

VLT 4000 VT Engineering Data – LCP Local Control Panel



The front LCP (Local Control Panel) provides a complete interface for operation and monitoring of the VLT 4000 VT drive.

The control panel is detachable and can, as an alternative, be installed up to 10 feet (3 meters) away from the VLT 4000 VT Series, e.g. on a control panel's front door, by means of the mounting kit option.

The functions of the LCP can be divided into five groups:







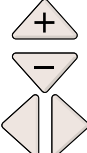




- Display
- Keys for changing display mode
- Keys for changing program parameters
- Indicator lamps
- Keys for local operation

All data is indicated by means of a 4-line alpha-numerical display, which in normal operation is able to show four system measurements and three operating conditions continuously. During programming, all the information required for quick, effective parameter setup of the VLT 4000 VT will be displayed. As a supplement to the display, there are three indicator LEDs for voltage (ON), warning and alarm.

Control Keys

The control keys on the LCP are divided into functions. The keys between the LCD display and the LEDs are used for parameter setup, including choice of display indication during normal operation.

Keys for local control are found under the LEDs.

	[DISPLAY MODE] is used for selecting the mode of display or for changing back to Display mode from either the Quick menu mode or the Menu mode
	[QUICK MENU] is used for programming the VLT unit using the 13 parameters in the Quick menu. It is possible to switch directly between Quick menu mode and Menu mode.
	[EXTENDED MENU] provides the access to all parameters for programming. It is possible to switch directly between Menu mode and Quick menu mode.
	[CHANGE DATA] is used for changing the data value of a parameter when programming.
	[CANCEL] is used to cancel the last programming command so it is not carried out.
	[OK] is used for confirming that the last programming change is acceptable and should be stored.
	[+/-], [<>] provide the user the ability to move the cursor around the LCD display, or sequence through display values. These keys are active during operation as well as programming modes.
	[HAND START] is used to start the motor. When Hand Start is activated, signals including Off Stop, Auto Start, Reset, Safety Interlock, Coasting Stop Inverse, Reversing, Setup Select, Jog, Run Permissive, Lock for Data Change, Stop Command from Serial Communication remain active.
	[OFF STOP] stops the motor.
	[AUTO START] is used if the VLT is to be controlled via the control terminals and/or serial communication. When a start signal is active on the control terminals and/or the bus, the VLT will start.
	[RESET] is used for resetting the VLT after an alarm (trip).

VLT 4000 VT Engineering Data – LCP Local Control Panel



Display

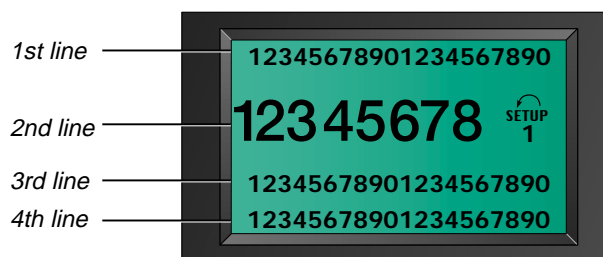
The LCD display has rear lighting and a total of 4 alpha-numerical lines that have the possibility to display various control, system and programming messages.

1st line shows up to 3 measurements continuously in normal operating status or the parameter name during programming.

2nd line continuously shows a measurement with relation to the unit, regardless of status (except in the case of alarm/warning). An arrow indicates the direction of rotation of the motor. The active setup is shown, as well as the setup in which programming is taking place. Programming is indicated by a flashing setup number.

3rd line is normally blank and is used in the menu mode to show the selected parameter group, parameter number and name.

4th line is used in operation for showing a status text or when in data change mode, the mode or value of the selected parameter.



Display Mode

In normal operation, up to 4 different operating variables can be indicated continuously on the 1st and 2nd lines. Line 4 displays the present operating status or any alarms or warnings that have occurred.

Display Mode— Selection of Read-Out State

There are three options to choose from the style of Display-mode: I, II and III. The choice determines the number of operating variables displayed simultaneously. The table at right lists the units available as variables in the first and second line of the display.

Operating variable	Unit
Reference	[%]
Reference	[unit]
Frequency	[Hz]
% max. output Frequency	[%]
Motor current	[A]
Power	[kW]
Power	[HP]
Output energy	[kWh]
Motor voltage	[V]
DC-link voltage	[V]
Motor thermal load	[%]
VLT thermal load	[%]
Hours run	[hours]
Input status, digital input	[binary code]
Input status, analog terminal 53	[V]
Input status, analog terminal 54	[V]
Input status, analog terminal 60	[mA]
Pulse reference	[Hz]
External Reference	[%]
Cooling plate temperature	[°C]
User-defined readout	[unit]
Setpoint 1	[unit]
Setpoint 2	[unit]
Feedback	[unit]
Feedback 1	[unit]
Feedback 2	[unit]
User-defined text	[-]

VLT 4000 VT Engineering Data – Quick Set-Up Menu



Quick Set-Up Menu

The Quick Menu keys gives access to the twelve most important parameters of the VLT 4000 VT. After programming, the VLT 4000 VT will in most cases be ready for operation. Scroll through the Quick Menu using the + and –keys and change the data values by pushing CHANGE DATA and OK.

At the bottom of the display, the parameter number and name are given on the 3rd line, with the status/value listed on the 4th line.

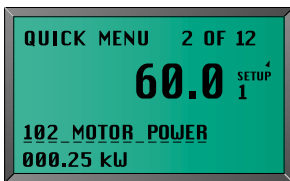
Parameter 1 of 12



Language

Used to select the language for the display. Select from one of nine available languages – English, German, French, Danish, Spanish, Italian, Swedish, Dutch and Portuguese. (This function corresponds to parameter 001 in the programming menu.)

Parameter 2 of 12

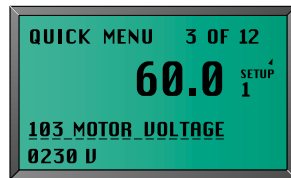


Motor Power

Select the kW value that equals the rated motor power $P_{M,N}$. There are five (5) possible power ratings to chose from: Nominal (based on VLT rating), four (4) undersized and one (1) oversized. Data values are listed in kilowatt (kW); to convert to

horsepower (HP), use: kW x 1.333. (This function corresponds to parameter 102 in the programming menu.)

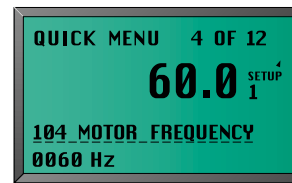
Parameter 3 of 12



Motor Voltage

Used to set the rated motor voltage $U_{M,N}$ while taking into consideration whether the motor is star or delta connected. For 200 VAC class VLT 4000 VT units, select from 200/208/330/230/240V. For 460 VAC class VLT 4000 VT units, select from 380/400/415/440/460/480/500V. (This function corresponds to parameter 103 in the programming menu.)

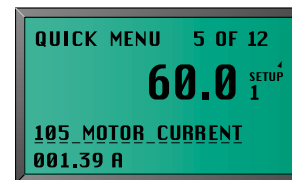
Parameter 4 of 12



Motor Frequency

Used to select the rated motor frequency $f_{M,N}$. Factory default offers a choice between 50 Hz or 60 Hz. If a special motor is to be used, it is possible to override the factory defaults and program the frequency manually from 24-1000 Hz. (This function corresponds to parameter 104 in the programming menu.)

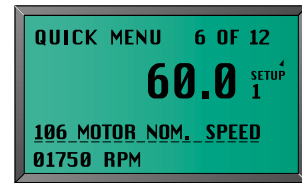
Parameter 5 of 12



Motor Current

Used to select the motor current $I_{M,N}$ while taking into consideration whether the motor is star or delta connected. The data value may be set anywhere from 0.01 to I_{VLmax} (Amps). (This function corresponds to parameter 105 in the programming menu.)

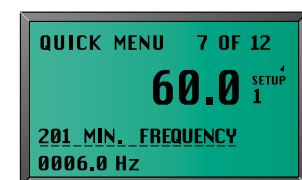
Parameter 6 of 12



Rated Motor Speed

Used to select the value that corresponds to the rated motor speed $n_{M,N}$ that can be seen from the nameplate data. This value relates to the nominal motor frequency or base speed rating. Program the rated motor speed within the range: 100 to 60,000 rpm. (This function corresponds to parameter 106 in the programming menu.)

Parameter 7 of 12



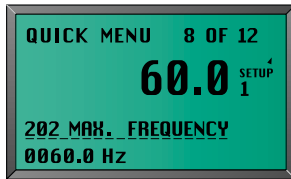
Output Frequency Low Limit

Used to select a minimum frequency limit corresponding to the lowest frequency at which the motor is to run. This determines the minimum operating speed of the motor by setting the low limit of the VLT 4000 VT output frequency. Programmable from 0.0 Hz to the output frequency high limit. (This function corresponds to parameter 201 in the programming menu.)

VLT 4000 VT Engineering Data – Quick Set-Up Menu



Parameter 8 of 12



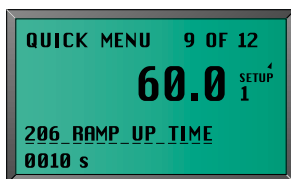
Output Frequency High

Limit

Used to select a maximum frequency limit corresponding to the highest frequency at which the motor is to run. This determines the maximum operating speed of the motor by setting the high limit of the VLT 4000 VT output frequency.

Programmable from the output frequency low limit to 120 Hz. (This function corresponds to parameter 202 in the programming menu.)

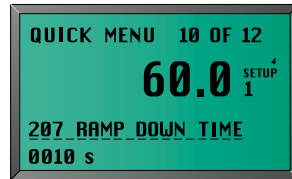
Parameter 9 of 12



Ramp-Up Time

The ramp-up time is the acceleration time from 0 Hz to the rated motor frequency $f_{M,N}$ (parameter 4 of 12) is programmable from 1 to 3,600 sec. (This function corresponds to parameter 206 in the programming menu.)

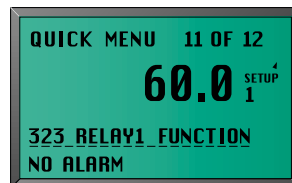
Parameter 10 of 13



Ramp-Down Time

The ramp-down time is the deceleration time from the rated motor frequency $f_{M,N}$ (parameter 4 of 12) to 0 Hz. Is programmable from 1 to 3,600 sec. (This function corresponds to parameter 207 in the programming menu.)

Parameter 11 of 12



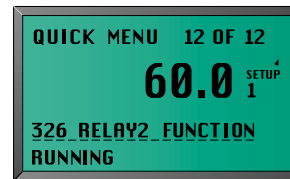
Relay 1 Output

Relay 1 output can be used for indicating status and warnings. The relay is activated when the conditions for the relevant data values have been fulfilled. Thirty different data values are available to choose from for indication of unit and/or application installation data.

Relay 1: Form C

Max 240 VAC, 2 A

(This function corresponds to parameter 323 in the programming menu.)



Parameter 12 of 12

Relay 2 Output

Relay 2 output can be used for indicating status and warnings. The relay is activated when the conditions for the relevant data values have been fulfilled. Thirty different data values are available to choose from for indication of unit and/or application installation data.

Relay 2: Form A

Max 50 VAC, 1 A, 60 VA

Max 75 VDC, 1 A, 30 W

(This function corresponds to parameter 326 in the programming menu.)

VLT 4000 VT Engineering Data – Programming



Selecting a unit for the 4 displays are programmed as follows:

Variable 1.1 = parameter 008
Variable 1.2 = parameter 009
Variable 1.3 = parameter 010
Variable 2 = parameter 007

Read-Out State I:



The display type shown is the default after starting up or re-initialization.

Line 2 gives the data value of an operating variable with related unit, and line 1 gives the parameter name of operating variables. In the example above, Reference is selected as variable via parameter 009. During normal operation the variable in line 2 can immediately be changed by using the [+/-] keys.

Line 4 shows that the VLT 4000 VT is in Auto mode with remote reference, and that the motor is running.

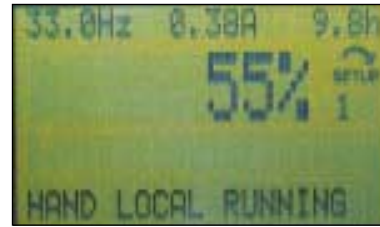
The left part of the status line indicates the location from which the VLT 4000 VT is being controlled.

AUTO means that control is via the control terminals, while HAND indicates that control is via the local keys on the control unit. OFF means that the VLT ignores all control commands and stops the motor.

The center part of the status line indicates the reference element that is active. REMOTE means that the reference from the control terminals is active, while LOCAL indicates that the reference is determined via the [+/-] keys on the control panel.

The last part of the status line indicates the current status, for example "Running", "Stop", or "Alarm."

Read-Out State II:



To switch between read-out states I and II press the [DISPLAY / STATUS] key.

In this condition, data values for four operating values are shown at the same time, giving the related unit. In the example shown, Frequency, Current, Work Hours and Reference are selected as variables in the first and second lines.

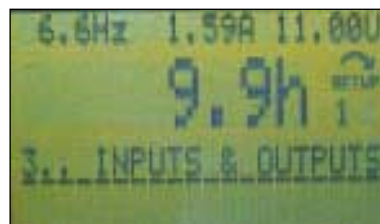
Read-Out State III:



This display is engaged as long as the [DISPLAY / STATUS] key is held in for 1 second or longer. When the key is released, it will shift back to read-out state II.

This display provides identification of the units programmed as the operation variables in the 1st line, the display in the 2nd line does not.

Menu Mode



The Menu mode is started by pressing the [MENU] key, which produces the following read-out on the display:

The 3rd line on the display shows the parameter group number and name.



Changing Parameter Values



Regardless of whether a parameter has been selected under the Quick menu or the Menu mode, the procedure for changing its value is the same.

Pressing the [CHANGE DATA] key gives access to the selected parameter's value, the value will appear on the 4th line of the display. The procedure for changing data depends on whether the selected parameter represents a numerical data value or a text value.

Changing a Text Value

If the selected parameter is a text value, it is changed by means of the [+/-] keys.

The bottom display line shows the text value that will be entered (stored) when acknowledgment is given using the [OK] key.

Changing a Data Value

There are parameters that provide a set of fixed data values to be chosen, such as .37, .55 or .75kW. These cannot be individually modified, as they are part of the software's data base. Other parameters provide data values that can be set within a range (i.e. 0-120Hz) and fine-tuned by the user.

Changing Fixed Numeric Data Values

If the chosen parameter represents a numeric data value, it is changed by means of the [+/-] keys.

The chosen data value is indicated by the digit flashing.

The bottom display line shows the data value that will be entered (saved) when signing off with the [OK] key.

Changing Variable Numeric Data Values

If the chosen parameter represents a numeric data value, that is programmable within a range, a blinking cursor will appear on a digit. The cursor can be moved on the display by means of the [< >] keys. Selecting a digit to the left allows for faster programming when a larger change is desired. Fine-tuning is easier using digits farther to the left on the data value. When the cursor is in place, the digit's value is changed by using the [+/-] keys.

The bottom display line shows the data value that will be entered (saved) when signing off with [OK] key.

Manual Initialization

Disconnect from AC line and hold the "Display/Status", "Change Data" and "OK" keys down while at the same time reconnecting the AC line. Release the keys; the VLT 4000 VT has now been programmed for the factory setting.

The following parameters are not zeroed by means of manual initialization:

Parameter	
600	Operating hours
601	Running hours
602	kWh counter
603	Number of power ups
604	Number of overtemperatures
605	Number of overvoltages

The nameplate data in parameters 621-631 is also not affected by manual initialization.