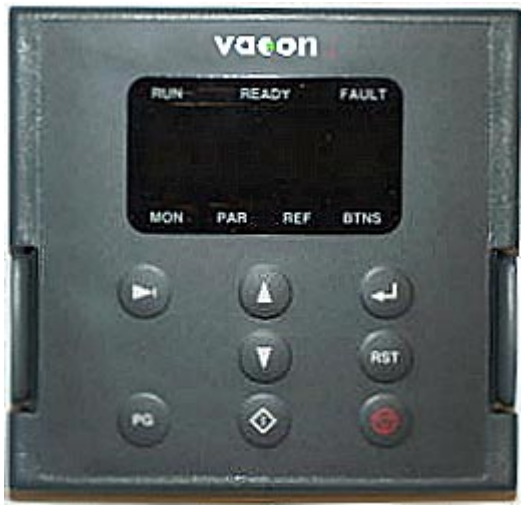
VACON

CX/CXL/CXS

FREQUENCY CONVERTERS



7-segment Control Panel

Subject to changes without notice.

FOR SMOOTH CONTROL



vacon

VACON 7-SEGMENT CONTROL PANEL

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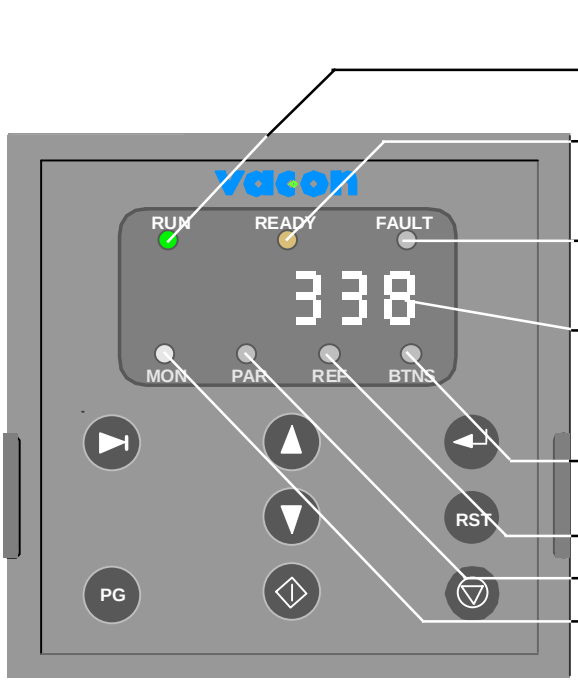
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1. GENERAL

The 7-segment control panel of the Vacon frequency converter has a six-digit LED display, three drive status indicators, four active menu page indicators and eight push-buttons.

The panel is removable and it has full galvanic isolation from the mains potential. The same panel can be used with all Vacon frequency converters.

In other questions and problems with Vacon CX/CXL/CXS frequency converter, please refer to the CX/CXLCXS User's Manual or the Five In One+ Application Manual



DRIVE STATUS INDICATORS

RUN = lights when the motor is running

READY = lights when mains voltage has been applied and the drive is ready to operate

FAULT = lights if fault occurs

DISPLAY — Displays parameter values, monitoring data, etc., six digits

ACTIVE MENU PAGE INDICATORS

BTNS = Programmable push-button (menu page)

REF = Reference values (menu page)

PAR = Parameters (menu page)

MON = Monitoring values (menu page)

(none) = Fault history (menu page)

Figure 1. Control panel with LED display.

PUSH-BUTTONS

= *Tab button:*
Toggles between display item indication and item data

= *Arrow up/down buttons:*
Changes item or data value

= *Enter button:*
Confirms the parameter value setting. Acts as push-button on the programmable push-button page. On the PAR-page the parameter number on the display will be changed into a higher parameter group.

= *Reset button:*
Resets faults

= *Page button:*
Changes active menu page

= *Start button:*
Starts the motor if the panel is the active control source

= *Stop button:*
Stops the motor if the panel is the active control source

2. Panel Operation

The panel operation is clear and it is organised in page type menus. There are different menu pages for monitoring, parameter settings, references, programmable push-button functions and fault history.

The active menu page LED as well as the leftmost character in the six digit read-out indicate which one of the pages is active. See the panel menu chart below.

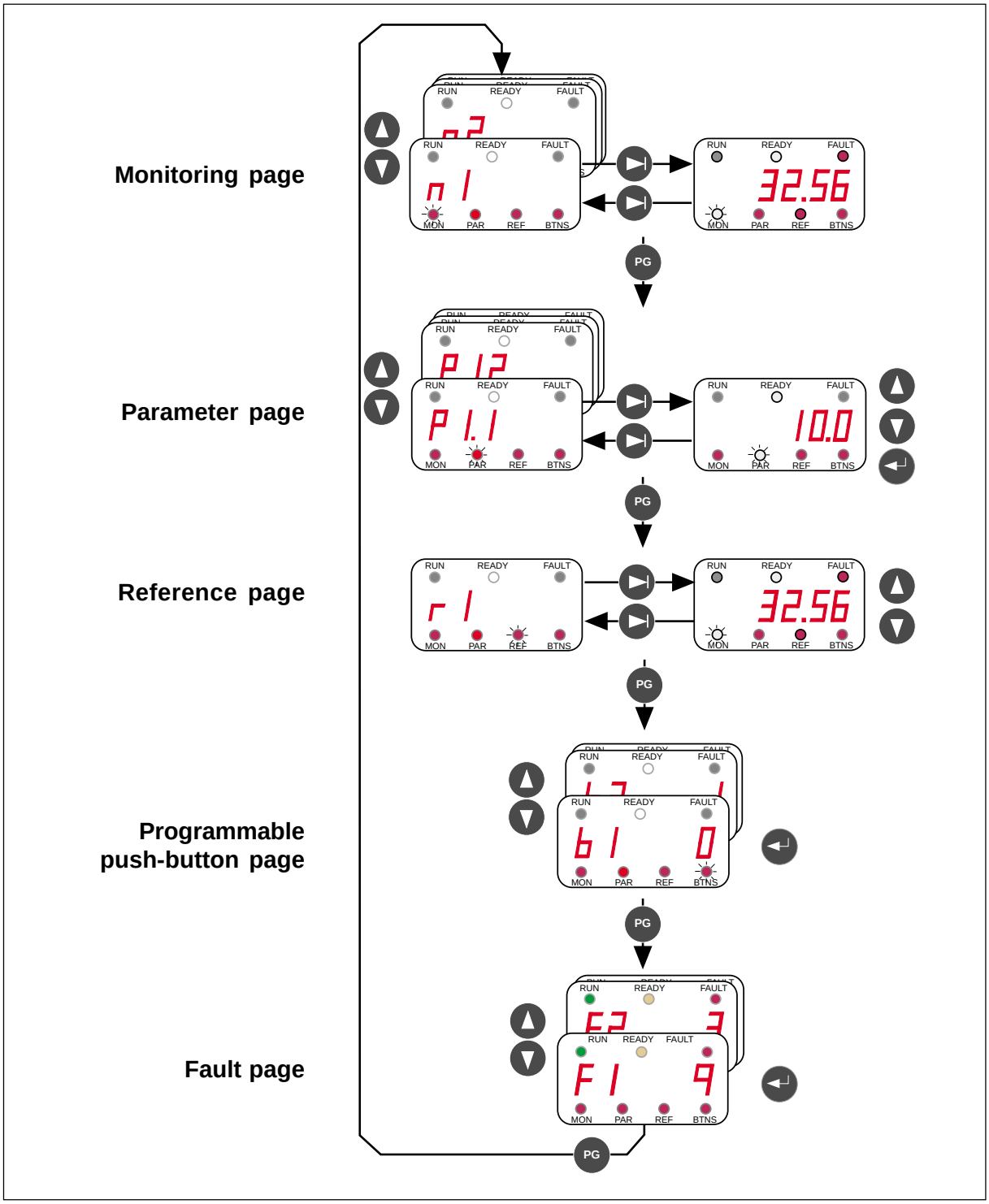


Figure 2. Panel operation.

7.3 Monitoring page

The MON indicator is lit when the monitoring page is active. In the item display the symbol for monitoring is "n" and the next digit is the item number. Figure 3. shows how monitored data values can be selected for display with the tab push-button.

Table 1. lists all the possible monitored items. All values are updated every 200 ms.

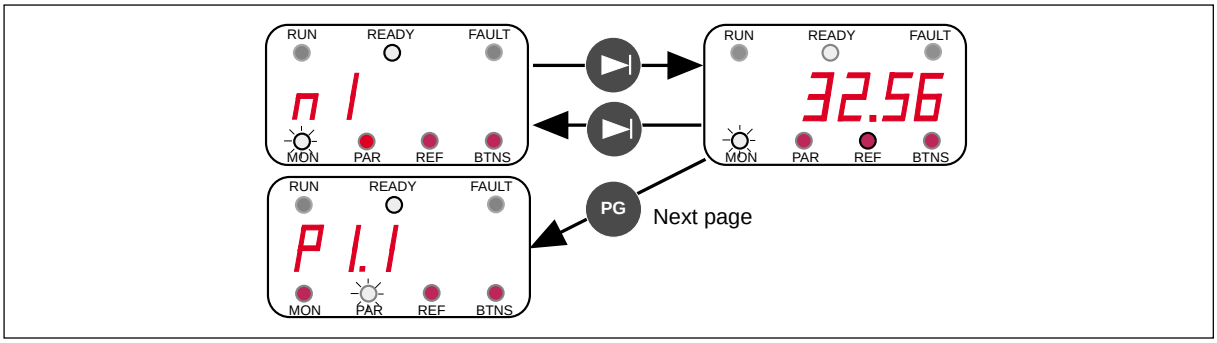


Figure 3. Monitoring page.

Number	Data name	Unit	Description
n 1	Output frequency	Hz	Frequency to the motor
n 2	Motor speed	rpm	Calculated motor speed
n 3	Motor current	A	Measured motor current
n 4	Motor torque	%	Calculated actual torque/nominal torque of the unit
n 5	Motor power	%	Calculated actual power/nominal power of the unit
n 6	Motor voltage	V	Calculated motor voltage
n 7	DC-link voltage	V	Measured DC-link voltage
n 8	Temperature	°C	Temperature of the heat sink
n 9	Operating day counter	DD.dd	Operating days 1), not resettable
n 10	Operating hours, "trip counter"	HH.hh	Operating hours 2), can be reset with program-mable button #3
n 11	MW-hours	MWh	Total MW-hours, not resetable
n 12	MW-hours, "trip counter"	MWh	MW-hours, can be reset with programmable button #4
n 13	Voltage/analogue input	V	Voltage of the terminal U_{in}+ (term. #2)
n 14	Current/analogue input	mA	Current of terminals I_{in}+ and I_{in}- (term. #4, #5)
n 15	Digital input status, gr. A		See Figure 4.
n 16	Digital input status, gr. B		See Figure 5.
n 17	Digital and relay output status		See Figure 6.
n 18	Control program		Version number of the control software
n 19	Unit nominal power	kW	Shows the power size of the unit
n 20	Motor temperature rise	%	100%= temperature of motor has risen to nominal value

Table 1. Monitored items.

1) DD = full days, dd = decimal part of a day
2) HH = full hours, hh = decimal part of an hour

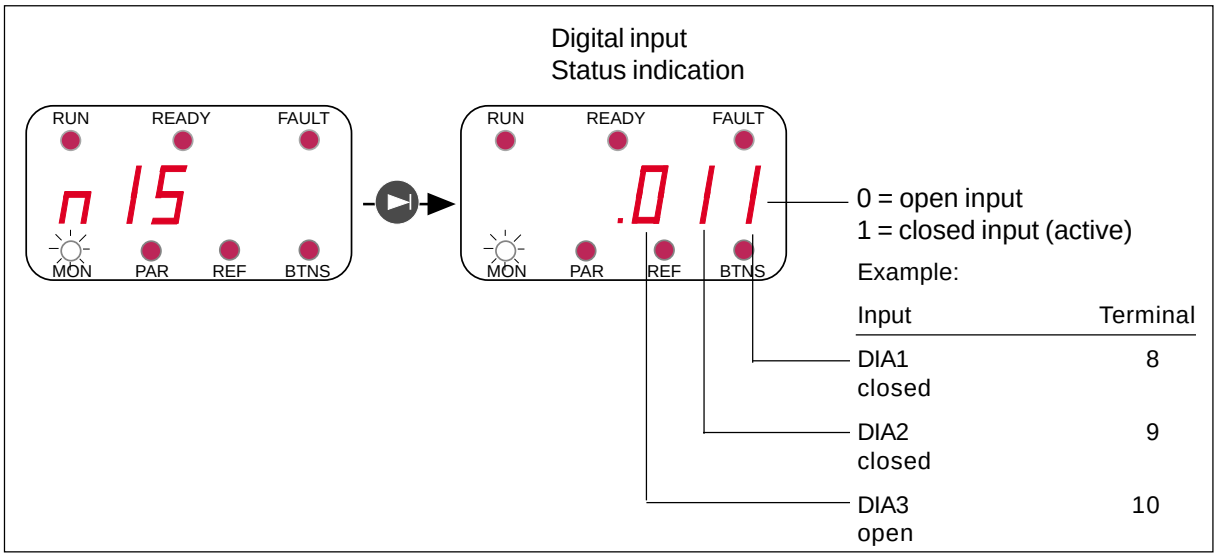


Figure 4. Digital inputs, Group A status.

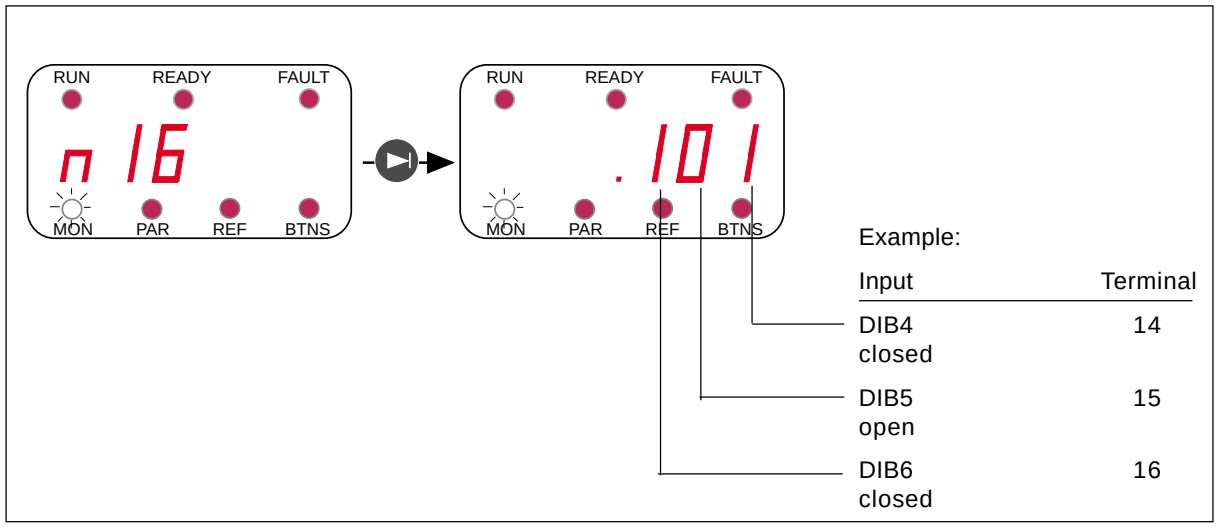


Figure 5. Digital inputs, Group B status.

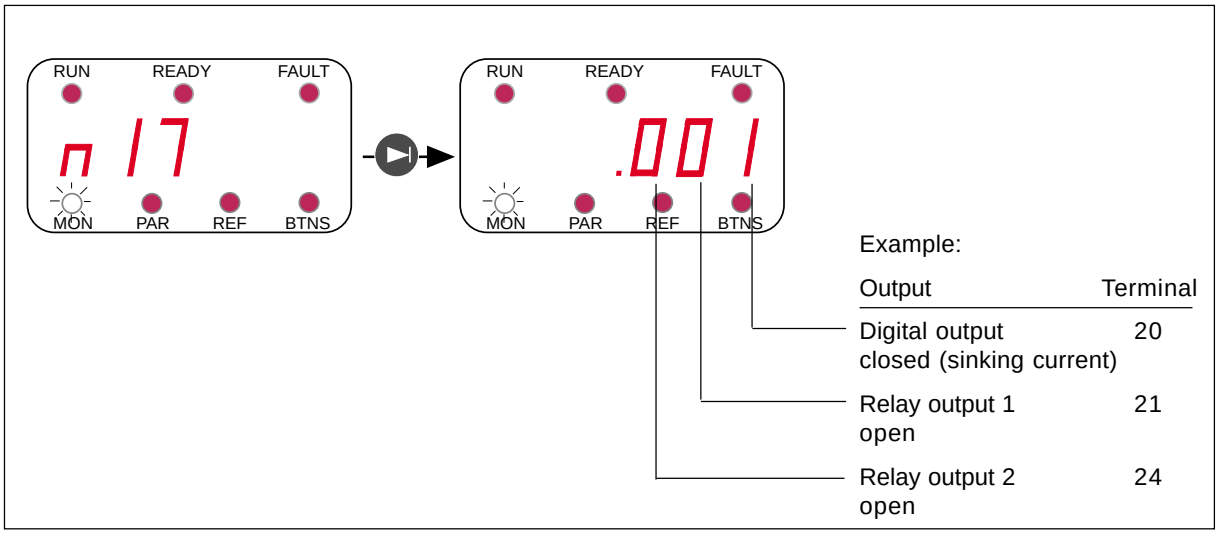


Figure 6. Output signal status.

4. Parameter page

The PAR indicator is lit when the Parameter page is active. Figure 7. shows how the parameter values can be changed.

The enter button confirms the change of the parameter value. When the new value is confirmed the PAR indicator blinks once.

If the enter button is not pressed the parameter value will not be changed.

In the Basic application (default setting) there is only parameter Group 1 which has all necessary parameters for the basic use of the device and System parameter Group 0. Group 0 becomes visible only when the Application package lock is opened. See Vacon CX/CXL/CXS User's Manual Chapter 11.

Other applications have more parameter groups. Parameters of the groups follow each other and changing from the last parameter of one group to the first parameter of the next group or vice versa is done simply by pushing arrow up/arrow down buttons. Alternatively, pressing selects the next group.

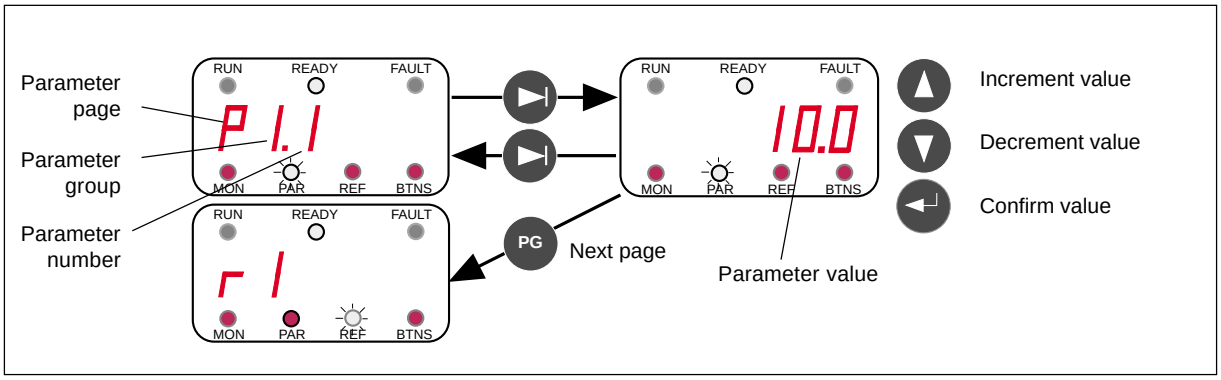


Figure 7. Parameter page.

5. Reference page

The reference page is active when the REF indicator is lit.

If the Control panel is the active control source, the frequency reference can be changed by changing the value on the display with arrow up/arrow down push-buttons, see Figure 8.

The reference change is valid immediately. The motor speed changes as fast as the reference is changing or the load inertia allows the motor to accelerate/decelerate.

The active control source can be selected with programmable button 2, see Chapter 6.

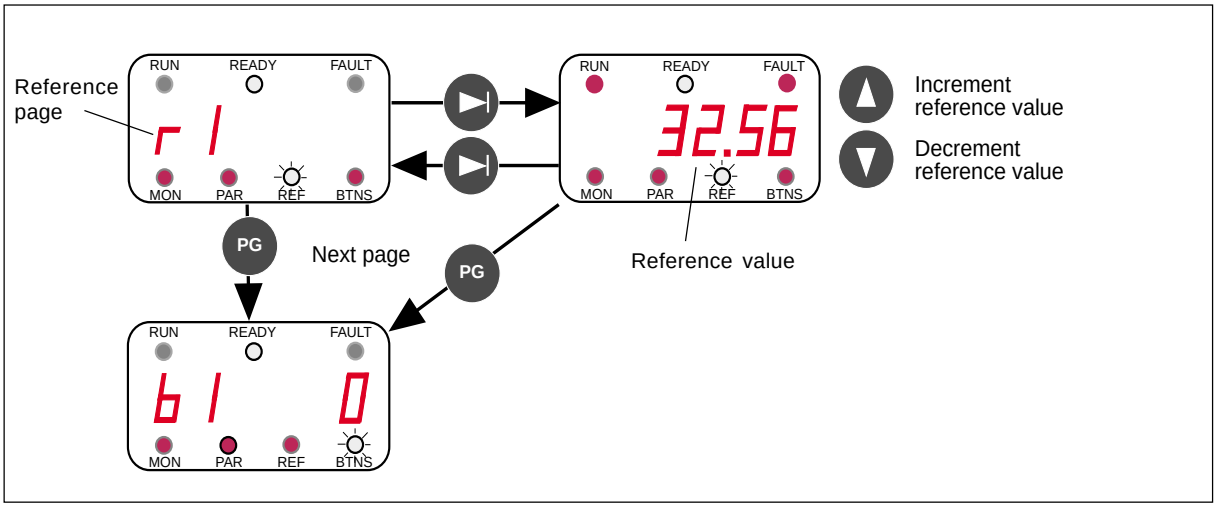


Figure 8. Control panel reference value setting.

6. Programmable push-button page

The BTNS indicator is lit when the programmable push button page is active. The function of the enter button can be selected on this page. The selected function is valid only on this page and on other pages the enter button has it's original function. The feedback information tells the state of the button function. When the button is pressed, the feedback information is shown small.

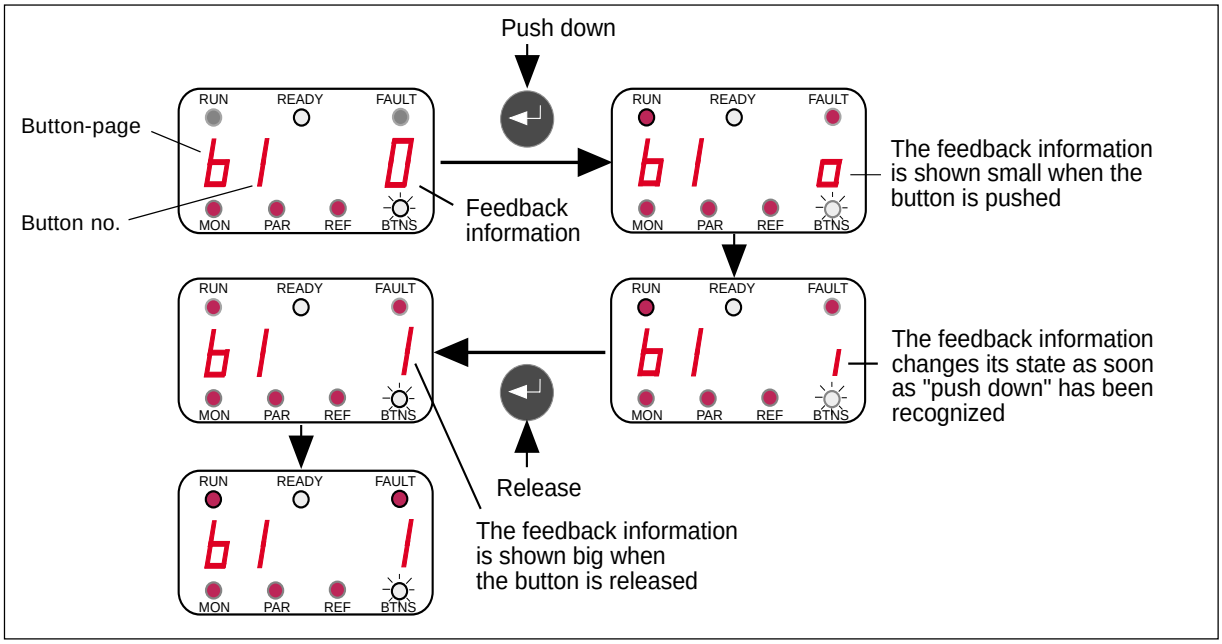


Figure 9. Programmable push button page.

Button number	Button name	Function	Feedback information		
			0	1	Note
b 1	Reverse	Changes the direction of rotation of the motor . Active only if the panel is the active control source	Direction command forward	Direction command reverse	Feedback information flashes as long as direction is different from the command
b 2	Active control source	Selects the active control source between the panel and I/O terminals	Control via I/O terminals	Control from the Control Panel	
b 3	Clear trip operating hour counter	When pressed clears the trip operating hour counter	No clearing	Clearing accepted	
b 4	Clear trip MWh counter	When pressed clears the MWh trip counter	No clearing	Clearing accepted	

Table 2. Programmable push-buttons.

7. Fault history page

When none of the indicators is lit, the fault history page is active, see Figure 10. The Vacon frequency converter stores maximum 9 faults in the order they appear. The latest fault has always number 1, the previous 2 and so on. If 9 faults are in the memory, the next coming fault erases the oldest fault record from the memory.

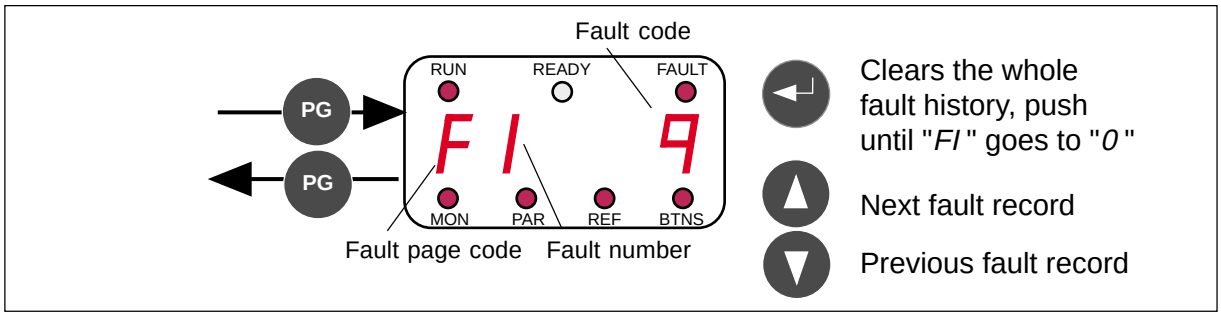


Figure 10. Fault history page.

8. Active fault display

When a fault trip occurs, the fault indicator is lit and the blinking symbol ***F*** appears on the display together with a blinking fault code. The fault codes are explained in Chapter 9 of the Vacon CX/CXLCXS User's Manual.

The display can be cleared with the Page button (PG). The read-out returns to the same display it had before the trip.

The fault remains active until it is cleared with the Reset button (RST) or with the reset signal from the I/O terminal.
See figure 11.

Note! Remove external Start signal before resetting a fault.

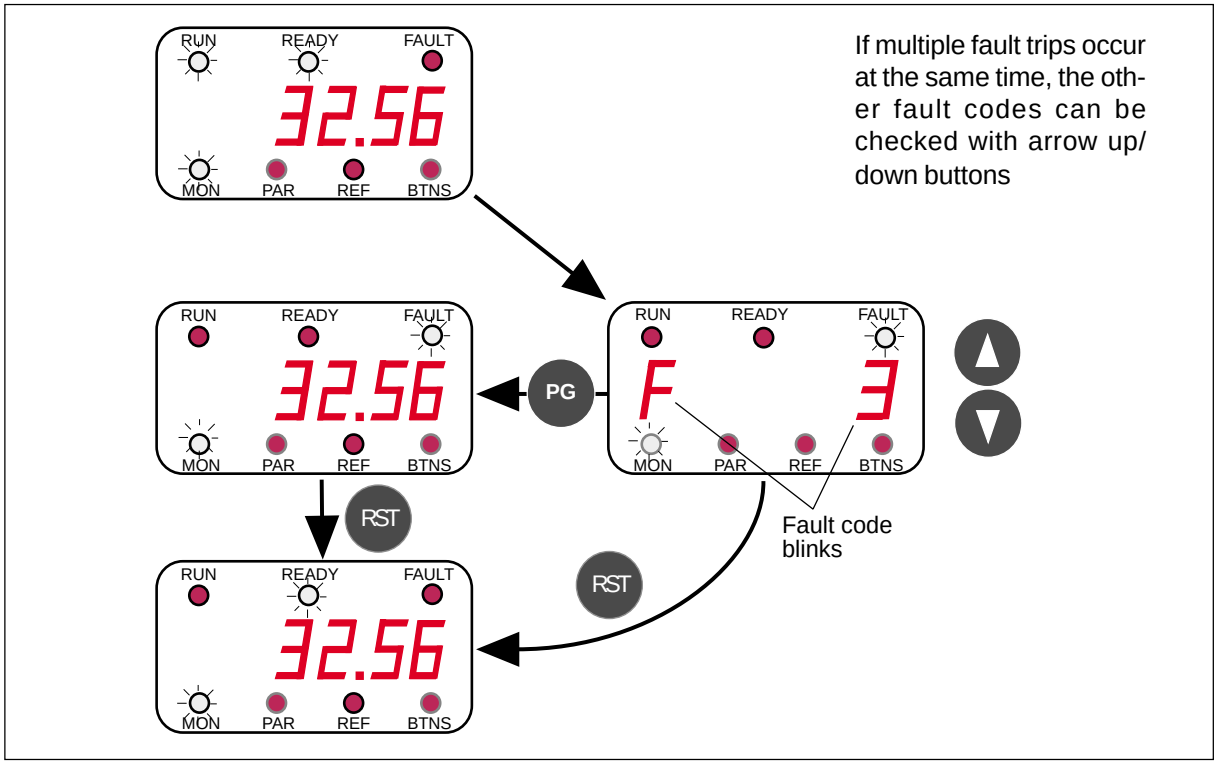


Figure 11. Active fault display.

9. Active warning display

When a warning occurs a symbol "***A***" appears on the display together with a blinking warning code. See Figure 12. Warning codes are explained in Table 3.

The display can be cleared with the PG (Page) button and the display returns to the state before the warning* appeared. If the cause of the warning stays active, a new warning is not given for 1 minute.

** The warning will be automatically cleared after 1 minute.*

Warning codes:

Code	Warning	Checking
A 15	Motor stalled (Motor stall protection)	Check motor
A 16	Motor over temperature (Motor thermal protection)	Decrease motor loading
A 17	Motor underload (Warning can be activated in "Five in One" applications)	Check motor loading
A 24	The values in the Fault history, MWh-counters or operating day/hour counters might have been changed in a previous mains interruption.	Does not need any actions Take a critical attitude to these values
A 28	The change of an application has failed	Choose the application again and Push Enter-button
A 30	Onbalance current fault, the load of the segments is not equal.	Contact nearest Vacon distributor
A 45	Vacon frequency converter overtemperature warning, temperature >70°C	Check the cooling air flow and the ambient temperature
A 46	Reference warning, the current of input I_{in+} <4 mA (Warning can be activated in "Five in One" applications)	Check the current loop circuitry
A 47	External warning (Warning can be activated in "Five in One" applications)	Check the external fault circuit or device

Table 3. Warning codes.

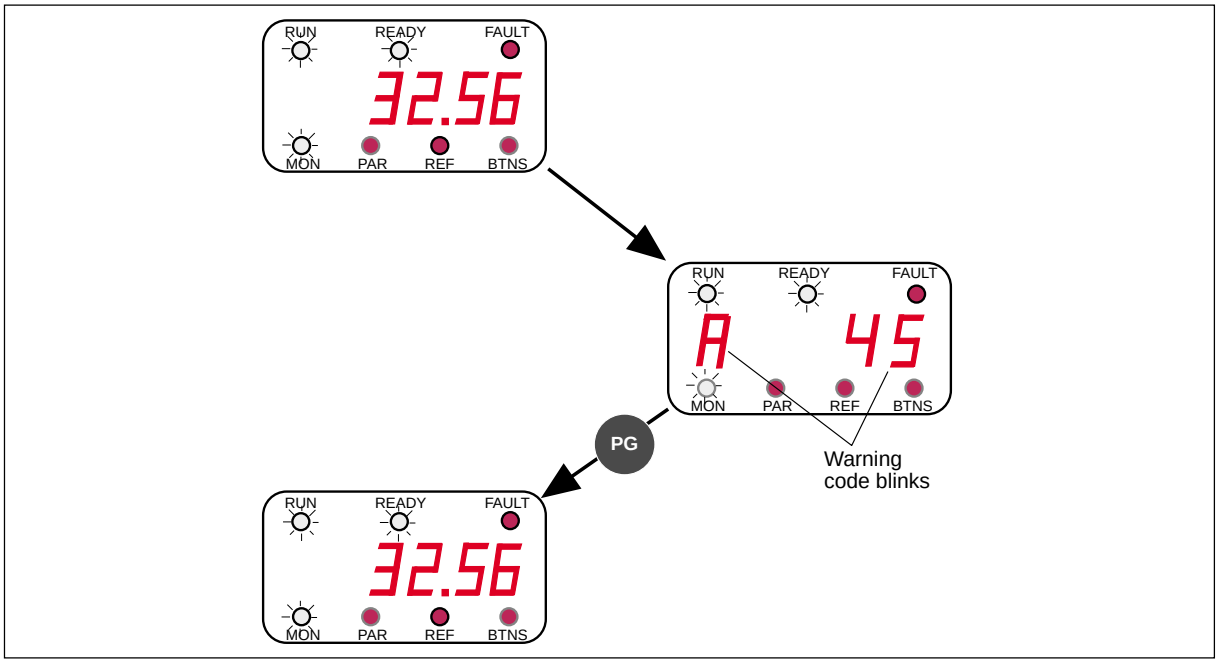


Figure 12. Warning code display.

10. Controlling the motor from the front panel

Vacon CX/CXL/CXS can have controls from the I/O terminals or from the front panel. The active control source can be changed with the programmable push button b2 (see Chapter 6.). The motor can be started, stopped and direction of rotation can be changed from the active control source.

10.1 Control source change from I/O terminals to front panel

After changing the control source the motor is stopped. The direction of rotation remains the same as with I/O control.

If the Start button is pushed at the same time as the programmable push button b2, the Run-state, direction of rotation and reference value will be copied from the I/O terminals to the front panel.

10.2 Control source change from panel to I/O terminals

After changing the control source, the I/O terminals determine the run-state, direction of rotation and reference value.

If motor potentiometer is used in the application, the panel reference value can be copied for a value of motor potentiometer reference by pushing the start button at the same time as the programmable push button b2. Motor potentiometer function mode must be "resetting at stop state" (Local/Remote Application: param. 1**.** 5 =4, Multi-purpose Application : param. 1**.** 5 = 9).

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