



Caracteristici Principale

Gama de produse	Altivar 71
Tip produs sau componenta	Variator de viteza
Aplicatie specifica produsului	Masini de mare putere, complexe
Nume componenta	ATV71
Putere motor kW	4 kW la 380...480 V 3 faze
Putere motor hp	5 CP la 380...480 V 3 faze
Lungime cablu motor	
[Us] tensiune nominală de alimentare	380...480 V (- 15...10 %)
Numar de fazein retea	3 faze
Curent de linie	11.5 A pentru 480 V 3 faze 4 kW / 5 CP 14.1 A pentru 380 V 3 faze 4 kW / 5 CP
Filtru EMC	Integrat
Stil de asamblare	Cu radiator
Putere aparentă	9.3 kVA la 380 V 3 faze 4 kW / 5 CP
Isc curent de scurtcircuit prezumat	<= 5 kA, 3 faze
Curent nominal de ieșire	10.5 A la 4 kHz 380 V 3 faze / 5 CP 7.6 A la 4 kHz 460 V 3 faze / 5 CP
Curent tranzitoriu maxim	15.8 A pentru 60 s 3 faze 4 kW / 5 CP 17.3 A pentru 2 s 3 faze 4 kW / 5 CP
Frecvența de ieșire a convertizorului	0.1...599 Hz
Frecventa de comutare nominala	4 kHz
Frecventa de comutare	1...16 kHz reglabil 4...16 kHz cu factor de declasare
Profil de control al motorului asincron	Sistem ENA (adaptare Energy) pentru sarcini neechilibrate Control vector de flux (FVC) fara senzor (vector de curent) Control vector de flux fara senzori (SFVC) (vector de tensiune sau curent) Raport tensiune/frecventa (2 sau 5 puncte)
Tip de polarizare	Fara impedanta pentru Modbus

Complementare

Destinatie produs	Motoare asincrone Motoare sincrone
Limite tensiune de alimentare	323...528 V
Frecventa de alimentare	50...60 Hz (- 5...5 %)
Limitele frecvenței rețelei	47.5...63 Hz
Gama de viteză	1...100 pentru motor asincron în buclă deschisă, fără reacție de viteză 1...50 pentru motor sincron în buclă deschisă, fără reacție de viteză 1...1000 pentru motor asincron în buclă închisă cu reacție de la encoder
Precizia vitezei	+/- 0.01 % din viteza nominală pentru 0.2 Tn la Tn variația cuplului în buclă închisă cu reacție de la encoder +/- 10 % din alunecarea nominală pentru 0.2 Tn la Tn variația cuplului fără reacție de viteză
Precizie cuplu	+/- 15 % în buclă deschisă, fără reacție de viteză +/- 5 % în buclă închisă cu reacție de la encoder
Cuplu excesiv tranzitoriu	220 % cuplul nominal al motorului +/- 10 % pentru 2 s 170 % din cuplul nominal al motorului +/- 10 % pentru 60 s la fiecare 10 minute
Cuplu de frânare	< 150 % cu rezistor de frânare sau de ridicare 30 % fără rezistență de frânare
Profil de control al motorului sincron	Control vector fara feedback pentru turatie

Bucula de reglare	Regulator PI reglabil
Compensare alunecare motor	Reglabil Automat indiferent de sarcina Indisponibilin raport tensiune/frecventa (2 sau 5 puncte) Posibilitate de suprimare
Semnalizare locala	1 LED rosu prezenta a tensiune variator
Tensiune de iesire	<= tensiunea de alimentare
Izolatie	Electricintre alimentare si control
Tip de cablu	Cu un kit NEMA Tip1: 3-fascicul cablu UL 508 la 40 °C, cupru 75 °C PVC Cu un kit IP21 sau IP31: 3-fascicul IEC cable la 40 °C, cupru 70 °C PVC Fără kit de montare: 1-fascicul IEC cable la 45 °C, cupru 70 °C PVC Fără kit de montare: 1-fascicul IEC cable la 45 °C, cupru 90 °C XLPE/EPR
Conexiune electrica	AI1-/AI1+, AI2, AO1, R1A, R1B, R1C, R2A, R2B, LI1...LI6, PWR borna 2.5 mm ² / AWG 14 L1/R, L2/S, L3/T, U/T1, V/T2, W/T3, PC/-, PO, PA+, PA, PB borna 4 mm ² / AWG 10
Cuplu de strângere	AI1-/AI1+, AI2, AO1, R1A, R1B, R1C, R2A, R2B, LI1...LI6, PWR 0.6 N.m L1/R, L2/S, L3/T, U/T1, V/T2, W/T3, PC/-, PO, PA+, PA, PB 1.4 N.m
Alimentare	Sursă internă pentru potențiometrul de referință (1 la 10 kOhm), 10.5 V c.c. +/- 5 %, <= 10 mA pentru protecție la suprasarcină și scurtcircuit Sursă internă, 24 V c.c., limitele tensiunii 21...27 V, <= 200 mA pentru protecție la suprasarcină și scurtcircuit
Numărul intrării analogice	2
Tip de intrare analogica	AI1-/AI1+ tensiune diferențială bipolară +/- 10 V c.c., tensiune de intrare 24 V max, rezoluție 11 biti + semn AI2 curent configurabil soft 0...20 mA, impedanță 242 Ohm, rezoluție 11 bits AI2 tensiune configurabilă soft 0...10 V c.c., tensiune de intrare 24 V max, impedanță 30000 Ohm, rezoluție 11 bits
Perioada de eșantionare	AI1-/AI1+ 2 ms, +/- 0.5 ms pentru analog intrări AI2 2 ms, +/- 0.5 ms pentru analog intrări LI1...LI5 2 ms, +/- 0.5 ms pentru discrete intrări LI6 (dacă este configurată ca intrare logică) 2 ms, +/- 0.5 ms pentru discret intrări
Timpe de raspuns	<= 100 ms în STO (Safe Torque Off) AO1 2 ms, toleranță +/- 0.5 ms pentru analogic iesiri R1A, R1B, R1C 7 ms, toleranță +/- 0.5 ms pentru discret iesiri R2A, R2B 7 ms, toleranță +/- 0.5 ms pentru discret iesiri
Precizie	AI1-/AI1+ +/- 0.6 % pentru o variație a temperaturii 60 °C AI2 +/- 0.6 % pentru o variație a temperaturii 60 °C AO1 +/- 1 % pentru o variație a temperaturii 60 °C
Eroare de liniaritate	AI1-/AI1+, AI2 +/- 0.15 % din valoarea maximă AO1 +/- 0,2 %
Numărul ieșirii analogice	1
Tip ieșire analogică	AO1 curent configurabil soft 0...20 mA, impedanță 500 Ohm, rezoluție 10 bits AO1 ieșire logică configurabilă soft 10 V <= 20 mA AO1 tensiune configurabilă soft 0...10 V c.c., impedanță 470 Ohm, rezoluție 10 bits
Număr ieșire discretă	2
Tip de iesire discreta	R1A, R1B, R1C releu cu logică configurabilă NO/NC, durabilitatea electrică 100000 cic R2A, R2B releu cu logică configurabilă nu, durabilitatea electrică 100000 cic
Curentul minim de comutare	Releu cu logică configurabilă 3 mA la 24 V c.c.
Curent maxim de comutație	R1, R2 pornit rezistiv sarcina, 5 A la 250 V c.a., cos phi = 1, R1, R2 pornit rezistiv sarcina, 5 A la 30 V c.c., cos phi = 1, R1, R2 pornit inductiv sarcina, 2 A la 250 V c.a., cos phi = 0.4, R1, R2 pornit inductiv sarcina, 2 A la 30 V c.c., cos phi = 0.4,
Număr intrare discretă	7
Tip de intrare discreta	LI6: configurabil cu microîntrerupătoare 24 V c.c. cu nivel 1 PLC, impedanță: 3500 Ohm PWR: intrare de securitate 24 V c.c., impedanță: 1500 Ohm conformitate cu ISO 13849-1 level d LI1...LI5: programabile 24 V c.c. cu nivel 1 PLC, impedanță: 3500 Ohm LI6: sondă PTC configurabilă cu microîntrerupătoare 0...6, impedanță: 1500 Ohm
Logica de intrare discreta	LI1...LI5 logica pozitiva (sursa), < 5 V (stare 0), > 11 V (stare 0) LI1...LI5 logica negativa (derivatie), > 16 V (stare 0), < 10 V (stare 0) LI6 (dacă este configurată ca intrare logică) logica pozitiva (sursa), < 5 V (stare 0), > 11 V (stare 0) LI6 (dacă este configurată ca intrare logică) logica negativa (derivatie), > 16 V (stare 0), < 10 V (stare 0)
Rampe de accelerare si decelerare	Adapt. aut. a rampei daca capac. de rupere e depasita, cu rezistenta Reglabil liniar separat, de la 0,01 la 9000 s S, U sau personalizat

Franare sau imobil	Cu injectie c.c.
Tip de protectie	Variator protecție la depășirea limitei de viteză Variator protecție la pierderea fazei de intrare Variator defectarea circuitului de comandă Variator întrerupere fază intrare Variator supratensiune în linia de alimentare Variator scăderea tensiunii de alimentare Variator supracurent între fazele de ieșire și pământ Variator protecție la supraîncălzire Variator supratensiuni pe magistrala de c.c. Variator scurtcircuit între fazele motorului Variator protecție termica Motor întrerupere fază motor Motor întreruperea alimentării Motor protecție termica
Rezistență de izolație	> 1 mOhm la 500 V c.c. pentru 1 minut la pământ
Rezoluția frecvenței	Intrare analogică 0.024/50 Hz Unitate de afisare 0.1 Hz
Protocol port de comunicare	CANopen Modbus
Tipul conectorului	1 RJ45 pentru Modbus pe partea frontală 1 RJ45 pentru Modbus pe borna Tată SUB-D 9 on RJ45 pentru CANopen
Interfața fizică	RS 485 cu 2 fire pentru Modbus
Cadru de transmisie	RTU pentru Modbus
Rata de transmisie	20 kbps, 50 kbps, 125 kbps, 250 kbps, 500 kbps, 1 Mbps pentru CANopen 4800 bps, 9600 bps, 19200 bps, 38.4 Kbps pentru Modbus pe borna 9600 bps, 19200 bps pentru Modbus pe partea frontală
Format data	8 biți, 1 stop, paritate pară pentru Modbus pe partea frontală 8 biți, impar par sau fără paritate configurabilă pentru Modbus pe borna
Număr de adrese	1...247 pentru Modbus 1...127 pentru CANopen
Metoda de acces	Slave pentru CANopen
Marcaj	CE
Poziție de operare	Vertical +/- 10 grade
Înălțime	260 mm
Adâncime	187 mm
Lățime	155 mm
Greutate produs	4 kg
Functionality	Full
Specific application	Other applications
Card opțional	CC-Link card de comunicare Card programabil controller inside DeviceNet card de comunicare Ethernet/IP card de comunicare Fipio card de comunicare Card de extensie I/O Interbus-S card de comunicare Card de interfață pentru encoder Modbus Plus card de comunicare Modbus TCP card de comunicare Modbus/Uni-Telway card de comunicare Card macara aeriană Profibus DP card de comunicare Profibus DP V1 card de comunicare

Mediu

nivel de zgomot	54.5 dB conformitate cu 86/188/EEC
rigiditate dielectrică	3535 V c.c. între pământ și terminalele de forță 5092 V c.c. între terminalele de comandă și de forță
compatibilitate electromagnetă	Test de imunitate la radiofrecvență condusă conformitate cu IEC 61000-4-6 nivel 3 Tranzienți rapizi/test de imunitate la impulsuri de ionizare conformitate cu IEC 61000-4-4 nivel 4 Test de imunitate la descărcări electrostatice conformitate cu IEC 61000-4-2 nivel 3 Test de imunitate la frecvență radio radiată conformitate cu IEC 61000-4-3 nivel 3 Test de imunitate la căderi de tensiune și întreruperi conformitate cu IEC 61000-4-11 1.2/50 μs - 8/20 μs test de imunitate la supratensiuni conformitate cu IEC 61000-4-5

standarde	EN 55011 clasa A, grupa 1 EN 61800-3 medii 1, categoria C2 EN 61800-3 medii 2, categoria C2 EN/IEC 61800-3 EN/IEC 61800-5-1 IEC 60721-3-3 clasa 3C1 IEC 60721-3-3 clasa 3S2 UL Tip 1
certificari produs	CSA C-Tick GOST NOM 117 UL
grad de poluare	2 conformitate cu EN/IEC 61800-5-1
grad de protectie IP	IP20
rezistenta la vibratii	1.5 mm vârf la vârf (f = 3...13 Hz) conformitate cu EN/IEC 60068-2-6 1 gn (f = 13...200 Hz) conformitate cu EN/IEC 60068-2-6
rezistenta la socuri	15 gn pentru 11 ms conformitate cu EN/IEC 60068-2-27
umiditate relativă	5...95 % fără condensare conformitate cu IEC 60068-2-3 5...95 % fără stropi de apă conformitate cu IEC 60068-2-3
temperatura de utilizare	-10...50 °C fără declasare
temperatura de depozitare	-25...70 °C
altitudinea de funcționare	<= 1000 m fără declasare 1000...3000 m cu declasarea curentului cu 1 % pe 100 m

Contractual warranty

Perioada	18 months
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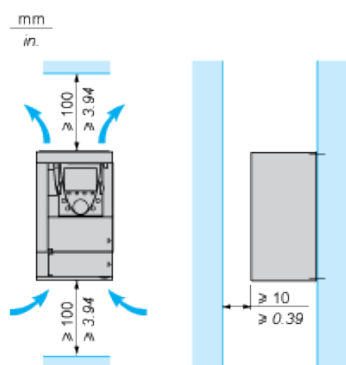
Mounting Recommendations

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:

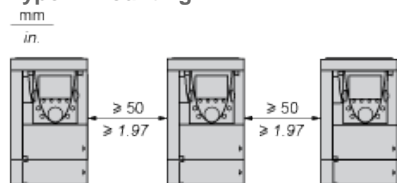
- Avoid placing it close to heating elements
- Leave sufficient free space to ensure that the air required for cooling purposes can circulate from the bottom to the top of the unit.

Clearance

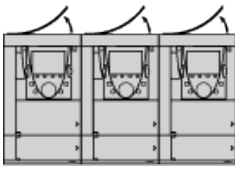


Mounting Types

Type A Mounting

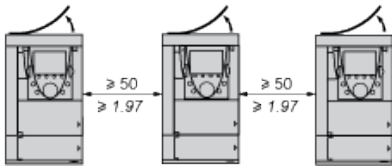


Type B Mounting



Type C Mounting

mm
in.



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).

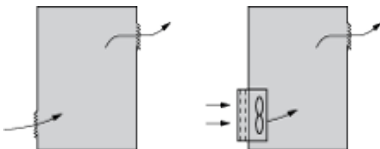
The protective blanking cover must be removed from ATV 71P•••N4Z drives when they are mounted in a dust and damp proof enclosure.

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.

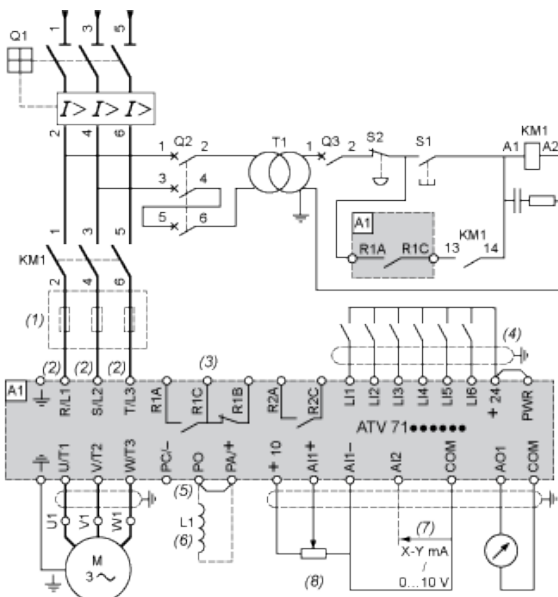
Dust and Damp Proof Metal Enclosure (IP 54)

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 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, XB4 B or XB5 A pushbuttons

S2

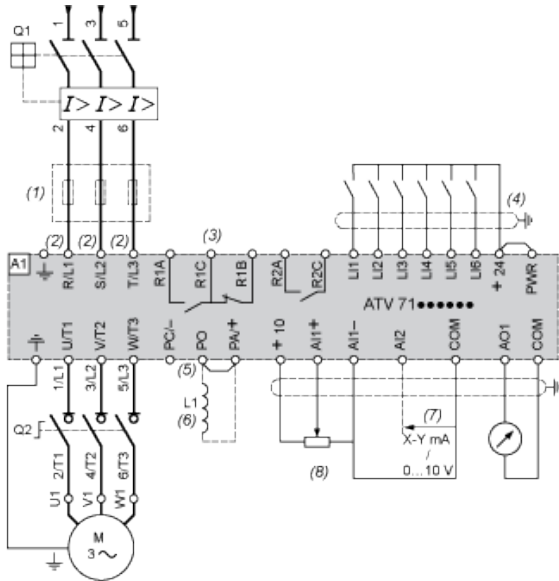
T1 100 VA transformer 220 V secondary

- (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 switched to the "source" position (for other connection types, refer to the user guide).
- (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 strap between the PO and PA/+ terminals. For ATV71HD55M3X, HD75M3X, ATV71HD90N4...HC50N4 drives, the choke is supplied with the drive; the customer is responsible for connecting it.
- (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)

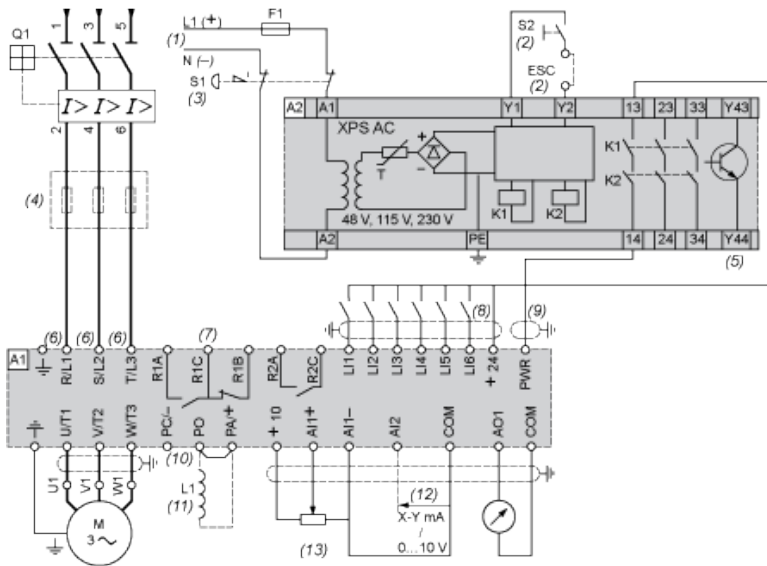
- (1) Line choke (three-phase), mandatory for ATV71HC11Y...HC63Y drives (except when a special transformer is used (12-pulse)).
- (2) For ATV71HC40N4 drives combined with a 400 kW motor, ATV71HC50N4 and ATV71HC40Y...HC63Y, refer to the power terminal connections diagram.
- (3) Fault relay contacts. Used 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 switched to the "source" position (for other connection types, refer to the user guide).
- (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 strap between the PO and PA/+ terminals. For ATV71HD55M3X, HD75M3X, ATV71HD90N4...HC50N4 drives, the choke is supplied with the drive; the customer is responsible for connecting it.
- (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

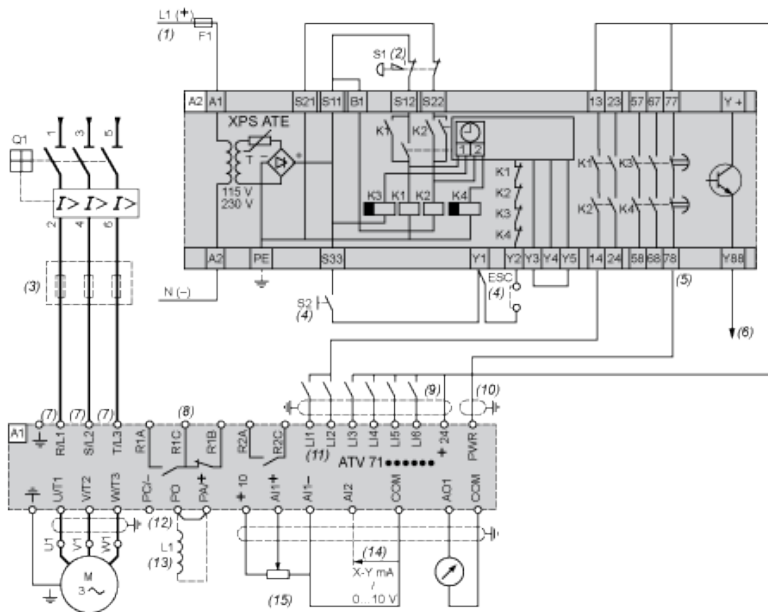


- A1 ATV71 drive
- A2 Preventa XPS AC safety module for monitoring emergency stops and switches. One safety module can manage the "Power Removal" function for several drives on the same machine. In this case, each drive must connect its PWR terminal to its + 24 V via the safety contacts on the XPS AC 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, 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 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 ATV71HC11Y...HC63Y drives.
- (11) Optional DC choke for ATV71H...M3, ATV71HD11M3X...HD45M3X, ATV71•075N4...•D75N4 and ATV71P...N4Z drives. Connected in place of the strap between the PO and PA/+ terminals. For ATV71HD55M3X, HD75M3X, ATV71HD90N4...HC50N4 drives, the choke is supplied with the drive; the customer is responsible for connecting it.
- (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

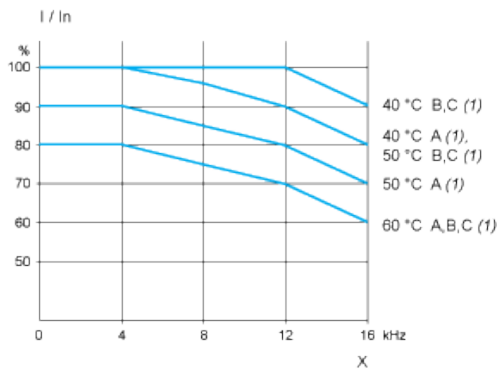


- A1 ATV71 drive
- A2 Preventa XPS ATE safety module for monitoring emergency stops and switches. One safety module can manage the "Power Removal" safety function for several drives on the same machine. In this case the time delay must be adjusted on the drive controlling the motor that requires the 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.
- (5) Removal" 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 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 300 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 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 ATV71HC11Y...HC63Y drives.
- (13) Optional DC choke for ATV71H...M3, ATV71HD11M3X...HD45M3X, ATV71•075N4...•D75N4 and ATV71P...N4Z drives. Connected in place of the strap between the PO and PA/+ terminals. For ATV71HD55M3X, HD75M3X, ATV71HD90N4...HC50N4 drives, the choke is supplied with the drive; the customer is responsible for connecting it.
- (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, the switching frequency and the mounting type. For intermediate temperatures (e.g. 55°C), interpolate between 2 curves.



X Switching frequency

(1) Mounting type