

# ATV340U22N4

variable speed drive - 2.2kW- 400V - 3 phases -  
ATV340



## Main

|                                    |  |
|------------------------------------|--|
| Range of product                   | Altivar Machine ATV340   |
| Product or component type          | Variable speed drive   |
| Device application                 | Machine  |
| Device short name                  | ATV340   |
| Variant                            | Standard version   |
| Product destination                | Asynchronous motors<br>Synchronous motors  |
| Mounting mode                      | Cabinet mount  |
| EMC filter                         | Integrated with <= 20 m motor cable maxi conforming to EN/IEC 61800-3 category C3  |
| IP degree of protection            | IP20 conforming to IEC 60529<br>IP20 conforming to IEC 61800-5-1   |
| Type of cooling                    | Forced convection  |
| Supply frequency                   | 50...60 Hz +/- 5 %   |
| Network number of phases           | 3 phases   |
| [Us] rated supply voltage          | 380...480 V - 15...10 %  |
| Motor power kW                     | 3 kW (normal duty)<br>2.2 kW (heavy duty)  |
| Motor power hp                     | 3 hp (normal duty)<br>3 hp (heavy duty)  |
| Line current                       | 8.4 A at 380 V without line choke (heavy duty)<br>6.6 A at 480 V without line choke (heavy duty)<br>6.6 A at 380 V with external line choke (normal duty)<br>5.3 A at 480 V with external line choke (normal duty)<br>5.1 A at 380 V with external line choke (heavy duty)<br>4.1 A at 480 V with external line choke (heavy duty) |
| Prospective line I <sub>sc</sub>   | 5 kA   |
| Apparent power                     | 5.2 kVA at 480 V (normal duty)<br>5.5 kVA at 480 V (heavy duty)  |
| Continuous output current          | 7.2 A at 4 kHz (normal duty)<br>5.6 A at 4 kHz (heavy duty)  |
| Maximum transient current          | 7.9 A during 60 s (normal duty)<br>9.7 A during 2 s (normal duty)<br>10.1 A during 2 s (heavy duty)<br>8 A during 60 s (heavy duty)  |
| Asynchronous motor control profile | Constant torque standard<br>Variable torque standard<br>Optimized torque mode  |
| Synchronous motor control profile  | Permanent magnet motor<br>Reluctance motor   |
| Speed drive output frequency       | 0.1...599 Hz   |
| Nominal switching frequency        | 4 kHz  |
| Switching frequency                | 2...16 kHz adjustable<br>4...16 kHz with   |
| Safety function                    | STO (safe torque off) SIL 3  |

## Complementary

|                             |  |
|-----------------------------|--|
| Discrete input logic        | 16 preset speeds                                     |
| Communication port protocol | Modbus serial  |
| Option card                 | Slot GP-FB : communication module for Profibus DP V1 |

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Slot GP-FB : communication module for Profinet  
 Slot GP-FB : communication module for DeviceNet  
 Slot GP-FB : communication module for CANopen daisy chain RJ45  
 Slot GP-FB : communication module for CANopen SUB-D 9  
 Slot GP-FB : communication module for CANopen screw terminals  
 Slot GP-FB : communication module for EtherCAT  
 Slot GP-X : digital and analog I/O extension module  
 Slot GP-X : output relay extension module  
 Slot GP-ENC : 5/12 V digital encoder interface module  
 Slot GP-ENC : analog encoder interface module  
 Slot GP-ENC : resolver encoder interface module

|                                     |   |
|-------------------------------------|---|
| Output voltage                      | <= power supply voltage   |
| Permissible temporary current boost | 1.1 x In for 60 s (normal duty)<br>1.5 x In for 60 s (heavy duty)<br>1.35 x In for 2 s (normal duty)<br>1.8 x In for 2 s (heavy duty)   |
| Motor slip compensation             | Adjustable<br>Automatic whatever the load<br>Can be suppressed<br>Not available in permanent magnet motor law   |
| Acceleration and deceleration ramps | S, U or customized<br>Linear adjustable separately from 0.01...9999 s   |
| Braking to standstill               | By DC injection   |
| Protection type                     | Motor: thermal protection<br>Drive: thermal protection<br>Drive: overheating<br>Drive: line supply overvoltage<br>Drive: line supply undervoltage<br>Drive: break on the control circuit<br>Motor: safe torque off<br>Drive: safe torque off<br>Drive: short-circuit between motor phases<br>Motor: motor phase loss<br>Drive: overcurrent<br>Drive: output overcurrent between motor phase and earth<br>Drive: output overcurrent between motor phases<br>Drive: short-circuit between motor phase and earth<br>Drive: motor phase loss<br>Drive: DC Bus overvoltage<br>Drive: input supply loss<br>Drive: exceeding limit speed |
| Frequency resolution                | Display unit: 0.1 Hz<br>Analog input: 0.012/50 Hz   |
| Electrical connection               | Screw terminal with clamping capacity: 1.5...4 mm <sup>2</sup> , AWG 14...AWG 12 on line side<br>Screw terminal with clamping capacity: 4...6 mm <sup>2</sup> , AWG 12...AWG 10 on DC bus<br>Screw terminal with clamping capacity: 1.5...4 mm <sup>2</sup> , AWG 14...AWG 12 on motor<br>Screw terminal with clamping capacity: 0.2...2.5 mm <sup>2</sup> , AWG 24...AWG 12 on control   |
| Connector type                      | Connector(s)1 x RJ45, Modbus serial on front face<br>Connector(s)1 x RJ45, Modbus serial for HMI on front face  |
| Physical interface                  | 2-wire RS 485 Modbus serial   |
| Transmission frame                  | RTU Modbus serial   |
| Transmission rate                   | 4800 bps, 9600 bps, 19200 bps, 38.4 Kbps Modbus serial  |
| Data format                         | 8 bits, configurable odd, even or no parity Modbus serial   |
| Type of polarization                | No impedance Modbus serial  |
| Number of addresses                 | Modbus serial   |
| Method of access                    | Slave Modbus RTU  |
| Supply                              | External supply for digital inputs : 24 V DC (19...30 V), <= 1.25 mA, protection type: overload and short-circuit protection<br>Internal supply for reference potentiometer (1 to 10 kOhm) : 10.5 V DC +/- 5 %, <= 10 mA, protection type: overload and short-circuit protection<br>Internal supply for digital inputs and STO : 24 V DC (21...27 V), <= 200 mA, protection type: overload and short-circuit protection   |
| Local signalling                    | 4 LED, mono/dual colour for local diagnostic<br>4 LED, dual colour for communication module status  |
| Width                               | 85 mm   |
| Height                              | 270 mm  |
| Depth                               | 232.5 mm  |
| Product weight                      | 1.8 kg  |
| Analogue input number               | 2   |

|                           |  |
|---------------------------|--|
| Analogue input type       | AI1 software-configurable current : 0...20 mA, impedance 250 Ohm, resolution 12 bits<br>AI1 software-configurable temperature probe or water level sensor<br>AI1 software-configurable voltage : 0...10 V DC, impedance 31.5 kOhm, resolution 12 bits<br>AI2 software-configurable voltage : - 10...10 V DC, impedance 20 kOhm, resolution 12 bits   |
| Discrete input number     | 8  |
| Discrete input type       | PTI programmable as pulse input : 0...30 kHz, 24 V DC (<= 30 V)<br>STOA, STOB safe torque off, 24 V DC (<= 30 V), impedance > 2.2 kOhm<br>DI1...DI5 programmable, 24 V DC (<= 30 V), impedance 4.4 kOhm  |
| Input compatibility       | DI1...DI5 : discrete input level 1 PLC conforming to EN/IEC 61131-2<br>PTI : pulse input level 1 PLC conforming to IEC 65A-68<br>STOA, STOB : discrete input level 1 PLC conforming to EN/IEC 61131-2  |
| Discrete input logic      | DI1...DI5 positive logic (source) at State 0: < 5 V, at State 1: > 11 V<br>DI1...DI5 negative logic (sink) at State 0: > 16 V, at State 1: < 10 V<br>PTI positive logic (source) at State 0: < 0.6 V, at State 1: > 2.5 V<br>STOA, STOB positive logic (source) at State 0: < 5 V, at State 1: > 11 V  |
| Analogue output number    | 1  |
| Analogue output type      | Software-configurable voltage AQ1 : 0...10 V DC impedance 470 Ohm, resolution 10 bits<br>Software-configurable current AQ1 : 0...20 mA impedance 500 Ohm, resolution 10 bits   |
| Input/output type         | Programmable as logic input/output DQ1 : 0...1 kHz, <= 30 V DC, 100 mA<br>Programmable as logic input/output DQ2 : 0...1 kHz, <= 30 V DC, 100 mA   |
| Sampling duration         | Discrete input DI1...DI5 : 2 ms (+/- 0.5 ms)<br>Pulse input PTI : 5 ms (+/- 1 ms)<br>Analog input AI1, AI2 : 1 ms (+/- 1 ms)<br>Analog output AQ1 : 5 ms (+/- 1 ms)<br>Discrete input/output DQ1, DQ2 : 2 ms (+/- 0.5 ms)  |
| Accuracy                  | Analog input AI1, AI2 : +/- 0.6 % for a temperature variation 60 °C<br>Analog output AQ1 : +/- 1 % for a temperature variation 60 °C   |
| Linearity error           | AI1, AI2 : +/- 0.15 % of maximum value for analog input<br>AQ1 : +/- 0.2 % for analog output   |
| Relay output number       | 2  |
| Relay output type         | Configurable relay logic R1 : fault relay NO/NC 100000 cycles at maximum switching current<br>Configurable relay logic R2 : sequence relay NO 100000 cycles at maximum switching current   |
| Refresh time              | Relay output R1, R2 : 5 ms (+/- 0.5 ms)  |
| Minimum switching current | Relay output R1, R2 : 5 mA at 24 V DC  |
| Maximum switching current | Relay output R1 : 3 A at 250 V AC on resistive load (cos phi = 1)<br>Relay output R1 : 3 A at 30 V DC on resistive load (cos phi = 1)<br>Relay output R1 : 2 A at 250 V AC on inductive load (cos phi = 0.4 and L/R = 7 ms)<br>Relay output R1 : 2 A at 30 V DC on inductive load (cos phi = 0.4 and L/R = 7 ms)<br>Relay output R2 : 5 A at 250 V AC on resistive load (cos phi = 1)<br>Relay output R2 : 5 A at 30 V DC on resistive load (cos phi = 1)<br>Relay output R2 : 2 A at 250 V AC on inductive load (cos phi = 0.4 and L/R = 7 ms)<br>Relay output R2 : 2 A at 30 V DC on inductive load (cos phi = 0.4 and L/R = 7 ms) |

## Environment

|                               |  |
|-------------------------------|--|
| isolation                     | Between power and control terminals  |
| insulation resistance         | > 1 mOhm 500 V DC for 1 minute to earth  |
| noise level                   | 55.4 dB conforming to 86/188/EEC   |
| power dissipation in W        | Natural convection : 65 W at 380 V, switching frequency 4 kHz (heavy duty)<br>Forced convection : 65 W at 380 V, switching frequency 4 kHz (heavy duty)<br>Natural convection : 80 W at 380 V, switching frequency 4 kHz (normal duty)<br>Forced convection : 80 W at 380 V, switching frequency 4 kHz (normal duty)   |
| operating position            | Vertical +/- 10 degree   |
| electromagnetic compatibility | 1.2/50 µs - 8/20 µs surge immunity test level 3 conforming to IEC 61000-4-5<br>Electrical fast transient/burst immunity test level 4 conforming to IEC 61000-4-4<br>Electrostatic discharge immunity test level 3 conforming to IEC 61000-4-2<br>Radiated radio-frequency electromagnetic field immunity test level 3 conforming to IEC 61000-4-3<br>Conducted radio-frequency immunity test level 3 conforming to IEC 61000-4-6 |
| pollution degree              | 2 conforming to EN/IEC 61800-5-1   |
| vibration resistance          | 1.5 mm peak to peak (f= 2...19 Hz) conforming to EN/IEC 60721-3-3 class 3M3<br>1 gn (f= 9...200 Hz) conforming to EN/IEC 60721-3-3 class 3M3   |
| shock resistance              | 15 gn (duration = 11 ms) conforming to EN/IEC 60721-3-3 class 3M3  |

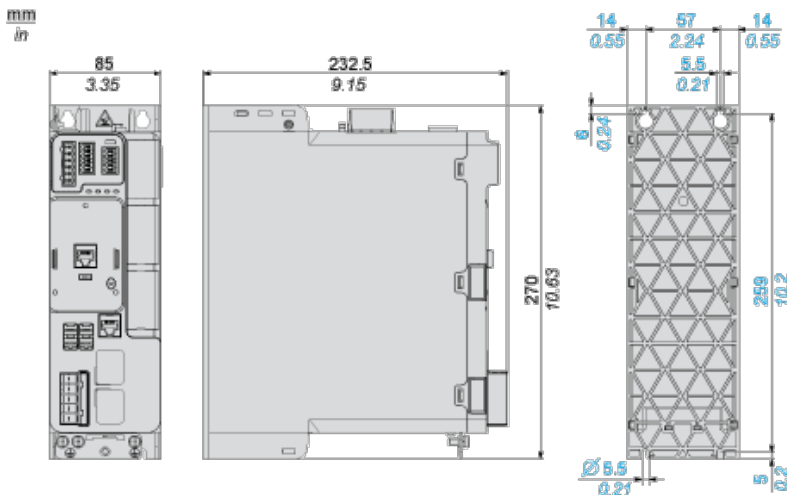
|                                       |   |
|---------------------------------------|---|
| relative humidity                     | 5...95 % without condensation conforming to EN/IEC 60721-3-3 class 3K3  |
| ambient air temperature for operation | 50...60 °C with current derating (heavy duty)<br>50...60 °C with current derating (heavy duty)<br>40...60 °C with current derating (normal duty)<br>-15...50 °C without current derating (heavy duty)<br>-15...40 °C without current derating (normal duty) |
| ambient air temperature for storage   | -40...70 °C   |
| operating altitude                    | <= 1000 m without derating<br>1000...3000 m with current derating 1 % per 100 m   |
| environmental characteristic          | Chemical pollution resistance class 3C3 conforming to EN/IEC 60721-3-3<br>Dust pollution resistance class 3S3 conforming to EN/IEC 60721-3-3  |
| standards                             | EN/IEC 61800-3<br>EN/IEC 61800-3 environment 1 category C2<br>EN/IEC 61800-3 environment 2 category C3<br>EN/IEC 61800-5-1<br>IEC 60721-3<br>IEC 61508<br>IEC 13849-1<br>UL 618000-5-1  |
| product certifications                | CSA<br>TÜV<br>UL<br>REACH   |
| marking                               | CE  |

## Offer Sustainability

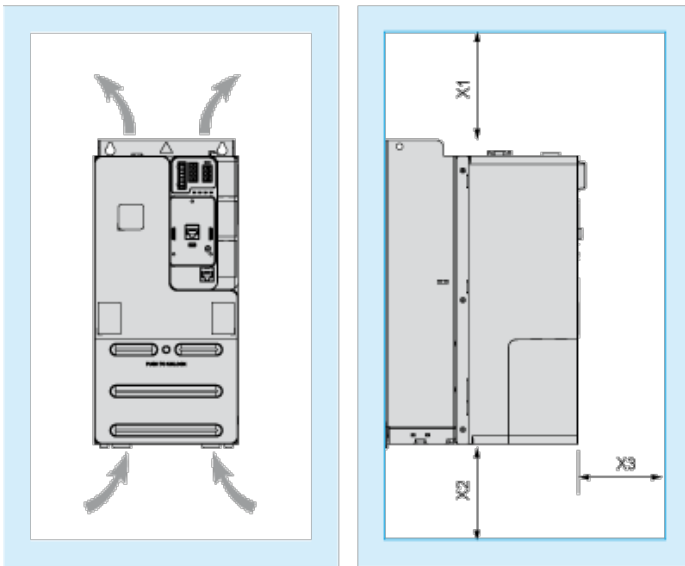
|                                  |   |
|----------------------------------|---|
| Sustainable offer status         | Green Premium product   |
| RoHS (date code: YYWW)           | Compliant - since 1635 - Schneider Electric declaration of conformity |
| REACH                            | Reference not containing SVHC above the threshold                     |
| Product environmental profile    | Available   |
| Product end of life instructions | Available   |

## Dimensions

### Views: Front - Left - Rear



## Clearance



Dimensions in mm

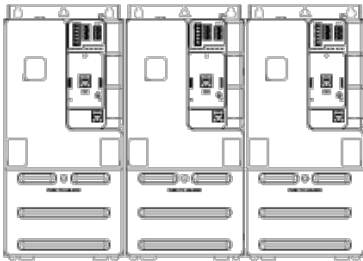
| X1    | X2    | X3   |
|-------|-------|------|
| ≧ 100 | ≧ 100 | ≧ 60 |

Dimensions in in.

| X1     | X2     | X3     |
|--------|--------|--------|
| ≧ 3.94 | ≧ 3.94 | ≧ 2.36 |

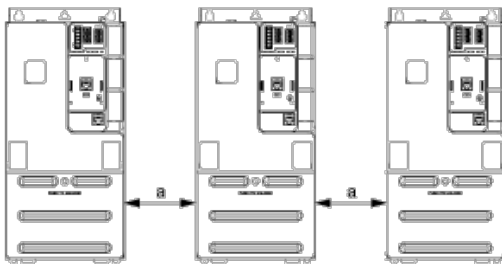
## Mounting Types

### Mounting Type A: Side by Side IP20



Possible, at ambient temperature  $\leq 50\text{ }^{\circ}\text{C}$  (122  $^{\circ}\text{F}$ )

### Mounting Type B: Individual IP20

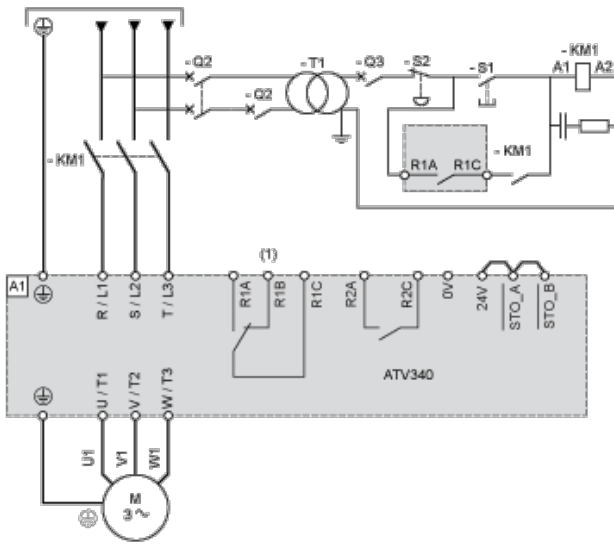


a  $\geq 50\text{ mm}$  (1.97 in.) from 50...60 $^{\circ}\text{C}$ , no restriction below 50 $^{\circ}\text{C}$

## Connections and Schema

### Three-phase Power Supply with Upstream Breaking via Line Contactor Without Safety Function STO

Connection diagrams conforming to standards ISO13849 category 1 and IEC/EN 61508 capacity SIL1, stopping category 0 in accordance with standard IEC/EN 60204-1.



(1) Use relay output R1 set to operating state Fault to switch Off the product once an error is detected.

A1 : Drive

KM1 :Line Contactor

Q2, Circuit breakers

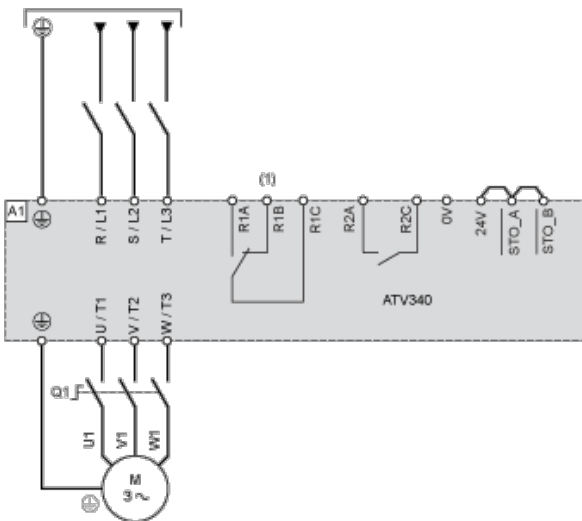
Q3 :

S1 : Pushbutton

S2 : Emergency stop

T1 : Transformer for control part

### Three-phase Power Supply With Downstream Breaking via Switch Disconnecter

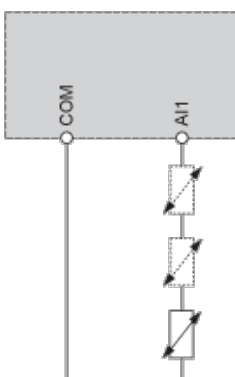


(1) Use relay output R1 set to operating state Fault to switch Off the product once an error is detected.

A1 : Drive

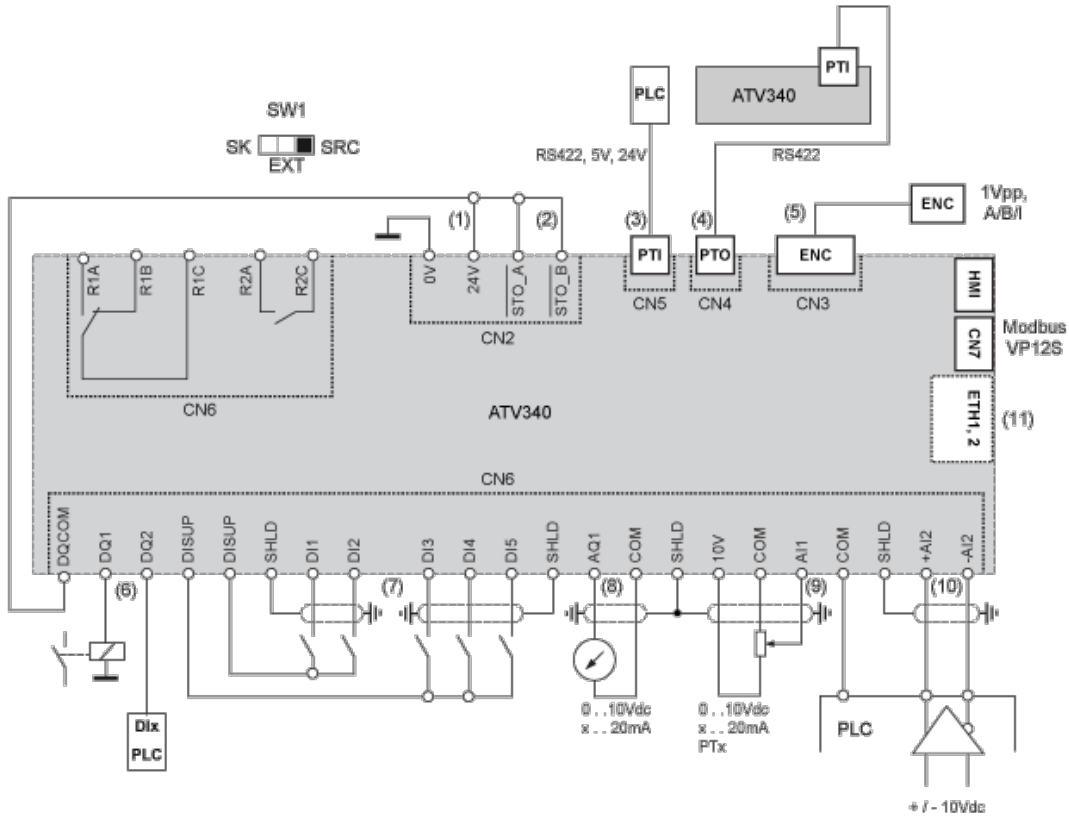
Q1 : Switch disconnecter

### Sensor Connection



It is possible to connect either 1 or 3 sensors on terminals A1.

## Control Block Wiring Diagram



- (1) 24V supply (STO)
- (2) STO - Safe Torque Off
- (3) PTI - Pulse Train In
- (4) PTO - Pulse Train Out
- (5) Motor Encoder connection
- (6) Digital outputs
- (7) Digital inputs
- (8) Analog output
- (9) Analog input
- (10) Differential Analog Input
- (11) Ethernet port (only on Ethernet drive version)

SW1 :Sink/Source switch

R1A, Fault relay

R1B,

R1C :

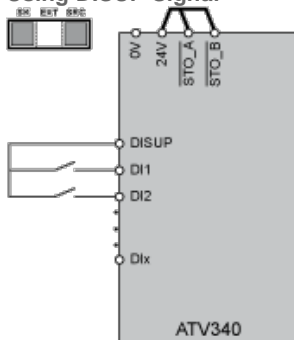
R2A, Sequence relay

R2C :

## Digital Inputs Wiring

### Digital Inputs: Internal Supply

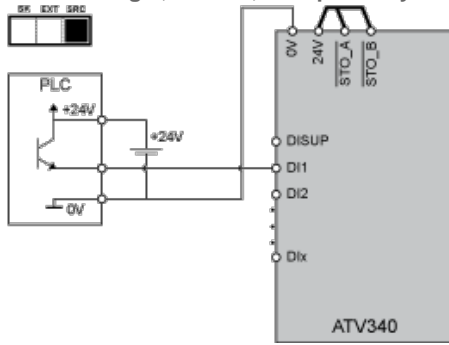
#### Using DISUP Signal



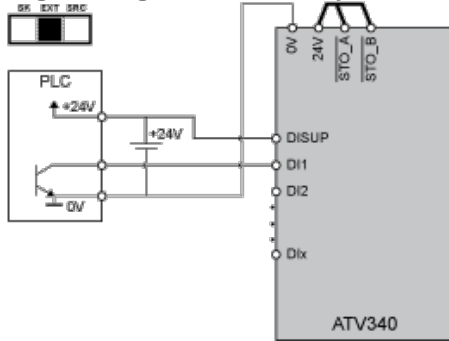
In SRC position DISUP outputs 24 V. In SK position DISUP is connected to 0 V.

## Digital Inputs: External Supply

### Positive Logic, Source, European Style

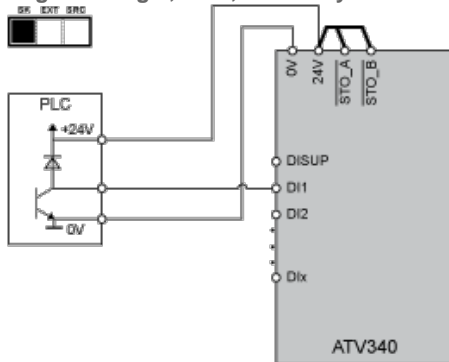


### Negative Logic, Sink, Asian Style



## Digital Inputs: Internal supply

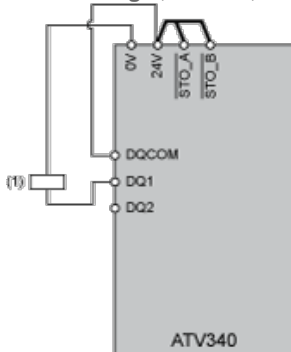
### Negative Logic, Sink, Asian Style



## Digital Outputs Wiring

### Digital Outputs: Internal Supply

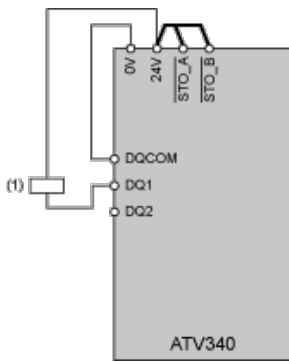
#### Positive Logic, Source, European Style, DQCOM to +24V



(1) Relay or valve

#### Negative Logic, Sink, Asian Style, DQCOM to 0V

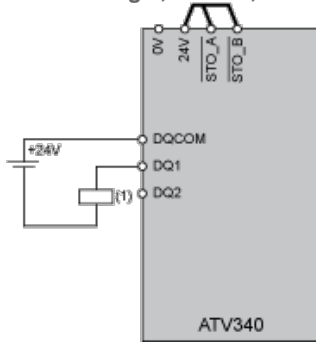




(1) Relay or valve

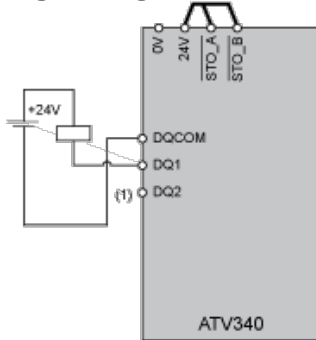
**Digital Outputs: External Supply**

Positive Logic, Source, European Style, DQCOM to +24V



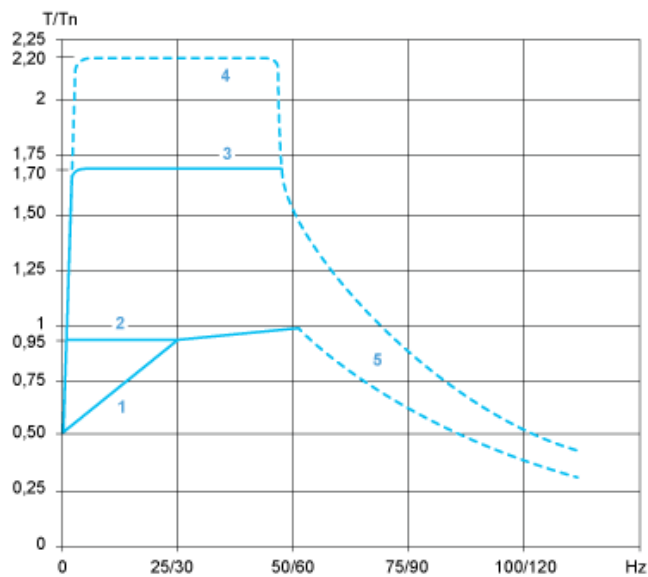
(1) Relay or valve

Negative Logic, Sink, Asian Style, DQCOM to 0V



(1) Relay or valve

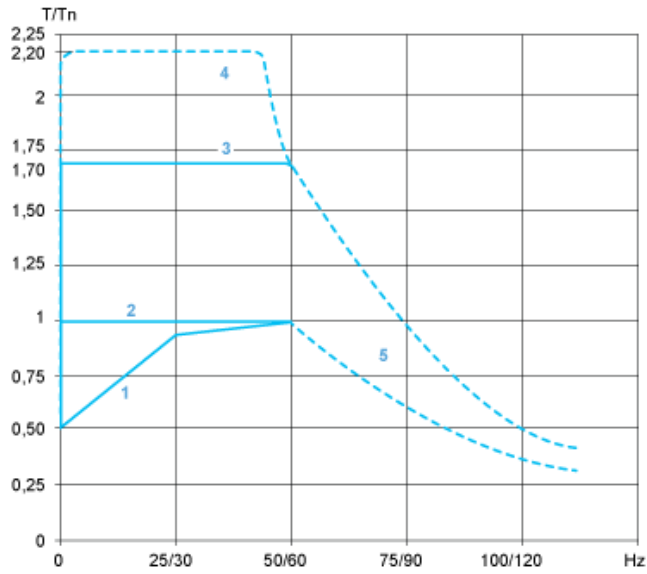
**Open Loop Applications**



- 1 : Self-cooled motor: continuous useful torque
- 2 : Force-cooled motor: continuous useful torque

- 3 : Overtorque for 60 s maximum
- 4 : Transient overtorque for 2 s maximum
- 5 : Torque in overspeed at constant power

## Closed Loop Applications



- 1 : Self-cooled motor: continuous useful torque
- 2 : Force-cooled motor: continuous useful torque
- 3 : Overtorque for 60 s maximum
- 4 : Transient overtorque for 2 s maximum
- 5 : Torque in overspeed at constant power