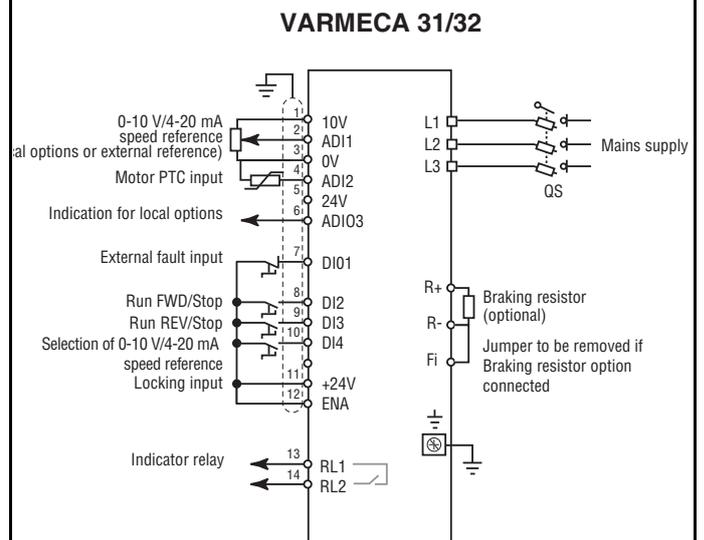




This manual is to be given to the end user



VARMECA 30

Variable speed motors and geared motors

Parameter-setting manual

VARMECA 30

Variable speed motors and geared motors

NOTE

LEROY-SOMER reserves the right to modify the characteristics of its products at any time in order to incorporate the latest technological developments. The information contained in this document may therefore be changed without notice.



For the user's own safety, this VARMECA 30 motor must be connected to an approved earth (⊕ terminal). If accidentally starting the installation is likely to cause a risk to personnel or the machines being driven, it is essential to supply the equipment via a circuit-breaking device (power contactor) which can be controlled via an external safety system (emergency stop, detection of errors on the installation).

The VARMECA 30 motor is fitted with safety devices which, in the event of a fault, control stopping and thus stop the motor. The motor itself can become jammed for mechanical reasons. Voltage fluctuations, and in particular power cuts, may also cause the motor to stop.

The removal of the causes of the shutdown can lead to restarting, which may be dangerous for certain machines or installations. In such cases, it is essential that the user takes appropriate precautions against the motor restarting after an unscheduled stop.

The variable speed drive is designed to be able to supply a motor and the driven machine above its rated speed.

If the motor or the machine are not mechanically designed to withstand such speeds, the user may be exposed to serious danger resulting from their mechanical deterioration. It is important that the user checks that the installation can withstand it, before programming a high speed.

The variable speed drive which is the subject of this manual is designed to be integrated in an installation or an electrical machine, and can under no circumstances be considered to be a safety device. It is therefore the responsibility of the machine manufacturer, the designer of the installation or the user to take all necessary precautions to ensure that the system complies with current standards, and to provide any devices required to ensure the safety of equipment and personnel.

LEROY-SOMER declines all responsibility in the event of the above recommendations not being observed.

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SAFETY AND OPERATING INSTRUCTIONS FOR ELECTRICAL ACTUATORS (In accordance with the low voltage directive 73/23/EEC modified by 93/68/EEC)



• Throughout the manual, this symbol warns of consequences which may arise from inappropriate use of the VARMECA 30, since electrical risks may lead to material or physical damage as well as constituting a fire hazard.

1 - General

Depending on their degree of protection, VARMECA 30 motors may contain moving parts, as well as hot surfaces, during operation.

Unjustified removal of protection devices, incorrect use, faulty installation or inappropriate operation could represent a serious risk to personnel and equipment.

For further information, consult the manual.

All work relating to transportation, installation, commissioning and maintenance must be performed by experienced, qualified personnel (see IEC 364 or CENELEC HD 384, or DIN VDE 0100, and also national specifications for installation and accident prevention).

In these basic safety instructions, qualified personnel means persons competent to install, mount, commission and operate the product and possessing the relevant qualifications.

2 - Use

VARMECA 30 motors are components designed for integration in installations or electrical machines.

When integrated in a machine, commissioning must not take place until it has been verified that the machine conforms with directive 89/392/EEC (Machinery Directive).

It is also necessary to comply with standard EN 60204, which stipulates in particular that electrical actuators (which include VARMECA 30) cannot be regarded as circuit-breaking devices and certainly not as isolating switches.

Commissioning can take place only if the requirements of the Electromagnetic Compatibility Directive (89/336/EEC, modified by 92/31/EEC) are met.

VARMECA 30 motors meet the requirements of the Low Voltage Directive 73/23/EEC, modified by 93/68/EEC. The harmonised standards of the DIN VDE 0160 series in connection with standard VDE 0660, part 500 and EN 60146/VDE 0558 are also applicable.

The technical characteristics and instructions concerning the connection conditions specified on the nameplate and in the documentation provided must be observed without fail.

3 - Transportation, storage

All instructions concerning transportation, storage and correct handling must be observed.

The climatic conditions specified in the technical manual must be observed.

4 - Installation

The installation and cooling of equipment must comply with the specifications in the manual supplied with the product.

VARMECA 30 motors must be protected against excessive stress. In particular, there must be no damage to parts and/or modification of the clearance between components during transportation and handling. Avoid touching the electronic components and contact parts.

VARMECA 30 motors contain parts which are sensitive to electrostatic stress and may be easily damaged if handled incorrectly. Electrical components must not be exposed to mechanical damage or destruction (risks to health!).

5 - Electrical connection

When work is performed on VARMECA 30 motors which are powered up, national accident prevention specifications must be respected.

The electrical installation must comply with the relevant specifications (for example conductor cross-sections, protection via fused circuit-breaker, connection of protective conductor). More detailed information is given in the manual. Instructions for an installation which meets the requirements for electromagnetic compatibility, such as screening, earthing, presence of filters and correct insertion of cables and conductors, are given in the documentation supplied with the VARMECA 30. These instructions must be followed in all cases, even if the VARMECA 30 carries the CE mark. Adherence to the limits given in the EMC legislation is the responsibility of the manufacturer of the installation or the machine.

6 - Operation

Installations incorporating VARMECA 30 motors must be fitted with additional protection and monitoring devices as laid down in the current relevant safety regulations: law on technical equipment, accident prevention regulations, etc. Modification of VARMECA 30 motors using control software is permitted.

Active parts of the device and live power connections must not be touched immediately after the VARMECA 30 is powered down, as the capacitors may still be charged. In view of this, the warnings fixed to VARMECA 30 motors must be observed. During operation, all doors and protective covers must remain closed.

7 - Servicing and maintenance

Refer to the manufacturer's documentation.

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NOTE

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GENERAL INFORMATION

1 - GENERAL INFORMATION



- The operating characteristics are described in section 2.5 "VARMECA 30 parameters".
- When using the VARMECA 30 parameter-setting tools, the precautions described in the installation and maintenance manual, Ref. 3776, should be applied.

1.1 - Operating principle

This manual describes how to access the parameter settings of the VARMECA 30 range via an LCD KEYPAD micro console or VMA SOFT PC software.

Combined with the VARMECA 30, these tools are used for programming, diagnostics and displaying parameters.

1.2 - General characteristics

1.2.1 - "LCD KEYPAD micro console" option

The kit comprises:

- 1 micro console with LCD digital display – 1 line of 12 characters, 2 lines of 16 characters, with cable (length = 3m)
- 1 parameter-setting manual

1.2.2 - "VMA SOFT" PC software option

The kit comprises:

- 1 connection cable (length = 1.5 m) to connect to the VARMECA 30.

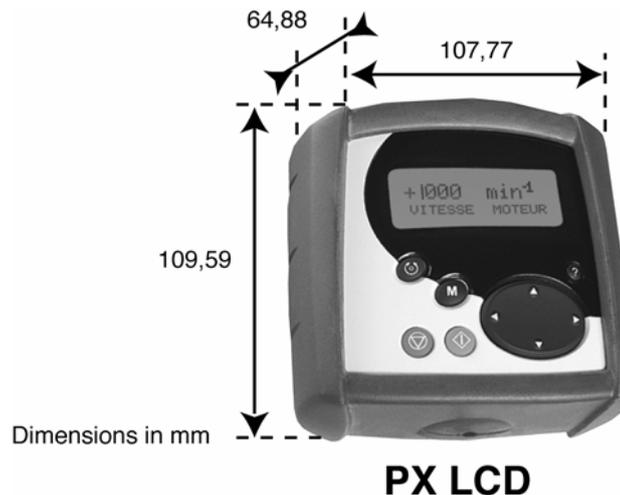
The software can be downloaded from the website : www.leroysoyer.com or contact your local sales office.

Minimum PC configuration:

- Pentium 700 MHz or equivalent
- 256 Mbytes of RAM - 300 Mbytes on hard disk
- Windows 98 - 2nd edition/NT/2000/XP

This manual is for use with software versions 1.00 (VMA 31/32), 2.20 (VMA 33/34), 2.00 (LCD KEYPAD console).

1.3 - Dimensions of the LCD KEYPAD micro console



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COMMISSIONING USING THE LCD KEYPAD MICRO CONSOLE

2 - COMMISSIONING USING THE LCD KEYPAD MICRO CONSOLE

2.1 - Installation

2.1.1 - Checks on receipt

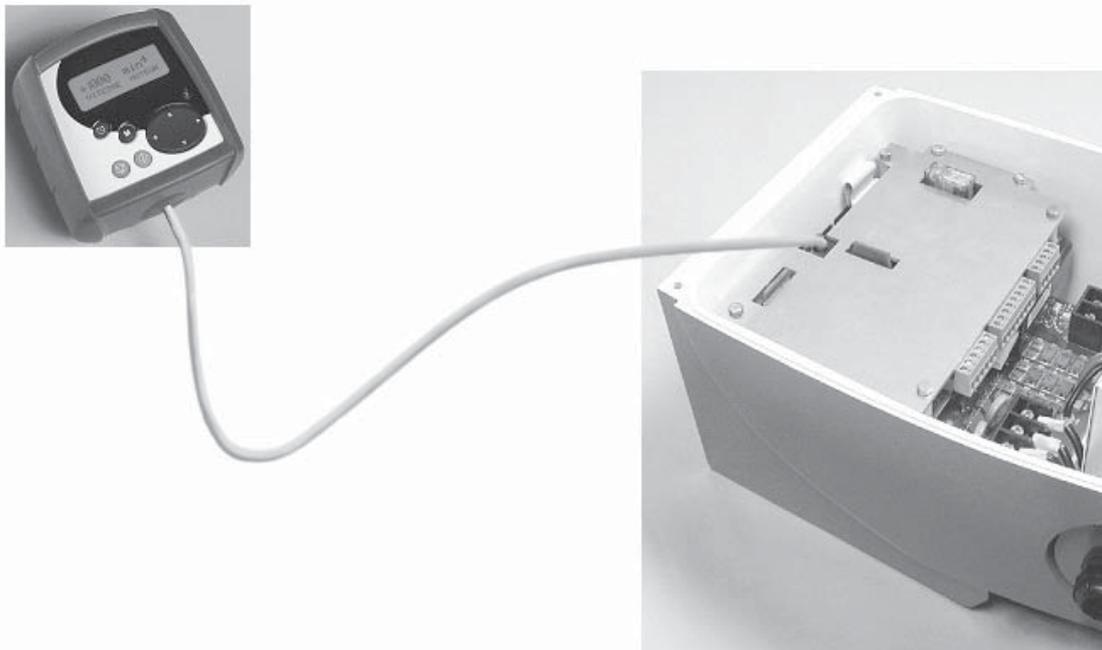
When you receive your LCD KEYPAD micro console, make sure that it has not been damaged during transport. Should damage have occurred please report it to those responsible for its transport.

2.1.2 - Connection

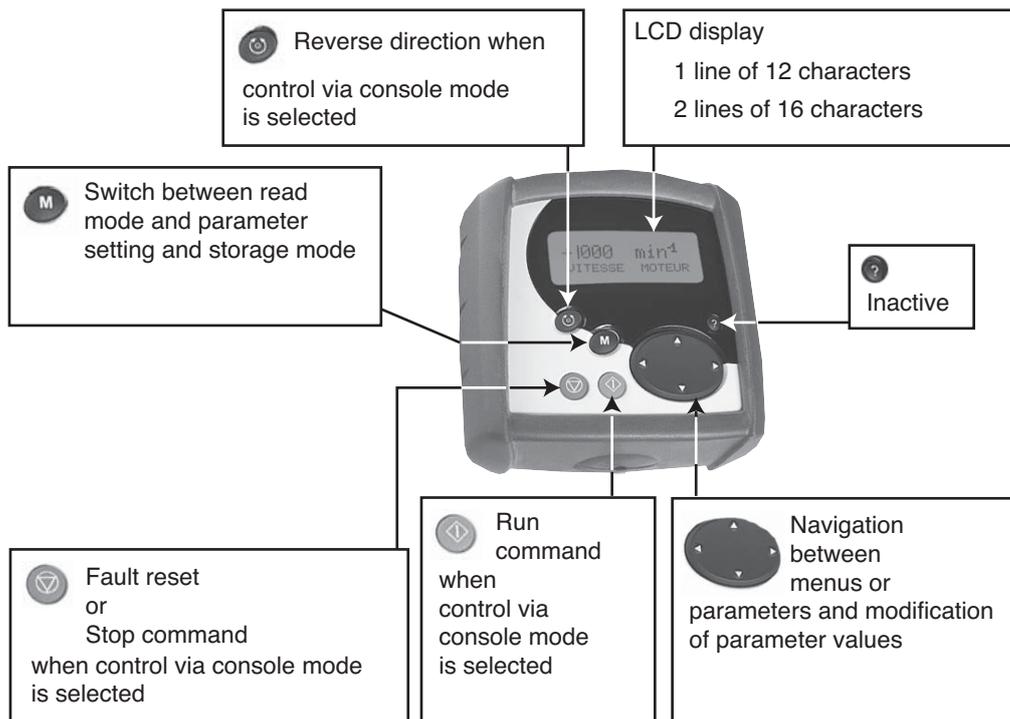
- Open the cover of the VARMECA 30.
- Connect the RJ45 plug in the connector on the drive (can be connected while powered up).



If there are no terminal blocks, a fault appears on power-up: "User 1, fault".



2.2 - Presentation of the LCD KEYPAD



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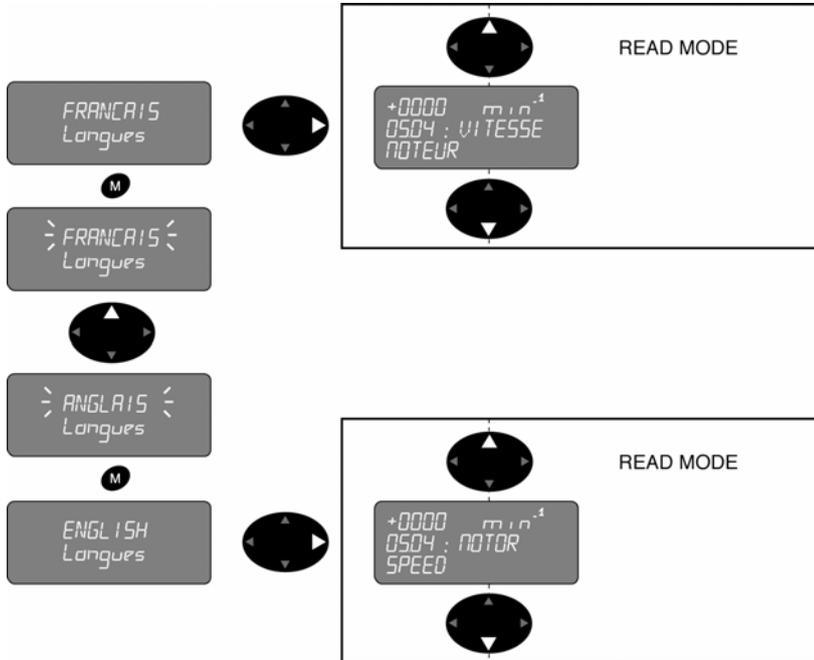
Variable speed motors and geared motors

COMMISSIONING USING THE LCD KEYPAD MICRO CONSOLE

2.3 - Read mode

2.3.1 - Selection of language

As soon as it is powered up, the LCD KEYPAD console offers a choice of languages

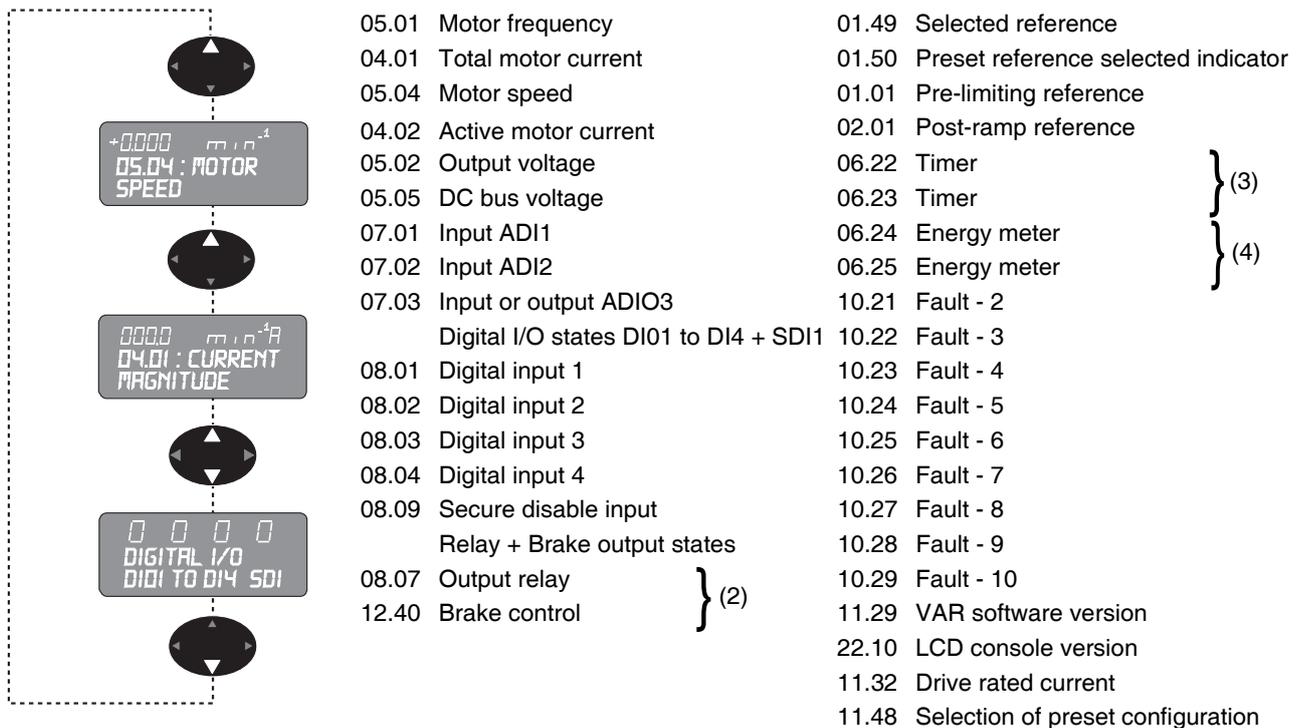


2.3.2 - Read mode

This mode is used to scroll through the parameters required for supervision and diagnostics:

– motor status, drive status, counters, faults, etc.

List of parameters that can be displayed



(1) Digital inputs 1, 2, 3, and 4 and the secure disable input are displayed on a single line according to their logic state (0 or 1) in the order (DI01, DI2, DI3, DI4, SDI1).

(2) Same as (1) for the output relay and brake control, in the order (relay, brake).

(3) Display of the timer on a single line (Year/Days, Hr/Min).

(4) Display of the energy meter on a single line (MWh, kWh).

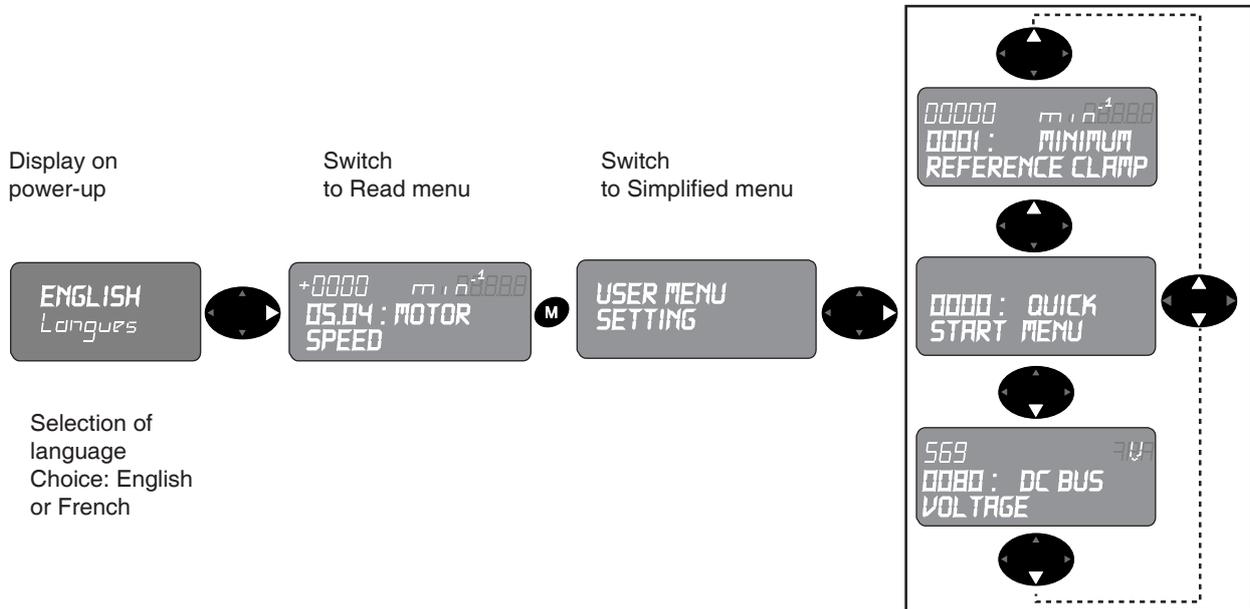
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COMMISSIONING USING THE LCD KEYPAD MICRO CONSOLE

2.4 - Parameter-setting mode via "SIMPLIFIED" menu

The "SIMPLIFIED" menu is a user menu for simple parameter setting.

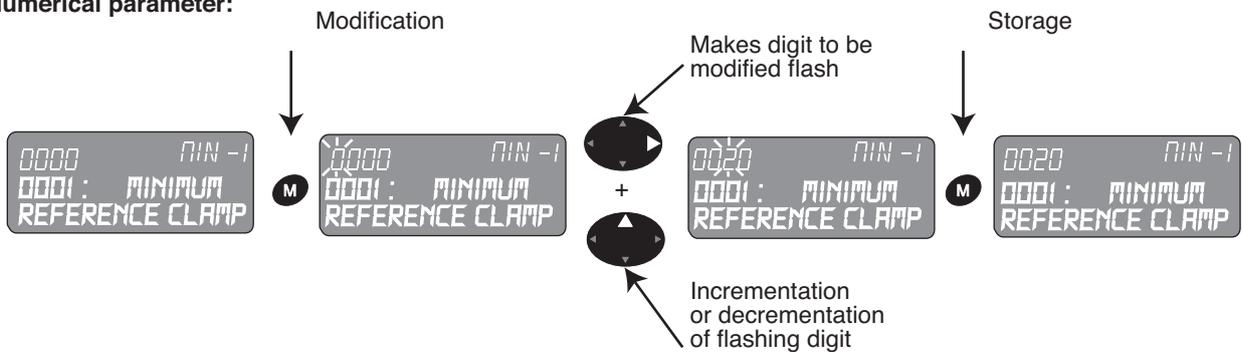


2.4.1 - Modifying a parameter

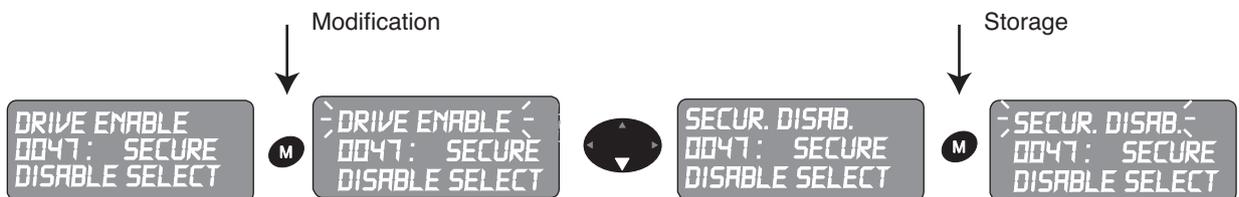
CAUTION:

Parameter setting must be carried out with the drive locked. Then unlock the drive before giving the run command.

Numerical parameter:



Parameter with mnemonics:



2.4.2 - Change from parameter-setting mode to read mode

en

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COMMISSIONING USING THE LCD KEYPAD MICRO CONSOLE

2.5 - VARMECA 30 parameters accessible in SIMPLIFIED MENU

2.5.1 - Selection of basic parameters

CAUTION:

Parameter setting must be carried out with the drive locked. Then unlock the drive before giving the run command.

Parameter	Name	Type	Factory setting	Adjustment range
01	MINIMUM LIMIT	R-W	600 min ⁻¹ (2-pole) 300 min ⁻¹ (4-pole) 200 min ⁻¹ (6-pole)	0 to 02 min ⁻¹ In uni-directional mode, this parameter defines the minimum speed. CAUTION: • In the case where the setting is lower than the factory setting, make sure the operating time at the minimum speed is compatible with the heating of the motor. • This parameter is inactive during jog operation. • If the value of 02 is lower than that of 01, the value of 01 is automatically changed to the new value of 02. (Address menu in manual reference 3997: 01.07)
02	MAXIMUM LIMIT	R-W	3000 or 4800 min ⁻¹ (2-pole) 1500 or 2400 min ⁻¹ (4-pole) 1000 or 1600 min ⁻¹ (6-pole)	0 to 32000 min ⁻¹ • Before setting a high maximum limit, check that the motor and the machine can withstand it. This parameter defines the maximum speed in both directions of rotation. (Address menu in manual reference 3997: 01.06)
03	ACCELERATION RAMP 1	R-W	3.0 s/k min ⁻¹	0.1 to 600 s/k min ⁻¹ Adjustment of the time to accelerate from 0 to 1000 min ⁻¹ . (Address menu in manual reference 3997: 02.11)
04	DECELERATION RAMP 1	R-W	5.0 s/k min ⁻¹	0.1 to 600 s/k min ⁻¹ Adjustment of the time to decelerate from 1000 min ⁻¹ to 0. (Address menu in manual reference 3997: 02.21)
05	SELECTION OF PRESET CONFIGURATION	R-W	STANDARD	STANDARD STANDARD + JOG STANDARD + PID 3VP + 1ANALOG. 3VP 1AN. ESFR 8VP LOCAL/REM. 2VP PROP. B PUMP REGUL. TORQUE CTRL FSTR/SLOWER FASTER/SLOWER MOTORISED POT. PADVMA30 CONTROL Any
06	MOTOR RATED CURRENT	R-W	–	VARMECA 0 to I max (A) This is the value of the motor rated current indicated on the nameplate. Above this value the motor is overloaded. (Address menu in manual reference 3997: 05.07)

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Parameter	Name	Type	Factory setting	Adjustment range
07	MOTOR RATED SPEED	R-W	-	<p style="text-align: center;">0 to 9 999 min⁻¹</p> <p>This is the on-load speed of the motor indicated on the nameplate. CAUTION: In the case of applications with high inertia and centrifugal (eg: ventilation) overvoltage can occur on the DC bus. In this case, set 07 to the synchronous speed (1000 min⁻¹ for 6 -pole, 1500 min⁻¹ for 4-pole, 3000 min⁻¹ for 2-pole,...). (Address menu in manual reference 3997: 05.08)</p>
08	MOTOR RATED VOLTAGE	R-W	-	<p style="text-align: center;">0 to 480 V</p> <p>This is the rated voltage indicated on the motor nameplate. (Address menu in manual reference 3997: 05.09)</p>
09	MOTOR POWER FACTOR	R-W	-	<p style="text-align: center;">0 to 1.00</p> <p>The power factor is measured automatically during an autocalibration phase in level 2 (see 6.3 in section 2.5.3) and set in this parameter. If it is not possible to carry out the level 2 autocalibration procedure, enter the cos φ value indicated on the motor nameplate. (Address menu in manual reference 3997: 05.10)</p>
10	MENU 0 ACCESS LEVEL	R-W	Level 2	<p style="text-align: center;">Level 1 Level 2 Read only</p> <p>Level 1: Level 1 access. Only parameters 01 to 10 can be accessed. Level 2: Level 2 access. Parameters 01 to 80 can be accessed. Read only: Used to store or reactivate a security code with the PADVMA30 option. (Address menu in manual reference 3997: 11.44)</p>

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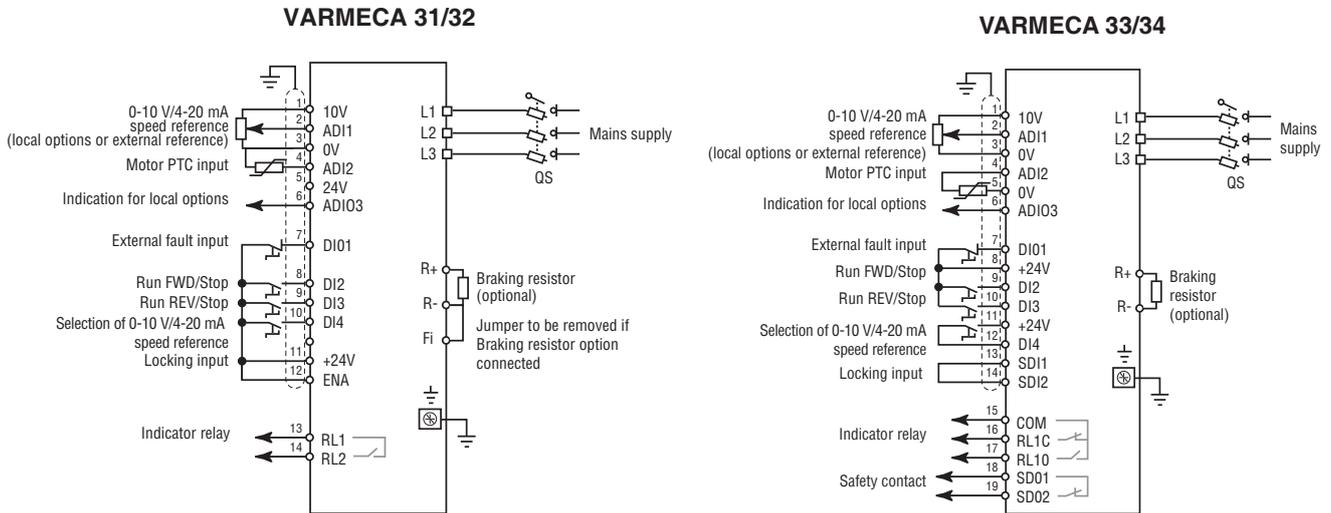
Variable speed motors and geared motors

COMMISSIONING USING THE LCD KEYPAD MICRO CONSOLE

2.5.2 - Selection of preset configuration

Parameters 11 to 24 are dependent on the choice made in 05, and thus on the selected preset configuration. Their assignments are listed in the following sections, with the wiring diagrams for the configurations.

2.5.2.1 - STANDARD CONFIGURATION (05 = STANDARD)



Note: For single-phase versions, the power supply is connected to terminals L and N.

- See manual 3776 for the connection and commissioning rules and the I/O characteristics
- The parameters must be set with the VARMECA 30 locked, i.e. jumper between terminals SDI1 and SDI2 or ENA and +24V open.
- The VARMECA 30 operates in positive logic.

ADI2 terminal: • Configured as "PTC" input. If not used, connect to 0 V terminal with a jumper.

DI01 terminal: • Configured as "External fault" input. For the drive to operate, this terminal must be connected to the + 24 V.

DI4 terminal: • Configured as 0-10 V/4-20 mA selection. When it is connected to the + 24 V, terminal ADI1 is intended for a 4-20µmA signal. Without a jumper (factory setting), the speed reference will be 0-10 V.

Parameters specific to the configuration accessible with the LCD KEYPAD option (VMA 31/32 only) :

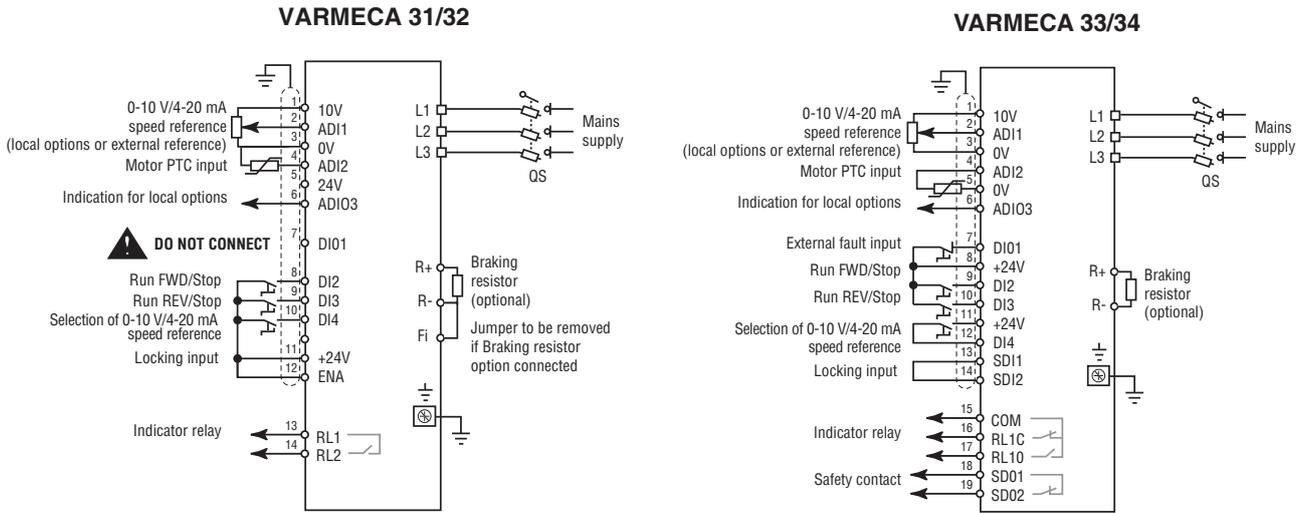
Parameter	Name	Type	Factory setting	Adjustment range
11	ADI1 MODE	R-W	0-10 V	0-20 mA; 20-0 mA; 4-20 mA detect; 20-4 mA detect; 4-20 mA no detect; 20-4 mA no detect; 0-10 V; Digital input detect: with detection of 4 mA signal loss. no detect: without detection of 4 mA signal loss.
12	ADI2 MODE	R-W	PTC SENSORS	0-20 mA; 20-0 mA; 4-20 mA detect; 20-4 mA detect; 4-20 mA no detect; 20-4 mA no detect; 0-10 V; Digital input; PTC sensors detect: with detection of 4 mA signal loss. no detect: without detection of 4 mA signal loss. (Address menu in manual reference 3997: 7.11)

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2.5.2.2 - STANDARD CONFIGURATION (O5 = STANDARD) WITH ESFR OPTION



Note: For single-phase versions, the power supply is connected to terminals L and N.

- See manual 3776 for the connection and commissioning rules and the I/O characteristics
- The parameters must be set with the VARMECA 30 locked, i.e. jumper between terminals SDI1 and SDI2 or ENA and +24V open.
- The VARMECA 30 operates in positive logic.

ADI2 terminal: • Configured as "PTC" input. If not used, connect to 0 V terminal with a jumper.

DI01 terminal: • Configured as "External fault" input. For the drive to operate, this terminal must be connected to the + 24 V.
 ⚠ **In VMA 31/32 this terminal must not be used.**

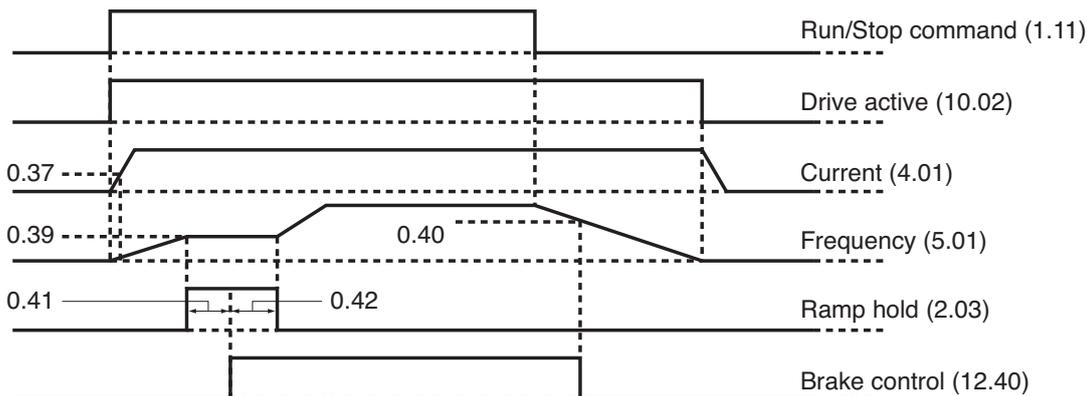
DI4 terminal: • Configured as 0-10 V/4-20 mA selection. When it is connected to the + 24 V, terminal ADI1 is intended for a 4-20mA signal. Without a jumper (factory setting), the speed reference will be 0-10 V.

To enable the ESFR option, set parameter 36 to: 36 = ON CONTACT.
 - In VMA 31/32 the display of parameter O5 will change to blank.

Parameters related to brake control:

Parameter	Name	Type	Factory setting	Adjustment range
36	BRAKE CONTROL	R-W	ON CONTACT	
37	BRAKE RELEASE CURRENT	R-W	10.0%	0 to 200.0%
38	BRAKE APPLY CURRENT	R-W	10.0%	0 to 200.0%
39	BRAKE RELEASE HZ	R-W	1.0 Hz	0 to 20.0 Hz
40	BRAKE APPLY HZ	R-W	2.0 Hz	0 to 20.0 Hz
41	MAGNETISATION TIME DELAY	R-W	0.1 s	0 to 25.0 s
42	RAMP UNLOCK TIME DELAY	R-W	0.1 s	0 to 25.0 s

Sequential brake control:



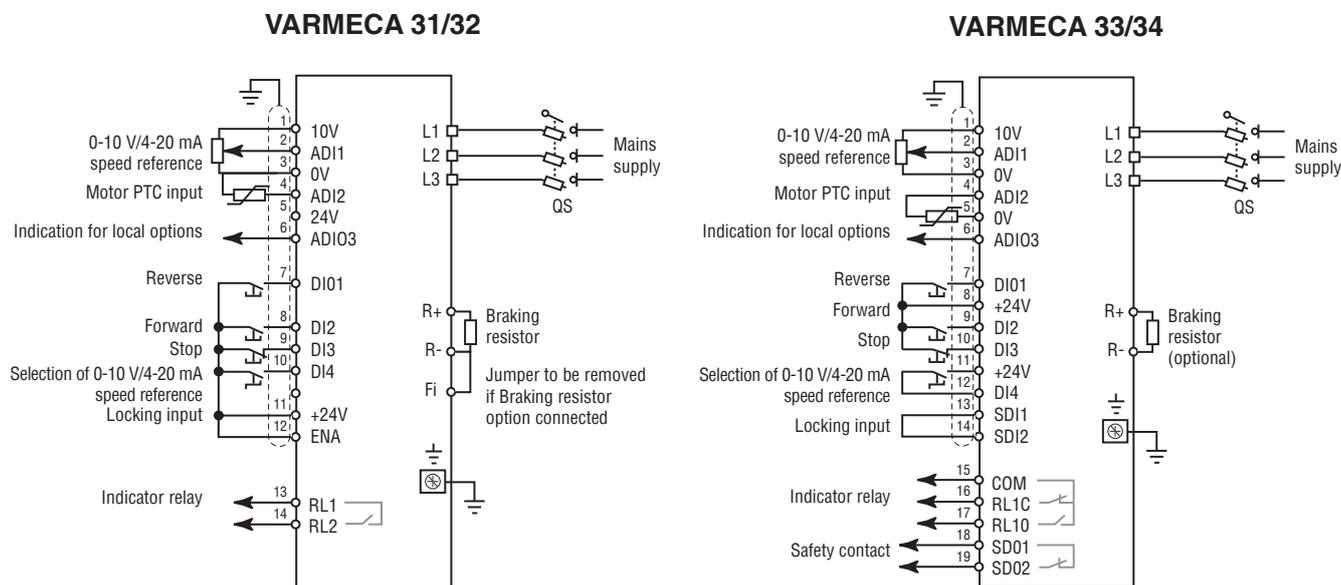
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COMMISSIONING USING THE LCD KEYPAD MICRO CONSOLE

2.5.2.3 - JOG CONFIGURATION (O5 = STANDARD + JOG)



Note: For single-phase versions, the power supply is connected to terminals L and N.

- See manual 3776 for the connection and commissioning rules and the I/O characteristics
- The parameters must be set with the VARMECA 30 locked, i.e. jumper between terminals SDI1 and SDI2 or ENA and +24V open.
- The VARMECA 30 operates in positive logic.

ADI2 terminal: • Configured as "PTC" input. If not used, connect to the 0 V terminal with a jumper.

DI4 terminal: • Configured as 0-10 V/4-20 mA selection. When it is connected to the + 24 V, terminal ADI1 is intended for a 4-20µmA signal. Without a jumper (factory setting), the speed reference will be 0-10 V.

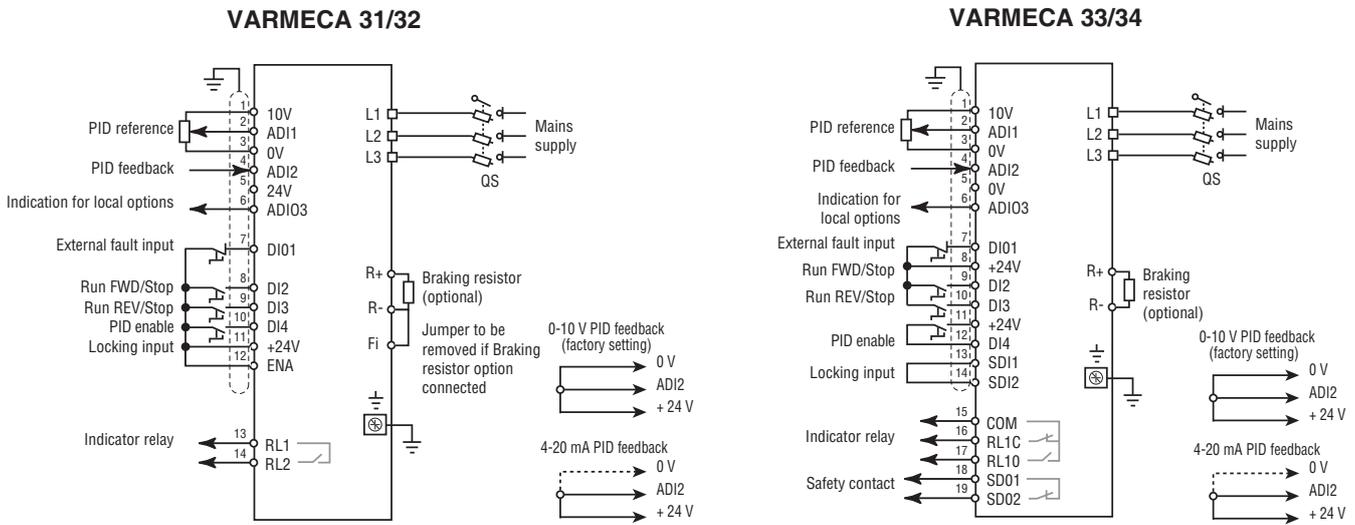
With this configuration none of the parameters between 11 and 24 are opened.

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2.5.2.4 - PID CONFIGURATION (O5 = STANDARD + PID)



Note: For single-phase versions, the power supply is connected to terminals L and N.

- See manual 3776 for the connection and commissioning rules and the I/O characteristics.
- The parameters must be set with the VARMECA 30 locked, i.e. jumper between terminals SDI1 and SDI2 or ENA and +24V open.
- The VARMECA 30 operates in positive logic.

DI01 terminal: • Configured as "External fault" input. For the drive to operate, this terminal must be connected to the + 24 V.

DI4 terminal: • Configured as "PID enable" input. When connected to the + 24 V, PID regulation is active, otherwise (contact open) the VARMECA 30 is controlled using the speed reference via terminal ADI1.

Parameters specific to the configuration accessible with the LCD KEYPAD option:

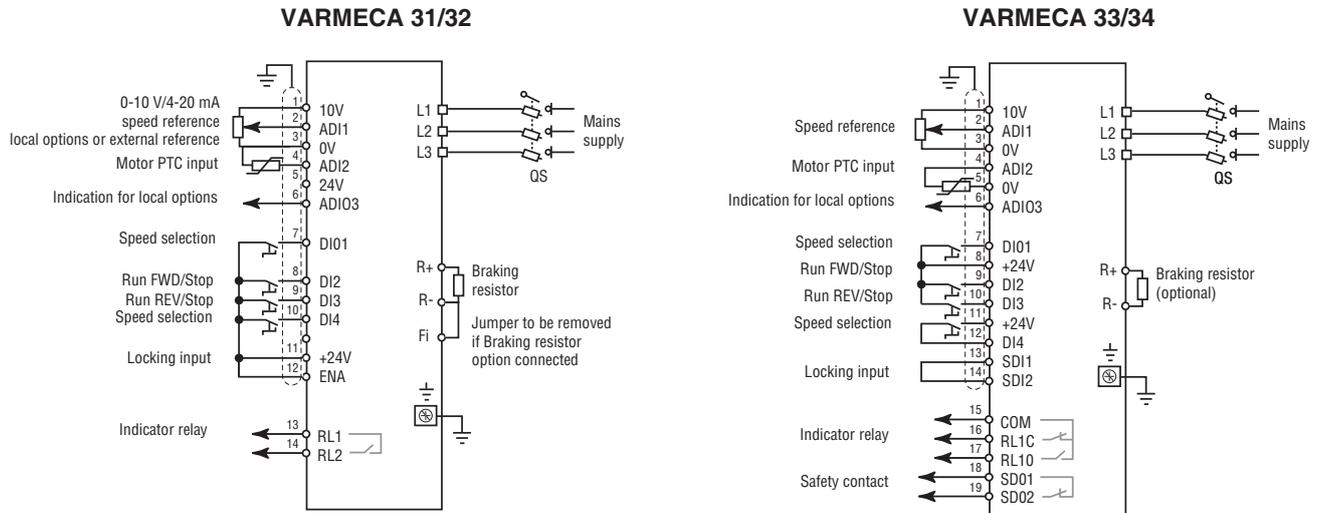
Parameter	Name	Type	Factory setting		Adjustment range
11	ADI1 MODE	R-W	0-10 V		0-20 mA; 20-0 mA; 4-20 mA detect; 20-4 mA detect; 4-20 mA no detect; 20-4 mA no detect; 0-10 V; Digital input detect: with detection of 4 mA signal loss no detect: without detection of 4 mA signal loss (Address menu in manual reference 3997: 7.06)
12	ADI2 MODE	R-W	0-10 V		0-20 mA; 20-0 mA; 4-20 mA detect; 20-4 mA detect; 4-20 mA no detect; 20-4 mA no detect; 0-10 V; Digital input; PTC sensors detect: with detection of 4 mA signal loss no detect: without detection of 4 mA signal loss (Address menu in manual reference 3997: 7.11)
13	PROPORTIONAL GAIN PID	R-W	VMA31/32 200.0	VMA34/35 150.0	0 to 320 (Address menu in manual reference 3997: 14.10)
14	PID INTEGRAL GAIN	R-W	VMA31/32 20.0	VMA34/35 20.0	0 to 320 (Address menu in manual reference 3997: 14.11)
15	PID DERIVATIVE GAIN	R-W	0.00		0 to 2.50 (Address menu in manual reference 3997: 14.12)
16	PID OUTPUT UPPER LIMIT	R-W	100.0%		0 to 100% (Address menu in manual reference 3997: 14.13)
17	PID OUTPUT LOWER LIMIT	R-W	- 100.0%		± 100.0% (Address menu in manual reference 3997: 14.14)
18	PID OUTPUT SCALE	R-W	1.00		0 to 2.50 (Address menu in manual reference 3997: 14.15)
19	ADI2 INPUT SCALE	R-W	1.00		0 to 2.50 (Address menu in manual reference 3997: 7.12)
20	Not used				
21	PRESET REFERENCE 7	RO	+00000 min ⁻¹		± Limit (O2) min ⁻¹ PID reference expressed as speed (Address menu in manual reference 3997: 14.20)
22	PRESET REFERENCE 8	RO	+00000 min ⁻¹		± Limit (O2) min ⁻¹ PID feedback expressed as speed (Address menu in manual reference 3997: 14.21)
23	PID ERROR	RO	+ 000.0%		± 100.0% (Address menu in manual reference 3997: 14.19)
24	PID OUTPUT VALUE	RO	+ 000.0 %		± 100.0% (Address menu in manual reference 3997: 14.01)

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2.5.2.5 - CONFIGURATION WITH 1 ANALOGUE REFERENCE + 3 PRESET REFERENCES (O5 = 3VP + 1ANALOG.)



Note: For single-phase versions, the power supply is connected to terminals L and N.

Reference selection table

DI4	DI01	Selection
0	0	0-10 V analogue reference (ADI1)
1	0	Preset reference 2
0	1	Preset reference 3
1	1	Preset reference 4

Note:

- See manual 3776 for the connection and commissioning rules and the I/O characteristics.
- The parameters must be set with the VARMECA 30 locked, i.e. jumper between terminals SDI1 and SDI2 or ENA and +24V open.
- The VARMECA 30 operates in positive logic.

ADI2 terminal: • Configured as "PTC" input. If not used, connect to the 0 V terminal with a jumper.

Parameters specific to the configuration accessible with the LCD KEYPAD option:

Parameter	Name	Type	Factory setting	Adjustment range
11	ADI1 MODE	R-W	0-10 V	0-20 mA; 20-0 mA; 4-20 mA detect; 20-4 mA detect; 4-20 mA no detect; 20-4 mA no detect; 0-10 V; Logic input detect: with detection of 4 mA signal loss no detect: without detection of 4 mA signal loss (Address menu in manual reference 3997: 7.06)
12	PRESET REFERENCE 2	R-W	+00000 min ⁻¹	Limit (O2) min ⁻¹ (Address menu in manual reference 3997: 1.22)
13	PRESET REFERENCE 3	R-W	+00000 min ⁻¹	Limit (O2) min ⁻¹ (Address menu in manual reference 3997: 1.23)
14	PRESET REFERENCE 4	R-W	+00000 min ⁻¹	Limit (O2) min ⁻¹ (Address menu in manual reference 3997: 1.24)
15 to 24	Not used			

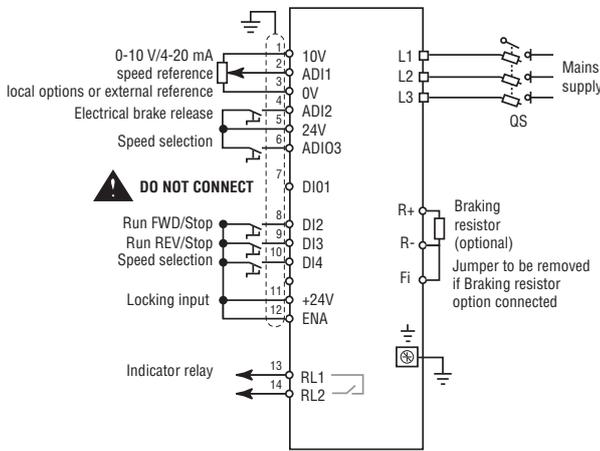
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COMMISSIONING USING THE LCD KEYPAD MICRO CONSOLE

2.5.2.6 - CONFIGURATION WITH 1 ANALOGUE REFERENCE + 3 VMA31/32 PRESET REFERENCES WITH ESFR OPTION (O5 = 3VP 1ANA.ESFR)

VARMECA 31/32



Reference selection table

DI4	ADI03	Selection
0	0	0-10 V analogue reference (ADI1)
1	0	Preset reference 2
0	1	Preset reference 3
1	1	Preset reference 4

Note: For single-phase versions, the power supply is connected to terminals L and N.

- See manual 3776 for the connection and commissioning rules and the I/O characteristics.
- The parameters must be set with the VARMECA 30 locked, i.e. jumper between terminals SDI1 and SDI2 or ENA and +24V open.
- The VARMECA 30 operates in positive logic.



DI01 terminal: • **this terminal must not be used.**

Parameters specific to the configuration accessible with the LCD KEYPAD option:

Parameter	Name	Type	Factory setting	Adjustment range
11	ADI1 MODE	R-W	0-10 V	0-20 mA; 20-0 mA; 4-20 mA detect; 20-4 mA detect; 4-20 mA no detect; 20-4 mA no detect; 0-10 V; Digital input detect: with detection of 4 mA signal loss. no detect: without detection of 4 mA signal loss. (Address menu in manual reference 3997: 7.06)
12	PRESET REFERENCE 2	R-W	+00000 min ⁻¹	Limit (O2) min ⁻¹ (Address menu in manual reference 3997: 1.22)
13	PRESET REFERENCE 3	R-W	+00000 min ⁻¹	Limit (O2) min ⁻¹ (Address menu in manual reference 3997: 1.23)
14	PRESET REFERENCE 4	R-W	+00000 min ⁻¹	Limit (O2) min ⁻¹ (Address menu in manual reference 3997: 1.24)
15 to 24	Not used			

Parameters related to brake control:

Parameter	Name	Type	Factory setting	Adjustment range
36	BRAKE CONTROL	R-W	ON CONTACT	
37	BRAKE RELEASE CURRENT	R-W	10.0%	0 to 200.0%
38	BRAKE APPLY CURRENT	R-W	10.0%	0 to 200.0%
39	BRAKE RELEASE HZ	R-W	1.0 Hz	0 to 20.0 Hz
40	BRAKE APPLY HZ	R-W	2.0 Hz	0 to 20.0 Hz
41	MAGNETISATION TIME DELAY	R-W	0.1 s	0 to 25.0 s
42	RAMP UNLOCK TIME DELAY	R-W	0.1 s	0 to 25.0 s

For a description of sequential brake control, see appendix.

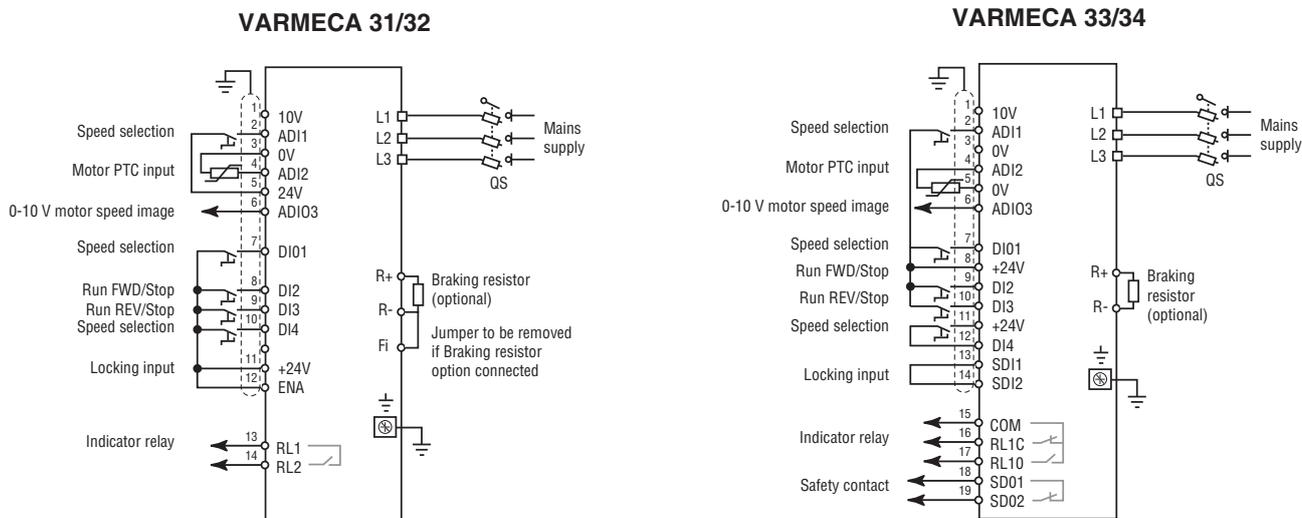
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VARMECA 30

Variable speed motors and geared motors

COMMISSIONING USING THE LCD KEYPAD MICRO CONSOLE

2.5.2.7 - CONFIGURATION WITH 8 PRESET REFERENCES (O5 = 8VP)



Note: For single-phase versions, the power supply is connected to terminals L and N.

Reference selection table

DI4	ADI1	DI01	Selection
0	0	0	Preset reference 1
1	0	0	Preset reference 2
0	1	0	Preset reference 3
1	1	0	Preset reference 4
0	0	1	Preset reference 5
1	0	1	Preset reference 6
0	1	1	Preset reference 7
1	1	1	Preset reference 8

Note:

- See manual 3776 for the connection and commissioning rules and the I/O characteristics.
- The parameters must be set with the VARMECA 30 locked, i.e. jumper between terminals SDI1 and SDI2 or ENA and +24V open.
- The VARMECA 30 operates in positive logic.

ADI2 terminal: • Configured as "PTC" input. If not used, connect to 0 V terminal with a jumper.

Parameters specific to the configuration accessible with the LCD KEYPAD option:

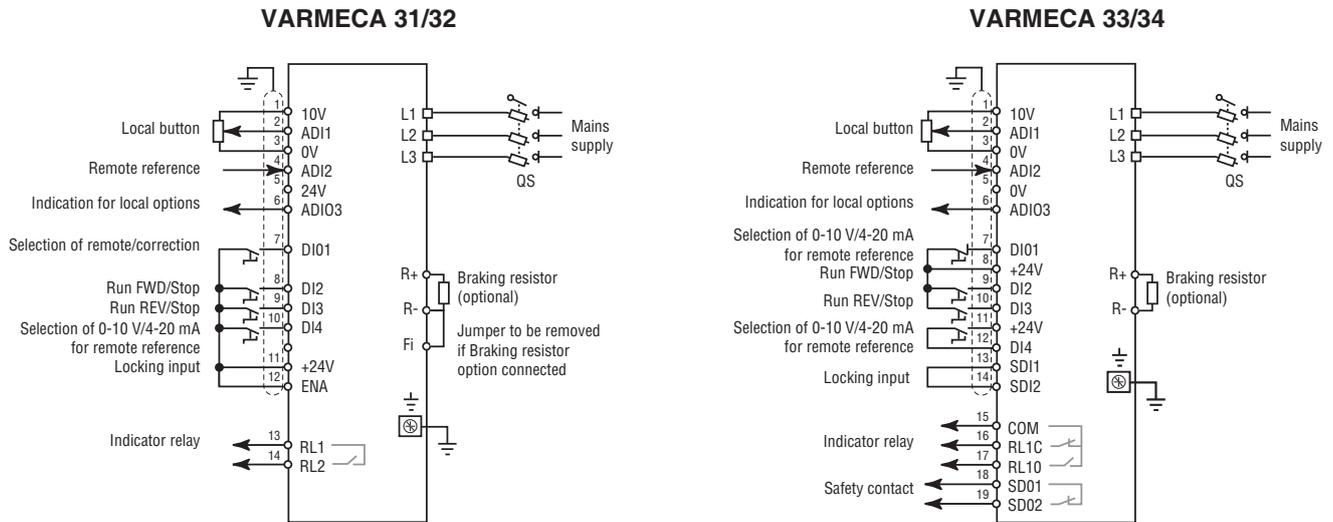
Parameter	Name	Type	Factory setting	Adjustment range
11	PRESET REFERENCE 1	R-W	+ 00000 min ⁻¹	Limit (O2) min ⁻¹ (Address menu in manual reference 3997: 1.21)
12	PRESET REFERENCE 2	R-W	+ 00000 min ⁻¹	Limit (O2) min ⁻¹ (Address menu in manual reference 3997: 1.22)
13	PRESET REFERENCE 3	R-W	+ 00000 min ⁻¹	Limit (O2) min ⁻¹ (Address menu in manual reference 3997: 1.23)
14	PRESET REFERENCE 4	R-W	+ 00000 min ⁻¹	Limit (O2) min ⁻¹ (Address menu in manual reference 3997: 1.24)
15	PRESET REFERENCE 5	R-W	+ 00000 min ⁻¹	Limit (O2) min ⁻¹ (Address menu in manual reference 3997: 1.25)
16	PRESET REFERENCE 6	R-W	+ 00000 min ⁻¹	Limit (O2) min ⁻¹ (Address menu in manual reference 3997: 1.26)
17	PRESET REFERENCE 7	R-W	+ 00000 min ⁻¹	Limit (O2) min ⁻¹ (Address menu in manual reference 3997: 1.27)
18	PRESET REFERENCE 8	R-W	+ 00000 min ⁻¹	Limit (O2) min ⁻¹ (Address menu in manual reference 3997: 1.28)
19 to 24	Not used			

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Variable speed motors and geared motors

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2.5.2.8 - CONFIGURATION WITH REFERENCE CORRECTION VIA LOCAL BUTTON (O5 = LOCAL/REM.)



Note: For single-phase versions, the power supply is connected to terminals L and N.

- See manual 3776 for the connection and commissioning rules and the I/O characteristics.
- The parameters must be set with the VARMECA 30 locked, i.e. jumper between terminals SDI1 and SDI2 or ENA and +24V open.
- The VARMECA 30 operates in positive logic.

DI01 terminal: • Configured as “Select Local Reference or Remote reference correction via local reference” input. When connected to the + 24 V, the remote reference is not corrected.

DI4 terminal: • Configured as 0-10 V/4-20 mA selection. When it is connected to the + 24 V, terminal ADI2 is intended for a 4-20mA signal. Without a jumper (factory setting), the remote reference will be 0-10 V.

Parameters specific to the configuration accessible with the LCD KEYPAD option:

Parameter	Name	Type	Factory setting	Adjustment range
11	ADI1 MODE	R-W	0-10 V	0-20 mA; 20-0 mA; 4-20 mA detect; 20-4 mA detect; 4-20mA no detect; 20-4 mA no detect; 0-10 V; Logic input detect: with detection of 4 mA signal loss no detect: without detection of 4 mA signal loss (Address menu in manual reference 3997: 7.06)
12	PERCENTAGE TRIM	RO	0 %	± 100.0% Read correction coefficient
13	READ ANALOGUE REFERENCE 1	RO	300 min ⁻¹	Read reference Limit (O2) min ⁻¹
14	FREQUENCY/SPEED REFERENCE SELECTED	RO	300 min ⁻¹	Result of correction Limit (O2) min ⁻¹
15 to 24	Not used			

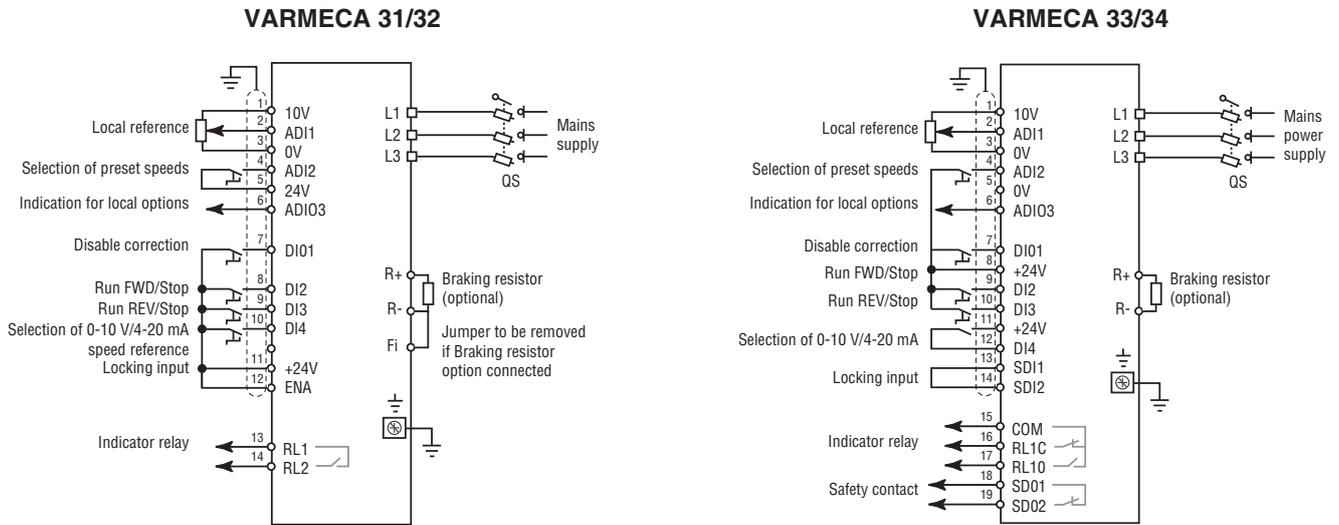
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VARMECA 30

Variable speed motors and geared motors

COMMISSIONING USING THE LCD KEYPAD MICRO CONSOLE

2.5.2.9 - CONFIGURATION WITH PRESET SPEED CORRECTION VIA LOCAL REFERENCE (O5 = 2VP PROP. B)



Note: For single-phase versions, the power supply is connected to terminals L and N.

Reference selection table

ADI2	Selection
0	Preset reference 1
1	Preset reference 2

- Note:**
- See manual 3776 for the connection and commissioning rules and the I/O characteristics
 - The parameters must be set with the VARMECA 30 locked, i.e. jumper between terminals SDI1 and SDI2 or ENA and +24V open.
 - The VARMECA 30 operates in positive logic.

DI01 terminal: • Configured as "Select Preset Speeds or Correction of preset speeds via local reference".

When connected to the + 24 V the correction via the local reference affects the selected preset speed.

DI4 terminal: • Configured as 0-10 V/4-20 mA selection. When it is connected to the + 24 V, terminal ADI1 is intended for a 4-20µmA signal. Without a jumper (factory setting), the speed reference will be 0-10 V.

Parameters specific to the configuration accessible with the LCD KEYPAD option:

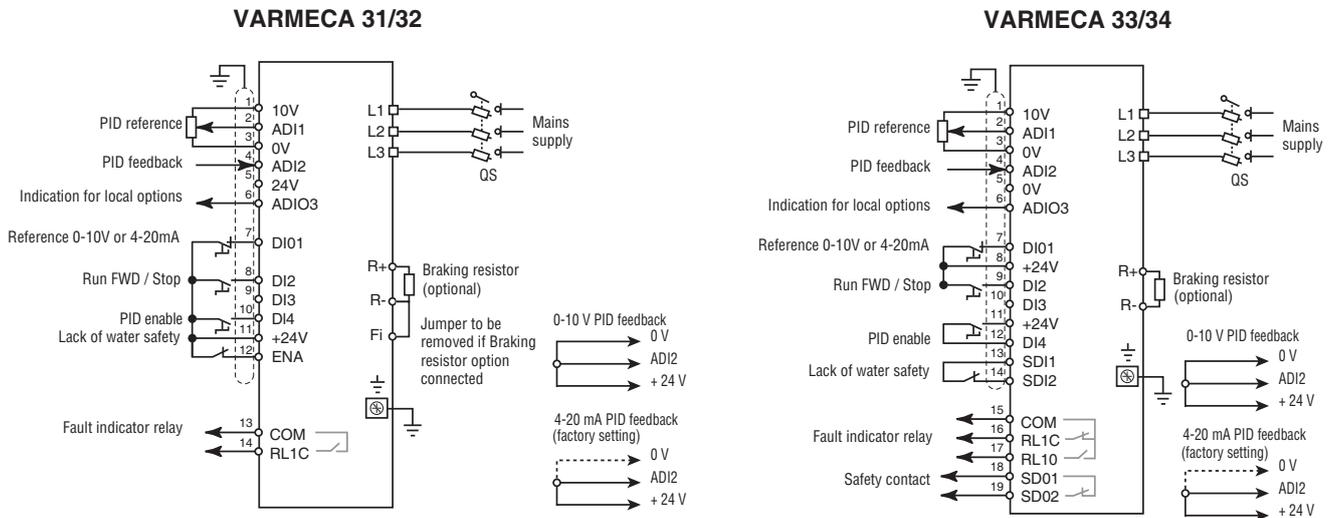
Parameter	Name	Type	Factory setting	Adjustment range	
11	BIT 0 SEL. R.P./DIG. INPUT	RO	Inactive	Inactive; Active Selection of preset speeds	
				ADI2	Selection
				0	Preset reference 1
12	PERCENTAGE TRIM	RO	0%	± 100.0% Read correction coefficient	
13	PRESET REFERENCE 1	R-W	0 min ⁻¹	Limit (O2) min ⁻¹ (Address menu in manual reference 3997: 1.21)	
14	PRESET REFERENCE 2	R-W	0 min ⁻¹	Limit (O2) min ⁻¹ (Address menu in manual reference 3997: 1.22)	
15	FREQUENCY/SPEED REFERENCE SELECTED	RO	0 min ⁻¹	Limit (O2) min ⁻¹ Result of correction (Address menu in manual reference 3997: 1.01)	
16 to 24	Not used				

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COMMISSIONING USING THE LCD KEYPAD MICRO CONSOLE

2.5.2.10 - REGULATION OF A PRESSURE WITH THE INTEGRATED PI LOOP - PI REFERENCE USING LOCAL OR EXTERNAL REFERENCE (O5 = VENT PUMPS)



Note:

- See manual 3776 for the connection and commissioning rules and the I/O characteristics.
- The parameters must be set with the VARMECA 30 locked, i.e. jumper between terminals SDI1 and SDI2 or ENA and +24V open.
- The VARMECA 30 operates in positive logic.

DI01 terminal: • Configured as input, you can select the type of the reference pressure. The reference is in 0-10V if the input is connected to +24V.

DI4 terminal: • Configured as "PID enable" input. When connected to the + 24 V, PID regulation is active, otherwise (contact open) the VARMECA 30 is controlled using the speed reference via terminal ADI1.

Parameters specific to the configuration accessible with the LCD KEYPAD option:

Parameter	Name	Type	Factory setting		Adjustment range
03	ACCELERATION RAMP 1	R-W	VMA 31/32	0.1 s / k min ⁻¹	0.1 to 600 s/k min ⁻¹ Adjustment of the time to accelerate from 0 to 1000 min ⁻¹ (Address menu in manual reference 3997 : 02.11)
			VMA 33/34	0.5 s / k min ⁻¹	
04	DECELERATION RAMP 1	R-W	5 s / k min ⁻¹		0.1 to 600 s/k min ⁻¹ Adjustment of the time to decelerate from 1000 min ⁻¹ to 0 (Address menu in manual reference 997: 02.21)
07	MOTOR RATED SPEED	R-W	3000 min ⁻¹		Adjustment of motor 2 poles (Address menu in manual reference 3997 : 05.08)
11	ADI1 MODE	R-W	0-10 V		0-20 mA; 20-0 mA; 4-20 mA detect; 20-4 mA detect; 4-20 mA no detect; 20-4 mA no detect; 0-10 V; Digital input detect: with detection of 4 mA signal loss no detect: without detection of 4 mA signal loss (Address menu in manual reference 3756: 7.06)
12	ADI2 MODE	R-W	4-20 mA detect		0-20 mA; 20-0 mA; 4-20 mA detect; 20-4 mA detect; 4-20 mA no detect; 20-4 mA no detect; 0-10 V; Logic input; PTC sensors detect: with detection of 4 mA signal loss no detect: without detection of 4 mA signal loss (Address menu in manual reference 3997: 7.11)
13	PID PROPORTIONAL GAIN	R-W	VMA31/32 100	VMA33/34 150	0 to 320 (Address menu in manual reference 3997: 14.10)
14	PID INTEGRAL GAIN	R-W	VMA31/32 80	VMA33/34 75	0 to 320 (Address menu in manual reference 3997: 14.11)
15	DIGITAL REFERENCE	R-W	0 %		0 to 100.0 % Value of digital reference (Address menu in manual reference 3997 : 14.51)

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Variable speed motors and geared motors

COMMISSIONING USING THE LCD KEYPAD MICRO CONSOLE

Parameter	Name	Type	Factory setting	Adjustment range
16	THRESHOLD DETECTOR 1	R-W	10.0%	0 to 100.0% Adjustment of draining threshold (Address menu in manual reference 3997: 12.04)
17	TIMER 1 VALUE	R-W	10.0 s	0 to 60.0 s Adjustment of draining time delay (Address menu in manual reference 3997: 16.05)
18	SENSOR COEFF.	R-W	10	0 to 30 Sensor feedback scaling coefficient for reading the pressure directly (Address menu in manual reference 3997: 14.53)
19	READ REFERENCE	R-O	-	+/- 32000 Reads the pressure reference and sensor feedback (Address menu in manual reference 3997: 14.54-14.55)
20	REFERENCE FEEDBACK	R-O	-	
21	MOTOR SPEED	R-O	- min ⁻¹	Reads the motor speed (Address menu in manual reference 3997: 05.04)
46	TIMER (year, day)	R-O		0 to 9.364
47	TIMER (hr, min)	R-O		0 to 23.59
48	LOCAL SCALE	R-W	0.9	0 to 2.5 Adjustment of automatic restart threshold (Address menu in manual reference 3997: 07.62)
49 to 58	FAULT - 1 to - 18	R-O		Log of the last 18 faults

Description of operation: see appendix.

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Variable speed motors and geared motors

COMMISSIONING USING THE LCD KEYPAD MICRO CONSOLE

DESCRIPTION OF CONFIGURATION 05 = VENT PUMPS

Regulation reference:

- 0-10 V or 4 - 20 mA depends of DI01.

Sensor:

- 0 - 10V or 4 - 20 mA
- Power supply: 24 VDC (max. consumption 60 mA).

Automatic Run/Stop:

- On a run command, the power pump assembly will adjust the flow so as to maintain a constant pressure throughout the system. When the flow ceases, the pump stops automatically. The pump restarts as soon as the pressure falls below its working threshold. If draining occurs, the system stops in "User 1" fault mode.

Pump settings:

1- Pump without pressure sensor (factory setting)

The drive controls the flow according to the speed reference.

2 - Pump with pressure sensor

2.1 - The inverter adjusts speed to control the power

- Programming using the LCD KEYPAD console
- Programming using the local operator display PAD VMA 30
- Access to the user menu (menu 00).

Once the configuration has been set (addr. 0.05) the drive opens the parameters linked to the application.

Note: after modification of the parameters, the address 0.05 turns "FREE"

2.2 - Possible displays

- Reference pressure (addr. 0.19)
- Actual pressure (addr. 0.20)
- Pump rotation speed (addr. 0.21)

2.3 - Emergency mode

If the pressure regulation malfunctions, you can revert to speed regulation without using a parameter-setting tool, simply by opening terminal DI4. The pressure reference becomes a speed reference and can be used to adjust the pump flow.

Commissioning:

1 - Wiring as shown in the diagram on page 21 depending on the type of VarMECA

- DI4 open

2 - Programming using the KEYPAD LCD micro console option (section 2.4)

2.1 - Set the operating point

- Max. flow (addr. 0.02) depends on the pump characteristics.

2.2 - Give a run command and check the direction of rotation, if necessary reverse two wires on the motor phases.

2.3 - Set the acceleration and deceleration time

- Accel. ramp (addr. 0.03 = 0.1s) VMA 31/32
- Accel. ramp (addr. 0.03 = 0.5s) VMA 33/34
- Decel. ramp (addr. 0.04 = 5 s)



DO NOT MODIFY THE RAMPS

This setting avoids altering the precision of regulation

2.4 - Select the "Vent. Pumps" configuration (addr. 0.05)

2.5 - Choice of reference type (address 0.11)

2.6 - Choice of sensor type (addr. 0.12)

Help with diagnostics (section 2.3.2)

In this read mode it is possible to display the state of the analogue and digital inputs, the motor data (speed, current, frequency, voltage), the timers and energy meters and also the list of the last ten faults.

Note:

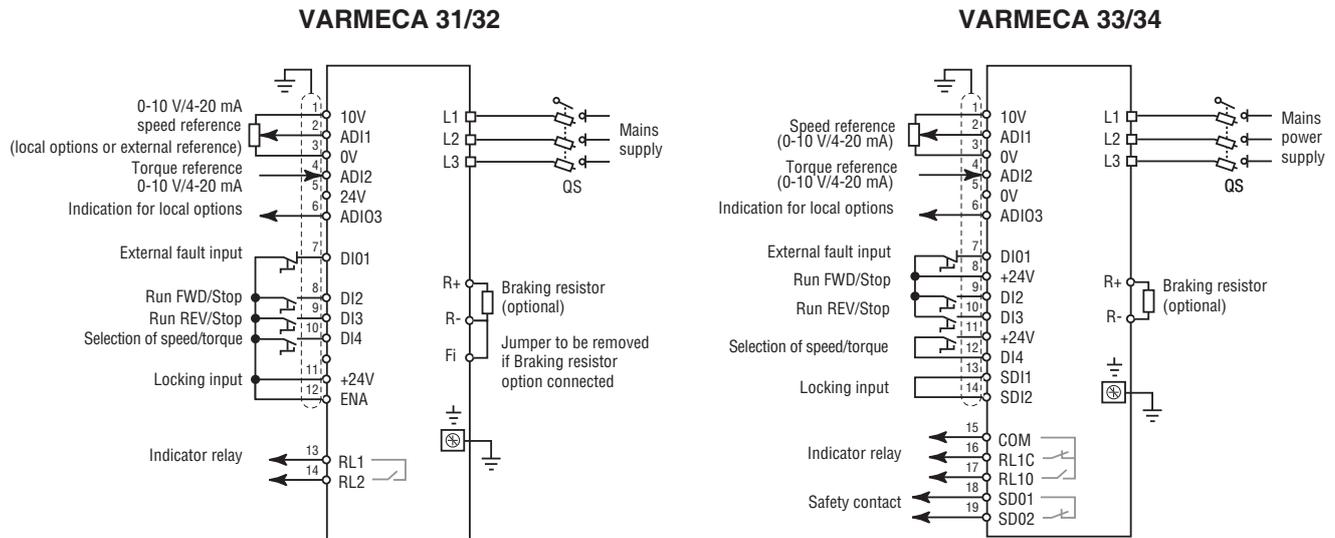
- to activate the reading mode, press 5's on the "M" button;
- Possibility of increasing time before stop (addr. 16.15) (factory adjustment : 25s)

VARMECA 30

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COMMISSIONING USING THE LCD KEYPAD MICRO CONSOLE

2.5.2.11 - CONFIGURATION OF TORQUE CONTROL WITH SPEED LIMITING (05 = TORQUE CNTRL.)



Note: For single-phase versions, the power supply is connected to terminals L and N.

Selection table

DI4	Selection
0	Speed-reference control via ADI1
1	Torque-reference control via ADI2 and speed limiting via parameter 13

- Note:
- See manual 3776 for the connection and commissioning rules and the I/O characteristics
 - The parameters must be set with the VARMECA 30 locked, i.e. jumper between terminals SDI1 and SDI2 or ENA and +24V open.
 - The VARMECA 30 operates in positive logic.

DI01 terminal: • Configured as "External fault" input. For the drive to operate, this terminal must be connected to the + 24 V.

DI4 terminal: • Configured as "Selection of speed control or torque control with speed limiting". When connected to the + 24 V, the VARMECA 30 is in torque control with speed limiting.

**• Do not change from speed regulation to torque regulation when there is an active run command:
Parameters specific to the configuration accessible with the LCD KEYPAD option.**

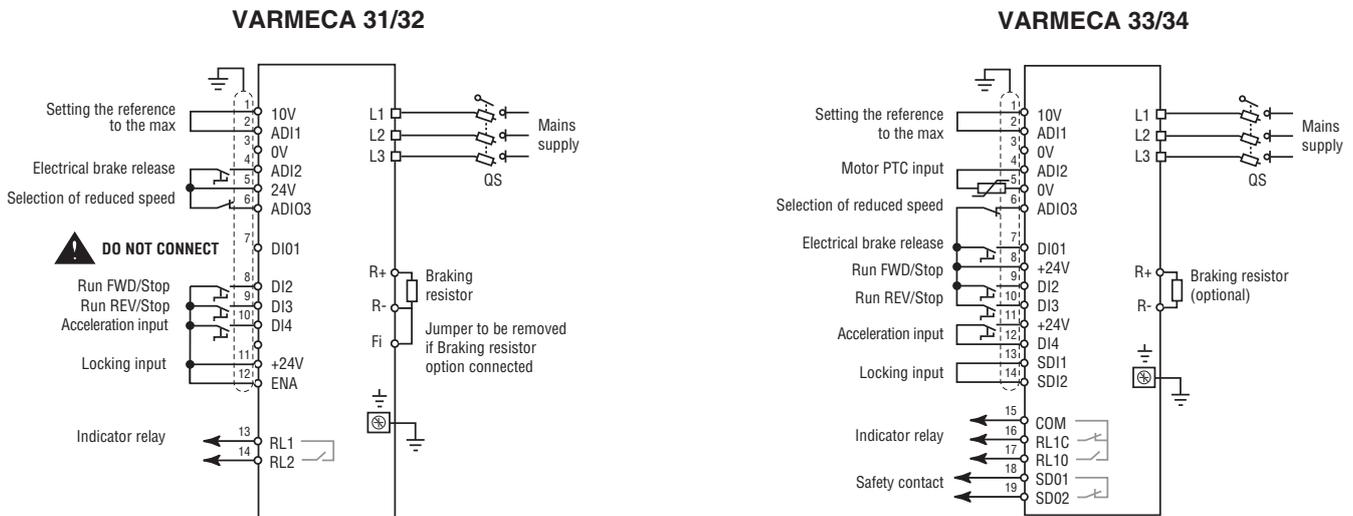
Parameter	Name	Type	Factory setting	Adjustment range
11	ADI1 MODE	R-W	0-10 V	0-20 mA; 20-0 mA; 4-20 mA detect; 20-4 mA detect; 4-20 mA no detect; 20-4 mA no detect; 0-10 V; Logic input detect: with detection of 4 mA signal loss no detect: without detection of 4 mA signal loss (Address menu in manual reference 3997: 7.06)
12	ADI2 MODE	R-W	0-10 V	0-20 mA; 20-0 mA; 4-20 mA detect; 20-4 mA detect; 4-20 mA no detect; 20-4 mA no detect; 0-10 V; Logic input; PTC sensors detect: with detection of 4 mA signal loss no detect: without detection of 4 mA signal loss (Address menu in manual reference 3997: 7.11)
13	MAXIMUM LIMIT	R-W	1 500 min ⁻¹	0 to 32000 min ⁻¹ (Address menu in manual reference 3997: 1.06)
14 to 24	Not used			

VARMECA 30

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COMMISSIONING USING THE LCD KEYPAD MICRO CONSOLE

2.5.2.12 - FASTER/SLOWER CONFIGURATION (O5 = FASTER/SLOWER, ESFR) IN VMA 31/32 WITH ESFR OPTION (O5 = FASTER/SLOWER) IN VMA 33/34 WITH OR WITHOUT ESFR OPTION



Note: For single-phase versions, the power supply is connected to terminals L and N.

DI01 terminal: **this terminal must not be used.**

Parameters specific to the configuration accessible with the LCD KEYPAD option:

Parameter	Name	Type	Factory setting	Adjustment range
0.11	PRESET REFERENCE 2	R-W	0000	$\pm 32000 \text{ min}^{-1}$ Reduced speed setting (Address menu in manual reference 3997: 1.22)

0.12 to 0.24 **NOT USED**

Parameters related to brake control:

Parameter	Name	Type	Factory setting	Adjustment range
36	BRAKE CONTROL	R-W	ON CONTACT	
37	BRAKE RELEASE CURRENT	R-W	10.0%	0 to 200.0%
38	BRAKE APPLY CURRENT	R-W	10.0%	0 to 200.0%
39	BRAKE RELEASE HZ	R-W	1.0 Hz	0 to 20.0 Hz
40	BRAKE APPLY HZ	R-W	2.0 Hz	0 to 20.0 Hz
41	MAGNETISATION TIME DELAY	R-W	0.1 s	0 to 25.0 s
42	RAMP UNLOCK TIME DELAY	R-W	0.1 s	0 to 25.0 s

For a description of operation of the faster/slower command, see page 26.
For a description of sequential brake control, see appendix.

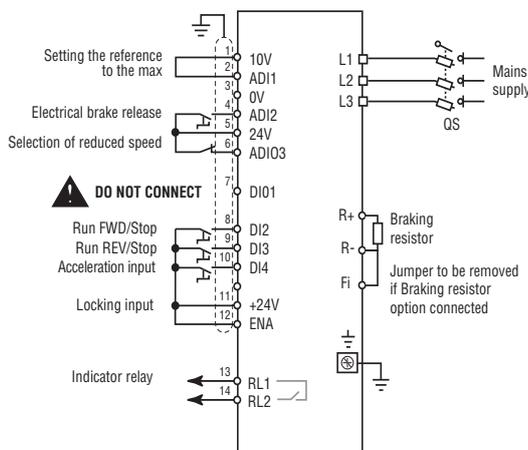
VARMECA 30

Variable speed motors and geared motors

COMMISSIONING USING THE LCD KEYPAD MICRO CONSOLE

2.5.2.13 - FASTER/SLOWER CONFIGURATION (05 = FASTER/SLOWER, NO ESFR) IN VMA 31/32 WITHOUT ESFR OPTION

VARMECA 31/32



Note: For single-phase versions, the power supply is connected to terminals L and N.

Parameters specific to the configuration accessible with the LCD KEYPAD option:

Parameter	Name	Type	Factory setting	Adjustment range
0.11	PRESET REFERENCE 2	R-W	0000	$\pm 32000 \text{ min}^{-1}$ Reduced speed setting (Address menu in manual reference 3997: 1.22)

Description of operation of the faster/slower command:

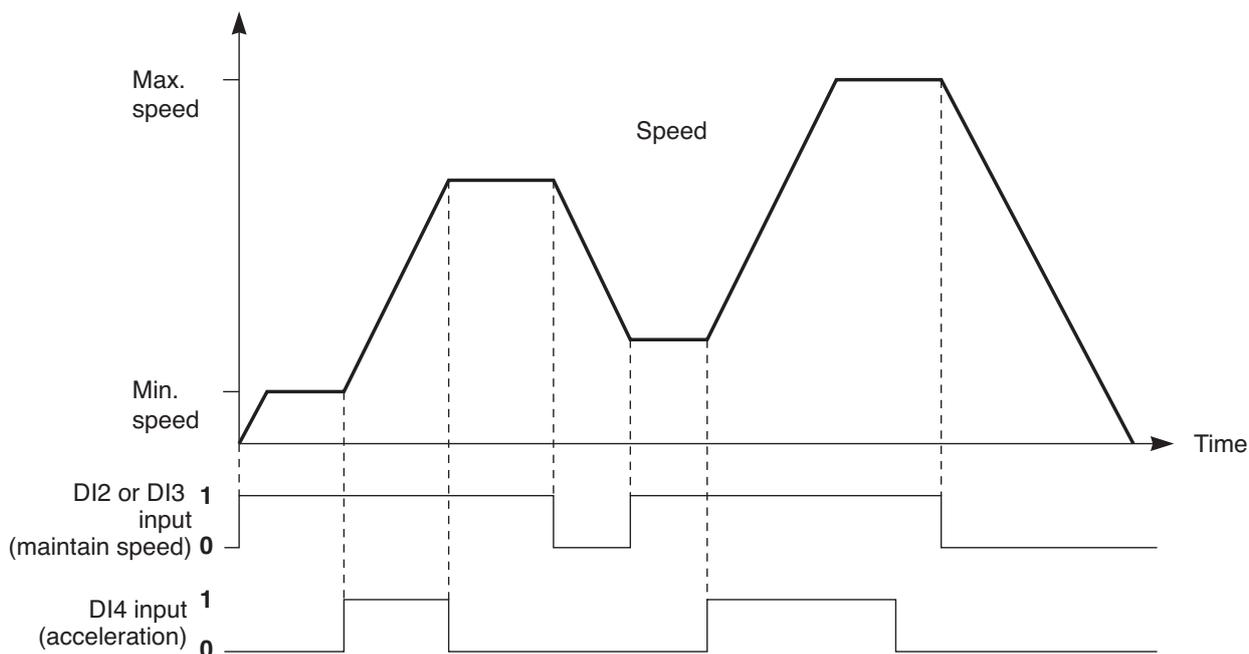
This function is used to stabilise the speed at all levels between min. speed and max. speed.

The command operates by means of two contacts:

- a Run/Stop, Forward or Reverse contact which is used for starting up to a min. speed, and for maintaining intermediate speeds, (DI2, DI3)
- an acceleration contact which is used to reach the max. speed (terminal DI4)

An additional input is used to reduce the max. speed (when ADI03 has been disabled). The faster/slower function can be used at any point down to the reduced speed. The reduced speed can be set in parameter 0.11.

Diagram:

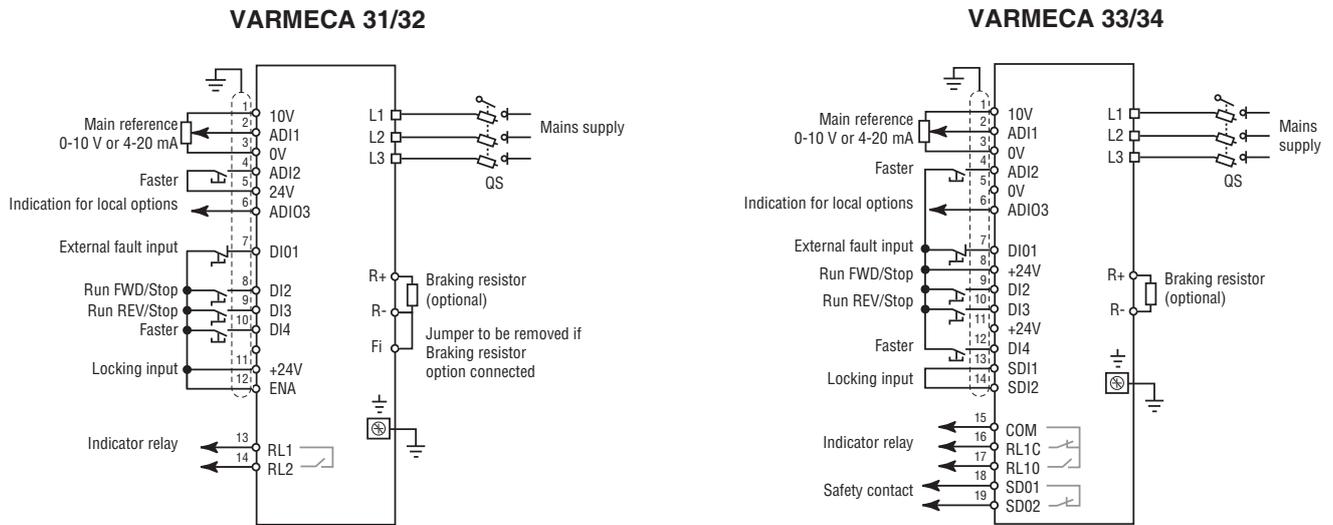


VARMECA 30

Variable speed motors and geared motors

COMMISSIONING USING THE LCD KEYPAD MICRO CONSOLE

2.5.2.14 - MOTORISED POTENTIOMETER CONFIGURATION (O5 = MOTORISED POT.)



Note: For single-phase versions, the power supply is connected to terminals L and N.

- See manual 3776 for the connection and commissioning rules and the I/O characteristics.
- The parameters must be set with the VARMECA 30 locked, i.e. jumper between terminals SDI1 and SDI2 or ENA and +24V open.
- The VARMECA 30 operates in positive logic.

DI01 terminal: • Configured as "External fault" input. For the drive to operate, this terminal must be connected to the + 24 V.

Parameters specific to the configuration accessible with the LCD KEYPAD option.

Parameter	Name	Type	Factory setting	Adjustment range
11	ADI1 MODE	R-W	0-10 V	0-20 mA; 20-0 mA; 4-20 mA detect; 20-4 mA detect; 4-20 mA no detect; 20-4 mA no detect; 0-10 V; Logic input detect: with detection of 4 mA signal loss no detect: without detection of 4 mA signal loss (Address menu in manual reference 3997: 7.06)
12	RESET MOTORISED POT. REF.	R-W	No	No; Reset When this parameter is at Reset, the faster/slower command reference is reset to zero. (Address menu in manual reference 3997: 9.28)
13	FASTER / SLOWER RESET MODE.	R-W	RESET/ INACTIVE	RESET/ACTIVE; PREC/ACTIVE; RESET/INACTIVE; PREC/INACTIVE RESET/ACTIVE: The reference is reset to 0 on each power-up. The faster/slower and reset inputs are continuously active. PREC/ACTIVE: On power-up, the reference is at the level it was on power-down. The faster/slower and reset inputs are continuously active. RESET/INACTIVE: The reference is reset to 0 on each power-up. The faster/slower inputs are only active when the drive output is active. The reset input is continuously active. PREC/INACTIVE: On power-up, the reference is at the level it was on power-down. The faster/slower inputs are only active when the drive output is active. The reset input is continuously active. (Address menu in manual reference 3997: 9.21)

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COMMISSIONING USING THE LCD KEYPAD MICRO CONSOLE

Parameter	Name	Type	Factory setting	Adjustment range
14	MOTORISED POT. REF. POLARITY	R-W	Positive	<p style="text-align: center;">Positive; Bi-directional</p> <p>Positive: The faster/slower command reference is limited to positive values (0 to 100.0%). Bi-directional: The faster/slower command reference can change from – 100% to + 100%. (Address menu in manual reference 3997: 9.22)</p>
15	MOTORISED POT. REF. RAMP	R-W	20 s	<p style="text-align: center;">0 to 250 s</p> <p>This parameter defines the time it takes for the faster/slower command reference to change from 0 to 100%. It will take twice as long to change from –100.0% to +100.0%. (Address menu in manual reference 3997: 9.23)</p>
16	MOTORISED POT. REF. SCALE	R-W	1.00	<p style="text-align: center;">0 to 2.50</p> <p>The maximum value of the faster/slower command reference automatically takes the maximum value of the parameter to which it is assigned. This parameter can therefore be used to adapt the maximum value of the faster/slower command reference to the maximum value required by the application. Example: - The faster/slower reference is addressed to a preset reference. - The maximum value of a preset reference is 32000pmin^{-1}. - We wish the maximum value of the faster/slower reference to correspond to 1500 min^{-1}. (Address menu in manual reference 3997: 9 .24)</p>
17	MOTORISED POT. REFERENCE	RO	0	<p style="text-align: center;">$\pm 100.0\%$</p> <p>(Address menu in manual reference 3997: 9.03)</p>
18 to 24	Not used			

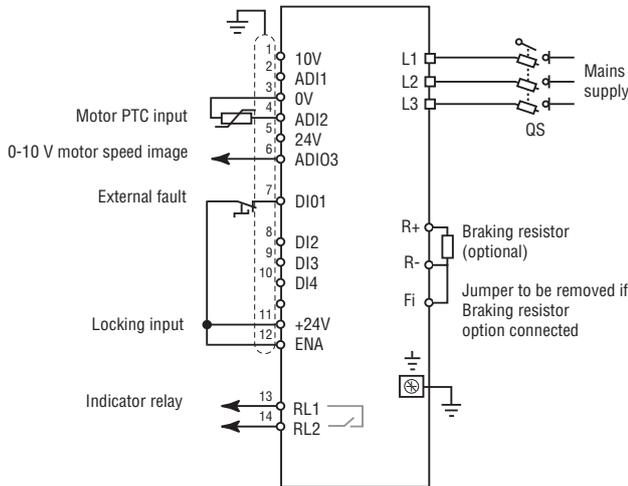
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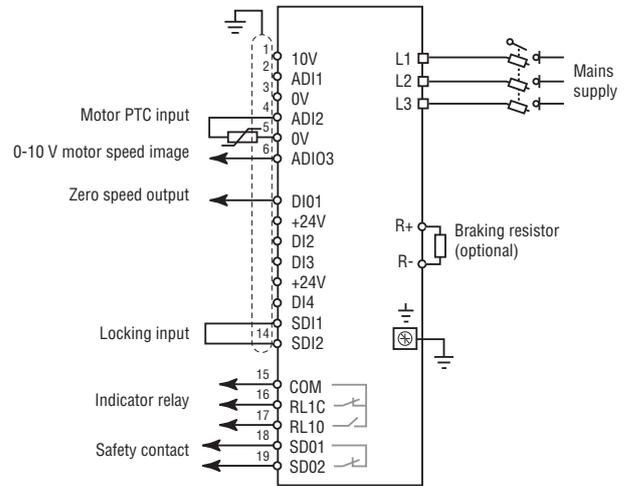
COMMISSIONING USING THE PADVMA30 KEYPAD

2.5.2.15 - KEYPAD CONFIGURATION (05 = PADVMA30)

VARMECA 31/32



VARMECA 33/34



Note: For single-phase versions, the power supply is connected to terminals L and N.

- See manual 3776 for the connection and commissioning rules and the I/O characteristics.
- The parameters must be set with the VARMECA 30 locked, i.e. jumper between terminals SDI1 and SDI2 or ENA and +24V open.
- The VARMECA 30 operates in positive logic.

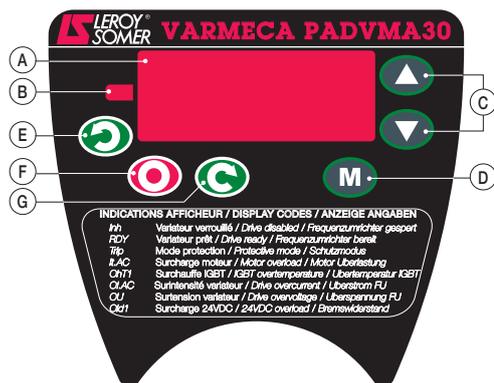
DI01 terminal (VMA 31/32) : Configured as "External fault" input. For the drive to operate, this terminal must be connected to the + 24 V.

The local control options (B31/32 - BMA 31/32 - BMAVAR 31/32 - B 33/34 - BMA 33/34 - BMAVAR 33/34) are not compatible with the use of the PAD VMA30 option



Presentation of the operator display:

The PADVMA30 operator display consists of a display unit, three control buttons and three parameter-setting keys.



Ref.	Function
(A)	Display comprising 4 x 7-segment digits for indicating: - the drive operating status - certain operating data - the adjustment parameters (01 to 80) and their value
(B)	LED providing a sign for the data (the lit LED corresponds to the " - " sign)
(C)	Keys which can be used to scroll up and down through the parameters or their value. These keys can also be used to vary the speed.
(D)	Keys which can be used to switch from standard mode to parameter-setting mode. In parameter-setting mode, the parameter number and value are displayed alternately on the display.
(E)	In keypad mode, these buttons are used for the following commands:
(F)	- Reverse
(G)	- Stop, clear fault
	- Forward

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Selection and modification of a parameter:

 - This procedure has been drawn up for initial commissioning.

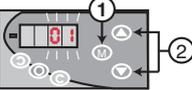
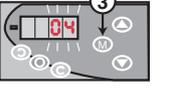
- If the drive is already powered up, the first parameter displayed may not be 01. Simply select the parameter to be displayed or modified using the  or  keys.

Change from parameter-setting mode to read mode:

- To switch from parameter-setting mode to read mode, press the  key for 3 seconds.

- In parameter-setting mode, if there is no operator action for 45 seconds (VMA31/32) or 240 seconds (VMA 33/34), the display stops flashing and returns automatically to the initial drive status.

 - The KEYPAD LCD console or the XPRESS KEY must not be connected to the RJ45 socket available on the PADVMA31/VMA32.

Action	Function
	Power-up Drive locked (JUMPER between SDI1 and SDI2 or ENA and +24V open). Display in "Read" mode (initial status)
	1: Access to parameter-setting mode. Press the  key. Parameter 01 is displayed, flashing alternately with its value. 2: The  and  keys are used to access the parameter to be modified. For example, press  to select parameter 04.
 	3: Access to parameter modification. Press the  key. The parameter value freezes. 4: Press and hold down the  or  key, to quickly scroll through the parameter value. The final setting is made by short presses on the same key.
	5: Press the  key. The new value of 04 is stored, and the parameter flashes alternately with its value. Press the  and  keys to select a new parameter to be modified.
	6: Return to the initial drive status.

Parameters specific to the configuration accessible from the keypad

Parameter	Name	Type	Factory setting	Adjustment range
11	POWER-UP KEYPAD CONTROL MODE REFERENCE	R-W	rSet	rSEt: at zero; Prec: identical to the reference at the time of powering down; Pr1: identical to RP1
12	REFERENCE ON POWER-UP (RP1)	R-W	0	± Maximum limit (02) min ⁻¹
13	ENABLE FORWARD KEY	R-W	1 (On)	0 (OFF), 1 (On)
14	ENABLE STOP KEY	R-W	1 (On)	0 (OFF), 1 (On)
15	ENABLE KEYPAD REVERSE KEY	R-W	0 (OFF)	0 (OFF), 1 (On)
16 to 24	NOT USED			

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COMMISSIONING USING THE PAD VMA 30 OPTION



THIS OPTION CAN BE INTEGRATED ON DRIVE VERSIONS 1.10 AND LATER.

VMA 31/32

- Power down the drive.
- Connect the option to the drive via the RJ45 socket.
- Lock the VMA 31/32 using terminals 11-12, then power it up. The display must show "inh".
- Access parameter 65 (return to factory settings) using the keys for scrolling through the parameters.
- Change the parameter to "ON" then save. After a few seconds, the parameter returns to "OFF".
- The PAD VMA 31/32 option is enabled.

VMA 33/34

- Power down the drive.
- Connect the option to the drive via the 20-pin connector.
- Lock the VMA 33/34 using terminals SD11 and SD12, then power it up. The display must show "inh".
- Access parameter 05 (selection of the configuration) using the keys for scrolling through the parameters.
- Change the parameter to "C9" then save.
- The PAD VMA 33/34 option is enabled.

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INFORMATION ON OPERATION

This provides the user with information on the status of the drive when it is stopped or in operation.

	Comment
Auto/tunE	- Auto and tunE alternately displayed - Autocalibration phase in progress
dEc	- Deceleration in progress after a stop command
inh	- The drive is locked and cannot start the motor - Freewheel stop
rdY	- The drive is unlocked and waiting for a command - The motor is ready to operate
StoP	- The drive maintains the motor torque at zero speed 
triP	- The drive has switched to protective mode - Alternating display of triP and the fault code (for the meaning of the code, see section 5.2)
Alar./USrx	- Alternating display of Alar. and USrx, where x is the customer fault number (1 to 4). - Alarms enabled by 10.54 to 10.57 (refer to the extended functions manual ref. 3997)

SWITCHING TO PROTECTIVE MODE

If the drive switches to protective mode, the drive output bridge is inactive and the drive no longer controls the motor. The display alternately indicates "triP" and the fault code.

All the faults indicated by the display are listed in the table in section 3: Switching to protective mode - Diagnostics.

CORRESPONDANCE BETWEEN THE CONFIGURATIONS OF THE PXLCD CONSOLE AND THE PADVMA30 DISPLAY UNIT

Configuration	PXLCD	PAD VMA31/32	PAD VMA33/34
Standard	Standard	Std	Std
Standard with 3-wire control	Standard + JOG	PULS	PULS
Standard with enabling of PID	Standard + PID	PID	PID
1 analogue reference + 3 PS without ESFR	3VP + 1 ANALOG.	C1	C1
1 analogue reference + 3 PS with ESFR	3VP1AN. ESFR	C2	/
8 preset speeds	8VP	C3	C2
Correction of a reference via local button	LOCAL/REM.	C4	C3
Correction of 2 PS via local button	2VP PROP. B	C5	C4
Pump regulation	PUMPS VENT.	C6	C5
Torque control	TORQUE CTRL	C7	C6
Faster/slower with ESFR	FSTR/SLWR, ESFR	C8	/
Faster/slower without ESFR	FSTR/SLWR, NO ESFR	C9	C7
Motorised potentiometer	MOTORISED POT.	C10	C8
PADVMA30 display unit	PAD (VMA33/34)	/	C9
Parameter setting is open	ANY	C11	OPEN

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2.5.3 - Rest of the simplified menu

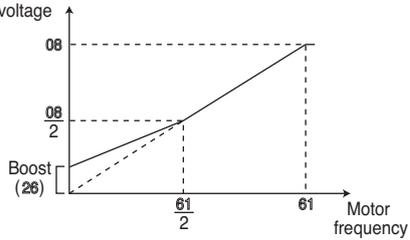
Selection of the control mode

Parameter	Name	Type	Factory setting	Adjustment range
25	VMA 31/32 OPEN LOOP MODE	R-W	SR/1st RUN	<p>SR: EACH Run, SR: NOT Meas, U/F linear, SR: 1st RUN, SR: POWER-UP, U/F Quadrat.</p> <p>Determines the open loop control mode. The difference between these modes is the method used to identify the motor parameters, particularly the stator resistance. These parameters vary with the temperature, and as they are essential for obtaining optimum performance levels, the machine cycle must be taken into account for selecting the most appropriate mode. U/F linear and U/F Quadratic modes correspond to a control mode by a U/F ratio. This ratio is linear in U/F mode and quadratic in U/F Quadratic mode.</p> <p>SR: EACH Run: The stator resistance and voltage offset are measured each time the drive receives a run command. These measurements are only valid if the machine is stopped, and totally defluxed. The measurement is not taken when the run command is given less than 2 seconds after the previous stop. This is the most effective flux vector control mode. However, the operating cycle should be compatible with the 2 seconds required between a stop command and a new run command.</p> <p>SR: NOT Meas: The stator resistance and voltage offset are not measured. This mode is of course the least effective. It should only be used when SR: EACH Run mode is incompatible with the operating cycle.</p> <p>U/F linear: voltage-frequency ratio with fixed boost adjustable via parameters 29 and 30.</p> <p>CAUTION: Use this mode to control several motors.</p> <p>SR: 1st RUN: The stator resistance and voltage offset are measured the first time the drive is unlocked.</p> <p>SR/ POWER-UP: The stator resistance and voltage offset are measured after the first unlocking operation following each power-up.</p> <p>U/F Quadrat.: quadratic voltage/frequency ratio.</p> <p>• In SR mode: Power-up, a voltage is briefly applied to the motor. For safety reasons, no electrical circuit should be accessible once the drive is powered up. (Address menu in manual reference 3997: 5.14)</p>
26 to 28	Not used			

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Parameter	Name	Type	Factory setting	Adjustment range
29	BOOST ON U/F RATIO	R-W	00.0%	<p style="text-align: center;">0 to 25%</p> <p>For operation in U/F mode, this parameter is used to overflux the motor at low speed so that it delivers more torque on starting. It is a percentage of the rated motor voltage (08).</p>  <p style="text-align: center;">(Address menu in manual reference 3997: 5.15)</p>
30	Not used			
31	CURRENT PROPORT. GAIN	R-W	20	<p style="text-align: center;">0 to 250</p> <p>Due to a certain number of internal drive factors, oscillations may occur in the following cases:</p> <ul style="list-style-type: none"> – Frequency regulation with current limiting around the rated frequency and on load impacts. – Torque regulation on machines with a low load and around the rated speed. – On a mains supply break or on a controlled deceleration ramp when DC bus regulation is requested. <p>To reduce these oscillations, we recommend that you first:</p> <ul style="list-style-type: none"> – Increase the proportional gain 31 – Then reduce the integral gain 32 <p>(Address menu in manual reference 3997: 4.13)</p>
32	CURRENT INTEGRAL GAIN	R-W	40	<p style="text-align: center;">0 to 250</p> <p>(Address menu in manual reference 3997: 4.14)</p>
VMA 33/34				Open loop, CL.LP vector, SERVO
25	DRIVE MODE	R-W	OPEN LOOP	<p>Open loop: The drive is in open loop control. Open loop control mode is defined by the setting of parameter 26.</p> <p>CL.LP vector: The drive is controlling an induction motor in closed loop flux vector control. The type of encoder and control mode are defined by parameters 26 to 33.</p> <p>Servo: The drive is controlling a synchronous motor. The type of encoder and control mode are defined by parameters 26 to 33.</p> <p>This parameter is used to select the control mode. A return to factory settings procedure does not modify the operating mode. The operating mode can only be selected when the drive is stopped.</p> <p>Note: The change from open loop mode (Open loop) to closed loop mode (CL.LP vector), or vice-versa, initiates a return to factory settings of parameters 40 (brake apply frequency or brake apply speed) and 41 (magnetisation time delay/speed threshold).</p> <p>(Address menu in manual reference 3997: 11.31)</p>

Parameters specific to the VMA 33/34.

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• If 25 = Open Loop

Parameter	Name	Type	Factory setting	Adjustment range
26	OPEN LOOP MODE	R-W	SR/1st RUN	<p>SR: EACH Run, SR: NOT Meas, U/F linear, SR: 1st RUN, SR: POWER-UP, U/F Quadrat.</p> <p>Determines the open loop control mode. The difference between these modes is the method used to identify the motor parameters, particularly the stator resistance. As these parameters vary with the temperature, and are essential for obtaining optimum performance levels, the machine cycle must be taken into account for selecting the most appropriate mode. U/F and QUASI SQUARE modes correspond to a control mode by a U/F ratio. This ratio is linear in U/F mode and quadratic in QUASI SQUARE mode.</p> <p>SR: EACH Run: The stator resistance and voltage offset are measured each time the drive receives a run command. These measurements are only valid if the machine is stopped, and totally defluxed. The measurement is not taken when the run command is given less than 2 seconds after the previous stop. This is the most effective flux vector control mode. However, the operating cycle should be compatible with the 2 seconds required between a stop command and a new run command.</p> <p>SR: NOT Meas: The stator resistance and voltage offset are not measured. This mode is of course the least effective. It should only be used when SR : EACH Run mode is incompatible with the operating cycle.</p> <p>U/F: Voltage-frequency ratio with fixed boost adjustable via parameters 29 and 30. CAUTION: Use this mode to control several motors.</p> <p>SR: 1st RUN: The stator resistance and voltage offset are measured the first time the drive is unlocked.</p> <p>SR/ POWER-UP: The stator resistance and voltage offset are measured after the first unlocking operation following each power-up.</p> <p>U/F Quadrat.: Quadratic voltage/frequency ratio.</p> <p>• In SR mode: Power-up, a voltage is briefly applied to the motor. For safety reasons, no electrical circuit should be accessible once the drive is powered up. (Address menu in manual reference 3997: 5.14)</p>

Parameters specific to the VMA 33/34.

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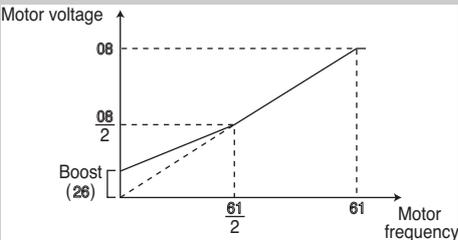
Variable speed motors and geared motors

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• If 25 = Open Loop and 26 = SR: EACH Run, SR: NOT Meas, SR: 1st RUN, SR/POWER-UP, U/F: Quadrat.

Parameter	Name	Type	Factory setting	Adjustment range
27 to 30	Not used			
31	CURRENT PROPOR. GAIN	R-W	20	0 to 25 Due to a certain number of internal drive factors, oscillations may occur in the following cases: - Frequency regulation with current limiting around the rated frequency and on load impacts - Torque regulation on machines with a low load and around the rated speed - on a mains supply break or on a controlled deceleration ramp when DC bus regulation is requested. To reduce these oscillations, we recommend that you first: - Increase the proportional gain 31 - Then reduce the integral gain 32 (Address menu in manual reference 3997: 4.13)
32	CURRENT INTEGRAL GAIN	R-W	40	0 to 25 (Address menu in manual reference 3997: 4.14)
33 to 35	Not used			

• If 25 = Open Loop and 26 = U/F

Parameter	Name	Type	Factory setting	Adjustment range
27 and 28	Not used			
29	BOOST ON U/F RATIO	R-W	0%	0 to 25% For operation in U/F mode, this parameter is used to overflux the motor at low speed so that it delivers more torque on starting. It is a percentage of the rated motor voltage (08).  (Address menu in manual reference 3997: 5.15)
30	U/F RATIO	R-W	Fixed	Fixed; Dynamic Fixed: The U/F ratio is fixed and set by the base frequency (08). Dynamic: Dynamic U/F ratio. Generates a voltage/frequency characteristic which varies with the load. It is for use in quadratic torque applications (pumps/fans/etc). It can be used in constant torque applications with low dynamics to reduce motor noise. (Address menu in manual reference 3997: 5.13)
31 to 35	Not used			

Parameters specific to the VMA 33/34.

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• If 25 = BF Vector

Parameter	Name	Type	Factory setting	Adjustment range
26	SENSOR TYPE	R-W	INCREMENTAL	<p>INCREMENTAL; INCREM.FD; INCREM.FWD/REV; INCREM. UVW; HALL EFFECT; NO MODE 1 NO MODE 2; NO MODE 3; NO MODE 4</p> <p>INCREMENTAL: Quadrature incremental encoder. INCREM.FD: Incremental encoder with Frequency/Direction output. INCREM.FWD/REV: Incremental encoder with FWD/REV outputs. INCREM. UVW: Incremental encoder with commutation channels. HALL EFFECT: Hall effect sensor. NO MODE 1 to 4: sensorless mode 1 to mode 4. (Address menu in manual reference 3997: 3.38)</p>
27	NO. PTS/ENCODER REV.	R-W	1024 ppr	<p>0 to 32000</p> <p>Used to configure the number of points per encoder revolution. Converts the encoder input into a speed. (Address menu in manual reference 3997: 3.34)</p>
28	ENCODER FILTER	R-W	0 ms	<p>0 to 16 ms</p> <p>This parameter is used to insert a moving average filter on the encoder speed feedback. This is particularly useful for attenuating the current demand when the load has a high inertia and when a high gain is necessary on the speed loop. If the filter is not enabled under these conditions, the speed loop output may change continuously from one current limit to another, blocking the integral function of the speed loop. The filter is inactive if 28 = 0. (Address menu in manual reference 3997: 3.42)</p>
29	SPEED PROPORT. GAIN	R-W	200	<p>0 to 32000</p> <p>Adjusts the stability of the motor speed in the event of sudden variations in the reference. Increase the proportional gain until vibrations occur in the motor, then reduce the value by 20 to 30%, checking that the motor remains stable in the event of sudden variations in speed, both at no load and on load. (Address menu in manual reference 3997: 3.10)</p>
30	SPEED INTEGRAL GAIN	R-W	100	<p>0 to 32000</p> <p>Adjusts the stability of the motor speed on load impact. Increase the integral gain so that the same speed is obtained on load and at no load in the event of load impact. (Address menu in manual reference 3997: 3.11)</p>

Parameters specific to the VMA 33/34.

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Parameter	Name	Type	Factory setting	Adjustment range
31	CURRENT PROPORT. GAIN	R-W	20	0 to 250 Due to a certain number of internal drive factors, oscillations may occur in the following cases: – Frequency regulation with current limiting around the rated frequency and on load impacts – Torque regulation on machines with a low load and around the rated speed – On a mains supply break or on a controlled deceleration ramp when DC bus regulation is requested. To reduce these oscillations, we recommend that you first: – Increase the proportional gain 31 – Then reduce the integral gain 32 (Address menu in manual reference 3997: 4.13)
32	CURRENT INTEGRAL GAIN	R-W	40	0 to 250 (Address menu in manual reference 3997: 4.14)
33	RAMP ENABLE	R-W	No	Yes/No No: ramps short-circuited. (Address menu in manual reference 3997: 2.02)
34 and 35	Not used			

• If 25 = Servo (same table - see above)

Requires a servomotor.

Configuration of terminal DI01 on VMA 31/32 ONLY

Parameter	Name	Type	Factory setting	Adjustment range
33	DI01 I/O INVERT	R-W	YES (or NO if 36 = contact)	YES/NO Used to invert digital input or output DI01 (Address menu in manual reference 3997: 8.11)
34	DI01 TERMINAL CONFIGUR.	R-W	INPUT (or OUTPUT if 36 = contact)	INPUT/OUTPUT Used to configure terminal DIO1 as input or output. (Address menu in manual reference 3997: 8.31)
35	DI01 INP./OUTP. DESTINAT.	R-W	1061 (or 1240 if 36 = contact)	0.00 to 16.89 This parameter selects the destination of the DI01 input or source. (Address menu in manual reference 3997: 8.21)

Parameters specific to the VMA 33/34.

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Variable speed motors and geared motors

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Selection of brake control and setting its parameters

Parameter	Name	Type	Factory setting	Adjustment range
36	BRAKE CONTROL	R-W	Disabled	Disabled; On contact; On relay; Any assignment Used to enable brake control and to select to which logic output it will be assigned. Disabled: Brake control is not enabled. On contact: Brake control is enabled and directed towards the ESFR option. (Address menu in manual reference 3997: 12.41)

• If 36 = Disabled

Parameter	Name	Type	Factory setting	Adjustment range
37 to 44	Not used			

• If 36 = On contact (with 25 = Open loop)

Parameter	Name	Type	Factory setting	Adjustment range
37	BRAKE RELEASE CURRENT THRESHOLD	R-W	10%	0 to 200% Used to adjust the current threshold at which the brake will be controlled. This current level should provide sufficient torque at the time the brake is released. (Address menu in manual reference 3997: 12.42)
38	BRAKE APPLY CURRENT THRESHOLD	R-W	10%	0 to 200% Used to adjust the current threshold below which brake control will be disabled. It should be adjusted so that loss of the motor power supply is detected. Note: This parameter is not active in closed loop mode with software versions \leq V2.0. (Address menu in manual reference 3997: 12.43)
39	BRAKE RELEASE Hz THRESHOLD	R-W	1.0 Hz	0 to 20 Hz Used to adjust the frequency threshold at which the brake will be controlled. This frequency level should provide sufficient torque to drive the load in the right direction at the time the brake is released. This threshold is usually set at a value slightly above the frequency corresponding to the motor slip at full load. Example: – $1500 \text{ min}^{-1} = 50 \text{ Hz}$ – Rated on-load speed = 1470 min^{-1} – Slip = $1500 - 1470 = 30 \text{ min}^{-1}$ – Slip frequency = $30/1500 \times 50 = 1 \text{ Hz}$. (Address menu in manual reference 3997: 12.44)

Parameters specific to the VMA 33/34.

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Parameter	Name	Type	Factory setting	Adjustment range
40	BRAKE APPLY Hz THRESHOLD	R-W	2.0 Hz	<p style="text-align: center;">0 to 20 Hz</p> <p>Used to adjust the frequency or speed threshold at which brake control will be disabled. This threshold enables the brake to be applied before zero speed so as to avoid load veering while the brake is being applied.</p> <p>If the frequency or speed drops below this threshold when no stop request has been made (change of direction of rotation), brake control will remain activated. This exception can be used to avoid the brake being engaged as the speed passes through zero.</p> <p>Note: This parameter is not active in closed loop mode with software versions \leq V2.0. (Address menu in manual reference 3997: 12.45)</p>
41	MAGNETISATION TIME DELAY	R-W	0.1 s	<p style="text-align: center;">0 to 25 s</p> <p>This time delay is triggered when all the conditions for brake release have been met. It enables enough time to be left to establish an adequate level of magnetising current in the motor and to ensure that the slip compensation function is fully activated. When this time delay has elapsed, brake control is enabled. (Address menu in manual reference 3997: 12.42)</p>
42	TIME DELAY BEFORE RAMP UNLOCK	R-W	0.1 s	<p style="text-align: center;">0 to 25 s</p> <p>This time delay is triggered when brake control is enabled. It is used to allow time for the brake to release before unlocking the ramp. (Address menu in manual reference 3997: 12.47)</p>
43	Not used			
44	Not used			
45	Not used			

Parameters specific to the VMA 33/34.

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• If 36 = On contact, On relay or Any assignment with 25 = CL LP Vector (VMA33/34)

Parameter	Name	Type	Factory setting	Adjustment range
37	Not used			
38	BRAKE APPLY CURRENT THRESHOLD	R-W	10%	0 to 200% Used to adjust the current threshold below which brake control will be disabled. It should be adjusted so that loss of the motor power supply is detected. Note: This parameter is not active in closed loop mode with software versions \leq V2.0. (Address menu in manual reference 3997: 12.43)
39	Not used			
40	BRAKE APPLY V_t THRESHOLD	R-W	5 min ⁻¹	0 to 100 min ⁻¹ Used to adjust the frequency or speed threshold at which brake control will be disabled. This threshold enables the brake to be applied before zero speed so as to avoid load veering while the brake is being engaged. If the frequency or speed drops below this threshold when no stop request has been made (change of direction of rotation), brake control will remain activated. This exception can be used to avoid the brake being engaged as the speed passes through zero. Note: This parameter is not active in closed loop mode with software versions \leq V2.0. (Address menu in manual reference 3997: 12.45)
41	BRAKE APPLY TIME DELAY	R-W	0.3 s	This time delay delays the brake apply command in relation to passing below the minimum speed threshold (40). It is useful for avoiding repeated application and release of the brake during operation around zero speed. (Address menu in manual reference: 12.46)
42	TIME DELAY BEFORE RAMP UNLOCK	R-W	1.00 s	0 to 25 s This time delay is triggered when brake control is enabled. It is used to allow time for the brake to release before unlocking the ramp. (Address menu in manual reference 3997: 12.47)
43	BRAKE APPLY TIME DELAY	R-W	1.00 s	0 to 25 s This time delay is used to maintain the torque at standstill while the brake is applied. When this time delay has elapsed, the drive output is deactivated. Note: This parameter is not active in closed loop mode with software versions \leq V2.0. (Address menu in manual reference 3997: 12.48)
44	BRAKE POSITION CONTROL	RO	Disabled	Disabled; Enabled Disabled: The brake is not controlled. Enabled: The brake is unlocked. (Address menu in manual reference 3997: 12.49)
45	Not used			

Parameters specific to the VMA 33/34.

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Additional parameter settings

Parameter	Name	Type	Factory setting	Adjustment range
46	MANAGING MICRO-CUTS	R-W	No stop	<p>Disabled; stop; Auto restart</p> <p>Disabled: The drive does not take account of mains supply breaks and continues to operate as long as the DC bus voltage is adequate.</p> <p>Stop: If there is a mains supply break, the drive will decelerate on a ramp, which is automatically calculated by the drive, so that the motor feeds back the energy to the drive's DC bus and thus continues to supply its control electronics. On return to normal conditions, the deceleration continues until the motor stops.</p> <p>Auto restart: If there is a mains supply break, the drive will decelerate on a ramp, which is automatically calculated by the drive, so that the motor feeds back the energy to the drive's DC bus and thus continues to supply its control electronics. On return to normal conditions, the motor re-accelerates up to reference speed. (Address menu in manual reference 3997: 6.03)</p>
47	Not used			Can be assigned by parameter 73
47	MANAGEMENT OF SDI INPUT	R-W	UNLOCK	<p>UNLOCK; SECURE DISABLE</p> <p>UNLOCK: The SDI input is used as a simple locking input.</p> <p>SECURE DISABLE: The SDI input is used as a secure disable input.</p> <p>In order to conform to safety standard EN 954-1 category 3, the drive must be wired in accordance with the recommended diagram (section 3.4).</p> <p>Note: 47 must be modified with the drive locked.</p> <p>CAUTION: The factory setting of 47 is 0 (Enab) for the 11 Pad configuration (05 = 9). The same applies if the drive is controlled via fieldbus or an LCD keypad. (Address menu in manual reference 3997: 8.10)</p>
48	PRODUCT IDENTIF. CODE	RO	-	<p>0 to 32000</p> <p>This product code gives information on the drive rating, size, hardware version and variant. When the nameplate is not visible, this code can be given to your LEROY-SOMER contact. (Address menu in manual reference 3997: 11.60)</p>
49-50	Not used (VMA 31/32)			Can be assigned by parameters 74 and 75
49	ADIO3 CONTROL	R-W	Any	<p>Motor speed; Motor load; Motor current; Motor power; Any</p> <p>This parameter is used to assign the ADIO3 function quickly when it is being used as an output.</p> <p>Motor speed: ADIO3 is assigned to Motor speed.</p> <p>Motor load: ADIO3 is assigned to Motor load.</p> <p>Motor current: ADIO3 is assigned to Motor current.</p> <p>Motor power: ADIO3 is assigned to Motor power.</p> <p>If ADIO3 is used as an input, 49 is forced to Any. When 49 = Any, assignment is at the user's discretion. Refer to the "extended functions" manual ref. 3756. (Address menu in manual reference 3997: 7.15)</p>

Parameters specific to the VMA 33/34.

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Parameter	Name	Type	Factory setting	Adjustment range
50	DIO1 CONTROL	R-W	Any	<p>Zero speed; Ref. reached; Min. speed; Rated load reached; Drive active; Gen. alarm; Current lim; Jogging input; Reset input; Any</p> <p>This parameter is used to assign the DIO1 function quickly.</p> <p>Zero speed: Zero speed output Ref. reached: Reference reached output Min. speed: Minimum speed output Rated load reached: Rated load reached output Drive active: Drive active output Gen. alarm: Drive general alarm output Current lim: Current limit output Jogging input: Jog input Reset input: Reset input Any: Any assignment (Address menu in manual reference 3997: 8.41)</p>
51	JOG REFERENCE	R-W	45 min ⁻¹	<p style="text-align: center;">0 to 16000 min⁻¹</p> <p>Operating frequency when the jog operation input has been selected. (Address menu in manual reference 3997: 1.05)</p>
52	BIPOLAR MODE ENABLE	R-W	+ ref. only	<p style="text-align: center;">+ ref. only; + and – ref.</p> <p>+ ref. only: All negative references are treated as zero. + and – ref: Used to change the direction of rotation by the reference polarity. May come from preset references. (Address menu in manual reference 3997: 1.10)</p>
53	SPEED SKIP 1	R-W	0 min ⁻¹	<p style="text-align: center;">0 to 32000 min⁻¹</p> <p>A skip is available to avoid a machine running at a critical speed. When the parameter is at 0, the function is deactivated. (Address menu in manual reference 3997: 1.29)</p>
54	SKIP WIDTH 1	R-W	15 min ⁻¹	<p style="text-align: center;">0 to 300 min⁻¹</p> <p>Defines the skip width around the avoided speed. The total skip will therefore equal the threshold set ± skip width. When the reference is within the window determined in this way, the drive will restore the speed corresponding to the lower value in the window. (Address menu in manual reference 3997: 1.30)</p>

Parameters specific to the VMA 33/34.

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Variable speed motors and geared motors

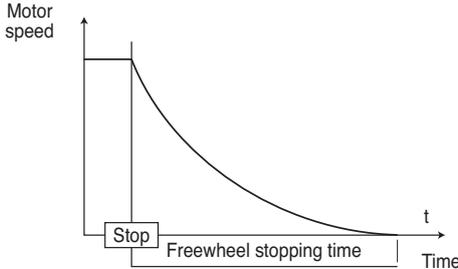
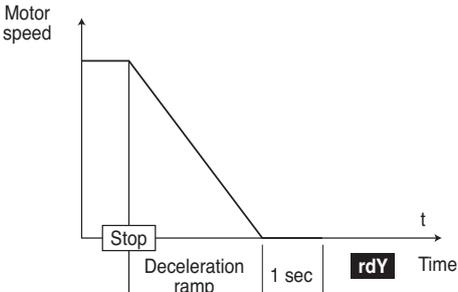
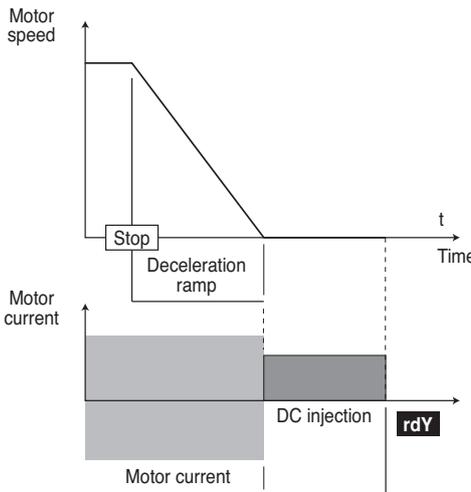
COMMISSIONING USING THE LCD KEYPAD MICRO CONSOLE

Parameter	Name	Type	Factory setting	Adjustment range/Description
55	DECELERATION MODE	R-W	Auto ramp	<p>Fixed ramp; Auto ramp; Auto ramp +; Fixed ramp +</p> <p>Fixed ramp: Deceleration ramp imposed. If the deceleration ramp which has been set is too fast in relation to the inertia of the load, the DC bus voltage exceeds its maximum value and the drive switches to overvoltage fault "OU".</p> <p>CAUTION: Select this mode when a braking resistor is being used.</p> <p>Auto ramp: Standard deceleration ramp with automatic extension of the ramp time in order to avoid causing a DC bus overvoltage fault on the drive.</p> <p>Auto ramp +: The drive allows the motor voltage to be increased up to 1.2 times the rated voltage set in O8 (motor rated voltage), to avoid reaching the maximum DC bus voltage threshold. However, if this is inadequate, the standard deceleration ramp time is extended, to avoid causing a DC bus overvoltage fault on the drive.</p> <p>For the same quantity of energy, Auto ramp + mode enables faster deceleration than Auto ramp mode.</p> <p>Fixed ramp +: Same as Auto ramp + mode, but the ramp is imposed.</p> <p>If the configured ramp is too fast, the drive goes into OU fault mode.</p> <p>CAUTION: In Auto ramp + and Fixed ramp + modes, the motor must be able to tolerate additional losses relating to the increase in voltage at its terminals. (Address menu in manual reference 3997: 2.04)</p>
56	NO. OF AUTOMATIC DRIVE RESETS	R-W	2	<p>None; 1; 2; 3; 4; 5</p> <p>0: Faults are not cleared automatically. A command must be given.</p> <p>1 to 5: Results in the programmed number of automatic fault reset attempts.</p> <p>When the counter reaches the permitted number of reset attempts, the drive locks. It is only possible to reset this last fault using a command.</p> <p>If there are no faults, the counter is decremented by one value every 5 minutes.</p> <p>(Address menu in manual reference 3997: 10.34)</p>
57	AUTO-RESET TIME DELAY	R-W	1.0 s	<p>0 to 25 s</p> <p>This parameter defines the time between the drive switching to fault mode and the automatic reset (subject to a minimum stop time for faults connected with overcurrents).</p> <p>(Address menu in manual reference 3997: 10.35)</p>

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Parameter	Name	Type	Factory setting	Adjustment range/Description
58	STOPPING MODE	R-W	Ramp	<p>Freewheel; Ramp ; Ramp + DC; Zero speed DC; Timed DC</p> <p>Freewheel: The power bridge is deactivated as soon as the stop command is given. The machine stopping time depends on its inertia. The drive cannot receive another run command for 2 s, the motor demagnetisation time.</p>  <p>Ramp: The drive decelerates the motor according to the deceleration mode chosen in parameter 55.</p>  <p>Ramp + DC: The drive decelerates the motor according to the deceleration mode chosen in parameter 55. When zero frequency is reached, the drive injects DC current for 1 second.</p>  <p>Zero speed DC: The drive decelerates the motor by setting a low frequency current resulting in almost zero speed, which the drive detects automatically.</p>

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Parameter	Name	Type	Factory setting	Adjustment range/Description
58 (continued)				<p>The drive then injects DC current for 1 second.</p> <p>Delayed DC: The drive decelerates the motor by imposing DC current for 1 second.</p> <p>(Address menu in manual reference 3997: 6.01)</p>
59	CATCH A SPINNING MOTOR	R-W	Disabled	<p>Disabled; 2 directions; Clockwise; Anti-clockwise</p> <p>If this parameter is enabled by 59 = 2 directions, Clockwise or Anti-clockwise, when there is a run command or after a mains supply break, the drive executes a procedure to calculate the motor frequency and direction of rotation. It will automatically recalibrate the output frequency to the measured value and re-accelerate the motor up to the reference frequency.</p> <ul style="list-style-type: none"> • If the load is stationary at the time of the run command or when the mains supply returns, this operation may cause the machine to rotate in both directions before the motor accelerates. • Before enabling this function, check that there is no danger to equipment and personnel. <p>(Address menu in manual reference 3997: 6.09)</p>

Parameters specific to the VMA 33/34.

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Parameter	Name	Type	Factory setting	Adjustment range/Description
60	SWITCHING FREQUENCY	R-W	4.5 kHz (VMA 33/34) 4 kHz (VMA 31/32)	VMA 33/34: 3kHz; 4.5kHz; 5.5kHz; 6kHz; 9kHz; 11kHz VMA 31/32: 3kHz; 4kHz; 5kHz; 6kHz; 8kHz, 10kHz, 12kHz, 16kHz Sets the VARMECA switching frequency. CAUTION: A high switching frequency reduces the magnetic noise. However it increases the motor temperature rise and the level of radio-frequency interference emission, and reduces the starting torque. If the temperature becomes too high, the drive can reduce the switching frequency selected by the user. (Address menu in manual reference 3997: 5.18)
61	MOTOR RATED FREQUENCY	R-W	50.0 Hz	0 to 400 Hz This is the point at which motor operation changes from constant torque to constant power. In standard operation, it is the frequency indicated on the motor nameplate. (Address menu in manual reference 3997: 5.06)
62	NUMBER OF MOTOR POLES	R-W	Automatic	Automatic; 2 poles; 4 poles; 6 poles; 8 poles When this parameter is set to Automatic, the drive automatically calculates the number of poles according to the rated speed (07) and the rated frequency (61). (Address menu in manual reference 3997: 5.11)
63	ENABLE AUTOCALIBRATION	R-W	No	No ; No rotation; Rotation • Measurements taken when 63 = Rotation must be performed with the motor uncoupled as the drive drives the motor at 2/3 of its rated speed. Check that this operation does not present any safety risks, and ensure that the motor is stopped before the autocalibration procedure. After modifying the motor parameters, it is advisable to repeat autocalibration. No: No autocalibration No rotation: Measurement of motor characteristics when stopped. The stator resistance and voltage offset are measured. Procedure: – Check that the motor parameters have been set and that the motor is stopped – Unlock the drive – Give a run command – Lock the drive and remove the run command The motor is then ready to operate normally. Parameter 63 returns to No as soon as autocalibration has been completed. CAUTION: This autocalibration is performed automatically even though 63 = No, in the following cases: – Initial commissioning of the drive – Return to factory settings, after the drive has been unlocked and a run command given Rotation: Measurement of motor characteristics with rotation. The stator resistance and the voltage offset are stored, and the magnetising current and the leakage inductance are used to calculate the power factor 09. This mode is used to obtain optimal performance. Procedure: – Check that the motor parameters have been set and that the motor is stopped

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Parameter	Name	Type	Factory setting	Adjustment range/Description
63 (continued)				<ul style="list-style-type: none"> – Unlock the drive – Give a run command. The motor accelerates up to 2/3 of rated speed, then stops in freewheel mode. During autocalibration, lock the drive and remove the run command The motor is then ready to operate normally. Parameter 63 returns to No as soon as autocalibration has been completed. (Address menu in manual reference 3997: 5.12)
64	COPY PARAMETERS	R-W	No	<p>No; Key to Drive; Drive to key; Auto key mem.</p> <p>Lock the drive before each modification</p> <p>Note: This parameter is not active with software versions \leq V2.0.</p> <p>No: No action.</p> <p>Key to drive: Inactive in VARMECA VMA 31/32 as the console and the key use the same RJ45 socket.</p> <p>Drive to Key: When this parameter is stored as Drive to Key and the drive output is not active, replace the console cable connector in the RJ45 socket with that of the key. Pressing the key button causes the parameters contained in the drive to be stored in the copy key. At the end of the transfer, the parameter returns to No, once the console has been reconnected. If confirmation is not received within 10 seconds of the first press, the procedure is cancelled.</p> <p>Auto key mem: Only in VMA 33/34. Used for automatic storing in the key when the parameters are modified using the PADVMA 33/34 option.</p> <p>CAUTION: The copy key contains parameters relating to the drive rating. If the parameters are copied into a drive with a different rating, the parameters relating to the drive and the motor characteristics will not be copied and the LED will not come on with a fixed light at the end of the transfer. (Address menu in manual reference 3997: 11.42).</p>
65	RETURN TO FACTORY SETTINGS	R-W	No	<p>No; Yes</p> <p>CAUTION: Lock the drive before changing 65.</p> <p>No: No return to factory settings procedure is performed.</p> <p>Yes: Reconfigures the drive to factory settings. Parameters relating to min. speed, max. speed, motor parameters, the motor control mode and the motor rating are not affected by the return to factory settings. (Address menu in manual reference 3997: 11.43)</p>

Parameters specific to the VMA 33/34.

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Security code:

Parameter	Name	Type	Factory setting	Adjustment range
66	CUSTOMER SECURITY CODE	R-W	0	<p>0 to 9999 Security code for the PADVMA30 option</p> <p>If this parameter is other than 0, and 10 is set to Read only, no parameter modification can take place. To modify a parameter, the user must enter the code equivalent to the value of 66. In read mode, this parameter is always at 0. (Address menu in manual reference 3997: 11.30)</p>

Parameters associated with the drive operating status

Parameter	Name	Type	Factory setting	Adjustment range
67	DISPLAY MODE	R-W	Speed	<p>PADVMA 30 display configuration Speed; Load; Speed/Load; User; Speed/User; Load/ User</p> <p>Speed: On power-up, the speed is displayed. The unit depends on the setting of 69 (frequency in Hz, speed in min^{-1} or a unit defined by the user). Load: On power-up, the load is displayed. The unit displayed depends on the setting of 68 (motor load as a % or output current in A). Speed/Load: Displays the speed and the load, or the current, alternately. User: On power-up, the speed selected by parameter 11.49 is displayed. Speed/User: Displays alternately the speed and the parameter selected in 11.49. Load/User: Displays alternately the load and the parameter selected in 11.49. (Address menu in manual reference 3997: 11.22)</p>
68	SELECT LOAD DISPLAY	R-W	As % of rated curr.	<p>As % of rated curr; In Amps</p> <p>This parameter is used to display the load or the total current. (Address menu in manual reference 3997: 04.21)</p>
69	SPEED DISPLAY UNIT	R-W	min^{-1}	<p>Hertz, min^{-1}, Customised</p> <p>This parameter is used to select the unit in which the speed is displayed. Customised: Customer unit defined using a coefficient determined in parameter 70 as follows, Customised = 79 (motor speed in min^{-1}) x 70. (Address menu in manual reference 3997: 05.34)</p>
70	CUSTOMER UNIT SCALE	R-W	1.000	<p>0 to 9,999</p> <p>This is a multiplication coefficient applied to the motor speed for expressing the speed in a unit defined by the user (see 69). Example: To obtain a reading in m/min for an application where the product is moving 200 mm for each motor revolution $\rightarrow 70 = 0.2$. (Address menu in manual reference 3997: 11.43)</p>
71	LAST FAULT	RO	–	Displays the last 5 drive faults.
72	FAULT - 2	RO	–	71: indicates the most recent fault, and 75 the oldest fault. See the table in section 5 for the list of faults. (Address menu in manual reference 3997: 10.20, 10.21, 10.22, 10.23, 10.24)

Parameters specific to the VMA 33/34.

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Parameter	Name	Type	Factory setting	Adjustment range
73	PARAMETER 47 ASSIGNMENT	R-W	0	Used to assign a parameter in parameters 47, 49, 50
74	PARAMETER 49 ASSIGNMENT	R-W	0	
75	PARAMETER 50 ASSIGNMENT	R-W	0	
73	ANALOGUE/DIGITAL INPUT 01	RO	0%	0 to 100.00%
74	ANALOGUE/DIGITAL INPUT 02	RO	0%	Read value of the ADI1, ADI2, ADI3 input (Address menu in manual reference 3997: 07.01, 07.02, 07.03)
75	ANALOGUE/DIGITAL INPUT 03	RO	0%	
76	REFERENCE BEFORE OFFSET	RO	300	$\pm 32000 \text{ min}^{-1}$ Indicates the value of the selected reference before offset. (Address menu in manual reference 3997: 01.60)
77	IGBT JUNCTION TEMP.	RO	-	0 to 120 °C Indicates the measured temperature of the junction of the IGBTs. The drives switches to fault mode when the temperature reaches 110 °C, and can be reset when the temperature falls below 100 °C. (Address menu in manual reference 3997: 07.34)
78	TOTAL MOTOR CURRENT	RO	-	VARMECA 0 to I _{max} (A) Reading of the rms current in each drive output phase. This is the result of the vectorial sum of the magnetising current and the active current. (Address menu in manual reference 3997: 04.01)
79	MOTOR SPEED	RO		$\pm 2 \times 02 \text{ min}^{-1}$ Indicates the calculated motor speed. (Address menu in manual reference 3997: 05.04)
80	DC BUS VOLTAGE	RO	-	0 to 420 V (TL); 0 to 830 V (T) Indicates the DC bus voltage measurement. (Address menu in manual reference 3997: 05.05)

Parameters specific to the VMA 33/34.

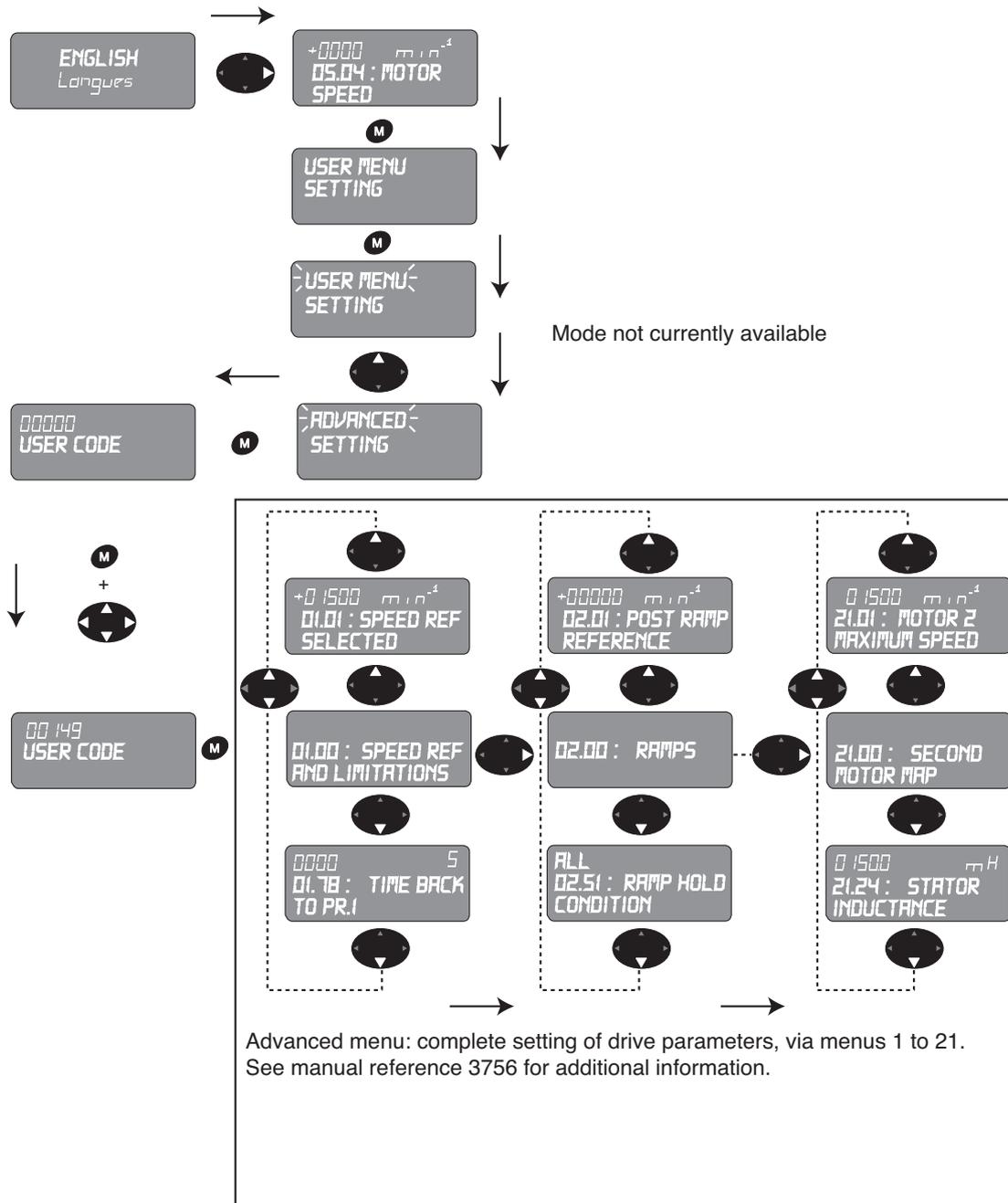
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COMMISSIONING USING THE LCD KEYPAD MICRO CONSOLE

2.6 - Parameter-setting mode via "ADVANCED" menu

All functions that can be accessed are described in document 3997).



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SWITCHING TO PROTECTIVE MODE – DIAGNOSTICS

3 - SWITCHING TO PROTECTIVE MODE – DIAGNOSTICS

 • The user must not attempt to repair the drive, or perform any diagnostics other than those listed in this section. If the drive malfunctions, it should be returned to LEROY-SOMER via your usual contact.

The LCD KEYPAD or PAD VMA options give a certain amount of information which simplifies the diagnostic process.

This information is broken down into 2 categories:

– Information concerning operation

– Fault tripping

If the drive switches to protection mode, the drive output bridge is inactive, and the drive no longer controls the motor.

The display indicates "trip" and the fault code alternately.

All the faults indicated by the display unit are listed in the following table in alphabetical order.

PAD VMA30	LCD KEYPAD	Cause	Solution
cL1	4 mA ADI1	Loss of the current reference on analogue input ADI1	<ul style="list-style-type: none"> • Check the connections of analogue input ADI1, ADI2 or ADI03 • Check that the reference is > 3 mA
cL2	4 mA ADI2	Loss of the current reference on analogue input ADI2	
cL3	4 mA ADI03	Loss of the current reference on analogue input ADI03	
EEF		The drive rating does not correspond to XPress Key	<ul style="list-style-type: none"> • Perform a return to factory settings procedure (see 65)
	EEPROM	EEPROM fault	
EnC1	Chann. U encod.	Loss of channel U	<ul style="list-style-type: none"> • Check the connection and supply voltage of the encoder • Check the speed feedback • Replace the encoder
EnC2	Chann. V encod.	Loss of channel V	<ul style="list-style-type: none"> • Check the encoder voltage and connections
EnC3	Chann. W encod.	Loss of channel W	<ul style="list-style-type: none"> • Check the encoder voltage and connections
Fbus	Bus loss	Disconnection of the fieldbus during operation	<ul style="list-style-type: none"> • Check the connections • Check the fixing of the fieldbus option
It.AC	I ² t motor	Motor overload $I^2 \times t$	<ul style="list-style-type: none"> • Check that the motor is not overloaded • Adjust the rated speed (■) • Check that the motor rated current is set correctly (O6) • Speed feedback: Check the coupling, and check that the signal is not subject to interference • Check the number of motor poles in 62
It.br	Brake resist.	Braking resistor overload $I^2 \times t$	<ul style="list-style-type: none"> • Read the battery value in 10.39 • Increase the resistor ohmic value • Check that 10.30 and 10.31 are set correctly (braking cycle too long) • Check the resistor wiring • Check the integrated transistor
Oht1	IGBT temp.	IGBT overheating (sensor)	<ul style="list-style-type: none"> • Reduce the motor load, the cycle, the switching frequency, and the acceleration and deceleration ramps
Oht2	RF int. temp.	Internal resistor overheating (sensor)	<ul style="list-style-type: none"> • Reduce the switching frequency • Reduce the cycle and the motor load
OI.AC	Drive output curr.	Overcurrent at drive output or instability and vibration*	<ul style="list-style-type: none"> • Check the motor insulation and connection • Increase the acceleration and deceleration ramps • Perform another calibration • Check the wiring, coupling and the speed feedback signals (■) • Reduce the speed loop gains 29 and 30 (■) • Reduce the current loop gains 31 and 32
OI.br	Brake IGBT curr.	Braking IGBT overcurrent	<ul style="list-style-type: none"> • Check the resistor insulation • Correct the short-circuit at the resistor output • Set a higher resistor ohmic value
OLD1	+24 V Ovrd.	Overload on + 24V source or digital output	<ul style="list-style-type: none"> • Check the total current consumption

* : Faults specific to the VMA 33/34

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SWITCHING TO PROTECTIVE MODE – DIAGNOSTICS

PAD VMA30 display	LCD KEYPAD display	Cause	Solution
OSP	Overspeed	Overspeed	<ul style="list-style-type: none"> • The speed is higher than 1.2 times the value of O2 • Check that the load is not driving • Check that the overspeed threshold has been set correctly • Adjust the speed loop gains • Set a longer deceleration time
OU	DC bus voltage	DC bus overvoltage	<ul style="list-style-type: none"> • Provide a braking resistor (optional). If a resistor is already connected, reduce its value (within the permitted limit) • Check that the mains supply is not disturbed • Check the motor insulation • Set a longer deceleration time in O4 • Check the deceleration mode
Ph	Loss of phase	No motor current with brake enabled	<ul style="list-style-type: none"> • Reduce parameter 38
rS	Stator resis.	Stator resistance measurement fault	<ul style="list-style-type: none"> • Adapt the drive power to that of the motor • Check the connection of the motor cables
SCL	COM loss	Serial link fault	<ul style="list-style-type: none"> • Check that the serial link cable is not damaged or incorrectly connected • Check 1163 = 0
Secd	Sec. disable inp.	Secure disable input fault	<ul style="list-style-type: none"> • Give a stop command before unlocking the drive
th	Motor sensor	Motor sensor trip	<ul style="list-style-type: none"> • Check the motor load • Reduce the overload level • Check the motor cooling and the ambient temperature • Check the wiring of terminal ADI2 on the control terminal block
tr 01	User 1	User fault 1 via logic input	<ul style="list-style-type: none"> • Check the wiring of terminal DI01 / underpressure fault in config 05 = VENT. PUMPS
tr 02	User 2	User fault 2 high internal temperature	<ul style="list-style-type: none"> • Check the cooling of the VMA 30
tr 03	User 3	User fault 3 via logic input	
tr 04	User 4	User fault 4 via logic input	
tr 05	User 5	User fault 5 via serial link	
tr 06	User 6	User fault 6 via serial link	
tr 07	User 7	User fault 7 via serial link	
tr 08	User 8	User fault 8 via serial link	
tr 09	User 9	User fault 9 via serial link	
tr 10	User 10	User fault 10 via serial link	
enC2	Encoder rot.	The measured position does not vary (the encoder is incorrectly connected or not supplied with power or the shaft is not turning)	
rot	Invers. A/B	The a, b, a\, b\ signals are the wrong way round	<ul style="list-style-type: none"> • Check the encoder wiring
tun 3	Invers. UVW	The u, v, w switching signals are the wrong way round	<ul style="list-style-type: none"> • Check the encoder wiring
tun 4	Cal U encod.	Some signals are present, but U is missing	<ul style="list-style-type: none"> • Check the encoder wiring
tun 5	Cal V encod.	Some signals are present, but V is missing	
tun 6	Cal W encod.	Some signals are present, but W is missing	
tun 7	No. of poles	The number of pairs of poles set is incorrect (the revolutions measured mechanically with a and b, and electrically with u, v and w, are inconsistent, given the number of pairs of poles entered)	<ul style="list-style-type: none"> • Check parameter 62
tun E	Autocalibr.	Autocalibration error	<ul style="list-style-type: none"> • Drive set to fault mode during the autocalibration phase • The Stop key has been pressed • The SDI contact has been opened during the autocalibration phase
UU	BUS Underv.	DC bus undervoltage	<ul style="list-style-type: none"> • Check the mains supply

* When a no-load test is carried out (i.e. with the motor disconnected), motor operation may appear unstable. This instability manifests itself in the form of vibration and, in extreme cases, in a fault (overload, overcurrent or braking resistor overload). However, the instability disappears as soon as the motor is loaded. To remove this instability during a no-load test, set parameter 5.13 to DYNAMIC. To return to normal machine operating conditions, reset parameter 5.13 to FIXED.

If the problem persists, contact Leroy-Somer.

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Variable speed motors and geared motors

APPENDIX

4 - APPENDIX

- Detailed parameter settings for preset configurations: page 55 to 64.
- Sequential brake control: page 65.

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Variable speed motors and geared motors

APPENDIX

05 = STANDARD

Parameter	Parameter definition	Factory setting
01.14	Selection of references	ana. input 1
06.04	Start/stop logic select	Latched Run/
06.43	Origin of commands	via terminals
07.10	AD11 input destination	01.36
07.11	AD12 mode	PTC sensor
07.14	AD12 input destination	00.00
07.15	AD103 mode	0-10V output
07.16	AD103 input or output scaling	1.0
07.17	AD103 input or output invert	no
07.18	AD103 input destination/output source	10.90
08.10	Drive enable mode select	lock
08.11	Digital input or output DIO1 invert	yes
08.12	Digital input DI2 invert	no
08.13	Digital input DI3 invert	no
08.14	Digital input DI4 invert	yes
08.21	DIO1 input destination	10.61
08.22	DI2 input destination	06.30
08.23	DI3 input destination	06.32
08.24	DI4 input destination	09.30
08.31	Selection of terminal DIO1 as input or output	input
09.33	Decimal output destination	07.06
09.34	Binary sum offset	4

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05 = STANDARD + JOG

Parameter	Parameter definition	Factory setting
01.14	Selection of references	ana. input 1
06.04	Start/stop logic select	Jog Run/Stop
06.43	Origin of commands	via terminals
07.10	AD11 input destination	01.36
07.11	AD12 mode	PTC sensor
07.14	AD12 input destination	00.00
07.15	AD103 mode	0-10V output
07.16	AD103 input or output scaling	1.0
07.17	AD103 input or output invert	no
07.18	AD103 input destination/output source	10.90
08.10	Drive enable mode select	lock
08.11	Digital input or output DIO1 invert	no
08.12	Digital input DI2 invert	no
08.13	Digital input DI3 invert	no
08.14	Digital input DI4 invert	yes
08.21	DIO1 input destination	06.32
08.22	DI2 input destination	06.30
08.23	DI3 input destination	06.39
08.24	DI4 input destination	09.30
08.31	Selection of terminal DIO1 as input or output	input
09.33	Decimal output destination	07.06
09.34	Binary sum offset	4

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APPENDIX

05 = STANDARD + PID

Parameter	Parameter definition	Factory setting
01.14	Selection of references	ana. input 1
06.04	Start/stop logic select	Latched Run/
06.43	Origin of commands	via terminals
07.06	ADI1 mode	0-10V
07.09	ADI1 input invert	no
07.10	ADI1 input destination	01.27
07.11	ADI2 mode	0-10V
07.14	ADI2 input destination	01.28
07.15	ADIO3 mode	0-10V output
07.16	ADIO3 input or output scaling	1.0
07.17	ADIO3 input or output invert	no
07.18	ADIO3 input destination/output source	10.90
08.10	Drive enable mode select	lock
08.11	Digital input or output DIO1 invert	yes
08.12	Digital input DI2 invert	no
08.13	Digital input DI3 invert	no
08.14	Digital input DI4 invert	no
08.21	DIO1 input destination	10.61
08.22	DI2 input destination	06.30
08.23	DI3 input destination	06.32
08.24	DI4 input destination	14.08
08.31	Selection of terminal DIO1 as input or output	input
14.02	Main reference source	01.27
14.03	PID reference source	01.27
14.04	PID feedback source	01.28
14.16	PID destination	01.36

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05 = 3VP + 1ANALOG.

Parameter	Parameter definition	Factory setting
01.14	Selection of references	ana. input 1
01.15	Selection of preset frequencies	via terminals
06.04	Start/stop logic select	Latched Run/
06.43	Origin of commands	via terminals
07.06	ADI1 mode	0-10V
07.08	ADI1 input scaling	1.0
07.09	ADI1 input invert	no
07.10	ADI1 input destination	01.36
07.11	ADI2 mode	PTC sensor
07.14	ADI2 input destination	00.00
07.15	ADIO3 mode	0-10V output
07.16	ADIO3 input or output scaling	1.0
07.17	ADIO3 input or output invert	no
07.18	ADIO3 input destination/output source	10.90
08.10	Drive enable mode select	lock
08.11	Digital input or output DIO1 invert	no
08.12	Digital input DI2 invert	no
08.13	Digital input DI3 invert	no
08.14	Digital input DI4 invert	no
08.21	DIO1 input destination	01.46
08.22	DI2 input destination	06.30
08.23	DI3 input destination	06.32
08.24	DI4 input destination	01.45
08.31	Selection of terminal DIO1 as input or output	input

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APPENDIX

05 = 3VP ANA ESFR (VMA 31/32 only)

Parameter	Parameter definition	Factory setting
01.14	Selection of references	ana. input 1
01.15	Selection of preset frequencies	via terminals
06.04	Start/stop logic select	Latched Run/
06.43	Origin of commands	via terminals
07.06	AD11 mode	0-10V
07.08	AD11 input scaling	1.0
07.09	AD11 input invert	no
07.10	AD11 input destination	01.36
07.11	AD12 mode	Digital input
07.14	AD12 input destination	12.51
07.15	AD103 mode	Digital input
07.16	AD103 input or output scaling	1.0
07.17	AD103 input or output invert	no
07.18	AD103 input destination/output source	01.46
08.11	Digital input or output DI01 invert	no
08.12	Digital input DI2 invert	no
08.13	Digital input DI3 invert	no
08.14	Digital input DI4 invert	no
08.21	DI01 input destination	12.40
08.22	DI2 input destination	06.30
08.23	DI3 input destination	06.32
08.24	DI4 input destination	01.45
08.31	Selection of terminal DI01 as input or output	output

05 = 8VP

Parameter	Parameter definition	Factory setting
01.14	Selection of references	preset ref.
01.15	Selection of preset frequencies	via terminals
06.04	Start/stop logic select	Latched Run/
06.43	Origin of commands	via terminals
07.06	AD11 mode	Digital input
07.08	AD11 input scaling	1.0
07.09	AD11 input invert	no
07.10	AD11 input destination	01.46
07.11	AD12 mode	PTC sensor
07.14	AD12 input destination	00.00
07.15	AD103 mode	0-10V output
07.16	AD103 input or output scaling	1.0
07.17	AD103 input or output invert	no
07.18	AD103 input destination/output source	10.90
08.10	Drive enable mode select	lock
08.11	Digital input or output DI01 invert	no
08.12	Digital input DI2 invert	no
08.13	Digital input DI3 invert	no
08.14	Digital input DI4 invert	no
08.21	DI01 input destination	01.47
08.22	DI2 input destination	06.30
08.23	DI3 input destination	06.32
08.24	DI4 input destination	01.45
08.31	Selection of terminal DI01 as input or output	input

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Variable speed motors and geared motors

APPENDIX

05 = LOCAL/REM

Parameter	Parameter definition	Factory setting
01.04	Reference offset	0
01.14	Selection of references	ana. input 1
06.04	Start/stop logic select	Latched Run/
06.43	Origin of commands	via terminals
07.06	AD11 mode	0-10V
07.08	AD11 input scaling	1.0
07.09	AD11 input invert	yes
07.10	AD11 input destination	01.38
07.11	AD12 mode	0-10V
07.12	AD12 input scaling	1.0
07.13	AD12 input invert	no
07.14	AD12 input destination	01.36
07.15	AD103 mode	0-10V output
07.16	AD103 input or output scaling	1.0
07.17	AD103 input or output invert	no
07.18	AD103 input destination/output source	10.90
08.10	Drive enable mode select	lock
08.11	Digital input or output DIO1 invert	no
08.12	Digital input DI2 invert	no
08.13	Digital input DI3 invert	no
08.14	Digital input DI4 invert	yes
08.21	DIO1 input destination	01.09
08.22	DI2 input destination	06.30
08.23	DI3 input destination	06.32
08.24	DI4 input destination	09.30
08.31	Selection of terminal DIO1 as input or output	input
09.33	Decimal output destination	07.11
09.34	Binary sum offset	4

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Variable speed motors and geared motors

APPENDIX

05 = 2VP PROP.B

Parameter	Parameter definition	Factory setting
01.04	Reference offset	0
01.14	Selection of references	preset ref.
01.15	Selection of preset speeds	via terminals
06.04	Start/stop logic select	Latched Run/
06.43	Origin of commands	via terminals
07.06	ADI1 mode	0-10V
07.08	ADI1 input scaling	1.0
07.09	ADI1 input invert	yes
07.10	ADI1 input destination	01.38
07.11	ADI2 mode	Digital input
07.12	ADI2 input scaling	1.0
07.13	ADI2 input invert	no
07.14	ADI2 input destination	01.45
07.15	ADIO3 mode	0-10V output
07.16	ADIO3 input or output scaling	1.0
07.17	ADIO3 input or output invert	no
07.18	ADIO3 input destination/output source	10.90
08.10	Drive enable mode select	lock
08.11	Digital input or output DIO1 invert	yes
08.12	Digital input DI2 invert	no
08.13	Digital input DI3 invert	no
08.14	Digital input DI4 invert	yes
08.21	DIO1 input destination	01.09
08.22	DI2 input destination	06.30
08.23	DI3 input destination	06.32
08.24	DI4 input destination	09.30
08.31	Selection of terminal DIO1 as input or output	input
09.33	Decimal output destination	07.06
09.34	Binary sum offset	4

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Variable speed motors and geared motors

APPENDIX

05 = PUMPS VENT

Parameter	Parameter definition	Factory setting
01.14	Selection of references	via terminals
01.24	RP 4	2
01.26	RP 6	5
1.27	RP 7	1
02.04	Deceleration mode	Fix ramp
02.11	Acceleration 1	0.1 0.5
02.20	Selection of deceleration ramp	Decel. N°5
02.21	Deceleration ramp 1	5
02.25	Deceleration 5	0.1 0.5
05.12	Autotune	No
07.08	AD11 input scaling	0.99
07.10	AD11 input destination	1224
07.11	AD12 mode	4-20mA detect
07.14	AD12 input destination	124
07.62	Potentiometer input scaling	0.9
07.64	Potentiometer input destination	1264
07.68	Source potentiometer	701
08.11	Digital input or output DI01 invert	No
08.14	Digital input DI4 invert	No
08.21	DIO1 input destination	931
08.22	DI2 input destination	0
08.23	DI3 input destination	0
08.24	DI4 input destination	1408
09.04	No. 1 AND function source 1	630
09.06	No. 1 AND function source 2	1630
09.14	No. 2 AND function source 1	1201
09.16	No. 2 AND function source 2	1002
09.34	Binary sum offset	2
09.64	No. 3 AND function source 1	1202
09.66	No. 3 AND function source 2	1004
09.70	No. 4 AND function destination	630
09.74	No. 4 AND function source 1	1641
09.76	No. 4 AND function source 2	802
10.35	Automatic fault erasure timer	2
10.70	Automatic under voltage reset	Yes
11.01	Determination of 46	622
11.02	Determination of 47	623
11.03	Determination of 48	762
11.04	Determination of 49	1020
11.05	Determination of 50	1021
11.06	Determination of 51	1022
11.07	Determination of 52	1023
11.08	Determination of 53	1024
11.09	Determination of 54	1025
11.10	Determination of 55	1026
11.11	Determination of 56	1027
11.12	Determination of 57	1402
11.13	Determination of 58	1403
12.03	Threshold detector 1 source	124
12.04	Threshold detector 1 threshold	10
12.05	Threshold detector 1 hysteresis	2
12.06	Threshold detector 1 invert	Yes
12.23	Threshold detector 2 source	702
12.25	Threshold detector 2 hysteresis	0.5
12.27	Threshold detector 2 destination	0
12.28	Variable selector 2 source 1	126
12.29	Variable selector 2 source 2	127
12.31	Destination sortie bloc 2	220

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APPENDIX

05 = PUMPS (continued)

Parameter	Parameter definition	Factory setting	
12.63	Threshold detector 3 source	702	
12.65	Threshold detector 3 hysteresis	0.5	
12.66	Threshold detector 3 output inversion	Yes	
14.02	Main reference source	701	
14.03	PID reference source	701	
14.04	PID feedback source	124	
14.09	PID enable condition	901	
14.10	PID proportional gain	100	150
14.11	PID integral gain	80	75
14.14	PID minimum limit	0	
14.16	PID output destination	136	
14.53	Sensor read coefficient	10	
16.02	Timer 1 source	902	
16.05	Timer 1 value	10	
16.12	Timer 2 source	961	
16.15	Timer 2 value (timed stop on Fmin)	25	
16.22	Input source timer 3	1631	
16.25	Timer set 3	3	
16.32	Input source timer 4	1202	
16.35	Timer set 4	10	
16.39	Output destination 4	1230	
16.42	Input ON auto maintain 1	1261	
16.43	Input OFF auto maintain 1	1611	
16.52	Input ON auto maintain 2	1601	
16.53	Input OFF auto maintain 2	804	
16.54	Input inversion OFF set 2	Yes	
16.59	Output destination auto maintain 2	1061	
16.62	Input ON auto maintain 3	1631	
16.63	Input OFF auto maintain 3	1671	
16.64	Input inversion OFF set 3	Yes	
16.69	Output destination auto maintain 3	142	
16.72	Input ON auto maintain 4	804	
16.73	Input OFF auto maintain 4	1202	
16.74	Input inversion OFF set 4	Yes	

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05 = TORQUE CTRL

Parameter	Parameter definition	Factory setting
01.14	Selection of references	ana. input 1
06.04	Start/stop logic select	Latched Run/
06.43	Origin of commands	via terminals
07.06	ADI1 mode	0-10V
07.10	ADI1 input destination	01.36
07.11	ADI2 mode	0-10V
07.14	ADI2 input destination	04.08
07.15	ADIO3 mode	0-10V output
07.16	ADIO3 input or output scaling	1.0
07.17	ADIO3 input or output inversion	no
07.18	ADIO3 input destination/output source	10.90
08.10	Drive enable mode select	interlock
08.11	Digital input or output DI01 invert	yes
08.12	Digital input DI2 invert	no
08.13	Digital input DI3 invert	no
08.14	Digital input DI4 invert	no
08.21	DIO1 input destination	10.61
08.22	DI2 input destination	06.30
08.23	DI3 input destination	06.32
08.24	DI4 input destination	04.11
08.31	Selection of terminal DIO1 as input or output	input

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APPENDIX

05 = FASTER/SLOWER NO ESR (VMA 31/32)

Parameter	Parameter definition	Factory setting
01.10	Selection of bi-directional mode	+ and - ref
01.14	Selection of references	ana. input 1
01.15	Selection of preset frequencies	via terminals
02.51	Ramp hold	> Vmin
06.04	Start/stop logic select	Latched Run/
06.43	Origin of commands	via terminals
07.06	AD11 mode	0-10V
07.08	AD11 input scaling	1.0
07.09	AD11 input invert	no
07.10	AD11 input destination	01.36
07.11	AD12 mode	PTC sensor
07.14	AD12 input destination	00.00
07.15	AD103 mode	Digital input
07.16	AD103 input or output scaling	1.0
07.17	AD103 input or output invert	yes
07.18	AD103 input destination/output source	01.45
08.11	Digital input or output DI01 invert	yes
08.12	Digital input DI2 invert	no
08.13	Digital input DI3 invert	no
08.14	Digital input DI4 invert	no
08.21	DIO1 input destination	10.61
08.22	DI2 input destination	06.30
08.23	DI3 input destination	06.32
08.24	DI4 input destination	00.00
08.31	Selection of terminal DIO1 as input or output	input
09.04	No. 1 AND function source 1	08.04
09.05	No. 1 AND function source 1 invert	yes
09.06	No. 1 AND function source 2	09.02
09.07	No. 1 AND function source 2 invert	yes
09.08	No. 1 AND output invert	no
09.10	No. 1 AND output destination	02.03
09.14	No. 2 AND function source 1	01.45
09.16	No. 2 AND function source 2	10.07

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APPENDIX

05 = FASTER/SLOWER ESFR (VMA 31/32)

05 = FASTER/SLOWER (VMA 33/34)

Parameter	Parameter definition	Factory setting	
01.10	Selection of bi-directional mode	+ and - ref	
01.14	Selection of references	ana. input 1	
01.15	Selection of preset frequencies	via terminals	
02.51	Ramp hold	> Vmin	
06.04	Start/stop logic select	Latched Run/Stop	
06.43	Origin of commands	via terminals	
07.06	ADI1 mode	0-10V	
07.08	ADI1 input scaling	1.0	
07.09	ADI1 input invert	no	
07.10	ADI1 input destination	01.36	
07.11	ADI2 mode	Digital input	PTC sensor
07.14	ADI2 input destination	12.51	00.00
07.15	ADIO3 mode	Digital input	
07.16	ADIO3 input or output scaling	1.0	
07.17	ADIO3 input or output invert	yes	
07.18	ADIO3 input destination/output source	01.45	
08.10	Drive enable mode select	lock	
08.11	Digital input or output DI01 invert	no	
08.12	Digital input DI2 invert	no	
08.13	Digital input DI3 invert	no	
08.14	Digital input DI4 invert	no	
08.21	DIO1 input destination	12.40	12.51
08.22	DI2 input destination	06.30	
08.23	DI3 input destination	06.32	
08.24	DI4 input destination	00.00	
08.31	Selection of terminal DIO1 as input or output	output	
09.04	No. 1 AND function source 1	08.04	
09.05	No. 1 AND function source 1 invert	yes	
09.06	No. 1 AND function source 2	09.02	
09.07	No. 1 AND function source 2 invert	yes	
09.08	No. 1 AND output invert	no	
09.10	No. 1 AND output destination	02.03	
09.14	No. 2 AND function source 1	01.45	
09.16	No. 2 AND function source 2	10.07	

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APPENDIX

05 = MOTORISED POT.

Parameter	Parameter definition	Factory setting
01.09	Reference offset select	ref + 01.04
01.14	Selection of references	ana. input 1
06.04	Start/stop logic select	Latched Run/
06.43	Origin of commands	via terminals
07.06	AD11 mode	0-10V
07.10	AD11 input destination	01.36
07.11	AD12 mode	Digital input
07.14	AD12 input destination	09.26
07.15	AD103 mode	0-10V output
07.16	AD103 input or output scaling	1.0
07.17	AD103 input or output invert	no
07.18	AD103 input destination/output source	10.90
08.10	Drive enable mode select	lock
08.11	Digital input or output DI01 invert	yes
08.12	Digital input DI2 invert	no
08.13	Digital input DI3 invert	no
08.14	Digital input DI4 invert	no
08.21	DIO1 input destination	10.61
08.22	DI2 input destination	06.30
08.23	DI3 input destination	06.32
08.24	DI4 input destination	09.27
08.31	Selection of terminal DIO1 as input or output	input
09.25	Faster/slower reference destination	01.04

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APPENDIX

DESCRIPTION OF SEQUENTIAL BRAKE CONTROL

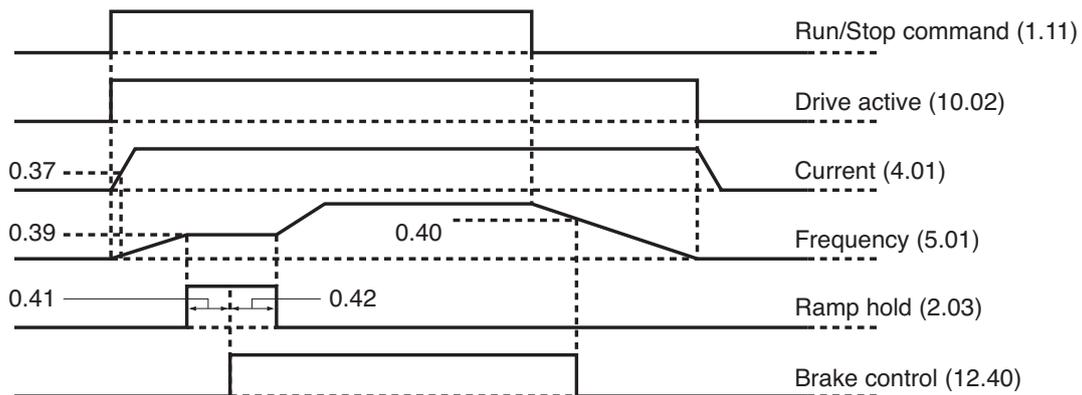
To enable sequential brake control, set parameter 0.36.

0.36 = ON CONTACT (ESFR OPTION ENABLED) OR ON RELAY OR ANY ASSIGNMENT using parameter 12.41.

Parameters related to brake control:

Parameter	Name	Type	Factory setting	Adjustment range
36	BRAKE CONTROL	R-W	DISABLED	DISABLED; ON CONTACT (Address menu in manual reference 3997: 12.41)
37	BRAKE RELEASE CURRENT THRESHOLD	R-W	10.0%	0 to 200.0% (Address menu in manual reference 3997: 12.42)
38	BRAKE APPLY CURRENT THRESHOLD	R-W	10.0%	0 to 200.0% (Address menu in manual reference 3997: 12.43)
39	BRAKE RELEASE HZ THRESHOLD	R-W	1.0 Hz	0 to 20.0 Hz (Address menu in manual reference 3997: 12.44)
40	BRAKE APPLY HZ THRESHOLD	R-W	2.0 Hz	0 to 20.0 Hz (Address menu in manual reference 3997: 12.45)
41	MAGNETISATION TIME DELAY	R-W	0.1 s	0 to 25.0 s (Address menu in manual reference 3997: 12.46)
42	RAMP UNLOCK TIME DELAY	R-W	0.1 s	0 to 25.0 s (Address menu in manual reference 3997: 12.47)

Sequential brake control:



IMPORTANT NOTE

In VMA 31/32, when 36 = ON CONTACT, the assignment of terminal DI01 is automatically enabled for brake control. The parameters concerning terminal DI01 become: 33 = NO; 34 = OUTPUT; 35 = 1240.

If brake control is disabled, 36 = DISABLED. Terminal DI01 must then be reassigned to external fault management via the following parameters: 33 = YES; 34 = INPUT; 35 = 1061, thus returning to the standard configuration.

The fault "loss of phase" is linked to the brake command. When the motor is rotating, if the motor current falls below the set point in parameter 38 (or 12.43), the drive goes into fault mode "loss of phase". To disconnect this control, parameter 38 (or 12.43) must be set to "0".

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NOTE

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NOTE



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