

ATV71HC11N4

variable speed drive ATV71 - 110kW-150HP -
480V - EMC filter-graphic terminal

Product availability : Stock - Normally stocked in distribution facility



Price* : 14,550.15 USD



Main

| | |
|------------------------------------|--|
| Range of product | Altivar 71 |
| Product or component type | Variable speed drive |
| Product specific application | Complex, high-power machines |
| Component name | ATV71 |
| Motor power kW | 110 kW at 380...480 V 3 phases |
| Motor power hp | 150 hp at 380...480 V 3 phases |
| Motor cable length | <= 328.08 ft (100 m) Shielded cable <= 656.17 ft (200 m) Unshielded cable |
| Power supply voltage | 380...480 V (- 15...10 %) |
| Phase | 3 phases |
| Line current | 163 A for 480 V 3 phases 110 kW / 150 hp 202 A for 380 V 3 phases 110 kW / 150 hp |
| EMC filter | Integrated |
| Assembly style | With heat sink |
| Variant | Reinforced version |
| Apparent power | 133 kVA at 380 V 3 phases 110 kW / 150 hp |
| Prospective line I _{sc} | 35 kA, 3 phases |
| Nominal output current | 215 A at 2.5 kHz 380 V 3 phases 110 kW / 150 hp 215 A at 2.5 kHz 460 V 3 phases 110 kW / 150 hp |
| Maximum transient current | 323 A for 60 s 3 phases 110 kW / 150 hp 355 A for 2 s 3 phases 110 kW / 150 hp |
| Output frequency | 0.1...500 Hz |
| Nominal switching frequency | 2.5 kHz |
| Switching frequency | 2.5...8 kHz adjustable 2.5...8 kHz with derating factor |
| Asynchronous motor control profile | ENA (Energy adaptation) system for unbalanced loads Flux vector control (FVC) with sensor (current vector) Sensorless flux vector control (SFVC) (voltage or current vector) |

Disclaimer: This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications

Voltage/frequency ratio (2 or 5 points)

| | |
|----------------------|---------------------|
| Type of polarization | No impedance Modbus |
|----------------------|---------------------|

Complementary

| | |
|--|--|
| Product destination | Asynchronous motors Synchronous motors |
| Power supply voltage limits | 323...528 V |
| Power supply frequency | 50...60 Hz (- 5...5 %) |
| Power supply frequency limits | 47.5...63 Hz |
| Speed range | 1...100 asynchronous motor in open-loop mode, without speed feedback 1...50 synchronous motor in open-loop mode, without speed feedback 1...1000 asynchronous motor in closed-loop mode with encoder feedback |
| Speed accuracy | +/- 0.01 % of nominal speed 0.2 Tn to Tn torque variation in closed-loop mode with encoder feedback +/- 10 % of nominal slip 0.2 Tn to Tn torque variation without speed feedback |
| Torque accuracy | +/- 15 % in open-loop mode, without speed feedback +/- 5 % in closed-loop mode with encoder feedback |
| Transient overtorque | 220 % of nominal motor torque +/- 10 % for 2 s 170 % of nominal motor torque +/- 10 % for 60 s every 10 minutes |
| Braking torque | <= 150 % with braking or hoist resistor 30 % without braking resistor |
| Synchronous motor control profile | Vector control without speed feedback |
| Regulation loop | Adjustable PI regulator |
| Motor slip compensation | Adjustable Automatic whatever the load Not available in voltage/frequency ratio (2 or 5 points) Suppressable |
| Diagnostic | 1 LED red presence of drive voltage |
| Output voltage | <= power supply voltage |
| Insulation | Electrical between power and control |
| Type of cable for mounting in an enclosure | With a NEMA Type1 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 Without mounting kit: 1-strand IEC cableat 113 °F (45 °C), copper 70 °C PVC Without mounting kit: 1-strand IEC cableat 113 °F (45 °C), copper 90 °C XLPE/EPR |
| Electrical connection | AI1-/AI1+, AI2, AO1, R1A, R1B, R1C, R2A, R2B, LI1...LI6, PWR terminal 2.5 mm ² / AWG 14 L1/R, L2/S, L3/T, U/T1, V/T2, W/T3 terminal 2 x 100 mm ² PA, PB terminal 60 mm ² PC/-, PO, PA/+ terminal 2 x 150 mm ² |
| Tightening torque | L1/R, L2/S, L3/T, U/T1, V/T2, W/T3 212.39 lbf.in (24 N.m) / 212 lb.in PA, PB 106.19 lbf.in (12 N.m) / 106 lb.in PC/-, PO, PA/+ 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 for reference potentiometer (1 to 10 kOhm), 10.5 V DC +/- 5 %, <= 10 mA for overload and short-circuit protection Internal supply, 24 V DC, voltage limits 21...27 V, <= 200 mA for overload and short-circuit protection |
| Analogue input number | 2 |
| Analogue input type | AI1-/AI1+ bipolar differential voltage +/- 10 V DC, input voltage 24 V max, resolution 11 bits + sign AI2 software-configurable current 0...20 mA, impedance 242 Ohm, resolution 11 bits AI2 software-configurable voltage 0...10 V DC, input voltage 24 V max, impedance 30000 Ohm, resolution 11 bits |
| Input sampling time | AI1-/AI1+ 2 ms, +/- 0.5 ms analog input(s) AI2 2 ms, +/- 0.5 ms analog input(s) LI1...LI5 2 ms, +/- 0.5 ms discrete input(s) LI6 (if configured as logic input) 2 ms, +/- 0.5 ms discrete input(s) |
| Response time | <= 100 ms in STO (Safe Torque Off) AO1 2 ms, tolerance +/- 0.5 ms analog output(s) R1A, R1B, R1C 7 ms, tolerance +/- 0.5 ms discrete output(s) R2A, R2B 7 ms, tolerance +/- 0.5 ms discrete output(s) |
| Absolute accuracy precision | AI1-/AI1+ +/- 0.6 % for a temperature variation 60 °C AI2 +/- 0.6 % for a temperature variation 60 °C AO1 +/- 1 % for a temperature variation 60 °C |
| Linearity error | AI1-/AI1+, AI2 +/- 0.15 % of maximum value AO1 +/- 0.2 % |
| Analogue output number | 1 |

| | |
|-------------------------------------|---|
| Analogue output type | AO1 software-configurable logic output 10 V 20 mA AO1 software-configurable current 0...20 mA, impedance 500 Ohm, resolution 10 bits AO1 software-configurable voltage 0...10 V DC, impedance 470 Ohm, resolution 10 bits |
| Discrete output number | 2 |
| Discrete output type | R1A, R1B, R1C configurable relay logic NO/NC, electrical durability 100000 cycles R2A, R2B configurable relay logic NO, electrical durability 100000 cycles |
| Minimum switching current | Configurable relay logic 3 mA at 24 V DC |
| Maximum switching current | R1, R2 on resistive load, 5 A at 250 V AC, cos phi = 1, R1, R2 on resistive load, 5 A at 30 V DC, cos phi = 1, R1, R2 on inductive load, 2 A at 250 V AC, cos phi = 0.4, R1, R2 on inductive load, 2 A at 30 V DC, cos phi = 0.4, |
| Discrete input number | 7 |
| Discrete input type | LI6: switch-configurable 24 V DC with level 1 PLC, impedance: 3500 Ohm PWR: safety input 24 V DC, impedance: 1500 Ohm conforming to ISO 13849-1 level d LI1...LI5: programmable 24 V DC with level 1 PLC, impedance: 3500 Ohm LI6: switch-configurable PTC probe 0...6, impedance: 1500 Ohm |
| Discrete input logic | LI1...LI5 positive logic (source), < 5 V (state 0), > 11 V (state 0) LI1...LI5 negative logic (sink), > 16 V (state 0), < 10 V (state 0) LI6 (if configured as logic input) positive logic (source), < 5 V (state 0), > 11 V (state 0) LI6 (if configured as logic input) negative logic (sink), > 16 V (state 0), < 10 V (state 0) |
| 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 | Drive against exceeding limit speed Drive against input phase loss Drive break on the control circuit Drive input phase breaks Drive line supply overvoltage Drive line supply undervoltage Drive overcurrent between output phases and earth Drive overheating protection Drive overvoltages on the DC bus Drive short-circuit between motor phases Drive thermal protection Motor motor phase break Motor power removal Motor thermal protection |
| Insulation resistance | > 1 mOhm at 500 V DC for 1 minute to earth |
| Frequency resolution | Analog input 0.024/50 Hz Display unit 0.1 Hz |
| Communication port protocol | CANopen Modbus |
| Connector type | 1 RJ45 Modbus on front face 1 RJ45 Modbus on terminal Male SUB-D 9 on RJ45 CANopen |
| 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 4800 bps, 9600 bps, 19200 bps, 38.4 Kbps Modbus on terminal 9600 bps, 19200 bps Modbus on front face |
| Data format | 8 bits, 1 stop, even parity Modbus on front face 8 bits, odd even or no configurable parity Modbus on terminal |
| Number of addresses | 1...247 Modbus 1...127 CANopen |
| Method of access | Slave CANopen |
| Marking | CE |
| Operating position | Vertical +/- 10 degree |
| Height | 40.24 in (1022 mm) |
| Depth | 14.84 in (377 mm) |
| Width | 14.17 in (360 mm) |
| Product weight | 233.69 lb(US) (106 kg) |
| Functionality | Full |

| Specific application | Other applications |
|----------------------|---|
| Option card | CC-Link communication card Controller inside programmable card DeviceNet communication card Ethernet/IP communication card Fipio communication card I/O extension card Interbus-S communication card Interface card for encoder Modbus Plus communication card Modbus TCP communication card Modbus/Uni-Telway communication card Overhead crane card Profibus DP communication card Profibus DP V1 communication card |

Environment

| | |
|---------------------------------------|---|
| Noise level | 69.5 dB conforming to 86/188/EEC |
| Dielectric strength | 3535 V DC between earth and power terminals 5092 V DC between control and power terminals |
| Electromagnetic compatibility | Conducted radio-frequency immunity test conforming to IEC 61000-4-6 level 3 Electrical fast transient/burst immunity test conforming to IEC 61000-4-4 level 4 Electrostatic discharge immunity test conforming to IEC 61000-4-2 level 3 Radiated radio-frequency electromagnetic field immunity test conforming to IEC 61000-4-3 level 3 Voltage dips and interruptions immunity test conforming to IEC 61000-4-11 1.2/50 μ s - 8/20 μ s surge immunity test conforming to IEC 61000-4-5 level 3 |
| Standards | EN 55011 class A group 2 EN 61800-3 environments 1 category C3 EN 61800-3 environments 2 category C3 EN/IEC 61800-3 EN/IEC 61800-5-1 IEC 60721-3-3 class 3C2 UL Type 1 |
| Product certifications | CSA C-Tick GOST NOM 117 UL |
| Pollution degree | 2 conforming to EN/IEC 61800-5-1 3 conforming to UL 840 |
| IP degree of protection | IP20 |
| Vibration resistance | 1.5 mm peak to peak (f = 3...10 Hz) conforming to EN/IEC 60068-2-6 0.6 gn (f = 10...200 Hz) conforming to EN/IEC 60068-2-6 |
| Shock resistance | 7 gn 11 ms conforming to EN/IEC 60068-2-27 |
| Relative humidity | 5...95 % without condensation conforming to IEC 60068-2-3 5...95 % without dripping water conforming to IEC 60068-2-3 |
| Ambient air temperature for operation | 14...122 °F (-10...50 °C) without derating |
| Ambient air temperature for storage | -13...158 °F (-25...70 °C) |
| Operating altitude | <= 3280.84 ft (1000 m) without derating 3280.84...9842.52 ft (1000...3000 m) with current derating 1 % per 100 m |

Ordering and shipping details

| | |
|-----------------------|--------------------------------------|
| Category | 22132 - ATV71 - 60 THRU 150HP DRIVES |
| Discount Schedule | CP4C |
| GTIN | 00785901446224 |
| Nbr. of units in pkg. | 1 |
| Package weight(Lbs) | 217.80000000000001 |
| Returnability | Y |
| Country of origin | IN |

Offer Sustainability

| | |
|--------------------------|-----------------------|
| Sustainable offer status | Green Premium product |
|--------------------------|-----------------------|

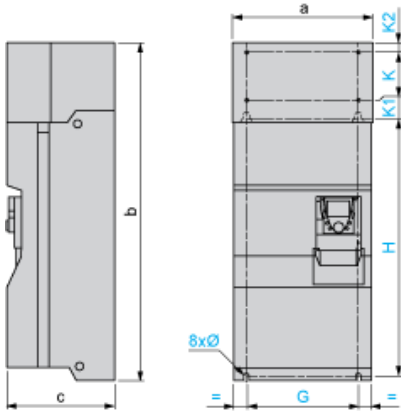
| | |
|----------------------------------|---|
| RoHS (date code: YYWW) | Compliant - since 1002 - Schneider Electric declaration of conformity Schneider Electric declaration of conformity |
| REACH | Reference not containing SVHC above the threshold Reference not containing SVHC above the threshold |
| Product environmental profile | Available End of Life Information |
| Product end of life instructions | Need no specific recycling operations |
| California proposition 65 | WARNING: This product can expose you to chemicals including: |
| ----- Substance 1 | Lead and lead compounds, which is known to the State of California to cause cancer and birth defects or other reproductive harm. |
| ----- Substance 2 | Bisphenol A (BPA), which is known to the State of California to cause birth defects or other reproductive harm. |
| ----- More information | For more information go to www.p65warnings.ca.gov |

Contractual warranty

| | |
|-----------------|-----------|
| Warranty period | 18 months |
|-----------------|-----------|

UL Type 1/IP 20 Drives

Dimensions with or without 1 Option Card (1)



Dimensions in mm

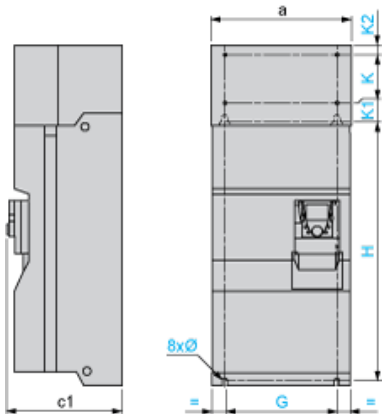
| a | b | c | G | H | K | K1 | K2 | Ø |
|-----|------|-----|-----|-----|-----|----|----|------|
| 360 | 1022 | 377 | 298 | 758 | 150 | 72 | 30 | 11.5 |

Dimensions in in.

| a | b | c | G | H | K | K1 | K2 | Ø |
|-------|-------|-------|-------|-------|------|------|------|------|
| 14.17 | 40.24 | 14.84 | 11.73 | 29.84 | 5.90 | 2.83 | 1.18 | 0.45 |

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

Dimensions with 2 Option Cards (1)



Dimensions in mm

| a | c1 | G | H | K | K1 | K2 | Ø |
|-----|-----|-----|-----|-----|----|----|------|
| 360 | 392 | 298 | 758 | 150 | 72 | 30 | 11.5 |

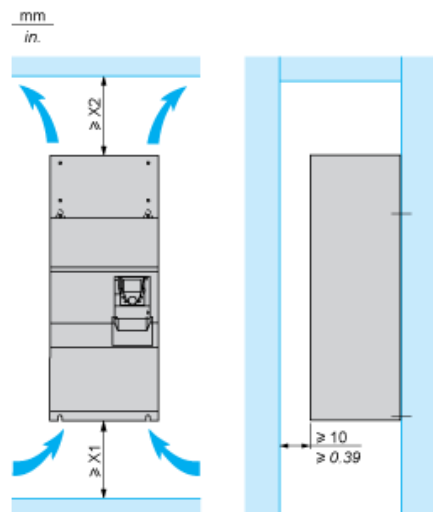
Dimensions in in.

| a | c1 | G | H | K | K1 | K2 | Ø |
|-------|-------|-------|-------|------|------|------|------|
| 14.17 | 15.43 | 11.73 | 29.84 | 5.90 | 2.83 | 1.18 | 0.45 |

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

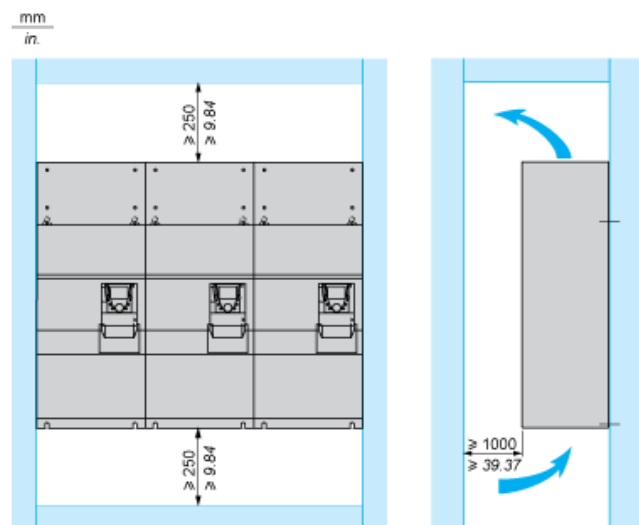
Mounting Recommendations

Clearance



| X1 in mm | X2 in mm | X1 in in. | X2 in in. |
|----------|----------|-----------|-----------|
| 150 | 150 | 5.91 | 5.91 |

These drives can be mounted side by side, observing the following mounting recommendations:

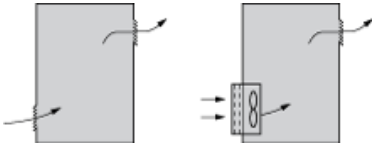


Specific Recommendations for Mounting the Drive in an Enclosure

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



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

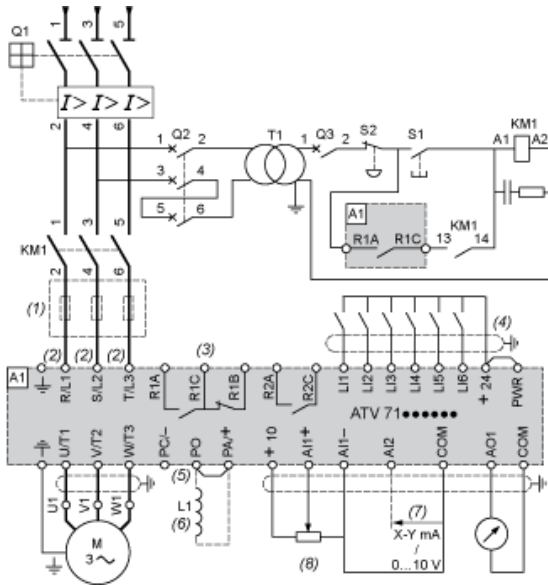
Dust and Damp Proof Metal Enclosure (IP 54)

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



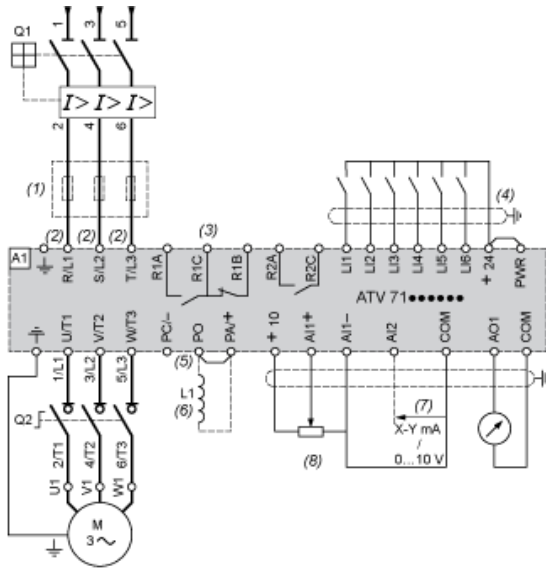
- A1 ATV71 drive
- KM1 Contactor
- L1 DC choke
- Q1 Circuit-breaker
- Q2 GV2 L rated at twice the nominal primary current of T1
- Q3 GB2CB05
- S1, S2 XB4 B or XB5 A pushbuttons
- T1 100 VA transformer 220 V secondary

- (1) Line choke (three-phase); mandatory for ATV71HC11Y...HC63Y drives (except when a special transformer is used (12-pulse)).
- (2) For ATV71HC40N4 drives combined with a 400 kW motor, ATV71HC50N4 and ATV71HC40Y...HC63Y, 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 switch.
- (5) There is no PO terminal on ATV71HC11Y...HC63Y drives.
- (6) Optional DC choke for ATV71H...M3, ATV71HD11M3X...HD45M3X, ATV71•075N4...•D75N4 and ATV71P...N4Z drives. Connected in place of the L1.
- (7) Software-configurable current (0...20 mA) or voltage (0...10 V) analog input.
- (8) Reference potentiometer.

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 Disconnecter

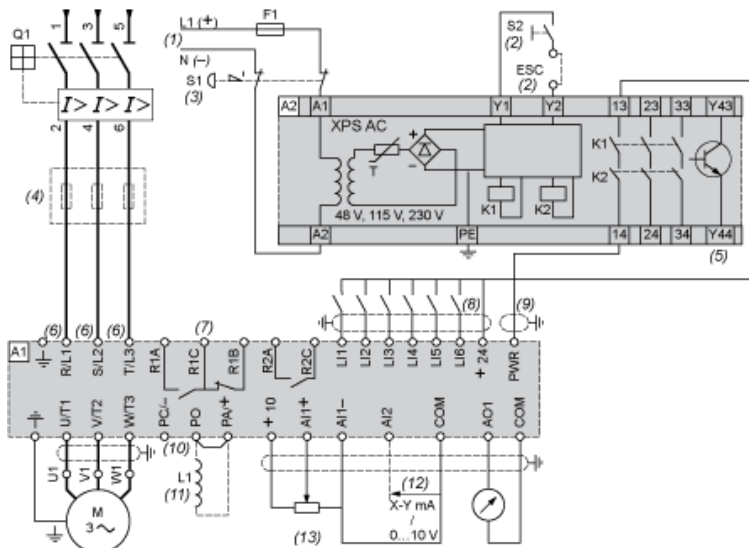


- A1 ATV71 drive
- L1 DC choke
- Q1 Circuit-breaker
- Q2 Switch disconnecter (Vario)
- (1) Line choke (three-phase), mandatory for ATV71HC11Y...HC63Y drives (except when a special transformer is used (12-pulse)).
- (2) For ATV71HC40N4 drives combined with a 400 kW motor, ATV71HC50N4 and ATV71HC40Y...HC63Y, 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 switch.
- (5) There is no PO terminal on ATV71HC11Y...HC63Y drives.
- (6) Optional DC choke for ATV71H...M3, ATV71HD11M3X...HD45M3X, ATV71•075N4...•D75N4 and ATV71P...N4Z drives. Connected in place of the L1.
- (7) Software-configurable current (0...20 mA) or voltage (0...10 V) analog input.
- (8) Reference potentiometer.

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

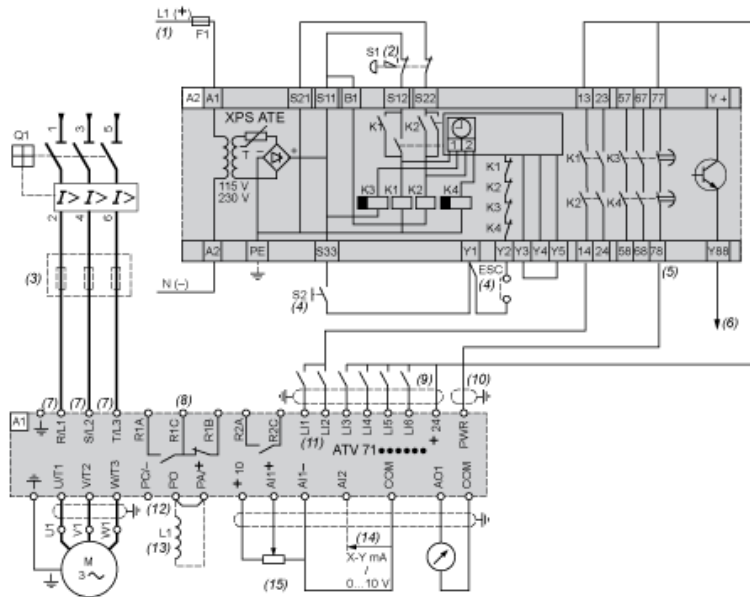


- A1 ATV71 drive
- A2 Preventa XPS AC safety module for monitoring emergency stops and switches. One safety module can manage the "Power Removal" function for several drives.
- F1 Fuse
- L1 DC choke
- Q1 Circuit-breaker
- S1 Emergency stop button with 2 contacts
- S2 XB4 B or XB5 A pushbutton
- (1) Power supply: 24 Vdc or Vac, 48 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 ATV71HC11Y...HC63Y 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 ATV71HC40N4 drives combined with a 400 kW motor, ATV71HC50N4 and ATV71HC40Y...HC63Y, 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 switch.
- (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 100 m.
- (10) There is no PO terminal on ATV71HC11Y...HC63Y drives.
- (11) Optional DC choke for ATV71H...M3, ATV71HD11M3X...HD45M3X, ATV71•075N4...•D75N4 and ATV71P...N4Z drives. Connected in place of the L1.
- (12) Software-configurable current (0...20 mA) or voltage (0...10 V) analog input.
- (13) Reference potentiometer.

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

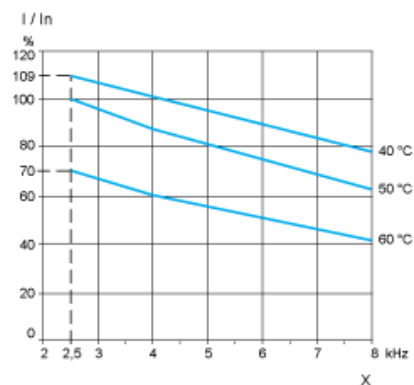


- A1 ATV71 drive
- A2 (5) Preventa XPS ATE safety module for monitoring emergency stops and switches. One safety module can manage the "Power Removal" safety function
- F1 Fuse
- L1 DC choke
- Q1 Circuit-breaker
- S1 Emergency stop button with 2 N/C contacts
- S2 Run button
- (1) Power supply: 24 Vdc 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 ATV71HC11Y...HC63Y 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) 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 30 seconds.
- (6) The logic output can be used to signal that the machine is in a safe state.
- (7) For ATV71HC40N4 drives combined with a 400 kW motor, ATV71HC50N4 and ATV71HC40Y...HC63Y, 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 switch.
- (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 100 m.
- (11) Logic inputs L1 and L2 must be assigned to the direction of rotation: L1 in the forward direction and L2 in the reverse direction.
- (12) There is no PO terminal on ATV71HC11Y...HC63Y drives.
- (13) Optional DC choke for ATV71H...M3, ATV71HD11M3X...HD45M3X, ATV71•075N4...•D75N4 and ATV71P...N4Z drives. Connected in place of the standard DC choke.
- (14) Software-configurable current (0...20 mA) or voltage (0...10 V) analog input.
- (15) Reference potentiometer.

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 and the switching frequency. For intermediate temperatures (e.g. 55°C), interpolate between 2 curves.



X Switching frequency