Steps for Setting Up the Drive

1 - Mount the drive

2 - Connect the following to the drive:

- The line supply, ensuring that it is:
  - **within the voltage range of the drive**
  - **voltage free**
- The motor, ensuring that its connections correspond to the supply voltage
- If required, the preset speeds via logic inputs LI3 and LI4

3 - Apply input power to the drive, but do not give a run command

4 - Configure the following:

- The nominal frequency (bFr) of the motor, if it is other than 50 Hz (only appears the first time the drive is switched on).
- The ACC (Acceleration) and dEC (Deceleration) parameters.
- The LSP (Low speed when the reference is zero) and HSP (High speed when the reference is maximum) parameters.
- The ItH parameter (Motor thermal protection).
- If required, the preset speeds SP2-SP3-SP4.

5 - Configure the following in the drC menu:

The motor parameters, only if the factory configuration of the drive is not suitable.

6 - Start the drive

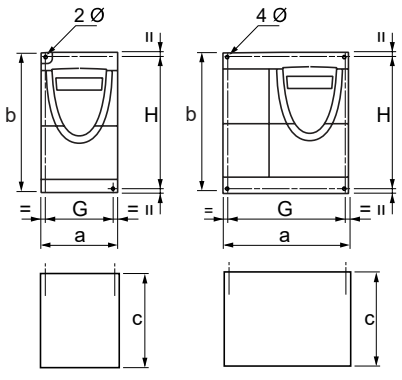
Factory configuration

The Altivar 11 is factory-configured for the most common operating conditions:

- Local control via the drive buttons (RUN/STOP, speed reference potentiometer).
- Logic inputs:
  - LI1, LI2: not assigned.
  - LI3, LI4: 4 preset speeds (speed 1 = speed reference or LSP, speed 2 = 10 Hz, speed 3 = 25 Hz, speed 4 = 50 Hz).
- Analog input AI1: not active.
- Relay R1: the contact opens in the event of a fault (or drive off)
- DO output: analog output, image of the motor frequency.

If the factory configuration is not suitable, the FUn menu can be used to modify the functions and the I/O assignments.

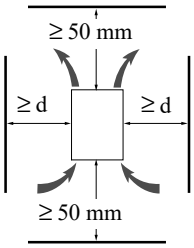
Dimensions



ATV 11H	a mm	b mm	c mm	G mm	H mm	Ø mm	Screws
U05●●●	72	142	108	60±1	131±1	2 x 5	M4
U09●●●	72	142	132	60±1	131±1	2 x 5	M4
U12M2●	72	142	145	60±1	131±1	2 x 5	M4
U18M●●	72	147	145	60±1	131±1	2 x 5	M4
U18F1● U29●●● U41●●●	117	142	163	106±1	131±1	4 x 5	M4

ATV 11P	a mm	b mm	c mm	G mm	H mm	Ø mm	Screws
all ratings	72	142	108	60±1	131±1	2 x 5	M4

Mounting and temperature conditions



Install the unit vertically, at ± 10°.
Do not place it close to heating elements.
Leave sufficient free space to insure that the air required for cooling purposes can circulate from the bottom to the top of the unit.
Free space in front of unit: 10 mm minimum.

When IP20 protection is adequate, it is recommended that the protective cover on the top of the drive is removed, as shown below.

- From -10°C to 40°C: • d ≥ 50 mm: no special precautions.
  • d = 0 (mounted side by side): remove the protective cover on the top of the drive, as shown below (the degree of protection becomes IP20).
- From 40°C to 50°C: • d ≥ 50 mm: remove the protective cover on the top of the drive, as shown below (the degree of protection becomes IP20).
- From 50°C to 60°C: • d ≥ 50 mm: remove the protective cover on the top of the drive, as shown below (the degree of protection becomes IP20), and derate the drive nominal current by 2.2% for every °C above 50°C.

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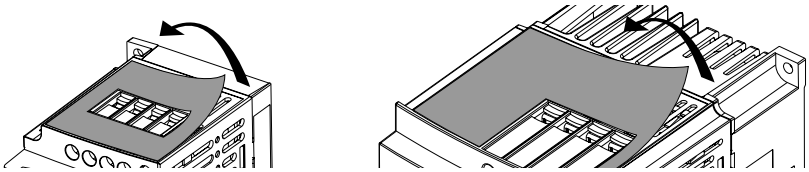
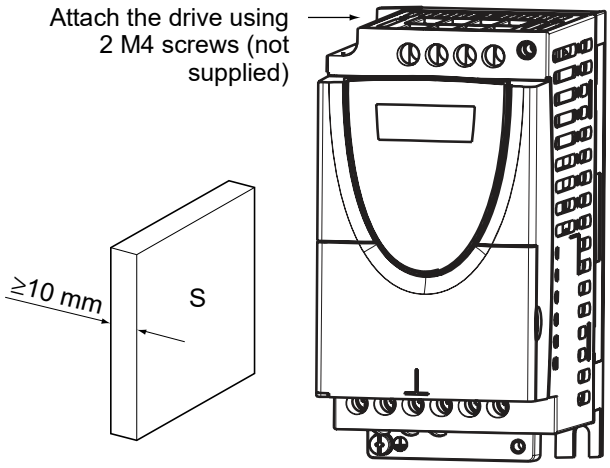
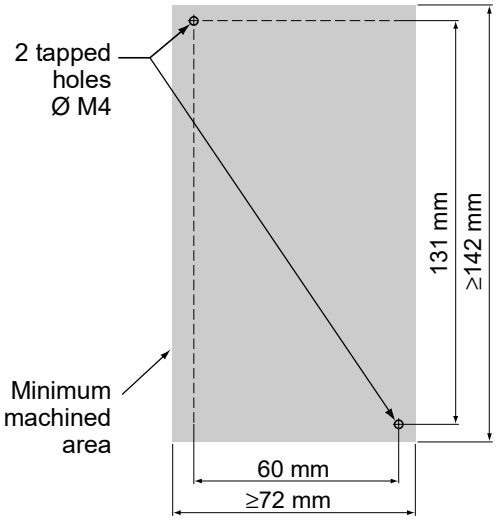


Mounting the drives on base plates

ATV 11P●●●●●● drives can be mounted on (or in) a steel or aluminium machine frame, observing the following conditions:

- Maximum ambient temperature: 40 °C
- Vertical mounting at ± 10°
- The drive must be fixed at the centre of a support (frame) which is a minimum of 10 mm thick and with a minimum square cooling area (S) of 0.12 m^2 for steel and 0.09 m^2 for aluminium, exposed to the open air.
- Support area for the drive (min 142 x 72) machined on the frame with a surface smoothness of 100 µm max and a roughness of 3.2 µm max.
- De-burr the tapped holes.
- Coat the whole support surface of the drive with thermal contact grease (or equivalent).

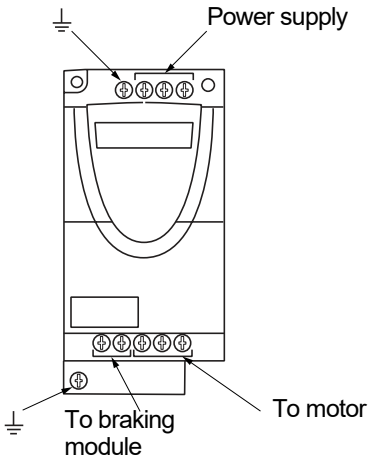


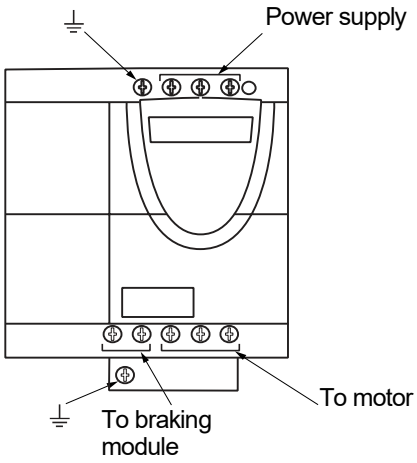


Verify the thermal state of the drive by checking parameter tHd (SUP menu), to confirm that the drive has been mounted correctly.

ENGLISH

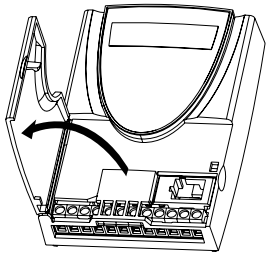
Power terminals

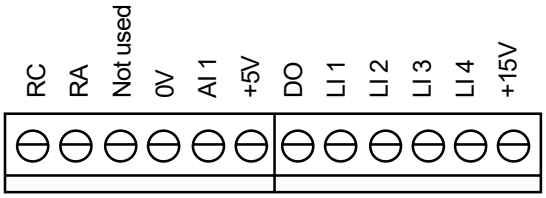




Altivar ATV 11● A and E327 ranges	Maximum connection capacity		Tightening torque in Nm
	AWG	mm^2	
U05●●●, U09●●●, U12M2●, U18M●●	AWG 14	1.5	0.75
U18F1●, U29●●●, U41●●●	AWG 10	4	1

Arrangement, specifications and functions of the control terminals





- Maximum connection capacity: 1.5 mm2 - AWG 14
- Max. tightening torque: 0.5 Nm.

Terminal	Function	Electrical characteristics
RC RA	Fault relay contact (open if there is a fault or the drive is off)	Min. switching capacity: 10 mA for 24 V ⎓ Max. switching capacity: • 2 A for 250 V ∿ and 30 V ⎓ on inductive load (cos φ = 0.4 - L/R = 7 ms) • 5 A for 250 V ∿ and 30 V ⎓ on resistive load (cos φ = 1- L/R = 0)
0V	I/O common	0 V
AI1	Voltage or current analog input	Analog input 0 + 5V or 0 + 10 V: impedance 40 kΩ, 30 V max. Analog input 0 - 20mA or 4 - 20mA: impedance 250 Ω (with no additional resistor)
+5V	Power supply for reference potentiometer 2.2 to 10 kΩ	• Precision: - 0 ± 5%
DO	Output which can be configured as analog or logic output	PWM open collector analog output at 2 kHZ: • voltage 30 V max., impedance 1 kΩ, 10 mA max. Open collector logic output: • voltage 30 V max., impedance 100 kΩ, 30 mA max.
LI1 LI2 LI3 LI4	Programmable logic inputs	• Power supply + 15 V (max. 30 V), Impedance 5 kΩ • state 0 if < 5 V, state 1 if > 11 V in positive logic • state 1 if < 5 V, state 0 if > 11 V or switched off (not connected) for negative logic
+15V	Logic input power supply	+ 15 V ± 15% protected against short-circuits and overloads. Max. customer current available 100 mA

Wiring diagram for factory settings

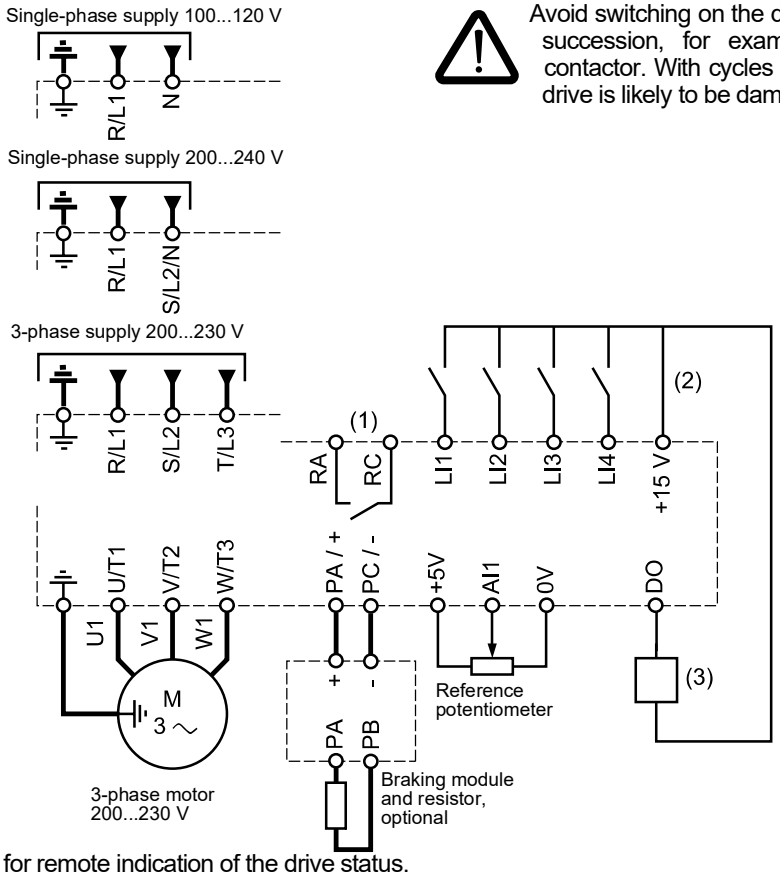
- Supply terminals at the top, motor terminals at the bottom
- Connect the power terminals before the control terminals

Avoid switching on the drive several times in close succession, for example when using a line contactor. With cycles of less than 5 minutes the drive is likely to be damaged.

ATV11●●●●F1●

ATV11●●●●M2●

ATV11●●●●M3●



(1) Fault relay contacts, for remote indication of the drive status.
(2) Internal + 15 V. If an external source is used (+ 24 V max.), connect the 0 V of the source to the 0 V terminal, and do not use the + 15 V terminal on the drive.
(3) Galvanometer or low level relay.

Note: Fit interference suppressors to all inductive circuits near the drive or coupled to the same circuit (relays, contactors, solenoid valves, etc).

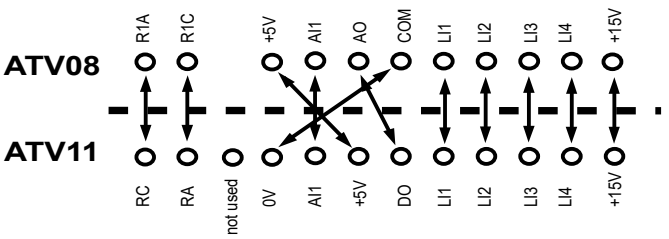
Choice of associated components:
See the Altivar 11 catalog.

Use of a braking resistor:

A VW3A11701 braking module must be connected between the drive and the braking resistor.

Replacing an ATV08 with an ATV11

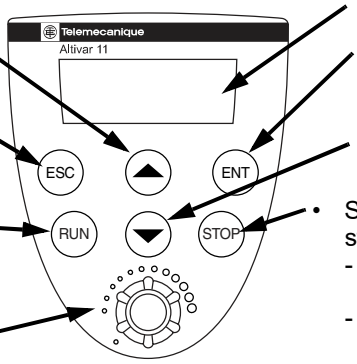
Caution, when replacing an ATV08 with an ATV11:
The control terminals are arranged and marked differently:



ENGLISH

Functions of the display and the keys

- Returns to the previous menu or parameter, or increases the displayed value
- Exits a menu or parameter, or aborts the displayed value to return to the previous value in the memory
- RUN button: controls motor switch-on in forward operation, if parameter tCC in the FUn menu is configured as LOC
- Reference potentiometer, active if parameter LSr in the FUn menu is configured as LOC

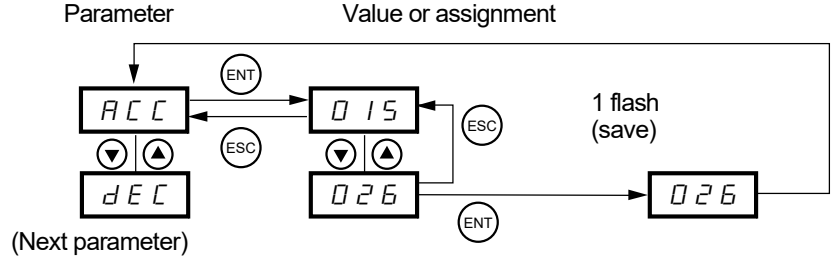


- 3 "7-segment" displays
- Enters a menu or a parameter, or saves the displayed parameter or value
- Goes to the next menu or parameter, or decreases the displayed value
- STOP button: always controls the stopping of the motor.
  - If tCC (FUn menu) is not configured as LOC, it is a freewheel stop.
  - If tCC (FUn menu) is configured as LOC, the stop is on a ramp, but if injection braking is in progress, a freewheel stop takes place.

Pressing ▲ or ▼ does not store the selection.

Save the selection : ENT

Example:



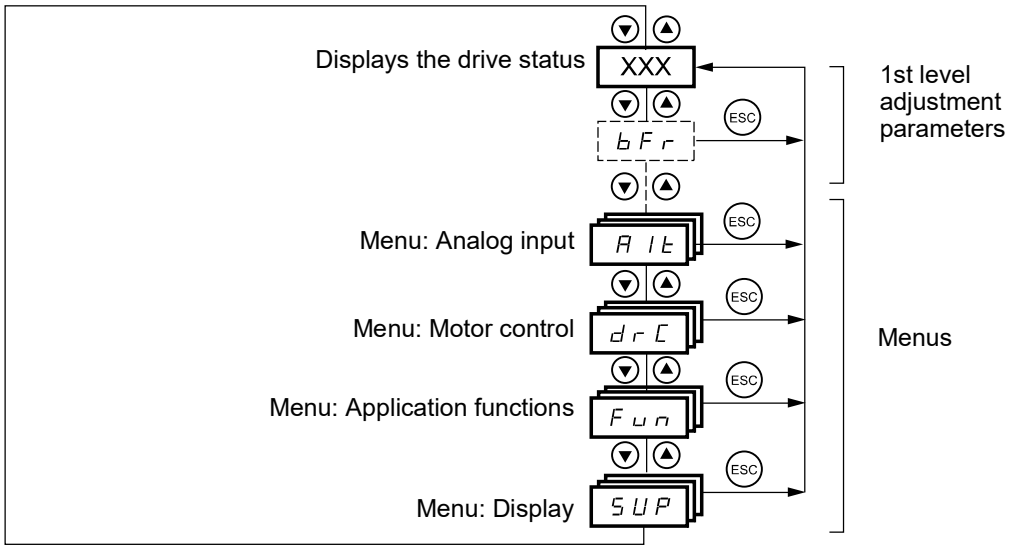
The display flashes when a value is stored.

Normal display, with no fault present and no startup:

- rdY: Drive ready
- 43.0: Display of the parameter selected in the SUP menu (default selection: frequency reference).
- dcb: DC injection braking in progress
- nSt: Freewheel stop

If there is a fault, it is shown with a flashing display.

Access to menus



1st level adjustment parameters

The parameters in clear boxes can only be modified when the drive is stopped and locked.

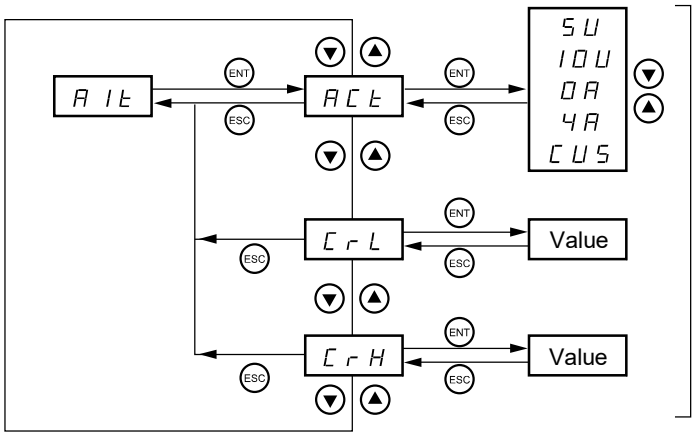
Parameters in shaded boxes can be modified with the drive operating or stopped.

Code	Description	Adjustment range	Factory setting
bFr	**Motor frequency**	50 Hz or 60 Hz	50
	This parameter is only visible the first time the drive is switched on. It can be modified at any time in the FUn menu.		
ACC	**Acceleration ramp time**	0 s to 99.9 s	3
	Range: 0 Hz to motor nominal frequency FrS (parameter in drC menu).		
dEC	**Deceleration ramp time**	0 s to 99.9 s	3
	Range: motor nominal frequency FrS (parameter in drC menu) to 0 Hz.		
LSP	**Low speed**	0 Hz to HSP	0
	Motor frequency at min. reference		
HSP	**High speed**	LSP to 200 Hz	= bFr
	Motor frequency at max. reference Check that this setting is appropriate for the motor and the application.		
ItH	**Motor thermal current**	0 to 1.5 In (1)	According to drive rating
	Current used for motor thermal protection. Set ItH to the nominal current marked on the motor rating plate. ⚠ **The memory of the motor thermal state returns to zero when the drive is switched off.**		
SP2	**2nd preset speed** (2)	0.0 Hz to HSP	10
SP3	**3rd preset speed** (2)	0.0 Hz to HSP	25
SP4	**4th preset speed** (2)	0.0 Hz to HSP	50
AIt	For version V1.1. For version V1.2 see AIt menu		

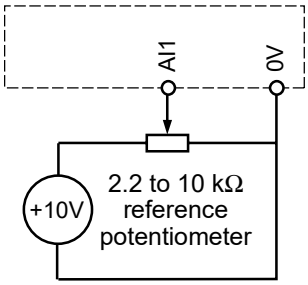
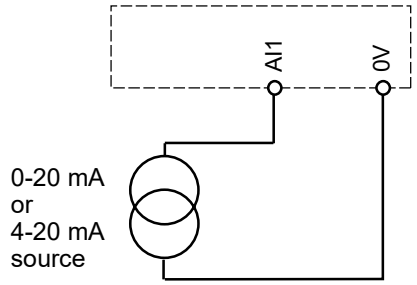
(1) In = nominal drive current
(2) The preset speeds only appear if the corresponding function has remained at the factory setting or has been reconfigured in the FUn menu.

Analog input menu AIt

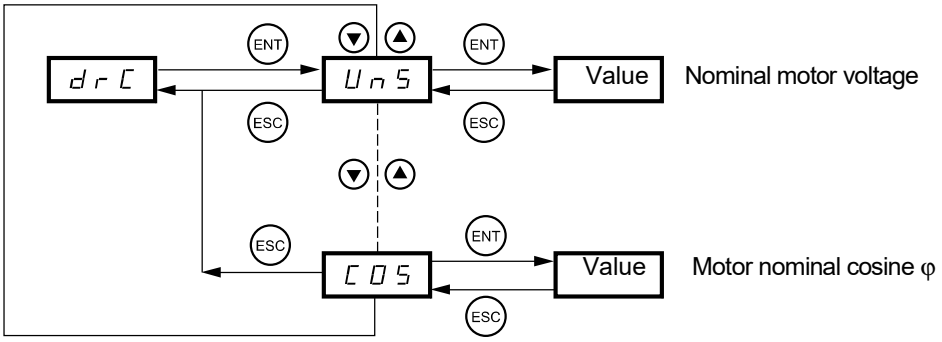
These parameters can only be modified when the drive is stopped and locked.



Version V1.2

Code	Description	Adjustment range	Factory setting
ACt	**Scale of analog input AI1**		"5U"
	5U: voltage 0-5 V (internal power supply only) 10U: voltage 0 - 10 V (external power supply) 0A: current 0 - 20 mA 4A: current 4 - 20 mA CUS: current X - Y mA (customised) If CUS is activated, CrL (X) and CrH (Y) must be configured. Use with external 10 V  0 - 20 or 4 - 20 mA  		
CrL	**Minimum value of the signal on input AI1**	0 to 20.0	4.0
	Appears if CUS has been activated. AI1 min reference in mA. (CrL < CrH)		
CrH	**Maximum value of the signal on input AI1**	0 to 20.0	20.0
	Appears if CUS has been activated. AI1 max reference in mA. (CrH > CrL)		

Motor control menu drC



The parameters in clear boxes can only be modified when the drive is stopped and locked.

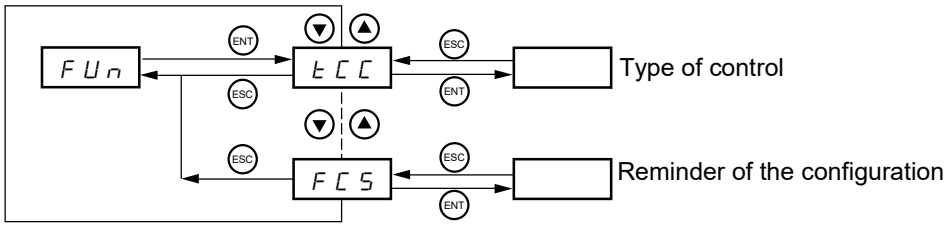
Parameters in shaded boxes can be modified with the drive operating or stopped.

Drive performance can be optimised by entering the values marked on the motor rating plate.

Code	Description	Adjustment range	Factory setting
UnS	**Nominal motor voltage marked on the rating plate**	100 to 500 V	Acc. to rating
	If the line voltage is less than the rated motor voltage, UnS should be set to the value of the line voltage applied to the drive terminals.		
FrS	**Nominal motor frequency marked on the rating plate**	40 to 200 Hz	50 / 60Hz dep. on bFr
StA	**Frequency loop stability**	0 to 100% when stopped 1 to 100% when running	20
	Value too high: lengthening of response time Value too low: overspeed, instability		
FLG	**Frequency loop gain**	0 to 100% when stopped 1 to 100% when running	20
	Value too high: overspeed, instability Value too low: lengthening of response time		
UFr	**IR compensation**	0 to 200%	50
	Used to optimise the torque at very low speed, or to adapt to special cases (example: for motors connected in parallel, lower UFr). If there is insufficient torque at low speed, increase UFr. Too high a value can cause the motor not to start (locking) or a change to current limit mode.		
nCr	**Nominal motor current marked on the rating plate**	0.25 to 1.5 In (1)	Acc. to rating
CLI	**Current limit**	0.5 to 1.5 In (1)	1.5 In
nSL	**Nominal motor slip**	0 to 10.0 Hz	Acc. to rating
	Calculate using the formula: nSL = parameter FrS x (1 - Nn/Ns) Nn = nominal motor speed marked on the rating plate Ns = motor synchronous speed		
SLP	**Slip compensation**	0 to 150% (of nSL)	100
	The motor rating plates are sometimes imprecise or incorrect (reduce if instability occurs, increase if the speed is inadequate). Used to adjust the slip compensation around the value set by the nominal motor slip nSL, or to adapt to special cases (example: for motors connected in parallel, lower SLP).		
COS	Nominal motor cosine φ marked on the rating plate	0.50 to 1.00	Acc. to rating

(1) In = nominal drive current

Application functions menu FUn



The parameters in clear boxes can only be modified when the drive is stopped and locked.

Parameters in shaded boxes can be modified with the drive operating or stopped.

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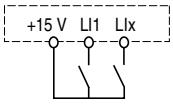
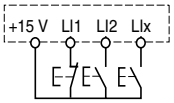
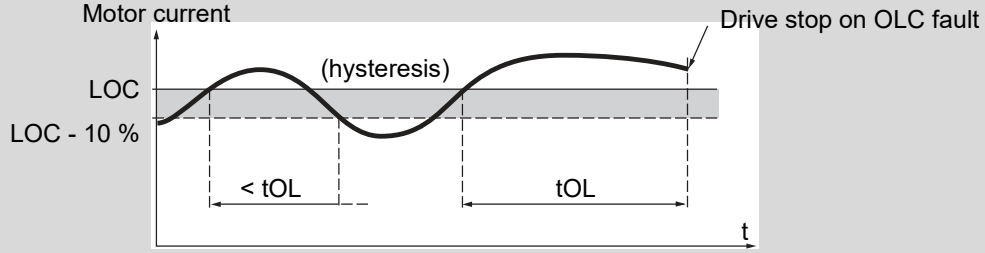
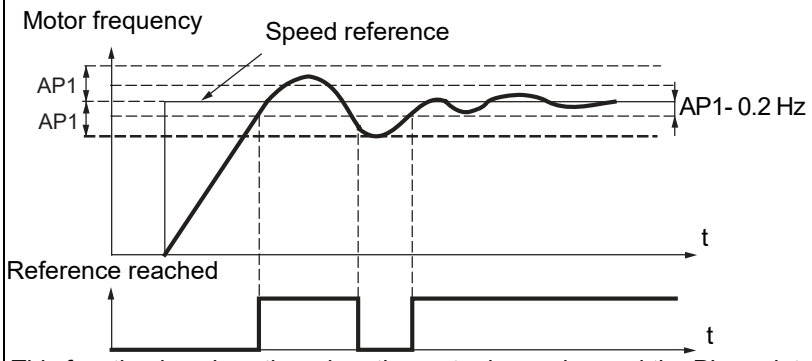
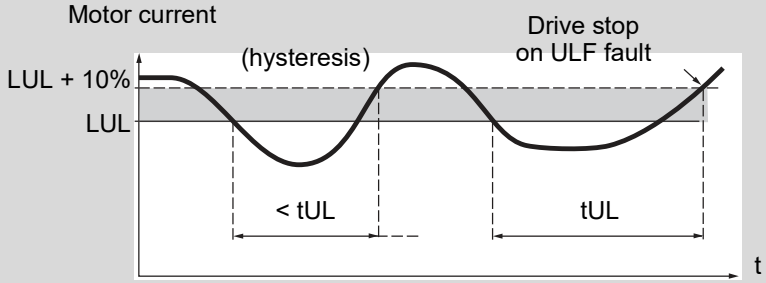
Code	Description	Factory setting
tCC	**Type of control**	
ACt	2C = 2-wire control 3C = 3-wire control LOC = local control (drive RUN / STOP)	LOC
	2-wire control: The open or closed state of the input controls the running or stopping. Example of wiring: LI1: forward LIx: reverse  3-wire control (pulse control): a "forward" or "reverse" pulse is sufficient to command starting, a "stop" pulse is sufficient to command stopping. Example of wiring: LI1: stop LI2: forward LIx: reverse  ⚠ To change the assignment of tCC press the "ENT" key for 2 s. This causes the following functions to return to factory setting: rrS, tCt, Atr, PS2 (LIA, LIb).	
tCt	Type of 2-wire control (parameter only accessible if tCC = 2C):	trn
	LEL: state 0 or 1 is taken into account for running or stopping. trn: a change of state (transition or edge) is necessary to initiate operation, in order to prevent accidental restarts after a power supply interruption. PFO: same as LEL, but the "forward" input always takes priority over the "reverse" input.	
rrS	**Reverse** If tCC = LOC, this parameter is inaccessible.	if tCC = 2C: LI2 if tCC = 3C: LI3
	nO: function inactive LI1 to LI4: choice of the input assigned to the reverse command	

Code	Description	Factory setting
PS2	**Preset speeds** (active even if tCC and LSr = LOC)	
	If LIA and LIb = 0: speed = reference If LIA = 1 and LIb = 0: speed = SP2 If LIA = 0 and LIb = 1: speed = SP3 If LIA = 1 and LIb = 1: speed = SP4	
LIA	Assignment of input LIA - nO: function inactive - LI1 to LI4: choice of the input assigned to LIA	LI3, except if tCC = 3C: LI4
LIb	Assignment of input LIb - nO: function inactive - LI1 to LI4: choice of the input assigned to LIb	LI4, except if tCC = 3C: nO
	SP2 is only accessible if LIA is assigned, SP3 and SP4 if LIA and LIb are assigned.	
SP2	2nd preset speed, adjustable from 0.0 Hz to HSP (1)	10
SP3	3rd preset speed, adjustable from 0.0 Hz to HSP (1)	25
SP4	4th preset speed, adjustable from 0.0 Hz to HSP (1) (1) The settings can also be accessed in the 1st level adjustment parameters.	50
HSP	**High speeds** (version V1.2 IE ⩾ 21)	
	If LIA and LIb = 0: HSP If LIA = 1 and LIb = 0: HS2 If LIA = 0 and LIb = 1: HS3 If LIA = 1 and LIb = 1: HS4	
LIA	Assignment of input LIA - nO: Function inactive - LI1 to LI4: Selection of input assigned to LIA	nO
LIb	Assignment of input LIb - nO: Function inactive - LI1 to LI4: Selection of input assigned to LIb	nO
	HS2 can only be accessed if LIA is assigned; HS3 and HS4 can only be accessed if LIA and Lib are assigned.	
HSP	1st high speed, adjustable between LSP and 200 Hz	bFr
HS2	2nd high speed, adjustable between LSP and 200 Hz	bFr
HS3	3rd high speed, adjustable between LSP and 200 Hz	bFr
HS4	4th high speed, adjustable between LSP and 200 Hz	bFr
LOC	**Overload threshold** (version V1.2 IE ⩾ 21) LOC can be adjusted between 70 and 150% of the nominal drive current.	90%
tOL	**Time delay for the overload function** (version V1.2 IE ⩾ 21)	5 s
	tOL can be adjusted between 0 and 100 s. This function can be used to stop the motor in the event of an overload. If the motor current exceeds the overload threshold LOC, a time delay tOL is activated. Once this time delay tOL has elapsed, if the current is still greater than the overload threshold LOC -10%, the drive will lock with an overload fault.	



Overload detection is only active when the system is in steady state (speed reference reached).
A value of 0 will deactivate overload detection.

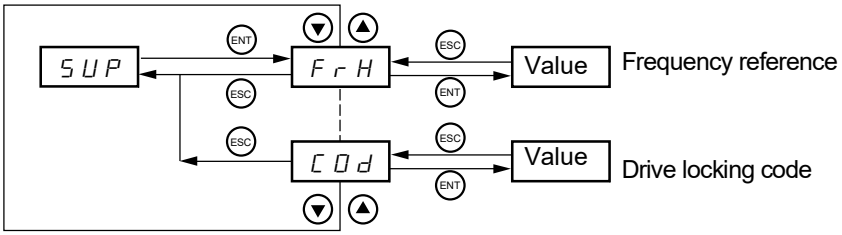
Code	Description	Factory setting
APi	**Hysteresis frequency reached** (version V1.2 IE ⩾ 21)	0.3 Hz
	API can be adjusted between 0 and 200 Hz. This parameter can be used to control the hysteresis of the function which determines if the drive has reached the frequency reference. Increase this parameter if the drive is struggling to reach the "reference reached" state. If rFr (motor frequency) - FrH (frequency reference) < AP1 - 0.2 Hz, reference reached = 1 If rFr (motor frequency) - FrH (frequency reference) > AP1, reference reached = 0  This function is only active when the motor is running and the PI regulator is in operation.	
LUL	**Underload threshold** (version V1.2 IE ⩾ 21) LUL can be adjusted between 20 and 100 % of the nominal drive current.	60 %
tUL	**Time delay for the underload function** (version V1.2 IE ⩾ 21)	5 s
	tUL can be adjusted between 0 and 100 s. If the motor current undershoots the underload threshold LUL for longer than the adjustable time delay tUL, the drive will lock with an underload fault ULF.  Underload detection is only active when the system is in steady state (speed reference reached). A value of 0 will deactivate underload detection.	
tLS	**PI function** (version V1.2)	
PI	Do not modify the factory configuration, or consult the technical manual.	
rSF	**Fault reset**	nO
	- nO: function inactive - LI1 to LI4: choice of the input assigned to this function The reset takes place at a transition on the input (rising edge: 0 to 1). It is only authorised if the fault has disappeared, and only on part of the faults (see page 32).	
rP2	**Second ramp**	
LI	Assignment of the 2nd ramp control input - nO: function inactive - LI1 to LI4: choice of assigned input	nO
	AC2 and dE2 are only accessible if LI is assigned.	
AC2	2nd acceleration ramp time, adjustable from 0.1 to 99.9 s	5.0
dE2	2nd deceleration ramp time, adjustable from 0.1 to 99.9 s	5.0
LC2	**2nd current limit** (version V1.2) Do not modify the factory configuration, or consult the technical manual.	

Code	Description	Factory setting
nSt	**Freewheel stop** (version V1.2)	nO
	- nO: function inactive - LI1 to LI4: choice of assigned input. Stop when the input is unconnected (state 0), ie. contact open. Causes the motor to stop using the resistive torque only. The supply to the motor is removed.	
StP	**Controlled stop on loss of line supply**	nO
	- nO: locking of the drive and freewheel stopping of the motor - FrP: stop according to the valid ramp (dEC or dE2), if there is sufficient inertia. - FSt: fast stop, the stopping time depends on the inertia and the braking ability of the drive.	
brA	**Deceleration ramp adaptation**	YES
	- nO: function inactive - YES: This function automatically increases the deceleration time, if this has been set at too low a value for the inertia of the load, thus avoiding the overvoltage fault.	
AdC	**Automatic DC injection**	
ACt	Operating mode	YES
	- nO: function inactive - YES: DC injection on stopping, duration adjustable via tdC, when operation is no longer controlled and the motor speed is zero. The value of this current can be adjusted via SdC. - Ct: Continuous DC injection on stopping, when operation is no longer controlled and the motor speed is zero. The value of this current can be adjusted via SdC. In 3-wire control, the injection is only active when LI1 is at 1.	
tdC	tdC is only accessible if ACt = YES, SdC if ACt = YES or Ct. Injection time on stopping, adjustable from 0.1 to 30.0 s	0.5
SdC	Injection current, adjustable from 0 to 1.2 In (In = nominal drive current)	0.7 In
SFt	**Switching frequency**	
ACt	Frequency range - LFr: random frequency around 2 or 4 kHz according to SFr - LF: fixed frequency of 2 or 4 kHz according to SFr - HF: fixed frequency of 8, 12 or 16 kHz according to SFr	LF
SFr	Switching frequency: - 2: 2 kHz (if ACt = LF or LFr) - 4: 4 kHz (if ACt = LF or LFr) - 8: 8 kHz (if ACt = HF) - 12: 12 kHz (if ACt = HF) - 16: 16 kHz (if ACt = HF) When SFr = 2 kHz, the frequency automatically changes to 4 kHz at high speed. When SFt = HF, the selected frequency automatically changes to the lower frequency if the thermal state of the drive is too high. It automatically returns to the SFr frequency as soon as the thermal state permits.	4 (if ACt = LF or LFr) 12 (if ACt = HF)
FLr	**Catch on the fly**	nO
	Enables a smooth restart if the run command is maintained after the following events: - loss of line supply or disconnection - fault reset or automatic restart - freewheel stop. The motor resumes from the estimated speed at the time of the restart then follows the ramp to the reference speed. This function requires 2-wire control (tCC = 2C) with tCt = LEL or PFO. - nO: function inactive - YES: function active The function intervenes at each run command, resulting in a slight delay (1 second max.). If continuous automatic injection braking has been configured (Ct) this function cannot be activated.	

Code	Description	Factory setting
dO	**Analog/logic output DO**	
ACt	Assignment:	rFr
	- nO: not assigned - OCr: analog output = current in the motor. The full signal corresponds to 200% of the nominal drive current. - rFr: analog output = motor frequency. The full signal corresponds to 100% HSP. - FtA: logic output = frequency threshold reached, closed (state 1) if the motor frequency exceeds the adjustable threshold Ftd. - SrA: logic output = reference reached, closed (state 1) if the motor frequency is equal to the reference. - CtA: logic output = current threshold reached, closed (state 1) if the motor current exceeds the adjustable threshold Ctd. - PI: Do not use, or consult the technical manual (version V1.2).	
	Ftd is only accessible if ACt = FtA, Ctd is only accessible if ACt = CtA.	
Ftd	frequency threshold, adjustable from 0 to 200 Hz	= bFr
Ctd	current threshold, adjustable from 0 to 1.5 In (In = nominal drive current)	In
AtR	**Automatic restart**	nO
	- nO: function inactive - YES: Automatic restart, after locking on a fault, if the fault has disappeared and the other operating conditions permit the restart. The restart is performed by a series of automatic attempts separated by increasingly long waiting periods: 1 s, 5 s, 10 s, then 1 min for the following periods. If the restart has not taken place after 6 min, the procedure is aborted and the drive remains locked until it is disconnected and then reconnected. The following faults permit this function: OHF, OLC, OLF, ObF, OSF, PHF, ULF. The drive fault relay remains activated if this function is active. The speed reference and the operating direction must be maintained. This function is only accessible in 2-wire control (tCC = 2C) with tCt = LEL or PFO. ⚠ **Check that an accidental start does not present any danger to personnel or equipment.**	
LSr	**Frequency reference mode**	LOC
	- LOC: the speed reference is given by the potentiometer on the front of the drive. - tEr: The speed reference is given by analog input AI1 ⚠ For LOC and tEr to be taken into account the ENT key must be held down for 2 s.	
SSr	**Frequency reference switching** (E327 range only)	nO
	Used to switch a reference via a logic input. - nO: Not assigned: the reference is given according to the configuration of LSr - LI1: Logic input LI1 - LI2: Logic input LI2 - LI3: Logic input LI4 - LI4: Logic input LI4 Logic input at state 0: the reference is given by the potentiometer on the front of the drive. Logic input at state 1: the reference is given by analog input AI1 ⚠ **Caution: Switching via logic input is incompatible with the PI function.**	
nPL	**Choice of logic for inputs**	POS
	- POS: the inputs are active (state 1) at a voltage of 11 V or more (for example + 15 V terminal) and inactive (state 0) when the drive is disconnected or at a voltage of less than 5 V. - nEG: the inputs are active (state 1) at a voltage of less than 5 V (for example 0V terminal) and inactive (state 0) at a voltage of 11 V or more, or when the drive is off. ⚠ For POS and nEG to be taken into account the ENT key must be held down for 2 s.	
bFr	**Motor frequency** (Same as bFr 1st level adjustment parameter)	50
	Set to 50 Hz or 60 Hz, taken from the motor rating plate.	

Code	Description	Factory setting
IPL	**Line phase loss fault configuration**	YES
	This parameter is only accessible on 3-phase drives. - nO: inhibition of the line phase loss fault - YES: monitoring of the line phase loss fault	
SCS	**Configuration backup**	nO
	- nO: function inactive - YES: saves the current configuration to the EEPROM memory. SCS automatically switches to nO as soon as the save has been performed. This function is used to keep another configuration in reserve, in addition to the current configuration. When drives leave the factory the current configuration and the backup configuration are both initialised to the factory configuration.	
FCS	**Reminder of the configuration**	nO
	- nO: function inactive - rEC: the current configuration becomes identical to the backup configuration previously saved by SCS. rEC is only visible if the backup has been carried out. FCS automatically switches to nO as soon as this action has been performed. - InI: the current configuration becomes identical to the factory setting. FCS automatically switches to nO as soon as this action has been performed. ⚠ For rEC and InI to be taken into account the ENT key must be held down for 2 s.	

Display menu SUP



When the drive is running, the value displayed is that of one of the monitoring parameters. The default value which is displayed is the motor reference (parameter FrH).

While the value of the required new monitoring parameter is being displayed, the **"ENT"** key must be pressed a second time to confirm the change of monitoring parameter and to store it. From then on the value of this parameter will be displayed during operation (even after the drive has been switched off).
If the new choice is not confirmed by pressing the **"ENT"** key for a second time, the drive will return to the previous parameter after it has been switched off.
The following parameters can be accessed, with the drive stopped or running.

Code	Parameter	Unit
FrH	**Display of the frequency reference** (factory configuration)	Hz
rFr	**Display of the output frequency applied to the motor**	Hz
LCr	**Display of the motor current**	A
ULn	**Display of the line voltage**	V
tHr	**Display of the motor thermal state**: 100% corresponds to the nominal thermal state. Above 118%, the drive trips on an OLF fault (motor overload). It can be reset below 100% (see ItH parameter page 23).	%
tHd	**Display of the drive thermal state**: 100% corresponds to the nominal thermal state. Above 118%, the drive trips on an OHF fault (drive overheating). It can be reset below 80%.	%
HSU	**Display of the value of the high speed used** (version V1.2 IE ⩾ 21)	Hz
rPF	**PI sensor feedback** (version V1.2) This parameter is only accessible if the PI function has been activated (PIF = AI1).	%

Code	Parameter	Unit
COd	**Terminal locking code** (version V1.2 IE ⩾ 21) Enables the drive configuration to be protected using an access code. • OFF: No access locking codes. • On: A code is locking access (2 to 999) - **To unlock access** enter the security code (incrementing the display using ▲) and press "ENT". The code remains on the display and access is unlocked until the next power-down. Parameter access will be locked again on the next power-up. If an incorrect code is entered, the display changes to "**On**", and parameter access remains locked. • **XXX**: Parameter access is unlocked (the code remains on the screen). To create an access code, consult the technical manual.	

Faults - Causes - Remedies

Drive does not start, no fault displayed

- Check that the run command input(s) have been actuated in accordance with the chosen control mode.
- When the drive is switched on, at a manual fault reset, or after a stop command, the motor can only be powered once the "forward" and "reverse" commands have been reset. If they have not been reset, the drive will display "rdY" or “nSt” but will not start.
- If an input is assigned to the freewheel stop function, when this input is active at state 0 (not connected: open contact), it should be connected to the + 15 V if nPL = POS or to the 0V if nPL = nEG to allow the drive to start (see nPL page 30).

Drive does not start, display off

- Check that line voltage is present at the drive terminals.
- Unplug all the connections on the drive U, V, W terminals:
  - Check there is no short-circuit between a phase and ground in the motor wiring or in the motor.
  - Check that a braking resistor has not been connected directly to the PA/+ and PC/- terminals. Caution, if this is the case, it will certainly have damaged the drive. A braking module must always be used between the drive and the resistor.

Faults displayed

The cause of the fault must be removed before resetting. Faults ObF, OHF, OLC, OSF, PHF, SOF and ULF can be reset via a logic input if this function has been configured. Faults ObF, OHF, OLC, OLF, OSF, PHF and ULF can be reset via the automatic restart function, if this function has been configured. All faults can be reset by switching the drive off then on again.

Fault	Remedy
CFF configuration fault	• Return to factory settings or retrieve the backup configuration, if it is valid. See parameter FCS in the FUn menu.
CrF charging circuit	• Replace the drive.
InF internal fault	• Check the environment (electromagnetic compatibility). • Replace the drive.
ObF overvoltage during deceleration	• Braking too harsh or driving load. Increase the deceleration time, add a braking module and resistor if necessary and activate the brA function if it is compatible with the application.
OCF overcurrent	• Ramp too short, check the settings. • Inertia or load too high, check the size of the motor/drive/load. • Mechanical locking, check the state of the mechanism.
OHF drive over temperature	• Check the motor load, the drive ventilation and the environment. Wait for the drive to cool before restarting.
OLC current overload	Current level greater than overload threshold LOC. • Check the value of parameters LOC and tOL in the FLt menu on page 27. • Check the mechanism (wear, rigidity, lubrication, blockages, etc.).
OLF motor overload	• Check the setting of the motor thermal protection, check the motor load. Wait for the motor to cool before restarting.
OSF overvoltage	• Check the line voltage.
PHF line phase failure	This protection only operates with the drive on load. • Check the power connection and the fuses. • Reset. • Check the line supply/drive compatibility. • If there is an unbalanced load, inhibit the fault via IPL = nO (FUn menu).
SCF motor short-circuit, insulation fault	• Check the cables connecting the drive to the motor, and the insulation of the motor.
SOF overspeed	• Instability, check the motor, gain and stability parameters. • Driving load too high, add a braking module and resistor and check the size of the motor/ drive/load.
ULF current underload	Current level less than underload threshold LUL • Check the value of parameters LUL and tUL in the FLt menu on page 28.
USF undervoltage	• Check the voltage and the voltage parameter.