

Variable speed drives for asynchronous motors

Altivar 21

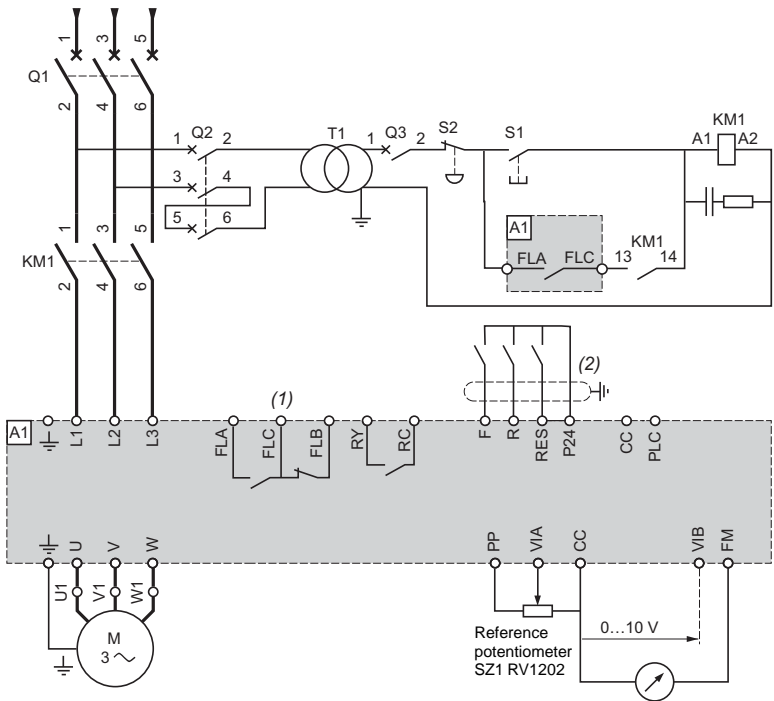
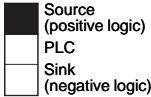
Recommended scheme for ATV 21H●●●M3X, ATV 21●●●●N4, ATV 21W●●●N4C

3-phase power supply

Switches (factory settings)

Voltage/current selection
for analog I/O (FM and VIA)

Selection of logic type



Note: All terminals are located at the bottom of the drive. Install interference suppressors on all inductive circuits near the drive or connected on the same circuit, such as relays, contactors, solenoid valves, fluorescent lighting, etc.

Compatible components (for a complete list of references, please consult the "Motor starter solutions. Control and protection components" catalogue).

Ref.	Description
A1	ATV 21 drive, see pages 60313/2 and 60313/3
KM1	Contacteur, see pages 60322/2 to 60322/5
Q1	Circuit breaker, see pages 60322/2 to 60322/5
Q2	GV2 L rated at twice the nominal primary current of T1
Q3	GB2 CB05
S1, S2	XB4 B or XB5 A pushbuttons
T1	100 VA transformer 220 V secondary

(1) Fault relay contacts for remote signalling of the drive status

(2) Connection of the common for the logic inputs depends on the positioning of the switch ("Source", "PLC", "Sink"), see page 60321/3.

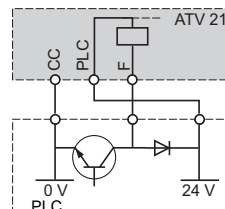
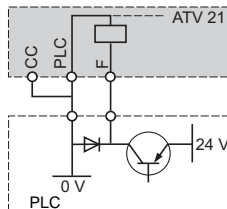
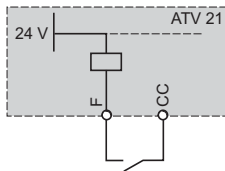
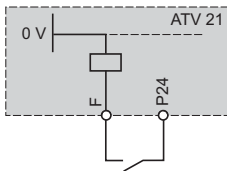
Examples of recommended schemes

Logic inputs according to the position of the logic type switch

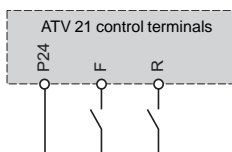
Source position

Sink position

PLC position with PLC transistor outputs

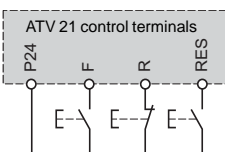


2-wire control



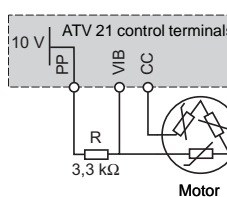
F: Forward
R: Preset speed

3-wire control



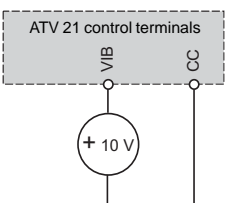
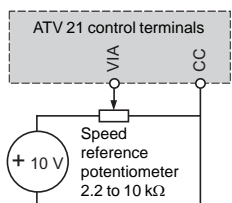
F: Forward
R: Stop
RES: Fault reset

PTC probe



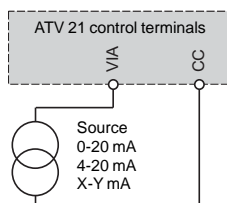
Voltage analog inputs

External + 10 V



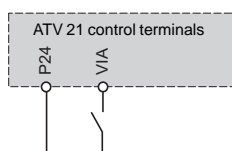
Analog input configured for current

0-20 mA, 4-20 mA, X-Y mA

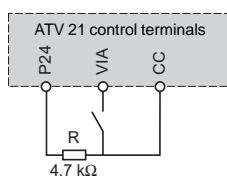


Analog input VIA configured as logic input

Positive logic (Source position)

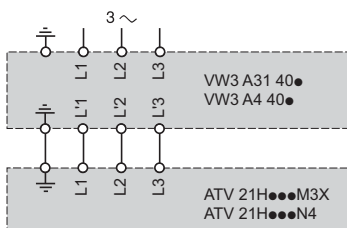


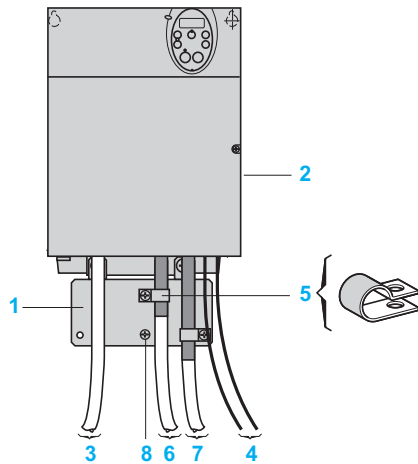
Negative logic (Sink position)



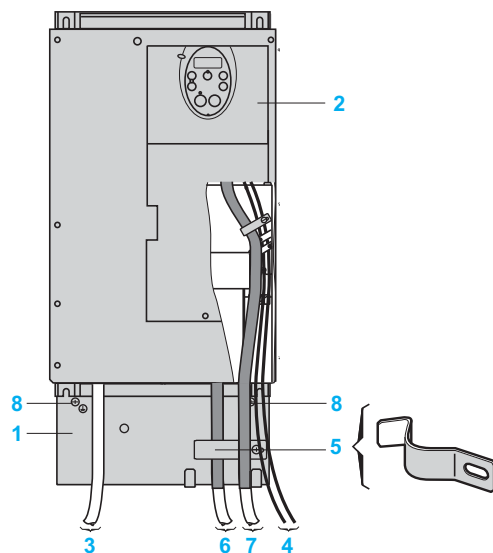
Additional EMC input filters VW3 A31 404, 406...409, VW3 A4 406...408

3-phase power supply





ATV 21H075M3X...HD18M3X,
ATV 21H075N4...HD18N4



ATV 21HD22M3X, HD30M3X,
ATV 21HD22N4...HD75N4

Connections to meet the requirements of EMC standards

Principle

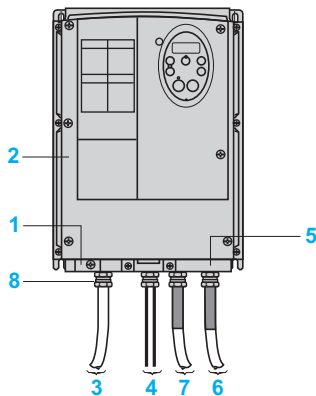
- Earths between the drive, motor and cable shielding must have "high frequency" equipotentiality.
- Use shielded cables with shielding connected to earth throughout 360° at both ends for the motor cable and the control-command cables. Conduit or metal ducting can be used for part of the shielding length provided that there is no break in the continuity of the earth connection.
- Ensure maximum separation between the power supply cable (line supply) and the motor cable.

Installation diagram for ATV 21H●●M3X and ATV 21H●●N4 drives

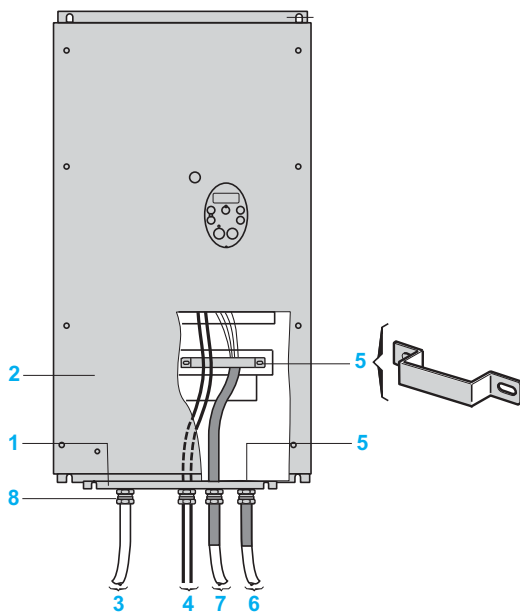
- 1 Steel plate to be mounted on the drive (earthed casing)
- 2 UL Type 1/IP 20 Altivar drive
- 3 Unshielded power supply wires or cable
- 4 Unshielded wires for the output of the fault relay contacts
- 5 Attach and earth the shielding of cables 6 and 7 as close as possible to the drive:
 - Strip the shielding.
 - Attach the cable to the metal plate 1 by tightening the clamp on the stripped part of the shielding.
 The shielding must be clamped tightly enough to the metal plate to ensure good contact.
- 6 Shielded cable for connecting the motor
- 7 Shielded cable for connecting the control/signal wiring
 - For applications requiring several conductors, use cables with a small cross-section (0.5 mm²).
 - For cables 6 and 7, the shielding must be earthed at both ends. The shielding must be continuous and intermediate terminals must be placed in EMC shielded metal boxes.
- 8 Earthing screw. Use this screw for the motor cable on low power rated drives, as the screw on the heatsink is inaccessible.

Note: The HF equipotential earth connection between the drive, motor and cable shielding does not remove the need to connect the PE conductors (green-yellow) to the appropriate terminals on each unit.

If using an additional EMC input filter, it should be mounted beneath the drive and connected directly to the line supply via an unshielded cable. Link 3 on the drive is then via the filter output cable.



ATV 21W075N4...WU75N4,
ATV 21W075N4C...WU75N4C



ATV 21WD11N4...WD30N4,
ATV 21WD11N4C...WD75N4C

Connections to meet the requirements of EMC standards (continued)

Installation diagram for ATV 21W ●●●N4, ATV 21W●●●N4C drives

- 1 Steel plate (earthed casing)
- 2 Altivar 21 IP 54 drive
- 3 Unshielded power supply wires or cable
- 4 Unshielded wires for the output of the fault relay contacts
- 5 Attach and earth the shielding for cables 6 and 7 as close as possible to the drive:
 - Strip the shielding.
 - Attach the shielded cable to the cable gland 8 ensuring it is fully in contact throughout 360°.
 - Fold back the shielding and clamp it between the ring and the body of the cable gland.
 Depending on the drive rating, the shielding of cable 7 can be earthed using a cable gland 8 or a cable clamp 5.
 The shielding must be clamped tightly enough to the metal plate to ensure good contact.
- 6 Shielded cable for connecting the motor
- 7 Shielded cable for connecting the control/signal wiring
 - For applications requiring several conductors, use cables with a small cross-section (0.5 mm²).
 - For cables 6 and 7, the shielding must be connected to the earth at both ends.
 - The shielding must be continuous and intermediate terminals must be placed in EMC shielded metal boxes.
- 8 Metal cable gland (not supplied) for cables 6 and 7.
Standard cable gland (not supplied) for cables 3 and 4.

Note: The HF equipotential earth connection between the drive, motor and cable shielding does not remove the need to connect the PE conductors (green-yellow) to the appropriate terminals on each unit.

Operation on an IT system

IT system: Isolated or impedance earthed neutral

Use a permanent insulation monitor compatible with non-linear loads, such as a Merlin Gerin type XM200 (please consult your Regional Sales Office).

ATV 21●●●N4 and ATV 21W●●●N4C drives have built-in EMC filters. These filters can be easily disconnected if using an IT system and subsequently reconnected if necessary.