

# Inverter



 **ETATRON**

**UK** OPERATING INSTRUCTIONS AND MAINTENANCE

# 1 DISPLAY

The graphic display panel mounted on the inverter allows parameter display and management of the metering pump.

## GRAPHIC DISPLAY PANEL



The inverter version with a graphic display panel appears as shown in the picture opposite, with the display already connected to the inverter via the single cable (right). The inverter is already programmed for start-up and speed adjustment directly from the panel. Use of the keypad to navigate the parameter menu is as follows:



Press **RUN** to start/pause device. When restarting after each shutdown, the device will be in the last state it was left in (manual or automatic mode, in RUN or STOP). Instead of pressing **RUN**, functions can also be operated by external control. See chapter 6 for connection



Pressing the **MAN** key switches to manual control, which allows the flow rate value (l/h) to be set with the two arrows.



Press and hold **PAR** to access the parameter menu: Display Menu, Setup Menu, User Menu, Clock Menu and Chrono Menu. If no button is pressed, the system returns to the operational display after 25 seconds from the settings menu and after 45 seconds from the parameter menu.



The **SEL** key to confirm parameter changes and to change numeric field during settings.



The arrow keys change values within the various parameters and can initiate the PRIMING function.

## 2 DISPLAY MENU

To choose the type of display, press the **PAR** key, DISPLAY MENU will appear. Use the **UP**, **DOWN** arrow keys to choose the value of the display type. Press **SEL** to select the chosen display.

### D001 – HOMEPAGE (default)

Time set	12:30	50.0°C	IGBT module temperature
	Q 3.5 l/h		
% analogue input	71%		Output power scale

This is the display we suggest for metering in both manual and automatic modes (proportional to a 4-20mA signal). To activate manual metering, with the system stopped (RUN LED off) pressing the **MAN** key (MAN LED on) enters manual mode and, using the arrow keys, the maximum flow rate value can be changed. Pressing the **RUN** button (RUN and MAN LEDs lit) will switch the pump on in manual mode, switching it off when the **RUN** button is pressed (RUN LED off).

In automatic mode (MAN LED off) the pump will only dose in the presence of the external 4-20mA signal:

### D002 – METERING UNIT

Time remaining	00:00:00	L	Units of measurement
	 0001.00		
Pump flow rate	5.00 L/h		Output power scale

With this display, manual metering can be carried out by programming the quantity to be dosed. When the system is stopped (RUN and MAN LEDs off), pressing the **MAN** key allows you to set the amount of liquid to be dosed in litres (L). With the arrow keys (**UP**, **DOWN**) I change the value, with the **SEL** key I confirm and move to the next numeric field. Pressing the **RUN** key starts metering (RUN LED and MAN lit). The display shows the remaining time to complete metering, depending on the max. flow rate set (Setup Menu S001), the remaining quantity to be dosed and the pump flow rate.

Also in this case, if the analogue signal is active (e.g. 4-20 mA), the pump will dose directly in proportion to the external signal.

### D100 – NUMBER OF ERRORS STORED

Output frequency	42.4Hz	1272rpm	Motor rpm
	ERR. 209		
RMS motor current	1.80A	0.08pf	Power factor (cos φ)

### D101 – D105 – LAST FIVE ERRORS OCCURRED

The codes of the last 5 errors occurred will be displayed in these menus, D101 to D105. Please refer to the chapter “Diagnostics and troubleshooting” for further details.

### D140-D141- SETUP MENU PASSWORD

It is a 4-digit numerical password and, once set, enables access to and modification of parameters in the SETUP MENU to be blocked.

Parameter D141 allows the password to be set. Once a password other than 0000 is set, access to the settings menu is blocked. To be able to access and change parameters, the password must be entered in D140. If the password is set, the display of parameter D141 is protected until the password is entered again on D140.

If the display is password-protected and unlocked, access to the setup menu will be automatically locked again one minute after the keys have remained idle.

To remove the password, simply reset parameter D141 to 0000.

### D150-D151- USER MENU PASSWORD

Same principle as D140-D141, with the difference that this password blocks access and modification to the user setup menu. The same rules as those written for parameters D140-D141 apply.

### D199 – SERIAL NUMBER DISPLAY

This parameter allows the serial number entered in parameter S29 of the setup menu to be displayed.

### D200 – PARTIAL HOUR METER – Hours and tenths of hours

H. meter. P.	
0066.7	

Pressing and holding the **SEL** key for 5 seconds will reset the partial hour meter.

### D201 – TOTAL HOUR METER – Hours and tenths of hours

H. meter. T.	
0566.7	

### D250-D254

Internal Wi-Fi info (Wi-Fi direct)

## 3 SETUP MENU

We recommend the use of this menu only to a skilled user. An error in the setting may jeopardise operation of the pump.

If the **SETUP MENU** password is active, it will not be possible to change the following parameters without **entering the correct password (D140)**.

Press the **PAR** key twice, **SETUP MENU** appears. Use the **UP**, **DOWN** arrow keys to choose the value of the display type. Press **SEL** to select the chosen parameter.

PARAMETER	DESCRIPTION	VALUES	UNIT OF MEASUREMENT	DEFAULT
S001	TOTAL FLOW RATE	2-6000	l/h	<b>2</b>
S002	NUMBER OF PULSES/HOUR	2-60000	-	<b>9367</b>
S003	REDUCTION RATIO	0.10-999	-	<b>1.00</b>
S004	ENABLING PULSE COUNTER MODE	ON-OFF	-	<b>OFF</b>
S005	0-10 Hz SECTION STRAIGHT LINE Q (FLOW RATE) ADJUSTMENT	-20-20	%	<b>0</b>
S006	10-20 Hz SECTION STRAIGHT LINE Q (FLOW RATE) ADJUSTMENT	-20-20	%	<b>0</b>
S007	20-30 Hz SECTION STRAIGHT LINE Q (FLOW RATE) ADJUSTMENT	-20-20	%	<b>0</b>
S008	30-40 Hz SECTION STRAIGHT LINE Q (FLOW RATE) ADJUSTMENT	-20-20	%	<b>0</b>
S009	40-50 Hz SECTION STRAIGHT LINE Q (FLOW RATE) ADJUSTMENT	-20-20	%	<b>0</b>
S010	50-60 Hz SECTION STRAIGHT LINE Q (FLOW RATE) ADJUSTMENT	-20-20	%	<b>0</b>
S011	INPUT 1 CONFIGURATION (8.1)	N.O./N.C.	-	<b>N.O.</b>
S012	INPUT 2 CONFIGURATION (8.2)	N.O./N.C.	-	<b>N.O.</b>
S013	INPUT 3 CONFIGURATION (8.3)	N.O./N.C.	-	<b>N.O.</b>
S014	INPUT 4 CONFIGURATION (8.4)	N.O./N.C.	-	<b>N.O.</b>
S015	BEHAVIOUR IN THE EVENT OF ERROR ON IN.3	STOP/RESTART	-	<b>RESTART</b>
S016	BEHAVIOUR IN THE EVENT OF ERROR ON IN.4	STOP/RESTART	-	<b>RESTART</b>
S017	ERROR IN CASE OF SENSOR FAILURE	ON/OFF	-	<b>ON</b>
S018	DISPLAY PARAMETER SHOWN AT SWITCH-ON	1-202	-	<b>1</b>
S019	MAXIMUM MOTOR INVERTER TEMPERATURE	45-80	-	<b>80</b>
S020	UNIT OF MEASUREMENT	°C,L/h or °F, gal/h	-	<b>°C,L/h</b>
S021	METER MODE	Up/Down	-	<b>Down</b>
S022	ANALOGUE INPUT CONFIGURATION	4-20mA or 0-10V	-	<b>4-20mA</b>
S023	MAXIMUM FREQUENCY	25-60	Hz	<b>60</b>
S024	ACCELERATION RAMP	0.5-60	s	<b>1</b>
S025	DECELERATION RAMP	0.5-60	s	<b>0.35</b>
S026	PWM MODULATION FREQUENCY	2.5-5-7.5-10-12.5-15	kHz	<b>5</b>
S027	MAXIMUM CURRENT (I)	0-8	A	<b>8</b>
S028	RESET ERRORS	Skip/Reset	-	<b>Skip</b>
S029	SERIAL NUMBER SETTING	-	-	-
S030	MOTOR VOLTAGE	90-230	V	<b>230</b>
S031	ENABLE CONSTANT MOTOR VOLTAGE	Enabled/Disabled	-	<b>Disabled</b>
S032	RESERVED FOR FUTURE APPLICATIONS	-	-	-
S033	RESERVED FOR FUTURE APPLICATIONS	-	-	-
S099	RESET TO DEFAULT VALUES	43	-	<b>43</b>

### 3.1 DETAILED DESCRIPTION OF REGISTERS

**S001 – TOTAL FLOW RATE** – Allows the flow rate to be changed according to the pump connected. Changing this parameter allows the times to be displayed correctly.

**S002 – S003 – S004 – PULSE MODE** – The pulse mode that can be used in metering unit mode can be enabled and changed by editing these parameters. For further information, see the operating modes chapter.

**S005 - 0-10 Hz SECTION STRAIGHT LINE Q (FLOW RATE) ADJUSTMENT** - By modifying this parameter, it is possible to change the flow rate values depending on the frequency for the range of the Q straight line from 0%-10%.

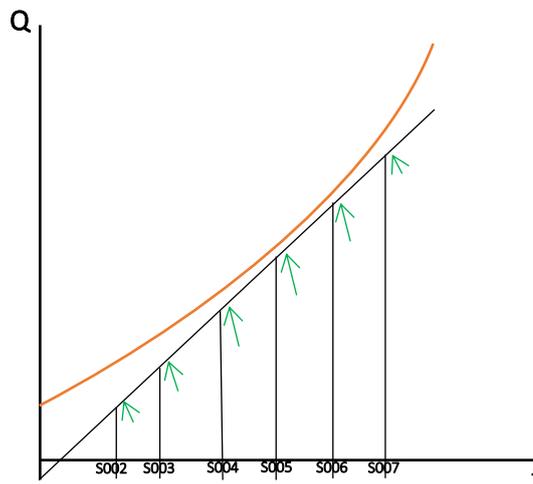
**S006 - 10-20 Hz SECTION STRAIGHT LINE Q (FLOW RATE) ADJUSTMENT** - By modifying this parameter, it is possible to change the flow rate values depending on the frequency for the range of the Q straight line from 11%-20%.

**S007 - 20-30 Hz SECTION STRAIGHT LINE Q (FLOW RATE) ADJUSTMENT** - By modifying this parameter, it is possible to change the flow rate values depending on the frequency for the range of the Q straight line from 21%-40%.

**S008 - 30-40 Hz SECTION STRAIGHT LINE Q (FLOW RATE) ADJUSTMENT** - By modifying this parameter, it is possible to change the flow rate values depending on the frequency for the range of the Q straight line from 41%-60%.

**S009 - ADJUSTMENT OF 40-50 STRAIGHT LINE Q (FLOW RATE)** - By modifying this parameter, it is possible to change the flow rate values as a function of frequency for the range of the Q straight line from 61%-80%.

**S0010 - ADJUSTMENT OF 50-60 STRAIGHT LINE Q (FLOW RATE)** - By modifying this parameter, it is possible to change the flow rate values depending on the frequency for the range of the Q straight line from 81%-100%.



**S015 – S016 – BEHAVIOUR IN THE EVENT OF ERROR ON INPUTS 3 AND 4** – They allow to choose what to have the system do in case an error occurs on either input. With RESTART the system will restart automatically once normal operation has been restored, with STOP the system will stand still until manually restarted.

**S017 – ERROR IN CASE OF SENSOR FAILURE** – If enabled, the system enters an error if it detects that the sensor is missing. If disabled, the system continues to function correctly even without the presence of the latter.

**S021 – METER MODE** – Enables to choose how the system displays the count: as a countdown, starting from the set parameter and reaching zero, or as a pure countdown, starting from zero and reaching the set parameter.

**S024-ACCELERATION RAMP** - Time required to accelerate from 0 to 50 Hz. The total acceleration time of the motor will depend on the speed jump being made (e.g. if the maximum frequency set is 100 Hz, the value “5” set in this parameter will result in an acceleration time of 10 seconds when going from 0 to 100Hz). The following formula is useful for calculating ramps:

$$x = \frac{t^*}{f^*} \cdot 50$$

Where x is the value to be set in S009, t\* is the desired acceleration time in seconds and f\* is the desired frequency to be achieved by the motor-inverter.

Caution: excessively short ramps may lead to tripping of the overcurrent protection during acceleration and overvoltage during deceleration.

Below 1.00 s, it varies in steps of 0.05 s.

**S025 - DECELERATION RAMP** - Time required to decelerate from 50 to 0 Hz. The same principle applies as for acceleration.

**S099 – RESET DEFAULT VALUES** – S099 = 43 resets set-up parameter values to their default values given in the table above.

**S030 – S031 – CONSTANT MOTOR VOLTAGE** – By setting S031 = ENABLED, the inverter will provide a constant voltage to the motor regardless of the value of the power supply input (within the inverter's operating range). Parameter S030 is used to set the voltage to be supplied to the motor.

This function is useful in all applications where the input power supply may vary over time or in the case of power distribution systems other than the European 230/400V standard (such as 120/240V).

## 4 USER SETUP MENU

**If the USER MENU SETUP password is active, it will not be possible to change the following parameters without entering the correct password.**

Press the **PAR** key until USER SETUP MENU appears. Use the **UP, DOWN** arrow keys to choose the value of the display type. Press **SEL** to select the chosen parameter.

In this menu, less sensitive settings for the correct operation of the system can be changed. All these parameters can also be configured via the SETUP MENU. Changing one of these parameters will also automatically change the equivalent parameter in the SETUP MENU and vice versa.

PARAMETER	DESCRIPTION	VALUES	UNIT OF MEASUREMENT	DEFAULT
SU001	INPUT 1 CONFIGURATION (8.1)	N.O./N.C.	-	N.O.
SU002	INPUT 2 CONFIGURATION (8.2)	N.O./N.C.	-	N.O.
SU003	INPUT 3 CONFIGURATION (8.3)	N.O./N.C.	-	N.O.
SU004	INPUT 4 CONFIGURATION (8.4)	N.O./N.C.	-	N.O.
SU005	BEHAVIOUR IN THE EVENT OF ERROR ON IN.3	STOP/RESTART	-	RESTART
SU006	BEHAVIOUR IN THE EVENT OF ERROR ON IN.4	STOP/RESTART	-	RESTART
SU007	ERROR IN CASE OF SENSOR FAILURE	ON/OFF	-	OFF
SU008	PARAMETER D DISPLAYED AT SWITCH-ON	1-202	-	4
SU009	UNIT OF MEASUREMENT	°C, L/h or °F, gal/h	-	°C,L/h
SU010	METER MODE	UP/DOWN	-	DOWN
SU011	ANALOGUE INPUT CONFIGURATION	4-20mA or 0-10V	-	4-20mA
SU012	OUTPUT 1 FUNCTION	Modbus	-	Disabled
SU013	ON-TIME OUTPUT 1		SEC	0
SU014	OFF-TIME OUTPUT 1		SEC	0
SU015	RESERVED FOR FUTURE APPLICATIONS	-	-	-
SU016	RESERVED FOR FUTURE APPLICATIONS	-	-	-

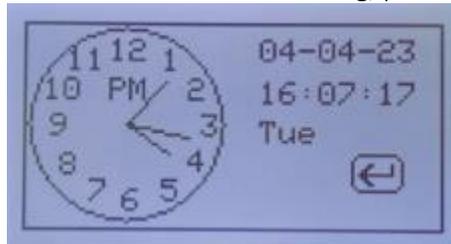
**SU012 – OUTPUT 1 FUNCTION** – Enables activation of output 1 according to the setting provided. The parameters that can be set are as follows:

DESCRIPTION	VALUE	MEANING	
OUTPUT 1 FUNCTION	Disabled	Output not enabled	For skilled users only
	Ready	Ready (power supply OK, no alarm)	
	Run	Run (run in progress)	
	Stop	Stop (stop in progress)	
	Run Reverse	Reverse (reverse run)	
	Ramp Down	Deceleration ramp in progress	
	Ramp up	Acceleration ramp in progress	
	Steady	End of acceleration ramp	
	Alarm	Alarm in progress (also “external fault” if progr.)	
	No Err	No error in progress	
	Modbus Control	Under remote control via RS485	
	Run FWD	Forward (run forward)	
	T. Inverter	Module temperature	
	Dig. In 5	Input 5	
Dig. In 6	Input 6		
Pulse	Pulse		

## 5 CLOCK MENU

Press the **PAR** key until CLOCK MENU appears.

Enables to set the date and time of the inverter. This is the same timer to which the programming of the CHRONO will refer. The **UP** and **DOWN arrow** keys are used to set values, while the **SEL** key confirms the value and changes the numeric field to be edited. To exit without saving, press the **PAR** key.



## 6 CHRONO MENU

Press the **PAR** key until CHRONO MENU appears. Press **SEL** to enter the Chrono Menu. This menu allows you to set up to 4 times that can be activated simultaneously.

The **UP** and **DOWN arrow** keys are used to **set** the ON and OFF values for each chrono. Confirm the value and move to the various fields. The metering for individual days of the week can be enabled/disabled. By switching **ON**, chrono metering is enabled.



Once the CHRONO function is enabled, the inverter will switch on and off at the set times.

For switching on and off to occur at the desired times, the date and time on the inverter must be set correctly. To do this, check the CLOCK menu.

To start the metering unit in chrono mode, only the **MAN** function must be active (MAN LED on and RUN LED off) and the clock must appear on the left of the display (figure below); if the clock image does not appear, press the **SEL** key to activate the chrono function.

Time set	12:30	50.0°C	IGBT module temperature
		3.5 <sub>l/h</sub>	
% analogue input	0%		Output power scale

## 7 OPERATING MODES

### 7.1 AUTOMATIC MODE

Valid for menus D001 and D002. When entering one of these modes, pressing the **RUN** key will start the system and use the analogue input as a reference to adjust the range.

In D002 (Metering unit), pressing the RUN button will cause the metering unit to manually dose the set quantity (see section 7.4 metering unit mode).

**If one or more TIMES are active, even if in automatic mode, the pump will dose in proportion to the 4-20mA signal value, but only during the time interval when the timer (CHRONO) is ON.**

### 7.2 CHRONO MODE

Valid for menus D001 and D002. With the system stopped (RUN LED off), pressing the **SEL** key allows the start to be set using the timers set in the CHRONO MENU . Flow rate regulation can be managed in both automatic and manual modes.

**If one or more TIMES are active, even if in automatic mode, the pump will dose in proportion to the 4-20mA signal value, but only during the time interval when the timer (CHRONO) is ON.**

### 7.3 PRIMING MODE



To enter this mode, with the system stopped, press the up and down arrow keys simultaneously for more than 5 seconds.

Press the **MAN** key to set the priming time.

Press the **SEL** key to select the digits of minutes and seconds to set the desired time or press the **MAN** key to set the priming frequency, always using SEL to navigate between the digits.

Press **MAN** for the third time to exit settings. To start priming simply press the **RUN** key, while to exit the key to be pressed is **PAR**.

### 7.4 METERING UNIT MODE

This mode is accessed via menu D002. Pressing the **MAN** key accesses the change of the quantity in litres to be dosed. This value can be changed using the up and down arrow keys to adjust the digits and the **SEL** key to move between them. The **RUN** key starts the system.

## 8 CONNECTION DIAGRAMS

### 8.1 DETAILS OF THE OUTPUT/INPUT CONNECTION SECTION

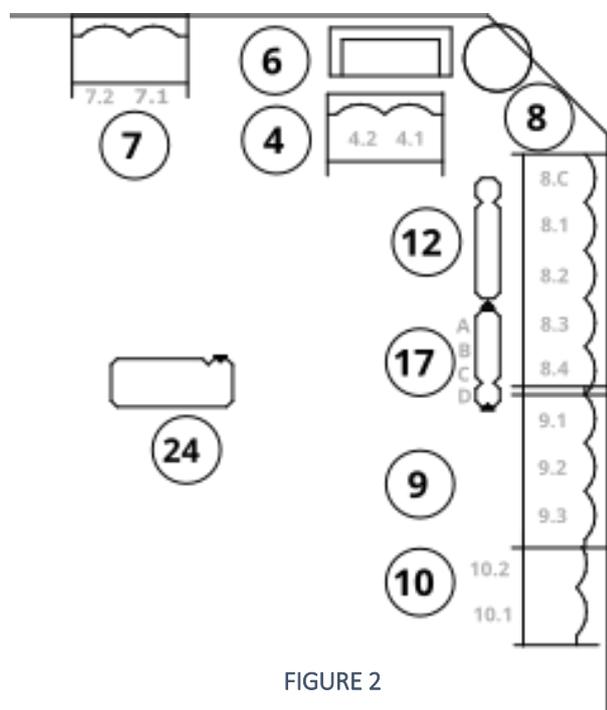


FIGURE 2

FUNCTION OF TERMINALS	
<b>Digital outputs:</b>	
7.1 - 7.2	PROGRAMMABLE RELAY OUTPUT
<b>Digital inputs:</b>	
8.1	NON-BLOCKING FLOAT INPUT 1
8.2	NON-BLOCKING FLOAT INPUT 2
8.3	BLOCKING FLOAT INPUT 1
8.4	BLOCKING FLOAT INPUT 2
8.C	COMMON +15V POSITIVE INPUTS
10.1	ENCODER A/PULSE COUNTER INPUT
10.2	ENCODER B/START BUTTON INPUT
<b>Analogue speed reference:</b>	
17	ANALOGUE INPUT MODE SELECTION.
9.1	GND
9.2	ANALOGUE INPUT
9.3	+10V
<b>RS485 connection:</b>	
4.1	RB-
4.2	RA+



When connecting the relay output to the 230VAC mains supply, wires with a suitable cross-section must be used in compliance with electrical safety regulations. **We recommend the use of cables with a cross-section of at least 0.75 mm<sup>2</sup>.**



The digital (reference 8 in Figure 2) and HSI (reference 10 in Figure 2) inputs are provided with voltage protection. However, it is recommended not to exceed 24VDC in order to prevent any external references used to control the inverter from breaking it. Common 8.C at terminal 8 is capable of supplying 15VDC and is suitable for use as a reference for digital inputs.



Input 4 can be used for RS485 connections. It is therefore recommended to use wires of a suitable cross-section to meet this standard.



The terminal for the analogue speed reference is voltage protected. On contact 9.3 there is a voltage of +10VDC (Max 40mA) which can be used as a positive for the external reference connection. On contact 9.2 it is recommended to use maximum voltages compatible with the 0-20mA and 4-20mA standards. Contact 9.3 is the isolated ground which can be used as a common for reference contacts 8, 9, 10.



**Under no circumstances apply 230VAC mains voltages to terminals 4, 8, 9, 10, 24, otherwise the inverter will break down and the warranty will become invalid.**

## 8.2 QUICK START BUTTON CONNECTION

Referring to FIGURES 1 and 2 in the following manual:

- **Connecting the start button:** 8.C and 10.2

### CONNECTION OF ANALOGUE SPEED REFERENCE

TYPE OF REFERENCE	CONNECTION ON CONNECTOR 9	HARDWARE SETTINGS ON CONNECTOR 17	
Analogue voltage signal		0 - 10 V A = OFF B = OFF C = OFF D = OFF	0 - 5 V A = OFF B = OFF C - D = jumper
Analogue current signal		0 - 20 mA 4 - 20 mA A - B = jumper C - D = jumper	

## 8.6 LEVEL PROBE CONNECTION

The metering unit is equipped with two types of inputs for level sensors:

- Non-blocking: activation of the float causes a warning message on the display but the metering unit continues to operate with the settings provided
- Blocking: activation of the float causes the metering unit to stop and an error message appears on the display.

With reference to FIGURE 2, use the digital inputs marked with number 8. To use non-blocking functions, connect the float between 8.C and 8.1/8.2, and to use blocking functions, connect the float between 8.C and 8.3/8.4.

## 9 DIAGNOSTICS AND TROUBLESHOOTING

### 9.1 DISPLAYING ERRORS AND PROTECTIONS

#### Error codes (stored in parameters D101 to D105)

ERROR CODE	DISPLAY	DESCRIPTION
1	ERR OT	Power module overtemperature
2	ERR OL	Overcurrent
3	ERR EF	"External Fault" (emergency input activation)
4	ERR OV	Overvoltage
5	ERR PF	Motor protection for average $\cos\phi$ greater than 5 times the set value
6	ERR UV	Undervoltage
10	ERR cL	Internal "Communication Line" error
11	ERR cB	Communication timeout on RS485
19	ERR RD	Deceleration ramp error
20	ERR RU	Acceleration ramp error
21	ERR VIPK	Current peak on the motor

Restarting the motor is always subject to the removal of the cause of the error.  
To restart the device, press the **RUN** key (automatic mode).

### 9.2 TRIPPING OF PROTECTIONS

Tripping of any inverter protection causes the motor to stop. The display can be used to view:

- the number of errors per protection occurred;
- the codes of the last five errors.

Appropriate programming of the outputs can enable the signalling to external equipment of the possible presence of errors in progress (or the NON-presence of errors). The programmability of the output function is limited to the error condition only; it is not possible via the digital outputs to obtain information about the type (code) of error that has occurred. The electronic protections in the inverter are as follows:

- **Overtemperature**: triggers when the temperature of the power module exceeds 80°C. When tripped, check that the motor-inverter is installed in an area with sufficient air exchange that can wash the inverter's external enclosure. **Caution**: this protection has no connection with motor temperature. However, excellent thermal motor protection is already achieved by  $\cos\phi$  control (see  $\cos\phi$  protection, explained below).
- **Overcurrent**: trips in the event of an instantaneous overcurrent at the output (at the motor). It can also trip under special working conditions with particularly low supply voltages and high mechanical loads applied to the motor axis.
- **Overvoltage**: trips when the voltage at the ends of the capacitors rises above the maximum permissible value. It is a condition that can occur if abrupt decelerations are carried out with strong inertial loads. In this case, the deceleration time must be increased (parameter S010). It can also occur due to a supply voltage exceeding the inverter's operating limit. In the case of repeated tripping, it must be checked whether the error occurs during motor deceleration, at standstill or at constant speed.
- **$\cos\phi$  protection**: this is the protection related to the actual measurement of the power factor that the inverter makes moment by moment on the motor. The standard parameters on the basis of which the inverter performs the calculation (hidden parameters) allow extremely effective protection of the motor against overheating under all operating conditions. Changing these parameters is not normally recommended in order to solve problems related to the repeated tripping of this protection (which should instead be solved by adding auxiliary ventilation to the motor, otherwise there is a risk of burning out the motor itself). For more details and possible optimisation of protection, please contact our Technical Support.
- **Communication error on RS485**: intervenes in the event of a timeout on RS485 communication (see "ModBus Manual" for full details).
- **"Communication Line" error**: this is an internal error and indicates a probable fault on one of the two microprocessors in the inverter.
- **"UnderVoltage" error**: The inverter input voltage is less than the value set at S005 - 10%. It is necessary to check the mains voltage or verify that parameter S005 has been set correctly.
- **"Ramp Down" error**: The set deceleration ramp is too low for the type of load applied to the motor inverter. To avoid breakage, the inverter avoids braking the load and lets the system stop by inertia. The inverter remains in an error state for 3 seconds before becoming operational again. Check parameter S004
- **"Ramp Up" error**: The set acceleration ramp is too low for the type of load applied. Check parameter S003.
- **"VIPK" error**: Inverter hardware error caused by a peak exceeding the limit of the IGBT module. Check the motor and type of application. Please contact our Technical Service in case of repeated alarms.