

ATV61HD45M3X

ATV61 45KW 60HP 240V 3 PHASE WO EMC
IP20



Product availability: Stock - Normally stocked in distribution facility



Main

Commercial Status	Commercialised
Range of product	Altivar 61
Product or component type	Variable speed drive
Product specific application	Pumping and ventilation machine
Component name	ATV61
Motor power kW	45 kW 3 phasesat 200...240 V
Motor power hp	60 hp 3 phasesat 200...240 V
[Us] rated supply voltage	200...240 V (- 15...10 %)
Phase	3 phases
Line current	167 Afor 200 V 3 phases 45 kW / 60 hp 147 Afor 240 V 3 phases 45 kW / 60 hp
EMC filter	Without EMC filter
Assembly style	With heat sink
Apparent power	61.1 kVAfor 240 V 3 phases 45 kW / 60 hp
Prospective line Isc	22 kA 3 phases
Maximum transient current	211.2 Afor 60 s 3 phases
Nominal switching frequency	12 kHz
Switching frequency	12...16 kHz with derating factor 1...16 kHz adjustable
Asynchronous motor control profile	Voltage/Frequency ratio, 2 points Voltage/Frequency ratio, 5 points Flux vector control without sensor, standard Voltage/Frequency ratio - Energy Saving, quadratic U/f
Synchronous motor control profile	Vector control without sensor, standard
Communication port protocol	CANopen Modbus
Type of polarization	No impedance Modbus
Option card	Profibus DP V1 communication card Profibus DP communication card Multi-pump card Modbus/Uni-Telway communication card Modbus TCP communication card Modbus Plus communication card METASYS N2 communication card LonWorks communication card Interbus-S communication card I/O extension card Fipio communication card Ethernet/IP communication card DeviceNet communication card Controller inside programmable card CC-Link communication card BACnet communication card APOGEE FLN communication card

Complementary

Product destination	Asynchronous motors Synchronous motors
Supply voltage limits	170...264 V
Supply frequency	50...60 Hz (- 5...5 %)
Network frequency limits	47.5...63 Hz
Continuous output current	176 Aat 12 kHz, 230 V 3 phases

Speed drive output frequency	0.1...500 Hz
Speed range	1...100 in open-loop mode, without speed feedback
Speed accuracy	+/- 10 % of nominal slip 0.2 Tn to Tn torque variation without speed feedback
Torque accuracy	+/- 15 % in open-loop mode, without speed feedback
Transient overtorque	130 % of nominal motor torque, +/- 10 % for 60 s
Braking torque	30 % without braking resistor ≤ 125 % with braking resistor
Regulation loop	Frequency PI regulator
Motor slip compensation	Adjustable Automatic whatever the load Can be suppressed Not available in voltage/frequency ratio (2 or 5 points)
Local signalling	1 LED red presence of drive voltage
Output voltage	≤ power supply voltage
Isolation	Between power and control terminals
Type of cable	Without mounting kit: 1-strand IEC cableat 113 °F (45 °C), copper 90 °C XLPE/EPR Without mounting kit: 1-strand IEC cableat 113 °F (45 °C), copper 70 °C PVC With UL Type 1 kit: 3-strand UL 508 cableat 104 °F (40 °C), copper 75 °C PVC With an IP21 or an IP31 kit: 3-strand IEC cableat 104 °F (40 °C), copper 70 °C PVC
Electrical connection	L1/R, L2/S, L3/T, U/T1, V/T2, W/T3, PC/-, PO, PA/+, PA, PB terminal 150 mm ² / 300 kcmil AI1-/AI1+, AI2, AO1, R1A, R1B, R1C, R2A, R2B, LI1...LI6, PWR terminal 2.5 mm ² / AWG 14
Tightening torque	L1/R, L2/S, L3/T, U/T1, V/T2, W/T3, PC/-, PO, PA/+, PA, PB 362.83 lbf.in (41 N.m) / 360 lb.in AI1-/AI1+, AI2, AO1, R1A, R1B, R1C, R2A, R2B, LI1...LI6, PWR 5.31 lbf.in (0.6 N.m)
Supply	Internal supply 24 V DC (21...27 V), ≤ 200 mA for overload and short-circuit protection Internal supply for reference potentiometer (1 to 10 kOhm) 10.5 V DC +/- 5 %, ≤ 10 mA for overload and short-circuit protection External supply 24 V DC (19...30 V), 30 W
Analogue input number	2
Analogue input type	AI2 software-configurable voltage 0...10 V DC, input voltage 24 V max, impedance 30000 Ohm, resolution 11 bits AI2 software-configurable current 0...20 mA, impedance 242 Ohm, resolution 11 bits AI1-/AI1+ bipolar differential voltage +/- 10 V DC, input voltage 24 V max, resolution 11 bits + sign
Sampling duration	Discrete input LI6 (if configured as logic input) 2 ms, +/- 0.5 ms Discrete input LI1...LI5 2 ms, +/- 0.5 ms Analog output AO1 2 ms, +/- 0.5 ms Analog input AI2 2 ms, +/- 0.5 ms Analog input AI1-/AI1+ 2 ms, +/- 0.5 ms
Accuracy	AO1 +/- 1 % for a temperature variation 60 °C AI2 +/- 0.6 % for a temperature variation 60 °C AI1-/AI1+ +/- 0.6 % for a temperature variation 60 °C
Linearity error	AO1 +/- 0.2 % AI2 +/- 0.15 % of maximum value AI1-/AI1+ +/- 0.15 % of maximum value
Analogue output number	1
Analogue output type	AO1 software-configurable logic output 10 V, ≤ 20 mA AO1 software-configurable voltage, analogue output range 0...10 V DC, impedance 470 Ohm, resolution 10 bits AO1 software-configurable current, analogue output range 0...20 mA, impedance 500 Ohm, resolution 10 bits
Discrete output number	2
Discrete output type	(R2A, R2B) configurable relay logic NO, electrical durability 100000 cycles (R1A, R1B, R1C) configurable relay logic NO/NC, electrical durability 100000 cycles
Response time	R2A, R2B ≤ 7 ms, tolerance +/- 0.5 ms R1A, R1B, R1C ≤ 7 ms, tolerance +/- 0.5 ms ≤ 100 ms in STO (Safe Torque Off)
Minimum switching current	Configurable relay logic 3 mA at 24 V DC

Maximum switching current	R1, R2 on resistive load, 5 Aat 30 V DC, $\cos \phi = 1$, L/R = 0 ms R1, R2 on resistive load, 5 Aat 250 V AC, $\cos \phi = 1$, L/R = 0 ms R1, R2 on inductive load, 2 Aat 30 V DC, $\cos \phi = 0.4$, L/R = 7 ms R1, R2 on inductive load, 2 Aat 250 V AC, $\cos \phi = 0.4$, L/R = 7 ms
Discrete input number	7
Discrete input type	(PWR) safety input, 24 V DC, voltage limits ≤ 30 V, impedance 1500 Ohm (LI6) switch-configurable PTC probe, 0...6, impedance 1500 Ohm (LI6) switch-configurable, 24 V DC, voltage limits ≤ 30 V, with level 1 PLC, impedance 3500 Ohm (LI1...LI5) programmable, 24 V DC, voltage limits ≤ 30 V, with level 1 PLC, impedance 3500 Ohm
Discrete input logic	LI6 (if configured as logic input) positive logic (source), < 5 V (state 0), > 11 V (state 1) LI6 (if configured as logic input) negative logic (sink), > 16 V (state 0), < 10 V (state 1) LI1...LI5 positive logic (source), < 5 V (state 0), > 11 V (state 1) LI1...LI5 negative logic (sink), > 16 V (state 0), < 10 V (state 1)
Acceleration and deceleration ramps	Automatic adaptation of ramp if braking capacity exceeded, by using resistor Linear adjustable separately from 0.01 to 9000 s S, U or customized
Braking to standstill	By DC injection
Protection type	Motor thermal protection Motor power removal Motor motor phase break Drive thermal protection Drive short-circuit between motor phases Drive power removal Drive overvoltages on the DC bus Drive overheating protection Drive overcurrent between output phases and earth Drive line supply undervoltage Drive line supply overvoltage Drive input phase breaks Drive break on the control circuit Drive against input phase loss Drive against exceeding limit speed
Insulation resistance	> 1 mOhm at 500 V DC for 1 minute to earth
Frequency resolution	Display unit 0.1 Hz Analog input 0.024/50 Hz
Type of connector	Male SUB-D 9 on RJ45 CANopen 1 RJ45 Modbus on terminal 1 RJ45 Modbus on front face
Physical interface	2-wire RS 485 Modbus
Transmission frame	RTU Modbus
Transmission rate	20 kbps, 50 kbps, 125 kbps, 250 kbps, 500 kbps, 1 Mbps CANopen 9600 bps, 19200 bps Modbus on front face 4800 bps, 9600 bps, 19200 bps, 38.4 Kbps Modbus on terminal
Data format	8 bits, odd even or no configurable parity Modbus on terminal 8 bits, 1 stop, even parity Modbus on front face
Number of addresses	1...247 Modbus 1...127 for CANopen
Method of access	Slave CANopen
Marking	CE
Operating position	Vertical ± 10 degree
Product weight	81.57 lb(US) (37 kg)
Width	12.6 in (320 mm)
Height	21.65 in (550 mm)
Depth	10.47 in (266 mm)

Environment

Noise level	64 dB conforming to 86/188/EEC
Dielectric strength	4230 V DC between control and power terminals 2830 V DC between earth and power terminals
Electromagnetic compatibility	Voltage dips and interruptions immunity test conforming to IEC 61000-4-11 Radiated radio-frequency electromagnetic field immunity test conforming to IEC 61000-4-3 level 3 Electrostatic discharge immunity test conforming to IEC 61000-4-2 level 3 Electrical fast transient/burst immunity test conforming to IEC 61000-4-4 level 4 Conducted radio-frequency immunity test conforming to IEC 61000-4-6 level 3
Standards	IEC 60721-3-3 class 3C1 IEC 60721-3-3 class 3S2 UL Type 1
Product certifications	CSA C-Tick DNV GOST NOM 117 UL
Pollution degree	3 conforming to UL 840 3 conforming to EN/IEC 61800-5-1
IP degree of protection	IP54 on lower part conforming to EN/IEC 61800-5-1 IP54 on lower part conforming to EN/IEC 60529 IP41 on upper part conforming to EN/IEC 61800-5-1 IP41 on upper part conforming to EN/IEC 60529 IP21 conforming to EN/IEC 61800-5-1 IP21 conforming to EN/IEC 60529 IP20 on upper part without blanking plate on cover conforming to EN/IEC 61800-5-1 IP20 on upper part without blanking plate on cover conforming to EN/IEC 60529
Vibration resistance	1.5 mm peak to peak (f = 3...13 Hz) conforming to EN/IEC 60068-2-6 1 gn (f = 13...200 Hz) conforming to EN/IEC 60068-2-6
Shock resistance	15 gn 11 ms conforming to EN/IEC 60068-2-27
Relative humidity	5...95 % without dripping water conforming to IEC 60068-2-3 5...95 % without condensation conforming to IEC 60068-2-3
Ambient air temperature for operation	122...140 °F (50...60 °C) with derating factor 14...122 °F (-10...50 °C) without derating
Ambient air temperature for storage	-13...158 °F (-25...70 °C)
Operating altitude	3280.84...9842.52 ft (1000...3000 m) with current derating 1 % per 100 m ≤ 3280.84 ft (1000 m) without derating

Ordering and shipping details

Category	22138 - ATV61 60 THRU 150 HP DRIVES
Discount Schedule	CP4C
GTIN	00785901639510
Nbr. of units in pkg.	1
Product availability	Stock - Normally stocked in distribution facility
Returnability	Y
Country of origin	IN

Offer Sustainability

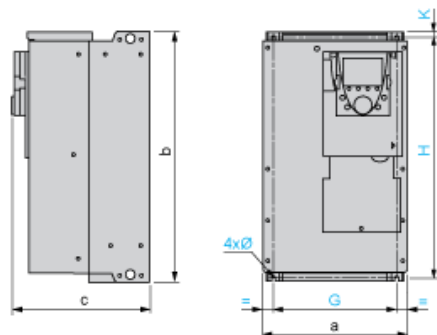
Sustainable offer status	Green Premium product
RoHS (date code: YYWW)	Compliant - since 0946 - Schneider Electric declaration of conformity
REACH	Reference contains SVHC above the threshold - go to CaP for more details
Product environmental profile	Available Download Product Environmental Profile
Product end of life instructions	Available Download End Of Life Manual

Contractual warranty

Warranty period	18 months
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UL Type 1/IP 20 Drives

Dimensions without Option Card



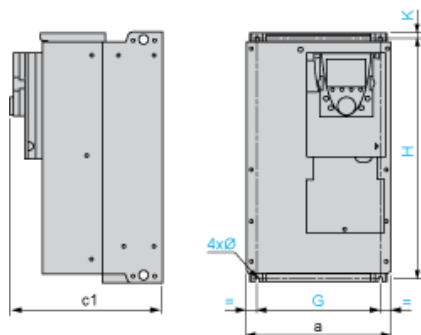
Dimensions in mm

a	b	c	G	H	K	Ø
320	550	266	280	524	20	9

Dimensions in in.

a	b	c	G	H	K	Ø
12.60	21.65	10.47	11.02	20.63	0.79	0.35

Dimensions with 1 Option Card (1)



Dimensions in mm

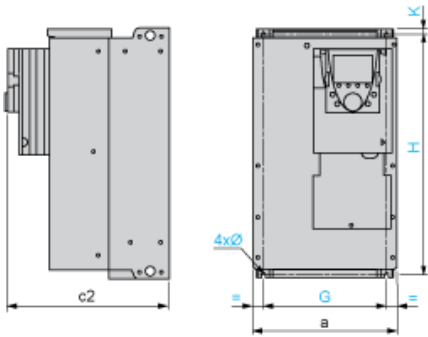
a	c1	G	H	K	Ø
320	289	280	524	20	9

Dimensions in in.

a	c1	G	H	K	Ø
12.60	11.38	11.02	20.63	0.79	0.35

(1) Option cards: I/O extension cards, communication cards or "Controller Inside" programmable card.

Dimensions with 2 Option Cards (1)



Dimensions in mm

a	c2	G	H	K	Ø
320	312	280	524	20	9

Dimensions in in.

a	c2	G	H	K	Ø
12.60	12.28	11.02	20.63	0.79	0.35

(1) Option cards: I/O extension cards, communication cards or "Controller Inside" programmable card.

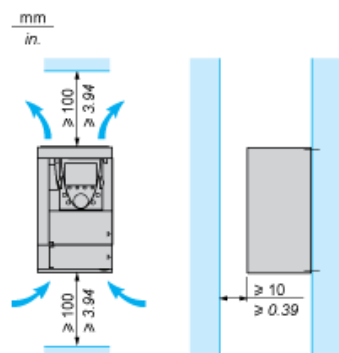
Mounting Recommendations

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:

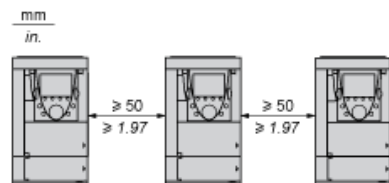
- Avoid placing it close to heating elements
- Leave sufficient free space to ensure that the air required for cooling purposes can circulate from the bottom to the top of the unit.

Clearance

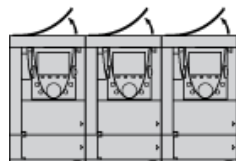


Mounting Types

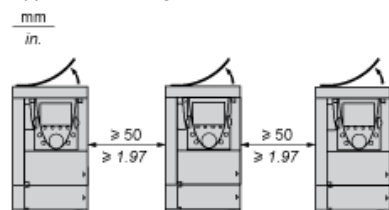
Type A Mounting



Type B Mounting



Type C Mounting



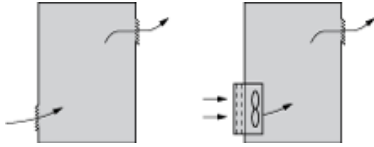
By removing the protective blanking cover from the top of the drive, the degree of protection for the drive becomes IP 20.
The protective blanking cover may vary according to the drive model (refer to the user guide).

Specific Recommendations for Mounting the Drive in an Enclosure

Ventilation

To ensure proper air circulation in the drive:

- Fit 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 (refer to the product characteristics).



- Use special filters with IP 54 protection.
- Remove the blanking cover from the top of the drive.

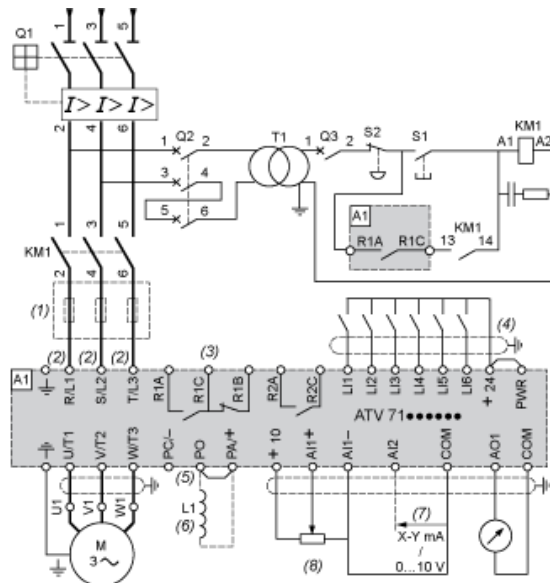
Dust and Damp Proof Metal Enclosure (IP 54)

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 reaches 50°C.

Wiring Diagram Conforming to Standards EN 954-1 Category 1, IEC/EN 61508 Capacity SIL1, in Stopping Category 0 According to IEC/EN 60204-1

Three-Phase Power Supply with Upstream Breaking via Contactor

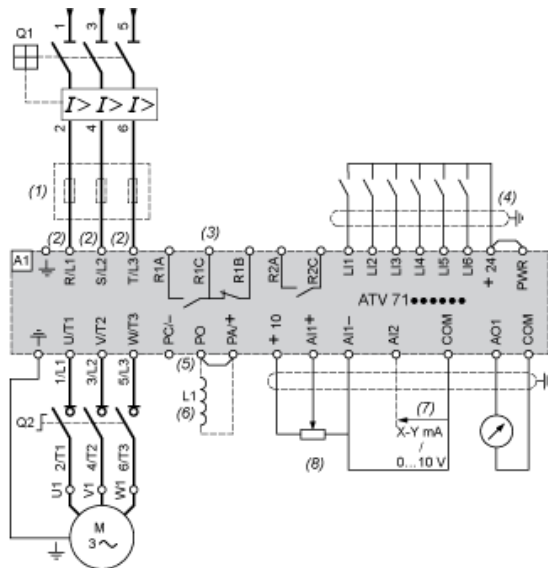


- A1 ATV61 drive
- KM1 Contactor
- L1 DC choke
- Q1 Circuit-breaker
- Q2 GV2 L rated at twice the nominal primary current of T1
- Q3 GB2CB05
- S1, XB4 B or XB5 A pushbuttons
- S2
- T1 100 VA transformer 220 V secondary
- (1) Line choke (three-phase); mandatory for ATV61HC11Y...HC80Y drives (except when a special transformer is used (12-pulse)).
- (2) For ATV61HC50N4, ATV61HC63N4 and ATV61HC50Y...HC80Y drives, refer to the power terminal connections diagram.
- (3) Fault relay contacts. Used for remote signalling of the drive status.
- (4) Connection of the common for the logic inputs depends on the positioning of the SW1 switch. The above diagram shows the internal power supply switched to the "source" position (for other connection types, refer to the user guide).
- (5) There is no PO terminal on ATV61HC11Y...HC80Y drives.
- (6) Optional DC choke for ATV61H...M3, ATV61HD11M3X...HD45M3X and ATV61H075N4...HD75N4 drives. Connected in place of the strap between the PO and PA/+ terminals. For ATV61HD55M3X...HD90M3X, ATV61HD90N4...HC63N4 drives, the choke is supplied with the drive; the customer is responsible for connecting it. For ATV61W...N4 and ATV61W...N4C drives, the DC choke is integrated.
- (7) Software-configurable current (0...20 mA) or voltage (0...10 V) analog input.
- (8) Reference potentiometer.

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

Wiring Diagram Conforming to Standards EN 954-1 Category 1, IEC/EN 61508 Capacity SIL1, in Stopping Category 0 According to IEC/EN 60204-1

Three-Phase Power Supply with Downstream Breaking via Switch Disconnect



A1 ATV61 drive

L1 DC choke

Q1 Circuit-breaker

Q2 Switch disconnect (Vario)

(1) Line choke (three-phase), mandatory for ATV61HC11Y...HC80Y drives (except when a special transformer is used (12-pulse)).

(2) For ATV61HC50N4, ATV61HC63N4 and ATV61HC50Y...HC80Y drives, refer to the power terminal connections diagram.

(3) Fault relay contacts. Used for remote signalling of the drive status.

(4) Connection of the common for the logic inputs depends on the positioning of the SW1 switch. The above diagram shows the internal power supply switched to the "source" position (for other connection types, refer to the user guide).

(5) There is no PO terminal on ATV61HC11Y...HC80Y drives.

(6) Optional DC choke for ATV61H...M3, ATV61HD11M3X...HD45M3X and ATV61H075N4...HD75N4 drives. Connected in place of the strap between the PO and PA/+ terminals. For ATV61HD55M3X...HD90M3X, ATV61HD90N4...HC63N4 drives, the choke is supplied with the drive; the customer is responsible for connecting it. For ATV61W...N4 and ATV61W...N4C drives, the DC choke is integrated.

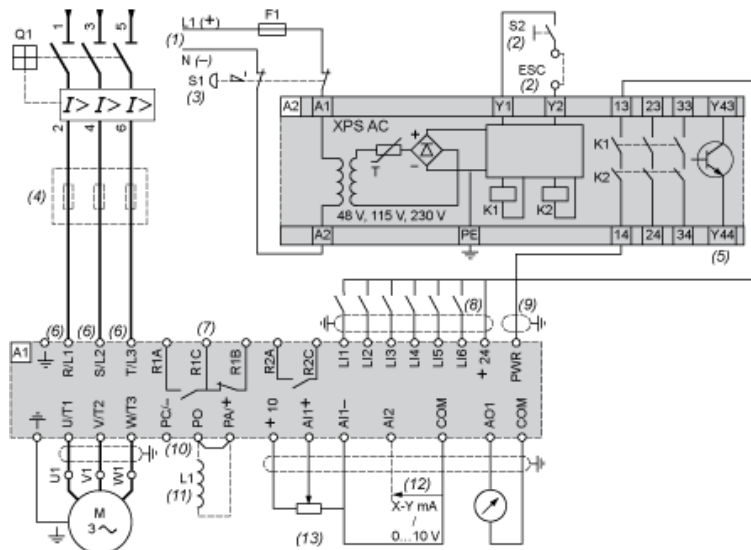
(7) Software-configurable current (0...20 mA) or voltage (0...10 V) analog input.

(8) Reference potentiometer.

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

Wiring Diagram Conforming to Standards EN 954-1 Category 3, IEC/EN 61508 Capacity SIL2, in Stopping Category 0 According to IEC/EN 60204-1

Three-Phase Power Supply, Low Inertia Machine, Vertical Movement

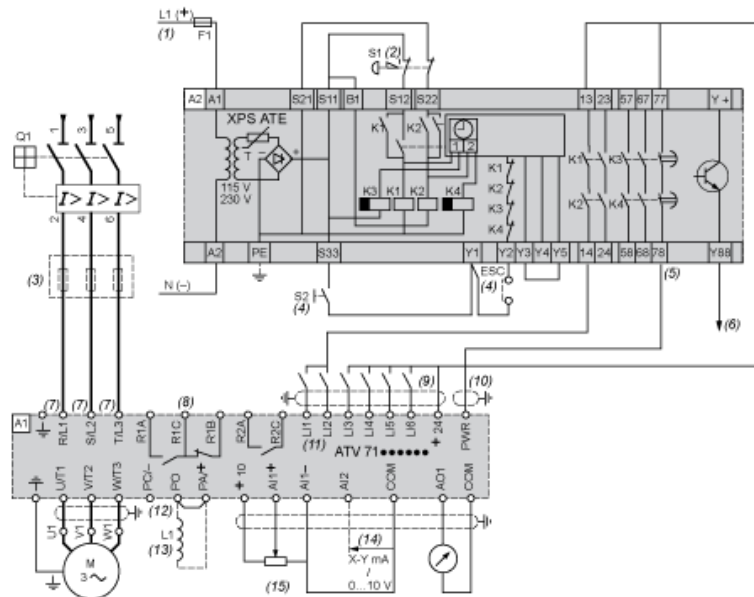


- A1 ATV61 drive
- A2 Preventa XPS AC safety module for monitoring emergency stops and switches. One safety module can manage the "Power Removal" function for several drives on the same machine. In this case, each drive must connect its PWR terminal to its + 24 V via the safety contacts on the XPS AC module. These contacts are independent for each drive.
- F1 Fuse
- L1 DC choke
- Q1 Circuit-breaker
- S1 Emergency stop button with 2 contacts
- S2 XB4 B or XB5 A pushbutton
- (1) Power supply: 24 Vdc or Vac, 115 Vac, 230 Vac.
- (2) S2: resets XPS AC module on power-up or after an emergency stop. ESC can be used to set external starting conditions.
- (3) Requests freewheel stopping of the movement and activates the "Power Removal" safety function.
- (4) Line choke (three-phase), mandatory for and ATV61HC11Y...HC80Y drives (except when a special transformer is used (12-pulse)).
- (5) The logic output can be used to signal that the machine is in a safe stop state.
- (6) For ATV61HC50N4, ATV61HC63N4 and ATV61HC50Y...HC80Y drives, refer to the power terminal connections diagram.
- (7) Fault relay contacts. Used for remote signalling of the drive status.
- (8) Connection of the common for the logic inputs depends on the positioning of the SW1 switch. The above diagram shows the internal power supply switched to the "source" position (for other connection types, refer to the user guide).
- (9) Standardized coaxial cable, type RG174/U according to MIL-C17 or KX3B according to NF C 93-550, external diameter 2.54 mm / 0.09 in., maximum length 15 m / 49.21 ft. The cable shielding must be earthed.
- (10) There is no PO terminal on ATV61HC11Y...HC80Y drives.
- (11) Optional DC choke for ATV61H...M3, ATV61HD11M3X...HD45M3X and ATV61H075N4...HD75N4 drives. Connected in place of the strap between the PO and PA/+ terminals. For ATV61HD55M3X...HD90M3X, ATV61HD90N4...HC63N4 drives, the choke is supplied with the drive; the customer is responsible for connecting it. For ATV61W...N4 and ATV61W...N4C drives, the DC choke is integrated.
- (12) Software-configurable current (0...20 mA) or voltage (0...10 V) analog input.
- (13) Reference potentiometer.

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

Wiring Diagram Conforming to Standards EN 954-1 Category 3, IEC/EN 61508 Capacity SIL2, in Stopping Category 1 According to IEC/EN 60204-1

Three-Phase Power Supply, High Inertia Machine

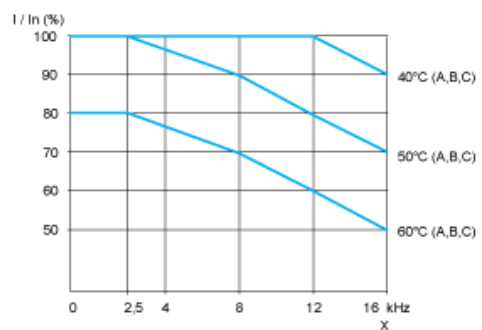


- A1 ATV61 drive
- A2 Preventa XPS ATE safety module for monitoring emergency stops and switches. One safety module can manage the "Power Removal"
- (5) safety function for several drives on the same machine. In this case the time delay must be adjusted on the drive controlling the motor that requires the longest stopping time. In addition, each drive must connect its PWR terminal to its + 24 V via the safety contacts on the XPS ATE module. These contacts are independent for each drive.
- F1 Fuse
- L1 DC choke
- Q1 Circuit-breaker
- S1 Emergency stop button with 2 contacts
- S2 XB4 B or XB5 A pushbutton
- (1) Power supply: 24 Vdc or Vac, 115 Vac, 230 Vac.
- (2) Requests controlled stopping of the movement and activates the "Power Removal" safety function.
- (3) Line choke (three-phase), mandatory for ATV61HC11Y...HC80Y drives (except when a special transformer is used (12-pulse)).
- (4) S2: resets XPS ATE module on power-up or after an emergency stop. ESC can be used to set external starting conditions.
- (5) The logic output can be used to signal that the machine is in a safe state.
- (6) For stopping times requiring more than 30 seconds in category 1, use a Preventa XPS AV safety module which can provide a maximum time delay of 300 seconds.
- (7) For ATV61HC50N4, ATV61HC63N4 and ATV61HC50Y...HC80Y drives, refer to the power terminal connections diagram.
- (8) Fault relay contacts. Used for remote signalling of the drive status.
- (9) Connection of the common for the logic inputs depends on the positioning of the SW1 switch. The above diagram shows the internal power supply switched to the "source" position (for other connection types, refer to the user guide).
- (10) Standardized coaxial cable, type RG174/U according to MIL-C17 or KX3B according to NF C 93-550, external diameter 2.54 mm/0.09 in., maximum length 15 m/49.21 ft. The cable shielding must be earthed.
- (11) Logic inputs LI1 and LI2 must be assigned to the direction of rotation: LI1 in the forward direction and LI2 in the reverse direction.
- (12) There is no PO terminal on ATV61HC11Y...HC80Y drives.
- (13) Optional DC choke for ATV61H...M3, ATV61HD11M3X...HD45M3X and ATV61H075N4...HD75N4 drives. Connected in place of the strap between the PO and PA/+ terminals. For ATV61HD55M3X...HD90M3X, ATV61HD90N4...HC63N4 drives, the choke is supplied with the drive; the customer is responsible for connecting it. For ATV61W...N4 and ATV61W...N4C drives, the DC choke is integrated.
- (14) Software-configurable current (0...20 mA) or voltage (0...10 V) analog input.
- (15) Reference potentiometer.

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

Derating Curves

The derating curves for the drive nominal current (I_n) depend on the temperature, the switching frequency and the mounting type (A, B or C). For intermediate temperatures (e.g. 55°C), interpolate between 2 curves.



X Switching frequency

NOTE: Above 50°C, the drive should be fitted with a control card fan kit.