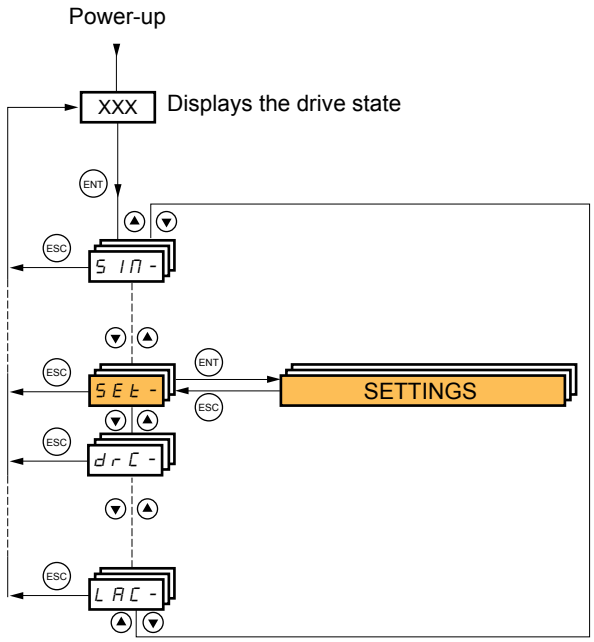
Code	Name/Description	Unit
ALGr	**Alarm groups:** Current alarm group numbers	
rPI	**Internal PID reference:** PID reference via graphic display terminal (can be accessed if the function has been configured).	as a process value
MFr	**Multiplying coefficient** (can be accessed if [Multiplier ref.-] (MA2,MA3) page 124 has been assigned)	%
FrH	**Frequency ref.**	Hz
trr	**Torque reference:** Can be accessed if the function is configured	%
rFr	**Output frequency**	Hz
LCr	**Motor current**	A
AUS	**ENA avg SPEED:** The parameter can be accessed if EnA = YES (see page 75)	Hz
SPd	**Motor speed**	rpm
UOP	**Motor voltage**	V
OPr	**Motor power**	%
Otr	**Motor torque**	%
ULn	**Line voltage:** Line voltage from the point of view of the DC bus, motor running or stopped.	V
tHr	**Motor thermal state**	%
tHd	**Drv thermal state**	%
tHb	**DBR thermal state:** Accessible on high rating drives only.	%
APH	**Consumption**	Wh, kWh or MWh
rtH	**Run time:** Length of time the motor has been turned on	seconds, minutes, hours
PtH	**Power on time:** Length of time the drive has been turned on	
tAC	**IGBT alarm counter:** Length of time the "IGBT temperature" alarm has been active	
rPC	**PID reference:** Can be accessed if the PID function has been configured	as a process value
rPF	**PID feedback:** Can be accessed if the PID function has been configured	
rPE	**PID error:** Can be accessed if the PID function has been configured	
rPO	**PID Output:** Can be accessed if the PID function has been configured	Hz
CLO-	**tIME, dAY :** Current date and time generated by the Controller Inside card (can be accessed if the card has been inserted)	
o02	**Applic card word 2:** Word generated by the Controller Inside card (can be accessed if the card has been inserted)	
o03	**Applic card word 3:** Word generated by the Controller Inside card (can be accessed if the card has been inserted)	
o04	**Applic card word 4:** Word generated by the Controller Inside card (can be accessed if the card has been inserted)	
o05	**Applic card word 5:** Word generated by the Controller Inside card (can be accessed if the card has been inserted)	
o06	**Applic card word 6:** Word generated by the Controller Inside card (can be accessed if the card has been inserted)	
CnFS	**Config. active:** CnF0, 1 or 2 (can be accessed if motor or configuration switching has been enabled, see page 185)	
CFPS	**Utilised param. set:** CFP1, 2 or 3 (can be accessed if parameter switching has been enabled, see page 181)	

[1.3 SETTINGS] (SEt-)

With graphic display terminal:



With integrated display terminal:



51

[1.3 SETTINGS] (SEt-)

The adjustment parameters can be modified with the drive running or stopped.

⚠ DANGER

UNINTENDED EQUIPMENT OPERATION

- Check that changes made to the settings during operation do not present any danger.
- We recommend stopping the drive before making any changes.

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

Code	Name/Description	Adjustment range	Factory setting
Inr 0.01 0.1 1	❑ **[Ramp increment]** ☐ **[0.01]**: Ramp up to 99.99 seconds ☐ **[0.1]**: Ramp up to 999.9 seconds ☐ **[1]**: Ramp up to 6000 seconds This parameter is valid for [Acceleration] (ACC), [Deceleration] (dEC), [Acceleration 2] (AC2) and [Deceleration 2] (dE2).	0.01 – 0.1 - 1	0.1
ACC	❑ **[Acceleration]** Time to accelerate from 0 to the [Rated motor freq.] (FrS) (page 65). Make sure that this value is compatible with the inertia being driven.	0.01 to 6000 s (1)	3.0 s
dEC	❑ **[Deceleration]** Time to accelerate from 0 to the [Rated motor freq.] (FrS) (page 65) to 0. Make sure that this value is compatible with the inertia being driven.	0.01 to 6000 s (1)	3.0 s
AC2 ★	❑ **[Acceleration 2]** See page 127 Time to accelerate from 0 to the [Rated motor freq.] (FrS). Make sure that this value is compatible with the inertia being driven.	0.01 to 6000 s (1)	5.0 s
dE2 ★	❑ **[Deceleration 2]** See page 127 Time to accelerate from 0 to the [Rated motor freq.] (FrS) to 0. Make sure that this value is compatible with the inertia being driven.	0.01 to 6000 s (1)	5.0 s
tA1 ★	❑ **[Begin Acc round]** See page 126 Rounding of start of acceleration ramp as a % of the [Acceleration] (ACC) or [Acceleration 2] (AC2) ramp time.	0 to 100%	10%
tA2 ★	❑ **[End Acc round]** See page 126 - Rounding of end of acceleration ramp as a % of the [Acceleration] (ACC) or [Acceleration 2] (AC2) ramp time. - Can be set between 0 and (100% - [Begin Acc round] (tA1)).		10%
tA3 ★	❑ **[Begin Dec round]** See page 126 Rounding of start of deceleration ramp as a % of ramp time [Deceleration] (dEC) or [Deceleration 2] (dE2).	0 to 100%	10%

(1) Range 0.01 to 99.99 s or 0.1 to 999.9 s or 1 to 999 s according to [Ramp increment] (Inr).

★ 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.

Code	Name/Description	Adjustment range	Factory setting
tA4 ★	❑ **[End Dec round]** See page 126 - Rounding of end of deceleration ramp as a % of ramp time [Deceleration] (dEC) or [Deceleration 2] (dE2). - Can be set between 0 and (100% - [Begin Dec round] (tA3)).		10%
LSP	❑ **[Low speed]** Motor frequency at minimum reference, can be set between 0 and [High speed] (HSP).		0 Hz
HSP	❑ **[High speed]** Motor frequency at maximum reference, can be set between [Low speed] (LSP) and [Max frequency] (tFr). The factory setting changes to 60 Hz if [Standard mot. freq] (bFr) = [60 Hz NEMA] (60).		50 Hz
ItH	❑ **[Mot. therm. current]** Motor thermal protection current, to be set to the rated current indicated on the nameplate.	0.2 to 1.5 In (1)	According to drive rating
SPG	❑ **[Speed prop. gain]** Speed loop proportional gain.	0 to 1000%	40%
SItE	❑ **[Speed time integral]** Speed loop integral time constant.	1 to 1000%	100%
SFC	❑ **[K speed loop filter]** Speed loop filter coefficient.	0 to 100	0

(1) In corresponds to the rated drive current indicated in the installation manual or on the drive nameplate.

Parameter settings for [K speed loop filter] (SFC), [Speed prop. gain] (SPG) and [Speed time integral] (SIt)

- These parameters can only be accessed in vector control profiles: [Motor control type] (Ctt) page 67 = [SVC U] (UUC), [SVC I] (CUC), [FVC] (FUC) and [Sync. mot.] (SYn) and if [ENA system] (EnA) page 75 = [No] (nO).
- The factory settings are suitable for most applications.

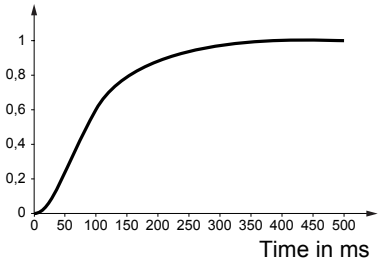
General case: Setting with [K speed loop filter] (SFC) = 0

The regulator is an "IP" type with filtering of the speed reference, for applications requiring flexibility and stability (hoisting or high inertia, for example).

- [Speed prop. gain] (SPG) affects excessive speed.
- [Speed time integral] (SIt) affects the passband and response time.

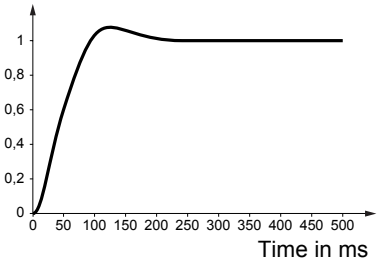
Initial response

Reference division



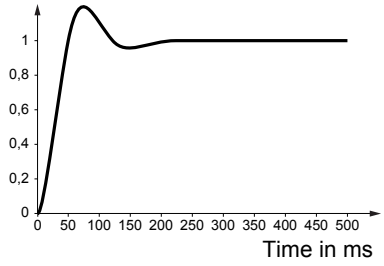
Reduction in SIT ↘

Reference division



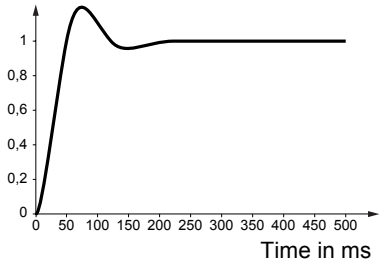
Reduction in SIT ↘↘

Reference division



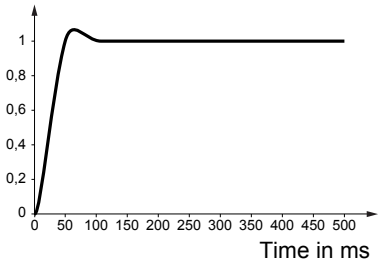
Initial response

Reference division



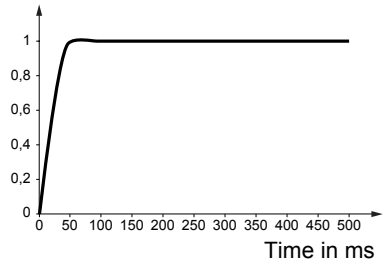
Increase in SPG ↗

Reference division



Increase in SPG ↗↗

Reference division



Special case: Parameter [K speed loop filter] (SFC) not 0

This parameter must be reserved for specific applications that require a short response time (trajectory positioning or servo control).

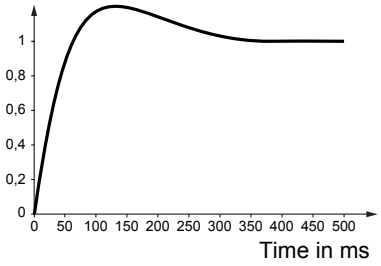
- When set to 100 as described above the regulator is a "PI" type, without filtering of the speed reference.
- Settings between 0 and 100 will obtain an intermediate function between the settings below and those on the previous page.

Example: Setting with [K speed loop filter] (SFC) = 100

- [Speed prop. gain] (SPG) affects the passband and response time.
- [Speed time integral] (SIt) affects excessive speed.

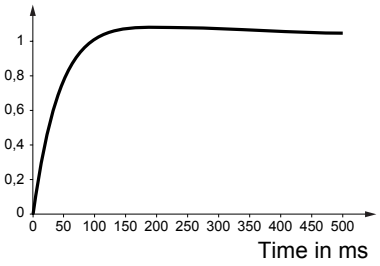
Initial response

Reference division



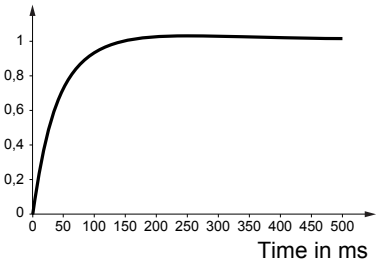
Reduction in SIT ↘

Reference division



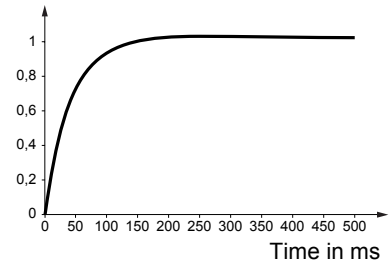
Reduction in SIT ↘↘

Reference division



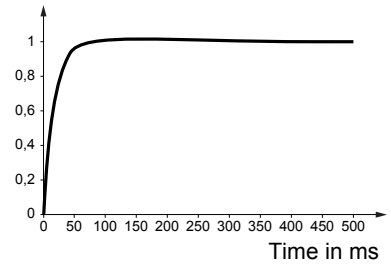
Initial response

Reference division



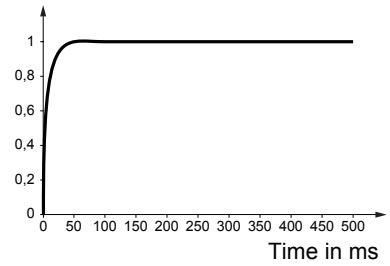
Increase in SPG ↗

Reference division



Increase in SPG ↗↗

Reference division



Code	Name/Description	Adjustment range	Factory setting
GPE ★	❑ [ENA prop.gain] See page 75	1 to 9999	250
G IE ★	❑ [ENA integral gain] See page 75	0 to 9999	100
UFr ★	❑ [IR compensation] See page 70	25 to 200%	100%
SLP ★	❑ [Slip compensation] See page 70	0 to 150%	100%
dCF ★	❑ [Ramp divider] See page 128	0 to 10	4
IdC ★	❑ [DC inject. level 1] See page 129 Level of DC injection braking current activated via logic input or selected as stop mode. **CAUTION** Check that the motor will withstand this current without overheating. **Failure to follow this instruction can result in equipment damage.**	0.1 to 1.41 In (1)	0.64 In (1)
tdI ★	❑ [DC injection time 1] See page 129 Maximum current injection time [DC inject. level 1] (IdC). After this time the injection current becomes [DC inject. level 2] (IdC2).	0.1 to 30 s	0.5 s
IdC2 ★	❑ [DC inject. level 2] See page 129 Injection current activated by logic input or selected as stop mode, once period of time [DC injection time 1] (tdI) has elapsed. **CAUTION** Check that the motor will withstand this current without overheating. **Failure to follow this instruction can result in equipment damage.**	0.1 to 1.41 In (1)	0.5 In (1)
tdC ★	❑ [DC injection time 2] See page 129 Maximum injection time [DC inject. level 2] (IdC2) for injection selected as stop mode only.	0.1 to 30 s	0.5 s

(1) In corresponds to the rated drive current indicated in the installation manual or on the drive nameplate.

★ 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.

Code	Name/Description	Adjustment range	Factory setting
SdC1 ★	❑ **[Auto DC inj. level 1]**	0 to 1.2 In (1)	0.7 In (1)

Level of standstill DC injection current. This parameter can be accessed if [Auto DC injection] (AdC) page 130 is not [No] (nO).
This parameter is forced to 0 if [Motor control type] (Ctt) page 67 = [Sync. mot.] (SYn).

CAUTION

Check that the motor will withstand this current without overheating.
Failure to follow this instruction can result in equipment damage.

tdC1 ★	❑ **[Auto DC inj. time 1]**	0.1 to 30 s	0.5 s

Standstill injection time. This parameter can be accessed if [Auto DC injection] (AdC) page 130 is not [No] (nO).
If [Motor control type] (Ctt) page 67 = [FVC] (FUC) or [Sync. mot.] (SYn) this time corresponds to the zero speed maintenance time.

SdC2 ★	❑ **[Auto DC inj. level 2]**	0 to 1.2 In (1)	0.5 In (1)

2nd level of standstill DC injection current.
This parameter can be accessed if [Auto DC injection] (AdC) page 130 is not [No] (nO).
This parameter is forced to 0 if [Motor control type] (Ctt) page 67 = [Sync. mot.] (SYn).

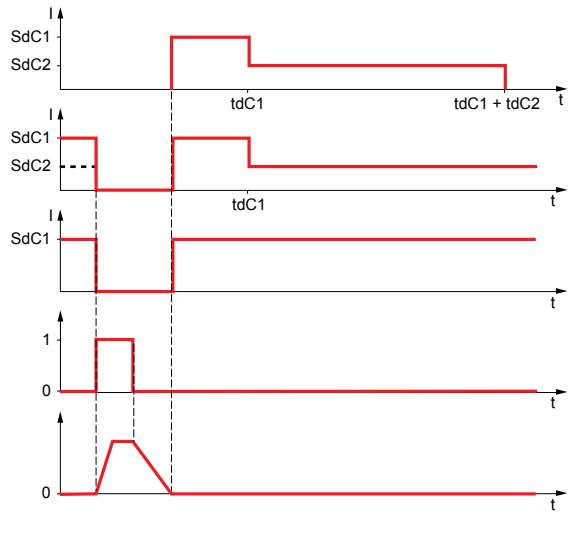
CAUTION

Check that the motor will withstand this current without overheating.
Failure to follow this instruction can result in equipment damage.

tdC2 ★	❑ **[Auto DC inj. time 2]**	0 to 30 s	0 s

2nd standstill injection time.
This parameter can be accessed if [Auto DC injection] (AdC) page 130 = [Yes] (YES).

AdC	SdC2	Operation
YES	x	
Ct	≠ 0	
Ct	= 0	
Run command		
Speed		



Note: When [Motor control type] (Ctt) page 67 = [FVC] (FUC):
[Auto DC inj. level 1] (SdC1), [Auto DC inj. level 2] (SdC2) and [Auto DC inj. time 2] (tdC2) are not accessible. Only [Auto DC inj. time 1] (tdC1) can be accessed.
This then corresponds to a zero speed maintenance time.

(1) In corresponds to the rated drive current indicated in the installation manual or on the drive nameplate.

Code	Name/Description	Adjustment range	Factory setting
SFr	❑ **[Switching freq.]**	1 to 16 kHz	2.5 kHz or 4 kHz depending on rating
	Switching frequency setting. If the value is less than 2 kHz, [Current Limitation] (CLI) and [I Limit. 2 value] (CL2) page 57 are limited to 1.36 In. Adjustment with drive running: - If the initial value is less than 2 kHz, it is not possible to increase it above 1.9 kHz while running. - If the initial value is greater than or equal to 2 kHz, a minimum of 2 kHz must be maintained while running. Adjustment with the drive stopped: No restrictions. ☞ **Note:** In the event of excessive temperature rise, the drive will automatically reduce the switching frequency and reset it once the temperature returns to normal.		
CLI	❑ **[Current Limitation]**	0 to 1.65 In (1)	1.5 In (1)
	Used to limit the motor current. The adjustment range is limited to 1.36 In if [Switching freq.] (SFr) page 57 is less than 2 kHz. ☞ **Note:** If the setting is less than 0.25 In, the drive may lock in [Output Phase Loss] (OPF) fault mode if this has been enabled (see page 201). If it is less than the no-load motor current, the limitation no longer has any effect.		
CL2 ★	❑ **[I Limit. 2 value]**	0 to 1.65 In (1)	1.5 In (1)
	See page 172 The adjustment range is limited to 1.36 In if [Switching freq.] (SFr) page 57 is less than 2 kHz. ☞ **Note:** If the setting is less than 0.25 In, the drive may lock in [Output Phase Loss] (OPF) fault mode if this has been enabled (see page 201). If it is less than the no-load motor current, the limitation no longer has any effect.		

(1) In corresponds to the rated drive current indicated in the installation manual or on the drive nameplate.

★ 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.

Code	Name/Description	Adjustment range	Factory setting
FLU	❑ **[Motor fluxing]** ☐ **[Not cont.]** (FnC): Non-continuous mode ☐ **[Continuous]** (FCt): Continuous mode. This option is not possible if [Auto DC injection] (AdC) page 130 is [Yes] (YES) or if [Type of stop] (Stt) page 128 is [Freewheel] (nSt). ☐ **[No]** (FnO): Function inactive. This option is not possible if [Motor control type] (Ctt) page 67 = [SVCI] (CUC) or [FVC] (FUC). If [Motor control type] (Ctt) page 67 = [SVCI] (CUC), [FVC] (FUC) or [Sync. mot.] (SYn) the factory setting is replaced by [Not cont.] (FnC). In order to obtain rapid high torque on startup, magnetic flux needs to be already established in the motor. • In [Continuous] (FCt) mode the drive automatically builds up flux when it is powered up. • In [Not cont.] (FnC) mode fluxing occurs when the motor starts. The flux current is greater than nCr (configured rated motor current) when the flux is established and is then adjusted to the motor magnetizing current... **CAUTION** Check that the motor will withstand this current without overheating. **Failure to follow this instruction can result in equipment damage.** If [Motor control type] (Ctt) page 67 = [Sync. mot.] (SYn), the [Motor fluxing] (FLU) parameter causes the alignment of the rotor and not the fluxing. If [Brake assignment] (bLC) page 148 is not [No] (nO), the [Motor fluxing] (FLU) parameter has no effect.		[No] (FnO)
tLS	❑ **[Low speed time out]** Maximum operating time at [Low speed] (LSP) (see page 40). Following operation at LSP for a defined period, a motor stop is requested automatically. The motor restarts if the reference is greater than LSP and if a run command is still present. Caution: Value 0 corresponds to an unlimited period.	0 to 999.9 s	0 s
JGF ★	❑ **[Jog frequency]** See page 132 Reference in jog operation.	0 to 10 Hz	10 Hz
JGt ★	❑ **[Jog delay]** See page 132 Anti-repeat delay between 2 consecutive jog operations.	0 to 2.0 s	0.5 s

(1) In corresponds to the rated drive current indicated in the installation manual or on the drive nameplate.

★ 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.

Code	Name/Description	Adjustment range	Factory setting
SP2 ★	❑ [Preset speed 2] See page 135 Preset speed 2	0 to 1000 Hz	10 Hz
SP3 ★	❑ [Preset speed 3] See page 135 Preset speed 3	0 to 1000 Hz	15 Hz
SP4 ★	❑ [Preset speed 4] See page 135 Preset speed 4	0 to 1000 Hz	20 Hz
SP5 ★	❑ [Preset speed 5] See page 135 Preset speed 5	0 to 1000 Hz	25 Hz
SP6 ★	❑ [Preset speed 6] See page 135 Preset speed 6	0 to 1000 Hz	30 Hz
SP7 ★	❑ [Preset speed 7] See page 135 Preset speed 7	0 to 1000 Hz	35 Hz
SP8 ★	❑ [Preset speed 8] See page 135 Preset speed 8	0 to 1000 Hz	40 Hz
SP9 ★	❑ [Preset speed 9] See page 135 Preset speed 9	0 to 1000 Hz	45 Hz
SP10 ★	❑ [Preset speed 10] See page 135 Preset speed 10	0 to 1000 Hz	50 Hz
SP11 ★	❑ [Preset speed 11] See page 135 Preset speed 11	0 to 1000 Hz	55 Hz
SP12 ★	❑ [Preset speed 12] See page 135 Preset speed 12	0 to 1000 Hz	60 Hz
SP13 ★	❑ [Preset speed 13] See page 135 Preset speed 13	0 to 1000 Hz	70 Hz
SP14 ★	❑ [Preset speed 14] See page 135 Preset speed 14	0 to 1000 Hz	80 Hz

★ 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.

Code	Name/Description	Adjustment range	Factory setting
SP 15 ★	❑ [Preset speed 15] See page 135 Preset speed 15	0 to 1000 Hz	90 Hz
SP 16 ★	❑ [Preset speed 16] See page 135 Preset speed 16	0 to 1000 Hz	100 Hz
MFr	❑ [Multiplying coeff.] Multiplying coefficient, can be accessed if [Multiplier ref.-] (MA2,MA3) page 124 has been assigned to the graphic terminal	0 to 100%	100%
SrP ★	❑ [+/- Speed limitation] See page 139 Limitation of +/- speed variation	0 to 50%	10%
rPG ★	❑ [PID prop. gain] See page 163 Proportional gain	0.01 to 100	1
r IG ★	❑ [PID integral gain] See page 164 Integral gain	0.01 to 100	1
rdG ★	❑ [PID derivative gain] See page 164 Derivative gain	0.00 to 100	0
PrP ★	❑ [PID ramp] See page 164 PID acceleration/deceleration ramp, defined to go from [Min PID reference] (PIP1) to [Max PID reference] (PIP2) and vice versa	0 to 99.9 s	0
POL ★	❑ [Min PID output] See page 164 Minimum value of regulator output in Hz	- 500 to 500 or - 1000 to 1000 according to rating	0 Hz
POH ★	❑ [Max PID output] See page 164 Maximum value of regulator output in Hz	0 to 500 or 1000 according to rating	60 Hz
PAL ★	❑ [Min fbk alarm] See page 164 Minimum monitoring threshold for regulator feedback	See page 164 (1)	100
PAH ★	❑ [Max fbk alarm] See page 164 Maximum monitoring threshold for regulator feedback	See page 164 (1)	1000

(1) If a graphic display terminal is not in use, values greater than 9999 will be displayed on the 4-digit display with a period mark after the thousand digit, e.g., 15.65 for 15650.

★ 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.

[1.3 SETTINGS] (SEt-)

Code	Name/Description	Adjustment range	Factory setting
PEr ★	❑ **[PID error Alarm]** See page 164 Regulator error monitoring threshold.	0 to 65535 (1)	100
PSr ★	❑ **[Speed input %]** See page 165 Multiplying coefficient for predictive speed input.	1 to 100%	100%
rP2 ★	❑ **[Preset ref. PID 2]** See page 166 Preset PID reference	See page 166 (1)	300
rP3 ★	❑ **[Preset ref. PID 3]** See page 166 Preset PID reference	See page 166 (1)	600
rP4 ★	❑ **[Preset ref. PID 4]** See page 166 Preset PID reference	See page 166 (1)	900
Ibr ★	❑ **[Brake release I FW]** See page 148 Brake release current threshold for lifting or forward movement	0 to 1.32 In (2)	0
Ird ★	❑ **[Brake release I Rev]** See page 148 Brake release current threshold for lowering or reverse movement	0 to 1.32 In (2)	0
brt ★	❑ **[Brake Release time]** See page 148 Brake release time delay	0 to 5.00 s	0 s
b lr ★	❑ **[Brake release freq]** See page 149 Brake release frequency threshold	[Auto] (AUtO) 0 to 10 Hz	[Auto] (AUtO)
bEn ★	❑ **[Brake engage freq]** See page 149 Brake engage frequency threshold	[Auto] (AUtO) 0 to 10 Hz	[Auto] (AUtO)
tbE ★	❑ **[Brake engage delay]** See page 149 Time delay before request to engage brake. To delay the engaging of the brake, for horizontal movement only, if you wish the brake to engage when the drive comes to a complete stop.	0 to 5.00 s	0 s

(1) If a graphic display terminal is not in use, values greater than 9999 will be displayed on the 4-digit display with a period mark after the thousand digit, e.g., 15.65 for 15650.
(2) In corresponds to the rated drive current indicated in the installation manual or on the drive nameplate.

★ 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.

[1.3 SETTINGS] (SEt-)

Code	Name/Description	Adjustment range	Factory setting
bEt ★	❑ **[Brake engage time]** See page 149 Brake engage time (brake response time)	0 to 5.00 s	0 s
JdC ★	❑ **[Jump at reversal]** See page 150	[Auto] (AUtO) 0 to 10 Hz	[Auto] (AUtO)
tEr ★	❑ **[Time to restart]** See page 150 Time between the end of a brake engage sequence and the start of a brake release sequence.	0 to 5.00 s	0 s
tL IM ★	❑ **[Motoring torque lim]** See page 171 Torque limitation in motor mode, as a % of the rated torque.	0 to 300%	100%
tL IG ★	❑ **[Gen. torque lim]** See page 171 Torque limitation in generator mode, as a % of the rated torque.	0 to 300%	100%
trH ★	❑ **[Traverse high]** See page 191	0 to 10 Hz	4 Hz
trL ★	❑ **[Traverse Low]** See page 191	0 to 10 Hz	4 Hz
qSH ★	❑ **[Quick step High]** See page 191	0 to [Traverse high] (trH)	0 Hz
qSL ★	❑ **[Quick step Low]** See page 191	0 to [Traverse low] (trL)	0 Hz
Ctd	❑ **[Current threshold]** Current threshold for [I attained] (CtA) function assigned to a relay or a logic output (see page 95).	0 to 1.5 In (1)	In (1)
Ftd	❑ **[Freq. threshold]** Frequency threshold for [Freq. Th. attain.] (FtA) function assigned to a relay or a logic output (see page 95).	0.0 to 1000 Hz	[High speed] (HSP)
F2d	❑ **[Frequency 2 threshold]** Frequency threshold for [Freq. Th. 2 attain.] (F2A) assigned to a relay or a logic output (see page 95).	0.0 to 1000 Hz	[High speed] (HSP)

(1) In corresponds to the rated drive current indicated in the installation manual or on the drive nameplate.

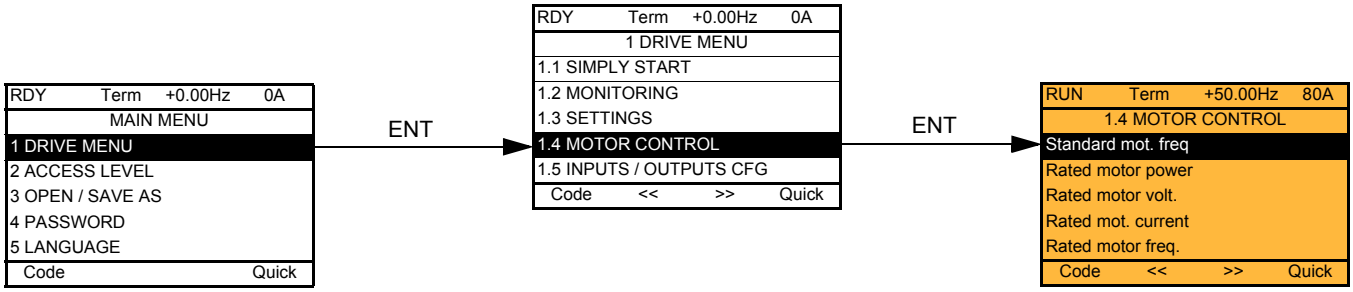
★ These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

Code	Name/Description	Adjustment range	Factory setting
tHd ★	❑ **[Motor therm. level]** See page 201 Trip threshold for motor thermal alarm (logic output or relay).	0 to 118%	100%
LbC ★	❑ **[Load correction]** See page 78 Rated correction in Hz.	0 to 1000 Hz	0

★ 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.

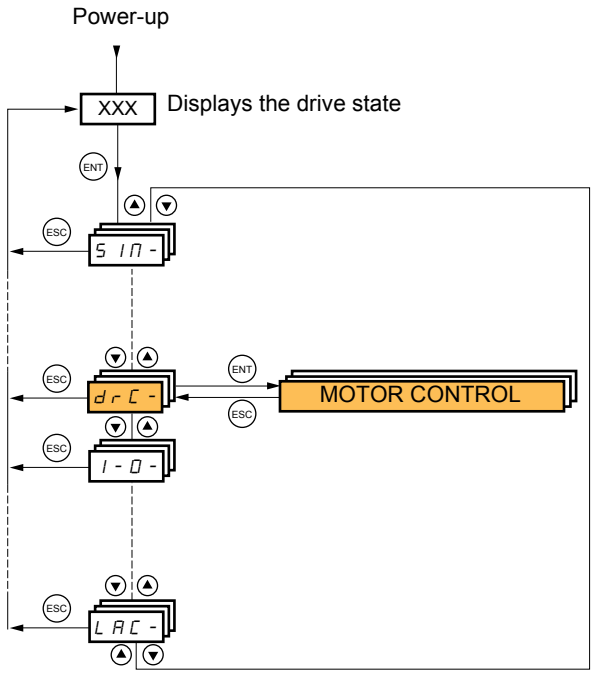
[1.4 MOTOR CONTROL] (drC-)

With graphic display terminal:



65

With integrated display terminal:



[1.4 MOTOR CONTROL] (drC-)

The parameters in the [1.4 MOTOR CONTROL] (drC-) menu can only be modified when the drive is stopped and no run command is present, with the following exceptions:

- [Auto tuning] (tUn) page 66, which causes the motor to start up.
- Parameters containing the sign ( ) in the code column, which can be modified with the drive running or stopped.

Code	Name/Description	Adjustment range	Factory setting
bFr 50 60	❑ **[Standard mot. freq]** ☐ **[50 Hz IEC]** (50): IEC ☐ **[60 Hz NEMA]** (60): NEMA This parameter modifies the presets of the following parameters: [High speed] (HSP) page 40, [Freq. threshold] (Ftd) page 62, [Rated motor volt.] (UnS), [Rated motor freq.] (FrS) and [Max frequency] (tFr) below.		[50 Hz IEC] (50)
nPr	❑ **[Rated motor power]** The parameter cannot be accessed if [Motor control type] (Ctt) page 67 = [Sync. mot.] (SYn). Rated motor power given on the nameplate, in kW if [Standard mot. freq] (bFr) = [50 Hz IEC] (50), in HP if [Standard mot. freq] (bFr) = [60 Hz NEMA] (60).	According to drive rating	According to drive rating
UnS	❑ **[Rated motor volt.]** The parameter cannot be accessed if [Motor control type] (Ctt) page 67 = [Sync. mot.] (SYn). Rated motor voltage given on the nameplate. ATV71●●●M3X: 100 to 240 V ATV71●●●N4: 200 to 480 V	According to drive rating	According to drive rating and [Standard mot. freq] (bFr)
nCr	❑ **[Rated mot. current]** The parameter cannot be accessed if [Motor control type] (Ctt) page 67 = [Sync. mot.] (SYn). Rated motor current given on the nameplate.	0.25 to 1.5 In (1)	According to drive rating and [Standard mot. freq] (bFr)
FrS	❑ **[Rated motor freq.]** The parameter cannot be accessed if [Motor control type] (Ctt) page 67 = [Sync. mot.] (SYn). Rated motor frequency given on the nameplate. The factory setting is 50 Hz, or preset to 60 Hz if [Standard mot. freq] (bFr) is set to 60 Hz. The maximum value is limited to 500 Hz if [Motor control type] (Ctt) (page 67) is not V/F or if the drive rating is higher than ATV71HD37. Values between 500 Hz and 1000 Hz are only possible in V/F control and for powers limited to 37 kW (50 HP). In this case, configure [Motor control type] (Ctt) before [Rated motor freq.] (FrS).	10 to 1000 Hz	50 Hz
nSP	❑ **[Rated motor speed]** The parameter cannot be accessed if [Motor control type] (Ctt) page 67 = [Sync. mot.] (SYn). Nominal motor speed given on the nameplate. 0 to 9999 rpm then 10.00 to 60.00 krpm on the integrated display terminal. If, rather than the rated speed, the nameplate indicates the synchronous speed and the slip in Hz or as a %, calculate the rated speed as follows: • Nominal speed = Synchronous speed x $\frac{100 - \text{slip as a \%}}{100}$ or • Nominal speed = Synchronous speed x $\frac{50 - \text{slip in Hz}}{50}$ (50 Hz motors) or • Nominal speed = Synchronous speed x $\frac{60 - \text{slip in Hz}}{60}$ (60 Hz motors)	0 to 60000 rpm	According to drive rating
tFr	❑ **[Max frequency]** The factory setting is 60 Hz, or preset to 72 Hz if [Standard mot. freq] (bFr) is set to 60 Hz. The maximum value is limited by the following conditions: • It must not exceed 10 times the value of [Rated motor freq.] (FrS). • It must not exceed 500 Hz if [Motor control type] (Ctt) (page 67) is not V/F or if the drive rating is higher than ATV71HD37. Values between 500 Hz and 1000 Hz are only possible in V/F control and for powers limited to 37 kW (50 HP). In this case configure [Motor control type] (Ctt) before [Max frequency] (tFr).	10 to 1000 Hz	60 Hz

(1) In corresponds to the rated drive current indicated in the installation manual and on the drive nameplate.

[1.4 MOTOR CONTROL] (drC-)

Code	Name/Description	Factory setting
tUn	❑ **[Auto-tuning]**	[No] (nO)
nO	☐ **[No]** (nO): Auto-tuning not performed.	
YES	☐ **[Yes]** (YES): Auto-tuning is performed as soon as possible, then the parameter automatically changes to [Done] (dOnE).	
dOnE	☐ **[Done]** (dOnE): Use of the values given the last time auto-tuning was performed.	
	Caution:	
	• It is essential that all the motor parameters are correctly configured before starting auto-tuning.	
	- Asynchronous motor: [Rated motor volt.](UnS), [Rated motor freq.] (FrS), [Rated mot. current] (nCr), [Rated motor speed] (nSP), [Rated motor power] (nPr)	
	- Synchronous motor: [Nominal I sync.] (nCrS), [Nom motor spdsync] (nSPS), [Pole pairs] (PPnS), [Syn. EMF constant] (PHS), [Autotune L d-axis] (LdS), [Autotune L q-axis] (LqS)	
	If at least one of these parameters is modified after auto-tuning has been performed, [Auto-tuning] (tUn) returns to [No] (nO) and must be performed again.	
	• Auto-tuning is only performed if no stop command has been activated. If a "freewheel stop" or "fast stop" function has been assigned to a logic input, this input must be set to 1 (active at 0).	
	• Auto-tuning takes priority over any run or prefluxing commands, which will be taken into account after the auto-tuning sequence.	
	• If auto-tuning fails, the drive displays [No] (nO) and, depending on the configuration of [Autotune fault mgt] (tnL) page 211, may switch to [Auto-tuning] (tnF) fault mode.	
	• Auto-tuning may last for 1 to 2 seconds. Do not interrupt the process. Wait for the display to change to "[Done] (dOnE)" or "[No] (nO)".	
	Note: During auto-tuning the motor operates at rated current.	
AUt	❑ **[Automatic autotune]**	[No] (nO)
nO	☐ **[No]** (nO): Function inactive.	
YES	☐ **[Yes]** (YES): Auto-tuning is performed on every power-up.	
	Caution: Same comments as for [Auto-tuning] (tUn) above.	
tUS	❑ **[Auto tuning status]**	[Not done] (tAb)
	For information only, cannot be modified.	
tAb	☐ **[Not done]** (tAb): The default stator resistance value is used to control the motor.	
PEnd	☐ **[Pending]** (PEnd): Auto-tuning has been requested but not yet performed.	
PrOG	☐ **[In Progress]** (PrOG): Auto-tuning in progress.	
FAIL	☐ **[Failed]** (FAIL): Auto-tuning has failed.	
dOnE	☐ **[Done]** (dOnE): The stator resistance measured by the auto-tuning function is used to control the motor.	
CUS	☐ **[Customized]** (CUS): Auto-tuning has been performed, but at least one parameter set by this auto-tuning operation has subsequently been modified. The [Auto-tuning] (tUn) parameter then returns to [No] (nO). The following auto-tuning parameters are concerned: [Cust. stator R syn] (rSAS) page 70, [R1w] (rSA), [Idw] (IdA), [LFw] (LFA) and [T2w] (trA) page 71.	
PHr	❑ **[Output Ph rotation]**	ABC
AbC	☐ **[ABC]** (AbC): Forward	
ACb	☐ **[ACB]** (ACb): Reverse	
	This parameter can be used to reverse the direction of rotation of the motor without reversing the wiring.	
	Do not modify the [Output Ph rotation] (PHr) parameter when [Motor control type] (Ctt) page 67 = [FVC] (FUC). The direction of rotation must be modified, if required, before or during the procedure to check the encoder page 73 when [Motor control type] (Ctt) is not [FVC] (FUC).	

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.

Code	Name/Description	Adjustment range	Factory setting
Ctt	❑ **[Motor control type]**		[SVC V] (UUC)

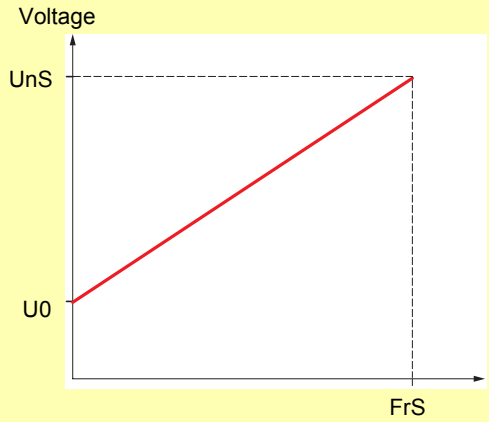
UUC ☐ **[SVC V]** (UUC): Open-loop voltage flux vector control. This type of control is recommended when replacing an ATV58. It supports operation with a number of motors connected in parallel on the same drive.

CUC ☐ **[SVC I]** (CUC): Open-loop current flux vector control. This type of control is recommended when replacing an ATV58F used in an open-loop configuration. It does not support operation with a number of motors connected in parallel on the same drive.

FUC ☐ **[FVC]** (FUC): Closed-loop current flux vector control for motor with incremental encoder type sensor. This type of control is recommended when replacing an ATV58F used in a closed-loop configuration. It provides better performance in terms of speed and torque accuracy and enables torque to be obtained at zero speed. It does not support operation with a number of motors connected in parallel on the same drive.

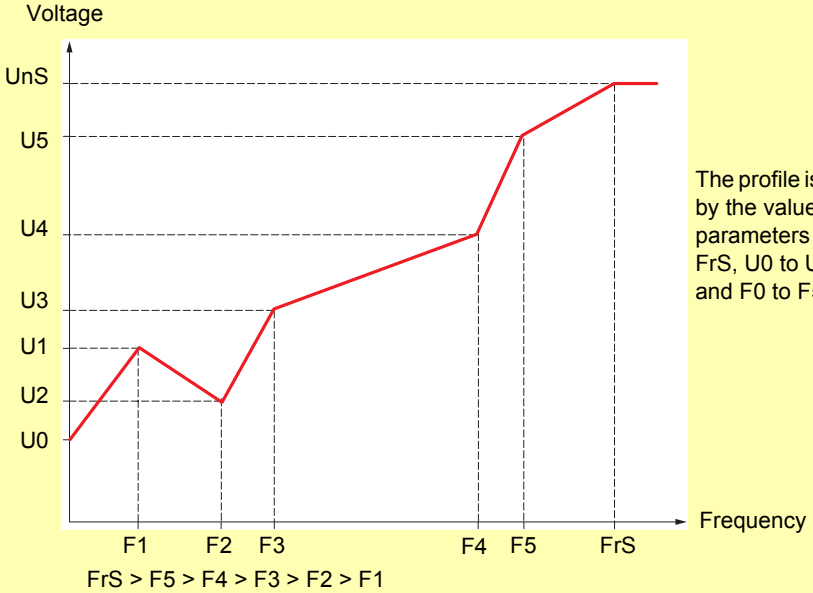
It is essential that the encoder check page 73 is performed successfully before selecting [FVC] (FUC).

UF2 ☐ **[V/F 2pts]** (UF2): Simple V/F profile without slip compensation. It supports operation with:
- Special motors (wound rotor, tapered rotor, etc.)
- A number of motors in parallel on the same drive
- High-speed motors
- Motors with a low power rating in comparison to that of the drive



The profile is defined by the values of parameters UnS, FrS and U0.

UF5 ☐ **[V/F 5pts]** (UF5): 5-segment V/F profile: As V/F 2 pts profile but also supports the avoidance of resonance (saturation).



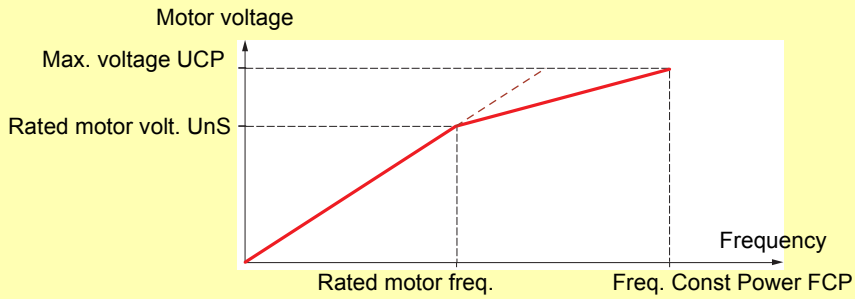
The profile is defined by the values of parameters UnS, FrS, U0 to U5 and F0 to F5.

FrS > F5 > F4 > F3 > F2 > F1

SYn ☐ **[Sync. mot.]** (SYn): For synchronous permanent magnet motors with sinusoidal electromotive force (EMF) only. This selection makes the asynchronous motor parameters inaccessible, and the synchronous motor parameters accessible.

[1.4 MOTOR CONTROL] (drC-)

Code	Name/Description	Adjustment range	Factory setting
U0	❑ **[U0]** V/F profile setting. The parameter can be accessed if [Motor control type] (Ctt) = [V/F 2pts] (UF2) or [V/F 5pts] (UF5)	0 to 600 V	0
U1	❑ **[U1]** V/F profile setting. The parameter can be accessed if [Motor control type] (Ctt) = [V/F 5pts] (UF5)	0 to 600 V	0
F1	❑ **[F1]** V/F profile setting. The parameter can be accessed if [Motor control type] (Ctt) = [V/F 5pts] (UF5)	0 to 1000 Hz	0
U2	❑ **[U2]** V/F profile setting. The parameter can be accessed if [Motor control type] (Ctt) = [V/F 5pts] (UF5)	0 to 600 V	0
F2	❑ **[F2]** V/F profile setting. The parameter can be accessed if [Motor control type] (Ctt) = [V/F 5pts] (UF5)	0 to 1000 Hz	0
U3	❑ **[U3]** V/F profile setting. The parameter can be accessed if [Motor control type] (Ctt) = [V/F 5pts] (UF5)	0 to 600 V	0
F3	❑ **[F3]** V/F profile setting. The parameter can be accessed if [Motor control type] (Ctt) = [V/F 5pts] (UF5)	0 to 1000 Hz	0
U4	❑ **[U4]** V/F profile setting. The parameter can be accessed if [Motor control type] (Ctt) = [V/F 5pts] (UF5)	0 to 600 V	0
F4	❑ **[F4]** V/F profile setting. The parameter can be accessed if [Motor control type] (Ctt) = [V/F 5pts] (UF5)	0 to 1000 Hz	0
U5	❑ **[U5]** V/F profile setting. The parameter can be accessed if [Motor control type] (Ctt) = [V/F 5pts] (UF5)	0 to 600 V	0
F5	❑ **[F5]** V/F profile setting. The parameter can be accessed if [Motor control type] (Ctt) = [V/F 5pts] (UF5)	0 to 1000 Hz	0

Code	Name/Description	Adjustment range	Factory setting
UC2	❏ **[Vector Control 2pt]**		[No] (nO)
	The parameter can be accessed if [Motor control type] (Ctt) = [SVC V] (UUC) or [SVC I] (CUC) or [FVC] (FVC). nO **[No]** (nO): Function inactive. YES **[Yes]** (YES): Function active. Used in applications in which the motor rated speed and frequency need to be exceeded in order to optimize operation at constant power, or when the maximum voltage of the motor needs to be limited to a value below the line voltage. The voltage/frequency profile must then be adapted in accordance with the motor's capabilities to operate at maximum voltage UCP and maximum frequency FCP.  		
UCP	❏ **[V. constant power]**	According to drive rating	According to drive rating and [Standard mot. freq] (bFr)
	The parameter can be accessed if [Vector Control 2pt] (UC2) = [Yes] (YES)		
FCP	❏ **[Freq. Const Power]**	According to drive rating and [Rated motor freq.] (FrS)	= [Standard mot. freq] (bFr)
	The parameter can be accessed if [Vector Control 2pt] (UC2) = [Yes] (YES)		

[1.4 MOTOR CONTROL] (drC-)

Synchronous motor parameters:

These parameters can be accessed if [Motor control type] (Ctt) page 67 = [Sync. mot.] (SYn). In this case, the asynchronous motor parameters cannot be accessed.

Code	Name/Description	Adjustment range	Factory setting
nCrS	❑ **[Nominal I sync.]** Rated synchronous motor current given on the nameplate.	0.25 to 1.5 In (2)	According to drive rating
nSPS	❑ **[Nom motor spdsync]** Rated synchronous motor speed given on the nameplate. On the integrated display unit: 0 to 9999 rpm then 10.00 to 60.00 krpm.	0 to 60000 rpm	According to drive rating
PPnS	❑ **[Pole pairs]** Number of pairs of poles on the synchronous motor.	1 to 50	According to drive rating
PHS	❑ **[Syn. EMF constant]** Synchronous motor EMF constant, in mV per 1000 rpm. On the integrated display unit: 0 to 9999 then 10.00 to 65.53 (10000 to 65535).	0 to 65535	According to drive rating
LdS	❑ **[Autotune L d-axis]** Axis "d" stator inductance in mH. On motors with smooth poles [Autotune L d-axis] (LdS) = [Autotune L q-axis] (LqS) = Stator inductance L.	0 to 655.3	According to drive rating
LqS	❑ **[Autotune L q-axis]** Axis "q" stator inductance in mH. On motors with smooth poles [Autotune L d-axis] (LdS) = [Autotune L q-axis] (LqS) = Stator inductance L.	0 to 655.3	According to drive rating
rSAS	❑ **[Cust. stator R syn]** Cold state stator resistance (per winding). The factory setting is replaced by the result of the auto-tuning operation, if it has been performed. The value can be entered by the user, if he knows it. Value in milliohms mΩ up to 75 kW (100 HP), in microhms µΩ above 75 kW. On the integrated display unit: 0 to 9999 then 10.00 to 65.53 (10000 to 65535).	According to drive rating	According to drive rating

Code	Name/Description	Adjustment range	Factory setting
UFr ( )	❑ **[IR compensation]** (1) The parameter can be accessed if [Motor control type] (Ctt) is not [V/F 2pts] (UF2) and [V/F 5pts] (UF5). Used to optimize the torque at very low speed (increase [IR compensation] (UFr) if the torque is insufficient). Check that the [IR compensation] (UFr) value is not too high when the motor is warm (risk of instability).	25 to 200%	100%
SLP ( )	❑ **[Slip compensation]** (1) The parameter can be accessed if [Motor control type] (Ctt) is not [V/F 2pts] (UF2), [V/F 5pts] (UF5) and [Sync. mot.] (SYn). Adjusts the slip compensation around the value set by the rated motor speed. The speeds given on motor nameplates are not necessarily exact. • If slip setting < actual slip: The motor is not rotating at the correct speed in steady state, but at a speed lower than the reference. • If slip setting > actual slip: the motor is overcompensated and the speed is unstable.	0 to 150%	100%

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.
(2) In corresponds to the rated drive current indicated in the installation manual and on the drive nameplate.

( ) Parameters that can be modified during operation or when stopped.

[1.4 MOTOR CONTROL] (drC-)

Motor parameters that can be accessed in [EXPERT] mode.

These include:

- Parameters calculated by the drive during auto-tuning, in read-only mode. For example, R1r, calculated cold stator resistance.
- The possibility of replacing some of these calculated parameters by other values, if necessary. For example, R1w, measured cold stator resistance.

When a parameter Xyw is modified by the user, the drive uses it in place of the calculated parameter Xyr.

Asynchronous motor

If an auto-tuning operation is performed or if one of the motor parameters on which auto-tuning depends is modified ([Rated motor volt.] (UnS), [Rated motor freq.] (FrS), [Rated mot. current] (nCr), [Rated motor speed] (nSP), [Rated motor power] (nPr)), parameters Xyw return to their factory settings.

Code	Name/Description
rSM	❑ **[Stator R measured]** Cold stator resistance, calculated by the drive, in read-only mode. Value in milliohms mΩ up to 75 kW (100 HP), in microhms µΩ above 75 kW.
IdM	❑ **[Idr]** Magnetizing current in A, calculated by the drive, in read-only mode.
LFM	❑ **[Lfr]** Leakage inductance in mH, calculated by the drive, in read-only mode.
trM	❑ **[T2r]** Rotor time constant in mS, calculated by the drive, in read-only mode.
nSL	❑ **[Nominal motor slip]** Rated slip in Hz, calculated by the drive, in read-only mode. To modify the rated slip, modify the [Rated motor speed] (nSP) (page 65).
PPn	❑ **[Pr]** Number of pairs of poles, calculated by the drive, in read-only mode.
rSA	❑ **[R1w]** Cold state stator resistance (per winding), modifiable value. In milliohms mΩ up to 75 kW (100 HP), in microhms µΩ above 75 kW. On the integrated display unit: 0 to 9999 then 10.00 to 65.53 (10000 to 65536).
IdA	❑ **[Idw]** Magnetizing current in A, modifiable value.
LFA	❑ **[Lfw]** Leakage inductance in mH, modifiable value.
trA	❑ **[T2w]** Rotor time constant in mS, modifiable value.

Synchronous motor

Code	Name/Description
rSMS	❑ **[R1rS]** Cold state stator resistance (per winding), in read-only mode. This is the drive factory setting or the result of the auto-tuning operation, if it has been performed. Value in milliohms mΩ up to 75 kW (100 HP), in microhms µΩ above 75 kW. On the integrated display unit: 0 to 9999 then 10.00 to 65.53 (10000 to 65536).
FrSS	❑ **[Nominal freq sync.]** Motor frequency at rated speed in Hz, calculated by the drive (rated motor frequency), in read-only mode.

Selecting the encoder

Follow the recommendations in the catalog and the installation manual.

Code	Name/Description	Adjustment range	Factory setting
EnS	❑ **[Encoder type]**		[AABB] (AAbb)
	To be configured in accordance with the type of card and encoder used (1). ☐ **[----]** (nO): Card missing. ☐ **[AABB]** (AAbb): For signals A, A-, B, B-. ☐ **[AB]** (Ab): For signals A, B. ☐ **[A]** (A): For signal A. Value cannot be accessed if [Encoder usage] (EnU) page 73 = [Spd fdk reg.] (rEG).		
PGI	❑ **[Number of pulses]**	100 to 5000	1024
	Number of pulses per encoder revolution. The parameter can be accessed if an encoder card has been inserted (1).		

(1) The encoder parameters can only be accessed if the encoder card has been inserted, and the available selections will depend on the type of encoder card used. The encoder configuration can also be accessed in the [1.5- INPUTS / OUTPUTS CFG] (I/O) menu.

Encoder check procedure

1. Set [Motor control type] (Ctt) to a value other than [FVC] (FUC) even if it is the required configuration.
2. Set up in open-loop mode, following the recommendations on page 5.
3. Set [Encoder usage] (EnU) = [No] (nO).
4. Set [Encoder type] (EnS) and [Number of pulses] (PGI) according to the encoder used.
5. Set [Encoder check] (EnC) = [Yes] (YES).
6. Check that the rotation of the motor is safe.
7. Set the motor rotating at stabilized speed ≈ 15% of the rated speed for at least 3 seconds, and use the [1.2-MONITORING] (SUP-) menu to monitor its behavior.
8. If it trips on an [Encoder fault] (EnF), [Encoder check] (EnC) returns to [No] (nO).
   - Check [Number of pulses] (PGI) and [Encoder type] (EnS).
   - Check that the mechanical and electrical operation of the encoder, its power supply and connections are all correct.
   - Reverse the direction of rotation of the motor ([Output Ph rotation] (PHr) parameter page 66) or the encoder signals.
9. Repeat the operations from 5 onwards until [Encoder check] (EnC) changes to [Done] (dOnE).
10. If necessary, reconfigure [Motor control type] (Ctt) [FVC] (FUC).

Code	Name/Description	Adjustment range	Factory setting
EnC	❑ **[Encoder check]** Check encoder feedback. See the procedure below. The parameter can be accessed if an encoder card has been inserted (1). nO ☐ **[Not done]** (nO) Check not performed. YES ☐ **[Yes]** (YES): Activates monitoring of the encoder. dOnE ☐ **[Done]** (dOnE): Check performed successfully. The check procedure checks: - The direction of rotation of the encoder/motor - The presence of signals (wiring continuity) - The number of pulses/revolution If a fault is detected, the drive locks in [Encoder fault] (EnF) mode.		[Not done] (nO)
EnU	❑ **[Encoder usage]** The parameter can be accessed if an encoder card has been inserted (1). nO ☐ **[No]** (nO): Function inactive. SEC ☐ **[Fdbk monit.]** (SEC): The encoder provides speed feedback for monitoring only. rEG ☐ **[Spd fdk reg.]** (rEG): The encoder provides speed feedback for regulation and monitoring. This configuration is automatic if the drive is configured for closed-loop operation ([Motor control type] (Ctt) = [FVC] (FUC). If [Motor control type] (Ctt) = [SVC V] (UUC) the encoder operates in speed feedback mode and enables static correction of the speed to be performed. This configuration is not accessible for other [Motor control type] (Ctt) values. PGr ☐ **[Speed ref.]** (PGr): The encoder provides a reference.		[No] (nO)

(1) The encoder parameters can only be accessed if the encoder card has been inserted, and the available selections will depend on the type of encoder card used. The encoder configuration can also be accessed in the [1.5- INPUTS / OUTPUTS CFG] (I/O) menu.

[ENA SYSTEM]

ENA SYSTEM is a control profile designed for rotating machines with unbalanced load.
It is used primarily for oil pumps. The operating principle applied:

- Allows operation without a braking resistor
- Reduces mechanical stress on the rod
- Reduces line current fluctuations
- Reduces energy consumption by improving the electric power/current ratio

[ENA prop.gain]

This setting is used to achieve a compromise between the reduced energy consumption (and/or line current fluctuations) and the mechanical stress to which the rod is subject.
Energy is saved by reducing current fluctuations and increasing the current while retaining the same average speed.

[ENA integral gain]

This setting is used to smooth the DC bus voltage.

Start up the machine with a low integral and proportional gain (proportional 25% and integral 10%) in order to avoid an overvoltage trip in the absence of a braking resistor. See if these settings are suitable.

Recommended adjustments to be made during operation:

- To eliminate the braking resistor and therefore the increase in the DC bus voltage:
  Display the machine speed on the graphic display terminal.
  Reduce the integral gain value until the machine speed drops. When this point is reached, increase the integral gain until the machine speed stabilizes.
  Use the graphic display terminal or an oscilloscope to check that the DC bus voltage is stable.
- To save energy:
  Reducing the proportional gain (gradually) may increase energy savings by reducing the maximum value of the line current, but it will increase speed variations and therefore mechanical stress.
  The aim is to identify settings that will enable energy to be saved and minimize mechanical stress.
  When reducing the proportional gain, it may be necessary to readjust the integral gain in order to avoid an overvoltage trip.

Note: Once the adjustments are complete, check that the pump starts up correctly. If the ENA integral gain setting is too low, this may lead to insufficient torque on startup.

[Reduction ratio]

This setting corresponds to the motor speed ahead of gearbox/speed after gearbox ratio. This parameter is used to display the average speed in Hz and the machine speed in customer units (e.g., in strokes per minute) on the graphic display terminal. In order to be displayed on the graphic display terminal, these values must be selected in the [1.2 MONITORING] (SUP-) menu.

[1.4 MOTOR CONTROL] (drC-)

Code	Name/Description	Adjustment range	Factory setting
EnA nO YES	❑ **[ENA system]** The parameter can be accessed if [Motor control type] (Ctt) = [SVC V] (UUC), see page 67. ☐ **[No]** (nO): Function inactive ☐ **[Yes]** (YES): Function active.		[No] (nO)
GPE ( )	❑ **[ENA prop.gain]** (1) The parameter can be accessed if [ENA system] (EnA) = [Yes] (YES)	1 to 9999	250
G IE ( )	❑ **[ENA integral gain]** (1) The parameter can be accessed if [ENA system] (EnA) = [Yes] (YES)	0 to 9999	100
rAP ( )	❑ **[Reduction ratio]** (1) The parameter can be accessed if [ENA system] (EnA) = [Yes] (YES)	10.0 to 999.9	10

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.

( ) Parameters that can be modified during operation or when stopped.

[1.4 MOTOR CONTROL] (drC-)

Code	Name/Description	Adjustment range	Factory setting
OFI nO YES	❑ **[Sinus filter]** ☐ **[No]** (nO): No sinus filter ☐ **[Yes]** (YES): Use of a sinus filter, to limit overvoltages on the motor and reduce the ground fault leakage current. ☞ **Note:** If [Sinus filter] (OFI) = [Yes] (YES), [Motor control type] (Ctt) page 67 must be [V/F 2pts] (UF2), [V/F 5pts] (UF5), or [SVC V] (UUC) **only**, and [Max frequency] (tFr) **must not exceed 100 Hz**.		[No] (nO)
SFr ( )	❑ **[Switching freq.]** (1) Switching frequency setting. ☞ **Note:** In the event of excessive temperature rise, the drive will automatically reduce the switching frequency and reset it once the temperature returns to normal. Adjustment with drive running: - If the initial value is less than 2 kHz, it is not possible to increase it above 1.9 kHz while running. - If the initial value is greater than or equal to 2 kHz, a minimum of 2 kHz must be maintained while running. Adjustment with the drive stopped: No restrictions. If the value is less than 2 kHz, [Current Limitation] (CLI) and [I Limit. 2 value] (CL2) page 57 are limited to 1.36 In. If the [Sinus filter] (OFI) parameter = [Yes] (YES), the factory setting changes to 4 kHz irrespective of the power of the drive, and the adjustment range changes to 4 to 8 kHz.	1 to 16 kHz	2.5 kHz or 4 kHz depending on rating
CLI ( )	❑ **[Current Limitation]** (1) Used to limit the current and the temperature rise of the motor. The adjustment range is limited to 1.36 In if [Switching freq.] (SFr) is less than 2 kHz. ☞ **Note:** If the setting is less than 0.25 In, the drive may lock in [Output Phase Loss] (OPF) fault mode if this has been enabled (see page 201). If it is less than the no-load motor current, the limitation no longer has any effect.	0 to 1.65 In (2)	1.5 In (2)
nrd nO YES	❑ **[Noise reduction]** ☐ **[No]** (nO): Fixed frequency ☐ **[Yes]** (YES): Frequency with random modulation Random frequency modulation prevents any resonance, which may occur at a fixed frequency.		[Yes] (YES)
SUL nO YES	❑ **[Motor surge limit.]** This function limits motor overvoltages and is useful in the following applications: - NEMA motors - Japanese motors - Spindle motors - Rewound motors ☐ **[No]** (nO): Function inactive ☐ **[Yes]** (YES): Function active This parameter can remain = [No] (nO) if a sinus filter is used, or for 230/400 V motors used at 230 V, 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		[No] (nO)
SOP	❑ **[Volt surge limit. opt]** Optimization parameter for transient overvoltages at the motor terminals. Accessible if [Motor surge limit.] (SUL) = [Yes] (YES). Set to 6, 8, or 10 µs, according to the following table.		10 µs

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.
(2) In corresponds to the rated drive current indicated in the installation manual and on the drive nameplate.

( ) Parameters that can be modified during operation or when stopped.

The value of the "SOP" parameter corresponds to the attenuation time of the cable used. It is defined to prevent the superimposition of voltage wave reflections resulting from long cable lengths. It limits overvoltages to twice the DC bus rated voltage.
The tables below give examples of correspondence between the "SOP" parameter and the length of cable between the drive and the motor. For longer cable lengths, a sinus filter or a dV/dt protection filter must be used.

- For motors in parallel, the sum of all the cable lengths must be taken into consideration. Compare the length given in the line corresponding to the power for one motor with that corresponding to the total power, and select the shorter length. Example: Two 7.5 kW (10 HP) motors - take the lengths on the 15 kW line, which are shorter than those on the 7.5 kW (10 HP) line, and divide by the number of motors to obtain the length per motor.

To retain the overall drive performance, do not increase the SOP value unnecessarily.

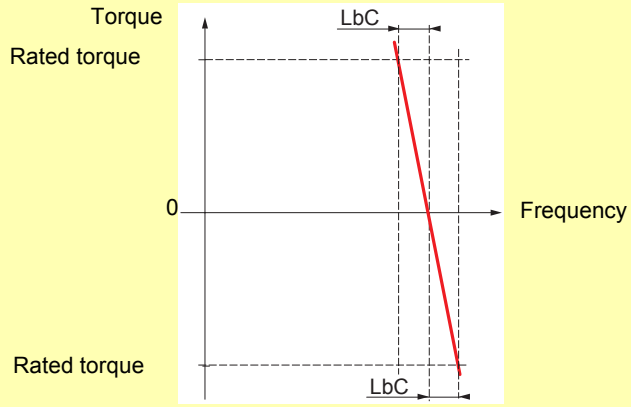
Tables giving the correspondence between the SOP parameter and the cable length, for 400 V line supply

Altivar 71	**Motor**		**Cable cross-section**		**Maximum cable length in meters**					
Reference	Power				Unshielded "GORSE" cable Type H07 RN-F 4Gxx			Shielded "GORSE" cable Type GVCSTV-LS/LH		
	kW	HP	in mm^2	AWG	**SOP = 10**	**SOP = 8**	**SOP = 6**	**SOP = 10**	**SOP = 8**	**SOP = 6**
ATV71H075N4	0.75	1	1.5	14	100 m	70 m	45 m	105 m	85 m	65 m
ATV71HU15N4	1.5	2	1.5	14	100 m	70 m	45 m	105 m	85 m	65 m
ATV71HU22N4	2.2	3	1.5	14	110 m	65 m	45 m	105 m	85 m	65 m
ATV71HU30N4	3	-	1.5	14	110 m	65 m	45 m	105 m	85 m	65 m
ATV71HU40N4	4	5	1.5	14	110 m	65 m	45 m	105 m	85 m	65 m
ATV71HU55N4	5.5	7.5	2.5	14	120 m	65 m	45 m	105 m	85 m	65 m
ATV71HU75N4	7.5	10	2.5	14	120 m	65 m	45 m	105 m	85 m	65 m
ATV71HD11N4	11	15	6	10	115 m	60 m	45 m	100 m	75 m	55 m
ATV71HD15N4	15	20	10	8	105 m	60 m	40 m	100 m	70 m	50 m
ATV71HD18N4	18.5	25	10	8	115 m	60 m	35 m	150 m	75 m	50 m
ATV71HD22N4	22	30	16	6	150 m	60 m	40 m	150 m	70 m	50 m
ATV71HD30N4	30	40	25	4	150 m	55 m	35 m	150 m	70 m	50 m
ATV71HD37N4	37	50	35	5	200 m	65 m	50 m	150 m	70 m	50 m
ATV71HD45N4	45	60	50	0	200 m	55 m	30 m	150 m	60 m	40 m
ATV71HD55N4	55	75	70	2/0	200 m	50 m	25 m	150 m	55 m	30 m
ATV71HD75N4	75	100	95	4/0	200 m	45 m	25 m	150 m	55 m	30 m

Altivar 71	**Motor**		**Cable cross-section**		**Maximum cable length in meters**					
Reference	Power				Shielded "BELDEN" cable Type 2950x			Shielded "PROTOFLEX" cable Type EMV 2YSLCY-J		
	kW	HP	in mm^2	AWG	**SOP = 10**	**SOP = 8**	**SOP = 6**	**SOP = 10**	**SOP = 8**	**SOP = 6**
ATV71H075N4	0.75	1	1.5	14	50 m	40 m	30 m			
ATV71HU15N4	1.5	2	1.5	14	50 m	40 m	30 m			
ATV71HU22N4	2.2	3	1.5	14	50 m	40 m	30 m			
ATV71HU30N4	3	-	1.5	14	50 m	40 m	30 m			
ATV71HU40N4	4	5	1.5	14	50 m	40 m	30 m			
ATV71HU55N4	5.5	7.5	2.5	14	50 m	40 m	30 m			
ATV71HU75N4	7.5	10	2.5	14	50 m	40 m	30 m			
ATV71HD11N4	11	15	6	10	50 m	40 m	30 m			
ATV71HD15N4	15	20	10	8	50 m	40 m	30 m			
ATV71HD18N4	18.5	25	10	8	50 m	40 m	30 m			
ATV71HD22N4	22	30	16	6				75 m	40 m	25 m
ATV71HD30N4	30	40	25	4				75 m	40 m	25 m
ATV71HD37N4	37	50	35	5				75 m	40 m	25 m
ATV71HD45N4	45	60	50	0				75 m	40 m	25 m
ATV71HD55N4	55	75	70	2/0				75 m	30 m	15 m
ATV71HD75N4	75	100	95	4/0				75 m	30 m	15 m

For 230/400 V motors used at 230 V, the [Motor surge limit.] (SUL) parameter can remain = [No] (nO).

Code	Name/Description	Adjustment range	Factory setting
UbR	**[Braking level]**		According to drive voltage rating
	DC bus voltage threshold above which the braking transistor cuts in to limit this voltage. ATV71●●●●M3●: factory setting 395 V. ATV71●●●●N4: factory setting 785 V. The adjustment range depends on the voltage rating of the drive and the [Mains voltage] (UrES) parameter, page 205.		
bbA	**[Braking balance]**		[No] (nO)
nO YES	☐ **[No]** (nO): Function inactive ☐ **[Yes]** (YES): Function active, to be used on drives connected in parallel via their DC bus. Used to balance the braking power between the drives. The [Braking level] (Ubr) parameter, page 78, must be set to the same value on the various drives. The value[Yes] (YES) is possible if [Dec ramp adapt.] (brA) = [No] (nO) (see page 127).		
LbA	**[Load sharing]**		[No] (nO)
nO YES	When 2 motors are connected mechanically and therefore at the same speed, and each is controlled by a drive, this function can be used to improve torque distribution between the two motors. To do this, it varies the speed based on the torque, having the same effect as slip. ☐ **[No]** (nO): Function inactive ☐ **[Yes]** (YES): Function active This parameter is only visible if [Motor control type] (Ctt) is not [FVC] (FUC) (see page 67).		
LbC	**[Load correction]** (1)	0 to 1000 Hz	0
	Rated correction in Hz. The parameter can be accessed if [Load sharing] (LbA) = [Yes] (YES).		

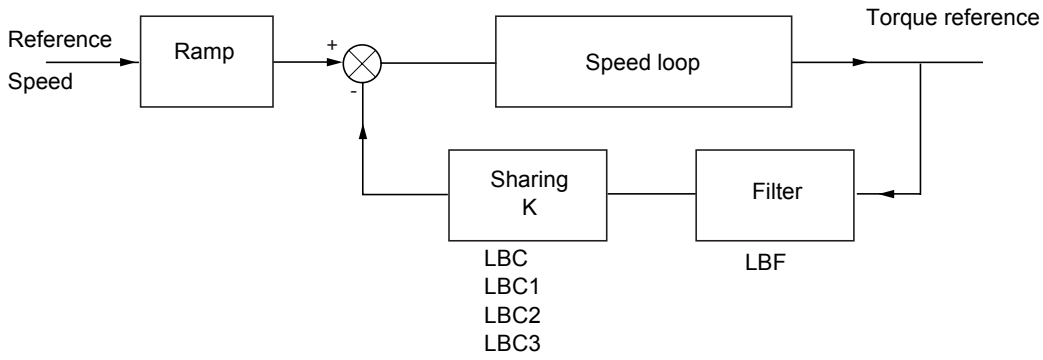


(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.

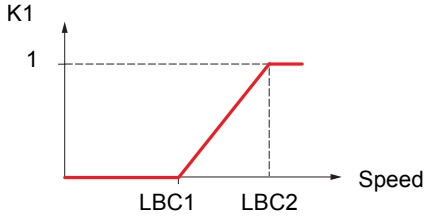
Parameters that can be modified during operation or when stopped.

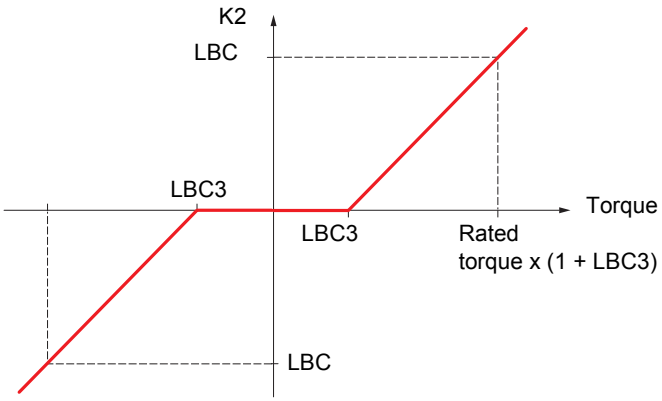
Load sharing, parameters that can be accessed at expert level

Principle



The load sharing factor K is determined by the torque and speed, with two factors K1 and K2 (K = K1 x K2).





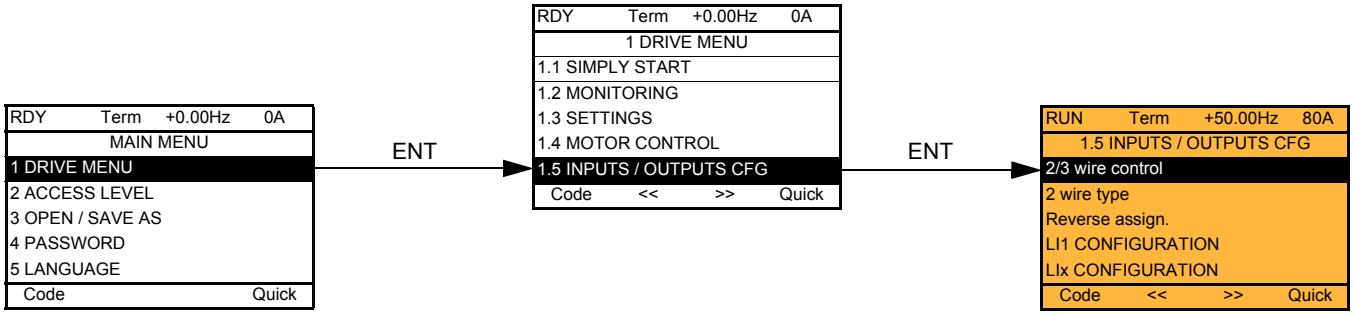
[1.4 MOTOR CONTROL] (drC-)

Code	Name/Description	Adjustment range	Factory setting
LbC1	❑ **[Correction min spd]** The parameter can be accessed if [Load sharing] (LbA) = [Yes] (YES) Minimum speed for load correction in Hz. Below this threshold, no corrections are made. Used to prevent correction at very low speed if this would hamper rotation of the motor.	0 to 999.9 Hz	0
LbC2	❑ **[Correction max spd]** The parameter can be accessed if [Load sharing] (LbA) = [Yes] (YES) Speed threshold in Hz above which maximum load correction is applied.	[Correction min spd] (LbC1) + 0.1 to 1000 Hz	0.1
LbC3	❑ **[Torque offset]** The parameter can be accessed if [Load sharing] (LbA) = [Yes] (YES) Minimum torque for load correction as a % of the rated torque. Below this threshold, no corrections are made. Used to avoid torque instabilities when the torque direction is not constant.	0 to 300%	0%
LbF	❑ **[Sharing filter]** The parameter can be accessed if [Load sharing] (LbA) = [Yes] (YES) Time constant (filter) for correction in ms. Used in the event of flexible mechanical coupling in order to avoid instabilities.	100 ms to 20 s	100 ms

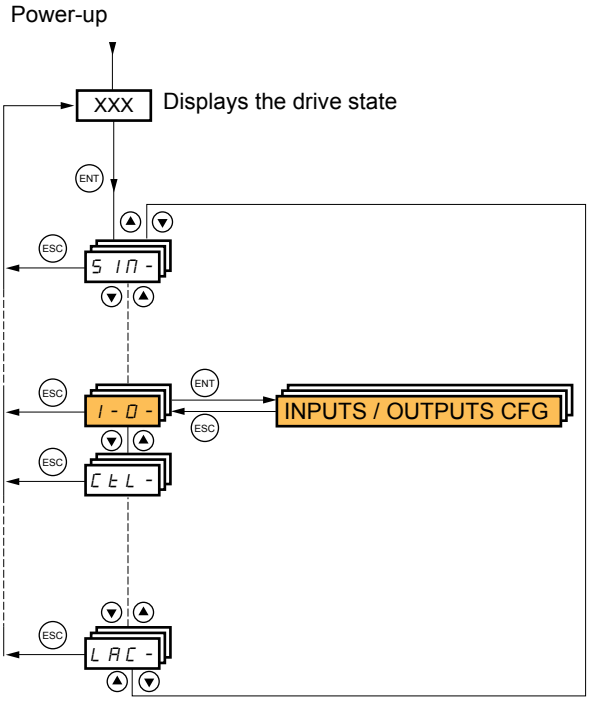
Parameters that can be modified during operation or when stopped.

[1.5 INPUTS / OUTPUTS CFG] (I-O-)

With graphic display terminal:



With integrated display terminal:



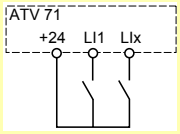
[1.5 INPUTS / OUTPUTS CFG] (I-O-)

The parameters in the [1.5 INPUTS / OUTPUTS CFG] (I-O-) menu can only be modified when the drive is stopped and no run command is present.

Code	Name/Description	Adjustment range	Factory setting
tCC	❑ **[2/3 wire control]**		[2 wire] (2C)
2C	☐ **[2 wire]** (2C)		
3C	☐ **[3 wire]** (3C)		

2-wire control: This is the input state (0 or 1) or edge (0 to 1 or 1 to 0), which controls running or stopping.

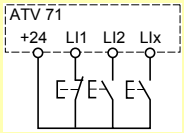
Example of "source" wiring:



LI1: forward
LIx: reverse

3-wire control (pulse control): A "forward" or "reverse" pulse is sufficient to command starting, a "stop" pulse is sufficient to command stopping.

Example of "source" wiring:



LI1: stop
LI2: forward
LIx: reverse

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

To change the assignment of [2/3 wire control] (tCC) press the "ENT" key for 2 s.
It causes the following functions to return to factory setting: [2 wire type] (tCt) and [Reverse assign.] (rrS) below, and all functions, which assign logic and analog inputs.
The macro configuration selected will also be reset if it has been customized (loss of custom settings).
It is advisable to configure this parameter before configuring the [1.6 COMMAND] (CtL-) and [1.7 APPLICATION FUNCT.] (FUn-) menus.
Check that this change is compatible with the wiring diagram used.
Failure to follow these instructions can result in death or serious injury.

tCt	❑ **[2 wire type]**		[Transition] (trn)
LEL	☐ **[Level]** (LEL): State 0 or 1 is taken into account for run (1) or stop (0).		
trn	☐ **[Transition]** (trn): A change of state (transition or edge) is necessary to initiate operation, in order to prevent accidental restarts after a break in the power supply.		
PFO	☐ **[Fwd priority]** (PFO): State 0 or 1 is taken into account for run or stop, but the "forward" input always takes priority over the "reverse" input.		
rrS	❑ **[Reverse assign.]**		[LI2] (LI2)
nO	☐ **[No]** (nO): Not assigned		
LI1	☐ **[LI1]** (LI1) to **[LI6]** (LI6)		
-	☐ **[LI7]** (LI7) to **[LI10]** (LI10): If VW3A3201 logic I/O card has been inserted		
-	☐ **[LI11]** (LI11) to **[LI14]** (LI14): If VW3A3202 extended I/O card has been inserted		
C101	☐ **[C101]** (C101) to **[C115]** (C115): With integrated Modbus in [I/O profile] (IO)		
-	☐ **[C201]** (C201) to **[C215]** (C215): With integrated CANopen in [I/O profile] (IO)		
-	☐ **[C301]** (C301) to **[C315]** (C315): With a communication card in [I/O profile] (IO)		
-	☐ **[C401]** (C401) to **[C415]** (C415): With a Controller Inside card in [I/O profile] (IO)		
Cd00	☐ **[CD00]** (Cd00) to **[CD13]** (Cd13): In [I/O profile] (IO) can be switched with possible logic inputs		
-	☐ **[CD14]** (Cd14) to **[CD15]** (Cd15): In [I/O profile] (IO) can be switched without logic inputs Assignment of the reverse direction command.		

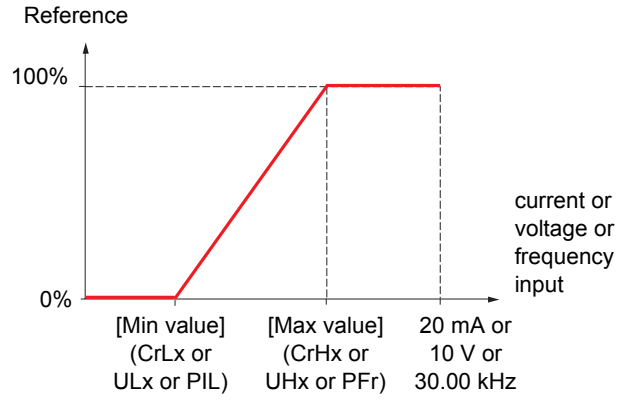
Code	Name/Description	Adjustment range	Factory setting
L I -	**■ [LI1 CONFIGURATION]**		
L IA	**❑ [LI1 assignment]** Read-only parameter, cannot be configured. It displays all the functions that are assigned to input LI1 in order to check multiple assignments.		
L Id	**❑ [LI1 On Delay]** This parameter is used to take account of the change of the logic input to state 1 with a delay that can be adjusted between 0 and 200 milliseconds, in order to filter out possible interference. The change to state 0 is taken into account without delay. **⚠ WARNING** **UNINTENDED EQUIPMENT OPERATION** Check that the delay set does not pose a risk or lead to undesired operation. The relative order in which these inputs are taken into account may be modified according to the delay values of the various logic inputs, and thus lead to unintended operation. **Failure to follow these instructions can result in death or serious injury.**	0 to 200 ms	0
L - -	**■ [LIx CONFIGURATION]**		
	All the logic inputs available on the drive are processed as in the example for LI1 above, up to LI6, LI10 or LI14, depending on whether or not option cards have been inserted.		

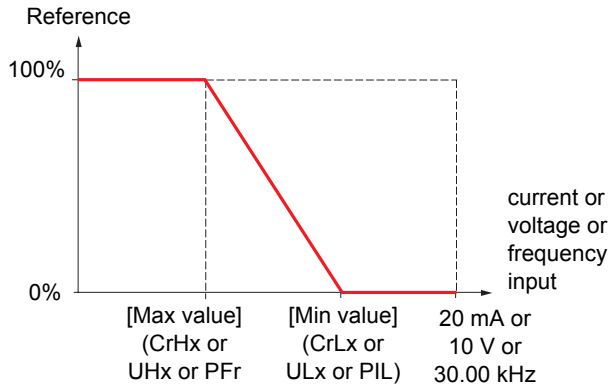
Configuration of analog inputs and Pulse input

The minimum and maximum input values (in volts, mA, etc.) are converted to % in order to adapt the references to the application.

Minimum and maximum input values:

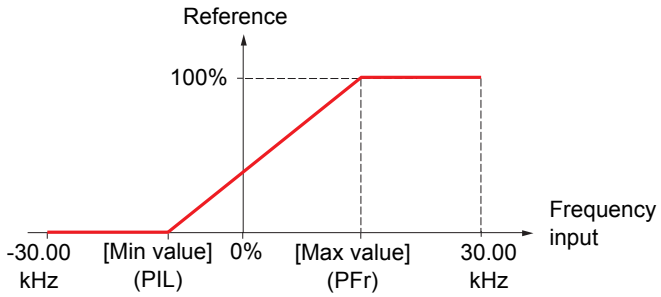
The minimum value corresponds to a reference of 0% and the maximum value to a reference of 100%. The minimum value may be greater than the maximum value:





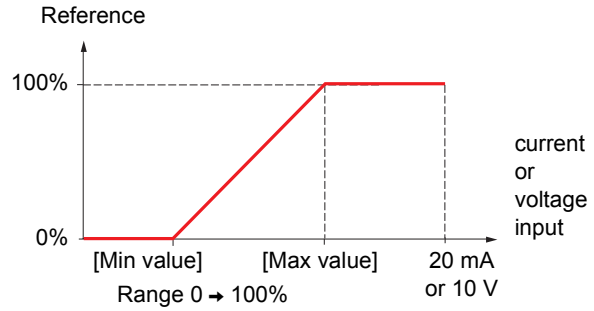
For +/- bidirectional inputs, the min. and max. are relative to the absolute value, for example, +/- 2 to 8 V.

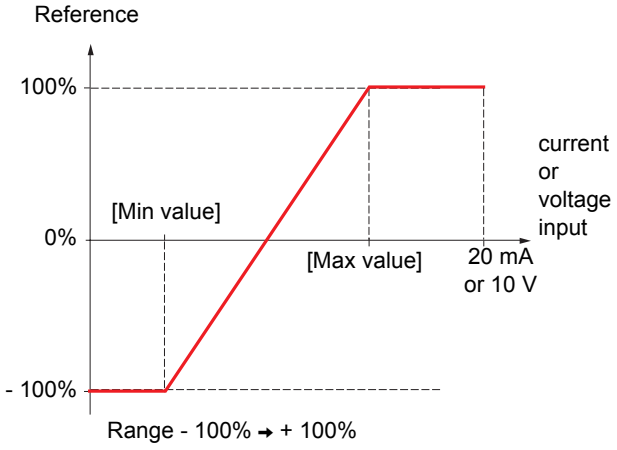
Negative min. value of Pulse input:



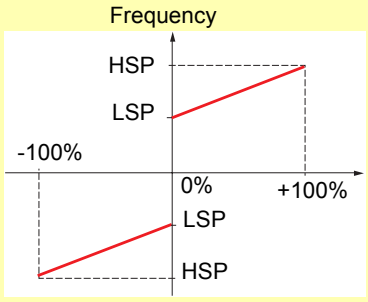
Range (output values): For analog inputs only

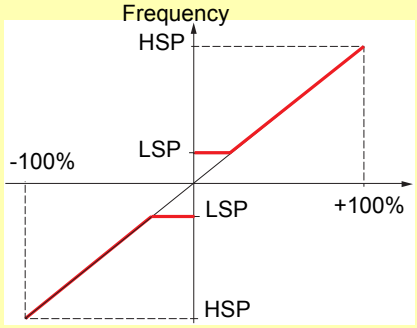
This parameter is used to configure the reference range to [0% ➞100%] or [-100% ➞ +100%] in order to obtain a bidirectional output from a unidirectional input.

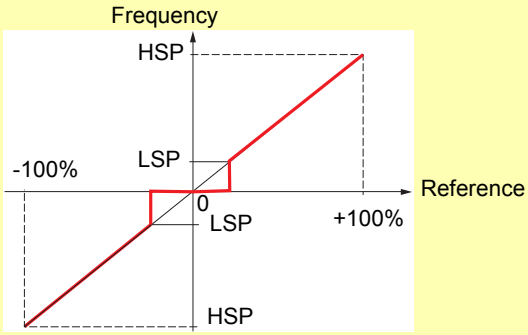


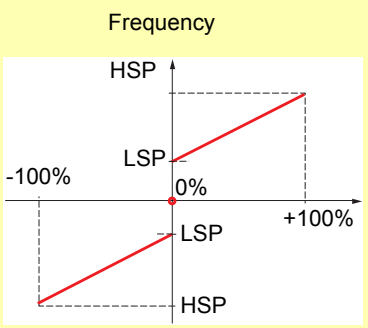


Code	Name/Description	Adjustment range	Factory setting
bSP	❑ **[Reference template]**		[Standard] (bSd)
bSd	☐ **[Standard]** (bSd)	At zero reference the frequency = LSP	
bLS	☐ **[Pedestal]** (bLS)	At reference = 0 to LSP the frequency = LSP	
bnS	☐ **[Deadband]** (bnS)	At reference = 0 to LSP the frequency = 0	
bnS0	☐ **[Deadband 0]** (bnS0)	This operation is the same as [Standard] (bSd), except that in the following cases at zero reference, the frequency = 0: • The signal is less than [Min value], which is greater than 0 (example 1 V on a 2 - 10 V input) • The signal is greater than [Min value], which is greater than [Max value] (example 11 V on a 10 - 0 V input). If the input range is configured as "bidirectional", operation remains identical to [Standard] (bSd).	







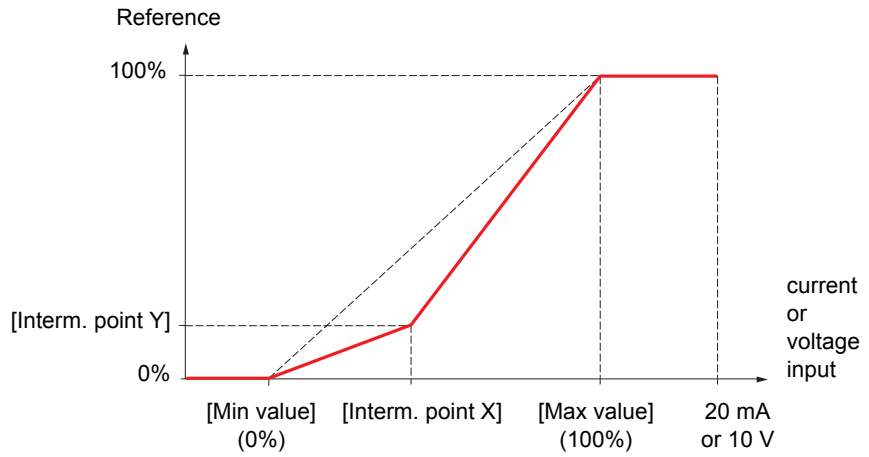


This parameter defines how the speed reference is taken into account, for analog inputs and Pulse input only. In the case of the PID regulator, this is the PID output reference.
The limits are set by the [Low speed] (LSP) and [High speed] (HSP) parameters, page 40

Delinearization: For analog inputs only

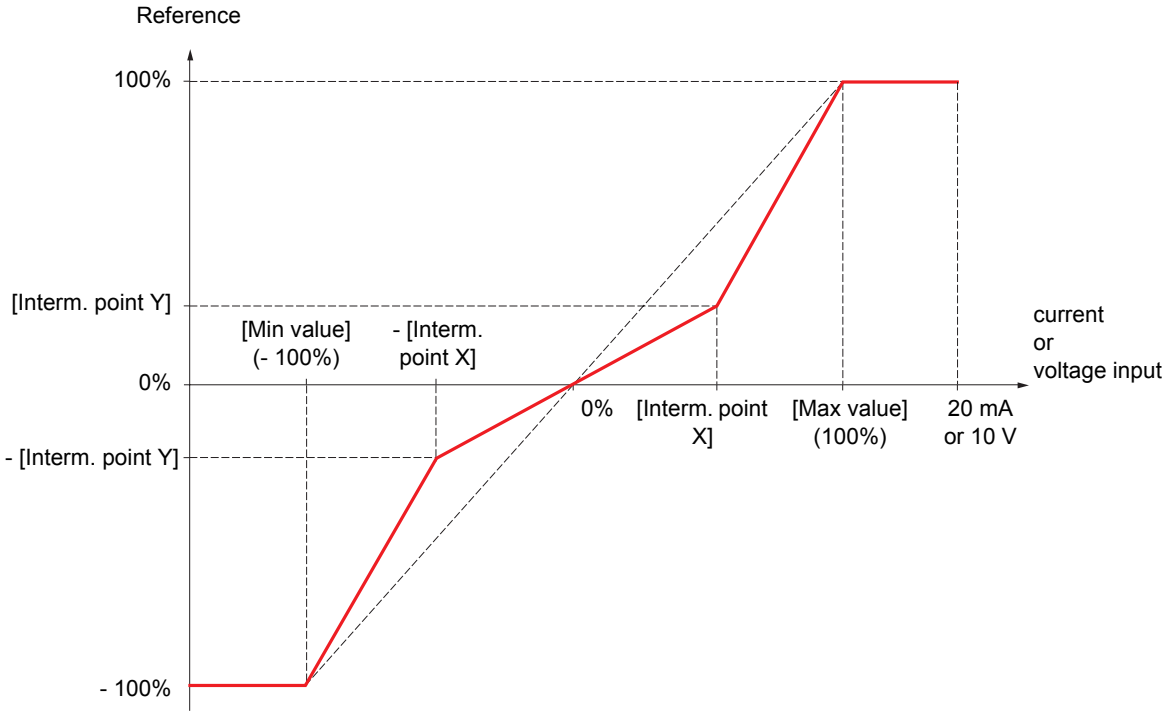
The input can be delinearized by configuring an intermediate point on the input/output curve of this input:

For range 0 ➙ 100%



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

For range -100% ➙ 100%



Code	Name/Description	Adjustment range	Factory setting
AI1-	**[AI1 CONFIGURATION]**		
AI1A	**[AI1assignment]** Read-only parameter, cannot be configured. It displays all the functions associated with input AI1 in order to check, for example, for compatibility problems.		
AI1t	**[AI1 Type]** Read-only parameter, cannot be configured. ☐ **[Voltage]** (10U): Voltage input		[Voltage] (10U)
UIL1	**[AI1 min value]**	0 to 10.0 V	0 V
UIH1	**[AI1 max value]**	0 to 10.0 V	10.0 V
AI1F	**[AI1 filter]** Interference filtering.	0 to 10.00 s	0 s
AI1E	**[AI1 Interm. point X]** Input delinearization point coordinate. • 0% corresponds to [AI1 min value] (UIL1). • 100% corresponds to [AI1 max value] (UIH1).	0 to 100%	0%
AI1S	**[AI1 Interm. point Y]** Output delinearization point coordinate (frequency reference).	0 to 100%	0%

Code	Name/Description	Adjustment range	Factory setting
A I2 -	**[AI2 CONFIGURATION]**		
A I2A	**[AI2 assignment]** Read-only parameter, cannot be configured. It displays all the functions associated with input AI2 in order to check, for example, for compatibility problems.		
A I2t 10U 0A	**[AI2 Type]** ☐ **[Voltage]** (10U): Voltage input ☐ **[Current]** (0 A): Current input		[Current] (0 A)
CrL2	**[AI2 min. value]** The parameter can be accessed if [AI2 Type] (AI2t) = [Current] (0 A)	0 to 20.0 mA	0 mA
U IL2	**[AI2 min. value]** The parameter can be accessed if [AI2 Type] (AI2t) = [Voltage] (10U)	0 to 10.0 V	0 V
CrH2	**[AI2 max. value]** The parameter can be accessed if [AI2 Type] (AI2t) = [Current] (0 A)	0 to 20.0 mA	20.0 mA
U IH2	**[AI2 max. value]** The parameter can be accessed if [AI2 Type] (AI2t) = [Voltage] (10U)	0 to 10.0 V	10.0 V
A I2F	**[AI2 filter]** Interference filtering.	0 to 10.00 s	0 s
A I2L POS nEG	**[AI2 range]** ☐ **[0 - 100%]** (POS): Unidirectional input ☐ **[+/- 100%]** (nEG): Bidirectional input Example: On a 0/10 V input - 0 V corresponds to reference -100% - 5 V corresponds to reference 0% - 10 V corresponds to reference + 100%		[0 - 100%] (POS)
A I2E	**[AI2 Interm. point X]** Input delinearization point coordinate. • 0% corresponds to [Min value] if the range is 0 ➡ 100%. • 0% corresponds to $\frac{\text{[Max value]} + \text{[Min value]}}{2}$ if the range is -100% ➡ + 100%. • 100% corresponds to [Max value].	0 to 100%	0%
A I2S	**[AI2 Interm. point Y]** Output delinearization point coordinate (frequency reference).	0 to 100%	0%

Code	Name/Description	Adjustment range	Factory setting
AI3-	**[AI3 CONFIGURATION]** Can be accessed if VW3A3202 option card has been inserted		
AI3A	**[AI3 assignment]** Read-only parameter, cannot be configured. It displays all the functions associated with input AI3 in order to check, for example, for compatibility problems.		
AI3t 0A	**[AI3 Type]** Read-only parameter, cannot be configured. ☐ **[Current]** (0 A): Current input		[Current] (0 A)
CrL3	**[AI3 min. value]**	0 to 20.0 mA	0 mA
CrH3	**[AI3 max. value]**	0 to 20.0 mA	20.0 mA
AI3F	**[AI3 filter]** Interference filtering.	0 to 10.00 s	0 s
AI3L POS nEG	**[AI3 range]** ☐ **[0 - 100%]** (POS): Unidirectional input ☐ **[+/- 100%]** (nEG): Bidirectional input Example: On a 4 - 20 mA input - 4 mA corresponds to reference -100% - 12 mA corresponds to reference 0% - 20 mA corresponds to reference + 100% Since AI3 is, in physical terms, a bidirectional input, the [+/- 100%] (nEG) configuration must only be used if the signal applied is unidirectional. A bidirectional signal is not compatible with a bidirectional configuration.		[0 - 100%] (POS)
AI3E	**[AI3 Interm. point X]** Input delinearization point coordinate. • 0% corresponds to [AI3 min. value] (CrL3) if the range is 0 ➞ 100%. • 0% corresponds to $\frac{\text{[AI3 max. value] (CrH3)} - \text{[AI3 min. value] (CrL3)}}{2}$ if the range is -100% ➞ +100%. • 100% corresponds to [AI3 max. value] (CrH3).	0 to 100%	0%
AI3S	**[AI3 Interm. point Y]** Output delinearization point coordinate (frequency reference).	0 to 100%	0%

Code	Name/Description	Adjustment range	Factory setting
AI4-	**[AI4 CONFIGURATION]** Can be accessed if VW3A3202 option card has been inserted		
AI4A	**[AI4 assignment]** Read-only parameter, cannot be configured. It displays all the functions associated with input AI4 in order to check, for example, for compatibility problems.		
AI4t 10U 0A	**[AI4 Type]** ☐ **[Voltage]** (10U): Voltage input ☐ **[Current]** (0 A): Current input		[Current] (0 A)
CrL4	**[AI4 min. value]** The parameter can be accessed if [AI4 Type] (AI4t) = [Current] (0 A)	0 to 20.0 mA	0 mA
UIL4	**[AI4 min value]** The parameter can be accessed if [AI4 Type] (AI4t) = [Voltage] (10U)	0 to 10.0 V	0 V
CrH4	**[AI4 max. value]** The parameter can be accessed if [AI4 Type] (AI4t) = [Current] (0 A)	0 to 20.0 mA	20.0 mA
UIH4	**[AI4 max value]** The parameter can be accessed if [AI4 Type] (AI4t) = [Voltage] (10U)	0 to 10.0 V	10.0 V
AI4F	**[AI4 filter]** Interference filtering.	0 to 10.00 s	0 s
AI4L POS nEG	**[AI4 range]** ☐ **[0 - 100%]** (POS): Unidirectional input ☐ **[+/- 100%]** (nEG): Bidirectional input Example: On a 0/10 V input - 0 V corresponds to reference -100% - 5 V corresponds to reference 0% - 10 V corresponds to reference + 100%		[0 - 100%] (POS)
AI4E	**[AI4 Interm.point X]** Input delinearization point coordinate. • 0% corresponds to [Min value] if the range is 0 ➞ 100%. • 0% corresponds to $\frac{\text{[Max value]} + \text{[Min value]}}{2}$ if the range is -100% ➞ + 100%. • 100% corresponds to [Max value].	0 to 100%	0%
AI4S	**[AI4 Interm.point Y]** Output delinearization point coordinate (frequency reference).	0 to 100%	0%

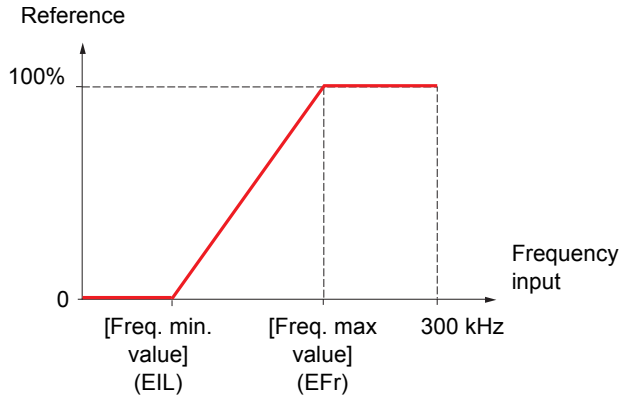
Code	Name/Description	Adjustment range	Factory setting
PLI-	**■ [RP CONFIGURATION]** Can be accessed if VW3A3202 option card has been inserted		
PIA	**❑ [RP assignment]** Read-only parameter, cannot be configured. It displays all the functions associated with the Pulse In input in order to check, for example, for compatibility problems.		
PIL	**❑ [RP min value]** Frequency corresponding to the minimum speed	-30.00 to 30.00 kHz	0
PFr	**❑ [RP max value]** Frequency corresponding to the maximum speed	0 to 30.00 kHz	30.00 kHz
PFI	**❑ [RP filter]** Interference filtering.	0 to 1000 ms	0

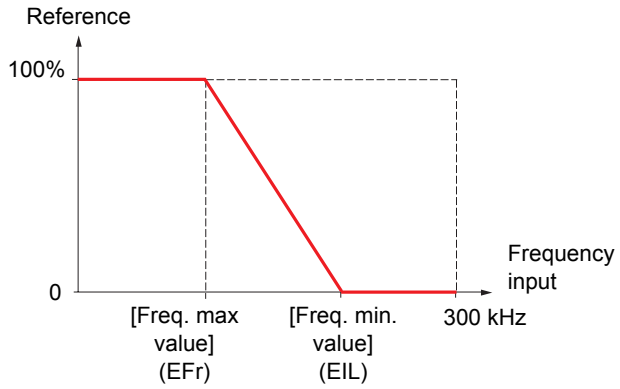
Configuration of the encoder input serving as a reference, with a frequency generator

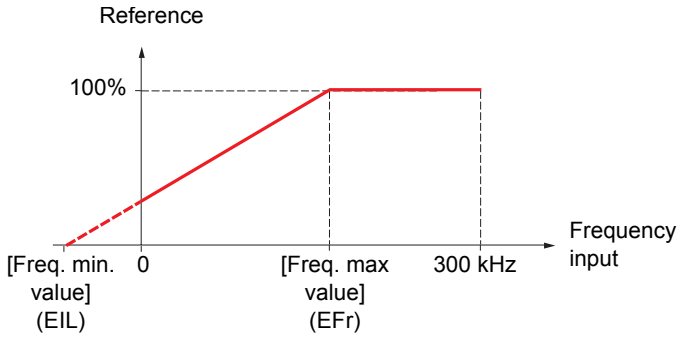
This reference is not signed, therefore the directions of operation must be given via the control channel (logic inputs, for example).

Minimum and maximum values (input values):

The minimum value corresponds to a minimum reference of 0% and the maximum value to a maximum reference of 100%. The minimum value may be greater than the maximum value. It may also be negative.







A reference can be obtained at zero frequency by assigning a negative value to the minimum value.

[1.5 INPUTS / OUTPUTS CFG] (I-O-)

The encoder configuration can also be accessed in the [1.4 MOTOR CONTROL] (drC-) menu.

Code	Name/Description	Adjustment range	Factory setting
IEn-	**[ENCODER CONFIGURATION]** The encoder parameters can only be accessed if the encoder card has been inserted, and the available selections will depend on the type of encoder card used.		
EnS	**[Encoder type]** The parameter can be accessed if an encoder card has been inserted. To be configured in accordance with the type of encoder used. nO **[----]** (nO): Card missing. AAbb **[AABB]** (AAbb): For signals A, A-, B, B-. Ab **[AB]** (Ab): For signals A, B. A **[A]** (A): For signal A. Value cannot be accessed if [Encoder usage] (EnU) page 94 = [Spd fdk reg.] (rEG).		[AABB] (AAbb)
EnC	**[Encoder check]** Check encoder feedback. See procedure page 74. The parameter can be accessed if an encoder card has been inserted and if [Encoder usage] (EnU) page 94 is not [Speed ref.] (PGr). nO **[Not done]** (nO) Check not performed. YES **[Yes]** (YES): Activates monitoring of the encoder. dOnE **[Done]** (dOnE): Check performed successfully. The check procedure checks: - The direction of rotation of the encoder/motor, - The presence of signals (wiring continuity), - The number of pulses/revolution. If a fault is detected, the drive locks in [Encoder fault] (EnF) fault mode.		[Not done] (nO)

Code	Name/Description	Adjustment range	Factory setting
	[ENCODER CONFIGURATION] (continued)		
EnU	**[Encoder usage]**		[No] (nO)
	The parameter can be accessed if an encoder card has been inserted. ☐ **[No]** (nO): Function inactive. In this case, the other parameters cannot be accessed. ☐ **[Fdbk monit.]** (SEC): The encoder provides speed feedback for monitoring only. ☐ **[Spd fdk reg.]** (rEG): The encoder provides speed feedback for regulation and monitoring. This configuration is automatic if the drive has been configured for closed-loop operation and is only possible in this type of operation. ☐ **[Speed ref.]** (PGr): The encoder provides a reference.		
PGI	**[Number of pulses]**	100 to 5000	1024
	Number of pulses per encoder revolution. The parameter can be accessed if an encoder card has been inserted.		
PGA	**[Reference type]**		[Encoder] (EnC)
	The parameter can be accessed if [Encoder usage] (EnU) = [Speed ref.] (PGr). ☐ **[Encoder]** (EnC): Use of an encoder. ☐ **[Freq. gen.]** (PtG): Use of a frequency generator (unsigned reference).		
EIL	**[Freq. min. value]**	-300 to 300 kHz	0
	The parameter can be accessed if [Encoder usage] (EnU) = [Speed ref.] (PGr) and if [Reference type] (PGA) = [Freq. gen.] (PtG). Frequency corresponding to the minimum speed		
EFr	**[Freq. max value]**	0.00 to 300 kHz	300 kHz
	The parameter can be accessed if [Encoder usage] (EnU) = [Speed ref.] (PGr) and if [Reference type] (PGA) = [Freq. gen.] (PtG). Frequency corresponding to the maximum speed		
EFI	**[Freq. signal filter]**	0 to 1000 ms	0
	The parameter can be accessed if [Encoder usage] (EnU) = [Speed ref.] (PGr). Interference filtering.		

Code	Name/Description	Adjustment range	Factory setting
r 1-	**[R1 CONFIGURATION]**		
r 1	**[R1 Assignment]**		[No drive flt] (FLt)
nO	☐ **[No]** (nO): **Not assigned**		
FLt	☐ **[No drive flt]** (FLt): Drive not faulty (relay normally energized, and de-energized if there is a fault)		
rUn	☐ **[Drv running]** (rUn): Drive running		
FtA	☐ **[Freq. Th. attain.]** (FtA): Frequency threshold reached		
FLA	☐ **[HSP attain.]** (FLA): High speed reached		
CtA	☐ **[I attained]** (CtA): Current threshold reached		
SrA	☐ **[Freq.ref.att]** (SrA): Frequency reference reached		
tSA	☐ **[Th.mot. att.]** (tSA): Motor 1 thermal state reached		
PEE	☐ **[PID error al.]** (PEE): PID error alarm		
PFA	☐ **[PID fdbk al.]** (PFA): PID feedback alarm		
AP2	☐ **[AI2 AI. 4-20]** (AP2): Alarm indicating absence of 4-20 mA signal on input AI2		
F2A	☐ **[Freq. Th. 2 attain.]** (F2A): Frequency threshold 2 reached		
tAd	☐ **[Th.drv.att.]** (tAd): Drive thermal state reached		
tS2	☐ **[Th.mot2 att.]** (tS2): Motor 2 thermal state reached		
tS3	☐ **[Th.mot3 att.]** (tS3): Motor 3 thermal state reached		
AtS	☐ **[Neg Torque]** (AtS): Negative torque (braking)		
CnF0	☐ **[Cnfg.0 act.]** (CnF0): Configuration 0 active		
CnF1	☐ **[Cnfg.1 act.]** (CnF1): Configuration 1 active		
CnF2	☐ **[Cnfg.2 act.]** (CnF2): Configuration 2 active		
CFP1	☐ **[Set 1 active]** (CFP1): Parameter set 1 active		
CFP2	☐ **[Set 2 active]** (CFP2): Parameter set 2 active		
CFP3	☐ **[Set 3 active]** (CFP3): Parameter set 3 active		
dbL	☐ **[DC charged]** (dbL): DC bus loading		
brS	☐ **[In braking]** (brS): Drive braking		
PrM	☐ **[P. removed]** (PRM): Drive locked by "Power removal" input		
MCP	☐ **[I present]** (MCP): Motor current present		
LSA	☐ **[Limit sw. att]** (LSA): Limit switch reached		
AG1	☐ **[Alarm Grp 1]** (AGI): Alarm group 1		
AG2	☐ **[Alarm Grp 2]** (AG2): Alarm group 2		
AG3	☐ **[Alarm Grp 3]** (AG3): Alarm group 3		
P1A	☐ **[PTC1 alarm]** (P1A): Probe alarm 1		
P2A	☐ **[PTC2 alarm]** (P2A): Probe alarm 2		
PLA	☐ **[LI6=PTC al.]** (PLA): LI6 = PTC probe alarms		
EFA	☐ **[Ext. fault al]** (EFA): External fault alarm		
USA	☐ **[Under V. al.]** (USA): Undervoltage alarm		
UPA	☐ **[Underv. prev.]** (UPA): Undervoltage warning		
AnA	☐ **[slipping al.]** (AnA): Slipping alarm		
tHA	☐ **[AI. °C drv]** (tHA): Drive overheating		
bSA	☐ **[Load mvt al]** (bSA): Braking speed alarm		
bCA	☐ **[Brk cont. al]** (bCA): Brake contact alarm		
SSA	☐ **[Lim T/I att.]** (SSA): Torque limit alarm		
rtA	☐ **[Trq. ctrl. al.]** (rtA): Torque control alarm		
tJA	☐ **[IGBT al.]** (tJA): IGBT alarm		
bOA	☐ **[Brake R. al.]** (bOA): Braking resistor temperature alarm		
APA	☐ **[Option al]** (APA): Alarm generated by the Controller Inside card		
AP3	☐ **[AI3 AI. 4-20]** (AP3): Alarm indicating absence of 4-20 mA signal on input AI3		
AP4	☐ **[AI4 AI. 4-20]** (AP4): Alarm indicating absence of 4-20 mA signal on input AI4		
rdY	☐ **[Ready]** (rdY): Drive ready		

Code	Name/Description	Adjustment range	Factory setting
	[R1 CONFIGURATION] (continued)		
r1d	**[R1 Delay time]**	0 to 9999 ms	0
	The change in state only takes effect once the configured time has elapsed, when the information becomes true. The delay cannot be set for the [No drive flt] (FLt) assignment, and remains at 0.		
r1S	**[R1 Active at]**		[1] (1)
POS nEG	Configuration of the operating logic: ☐ **[1]**: State 1 when the information is true ☐ **[0]**: State 0 when the information is true Configuration [1] (1) cannot be modified for the [No drive flt] (FLt) assignment.		
r1H	**[R1 Holding time]**	0 to 9999 ms	0
	The change in state only takes effect once the configured time has elapsed, when the information becomes false. The holding time cannot be set for the [No drive flt] (FLt) assignment, and remains at 0.		
r2-	**[R2 CONFIGURATION]**		
r2	**[R2 Assignment]**		[No] (nO)
	Identical to R1 (see page 95) with the addition of (shown for information only as these selections can only be configured in the [APPLICATION FUNCT.] (Fun-)) menu: ☐ **[Brk control]** (bLC): Brake contactor control ☐ **[Input cont.]** (LLC): Line contactor control ☐ **[Output cont.]** (OCC): Output contactor control ☐ **[Spool end]** (EbO): Spool end (traverse control function) ☐ **[Sync wobbl]** (tSY): "Counter wobble" synchronization ☐ **[DC charging]** (dCO): DC bus precharging contactor control		
r2d	**[R2 Delay time]**	0 to 9999 ms	0
	The delay cannot be set for the [No drive flt] (FLt), [Brk control] (bLC), [Output cont.] (OCC), [DC charging] (dCO), and [Input cont.] (LLC) assignments and remains at 0. The change in state only takes effect once the configured time has elapsed, when the information becomes true.		
r2S	**[R2 Active at]**		[1] (1)
POS nEG	Configuration of the operating logic: ☐ **[1]**: State 1 when the information is true ☐ **[0]**: State 0 when the information is true The configuration [1] (1) cannot be modified for the [No drive flt] (FLt), [Brk control] (bLC), [DC charging] (dCO), and [Input cont.] (LLC) assignments.		
r2H	**[R2 Holding time]**	0 to 9999 ms	0
	The holding time cannot be set for the [No drive flt] (FLt), [Brk control] (bLC), [DC charging] (dCO), and [Input cont.] (LLC) assignments and remains at 0. The change in state only takes effect once the configured time has elapsed, when the information becomes false.		

Code	Name/Description	Adjustment range	Factory setting
r 3 -	**■ [R3 CONFIGURATION]** Can be accessed if a VW3A3201 option card has been inserted		
r 3	**❑ [R3 Assignment]** Identical to R2		[No] (nO)
r 3 d	**❑ [R3 Delay time]** The delay cannot be set for the [No drive flt] (FLt), [Brk control] (bLC), [Output cont.] (OCC), [DC charging] (dCO), and [Input cont.] (LLC) assignments, and remains at 0. The change in state only takes effect once the configured time has elapsed, when the information becomes true.	0 to 9999 ms	0
r 3 S POS nEG	**❑ [R3 Active at]** Configuration of the operating logic: ☐ **[1]**: State 1 when the information is true ☐ **[0]**: State 0 when the information is true The configuration [1] (1) cannot be modified for the [No drive flt] (FLt), [Brk control] (bLC), [DC charging] (dCO), and [Input cont.] (LLC) assignments.		[1] (1)
r 3 H	**❑ [R3 Holding time]** The holding time cannot be set for the [No drive flt] (FLt), [Brk control] (bLC), [DC charging] (dCO), and [Input cont.] (LLC) assignments and remains at 0. The change in state only takes effect once the configured time has elapsed, when the information becomes false.	0 to 9999 ms	0
r 4 -	**■ [R4 CONFIGURATION]** Can be accessed if a VW3A3202 option card has been inserted		
r 4	**❑ [R4 Assignment]** Identical to R2 (see page 96).		[No] (nO)
r 4 d	**❑ [R4 Delay time]** The delay cannot be set for the [No drive flt] (FLt), [Brk control] (bLC), [Output cont.] (OCC), [DC charging] (dCO), and [Input cont.] (LLC) assignments, and remains at 0. The change in state only takes effect once the configured time has elapsed, when the information becomes true.	0 to 9999 ms	0
r 4 S POS nEG	**❑ [R4 Active at]** Configuration of the operating logic: ☐ **[1]**: State 1 when the information is true ☐ **[0]**: State 0 when the information is true The configuration [1] (1) cannot be modified for the [No drive flt] (FLt), [Brk control] (bLC), [DC charging] (dCO), and [Input cont.] (LLC) assignments.		[1] (1)
r 4 H	**❑ [R4 Holding time]** The holding time cannot be set for the [No drive flt] (FLt), [Brk control] (bLC), [DC charging] (dCO), and [Input cont.] (LLC) assignments and remains at 0. The change in state only takes effect once the configured time has elapsed, when the information becomes false.	0 to 9999 ms	0

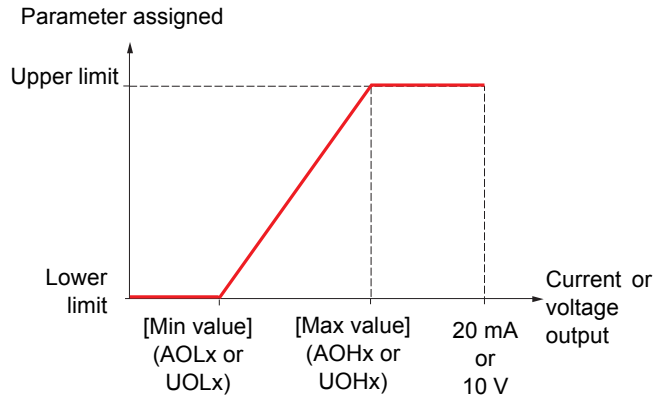
Code	Name/Description	Adjustment range	Factory setting
LO1-	**[LO1 CONFIGURATION]** Can be accessed if a VW3A3201 option card has been inserted		
LO1	**[LO1 assignment]** Identical to R1 (see page 95) with the addition of (shown for information only as these selections can only be configured in the [APPLICATION FUNCT.] (Fun-) menu): ☐ **[Brk control]** (bLC): Brake contactor control ☐ **[Input cont.]** (LLC): Line contactor control ☐ **[Output cont.]** (OCC): Output contactor control ☐ **[Spool end]** (EbO): Spool end (traverse control function) ☐ **[Sync wobbl]** (tSY): "Counter wobble" synchronization ☐ **[DC charging]** (dCO): DC bus precharging contactor control bLC LLC OCC EbO tSY dCO		[No] (nO)
LO1d	**[LO1 delay time]** The delay cannot be set for the [No drive flt] (FLt), [Brk control] (bLC), [Output cont.] (OCC), [DC charging] (dCO), and [Input cont.] (LLC) assignments, and remains at 0. The change in state only takes effect once the configured time has elapsed, when the information becomes true.	0 to 9999 ms	0
LO1S	**[LO1 active at]** Configuration of the operating logic: ☐ **[1]**: State 1 when the information is true ☐ **[0]**: State 0 when the information is true The configuration [1] (1) cannot be modified for the [No drive flt] (FLt), [Brk control] (bLC), [DC charging] (dCO), and [Input cont.] (LLC) assignments. POS nEG		[1] (1)
LO1H	**[LO1 holding time]** The holding time cannot be set for the [No drive flt] (FLt), [Brk control] (bLC), [DC charging] (dCO), and [Input cont.] (LLC) assignments and remains at 0. The change in state only takes effect once the configured time has elapsed, when the information becomes false.	0 to 9999 ms	0
LO2-	**[LO2 CONFIGURATION]** Can be accessed if a VW3A3201 option card has been inserted		
LO2	**[LO2 assignment]** Identical to LO1.		[No] (nO)
LO2d	**[LO2 delay time]** The delay cannot be set for the [No drive flt] (FLt), [Brk control] (bLC), [Output cont.] (OCC), [DC charging] (dCO), and [Input cont.] (LLC) assignments, and remains at 0. The change in state only takes effect once the configured time has elapsed, when the information becomes true.	0 to 9999 ms	0
LO2S	**[LO2 active at]** Configuration of the operating logic: ☐ **[1]**: State 1 when the information is true ☐ **[0]**: State 0 when the information is true The configuration [1] (1) cannot be modified for the [No drive flt] (FLt), [Brk control] (bLC), [DC charging] (dCO), and [Input cont.] (LLC) assignments. POS nEG		[1] (1)
LO2H	**[LO2 holding time]** The holding time cannot be set for the [No drive flt] (FLt), [Brk control] (bLC), [DC charging] (dCO), and [Input cont.] (LLC) assignments and remains at 0. The change in state only takes effect once the configured time has elapsed, when the information becomes false.	0 to 9999 ms	0

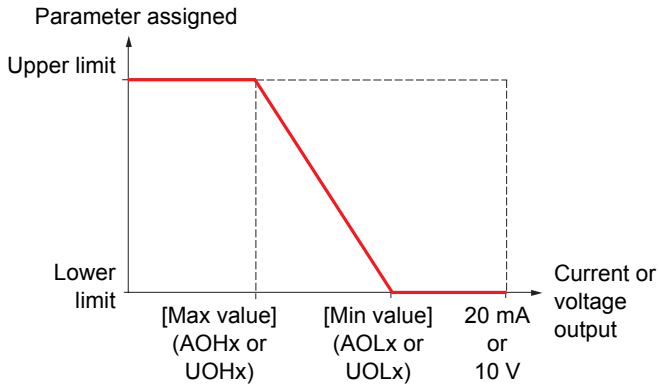
Code	Name/Description	Adjustment range	Factory setting
LO3-	**[LO3 CONFIGURATION]** Can be accessed if a VW3A3202 option card has been inserted		
LO3	**[LO3 assignment]** Identical to LO1 (see page 98).		[No] (nO)
LO3d	**[LO3 delay time]** The delay cannot be set for the [No drive flt] (FLt), [Brk control] (bLC), [Output cont.] (OCC), [DC charging] (dCO), and [Input cont.] (LLC) assignments, and remains at 0. The change in state only takes effect once the configured time has elapsed, when the information becomes true.	0 to 9999 ms	0
LO3S POS nEG	**[LO3 active at]** Configuration of the operating logic: ☐ **[1]**: State 1 when the information is true ☐ **[0]**: State 0 when the information is true The configuration [1] (1) cannot be modified for the [No drive flt] (FLt), [Brk control] (bLC), [DC charging] (dCO), and [Input cont.] (LLC) assignments.		[1] (1)
LO3H	**[LO3 holding time]** The holding time cannot be set for the [No drive flt] (FLt), [Brk control] (bLC), [DC charging] (dCO), and [Input cont.] (LLC) assignments and remains at 0. The change in state only takes effect once the configured time has elapsed, when the information becomes false.	0 to 9999 ms	0
LO4-	**[LO4 CONFIGURATION]** Can be accessed if a VW3A3202 option card has been inserted		
LO4	**[LO4 assignment]** Identical to LO1 (see page 98).		[No] (nO)
LO4d	**[LO4 delay time]** The delay cannot be set for the [No drive flt] (FLt), [Brk control] (bLC), [Output cont.] (OCC), [DC charging] (dCO), and [Input cont.] (LLC) assignments, and remains at 0. The change in state only takes effect once the configured time has elapsed, when the information becomes true.	0 to 9999 ms	0
LO4S POS nEG	**[LO4 active at]** Configuration of the operating logic: ☐ **[1]**: State 1 when the information is true ☐ **[0]**: State 0 when the information is true The configuration [1] (1) cannot be modified for the [No drive flt] (FLt), [Brk control] (bLC), [DC charging] (dCO), and [Input cont.] (LLC) assignments.		[1] (1)
LO4H	**[LO4 holding time]** The holding time cannot be set for the [No drive flt] (FLt), [Brk control] (bLC), [DC charging] (dCO), and [Input cont.] (LLC) assignments and remains at 0. The change in state only takes effect once the configured time has elapsed, when the information becomes false.	0 to 9999 ms	0

Configuration of analog outputs

Minimum and maximum values (output values):

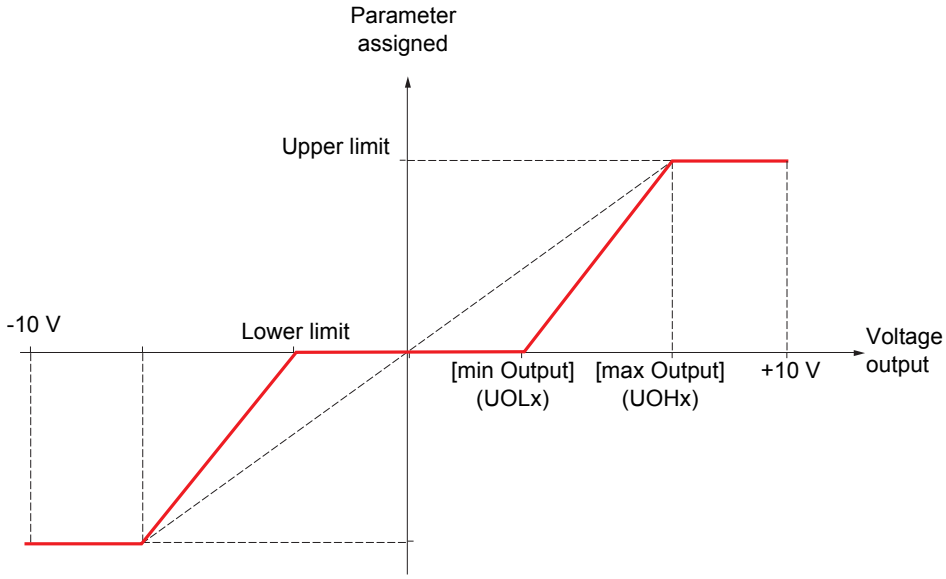
The minimum output value, in volts or mA, corresponds to the lower limit of the assigned parameter and the maximum value corresponds to its upper limit. The minimum value may be greater than the maximum value:





Outputs AO2 and AO3 configured as bipolar outputs:

The [min Output] (UOLx) and [max Output] (UOHx) parameters are absolute values, although they function symmetrically. In the case of bipolar outputs, always set the maximum value higher than the minimum value.



Code	Name/Description	Adjustment range	Factory setting
AO1-	**[AO1 CONFIGURATION]**		
AO1	**[AO1 assignment]**		[Motor freq.] (OFr)
	☐ **[No]** (nO): Not assigned ☐ **[I motor]** (OCr): Current in the motor, between 0 and 2 In (In = rated drive current indicated in the installation manual and on the drive nameplate). ☐ **[Motor freq.]** (OFr): Output frequency, between 0 and [Max frequency] (tFr) ☐ **[Ramp out.]** (OrP): Between 0 and [Max frequency] (tFr) ☐ **[Motor torq.]** (trq): Motor torque, between 0 and 3 times the rated motor torque ☐ **[Sign. torque]** (Stq): Signed motor torque, between -3 and +3 times the rated motor torque ☐ **[sign ramp]** (OrS): Signed ramp output, between - [Max frequency] (tFr) and + [Max frequency] (tFr) ☐ **[PID ref.]** (OPS): PID regulator reference [Min PID reference] (PIP1) to [Max PID reference] (PIP2) ☐ **[PID feedback]** (OPF): PID regulator feedback between [Min PID feedback] (PIF1) and [Max PID feedback] (PIF2) ☐ **[PID error]** (OPE): PID regulator error between - 5% and + 5% of ([Max PID feedback] (PIF2) - [Min PID feedback] (PIF1)) ☐ **[PID output]** (OPI): PID regulator output between [Low speed] (LSP) and [High speed] (HSP) ☐ **[Mot. power]** (OPr): Motor power, between 0 and 2.5 times [Rated motor power] (nPr) ☐ **[Mot thermal]** (tHr): Motor thermal state, between 0 and 200% of the rated thermal state ☐ **[Drv thermal]** (tHd): Drive thermal state, between 0 and 200% of the rated thermal state ☐ **[Sign. o/p frq.]** (OFS): Signed output frequency, between - [Max frequency] (tFr) and + [Max frequency] (tFr) ☐ **[Mot therm2]** (tHr2): Thermal state of motor 2, between 0 and 200% of the rated thermal state ☐ **[Mot therm3]** (tHr3): Thermal state of motor 3, between 0 and 200% of the rated thermal state ☐ **[Uns.TrqRef]** (Utr): Torque reference, between 0 and 3 times the rated motor torque ☐ **[Sign trq ref]** (Str): Signed torque reference, between -3 and +3 times the rated motor torque ☐ **[Torque lim.]** (tqL): Torque limit, between 0 and 3 times the rated motor torque ☐ **[Motor volt.]** (UOP): Voltage applied to the motor, between 0 and [Rated motor volt.] (UnS)		
AO1t	**[AO1 Type]**		[Current] (0 A)
	☐ **[Voltage]** (10U): **Voltage output** ☐ **[Current]** (0 A): Current output		
AOL1	**[AO1 min Output]** The parameter can be accessed if [AO1 Type] (AO1t) = [Current] (0 A)	0 to 20.0 mA	0 mA
AOH1	**[AO1 max Output]** The parameter can be accessed if [AO1 Type] (AO1t) = [Current] (0 A)	0 to 20.0 mA	20.0 mA
UOL1	**[AO1 min Output]** The parameter can be accessed if [AO1 Type] (AO1t) = [Voltage] (10U)	0 to 10.0 V	0 V
UOH1	**[AO1 max Output]** The parameter can be accessed if [AO1 Type] (AO1t) = [Voltage] (10U)	0 to 10.0 V	10.0 V
AO1F	**[AO1 Filter]** Interference filtering.	0 to 10.00 s	0 s

Code	Name/Description	Adjustment range	Factory setting
AO2-	**[AO2 CONFIGURATION]** Can be accessed if a VW3A3202 option card has been inserted		
AO2	**[AO2 assignment]** Same assignments as AO1		[No] (nO)
AO2t 10U 0A n10U	**[AO2 Type]** ☐ **[Voltage]** (10U): Voltage output ☐ **[Current]** (0 A): Current output ☐ **[Voltage +/-]** (n10U): Bipolar voltage output		[Current] (0 A)
AOL2	**[AO2 min Output]** The parameter can be accessed if [AO2 Type] (AO2t) = [Current] (0 A)	0 to 20.0 mA	0 mA
AOH2	**[AO2 max Output]** The parameter can be accessed if [AO2 Type] (AO2t) = [Current] (0 A)	0 to 20.0 mA	20.0 mA
UOL2	**[AO2 min Output]** The parameter can be accessed if [AO2 Type] (AO2t) = [Voltage] (10U) or [Voltage +/-] (n10U)	0 to 10.0 V	0 V
UOH2	**[AO2 max Output]** The parameter can be accessed if [AO2 Type] (AO2t) = [Voltage] (10U) or [Voltage +/-] (n10U)	0 to 10.0 V	10.0 V
AO2F	**[AO2 Filter]** Interference filtering.	0 to 10.00 s	0 s
AO3-	**[AO3 CONFIGURATION]** Can be accessed if a VW3A3202 option card has been inserted		
AO3	**[AO3 assignment]** Same assignments as AO1		[No] (nO)
AO3t 10U 0A n10U	**[AO3 Type]** ☐ **[Voltage]** (10U): Voltage output ☐ **[Current]** (0 A): Current output ☐ **[Voltage +/-]** (n10U): Bipolar voltage output		[Current] (0 A)
AOL3	**[AO3 min Output]** The parameter can be accessed if [AO3 Type] (AO3t) = [Current] (0 A)	0 to 20.0 mA	0 mA
AOH3	**[AO3 max Output]** The parameter can be accessed if [AO3 Type] (AO3t) = [Current] (0 A)	0 to 20.0 mA	20.0 mA
UOL3	**[AO3 min Output]** The parameter can be accessed if [AO3 Type] (AO3t) = [Voltage] (10U) or [Voltage +/-] (n10U)	0 to 10.0 V	0 V
UOH3	**[AO3 max Output]** The parameter can be accessed if [AO3 Type] (AO3t) = [Voltage] (10U) or [Voltage +/-] (n10U)	0 to 10.0 V	10.0 V
AO3F	**[AO3 Filter]** Interference filtering.	0 to 10.00 s	0 s

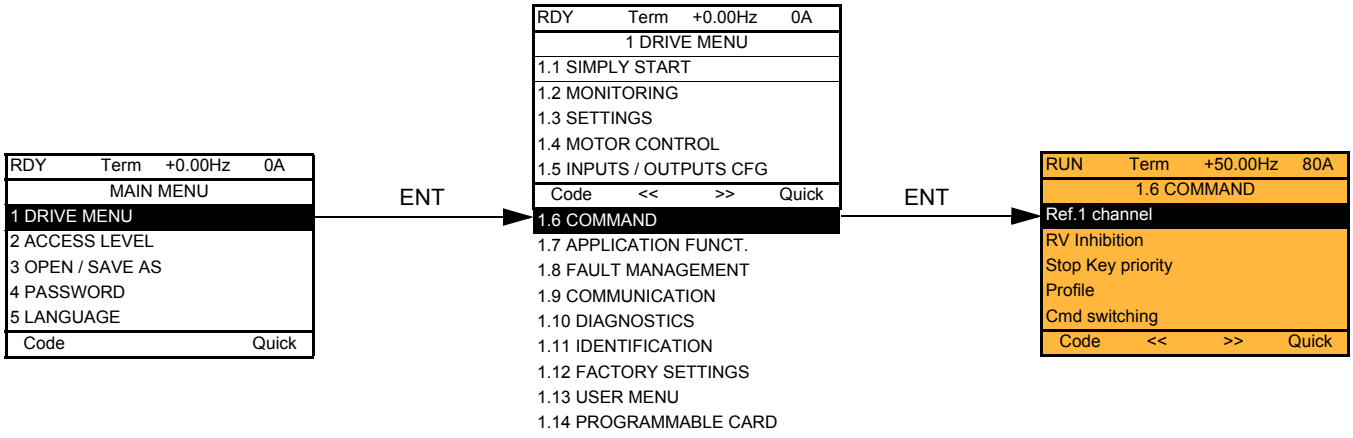
[1.5 INPUTS / OUTPUTS CFG] (I-O-)

The following submenus group the alarms into 1 to 3 groups, each of which can be assigned to a relay or a logic output for remote signaling. These groups can also be displayed on the graphic display terminal (see [6 MONITORING CONFIG.] menu) and viewed via the [1.2 MONITORING](SUP) menu.
When one or a number of alarms selected in a group occurs, this alarm group is activated.

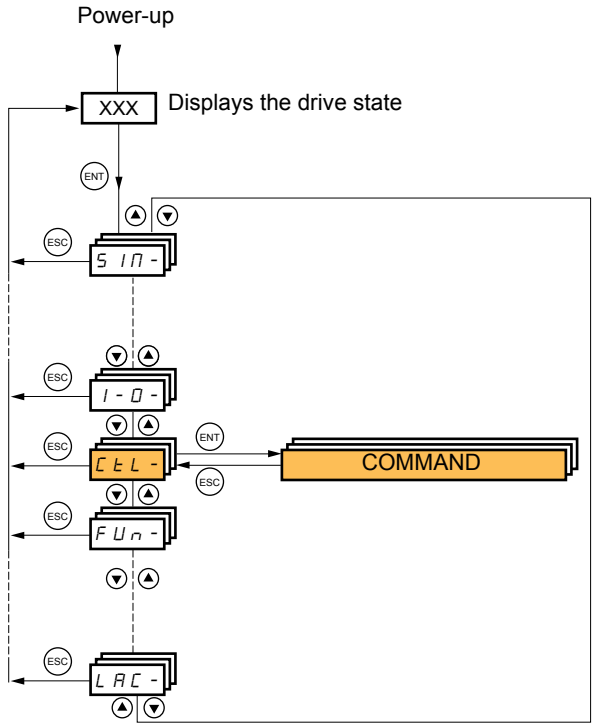
Code	Name/Description	Adjustment range	Factory setting
A1C-	**[ALARM GRP1 DEFINITION]**		
	Selection to be made from the following list: ☐ **[LI6=PTC al.]** (PLA): LI6 = PTC probe alarms ☐ **[PTC1 alarm]** (P1A): Probe alarm 1 ☐ **[PTC2 alarm]** (P2A): Probe alarm 2 ☐ **[Ext. fault al]** (EFA): External fault alarm ☐ **[Under V. al.]** (USA): Undervoltage alarm ☐ **[slipping al.]** (AnA): Slipping alarm ☐ **[I attained]** (CtA): Current threshold reached ☐ **[Freq. Th. attain.]** (FtA): Frequency threshold reached ☐ **[Freq. Th. 2 attain.]** (F2A): Frequency threshold 2 reached ☐ **[Freq.ref.att]** (SrA): Frequency reference reached ☐ **[Th.mot. att.]** (tSA): Motor 1 thermal state reached ☐ **[Th.mot2 att.]** (tS2): Motor 2 thermal state reached ☐ **[Th.mot3 att.]** (tS3): Motor 3 thermal state reached ☐ **[Underv. prev.]** (UPA): Undervoltage warning ☐ **[HSP attain.]** (FLA): High speed reached ☐ **[AI. °C drv]** (tHA): Drive overheating ☐ **[Load mvt al]** (bSA): Braking speed alarm ☐ **[Brk cont. al]** (bCA): Brake contact alarm ☐ **[PID error al.]** (PEE): PID error alarm ☐ **[PID fdbk al.]** (PFA): PID feedback alarm ☐ **[AI2 AI. 4-20]** (AP2): Alarm indicating absence of 4-20 mA signal on input AI2 ☐ **[AI3 AI. 4-20]** (AP3): Alarm indicating absence of 4-20 mA signal on input AI3 ☐ **[AI4 AI. 4-20]** (AP4): Alarm indicating absence of 4-20 mA signal on input AI4 ☐ **[Lim T/I att.]** (SSA): Torque limit alarm ☐ **[Th.drv.att.]** (tAd): Drive thermal state reached ☐ **[IGBT alarm]** (tJA): IGBT alarm ☐ **[Torque Control al.]** (rtA): Torque control alarm ☐ **[Brake R. al.]** (bOA): Braking resistor temperature alarm ☐ **[Option alarm]** (APA): Alarm generated by an option card. ☐ **[Regen. underV. al.]** (UrA): Reserved. See the multiple selection procedure on page 26 for the integrated display terminal, and page 17 for the graphic display terminal.		
A2C-	**[ALARM GRP2 DEFINITION]**		
	Identical to [ALARM GRP 1 DEFINITION] (A1C-)		
A3C-	**[ALARM GRP3 DEFINITION]**		
	Identical to [ALARM GRP 1 DEFINITION] (A1C-)		

[1.6 COMMAND] (CtL-)

With graphic display terminal:



With integrated display terminal:



[1.6 COMMAND] (CtL-)

The parameters in the [1.6 COMMAND] (CtL) menu can only be modified when the drive is stopped and no run command is present.

Command and reference channels

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

Command	Reference
• Terminals: Logic inputs LI • Graphic display terminal • Integrated Modbus • Integrated CANopen • Communication card • Controller Inside card	• Terminals: Analog inputs AI, frequency input, encoder • Graphic display terminal • Integrated Modbus • Integrated CANopen • Communication card • Controller Inside card • +/- speed via the terminals • +/- speed via the graphic display terminal

The behavior of the Altivar 71 can be adapted according to requirements:

- [8 serie] (SE8): To replace an Altivar 58. See the migration manual.
- [Not separ.] (SIM): Command and reference are sent via the same channel.
- [Separate] (SEP): 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 parameters manual). The application functions cannot be accessed via the communication interface.

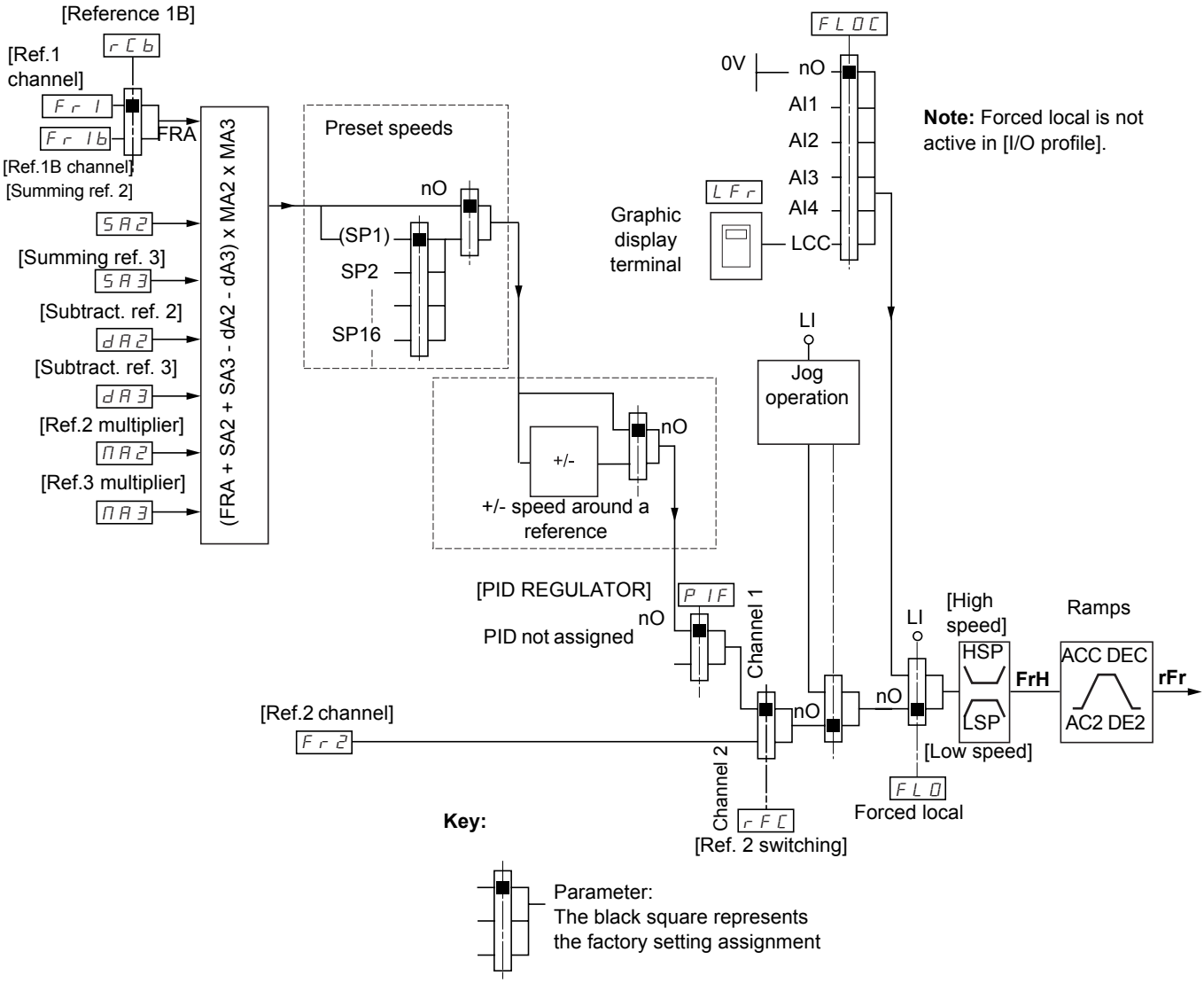
- [I/O profile] (IO): Command and reference may be sent via different channels. This configuration both simplifies and extends use via the communication interface.
  Commands may be sent via the logic inputs on the terminals or via the communication bus.
  When commands are sent via a bus, they are available on a word, which acts as virtual terminals containing only logic 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 terminals remain active even if the terminals are not the active command channel.

Note: The integrated Modbus channel has 2 physical communication ports:
- The Modbus network port
- The Modbus HMI port

The drive does not differentiate between these two ports, but recognizes the graphic display terminal irrespective of the port to which it is connected.

Reference channel for [Not separ.] (SIM), [Separate] (SEP) and [I/O profile] (IO) configurations, PID not configured



References

Fr1, SA2, SA3, dA2, dA3, MA2, MA3:

- Terminals, graphic display terminal, integrated Modbus, integrated CANopen, communication card, Controller Inside card

Fr1b, for SEP and IO:

- Terminals, graphic display terminal, integrated Modbus, integrated CANopen, communication card, Controller Inside card

Fr1b, for SIM:

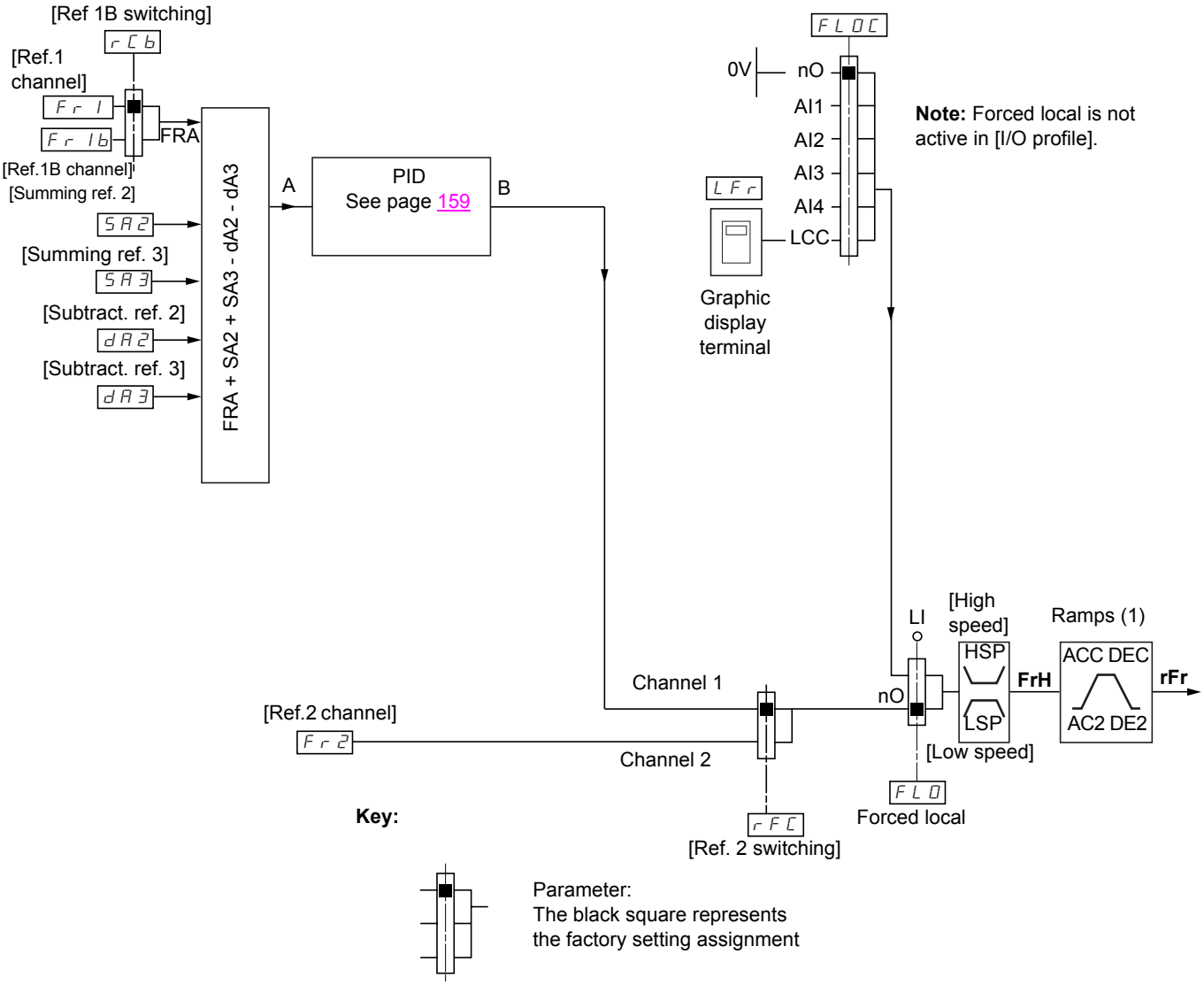
- Terminals, only accessible if Fr1 = terminals

Fr2:

- Terminals, graphic display terminal, integrated Modbus, integrated CANopen, communication card, Controller Inside card, **and +/- speed**

Note: [Ref.1B channel] (Fr1b) and [Ref 1B switching] (rCb) must be configured in the [APPLICATION FUNCT.] (Fun-) menu.

Reference channel for [Not separ.] (SIM), [Separate] (SEP) and [I/O profile] (IO) configurations, PID configured with PID references at the terminals



References

Fr1:

- Terminals, graphic display terminal, integrated Modbus, integrated CANopen, communication card, Controller Inside card

Fr1b, for SEP and IO:

- Terminals, graphic display terminal, integrated Modbus, integrated CANopen, communication card, Controller Inside card

Fr1b, for SIM:

- Terminals, only accessible if Fr1 = terminals

SA2, SA3, dA2, dA3:

- Terminals only

Fr2:

- Terminals, graphic display terminal, integrated Modbus, integrated CANopen, communication card, Controller Inside card, **and +/- speed**

(1) Ramps not active if the PID function is active in automatic mode.

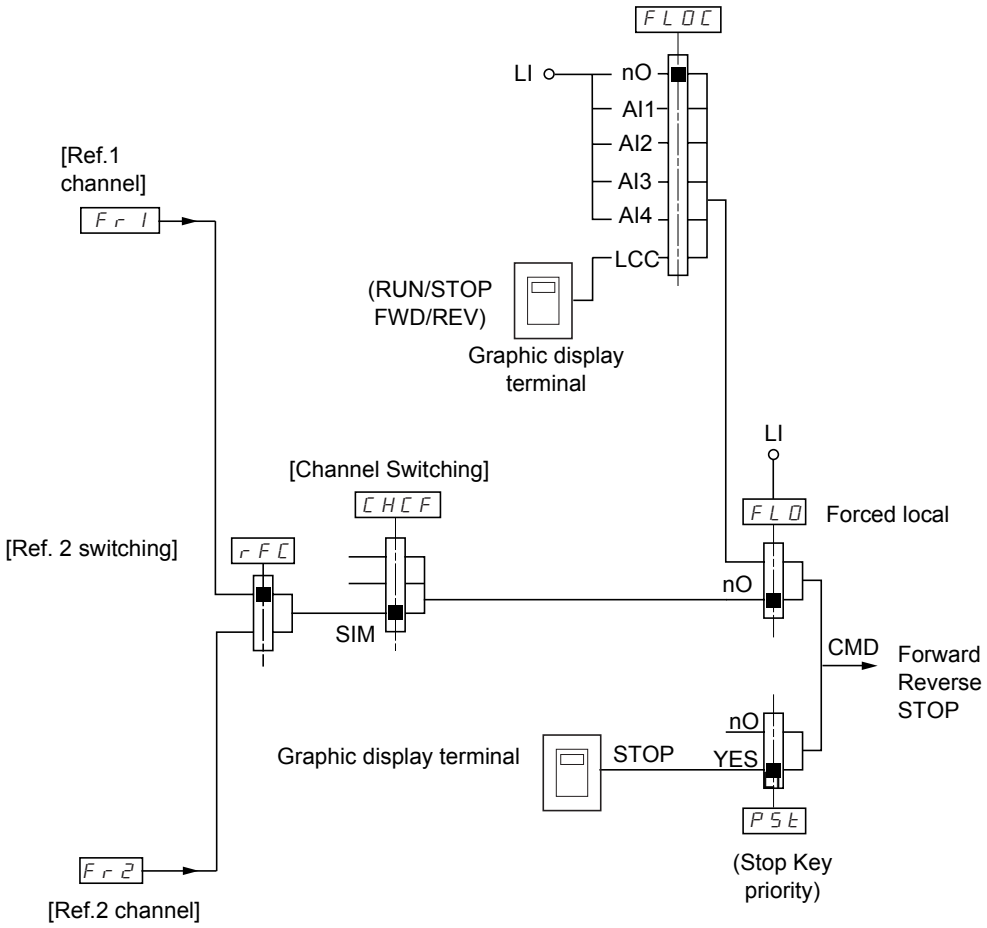
Note: [Ref.1B channel] (Fr1b) and [Ref 1B switching] (rCb) must be configured in the [APPLICATION FUNCT.] (Fun-) menu.

Command channel for [Not separ.] (SIM) configuration

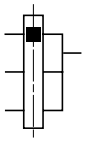
Reference and command, not separate

The command channel is determined by the reference channel. Parameters Fr1, Fr2, rFC, FLO and FLOC are common to reference and command.

Example: If the reference is Fr1 = AI1 (analog input at the terminals), control is via LI (logic input at the terminals).



Key:



Parameter:
The black square represents the factory setting assignment.

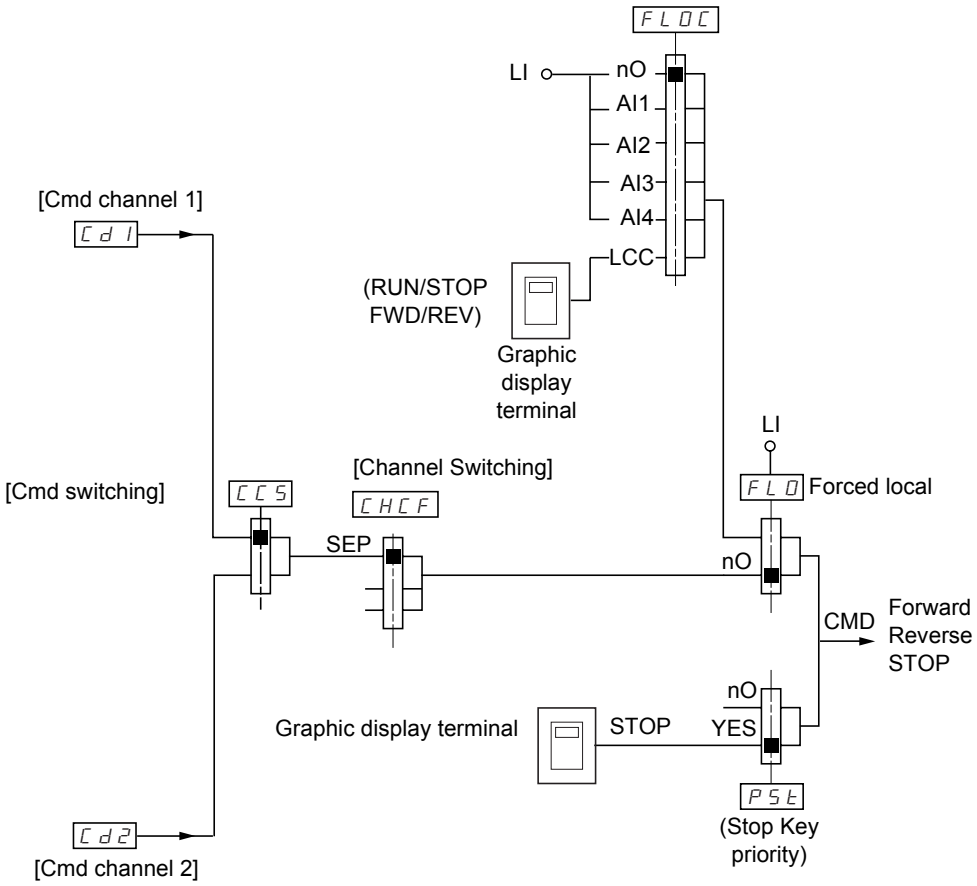
Command channel for [Separate] (SEP) configuration

Separate reference and command

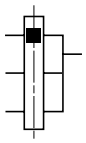
Parameters FLO and FLOC are common to reference and command.

Example: If the reference is in forced local mode via AI1 (analog input at the terminals), command in forced local mode is via LI (logic input at the terminals).

The command channels Cd1 and Cd2 are independent of the reference channels Fr1, Fr1b and Fr2.



Key:



Parameter:
The black rectangle represents the factory setting assignment, except for [Channel Switching].

Commands

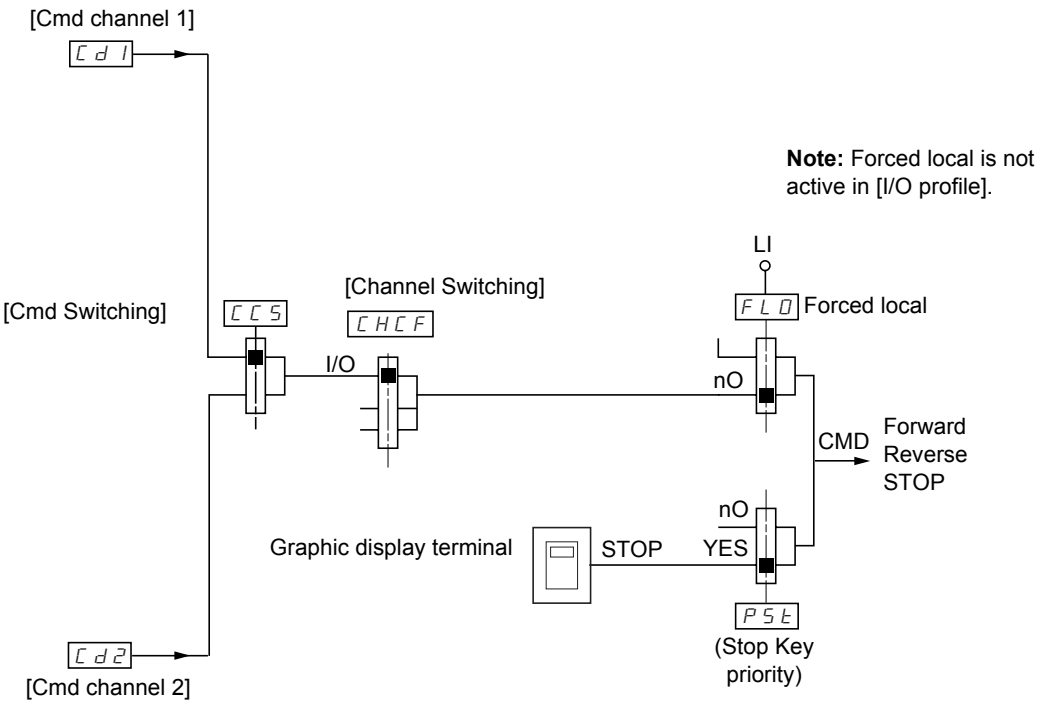
Cd1, Cd2:

- Terminals, graphic display terminal, integrated Modbus, integrated CANopen, communication card, Controller Inside card

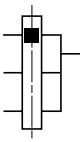
Command channel for [I/O profile] (IO) configuration

Separate reference and command, as in [Separate] (SEP) configuration

The command channels Cd1 and Cd2 are independent of the reference channels Fr1, Fr1b and Fr2.



Key:



Parameter:
The black rectangle represents the factory setting assignment, except for [Channel Switching].

Commands

Cd1, Cd2:

- Terminals, graphic display terminal, integrated Modbus, integrated CANopen, communication card, Controller Inside card

Command channel for [I/O profile] (IO) configuration

Selection of a command channel:

A command or an action can be assigned:

- To a fixed channel by selecting an LI input or a Cxxx bit:
  - By selecting e.g., LI3, this action will always be triggered by LI3 regardless of which command channel is switched.
  - By selecting e.g., C214, this action will always be triggered by integrated CANopen with bit 14 regardless of which command channel is switched.

- To a switchable channel by selecting a CDxx bit:
  - By selecting e.g., CD11, this action will be triggered by:
    LI12 if the terminals channel is active,
    C111 if the integrated Modbus channel is active,
    C211 if the integrated CANopen channel is active,
    C311 if the communication card channel card is active,
    C411 if the Controller Inside card channel is active.

If the active channel is the graphic display terminal, the functions and commands assigned to CDxx switchable internal bits are inactive.

Note:

- CD14 and CD15 can only be used for switching between 2 networks. They do not have equivalent logic inputs.

Terminals	Integrated Modbus	Integrated CANopen	Communication card	Controller Inside card	Internal bit, can be switched
					CD00
LI2 (1)	C101 (1)	C201 (1)	C301 (1)	C401 (1)	CD01
LI3	C102	C202	C302	C402	CD02
LI4	C103	C203	C303	C403	CD03
LI5	C104	C204	C304	C404	CD04
LI6	C105	C205	C305	C405	CD05
LI7	C106	C206	C306	C406	CD06
LI8	C107	C207	C307	C407	CD07
LI9	C108	C208	C308	C408	CD08
LI10	C109	C209	C309	C409	CD09
LI11	C110	C210	C310	C410	CD10
LI12	C111	C211	C311	C411	CD11
LI13	C112	C212	C312	C412	CD12
LI14	C113	C213	C313	C413	CD13
-	C114	C214	C314	C414	CD14
-	C115	C215	C315	C415	CD15

(1) If [2/3 wire control] (tCC) page 82 = [3 wire] (3C), LI2, C101, C201, C301, and C401 cannot be accessed.

Assignment conditions for logic inputs and control bits

The following elements are available for every command or function that can be assigned to a logic input or a control bit:

[LI1] (LI1) to [LI6] (LI6)	Drive with or without option
[LI7] (LI7) to [LI10] (LI10)	With VW3A3201 logic I/O card
[LI11] (LI11) to [LI14] (LI14)	With VW3A3202 extended I/O card
[C101] (C101) to [C110] (C110)	With integrated Modbus in [I/O profile] (IO) configuration
[C111] (C111) to [C115] (C115)	With integrated Modbus regardless of configuration
[C201] (C201) to [C210] (C210)	With integrated CANopen in [I/O profile] (IO) configuration
[C211] (C211) to [C215] (C215)	With integrated CANopen regardless of configuration
[C301] (C301) to [C310] (C310)	With a communication card in [I/O profile] (IO) configuration
[C311] (C311) to [C315] (C315)	With a communication card regardless of configuration
[C401] (C401) to [C410] (C410)	With Controller Inside card in [I/O profile] (IO) configuration
[C411] (C411) to [C415] (C415)	With Controller Inside card regardless of configuration
[CD00] (Cd00) to [CD10] (Cd10)	In [I/O profile] (IO) configuration
[CD11] (Cd11) to [CD15] (Cd15)	Regardless of configuration

Note: In [I/O profile] (IO) configuration, LI1 cannot be accessed and if [2/3 wire control] (tCC) page 82 = [3 wire] (3C), LI2, C101, C201, C301, and C401 cannot be accessed either.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

Inactive communication channels are not monitored (no lock following malfunction in the event of a communication bus failure). Make sure that the commands and functions assigned to bits C101 to C415 will not pose a risk in the event of the failure of the associated communication bus.

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

Code	Name/Description	Adjustment range	Factory setting
Fr1	❑ **[Ref.1 chan]**		[AI1] (AI1)
AI1	☐ **[AI1]** (AI1): Analog input		
AI2	☐ **[AI2]** (AI2): Analog input		
AI3	☐ **[AI3]** (AI3): Analog input, if VW3A3202 extension card has been inserted		
AI4	☐ **[AI4]** (AI4): Analog input, if VW3A3202 extension card has been inserted		
LCC	☐ **[HMI]** (LCC): Graphic display terminal		
Mdb	☐ **[Modbus]** (Mdb): Integrated Modbus		
CAn	☐ **[CANopen]** (CAn): Integrated CANopen		
nEt	☐ **[Com. card]** (nEt): Communication card (if inserted)		
APP	☐ **[Prog. card]** (APP): Controller Inside card (if inserted)		
PI	☐ **[RP]** (PI): Frequency input, if VW3A3202 extension card has been inserted		
PG	☐ **[Encoder ref]** (PG): Encoder input, if encoder card has been inserted.		
rIn	❑ **[RV Inhibition]**		[No] (nO)
nO	☐ **[No]** (nO)		
YES	☐ **[Yes]** (YES) Inhibition of movement in reverse direction, does not apply to direction requests sent by logic inputs. - Reverse direction requests sent by logic inputs are taken into account. - Reverse direction requests sent by the graphic display terminal are not taken into account. - Reverse direction requests sent by the line are not taken into account. - Any reverse speed reference originating from the PID, summing input, etc., is interpreted as a zero reference.		
PSt	❑ **[Stop Key priority]**		[Yes] (YES)
nO	☐ **[No]** (nO)		
YES	☐ **[Yes]** (YES): Gives priority to the STOP key on the graphic display terminal when the graphic display terminal is not enabled as the command channel. Press and hold down ENT for 2 seconds in order for any change in the assignment of [Stop Key priority] (PSt) to be taken into account. This will be a freewheel stop. If the active command channel is the graphic display terminal, the stop will be performed according to the [Type of stop] (Stt) page 128 irrespective of the configuration of [Stop Key priority] (PSt).		
CHCF	❑ **[Profile]**		[Not separ.] (SIM)
SE8	☐ **[8 serie]** (SE8): ATV58 interchangeability (see migration manual). The [8 serie] (SE8) configuration is used to load, via PowerSuite, for example, an ATV58 drive configuration in an ATV71 that has already been set to this configuration. This assignment cannot be accessed if a Controller Inside card has been inserted. ☞ **Note:** Modifications to the configuration of the ATV71 must only be made using PowerSuite when it is in this configuration, otherwise operation cannot be guaranteed.		
SIM	☐ **[Not separ.]** (SIM): Reference and command, not separate		
SEP	☐ **[Separate]** (SEP): Separate reference and command This assignment cannot be accessed in [I/O profile] (IO)		
IO	☐ **[I/O profile]** (IO): I/O profile When [8 serie] (SE8) is selected and [I/O profile] (IO) is deselected, the drive automatically returns to the factory setting (this is mandatory). This factory setting only affects the [1 DRIVE MENU] menu. It does not affect either [1.9 COMMUNICATION] or [1.14 PROGRAMMABLE CARD]. - With the graphic display terminal, a screen appears to perform this operation. Follow the instructions on the screen. - With the integrated display terminal, press ENT and hold it down (for 2 s). This will save the selection and return to the factory setting.		

[1.6 COMMAND] (CtL-)

Code	Name/Description	Adjustment range	Factory setting
CCS	❑ **[Cmd switching]**		[ch1 active] (Cd1)
	The parameter can be accessed if [Profile] (CHCF) = [Separate] (SEP) or [I/O profile] (IO)		
Cd1	☐ **[ch1 active]** (Cd1): [Cmd channel 1] (Cd1) active (no switching)		
Cd2	☐ **[ch2 active]** (Cd2): [Cmd channel 2] (Cd2) active (no switching)		
LI1	☐ **[LI1]** (LI1)		
-	:		
-	:		
-	☐ **[...]** (...): See the assignment conditions on page 112 (not CDOO to CD14).		
	If the assigned input or bit is at 0, channel [Cmd channel 1] (Cd1) is active.		
	If the assigned input or bit is at 1, channel [Cmd channel 2] (Cd2) is active.		
Cd1	❑ **[Cmd channel 1]**		[Terminals] (tEr)
tEr	☐ **[Terminals]** (tEr): Terminals		
LCC	☐ **[HMI]** (LCC): Graphic display terminal		
Mdb	☐ **[Modbus]** (Mdb): Integrated Modbus		
CAn	☐ **[CANopen]** (CAn): Integrated CANopen		
nEt	☐ **[Com. card]** (nEt): Communication card (if inserted)		
APP	☐ **[Prog. card]** (APP): Controller Inside card (if inserted)		
	The parameter is available if [Profile] (CHCF) = [Separate] (SEP) or [I/O profile] (IO).		
Cd2	❑ **[Cmd channel 2]**		[Modbus] (Mdb)
tEr	☐ **[Terminals]** (tEr): Terminals		
LCC	☐ **[HMI]** (LCC): Graphic display terminal		
Mdb	☐ **[Modbus]** (Mdb): Integrated Modbus		
CAn	☐ **[CANopen]** (CAn): Integrated CANopen		
nEt	☐ **[Com. card]** (nEt): Communication card (if inserted)		
APP	☐ **[Prog. card]** (APP): Controller Inside card (if inserted)		
	The parameter is available if [Profile] (CHCF) = [Separate] (SEP) or [I/O profile] (IO).		
rFC	❑ **[Ref. 2 switching]**		[ch1 active] (Fr1)
Fr1	☐ **[ch1 active]** (Fr1): No switching, [Ref.1 channel] (Fr1) active		
Fr2	☐ **[ch2 active]** (Fr2): No switching, [Ref. 2 channel] (Fr2) active		
LI1	☐ **[LI1]** (LI1)		
-	:		
-	:		
-	☐ **[...]** (...): See the assignment conditions on page 112 (not CDOO to CD14).		
	If the assigned input or bit is at 0, channel [Ref.1 channel] (Fr1) is active.		
	If the assigned bit or input is at 1, channel [Ref. 2 channel] (Fr2) is active.		
Fr2	❑ **[Ref.2 channel]**		[No] (nO)
nO	☐ **[No]** (nO): Not assigned If [Profile] (CHCF) = [Not separ.] (SIM), command is at the terminals with a zero reference. If [Profile] (CHCF) = [Separate] (SEP) or [I/O profile] (IO) , the reference is zero.		
AI1	☐ **[AI1]** (AI1): Analog input		
AI2	☐ **[AI2]** (AI2): Analog input		
AI3	☐ **[AI3]** (AI3): Analog input, if VW3A3202 extension card has been inserted		
AI4	☐ **[AI4]** (AI4): Analog input, if VW3A3202 extension card has been inserted		
UPdt	☐ **[+/- Speed]** (UPdt): +/-Speed command		
LCC	☐ **[HMI]** (LCC): Graphic display terminal		
Mdb	☐ **[Modbus]** (Mdb): Integrated Modbus		
CAn	☐ **[CANopen]** (CAn): Integrated CANopen		
nEt	☐ **[Com. card]** (nEt): Communication card (if inserted)		
APP	☐ **[Prog. card]** (APP): Controller Inside card (if inserted)		
PI	☐ **[RP]** (PI): Frequency input, if VW3A3202 extension card has been inserted		
PG	☐ **[Encoder]** (PG): Encoder input, if encoder card has been inserted		

Code	Name/Description	Adjustment range	Factory setting
COP	❑ **[Copy channel 1 <> 2]**		[No] (nO)

Can be used to copy the current reference and/or the command by means of switching, in order to avoid speed surges, for example.
If [Profile] (CHCF) page 113 = [Not separ.] (SIM) or [Separate] (SEP), copying will only be possible from channel 1 to channel 2.
If [Profile] (CHCF) = [I/O profile] (IO), copying will be possible in both directions.

nO ☐ **[No]** (nO): No copy
SP ☐ **[Reference]** (SP): Copy reference
Cd ☐ **[Command]** (Cd): Copy command
ALL ☐ **[Cmd + ref.]** (ALL): Copy command and reference

- A reference or a command cannot be copied to a channel on the terminals.
- The reference copied is FrH (before ramp) unless the destination channel reference is set via +/- speed. In this case, the reference copied is rFr (after ramp).

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

Copying the command and/or reference can change the direction of rotation.
Check that this is safe.
Failure to follow these instructions can result in death or serious injury.

[1.6 COMMAND] (CtL-)

As the graphic display terminal may be selected as the command and/or reference channel, its action modes can be configured.
The parameters on this page can only be accessed on the graphic display terminal, and not on the integrated display terminal.

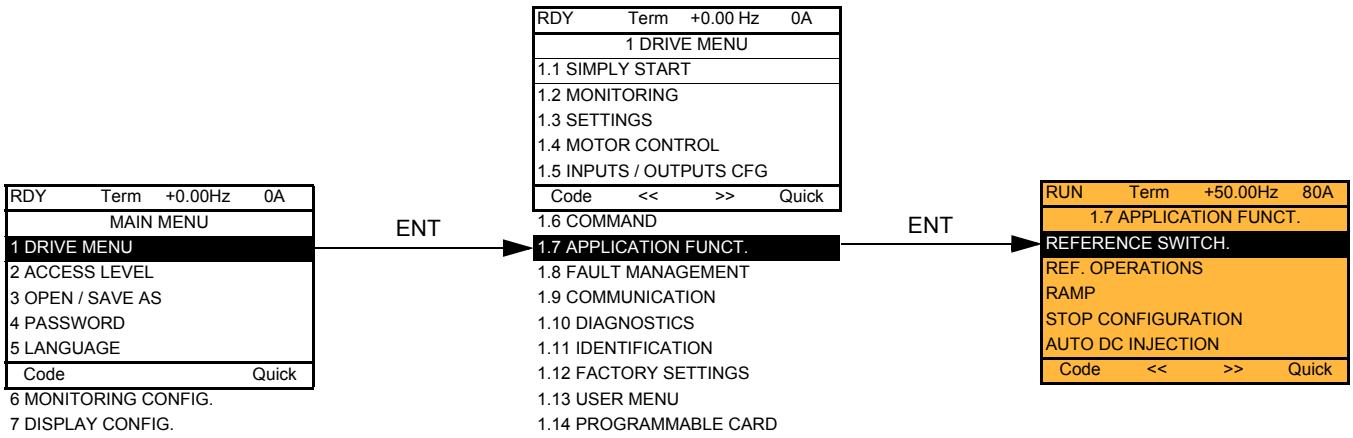
Notes:

- The display terminal command/reference is only active if the command and/or reference channels from the terminal are active with the exception of [T/K] (command via the display terminal), which takes priority over these channels. Press [T/K] (command via the display terminal) again to revert control to the selected channel.
- Command and reference via the display terminal are impossible if the latter is connected to more than one drive.
- The JOG, preset speed and +/- speed functions can only be accessed if [Profile] (CHCF) = [Not separ.] (SIM).
- The preset PID reference functions can only be accessed if [Profile] (CHCF) = [Not separ.] (SIM) or [Separate] (SEP).
- The [T/K] (command via the display terminal) can be accessed regardless of the [Profile] (CHCF).

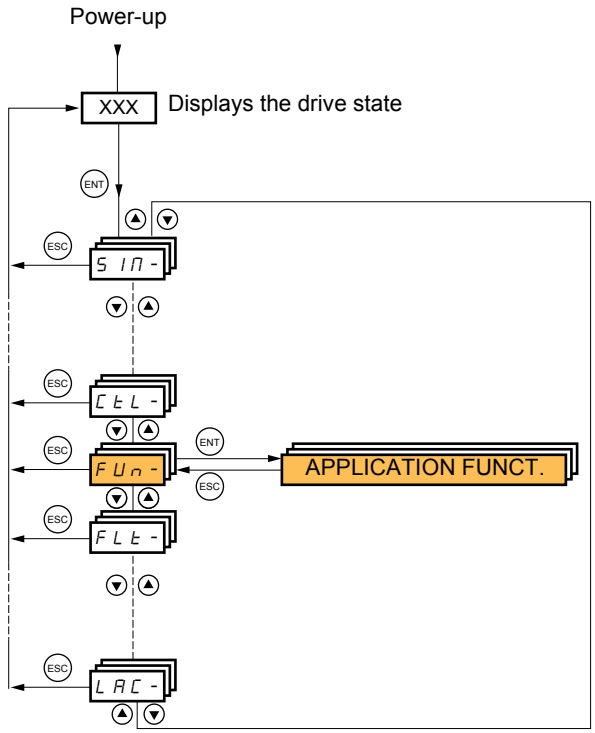
Name/Description	Adjustment range	Factory setting
❑ **[F1 key assignment]**		[No]
☐ **[No]**: Not assigned ☐ **[Jog]**: JOG operation ☐ **[Preset spd2]**: Press the key to run the drive at the 2nd preset speed [Preset spd2] (SP2) page 135. Press STOP to stop the drive. ☐ **[Preset spd3]**: Press the key to run the drive at the 3rd preset speed [Preset spd3] (SP3) page 135. Press STOP to stop the drive. ☐ **[PID ref. 2]**: Sets a PID reference equal to the 2nd preset PID reference [Preset ref. PID 2] (rP2) page 166 without sending a run command. Only operates if [Ref.1 channel] (Fr1) = [HMI] (LCC). Does not operate with the [T/K] function. ☐ **[PID ref. 3]**: Sets a PID reference equal to the 3rd preset PID reference [Preset ref. PID 3] (rP3) page 166 without sending a run command. Only operates if [Ref.1 channel] (Fr1) = [HMI] (LCC). Does not operate with the [T/K] function. ☐ **[+Speed]**: Faster, only operates if [Ref.2 channel] (Fr2) = [HMI] (LCC). Press the key to run the drive and increase the speed. Press STOP to stop the drive. ☐ **[-Speed]**: Slower, only operates if [Ref.2 channel] (Fr2) = [HMI] (LCC) and if a different key has been assigned to [+Speed]. Press the key to run the drive and decrease the speed. Press STOP to stop the drive. ☐ **[T/K]**: Command via the display terminal: Takes priority over [Cmd switching] (CCS) and over [Ref. 2 switching] (rFC).		
❑ **[F2 key assignment]**		[No]
Identical to [F1 key assignment].		
❑ **[F3 key assignment]**		[No]
Identical to [F1 key assignment].		
❑ **[F4 key assignment]**		[No]
Identical to [F1 key assignment].		
❑ **[HMI cmd.]**		[Stop]
When the [T/K] function is assigned to a key and that function is active, this parameter defines the behavior at the moment when control returns to the graphic display terminal. ☐ **[Stop]**: Stops the drive (although the controlled direction of operation and reference of the previous channel are copied (to be taken into account on the next RUN command)). ☐ **[Bumpless]**: Does not stop the drive (the controlled direction of operation and the reference of the previous channel are copied).		

[1.7 APPLICATION FUNCT.] (FUn-)

With graphic display terminal:



With integrated display terminal:



Summary of functions:

Code	Name	Page
rEF-	[REFERENCE SWITCH.]	123
OAI-	[REF. OPERATIONS]	124
rPt-	[RAMP]	125
Stt-	[STOP CONFIGURATION]	128
AdC-	[AUTO DC INJECTION]	130
JOG-	[JOG]	132
PSS-	[PRESET SPEEDS]	134
UPd-	[+/-Speed]	137
SrE-	[+/-SPEED AROUND REF.]	139
SPM-	[MEMO REFERENCE]	140
FLI-	[FLUXING BY LI]	141
LSt-	[LIMIT SWITCHES]	143
bLC-	[BRAKE LOGIC CONTROL]	148
ELM-	[EXTERNAL WEIGHT MEAS.]	154
HSH-	[HIGH SPEED HOISTING]	158
PId-	[PID REGULATOR]	163
PrI-	[PID PRESET REFERENCES]	166
tOr-	[TORQUE CONTROL]	168
tOL-	[TORQUE LIMITATION]	171
CLI-	[2nd CURRENT LIMIT.]	172
LLC-	[LINE CONTACTOR COMMAND]	174
OCC-	[OUTPUT CONTACTOR CMD]	176
LPO-	[POSITIONING BY SENSORS]	179
nLP-	[PARAM. SET SWITCHING]	181
nMC-	[MULTIMOTORS/CONFIG.]	185
tnL-	[AUTO TUNING BY LI]	185
trO-	[TRAVERSE CONTROL]	191
rFt-	[EVACUATION]	193
dCO-	[DC BUS SUPPLY]	194

[1.7 APPLICATION FUNCT.] (FUn-)

The parameters in the [1.7 APPLICATION FUNCT.] (FUn-) menu can only be modified when the drive is stopped and there is no run command, except for parameters with a ↻ symbol in the code column, which can be modified with the drive running or stopped.

☞ **Note: Compatibility of functions**
The choice of application functions may be limited by the number of I/O and by the fact that some functions are incompatible with one another. Functions that are not listed in the table below are fully compatible.
If there is an incompatibility between functions, the first function configured will prevent the others being configured.

Each of the functions on the following pages can be assigned to one of the inputs or outputs.
A single input can activate several functions at the same time (reverse and 2nd ramp, for example). **The user must therefore ensure that these functions can be used at the same time**. It is only possible to assign one input to several functions at [Advanced] (AdU) and [Expert] (EPr) level.

Before assigning a command, reference or function to an input or output, the user must make sure that this input or output has not already been assigned and that another input or output has not been assigned to an incompatible or undesirable function.
The drive factory setting or macro configurations automatically configure functions, **which may prevent other functions being assigned. It may be necessary to unconfigure one or more functions in order to be able to enable another.** Check the compatibility table below.

Compatibility table

	Ref. operations (page 124)	+/- speed (3) (page 137)	Management of limit switches (page 143)	Preset speeds (page 134)	PID regulator (page 163)	Traverse control (page 191)	JOG operation (page 132)	Brake logic control (page 148)	Catch on the fly (page 199)		DC injection stop (page 128)	Fast stop (page 128)	Freewheel stop (page 128)	+/- speed around a reference (page 139)	High speed hoisting (page 158)	Torque control (page 168)	Load sharing (page 78)	Positioning by sensors (page 179)	Synchrononous motor (page 71)
Ref. operations (page 124)				↑	●(4)		↑									●(1)			
+/- speed (3) (page 137)						●	●									●(1)			
Management of limit switches (page 143)					●														
Preset speeds (page 134)	←						↑									●(1)			
PID regulator (page 163)	●(4)		●			●	●	●						●	●	●(1)	●	●	
Traverse control (page 191)		●			●		●							●	●	●(1)			
JOG operation (page 132)	←	●		←	●	●		●						●	●	●(1)			
Brake logic control (page 148)					●		●		●		●					●			●
Catch on the fly (page 199)								●								●(1)			
DC injection stop (page 128)								●				●(2)	↑						●
Fast stop (page 128)											●(2)		↑						
Freewheel stop (page 128)											←	←							
+/- speed around a reference (page 139)					●	●	●									●(1)			
High speed hoisting (page 158)					●	●	●									●		●	
Torque control (page 168)	●(1)	●(1)		●(1)	●(1)	●(1)	●(1)	●	●(1)					●(1)	●		●	●(1)	●
Load sharing (page 78)					●											●			
Positioning by sensors (page 179)					●										●	●(1)			
Synchrononous motor (page 71)								●			●					●			

(1) Torque control and these functions are only incompatible while torque control mode is active.
(2) Priority is given to the first of these two stop modes to be activated.
(3) Excluding special application with reference channel Fr2 (see diagrams on pages 106 and 107).
(4) Only the multiplier reference is incompatible with the PID regulator.

● Incompatible functions Compatible functions N/A

Priority functions (functions, which cannot be active at the same time):

← ↑ The function marked with the arrow takes priority over the other.

Stop functions have priority over run commands.
Speed references via logic command have priority over analog references.

Note: This compatibility table does not affect commands that can be assigned to the keys of the graphic display terminal (see page 116).

Incompatible functions

The following functions will be inaccessible or deactivated in the cases described below:

Automatic restart

This is only possible for control type [2/3 wire control] (tCC) = [2 wire] (2C) and [2 wire type] (tCt) = [Level] (LEL) or [Fwd priority] (PFO). See page 82.

Catch on the fly

This is only possible for control type [2/3 wire control] (tCC) = [2 wire] (2C) and [2 wire type] (tCt) = [Level] (LEL) or [Fwd priority] (PFO). See page 82.
This function is locked if automatic injection on stop [Auto DC injection] (AdC) = [Continuous] (Ct). See page 130.

The SUP- monitoring menu (page 41) can be used to display the functions assigned to each input in order to check their compatibility.

When a function is assigned, a ✓ appears on the graphic display terminal, as illustrated in the example below:

RDY	Term	+0.00Hz	0A
1.7 APPLICATION FUNCT.			
REFERENCE SWITCH.			
REF. OPERATIONS			
RAMP			✓
STOP CONFIGURATION			
AUTO DC INJECTION			
Code	<<	>>	Quick

JOG

If you attempt to assign a function that is incompatible with another function that has already been assigned, an alarm message will appear:

With the graphic display terminal:

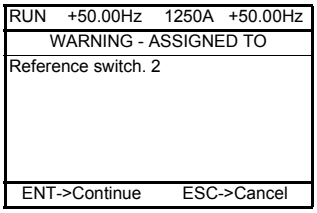
RDY	Term	+0.00Hz	0A
INCOMPATIBILITY			
The function can't be assigned because an incompatible function is already selected. See programming book.			
ENT or ESC to continue			

With the integrated display terminal:
COMP flashes until ENT or ESC is pressed.

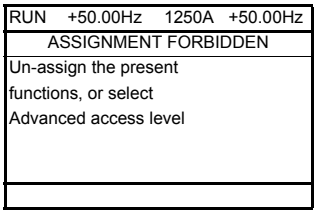
When you assign a logic input, an analog input, a reference channel or a bit to a function, pressing the HELP button will display the functions that may already have been activated by this input, bit or channel.

When a logic input, an analog input, a reference channel or a bit that has already been assigned is assigned to another function, the following screens appear:

With the graphic display terminal:



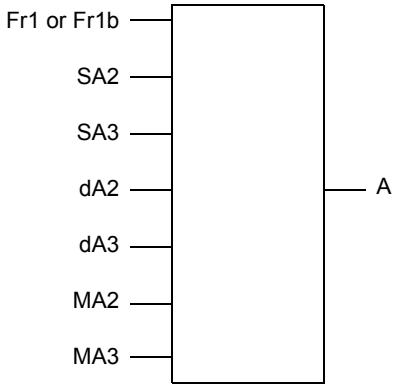
If the access level permits this new assignment, pressing ENT confirms the assignment.
If the access level does not permit this new assignment, pressing ENT results in the following display.



With the integrated display terminal:

The code for the first function, which is already assigned, is displayed flashing.
If the access level permits this new assignment, pressing ENT confirms the assignment.
If the access level does not permit this new assignment, pressing ENT has no effect, and the message continues to flash. It is only possible to exit by pressing ESC.

Summing input/Subtracting input/Multiplier

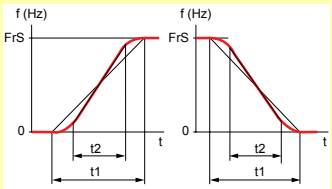
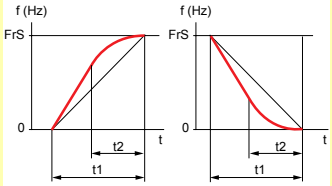
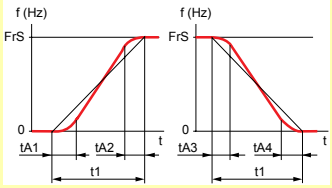


A = (Fr1 or Fr1b + SA2 + SA3 - dA2 - dA3) x MA2 x MA3

- If SA2, SA3, dA2, dA3 are not assigned, they are set to 0.
- If MA2, MA3 are not assigned, they are set to 1.
- A is limited by the minimum LSP and maximum HSP parameters.
- For multiplication, the signal on MA2 or MA3 is interpreted as a %; 100% corresponds to the maximum value of the corresponding input. If MA2 or MA3 is sent via the communication bus or graphic display terminal, an MFr multiplication variable (see page 47) must be sent via the bus or graphic display terminal.
- Reversal of the direction of operation in the event of a negative result can be inhibited (see page 113).

Code	Name/Description	Adjustment range	Factory setting
rEF-	**[REFERENCE SWITCH.]**		
rCb	**[Ref 1B switching]** See the diagrams on pages 106 and 107.		[ch1 active] (Fr1)
Fr1 Fr1b	☐ **[ch1 active]** (Fr1): No switching, [Ref.1 channel] (Fr1) active ☐ **[ch1B active]** (Fr1b): No switching, [Ref.1B channel] (Fr1b) active		
LI1 - - -	☐ **[LI1]** (LI1) : : ☐ **[...]** (...): See the assignment conditions on page 112 (not CDOO to CD14). • If the assigned input or bit is at 0, [Ref.1 channel] (Fr1) is active (see page 113). • If the assigned input or bit is at 1, [Ref.1B channel] (Fr1b) is active. [Ref 1B switching] (rCb) is forced to [ch1 active] (Fr1) if [Profile] (CHCF) = [Not separ.] (SIM) with [Ref.1 channel] (Fr1) assigned via the terminals (analog inputs, encoder, pulse input); see page 113.		
Fr1b	**[Ref.1B channel]**		[No] (nO)
nO AI1 AI2 AI3 AI4 LCC Mdb CAn nEt APP PI PG	☐ **[No]** (nO): Not assigned ☐ **[AI1]** (AI1): Analog input ☐ **[AI2]** (AI2): Analog input ☐ **[AI3]** (AI3): Analog input, if VW3A3202 extension card has been inserted ☐ **[AI4]** (AI4): Analog input, if VW3A3202 extension card has been inserted ☐ **[HMI]** (LCC): Graphic display terminal ☐ **[Modbus]** (Mdb): Integrated Modbus ☐ **[CANopen]** (CAn): Integrated CANopen ☐ **[Com. card]** (nEt): Communication card (if inserted) ☐ **[Prog. card]** (APP): Controller Inside card (if inserted) ☐ **[RP]** (PI): Frequency input, if VW3A3202 extension card has been inserted ☐ **[Encoder]** (PG): Encoder input, if encoder card has been inserted **Note**: In the following instances, only assignments via the terminals are possible: - [Profile] (CHCF) = [Not separ.] (SIM) with [Ref.1 channel] (Fr1) assigned via the terminals (analog inputs, encoder, pulse input); see page 113. - PID configured with PID references via the terminals		

Code	Name/Description	Adjustment range	Factory setting
dA1-	**■ [REF. OPERATIONS]** Reference = (Fr1 or Fr1b + SA2 + SA3 - dA2 - dA3) x MA2 x MA3. See the diagrams on pages 106 and 107. **Note:** This function cannot be used with certain other functions. Follow the instructions on page 118.		
SA2	**❑ [Summing ref. 2]** Selection of a reference to be added to [Ref.1 channel] (Fr1) or [Ref.1B channel] (Fr1b). ☐ **[No]** (nO): No source assigned ☐ **[AI1]** (AI1): Analog input ☐ **[AI2]** (AI2): Analog input ☐ **[AI3]** (AI3): Analog input, if VW3A3202 extension card has been inserted ☐ **[AI4]** (AI4): Analog input, if VW3A3202 extension card has been inserted ☐ **[HMI]** (LCC): Graphic display terminal ☐ **[Modbus]** (Mdb): Integrated Modbus ☐ **[CANopen]** (CAn): Integrated CANopen ☐ **[Com. card]** (nEt): Communication card (if inserted) ☐ **[Prog. card]** (APP): Controller Inside card (if inserted) ☐ **[RP]** (PI): Frequency input, if VW3A3202 extension card has been inserted ☐ **[Encoder]** (PG): Encoder input, if encoder card has been inserted	[No] (nO)	
SA3	**❑ [Summing ref. 3]** Selection of a reference to be added to [Ref.1 channel] (Fr1) or [Ref.1B channel] (Fr1b). • Possible assignments are identical to [Summing ref. 2] (SA2) above.	[No] (nO)	
dA2	**❑ [Subtract ref. 2]** Selection of a reference to be subtracted from [Ref.1 channel] (Fr1) or [Ref.1B channel] (Fr1b). • Possible assignments are identical to [Summing ref. 2] (SA2) above.	[No] (nO)	
dA3	**❑ [Subtract ref. 3]** Selection of a reference to be subtracted from [Ref.1 channel] (Fr1) or [Ref.1B channel] (Fr1b). • Possible assignments are identical to [Summing ref. 2] (SA2) above.	[No] (nO)	
MA2	**❑ [Multiplier ref. 2]** Selection of a multiplier reference [Ref.1 channel] (Fr1) or [Ref.1B channel] (Fr1b). • Possible assignments are identical to [Summing ref. 2] (SA2) above.	[No] (nO)	
MA3	**❑ [Multiplier ref. 3]** Selection of a multiplier reference [Ref.1 channel] (Fr1) or [Ref.1B channel] (Fr1b). • Possible assignments are identical to [Summing ref. 2] (SA2) above.	[No] (nO)	

Code	Name/Description	Adjustment range	Factory setting
rPt-	**[RAMP]**		
rPt LIn S U CUS	**[Ramp type]** ☐ **[Linear]** (LIn) ☐ **[S ramp]** (S) ☐ **[U ramp]** (U) ☐ **[Customized]** (CUS) S ramps  The curve coefficient is fixed, where t2 = 0.6 x t1 and t1 = set ramp time. U ramps  The curve coefficient is fixed, where t2 = 0.5 x t1 and t1 = set ramp time. Customized ramps  tA1: adjustable from 0 to 100% tA2: adjustable from 0 to (100% - tA1) tA3: adjustable from 0 to 100% tA4: adjustable from 0 to (100% - tA3) As a % of t1, where t1 = set ramp time		[Linear] (LIn)
Inr 0.01 0.1 1	**[Ramp increment]** (1) ☐ **[0.01]**: Ramp up to 99.99 seconds ☐ **[0.1]**: Ramp up to 999.9 seconds ☐ **[1]**: Ramp up to 6000 seconds This parameter is valid for [Acceleration] (ACC), [Deceleration] (dEC), [Acceleration 2] (AC2) and [Deceleration 2] (dE2).		[0.1] (0.1)
ACC	**[Acceleration]** (1) Time to accelerate from 0 to the [Rated motor freq.] (FrS) (page 65). Make sure that this value is compatible with the inertia being driven.	0.01 to 6000 s (2)	3.0 s
dEC	**[Deceleration]** (1) Time to decelerate from the [Rated motor freq.] (FrS) (page 65) to 0. Make sure that this value is compatible with the inertia being driven.	0.01 to 6000 s (2)	3.0 s

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.
(2) Range 0.01 to 99.99 s or 0.1 to 999.9 s or 1 to 6000 s according to [Ramp increment] (Inr).

Parameters that can be modified during operation or when stopped.

Code	Name/Description	Adjustment range	Factory setting
	[RAMP] (continued)		
tA1	**[Begin Acc round]** (1) - Rounding of start of acceleration ramp as a % of the [Acceleration] (ACC) or [Acceleration 2] (AC2) ramp time. - Can be set between 0 and 100% - The parameter can be accessed if the [Ramp type] (rPt) is [Customized] (CUS).	0 to 100%	10%
tA2	**[End Acc round]** (1) - Rounding of end of acceleration ramp as a % of the [Acceleration] (ACC) or [Acceleration 2] (AC2) ramp time. - Can be set between 0 and (100% - [Begin Acc round] (tA1)) - The parameter can be accessed if the [Ramp type] (rPt) is [Customized] (CUS).		10%
tA3	**[Begin Dec round]** (1) - Rounding of start of deceleration ramp as a % of the [Deceleration] (dEC) or [Deceleration 2] (dE2) ramp time. - Can be set between 0 and 100% - The parameter can be accessed if the [Ramp type] (rPt) is [Customized] (CUS).	0 to 100%	10%
tA4	**[End Dec round]** (1) - Rounding of end of deceleration ramp as a % of the [Deceleration] (dEC) or [Deceleration 2] (dE2) ramp time. - Can be set between 0 and (100% - [Begin Dec round] (tA3)) - The parameter can be accessed if the [Ramp type] (rPt) is [Customized] (CUS).		10%

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.

Parameters that can be modified during operation or when stopped.

Code	Name/Description	Adjustment range	Factory setting
	[RAMP] (continued)		
FrE	**[Ramp 2 threshold]**	0 to 500 or 1000 Hz according to rating	0 Hz

Ramp switching threshold
The 2nd ramp is switched if the value of Frt is not 0 (0 deactivates the function) and the output frequency is greater than Frt.
Threshold ramp switching can be combined with [Ramp switch ass.] (rPS) switching as follows:

LI or bit	Frequency	Ramp
0	<Frt	ACC, dEC
0	>Frt	AC2, dE2
1	<Frt	AC2, dE2
1	>Frt	AC2, dE2

rPS	**[Ramp switch ass.]**	[No] (nO)

nO ☐ **[No]** (nO): Not assigned.

LI1 ☐ **[LI1]** (LI1)
:
:
- ☐ **[...]** (...): See the assignment conditions on page 112.

- ACC and dEC are enabled when the assigned input or bit is at 0.
- AC2 and dE2 are enabled when the assigned input or bit is at 1.

AC2 ( )	**[Acceleration 2]** (1)	0.01 to 6000 s (2)	5.0 s

Time to accelerate from 0 to the [Rated motor freq.] (FrS). Make sure that this value is compatible with the inertia being driven.
The parameter can be accessed if [Ramp 2 threshold] (Frt) > 0 or if [Ramp switch ass.] (rPS) assigned.

dE2 ( )	**[Deceleration 2]** (1)	0.01 to 6000 s (2)	5.0 s

Time to decelerate from the [Rated motor freq.] (FrS) to 0. Make sure that this value is compatible with the inertia being driven.
The parameter can be accessed if [Ramp 2 threshold] (Frt) > 0 or if [Ramp switch ass.] (rPS) assigned.

brA	**[Dec ramp adapt.]**	[Yes] (YES)

Activating this function automatically adapts the deceleration ramp, if this has been set at too low a value for the inertia of the load.

nO ☐ **[No]** (nO): Function inactive.

YES ☐ **[Yes]** (YES): Function active, for applications that do not require strong deceleration.

The following selections appear depending on the rating of the drive. They enable stronger deceleration to be obtained than with [Yes] (YES).

dYnA ☐ **[High torq. A]** (dYnA)

dYnb ☐ **[High torq. B]** (dYnb)

dYnC ☐ **[High torq. C]** (dYnC)

[Dec ramp adapt.] (brA) is forced to [No] (nO) if brake control [Brake assignment] (bLC) is assigned (page 148), or if [Braking balance] (bbA) page 78 = [Yes] (YES).
The function is incompatible with applications requiring:
- Positioning on a ramp
- The use of a braking resistor (the resistor would not operate correctly)

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.
(2) Range 0.01 to 99.99 s or 0.1 to 999.9 s or 1 to 999 s according to [Ramp increment] (Inr) page 125.

( ) Parameters that can be modified during operation or when stopped.

Code	Name/Description	Adjustment range	Factory setting
StE-	**[STOP CONFIGURATION]** **Note:** Some types of stop cannot be used with all other functions. Follow the instructions on page 118.		
Stt rMP FSt nSt dCI	**[Type of stop]** Stop mode on disappearance of the run command or appearance of a stop command. ☐ **[Ramp stop]** (rMP): On ramp ☐ **[Fast stop]** (FSt): Fast stop ☐ **[Freewheel stop]** (nSt): Freewheel stop ☐ **[DC injection]** (dCI): DC injection stop **Note:** If the "brake logic" function on page 148 has been enabled, only ramp type stops may be configured.		[Ramp stop] (rMP)
nSt nO LI1 - - C101 - - - CD00 -	**[Freewheel stop]** ☐ **[No]** (nO): Not assigned ☐ **[LI1]** (LI1) to **[LI6]** (LI6) ☐ **[LI7]** (LI7) to **[LI10]** (LI10): If VW3A3201 logic I/O card has been inserted ☐ **[LI11]** (LI11) to **[LI14]** (LI14): If VW3A3202 extended I/O card has been inserted ☐ **[C101]** (C101) to **[C115]** (C115): With integrated Modbus in [I/O profile] (IO) ☐ **[C201]** (C201) to **[C215]** (C215): With integrated CANopen in [I/O profile] (IO) ☐ **[C301]** (C301) to **[C315]** (C315): With a communication card in [I/O profile] (IO) ☐ **[C401]** (C401) to **[C415]** (C415): With a Controller Inside card in [I/O profile] (IO) ☐ **[CD00]** (Cd00) to **[CD13]** (Cd13): In [I/O profile] (IO) can be switched with possible logic inputs ☐ **[CD14]** (Cd14) to **[CD15]** (Cd15): In [I/O profile] (IO) can be switched without logic inputs The stop is activated when the input or bit is 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] (tCC) page 82 = [2 wire] (2C) and [2 wire type] (tCt) = [Level] (LEL) or [Fwd priority] (PFO). If not, a new run command must be sent.		[No] (nO)
FSt nO LI1 - - -	**[Fast stop assign.]** **Note:** This function cannot be used with certain other functions. Follow the instructions on page 118. ☐ **[No]** (nO): Not assigned ☐ **[LI1]** (LI1) : : ☐ **[...]** (...): See the assignment conditions on page 112. The stop is activated when the input changes to 0 or the bit changes to 1(bit in [I/O profile] (IO) 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] (tCC) page 82 = [2 wire] (2C) and [2 wire type] (tCt) = [Level] (LEL) or [Fwd priority] (PFO). If not, a new run command must be sent.		[No] (nO)
dCF ( )	**[Ramp divider]** (1) The parameter can be accessed if [Type of stop] (Stt) = [Fast stop] (FSt) and if [Fast stop assign.] (FSt) is not [No] (nO). The ramp that is enabled (dEC or dE2) is then divided by this coefficient when stop requests are sent. Value 0 corresponds to a minimum ramp time.	0 to 10	4

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.

( ) Parameters that can be modified during operation or when stopped.

Code	Name/Description	Adjustment range	Factory setting
	[STOP CONFIGURATION] (continued)		
dCI	**[DC injection assign.]**		[No] (nO)
	Note: This function cannot be used with certain other functions. Follow the instructions on page 118.		
nO	☐ **[No]** (nO): Not assigned		
LI1 - - -	☐ **[LI1]** (LI1) : : ☐ **[...]** (...): See the assignment conditions on page 112.		
	DC injection braking is initiated when the assigned input or bit changes to state 1. If the input returns to state 1 and the run command is still active, the motor will only restart if [2/3 wire control] (tCC) page 82 = [2 wire] (2C) and [2 wire type] (tCt) = [Level] (LEL) or [Fwd priority] (PFO). If not, a new run command must be sent.		
IdC ()	**[DC inject. level 1]** (1) (3)	0.1 to 1.41 In (2)	0.64 In (2)
	Level of DC injection braking current activated via logic input or selected as stop mode. The parameter can be accessed if [Type of stop] (Stt) = [DC injection] (dCI) or if [DC injection assign.] (dCI) is not [No] (nO).		
	CAUTION Check that the motor will withstand this current without overheating. **Failure to follow this instruction can result in equipment damage.**		
tdI ()	**[DC injection time 1]** (1) (3)	0.1 to 30 s	0.5 s
	Maximum current injection time [DC inject. level 1] (IdC). After this time the injection current becomes [DC inject. level 2] (IdC2). The parameter can be accessed if [Type of stop] (Stt) = [DC injection] (dCI) or if [DC injection assign.] (dCI) is not [No] (nO).		
IdC2 ()	**[DC inject. level 2]** (1) (3)	0.1 to 1.41 In (2)	0.5 In (2)
	Injection current activated by logic input or selected as stop mode, once period of time [DC injection time 1] (tdI) has elapsed. The parameter can be accessed if [Type of stop] (Stt) = [DC injection] (dCI) or if [DC injection assign.] (dCI) is not [No] (nO).		
	CAUTION Check that the motor will withstand this current without overheating. **Failure to follow this instruction can result in equipment damage.**		
tdC ()	**[DC injection time 2]** (1) (3)	0.1 to 30 s	0.5 s
	Maximum injection time [DC inject. level 2] (IdC2) for injection, selected as stop mode only. The parameter can be accessed if [Type of stop] (Stt) = [DC injection] (dCI).		

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.
(2) In corresponds to the rated drive current indicated in the installation manual and on the drive nameplate.
(3) Warning: These settings are independent of the [AUTO DC INJECTION] (AdC-) function.

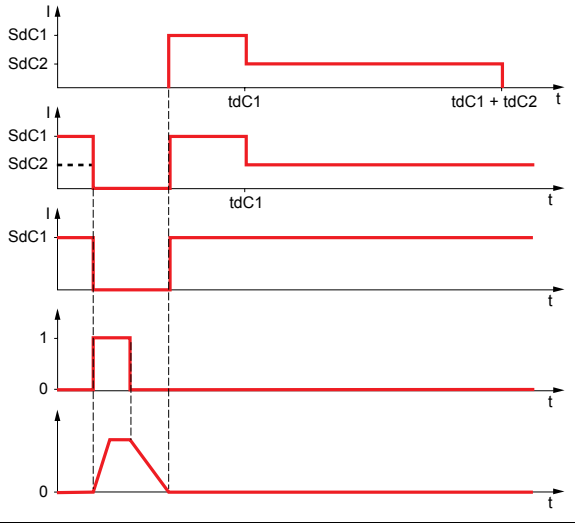
() Parameters that can be modified during operation or when stopped.

Code	Name/Description	Adjustment range	Factory setting
AdC-	**[AUTO DC INJECTION]**		
AdC nO YES Ct	**[Auto DC injection]** Automatic current injection on stopping (at the end of the ramp) ☐ **[No]** (nO): No injection ☐ **[Yes]** (YES): Adjustable injection time ☐ **[Continuous]** (Ct): Continuous standstill injection **Warning**: There is an interlock between this function and [Motor fluxing] (FLU) page 141. If [Motor fluxing] (FLU) = [Continuous] (FCt), [Auto DC injection] (Adc) must be [No] (nO). **Note:** This parameter gives rise to the injection of current even if a run command has not been sent. It can be accessed with the drive running.		[Yes] (YES)
SdC1	**[Auto DC inj. level 1]** (1) Level of standstill DC injection current. The parameter can be accessed if [Auto DC injection] (AdC) is not [No] (nO). This parameter is forced to 0 if [Motor control type] (Ctt) page 67 = [Sync. mot.] (SYn). **CAUTION** Check that the motor will withstand this current without overheating. **Failure to follow this instruction can result in equipment damage.**	0 to 1.2 In (2)	0.7 In (2)
tdC1	**[Auto DC inj. time 1]** (1) Standstill injection time. The parameter can be accessed if [Auto DC injection] (AdC) is not [No] (nO). If [Motor control type] (Ctt) page 67 = [FVC] (FUC) or [Sync. mot.] (SYn) this time corresponds to the zero speed maintenance time.	0.1 to 30 s	0.5 s
SdC2	**[Auto DC inj. level 2]** (1) 2nd level of standstill DC injection current. The parameter can be accessed if [Auto DC injection] (AdC) is not [No] (nO). This parameter is forced to 0 if [Motor control type] (Ctt) page 67 = [Sync. mot.] (SYn). **CAUTION** Check that the motor will withstand this current without overheating. **Failure to follow this instruction can result in equipment damage.**	0 to 1.2 In (2)	0.5 In (2)

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.
(2) In corresponds to the rated drive current indicated in the installation manual and on the drive nameplate.

Parameter that can be modified during operation or when stopped.

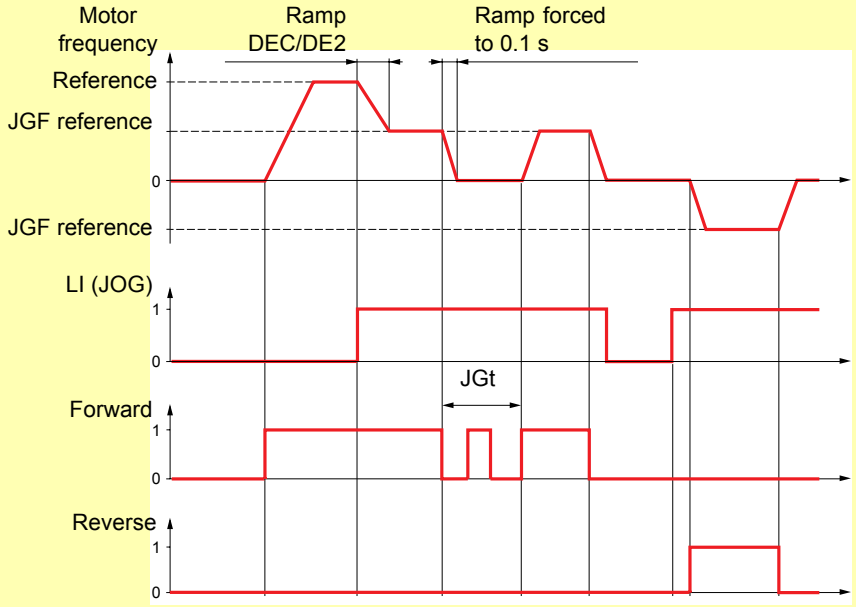
Code	Name/Description	Adjustment range	Factory setting
	[AUTO DC INJECTION] (continued)		
tdC2	**[Auto DC inj. time 2]** (1) 2nd standstill injection time. The parameter can be accessed if [Auto DC injection] (AdC) = [Yes] (YES.)	0 to 30 s	0 s

AdC	SdC2	Operation
YES	x	
Ct	≠ 0	
Ct	= 0	
Run command		
Speed		

Note: When [Motor control type] (Ctt) page 67 = [FVC] (FUC):
[Auto DC inj. level 1] (SdC1), [Auto DC inj. level 2] (SdC2) and [Auto DC inj. time 2] (tdC2) are not accessible. Only [Auto DC inj. time 1] (tdC1) can be accessed. This then corresponds to a zero speed maintenance time.

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.

Parameter that can be modified during operation or when stopped.

Code	Name/Description	Adjustment range	Factory setting
JOG-	**■ [JOG]** **Note:** This function cannot be used with certain other functions. Follow the instructions on page 118.		
JOG	**❑ [JOG]** Pulse operation. **The JOG function is only active if the command channel and the reference channels are on the terminals.** Selecting the assigned logic input or bit activates the function. ☐ **[No]** (nO): Not assigned ☐ **[LI1]** (LI1) to **[LI6]** (LI6) ☐ **[LI7]** (LI7) to **[LI10]** (LI10): If VW3A3201 logic I/O card has been inserted ☐ **[LI11]** (LI11) to **[LI14]** (LI14): If VW3A3202 extended I/O card has been inserted ☐ **[C101]** (C101) to **[C115]** (C115): With integrated Modbus in [I/O profile] (IO) configuration ☐ **[C201]** (C201) to **[C215]** (C215): With integrated CANopen in [I/O profile] (IO) configuration ☐ **[C301]** (C301) to **[C315]** (C315): With a communication card in [I/O profile] (IO) configuration ☐ **[C401]** (C401) to **[C415]** (C415): With a Controller Inside card in [I/O profile] (IO) configuration ☐ **[CD00]** (Cd00) to **[CD13]** (Cd13): In [I/O profile] (IO) configuration can be switched with possible logic inputs ☐ **[CD14]** (Cd14) to **[CD15]** (Cd15): In [I/O profile] (IO) configuration can be switched without logic inputs The function is active when the assigned input or bit is at 1. Example: 2-wire control operation (tCC = 2C)  	[No] (nO)	
nO LI1 - - C101 - - - Cd00 - JGF ↻	**❑ [Jog frequency]** (1) The parameter can be accessed if [JOG] (JOG) is not [No] (nO). Reference in jog operation	0 to 10 Hz	10 Hz
JGt ↻	**❑ [Jog delay]** (1) The parameter can be accessed if [JOG] (JOG) is not [No] (nO). Anti-repeat delay between 2 consecutive jog operations.	0 to 2.0 s	0.5 s

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.

↻ Parameter that can be modified during operation or when stopped.

Preset speeds

2, 4, 8 or 16 speeds can be preset, requiring 1, 2, 3 or 4 logic inputs respectively.

Note: **You must configure 2 and 4 speeds in order to obtain 4 speeds.**
You must configure 2, 4 and 8 speeds in order to obtain 8 speeds.
You must configure 2, 4, 8, and 16 speeds in order to obtain 16 speeds.

Combination table for preset speed inputs

16 speeds LI (PS16)	8 speeds LI (PS8)	4 speeds LI (PS4)	2 speeds LI (PS2)	Speed reference
0	0	0	0	Reference (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) See the diagram on page 106: Reference 1 = (SP1).

Code	Name/Description	Adjustment range	Factory setting
PSS-	**[PRESET SPEEDS]** **Note:** This function cannot be used with certain other functions. Follow the instructions on page 118.		
PS2 nO LI1 - - -	**[2 preset speeds]** ☐ **[No]** (nO): Function inactive ☐ **[LI1]** (LI1) : : ☐ **[...]** (...): See the assignment conditions on page 112.		[LI5] (LI5)
PS4 nO LI1 - - -	**[4 preset speeds]** ☐ **[No]** (nO): Function inactive ☐ **[LI1]** (LI1) : : ☐ **[...]** (...): See the assignment conditions on page 112. To obtain 4 speeds you must also configure 2 speeds.		[LI6] (LI6)
PS8 nO LI1 - - -	**[8 preset speeds]** ☐ **[No]** (nO): Function inactive ☐ **[LI1]** (LI1) : : ☐ **[...]** (...): See the assignment conditions on page 112. To obtain 8 speeds you must also configure 2 and 4 speeds.		[No] (nO)
PS16 nO LI1 - - -	**[16 preset speeds]** ☐ **[No]** (nO): Function inactive ☐ **[LI1]** (LI1) : : ☐ **[...]** (...): See the assignment conditions on page 112. To obtain 16 speeds you must also configure 2, 4 and 8 speeds.		[No] (nO)

Code	Name/Description		Adjustment range	Factory setting
	■ [PRESET SPEEDS] (continued)			
SP2 ( )	❑ [Preset speed 2]	(1)	0 to 1000 Hz	10 Hz
SP3 ( )	❑ [Preset speed 3]	(1)		15 Hz
SP4 ( )	❑ [Preset speed 4]	(1)		20 Hz
SP5 ( )	❑ [Preset speed 5]	(1)		25 Hz
SP6 ( )	❑ [Preset speed 6]	(1)		30 Hz
SP7 ( )	❑ [Preset speed 7]	(1)		35 Hz
SP8 ( )	❑ [Preset speed 8]	(1)		40 Hz
SP9 ( )	❑ [Preset speed 9]	(1)		45 Hz
SP10 ( )	❑ [Preset speed 10]	(1)		50 Hz
SP11 ( )	❑ [Preset speed 11]	(1)		55 Hz
SP12 ( )	❑ [Preset speed 12]	(1)		60 Hz
SP13 ( )	❑ [Preset speed 13]	(1)		70 Hz
SP14 ( )	❑ [Preset speed 14]	(1)		80 Hz
SP15 ( )	❑ [Preset speed 15]	(1)		90 Hz
SP16 ( )	❑ [Preset speed 16]	(1)		100 Hz
	The appearance of these [Preset speed x] (SPx) parameters is determined by the number of speeds configured.			

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.

( ) Parameter that can be modified during operation or when stopped.

+/- speed

Two types of operation are available.

1. **Use of single-press buttons:** Two logic inputs are required in addition to the operating direction(s).
   The input assigned to the "+ speed" command increases the speed, the input assigned to the "- speed" command decreases the speed.

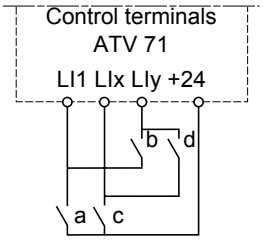
2. **Use of double-press buttons:** Only one logic input assigned to "+ speed" is required.

+/- speed with double-press buttons:

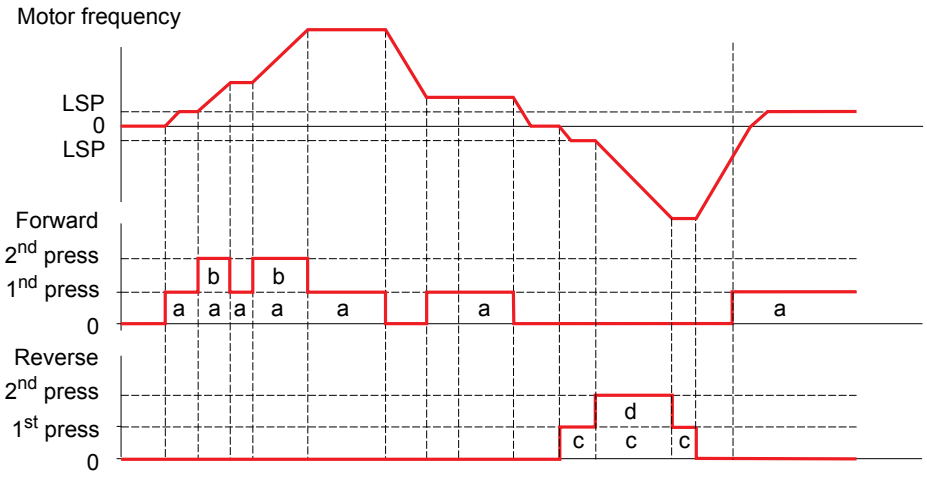
Description: 1 button pressed twice (2 steps) for each direction of rotation. A contact closes each time the button is pressed.

	Released (- speed)	1st press (speed maintained)	2nd press (+ speed)
Forward button	–	a	a and b
Reverse button	–	c	c and d

Example of wiring:



LI1: forward
LIx: reverse
LIy: + speed



Do not use this +/-speed type with 3-wire control.

Whichever type of operation is selected, the max. speed is set by [High speed] (HSP) (see page 40).

Note:
If the reference is switched via rFC (see page 114) from any one reference channel to another reference channel with "+/- speed", the value of reference rFr (after ramp) may be copied at the same time in accordance with the [Copy channel 1<>2] (COP) parameter, see page 115.
If the reference is switched via rFC (see page 114) from one reference channel to any other reference channel with "+/- speed", the value of reference rFr (after ramp) is always copied at the same time.

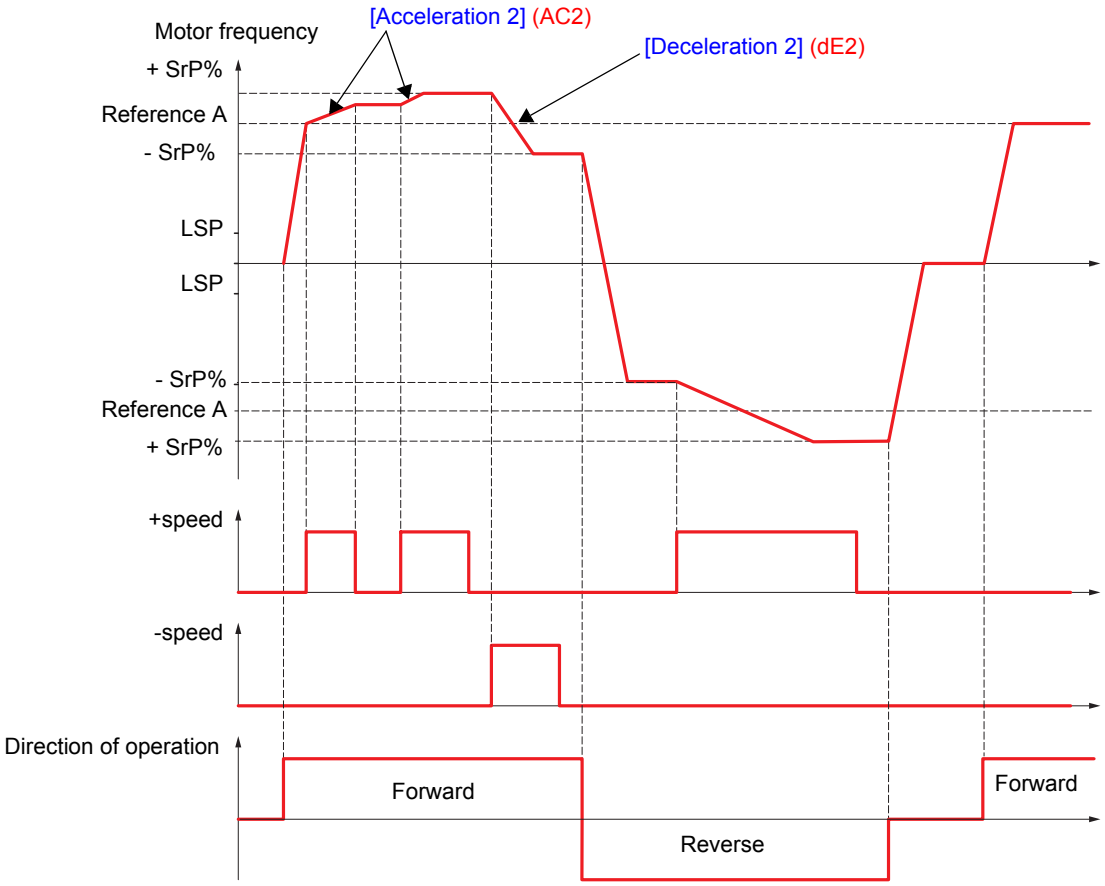
This prevents the speed being incorrectly reset to zero when switching takes place.

Code	Name/Description	Adjustment range	Factory setting
UPd-	**■ [+/-Speed]** Function can be accessed if reference channel [Ref.2 channel] (Fr2) = [+/-Speed] (UPdt), see page 114. **Note:** This function cannot be used with certain other functions. Follow the instructions on page 118.		
USP	**❑ [+ speed assignment]** ☐ **[No]** (nO): Function inactive ☐ **[LI1]** (LI1) to **[LI6]** (LI6) ☐ **[LI7]** (LI7) to **[LI10]** (LI10): If VW3A3201 logic I/O card has been inserted ☐ **[LI11]** (LI11) to **[LI14]** (LI14): If VW3A3202 extended I/O card has been inserted ☐ **[C101]** (C101) to **[C115]** (C115): With integrated Modbus in [I/O profile] (IO) ☐ **[C201]** (C201) to **[C215]** (C215): With integrated CANopen in [I/O profile] (IO) ☐ **[C301]** (C301) to **[C315]** (C315): With a communication card in [I/O profile] (IO) ☐ **[C401]** (C401) to **[C415]** (C415): With a Controller Inside card in [I/O profile] (IO) ☐ **[CD00]** (Cd00) to **[CD13]** (Cd13): In [I/O profile] (IO) can be switched with possible logic inputs ☐ **[CD14]** (Cd14) to **[CD15]** (Cd15): In [I/O profile] (IO) can be switched without logic inputs Function active if the assigned input or bit is at 1.	[No] (nO)	
dSP	**❑ [-Speed assignment]** ☐ **[No]** (nO): Function inactive ☐ **[LI1]** (LI1) to **[LI6]** (LI6) ☐ **[LI7]** (LI7) to **[LI10]** (LI10): If VW3A3201 logic I/O card has been inserted ☐ **[LI11]** (LI11) to **[LI14]** (LI14): If VW3A3202 extended I/O card has been inserted ☐ **[C101]** (C101) to **[C115]** (C115): With integrated Modbus in [I/O profile] (IO) ☐ **[C201]** (C201) to **[C215]** (C215): With integrated CANopen in [I/O profile] (IO) ☐ **[C301]** (C301) to **[C315]** (C315): With a communication card in [I/O profile] (IO) ☐ **[C401]** (C401) to **[C415]** (C415): With a Controller Inside card in [I/O profile] (IO) ☐ **[CD00]** (Cd00) to **[CD13]** (Cd13): In [I/O profile] (IO) can be switched with possible logic inputs ☐ **[CD14]** (Cd14) to **[CD15]** (Cd15): In [I/O profile] (IO) can be switched without logic inputs Function active if the assigned input or bit is at 1.	[No] (nO)	
Str	**❑ [Reference saved]** Associated with the "+/- speed" function, this parameter can be used to save the reference: • When the run commands disappear (saved to RAM) • When the line supply or the run commands disappear (saved to EEPROM) Therefore, the next time the drive starts up, the speed reference is the last reference saved. ☐ **[No]** (nO): No save (the next time the drive starts up, the speed reference is [Low speed] (LSP), see page 40) ☐ **[RAM]** (rAM): Save to RAM ☐ **[EEprom]** (EEP): Save to EEPROM	[No] (nO)	

+/- speed around a reference

The reference is given by Fr1 or Fr1b with summing/subtraction/multiplication functions and preset speeds if relevant (see the diagram on page 106). For improved clarity, we will call this reference A. The action of the +speed and -speed buttons can be set as a % of this reference A. On stopping, the reference (A +/- speed) is not saved, so the drive restarts with reference A only.
The maximum total reference is always limited by [High speed] (HSP) and the minimum reference by [Low speed] (LSP), see page 40.

Example of 2-wire control:



Code	Name/Description	Adjustment range	Factory setting
SrE-	**■ [+/-SPEED AROUND REF.]** The function can be accessed for reference channel [Ref.1 channel] (Fr1). **Note:** This function cannot be used with certain other functions. Follow the instructions on page 118.		
USI nO LI1 - - -	**❑ [+ speed assignment]** ☐ **[No]** (nO): Function inactive ☐ **[LI1]** (LI1) : : ☐ **[...]** (...): See the assignment conditions on page 112. Function active if the assigned input or bit is at 1.		[No] (nO)
dSI nO LI1 - - -	**❑ [-Speed assignment]** ☐ **[No]** (nO): Function inactive ☐ **[LI1]** (LI1) : : ☐ **[...]** (...): See the assignment conditions on page 112. Function active if the assigned input or bit is at 1.		[No] (nO)
SrP ( )	**❑ [+/-Speed limitation]** This parameter limits the variation range with +/- speed as a % of the reference. The ramps used in this function are [Acceleration 2] (AC2) and [Deceleration 2] (dE2). The parameter can be accessed if +/- speed is assigned.	0 to 50%	10%
AC2	**❑ [Acceleration 2]** (1) Time to accelerate from 0 to the [Rated motor freq.] (FrS). Make sure that this value is compatible with the inertia being driven. The parameter can be accessed if +/- speed is assigned.	0.01 to 6000 s (2)	5.0 s
dE2	**❑ [Deceleration 2]** (1) Time to decelerate from the [Rated motor freq.] (FrS) to 0. Make sure that this value is compatible with the inertia being driven. The parameter can be accessed if +/- speed is assigned.	0.01 to 6000 s (2)	5.0 s

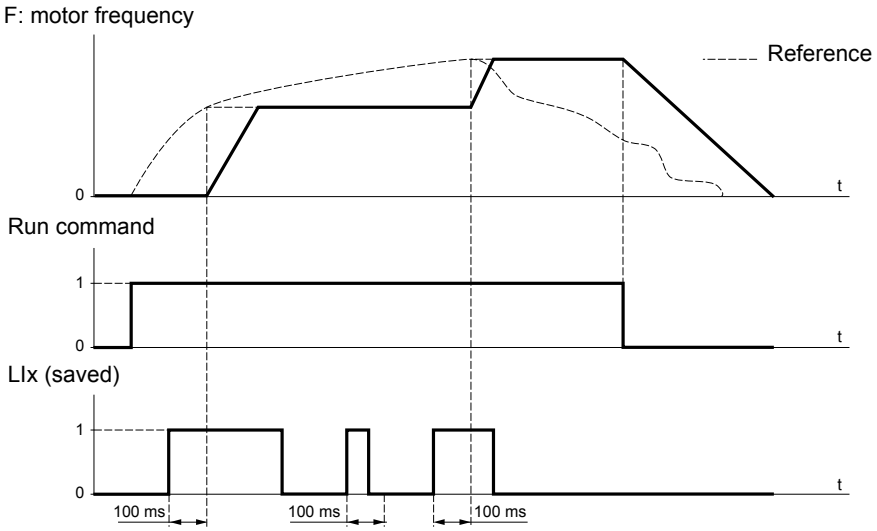
(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.
(2) Range 0.01 to 99.99 s or 0.1 to 999.9 s or 1 to 6000 s according to [Ramp increment] (Inr) page 125.

( ) Parameter that can be modified during operation or when stopped.

Reference saving:

Saving a speed reference value using a logic input command lasting longer than 0.1 s.

- This function is used to control the speed of several drives alternately via a single analog reference and one logic input for each drive.
- It is also used to confirm a line reference (communication bus or network) on several drives via a logic input. This allows movements to be synchronized by getting rid of variations when the reference is sent.
- The reference is acquired 100 ms after the rising edge of the request. A new reference is not then acquired until a new request is made.



Code	Name/Description	Adjustment range	Factory setting
SPn-	**[MEMO REFERENCE]**		
SPn nO LI1 - LI14	**[Ref. memo ass.]** ☐ **[No]** (nO): Function inactive ☐ **[LI1]** (LI1) to **[LI6]** (LI6) ☐ **[LI7]** (LI7) to **[LI10]** (LI10): If VW3A3201 logic I/O card has been inserted ☐ **[LI11]** (LI11) to **[LI14]** (LI14): If VW3A3202 extended I/O card has been inserted Assignment to a logic input. Function active if the assigned input is at 1.		[No] (nO)

Code	Name/Description	Adjustment range	Factory setting
FLI-	**[FLUXING BY LI]**		
FLU	**[Motor fluxing]**	(1)	[No] (FnO)
FnC	☐ **[Not cont.]** (FnC): Non-continuous mode		
FCt	☐ **[Continuous]** (FCt): Continuous mode. This option is not possible if [Auto DC injection] (AdC) page 130 is [Yes] (YES) or if [Type of stop] (Stt) page 128 is [Freewheel] (nSt).		
FnO	☐ **[No]** (FnO): Function inactive. This option is not possible if [Motor control type] (Ctt) page 67 = [SVCI] (CUC) or [FVC] (FUC). If [Motor control type] (Ctt) page 67 = [SVC I] (CUC), [FVC] (FUC) or [Sync. mot.] (SYn) the factory setting is replaced by [Not cont.] (FnC).		
	In order to obtain rapid high torque on startup, magnetic flux needs to already have been established in the motor. • In [Continuous] (FCt) mode, the drive automatically builds up flux when it is powered up. • In [Not cont.] (FnC) mode, fluxing occurs when the motor starts up.		
	The flux current is greater than nCr (configured rated motor current) when the flux is established and is then adjusted to the motor magnetizing current...		
	CAUTION Check that the motor will withstand this current without overheating. **Failure to follow this instruction can result in equipment damage.**		
	If [Motor control type] (Ctt) page 67 = [Sync. mot.] (SYn), the [Motor fluxing] (FLU) parameter causes the alignment of the rotor and not the fluxing. If [Brake assignment] (bLC) page 148 is not [No] (nO), the [Motor fluxing] (FLU) parameter has no effect.		
FLI	**[Fluxing assignment]**		[No] (nO)
nO	☐ **[No]** (nO): Function inactive		
LI1 - - -	☐ **[LI1]** (LI1) : : ☐ **[...]** (...): See the assignment conditions on page 112.		
	Assignment is only possible if [Motor fluxing] (FLU) is not [Continuous] (FCt). • In [Not cont.] (FnC) mode: - If an LI or a bit is assigned to the motor fluxing command, flux is built up when the assigned input or bit is at 1. - If an LI or a bit has not been assigned, or if the LI or bit assigned is at 0 when a run command is sent, fluxing occurs when the motor starts. • In [No] (FnO) mode: - If an LI or a bit is assigned to the motor fluxing command, flux is built up when the assigned input or bit is at 1 and is suppressed when the assigned input or bit is at 0.		

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.

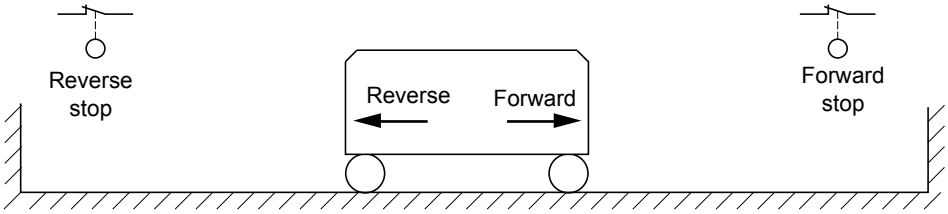
Parameter that can be modified during operation or when stopped.

Limit switch management

This function can be used to manage trajectory limits using limit switches.

The stop mode is configurable.
When the stop contact is activated, startup in the other direction is authorized.

Example:



The stop is activated when the input is at 0 (contact open).

Code	Name/Description	Adjustment range	Factory setting
LSt-	**[LIMIT SWITCHES]** **Note:** This function cannot be used with certain other functions. Follow the instructions on page 118.		
LAF	**[Stop FW limit sw.]** ☐ **[No]** (nO): Function inactive ☐ **[LI1]** (LI1) to **[LI6]** (LI6) ☐ **[LI7]** (LI7) to **[LI10]** (LI10): If VW3A3201 logic I/O card has been inserted ☐ **[LI11]** (LI11) to **[LI14]** (LI14): If VW3A3202 extended I/O card has been inserted ☐ **[C101]** (C101) to **[C115]** (C115): With integrated Modbus in [I/O profile] (IO) ☐ **[C201]** (C201) to **[C215]** (C215): With integrated CANopen in [I/O profile] (IO) ☐ **[C301]** (C301) to **[C315]** (C315): With a communication card in [I/O profile] (IO) ☐ **[C401]** (C401) to **[C415]** (C415): With a Controller Inside card in [I/O profile] (IO) ☐ **[CD00]** (Cd00) to **[CD13]** (Cd13): In [I/O profile] (IO) can be switched with possible logic inputs ☐ **[CD14]** (Cd14) to **[CD15]** (Cd15): In [I/O profile] (IO) can be switched without logic inputs		[No] (nO)
LAr	**[Stop RV limit sw.]** Same assignments possible as for [Stop FW limit sw.] (LAF) below.		[No] (nO)
LAS	**[Stop type]** ☐ **[Ramp stop]** (rMP) ☐ **[Fast stop]** (FSt) ☐ **[Freewheel]** (nSt) When the assigned input changes to 0, the stop is controlled in accordance with the selected type. Restarting is only authorized for the other operating direction once the motor has stopped. If the two inputs [Stop FW limit sw.] (LAF) and [Stop RV limit sw.] (LAr) are assigned and at state 0, restarting will be impossible. The parameter can be accessed if [Stop FW limit sw.] (LAF) or [Stop RV limit sw.] (LAr) is assigned.		[Freewheel] (nSt)

Brake logic control

Used to control an electromagnetic brake by the drive, for horizontal and vertical hoisting applications, and for unbalanced machines.

Principle:

Vertical hoisting movement:

Maintain motor torque in the driving load holding direction during brake opening and closing, in order to hold the load, start smoothly when the brake is released and stop smoothly when the brake is engaged.

Horizontal movement:

Synchronize brake release with the build-up of torque during startup and brake engage at zero speed on stopping, to prevent jolting.

Recommended settings for brake logic control for a vertical hoisting application:

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

Check that the selected settings and configurations will not result in the dropping or loss of control of the load being lifted.

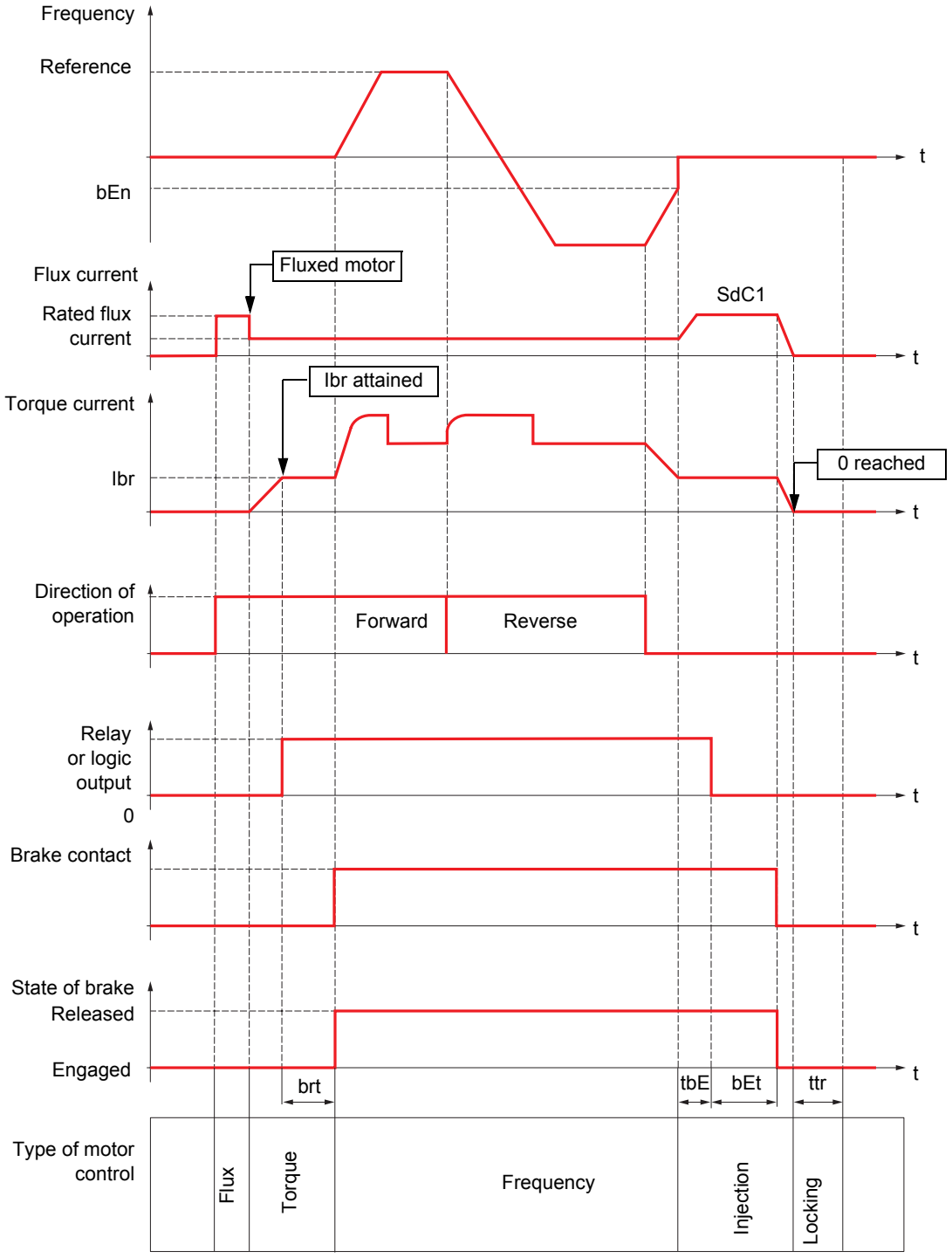
Failure to follow this instruction can result in death or serious injury.

1. Brake impulse (bIP): YES. Ensure that the direction of rotation FW corresponds to lifting the load.
   For applications in which the load being lowered is very different from the load being lifted, set BIP = 2 Ibr (e.g., ascent always with a load and descent always without a load).
2. Brake release current (Ibr and Ird if BIP = 2 Ibr): Adjust the brake release current to the nominal current indicated on the motor. During testing, adjust the brake release current in order to hold the load smoothly.
3. Acceleration time: For hoisting applications it is advisable to set the acceleration ramps to more than 0.5 seconds. Ensure that the drive does not exceed the current limit.
   The same recommendation applies for deceleration.
   Note: For a hoisting movement, a braking resistor should be used.
4. Brake release time (brt): Adjust according to the type of brake. It is the time required for the mechanical brake to release.
5. Brake release frequency (bIr), in open-loop mode only: Leave in [Auto], adjust if necessary.
6. Brake engage frequency (bEn): Leave in [Auto], adjust if necessary.
7. Brake engage time (bEt): Adjust according to the type of brake. It is the time required for the mechanical brake to engage.

Recommended settings for brake logic control for a horizontal hoisting application:

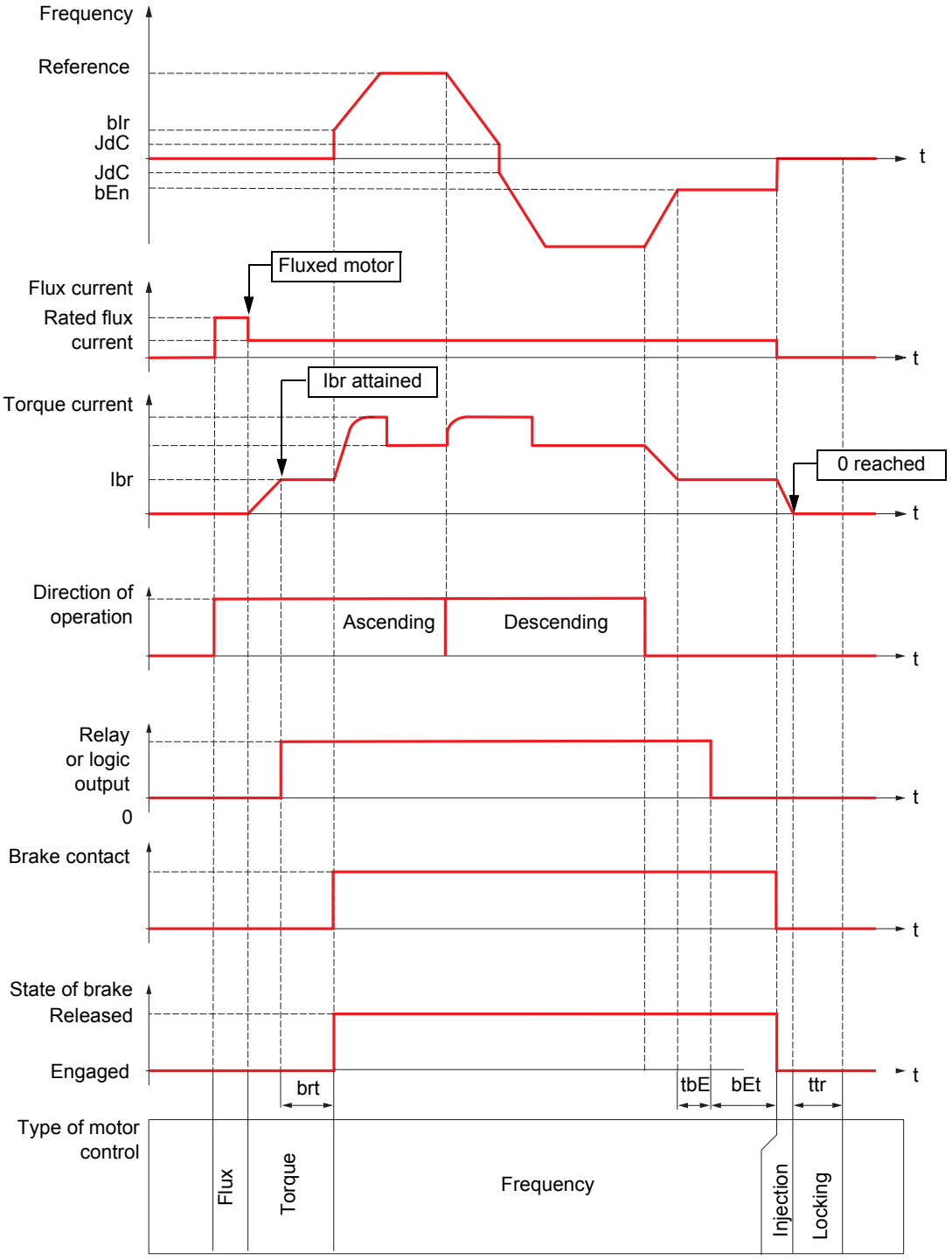
1. Brake impulse (bIP): No
2. Brake release current (Ibr): Set to 0.
3. Brake release time (brt): Adjust according to the type of brake. It is the time required for the mechanical brake to release.
4. Brake engage frequency (bEn), in open-loop mode only: Leave in [Auto], adjust if necessary.
5. Brake engage time (bEt): Adjust according to the type of brake. It is the time required for the mechanical brake to engage.

Brake logic control, horizontal movement in open-loop mode



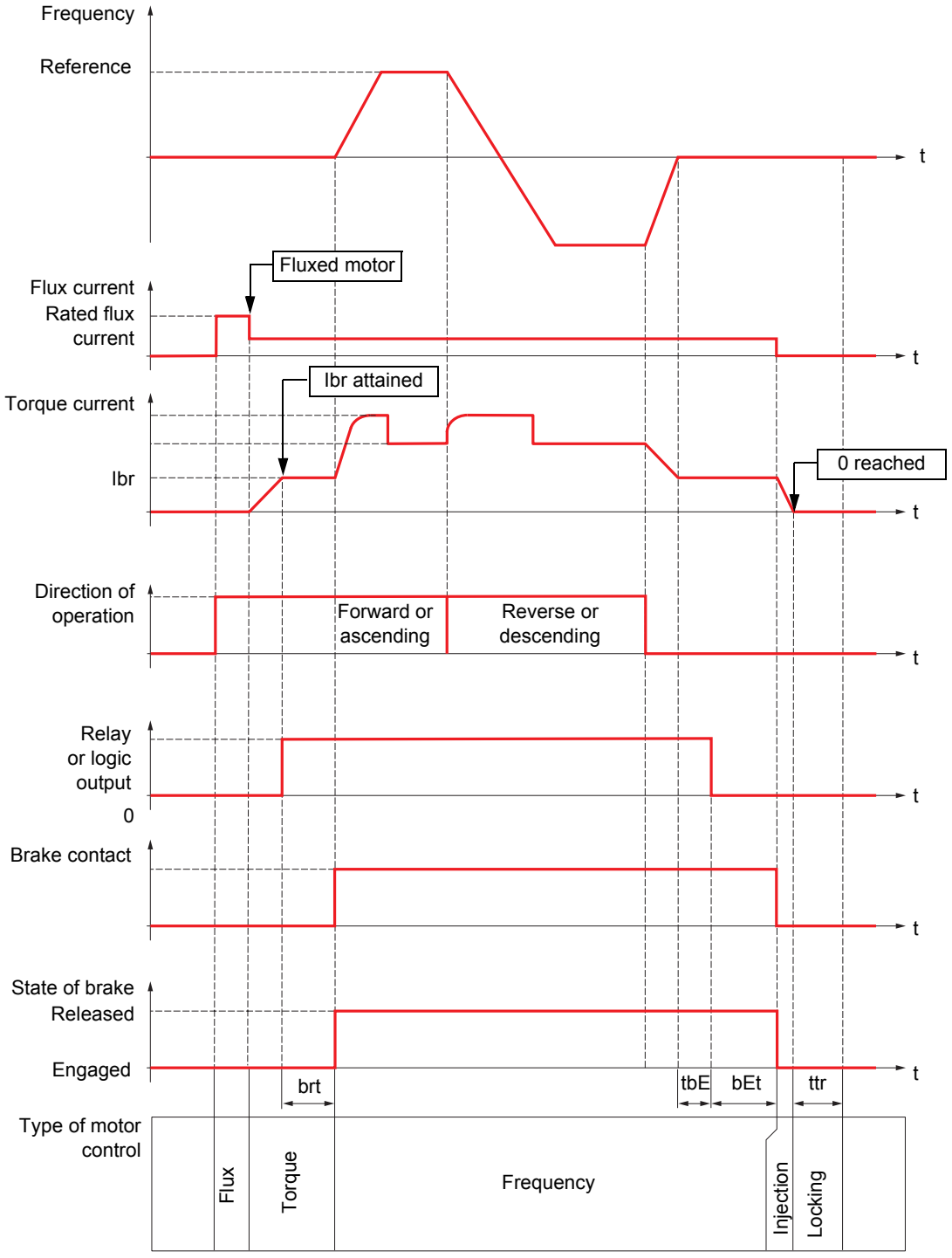
Key:
- (bEn): [Brake engage freq]
- (bEt): [Brake engage time]
- (brt): [Brake Release time]
- (Ibr): [Brake release I FW]
- (SdC1): [Auto DC inj. level 1]
- (tbE): [Brake engage delay]
- (ttr): [Time to restart]

Brake logic control, vertical movement in open-loop mode



Key:
- (bEn): [Brake engage freq]
- (bEt): [Brake engage time]
- (blr): [Brake release freq]
- (brt): [Brake Release time]
- (Ibr): [Brake release I FW]
- (JdC): [Jump at reversal]
- (tbE): [Brake engage delay]
- (ttr): [Time to restart]

Brake logic control, vertical or horizontal movement in closed-loop mode



Key:
- (bEt): [Brake engage time]
- (brt): [Brake Release time]
- (Ibr): [Brake release I FW]
- (tbE): [Brake engage delay]
- (ttr): [Time to restart]

[1.7 APPLICATION FUNCT.] (FUn-)

Code	Name/Description	Adjustment range	Factory setting
bLC-	**■ [BRAKE LOGIC CONTROL]** **Note:** This function cannot be used with certain other functions. Follow the instructions on page 118.		
bLC	**❑ [Brake assignment]** **Note: If the brake is assigned, only a ramp stop is possible.** Check the [Type of stop] (Stt) page 128. Logic output or control relay ☐ **[No]** (nO): Function not assigned (in this case, none of the function parameters can be accessed). ☐ **[R2]** (r2) to **[R4]** (r4): Relay (selection extended to R3 or R4 if one or two I/O cards have been inserted). ☐ **[LO1]** (LO1) to **[LO4]** (LO4): Logic output (if one or two I/O cards have been inserted, LO1 to LO2 or LO4 can be selected).		[No] (nO)
bSt	**❑ [Movement type]** ☐ **[Traveling]** (HOr): Resistive-load movement (translational motion of overhead crane, for example). ☐ **[Hoisting]** (VEr): Driving-load movement (hoisting winch, for example). If [Weight sensor ass.] (PES) page 154 is not [No] (nO) [Movement type] (bSt) is forced to [Hoisting] (VEr).		[Hoisting] (UEr)
bCI	**❑ [Brake contact]** If the brake is fitted with a monitoring contact (closed for released brake). ☐ **[No]** (nO): Function inactive ☐ **[LI1]** (LI1) : : ☐ **[...]** (...): See the assignment conditions on page 112.		[No] (nO)
bIP ❮❯	**❑ [Brake impulse]** The parameter can be accessed if [Weight sensor ass.] (PES) = [No] (nO) (see page 154) and if [Movement type] (bSt) = [Hoisting] (UEr). ☐ **[No]** (nO): The motor torque is given in the required operating direction, at current Ibr. ☐ **[Yes]** (YES): The motor torque is always Forward (check that this direction corresponds to ascending), at current Ibr. ☐ **[2 IBR]** (2Ibr): The torque is in the required direction, at current Ibr for Forward and Ird for Reverse, for certain specific applications.		[No] (nO)
Ibr ❮❯	**❑ [Brake release I FW]** (1) Brake release current threshold for ascending or forward movement. The parameter can be accessed if [Weight sensor ass.] (PES) = [No] (nO) (see page 154).	0 to 1.32 In (2)	0
Ird ❮❯	**❑ [Brake release I Rev]** (1) Brake release current threshold for descending or reverse movement. The parameter can be accessed if [Brake impulse] (bIP) = [2 IBR] (2Ibr).	0 to 1.32 In (2)	0
brt ❮❯	**❑ [Brake Release time]** (1) Brake release time delay.	0 to 5.00 s	0

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.
(2) In corresponds to the rated drive current indicated in the installation manual and on the drive nameplate.

❮❯ Parameters that can be modified during operation or when stopped.

Code	Name/Description	Adjustment range	Factory setting
	[BRAKE LOGIC CONTROL] (continued)		
bIr ( )	**[Brake release freq]** (1) Brake release frequency threshold (initialization of acceleration ramp). The parameter can be accessed if [Motor control type] (Ctt) page 67 is not [FVC] (FUC) and if [Movement type] (bSt) page 148 is [Hoisting] (UEr). AUtO ☐ **[Auto]** (AUtO): The drive takes a value equal to the rated slip of the motor, calculated using the drive parameters. - ☐ **0 to 10 Hz**: Manual control		[Auto] (AUtO)
bEn ( )	**[Brake engage freq]** (1) Brake engage frequency threshold. The parameter can be accessed if [Motor control type] (Ctt) page 67 is not [FVC] (FUC). AUtO ☐ **[Auto]** (AUtO): The drive takes a value equal to the rated slip of the motor, calculated using the drive parameters. - ☐ **0 to 10 Hz**: Manual control		[Auto] (AUtO)
tbE ( )	**[Brake engage delay]** (1) Time delay before request to engage brake. To delay brake engagement, if you wish the brake to be engaged when the drive comes to a complete stop.	0 to 5.00 s	0
bEt ( )	**[Brake engage time]** (1) Brake engage time (brake response time).	0 to 5.00 s	0
SdC1 ( )	**[Auto DC inj. level 1]** (1) Level of standstill DC injection current. **Note:** The parameter can be accessed if [Motor control type] (Ctt) page 67 is not [FVC] (FUC) and if [Movement type] (bSt) page 148 is [Traveling] (HOr). **CAUTION** Check that the motor will withstand this current without overheating. **Failure to follow this instruction can result in equipment damage.**	0 to 1.2 In (2)	0.7 In (2)
bEd ( )	**[Engage at reversal]** nO ☐ **[No]** (nO): The brake does not engage. YES ☐ **[Yes]** (YES): The brake engages. Can be used to select whether or not the brake engages on transition to zero speed when the operating direction is reversed.		[No] (nO)

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.
(2) In corresponds to the rated drive current indicated in the installation manual and on the drive nameplate.

( ) Parameters that can be modified during operation or when stopped.

Code	Name/Description	Adjustment range	Factory setting
	[BRAKE LOGIC CONTROL] (continued)		
JdC ↻	**[Jump at reversal]** (1) The parameter can be accessed if [Motor control type] (Ctt) page 67 is not [FVC] (FUC) and if [Movement type] (bSt) page 148 is [Hoisting] (UEr). AUtO: **[Auto]** (AUtO): The drive takes a value equal to the rated slip of the motor, calculated using the drive parameters. -: **0 to 10 Hz**: Manual control When the reference direction is reversed, this parameter can be used to avoid loss of torque (and consequential release of load) on transition to zero speed. Parameter is not applicable if [Engage at reversal] (bEd) = [Yes] (YES).	0 to 10.0 Hz	[Auto] (AUtO)
tbr ↻	**[Time to restart]** (1) Time between the end of a brake engage sequence and the start of a brake release sequence.	0 to 5.00 s	0

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.

↻ Parameter that can be modified during operation or when stopped.

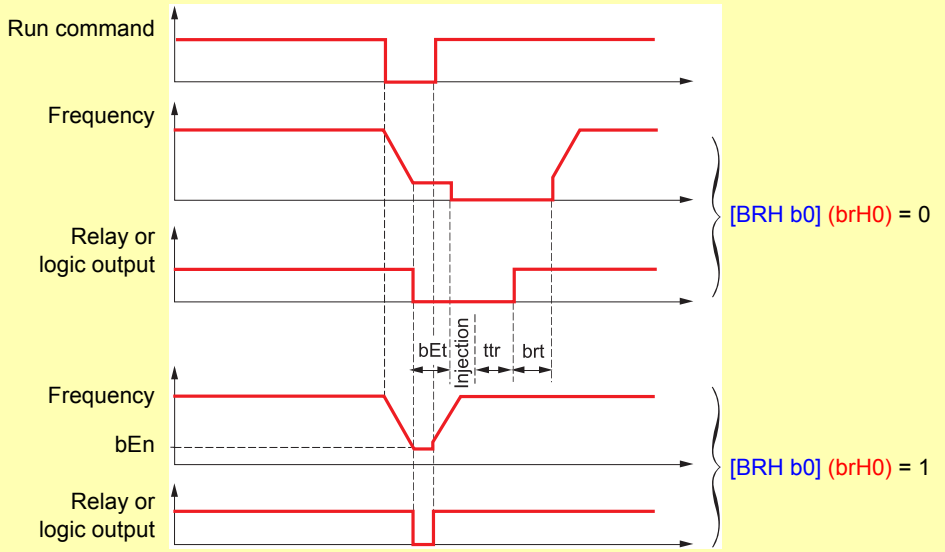
Brake control logic expert parameters

Code	Name/Description	Adjustment range	Factory setting
brH0	❏ [BRH b0]		0
0	☐ [0] (0): The engage/release sequence is executed in full.		
1	☐ [1] (1): The brake is released immediately.		

Selection of the brake restart sequence if a run command is repeated while the brake is engaging.

Use in open-loop and closed-loop mode.

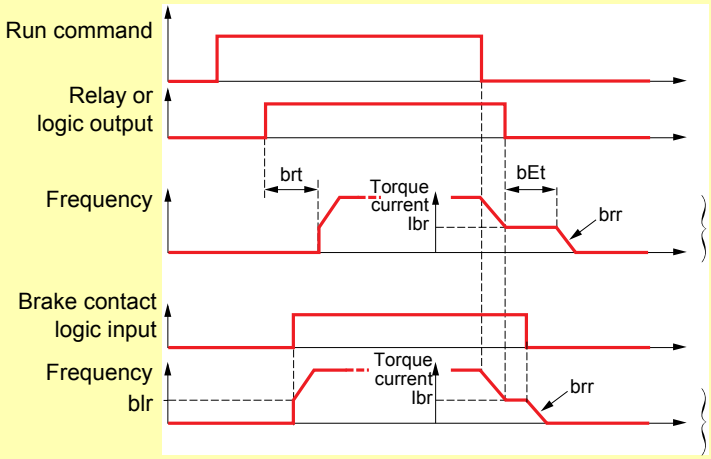
- A run command may be requested during the brake engagement phase. Whether or not the brake release sequence is executed depends on the value selected for [BRH b0] (brH0).



Note: If a run command is requested during the "ttr" phase, the complete brake control sequence is initialized.

brH1	❏ [BRH b1]		0
0	☐ [0] (0): The brake contact in steady state fault is active (fault if the contact is open during operation). The brF brake contact fault is monitored in all operating phases.		
1	☐ [1] (1): The brake contact in steady state fault is inactive. The brF brake contact fault is only monitored during the brake release and engage phases.		

Deactivation of the brake contact in steady state fault.

Code	Name/Description	Adjustment range	Factory setting
brH2 0 1	❑ **[BRH b2]** Taking the brake contact into account for the brake control sequence. ☐ **[0]** (0): The brake contact is not taken into account. ☐ **[1]** (1): The brake contact is taken into account. Use in open-loop and closed-loop mode. • If a logic input is assigned to the brake contact. [BRH b2] (brH2) = 0: During the brake release sequence, the reference is enabled at the end of the time [Brake Release time] (brt). During the brake engage sequence, the current changes to 0 according to the ramp [Current ramp time] (brr) at the end of the [Brake engage time] (bEt). [BRH b2] (brH2) = 1: When the brake is released, the reference is enabled when the logic input changes to 1. When the brake is engaged, the current changes to 0 according to the ramp [Current ramp time] (brr) when the logic input changes to 0.  		0
brH3 0 1	❑ **[BRH b3]** In closed-loop mode only. Management of the absence of brake contact response, if it is assigned. ☐ **[0]** (0): During the brake engage sequence, the brake contact must be open before the end of [Brake engage time] (bEt), otherwise the drive locks in a brF brake contact fault. ☐ **[1]** (1): During the brake engage sequence, the brake contact must be open before the end of [Brake engage time] (bEt), otherwise a bCA brake contact alarm is triggered and zero speed is maintained.		0
brH4 0 1	❑ **[BRH b4]** In closed-loop mode only. Activation of the speed loop at zero if a movement for which no command has been given occurs (measurement of a speed greater than a fixed min. threshold). ☐ **[0]** (0): No action in the event of a movement for which no command has been given. ☐ **[1]** (1): If a movement occurs for which no command has been given, the drive switches to zero speed regulation, with no brake release command, and a bSA alarm is triggered.		0
brr ( )	❑ **[Current ramp time]** Torque current ramp time (increase and decrease) for a current variation equal to [Brake release I FW] (Ibr).	0 to 5.00 s	0 s

( ) Parameter that can be modified during operation or when stopped.

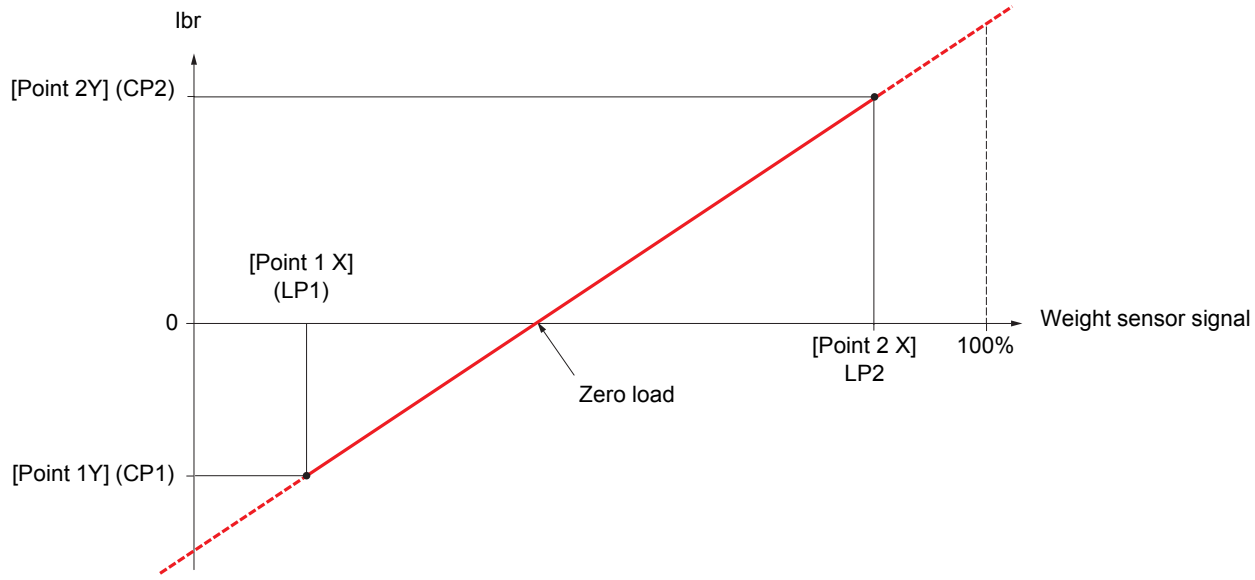
External weight measurement:

This function uses the information supplied by a weight sensor to adapt the current [Brake release I FW] (Ibr) of the [BRAKE LOGIC CONTROL] (bLC-) function. The signal from the weight sensor can be assigned to an analog input (usually a 4 - 20 mA signal), to the pulse in input or to the encoder input, according to the type of weight sensor.

Examples:

- Measurement of the total weight of a hoisting winch and its load.
- Measurement of the total weight of an elevator winch, the cabin and the counterweight.

The current [Brake release I FW] (Ibr) is adapted in accordance with the curve below.



This curve can represent a weight sensor on an elevator winch, where zero load on the motor occurs when the load in the cabin is not zero.

[1.7 APPLICATION FUNCT.] (FUn-)

Code	Name/Description	Adjustment range	Factory setting
ELn-	**■ [EXTERNAL WEIGHT MEAS.]**		
PES	**❑ [Weight sensor ass.]**		[No] (nO)
nO	☐ **[No]** (nO): Function inactive		
AI1	☐ **[AI1]** (AI1): Analog input		
AI2	☐ **[AI2]** (AI2): Analog input		
AI3	☐ **[AI3]** (AI3): Analog input, if VW3A3202 extension card has been inserted		
AI4	☐ **[AI4]** (AI4): Analog input, if VW3A3202 extension card has been inserted		
PI	☐ **[RP]** (PI): Frequency input, if VW3A3202 extension card has been inserted		
PG	☐ **[Encoder]** (PG): Encoder input, if encoder card has been inserted		
	Function can be accessed if brake logic control is assigned (see page 148). If [Weight sensor ass.] (PES) is not [No] (nO), [Movement type] (bSt) page 148 is forced to [Hoisting] (UEr).		
LP1	**❑ [Point 1 X]**	0 to 99.99%	0
	0 to 99.99% of signal on assigned input. [Point 1 X] (LP1) must be less than [Point 2X] (LP2). The parameter can be accessed if [Weight sensor ass.] (PES) is assigned.		
CP1	**❑ [Point 1Y]**	-1.36 to +1.36 In (1)	- In
	Current corresponding to load [Point 1 X] (LP1), in A. The parameter can be accessed if [Weight sensor ass.] (PES) is assigned.		
LP2	**❑ [Point 2 X]**	0.01 to 100%	50%
	0.01 to 100% of signal on assigned input. [Point 2 X] (LP2) must be greater than [Point 1 X] (LP1). The parameter can be accessed if [Weight sensor ass.] (PES) is assigned.		
CP2	**❑ [Point 2Y]**	-1.36 to +1.36 In (1)	0
	Current corresponding to load [Point 2 X] (LP2), in A. The parameter can be accessed if [Weight sensor ass.] (PES) is assigned.		
IbrA	**❑ [Ibr 4-20 mA loss]**	0 to 1.36 In (1)	0
	Brake release current in the event of the loss of the weight sensor information. This parameter can be accessed if the weight sensor is assigned to an analog current input and the 4-20 mA loss fault is deactivated. Recommended settings: - 0 for elevators - Rated motor current for a hoisting application		

(1) In corresponds to the rated drive current indicated in the installation manual and on the drive nameplate.

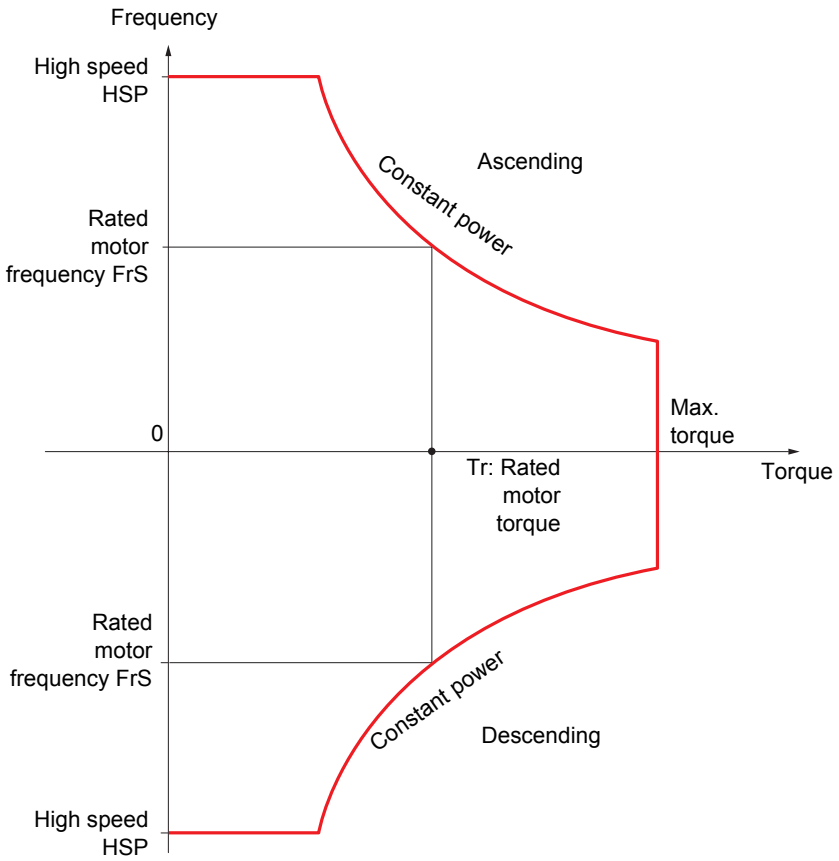
Parameter that can be modified during operation or when stopped.

High-speed hoisting:

This function can be used to optimize the cycle times for hoisting movements for zero or lightweight loads. It authorizes operation at "constant power" in order to reach a speed greater than the rated speed without exceeding the rated motor current.
The speed remains limited by the [High speed] (HSP) parameter, page 40.

The function acts on the speed reference pedestal and not on the reference itself.

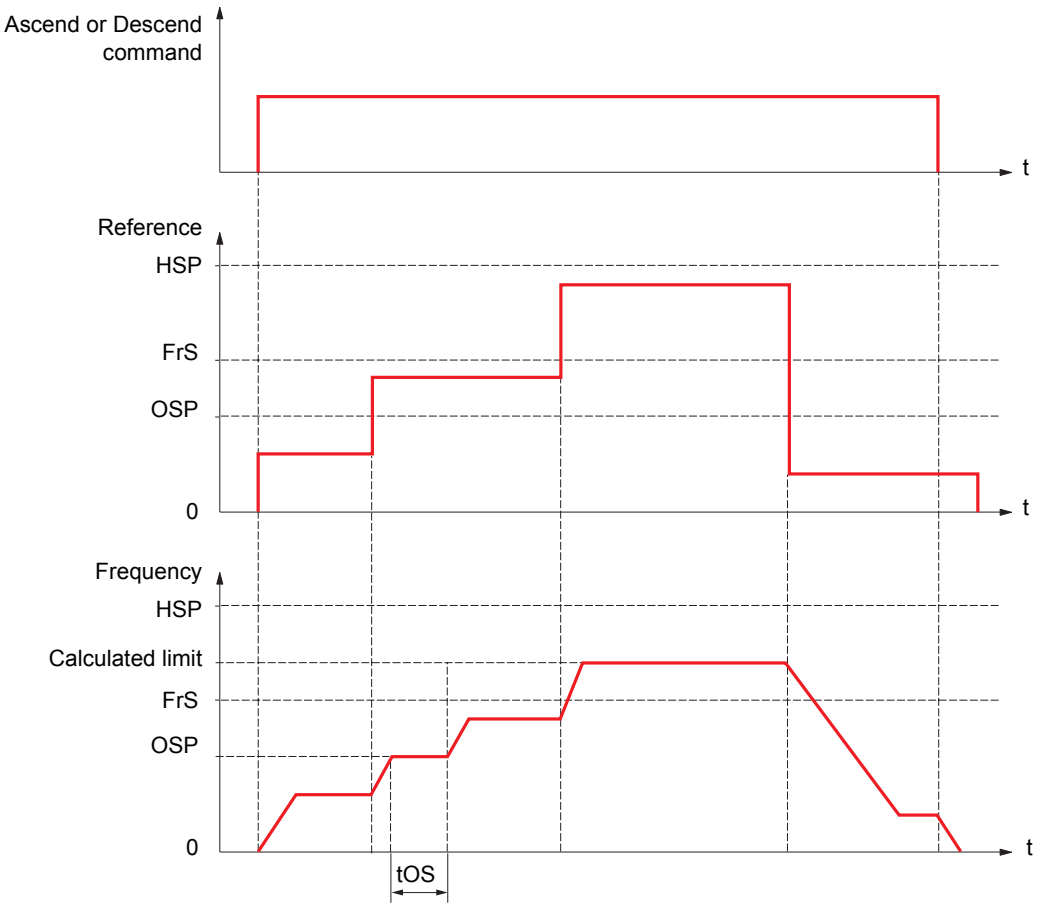
Principle:



There are 2 possible operating modes:

- "Speed reference" mode: The maximum permissible speed is calculated by the drive during a speed step that is set so that the drive can measure the load.
- "Current limitation" mode: The maximum permissible speed is the speed that supports current limitation in motor mode, in the "Ascending" direction only. For the "Descending" direction, operation is always in "Speed reference" mode.

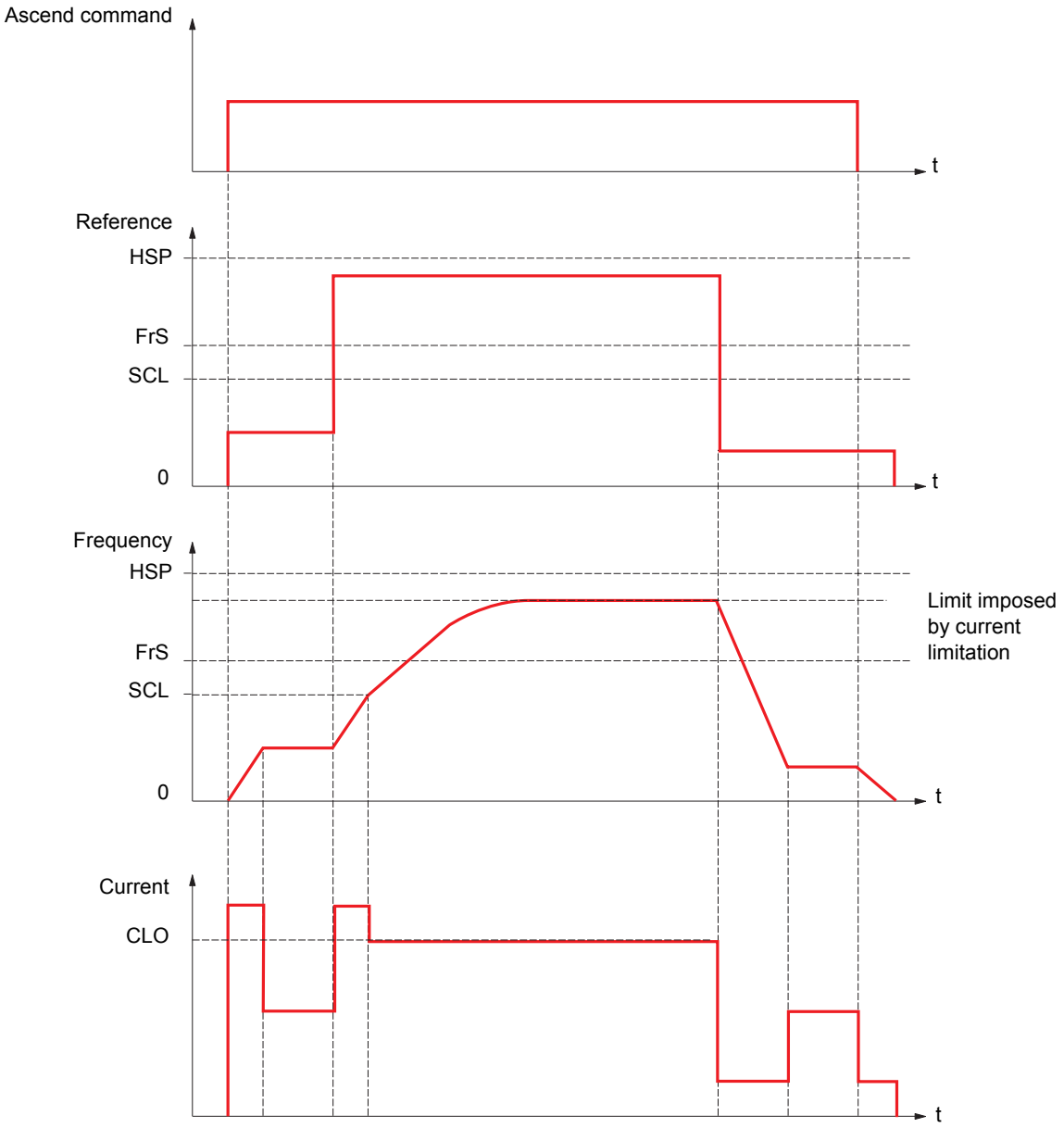
Speed reference mode



OSP: Adjustable speed step for load measurement
tOS: Load measuring time

Two parameters are used to reduce the speed calculated by the drive, for ascending and descending.

Current limitation mode



SCL: Adjustable speed threshold, above which current limitation is active
CLO: Current limitation for high-speed function

[1.7 APPLICATION FUNCT.] (FUn-)

Code	Name/Description	Adjustment range	Factory setting
HSH-	**■ [HIGH SPEED HOISTING]** **Note:** This function cannot be used with certain other functions. Follow the instructions on page 118.		
HSO nO SSO CSO	**❑ [High speed hoisting]** ☐ **[No]** (nO): Function inactive ☐ **[Speed ref]** (SSO): "Speed reference" mode ☐ **[I Limit]** (CSO): "Current limitation" mode		[No] (nO)
COF ()	**❑ [Motor speed coeff.]** Speed reduction coefficient calculated by the drive for Ascending direction. The parameter can be accessed if [High speed hoisting] (HSO) = [Speed ref] (SSO).	0 to 100%	100%
COr ()	**❑ [Gen. speed coeff]** Speed reduction coefficient calculated by the drive for Descending direction. The parameter can be accessed if [High speed hoisting] (HSO) is not [No] (nO).	0 to 100%	50%
tOS ()	**❑ [Load measuring tm.]** Duration of speed step for measurement. The parameter can be accessed if [High speed hoisting] (HSO) is not [No] (nO).	0.1 s to 65 s	0.5 s
OSP ()	**❑ [Measurement spd]** Speed stabilized for measurement. The parameter can be accessed if [High speed hoisting] (HSO) is not [No] (nO).	0 to [Rated motor freq.] (FrS)	40 Hz
CLO ()	**❑ [High speed I Limit]** Current limitation at high speed. The parameter can be accessed if [High speed hoisting] (HSO) = [I Limit] (CSO). The adjustment range is limited to 1.36 In if [Switching freq.](SFr) page 57 is less than 2 kHz. **Note:** If the setting is less than 0.25 In, the drive may lock in [Output Phase Loss] (OPF) fault mode if this has been enabled (see page 201).	0 to 1.65 In (1)	In
SCL ()	**❑ [I Limit. frequency]** Frequency threshold, above which the high-speed limitation current is active. The parameter can be accessed if [High speed hoisting] (HSO) = [I Limit] (CSO)	0 to 500 or 1000 Hz according to rating	40 Hz

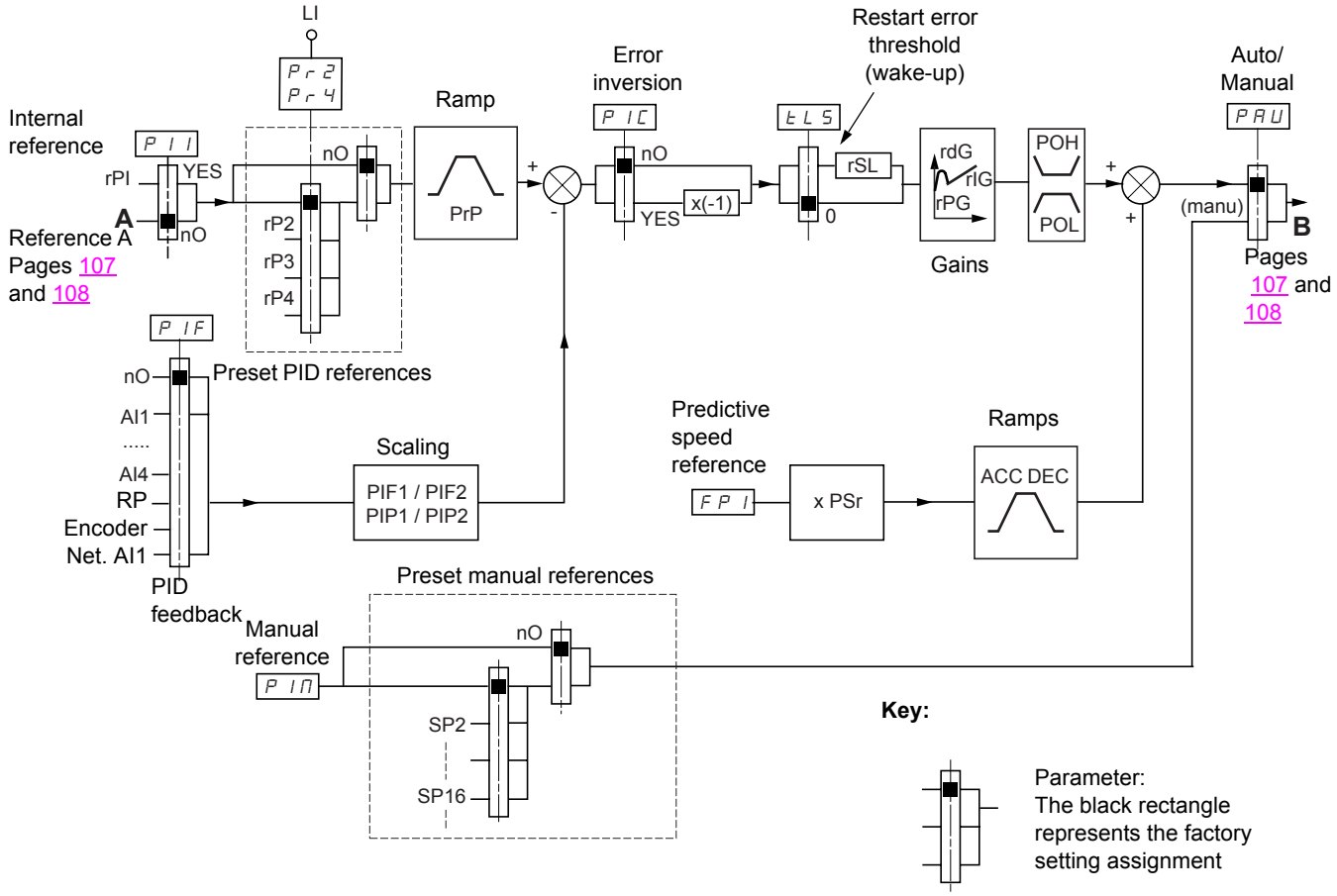
(1) In corresponds to the rated drive current indicated in the installation manual and on the drive nameplate.

() Parameter that can be modified during operation or when stopped.

PID regulator

Block diagram

The function is activated by assigning an analog input to the PID feedback (measurement).



PID feedback:
The PID feedback must be assigned to one of the analog inputs AI1 to AI4, to the frequency input or the encoder, according to whether any extension cards have been inserted.

PID reference:
The PID reference must be assigned to the following parameters:

- Preset references via logic inputs (rP2, rP3, rP4)
- In accordance with the configuration of [Act. internal PID ref.] (PII) pages 163:
  - Internal reference (rPI) or
  - Reference A (Fr1 or Fr1b, see page 107)

Combination table for preset PID references

LI (Pr4)	LI (Pr2)	Pr2 = nO	Reference
			rPI or A
0	0		rPI or A
0	1		rP2
1	0		rP3
1	1		rP4

A predictive speed reference can be used to initialize the speed on restarting the process.

Scaling of feedback and references:

- Parameters PIF1, PIF2
  Can be used to scale the PID feedback (sensor range).
  This scale MUST be maintained for all other parameters.

- Parameters PIP1, PIP2
  Can be used to scale the adjustment range.
  Example: Adjustment of the volume in a tank, between 6 m^3 and 15 m^3.
  - Sensor used 4-20 mA, 4.5 m^3 for 4 mA, 20 m^3 for 20 mA, with the result that PIF1 = 4500 and PIF2 = 20000 (use values as close as possible to the maximum format (32767), while retaining powers of 10 in relation to the actual values).
  - Adjustment range 6 to 15 m^3, with the result that PIP1 = 6000 and PIP2 = 15000.
  - Example references:
    - rP1 (internal reference) = 9500
    - rp2 (preset reference) = 6500
    - rP3 (preset reference) = 8000
    - rP4 (preset reference) = 11200

The [DISPLAY CONFIG.] menu can be used to customize the name of the unit displayed and its format.

Other parameters:

- rSL parameter:
  Can be used to set the PID error threshold, above which the PID regulator will be reactivated (wake-up) after a stop due to the max. time threshold being exceeded at low speed (tLS).

- Reversal of the direction of correction (PIC): If PIC = nO, the speed of the motor will increase when the error is positive, for example: pressure control with a compressor. If PIC = YES, the speed of the motor will decrease when the error is positive, for example: temperature control using a cooling fan.

- The integral gain may be short-circuited by a logic input.

- An alarm on the PID feedback may be configured and indicated by a logic output.

- An alarm on the PID error may be configured and indicated by a logic output.

"Manual - Automatic" operation with PID

This function combines the PID regulator, the preset speeds and a manual reference. Depending on the state of the logic input, the speed reference is given by the preset speeds or by a manual reference input via the PID function.

Manual reference (PIM)

- Analog inputs AI1 to AI4
- Frequency input
- Encoder

Predictive speed reference (FPI)

- [AI1] (AI1): Analog input
- [AI2] (AI2): Analog input
- [AI3] (AI3): Analog input, if VW3A3202 extension card has been inserted
- [AI4] (AI4): Analog input, if VW3A3202 extension card has been inserted
- [RP] (PI): Frequency input, if VW3A3202 extension card has been inserted
- [Encoder] (PG): Encoder input, if encoder card has been inserted
- [HMI] (LCC): Graphic display terminal
- [Modbus] (Mdb): Integrated Modbus
- [CANopen] (CAn): Integrated CANopen
- [Com. card] (nEt): Communication card (if inserted)
- [Prog. card] (APP): Controller Inside card (if inserted)

Setting up the PID regulator

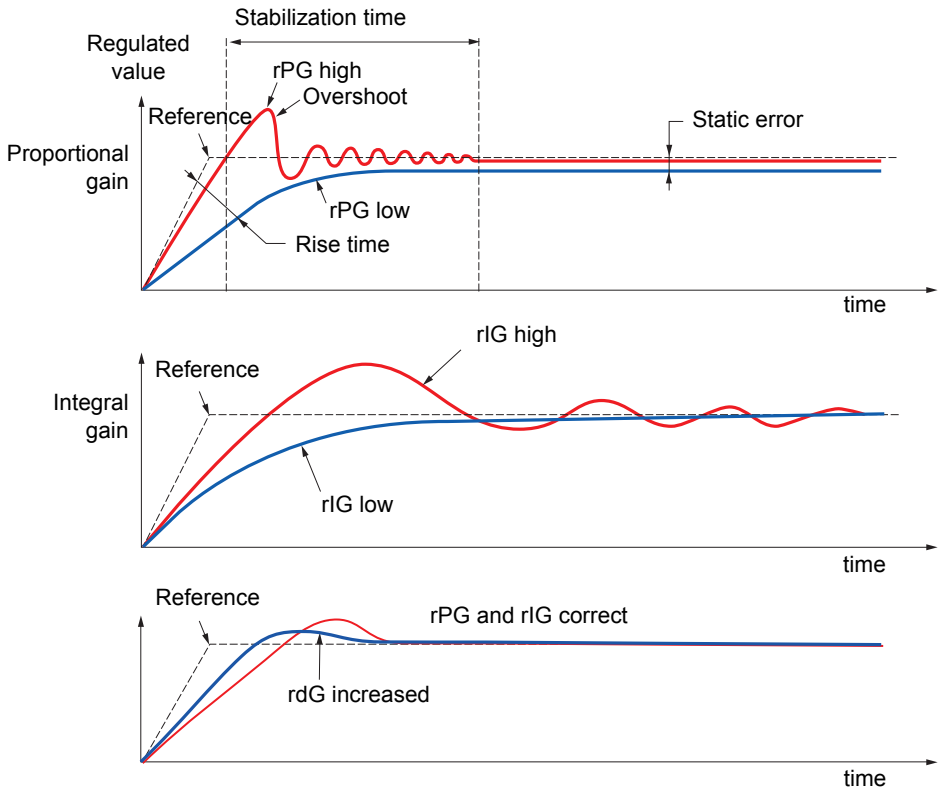
1. **Configuration in PID mode**
   See the diagram on page 159.

2. **Perform a test in factory settings mode (in most cases, this will be sufficient)**
   To optimize the drive, adjust rPG or rIG 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**

   - Perform a test with a speed reference in Manual mode (without PID regulator) 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 this is not the case, see the settings for the drive and/or sensor signal and cabling.

   - Switch to PID mode.
   - Set brA to no (no auto-adaptation of the ramp).
   - Set the PID ramp (PrP) to the minimum permitted by the mechanism without triggering an ObF fault.
   - Set the integral gain (rIG) to minimum.
   - Leave the derivative gain (rdG) at 0.
   - Observe the PID feedback and the reference.
   - Switch the drive ON/OFF a number of times or vary the load or reference rapidly a number of times.
   - Set the proportional gain (rPG) in order to ascertain the best compromise between response time and stability in transient phases (slight overshoot and 1 to 2 oscillations before stabilizing).
   - If the reference varies from the preset value in steady state, gradually increase the integral gain (rIG), reduce the proportional gain (rPG) in the event of instability (pump applications), find a compromise between response time and static precision (see diagram).
   - Lastly, the derivative gain may permit the overshoot to be reduced and the response time to be improved, although this will make it more difficult to obtain a compromise in terms of stability, as it depends on 3 gains.
   - 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 ↗	=	↘	↘	=

Code	Name/Description	Adjustment range	Factory setting
PId-	**[PID REGULATOR]** **Note:** This function cannot be used with certain other functions. Follow the instructions on page 118.		
PIF	**[PID feedback ass.]**		[No] (nO)
nO	☐ **[No]** (nO): Not assigned (function inactive) In this case, none of the function parameters can be accessed.		
AI1	☐ **[AI1]** (AI1): Analog input		
AI2	☐ **[AI2]** (AI2): Analog input		
AI3	☐ **[AI3]** (AI3): Analog input, if VW3A3202 extension card has been inserted		
AI4	☐ **[AI4]** (AI4): Analog input, if VW3A3202 extension card has been inserted		
PI	☐ **[RP]** (PI): Frequency input, if VW3A3202 extension card has been inserted		
PG	☐ **[Encoder]** (PG): Encoder input, if encoder card has been inserted		
AIU1	☐ **[Network AI]** (AIV1): Feedback via communication bus		
AIC1	**[AI net. channel]**		[No] (nO)
	The parameter can be accessed if [PID feedback ass.] (PIF) = [Network AI] (AIU1).		
nO	☐ **[No]** (nO): **Not assigned**		
Mdb	☐ **[Modbus]** (Mdb): Integrated Modbus		
CAn	☐ **[CANopen]** (CAn): Integrated CANopen		
nEt	☐ **[Com. card]** (nEt): Communication card (if inserted)		
APP	☐ **[Prog. card]** (APP): Controller Inside card (if inserted)		
PIF1 ( )	**[Min PID feedback]** (1)		100
	Value for minimum feedback. Adjustment range from 0 to [Max PID feedback] (PIF2) (2).		
PIF2 ( )	**[Max PID feedback]** (1)		1000
	Value for maximum feedback Adjustment range from [Min PID feedback] (PIF1) to 32767 (2).		
PIP1 ( )	**[Min PID reference]** (1)		150
	Minimum process value Adjustment range from [Min PID feedback] (PIF1) to [Max PID reference] (PIP2) (2).		
PIP2	**[Max PID reference]** (1)		900
	Maximum process value Adjustment range from [Min PID reference] (PIP1) to [Max PID feedback] (PIF2) (2).		
PII	**[Act. internal PID ref.]**		[No] (nO)
	Internal PID regulator reference		
nO	☐ **[No]** (nO): The PID regulator reference is given by Fr1 or Fr1b with summing/subtraction/multiplication functions (see the diagram on page 106).		
YES	☐ **[Yes]** (YES): The PID regulator reference is internal via parameter rPI.		
rPI ( )	**[Internal PID ref.]**		150
	Internal PID regulator reference This parameter can also be accessed in the [1.2 MONITORING] (SUP-) menu. Adjustment range from [Min PID reference] (PIP1) to [Max PID reference] (PIP2) (2).		
rPG ( )	**[PID prop. gain]**	0.01 to 100	1
	Proportional gain		

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.
(2) If a graphic display terminal is not in use, values greater than 9999 will be displayed on the 4-digit display with a period mark after the thousand digit, e.g., 15.65 for 15650.

( ) Parameter that can be modified during operation or when stopped.

[1.7 APPLICATION FUNCT.] (FUn-)

Code	Name/Description	Adjustment range	Factory setting
	■ [PID REGULATOR] (continued)		
rIG	**❑ [PID integral gain]** Integral gain	0.01 to 100	1
rdG	**❑ [PID derivative gain]** Derivative gain	0.00 to 100	0
PrP	**❑ [PID ramp]** (1) PID acceleration/deceleration ramp, defined to go from [Min PID reference] (PIP1) to [Max PID reference] (PIP2) and vice versa.	0 to 99.9 s	0 s
PIC nO YES	**❑ [PID correct. reverse]** ☐ **[No]** (nO) ☐ **[Yes]** (YES) Reversal of the direction of correction (PIC): If PIC = nO, the speed of the motor will increase when the error is positive. Example: pressure control with a compressor. If PIC = YES, the speed of the motor will decrease when the error is positive. Example: temperature control using a cooling fan.		[No] (nO)
POL	**❑ [Min PID output]** (1) Minimum value of regulator output in Hz.	- 500 to 500 or - 1000 to 1000 according to rating	0 Hz
POH	**❑ [Max PID output]** (1) Maximum value of regulator output in Hz.	0 to 500 or 1000 according to rating	60 Hz
PAL	**❑ [Min fbk alarm]** (1) Minimum monitoring threshold for regulator feedback. Adjustment range from [Min PID feedback] (PIF1) to [Max PID feedback] (PIF2) (2).		100
PAH	**❑ [Max fbk alarm]** (1) Maximum monitoring threshold for regulator feedback. Adjustment range from [Min PID feedback] (PIF1) to [Max PID feedback] (PIF2) (2).		1000
PEr	**❑ [PID error Alarm]** (1) Regulator error monitoring threshold.	0 to 65535 (2)	100
PIS nO LI1 - - -	**❑ [PID integral reset]** ☐ **[No]** (nO): Function inactive ☐ **[LI1]** (LI1) : : ☐ **[...]** (...): See the assignment conditions on page 112. 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).		[No] (nO)

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.
(2) If a graphic display terminal is not in use, values greater than 9999 will be displayed on the 4-digit display with a period mark after the thousand digit,
e.g., 15.65 for 15650.

Parameter that can be modified during operation or when stopped.

Code	Name/Description	Adjustment range	Factory setting
	[PID REGULATOR] (continued)		
FPI	**[Speed ref. assign.]**		[No] (nO)
	PID regulator predictive speed input ☐ **[No]** (nO): Not assigned (function inactive) ☐ **[AI1]** (AI1): Analog input ☐ **[AI2]** (AI2): Analog input ☐ **[AI3]** (AI3): Analog input, if VW3A3202 extension card has been inserted ☐ **[AI4]** (AI4): Analog input, if VW3A3202 extension card has been inserted ☐ **[HMI]** (LCC): Graphic display terminal ☐ **[Modbus]** (Mdb): Integrated Modbus ☐ **[CANopen]** (CAn): Integrated CANopen ☐ **[Com. card]** (nEt): Communication card (if inserted) ☐ **[Prog. card]** (APP): Controller Inside card (if inserted) ☐ **[RP]** (PI): Frequency input, if VW3A3202 extension card has been inserted ☐ **[Encoder]** (PG): Encoder input, if encoder card has been inserted		
PSr ↻	**[Speed input %]** (1)	1 to 100%	100%
	Multiplying coefficient for predictive speed input. The parameter cannot be accessed [Speed ref. assign.] (FPI) = [No] (nO)		
PAU	**[Auto/Manual assign.]**		[No] (nO)
	☐ **[No]** (nO): The PID is always active. ☐ **[LI1]** (LI1) : : ☐ **[...]** (...): See the assignment conditions on page 112. If the assigned input or bit is at 0, the PID is active. If the assigned input or bit is at 1, manual operation is active.		
PIN	**[Manual reference]**		[No] (nO)
	Manual speed input. The parameter can be accessed if [Auto/Manual assign.] (PAU) is not [No] (nO). ☐ **[No]** (nO): Not assigned (function inactive) ☐ **[AI1]** (AI1): Analog input ☐ **[AI2]** (AI2): Analog input ☐ **[AI3]** (AI3): Analog input, if VW3A3202 extension card has been inserted ☐ **[AI4]** (AI4): Analog input, if VW3A3202 extension card has been inserted ☐ **[RP]** (PI): Frequency input, if VW3A3202 extension card has been inserted ☐ **[Encoder]** (PG): Encoder input, if encoder card has been inserted The preset speeds are active on the manual reference if they have been configured.		
tLS ↻	**[Low speed time out]** (1)	0 to 999.9 s	0 s
	Maximum operating time at [Low speed] (LSP) (see page 40) Following operation at LSP for a defined period, a motor stop is requested automatically. The motor restarts if the reference is greater than LSP and if a run command is still present. Caution: Value 0 corresponds to an unlimited period.		

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.
(2) If a graphic display terminal is not in use, values greater than 9999 will be displayed on the 4-digit display with a period mark after the thousand digit,
e.g., 15.65 for 15650.

↻ Parameter that can be modified during operation or when stopped.

[1.7 APPLICATION FUNCT.] (FUn-)

Code	Name/Description	Adjustment range	Factory setting
	[PID REGULATOR] (continued)		
rSL	**[PID wake up thresh.]**	0.0 to 100.0	0

If the "PID" and "Low speed operating time" tLS functions are configured at the same time, the PID regulator may attempt to set a speed lower than LSP.
This results in unsatisfactory operation, which consists of starting, operating at low speed then stopping, and so on…
Parameter rSL (restart error threshold) can be used to set a minimum PID error threshold for restarting after a stop at prolonged LSP.
The function is inactive if tLS = 0 or if rSL = 0.

WARNING

UNINTENDED EQUIPMENT OPERATION

Check that unintended restarts will not present any danger.
Failure to follow this instruction can result in death or serious injury.

PrI-	**[PID PRESET REFERENCES]**		

Function can be accessed if [PID feedback ass.] (PIF) is assigned.

Pr2	**[2 preset PID ref.]**		[No] (nO)

nO / LI1 / - / - / -

- **[No]** (nO): Function inactive
- **[LI1]** (LI1)
  :
  :
- **[...]** (...): See the assignment conditions on page 112.

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.

Pr4	**[4 preset PID ref.]**		[No] (nO)

Make sure that [2 preset PID ref.] (Pr2) has been assigned before assigning this function

nO / LI1 / - / - / -

- **[No]** (nO): Function inactive
- **[LI1]** (LI1)
  :
  :
- **[...]** (...): See the assignment conditions on page 112.

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.

rP2	**[2 preset PID ref.]**	(1)	300

The parameter can be accessed if [2 preset PID ref.] (Pr2) is assigned.
Adjustment range from [Min PID reference] (PIP1) to [Max PID reference] (PIP2) (2).

rP3	**[Preset ref. PID 3]**	(1)	600

The parameter can be accessed if [4 preset PID ref.] (Pr4) is assigned.
Adjustment range from [Min PID reference] (PIP1) to [Max PID reference] (PIP2) (2).

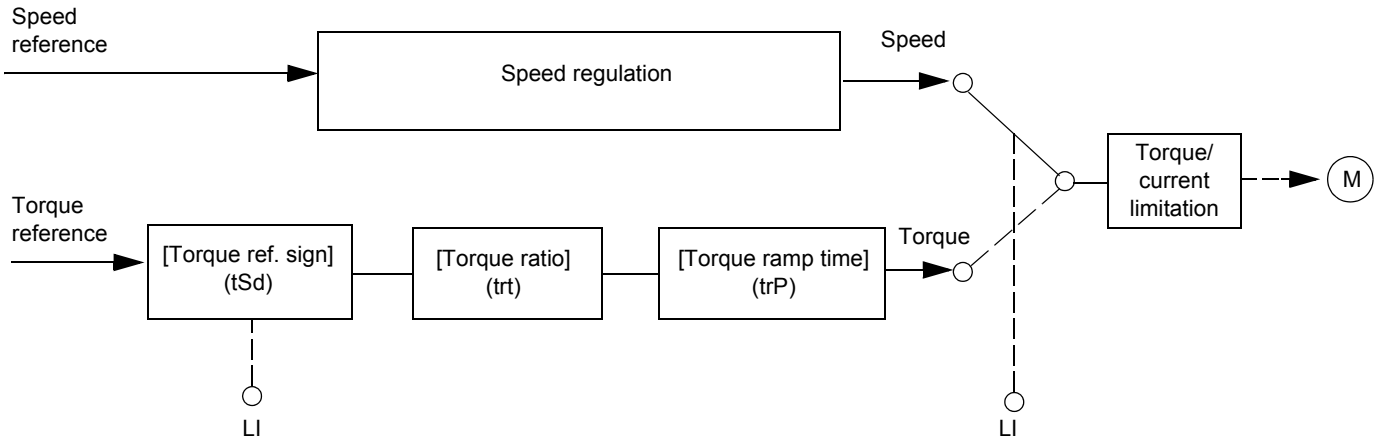
rP4	**[Preset ref. PID 4]**	(1)	900

The parameter can be accessed if [Preset ref. PID 4] (Pr4) is assigned.
Adjustment range from [Min PID reference] (PIP1) to [Max PID reference] (PIP2) (2).

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.
(2) If a graphic display terminal is not in use, values greater than 9999 will be displayed on the 4-digit display with a period mark after the thousand digit, e.g., 15.65 for 15650.

Parameter that can be modified during operation or when stopped.

Torque regulation



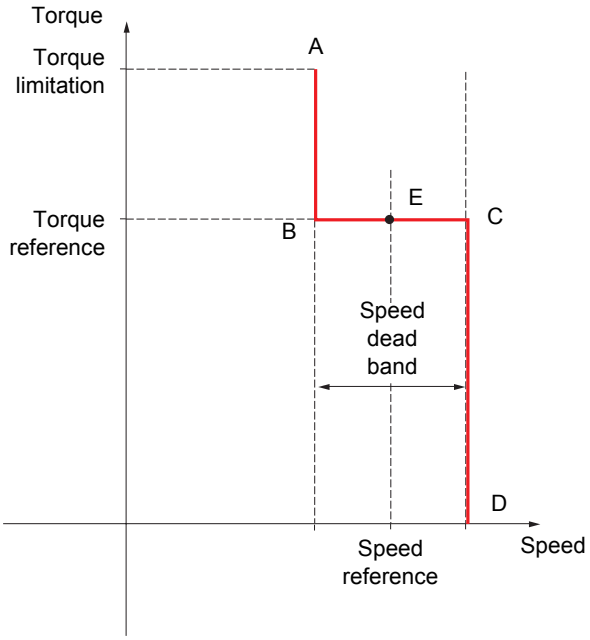
The function can be used to switch between operation in speed regulation mode and operation in torque control mode.
In torque control mode, the speed may vary within a configurable "deadband". When it reaches a lower or upper limit, the drive automatically reverts to speed regulation mode (fallback) and remains at this limit speed. The regulated torque is therefore no longer maintained and two scenarios may occur.

- If the torque returns to the required value, the drive will return to torque control mode.
- If the torque does not return to the required value at the end of a configurable period of time, the drive will switch to fault or alarm mode.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

Check that the changes in the behavior of the motor do not present any danger.
Failure to follow this instruction can result in death or serious injury.



- AB and CD: "Fallback" to speed regulation
- BC: Torque control zone
- E: Ideal operating point

The torque sign and value can be transmitted via a logic output and an analog output.

Code	Name/Description	Adjustment range	Factory setting
tOr-	**[TORQUE CONTROL]** This function can only be accessed for [Motor control type] (Ctt) = [SVC I] (CUC) or [Closed loop] (FUC). **Note:** This function cannot be used with certain other functions. Follow the instructions on page 118.		
tSS nO YES LI1 - - -	**[Trq/spd switching]** ☐ **[No]** (nO): Function inactive, thereby preventing access to other parameters. ☐ **[Yes]** (YES): Permanent torque control ☐ **[LI1]** (LI1) : : ☐ **[...]** (...): See the assignment conditions on page 112. If the assigned input or bit is at 1: Torque control If the assigned input or bit is at 0: Speed regulation		[No] (nO)
tr1 nO AI1 AI2 AI3 AI4 LCC Mdb CAn nEt APP PI PG	**[Torque ref. channel]** ☐ **[No]** (nO): Not assigned (zero torque reference). ☐ **[AI1]** (AI1): Analog input ☐ **[AI2]** (AI2): Analog input ☐ **[AI3]** (AI3): Analog input, if VW3A3202 I/O card has been inserted ☐ **[AI4]** (AI4): Analog input, if VW3A3202 I/O card has been inserted ☐ **[HMI]** (LCC): Graphic display terminal ☐ **[Modbus]** (Mdb): Integrated Modbus ☐ **[CANopen]** (CAn): Integrated CANopen ☐ **[Com. card]** (nEt): Communication card (if inserted) ☐ **[Prog. card]** (APP): Controller Inside card (if inserted) ☐ **[RP]** (PI): Frequency input, if VW3A3202 I/O card has been inserted ☐ **[Encoder]** (PG): Encoder input, if encoder card has been inserted 100 % of the reference correspond to 300 % of the nominal torque.		[No] (nO)
tSd nO LI1 - - -	**[Torque ref. sign]** ☐ **[No]** (nO): Function inactive ☐ **[LI1]** (LI1) : : ☐ **[...]** (...): See the assignment conditions on page 112. If the assigned input or bit is at 0, the torque sign is the same as the reference. If the assigned input or bit is at 1, the torque sign is the opposite of the reference.		[No] (nO)
trt ( )	**[Torque ratio]** Coefficient applied to [Torque reference] (tr1).	0 to 1000%	100%
trP ( )	**[Torque ramp time]** Torque rise and fall time for a variation of 100% of the nominal torque.	0 to 99.99 s	3 s
tSt SPd YES SPn	**[Torque control stop]** ☐ **[Speed]** (SPd): Speed regulation stop, in accordance with the type of stop configuration (see page 128) ☐ **[Freewheel]** (YES): Freewheel stop. ☐ **[Spin]** (SPn): Zero torque stop, but maintaining the flux in the motor. This type of operation is only possible if [Motor control type] (Ctt) = [FVC] (FUC).		[Speed] (SPd)
SPt ( )	**[Spin time]** The parameter can be accessed if [Torque control stop] (tSt) = [Spin] (SPn) Spin time following stop, in order to remain ready to restart quickly.	0 to 3600 s	1

( ) Parameter that can be modified during operation or when stopped.

Code	Name/Description	Adjustment range	Factory setting
	[TORQUE CONTROL] (continued)		
dbP ↻	**[Positive deadband]** Positive deadband. Value added algebraically to the speed reference. Example for dbP = 10: • If reference = +50 Hz: + 50 + 10 = 60 • If reference = - 50 Hz: - 50 + 10 = - 40	0 to 2 x [Max frequency] (tFr)	10 Hz
dbn ↻	**[Negative deadband]** Negative deadband. Value subtracted algebraically from the speed reference. Example for dbn = 10: • If reference = +50 Hz: + 50 - 10 = 40 • If reference = - 50 Hz: - 50 - 10 = - 60	0 to 2 x [Max frequency] (tFr)	10 Hz
rtO	**[Torque ctrl time out]** Time following automatic exit of torque control mode in the event of a fault or alarm.	0 to 999.9 s	60
tOb	**[Torq. ctrl fault mgt]** Response of drive once time [Torque ctrl time out] (rtO) has elapsed.		[Alarm] (ALrM)
ALrM	☐ **[Alarm]** (ALrM)		
FLt	☐ **[Fault]** (FLt): Fault with freewheel stop.		

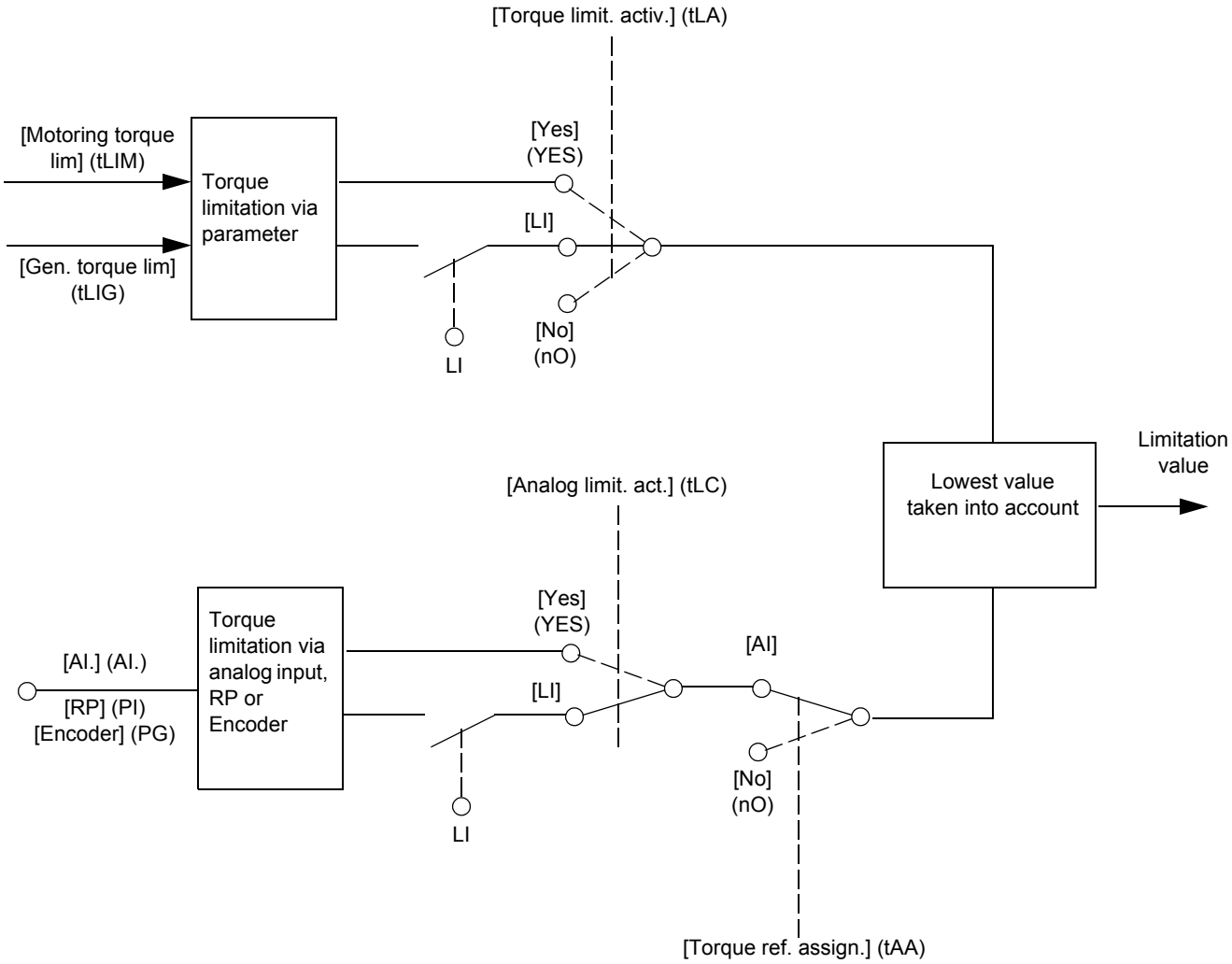
↻ Parameter that can be modified during operation or when stopped.

Torque limitation

There are two types of torque limitation:

- With a value that is fixed by a parameter
- With a value that is set by an analog input (AI, pulse or encoder)

If both types are enabled, the lowest value is taken into account. The two types of limitation can be configured or switched remotely using a logic input or via the communication bus.



Code	Name/Description	Adjustment range	Factory setting
tOL-	**[TORQUE LIMITATION]** This function cannot be accessed in V/F profile mode.		
tLA nO YES LI1 - - -	**[Torque limit. activ.]** ☐ **[No]** (nO): Function inactive ☐ **[Yes]** (YES): Function always active ☐ **[LI1]** (LI1) : : ☐ **[...]** (...): See the assignment conditions on page 112. 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.		[No] (nO)
tLIM ( )	**[Motoring torque lim]** (1) The parameter cannot be accessed if [Torque limit. activ.] (tLA) = [No] (nO) Torque limitation in motor mode, as a % of the rated torque.	0 to 300%	100%
tLIG ( )	**[Gen. torque lim]** (1) The parameter cannot be accessed if [Torque limit. activ.] (tLA) = [No] (nO) Torque limitation in generator mode, as a % of the rated torque.	0 to 300%	100%
tAA nO AI1 - AI4 PI PG	**[Torque ref. assign.]** ☐ **[No]** (nO): Not assigned (function inactive) ☐ **[AI1]** (AI1) to **[AI4]** (AI4): Analog input, if VW3A3202 I/O card has been inserted ☐ **[RP]** (PI): Frequency input, if VW3A3202 I/O card has been inserted ☐ **[Encoder]** (PG): Encoder input, if encoder card has been inserted If the function is assigned, the limitation varies between 0% and 300% of the rated torque on the basis of the 0% to 100% signal applied to the assigned input. Examples: - 12 mA on a 4-20 mA input results in limitation to 150% of the rated torque. - 2.5 V on a 10 V input results in 75% of the rated torque.		[No] (nO)
tLC YES LI1 - - -	**[Analog limit. act.]** The parameter can be accessed if [Torque ref. assign.] (tAA) is not [No] (nO). ☐ **[Yes]** (YES): The limitation depends on the input assigned by [Torque ref. assign.] (tAA). ☐ **[LI1]** (LI1) : : ☐ **[...]** (...): See the assignment conditions on page 112. If the assigned input or bit is at 0: • The limitation is specified by the [Motoring torque lim] (tLIM) and [Gen. torque lim.] parameters (tLIG) if [Torque limit. activ.] (tLA) is not [No] (nO). • No limitation if [Torque limit. activ.] (tLA) = [No] (nO). If the assigned input or bit is at 1: • The limitation depends on the input assigned by [Torque ref. assign.] (tAA). **Note:** If [Torque limitation] (tLA) and [Torque ref. assign.] (tAA) are enabled at the same time, the lowest value is taken into account.		[Yes] (YES)

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.

( ) Parameter that can be modified during operation or when stopped.

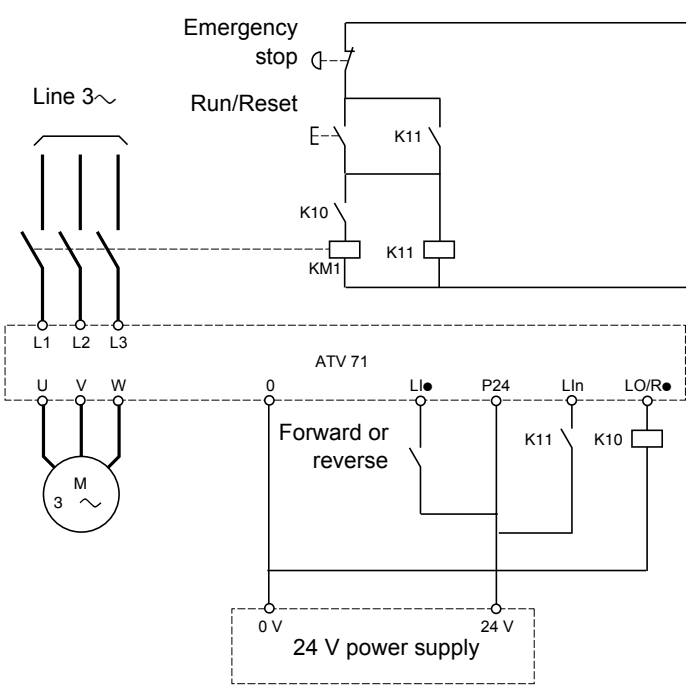
Code	Name/Description	Adjustment range	Factory setting
CL1-	**■ [2nd CURRENT LIMIT.]**		
LC2 nO LI1 - - -	**❑ [Current limit 2]** ☐ **[No]** (nO): Function inactive. ☐ **[LI1]** (LI1) : : ☐ **[...]** (...): See the assignment conditions on page 112. If the assigned input or bit is at 0, the first current limitation is active. If the assigned input or bit is at 1, the second current limitation is active.		[No] (nO)
CL2 ( )	**❑ [I Limit. 2 value]** (1) Second current limitation The parameter can be accessed if [Current limit 2] (LC2) is not [No] (nO). The adjustment range is limited to 1.36 In if [Switching freq.] (SFr) page 57 is less than 2 kHz. **Note:** If the setting is less than 0.25 In, the drive may lock in [Output Phase Loss] (OPF) fault mode if this has been enabled (see page 201). If it is less than the no-load motor current, the limitation no longer has any effect.	0 to 1.65 In (2)	1.5 In (2)
CL1 ( )	**❑ [Current Limitation]** (1) First current limitation The parameter can be accessed if [Current limit 2] (LC2) is not [No] (nO). The adjustment range is limited to 1.36 In if [Switching freq.] (SFr) page 57 is less than 2 kHz. **Note:** If the setting is less than 0.25 In, the drive may lock in [Output Phase Loss] (OPF) fault mode if this has been enabled (see page 201). If it is less than the no-load motor current, the limitation no longer has any effect.	0 to 1.65 In (2)	1.5 In (2)

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.
(2) In corresponds to the rated drive current indicated in the installation manual and on the drive nameplate.

( ) Parameter that can be modified during operation or when stopped.

Line contactor command

Example circuit:



Note: The "Run/Reset" button must be pressed once the "Emergency stop" button has been released.

The drive control power supply must be provided via an external 24 V source.

CAUTION
This function can only be used for a small number of consecutive operations with a cycle time longer than 60 s (in order to avoid premature aging of the filter capacitor charging circuit). **Failure to follow this instruction can result in equipment damage.**

Note: The line contactor closes every time a run command (forward or reverse) is sent and opens after every stop.

Code	Name/Description	Adjustment range	Factory setting
LLC-	**■ [LINE CONTACTOR COMMAND]**		
LLC	**❑ [Line contactor ass.]**		[No] (nO)
	Logic output or control relay ☐ **[No]** (nO): Function not assigned (in this case, none of the function parameters can be accessed). ☐ **[LO1]** (LO1) to **[LO4]** (LO4): Logic output (if one or two I/O cards have been inserted, LO1 to LO2 or LO4 can be selected). ☐ **[R2]** (r2) to **[R4]** (r4): Relay (selection of R2 extended to R3 or R4 if one or two I/O cards have been inserted).		
LES	**❑ [Drive lock]**		[No] (nO)
	☐ **[No]** (nO): Function inactive. ☐ **[LI1]** (LI1) : : ☐ **[...]** (...): See the assignment conditions on page 112. The drive locks when the assigned input or bit changes to 0.		
LCt	**❑ [Mains V. time out]**	5 to 999 s	5 s
	Monitoring time for closing of line contactor. If, once this time has elapsed, there is no voltage on the drive power circuit, the drive will lock with a "line contactor" (LCF) fault.		

Output contactor command

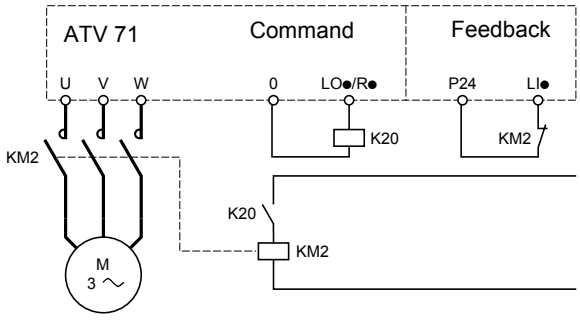
This allows the drive to control a contactor located between the drive and the motor. The request for the contactor to close is made when a run command is sent. The request for the contactor to open is made when there is no longer any current in the motor.

CAUTION
If a DC injection braking function has been configured it should not be left operating too long in stop mode, as the contactor only opens at the end of braking. **Failure to follow this instruction can result in equipment damage.**

Output contactor feedback

The corresponding logic input should be at 1 when there is no run command and at 0 during operation.
In the event of an inconsistency, the drive trips on an FCF1 fault if the output contactor fails to close (LIx at 1) and on an FCF2 fault if it is stuck (LIx at 0).
The parameter [Time to motor run] (dbS) can be used to delay tripping in fault mode when a run command is sent and the parameter [Time to open cont.] (dAS) delays the fault when a stop command is set.

Note:
Fault FCF1 (contactor failing to close) can be reset by the run command changing state from 1 to 0 (0 --> 1 --> 0 in 3-wire control).



The [Out. contactor ass.] (OCC) and [Output contact. fdbk] (rCA) functions can be used individually or together.

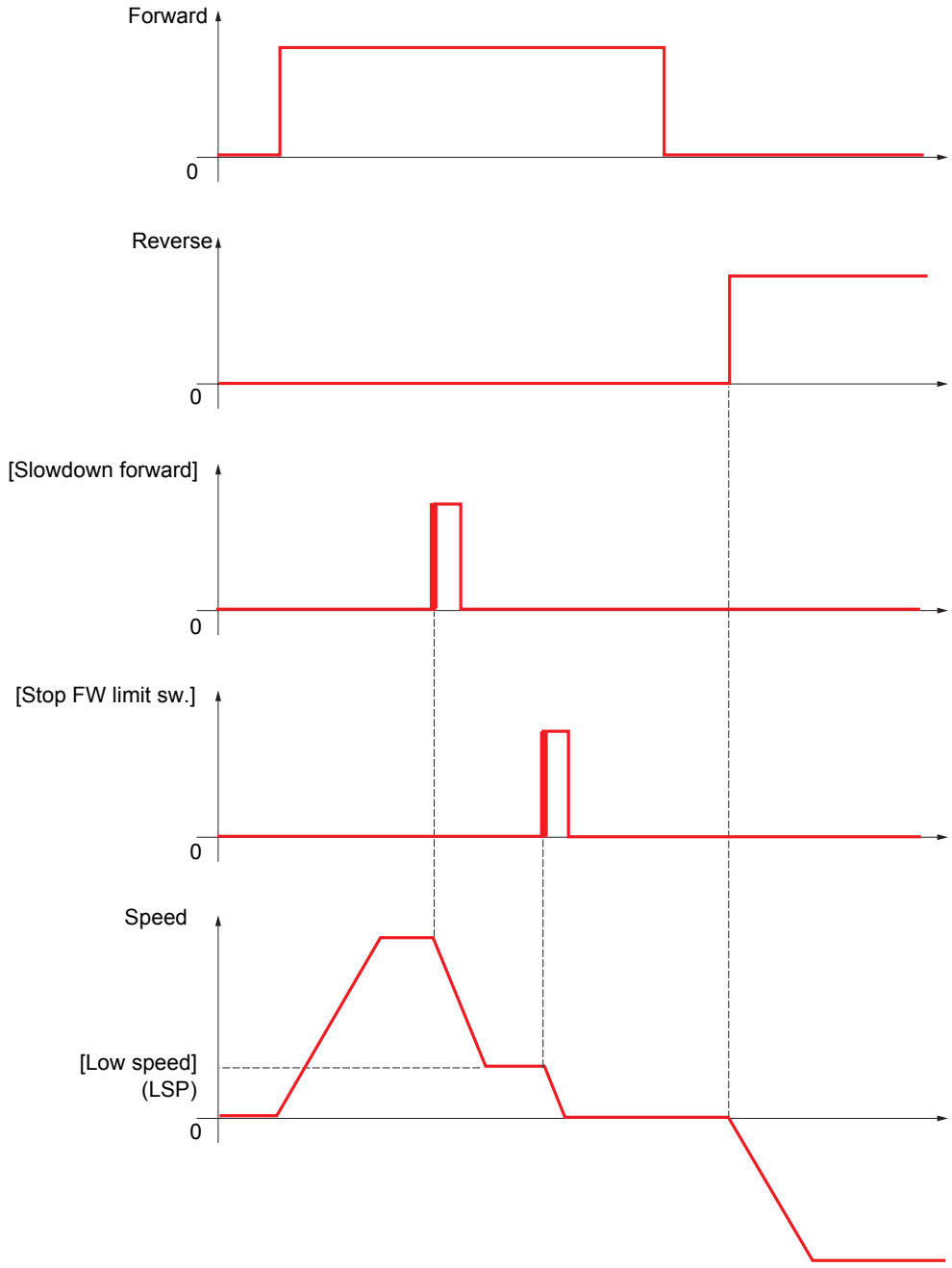
Code	Name/Description	Adjustment range	Factory setting
OCC-	**[OUTPUT CONTACTOR CMD]**		
OCC nO LO1 - LO4 r2 - r4	**[Out. contactor ass.]** Logic output or control relay ☐ **[No]** (nO): Function not assigned (in this case, none of the function parameters can be accessed). ☐ **[LO1]** (LO1) to **[LO4]** (LO4): Logic output (if one or two I/O cards have been inserted, LO1 to LO2 or LO4 can be selected). ☐ **[R2]** (r2) to **[R4]** (r4): Relay (selection of R2 extended to R3 or R4 if one or two I/O cards have been inserted).		[No] (nO)
rCA nO LI1 - - -	**[Output contact. fdbk]** ☐ **[No]** (nO): Function inactive. ☐ **[LI1]** (LI1) : : ☐ **[...]** (...): See the assignment conditions on page 112. The motor starts up when the assigned input or bit changes to 0.		[No] (nO)
dbS ()	**[Time to motor run]** Time delay for: • Motor control following the sending of a run command. • Output contactor fault monitoring, if the feedback is assigned. If the contactor fails to close at the end of the set time, the drive will lock in FCF1 fault mode. This parameter can be accessed if [Output cont.] (OCC) is assigned or if [Output cont. fdbk] (rCA) is assigned. The time delay must be greater than the closing time of the output contactor.	0.05 to 60 s	0,15
dAS ()	**[Time to open cont.]** Time delay for output contactor opening command following motor stop. This parameter can be accessed if [Output contact. fdbk] (rCA) is assigned. The time delay must be greater than the opening time of the output contactor. If it is set to 0, the fault will not be monitored. If the contactor fails to open at the end of the set time, the drive will lock in FCF2 fault mode.	0 to 5.00 s	0,10

() Parameter that can be modified during operation or when stopped.

Positioning by sensors or limit switches

This function is used for managing positioning using position sensors or limit switches linked to logic inputs or using control word bits:

- Slowing down
- Stopping

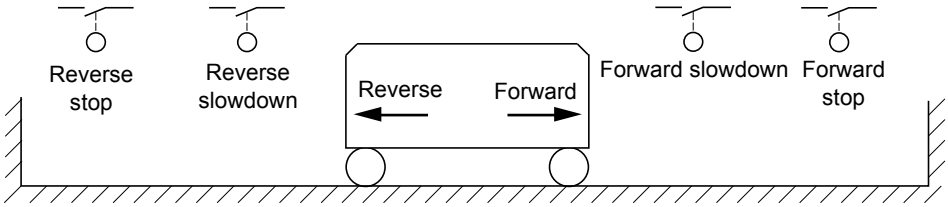


The slowdown mode and stop mode can be configured.
The operation is identical for both directions of operation. Slowdown and stopping operate according to the same logic, described below.

Example: Slowdown in forward operation

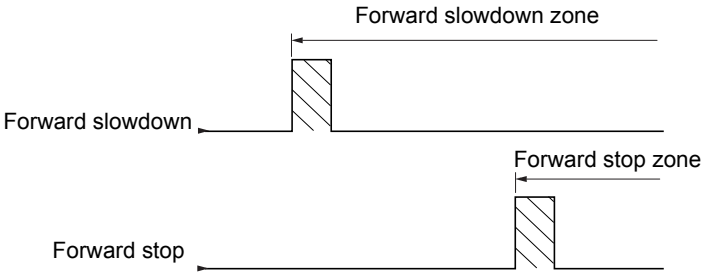
- Forward slowdown takes place on a rising edge (change from 0 to 1) of the input or bit assigned to forward slowdown if this rising edge occurs in forward operation. The slowdown command is then memorized, even in the event of a power outage. Operation in the opposite direction is authorized at high speed. The slowdown command is deleted on a falling edge (change from 1 to 0) of the input or bit assigned to forward slowdown if this falling edge occurs in reverse operation.
- A bit or a logic input can be assigned to disable this function.
- Although forward slowdown is disabled while the disable input or bit is at 1, sensor changes continue to be monitored and saved.

Example: Positioning on a limit switch



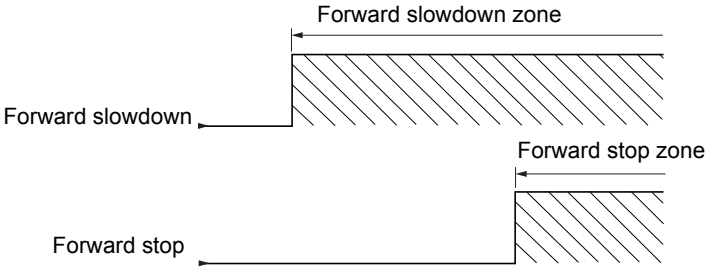
Operation with short cams:

In this case, the first time the drive is operated or after a return to factory settings, it must be started initially outside the slowdown and stopping zones in order to initialize the function.



Operation with long cams:

In this instance, there is no restriction, which means that the function is initialized across the whole trajectory.



Code	Name/Description	Adjustment range	Factory setting
LPO-	**[POSITIONING BY SENSORS]** **Note:** This function cannot be used with certain other functions. Follow the instructions on page 118.		
SAF nO LI1 - - C101 - - - CD00 -	**[Stop FW limit sw.]** ☐ **[No]** (nO): Not assigned ☐ **[LI1]** (LI1) to **[LI6]** (LI6) ☐ **[LI7]** (LI7) to **[LI10]** (LI10): If VW3A3201 logic I/O card has been inserted ☐ **[LI11]** (LI11) to **[LI14]** (LI14): If VW3A3202 extended I/O card has been inserted ☐ **[C101]** (C101) to **[C115]** (C115): With integrated Modbus in [I/O profile] (IO) ☐ **[C201]** (C201) to **[C215]** (C215): With integrated CANopen in [I/O profile] (IO) ☐ **[C301]** (C301) to **[C315]** (C315): With a communication card in [I/O profile] (IO) ☐ **[C401]** (C401) to **[C415]** (C415): With a Controller Inside card in [I/O profile] (IO) ☐ **[CD00]** (Cd00) to **[CD13]** (Cd13): In [I/O profile] (IO) can be switched with possible logic inputs ☐ **[CD14]** (Cd14) to **[CD15]** (Cd15): In [I/O profile] (IO) can be switched without logic inputs Forward stop, controlled on a rising edge (change from 0 to 1) of the assigned bit or input.		[No] (nO)
SAr	**[Stop RV limit sw.]** Same assignments possible as for [Stop FW limit sw.] (SAF) above. Reverse stop, controlled on a rising edge (change from 0 to 1) of the assigned bit or input.		[No] (nO)
dAF	**[Slowdown forward]** Same assignments possible as for [Stop FW limit sw.] (SAF) above. Forward slowdown, controlled on a rising edge (change from 0 to 1) of the assigned bit or input.		[No] (nO)
dAr	**[Slowdown reverse]** Same assignments possible as for [Stop FW limit sw.] (SAF) above. Reverse slowdown, controlled on a rising edge (change from 0 to 1) of the assigned bit or input.		[No] (nO)
CLS nO LI1 - - -	**[Disable limit sw.]** The parameter can be accessed if at least one limit switch or one sensor has been assigned. ☐ **[No]** (nO): Not assigned ☐ **[LI1]** (LI1) : : ☐ **[...]** (...): See the assignment conditions on page 112. The action of the limit switches is disabled when the assigned bit or input is at 1. If, at this time, the drive is stopped or being slowed down by limit switches, it will restart up to its speed reference.		[No] (nO)
PAS rMP FSt YES	**[Stop type]** The parameter can be accessed if at least one limit switch or one sensor has been assigned. ☐ **[Ramp stop]** (rMP): On ramp ☐ **[Fast stop]** (FSt): Fast stop (ramp time reduced by [Ramp divider] (dCF), see page 128) ☐ **[Freewheel]** (YES): Freewheel stop		[Ramp stop] (rMP)
dSF Std OPt	**[Deceleration type]** The parameter can be accessed if at least one limit switch or one sensor has been assigned. ☐ **[Standard]** (Std): Uses the [Deceleration] (dEC) or [Deceleration 2] (dE2) ramp (depending on which has been enabled). ☐ **[Optimized]** (OPt): The ramp time is calculated on the basis of the actual speed when the slowdown contact switches, in order to limit the operating time at low speed (optimization of the cycle time: the slowdown time is constant regardless of the initial speed).		[Standard] (Std)

Parameter set switching [PARAM. SET SWITCHING]

A set of 1 to 15 parameters from the [1.3 SETTINGS] (SEt-) menu on page 50 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 logic inputs or control word bits. This switching can be performed during operation (motor running).

	Values 1	Values 2	Values 3
Parameter 1 Parameter 2 Parameter 3 Parameter 4 Parameter 5 Parameter 6 Parameter 7 Parameter 8 Parameter 9 Parameter 10 Parameter 11 Parameter 12 Parameter 13 Parameter 14 Parameter 15	Parameter 1 Parameter 2 Parameter 3 Parameter 4 Parameter 5 Parameter 6 Parameter 7 Parameter 8 Parameter 9 Parameter 10 Parameter 11 Parameter 12 Parameter 13 Parameter 14 Parameter 15	Parameter 1 Parameter 2 Parameter 3 Parameter 4 Parameter 5 Parameter 6 Parameter 7 Parameter 8 Parameter 9 Parameter 10 Parameter 11 Parameter 12 Parameter 13 Parameter 14 Parameter 15	Parameter 1 Parameter 2 Parameter 3 Parameter 4 Parameter 5 Parameter 6 Parameter 7 Parameter 8 Parameter 9 Parameter 10 Parameter 11 Parameter 12 Parameter 13 Parameter 14 Parameter 15
Input LI or bit 2 values	0	1	0 or 1
Input LI or bit 3 values	0	0	1

☞ **Note:** These parameters can no longer be modified in the [1.3 SETTINGS] (SEt-) menu. Any modifications made in the [1.3 SETTINGS] (SEt-) menu will be lost the next time the drive is shut down. The parameters can be adjusted during operation in the [PARAM. SET SWITCHING] (MLP-) menu, on the active configuration.

Note: Parameter set switching cannot be configured from the integrated display terminal.
Parameters can only be adjusted on the integrated display terminal if the function has been configured previously via the graphic display terminal, by PowerSuite or via the bus or communication network. If the function has not been configured, the **MLP-** menu and the **PS1-**, **PS2-**, **PS3-** submenus do not appear.

Code	Name/Description	Adjustment range	Factory setting

nLP- ■ [PARAM. SET SWITCHING]

CHA1 ❏ [2 Parameter sets]

[No] (nO)

- ☐ **[No]** (nO): Function inactive.
- ☐ **[LI1]** (LI1)
  :
  :
- ☐ **[...]** (...): See the assignment conditions on page 112.

Switching 2 parameter sets

CHA2 ❏ [3 Parameter sets]

[No] (nO)

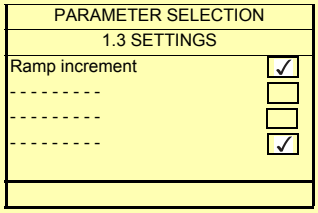
- ☐ **[No]** (nO): Function inactive.
- ☐ **[LI1]** (LI1)
  :
  :
- ☐ **[...]** (...): See the assignment conditions on page 112.

Switching 3 parameter sets

Note: In order to obtain 3 parameter sets, [2 Parameter sets] must also be configured.

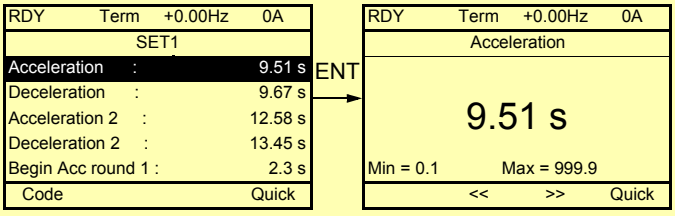
❏ [PARAMETER SELECTION]

The parameter can only be accessed on the graphic display terminal if [2 Parameter sets] is not [No].
Making an entry in this parameter opens a window containing all the adjustment parameters that can be accessed.
Select 1 to 15 parameters using ENT (a tick then appears next to the parameter). Parameter(s) can also be deselected using ENT.
Example:



PS1- ❏ [SET 1]

The parameter can be accessed if at least 1 parameter has been selected in [PARAMETER SELECTION].
Making an entry in this parameter opens a settings window containing the selected parameters **in the order in which they were selected**.
With the graphic display terminal:



With the integrated display terminal:
Proceed as in the Settings menu using the parameters that appear.

Code	Name/Description	Adjustment range	Factory setting
	■ [PARAM. SET SWITCHING] (continued)		
PS2-	❑ [SET 2] The parameter can be accessed if at least 1 parameter has been selected in [PARAMETER SELECTION]. Procedure identical to [SET 1] (PS1-).		
PS3-	❑ [SET 3] The parameter can be accessed if [3 Parameter sets] is not [No] and if at least 1 parameter has been selected in [PARAMETER SELECTION]. Procedure identical to [SET 1] (PS1-).		

☞ **Note: We recommend that a parameter set switching test is carried out on stopping and a check is made to ensure that it has been performed correctly.**
Some parameters are interdependent and in this case may be restricted at the time of switching.

Interdependencies between parameters must be respected, even between different sets.

Example: The highest [Low speed] (LSP) must be below the lowest [High speed] (HSP).

[1.7 APPLICATION FUNCT.] (FUn-)

Motor or configuration switching [MULTIMOTORS/CONFIG.]

The drive may contain up to 3 configurations, which can be saved using the [1.12 FACTORY SETTINGS] (FCS-) menu, page 221.
Each of these configurations can be activated remotely, enabling adaptation to:

- 2 or 3 different motors or mechanisms (multimotor mode)
- 2 or 3 different configurations for a single motor (multiconfiguration mode)

The two switching modes cannot be combined.

Note: The following conditions MUST be observed:

- Switching may only take place when stopped (drive locked). If a switching request is sent during operation, it will not be executed until the next stop.
- In the event of motor switching, the following additional conditions apply:
  - When the motors are switched, the power and control terminals concerned must also be switched as appropriate.
  - The maximum power of the drive must not be exceeded by any of the motors.
- All the configurations to be switched must be set and saved in advance in the same hardware configuration, this being the definitive configuration (option and communication cards). Failure to follow this instruction can cause the drive to lock on a fault [Incorrect config.] (CFF).

Menu and parameters switched in multimotor mode

- [1.3 SETTINGS] (SEt-)
- [1.4 MOTOR CONTROL] (drC-)
- [1.5 INPUTS / OUTPUTS CFG] (I-O-)
- [1.6 COMMAND] (CtL-)
- [1.7 APPLICATION FUNCT.] (FUn-) with the exception of the [MULTIMOTORS/CONFIG.] function (to be configured once only)
- [1.8 FAULT MANAGEMENT] (FLt)
- [1.13 USER MENU]
- [USER CONFIG.]: The name of the configuration specified by the user in the [1.12 FACTORY SETTINGS] (FCS-) menu

Menu and parameters switched in multiconfiguration mode

As in multimotor mode, except for the motor parameters that are common to the three configurations:

- Rated current
- Thermal current
- Rated voltage
- Rated frequency
- Rated speed
- Rated power
- IR compensation
- Slip compensation
- Synchronous motor parameters
- Type of thermal protection
- Thermal state
- The auto-tuning parameters and motor parameters that can be accessed in expert mode
- Type of motor control

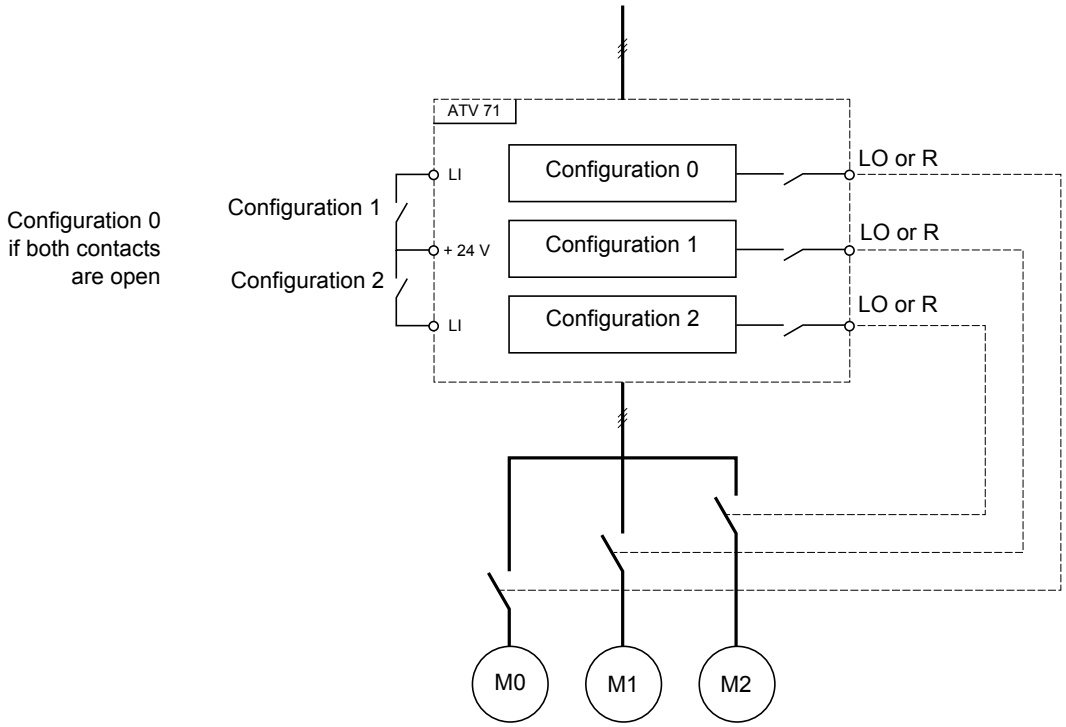
Note: No other menus or parameters can be switched.

Switching command

Depending on the number of motors or selected configuration (2 or 3), the switching command is sent using one or two logic inputs. The table below lists the possible combinations.

LI 2 motors or configurations	LI 3 motors or configurations	Number of configuration or active motor
0	0	0
1	0	1
0	1	2
1	1	2

Schematic diagram for multimotor mode



Auto-tuning in multimotor mode

This auto-tuning can be performed:

- Manually using a logic input when the motor changes
- Automatically each time the motor is activated for the 1st time after switching on the drive, if the [Automatic autotune] (AUt) parameter on page 66 = [Yes] (YES).

Motor thermal states in multimotor mode:

The drive protects the three motors individually. Each thermal state takes into account all stop times, including drive shutdowns.
It is therefore not necessary to perform auto-tuning every time the power is switched on. It is sufficient to auto-tune each motor at least once.

Configuration information output

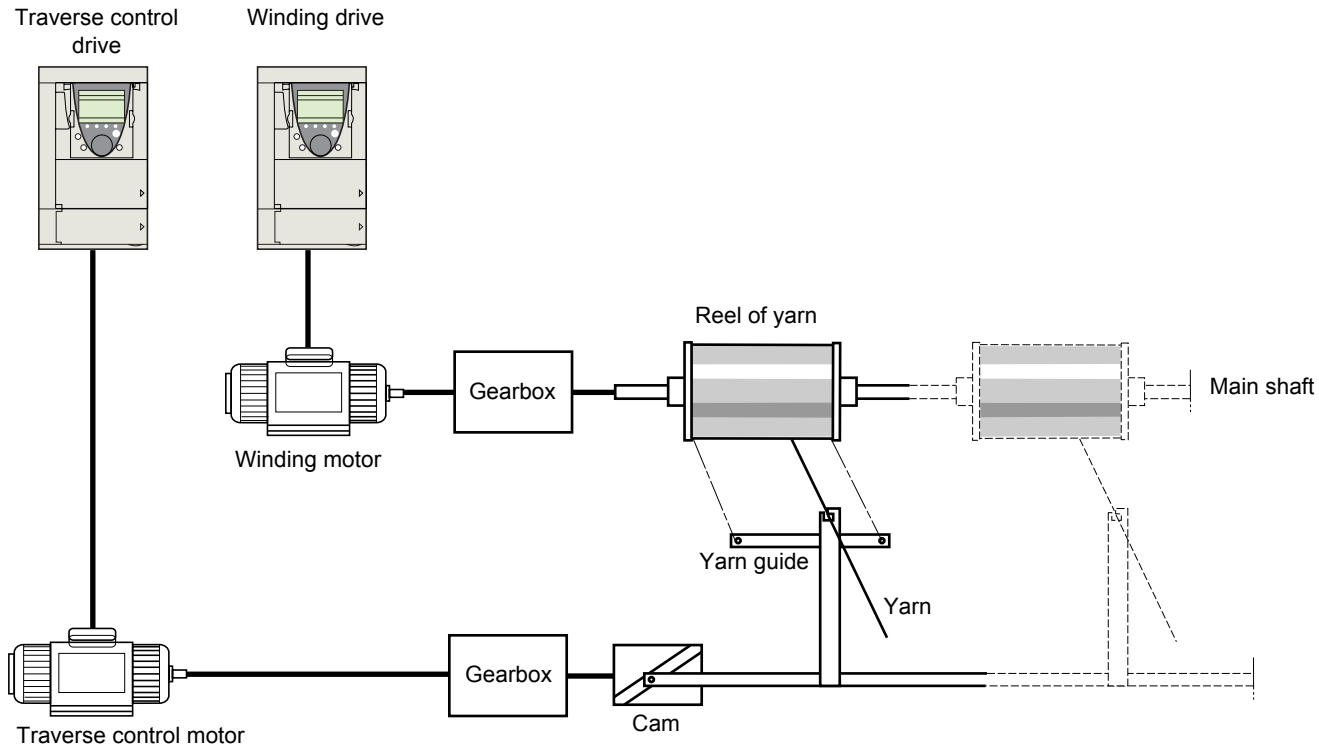
In the [1.5 INPUTS / OUTPUTS CFG] (I-O-) menu, a logic output can be assigned to each configuration or motor (2 or 3) for remote information transmission.

Note: As the [1.5 INPUTS / OUTPUTS CFG] (I-O-) menu is switched, these outputs must be assigned in all configurations in which information is required.

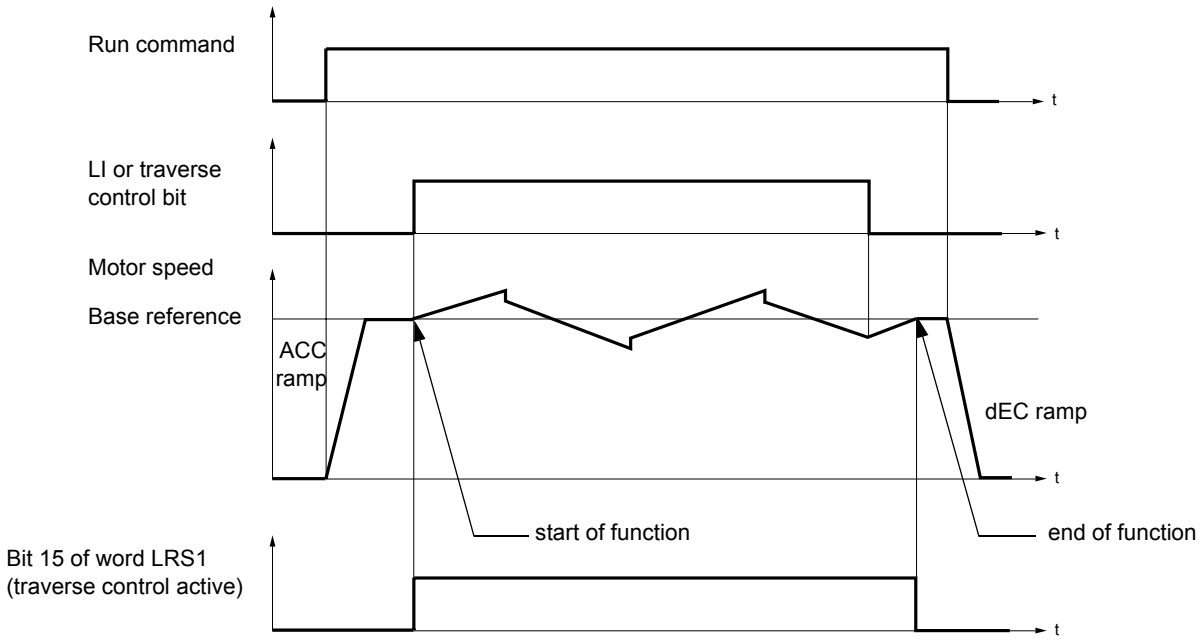
Code	Name/Description	Adjustment range	Factory setting
nnC-	**[MULTIMOTORS/CONFIG.]**		
CHn	**[Multimotors]**		[No] (nO)
nO	☐ **[No]** (nO): Multiconfiguration possible		
YES	☐ **[Yes]** (YES): Multimotor possible		
CnF1	**[2 Configurations]**		[No] (nO)
nO	☐ **[No]** (nO): No switching		
LI1	☐ **[LI1]** (LI1) to **[LI6]** (LI6)		
-	☐ **[LI7]** (LI7) to **[LI10]** (LI10): If VW3A3201 logic I/O card has been inserted		
-	☐ **[LI11]** (LI11) to **[LI14]** (LI14): If VW3A3202 extended I/O card has been inserted		
C111	☐ **[C111]** (C111) to **[C115]** (C115): With integrated Modbus		
-	☐ **[C211]** (C211) to **[C215]** (C215): With integrated CANopen		
-	☐ **[C311]** (C311) to **[C315]** (C315): With a communication card		
-	☐ **[C411]** (C411) to **[C415]** (C415): With a Controller Inside card		
	Switching of 2 motors or 2 configurations		
CnF2	**[3 Configurations]**		[No] (nO)
nO	☐ **[No]** (nO): No switching		
LI1	☐ **[LI1]** (LI1) to **[LI6]** (LI6)		
-	☐ **[LI7]** (LI7) to **[LI10]** (LI10): If VW3A3201 logic I/O card has been inserted		
-	☐ **[LI11]** (LI11) to **[LI14]** (LI14): If VW3A3202 extended I/O card has been inserted		
C111	☐ **[C111]** (C111) to **[C115]** (C115): With integrated Modbus		
-	☐ **[C211]** (C211) to **[C215]** (C215): With integrated CANopen		
-	☐ **[C311]** (C311) to **[C315]** (C315): With a communication card		
-	☐ **[C411]** (C411) to **[C415]** (C415): With a Controller Inside card		
	Switching of 3 motors or 3 configurations		
	Note: In order to obtain 3 motors or 3 configurations, [2 Configurations] (CnF1) must also be configured.		
tnL-	**[AUTO TUNING BY LI]**		
tUL	**[Auto-tune assign.]**		[No] (nO)
nO	☐ **[No]** (nO): Not assigned		
LI1	☐ **[LI1]** (LI1)		
-	:		
-	:		
-	☐ **[...]** (...): See the assignment conditions on page 112.		
	Auto-tuning is performed when the assigned input or bit changes to 1.		
	Note: Auto-tuning causes the motor to start up.		

Traverse control

Function for winding reels of yarn (in textile applications)



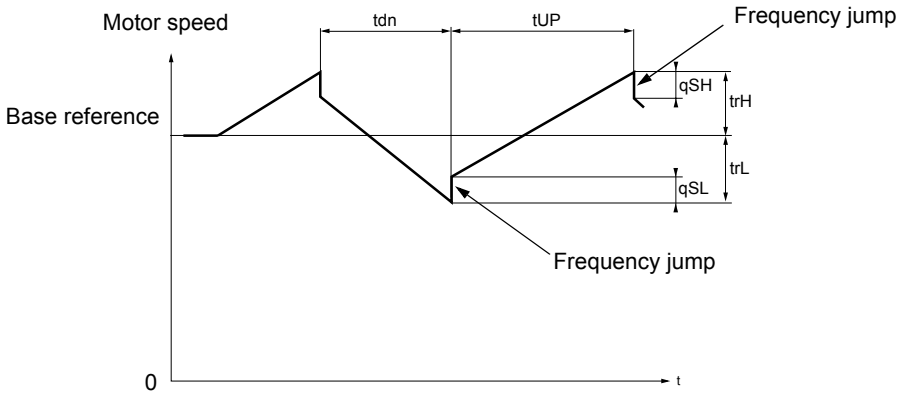
The speed of rotation of the cam must follow a precise profile to ensure that the reel is steady, compact and linear:



The function starts when the drive has reached its base reference and the traverse control command has been enabled.
When the traverse control command is disabled, the drive returns to its base reference, following the ramp determined by the traverse control function. The function then stops, as soon as it has returned to this reference.
Bit 15 of word LRS1 is at 1 while the function is active.

Function parameters:

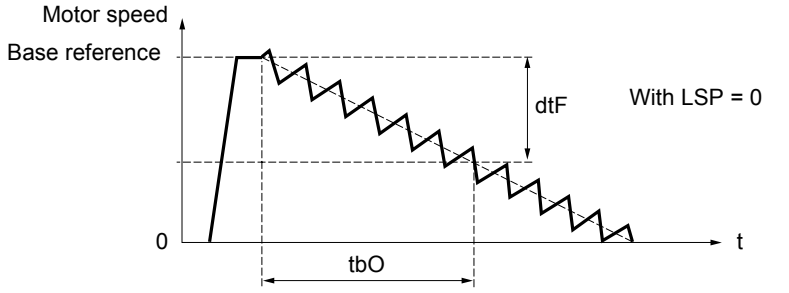
These define the cycle of frequency variations around the base reference, as shown in the diagram below:

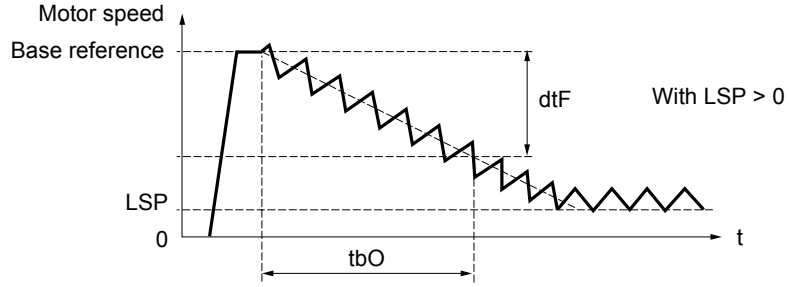


- trC: [Yarn control]: Assignment of the traverse control command to a logic input or to a communication bus control word bit
- tdn: [Traverse ctrl. decel] time, in seconds
- tUP: [Traverse ctrl. accel.] time, in seconds
- trH: [Traverse high], in Hertz
- trL: [Traverse Low], in Hertz
- qSH: [Quick step High], in Hertz
- qSL: [Quick step Low], in Hertz

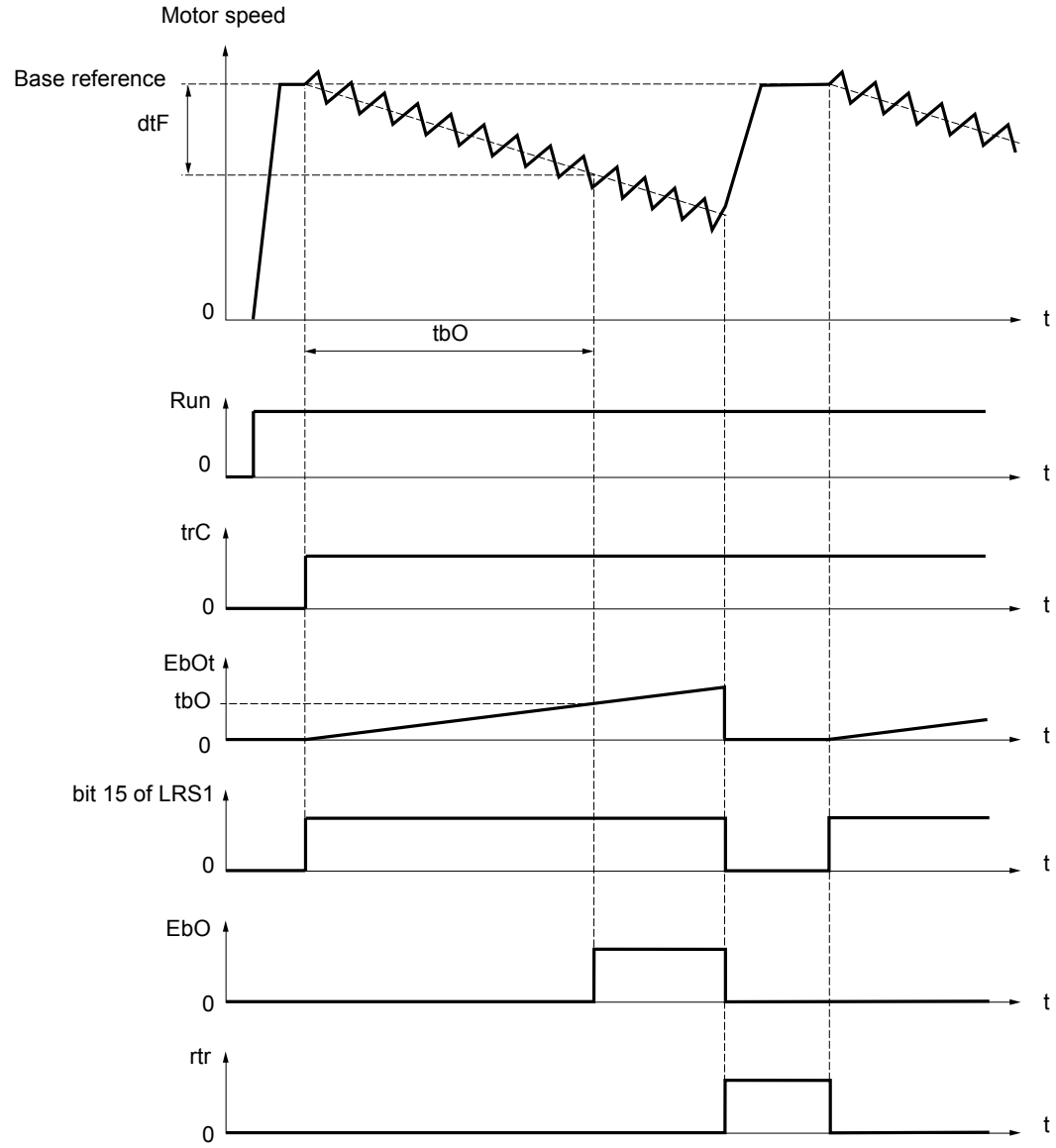
Reel parameters:

- tbO: [Reel time]: Time taken to make a reel, in minutes.
  This parameter is intended to signal the end of winding. When the traverse control operating time since command trC reaches the value of tbO, the logic output or one of the relays changes to state 1, if the corresponding function EbO has been assigned.
  The traverse control operating time EbOt can be monitored online by a communication bus and in the Monitoring menu.
- dtF: [Decrease ref. speed]: Decrease in the base reference.
  In certain cases, the base reference has to be reduced as the reel increases in size. The dtF value corresponds to time tbO. Once this time has elapsed, the reference continues to fall, following the same ramp. If low speed LSP is at 0, the speed reaches 0 Hz, the drive stops and must be reset by a new run command.
  If low speed LSP is not 0, the traverse control function continues to operate above LSP.

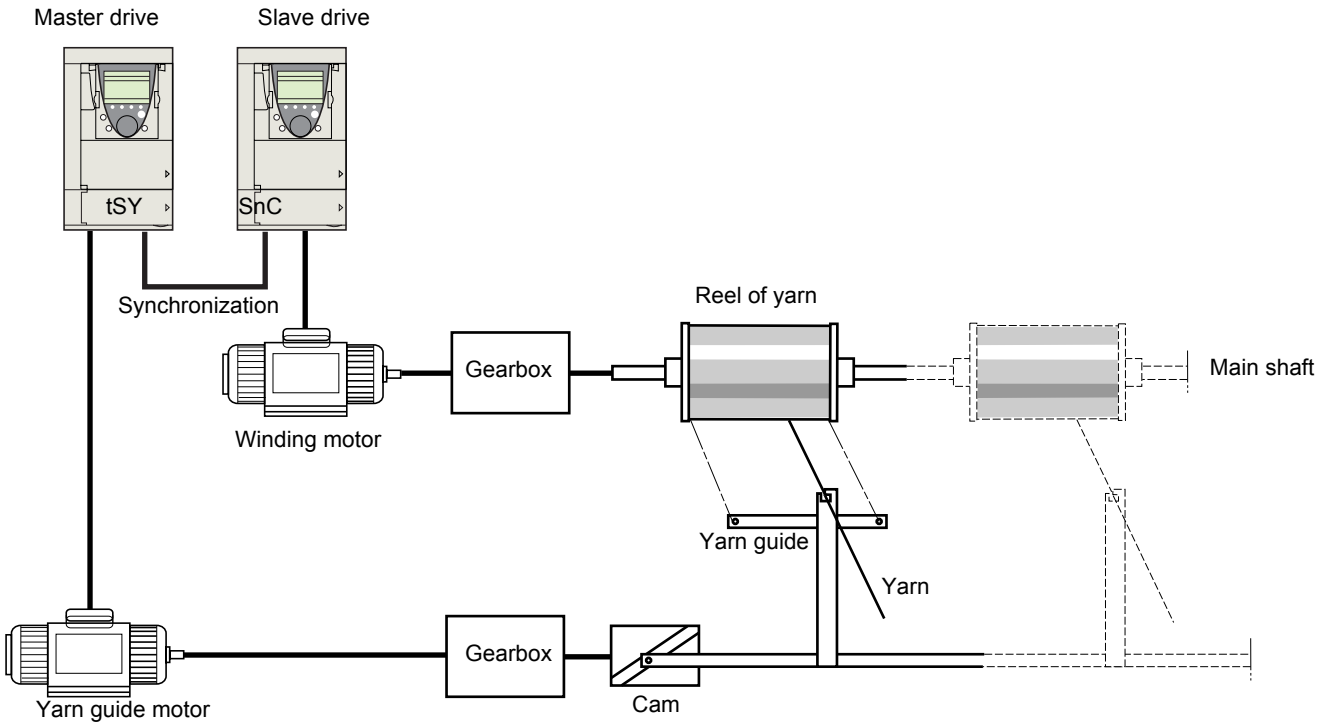




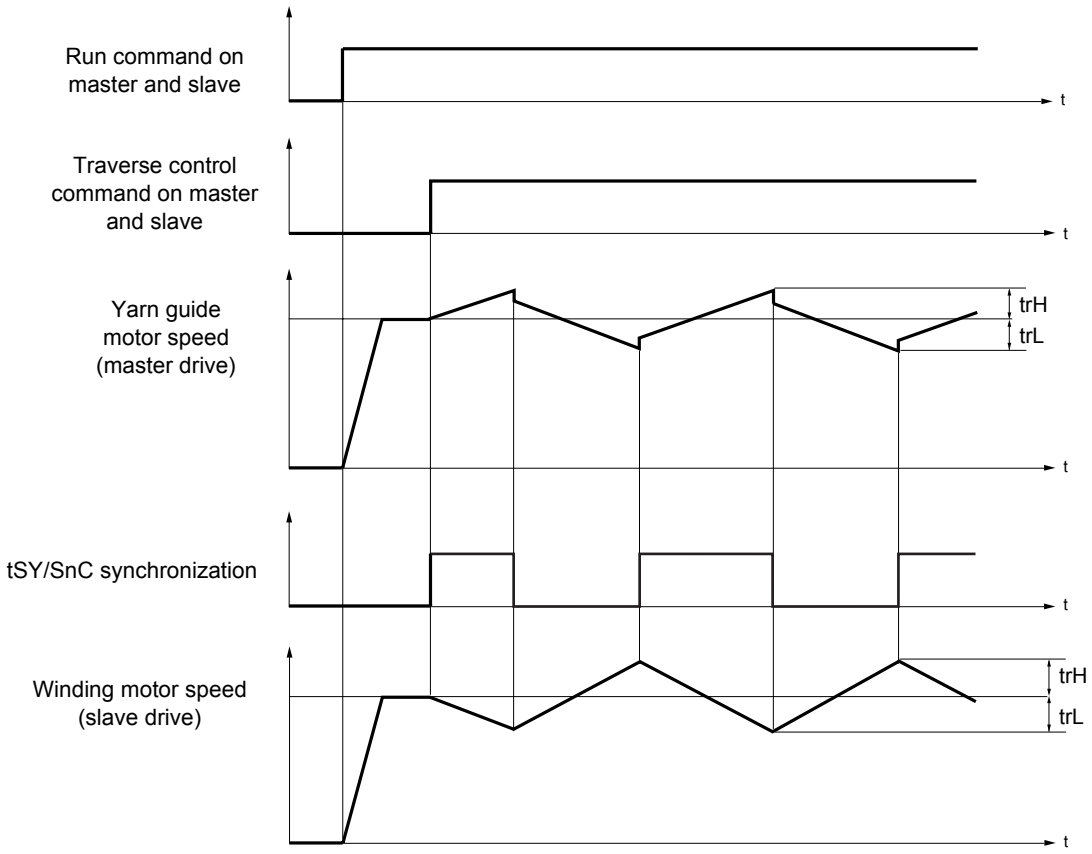
- rtr: [Init. traverse ctrl] Reinitialize traverse control.
  This command can be assigned to a logic input or to a communication bus control word bit. It resets the EbO alarm and the EbOt operating time to zero and reinitializes the reference to the base reference. As long as rtr remains at 1, the traverse control function is disabled and the speed remains the same as the base reference.
  This command is used primarily when changing reels.



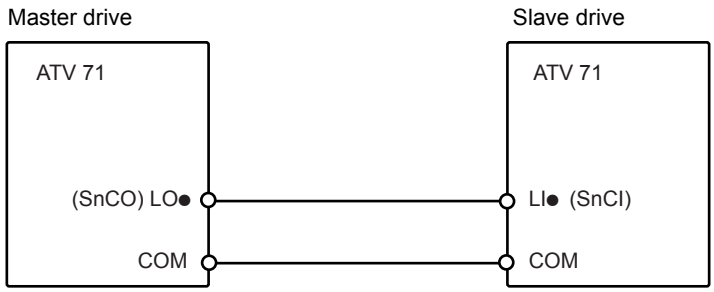
Counter wobble



The "Counter wobble" function is used, in certain applications, to obtain a constant yarn tension when the Traverse control function causes significant variations in speed on the yarn guide motor (trH and trL, see page 191).
Two drives must be used (one master and one slave).
The master controls the speed of the yarn guide, the slave controls the winding speed. The function assigns the slave a speed profile, which is in antiphase to that of the master. This means that synchronization is required, using one of the master's logic outputs and one of the slave's logic inputs.



Connection of synchronization I/O



The starting conditions for the function are:

- Base speeds reached on both drives
- [Yarn control] (trC) input activated
- Synchronization signal present

Note: On the slave drive, the [Quick step High] (qSH) and [Quick step Low] (qSL) parameters should generally be left at zero.

Code	Name/Description		Adjustment range	Factory setting
trO-	**[TRAVERSE CONTROL]** **Note:** This function cannot be used with certain other functions. Follow the instructions on page 118.			
trC nO LI1 - - -	**[Yarn control]** ☐ **[No]** (nO): Function inactive, thereby preventing access to other parameters. ☐ **[LI1]** (LI1) : : ☐ **[...]** (...): See the assignment conditions on page 112. The "traverse control" cycle starts when the assigned input or bit changes to 1 and stops when it changes to 0.			[No] (nO)
trH ()	**[Traverse high]**	(1)	0 to 10 Hz	4 Hz
trL ()	**[Traverse Low]**	(1)	0 to 10 Hz	4 Hz
qSH ()	**[Quick step High]**	(1)	0 to [Traverse high] (trH)	0 Hz
qSL ()	**[Quick step Low]**	(1)	0 to [Traverse Low] (trL)	0 Hz
tUP ()	**[Traverse ctrl. accel.]**		0.1 to 999.9 s	4 s
tdn ()	**[Traverse ctrl. decel]**		0.1 to 999.9 s	4 s
tbO ()	**[Reel time]** Reel execution time		0 to 9999 minutes	0 minute
EbO nO LO1 - LO4 r2 - r4	**[End reel]** ☐ **[No]** (nO): Function not assigned. ☐ **[LO1]** (LO1) to **[LO4]** (LO4): Logic output (if one or two I/O cards have been inserted, LO1 to LO2 or LO4 can be selected). ☐ **[R2]** (r2) to ☐ **[R4]** (r4): Relay (selection of R2 extended to R3 or R4 if one or two I/O cards have been inserted). The assigned output or relay changes to state 1 when the traverse control operating time reaches the [Reel time] (tbO).			[No] (nO)

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.

() Parameter that can be modified during operation or when stopped.

Code	Name/Description	Adjustment range	Factory setting
	[TRAVERSE CONTROL] (continued)		
SnC nO LI1 - - -	**[Counter wobble]** ☐ **[No]** (nO): Function not assigned. ☐ **[LI1]** (LI1) : : ☐ **[...]** (...): See the assignment conditions on page 112. To be configured on the winding drive (slave) only.		[No] (nO)
tSY nO LO1 - LO4 r2 - r4	**[Sync. wobble]** ☐ **[No]** (nO): Function not assigned. ☐ **[LO1]** (LO1) to **[LO4]** (LO4): Logic output (if one or two I/O cards have been inserted, LO1 to LO2 or LO4 can be selected). ☐ **[R2]** (r2) to ☐ **[R4]** (r4): Relay (selection of R2 extended to R3 or R4 if one or two I/O cards have been inserted). The assigned output or relay changes to state 1 when the traverse control operating time reaches the [Reel time] (tbO). To be configured on the yarn guide drive (master) only.		[No] (nO)
dtF ( )	**[Decrease ref. speed]** Decrease in the base reference during the traverse control cycle.	0 to 1000 Hz	0 Hz
rtr nO LI1 - - -	**[Init. traverse ctrl]** ☐ **[No]** (nO): Function not assigned. ☐ **[LI1]** (LI1) : : ☐ **[...]** (...): See the assignment conditions on page 112. When the state of the assigned input or bit changes to 1, the traverse control operating time is reset to zero, along with the [Decrease ref. speed] (dtF).		[No] (nO)

Evacuation function

The evacuation function is designed for "elevator" applications. It is only accessible for ATV71●●●N4 (380/480 V) drives.
When an elevator is stuck between 2 floors due to a power outage, it must be possible to evacuate its occupants within a reasonable period of time.
This function requires an emergency power supply to be connected to the drive.
This power supply is at a reduced voltage, and only allows a derated operating mode, at reduced speed, but with full torque.

The function requires:
- One logic input to control "evacuation" operation
- Reduction of the voltage monitoring threshold
- An appropriate low speed reference

Following a power outage and **turning off of the drive**, the latter can be powered up again without going into [UNDERVOLTAGE] (USF) fault mode if the corresponding control bit or logic input is at 1 at the same time. It is then possible to control ascent (FW) or descent (RV).

CAUTION

- This input must not be at 1 when the drive is powered from the line supply. To ensure this and also avoid any short-circuits, supply changeover contactors must be used.
- When switching back from the emergency power supply to the line supply, set this input to 0 and apply a power-off hold time of at least 10 seconds.

Failure to follow these instructions can result in equipment damage.

Code	Name/Description	Adjustment range	Factory setting
rFt-	**■ [EVACUATION]** This function is only accessible for ATV71●●●N4 (380/480 V) drives.		
rFt- nO LI1 - LI14	**❑ [Evacuation assign.]** ☐ **[No]** (nO): Function not assigned. ☐ **[LI1]** (LI1) to **[LI6]** (LI6). ☐ **[LI7]** (LI7) to **[LI10]** (LI10): If VW3A3201 logic I/O card has been inserted ☐ **[LI11]** (LI11) to **[LI14]** (LI14): If VW3A3202 extended I/O card has been inserted. Evacuation is activated when the assigned input is at 1, if the drive is stationary. Evacuation is activated when the assigned input is at 0, as soon as the drive stops.		[No] (nO)
rSU	**❑ [Evacuation Input V.]** Minimum permissible AC voltage value of the emergency power supply. The parameter can be accessed if [Evacuation assign.] (rFt) is not [No] (nO).	220 to 320 V	220 V
rSP ( )	**❑ [Evacuation freq.]** Value of the "evacuation" mode frequency reference. The parameter can be accessed if [Evacuation assign.] (rFt) is not [No] (nO). The adjustment range is determined by the [Low speed] (LSP) (page 52), [Rated motor freq.] (FrS) and [Rated motor volt.] (UnS) (page 65) parameters and by [Evacuation Input V.] (rSU) above. • If LSP < (Frs x rSU/UnS): rSP min. = LSP, rSP max. = (Frs x rSU/UnS) • If LSP ≥ (Frs x rSU/UnS): rSP = (Frs x rSU/UnS).		5 Hz

( ) Parameter that can be modified during operation or when stopped.

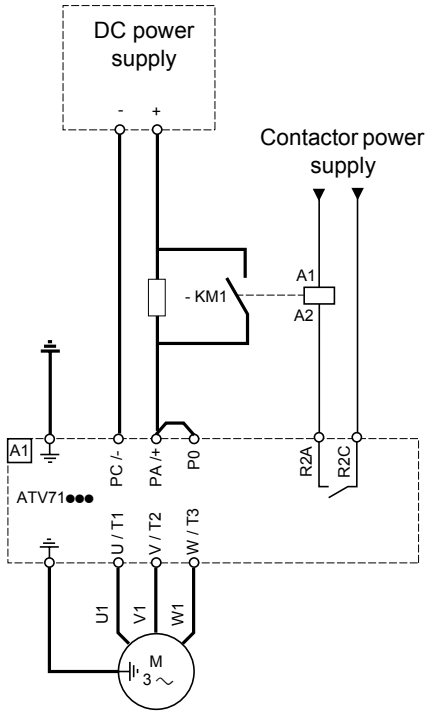
Direct power supply via DC bus

This function is only accessible for ATV71●●●M3 ⩾ 18.5 kW and ATV71●●●N4 > 18.5 kW drives.

Direct power supply via the DC bus requires a protected direct current source with adequate power and voltage as well as a suitably dimensioned resistor and capacitor precharging contactor. Consult Schneider Electric for information about dimensioning these components.

The "direct power supply via DC bus" function can be used to control the precharging contactor via a relay or a logic input on the drive.

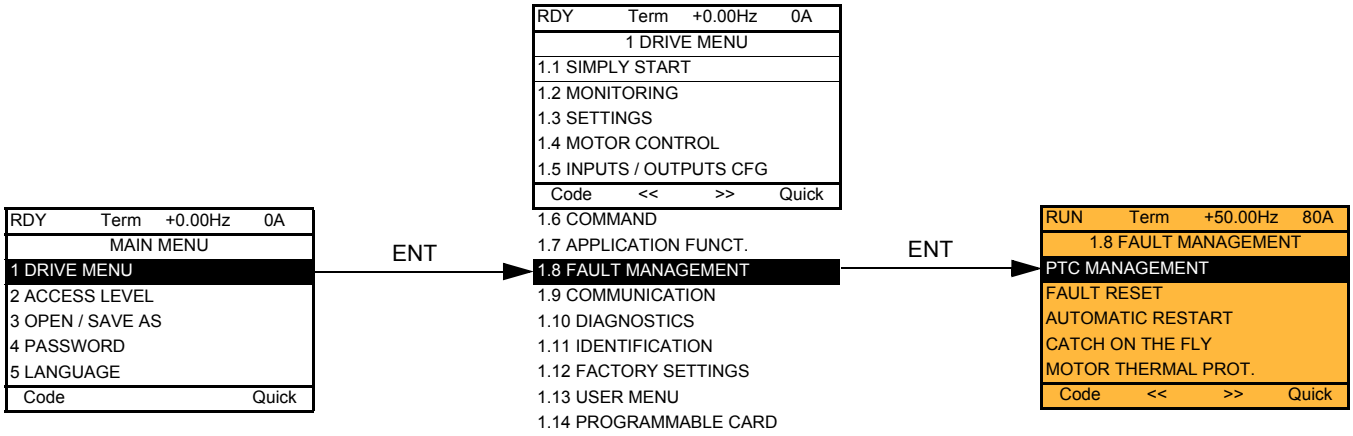
Example circuit using R2 relay:



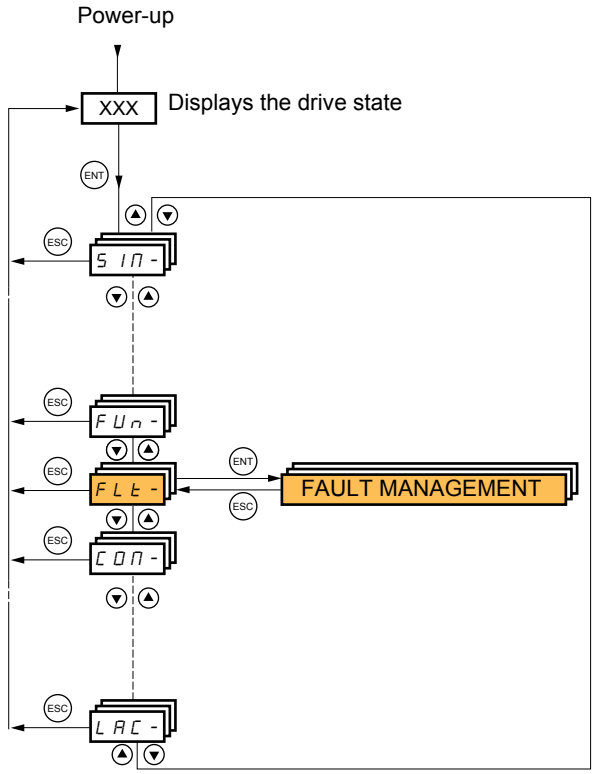
Code	Name/Description	Adjustment range	Factory setting
dCO-	**[DC BUS SUPPLY]** This function is only accessible for ATV71●●●M3 ⩾ 18.5 kW and ATV71●●●N4 > 18.5 kW drives.		
dCO	**[Precharge cont. ass.]**		[No] (nO)
	Logic output or control relay ☐ **[No]** (nO): Function not assigned. ☐ **[LO1]** (LO1) to **[LO4]** (LO4): Logic output (if one or two I/O cards have been inserted, LO1 to LO2 or LO4 can be selected). ☐ **[R2]** (r2) to **[R4]** (r4): Relay (selection of R2 extended to R3 or R4 if one or two I/O cards have been inserted).		
nO			
LO1			
-			
LO4			
r2			
-			
r4			

[1.8 FAULT MANAGEMENT] (FLt-)

With graphic display terminal:



With integrated display terminal:



Summary of functions:

Code	Name	Page
PtC-	[PTC MANAGEMENT]	197
rSt-	[FAULT RESET]	197
Atr-	[AUTOMATIC RESTART]	198
FLr-	[CATCH ON THE FLY]	199
tHt-	[MOTOR THERMAL PROT.]	201
OPL-	[OUTPUT PHASE LOSS]	201
IPL-	[INPUT PHASE LOSS]	202
OHL-	[DRIVE OVERHEAT]	202
SAt-	[THERMAL ALARM STOP]	203
EtF-	[EXTERNAL FAULT]	204
USb-	[UNDERVOLTAGE MGT]	205
t It-	[IGBT TESTS]	206
LFL-	[4-20mA LOSS]	207
InH-	[FAULT INHIBITION]	208
CLL-	[COM. FAULT MANAGEMENT]	209
Sdd-	[ENCODER FAULT]	210
t Id-	[TORQUE OR I LIM. DETECT.]	210
brP-	[DB RES. PROTECTION]	211
tnF-	[AUTO TUNING FAULT]	211
PPI-	[CARDS PAIRING]	212
LFF-	[FALLBACK SPEED]	213
FSt-	[RAMP DIVIDER]	213
dCI-	[DC INJECTION]	213

[1.8 FAULT MANAGEMENT] (FLt-)

The parameters in the [1.8 FAULT MANAGEMENT] (FLt-) menu can only be modified when the drive is stopped and there is no run command, except for parameters with a ↻ symbol in the code column, which can be modified with the drive running or stopped.

PTC probes

3 sets of PTC probes can be managed by the drive in order to protect the motors:

- 1 on logic input LI6 converted for this use by switch "**SW2**" on the control card.
- 1 on each of the 2 option cards VW3A3201 and VW3A3202.

Each of these sets of PTC probes is monitored for the following faults:

- Motor overheating
- Sensor break fault
- Sensor short-circuit fault

Protection via PTC probes does not disable protection via I^2t calculation performed by the drive (the two types of protection can be combined).

[1.8 FAULT MANAGEMENT] (FLt-)

Code	Name/Description	Adjustment range	Factory setting
PtC-	**[PTC MANAGEMENT]**		
PtCL	**[LI6 = PTC probe]**		[No] (nO)
	Can be accessed if switch **SW2** on the control card is set to PTC.		
nO	☐ **[No]** (nO): Not used.		
AS	☐ **[Always]** (AS): "PTC probe" faults are monitored permanently, even if the power supply is not connected (as long as the control remains connected to the power supply).		
rdS	☐ **[Power ON]** (rdS): "PTC probe" faults are monitored while the drive power supply is connected.		
rS	☐ **[Motor ON]** (rS): "PTC probe" faults are monitored while the motor power supply is connected.		
PtC1	**[PTC1 probe]**		[No] (nO)
	Can be accessed if a VW3A3201 option card has been inserted.		
nO	☐ **[No]** (nO): Not used.		
AS	☐ **[Always]** (AS): "PTC probe" faults are monitored permanently, even if the power supply is not connected (as long as the control remains connected to the power supply).		
rdS	☐ **[Power ON]** (rdS): "PTC probe" faults are monitored while the drive power supply is connected.		
rS	☐ **[Motor ON]** (rS): "PTC probe" faults are monitored while the motor power supply is connected.		
PtC2	**[PTC2 probe]**		[No] (nO)
	Can be accessed if a VW3A3202 option card has been inserted.		
nO	☐ **[No]** (nO): Not used.		
AS	☐ **[Always]** (AS): "PTC probe" faults are monitored permanently, even if the power supply is not connected (as long as the control remains connected to the power supply).		
rdS	☐ **[Power ON]** (rdS): "PTC probe" faults are monitored while the drive power supply is connected.		
rS	☐ **[Motor ON]** (rS): "PTC probe" faults are monitored while the motor power supply is connected.		
rSt-	**[FAULT RESET]**		
rSF	**[Fault reset]**		[No] (nO)
	Manual fault reset		
nO	☐ **[No]** (nO): Function inactive.		
LI1	☐ **[LI1]** (LI1) to **[LI6]** (LI6).		
-	☐ **[LI7]** (LI7) to **[LI10]** (LI10): If VW3A3201 logic I/O card has been inserted.		
-	☐ **[LI11]** (LI11) to **[LI14]** (LI14): If VW3A3202 extended I/O card has been inserted.		
C101	☐ **[C101]** (C101) to **[C115]** (C115): With integrated Modbus in [I/O profile] (IO).		
-	☐ **[C201]** (C201) to **[C215]** (C215): With integrated CANopen in [I/O profile] (IO).		
-	☐ **[C301]** (C301) to **[C315]** (C315): With a communication card in [I/O profile] (IO).		
-	☐ **[C401]** (C401) to **[C415]** (C415): With a Controller Inside card in [I/O profile] (IO).		
Cd00	☐ **[CD00]** (Cd00) to **[CD13]** (Cd13): In [I/O profile] (IO) can be switched with possible logic inputs.		
-	☐ **[CD14]** (Cd14) to **[CD15]** (Cd15): In [I/O profile] (IO) can be switched without logic inputs.		
	Faults are reset when the assigned input or bit changes to 1, if the cause of the fault has disappeared. The STOP/RESET button on the graphic display terminal performs the same function. See pages 240 to 243 for the list of faults that can be reset manually.		

Code	Name/Description	Adjustment range	Factory setting

Atr- [AUTOMATIC RESTART]

Atr [Automatic restart]

[No] (nO)

- ☐ **[No]** (nO): Function inactive
- ☐ **[Yes]** (YES): Automatic restart, after locking on a fault, if the fault 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 min for the following periods.
  The drive fault relay remains activated if this function is active. The speed reference and the operating direction must be maintained.
  Use 2-wire control ([2/3 wire control] (tCC) = [2 wire] (2C) and [2 wire type] (tCt) = [Level] (LEL), see page 82).

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

Check that an automatic restart will not endanger personnel or equipment in any way.

Failure to follow this instruction can result in death or serious injury.

If the restart has not taken place once the configurable time tAr has elapsed, the procedure is aborted and the drive remains locked until it is turned off and then on again.
The faults, which permit this function, are listed on page 242:

tAr [Max. restart time]

[5 minutes] (5)

- ☐ **[5 minutes]** (5): 5 minutes
- ☐ **[10 minutes]** (10): 10 minutes
- ☐ **[30 minutes]** (30): 30 minutes
- ☐ **[1 hour]** (1h): 1 hour
- ☐ **[2 hours]** (2h): 2 hours
- ☐ **[3 hours]** (3h): 3 hours
- ☐ **[Unlimited]** (Ct): Unlimited

  This parameter appears if [Automatic restart] (Atr) = [Yes] (YES). It can be used to limit the number of consecutive restarts on a recurrent fault.

Code	Name/Description	Adjustment range	Factory setting
FLr-	**■ [CATCH ON THE FLY]** ☞ **Note:** This function cannot be used with certain other functions. Follow the instructions on page 118.		
FLr nO YES	**❑ [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 • Reset of current fault or automatic restart • Freewheel stop The speed given by the drive resumes from the estimated 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. ☐ **[No]** (nO): Function inactive ☐ **[Yes]** (YES): Function active 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 the fly] (FLr) is forced to [No] (nO) if the brake logic control [Brake assignment] (bLC) is assigned (page 148).		[No] (nO)
Ucb ( )	**❑ [Sensitivity]** The parameter can be accessed from 55 kW (75 HP) upwards for the ATV71●●●M3X and from 90 kW (120 HP) upwards for the ATV71●●●N4, if [Catch on the fly] (FLr) = [Yes] (YES). Adjusts the catch-on-the-fly sensitivity around the zero speed. Decrease the value if the drive is not able to perform the catch on the fly, and increase it if the drive locks on a fault as it performs the catch on the fly.	0.4 to 15%	12%

( ) Parameter that can be modified during operation or when stopped.

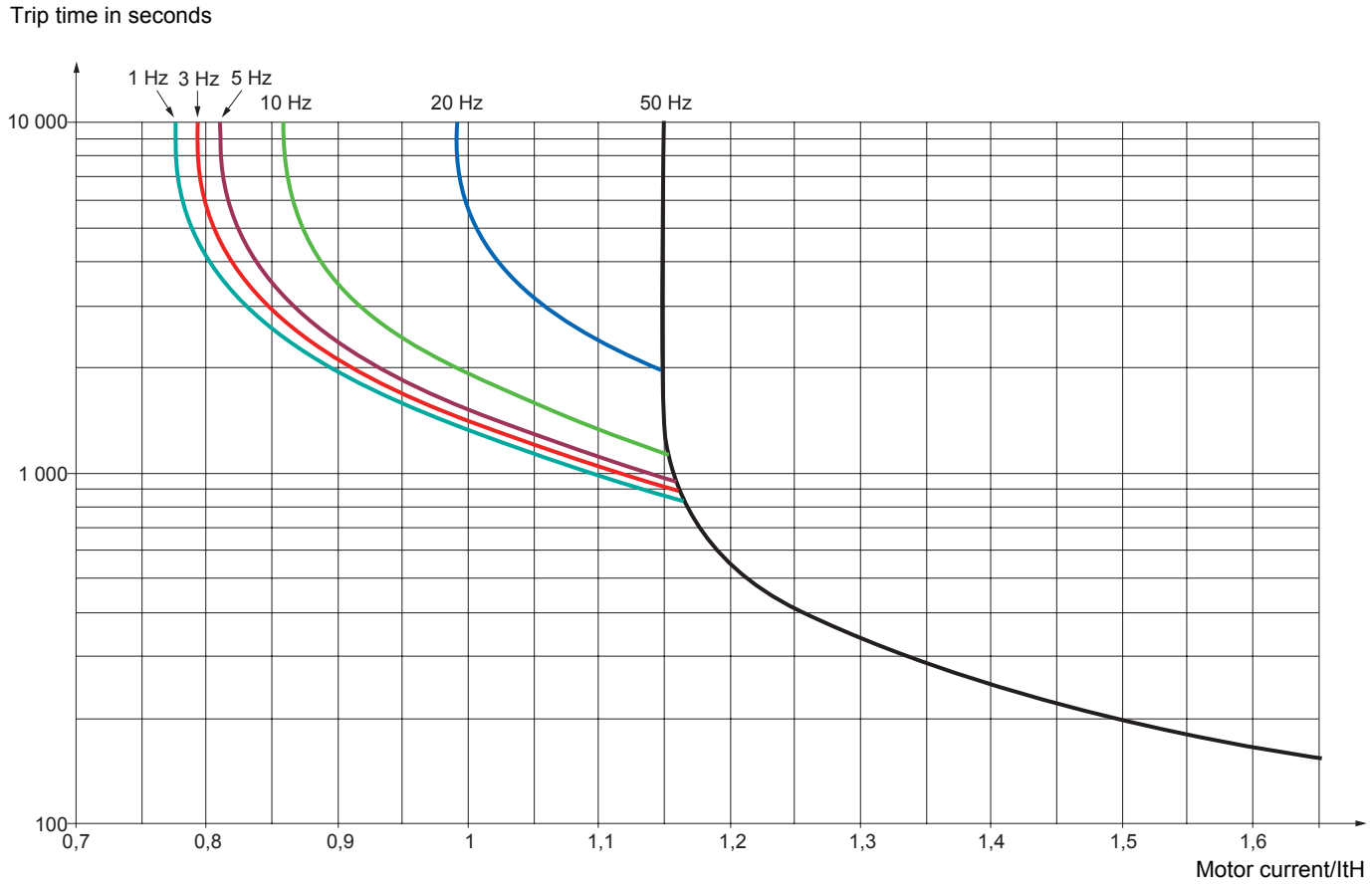
Motor thermal protection

Function:

Thermal protection by calculating the I^2t.

Note: The memory of the motor thermal state returns to zero when the drive control is disconnected.

- Naturally-cooled motors:
  The tripping curves depend on the motor frequency.
- Force-cooled motors:
  Only the 50 Hz tripping curve needs to be considered, regardless of the motor frequency.



[1.8 FAULT MANAGEMENT] (FLt-)

Code	Name/Description	Adjustment range	Factory setting
tHt-	**[MOTOR THERMAL PROT.]**		
tHt	**[Motor protect. type]**		[Self cooled] (ACL)
nO	☐ **[No]** (nO): No protection.		
ACL	☐ **[Self cooled]** (ACL): For self-cooled motors		
FCL	☐ **[Force-cool]** (FCL): For force-cooled motors **Note:** A fault trip will occur when the thermal state reaches 118% of the rated state and reactivation will occur when the state falls back below 100%.		
ttd	**[Motor therm. level]** (1) Trip threshold for motor thermal alarm (logic output or relay)	0 to 118%	100%
ttd2	**[Motor2 therm. level]** Trip threshold for motor 2 thermal alarm (logic output or relay)	0 to 118%	100%
ttd3	**[Motor3 therm. level]** Trip threshold for motor 3 thermal alarm (logic output or relay)	0 to 118%	100%
OLL	**[Overload fault mgt]**		[Freewheel] (YES)
	Type of stop in the event of a motor thermal fault		
nO	☐ **[No]** (nO): Fault ignored		
YES	☐ **[Freewheel]** (YES): Freewheel stop		
Stt	☐ **[Per STT]** (Stt): Stop according to configuration of [Type of stop] (Stt) page 128, without fault tripping. In this case the fault relay does not open and the drive is ready to restart as soon as the fault disappears, according to the restart conditions of the active command channel (e.g., according to [2/3 wire control] (tCC) and [2 wire type] (tCt) page 82 if control is via the terminals). Configuring an alarm for this fault is recommended (assigned to a logic output, for example) in order to indicate the cause of the stop.		
LFF	☐ **[fallback spd]** (LFF): Switch to fallback speed, maintained as long as the fault is present and the run command is not disabled.		
rLS	☐ **[Spd maint.]** (rLS): The drive maintains the speed being applied when the fault occurred, as long as the fault is present and the run command is not disabled.		
rMP	☐ **[Ramp stop]** (rMP): Stop on ramp		
FSt	☐ **[Fast stop]** (FSt): Fast stop.		
dCI	☐ **[DC injection]** (dCI): DC injection stop. This type of stop cannot be used with certain other functions. See table on page 118.		
OPL-	**[OUTPUT PHASE LOSS]**		
OPL	**[Output Phase Loss]**		[Yes] (YES)
nO	☐ **[No]** (nO): Function inactive.		
YES	☐ **[Yes]** (YES): Tripping on OPF fault with freewheel stop.		
OAC	☐ **[Output cut]** (OAC): No fault 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). **Note:** [Output Phase Loss] (OPL) is forced to [Yes] (YES) if brake logic control is configured (see page 148).		
Odt	**[OutPh time detect]** Time delay for taking [Output Phase Loss] (OPL) fault into account.	0.5 to 10 s	0.5 s

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.

Parameter that can be modified during operation or when stopped.

IPL- ■ [INPUT PHASE LOSS]

IPL ❏ [Input phase loss] — According to drive rating

- ☐ **[Ignore]** (nO): Fault ignored, to be used when the drive is supplied via a single-phase supply or by the DC bus.
- ☐ **[Freewheel]** (YES): Fault, with freewheel stop.

If one phase disappears, the drive switches to fault mode [Input phase loss] (IPL) but if 2 or 3 phases disappear, the drive continues to operate until it trips on an undervoltage fault.

Factory setting: [Ignore] (nO) for ATV71H037M3 to HU30M3, [Freewheel] (YES) for all others.

OHL- ■ [DRIVE OVERHEAT]

OHL ❏ [Overtemp fault mgt] — [Freewheel] (YES)

Behavior in the event of the drive overheating

- ☐ **[Ignore]** (nO): Fault ignored
- ☐ **[Freewheel]** (YES): Freewheel stop
- ☐ **[Per STT]** (Stt): Stop according to configuration of [Type of stop] (Stt) page 128, without fault tripping. In this case the fault relay does not open and the drive is ready to restart as soon as the fault disappears, according to the restart conditions of the active command channel (e.g., according to [2/3 wire control] (tCC) and [2 wire type] (tCt) page 82 if control is via the terminals). Configuring an alarm for this fault is recommended (assigned to a logic output, for example) in order to indicate the cause of the stop.
- ☐ **[fallback spd]** (LFF): Switch to fallback speed, maintained as long as the fault is present and the run command is not disabled.
- ☐ **[Spd maint.]** (rLS): The drive maintains the speed being applied when the fault occurred, as long as the fault is present and the run command is not disabled.
- ☐ **[Ramp stop]** (rMP): Stop on ramp
- ☐ **[Fast stop]** (FSt): Fast stop.
- ☐ **[DC injection]** (dCI): DC injection stop. This type of stop cannot be used with certain other functions. See table on page 118.

Note: A fault trip will occur when the thermal state reaches 118% of the rated state and reactivation will occur when the state falls back below 90%.

tHA ❏ [Drv therm. state al] — 0 to 118% — 100%

Trip threshold for drive thermal alarm (logic output or relay)

Parameter that can be modified during operation or when stopped.

Deferred stop on thermal alarm

This function is designed in particular for elevator applications. It prevents the elevator stopping between two floors if the drive or motor overheats, by authorizing operation until the next stop. At the next stop, the drive is locked while waiting for the thermal state to fall back to below 80% of the set threshold. Example: A trip threshold set at 90% enables reactivation at 72%.
One thermal state threshold must be defined for the drive, and one thermal state threshold for the motor(s), which will trip the deferred stop.

Code	Name/Description	Adjustment range	Factory setting
SAt-	**[THERMAL ALARM STOP]**		
SAt nO YES	**[Thermal alarm stop]** ☐ **[No]** (nO): Function inactive (in this case, the following parameters cannot be accessed) ☐ **[Yes]** (YES): Freewheel stop on drive or motor thermal alarm		[No] (nO)
tHA ( )	**[Drv therm. state al]** Thermal state threshold of the drive tripping the deferred stop.	0 to 118%	100%
ttd ( )	**[Motor therm. level]** Thermal state threshold of the motor tripping the deferred stop.	0 to 118%	100%
ttd2 ( )	**[Motor2 therm. level]** Thermal state threshold of the motor 2 tripping the deferred stop.	0 to 118%	100%
ttd3 ( )	**[Motor3 therm. level]** Thermal state threshold of the motor 3 tripping the deferred stop.	0 to 118%	100%

( ) Parameter that can be modified during operation or when stopped.

[1.8 FAULT MANAGEMENT] (FLt-)

Code	Name/Description	Adjustment range	Factory setting
EtF-	**■ [EXTERNAL FAULT]**		
EtF	**❑ [External fault ass.]**		[No] (nO)
nO	☐ **[No]** (nO): Function inactive.		
LI1	☐ **[LI1]** (LI1)		
-	:		
-	:		
-	☐ **[...]** (...): See the assignment conditions on page 112.		
	No external fault if the assigned input or bit is at 0.		
	External fault if the assigned input or bit is at 1.		
EPL	**❑ [External fault mgt]**		[Freewheel] (YES)
	Type of stop in the event of an external fault.		
nO	☐ **[Ignore]** (nO): Fault ignored.		
YES	☐ **[Freewheel]** (YES): Freewheel stop.		
Stt	☐ **[Per STT]** (Stt): Stop according to configuration of [Type of stop] (Stt) page 128, without fault tripping. In this case the fault relay does not open and the drive is ready to restart as soon as the fault disappears, according to the restart conditions of the active command channel (e.g., according to [2/3 wire control] (tCC) and [2 wire type] (tCt) page 82 if control is via the terminals). Configuring an alarm for this fault is recommended (assigned to a logic output, for example) in order to indicate the cause of the stop.		
LFF	☐ **[fallback spd]** (LFF): Switch to fallback speed, maintained as long as the fault is present and the run command is not disabled.		
rLS	☐ **[Spd maint.]** (rLS): The drive maintains the speed being applied when the fault occurred, as long as the fault is present and the run command is not disabled.		
rMP	☐ **[Ramp stop]** (rMP): Stop on ramp.		
FSt	☐ **[Fast stop]** (FSt): Fast stop.		
dCI	☐ **[DC injection]** (dCI): DC injection stop. This type of stop cannot be used with certain other functions. See table on page 118.		

Code	Name/Description	Adjustment range	Factory setting
USb-	**[UNDERVOLTAGE MGT]**		
USb	**[UnderV. fault mgt]**		[Flt&R1open] (0)
	Behavior of the drive in the event of an undervoltage ☐ **[Flt&R1open]** (0): Fault and fault relay open. ☐ **[Flt&R1close]** (1): Fault and fault relay closed. ☐ **[Alarm]** (2): Alarm and fault relay remains closed. The alarm may be assigned to a logic output or a relay.		
UrES	**[Mains voltage]**	According to drive voltage rating	According to drive voltage rating
	Rated voltage of the line supply in V. For ATV71ATV71●●●M3: ☐ **[200V ac]** (200): 200 V AC ☐ **[220V ac]** (220): 220 V AC ☐ **[240V ac]** (240): 240 V AC ☐ **[260V ac]** (260): 260 V AC (factory setting) For ATV71●●●N4: ☐ **[380V ac]** (380): 380 V AC ☐ **[400V ac]** (400): 400 V AC ☐ **[440V ac]** (440): 440 V AC ☐ **[460V ac]** (460): 460 V AC ☐ **[480V ac]** (480): 480 V AC (factory setting)		
USL	**[Undervoltage level]**		
	Undervoltage fault trip level setting in V. The adjustment range and factory setting are determined by the drive voltage rating and the [Mains voltage] (UrES) value.		
USt	**[Undervolt. time out]**	0.2 s to 999.9 s	0.2 s
	Time delay for taking undervoltage fault into account.		
StP	**[UnderV. prevention]**		[No] (nO)
	Behavior in the event of the undervoltage fault prevention level being reached. ☐ **[No]** (nO): No action ☐ **[DC Maintain]** (MMS): This stop mode uses the inertia to maintain the DC bus voltage as long as possible. ☐ **[Ramp stop]** (rMP): Stop following an adjustable ramp [Max stop time] (StM). ☐ **[Lock-out]** (LnF): Lock (freewheel stop) without fault.		
tSM	**[UnderV. restart tm]**	1.0 s to 999.9 s	1.0 s
	Time delay before authorizing the restart after a complete stop for [UnderV. prevention] (StP) = [Ramp stop] (rMP), if the voltage has returned to normal.		
UPL	**[Prevention level]**		
	Undervoltage fault prevention level setting in V, which can be accessed if [UnderV. prevention] (StP) is not [No] (nO). The adjustment range and factory setting are determined by the drive voltage rating and the [Mains voltage] (UrES) value.		
StM ↻	**[Max stop time]**	0.01 to 60.00 s	1.00 s
	Ramp time if [UnderV. prevention] (StP) = [Ramp stop] (rMP).		
tbS ↻	**[DC bus maintain tm]**	1 to 9999 s	9999 s
	DC bus maintain time if [UnderV. prevention] (StP) = [DC Maintain] (MMS).		

↻ Parameter that can be modified during operation or when stopped.

Code	Name/Description	Adjustment range	Factory setting
tIt-	**[IGBT TESTS]**		
Stst	**[IGBT test]**		[No] (nO)
nO	☐ **[No]** (nO): No test		
YES	☐ **[Yes]** (YES): The IGBTs are tested on power up and every time a run command is sent. These tests cause a slight delay (a few ms). In the event of a fault, the drive will lock. The following faults can be detected: - Drive output short-circuit (terminals U-V-W): SCF display. - IGBT faulty: xtF, where x indicates the number of the IGBT concerned. - IGBT short-circuited: x2F, where x indicates the number of the IGBT concerned.		

Code	Name/Description	Adjustment range	Factory setting

LFL- ■ [4-20mA LOSS]

LFL2 ❑ [AI2 4-20mA loss]

[No] (nO)

- nO ☐ **[Ignore]** (nO): Fault ignored. This configuration is the only one possible if [AI2 min. value] (CrL2) page 88 is not greater than 3 mA or if [AI2 Type] (AI2t) page 88 = [Voltage] (10U).
- YES ☐ **[Freewheel]** (YES): Freewheel stop.
- Stt ☐ **[Per STT]** (Stt): Stop according to configuration of [Type of stop] (Stt) page 128, without fault tripping. In this case the fault relay does not open and the drive is ready to restart as soon as the fault disappears, according to the restart conditions of the active command channel (e.g., according to [2/3 wire control] (tCC) and [2 wire type] (tCt) page 82 if control is via the terminals). Configuring an alarm for this fault is recommended (assigned to a logic output, for example) in order to indicate the cause of the stop.
- LFF ☐ **[fallback spd]** (LFF): Switch to fallback speed, maintained as long as the fault is present and the run command is not disabled.
- rLS ☐ **[Spd maint.]** (rLS): The drive maintains the speed being applied when the fault occurred, as long as the fault is present and the run command is not disabled.
- rMP ☐ **[Ramp stop]** (rMP): Stop on ramp.
- FSt ☐ **[Fast stop]** (FSt): Fast stop.
- dCI ☐ **[DC injection]** (dCI): DC injection stop. This type of stop cannot be used with certain other functions. See table on page 118.

LFL3 ❑ [AI3 4-20mA loss]

[No] (nO)

- nO ☐ **[Ignore]** (nO): Fault ignored. This configuration is the only one possible if [AI3 min. value] (CrL3) page 89 is not greater than 3 mA.
- YES ☐ **[Freewheel]** (YES): Freewheel stop.
- Stt ☐ **[Per STT]** (Stt): Stop according to configuration of [Type of stop] (Stt) page 128, without fault tripping. In this case the fault relay does not open and the drive is ready to restart as soon as the fault disappears, according to the restart conditions of the active command channel (e.g., according to [2/3 wire control] (tCC) and [2 wire type] (tCt) page 82 if control is via the terminals). Configuring an alarm for this fault is recommended (assigned to a logic output, for example) in order to indicate the cause of the stop.
- LFF ☐ **[fallback spd]** (LFF): Switch to fallback speed, maintained as long as the fault is present and the run command is not disabled.
- rLS ☐ **[Spd maint.]** (rLS): The drive maintains the speed being applied when the fault occurred, as long as the fault is present and the run command is not disabled.
- rMP ☐ **[Ramp stop]** (rMP): Stop on ramp.
- FSt ☐ **[Fast stop]** (FSt): Fast stop.
- dCI ☐ **[DC injection]** (dCI): DC injection stop. This type of stop cannot be used with certain other functions. See table on page 118.

LFL4 ❑ [AI4 4-20mA loss]

[No] (nO)

- nO ☐ **[Ignore]** (nO): Fault ignored. This configuration is the only one possible if [AI4 min. value] (CrL4) page 90 is not greater than 3 mA or if [AI4 Type] (AI4t) page 90 = [Voltage] (10U).
- YES ☐ **[Freewheel]** (YES): Freewheel stop.
- Stt ☐ **[Per STT]** (Stt): Stop according to configuration of [Type of stop] (Stt) page 128, without fault tripping. In this case the fault relay does not open and the drive is ready to restart as soon as the fault disappears, according to the restart conditions of the active command channel (e.g., according to [2/3 wire control] (tCC) and [2 wire type] (tCt) page 82 if control is via the terminals). Configuring an alarm for this fault is recommended (assigned to a logic output, for example) in order to indicate the cause of the stop.
- LFF ☐ **[fallback spd]** (LFF): Switch to fallback speed, maintained as long as the fault is present and the run command is not disabled.
- rLS ☐ **[Spd maint.]** (rLS): The drive maintains the speed being applied when the fault occurred, as long as the fault is present and the run command is not disabled.
- rMP ☐ **[Ramp stop]** (rMP): Stop on ramp.
- FSt ☐ **[Fast stop]** (FSt): Fast stop.
- dCI ☐ **[DC injection]** (dCI): DC injection stop. This type of stop cannot be used with certain other functions. See table on page 118.

[1.8 FAULT MANAGEMENT] (FLt-)

Parameter can be accessed in [EXPERT] mode.

Code	Name/Description	Adjustment range	Factory setting
InH-	**[FAULT INHIBITION]**		
InH	**[Fault inhibit assign.]**		[No] (nO)

To assign fault inhibit, press the "ENT" key for 2 s.

CAUTION

Inhibiting faults results in the drive not being protected. This invalidates the warranty.
Check that the possible consequences do not present any risk.
Failure to follow these instructions can result in equipment damage.

nO / LI1 / - / - / -

- **[No]** (nO): Function inactive
- **[LI1]** (LI1)
  :
  :
- **[...]** (...): See the assignment conditions on page 112.

If the assigned input or bit is at 0, fault monitoring is active. If the assigned input or bit is at 1, fault monitoring is inactive. Active faults are reset on a rising edge (change from 0 to 1) of the assigned input or bit.

Note: The "Power Removal" function and any faults that prevent any form of operation are not affected by this function.
See pages 240 to 244 for the list of faults affected by this function.

Code	Name/Description	Adjustment range	Factory setting
CLL-	**■ [COM. FAULT MANAGEMENT]**		
CLL	**❑ [Network fault mgt]**		[Freewheel] (YES)
	Behavior of the drive in the event of a communication fault with a communication card.		
nO	☐ **[Ignore]** (nO): Fault ignored.		
YES	☐ **[Freewheel]** (YES): Freewheel stop.		
Stt	☐ **[Per STT]** (Stt): Stop according to configuration of [Type of stop] (Stt) page 128, without fault tripping. In this case the fault relay does not open and the drive is ready to restart as soon as the fault disappears, according to the restart conditions of the active command channel (e.g., according to [2/3 wire control] (tCC) and [2 wire type] (tCt) page 82 if control is via the terminals). Configuring an alarm for this fault is recommended (assigned to a logic output, for example) in order to indicate the cause of the stop.		
LFF	☐ **[fallback spd]** (LFF): Switch to fallback speed, maintained as long as the fault is present and the run command is not disabled.		
rLS	☐ **[Spd maint.]** (rLS): The drive maintains the speed being applied when the fault occurred, as long as the fault is present and the run command is not disabled.		
rMP	☐ **[Ramp stop]** (rMP): Stop on ramp.		
FSt	☐ **[Fast stop]** (FSt): Fast stop.		
dCI	☐ **[DC injection]** (dCI): DC injection stop. This type of stop cannot be used with certain other functions. See table on page 118.		
COL	**❑ [CANopen fault mgt]**		[Freewheel] (YES)
	Behavior of the drive in the event of a communication fault with integrated CANopen.		
nO	☐ **[Ignore]** (nO): Fault ignored.		
YES	☐ **[Freewheel]** (YES): Freewheel stop.		
Stt	☐ **[Per STT]** (Stt): Stop according to configuration of [Type of stop] (Stt) page 128, without fault tripping. In this case the fault relay does not open and the drive is ready to restart as soon as the fault disappears, according to the restart conditions of the active command channel (e.g., according to [2/3 wire control] (tCC) and [2 wire type] (tCt) page 82 if control is via the terminals). Configuring an alarm for this fault is recommended (assigned to a logic output, for example) in order to indicate the cause of the stop.		
LFF	☐ **[fallback spd]** (LFF): Switch to fallback speed, maintained as long as the fault is present and the run command is not disabled.		
rLS	☐ **[Spd maint.]** (rLS): The drive maintains the speed being applied when the fault occurred, as long as the fault is present and the run command is not disabled.		
rMP	☐ **[Ramp stop]** (rMP): Stop on ramp.		
FSt	☐ **[Fast stop]** (FSt): Fast stop.		
dCI	☐ **[DC injection]** (dCI): DC injection stop. This type of stop cannot be used with certain other functions. See table on page 118.		
SLL	**❑ [Modbus fault mgt]**		[Freewheel] (YES)
	Behavior of the drive in the event of a communication fault with integrated Modbus		
nO	☐ **[Ignore]** (nO): Fault ignored.		
YES	☐ **[Freewheel]** (YES): Freewheel stop.		
Stt	☐ **[Per STT]** (Stt): Stop according to configuration of [Type of stop] (Stt) page 128, without fault tripping. In this case the fault relay does not open and the drive is ready to restart as soon as the fault disappears, according to the restart conditions of the active command channel (e.g., according to [2/3 wire control] (tCC) and [2 wire type] (tCt) page 82 if control is via the terminals). Configuring an alarm for this fault is recommended (assigned to a logic output, for example) in order to indicate the cause of the stop.		
LFF	☐ **[fallback spd]** (LFF): Switch to fallback speed, maintained as long as the fault is present and the run command is not disabled.		
rLS	☐ **[Spd maint.]** (rLS): The drive maintains the speed being applied when the fault occurred, as long as the fault is present and the run command is not disabled.		
rMP	☐ **[Ramp stop]** (rMP): Stop on ramp.		
FSt	☐ **[Fast stop]** (FSt): Fast stop.		
dCI	☐ **[DC injection]** (dCI): DC injection stop. This type of stop cannot be used with certain other functions. See table on page 118.		

[1.8 FAULT MANAGEMENT] (FLt-)

Code	Name/Description	Adjustment range	Factory setting
Sdd-	**■ [ENCODER FAULT]** Can be accessed if the encoder option card has been inserted and the encoder is used for speed feedback (see page 73).		
Sdd	**❑ [Load slip detection]** ☐ **[No]** (nO): Fault not monitored. Only the alarm may be assigned to a logic output or a relay. ☐ **[Yes]** (YES): Fault monitored. The fault is triggered by comparison with the ramp output and the speed feedback, and is only effective for speeds greater than 10% of [Rated motor freq.] (FrS), see page 65. In the event of a fault, the drive switches to freewheel stop and if the brake logic control function has been configured, the brake control is set to 0.		[Yes] (YES)
ECC	**❑ [Encoder coupling]** ☐ **[No]** (nO): Fault not monitored. ☐ **[Yes]** (YES): Fault monitored. If the brake logic control function has been configured, the factory setting changes to [Yes] (YES). [Encoder coupling] (ECC) = [Yes] (YES) is only possible if [Load slip detection] (Sdd) = [Yes] (YES) and [Motor control type] (Ctt) page 67 = [FVC] (FUC) and [Brake assignment] (bLC) page 148 is not [No] (nO). The fault monitored is the break in the mechanical coupling of the encoder. In the event of a fault, the drive switches to freewheel stop and if the brake logic control function has been configured, the brake control is set to 0.		[No] (nO)
ECt	**❑ [Encoder check time]** Encoder faults filtering time The parameter can be accessed if [Encoder coupling] (ECC) = [Yes] (YES)	2 to 10 s	2 s
tId-	**■ [TORQUE OR I LIM. DETECT.]**		
SSb	**❑ [Trq/I limit. stop]** Behavior in the event of switching to torque or current limitation ☐ **[Ignore]** (nO): Fault ignored ☐ **[Freewheel]** (YES): Freewheel stop ☐ **[Per STT]** (Stt): Stop according to configuration of [Type of stop] (Stt) page 128, without fault tripping. In this case the fault relay does not open and the drive is ready to restart as soon as the fault disappears, according to the restart conditions of the active command channel (e.g., according to [2/3 wire control] (tCC) and [2 wire type] (tCt) page 82 if control is via the terminals). Configuring an alarm for this fault is recommended (assigned to a logic output, for example) in order to indicate the cause of the stop. ☐ **[fallback spd]** (LFF): Switch to fallback speed, maintained as long as the fault is present and the run command is not disabled. ☐ **[Spd maint.]** (rLS): The drive maintains the speed being applied when the fault occurred, as long as the fault is present and the run command is not disabled. ☐ **[Ramp stop]** (rMP): Stop on ramp. ☐ **[Fast stop]** (FSt): Fast stop. ☐ **[DC injection]** (dCI): DC injection stop. This type of stop cannot be used with certain other functions. See table on page 118.		[Freewheel] (YES)
StO	**❑ [Trq/I limit. time out]** (If fault has been configured). Time delay for taking SSF "Limitation" fault into account.	0 to 9999 ms	1000 ms

Parameter that can be modified during operation or when stopped.

Code	Name/Description	Adjustment range	Factory setting
brP-	**■ [DB RES. PROTECTION]**		
brO nO YES FLt	**❑ [DB res. protection]** ☐ **[No]** (nO): No braking resistor protection (thereby preventing access to the other function parameters). ☐ **[Alarm]** (YES): Alarm. The alarm may be assigned to a logic output or a relay (see page 95). ☐ **[Fault]** (FLt): Switch to fault (bOF) with locking of drive (freewheel stop). ☞ **Note:** The thermal state of the resistor can be displayed on the graphic display terminal. It is calculated for as long as the drive control remains connected to the power supply.		[No] (nO)
brP ( )	**❑ [DB Resistor Power]** The parameter can be accessed if [DB res. protection] (brO) is not [No] (nO). Rated power of the resistor used.	0.1 kW to 1000 kW	0.1 kW (50 HP)
brU ( )	**❑ [DB Resistor value]** The parameter can be accessed if [DB res. protection] (brO) is not [No] (nO). Rated value of the braking resistor in Ohms.	0.1 to 200 Ohms	0.1 Ohm
tnF-	**■ [AUTO TUNING FAULT]**		
tnL nO YES	**❑ [Autotune fault mgt]** ☐ **[Ignore]** (nO): Fault ignored. ☐ **[Freewheel]** (YES): Freewheel stop.		[Freewheel] (YES)

( ) Parameter that can be modified during operation or when stopped.

Cards pairing

This function is used to detect whenever a card has been replaced or the software has been modified in any way.
When a pairing password is entered, the parameters of the cards currently inserted are stored. On every subsequent power-up these parameters are verified and in the event of a discrepancy the drive locks in HCF fault mode. Before the drive can be restarted you must revert to the original situation or re-enter the pairing password.

The following parameters are verified:

- The type of card for: all cards.
- The software version for: the two control cards, the VW3A3202 extension card, the Controller Inside card and the communication cards.
- The serial number for: both control cards.

Code	Name/Description	Adjustment range	Factory setting
PPI-	■ [CARDS PAIRING]		
PPI	❑ [Pairing password] The [OFF] (OFF) value signifies that the cards pairing function is inactive. The [ON] (On) value signifies that cards pairing is active and that an access code must be entered in order to start the drive in the event of a cards pairing fault. As soon as the code has been entered the drive is unlocked and the value changes to [ON] (On). - The PPI code is an unlock code known only to Schneider Electric Product Support.	OFF to 9999	[OFF] (OFF)

[1.8 FAULT MANAGEMENT] (FLt-)

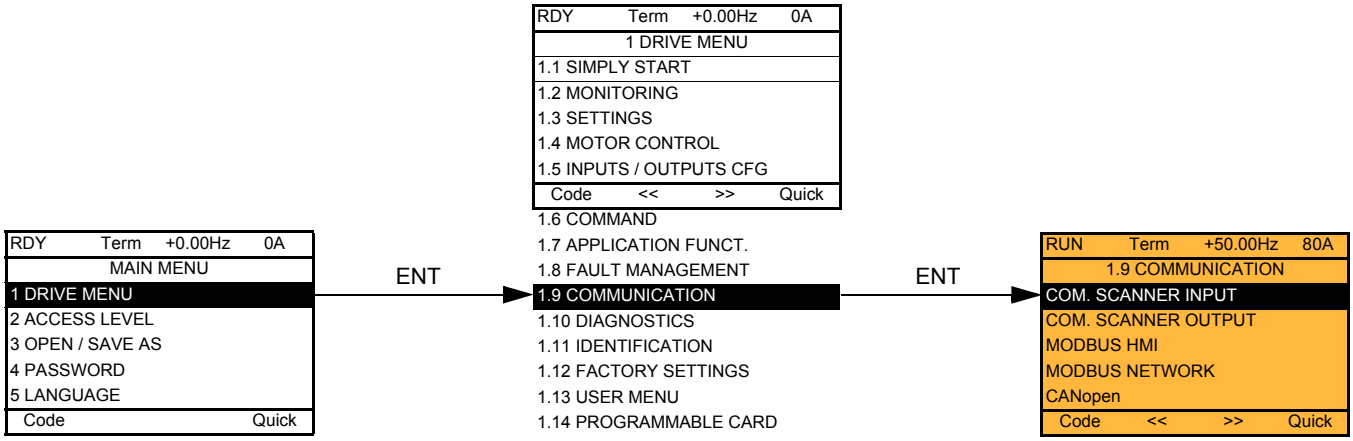
Code	Name/Description	Adjustment range	Factory setting
LFF-	**■ [FALLBACK SPEED]**		
LFF	**❑ [Fallback speed]** Selection of the fallback speed	0 to 1000 Hz	0 Hz
FSt-	**■ [RAMP DIVIDER]**		
dCF ()	**❑ [Ramp divider]** (1) The ramp that is enabled (dEC or dE2) is then divided by this coefficient when stop requests are sent. Value 0 corresponds to a minimum ramp time.	0 to 10	4
dCI-	**■ [DC INJECTION]**		
IdC ()	**❑ [DC inject. level 1]** (1) (3) Level of DC injection braking current activated via logic input or selected as stop mode. **CAUTION** Check that the motor will withstand this current without overheating. **Failure to follow this instruction can result in equipment damage.**	0.1 to 1.41 In (2)	0.64 In (2)
tdI ()	**❑ [DC injection time 1]** (1) (3) Maximum current injection time [DC inject. level 1] (IdC). After this time the injection current becomes [DC inject. level 2] (IdC2).	0.1 to 30 s	0.5 s
IdC2 ()	**❑ [DC inject. level 2]** (1) (3) Injection current activated by logic input or selected as stop mode, once period of time [DC injection time 1] (tdI) has elapsed. **CAUTION** Check that the motor will withstand this current without overheating. **Failure to follow this instruction can result in equipment damage.**	0.1 to 1.41 In (2)	0.5 In (2)
tdC ()	**❑ [DC injection time 2]** (1) (3) Maximum injection time [DC inject. level 2] (IdC2) for injection, selected as stop mode only. (Can be accessed if [Type of stop] (Stt) = [DC injection] (dCI)).	0.1 to 30 s	0.5 s

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) and [1.7 APPLICATION FUNCT.] (FUn-) menus.
(2) In corresponds to the rated drive current indicated in the installation manual and on the drive nameplate.
(3) Warning: These settings are independent of the [AUTO DC INJECTION] (AdC-) function.

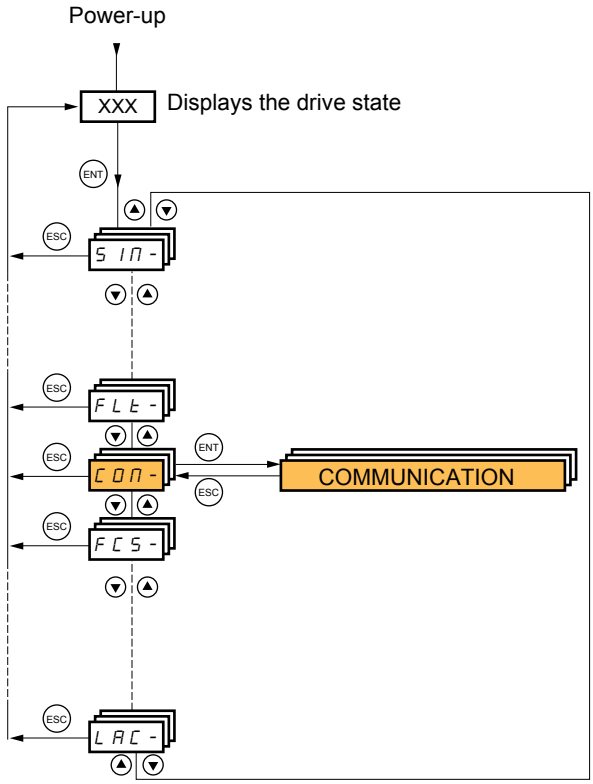
() Parameter that can be modified during operation or when stopped.

[1.9 COMMUNICATION] (COM-)

With graphic display terminal:



With integrated display terminal:



Code	Name/Description	Adjustment range	Factory setting
	■ [COM. SCANNER INPUT] **Only accessible via graphic display terminal**		
nMA1	❑ **[Scan. IN1 address]** Address of the 1st input word		3201
nMA2	❑ **[Scan. IN2 address]** Address of the 2nd input word		8604
nMA3	❑ **[Scan. IN3 address]** Address of the 3rd input word		0
nMA4	❑ **[Scan. IN4 address]** Address of the 4th input word		0
nMA5	❑ **[Scan. IN5 address]** Address of the 5th input word		0
nMA6	❑ **[Scan. IN6 address]** Address of the 6th input word		0
nMA7	❑ **[Scan. IN7 address]** Address of the 7th input word		0
nMA8	❑ **[Scan. IN8 address]** Address of the 8th input word		0
	■ [COM. SCANNER OUTPUT] **Only accessible via graphic display terminal**		
nCA1	❑ **[Scan.Out1 address]** Address of the 1st output word		8501
nCA2	❑ **[Scan.Out2 address]** Address of the 2nd output word		8602
nCA3	❑ **[Scan.Out3 address]** Address of the 3rd output word		0
nCA4	❑ **[Scan.Out4 address]** Address of the 4th output word		0
nCA5	❑ **[Scan.Out5 address]** Address of the 5th output word		0
nCA6	❑ **[Scan.Out6 address]** Address of the 6th output word		0
nCA7	❑ **[Scan.Out7 address]** Address of the 7th output word		0
nCA8	❑ **[Scan.Out8 address]** Address of the 8th output word		0

[1.9 COMMUNICATION] (COM-)

Code	Name/Description	Adjustment range	Factory setting
Md2-	**■ [MODBUS HMI]** Communication with the graphic display terminal		
tbr2	**❑ [HMI baud rate]** 9.6 or 19.2 kbps via the integrated display terminal. 9600 or 19200 bauds via the graphic display terminal. The graphic display terminal only operates if [HMI baud rate] (tbr2) = 19200 bauds (19.2 kbps). In order for any change in the assignment of [HMI baud rate] (tbr2) to be taken into account you must: - Provide confirmation in a confirmation window if using the graphic display terminal. - Press the ENT key for 2 s if using the integrated display terminal.		19.2 kbps
tFO2	**❑ [HMI format]** Read-only parameter, cannot be modified.		8E1
Md1-	**■ [MODBUS NETWORK]**		
Add	**❑ [Modbus Address]** OFF to 247		OFF
ANOA	**❑ [Modbus add Prg C.]** Modbus address of the Controller Inside card. OFF to 247 The parameter can be accessed if the Controller Inside card has been inserted and depending on its configuration (please consult the specific documentation).		OFF
ANOC	**❑ [Modbus add Com.C.]** Modbus address of the communication card. OFF to 247 The parameter can be accessed if a communication card has been inserted and depending on its configuration (please consult the specific documentation).		OFF
tbr	**❑ [Modbus baud rate]** 4.8 - 9.6 - 19.2 - 38.4 kbps on the integrated display terminal. 4800, 9600, 19200 or 38400 bauds on the graphic display terminal.		19.2 kbps
tFO	**❑ [Modbus format]** 8O1 - 8E1 - 8n1, 8n2		8E1
ttO	**❑ [Modbus time out]** 0.1 to 30 s		10.0 s
CnO-	**■ [CANopen]**		
AdCO	**❑ [CANopen address]** OFF to 127		OFF
bdCO	**❑ [CANopen bit rate]** 20 - 50 - 125 - 250 - 500 kbps - 1 Mbps		125 kbps
ErCO	**❑ [Error code]** Read-only parameter, cannot be modified.		

- [COMMUNICATION CARD]

See the specific documentation for the card used.

LCF- [FORCED LOCAL]

FLO [Forced local assign.]

[No] (nO)

- ☐ **[No]** (nO): Function inactive
- ☐ **[LI1]** (LI1) to **[LI6]** (LI6)
- ☐ **[LI7]** (LI7) to **[LI10]** (LI10): If VW3A3201 logic I/O card has been inserted
- ☐ **[LI11]** (LI11) to **[LI14]** (LI14): If VW3A3202 extended I/O card has been inserted

Forcing to local is active when the input is at state 1.
[Forced local assign.] (FLO) is forced to [No] (nO) if [Profile] (CHCF), page 113 = [I/O profile] (IO).

FLOC [Forced local Ref.]

[No] (nO)

- ☐ **[No]** (nO): Not assigned (control via the terminals with zero reference).
- ☐ **[AI1]** (AI1): Analog input
- ☐ **[AI2]** (AI2): Analog input
- ☐ **[AI3]** (AI3): Analog input, if VW3A3202 extension card has been inserted
- ☐ **[AI4]** (AI4): Analog input, if VW3A3202 extension card has been inserted
- ☐ **[HMI]** (LCC): Assignment of the reference and command to the graphic display terminal.
  Reference: [HMI Frequency ref.] (LFr), page 47, control: RUN/STOP/FWD/REV buttons.
- ☐ **[RP]** (PI): Frequency input, if VW3A3202 card has been inserted
- ☐ **[Encoder]** (PG): Encoder input, if encoder card has been inserted

If the reference is assigned to an analog input, [RP] (PI) or [Encoder] (PG) the command is automatically assigned to the terminals as well (logic inputs).

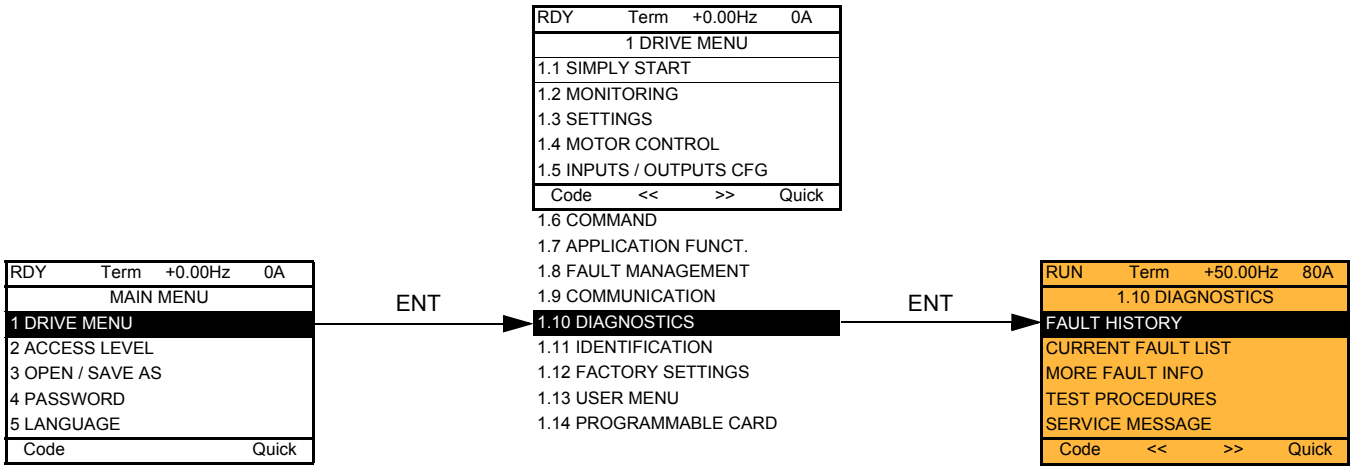
FLOT [Time-out forc. local]

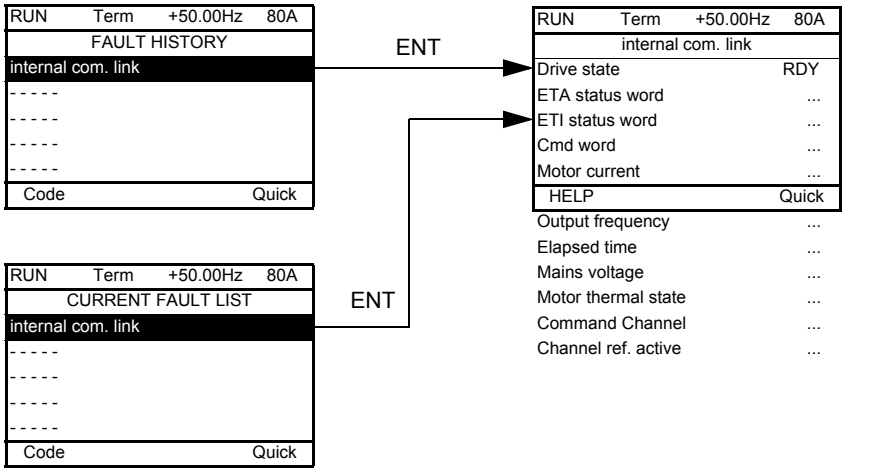
10.0 s

0.1 to 30 s
The parameter can be accessed if [Forced local assign.] (FLO) is not [No] (nO).
Time delay before communication monitoring is resumed on leaving forced local mode.

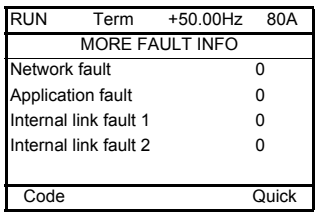
[1.10 DIAGNOSTICS]

This menu can only be accessed with the graphic display terminal.





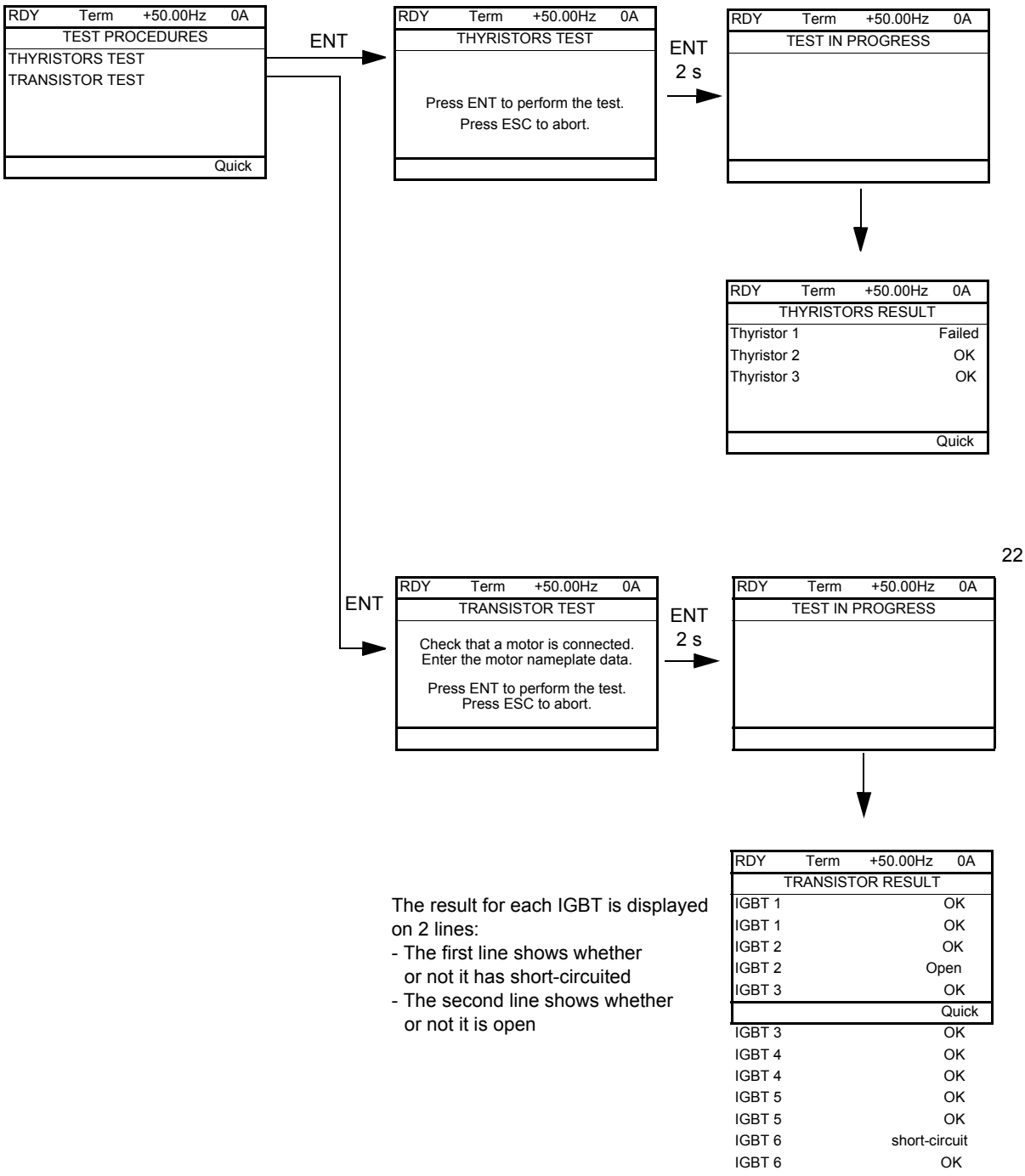
This screen indicates the state of the drive at the moment the selected fault occurred.



This screen indicates the number of communication faults, for example, with the option cards.
Number: 0 to 65535

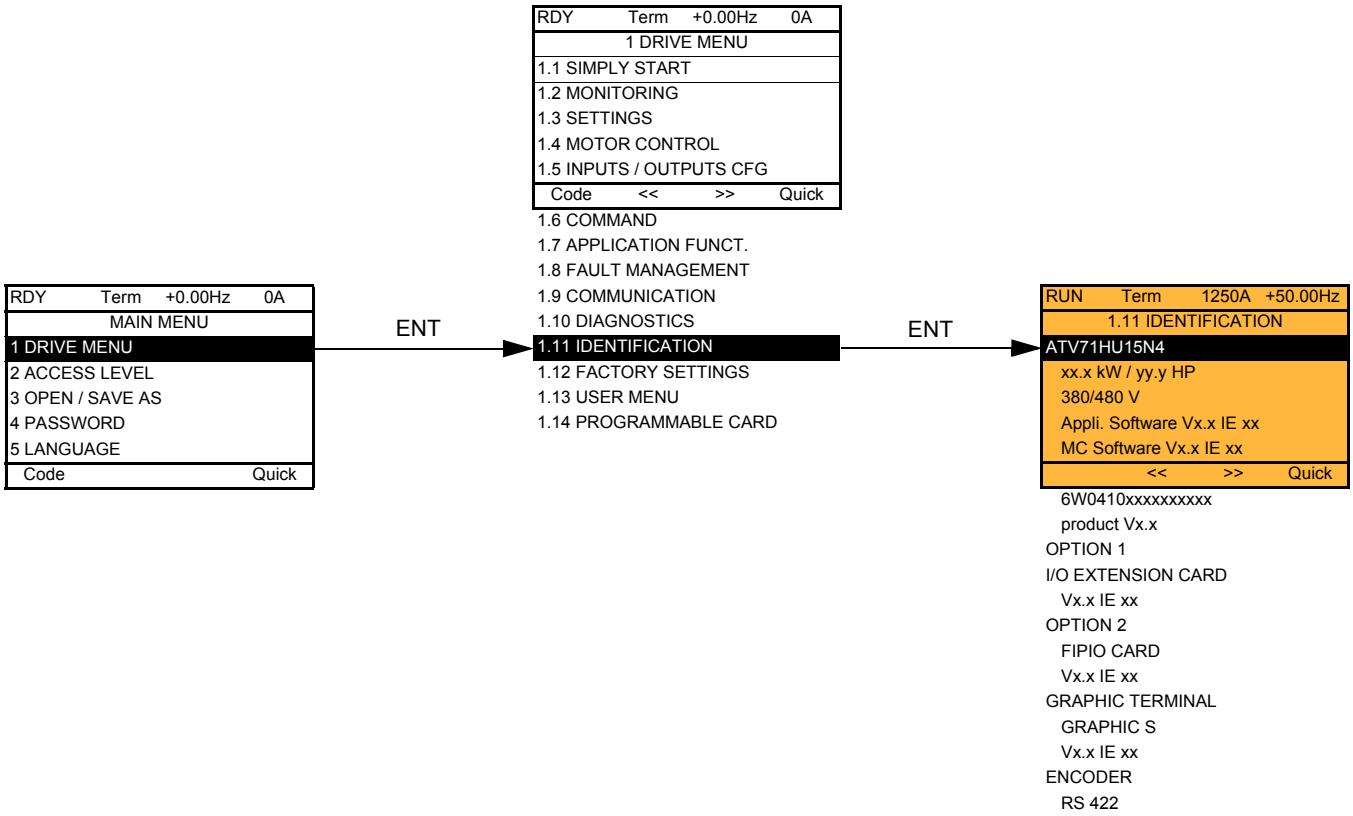
[1.10 DIAGNOSTICS]

[THYRISTORS TEST] is only accessible for ATV71●●●M3 ≥ 18.5 kW and ATV71●●●N4 > 18.5 kW drives.



Note: To start the tests, press and hold down (2 s) the ENT key.

[1.11 IDENTIFICATION]

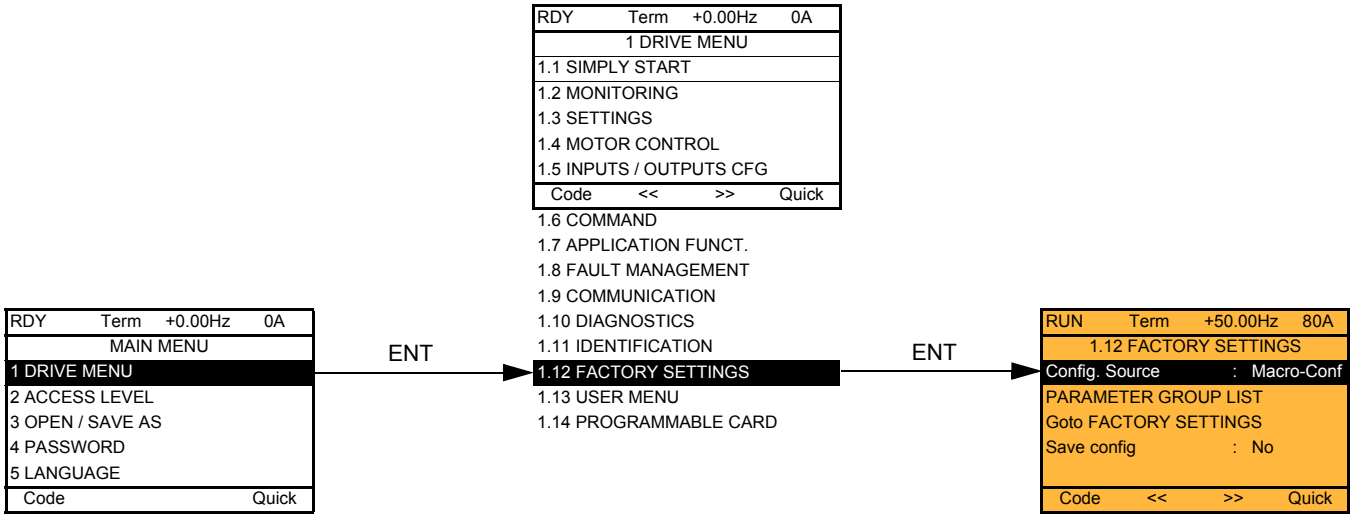


The [1.11 IDENTIFICATION] menu can only be accessed on the graphic display terminal.
This is a read-only menu that cannot be configured. It enables the following information to be displayed:

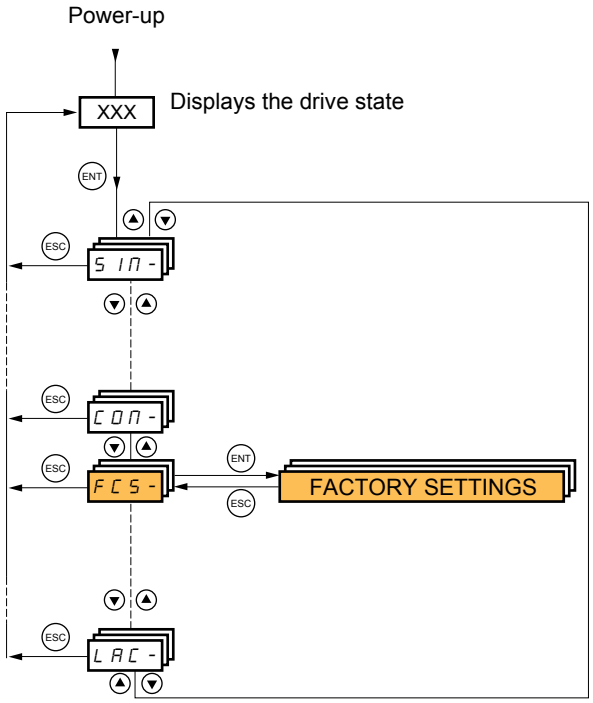
- Drive reference, power rating and voltage
- Drive software version
- Drive serial number
- Type of options present, with their software version

[1.12 FACTORY SETTINGS] (FCS-)

With graphic display terminal:



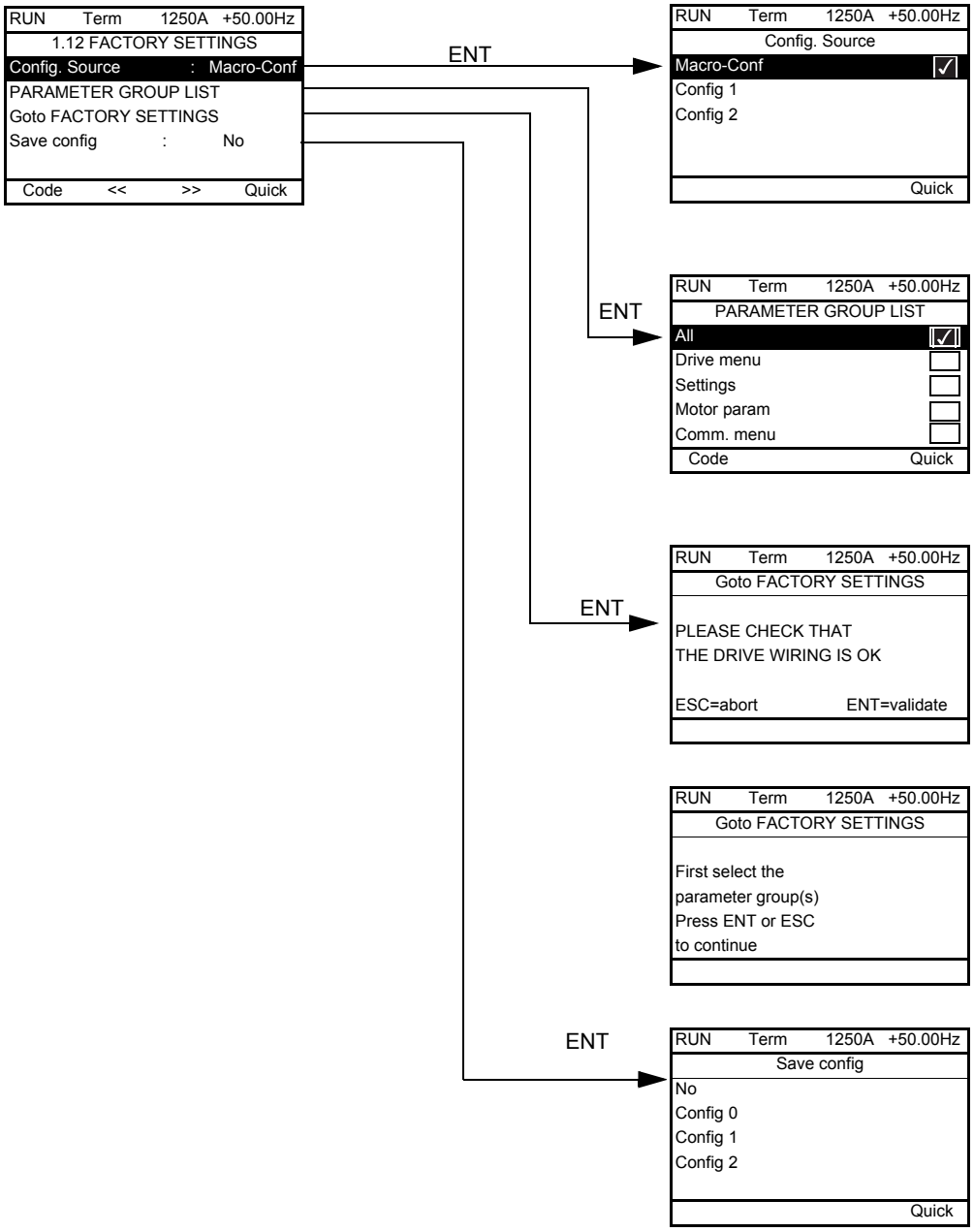
With integrated display terminal:



The [1.12 FACTORY SETTINGS] (FCS-) menu is used to:

- Replace the current configuration with the factory configuration or a previously saved configuration.
  All or part of the current configuration can be replaced: Select a group of parameters in order to select the menus you wish to load with the selected source configuration.
- Save the current configuration to a file.

[1.12 FACTORY SETTINGS] (FCS-)



Selection of source configuration

Selection of the menus to be replaced

Note: In factory configuration and after a return to "factory settings", [PARAMETER GROUP LIST] will be empty.

Command to return to "factory settings"

This window appears if no group of parameters is selected.

[1.12 FACTORY SETTINGS] (FCS-)

Code	Name/Description
FCSI	❑ **[Config. Source]** Choice of source configuration. ☐ **[Macro-Conf]** (InI) Factory configuration, return to selected macro configuration. ☐ **[Config 1]** (CFG1) ☐ **[Config 2]** (CFG2) If the configuration switching function is configured, it will not be possible to access [Config 1] (CFG1) and [Config 2] (CFG2).
FrY-	❑ **[PARAMETER GROUP LIST]** Selection of menus to be loaded ☐ **[All]** (ALL): All parameters. ☐ **[Drive menu]** (drM): The [1 DRIVE MENU] menu without [1.9 COMMUNICATION] and [1.14 PROGRAMMABLE CARD]. In the [7 DISPLAY CONFIG.] menu, [Return std name] page 235 returns to [No]. ☐ **[Settings]** (SEt): The [1.3 SETTINGS] without the [IR compensation] (UFr), [Slip compensation] (SLP) et [Mot. therm. current] (ItH) parameters. ☐ **[Motor param]** (MOt): Motor parameters, see list below. The following selections can only be accessed if [Config. Source] (FCSI) = [Macro-Conf] (InI): ☐ **[Comm. menu]** (COM): The [1.9 COMMUNICATION] menu without either [Scan. IN1 address] (nMA1) to [Scan. IN8 address] (nMA8) or [Scan.Out1 address] (nCA1) to [Scan.Out8 address] (nCA8). ☐ **[Prog. card menu]** (PLC): The [1.14 PROGRAMMABLE CARD] menu. ☐ **[Monitor config.]** (MOn): The [6 MONITORING CONFIG.] menu. ☐ **[Display config.]** (dIS): The [7 DISPLAY CONFIG.] menu. See the multiple selection procedure on page 26 for the integrated display terminal and page 17 for the graphic display terminal. **Note:** In factory configuration and after a return to "factory settings", [PARAMETER GROUP LIST] will be empty.
GFS	❑ **[Goto FACTORY SETTINGS]** It is only possible to revert to the factory settings if at least one group of parameters has previously been selected. With the integrated display terminal: - No - Yes: The parameter changes back to nO automatically as soon as the operation is complete. With the graphic display terminal: See the previous page.
SCSI	❑ **[Save config]** ☐ **[No]** (nO): ☐ **[Config 0]** (Str0): Press the "ENT" key for 2 s. ☐ **[Config 1]** (Str1): Press the "ENT" key for 2 s. ☐ **[Config 2]** (Str2): Press the "ENT" key for 2 s. The active configuration to be saved does not appear for selection. For example, if the active configuration is [Config 0] (Str0), only [Config 1] (Str1) and [Config 2] (Str2) appear. The parameter changes back to [No] (nO) automatically as soon as the operation is complete.

List of motor parameters

[1.4 MOTOR CONTROL] (drC-) menu:

[Rated motor power] (nPr) - [Rated motor volt.] (UnS) - [Rated mot. current] (nCr) - [Rated motor freq.] (FrS) - [Rated motor speed] (nSP) - [Auto tuning] (tUn) - [Auto tuning status] (tUS) - [U0] (U0) to [U5] (U5) - [F1] (F1) to [F5] (F5) - [V. constant power] (UCP) - [Freq. Const Power] (FCP) - [Nominal I sync.] (nCrS) - [Nom motor spdsync] (nSPS) - [Pole pairs] (PPnS) - [Syn. EMF constant] (PHS) - [Autotune L d-axis] (LdS) - [Autotune L q-axis] (LqS) - [Cust. stator R syn] (rSAS) - [IR compensation] (UFr) - [Slip compensation] (SLP) - the motor parameters that can be accessed in [EXPERT] mode, page 71.

Menu [1.3 SETTINGS] (SEt-) menu:

[Mot. therm. current] (ItH)

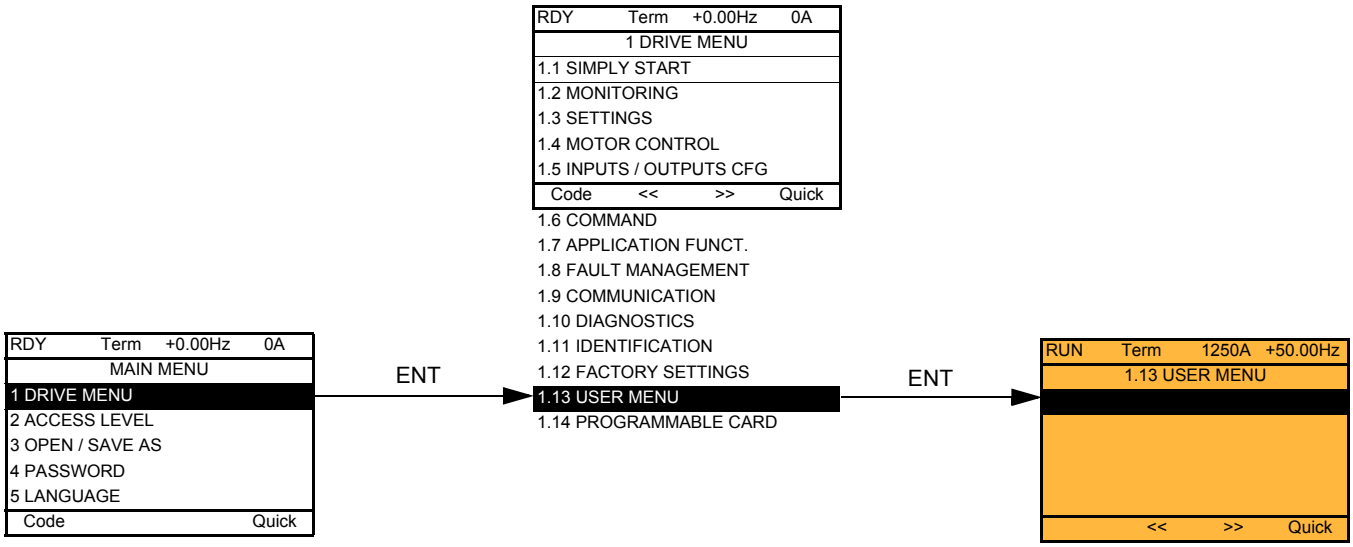
Example of total return to factory settings

1. [Config. Source] (FCSI) = [Macro-conf] (InI)
2. [PARAMETER GROUP LIST] (FrY-) = [All] (ALL)
3. [Goto FACTORY SETTINGS] (GFS = YES)

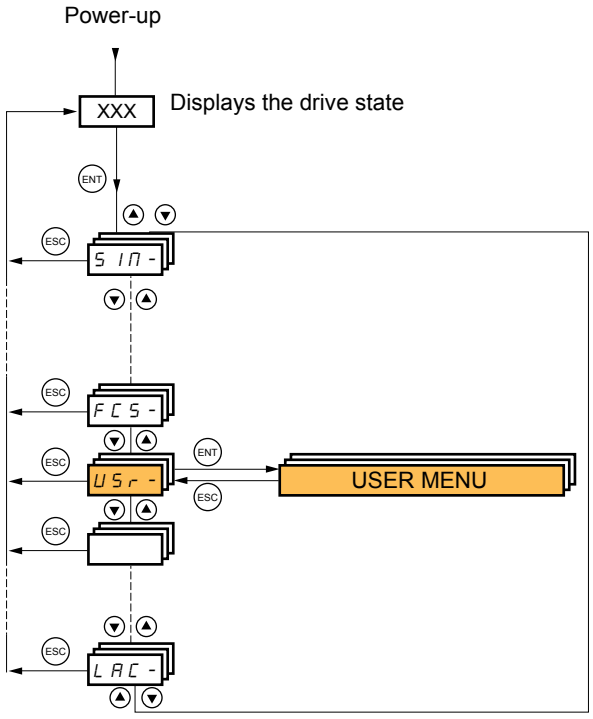
[1.13 USER MENU] (USr-)

This menu contains the parameters selected in the [7 DISPLAY CONFIG.] menu on page 234.

With graphic display terminal:



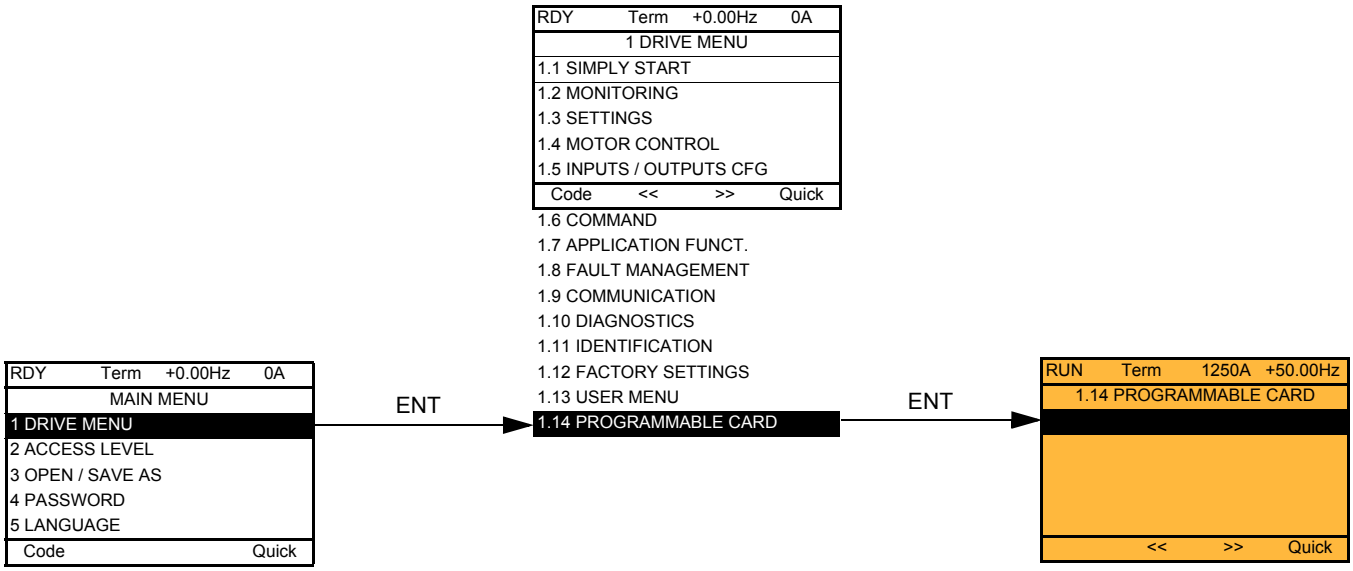
With integrated display terminal:



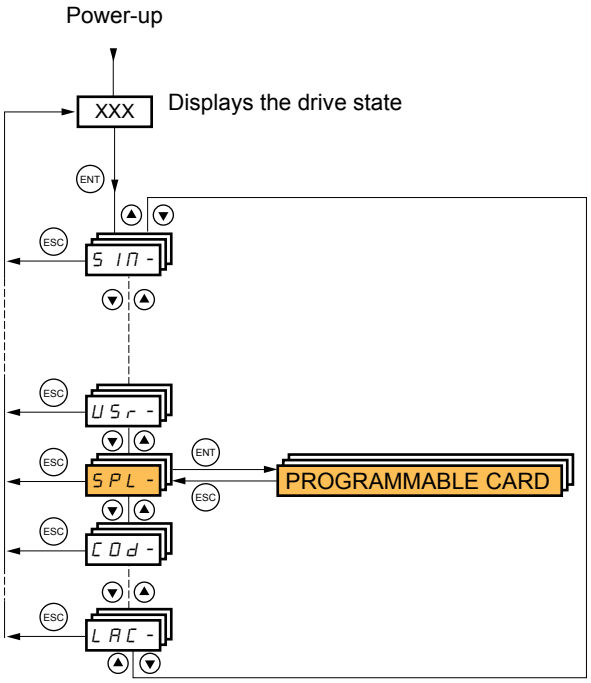
[1.14 PROGRAMMABLE CARD] (SPL-)

This menu can only be accessed if a Controller Inside card has been inserted. Please refer to the documentation specific to this card.

With graphic display terminal:

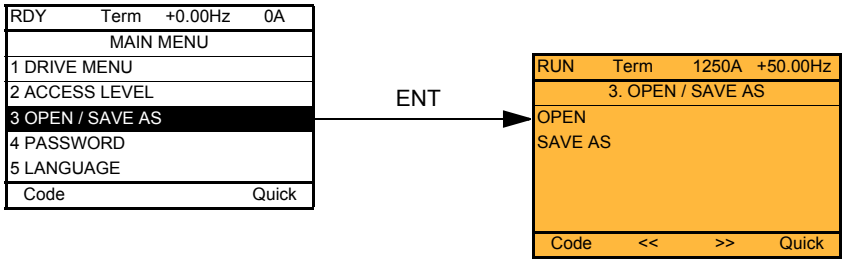


With integrated display terminal:

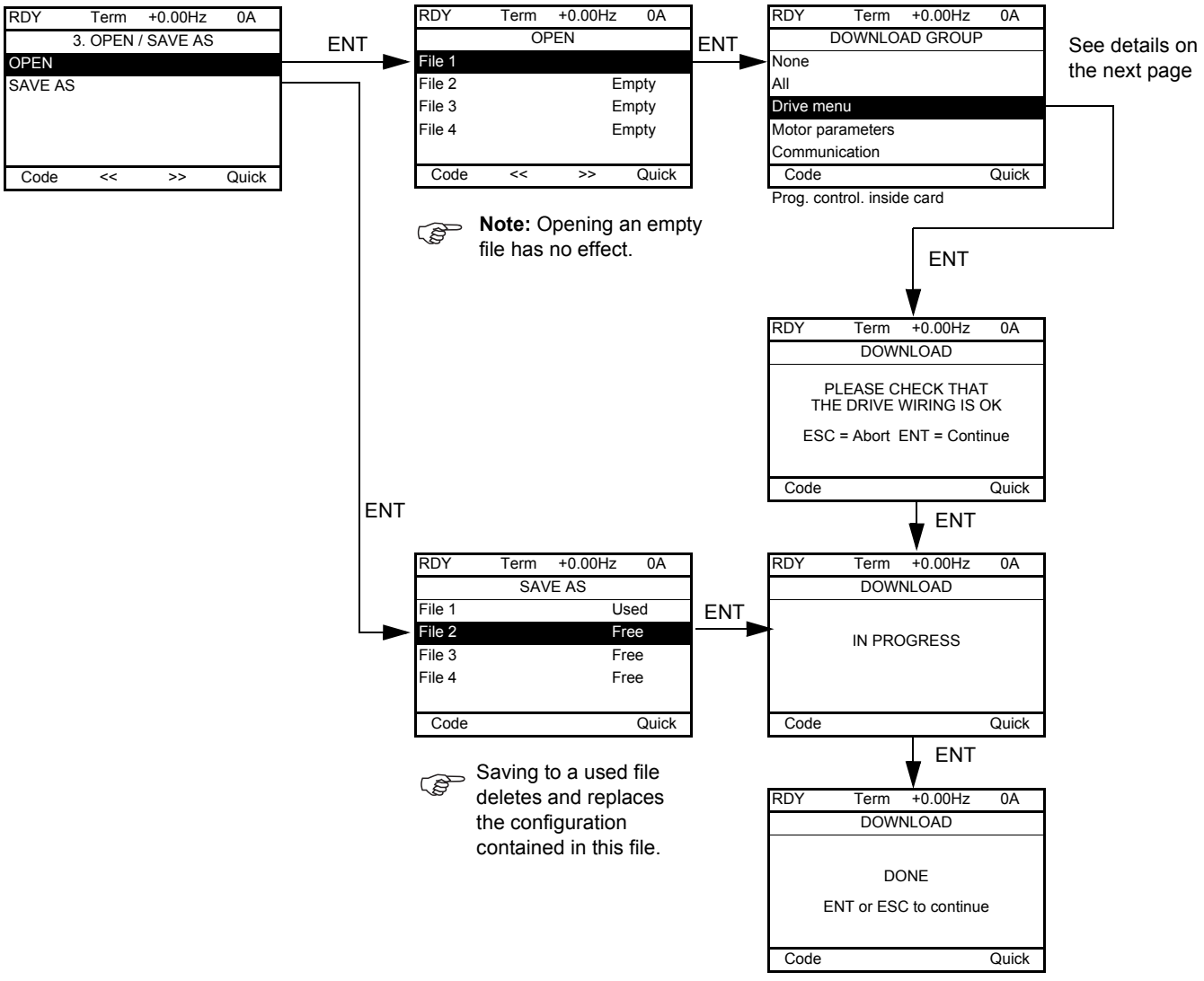


[3. OPEN / SAVE AS]

This menu can only be accessed with the graphic display terminal.



[OPEN]: To download one of the 4 files from the graphic display terminal to the drive.
[SAVE AS]: To download the current configuration from the drive to the graphic display terminal.



Various messages may appear when the download is requested:

- [IN PROGRESS]
- [DONE]
- Error messages if download not possible
- [Motor parameters are NOT COMPATIBLE. Do you want to continue?]: In this case the download is possible, but the parameters will be restricted.

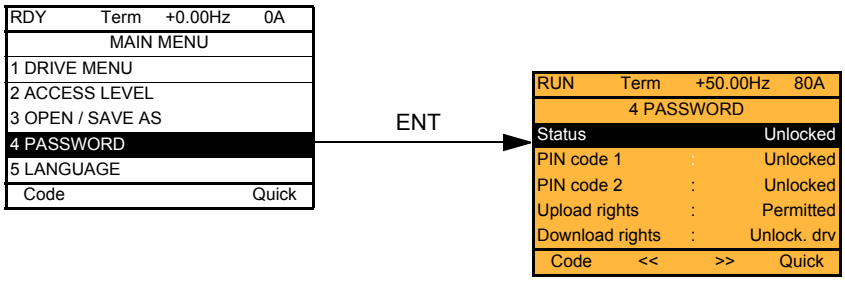
[3. OPEN / SAVE AS

[DOWNLOAD GROUP]

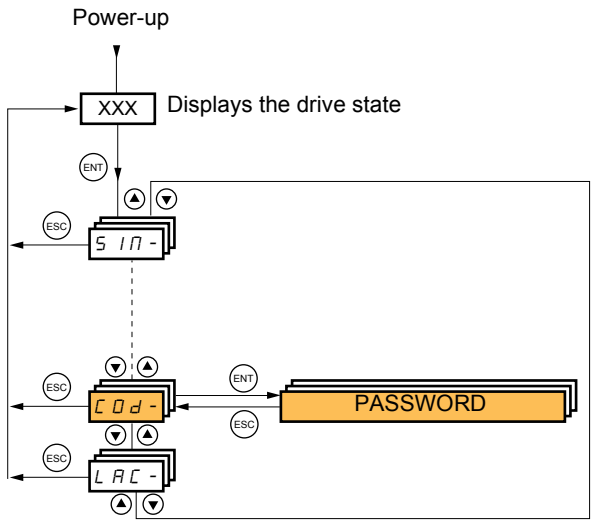
[None]:		No parameters
[All]:		All parameters in all menus
[Drive menu.]:		The entire [1 DRIVE MENU] without [1.9 COMMUNICATION] and [1.14 PROGRAMMABLE CARD]
[Motor parameters]:	[Rated motor power] (nPr)	in the [1.4 MOTOR CONTROL] (drC-) menu
	[Rated motor volt.] (UnS)	
	[Rated mot. current] (nCr)	
	[Rated motor freq.] (FrS)	
	[Rated motor speed] (nSP)	
	[Auto tuning] (tUn)	
	[Auto tuning status] (tUS)	
	[U0] (U0) to [U5] (U5)	
	[F1] (F1) to [F5] (F5)	
	[V. constant power] (UCP)	
	[Freq. Const Power] (FCP)	
	[Nominal I sync.] (nCrS)	
	[Nom motor spdsync] (nSPS)	
	[Pole pairs] (PPnS)	
	[Syn. EMF constant] (PHS)	
	[Autotune L d-axis] (LdS)	
	[Autotune L q-axis] (LqS)	
	[Cust. stator R syn] (rSAS)	
	[IR compensation] (UFr)	
	[Slip compensation] (SLP)	
	The motor parameters that can be accessed in [EXPERT] mode, page 71	
	[Mot. therm. current] (ItH)	in the [1.3 SETTINGS] (SEt-) menu
[Communication]:		All the parameters in the [1.9 COMMUNICATION] menu
[Prog. control. inside card]:		All the parameters in the [1.14 PROGRAMMABLE CARD] menu

[4. PASSWORD] (COd-)

With graphic display terminal:

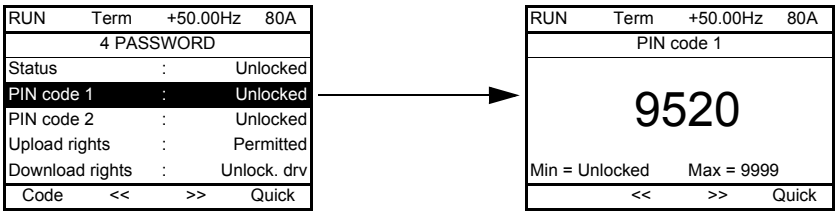


With integrated display terminal:



Enables the configuration to be protected with an access code or a password to be entered in order to access a protected configuration.

Example with graphic display terminal:



- The drive is unlocked when the PIN codes are set to [unlocked] (OFF) (no password) or when the correct code has been entered.
- Before protecting the configuration with an access code, you must:
  - Define the [Upload rights] (ULr) and [Download rights] (dLr).
  - Make a careful note of the code and keep it in a safe place where you will always be able to find it.
- The drive has 2 access codes, enabling 2 access levels to be set up.
  - PIN code 1 is a public unlock code: 6969.
  - PIN code 2 is an unlock code known only to Schneider Electric Product Support. It can only be accessed in [EXPERT] mode.
  - Only one PIN1 or PIN2 code can be used - the other must remain set to [OFF] (OFF).

Note: When the unlock code is entered, the user access code appears.

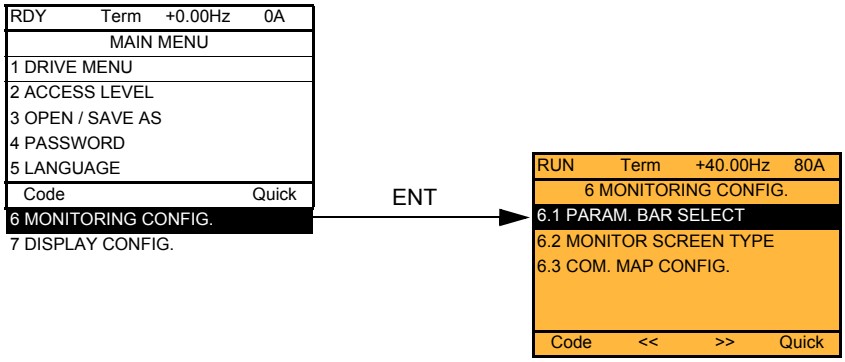
The following items are access-protected:
- Return to factory settings ([1.12 FACTORY SETTINGS] (FCS-) menu.
- The channels and parameters protected by the [1.13 USER MENU] as well as the menu itself.
- The custom display settings ([7 DISPLAY CONFIG.] menu).

[4. PASSWORD] (COd-)

Code	Name/Description	Adjustment range	Factory setting
CSt	❑ **[Status]**		[unlocked] (ULC)
	Information parameter, cannot be modified.		
LC	☐ **[Locked]** (LC): The drive is locked by a password.		
ULC	☐ **[Unlocked]** (ULC): The drive is not locked by a password.		
COd	❑ **[PIN code 1]**	OFF to 9999	[OFF] (OFF)
	1st access code. The value [OFF] (OFF) indicates that no password has been set [unlocked]. The value [ON] (On) indicates that the drive is protected and an access code must be entered in order to unlock it. Once the correct code has been entered, it remains on the display and the drive is unlocked until the next time the power supply is disconnected. - PIN code 1 is a public unlock code: 6969.		
COd2	❑ **[PIN code 2]**	OFF to 9999	[OFF] (OFF)
	Parameters that can be accessed in [EXPERT] mode only. 2nd access code. The value [OFF] (OFF) indicates that no password has been set [unlocked]. The value [ON] (On) indicates that the drive is protected and an access code must be entered in order to unlock it. Once the correct code has been entered, it remains on the display and the drive is unlocked until the next time the power supply is disconnected. - PIN code 2 is an unlock code known only to Schneider Electric Product Support.		
ULr	❑ **[Upload rights]**		[Permitted] (ULr1)
	Read or copy the current configuration to the drive.		
ULr1	☐ **[Permitted]** (ULr1): The current drive configuration can always be uploaded to the graphic display terminal or PowerSuite.		
ULr0	☐ **[Not allowed]** (ULr0): The current drive configuration can only be uploaded to the graphic display terminal or PowerSuite if the drive is not protected by an access code or if the correct code has been entered.		
dLr	❑ **[Download rights]**		[Unlock. drv] (dLr1)
	Writes the current configuration to the drive or downloads a configuration to the drive.		
dLr0	☐ **[Locked drv]** (dLr0): A configuration file can only be downloaded to the drive if the drive is protected by an access code, which is the same as the access code for the configuration to be downloaded.		
dLr1	☐ **[Unlock. drv]** (dLr1): A configuration file can be downloaded to the drive or a configuration in the drive can be modified if the drive is unlocked (access code entered) or is not protected by an access code.		
dLr2	☐ **[not allowed]** (dLr2): Download not authorized.		
dLr3	☐ **[Lock/unlock]** (dLr3): Combination of [Locked drv] (dLr0) and [Unlock. drv] (dLr1).		

[6 MONITORING CONFIG.]

This menu can only be accessed with the graphic display terminal.



This can be used to configure the information displayed on the graphic display screen during operation.

[6.1. PARAM. BAR SELECT]: Selection of 1 to 2 parameters displayed on the top line (the first 2 cannot be modified).

[6.2. MONITOR SCREEN TYPE]: Selection of parameters displayed in the centre of the screen and the display mode (values in digital or bar graph format).

[6.3. COM. MAP CONFIG.]: Selection of the words displayed and their format.

Name/Description

[6.1 PARAM. BAR SELECT]

- ☐ **[Alarm groups]**
- ☐ **[Frequency ref.]** in Hz: parameter displayed in factory configuration
- ☐ **[Torque reference]** as a %
- ☐ **[Output frequency]** in Hz
- ☐ **[Motor current]** in A: parameter displayed in factory configuration
- ☐ **[ENA avg speed]** in Hz
- ☐ **[Motor speed]** in rpm
- ☐ **[Motor voltage]** in V
- ☐ **[Motor power]** in W
- ☐ **[Motor torque]** as a %
- ☐ **[Mains voltage]** in V
- ☐ **[Motor thermal state]** as a %
- ☐ **[Drv. thermal state]** as a %
- ☐ **[DBR thermal state]** as a %
- ☐ **[Consumption]** in Wh or kWh depending on drive rating
- ☐ **[Run time]** in hours (length of time the motor has been switched on)
- ☐ **[Power on time]** in hours (length of time the drive has been switched on)
- ☐ **[IGBT alarm counter]** in seconds (total time of IGBT overheating alarms)
- ☐ **[PID reference]** as a %
- ☐ **[PID feedback]** as a %
- ☐ **[PID error]** as a %
- ☐ **[PID Output]** in Hz
- ☐ **[Applic card word 2]** Word generated by the Controller Inside card (can be accessed if the card has been inserted)

to

- ☐ **[Applic card word 6]** Word generated by the Controller Inside card (can be accessed if the card has been inserted)
- ☐ **[Config. active]** CNFO, 1 or 2 (see page 183)
- ☐ **[Utilised param. set]** SET1, 2 or 3 (see page 181)

Select the parameter using ENT (a ☑ then appears next to the parameter). Parameter(s) can also be deselected using ENT. 1 or 2 parameters can be selected.

Example:

PARAM. BAR SELECT		
MONITORING		
---------	✓	☐
---------		☐
---------		☐
---------	✓	☐

Name/Description

■ [6.2 MONITOR SCREEN TYPE]

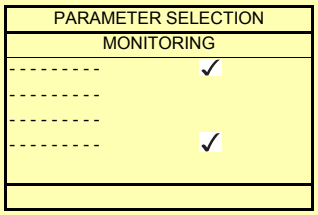
❑ [Display value type]

- ☐ **[Digital]**: Display of one or two digital values on the screen (factory configuration).
- ☐ **[Bar graph]**: Display of one or two bar graphs on the screen.
- ☐ **[List]**: Display a list of between one and five values on the screen.

❑ [PARAMETER SELECTION]

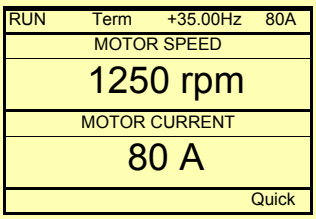
☐ **[Alarm groups]**	can only be accessed if [Display value type] = [List]
☐ **[Frequency ref.]**	in Hz: parameter displayed in factory configuration
☐ **[Torque reference]**	as a %
☐ **[Output frequency]**	in Hz
☐ **[Motor current]**	in A
☐ **[ENA avg speed]**	in Hz
☐ **[Motor speed]**	in rpm
☐ **[Motor voltage]**	in V
☐ **[Motor power]**	in W
☐ **[Motor torque]**	as a %
☐ **[Mains voltage]**	in V
☐ **[Motor thermal state]**	as a %
☐ **[Drv. thermal state]**	as a %
☐ **[DBR thermal state]**	as a %
☐ **[Consumption]**	in Wh or kWh depending on drive rating
☐ **[Run time]**	in hours (length of time the motor has been switched on)
☐ **[Power on time]**	in hours (length of time the drive has been switched on)
☐ **[IGBT alarm counter]**	in seconds (total time of IGBT overheating alarms)
☐ **[PID reference]**	as a %
☐ **[PID feedback]**	as a %
☐ **[PID error]**	as a %
☐ **[PID Output]**	in Hz
☐ **[Applic card word 2]**	Word generated by the Controller Inside card (can be accessed if the card has been inserted)
to	
☐ **[Applic card word 6]**	Word generated by the Controller Inside card (can be accessed if the card has been inserted)
☐ **[Config. active]**	CNFO, 1 or 2 (see page 183), can only be accessed if [Display value type] = [List]
☐ **[Utilised param. set]**	SET1, 2 or 3 (see page 181), can only be accessed if [Display value type] = [List]

Select the parameter(s) using ENT (a ☑ then appears next to the parameter). Parameter(s) can also be deselected using ENT.

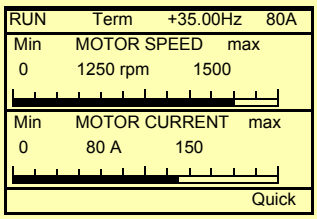


Examples:

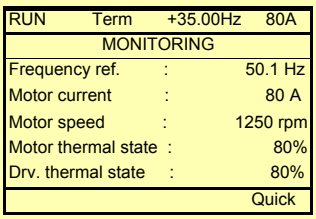
Display of 2 digital values



Display of 2 bar graphs



Display of a list of 5 values



Name/Description

■ [6.3 COM. MAP CONFIG.]

❑ [Word 1 add. select.]

Select the address of the word to be displayed by pressing the <<, >> (F2 and F3) keys and rotating the navigation button.

❑ [Format word 1]

Format of word 1.

- ☐ **[Hex]**: Hexadecimal
- ☐ **[Signed]**: Decimal with sign
- ☐ **[Unsigned]**: Decimal without sign

❑ [Word 2 add. select.]

Select the address of the word to be displayed by pressing the <<, >> (F2 and F3) keys and rotating the navigation button.

❑ [Format word 2]

Format of word 2.

- ☐ **[Hex]**: Hexadecimal
- ☐ **[Signed]**: Decimal with sign
- ☐ **[Unsigned]**: Decimal without sign

❑ [Word 3 add. select.]

Select the address of the word to be displayed by pressing the <<, >> (F2 and F3) keys and rotating the navigation button.

❑ [Format word 3]

Format of word 3.

- ☐ **[Hex]**: Hexadecimal
- ☐ **[Signed]**: Decimal with sign
- ☐ **[Unsigned]**: Decimal without sign

❑ [Word 4 add. select.]

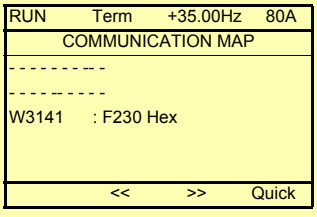
Select the address of the word to be displayed by pressing the <<, >> (F2 and F3) keys and rotating the navigation button.

❑ [Format word 4]

Format of word 4.

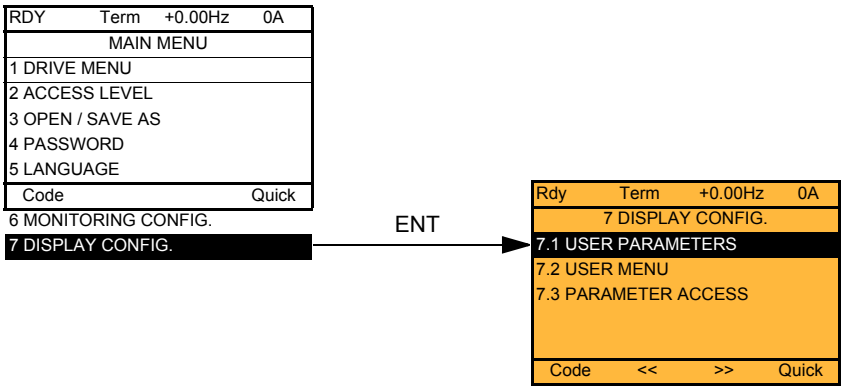
- ☐ **[Hex]**: Hexadecimal
- ☐ **[Signed]**: Decimal with sign
- ☐ **[Unsigned]**: Decimal without sign

It will then be possible to view the selected words in the [COMMUNICATION MAP] submenu of the [1.2 MONITORING] menu.
example:



[7 DISPLAY CONFIG.]

This menu can only be accessed with the graphic display terminal. It can be used to customize parameters or a menu and to access parameters.



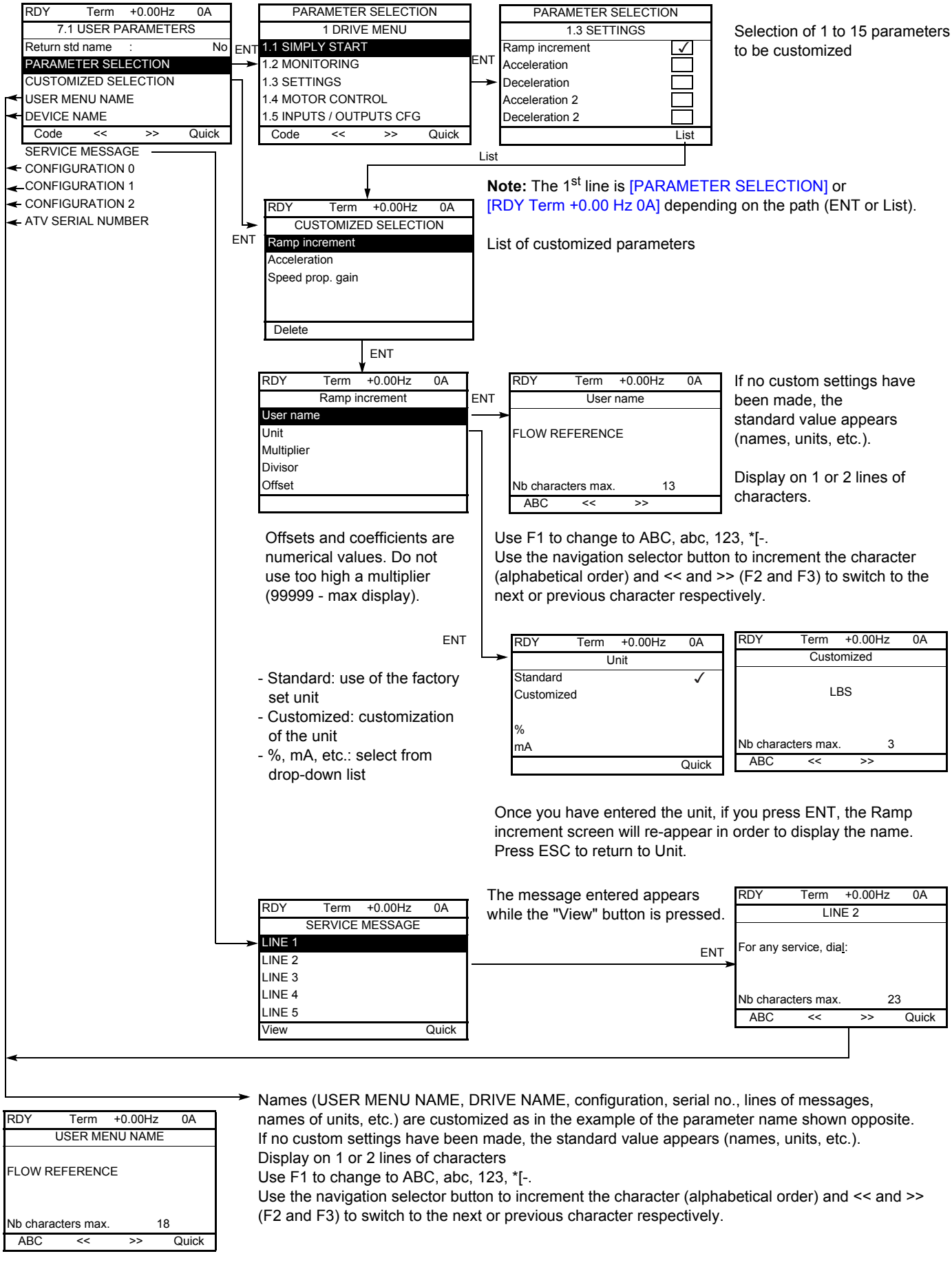
7.1 USER PARAMETERS: Customization of 1 to 15 parameters.

7.2 USER MENU: Creation of a customized menu.

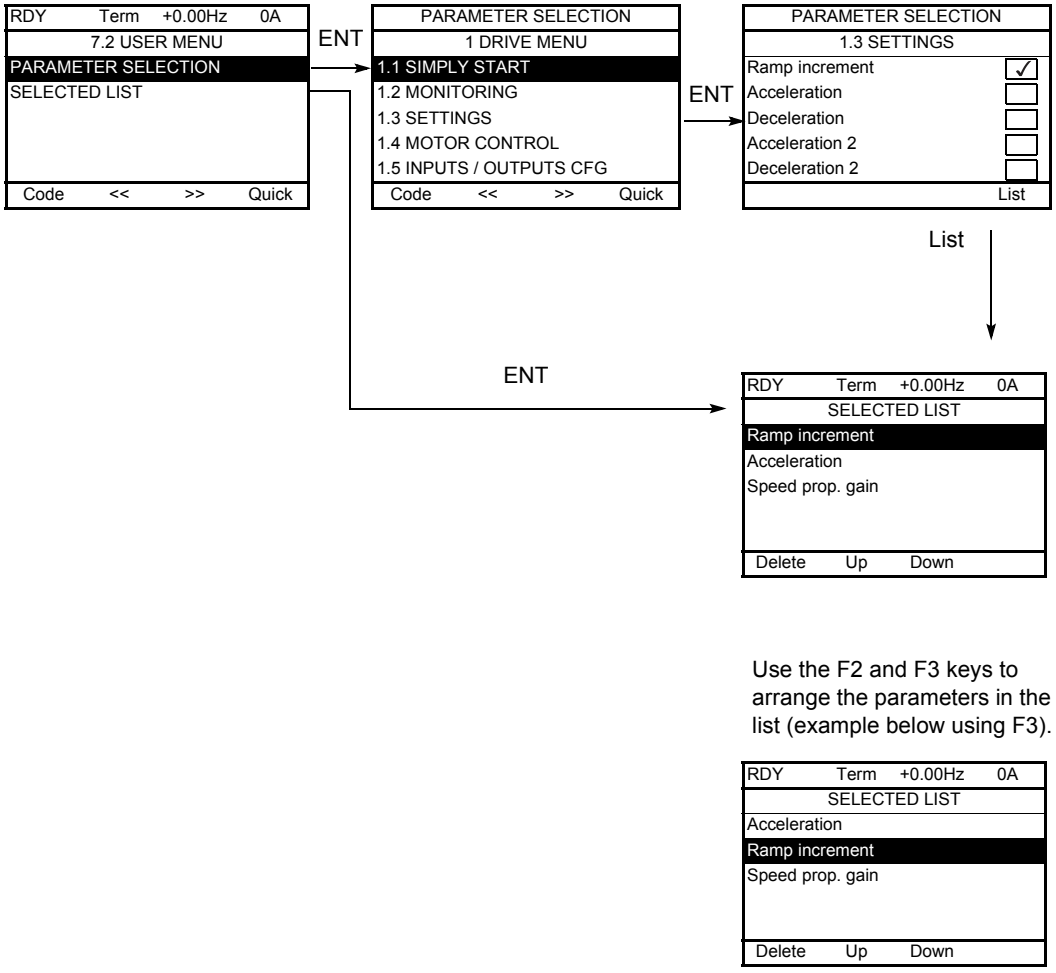
7.3 PARAMETER ACCESS: Customization of the visibility and protection mechanisms of menus and parameters.

[7 DISPLAY CONFIG.]

If [Return std name] = [Yes] the display reverts to standard but the custom settings remain stored.



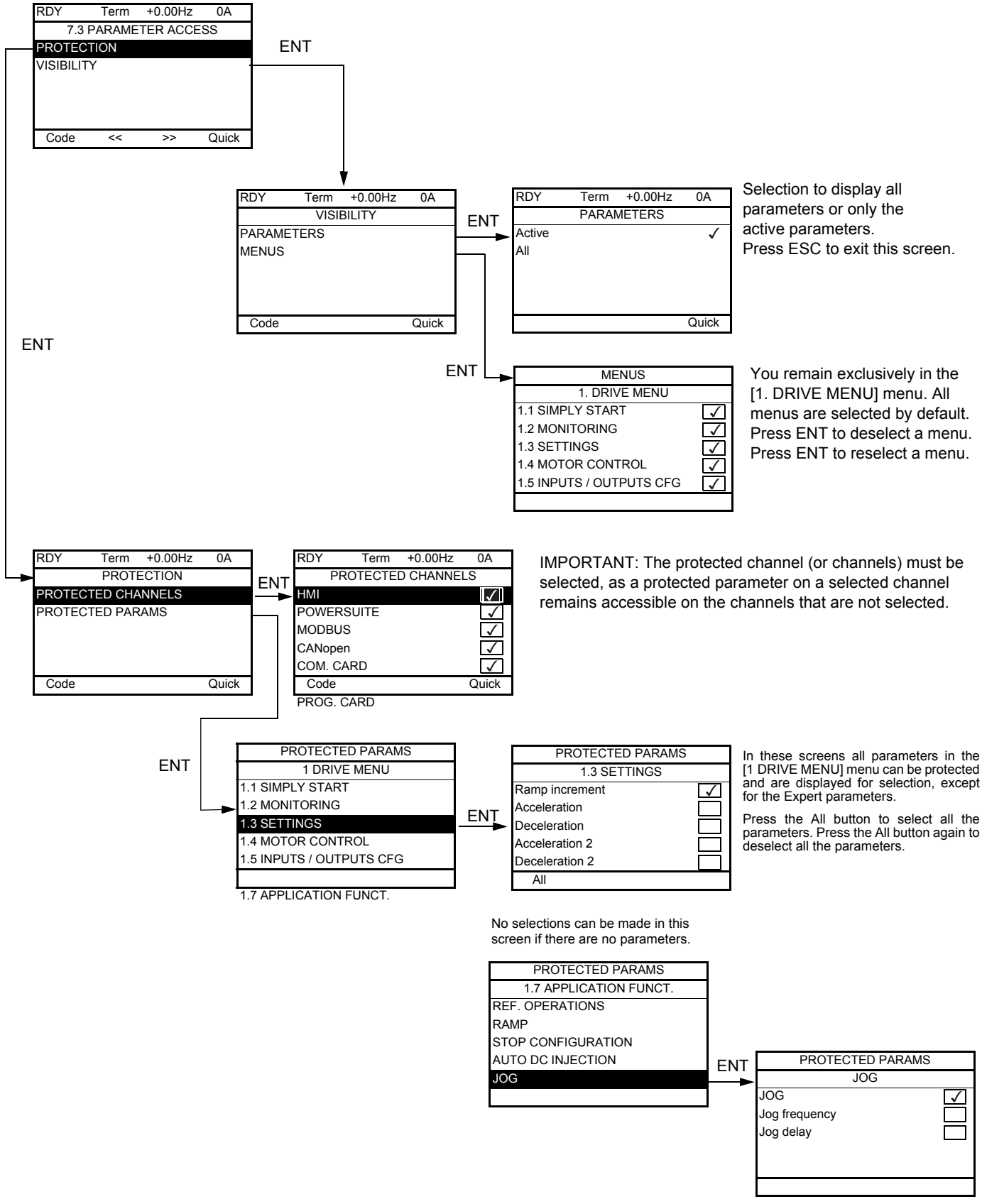
[7 DISPLAY CONFIG.]



Selection of parameters included in the user menu

Note: The 1st line is [PARAMETER SELECTION] or [RDY Term +0.00 Hz 0A] depending on the path (ENT or List).

Parameter list making up the user menu.

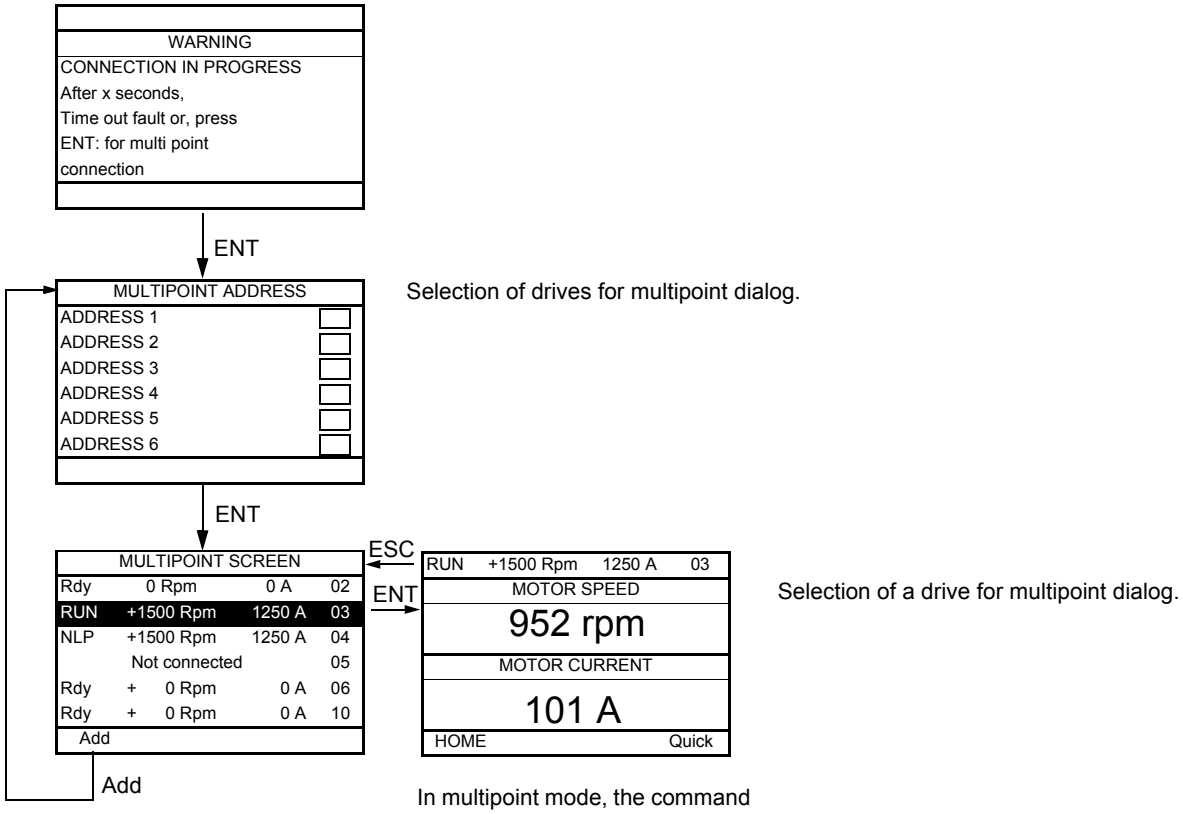


Note: The protected parameters are no longer accessible and are not, therefore, displayed for the selected channels.

[MULTIPOINT SCREEN]

Communication is possible between a graphic display terminal and a number of drives connected on the same bus. The addresses of the drives must be configured in advance in the [1.9 COMMUNICATION] menu using the [Modbus Address] (Adb) parameter, page 216.

When a number of drives are connected to the same display terminal, the terminal automatically displays the following screens:



All menus can be accessed in multipoint mode. Only drive control via the graphic display terminal is not authorized, apart from the Stop key, which locks all the drives.
If there is a fault on a drive, this drive is displayed.

Servicing

The Altivar 71 does not require any preventive maintenance. It is nevertheless advisable to perform the following regularly:

- Check the condition and tightness of the connections.
- Ensure that the temperature around the unit remains at an acceptable level and that ventilation is effective (average service life of fans: 3 to 5 years depending on the operating conditions).
- Remove any dust from the drive.

Assistance with maintenance, fault display

If a problem arises during setup or operation, first check that the recommendations relating to the environment, mounting and connections have been observed.

The first fault detected is saved and displayed, and the drive locks.
The drive switching to fault mode can be indicated remotely via a logic output or a relay, which can be configured in the [1.5 INPUTS / OUTPUTS CFG] (I-O-) menu, see for example [R1 CONFIGURATION] (r1-), page 95.

[1.10 DIAGNOSTICS] menu

This menu can only be accessed with the graphic display terminal. It displays faults and their cause in plain text and can be used to carry out tests, see page 218.

Clearing the fault

Cut the power supply to the drive in the event of a non-resettable fault.
Wait for the display to disappear completely.
Find the cause of the fault in order to correct it.

The drive is unlocked after a fault:

- By switching off the drive until the display disappears completely, then switching on again.
- Automatically in the scenarios described for the[AUTOMATIC RESTART] (Atr-) function, page 198.
- By means of a logic input or control bit assigned to the [FAULT RESET] (rSt-) function, page 197.
- By pressing the STOP/RESET button on the graphic display terminal.

[1.2 MONITORING] (SUP-) menu:

This is used to prevent and find the causes of faults by displaying the drive state and its current values.
It can be accessed with the integrated display terminal.

Spares and repairs:

Consult Schneider Electric product support.

Faults - Causes - Remedies

Starter does not start, no fault displayed

- If the display does not light up, check the power supply to the drive.
- The assignment of the "Fast stop" or "Freewheel" functions will prevent the drive starting if the corresponding logic inputs are not powered up. The ATV71 then displays [Freewheel] (nSt) in freewheel stop and [Fast stop] (FSt) in fast stop. This is normal since these functions are active at zero so that the drive will be stopped safely if there is a wire break.
- Make sure that the run command input or inputs are activated in accordance with the selected control mode ([2/3 wire control] (tCC) and [2 wire type] (tCt) parameters, page 82).
- If an input is assigned to the limit switch function and this input is at zero, the drive can only be started up by sending a command for the opposite direction (see pages 142 and 177).
- If the reference channel or command channel is assigned to a communication bus, when the power supply is connected, the drive will display [Freewheel] (nSt) and remain in stop mode until the communication bus sends a command.

Faults, which cannot be reset automatically

The cause of the fault must be removed before resetting by turning off and then back on.
AnF, brF, ECF, EnF, SOF, SPF and tnF faults can also be reset remotely by means of a logic input or control bit ([Fault reset] (rSF) parameter, page 197).
AnF, EnF, InFA, InFb, SOF, SPF, and tnF faults can be inhibited and cleared remotely by means of a logic input or control bit ([Fault inhibit assign.] (InH) parameter, page 208).

Fault	Name	Probable cause	Remedy
AI2F	[AI2 input]	• Non-conforming signal on analog input AI2	• Check the wiring of analog input AI2 and the value of the signal
AnF	[Load slipping]	• The encoder speed feedback does not match the reference	• Check the motor, gain and stability parameters • Add a braking resistor • Check the size of the motor/drive/load • Check the encoder's mechanical coupling and its wiring
bOF	[DBR overload]	• The braking resistor is under excessive stress	• Check the size of the resistor and wait for it to cool down • Check the [DB Resistor Power] (brP) and [DB Resistor value] (brU) parameters, page 211
brF	[Brake feedback]	• The brake feedback contact does not match the brake logic control	• Check the feedback circuit and the brake logic control circuit • Check the mechanical state of the brake
bUF	[DB unit sh. Circuit]	• Short-circuit output from braking unit	• Check the wiring of the braking unit and the resistor • Check the braking resistor
CrF1	[Precharge]	• Load relay control fault or charging resistor damaged	• Switch the drive off and then back on again • Check the internal connections • Inspect/repair the drive
CrF2	[Thyr. soft charge]	• DC bus charging fault (thyristors)	
ECF	[Encoder coupling]	• Break in encoder's mechanical coupling	• Check the encoder's mechanical coupling
EEF1	[Control Eeprom]	• Internal memory fault, control card	• Check the environment (electromagnetic compatibility) • Turn off, reset, return to factory settings • Inspect/repair the drive
EEF2	[Power Eeprom]	• Internal memory fault, power card	
EnF	[Encoder]	• Encoder feedback fault	• Check [Number of pulses] (PGI) and [Encoder type] (EnS), page 72 • Check that the encoder's mechanical and electrical operation, its power supply and connections are all correct • If necessary, reverse the direction of rotation of the motor ([Output Ph rotation] (PHr) parameter, page 66) or the encoder signals
FCF1	[Out. contact. stuck]	• The output contactor remains closed although the opening conditions have been met	• Check the contactor and its wiring • Check the feedback circuit

Faults, which cannot be reset automatically (continued)

Fault	Name	Probable cause	Remedy
HdF	[IGBT desaturation]	• Short-circuit or grounding at the drive output	• Check the cables connecting the drive to the motor, and the insulation of the motor • Perform the diagnostic tests via the [1.10 DIAGNOSTICS] menu
ILF	[internal com. link]	• Communication fault between option card and drive	• Check the environment (electromagnetic compatibility) • Check the connections • Check that no more than 2 option cards (max. permitted) have been installed on the drive • Replace the option card • Inspect/repair the drive
InF1	[Rating error]	• The power card is different from the card stored	• Check the reference of the power card
InF2	[Incompatible PB]	• The power card is incompatible with the control card	• Check the reference of the power card and its compatibility
InF3	[Internal serial link]	• Communication fault between the internal cards	• Check the internal connections • Inspect/repair the drive
InF4	[Internal MFG area]	• Internal data inconsistent	• Recalibrate the drive (performed by Schneider Electric Product Support)
InF6	[Internal-option]	• The option installed in the drive is not recognized	• Check the reference and compatibility of the option
InF7	[Internal-hard init.]	• Initialization of the drive is incomplete	• Turn off and reset
InF8	[Internal-ctrl supply]	• The control power supply is incorrect	• Check the control power supply
InF9	[Internal- I measure]	• The current measurements are incorrect	• Replace the current sensors or the power card • Inspect/repair the drive
InFA	[Internal-mains circuit]	• The input stage is not operating correctly	• Perform the diagnostic tests via the [1.10 DIAGNOSTICS] menu • Inspect/repair the drive
InFb	[Internal- th. sensor]	• The drive temperature sensor is not operating correctly	• Replace the temperature sensor • Inspect/repair the drive
InFC	[Internal-time meas.]	• Fault on the electronic time measurement component	• Inspect/repair the drive
InFE	[internal- CPU]	• Internal microprocessor fault	• Turn off and reset. Inspect/repair the drive
OCF	[Overcurrent]	• Parameters in the [SETTINGS] (SEt-) and [1.4 MOTOR CONTROL] (drC-) menus are not correct • Inertia or load too high • Mechanical locking	• Check the parameters • Check the size of the motor/drive/load • Check the state of the mechanism
PrF	[Power removal]	• Fault with the drive's "Power removal" safety function	• Inspect/repair the drive
SCF1	[Motor short circuit]	• Short-circuit or grounding at the drive output • Significant earth leakage current at the drive output if several motors are connected in parallel	• Check the cables connecting the drive to the motor, and the insulation of the motor • Perform the diagnostic tests via the [1.10 DIAGNOSTICS] menu • Reduce the switching frequency • Connect chokes in series with the motor
SCF2	[Impedant sh. circuit]		
SCF3	[Ground short circuit]		
SOF	[Overspeed]	• Instability or driving load too high	• Check the motor, gain and stability parameters • Add a braking resistor • Check the size of the motor/drive/load
SPF	[Speed fdback loss]	• Encoder feedback signal missing	• Check the wiring between the encoder and the drive • Check the encoder
tnF	[Auto-tuning]	• Special motor or motor whose power is not suitable for the drive • Motor not connected to the drive	• Check that the motor/drive are compatible • Check that the motor is present during auto-tuning • If an output contactor is being used, close it during auto-tuning

Faults - Causes - Remedies

Faults that can be reset with the automatic restart function, after the cause has disappeared

These faults can also be reset by turning on and off or by means of a logic input or control bit ([Fault reset] (rSF) parameter, page 197). APF, CnF, COF, EPF1, EPF2, FCF2, LFF2, LFF3, LFF4, ObF, OHF, OLF, OPF1, OPF2, OSF, OtF1, OtF2, OtFL, PHF, PtF1, PtF2, PtFL, SLF1, SLF2, SLF3, SrF, SSF and tJF faults can be inhibited and cleared remotely by means of a logic input or control bit ([Fault inhibit assign.] (InH)parameter, page 208).

Fault	Name	Probable cause	Remedy
APF	[Application fault]	• Controller Inside card fault	• Please refer to the card documentation
bLF	[Brake control]	• Brake release current not reached • Brake engage frequency threshold [Brake engage freq] (bEn) only regulated when brake logic control is assigned	• Check the drive/motor connection • Check the motor windings • Check the [Brake release I FW] (Ibr) and [Brake release I Rev] (Ird) settings, page 148. • Apply the recommended settings for [Brake engage freq] (bEn)
CnF	[Com. network]	• Communication fault on communication card	• Check the environment (electromagnetic compatibility) • Check the wiring • Check the time-out • Replace the option card • Inspect/repair the drive
COF	[CAN com.]	• Interruption in communication on the CANopen bus	• Check the communication bus • Check the time-out • Refer to the CANopen user's manual
EPF1	[External flt-LI/Bit]	• Fault triggered by an external device, depending on user	• Check the device, which caused the fault, and reset
EPF2	[External fault com.]	• Fault triggered by a communication network	• Check for the cause of the fault and reset
FCF2	[Out. contact. open.]	• The output contactor remains open although the closing conditions have been met	• Check the contactor and its wiring • Check the feedback circuit
LCF	[input contactor]	• The drive is not turned on even though [Mains V. time out] (LCt) has elapsed	• Check the contactor and its wiring • Check the time-out • Check the line/contactor/drive connection
LFF2 LFF3 LFF4	[AI2 4-20mA loss] [AI3 4-20mA loss] [AI4 4-20mA loss]	• Loss of the 4-20 mA reference on analog input AI2, AI3 or AI4	• Check the connection on the analog inputs
ObF	[Overbraking]	• Braking too sudden or driving load	• Increase the deceleration time • Install a braking resistor if necessary • Activate the [Dec ramp adapt.] (brA) function, page 127, if it is compatible with the application
OHF	[Drive overheat]	• Drive temperature too high	• Check the motor load, the drive ventilation and the ambient temperature. Wait for the drive to cool down before restarting
OLF	[Motor overload]	• Triggered by excessive motor current	• Check the setting of the motor thermal protection, check the motor load. Wait for the drive to cool down before restarting
OPF1	[1 output phase loss]	• Loss of one phase at drive output	• Check the connections from the drive to the motor

Faults - Causes - Remedies

Faults that can be reset with the automatic restart function, after the cause has disappeared (continued)

Fault	Name	Probable cause	Remedy
OPF2	[3 output phase loss]	• Motor not connected or motor power too low • Output contactor open • Instantaneous instability in the motor current	• Check the connections from the drive to the motor • If an output contactor is being used, parameterize [Output Phase Loss] (OPL) = [Output cut] (OAC), page 201 • Test on a low power motor or without a motor: In factory settings mode, motor phase loss detection is active [Output Phase Loss] (OPL) = [Yes] (YES). To check the drive in a test or maintenance environment, without having to use a motor with the same rating as the drive (in particular for high power drives), deactivate motor phase loss detection [Output Phase Loss] (OPL) = [No] (nO) • Check and optimize the following parameters: [IR compensation] (UFr), page 70, [Rated motor volt.] (UnS) and [Rated mot. current] (nCr), page 65, and perform [Auto tuning] (tUn), page 66
OSF	[Mains overvoltage]	• Mains voltage too high • Disturbed mains supply	• Check the mains voltage
OtF1	[PTC1 overheat]	• Overheating of the PTC1 probes detected	• Check the motor load and motor size • Check the motor ventilation • Wait for the motor to cool before restarting • Check the type and state of the PTC probes
OtF2	[PTC2 overheat]	• Overheating of the PTC2 probes detected	
OtFL	[LI6=PTC overheat]	• Overheating of PTC probes detected on input LI6	
PtF1	[PTC1 probe]	• PTC1 probes open or short-circuited	• Check the PTC probes and the wiring between them and the motor/drive
PtF2	[PTC2 probe]	• PTC2 probes open or short-circuited	
PtFL	[LI6=PTC probe]	• PTC probes on input LI6 open or short-circuited	
SCF4	[IGBT short circuit]	• Power component fault	• Perform a diagnostic test via the [1.10 DIAGNOSTICS] menu • Inspect/repair the drive
SCF5	[Motor short circuit]	• Short-circuit at drive output	• Check the cables connecting the drive to the motor, and the motor's insulation • Perform diagnostic tests via the [1.10 DIAGNOSTICS] menu • Inspect/repair the drive
SLF1	[Modbus com.]	• Interruption in communication on the Modbus bus	• Check the communication bus • Check the time-out • Refer to the Modbus user's manual
SLF2	[PowerSuite com.]	• Fault communicating with PowerSuite	• Check the PowerSuite connecting cable • Check the time-out
SLF3	[HMI com.]	• Fault communicating with the graphic display terminal	• Check the terminal connection • Check the time-out
SrF	[Torque time-out]	• The time-out of the torque control function is attained	• Check the function's settings • Check the state of the mechanism
SSF	[Torque/current lim]	• Switch to torque limitation	• Check if there are any mechanical problems • Check the parameters of [TORQUE LIMITATION] (tLA-) page 171 and the parameters of fault [TORQUE OR I LIM. DETECT.] (tId-), page 210)
tJF	[IGBT overheat]	• Drive overheated	• Check the size of the load/motor/drive • Reduce the switching frequency • Wait for the motor to cool before restarting

Faults - Causes - Remedies

Faults that can be reset as soon as their causes disappear

The USF fault can be inhibited and cleared remotely by means of a logic input or control bit ([Fault inhibit assign.] (InH), page 208).

Fault	Name	Probable cause	Remedy
CFF	[Incorrect config.]	• Option card changed or removed	• Check that there are no card errors • In the event of the option card being changed/removed deliberately, see the remarks below
		• Control card replaced by a control card configured on a drive with a different rating	• Check that there are no card errors • In the event of the control card being changed deliberately, see the remarks below
		• The current configuration is inconsistent	• Return to factory settings or retrieve the backup configuration, if it is valid (see page 223)
CFI	[Invalid config.]	• Invalid configuration The configuration loaded in the drive via the bus or communication network is inconsistent	• Check the configuration loaded previously • Load a compatible configuration
HCF	[Cards pairing]	• The [CARDS PAIRING] (PPI-) function, page 212, has been configured and a drive card has been changed	• In the event of a card error, reinsert the original card • Confirm the configuration by entering the [Pairing password] (PPI) if the card was changed deliberately
PHF	[Input phase loss]	• Drive incorrectly supplied or a fuse blown • Failure of one phase • 3-phase ATV71 used on a single-phase line supply • Unbalanced load This protection only operates with the drive on load	• Check the power connection and the fuses • Use a 3-phase mains supply • Disable the fault by [Input phase loss] (IPL) = [No] (nO) (page 202)
USF	[Undervoltage]	• Line supply too low • Transient voltage dip • Damaged pre-charge resistor	• Check the voltage and the parameters of [UNDERVOLTAGE MGT] (USb-), page 205 • Replace the pre-charge resistor • Inspect/repair the drive

Option card changed or removed

When an option card is removed or replaced by another, the drive locks in [Incorrect config.] (CFF) fault mode on power-up. If the card has been deliberately changed or removed, the fault can be cleared by pressing the ENT key twice, which **causes the factory settings to be restored** (see page 223) for the parameter groups affected by the card. These are as follows:

Card replaced by a card of the same type

- I/O cards: [Drive menu] (drM)
- Encoder cards: [Drive menu] (drM)
- Communication cards: Only the parameters that are specific to communication cards
- Controller Inside cards: [Prog. card menu.] (PLC)

Card removed (or replaced by a different type of card)

- I/O card: [Drive menu] (drM)
- Encoder card: [Drive menu] (drM)
- Communication card: [Drive menu] (drM) and parameters specific to communication cards
- Controller Inside card: [Drive menu] (drM) and [Prog. card menu] (PLC)

Control card changed

When a control card is replaced by a control card configured on a drive with a different rating, the drive locks in [Incorrect config.] (CFF) fault mode on power-up. If the card has been deliberately changed, the fault can be cleared by pressing the ENT key twice, which **causes all the factory settings to be restored.**

User settings tables

[1.1 SIMPLY START] (SIM-) menu

Code	Name	Factory setting	Customer setting
tCC	**[2/3 wire control]**	[2 wire] (2C)	
CFG	**[Macro configuration]**	[Start/Stop] (StS)	
bFr	**[Standard mot. freq]**	[50 Hz] (50)	
nPr	**[Rated motor power]**	According to drive rating	
UnS	**[Rated motor volt.]**	According to drive rating	
nCr	**[Rated mot. current]**	According to drive rating	
FrS	**[Rated motor freq.]**	50 Hz	
nSP	**[Rated motor speed]**	According to drive rating	
tFr	**[Max frequency]**	60 Hz	
PHr	**[Output Ph rotation]**	ABC	
ItH	**[Mot. therm. current]**	According to drive rating	
ACC	**[Acceleration]**	3.0 s	
dEC	**[Deceleration]**	3.0 s	
LSP	**[Low speed]**	0	
HSP	**[High speed]**	50 Hz	

Functions assigned to I/O

I/O	Functions assigned
LI1	
LI2	
LI3	
LI4	
LI5	
LI6	
LI7	
LI8	
LI9	
LI10	
LI11	
LI12	
LI13	
LI14	

I/O	Functions assigned
LO1	
LO2	
LO3	
LO4	
AI1	
AI2	
AI3	
AI4	
R1	
R2	
R3	
R4	
RP	
Encoder	

Other parameters (table to be created by the user)

Code	Name	Customer setting

Code	Name	Customer setting

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	[1.1 SIMPLY START] (SIM-)	[1.2 MONITORING] (SUP-)	[1.3 SETTINGS] (SEt-)	[1.4 MOTOR CONTROL] (drC-)	[1.5 INPUTS / OUTPUTS CFG] (I-O-)	[1.6 COMMAND] (CtL-)	[1.7 APPLICATION FUNCT.] (FUn-)	[1.8 FAULT MANAGEMENT] (FLt-)	[1.9 COMMUNICATION] (COM-)	[1.12 FACTORY SETTINGS] (FCS-)	[4 PASSWORD] (COd-)
AIC-					103						
A2C-					103						
A3C-					103						
AC2			51				127 139				
ACC	40		51				125				
AdC							130				
AdCO									216		
Add									216		
AI1A		48			87						
AI1E					87						
AI1F					87						
AI1S					87						
AI1t					87						
AI2A		48			88						
AI2E					88						
AI2F					88						
AI2L					88						
AI2S					88						
AI2t					88						
AI3A		48			89						
AI3E					89						
AI3F					89						
AI3L					89						
AI3S					89						
AI3t					89						
AI4A		48			90						
AI4E					90						
AI4F					90						
AI4L					90						
AI4S					90						
AI4t					90						
AIC1							163				
ALGr		49									
ANOA									216		
ANOC									216		
AO1					101						

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AO1F					101						
AO1t					101						
AO2					102						
AO2F					102						
AO2t					102						
AO3					102						
AO3F					102						
AO3t					102						
AOH1					101						
AOH2					102						
AOH3					102						
AOL1					101						
AOL2					102						
AOL3					102						
APH		49									
Atr								198			
AUS		49									
AUt				66							
bbA				78							
bC1							148				
bdCO									216		
bEd							149				
bEn			61				149				
bEt			62				149				
bFr	38		65								
b1P							148				
b1r			61				149				
bLC							148				
brA							127				
brHO							151				
brH1							151				
brH2							152				
brH3							152				
brH4							152				
brO								211			
brP								211			

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brr							152				
brt			61				148				
brU								211			
bSP					85						
bSt							148				
CCFG	37										
CCS						114					
Cd1						114					
Cd2						114					
CFG	37										
CFPS		49									
CHA1							181				
CHA2							181				
CHCF						113					
CHn							185				
CL2			57				172				
CL1			57	76			172				
CLL								209			
CLO							158				
CLS							179				
CnF1							185				
CnF2							185				
CnFS		49									
COd											229
COd2											229
COF							158				
COL								209			
COP						115					
COr							158				
CP1							154				
CP2							154				
CrH2					88						
CrH3					89						
CrH4					90						
CrL2					88						
CrL3					89						

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CrL4					90						
CSt											229
Ctd			62								
Ctt				67							
dA2							124				
dA3							124				
dAF							179				
dAr							179				
dAS							176				
dbn							169				
dbP							169				
dbS							176				
dCF			55				128	213			
dCI							129				
dCO							194				
dE2			51				127, 139				
dEC	40		51				125				
dLr											229
dSF							179				
dSI							139				
dSP							137				
dtF							192				
Eb0							191				
ECC								210			
ECt								210			
EFI					94						
EFr					94						
EIL					94						
EnA				75							
EnC				73	93						
EnS				72	93						
EnU				73	94						
EPL								204			
ErCO									216		
EtF								204			

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F1				68							
F2				68							
F2d			62								
F3				68							
F4				68							
F5				68							
FCP				69							
FCS1										223	
FL1							141				
FLO									217		
FLOC									217		
FLOt									217		
FLr								199			
FLU			58				141				
FP1							165				
Fr1						113					
Fr1b							123				
Fr2						114					
FrH		49									
FrS	38		65								
FrSS				71							
Frt							127				
Fry-										223	
FSt							128				
Ftd			62								
GFS										223	
GIE			55	75							
GPE			55	75							
HSO							158				
HSP	40		52								
Ibr			61				148				
IbrA							154				
IdA				71							
IdC			55				129	213			
IdC2			55				129	213			
IdN				71							

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InH								208			
Inr			51				125				
IPL	38							202			
Ird			61				148				
ItH	40		52								
JdC			62				150				
JGF			58				132				
JGt			58				132				
JOG							132				
L IA to L I4A		48			83						
L Id to L I4d					83						
LAF							143				
LAr							143				
LAS							143				
LbA				78							
LbC			63	78							
LbC1				80							
LbC2				80							
LbC3				80							
LbF				80							
LC2							172				
LCr		49									
LCt							174				
LdS				70							
LES							174				
LFA				71							
LFF								213			
LFL2 LFL3 LFL4								207			
LFn				71							
LIS1		48									
LIS2		48									
LLC							174				
LOI					98						

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LO1d					98						
LO1H					98						
LO1S					98						
LO2					98						
LO2d					98						
LO2H					98						
LO2S					98						
LO3					99						
LO3d					99						
LO3H					99						
LO3S					99						
LO4					99						
LO4d					99						
LO4H					99						
LO4S					99						
LP1							154				
LP2							154				
L9S				70							
LSP	40		52								
MA2							124				
MA3							124				
MFr		49	60								
nCA1									215		
nCA2									215		
nCA3									215		
nCA4									215		
nCA5									215		
nCA6									215		
nCA7									215		
nCA8									215		
nCr	38		65								
nCrS				70							
nMA1									215		
nMA2									215		
nMA3									215		
nMA4									215		

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nMA5									215		
nMA6									215		
nMA7									215		
nMA8									215		
nPr	38		65								
nrd				76							
nSL				71							
nSP	38		65								
nSPS				70							
nSt							128				
oA6		49									
oA2		49									
oA3		49									
oA4		49									
oA5		49									
OCC							176				
Odt								201			
OFI				76							
OHL								202			
OLL								201			
OPL								201			
OPr		49									
OSP							158				
PAH			60				164				
PAL			60				164				
PAS							179				
PAU							165				
PEr			61				164				
PES							154				
PFI					91						
PFr					91						
PGA					94						
PGI				72	94						
PHS				70							
PHr	39			66							
PIA					91						

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PIC							164				
PIF							163				
PIF1							163				
PIF2							163				
PII							163				
PIL					91						
PIM							165				
PIP1							163				
PIP2							163				
PIS							164				
POH			60				164				
POL			60				164				
PPI								212			
PPn				71							
PPnS				70							
Pr2							166				
Pr4							166				
PrP			60				164				
PS1-							181				
PS2-							182				
PS3-							182				
PS2							134				
PS4							134				
PSB							134				
PS16							134				
PSr			61				165				
PSt						113					
PtC1								197			
PtC2								197			
PtCL								197			
PtH		49									
9SH			62				191				
9SL			62				191				
r1					95						
r1d					96						
r1H					96						

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	[1.1 SIMPLY START] (SIM-)	[1.2 MONITORING] (SUP-)	[1.3 SETTINGS] (SET-)	[1.4 MOTOR CONTROL] (drC-)	[1.5 INPUTS / OUTPUTS CFG] (I-O-)	[1.6 COMMAND] (CtL-)	[1.7 APPLICATION FUNCT.] (FUn-)	[1.8 FAULT MANAGEMENT] (FLt-)	[1.9 COMMUNICATION] (COM-)	[1.12 FACTORY SETTINGS] (FCS-)	[4 PASSWORD] (COd-)
r1S					96						
r2					96						
r2d					96						
r2H					96						
r2S					96						
r3					97						
r3d					97						
r3H					97						
r3S					97						
r4					97						
r4d					97						
r4H					97						
r4S					97						
rAP				75							
rCA							176				
rCb							123				
rdG			60				164				
rFC						114					
rFr		49									
rFt-							193				
rIG			60				164				
rIn						113					
rP2			61				166				
rP3			61				166				
rP4			61				166				
rPC		49									
rPE		49									
rPF		49									
rPG			60				163				
rPI							163				
rPO		49									
rPS							127				
rPt							125				
rrS					82						
rSA				71							
rSAS				70							

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rSF								197			
rSL							166				
rSM				71							
rSMS				71							
rSP							193				
rSU							193				
rtH		49									
rtO							169				
rtr							192				
SA2							124				
SA3							124				
SAF							179				
SAr							179				
SAt								203			
SCL							158				
SCS1										223	
SdC1			56				130, 149				
SdC2			56				130				
Sdd								210			
SFC			52								
SFr			57	76							
SIt			52								
SLL								209			
SLP			55	70							
SnC							192				
SOP				76							
SP2			59				135				
SP3			59				135				
SP4			59				135				
SP5			59				135				
SP6			59				135				
SP7			59				135				
SP8			59				135				
SP9			59				135				
SP10			59				135				

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	[1.1 SIMPLY START] (SIM-)	[1.2 MONITORING] (SUP-)	[1.3 SETTINGS] (SET-)	[1.4 MOTOR CONTROL] (drC-)	[1.5 INPUTS / OUTPUTS CFG] (I-O-)	[1.6 COMMAND] (CtL-)	[1.7 APPLICATION FUNCT.] (FUn-)	[1.8 FAULT MANAGEMENT] (FLt-)	[1.9 COMMUNICATION] (COM-)	[1.12 FACTORY SETTINGS] (FCS-)	[4 PASSWORD] (COd-)
SP11			59				135				
SP12			59				135				
SP13			59				135				
SP14			59				135				
SP15			60				135				
SP16			60				135				
SPd		49									
SPG			52								
SPn							140				
SPt							168				
SrP			60				139				
SSb								210			
StN								205			
StO								210			
StP								205			
Str							137				
Strt								206			
Stt							128				
SUL				76							
tA1			51				126				
tA2			51				126				
tA3			51				126				
tA4			52				126				
tAA							171				
tAC		49									
tAr								198			
tbE			61				149				
tbO							191				
tbr									216		
tbr2									216		
tbS								205			
tCC	37				82						
tCt					82						
td1			55				129	213			
tdC			55				129	213			
tdC1			56				130				

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tdC2			56				131				
tdn							191				
tFO									216		
tFO2									216		
tFr	38		65								
tHA								202, 203			
tHd		49									
tHr		49									
tHt								201			
tLA							171				
tLC							171				
tL IG			62				171				
tL IN			62				171				
tLS			58				165				
tOb							169				
tOS							158				
tr I							168				
trA				71							
trC							191				
trH			62				191				
trL			62				191				
trn				71							
trP							168				
trr		49									
trt							168				
tSd							168				
tSn								205			
tSS							168				
tSt							168				
tSY							192				
ttd			63					201, 203			
ttd2								201, 203			
ttd3								201, 203			

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tbO								216			
tbr			62				150				
tUL							185				
tUn	39			66							
tUP							191				
tUS	39			66							
U0				68							
U1				68							
U2				68							
U3				68							
U4				68							
U5				68							
Ubr				78							
UC2				69							
Ucb								199			
UCP				69							
UFr			55	70							
UIH1					87						
UIH2					88						
UIH4					90						
UIL1					87						
UIL2					88						
UIL4					90						
ULn		49									
ULr											229
UnS	38		65								
UOH1					101						
UOH2					102						
UOH3					102						
UOL1					101						
UOL2					102						
UOL3					102						
UOP		49									
UPL								205			
UrES								205			
USb								205			

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USI							139				
USL								205			
USP							137				
USt								205