Product data sheet

Specifications



() Discontinued

variable speed drive ATV71 -15kW-20HP - 240V - w/o EMC filtergraphic terminal

ATV71HD15M3X337

Uiscontinued on: Jan 1, 2018

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	15 kW, 3 phases at 200240 V			
Motor Power Hp	20 hp, 3 phases at 200240 V			
Maximum Motor Cable Length	50 m shielded cable 100 m unshielded cable			
Power Supply Voltage	200240 V - 1510 %			
Network Number Of Phases	3 phases			
Line Current	61.6 A for 240 V 3 phases 15 kW / 20 hp 71.7 A for 200 V 3 phases 15 kW / 20 hp			
Emc Filter	Without EMC filter			
Assembly Style	With heat sink			
Variant	Reinforced version			
Apparent Power	25.6 kVA at 240 V 3 phases 15 kW / 20 hp			
Prospective Line Isc	22 kA for 3 phases			
Nominal Output Current	66 A at 4 kHz 230 V 3 phases 15 kW / 20 hp			
Maximum Transient Current	109 A for 2 s 3 phases 15 kW / 20 hp 99 A for 60 s 3 phases 15 kW / 20 hp			
Output Frequency	0.1599 Hz			
Nominal Switching Frequency	4 kHz			
Switching Frequency	116 kHz adjustable 416 kHz with derating factor			
Asynchronous Motor Control Profile	Sensorless flux vector control (SFVC) (voltage or current vector) Flux vector control (FVC) with sensor (current vector) ENA (Energy adaptation) system for unbalanced loads Voltage/frequency ratio (2 or 5 points)			
Type Of Polarization	No impedance for Modbus			

Complementary

Product Destination	Asynchronous motors Synchronous motors
Power Supply Voltage Limits	170264 V

Power Supply Frequency	5060 Hz - 55 %					
Power Supply Frequency Limits	47.563 Hz					
Speed Range	 1100 for asynchronous motor in open-loop mode, without speed feedback 11000 for asynchronous motor in closed-loop mode with encoder feedback 150 for synchronous motor in open-loop mode, without speed feedback 					
Speed Accuracy	 +/- 0.01 % of nominal speed in closed-loop mode with encoder feedback 0.2 Tn to Tn +/- 10 % of nominal slip without speed feedback 0.2 Tn to Tn 					
Torque Accuracy	+/- 15 % in open-loop mode, without speed feedback +/- 5 % in closed-loop mode with encoder feedback					
Transient Overtorque	170 % of nominal motor torque +/- 10 % for 60 s every 10 minutes 220 % of nominal motor torque +/- 10 % for 2 s					
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	Not available in voltage/frequency ratio (2 or 5 points) Adjustable Suppressable Automatic whatever the load					
Diagnostic	1 LED (red) for 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 wire(s)UL 508 cable at 40 °C, copper 75 °C / PVC With an IP21 or an IP31 kit: 3 wire(s)IEC cable at 40 °C, copper 70 °C / PVC Without mounting kit: 1 wire(s)IEC cable at 45 °C, copper 70 °C / PVC Without mounting kit: 1 wire(s)IEC cable at 45 °C, copper 90 °C / XLPE/EPR					
Electrical Connection	Terminal, clamping capacity: 2.5 mm², AWG 14 (Al1-/Al1+, Al2, AO1, R1A, R1B, R1C, R2A, R2B, L11Ll6, PWR) Terminal, clamping capacity: 35 mm², AWG 2 (L1/R, L2/S, L3/T, U/T1, V/T2, W/T3, PC/-, PO, PA/+, PA, PB)					
Tightening Torque	0.6 N.m (Al1-/Al1+, Al2, AO1, R1A, R1B, R1C, R2A, R2B, Ll1Ll6, PWR) 5.4 N.m, 47.7 Ib.in (L1/R, L2/S, L3/T, U/T1, V/T2, W/T3, PC/-, PO, PA/+, PA, PB)					
Supply	Internal supply for reference potentiometer (1 to 10 kOhm): 10.5 V DC +/- 5 %, <10 mA, protection type: overload and short-circuit protection Internal supply: 24 V DC (2127 V), <200 mA, protection type: overload and short-circuit protection					
Analogue Input Number	2					
Analogue Input Type	Al1-/Al1+ bipolar differential voltage: +/- 10 V DC 24 V max, resolution 11 bits + sign Al2 software-configurable current: 020 mA, impedance: 242 Ohm, resolution 11 bits Al2 software-configurable voltage: 010 V DC 24 V max, impedance: 30000 Ohm, resolution 11 bits					
Input Sampling Time	2 ms +/- 0.5 ms (Al1-/Al1+) - analog input(s) 2 ms +/- 0.5 ms (Al2) - analog input(s) 2 ms +/- 0.5 ms (L11L15) - discrete input(s) 2 ms +/- 0.5 ms (L16)if configured as logic input - discrete input(s)					
Response Time	<= 100 ms in STO (Safe Torque Off) AO1 2 ms, tolerance +/- 0.5 ms for analog output(s) R1A, R1B, R1C 7 ms, tolerance +/- 0.5 ms for discrete output(s) R2A, R2B 7 ms, tolerance +/- 0.5 ms for discrete output(s)					
Absolute Accuracy Precision	+/- 0.6 % (Al1-/Al1+) for a temperature variation 60 °C +/- 0.6 % (Al2) for a temperature variation 60 °C +/- 1 % (AO1) for a temperature variation 60 °C					
Linearity Error	+/- 0.15 % of maximum value (AI1-/Al1+, Al2) +/- 0.2 % (AO1)					
Analogue Output Number	1					

Analogue Output Type	AO1 software-configurable logic output 10 V 20 mA AO1 software-configurable current 020 mA, impedance: 500 Ohm, resolution 10				
	bits				
	AO1 software-configurable voltage 010 V DC, impedance: 470 Ohm, resolution 10 bits				
Discrete Output Number	2				
Discrete Output Type	Configurable relay logic: (R1A, R1B, R1C) NO/NC - 100000 cycles Configurable relay logic: (R2A, R2B) NO - 100000 cycles				
Minimum Switching Current	3 mA at 24 V DC for configurable relay logic				
Maximum Switching Current	R1, R2: 2 A at 250 V AC inductive load, cos phi = 0.4				
	R1, R2: 2 A at 30 V DC inductive load, cos phi = 0.4				
	R1, R2: 5 A at 250 V AC resistive load, cos phi = 1 R1, R2: 5 A at 30 V DC resistive load, cos phi = 1				
Discrete Input Number	7				
Discrete Input Type	LI1LI5: programmable 24 V DC with level 1 PLC, impedance: 3500 Ohm				
	LI6: switch-configurable 24 V DC with level 1 PLC, impedance: 3500 Ohm				
	LI6: switch-configurable PTC probe 06, impedance: 1500 Ohm				
	PWR: safety input 24 V DC, impedance: 1500 Ohm conforming to ISO 13849-1 level d				
Discrete Input Logic	Negative logic (sink) (LI1LI5), > 16 V (state 0), < 10 V (state 1)				
	Positive logic (source) (LI1LI5), < 5 V (state 0), > 11 V (state 1)				
	Negative logic (sink) (LI6)if configured as logic input, > 16 V (state 0), < 10 V (state 1)				
	Positive logic (source) (LI6)if configured as logic input, < 5 V (state 0), > 11 V (state 1)				
Acceleration And Deceleration	S, U or customized				
Ramps	Automatic adaptation of ramp if braking capacity exceeded, by using resistor				
	Linear adjustable separately from 0.01 to 9000 s				
Braking To Standstill	By DC injection				
Protection Type	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: drive				
	Motor phase break: motor				
	Power removal: motor				
Insulation Resistance	Thermal protection: motor				
Frequency Resolution	> 1 mOhm 500 V DC for 1 minute to earth				
	Analog input: 0.024/50 Hz Display unit: 0.1 Hz				
Communication Port Protocol	Modbus				
	CANopen				
Connector Type	1 RJ45 (on front face) for Modbus				
	1 RJ45 (on terminal) for Modbus Male SUB-D 9 on RJ45 for CANopen				
Physical Interface	2-wire RS 485 for Modbus				
Transmission Frame	RTU for Modbus				
Transmission Rate					
nanomiosion nate	4800 bps, 9600 bps, 19200 bps, 38.4 Kbps for Modbus on terminal 9600 bps, 19200 bps for Modbus on front face				
	20 kbps, 50 kbps, 125 kbps, 250 kbps, 500 kbps, 1 Mbps for CANopen				
Data Format	8 bits, 1 stop, even parity for Modbus on front face				
	8 bits, odd even or no configurable parity for Modbus on terminal				
Number Of Addresses	1127 for CANopen 1247 for Modbus				
Method Of Access					
MEUIUU UI ACCESS	Slave CANopen				

Marking	CE				
Operating Position	Vertical +/- 10 degree				
Height	400 mm				
Depth	213 mm				
Width	230 mm				
Net Weight	22 kg				
Option Card	Communication card for CC-Link Controller inside programmable card Communication card for DeviceNet Communication card for EtherNet/IP Communication card for Fipio I/O extension card Communication card for Interbus-S Interface card for encoder Communication card for Modbus Plus Communication card for Modbus TCP Communication card for Modbus/Uni-Telway Overhead crane card Communication card for Profibus DP Communication card for Profibus DP				

Environment

Noise Level	60.2 dB conforming to 86/188/EEC				
Dielectric Strength	2830 V DC between earth and power terminals 4230 V DC between control and power terminals 1.2/50 μs - 8/20 μs surge immunity test level 3 conforming to IEC 61000-4-5 Conducted radio-frequency immunity test level 3 conforming to IEC 61000-4-6 Electrical fast transient/burst immunity test level 4 conforming to IEC 61000-4-4 Electrostatic discharge immunity test level 3 conforming to IEC 61000-4-2 Radiated radio-frequency electromagnetic field immunity test level 3 conforming to IEC 61000-4-3 Voltage dips and interruptions immunity test conforming to IEC 61000-4-11				
Electromagnetic Compatibility					
Standards	UL Type 1 IEC 60721-3-3 class 3C2				
Product Certifications	GOST NOM 117 UL CSA C-Tick				
Pollution Degree	2 conforming to EN/IEC 61800-5-1				
Ip Degree Of Protection	IP20 on upper part without blanking plate on cover conforming to EN/IEC 60529 IP20 on upper part without blanking plate on cover conforming to EN/IEC 61800-5-1 IP21 conforming to EN/IEC 60529 IP21 conforming to EN/IEC 61800-5-1 IP41 on upper part conforming to EN/IEC 60529 IP41 on upper part conforming to EN/IEC 61800-5-1 IP54 on lower part conforming to EN/IEC 60529 IP54 on lower part conforming to EN/IEC 61800-5-1				
Vibration Resistance	1 gn (f= 13200 Hz) conforming to EN/IEC 60068-2-6 1.5 mm peak to peak (f= 313 Hz) conforming to EN/IEC 60068-2-6				
Shock Resistance	15 gn for 11 ms conforming to EN/IEC 60068-2-27				
Relative Humidity	595 % without condensation conforming to IEC 60068-2-3 595 % without dripping water conforming to IEC 60068-2-3				
Ambient Air Temperature For Operation	-1050 °C (without derating)				
Ambient Air Temperature For Storage	-2570 °C				
Operating Altitude	<= 1000 m without derating				

Packing Units

Unit Type Of Package 1	PCE
Number Of Units In Package 1	1

Contractual warranty

Warranty

18 months

Sustainability

Green PremiumTM label is Schneider Electric's commitment to delivering products with best-inclass environmental performance. Green Premium promises compliance with the latest regulations, transparency on environmental impacts, as well as circular and low-CO₂ products.

Guide to assessing product sustainability is a white paper that clarifies global eco-label standards and how to interpret environmental declarations.

Learn more about Green Premium >

Guide to assess a product's sustainability >



RoHS/REACh

Well-being performance



Rohs Exemption Information Yes

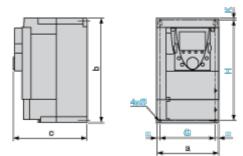
Certifications & Standards

Eu Rohs Directive	Pro-active compliance (Product out of EU RoHS legal scope)		
	EU RoHS Declaration		
China Rohs Regulation	China RoHS declaration		
Weee	The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins		
Circularity Profile	End of Life Information		
California Proposition 65	WARNING: This product can expose you to chemicals including: Lead and lead compounds, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov		

Dimensions Drawings

UL Type 1/IP 20 Drives

Dimensions without Option Card



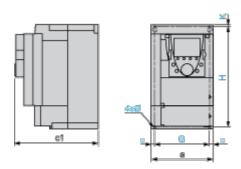
Dimensions in mm

а	b	с	G	Н	Κ	Ø
230	400	213	210	386	8	6

Dimensions in in.

а	b	с	G	Н	К	Ø
9.05	15.75	8.38	8.26	15.20	0.31	0.23

Dimensions with 1 Option Card (1)



Dimensions in mm

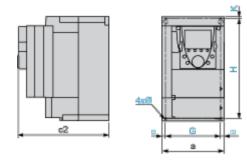
а	c1	G	Н	Κ	Ø
230	236	210	386	8	6

Dimensions in in.

а	c1	G	Н	К	Ø
9.05	9.29	8.26	15.20	0.31	0.23

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

Dimensions with 2 Option Cards (1)



Dimensions in mm

а	c2	G	Н	Κ	Ø
230	259	210	386	8	6

Dimensions in in.

а	c2	G	Н	к	Ø
9.05	10.20	8.26	15.20	0.31	0.23

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

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Product data sheet

ATV71HD15M3X337

Mounting and Clearance

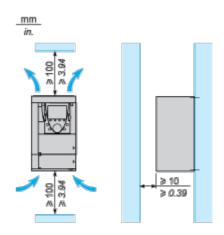
Mounting Recommendations

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

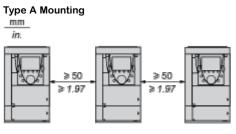
Install the unit vertically:

- 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.

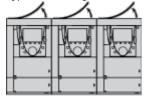
Clearance



Mounting Types

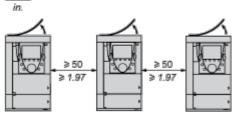


Type B Mounting



Type C Mounting

mm



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).

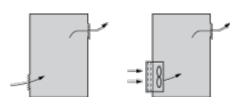
The protective blanking cover must be removed from ATV 71P••••N4Z drives when they are mounted in a dust and damp proof enclosure.

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.

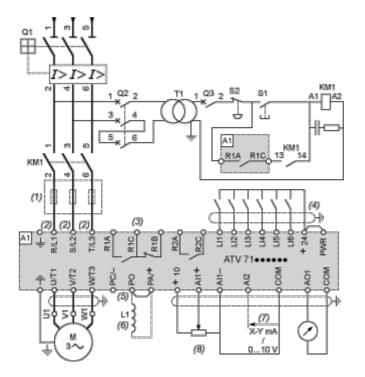
Dust and Damp Proof Metal Enclosure (IP 54)

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.

Connections and Schema

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

- 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 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.

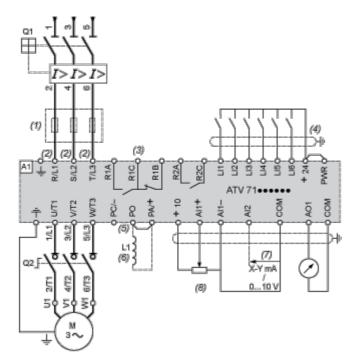
(7) Software-configurable current (0...20 mA) or voltage (0...10 V) analog input.

(8) Reference potentiometer.

KM1 Contactor

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 ATV71 drive
- L1 DC choke
- Q1 Circuit-breaker
- Q2 Switch disconnector (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.

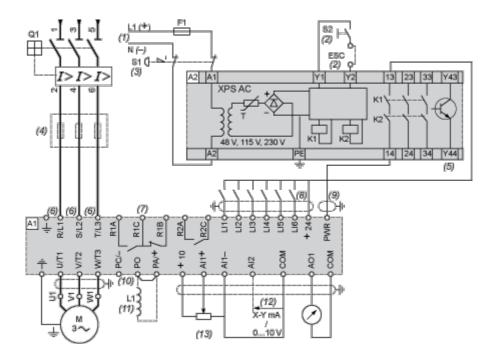
(6) Optional DC choke for ATV71H•••M3, ATV71HD11M3X...HD45M3X, ATV71•075N4...•D75N4 and ATV71P•••N4Z drives. Connected in place of the strap between the PO and PA/+ terminals. For ATV71HD55M3X, HD75M3X, ATV71HD90N4...HC50N4 drives, the choke is supplied with the drive; the customer is responsible for connecting it.

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

(8) Reference potentiometer.

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,

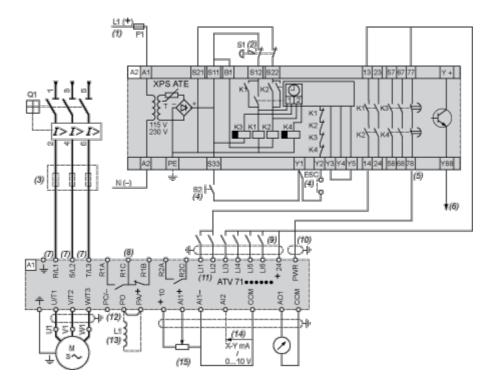
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HD75M3X, ATV71HD90N4...HC50N4 drives, the choke is supplied with the drive; the customer is responsible for connecting it.

- (12) Software-configurable current (0...20 mA) or voltage (0...10 V) analog input.
- (13) Reference potentiometer.

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 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.

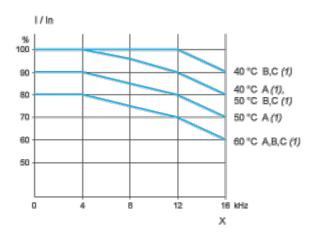
(14) Software-configurable current (0...20 mA) or voltage (0...10 V) analog input.

(15) Reference potentiometer.

Performance Curves

Derating Curves

The derating curves for the drive nominal current (In) 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