Specifications



① Discontinued

# variable speed drive ATV71 -400kW-600HP - 480V - EMC filtergraphic terminal

ATV71HC40N4

(!) To be discontinued on: 01-Jan-2026

### 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	355 kW, 3 phases at 380480 V 400 kW, 3 phases at 380480 V
Motor power hp	600 hp, 3 phases at 380480 V
Maximum motor cable length	100 m shielded cable 200 m unshielded cable
power supply voltage	380480 V - 1510 %
Network number of phases	3 phases
Line current	512 A for 480 V 3 phases 355 kW 568 A for 480 V 3 phases 400 kW / 600 hp 637 A for 380 V 3 phases 355 kW 709 A for 380 V 3 phases 400 kW / 600 hp
EMC filter	Integrated
Assembly style	With heat sink
Variant	Reinforced version
Apparent power	419.3 kVA at 380 V 3 phases 355 kW 466.6 kVA at 380 V 3 phases 400 kW / 600 hp
Prospective line Isc	50 kA for 3 phases
Nominal output current	671 A at 2.5 kHz 380 V 3 phases 355 kW 671 A at 2.5 kHz 460 V 3 phases 355 kW 759 A at 2.5 kHz 380 V 3 phases 400 kW / 600 hp 759 A at 2.5 kHz 460 V 3 phases 400 kW / 600 hp
Maximum transient current	1138 A for 60 s 3 phases 400 kW / 600 hp 1252 A for 2 s 3 phases 400 kW / 600 hp 1006 A for 60 s 3 phases 355 kW 1107 A for 2 s 3 phases 355 kW
Output frequency	0.1500 Hz
Nominal switching frequency	2.5 kHz
Switching frequency	2.58 kHz adjustable 2.58 kHz with derating factor
Asynchronous motor control profile	ENA (Energy adaptation) system for unbalanced loads Voltage/frequency ratio (2 or 5 points) Flux vector control (FVC) with sensor (current vector) Sensorless flux vector control (SFVC) (voltage or current vector)
Type of polarization	No impedance for Modbus

# Complementary

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Product destination	Synchronous motors Asynchronous motors						
power supply voltage limits	323528 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) Suppressable Automatic whatever the load Adjustable						
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, L1Ll6, PWR) Terminal, clamping capacity: 8 x 185 mm² (PC/-, PA/+) Terminal, clamping capacity: 2 x 2 x 185 mm² (R/L1.1, S/L2.1, T/L3.1, R/L1.2, S/L2.2, T/L3.2) Terminal, clamping capacity: 4 x 185 mm² (U/T1, V/T2, W/T3)						
Tightening torque	0.6 N.m (Al1-/Al1+, Al2, AO1, R1A, R1B, R1C, R2A, R2B, Ll1Ll6, PWR) 41 N.m, 360 lb.in (PC/-, PA/+) 41 N.m, 360 lb.in (R/L1.1, S/L2.1, T/L3.1, R/L1.2, S/L2.2, T/L3.2) 41 N.m, 360 lb.in (U/T1, V/T2, W/T3)						
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 (AI1-/AI1+) - analog input(s) 2 ms +/- 0.5 ms (AI2) - analog input(s) 2 ms +/- 0.5 ms (LI1LI5) - discrete input(s) 2 ms +/- 0.5 ms (LI6)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 % (AI1-/AI1+) for a temperature variation 60 °C
absolute accuracy precision	+/- 0.6 % (Al2) for a temperature variation 60 $^{\circ}$ C
	+/- 1 % (AO1) for a temperature variation 60 °C
inearity error	+/- 0.15 % of maximum value (Al1-/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	Linear adjustable separately from 0.01 to 9000 s
amps	Automatic adaptation of ramp if braking capacity exceeded, by using resistor
	S, U or customized
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
	Thermal protection: motor
nsulation resistance	> 1 mOhm 500 V DC for 1 minute to earth
Frequency resolution	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	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	Slave CANopen					
Marking	CE					
Operating position	Vertical +/- 10 degree					
Height	1390 mm					
Depth	377 mm					
Width	890 mm					
Net weight	330 kg					
Functionality	Full					
Specific application	Other applications					
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	77 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	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
Standards	UL Type 1
	EN 61800-3 environments 1 category C3
	EN/IEC 61800-5-1
	IEC 60721-3-3 class 3C2
	EN 61800-3 environments 2 category C3
	EN 55011 class A group 2
	EN/IEC 61800-3
Product certifications	UL
	CSA
	NOM 117
	C-Tick
	GOST
Pollution degree	2 conforming to EN/IEC 61800-5-1
	3 conforming to UL 840
IP degree of protection	IP20

Vibration resistance	0.6 gn (f= 10200 Hz) conforming to EN/IEC 60068-2-6 1.5 mm peak to peak (f= 310 Hz) conforming to EN/IEC 60068-2-6
Shock resistance	4 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 10003000 m with current derating 1 % per 100 m

# **Packing Units**

Unit Type of Package 1	PCE
Number of Units in Package 1	1
Package 1 Height	53.0 cm
Package 1 Width	92.0 cm
Package 1 Length	145.0 cm
Package 1 Weight	336.0 kg

# **Contractual warranty**

Warranty

18 months

# C Environmental Data

Schneider Electric aims to achieve Net Zero status by 2050 through supply chain partnerships, lower impact materials, and circularity via our ongoing "Use Better, Use Longer, Use Again" campaign to extend product lifetimes and recyclability.

Environmental Data explained >

How we assess product sustainability  $\geq$ 

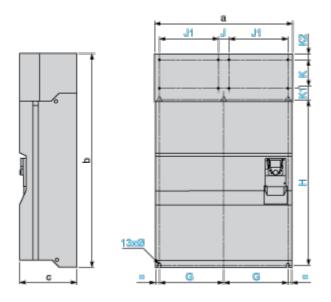
#### **Use Better**

Materials and Substances	
EU RoHS Directive	Pro-active compliance (Product out of EU RoHS legal scope)
Use Again	
$^{\circlearrowright}$ Repack and remanufacture	
WEEE	The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins

**Dimensions Drawings** 

### UL Type 1/IP 20 Drives

### Dimensions with or without 1 Option Card (1)



#### Dimensions in mm

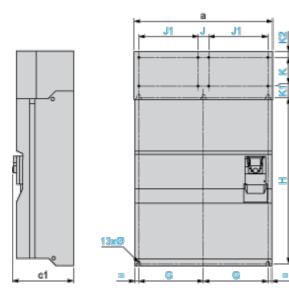
а	b	с	G	J	J1	Н	К	K1	K2	Ø
890	1390	377	417.5	75	380	1120	150	75	30	11.5

Dimensions in in.

а	b	с	G	J	J1	Н	К	K1	K2	Ø
35.04	54.72	14.84	16.44	2.95	14.96	44.09	5.90	2.95	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

# ATV71HC40N4

а	c1	G	J	J1	Н	К	K1	K2	Ø
890	392	417.5	75	380	1120	150	75	30	11.5

Dimensions in in.

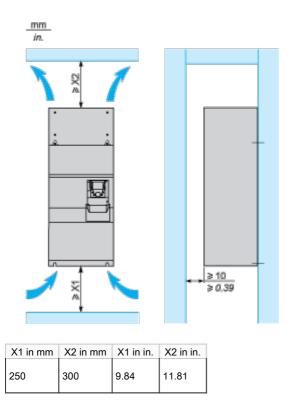
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а	c1	G	J	J1	Н	к	K1	K2	Ø		
35.04	15.43	16.44	2.95	14.96	44.09	5.90	2.95	1.18	0.45		

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

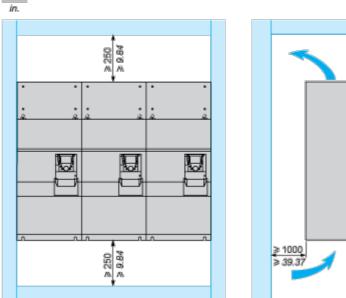
### Mounting and Clearance

### **Mounting Recommendations**

### Clearance



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



mm

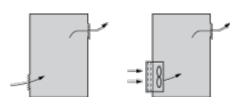
### ATV71HC40N4

#### 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.

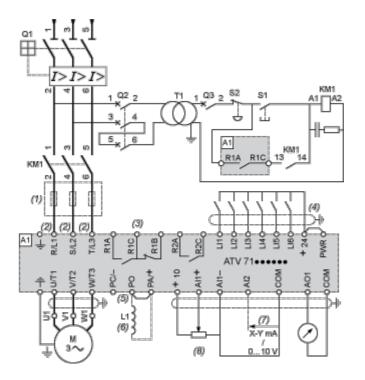
#### Dust and Damp Proof Metal Enclosure (IP 54)

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

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 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.

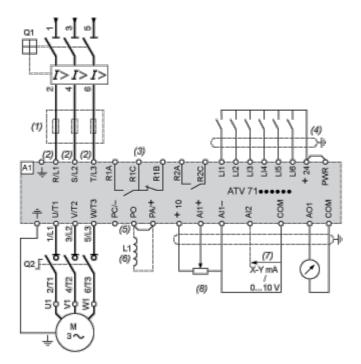
(8) Reference potentiometer.

## ATV71HC40N4

### ATV71HC40N4

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.

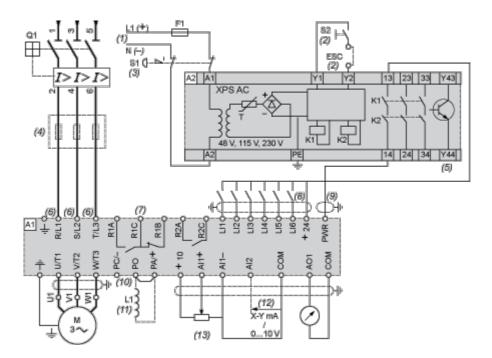
(6) Optional DC choke for ATV71H•••M3, ATV71HD11M3X...HD45M3X, ATV71•075N4...•D75N4 and ATV71P•••N4Z drives. Connected in place of the strap between the PO and PA/+ terminals. For ATV71HD55M3X, HD75M3X, ATV71HD90N4...HC50N4 drives, the choke is supplied with the drive; the customer is responsible for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

### ATV71HC40N4

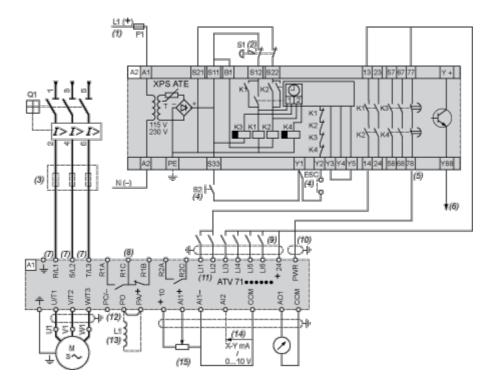
HD75M3X, ATV71HD90N4...HC50N4 drives, the choke is supplied with the drive; the customer is responsible for connecting it.

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

### ATV71HC40N4

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.

## ATV71HC40N4

(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.

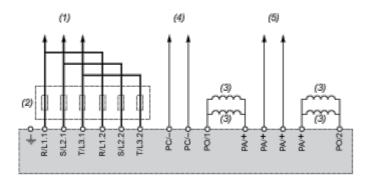
(12) There is no PO terminal on ATV71HC11Y...HC63Y drives.

(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.

#### Power Terminal Connections for the Drive Combined with a 400 kW Motor

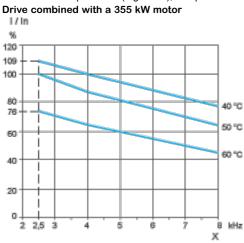


- (1) To circuit-breaker.
- (2) Line chokes, these are mandatory for ATV71HC40Y...HC63Y drives, to be ordered separately.
- (3) DC chokes supplied as standard with ATV71HC40N4, HC50N4 drives. Not available for ATV71HC40Y...HC63Y.
- (4) To DC bus -
- (5) To DC bus +

### Performance Curves

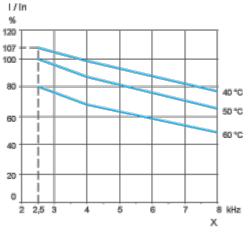
#### **Derating Curves**

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

Drive combined with a 400 kW motor



X Switching frequency