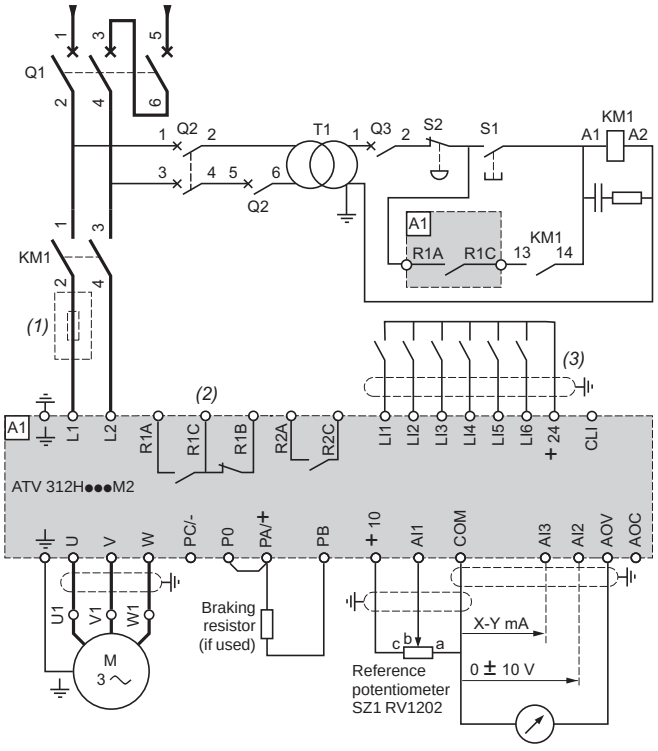
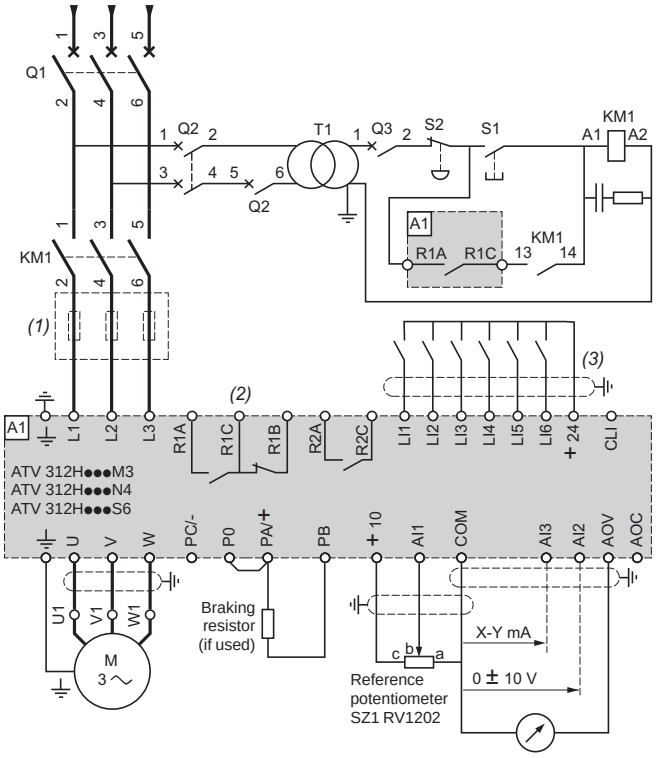
Variable speed drives
Altivar 312

ATV 312H●●●M2
Single-phase power supply



ATV 312H●●●M3, ATV 312H●●●N4, ATV 312H●●●S6
Three-phase power supply



(1) Line choke (single-phase or three-phase).
(2) Fault relay contacts. Used for remote signalling of the drive status.
(3) Connection of the common for the logic inputs depends on the position of the switch (see schemes below).

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.

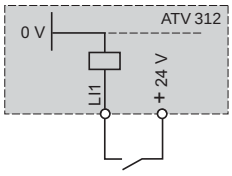
Compatible components (for a complete list of references, please refer to the "Motor starter solutions - Control and protection components" catalogue).

Item no.	Designation
KM1	Line contactor LC1 ●●● + suppressor module LA4 DA2U (see page 60431/2)
Q1	GV2 L magnetic circuit-breaker or Compact NS circuit-breaker (see page 60431/2)
Q2	GV2 L magnetic circuit-breaker rated at twice the nominal primary current of T1
Q3	GB2 CB05 thermal magnetic circuit breaker
S1, S2	XB4 B or XB5 A pushbuttons
T1	100 VA transformer 220 V secondary

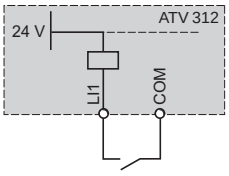
Examples of recommended schemes

Logic input switches

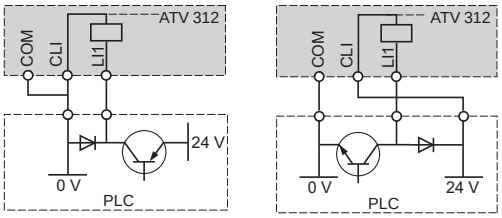
Source position



Sink position

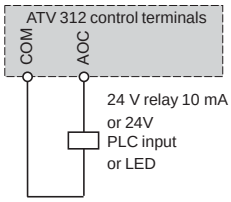


CLI position with PLC transistor outputs

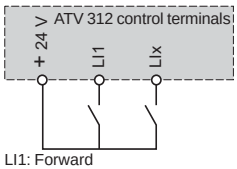


AOC output

Wired as logic output

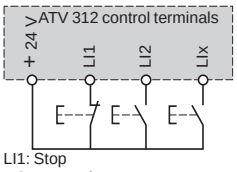


2-wire control



LI1: Forward
LIx: Reverse

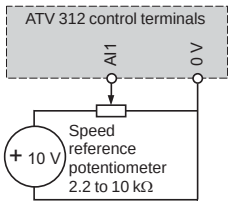
3-wire control



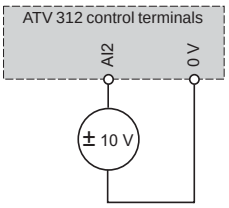
LI1: Stop
LI2: Forward
LIx: Reverse

Voltage analog inputs

External + 10 V

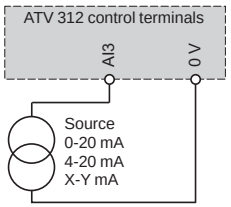


External ± 10 V



Current analog input

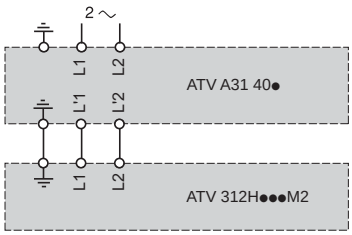
0-20 mA, 4-20 mA, X-Y mA



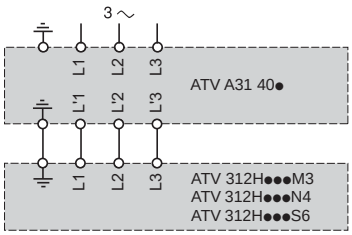
Presentation: page 60420/2
Characteristics: page 60421/2
References: page 60422/2
Dimensions: page 60429/2
Functions: page 60432/2

Additional EMC input filters VW3 A31 40●

Single-phase power supply



Three-phase power supply

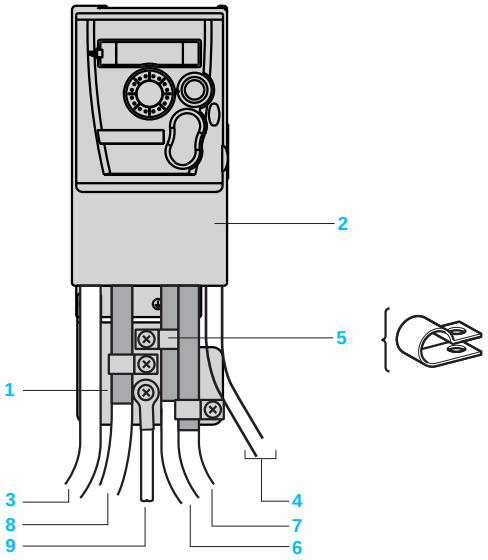


Connections ensuring conformity to EMC standards

Principle

■ Earths between the drive, motor and cable shielding must have “high-frequency” equipotentiality.
■ Use shielded cables with the shielding connected to earth throughout 360° at both ends for the motor cable, the braking resistor cable and the control-signal cables. Metal conduit or 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 and the motor cable.

Installation diagram



1 Steel plate to be mounted on the drive (earthed casing)
2 Altivar 312 drive
3 Unshielded power supply wires or cable
4 Unshielded wires or cable for the output of the fault relay contacts
5 Attach and earth the shielding of cables 6, 7 and 8 as close as possible to the drive:
- Strip the cable to expose the shielding
- Attach the cable to the plate 1, attaching the clamp on the stripped part of the shielding.

The shielding must be clamped tightly enough to the metal sheet to ensure good contact.
For cables 6, 7 and 8, the shielding must be connected to earth at both ends. The shielding must be continuous, and if intermediate terminals are used, they must be placed in EMC shielded metal boxes.
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 mm^2).
8 Shielded cable for connecting the braking resistor
9 PE cable (green-yellow)

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 device. If using an additional EMC input filter, it must be mounted under 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.*

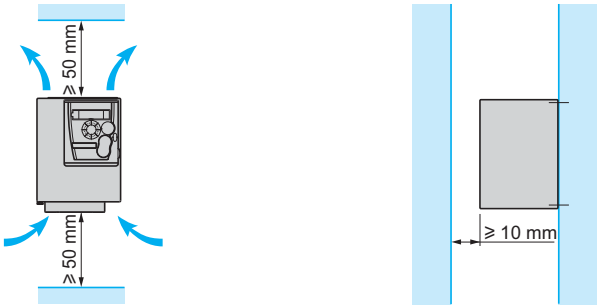
Operation on an IT system (isolated or impedance earthed neutral)

Use a permanent insulation monitor compatible with non-linear loads, such as the Schneider Electric XM200 (please consult our website www.schneider-electric.com or contact your Customer Care Center).
ATV 312H●●●M2 and ATV 312H●●●N4 drives have integrated EMC filters. For use on an IT system, these filters can be disconnected by removing their earth connection:
■ For ATV 312H018M2…HU22M2 and H037N4…HU40N4 drives, remove a jumper to disconnect the filter.
■ For ATV 312HU55N4…HD15N4 drives, move the wire with the cable tag to disconnect the filter.

Installation recommendations

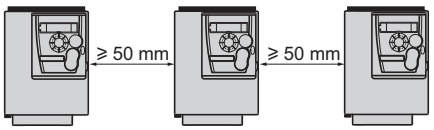
Depending on the conditions in which the drive is to be used, its installation will require certain precautions and the use of appropriate accessories.

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

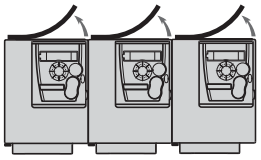


Mounting types

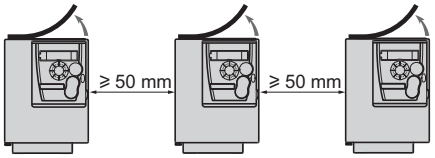
■ Type A mounting

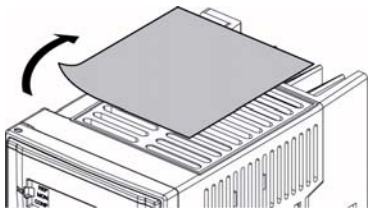


■ Type B mounting



■ Type C mounting

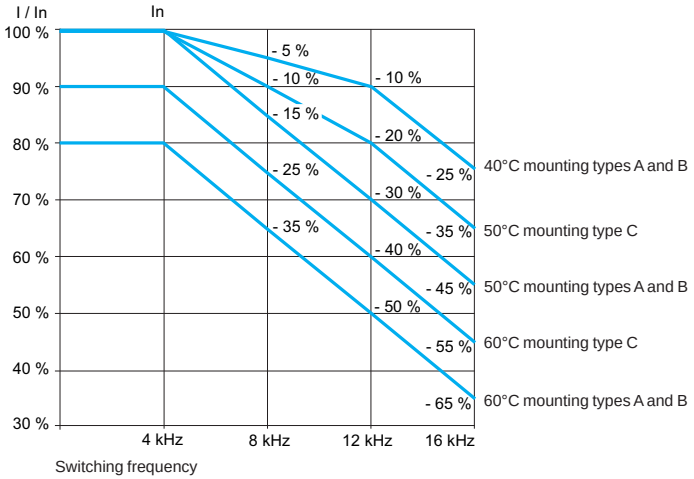




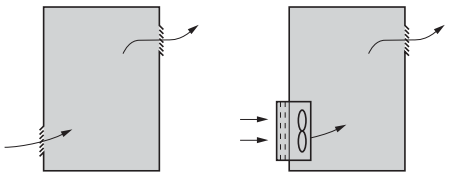
Removing the protective cover

Removing the protective cover from the top of the drive (as shown opposite) changes the degree of protection to IP 20.

Derating curves for the nominal drive current (In) as a function of temperature, switching frequency and mounting type.



For intermediate temperatures (for example, 55°C), interpolate between 2 curves.



Specific recommendations for mounting in an enclosure

Follow the mounting recommendations on the opposite page.
To ensure proper air circulation in the drive:
- Install ventilation grilles
- Ensure that there is sufficient ventilation. If there is not, install a forced ventilation unit with a filter. The openings and/or fans must provide a flow rate at least equal to that of the drive fans (see below).
- Use special filters with IP 54 protection
- Remove the protective cover from the top of the drive

Fan flow rate depending on the drive rating

ATV 312	Flow rate m³/min
H018M2…H055M2 H018M3…H055M3 H037N4…HU11N4 H075S6, HU15S6	0.3
H075M2…HU15M2 H075M3…HU15M3 HU15N4, HU22N4 HU22S6, HU40S6	0.55
HU22M2 HU22M3…HU40M3 HU30N4, HU40N4 HU55S6, HU75S6	1.55
HU55M3 HU55N4, HU75N4 HD11S6	1.7
HU75M3, HD11M3 HD11N4, HD15N4 HD15S6	2.8
HD15M3	3.6

Metal dust and damp proof wall-mounted or floor-standing enclosure (IP 54 degree of protection)

The drive must be mounted in a dust and damp proof enclosure in certain environmental conditions: dust, corrosive gases, high humidity with risk of condensation and dripping water, splashing liquid, etc.
This enables the drive to be used in an enclosure where the maximum internal temperature can reach 50°C.

Calculating the dimensions of the enclosure

Maximum thermal resistance Rth (°C/W)

$$Rth = \frac{\theta° - \theta e}{P}$$

θ = maximum temperature inside the enclosure in °C
θe = maximum external temperature in °C
P = total power dissipated in the enclosure in W

Power dissipated by drive: see page 60422/2.
Add the power dissipated by the other components of the device.

Useful heat exchange area of enclosure S (m²)

(sides + top + front panel if wall-mounted)

$$S = \frac{K}{Rth}$$

K = thermal resistance per m² of the enclosure

For metal enclosures:
- K = 0.12 with internal fan
- K = 0.15 without fan

Note: *Do not use insulated enclosures, as they have a poor level of conductivity.*