Tehničke karakteristike proizvoda
Karakteristike

ATV61WU40N4
frekventni regulator ATV61 - 4kW 5HP - 380...480V - EMC filter - IP54

Osnovne informacije

Grupa proizvoda	Altivar 61
Tip proizvoda ili komponente	Frekventni regulator
Specifične primene proizvoda	Pumpe i ventilatori
Ime komponente	ATV61
Snaga motora kw	4 kW, trofazne pri 380...480 V
Snaga motora hp	5 hp, trofazne pri 380...480 V
Power supply voltage	380...480 V - 15...10 %
Supply number of phases	Trofazne
Linijska struja	7,4 A za 480 V trofazne 4 kW / 5 hp 8,8 A za 380 V trofazne 4 kW / 5 hp
Emc filter	Klasa C2 EMC integrisani filter
Način spajanja	Zatvoren
Prividna snaga	5,8 kVA pri 380 V trofazne 4 kW / 5 hp
Maximum prospective line Isc	5 kA za trofazne
Maksimalna prelazna struja	10 A za 60 s, trofazne
Nazivna prekidačka frekvencija	8 kHz
Prekidačka frekvencija	2...16 kHz podesivo 8...16 kHz sa faktorom smanjenja karakteristika
Asynchronous motor control	Fluks vektorska kontrola bez senzora, standardna U/F upravljanje, 5 tačaka U/F upravljanje, 2 tačke U/f upravljanje - Energy Saving, kvadratno U/f
Profil upravljanja sinhronim motorom	Vektorsko upravljanje bez senzora, standardno
Protokol komunikacionog porta	Modbus CANopen
Tip polarizacije	Bez impedanse za Modbus
Opciona kartica	Komunikaciona kartica za APOGEE FLN Komunikaciona kartica za BACnet Komunikaciona kartica za CC-Link "Controller inside" programabilna kartica Komunikaciona kartica za DeviceNet Komunikaciona kartica za Ethernet/IP Komunikaciona kartica za Fipio I/O kartica za proširenje Komunikaciona kartica za Interbus-S Komunikaciona kartica za LonWorks Komunikaciona kartica za METASYS N2 Komunikaciona kartica za Modbus Plus Komunikaciona kartica za Modbus TCP Komunikaciona kartica za Modbus/Uni-Telway "Multi-pump" kartica Komunikaciona kartica za Profibus DP Komunikaciona kartica za Profibus DP V1

Dopunske informacije

Namena proizvoda	Sinhroni motori Asinhroni motori
Power supply voltage limits	323…528 V
Power supply frequency	50...60 Hz - 5...5 %
Power supply frequency limits	47.5...63 Hz
Stalna izlazna struja	7,6 A pri 8 kHz, 460 V - trofazne 9,1 A pri 8 kHz, 380 V - trofazne
Izlazna frekvencija	0,1…599 Hz
Opseg brzina	1…100 u otvorenoj petlji, bez povratne sprege
Tačnost brzine	+/- 10 % nominalnog klizanja 0.2 Tn do Tn bez brzinske sprege
Tačnost momenta	+/- 15 % u otvorenoj petlji, bez povratne sprege
Prelazni nadmoment	130 % nazivnog momenta +/- 10 % za 60 s
Moment kočenja	<= 125 % sa kočionim otpornikom 30 % bez kočionog otpornika
Podešavanje petlje	PI regulator frekvencije
Kompenzacija klizanja motora	Može se ukinuti Podesiva Automatska bez obzira na opterećenje Nedostupna u U/f upravljanju (2 ili 5 tačaka)
Diagnostic	Zanapona frekventnog regulatora: 1 LED (crvena)
Izlazni napon	<= napon napajanja
Electrical isolation	Između napajanja i kontrolnih priključaka
Type of cable for mounting in an enclosure	Sa IP21 ili IP31 setom: 3 žica(e)IEC kabl pri 40 °C, bakar 70 °C / PVC Sa UL tip 1 setom: 3 žica(e)UL 508 kabl pri 40 °C, bakar 75 °C / PVC Bez seta za montažu: 1 žica(e)IEC kabl pri 45 °C, bakar 70 °C / PVC Bez seta za montažu: 1 žica(e)IEC kabl pri 45 °C, bakar 90 °C / XLPE/EPR
Električna veza	Priključak 2.5 mm² / AWG 14 (AI1-/AI1+, AI2, AO1, R1A, R1B, R1C, R2A, R2B, LI1...LI6, PWR) Priključak 6 mm² / AWG 8 (L1/R, L2/S, L3/T, U/T1, V/T2, W/T3, PC/-, PO, PA/+, PA, PB)
Moment pritezanja	0,6 N.M (AI1-/AI1+, AI2, AO1, R1A, R1B, R1C, R2A, R2B, LI1...LI6, PWR) 1,4 N.m, 12.3 lb.in (L1/R, L2/S, L3/T, U/T1, V/T2, W/T3, PC/-, PO, PA/+, PA, PB)
Napajanje	Interno napajanje za potenciometar (1 do 10 kΩ): 10.5 V DC, +/- 5 %, <10 mA sa zaštita od preopterećenja i kratkog spoja Interno napajanje: 24 V DC (21…27 V), <200 mA sa zaštita od preopterećenja i kratkog spoja Spoljašnje napajanje: 24 V DC (19…30 V)
Broj analognih ulaza	2
Tip analognog ulaza	AI1-/AI1+ bipolarni diferencijalni napon: +/- 10 V DC 24 V maksimalno, rezolucija 11 bitova + znak AI2 softverski podesiva struja: 0...20 mA, impedansa: 242 Ohm, rezolucija 11 bitova AI2 softverski podesiv napon: 0...10 V DC 24 V maksimalno, impedansa: 30000 Ohm, rezolucija 11 bitova
Sampling time	2 Milisekundi +/- 0.5 ms (AI1-/AI1+) - analogni ulaz 2 Milisekundi +/- 0.5 ms (AI2) - analogni ulaz 2 Milisekundi +/- 0.5 ms (AO1) - analogni izlaz 2 Milisekundi +/- 0.5 ms (LI1...LI5) - digitalni ulaz 2 milisekundi +/- 0.5 ms (LI6)ako je konfigurisan kao digitalni ulaz - digitalni ulaz
Absolute accuracy precision	+/- 0.6 % (AI1-/AI1+) za temperaturne promene od 60 °C +/- 0.6 % (AI2) za temperaturne promene od 60 °C +/- 1 % (AO1) za temperaturne promene od 60 °C
Greška linearnosti	+/- 0.15 % maksimalne vrednosti (AI1-/AI1+) +/- 0.15 % maksimalne vrednosti (AI2) +/- 0.2 % (AO1)
Broj analognih izlaza	1
Tip analognog izlaza	AO1 softverski podesiva struja, opseg analognog izlaza 0...20 mA, impedansa: 500 Ω, rezolucija 10 bitova AO1 softverski podesivi napon, opseg analognog izlaza 0...10 V DC, impedansa: 470 Ω, rezolucija 10 bitova AO1 softverski podesivi digitalni izlaz 10 V, 20 mA
Broj digitalnih izlaza	2
Tip digitalnih izlaza	Podesiva funkcija releja: (R1A, R1B, R1C) NO/NC - 100000 ciklusa Podesiva funkcija releja: (R2A, R2B) NO - 100000 ciklusa

Maximum response time	<= 100 ms u STO (Safe Torque Off) R1A, R1B, R1C <= 7 ms, tolerancija +/- 0.5 ms R2A, R2B <= 7 ms, tolerancija +/- 0.5 ms
Minimalna struja preklapanja	3 mA pri 24 V DC za podesiva funkcija releja
Maksimalna struja preklapanja	R1, R2: 2 A pri 250 V AC induktivno opterećenje, cos phi = 0,4 i L/R = 7 milisekundi R1, R2: 2 A pri 30 V DC induktivno opterećenje, cos phi = 0,4 i L/R = 7 milisekundi R1, R2: 5 A pri 250 V AC rezistivno opterećenje, cos phi = 1 i L/R = 0 milisekundi R1, R2: 5 A pri 30 V DC rezistivno opterećenje, cos phi = 1 i L/R = 0 milisekundi
Broj digitalnog ulaza	7
Tip digitalnih ulaza	Podesivi (LI1...LI5)24 V DC (<= 30 V), sa nivo 1 PLC - 3500 Ω Podesiv izbornim prekidačem (LI6)24 V DC (<= 30 V), sa nivo 1 PLC - 3500 Ω PTC sonda - podesiv izbornim prekidačem (LI6)0…6 sondi - 1500 Ohm Sigurnosni ulaz (PWR)24 V DC (<= 30 V) - 1500 Ohm
Logika digitalnog ulaza	Negativna logika (sink) (LI1...LI5), > 16 V (stanje 0), < 10 V (stanje 1) Pozitivna logika (source) (LI1...LI5), < 5 V (stanje 0), > 11 V (stanje 1) Negativna logika (sink) (LI6)ako je konfigurisan kao digitalni ulaz, > 16 V (stanje 0), < 10 V (stanje 1) Pozitivna logika (source) (LI6)ako je konfigurisan kao digitalni ulaz, < 5 V (stanje 0), > 11 V (stanje 1)
Rampe ubrzanja i usporenja	Linearno podesivo zasebno od 0.01 do 9000 s Automatska adaptacija rampe ako je premašena mogućnost kočenja, sa otpornikom S, U ili korisnički definisano
Kočenje do mirovanja	Sa ubacivanjem DC struje
Tip zaštite	Protiv prekoračenja brzine: frekventni regulator Protiv gubitka ulazne faze: frekventni regulator Kvar na upravljačkom kolu: frekventni regulator Zaštita od gubitka ulazne faze: frekventni regulator Prenapon napajanja: frekventni regulator Podnapon napajanja: frekventni regulator Prekostrujna između izlaznih faza i uzemljenja: frekventni regulator Zaštita od pregrevanja: frekventni regulator Prenaponi na DC bus-u: frekventni regulator Ukidanje napajanja izlaza: frekventni regulator Kratki spoj između faza motora: frekventni regulator Termička zaštita: frekventni regulator Gubitak faze motora: motor Ukidanje napajanja izlaza: motor Termička zaštita: motor
Otpornost izolacije	> 1 mOhm 500 V DC tokom 1 minuta prema uzemljenju
Rezolucija frekvencije	Analogni ulaz: 0.024/50 Hz Displej: 0.1 Hz
Tip priključka	1 RJ45 (na prednjem delu) za Modbus 1 RJ45 (na priključku) za Modbus Muški SUB-D 9 na RJ45 za CANopen
Fizički interfejs	2-žični RS 485 za Modbus
Paket podataka za prenos	RTU za Modbus
Brzina prenosa	4800 bps, 9600 bps, 19200 bps, 38.4 Kbps za Modbus na priključku 9600 bps, 19200 bps za Modbus na prednjem delu 20 kbps, 50 kbps, 125 kbps, 250 kbps, 500 kbps, 1 Mbps za CANopen
Format podataka	8 bitova, 1 stop, parno za Modbus na prednjem delu 8 bitova, neparno parno ili nekonfigurisana parnost za Modbus na priključku
Broj adresa	1…127 za CANopen 1…247 za Modbus
Način pristupa	Slave CANopen
Označavanje	CE
Radni položaj	Vertikalno +/- 10 stepeni
Masa proizvoda	16 kg
Širina	240 mm
Visina	490 mm
Dubina	286 mm

Okruženje

Nivo buke	54,5 dB u skladu sa 86/188/EEC
Dielektrična snaga	3535 V DC između uzemljenja i energetskih priključaka 5092 V DC između kontrolnih i napojnih priključaka
Elektromagnetna kompatibilnost	Test otpornosti emisije vezane sa vodovima nivo 3 u skladu sa IEC 61000-4-6 Test otpornosti električnih brzih prelaza (EFT)/kratak signal nivo 4 u skladu sa IEC 61000-4-4 Test otpornosti elektrostatičkog pražnjenja nivo 3 u skladu sa IEC 61000-4-2 Test otpornosti na emisije vezane sa zračenjem EM polja nivo 3 u skladu sa IEC 61000-4-3 Test otpornosti propada i prekida napona u skladu sa IEC 61000-4-11
Standardi	EN/IEC 61800-5-1 UL tip 12 EN/IEC 61800-3 IEC 60721-3-3 klasa 3S2 IEC 60721-3-3 klasa 3C1 EN 61800-3 okruženja 2 kategorija C2 EN 61800-3 okruženja 1 kategorija C2 EN 55011 klasa A grupa 1
Sertifikacija proizvoda	UL[RETURN]NOM 117[RETURN]DNV[RETURN]CSA[RETURN]C-Tick[RETURN]GOST
Stepen zaprljanosti	2 u skladu sa EN/IEC 61800-5-1
Degree of proctection	IP54 u skladu sa EN/IEC 60529 IP54 u skladu sa EN/IEC 61800-5-1 IP54 u skladu sa UL tip 12
Otpornost na vibracije	1 gn (f= 13…200 Hz) u skladu sa EN/IEC 60068-2-6 1.5 mm između pikova (f= 3…13 Hz) u skladu sa EN/IEC 60068-2-6
Otpornost na udare	15 gn za 11 milisekundi u skladu sa EN/IEC 60068-2-27
Relativna vlažnost	5…95 % bez kondenzacije u skladu sa IEC 60068-2-3 5…95 % bez kapljica vode u skladu sa IEC 60068-2-3
Temperatura okoline za rad	-10…40 °C (bez smanjenja karakteristika) -10…50 °C (sa faktorom smanjenja karakteristika)
Temperatura okoline za skladištenje	-25…70 °C
Nadmorska visina za rad uređaja	<= 1000 m bez smanjenja karakteristika 1000...3000 m sa smanjenjem vrednosti struje 1 % na 100 m

Pakovanje

Unit Type of Package 1	PCE
Number of Units in Package 1	1
Package 1 Height	40,0 cm
Package 1 Width	60,0 cm
Package 1 Length	40,0 cm
Package 1 Weight	18,397 kg

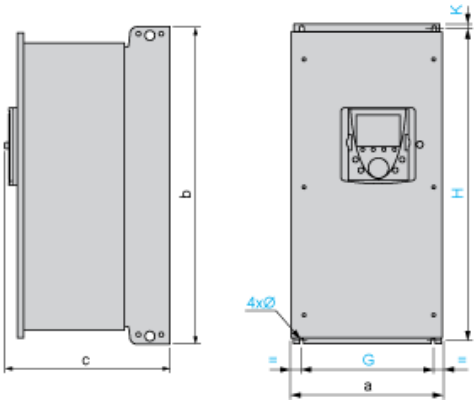
Ugovorna garancija

Garancija	18 meseci

Dimensions Drawings

UL Type 12/IP 54 Drives

Dimensions



Dimensions in mm

a	b	c	G	H	K	Ø
240	490	286	200	476	6	6

Dimensions in in.

a	b	c	G	H	K	Ø
9.44	19.29	11.26	7.87	18.74	0.23	0.23

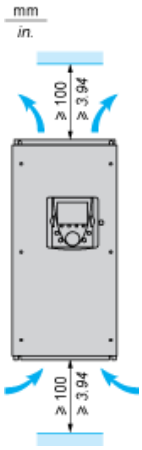
Mounting and Clearance

Mounting Recommendations

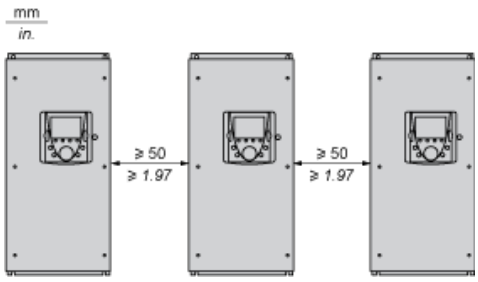
Depending on the conditions in which the drive is to be used, its installation will require certain precautions and the use of appropriate accessories.Install the unit vertically:

- 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

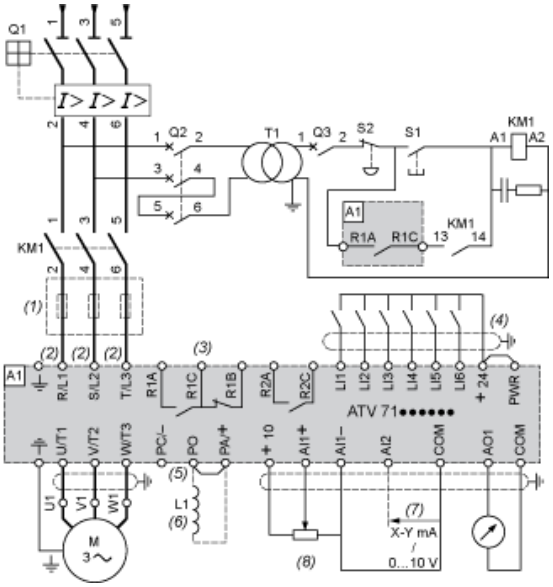


Mounting



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

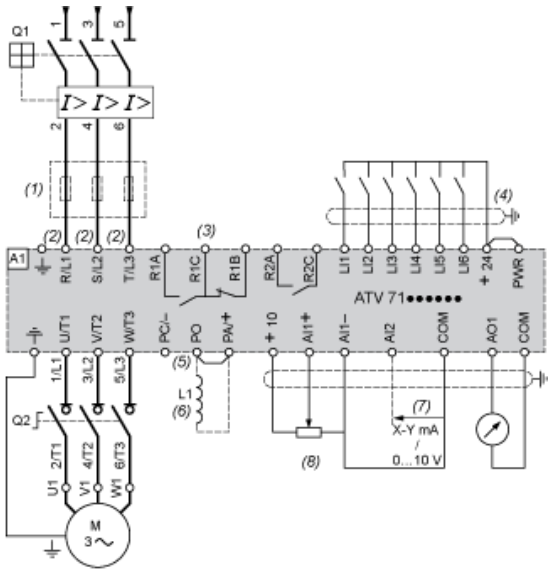


A1 ATV61 drive
KM1 Contactor
L1 DC choke
Q1 Circuit-breaker
Q2 GV2 L rated at twice the nominal primary current of T1
Q3 GB2CB05
S1, S2 XB4 B or XB5 A pushbuttons
T1 100 VA transformer 220 V secondary
(1) Line choke (three-phase); mandatory for ATV61HC11Y…HC80Y drives (except when a special transformer 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 Disconnector

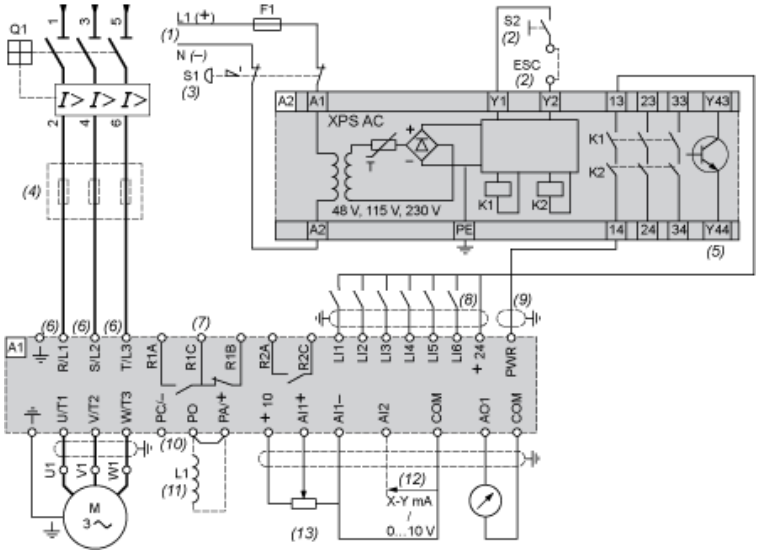


A1 ATV61 drive
L1 DC choke
Q1 Circuit-breaker
Q2 Switch disconnector (Vario)
(1) Line choke (three-phase), mandatory for ATV61HC11Y…HC80Y drives (except when a special transformer is used (12-pulse)).
(2) For ATV61HC50N4, ATV61HC63N4 and ATV61HC50Y…HC80Y drives, refer to the power terminal connections 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

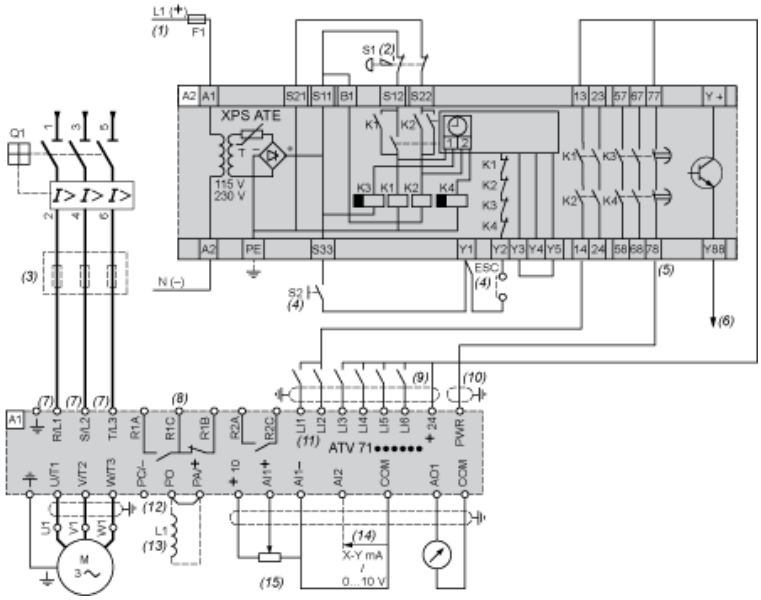


A1 ATV61 drive
A2 Preventa XPS AC safety module for monitoring emergency stops and switches. One safety module can manage the “Power Removal” function for several drives on the same machine. In this case, each drive must connect its PWR terminal to its + 24 V via the safety contacts on the XPS AC module. 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.

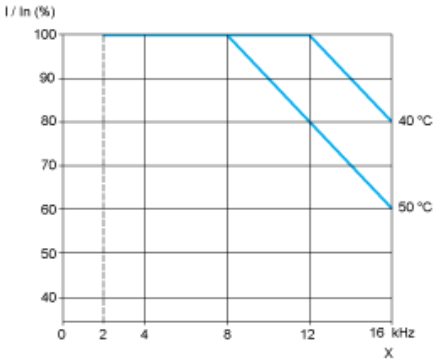
(15) Reference potentiometer.

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.

Performance Curves

Derating Curves

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



X Switching frequency