Altivar® 21

Adjustable Speed Drive Controllers

Quick Start Guide

Instruction Bulletin

30072-451-90

Retain for future use.

a brand of Schneider Electric

Telemecanique

HAZARD CATEGORIES AND SPECIAL SYMBOLS

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this bulletin or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of the lightning bolt or ANSI man symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which, as indicated below, can or will result in personal injury if the instructions are not followed.

The exclamation point symbol is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

Symbol	Name
	Lightning Bolt
	ANSI Man
	Exclamation Point

⚠ DANGER

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, can result in death or serious injury.

⚠ CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, can result in minor or moderate injury.

CAUTION
CAUTION, used without the safety alert symbol, indicates a potentially hazardous situation which, if not avoided, can result in property damage.

PRODUCT SUPPORT

For support and assistance, contact the Product Support Group. The Product Support Group is staffed from 8:00 am until 6:00 pm Eastern time to assist with product selection, start-up, and diagnosis of product or application problems. Emergency phone support is available 24 hours a day, 365 days a year.

Toll free: 888-SquareD (888-778-2733)
E-Mail: drive.products.support@us.schneider-electric.com
Fax: 919-217-6508

ABOUT THIS DOCUMENT

This Quick Start Guide describes the minimum steps necessary for bringing an Altivar® 21 (ATV21) drive controller into service with the factory settings. The CD-ROM supplied with the drive controller contains the following additional documentation:

- *Altivar® 21 Installation Guide,* 30072-451-61
- *Altivar® 21 Programming and Operation Guide,* 30072-451-63
- *Altivar® 21 Remote Keypad Display, VW3A21101,* 30072-451-72

BEFORE YOU BEGIN

Read and understand these instructions before performing any procedure on this drive controller.

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Read and understand this manual before installing or operating the Altivar 21 (ATV21) drive controller. Installation, adjustment, repair, and maintenance must be performed by qualified personnel.
- The user is responsible for compliance with all international and national electrical code requirements with respect to grounding of all equipment.
- Many parts of this drive controller, including the printed circuit boards, operate at the line voltage. DO NOT TOUCH. Use only electrically insulated tools.
- DO NOT touch unshielded components or terminal strip screw connections with voltage present.
- DO NOT short across terminals PA/+ and PC/– or across the DC bus capacitors.
- Before servicing the drive controller:
  - — Disconnect all power, including external control power that may be present.
  - — Place a “DO NOT TURN ON” label on all power disconnects.
  - — Lock all power disconnects in the open position.
  - — WAIT 15 MINUTES to allow the DC bus capacitors to discharge. Then follow the DC bus voltage measurement procedure on page 21 to verify that the DC voltage is less than 45 V. The drive LED is not an indicator of the absence of DC bus voltage.
- Install and close all covers before applying power or starting and stopping the drive controller.

Failure to follow these instructions will result in death or serious injury.

⚠ DANGER

UNINTENDED EQUIPMENT OPERATION

Before turning on the drive controller or upon exiting the configuration menus, ensure that the inputs assigned to the Run command are in a state that will not cause the drive controller to run. Otherwise, the motor can start immediately.

Failure to follow this instruction will result in death, serious injury, or equipment damage.

⚠ WARNING

LOSS OF CONTROL

- The designer of any control scheme must consider the potential failure modes of control paths and, for certain critical control functions, provide a means to achieve a safe state during and after a path failure. Examples of critical control functions are emergency stop and overtravel stop.
- Separate or redundant control paths must be provided for critical control functions.
- System control paths may include communication links. Consideration must be given to the implications of unanticipated transmission delays or failures of the link.[1]
- Each implementation of an Altivar 21 drive controller must be individually and thoroughly tested for proper operation before being placed into service.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

[1] For additional information refer to NEMA ICS 1.1 (latest edition), “Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control” and to NEMA ICS 7.1 (latest edition), “Safety Standards for Construction and Guide for Selection, Installation and Operation of Adjustable-Speed Drive Systems.”

⚠ WARNING

LOSS OF CONTROL

- Set the communication error trip time to stop the drive controller in case the remote keypad display is deactivated by an unusual event such as tripping, an operation error, or a power outage.
- Ensure that the communication error trip time is properly set before deactivating the remote keypad display.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ CAUTION

INCOMPATIBLE LINE VOLTAGE

Before turning on and configuring the drive controller, ensure that the line voltage is compatible with the line voltage range specified on the drive controller nameplate. The drive controller can be damaged if the line voltage is not compatible.

Failure to follow this instruction can result in injury or equipment damage.

QUICK START PROCEDURE

■ 1 Receive and inspect the drive controller (pages **11–12**).

- Ensure that the catalog number printed on the label is the same as that on the packing slip.
- Remove the drive controller from its packaging and ensure that it has not been damaged in transit.

■ 2 Check the line voltage.

- Ensure that the line voltage is compatible with the voltage range of the drive controller.

■ 3 Mount the drive controller (pages **18–20**).

- Refer to the *Altivar® 21 Installation Guide*, 30072-451-61, if the ambient temperature is higher than 40 °C or if the switching frequency is higher than 12 kHz.

■ 4 Wire the drive controller (pages **21**–**31**).

Steps 1 to 4 must be performed with the power off.

- Connect the grounding conductors.
- Connect the motor. Ensure that its rating corresponds to the drive controller's voltage.
- Connect the line supply. Ensure that it is within the voltage range of the drive controller.
- Connect the control wiring.
- Connect the speed reference.

■ 5 Power up the drive controller.

■ 6 Configure the drive controller (pages **40**–**41**).

With the drive controller stopped:

- Set nCr to the motor nominal current.
- For a 60 Hz motor, set tYP to 2.

■ 7 Test operation.

Completely test operation before placing the drive controller into service.

RECEIVING AND PRELIMINARY INSPECTION

⚠ WARNING

DAMAGED PACKAGING

If the packaging appears damaged, it can be dangerous to open it or handle it. Handle with care.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

⚠ WARNING

DAMAGED EQUIPMENT

Do not operate or install any drive controller that appears damaged.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

Before installing the ATV21 drive controller, read this manual and follow all precautions.

Before removing the drive controller from its packaging, verify that the carton was not damaged in shipping. Carton damage usually indicates improper handling and the potential for device damage. If any damage is found, notify the carrier and your Schneider Electric representative.

Storing and Shipping

If the drive controller is not being immediately installed, store it in a clean, dry area where the ambient temperature is between -25 and +70 °C (-13 and +158 °F). If the drive controller must be shipped to another location, use the original shipping carton and packing material to protect it.

Lifting and Handling

⚠ WARNING

HANDLING AND LIFTING HAZARD

Keep the area below any equipment being lifted clear of all personnel and property. Use the lifting method illustrated in the figure below.

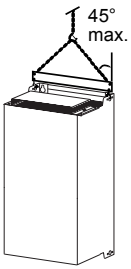
Failure to follow this instruction can result in death, serious injury, or equipment damage.

⚠ WARNING

RISK OF TOPPLING

- Keep the drive controller on the pallet until ready to install.
- Never place the drive controller in an upright position without proper support, such as a hoist, braces, or other mounting supports.

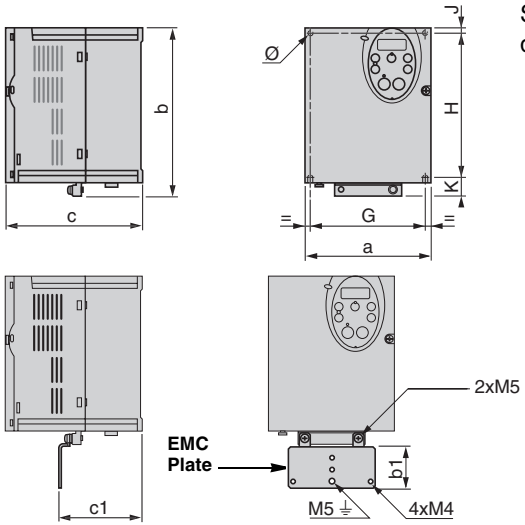
Failure to follow these instructions can result in death, serious injury, or equipment damage.



- Altivar 21 drive controllers up to 25 hp can be removed from their packaging and installed without a handling device.
- A hoist must be used for handling and lifting drive controllers with ratings of 30–100 hp.
- After removing the drive controller from its packaging, inspect it for damage. If any damage is found, notify the carrier and your sales representative.
- Verify that the drive controller nameplate and label conform to the packing slip and corresponding purchase order.

DIMENSIONS AND WEIGHTS

Figure 1: Outline Drawings: 3-Phase, 230 V, 1–5 hp / 460 V, 1–7.5 hp



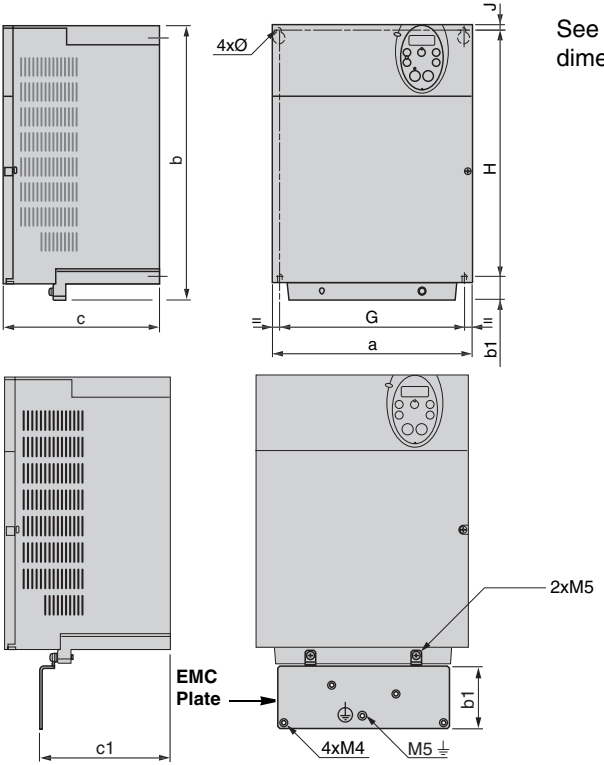
See Table 1 for dimensions.

Table 1: Dimensions and Weights: 3-Phase, 230 V, 1–5 hp / 460 V, 1–7.5 hp

Voltage	Motor hp	Catalog no. ATV21••••[1]	Dimensions mm (in.)									Weight kg (lb)
			a	b	b1	c	c1	G	H	J	Ø	
3-phase 230 V	1	H075M3X	107 (4.2)	143 (5.6)	49 (1.93)	150 (5.9)	67.3 (2.65)	93 (3.6)	121.5 (4.7)	5 (0.20)	5 (0.20)	1.80 (3.978)
	2	HU15M3X										
	3	HU22M3X										
	4	HU30M3x	142 (5.6)	184 (7.2)	48 (1.8)	150 (5.9)	88.8 (3.50)	126 (4.9)	157 (6.1)	6.5 (0.26)	5 (0.20)	3.05 (6.741)
	5	HU40M3X										
3-phase 460 V	1	H075N4	107 (4.2)	143 (5.6)	49 (1.93)	150 (5.9)	67.3 (2.65)	93 (3.6)	121.5 (4.7)	5 (0.20)	5 (0.20)	2.00 (4.42)
	2	HU15N4										
	3	HU22N4										
	4	HU30N4	142 (5.6)	184 (7.2)	48 (1.8)	150 (5.9)	88.8 (3.50)	126 (4.9)	157 (6.1)	6.5 (0.26)	5 (0.20)	3.35 (7.404)
	5	HU40N4										
	7.5	HU55N4										

[1] The symbol "•" in a catalog number indicates part of the number that varies with drive controller size or rating.

Figure 2: Outline Drawings: 3-Phase, 230 V, 7.5–25 hp / 460 V, 10–25 hp



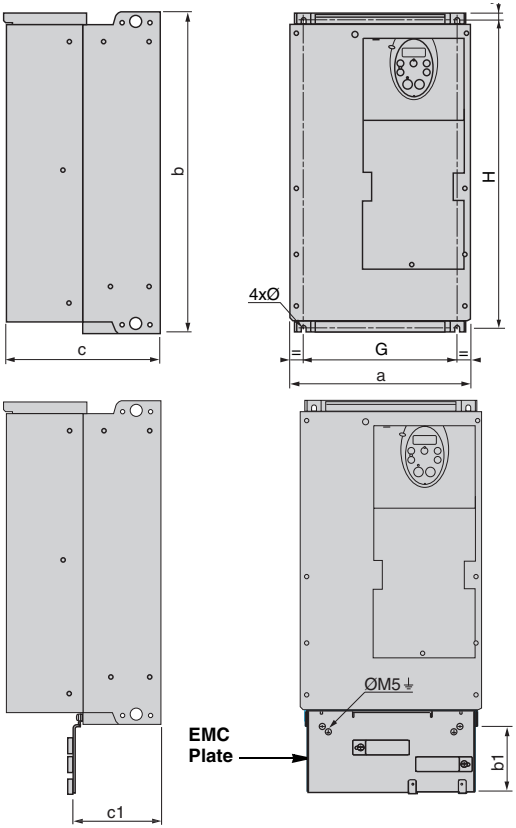
See Table 2 for dimensions.

Table 2: Dimensions: 3-Phase, 230 V, 7.5–25 hp / 460 V, 10–25 hp

Voltage	Motor hp	Catalog no. ATV21••••[1]	Dimensions mm (in.)									Weight kg (lb)
			a	b	b1	c	c1	G	H	J	Ø	
3-phase 230 V	7.5	HU55M3X	180 (7)	232 (9.1)	75 (2.9)	170 (6.7)	134.8 (5.31)	160 (6.3)	210 (8.2)	5 (0.20)	5 (0.20)	6.10 (13.481)
	10	HU75M3X										
	15	HD11M3X	245 (9.6)	329.5 (13)	75 (2.9)	190 (7.5)	147.6 (5.8)	225 (8.8)	295 (11.6)	7 (0.28)	6 (0.24)	11.50 (25.4)
	20	HD15M3X										
	25	HD18M3X										
3-phase 460 V	10	HU75N4	180 (7)	232 (9.1)	75 (2.9)	170 (6.7)	134.8 (5.31)	160 (6.3)	210 (8.2)	5 (0.20)	5 (0.20)	6.45 (14.26)
	15	HD11N4										
	20	HD15N4	245 (9.6)	329.5 (13)	75 (2.9)	190 (7.5)	147.6 (5.8)	225 (8.8)	295 (11.6)	7 (0.28)	6 (0.24)	11.65 (25.75)
	25	HD18N4										

[1] The symbol "•" in a catalog number indicates part of the number that varies with drive controller size or rating.

Figure 3: Outline Drawings: 3-Phase, 230 V, 30 hp / 460 V, 30–60 hp



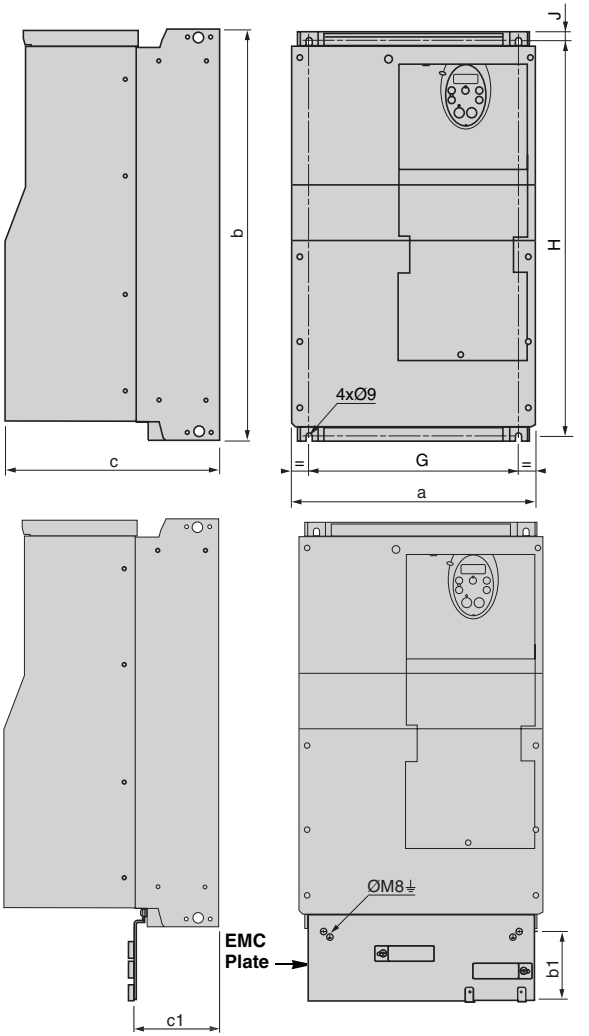
See Table 3 for dimensions.

Table 3: Dimensions and Weights: 3-Phase, 230 V, 30 hp / 460 V, 30–60 hp

Voltage	Motor hp	Catalog no. ATV21••••[1]	Dimensions mm (in.)									Weight kg (lb)
			a	b	b1	c	c1	G	H	J	Ø	
3-phase 230 V	30	HD22M3X	240 (9.4)	420 (16.5)	122 (4.8)	214 (8.4)	120 (4.72)	206 (8.1)	403 (15.8)	10 (0.39)	6 (0.24)	27.40 (60.554)
3-phase 460 V	30	HD22N4	240 (9.4)	420 (16.5)	122 (4.8)	214 (8.4)	120 (4.72)	206 (8.1)	403 (15.8)	10 (0.39)	6 (0.24)	26.40 (58.344)
	40	HD30N4										
	50	HD37N4	240 (9.4)	550 (21.65)	113 (4.45)	244 (9.61)	127 (5.0)	206 (8.1)	529 (20.83)	10 (0.39)	6 (0.24)	23.50 (51.81)
	60	HD45N4										

[1] The symbol "•" in a catalog number indicates part of the number that varies with drive controller size or rating.

Figure 4: Outline Drawings: 3-Phase, 230 V, 40 hp / 460 V, 75–100 hp



See Table 4 for dimensions.

Table 4: Dimensions and Weights: 3-Phase, 230 V, 40 hp / 460 V, 75–100 hp

Voltage	Motor hp	Catalog no. ATV21••••[1]	Dimensions mm (in.)									Weight kg (lb)
			a	b	b1	c	c1	G	H	J	Ø	
3-phase 230 V	40	HD30M3X	320 (12.5)	630 (24.8)	118 (4.65)	290 (11.4)	173 (6.81)	280 (11)	604.5 (23.8)	10 (0.39)	9 (0.35)	38.650 (85.42)
3-phase 460 V	75	HD55N4	320 (12.5)	630 (24.8)	118 (4.65)	290 (11.4)	173 (6.81)	280 (11)	604.5 (23.8)	10 (0.39)	9 (0.35)	39.70 (87.74)
	100	HD75N4										

[1] The symbol "•" in a catalog number indicates part of the number that varies with drive controller size or rating.

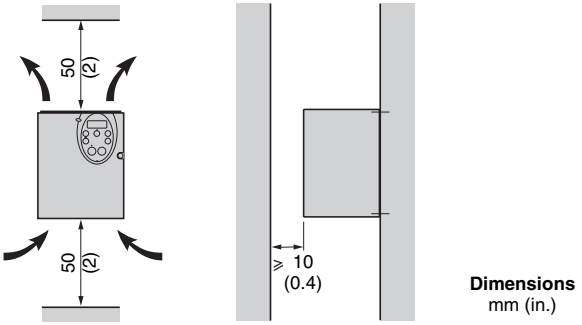
MOUNTING THE DRIVE CONTROLLER

Clearances

When mounting an ATV21 drive controller:

- Install the drive controller vertically, ± 10°.
- Do not place the drive controller close to heat sources.
- Leave sufficient free space around the drive controller to ensure that air can circulate from the bottom to the top of the unit. See Figure 5.
- Leave a minimum of 10 mm (0.4 in.) of free space in front of the drive controller.

Figure 5: Clearances for ATV21 Drive Controllers



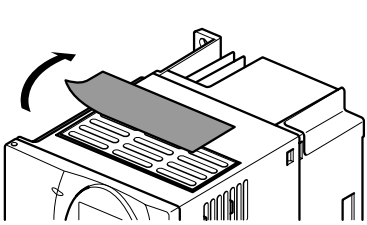
Removing the Top Vent Cover

See “Mounting Methods” on page 20 to determine the type of mounting appropriate for your application before removing the protective cover from the drive controller.

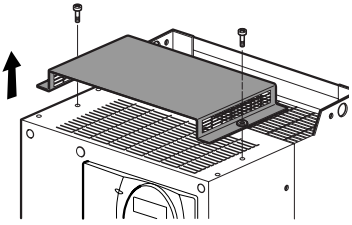
When IP20 protection is adequate, remove the protective cover on top of the drive controller as shown in Figure 6.

For UL Type 1 protection, leave the protective cover on top of the drive controller and install a conduit entry kit.

Figure 6: Removing the Top Vent Cover



Removing the top vent cover from:
ATV21H075M3X–D18M3X,
ATV21H075N4–D18N4



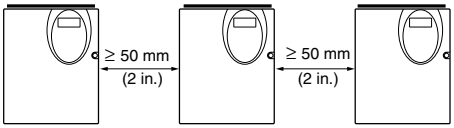
Removing the top vent cover from:
ATV21HD22M3X, D30M3X,
ATV21HD22N4, D30N4

Mounting Methods

The mounting methods illustrated below are for ambient temperatures of 40 °C or lower and switching frequencies of 12 kHz or lower. For higher ambient temperatures and switching frequencies, consult the *Altivar® 21 Installation Guide*, 30072-451-61.

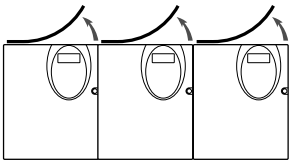
Type A Mounting

Free space ≥ 50 mm (2 in.) on each side, with the top vent cover in place.



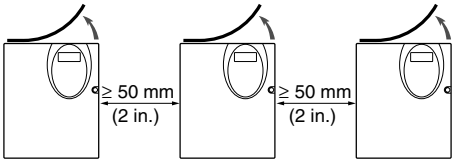
Type B Mounting

Drive controllers mounted side-by-side, with the top vent cover removed (degree of protection becomes open type IP20).



Type C Mounting

Free space ≥ 50 mm (2 in.) on each side, with the top vent cover removed (degree of protection becomes open type IP20).



BUS VOLTAGE MEASUREMENT PROCEDURE

Before working on the drive controller, remove all power and wait 15 minutes to allow the DC bus to discharge. Then measure the DC bus voltage between the PA/+ and PC/– terminals.

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

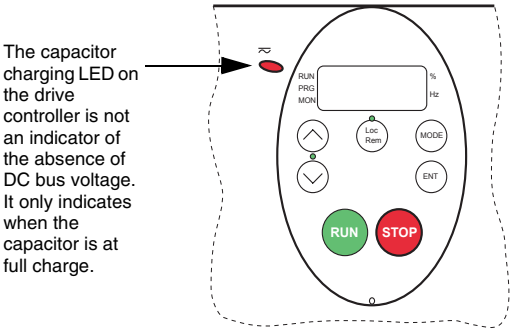
Read and understand the precautions in “Before You Begin” on page 7 before performing this procedure.

Failure to follow this instruction will result in death or serious injury.

The DC bus voltage can exceed 1,000 Vdc. Use a properly rated voltage-sensing device when performing this procedure. To measure the DC bus voltage:

1. Disconnect all power.
2. Wait 15 minutes to allow the DC bus to discharge.
3. Measure the voltage of the DC bus between the PA/+ and PC/– terminals to ensure that the voltage is less than 45 Vdc.
4. If the DC bus capacitors do not discharge completely, contact your local Schneider Electric representative. Do not repair or operate the drive controller.

Figure 7: Capacitor Charging LED



WIRING

Wiring Recommendations

Good wiring practice requires the separation of control wiring from all power (line) wiring. In addition, power wiring to the motor must have the maximum possible separation from all other power wiring, whether from the same drive controller or other drive controllers. **Do not run power and control wiring, or multiple power wiring, in the same conduit.** This separation reduces the possibility of coupling electrical transients from power circuits into control circuits or from motor power wiring into other power circuits.

⚠ WARNING

IMPROPER WIRING PRACTICES

- Follow the wiring practices described in this document in addition to those already required by the National Electrical Code and local electrical codes.
- Do not apply input line voltage to the output terminals (U/T1, V/T2, W/T3).
- Check the power connections before energizing the drive controller.
- If replacing another drive controller, verify that all wiring connections to the ATV21 drive controller comply with all wiring instructions in this manual.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Follow the practices below when wiring ATV21 drive controllers:

- Verify that the voltage and frequency of the input supply line and the voltage, frequency, and current of the motor match the rating on the drive controller nameplate.
- Use metallic conduit for all drive controller wiring. Do not run control and power wiring in the same conduit.
- Separate the metallic conduits carrying power wiring or low-level control wiring by at least 76 mm (3 in.).
- Separate the non-metallic conduits or cable trays carrying power wiring from the metallic conduit carrying control wiring by at least 305 mm (12 in.).

- Whenever power and control wiring cross, the metallic conduits and non-metallic conduits or trays must cross at right angles.
- Equip all inductive circuits near the drive controller (such as relays, contactors, and solenoid valves) with noise suppressors.
- Cable lengths greater than 30.5 m (100 ft) can affect the drive controller and motor performance. For cables longer than 100 ft, an output filter may be necessary.

Branch Circuit Protection

Refer to NEC Article 430 for sizing of branch circuit conductors. Ensure that all branch circuit components and equipment (such as transformers, feeder cables, disconnect devices, and protective devices) are rated for the input current of the ATV21 drive controller, or for the rated output current, whichever value is larger. Rated input and output current values are shown on the drive controller nameplate.

NOTE: Ensure that the branch circuit feeder protection rating is not less than the rated output current of the drive controller.

⚠ WARNING

INADEQUATE OVERCURRENT PROTECTION

- Overcurrent protective devices must be properly coordinated.
- The National Electrical Code and the Canadian Electricity Code require branch circuit protection. Use the fuses recommended on the drive controller nameplate to achieve published fault withstand current ratings.
- Do not connect the drive controller to a power feeder whose short circuit capacity exceeds the drive controller short circuit current rating listed on the drive controller nameplate.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Grounding

Ground the drive controller according to the National Electrical Code and all local codes for safe, dependable operation.

- To comply with current regulations concerning high leakage currents (above 3.5 mA), use at least a 10 mm² (6 AWG) protective conductor, or 2 protective conductors with the same cross-section as the power section AC supply conductors.
- Verify that resistance to ground is 1 Ω or less. Improper grounding causes intermittent and unreliable operation.

⚠ DANGER

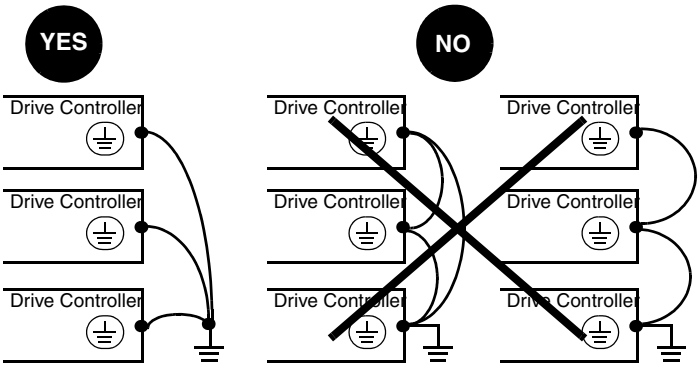
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Ground the equipment using the provided ground connecting point as shown in Figure 8. The drive controller panel must be properly grounded before power is applied.

Failure to follow this instruction will result in death or serious injury.

Ground multiple drive controllers as shown in Figure 8. Do not loop the ground cables or connect them in series.

Figure 8: Grounding Multiple Drive Controllers

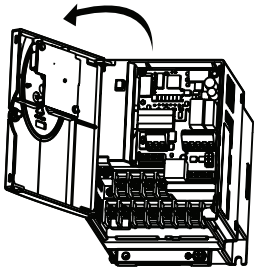


Power Terminals

To access the power terminals, open the cover using one of the methods illustrated in Figure 9.

Figure 9: Power Terminal Access

Example: 2 hp ATV21 Drive Controller



Example: 30 hp ATV21 Drive Controller

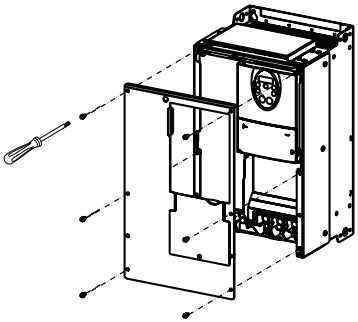


Table 5: Power Terminal Functions

Terminals	Function
⏚	Ground terminal[1]
R/L1 S/L2 T/L3	Power supply
U/T1 V/T2 W/T3	Outputs to the motor
PO[2]	DC bus (+) polarity (do not use)
PA/+[2, 3]	DC bus (+) polarity
PB	DC bus connection (do not use)
PC/–[3]	DC bus (–) polarity

1 ATV21 drive controllers have two ground terminals, one on the power terminal strip and one on the heatsink.

2 **Never remove the jumper between PO and PA/+.**

3 The PA/+ and PC/– terminals can only be used to measure the DC bus voltage.

Table 6: Maximum Conductor Sizes for Power Terminals

Voltage	hp	Catalog no. ATV21H•••• [1]	Maximum conductor size [2]						Maximum tightening torque	
			Input power terminals		Output power terminals		Ground terminals			
			mm^2	AWG	mm^2	AWG	mm^2	AWG	N•m	lb-in
208 / 240 Vac	1	075M3X	6	10	6	10	6	10	1.3	11.5
	2	U15M3X	6	10	6	10	6	10	1.3	11.5
	3	U22M3X	6	10	6	10	6	10	1.3	11.5
	3 kW	U30M3X	6	10	6	10	6	10	1.3	11.5
	5	U40M3X	6	10	6	10	6	10	1.3	11.5
	7.5	U55M3X	16	6	16	6	16	6	2.5	22.0
	10	U75M3X	16	6	16	6	16	6	2.5	22.0
	15	D11M3X	25	3	25	3	25	3	4.5	40.0
	20	D15M3X	25	3	25	3	25	3	4.5	40.0
	25	D18M3X	25	3	25	3	25	3	4.5	40.0
	30	D22M3X	50	1/0	50	1/0	50	1/0	24	212.0
	40	D30M3X	150	300 mcm	150	300 mcm	150	300 mcm	41	363.0
480 Vac	1	075N4	6	10	6	10	6	10	1.3	11.5
	2	U15N4	6	10	6	10	6	10	1.3	11.5
	3 kW	U22N4	6	10	6	10	6	10	1.3	11.5
	—	U30N4	6	10	6	10	6	10	1.3	11.5
	5	U40N4	6	10	6	10	6	10	1.3	11.5
	7.5	U55N4	6	10	6	10	6	10	1.3	11.5
	10	U75N4	6	6	16	6	16	6	2.5	22.0
	15	D11N4	16	6	16	6	16	6	2.5	22.0
	20	D15N4	25	3	25	3	25	3	4.5	40.0
	25	D18N4	25	3	25	3	25	3	4.5	40.0
	30	D22N4	50	1/0	50	1/0	50	1/0	24	212.0
	40	D30N4	50	1/0	50	1/0	50	1/0	24	212.0
	50	D37N4	50	1/0	50	1/0	50	1/0	24	212.0
	60	D45N4	50	1/0	50	1/0	50	1/0	24	212.0
	75	D55N4	150	300 mcm	150	300 mcm	150	300 mcm	41	363.0
	100	D75N4	150	300 mcm	150	300 mcm	150	300 mcm	41	363.0

[1] The symbol "•" in a catalog number indicates part of the number that varies with drive controller size or rating

[2] 75 °C copper.

Control Terminals

⚠ DANGER

UNINTENDED EQUIPMENT OPERATION

- Prevent accidental grounding of logic inputs configured for sink logic. Accidental grounding can result in unintended activation of drive controller functions.
- Protect the signal conductors against damage that could result in unintentional conductor grounding.
- Follow NFPA 79 and EN 60204 guidelines for proper control circuit grounding practices.

Failure to follow these instructions will result in death or serious injury.

⚠ WARNING

RISK OF IMPROPER OPERATION

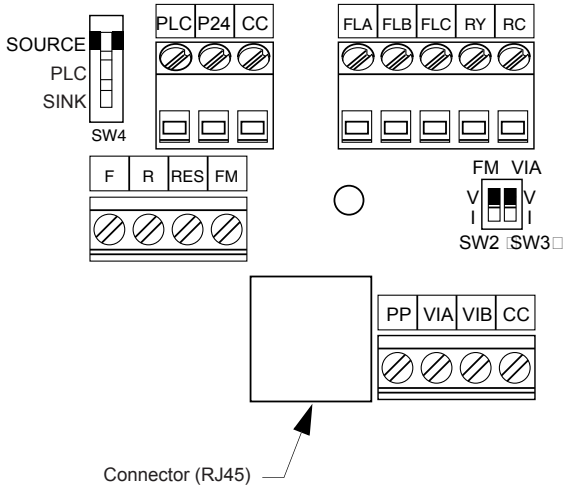
Do not change the setting of switch SW4 unless your system is wired for sink logic.

Failure to follow this instruction can result in death or serious injury.

Refer to the *Altivar® 21 Installation Guide*, 30072-451-61, for recommended circuit diagrams for source and sink logic.

The control terminals are illustrated in Figure 10. The same control card is used for all Altivar 21 drive controllers. Refer to the *Altivar® 21 Programming and Operation Guide*, 30072-451-63, for information on configuring control terminal functions.

Figure 10: Control Terminals



Switch:	Factory Setting:
SW4 (Selection of logic type)	SOURCE side (positive)
SW2 (FM voltage/ current selection)	V (Voltage)
SW3 (VIA voltage/current selection)	V (Voltage)

Control Terminal Wire Size and Torque:

Maximum wire size: 2.5 mm² (AWG 14)
Tightening torque: 0.6 Nm (5.3 lb.in)

Table 7: Control Terminal Characteristics

Terminals	Function	Characteristics	Default function setting
PLC	External power supply input	+24 Vdc input for external power supply for logic inputs Max. permissible voltage: 50 Vdc	—
P24	Internal supply	Short-circuit and overload protection: 24 Vdc supply (min. 21 Vdc, max. 27 Vdc), maximum current: 200 mA	
CC	Common	0 Vdc common (2 terminals)	
FLA, FLB, FLC	Configurable relay outputs	1 relay logic output, 1 N/C contact (FLB), and 1 N/O contact (FLA) with common point (FLC) Minimum switching capacity: 3 mA for 24 Vdc Maximum switching capacity: • On resistive load (cos φ = 1): 5 A for 250 Vac or 30 Vdc • On inductive load (cos φ = 0.4 and L/R = 7 ms): 2 A for 250 Vac or 30 Vdc Max. response time: 7 ms ± 0.5 ms	Fault relay
RY, RC		1 relay logic output, 1 N/O contact Minimum switching capacity: 3 mA for 24 Vdc Maximum switching capacity: • On resistive load (cos φ = 1): 5 A for 250 Vac or 30 Vdc • On inductive load (cos φ = 0.4 and L/R = 7 ms): 2 A for 250 Vac or 30 Vdc Max. response time: 7 ms ± 0.5 ms	Speed attained
F R RES	Configurable logic inputs	3 programmable logic inputs, 24 Vdc, compatible with level 1 PLC, IEC 65A-68 standard Impedance: 3.5 kΩ Maximum voltage: 30 Vdc Max. sampling time: 2 ms ±0.5 ms Multiple assignment makes it possible to configure several functions on one input	F: Run forward (2-wire control) R: Preset speed 1 command (15 Hz) RES: Fault reset
		Positive logic (Source): State 0 if ⩽ 5 Vdc or logic input not wired, state 1 if ⩾ 11 Vdc	
		Negative logic (Sink): State 0 if ⩾ 16 Vdc or logic input not wired, state 1 if ⩽ 10 Vdc	
FM	Configurable analog output	1 switch-configurable voltage or current analog output: • Voltage analog output 0–10 Vdc, minimum load impedance 470 Ω • Current analog output X–Y mA by programming X and Y from 0 to 20 mA, maximum load impedance: 500 Ω Max. sampling time: 2 ms ±0.5 ms Resolution: 10 bits Accuracy: ±1 % for a temperature variation of 60 °C Linearity: ±0.2%	Output frequency

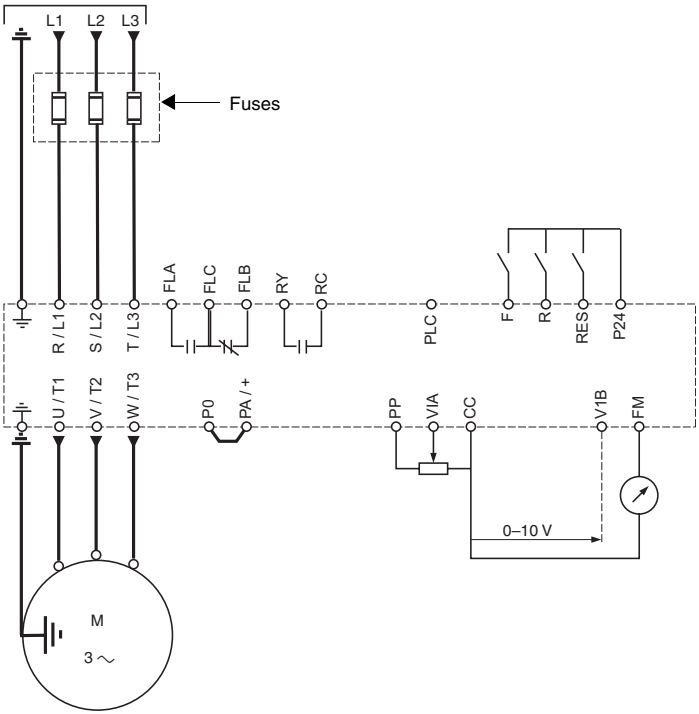
Table 7: Control Terminal Characteristics *(continued)*

Terminals	Function	Characteristics	Default function setting
PP	Internal supply available	Short-circuit and overload protection: One 10.5 Vdc ± 5% supply for the reference potentiometer (1 to 10 kΩ), maximum current: 10 mA	—
VIA	Configurable analog/logic input	Switch-configurable voltage or current analog input: • Voltage analog input 0–10 Vdc, impedance 30 kΩ (max. safe voltage: 24 Vdc) • Analog current input X–Y mA by programming X and Y from 0 to 20 mA, with impedance 242 Ω Max. sampling time: 2 ms ±0.5 ms Resolution: 11 bits Accuracy: ±0.6% for a temperature variation of 60 °C Linearity: ±0.15% of the maximum value This analog input is also configurable as a logic input. Consult the *Altivar® 21 Programming and Operation Guide* (30072-451-63) for more information.	Primary speed reference, 0–10 V
VIB	Configurable analog input	Voltage analog input, configurable as an analog input or as a PTC probe input. Voltage analog input: • 0–10 Vdc, impedance 30 kΩ (max. safe voltage 24 Vdc) • Max. sampling time: 2 ms ±0.5 ms • Resolution: 11 bits • Accuracy: ±0.6% for a temperature variation of 60 °C • Linearity: ±0.15% of the maximum value PTC probe input: • 6 probes max. mounted in series • Nominal value < 1.5 kΩ • Trip resistance 3 kΩ, reset value 1.8 kΩ • Short-circuit protection < 50 Ω	Secondary speed reference, 1–10 V

Connection Diagram

Figure 11 is a three-phase connection diagram for the drive controller at the factory settings.

Figure 11: 3-Phase Connection Diagram



NOTE: Connect the power terminals before connecting the control terminals. Install surge suppressors on all inductive circuits located near the drive controller or coupled to the same circuit.

INTEGRATED DISPLAY TERMINAL

The LEDs and keys on the integrated display terminal are illustrated in Figure 12.

Figure 12: Description of Display Terminal

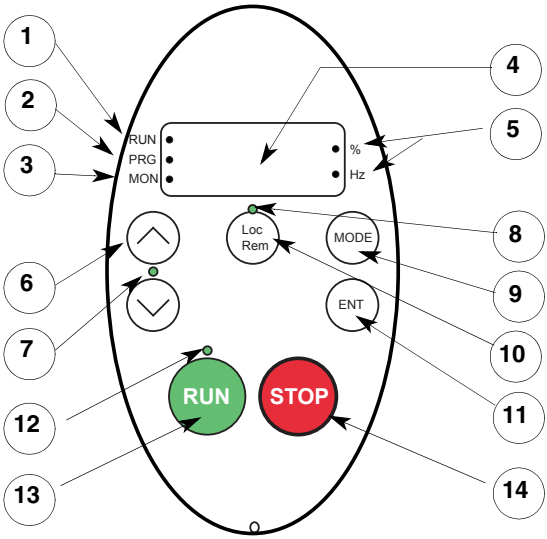


Table 8: Display Terminal Features

	LED/Key	Characteristics
1	Display RUN LED	• Illuminates when a run command is applied to the drive controller • Flashes when a speed reference is present with the run command.
2	Display PRG LED	• Illuminates when Programming mode is active • Flashes when *AUF–Gru* menus are active.
3	Display MON LED	• Illuminates when Monitoring mode is active • Flashes in fault record display mode
4	Display unit	4 digits, 7 segments
5	Display unit LED	• The % LED illuminates when a displayed numeric value is a percentage. • The Hz LED illuminates when a displayed numeric value is in hertz.
6	Up/Down arrows	Depending on the mode, you can use the arrows to: • Navigate between the menus • Change a value • Change the speed reference when the Up/Down LED (7) is lit
7	Up/Down LED	Illuminates when the Up/Down arrows are controlling the speed reference
8	Loc/Rem LED	Illuminates when Local mode is selected

Table 8: Display Terminal Features *(continued)*

	LED/Key	Characteristics
9	Mode	Press to select the Mode. See Figure 13. • Run mode (default) • Programming mode • Monitoring mode Can also be used to go back to the previous menu
10	Loc/Rem key	Switches between Local and Remote modes
11	ENT	Press to display a parameter's value or to save a changed value
12	RUN LED	Illuminates when the Run key is enabled
13	RUN	Pressing this key when the RUN LED is illuminated starts the drive controller.
14	STOP	Stop/reset key In Local mode, pressing the STOP key causes the drive controller to stop based on the setting of parameter F721. In Remote mode, pressing the STOP key causes the drive controller to stop based on the setting of parameter F603. The drive display will indicate a flashing "E". If F 7 3 5 is set to 0 (default setting), pressing the stop key twice resets a flashing "E" fault, and other resettable faults, if the fault condition has been resolved.

PROGRAMMING THE DRIVE CONTROLLER

This section describes how to access drive controller modes and parameters, and how to configure the drive controller for the most common applications.

Refer to the *Altivar® 21 Programming and Operation Guide*, 30072-451-63, for complete programming information.

Refer to “Integrated Display Terminal” on page 32 for operation of the display terminal.

Mode Access

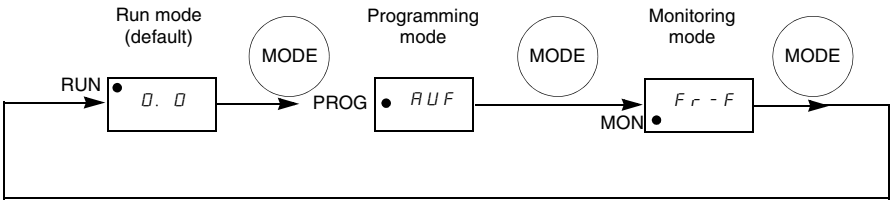
Altivar 21 drive controllers have three modes of operation, described in Table 9.

Table 9: Mode Descriptions

Run mode (default)	• Active when power is applied to the drive controller. • Use to display drive controller parameters, alarms, and faults.
Programming mode	• Use to modify drive controller parameters.
Monitoring mode	• Use to display drive controller operational data in real time.

Figure 13 illustrates how to access the modes with the display terminal MODE key.

Figure 13: Mode Access



Parameter Groups

Table 10 describes the Altivar 21 drive parameter groups. Only the Quick menu parameters are covered in this guide.

For information on configuring the other Basic parameters and the Extended parameters, refer to the *Altivar® 21 Programming and Operation Guide*, 30072-451-63.

Table 10: ATV21 Parameter Groups

Parameter type	Description
Basic parameters	Parameters used in the most common applications
Extended Parameters (menu F - - -)	Parameters used for special settings and applications
User Parameters (menu Gr U)	A list of the Basic and Extended parameters whose values have been changed from the factory default settings
Quick menu (menu AUF)	A menu of frequently used Basic and Extended parameters
History Parameters (menu AUH)	A list of the five Basic and Extended parameters whose values were last changed, with the most recently changed parameters displayed first

Access to Menus and Parameters

Figure 14 illustrates how to access menus, and Figure 15 (page 37) illustrates how to access parameters.

Figure 14: Menu Access

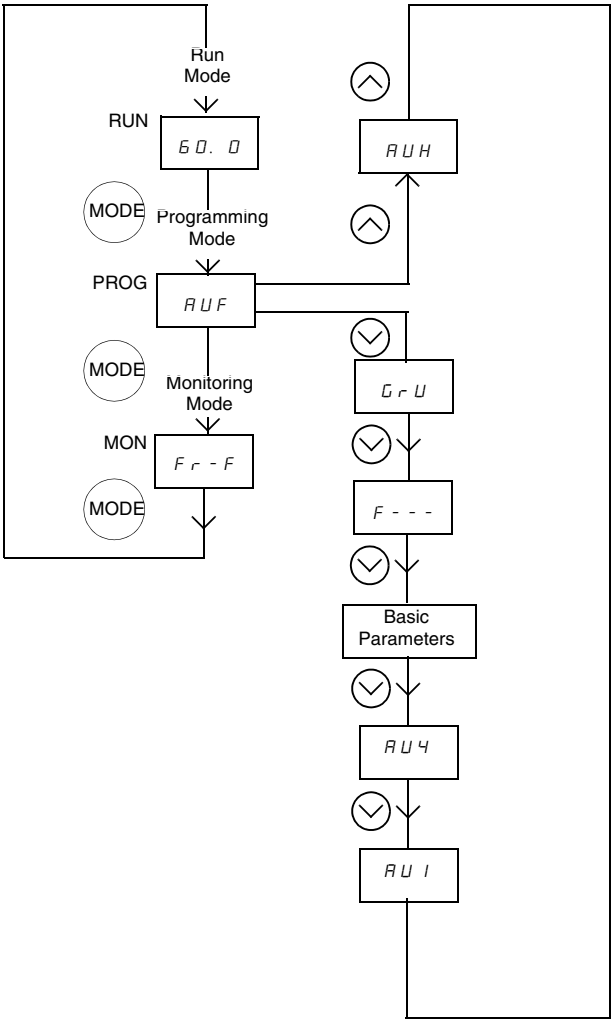
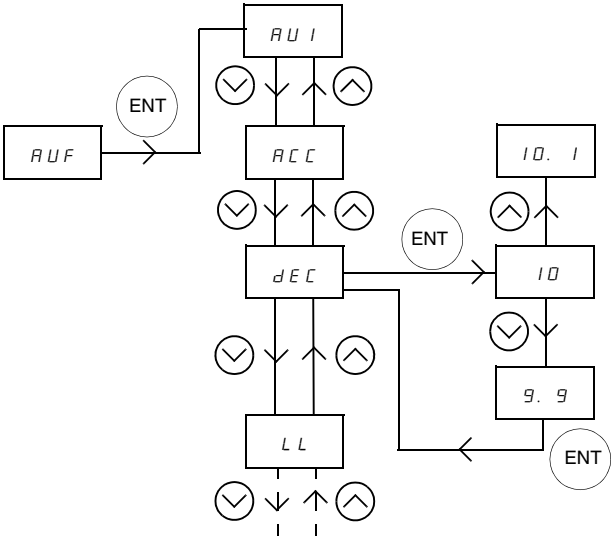


Figure 15: Access to Parameters



Press the MODE key to go back to the previous level. For example:

- To go from 9.9 to *dEC*
- To go from *dEC* to *AUF*

AUF Quick Menu

Figure 16: AUF Quick Menu Parameters (see also page 39)

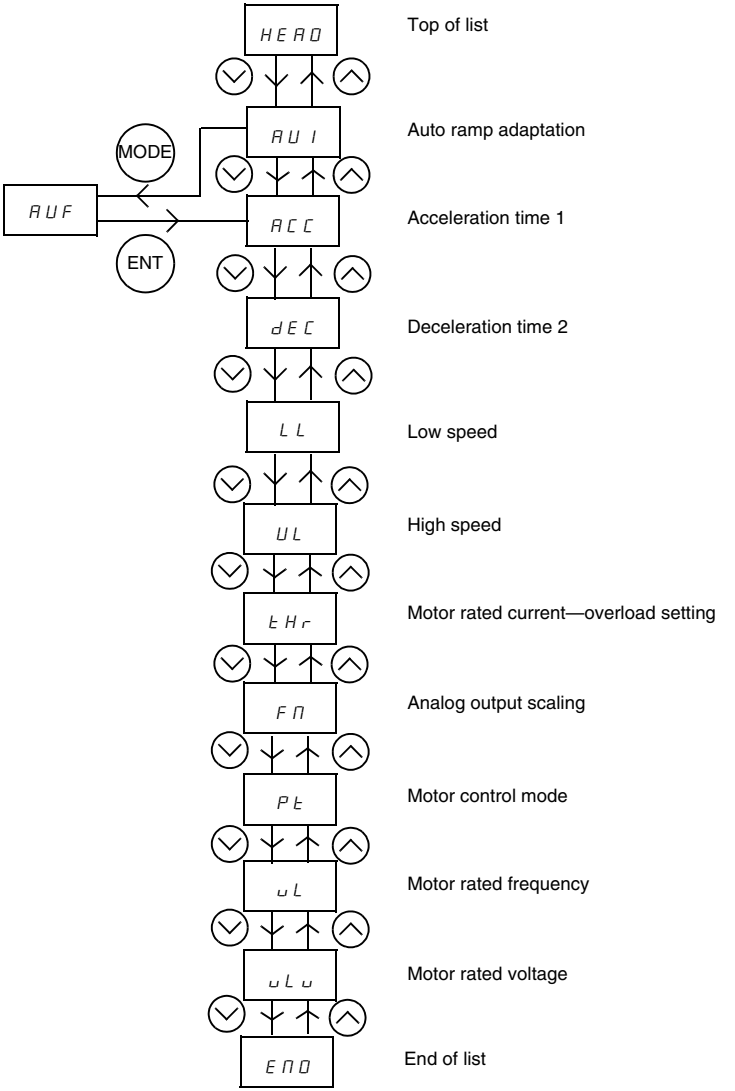


Table 11 describes the parameters that can be accessed from the AUF Quick menu. With the exception of ACC and dEC, the parameters cannot be modified while the drive controller is running.

Table 11: AUF Quick Menu Parameters

Parameter	Name	Unit	Keypad min. setting	Serial comm. min. setting	Adjustment range		Factory setting
FM	Analog output scaling	—	—	—	—	—	—
ACC	Acceleration time 1	seconds	0.1	0.1	—	0.0 to 3200	Model dependant
dEC	Deceleration time 1	seconds	0.1	0.1	—	0.0 to 3200	Model dependant
UL	High speed	Hz	0.1	0.01	—	0.5 to FH	50.0
LL	Low speed	Hz	0.1	0.01	—	0.0 to UL	0.0
uL	Motor rated frequency	Hz	0.1	0.01	—	25.0 to 200.00	50.0
uLu	Motor rated voltage	V	1	0.1	230 V models	50 to 330	230
					460 V models	50 to 660	400
PE	Motor control mode	—	—	—	0	Constant V/Hz	1
					1	Variable torque	
					2	Constant V/Hz with automatic torque boost	
					3	Sensorless vector control	
					4	Energy savings	
					5	Reserved (DO NOT USE)	
					6	Reserved (DO NOT USE)	
EHr	Motor rated current—overload setting	% or A	1	1	—	10 to 100% of the drive controller's output current rating	100%

Configuring the Drive Controller

To configure the drive controller for the most common applications:

1. Set ᴛHr, Motor Rated Current—Overload Setting, to the nominal current value on the motor nameplate. See “Motor Rated Current—Overload Setting, ᴛHr” below.
2. For motors with a nominal frequency of 60 Hz, set ᴛYP to 2 (60 Hz). See “Parameter Reset, ᴛYP” on page 41.

Motor Rated Current—Overload Setting, ᴛHr

This drive controller does not provide direct thermal protection for the motor. Consult the motor manufacturer for the thermal capability of the motor when operated over the desired speed range.

⚠ CAUTION

MOTOR OVERHEATING

Use a thermal sensor in the motor as required by the motor manufacturer for protection at all speeds and load conditions.

Failure to follow this instruction can result in injury or equipment damage.

Set parameter ᴛHr to the nominal current value on the motor nameplate.

If parameter F701 is set to 1, parameter ᴛHr is expressed in amperes.

If parameter F701 is set to 0, parameter ᴛHr is expressed as a percentage of the drive controller’s rated current.

Table 12: Motor Rated Current—Overload Setting

Parameter	Units	Adjustment range	Default setting
ᴛHr	A or %	10–100% of the drive controller’s rated current	100%

Parameter Reset, EtYP

This function provides a variety of parameter reset options. You must stop the drive controller before changing the setting of EtYP.

For 60 Hz motors, set EtYP to 2. Consult the *Altivar® 21 Programming and Operation Guide*, 30072-451-63, for a list of the parameters that are affected by this reset action and their resultant values.

Also consult the *Altivar® 21 Programming and Operation Guide* before setting EtYP to any other setting.

Table 13: Parameter Reset

Parameter	Units	Adjustment range	Default setting
EtYP	—	0: No action 1: 50 Hz parameter reset 2: 60 Hz parameter reset 3: Factory reset 4: Fault history reset 5: Elapsed motor run time reset 6: Reset of EtYP fault 7: Save the user-defined parameters 8: Recall the user-defined parameters 9: Elapsed drive run time reset	0

TROUBLESHOOTING

Refer to Tables 14 and 15 to diagnose and resolve problems when a fault or alarm occurs.

If the problem cannot be resolved by the actions described in the tables, refer to the *Altivar® 21 Programming and Operation Guide*, 30072-451-63, or contact your Schneider Electric representative.

Drive Controller Fault Conditions

Table 14: Fault Codes

Fault code	Problem	Possible causes	Remedies
E - 18	Break in VIA signal cable	• The VIA analog signal is below the level set by parameter F633.	• Check the signal at VIA and rectify the cause of the signal loss. • Verify that parameter F633 is set correctly.
E - 19	CPU communications error	• Communication error between control CPUs	• Contact Schneider Electric to repair the drive controller.
E - 20	Excessive torque boost	• Torque boost parameter F402 is set too high. • The motor impedance is too low.	• Repeat the drive controller auto-tune and then adjust down parameter F402.
E - 21	CPU fault 2	• The control board CPU is inoperable.	• Contact Schneider Electric to repair the drive controller.
EEP1	EEPROM fault 1	• A data writing error has occurred.	• Cycle power to clear the fault. • If the fault does not clear, contact Schneider Electric to repair the drive controller.
EEP2	EEPROM fault 2	• Power was removed from the drive controller during a parameter reset operation resulting in a data writing error.	• Cycle power to clear the fault and try the parameter reset operation again. • If the fault does not clear, contact Schneider Electric to repair the drive controller.
EEP3	EEPROM fault 3	• A data reading error has occurred.	• Cycle power to clear the fault. • If the fault does not clear, contact Schneider Electric to repair the drive controller.
EF2	Ground fault	• Ground fault in motor or motor cables	• Using a 1000 V megger, check the motor and motor cables for ground faults.
EPH1	Input phase loss	• Loss of one input phase	• Determine the cause of the missing input phase and rectify. • Set parameter F608 to 0. • Contact Schneider Electric to repair the drive controller.

Table 14: Fault Codes *(continued)*

Fault code	Problem	Possible causes	Remedies
EPHO	Output phase loss	• Loss of one or more output phases	• Determine the cause of the missing output phase (such as a bad connection, an output disconnect, or an open winding in the motor) and rectify the problem. • Set parameter F605 to 0.
Err1	Frequency setting point error alarm	• Parameters F202, F203, F210, or F212 are set improperly.	• Set the parameters to the correct settings.
Err2	Control board RAM fault	• The control board RAM is inoperable.	• Contact Schneider Electric to repair the drive controller.
Err3	Control board ROM fault	• The control board ROM is inoperable.	• Contact Schneider Electric to repair the drive controller.
Err4	CPU fault 1	• The control board CPU is inoperable.	• Contact Schneider Electric to repair the drive controller.
Err5	Communication fault	• Serial communication error	• Check network control devices and cables. • Check the setting of the communication timeout parameter, F803. • Check the remote keypad cable.
Err7	Current sensor fault	• A motor current sensor is inoperable.	• Contact Schneider Electric to repair the drive controller.
Err8	Network error	• Network communication error	• Check the network control devices and cables.
Etn1	Auto-tuning error	• Parameters F401 to F494 are incorrectly set. • The motor is too large for the drive controller. • The motor cable gauge is too small. • The motor is still rotating at the start of the auto-tune. • The drive controller is not powering a 3-phase induction motor.	• Set parameters F401–F494 correctly. • Use a larger drive controller. • Use a larger gauge motor cable. • Verify that the motor is stopped before starting an auto-tune. • Use the drive controller to power only a 3-phase induction motor.
EtYP	Drive controller type fault	• The main control board is inoperable.	• Contact Schneider Electric to repair the drive controller.
h999	Accumulated input power error	• The accumulated input power value is more than 999.999 kWh.	• Clear the accumulated input power value using logic input function 51, or parameter F748.
H999	Accumulated output power error	• The accumulated output power value is more than 999.999 kWh.	• Clear the accumulated input power value using logic input function 51, or parameter F748.

Table 14: Fault Codes *(continued)*

Fault code	Problem	Possible causes	Remedies
OC 1	Overcurrent during acceleration	• The acceleration time is too short. • The setting of parameter Pt is incorrect. • The drive controller is starting into a rotating load. • The drive controller is powering a low impedance motor. • Ground fault	• Increase the acceleration time parameters (ACC or F500). • Select the correct setting for parameter Pt. • Enable catch on the fly, parameter F301. • Adjust the switching frequency parameter F300. • Set parameter F316 to 1 or 3.
OC 1P	Ground fault	• Short circuit or ground fault during acceleration	• Using a 1000 V megger, check the motor and motor cables for ground faults. • Contact Schneider Electric to repair the drive controller.
OC 2	Overcurrent during deceleration	• The deceleration time is too short. • Ground fault	• Increase the deceleration time parameters (dEC or F501). • Set parameter F316 to 1 or 3.
OC 2P	Ground fault	• Short circuit or ground fault during deceleration	• Using a 1000 V megger, check the motor and motor cables for ground faults. • Contact Schneider Electric to repair the drive controller.
OC 3	Overcurrent during constant speed operation	• Abrupt fluctuations in load • Abnormal load condition	• Reduce the load fluctuations. • Check the load. • Set parameter F316 to 1 or 3.
OC 3P	Ground fault	• Short circuit or ground fault during constant speed operation	• Using a 1000 V megger, check the motor and motor cables for ground faults. • Contact Schneider Electric to repair the drive controller.
OCA	Arm overcurrent during startup	• Ground fault	• Using a 1000 V megger, check the motor and motor cables for ground faults. • Contact Schneider Electric to repair the drive controller.
OCL	Short Circuit	• Phase to phase output short circuit • The motor impedance is too low.	• Using a 1000 V megger, check the motor and motor cables for ground faults. • Contact Schneider Electric to repair the drive controller.

Table 14: Fault Codes *(continued)*

Fault code	Problem	Possible causes	Remedies
OH	Drive controller overtemperature fault	• The drive controller cooling fan is not working. • The ambient temperature is too high. • An enclosure air vent is blocked. • A heat source is too close to the drive controller. • The drive controller heatsink temperature sensor is malfunctioning.	• Restart operation by resetting the drive controller fault after cool-off. • Decrease the ambient temperature by increasing the free space around the drive controller and removing any heat generating source from the proximity of the drive controller. • Contact Schneider Electric to repair the drive controller.
OH2	Motor PTC overtemperature fault	• The external PTC embedded in the motor windings indicates a motor overtemperature condition.	• Correct the motor overload condition. • Check the PTC for correct operation.
OLI	Drive controller overload	• The acceleration time is too short. • The DC injection current level is too high. • The setting of parameter Pt is incorrect. • The drive controller is starting into a rotating load. • The load is too large.	• Increase the acceleration time parameters (ACC or F500). • Reduce the setting of parameters F251 and/or F252. • Select the correct setting for parameter Pt. • Enable catch on the fly, parameter F301. • Set parameter F302 to 2. • Use a drive controller with a higher power rating.
OL2	Motor overload	• The setting of parameter Pt is incorrect. • The motor is jammed. • Low-speed operation is performed continuously • Excessive load is applied to the motor.	• Select the correct setting for parameter Pt. • Check the load. • Adjust parameter OLN to the overload level that the motor can withstand during low speed operation.
OPI	Overvoltage during acceleration	• The input voltage is fluctuating abnormally. • Power network is greater than 200 kVA. • Power factor capacitor switching • SCR switching on power network • The drive controller is starting into a rotating load. • Intermittent output phase fault	• Install a line reactor. • Enable catch on the fly, parameter F301. • Set parameter F302 to 2. • Determine the cause of the missing output phase (such as a bad connection, an output disconnect, or an open winding in the motor) and rectify the problem.

Table 14: Fault Codes *(continued)*

Fault code	Problem	Possible causes	Remedies
OP2	Overvoltage during deceleration	• The deceleration time is too short. • Overhauling load • The input voltage is fluctuating abnormally. • Power network is greater than 200 kVA • Power factor capacitor switching • SCR switching on power network • The drive controller is starting into a rotating load. • Intermittent output phase fault	• Increase the deceleration time parameters (DEC or F501). • Enable parameter F305. • Install a line reactor. • Check the input and output circuits for phase failure and rectify. • Enable catch on the fly, parameter F301.
OP3	Overvoltage during constant speed operation	• The input voltage is fluctuating abnormally. • Power network is greater than 200 kVA • Power factor capacitor switching • SCR switching on power network • The drive controller is regenerating—the load causes the motor to run at a frequency higher than drive controller output frequency. • Intermittent output phase fault	• Install a line reactor. • Check the input and output circuits for phase failure and rectify.
OL	Overtorque fault	• The calculated motor torque has reached the level set by parameter F616.	• Adjust the settings of parameters F615 and F616 as needed. • Verify machine operation.
SOUL	Permanent magnet motor pulls out of synchronism	• The motor is jammed. • Output phase loss • Impact load	• Check the load and correct the jammed condition. • Check the condition of the motor and load wiring.
UC	Underload fault	• The measured motor current has dropped below the level set by parameter F611.	• Check parameters F610–612 for the correct settings. • Contact Schneider Electric to repair the drive controller.
UP1	DC bus undervoltage fault	• The input voltage is too low.	• Check the input voltage and rectify the problem. • Select the correct setting for parameter F627. • Enable catch on the fly, parameter F301. • Set parameter F302 to 2.

Drive Controller Alarm Conditions

Alarms do not cause the drive controller to enter a fault condition.

Table 15: Alarm Codes

Alarm code	Problem	Possible causes	Remedies
AtnI	Auto-tuning	• Auto-tuning in process	• Normal if it the message disappears after a few seconds.
CLr	Clear command acceptable	• This message is displayed after the STOP key is pressed while an error code is displayed.	• Press the STOP key again to clear the fault.
db	DC braking	• DC braking in process	• The alarm code goes off in several seconds if no problem occurs.
E-17	Keypad error	• A keypad key has been held down for more than 20 seconds. • A keypad key may not be operating properly.	• Release the keypad key. • If this does not clear the error, replace the drive controller.
EI	The number of digits that can be displayed has been exceeded	• The number of digits entered for values such as frequencies is more than 4. (The upper digits have priority.)	• Lower the frequency free-unit magnification F702.
EOFF	Emergency stop command acceptable	• The operation panel is used to stop the operation in automatic control or remote control mode.	• Press the STOP key for an emergency stop. To cancel the emergency stop, press any other key.
Err1	Frequency point setting error alarm	• The frequency setting signals at points 1 and 2 are set too close to each other.	• Set the frequency setting signals at points 1 and 2 apart from each other.
h999	Integral input power	• Integral input power is more than 999.99 kWh.	• Press and hold down the key for 3 s or more when power is off or when the input terminal function CKWH is turned on or displayed.
H999	Integral output power	• Integral output power is more than 999.99 kWh.	• Press and hold down the key for 3 s or more when power is off or when the input terminal function CKWH is turned on or displayed.
HEAd/ End	Display of first/last data items	• The first and last data item in the AUX data group is displayed.	• Press MODE key to exit the data group.
HI/ LO	Parameter adjustment error	• During programming, a value was entered that exceeds the maximum or minimum value of the parameter.	• Enter a value within the bounds of the parameter
InIt	Parameters in the process of initialization	• Parameters are being initialized to default values.	• Normal if the message disappears after several seconds.

Table 15: Alarm Codes *(continued)*

Alarm code	Problem	Possible causes	Remedies
LStP	Auto-stop because of continuous operation at the lower-limit frequency	• The automatic stop function selected with F256 was activated.	• To deactivate the automatic stop function, increase the frequency command above the lower-limit frequency (LL) + 0.2 Hz or turn off the operation command.
nOFF	Line supply undervoltage fault	• The phase-to-phase input voltage is too low.	• Measure the main circuit supply voltage. If the voltage is at a normal level, the drive controller requires repair. • Contact your local Schneider Electric representative.
OFF	ST terminal OFF	• The ST-CC (run permissive) circuit is open.	• Close the ST-CC circuit.
rtry	Restart in process	• The drive controller is in the process of restart. • A momentary stop occurred.	• The drive controller is operating normally if it restarts after several seconds.
StOP	Momentary power failure slowdown stop prohibition function activated.	• The slowdown stop prohibition function set with F302 (momentary power failure ride-through operation) is activated.	• To restart operation, reset the drive controller or input an operation signal again.

Pre-alarm Displays

Table 16: Pre-alarm codes

C	Overcurrent alarm	Same as OC (overcurrent)
P	Overvoltage alarm	Same as OP (overvoltage)
L	Overload alarm	Same as OL I and OL 2 (overload)
H	Overheating alarm	Same as OH (overheating)

The pre-alarms are displayed, blinking, in the following order from left to right: C , P, L , H.

If two or more problems arise simultaneously, one of the following alarms appears and blinks: CP, PL , CPL .

Resetting the Drive Controller after a Fault Condition is Detected

Clear the cause of a fault trip condition before resetting the drive controller. Resetting the tripped drive controller before eliminating the problem causes it to fault again.

The drive controller can be reset after a fault with any of the following operations:

1. By turning off the power.
2. By means of an external signal.
3. With the Stop key on the display terminal:
   a. Press the STOP key and make sure that CLr is displayed.
   b. Eliminate the cause of the fault.
   c. Press the STOP key again to reset the drive controller.
4. By a fault clear signal from a remote communication device.

When any overload function (OII or OL2) is active, the drive controller cannot be reset by inputting a reset signal from an external device or with the Stop key on the display terminal if the calculated cooling time has not expired. Calculated cooling time:

- OL1: 30 seconds after the fault has occurred
- OL2: 120 seconds after the fault has occurred

CAUTION

MOTOR OVERHEATING

- Repeated reset of the thermal state after a thermal overload can result in thermal stress to the motor.
- When faults occur, promptly inspect the motor and driven equipment for problems (such as a locked shaft or mechanical overload) before restarting. Also check the power supplied to the motor for abnormal conditions (such as a phase loss or phase imbalance).

Failure to follow these instructions can result in equipment damage.

Altivar® 21 Adjustable Speed Drive Controllers Quick Start Guide
Instruction Bulletin

Schneider Electric USA
8001 Knightdale Blvd.
Knightdale, NC 27545 USA
1-888-SquareD (1-888-778-2733)
www.us.SquareD.com

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