Table of Contents

Steps for Setting Up the Speed Controller

1 - Delivery of the speed controller

• Check that the speed controller reference printed on the label is the same as that on the delivery note corresponding to the purchase order

• Remove the Altivar 28 from its packaging and check that it has not been damaged in transit

2 - Fit the speed controller and attach its labels (page 54)

3 - Check that the line voltage is compatible with the voltage range of the drive (page 56)

The drive may be damaged if the line voltage is not compatible

4 - Connect the following to the speed controller

• The line supply, ensuring that it is **volt-free**

• The motor, ensuring that the terminal configuration corresponds to the supply voltage

5 - Switch on the speed controller, but do not give a run command

6 - Configure

• The nominal frequency (bFr) of the motor, if it is other than 50 Hz

• The parameters of the I/O, and drC menus but only if the factory configuration of the speed controller is not suitable for the application

7 - Set the following in the Set menu

If the speed controller factory settings are not suitable:

• The acceleration (ACC) and deceleration (dEC) ramps

• The minimum (LSP) and maximum (HSP) speeds

• The motor thermal protection current (ItH) to the nominal current marked on the motor rating plate

• Other parameters as required

8 - Start the speed controller

If problems arise, refer to section “Faults - Causes - Remedies”, page 93

Practical recommendations

• To help with programming the speed controller, fill in the configuration and settings tables (page 96), in particular when the factory configuration has been changed

• It is always possible to return to the factory settings using the FCS parameter in the drC menu (set YES to activate the function see page 86)

Caution : A check must be made to ensure that the functions which have been programmed are compatible with the wiring layout used

Factory Configuration

Factory settings

The Altivar 28 is factory-set for the most common operating conditions :

- Display : speed controller ready (when stopped), motor frequency (when running)
- Nominal motor frequency: 50 Hz
- Motor voltage : 230V or 400V, depending on product
- Ramps : 3 seconds
- Low speed : 0 Hz
- High speed : 50 Hz
- Frequency loop gain : standard
- Motor thermal current = nominal speed controller current
- Standstill injection braking current = 0.7 x nominal speed controller current, for 0.5 seconds
- Constant torque operation, with sensorless flux vector control
- Automatic adaptation of the deceleration ramp in the event of overvoltage on braking
- Switching frequency 4 kHz
- Logic inputs :
    - LI1, LI2 : 2 directions of operation, 2-wire control on rising edge
    - LI3, LI4 : 4 preset speeds (0 Hz, 10 Hz, 15 Hz, 50 Hz)
- Analog inputs :
    - AI1 (0 + 10 V) : speed reference
    - AI2 (0 + 10 V) or AIC (0, 20 mA) : summing AI1
- Relay R2 :
    - speed reference reached
- Analog output AO (0 - 20 mA) :
    - motor frequency

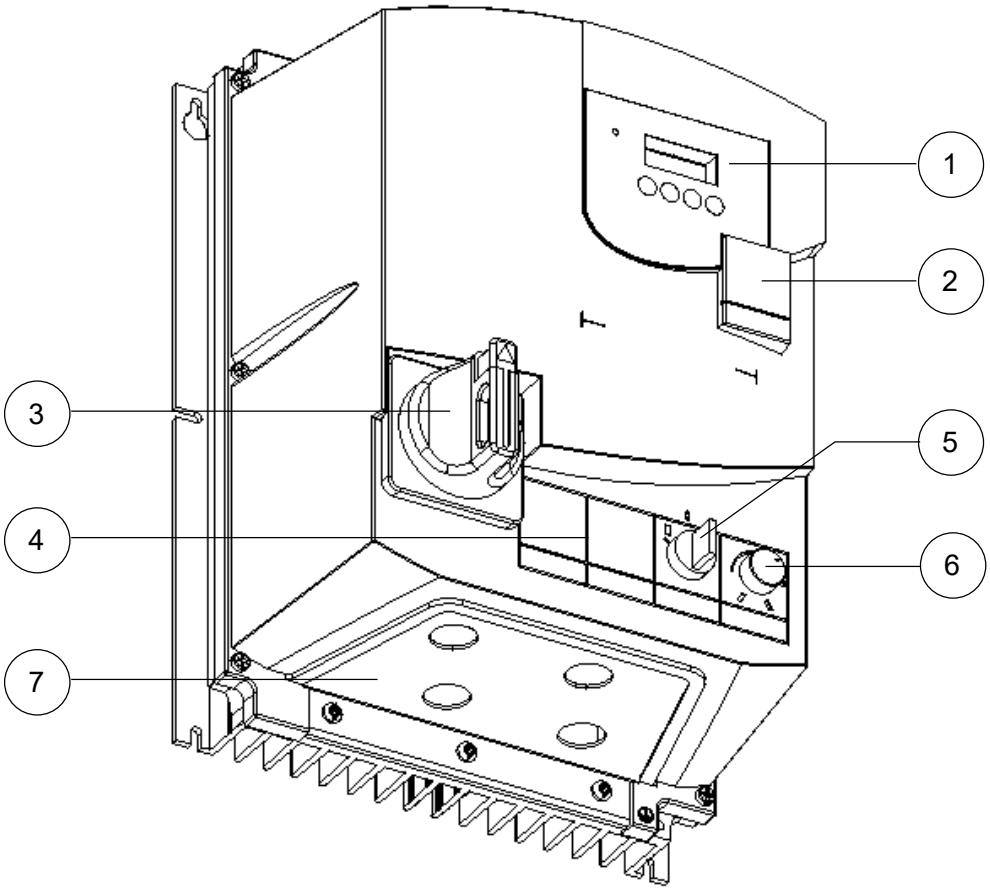
If the above values are compatible with the application, the speed controller can be used without changing the settings.

Labels

The speed controller is supplied with labels in the cover :

- 1 label fixed inside the cover : wiring diagram
- 3 self-adhesive labels to be fixed near the speed controller if required : programming of the main parameters, meaning of the fault codes and customer settings (blank label)

Presentation



1 - Display and buttons for settings and configuration
2 - Cover for access to RS485 serial link. **Caution, when this cover is removed in order to use the remote display module, the PC connection kit or the RS 485 serial link kit, the degree of protection is no longer IP55 but becomes IP43**
3 - Power supply switch
4 - Two positions available for the optional addition of control or signalling units
5 - 3-position switch : Stop and two operating directions (FW, RV)
The speed controller is delivered with only one direction wired
6 - Speed reference potentiometer
7 - Gland plate for customer cable glands

Speed Controller References

Single phase supply voltage (1) U1...U2 : 200…240 V 50/60 Hz

Motor		Line supply			Altivar 28		
Power indicated on plate (2)		Line current (3)		Max. prosp. line Isc (5)	Nominal current	Max. transient current (4)	Reference
		at U 1	at U 2				
kW	HP	A	A	kA	A	A	
0.37	0.5	7.3	6.1	1	3.3	3.6	**ATV-28EU09M2**
0.75	1	9.8	8.2	1	4.8	6	**ATV-28EU18M2**
1.5	2	16	13.5	1	7.8	10.9	**ATV-28EU29M2**
2.2	3	22.1	18.6	1	11	15	**ATV-28EU41M2**

3-phase supply voltage (1) U1...U2 : 200…230 V 50/60 Hz

3	-	17.6	15.4	5	13.7	18.5	**ATV-28EU54M2**
4	5	21.9	19.1	5	17.5	24.6	**ATV-28EU72M2**

3-phase supply voltage (1) U1...U2 : 380…500 V 50/60 Hz

Motor		Line supply			Altivar 28			
Power indicated on plate (2)		Line current (3)		Max. prosp. line Isc (5)	Nominal current		Max. transient current (4)	Reference
		at U 1	at U 2		at 380 to 460V	at 500V		
kW	HP	A	A	kA	A	A	A	
0.75	1	3.9	3.5	5	2.3	2.1	3.5	**ATV-28EU18N4**
1.5	2	6.5	5.7	5	4.1	3.8	6.2	**ATV-28EU29N4**
2.2	3	8.4	7.5	5	5.5	5.1	8.3	**ATV-28EU41N4**
3	-	10.3	9.1	5	7.1	6.5	10.6	**ATV-28EU54N4**
4	5	13	11.8	5	9.5	8.7	14.3	**ATV-28EU72N4**

(1) Nominal supply voltages : min. U1, max. U2

(2) These power ratings are for a maximum switching frequency of 4 kHz, in continuous operation. The switching frequency is adjustable from 2 to 15 kHz
Above 4 kHz derate the nominal speed controller current. The nominal motor current must not exceed this value :
- Up to 12 kHz derate by 10%
- Above 12 kHz derate by 20%

(3) Typical value for a 4-pole motor and a maximum switching frequency of 4 kHz, with no additional line choke

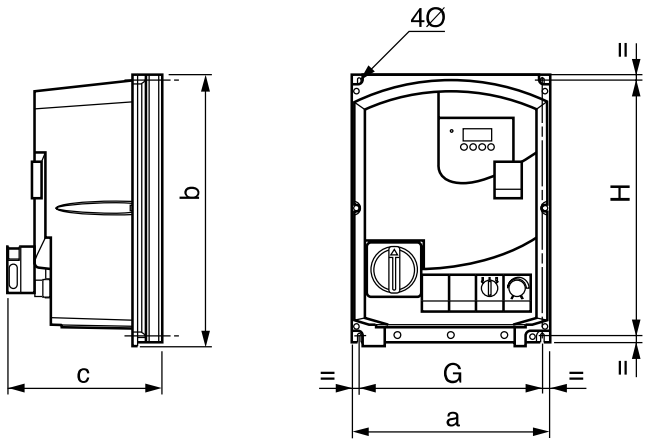
(4) For 60 seconds

(5) If Isc line is greater than the values in the table, add line chokes (see catalog)

ENGLISH

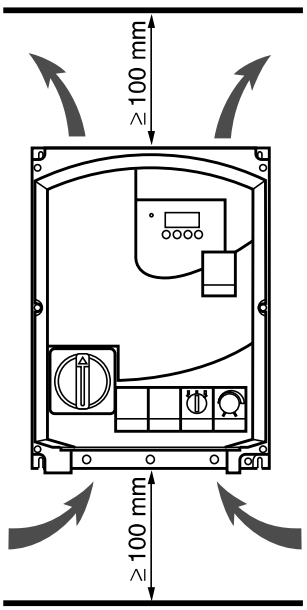
Mounting

Dimensions and weights



ATV-28E	a mm	b mm	c mm	G mm	H mm	Ø mm	weight kg
U09M2, U18M2	219	297	177	202	280	5.5	5
U29M2, U18N4, U29N4	219	297	201	202	280	5.5	6.5
U41M2, U54M2, U72M2, U41N4, U54N4, U72N4	230	347	222	213	320	5.5	9.5

Mounting recommendations



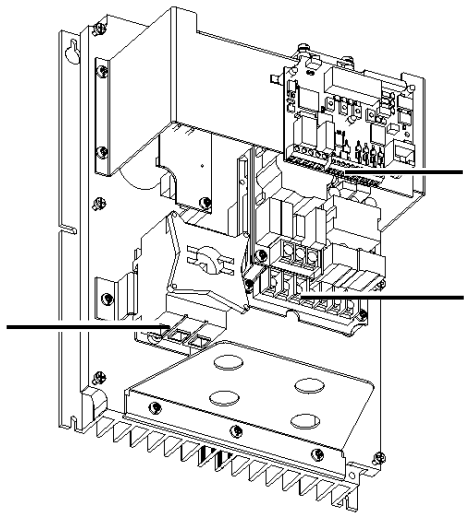
Install the unit vertically, at ± 10°.
Do not place it close to heating elements.
Leave sufficient free space to ensure that the air required for cooling purposes can circulate from the bottom to the top of the unit.

Minimum and maximum ambient air temperatures permissible during operation :
- 10 °C to + 40 °C

Wiring

Access to terminals

Before working on the unit, switch off the power supply upstream of the ATV28E••• and wait 10 minutes for the capacitors to discharge.
Set the switch to OFF, then remove the screwed cover. Disconnect the control wire connector to release the cover.



Power terminals

Specifications of the speed controller power terminals

Altivar ATV-28E	Maximum connection capacity		Tightening torque in Nm
	AWG	mm2	
U09M2, U18M2	AWG 14	2.5	0.8
U29M2, U18N4, U29N4	AWG 12	3	1.2
U41M2, U54M2, U72M2, U41N4, U54N4, U72N4	AWG 10	5	1.2

Specifications of the Vario switch terminals (line supply wiring)

Altivar ATV-28E	Maximum connection capacity		Tightening torque in Nm
	AWG	mm2	
All ratings	AWG 8	6	2

Wiring

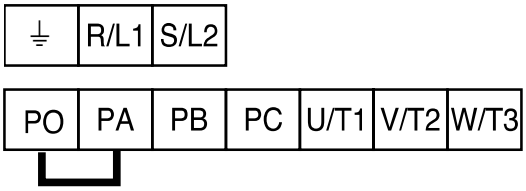
Functions of the speed controller power terminals

Terminal	Function	For Altivar ATV-28E
⏚	Altivar ground terminal	All ratings
L1 L2	Power supply terminals connected to the switch	All ratings
L3		3-phase only
PO	DC bus + polarity	All ratings
PA	Output to braking resistor	All ratings
PB	Output to braking resistor	All ratings
PC	DC bus - polarity	All ratings
U V W	Output to motor	All ratings

Arrangement of the speed controller power terminals

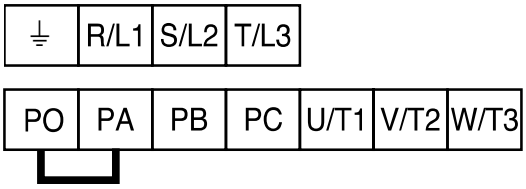
Do not remove the connector linking terminals PO and PA.

ATV-28EU09M2, U18M2, U29M2,U41M2 :



For the motor ground, use the ground screw provided on the heatsink.

ATV-28EU54M2, U72M2, U18N4, U29N4, U41N4, U54N4, U72N4 :

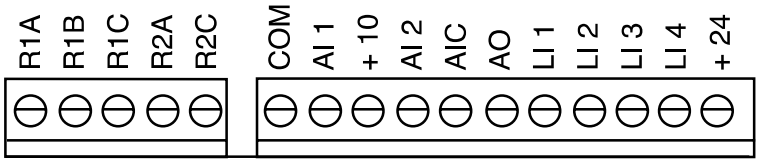


For the motor ground, use the ground screw provided on the heatsink.

Wiring

Control terminals

Arrangement, specifications and functions of the control terminals



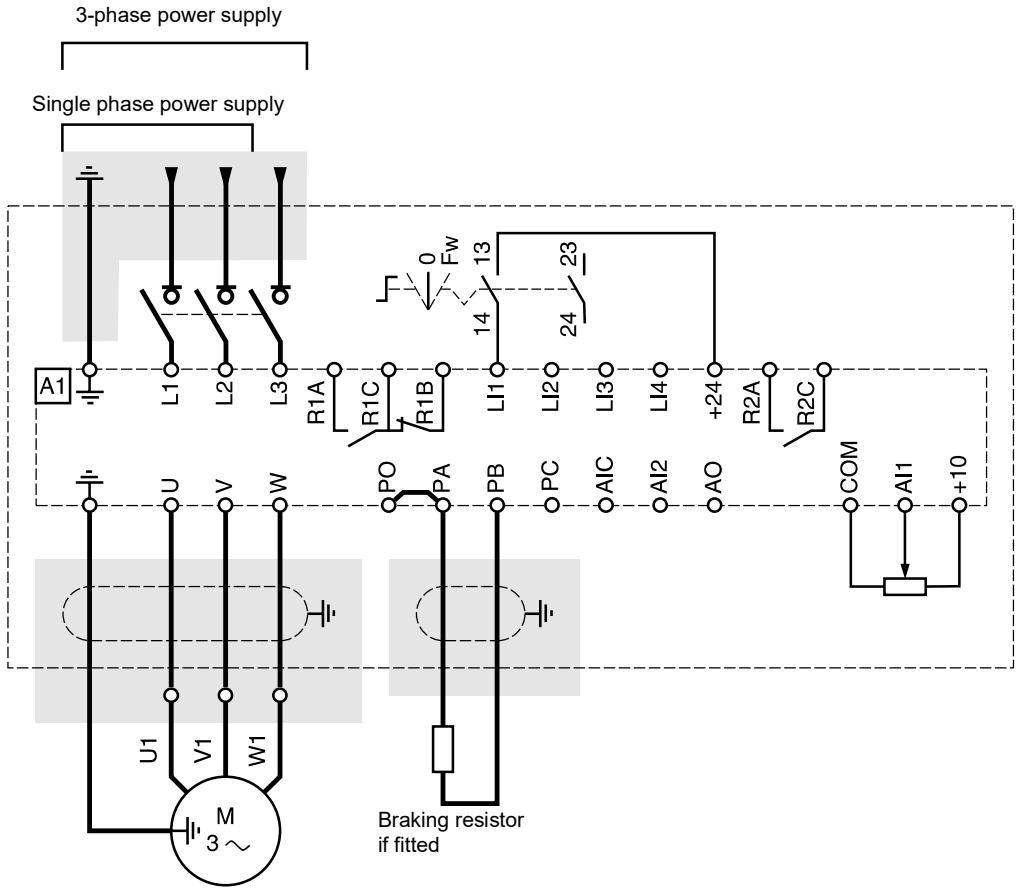
- Maximum connection capacity :
  1.5 mm2 - AWG 16
- Max. tightening torque :
  0.5 Nm

Terminal	Function	Electrical specifications
R1A R1B R1C	Common point C/O contact (R1C) of R1 fault relay	Min. switching capacity • 10 mA for 5 V⎓ Max. switching capacity on inductive load (cos φ = 0.4 and L/R = 7 ms) : • 1.5 A for 250 V~ and 30 V⎓
R2A R2C	N/O contact of R2 programmable relay	
COM	I/O common	
AI1	Analog voltage input	Analog input 0 + 10 V (max. safe voltage 30 V/min. safe voltage -0.6 V) • impedance 30 kΩ • resolution 0.01 V, 10-bit converter • precision ± 4.3%, linearity ± 0.2%, of max. value • acquisition time 5 ms max.
+10	Power supply for potentiometer 1 to 10 kΩ	+10 V (+ 8 % - 0), 10 mA max, protected against short-circuits and overloads
AI2 AIC	Analog voltage input Analog current input AI2 or AIC are assignable Use either, but not both	Analog input 0 + 10 V, impedance 30 kΩ Analog input X - Y mA. X and Y can be programmed from 0 to 20 mA, impedance 250 Ω Resolution, precision, and acquisition time of AI2 or AIC = AI1
AO	Analog output	Output can be programmed for 0 - 20 mA or 4 - 20 mA • Precision ± 6% of the max. value, max. load impedance 500 Ω
LI1 LI2 LI3 LI4	Logic inputs	Programmable logic inputs • + 24 V power supply **(max. 30 V)** • Impedance 3.5 kΩ • State 0 if < 5 V, state 1 if > 11 V • Acquisition time 9 ms max.
+ 24	Logic input power supply	+ 24 V protected against short-circuits and overloads, min. 19 V, max. 30 V. Max. customer current available 100 mA

Wiring

Wiring diagram for factory settings

The shaded parts need to be wired by the user.



Note : The 3-position switch is factory-wired for one direction of operation only. The contact (23-24) for the 2nd direction of operation is available and can be wired if necessary between the + 24 and LI2.

Wiring

Wiring recommendations

Power

Observe the cable cross-sectional areas recommended in the standards.

The speed controller must be earthed, in order to comply with regulations concerning high leakage currents (over 3.5 mA). When the use of an upstream "residual current device" for protection is required by the installation standards, a "type B" device must be used, which will operate even in the presence of DC components. If the installation has several speed controllers on the same line, each controller must be earthed separately. If necessary, fit a line choke (consult the catalog).

Keep the power cables separate from circuits in the installation with low level signals (detectors, PLCs, measuring apparatus, video, telephone).

Control

Keep the control circuits and the power cables apart. For control and speed reference circuits, we recommend using shielded twisted cables with a pitch of between 25 and 50 mm, connecting the shielding to ground at each end.

Wiring

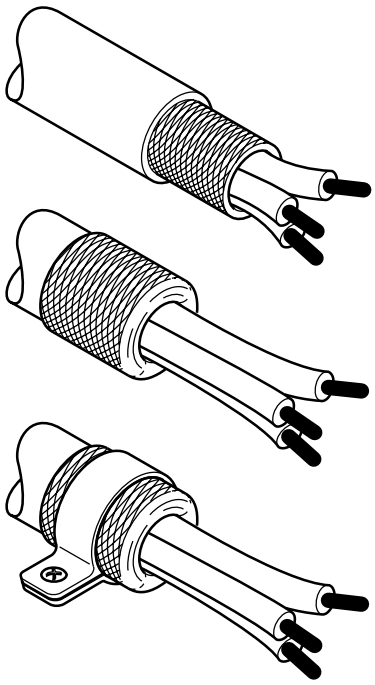
Electromagnetic compatibility

Principle

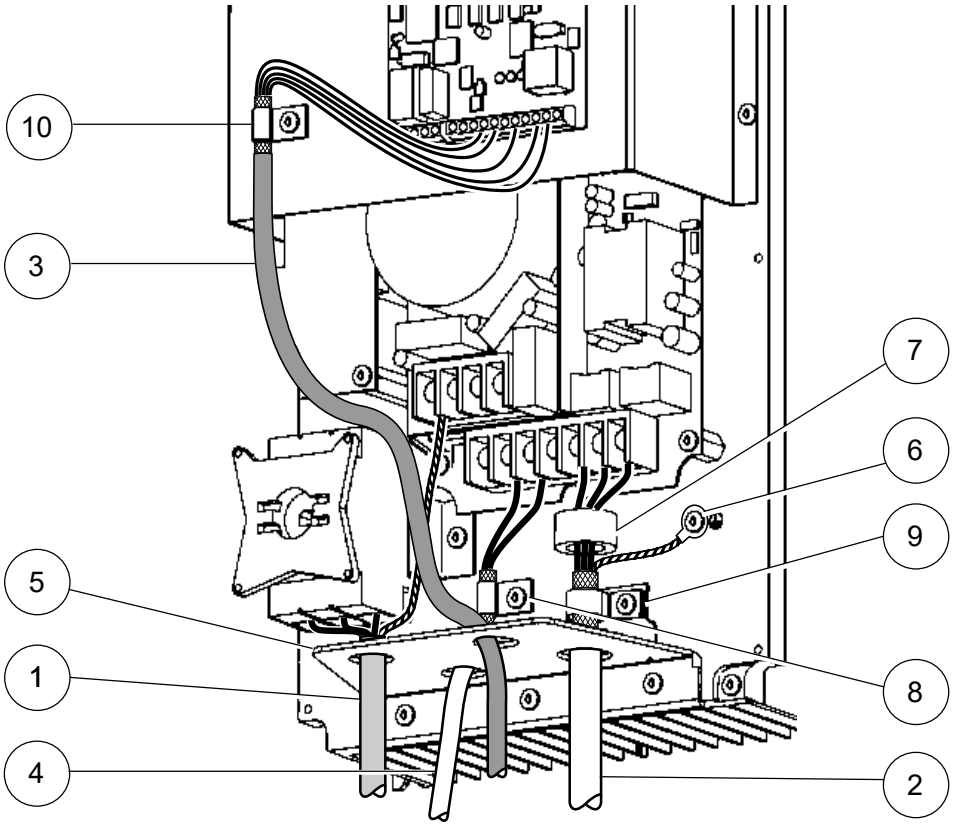
• Grounds between speed controller, motor and cable shielding should have "high frequency" equipotentiality
• Use shielded cables with shielding connected to ground at 360° at both ends for the motor cable, braking resistor (if used) and control-command cables. Conduit or metal ducting can be used for part of the shielding length, provided that there is no break in continuity
• Ensure maximum separation between the power supply cable (line supply) and the motor cable

Installation diagram

Assembling and connecting a shielded cable with metal clamp :
• Strip the shielding at one end of the cable
• Fold the shielding back over the external insulating sheath
• Feed the cable into the metal clamp and tighten the clamp around the shielding



Wiring



1 - Non-shielded power supply cable (2 or 3 phases to be connected to the Vario switch, and the PE conductor to be connected to the ground terminal of the speed controller)
2 - Shielded motor cable (3 phases to be connected to the speed controller U-V-W terminals passing through the ferrite core **7** (only ATV28EU••M2), and the PE conductor which is to be connected to the earthing screw on the heatsink **6** without passing through the ferrite core
3 - Control cable if used
4 - Cable for braking resistor (if used)
5 - Gland plate for customer cable glands. Glands should be of a type which does not reduce the IP rating

• Shielded cables must be used for connection to the control (if required) and connection to the braking resistor (if required)
• The ferrite core 7, and clamps 8, 9 and 10 for grounding the shielding are provided with the speed controller
• The optional connection to the relay contacts can be made using non-shielded cables

Basic Functions

Fault relay, unlocking

The fault relay is energized when the speed controller is powered up and there is no fault. It has a common point C/O contact.

The speed controller is unlocked after a fault by the following operations :
- Powering down the speed controller until the display and the red LED extinguish, then powering up again
- Automatically when the "automatic restart" function has been activated
- Via a logic input when this input is assigned to the "fault reset" function

Speed controller thermal protection

Function

Thermal protection by thermistor fitted on the heatsink or integrated in the power module.

Indirect protection of the speed controller against overloads by current limit. Typical tripping points :
- motor current = 185 % of nominal speed controller current : 2 seconds
- motor current = maximum speed controller transient current : 60 seconds

Speed controller ventilation

The fan is powered automatically when the speed controller is unlocked (operating direction + reference). It is powered down a few seconds after the speed controller is locked (motor speed < 0.5 Hz and injection braking completed).

Motor thermal protection

Function

Thermal protection by calculating I^2t.

Caution : The motor thermal state memory is reset to zero when the speed controller is switched off.

Configurable I/O Application Functions

Logic input application functions

Direction of operation : forward / reverse

Reverse operation can be disabled for applications with a single direction of motor rotation.

2-wire control

Run (forward or reverse) and stop are controlled by the same logic input, for which state 1 (run) or 0 (stop) is taken into account.
On power-up or a manual fault reset or after a stop command, the motor can only be powered once the "forward", "reverse" and "DC injection stop" commands have been reset. If the automatic restart function is configured (parameter Atr in the drC menu), these commands are taken into account without a reset being necessary.

3-wire control

Run (forward or reverse) and stop are controlled by 2 different logic inputs.
LI1 is always assigned to the stop function. Stop occurs on opening (state 0).
The pulse on the run input is memorized until the stop input is opened.
On power-up or a manual fault reset or after a stop command, the motor can only be powered once the "forward", "reverse" and "DC injection stop" commands have been reset.

Ramp switching : 1st ramp : ACC, dEC ; 2nd ramp : AC2, dE2

This can be activated in 2 ways :
- By activating a logic input LIx or by detection of an adjustable frequency threshold Frt

Step by step operation (JOG): Low speed operation pulse

If the JOG contact is closed and an operating direction is activated or deactivated, the ramps are 0.1 s regardless of the ACC, dEC, AC2 and dE2 settings.
The minimum time between 2 JOG operations is 0.5 seconds.
Parameter which can be accessed in the adjust menu :
- JOG speed

Configurable I/O Application Functions

Preset speeds

2, 4 or 8 speeds can be preset, and requiring 1, 2, or 3 logic inputs respectively.

The following assignment order must be observed : PS2 (LIx), then PS4 (LIy), then PS8 (LIz).

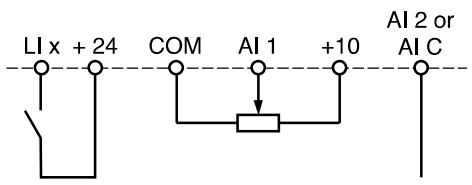
2 preset speeds		4 preset speeds			8 preset speeds			
Assign : LIx to PS2		Assign : LIx to PS2, then LIy to PS4			Assign : LIx to PS2, then LIy to PS4, then LIz to PS8			
LIx	speed reference	LIy	LIx	speed reference	LIz	LIy	LIx	speed reference
0	Reference (min = LSP)	0	0	Reference (min = LSP)	0	0	0	Reference (min = LSP)
1	HSP	0	1	SP2	0	0	1	SP2
		1	0	SP3	0	1	0	SP3
		1	1	HSP	0	1	1	SP4
					1	0	0	SP5
					1	0	1	SP6
					1	1	0	SP7
					1	1	1	HSP

To unassign the logic inputs, the following order must be observed : PS8 (LIz), then PS4 (LIy), then PS2 (LIx).

Reference switching

Two references are switched (AI1 reference and AI2 or AIC reference) by a command on a logic input. This function automatically assigns AI2 or AIC to speed reference 2.

Connection diagram



Contact open, reference = AI2 or AIC
Contact closed, reference = AI1

If AI2/AIC is assigned to the PI function, operation combines both functions, (see page 70)

Configurable I/O Application Functions

Freewheel stop

Stops the motor by the resistive torque only. The motor power supply is cut.
The freewheel stop occurs when the logic input assigned to this function opens (state 0).

DC injection stop

This can be activated in 2 ways :
- by activation of a logic input assigned to this function (state 1)
- automatically if the frequency is below 0.5 Hz

Fast stop

Braked stop with the current deceleration ramp time divided by 4 within the limits of the braking possibilities.
The fast stop occurs when the logic input assigned to this function opens (state 0). On this type of stop, no DC injection at the end of the ramp.

Fault reset

Clears the memorized fault and resets the speed controller if the cause of the fault has disappeared, except for OCF (overcurrent), SCF (motor short-circuit), EEF and InF (internal faults) faults, which require the controller to be powered down.
The fault is cleared when the logic input assigned to this function changes from 0 to 1.

Forced local mode when using the serial link

Changes from line control mode (serial link) to local mode (control via the terminal block).

Configurable I/O Application Functions

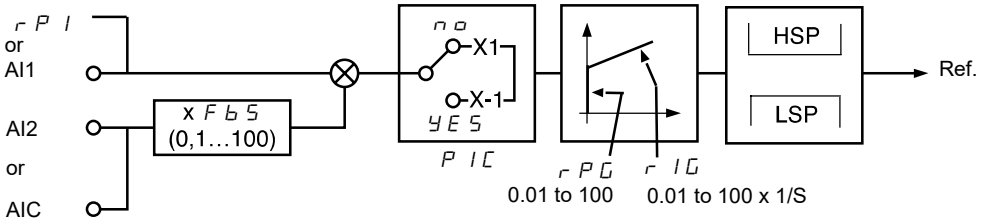
Analog input application functions

Input AI1 is always the reference.

Assignment of AI2/AIC (AI2 = 0, +10 V or AIC = X-Y mA, X and Y can be configured from 0 to 20mA)
Assign **CrL** and **CrH** (I/O assignment menu).

Summing speed reference : The frequency reference from AI2/AIC can be summed with AI1

PI regulator : Can be assigned to AI2/AIC. Allows a sensor to be connected and activates the PI regulator
The PI function is programmed via AIC in the I/O menu. The 2 parameters used to configure the PI function are:
- **AIC = PIA** configuration of the PI reference at the terminal on AI1. The reference is input AI1 and the feedback is AI2 or AIC. The PI regulator output becomes the frequency reference.
Application: process control which can be controlled by the motor speed
- **AIC = PII** configuration of the internal reference **rPI** which can be adjusted via the keypad (**SEt** adjust menu). The feedback is AI2 or AIC
Parameters which can be accessed in the adjust menu **SEt**:
- regulator proportional gain (rPG)
- regulator integral gain (rIG)
- PI feedback multiplication coefficient (FbS) : is used to adjust the max. value of the feedback so that it corresponds to the max. value of the PI regulator reference
- reversal of the direction of correction (PIC) : if PIC = no, the motor speed increases when the error is positive, example: pressure control with a compressor
If PIC = YES, the motor speed decreases when the error is positive, example: temperature control via a cooling fan.



Configurable I/O Application Functions

Recommendations:
• In 2-wire control (TCC=2C), do not assign Atr to no (drC menu)
• In 3-wire control (TCC=3C), the PI output (ref.) must be greater than 0.7 Hz. If it is less than 0.7 Hz, this state is interpreted as a stop (machine safety regulations). In order to restart, the PI ref. must be greater than 0.7 Hz. LSP must be set to a value greater than 0.7 Hz. To stop the motor, set LI1 (STOP)=0

Notes:
The PI function is incompatible in terminal mode (LCC = Yes)

"Manual - Automatic" operation with PI

This function combines the PI regulator and reference switching by a logic input. The speed reference is given by AI1 or by the PI function, depending on the state of the logic input.

Configurable I/O Application Functions

R2 relay application functions

Frequency threshold reached (FtA) : The relay contact is closed if the motor frequency is greater than or equal to the frequency threshold set by Ftd in the adjust menu.

Speed reference reached (SrA) : The relay contact is closed if the motor frequency is greater than or equal to the speed reference value.

Current threshold reached (CtA) : The relay contact is closed if the motor current is greater than or equal to the current threshold set by Ctd in the adjust menu.

Thermal state reached (tSA) : The relay contact is closed if the motor thermal state is greater than or equal to the thermal state threshold set by ttd in the adjust menu.

Analog output AO application functions

Analog output AO is a current output, which can be configured for 0 - 20 mA or 4 - 20 mA.

Motor current (code OCr) : supplies the image of the motor rms current.
20 mA corresponds to twice the nominal drive current.

Motor frequency (code rFr) : supplies the motor frequency calculated by the speed controller.
20 mA corresponds to the maximum frequency (parameter tFr).

Motor torque (code OLO) : supplies the image of the motor torque as an absolute value.
20 mA corresponds to twice the nominal motor torque (typical value).

Power (code OPr) : supplies the image of the power supplied to the motor by the speed controller.
20 mA corresponds to twice the nominal speed controller power (typical value).

Configurable I/O Application Functions

Function compatibility table

The choice of application functions may be limited by the number of I/O and by that fact that some functions are incompatible with one another. Functions which are not listed in this table are fully compatible.

	DC injection braking	Summing input	PI regulator	Reference switching	Freewheel stop	Fast stop	JOG operation	Preset speeds
DC injection braking					↑			
Summing input			●	●				
PI regulator		●					●	●
Reference switching		●						●
Freewheel stop	←					←		
Fast stop					↑			
JOG operation			●					←
Preset speeds			●	●			↑	

●	Incompatible functions
	Compatible functions
	N/A

Priority functions (functions which cannot be active at the same time) :

← ↑	The function marked with the arrow takes priority over the other.

Stop functions take priority over run commands.
Speed references via logic command take priority over analog references.

Setup - Preliminary Recommendations

Prior to powering up and configuring the speed controller

- Check that the line voltage is compatible with the supply voltage range of the drive (see page 56). The drive may be damaged if the line voltage is not compatible
- Power down the logic inputs (state 0) to prevent any accidental startup. Otherwise, an input assigned to the run command may cause the motor to start immediately when exiting the configuration menus
- Check that the cover has been replaced and that its connector (control wires) has been attached correctly

Operating recommendations

The ATV-28E speed controller is delivered wired and configured to restart automatically after any fault causing a stop disappears, for example loss then restoration of the line supply.
- Check that this operation is compatible with the safety conditions of the application. If it is not compatible, the wiring and configuration must be modified

To use the available inputs and outputs, the wiring should be connected as required.

User adjustment and extension of functions

If necessary, the display and the buttons can be used to modify the settings and to extend the functions described in the following pages. It is very easy to return to the factory settings via the FCS parameter in the drC menu (set to YES to activate the function, see page 86).
There are three types of parameter :
- display : values displayed by the speed controller
- adjustment : can be changed during operation or when stopped
- configuration : can only be modified when stopped and no braking is taking place. Can be displayed during operation

- Check that changes to the current operating settings do not present any danger Changes should preferably be made with the speed controller stopped

Setup - Preliminary Recommendations

Manual starting

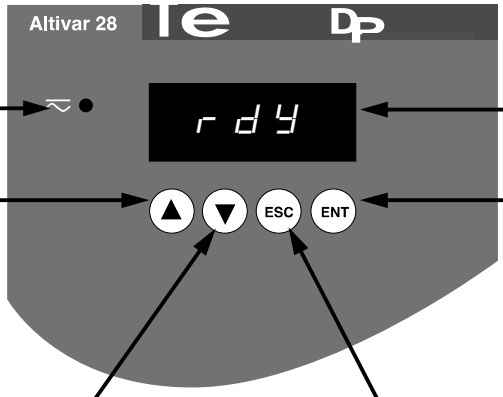
Important: In factory settings mode, on power-up or a manual fault reset or after a stop command, the motor can only be powered once the "forward", "reverse" and "DC injection stop" commands have been reset. If they have not been reset, the drive will display "rdY" but will not start. If the automatic restart function is configured (parameter Atr in the drC menu see page 85), these commands are taken into account without a reset being necessary.

Test on a low power motor or without a motor

In factory settings mode, motor phase loss detection is active (OPL = YES). To check the drive in a test or maintenance environment without having to switch to a motor with the same rating as the drive (particularly useful in the case of high power drives), deactivate motor phase loss detection (OPL = no).

Programming

Functions of the keys and the display



• Red LED : powered up (DC bus voltage)

• 4 seven-segment displays

• Returns to the previous menu or parameter, or increases the displayed value

• 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

• Exits a menu or parameter, or aborts the displayed value to return to the previous value in the memory

Pressing ▲ or ▼ does not store the choices

Store, save the displayed choice : ENT
The display flashes when a value is stored.

Normal display, with no fault present and no startup :

- Init : Initialization sequence

- rdY : Speed controller ready

- 43.0 : Display of the frequency reference

- dcb : DC injection braking in progress

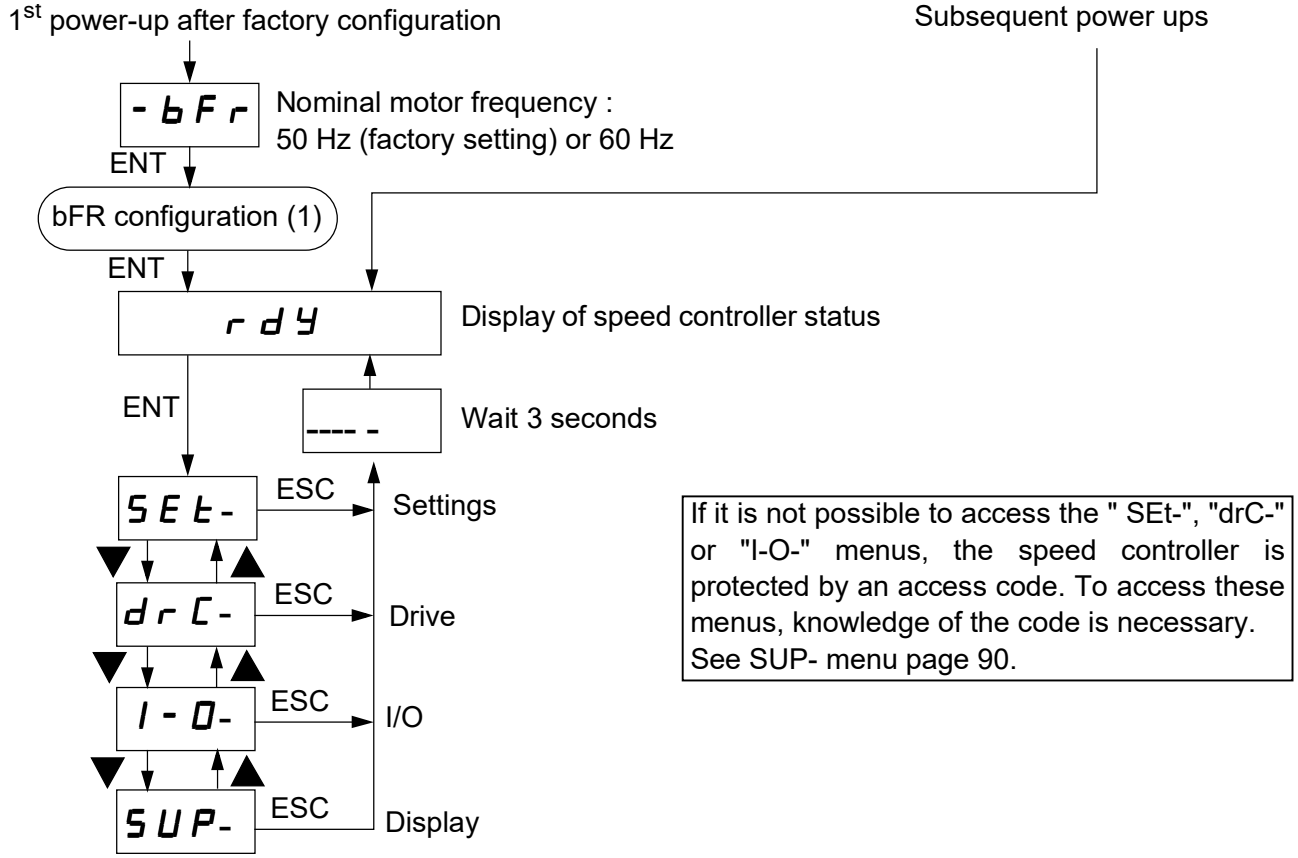
- rtrY : Automatic restart in progress

- nSt : Freewheel stop command

- FSt : Fast stop command

Programming

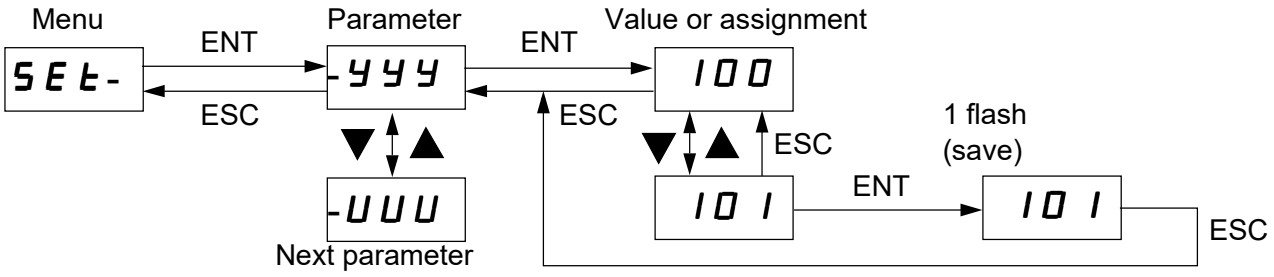
Access to menus



If it is not possible to access the " SEt-", "drC-" or "I-O-" menus, the speed controller is protected by an access code. To access these menus, knowledge of the code is necessary.
See SUP- menu page 90.

Access to parameters

Example :



(1) Configure bFr at the 1st power-up, using the same procedure as for the other parameters, as described above. **Caution**, bFr can only then be modified after a return to "factory settings".

Notes

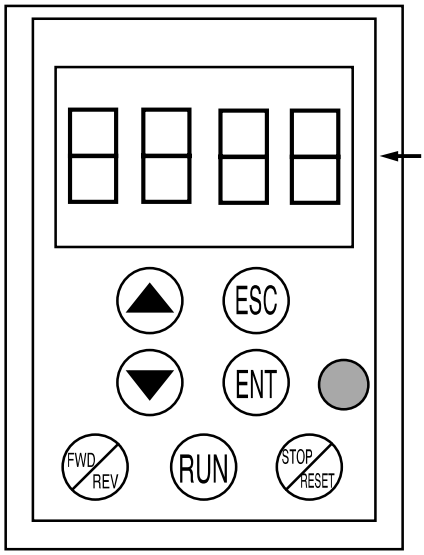
Remote Display Module Option

This module is a local control unit which can be mounted on the door of the wall-mounted or floor-standing enclosure. It has a cable with connectors, which is connected to the speed controller serial link (see the manual supplied with the display module). It has the same display and the same programming buttons as the Altivar 28 with the addition of a switch to lock access to the menus and three buttons for controlling the speed controller :

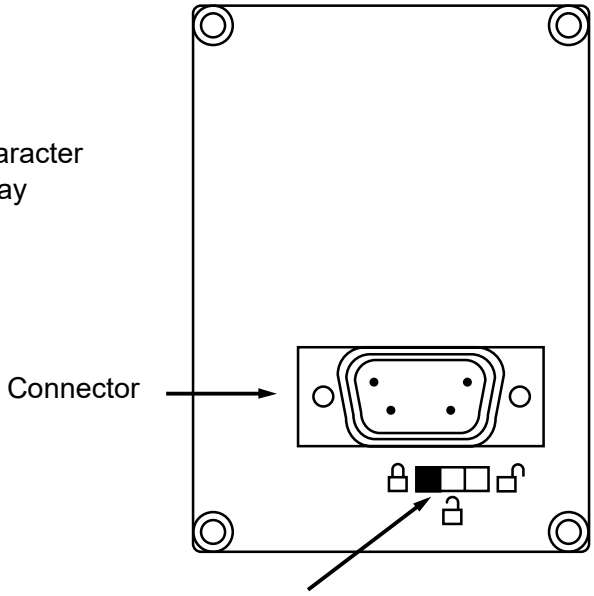
- FWD/RV : reversal of the direction of rotation
- RUN : motor run command
- STOP/RESET : motor stop command or fault reset

  The first press on the button stops the motor, and if DC injection standstill braking is configured, a second press stops this braking.

View of the front panel :



View of the rear panel :



Access switch :

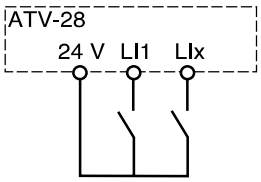
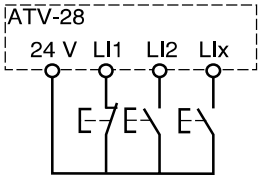
- position 🔒 : settings and configuration not accessible
- position 🔒 : settings accessible
- position 🔓 : settings and configuration accessible

Set bdr to 19.2 (I/O menu see page 82)

Configuration

I/O assignment menu I - O -

The parameters can only be modified when the speed controller is stopped and locked.
The functions are defined in the section "Configurable I/O Application Functions".

Code	Assignment	Factory setting
- t C C	Configuration of terminal block control : 2-wire or 3-wire control. 2C = 2-wire, 3C = 3-wire. 2-wire control : The open or closed state of the input controls running or stopping. Wiring example : LI1 : forward LIX : reverse  3-wire control (pulse control) : one pulse is all that is needed to control start-up. Wiring example : LI1 : stop LI2 : forward LIx : reverse  **Changing the assignment of tCC returns the logic inputs to the factory setting :** • tCC = 2C : LI1 : "Forward", cannot be reassigned LI2 : rrS ("Reverse") LI3 : PS2 LI4 : PS4 • tCC = 3C : LI1 : Stop, cannot be reassigned LI2 : For ("Forward"), cannot be reassigned LI3 : rrS ("Reverse") LI4 : JOG	2C
- L C C	Parameter only accessible with the remote display module option : no - YES Enables control of the speed controller using the STOP / RESET, RUN and FWD / REV buttons on the display module. The speed reference is then given by parameter LFr in the SEt- menu. Only the freewheel, fast stop and DC injection stop commands remain active on the terminal block. If the speed controller / display module link is broken, the speed controller locks on an SLF fault.	no

Configuration

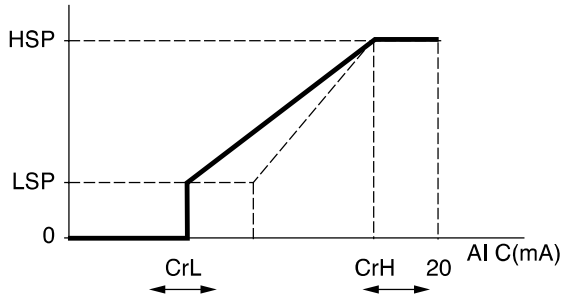
I/O assignment menu I-O- (continued)

Code	Assignment	Factory setting
-L I2 -L I3 -L I4	Logic inputs no : not assigned rrS : reverse rotation (2 operating directions) rP2 : ramp switching (1) JOG : "step by step" operation (1) PS2, PS4, PS8: See “Preset speeds”, page 67. nSt : freewheel stop. Function active when the input is powered down dCI : DC injection braking IdC, peak limited at 0.5 ItH after 5 seconds if the command is maintained FSt : fast stop. Function active when the input is powered down FLO : forced local mode rSt : fault reset rFC : reference switching (when the input is powered down the speed reference is AIC/AI2 or that generated by the PI function if it is assigned).When the input is powered up the speed reference is AI1 • If tCC = 3C, LI2 = For (forward), cannot be reassigned • If a function is already assigned to another input it still appears, but its storage using ENT is inactive • The 4 or 8 preset speeds must be configured in the following order of assignment : PS2 then PS4 then PS8. They must be cancelled in the reverse order (see Configurable I/O Application Functions)	rrS PS2 PS4
-AIC	Analog input AIC / AI2 no : not assigned SAI : summing with AI1 PII : PI regulator feedback, the PI reference being internal adjustment parameter rPI (1) PIA : PI regulator feedback, the PI reference being automatically assigned to AI1 (1) • SAI cannot be assigned if a logic input is assigned to rFC (reference switching) • PII and PIA cannot be assigned if a logic input is assigned to JOG or to PS2 • If a logic input LIx is assigned to rFC (reference switching) and AIC is assigned to PII or PIA, the speed reference is taken on AI1 if LIx = 1 and is the output of PI if LIx = 0	SAI

(1) Assigning this function displays the corresponding settings in the SEt- menu so that they can be adjusted.

Configuration

I/O assignment menu I-O (continued)

Code	Assignment	Factory setting
-CrL -CrH	Minimum value on input AIC, adjustable from 0 to 20 mA Maximum value on input AIC, adjustable from 0 to 20 mA These two parameters are used to configure the input for 0-20 mA, 4-20 mA, 20-4 mA, etc. Frequency  If the input used is AI2, these parameters remain proportionally active : 4 mA ➜ 2 V 20 mA ➜ 10 V For a 0 - 10 V input, configure CrL at 0 and CrH at 20. These parameters should be adjusted when the PI function is activated.	4 mA 20 mA
-AO	Analog output no : not assigned OCr : motor current. 20 mA corresponds to twice the nominal drive current rFr : motor frequency. 20 mA corresponds to the maximum frequency tFr OLO : motor torque. 20 mA corresponds to twice the nominal motor torque OPr : power supplied by the speed controller. 20 mA corresponds to twice the nominal drive power	rFr
-AOt	Analog output 0 : 0-20 mA configuration 4 : 4-20 mA configuration	0

Configuration

I/O assignment menu I-O- (continued)

Code	Assignment	Factory setting
-r2	Relay R2 no : not assigned FtA : frequency threshold reached. The contact is closed if the motor frequency is greater than or equal to the threshold set by Ftd (1) CtA : current threshold reached. The contact is closed if the motor current is greater than or equal to the threshold set by Ctd (1) SrA : speed reference reached. The contact is closed if the motor frequency is greater than or equal to the speed reference tSA : thermal threshold reached. The contact is closed if the motor thermal state is greater than or equal to the threshold set by ttd (1)	SrA
-Add	Address of the speed controller when it is controlled via the serial link. Adjustable from 1 to 31.	1
-bdr	Serial link transmission speed : 9.6 = 9600 bits / s or 19.2 = 19200 bits / s 19200 bits / s is the transmission speed for operating the remote display module. Modification of this parameter is only taken into account after the speed controller has been powered down then powered up.	19.2

(1) Assigning this function displays the corresponding settings in the SEt- menu so that they can be adjusted.

Configuration

Drive menu drC-

The parameters can only be modified with the speed controller stopped and locked, except for Frt, SFr, nrd and SdS, which can be adjusted with the controller running.

Drive performance can be optimized by :
- entering the values given on the rating plate
- performing an auto-tune operation (on a standard asynchronous motor)

ENGLISH

Code	Assignment	Adjustment range	Factory setting
-UnS	Nominal motor voltage marked on the motor rating plate. The adjustment range depends on the speed controller model : ATV28••••M2 ATV28••••N4	 200 to 240V 380 to 500 V	 230 V 400 V if bFr = 50 460 V if bFr = 60
-FrS	Nominal motor frequency marked on the motor rating plate	40 to 400 Hz	50 / 60Hz acc. to bFr
-tUn	Auto-tuning: optimization of the drive performance by measuring the stator resistance. Only active for V/F ratios : n and nLd (Uft parameter) - no (factory parameters of standard IEC motors) - donE (auto-tuning already done) : use the parameters of the auto-tune which has already been done - YES : starts auto-tuning When auto-tuning is complete, rdY is displayed. On returning to tUn, donE is displayed. If the fault tnF appears, check that the motor is connected correctly. If the connection is correct, the motor is not suitable : use the L or the P ratio (Uft parameter). Caution : Auto-tuning will only be performed if no command has been activated. If a "freewheel" or "fast stop" function is assigned to a logic input, this input must be set to 1 (active at 0).	no-donE-YES	no
-tFr	Maximum output frequency	40 to 400 Hz	60 / 72 Hz (1.2 x bFr)

Configuration

Drive menu dr C - (continued)

Code	Assignment	Adjustment range	Factory setting
- UFt	Selection of the type of voltage / frequency ratio - L : constant torque for motors connected in parallel or special motors - P : variable torque: pump and fan applications - n : sensorless flux vector control for constant torque applications - nLd : energy saving, for variable torque applications or constant torque applications not requiring high dynamics	L - P - n - nLd	n
- brA	Activating this function automatically adapts the deceleration ramp, if this has been set at too low a value for the inertia of the load. no : function inactive. YES : function active. The adaptation of the deceleration ramp depends on the DEC settings and the gain FLG (see SET adjust menu page 88). The function is incompatible with: • positioning on a ramp • the use of a braking resistor	no - YES	YES
- Frt	Ramp switching frequency When the output frequency becomes greater than Frt, the ramp times taken into account are AC2 and dE2. If Frt = 0, the function is inactive. This parameter does not appear if a logic input is assigned to the ramp switching function rP2.	0 to HSP	0 Hz
- SFr	Switching frequency The switching frequency can be adjusted to reduce the noise generated by the motor. Above 4 kHz, the speed controller output current must be derated : • up to 12 kHz : derated by 1.25% per kHz or 10% at 12 kHz • above 12 kHz : derated by 10% + 3.3 % per kHz or 19.9% at 15 kHz	2 to 15 kHz	4.0
- nrd	This function randomly modulates the switching frequency to reduce the motor noise. no : function inactive. YES : function active.	no - YES	YES

Parameter can be adjusted during operation.

Configuration

Drive menu dr C - (continued)

Code	Assignment	Adjustment range	Factory setting
- AtC	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 longer waiting periods : 1 s, 5 s, 10 s, then 1 min for the following attempts. If the restart has not taken place after 6 min, the procedure is aborted and the speed controller remains locked until it is powered down then powered up. The following faults permit this function : OHF, OLF, USF, ObF, OSF, PHF, OPF, SLF. The speed controller fault relay remains activated if this function is active. The speed reference and the operating direction must be maintained. This function can only be used in 2-wire control (tCC = 2C). ⚠ **- Check that any accidental start does not present any danger to personnel or equipment** - no : Function inactive - YES : Function active - USF : Function only active for the USF fault	no - YES - USF	no
- OPL	Enables the motor phase failure fault. - no : function inactive - YES : function active (motor phase loss detection) - OAC: activation of the function which manages the presence of a down-stream contactor	no - YES - OAC	YES
- IPL	Enables the line supply phase failure fault. no : function inactive. YES : function active. This parameter does not exist on the ATV28HU09M2, U18M2, U29M2 and U41M2 for a single phase line supply. The fault is only detected if the motor is on-load (around 0.7 times the nominal power). At low load, single phase operation does not cause damage.	no - YES	YES
- StP	Controlled stop on loss of line supply : Controls the stopping of the motor when there is a loss of line supply, following a ramp which which can be adjusted via FLG (see SET adjust menu page 88) according to the kinetic energy restored. no : function inactive. YES : function active.	no - YES	no

Configuration

Drive menu dr C - (continued)

Code	Assignment	Adjustment range	Factory setting
- F L r	Enables a smooth restart (catch a spinning load) after the following events : - loss of line supply or power off - fault reset or automatic restart - freewheel stop or DC injection stop with logic input no : function inactive. YES : function active.	no - YES	no
- d r n	Lowers the tripping threshold of the USF fault in order to operate on a line supply with 40% voltage drops. no : function inactive. YES : function active : ⚠ **• A line choke must be used** **• The performance of the speed controller can no longer be guaranteed when operating at undervoltage**	no - YES	no
- S d S	Scale factor for the display parameter SPd (-SUP menu), used to scale a value in proportion to the output frequency, the machine speed or the motor speed. For example : 4-pole motor, 1500 rpm at 50 Hz : -SdS = 30 -SPd =1500 at 50 Hz	1 to 200	30
- F C S	Return to factory settings (except LCC setting, see I/O menu page 79) no : no YES : the next display will be InIt then bFr (start of the menus)	no - YES	no

Parameter can be adjusted during operation.

ENGLISH

Settings

Adjust menu SEt -

- These adjustment parameters can be modified with the speed controller stopped or running. Ensure that changes made during operation do not present any danger. Changes should preferably be made with the speed controller stopped.

Code	Assignment	Adjustment range	Factory setting
- LFr	Speed reference via the display module. This parameter appears with the remote display module option if control of the speed controller via the display module is enabled : LCC parameter in I-O- menu.	LSP to HSP	
- rPI	Internal PI reference This parameter appears if analog input AIC/AI2 is assigned to the internal PI function (AIC = PII). The adjustment range of rPI is a percentage of AI max. (internal value of the frequency reference). AI max. depends on the voltage applied at AI2 or on the input current in AIC and the CrL and CrH parameter settings in the I/O menu (see page 81). To define rPI: $rPI = 100 \frac{(AIC \times FbS) - CrL}{CrH - CrL}$ with $(AIC \times FbS) \leq 10$ Example: process control with 10 mA of feedback on input AIC configured as 4 mA - 20 mA. $rPI = 100 \frac{10 - 4}{20 - 4} = 37,5$	0.0 to 100.0 %	0.0
- ACC - dEC	Acceleration and deceleration ramp times Defined to range from 0 to nominal frequency bFr Ensure that the value of DEC is not too low in relation to the load to be stopped.	0.0 to 3600 s 0.0 to 3600 s	3 s 3 s

The parameters in shaded boxes appear if the corresponding functions have been configured in the drC- or I-O- menus.

Settings

Adjust menu SEt - (continued)

Code	Assignment	Adjustment range	Factory setting
-AC2 -dE2	2nd acceleration ramp time 2nd deceleration ramp time These parameters are accessible if the ramp switching threshold (Frt parameter in the drC- menu) is other than 0 Hz or if a logic input is assigned to ramp switching.	0.0 to 3600 s 0.0 to 3600 s	5 s 5 s
-LSP	Low speed	0 to HSP	0 Hz
-HSP	High speed : ensure that this setting is appropriate for the motor and the application	LSP to tFr	bFr
-ItH	Current used for the motor thermal protection. Set ItH to the nominal current marked on the motor rating plate. To disable thermal protection, increase the value to the maximum (ntH displayed).	0.20 to 1.15 In (1)	In (1)
-UFr	Optimizes the torque at very low speed Ensure that the value of UFr is not too high which will cause the motor to saturate.	0 to 100 %	20
-SLP	Adjusts the slip compensation around the value set by the nominal motor speed. This parameter only appears if parameter UFt = n in the drC- menu.	0.0 to 5.0 Hz	According to controller rating
-FLG	Frequency loop gain, acts primarily when brA=YES (see page 84) and during deceleration. Practical advice: - machines with high inertia: gradually reduce the value in the event of overvoltage faults on deceleration (OBF) - machines with fast cycles or low inertia: gradually increase the gain FLG to optimize the following of the deceleration ramp (dEC) and limit the number of overvoltage faults on deceleration (OBF) Too high a gain may result in operating instability.	0 to 100 %	33
-IdC	Level of DC injection braking current After 5 seconds the injection current is peak limited at 0.5 Ith if it is set at a higher value.	0.1 ItH to In (1)	0.7 In (1)

(1) In is the nominal speed controller current shown in the catalog and on the speed controller rating plate.

The parameters in shaded boxes appear if the corresponding functions have been configured in the drC- or I-O- menus.

ENGLISH

Settings

Adjust menu SEt - (continued)

Code	Assignment	Adjustment range	Factory setting
-tdC	DC injection standstill braking time If the time is increased to 25.5 s, "Cont" is displayed. The DC injection is then continuous at standstill.	0 to 25.4 s Cont.	0.5 s
-JPF	Skip frequency prevents prolonged operation at a frequency range of 2 Hz around JPF. This function prevents a critical speed which leads to resonance. Setting the function to 0 renders it inactive.	0 to HSP	0 Hz
-JOG	Jog operating frequency	0 to 10 Hz	10 Hz
-rPG	PI regulator proportional gain, contributes to dynamic performance during rapid changes in the PI feedback.	0.01 to 100	1
-rIG	PI regulator integral gain, contributes to the static precision during slow changes in the PI feedback.	0.01 to 100 / s	1 / s
-Fbs	PI feedback multiplication coefficient	0.1 to 100	1
-PIC	Reversal of the direction of correction of the PI regulator : no : normal, YES : reverse	no - YES	no
-SP2	2 nd preset speed	LSP to HSP	10 Hz
-SP3	3 rd preset speed	LSP to HSP	15 Hz
-SP4	4 th preset speed	LSP to HSP	20 Hz
-SP5	5 th preset speed	LSP to HSP	25 Hz
-SP6	6 th preset speed	LSP to HSP	30 Hz
-SP7	7 th preset speed	LSP to HSP	35 Hz
-Ftd	Motor frequency threshold beyond which the contact on relay R2=FtA closes	0 to HSP	bFr
-Ctd	Current threshold beyond which the contact on relay R2=CtA closes	0.1 In to 1.5 In (1)	1.5 In (1)
-ttd	Motor thermal state threshold beyond which the contact on relay R2=tSA closes	1 to 118 %	100 %
-tLS	Low speed operating time Following operation at LSP for a defined period, a motor stop is requested automatically. The motor restarts if the frequency reference is greater than LSP and if a run command is still present. Caution : value 0 corresponds to an unlimited period.	0 to 25.5 s	0 (no time limit)

(1) In is the nominal speed controller current shown in the catalog and on the speed controller rating plate.

The parameters in shaded boxes appear if the corresponding functions have been configured in the drC- or I-O- menus.

Settings

Display menu SUP- (choice of parameter to be displayed during operation, view the last fault, speed controller software version and access code)

The display chosen is saved by :
- Pressing the ENT key once: the choice is temporary, it will be cleared at the next power up
- Pressing the ENT key twice : the choice is permanent. The second press on ENT exits the SUP- menu

The following parameters can be accessed, with the speed controller stopped or running.

Code	Parameter	Unit
-FrH	Display the frequency reference	Hz
-rFr	Display the output frequency applied to the motor	Hz
-SPd	Display the value calculated by the speed controller (rFr x SdS)	–
-LCr	Display the motor current	A
-OPr	Display the power supplied by the motor, estimated by the speed controller 100 % corresponds to the nominal speed controller power	%
-ULn	Display the line voltage	V
-tHr	Display the motor thermal state : 100% corresponds to the nominal thermal state Above 118%, the speed controller triggers an OLF fault (motor overload)	%
-tHd	Display the speed controller thermal state : 100% corresponds to the nominal thermal state Above 118%, the speed controller triggers an OHF fault (drive overheated LED) It can be reset below 70%	%
-LFt	View the last fault which appeared. If there has been no fault, the display shows : noF	–
-CPU	Speed controller software version	–
-COd	Access code : 0 to 9999. Value 0 (factory setting) does not prevent access. All other values lock access to the SEt-, drC- and I-O- menus To lock access to the speed controller, the code can be incremented using (▲ ▼) then saved using (ENT) ⚠ **• Do not forget to make a note of the code, as once it has been saved, it is no longer displayed** To access the menus on a speed controller which is locked by a code, the code can be incremented using (▲ ▼) and confirmed with (ENT) : • If the correct access code is displayed, it flashes, and code 0 can then be configured in order to access the menus • If an incorrect code is displayed, the speed controller returns to the initial display (rdY)	

ENGLISH

Settings

Display menu SUP - (continued)

Code	Parameter
- - - -	Display of speed controller status : the operating phase of the motor or a fault - Init : Initialization sequence - rdY : Speed controller ready - 43.0 : Display of the frequency reference - dcb : DC injection braking in progress - rtrY : Automatic restart in progress - nSt : Freewheel stop command - FSt : Fast stop command - mEmO: Save parameter

Maintenance

Servicing

The Altivar 28 does not require any preventative maintenance. It is nevertheless advisable to carry out the following operations regularly :

- Check the condition and tightness of connections
- Check that the temperature around the unit remains at an acceptable level and that the ventilation is effective (average service life of fans : 3 to 5 years depending on operating conditions)
- Remove any dust from the speed controller

Assistance with maintenance

If there is a problem when starting up or during operation, firstly check that the recommendations relating to the environment, mounting and connections have been followed

The first fault detected is memorized and displayed on the screen : the speed controller locks and fault relay R1 is tripped

Clearing faults

Switch off the speed controller power supply in the event of a fault which cannot be reset
Wait for the LED and the display to go off completely
Find the cause of the fault in order to correct it
Restore the power supply : this will clear the fault if it has disappeared

In some cases there may be an automatic restart after the fault has disappeared if this function has been programmed (see Atr menu drC page 85)

Display menu

This is used to prevent and find the causes of faults by displaying the speed controller status and its current values

Spares and repairs

Consult Schneider Electric product support

Faults - Causes - Remedies

Speed controller does not start, no fault displayed

• The assignment of the "Fast stop" or "Freewheel stop" functions will prevent the controller from starting if the corresponding logic inputs are not powered up. The ATV-28 then displays "nSt" in freewheel stop mode and "FSt" in fast stop mode. This is normal since these functions are active at zero so that the controller will be stopped safely if there is a wire break

• On power-up or a manual fault reset or after a stop command, the motor cannot be powered up until the "forward", "reverse" and "DC injection stop" commands have been reset. If they have not been reset, the speed controller will display "rdY" but will not start. If the automatic restart function is configured (parameter Atr in the drC menu), these commands are taken into account without a reset being necessary

Faults which cannot be reset automatically

The cause of the fault must be corrected before resetting by powering down and then powering up.

Fault	Probable cause	Remedy
-OCF overcurrent	- ramp too short - inertia or load too high - mechanical blocking - motor phase short-circuit	- Check the settings - Check the motor/speed controller/load sizing - Check the state of the mechanism - Check the cables connecting the drive to the motor
-SCF motor short-circuit	- short-circuit or earthing at the speed controller output - significant earth leakage current at the drive output if several motors are connected in parallel	- Check the cables connecting the speed controller to the motor, and the insulation of the motor - Adjust the switching frequency - Add motor chokes
- InF internal fault	- internal fault	- Check the environment (electromagnetic compatibility) - Check that the "local control" option has not been connected or disconnected with the controller powered up - Send the speed controller to be checked/repaired
-tnF auto-tuning fault	- special motor or motor whose power is not suitable for the speed controller - motor not connected to the drive	- Use the L or the P ratio - Check the presence of the motor during auto-tuning - If a downstream contactor is being used, close it during auto-tuning
-EEF internal fault (EEPROM)	- internal fault	- Send the speed controller to be checked/repaired - Polluted environment, ensure the installation guidelines contained in the manuals have been respected

Faults - Causes - Remedies

Faults which can be reset with the automatic restart function, after the cause has disappeared

Fault	Probable cause	Remedy
- OHF speed controller overload	- I^2t too high: > 1,85 In drv - 2s > 1,50 In drv - 60s - speed controller temperature too high	- Check the motor load - Check the drive ventilation and the environment Wait for the controller to cool before restarting
- OLF motor overload	- tripped by I^2t motor being too high	- Check the setting of the motor thermal protection, check the motor load. Wait for the controller to cool before restarting
- OSF overvoltage in steady state or during acceleration	- line voltage too high - disturbed line supply	- Check the line voltage
- USF undervoltage	- line supply too low - transient voltage dip - damaged load resistor	- Check the voltage and the voltage parameter - Reset - Send the speed controller to be checked/repaired
- ObF overvoltage during operation or deceleration	- braking too sudden or driving load - line voltage too high - disturbed line supply	- Increase the deceleration time - Install a braking resistor if necessary - Activate the brA function if it is compatible with the application - Reduce the frequency loop gain FLG if brA is active - Check the line voltage
- PHF phase failure under load conditions	- speed controller incorrectly supplied or a fuse blown - transient phase fault - 3-phase ATV28 used on a single phase line supply - supply transformer too small - mains ripple - load instability	- Check the power connection and the fuses - Reset - Use a 3-phase line supply - Check the supply transformer power - Adjust the voltage loop gain UFr

Faults - Causes - Remedies

Faults which can be reset with the automatic restart function, after the cause has disappeared (continued)

Fault	Probable cause	Remedy
-OPF motor phase failure	- loss of a phase at the speed controller output - downstream contactor open - motor not connected or motor power too low - instantaneous instability in the motor current	- Check the connections from the speed controller to the motor - If a downstream contactor is being used, set OPL to OAC - Test on a low power motor or without a motor: In factory settings mode, motor phase loss detection is active (OPL = YES) To check the drive in a test or maintenance environment without having to switch to a motor with the same rating as the drive (particularly useful in the case of high power drives), deactivate motor phase loss detection (OPL = no) - Optimize the drive settings via Ith, UnS, UFr and auto-tuning
-SLF serial link failure	- incorrect connection on the speed controller connector - disconnection of communication in local control mode	- Check the serial link connection on the speed controller connector - Restore the connection

Malfunction with no fault display

Display	Probable cause	Remedy
no code, LED not illuminated	- no power supply	- Check power supply to drive
- rdy red LED illuminated	- an LI input is assigned to "freewheel stop" or "fast stop" and this input is not switched on. These stops are controlled by loss of the input	- Connect the input to 24 V to disable the stop
-rdy or nSt non-following of deceleration ramp	- high inertia or driving load	- Reset dEC and FLG

Configuration/Settings Tables

Speed controller ATV-28 : .....
Optional customer identification no.: .....
Software version (CPU parameter in the SUP menu) : .....
Optional access code : .....

Menu I-O- (inputs/outputs)

Code	Factory setting	Customer setting	Code	Factory setting	Customer setting
-tCC	2C		-LI2	rrS	
-LI3	PS2		-LI4	PS4	
-AIC	SAI		-CrL	4 mA	mA
-CrH	20 mA	mA	-AO	rFr	
-AOt	0 mA	mA	-r2	SrA	
-Add	1		-bdr	19.2	

Menu drC- (drive)

Code	Factory setting	Customer setting	Code	Factory setting	Customer setting
-UnS	V	V	-FrS	Hz	Hz
-tUn	no		-tFr	Hz	Hz
-UFt	n		-brA	YES	
-Frt	0 Hz	Hz	-SFr	4.0 kHz	kHz
-nrd	YES		-Atr	no	
-OPL	YES		-IPL	YES	
-StP	no		-FLr	no	
-drn	no		-SdS	30	

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Configuration/Settings Tables

Menu SEt- (settings)

Code	Factory setting		Customer setting	Code	Factory setting		Customer setting
-rPI	0.0	%	Control	-rOt	For		Control
-ACC	3.0	s	s	-dEC	3.0	s	s
-AC2	5.0	s	s	-dE2	5.0	s	s
-LSP	0.0	Hz	Hz	-HSP		Hz	Hz
-ItH		A	A	-UFr	20	%	%
-SLP		Hz	Hz	-FLG	33	%	%
-IdC		A	A	-tdC	0.5	s	s
-JPF	0	Hz	Hz	-JOG	10	Hz	Hz
-rPG	1			-r IG	1	/s	/s
-Fbs	1			-P IC	no		
-SP2	10	Hz	Hz	-SP3	15	Hz	Hz
-SP4	20	Hz	Hz	-SP5	25	Hz	Hz
-SP6	30	Hz	Hz	-SP7	35	Hz	Hz
-Ftd		Hz	Hz	-Ctd		A	A
-ttd	100	%	%	-tLS	0.0	s	s

The parameters in shaded boxes appear if the corresponding functions have been configured in the drC- or I-O- menus.

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