

# Product data sheet

Specifications



## Variable speed drive, Altivar Machine ATV340, 37 kW Heavy Duty, 400 V, 3 phases, Ethernet

ATV340D37N4E

### Main

Range of product	Altivar Machine ATV340
Product or component type	Variable speed drive
Product specific application	Machine
Variant	Standard version
Mounting mode	Wall mount
Communication port protocol	Modbus TCP Modbus serial EtherNet/IP
Option card	Communication module, Profinet Communication module, DeviceNet Communication module, CANopen Communication module, EtherCAT
Network number of phases	3 phases
Supply frequency	50...60 Hz +/- 5 %
[Us] rated supply voltage	380...480 V - 15...10 %
Nominal output current	74.5 A
Motor power kW	45 kW for normal duty 37 kW for heavy duty
Motor power hp	60 hp for normal duty 50 hp for heavy duty
EMC filter	Class C3 EMC filter integrated
IP degree of protection	IP20
Degree of protection	UL type 1

### Complementary

Discrete input number	8
Discrete input type	PTI safe torque off: 0...30 kHz, 24 V DC (30 V) DI1...DI5 programmable as pulse input, 24 V DC (30 V), impedance: 3.5 kOhm programmable
Number of preset speeds	16 preset speeds
Discrete output number	1.0
Discrete output type	Programmable output DQ1, DQ2 30 V DC 100 mA
Analogue input number	3
Analogue input type	AI1 software-configurable current: 0...20 mA, impedance: 250 Ohm, resolution 12 bits AI1 software-configurable temperature probe or water level sensor

Disclaimer: This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications

AI1 software-configurable voltage: 0...10 V DC, impedance: 31.5 kOhm, resolution 12 bits  
 AI2 software-configurable voltage: - 10...10 V DC, impedance: 31.5 kOhm, resolution 12 bits

<b>Analogue output number</b>	2
<b>Analogue output type</b>	Software-configurable voltage AQ1, AQ2: 0...10 V DC impedance 470 Ohm, resolution 10 bits Software-configurable current AQ1, AQ2: 0...20 mA impedance 500 Ohm, resolution 10 bits
<b>Relay output number</b>	3
<b>Output voltage</b>	<= power supply voltage
<b>Relay output type</b>	Relay outputs R1A Relay outputs R1C electrical durability 100000 cycles Relay outputs R2A Relay outputs R2C electrical durability 100000 cycles
<b>Maximum switching current</b>	Relay output R1C on resistive load, cos phi = 1: 3 A at 250 V AC Relay output R1C on resistive load, cos phi = 1: 3 A at 30 V DC Relay output R1C on inductive load, cos phi = 0.4 and L/R = 7 ms: 2 A at 250 V AC Relay output R1C on inductive load, cos phi = 0.4 and L/R = 7 ms: 2 A at 30 V DC Relay output R2C on resistive load, cos phi = 1: 5 A at 250 V AC Relay output R2C on resistive load, cos phi = 1: 5 A at 30 V DC Relay output R2C on inductive load, cos phi = 0.4 and L/R = 7 ms: 2 A at 250 V AC Relay output R2C on inductive load, cos phi = 0.4 and L/R = 7 ms: 2 A at 30 V DC
<b>Minimum switching current</b>	Relay output R1B: 5 mA at 24 V DC Relay output R2C: 5 mA at 24 V DC
<b>Physical interface</b>	2-wire RS 485
<b>Connector type</b>	3 RJ45
<b>Method of access</b>	Slave Modbus RTU Slave Modbus TCP
<b>Transmission rate</b>	4.8 kbit/s 9.6 kbit/s 19.2 kbit/s 38.4 kbit/s
<b>Transmission frame</b>	RTU
<b>Number of addresses</b>	1...247
<b>Data format</b>	8 bits, configurable odd, even or no parity
<b>Type of polarization</b>	No impedance
<b>4 quadrant operation possible</b>	True
<b>Asynchronous motor control profile</b>	Optimized torque mode Variable torque standard Constant torque standard
<b>Synchronous motor control profile</b>	Reluctance motor Permanent magnet motor
<b>Pollution degree</b>	2 conforming to EN/IEC 61800-5-1
<b>Maximum output frequency</b>	0.599 kHz
<b>Acceleration and deceleration ramps</b>	Linear adjustable separately from 0.01...9999 s S, U or customized
<b>Motor slip compensation</b>	Adjustable Can be suppressed Automatic whatever the load Not available in permanent magnet motor law
<b>Switching frequency</b>	2...16 kHz adjustable 4...16 kHz with derating factor
<b>Nominal switching frequency</b>	4 kHz
<b>Braking to standstill</b>	By DC injection
<b>Brake chopper integrated</b>	True
<b>Line current</b>	79.8 A at 380 V (normal duty) 69.1 A at 480 V (normal duty) 67.1 A at 380 V (heavy duty) 59.0 A at 480 V (heavy duty)
<b>Line current</b>	79.8 A at 380 V with internal line choke (normal duty) 69.1 A at 480 V with internal line choke (normal duty) 67.1 A at 380 V with internal line choke (heavy duty) 59 A at 480 V with internal line choke (heavy duty) 67.1 A

	59.0 A
<b>Maximum input current</b>	79.8 A
<b>Maximum output voltage</b>	480 V
<b>Apparent power</b>	57.4 kVA at 480 V (normal duty) 49.1 kVA at 480 V (heavy duty)
<b>Maximum transient current</b>	105.6 A during 60 s (normal duty) 105.6 A during 2 s (normal duty) 111.8 A during 60 s (heavy duty) 111.8 A during 2 s (heavy duty)
<b>Electrical connection</b>	Screw terminal, clamping capacity: 0.75...1.5 mm <sup>2</sup> for control Screw terminal, clamping capacity: 35...50 mm <sup>2</sup> for line side Screw terminal, clamping capacity: 35...50 mm <sup>2</sup> for DC bus Screw terminal, clamping capacity: 50 mm <sup>2</sup> for motor
<b>Prospective line I<sub>sc</sub></b>	50 kA
<b>Base load current at high overload</b>	74.5 A
<b>Base load current at low overload</b>	88.0 A
<b>Power dissipation in W</b>	Natural convection: 90 W at 380 V, switching frequency 4 kHz (heavy duty) Forced convection: 796 W at 380 V, switching frequency 4 kHz (heavy duty) Natural convection: 105 W at 380 V, switching frequency 4 kHz (normal duty) Forced convection: 943 W at 380 V, switching frequency 4 kHz (normal duty)
<b>Electrical connection</b>	Control: screw terminal 0.75...1.5 mm <sup>2</sup> /AWG 18...AWG 16 Line side: screw terminal 35...50 mm <sup>2</sup> /AWG 2...AWG 1 DC bus: screw terminal 35...50 mm <sup>2</sup> /AWG 3...AWG 1 Motor: screw terminal 50 mm <sup>2</sup> /AWG 1
<b>With safety function Safely Limited Speed (SLS)</b>	True
<b>With safety function Safe brake management (SBC/SBT)</b>	True
<b>With safety function Safe Operating Stop (SOS)</b>	False
<b>With safety function Safe Position (SP)</b>	False
<b>With safety function Safe programmable logic</b>	False
<b>With safety function Safe Speed Monitor (SSM)</b>	False
<b>With safety function Safe Stop 1 (SS1)</b>	True
<b>With sft fct Safe Stop 2 (SS2)</b>	False
<b>With safety function Safe torque off (STO)</b>	True
<b>With safety function Safely Limited Position (SLP)</b>	False
<b>With safety function Safe Direction (SDI)</b>	False
<b>Protection type</b>	Thermal protection: motor Safe torque off: motor Motor phase loss: motor Thermal protection: drive Safe torque off: drive Overheating: drive Overcurrent: drive Output overcurrent between motor phase and earth: drive Output overcurrent between motor phases: drive Short-circuit between motor phase and earth: drive Short-circuit between motor phases: drive Motor phase loss: drive DC Bus overvoltage: drive Line supply overvoltage: drive Line supply undervoltage: drive Input supply loss: drive Exceeding limit speed: drive Break on the control circuit: drive

<b>Width</b>	213.0 mm
<b>Height</b>	660.0 mm
<b>Depth</b>	262.0 mm
<b>Net weight</b>	28.4 kg
<b>Continuous output current</b>	88 A at 4 kHz for normal duty 74.5 A at 4 kHz for heavy duty

## Environment

<b>Operating altitude</b>	<= 4800 m with current derating above 1000m
<b>Operating position</b>	Vertical +/- 10 degree
<b>Product certifications</b>	UL CSA TÜV EAC CTick
<b>Marking</b>	CE
<b>Standards</b>	EN/IEC 61800-3 EN/IEC 61800-5-1 IEC 60721-3 IEC 61508 IEC 13849-1 UL 618000-5-1 UL 508C IEC 61000-3-12
<b>Maximum THDI</b>	<48 % full load conforming to IEC 61000-3-12 <48 % 80 % load conforming to IEC 61000-3-12
<b>Assembly style</b>	With heat sink
<b>Electromagnetic compatibility</b>	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 Electrical fast transient/burst immunity test level 4 conforming to IEC 61000-4-4 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
<b>Environmental class (during operation)</b>	Class 3C3 according to IEC 60721-3-3 Class 3S3 according to IEC 60721-3-3
<b>Maximum acceleration under shock impact (during operation)</b>	150 m/s <sup>2</sup> at 11 ms
<b>Maximum acceleration under vibrational stress (during operation)</b>	10 m/s <sup>2</sup> at 13...200 Hz
<b>Maximum deflection under vibratory load (during operation)</b>	1.5 mm at 2...13 Hz
<b>Permitted relative humidity (during operation)</b>	Class 3K5 according to EN 60721-3
<b>Volume of cooling air</b>	240.0 m <sup>3</sup> /h
<b>Type of cooling</b>	Forced convection
<b>Overvoltage category</b>	Class III
<b>Regulation loop</b>	Adjustable PID regulator
<b>Noise level</b>	63.5 dB
<b>Pollution degree</b>	2
<b>Ambient air transport temperature</b>	-40...70 °C
<b>Ambient air temperature for operation</b>	-15...50 °C without derating (vertical position) 50...60 °C with derating factor (vertical position)
<b>Ambient air temperature for storage</b>	-40...70 °C
<b>Isolation</b>	Between power and control terminals

## Packing Units

Unit Type of Package 1	PCE
Number of Units in Package 1	1
Package 1 Weight	28.7 kg
Package 1 Height	53 cm
Package 1 width	34 cm
Package 1 Length	84 cm
Unit Type of Package 2	BB1
Number of Units in Package 2	1
Package 2 Weight	38.5 kg
Package 2 Height	53.4 cm
Package 2 width	33.2 cm
Package 2 Length	83.2 cm
Unit Type of Package 3	PAL
Number of Units in Package 3	1
Package 3 Weight	36 kg
Package 3 Height	54 cm
Package 3 width	85 cm
Package 3 Length	35 cm

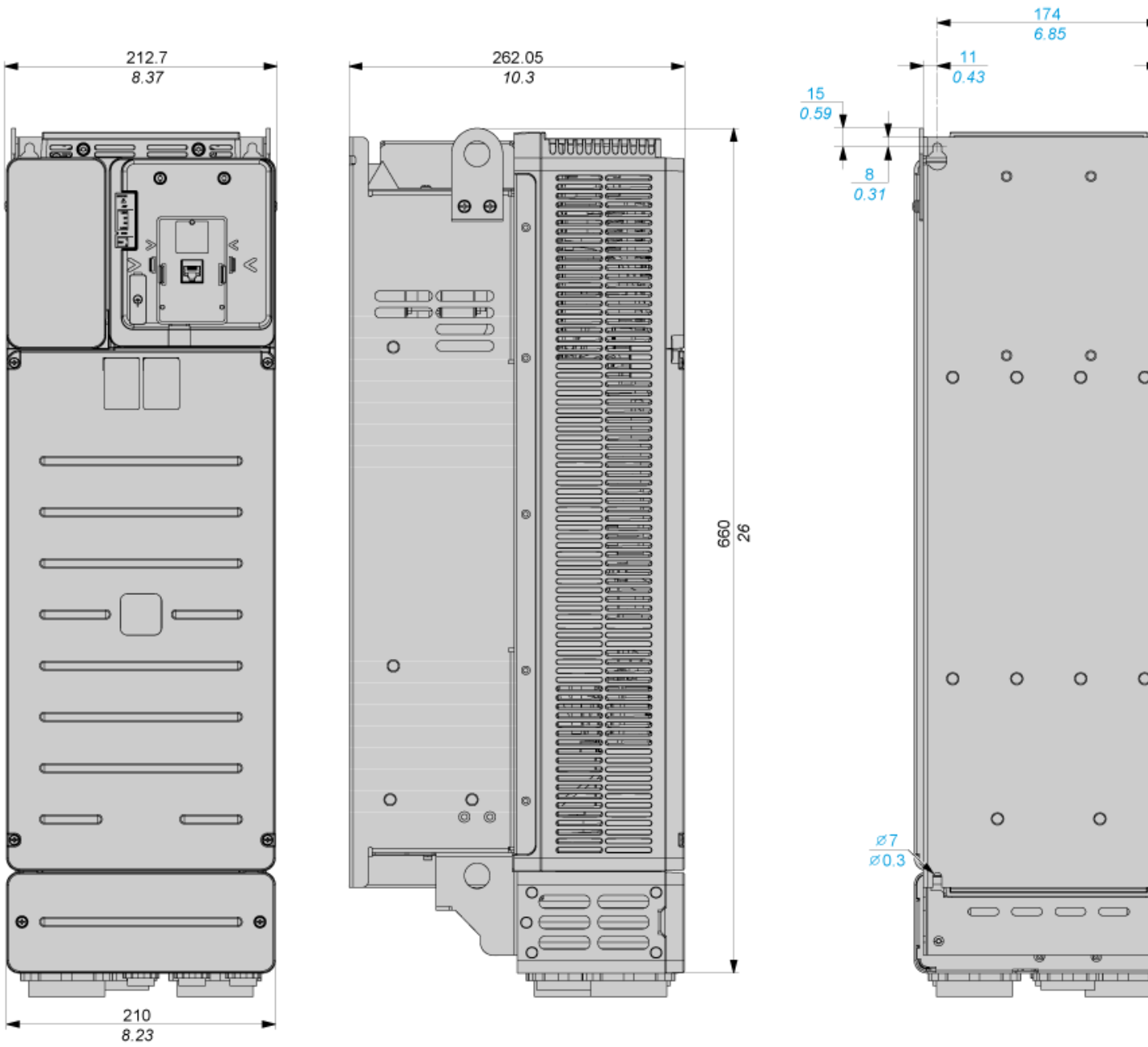
## Offer Sustainability

Sustainable offer status	Green Premium product
REACH Regulation	<a href="#">REACH Declaration</a>
EU RoHS Directive	Pro-active compliance (Product out of EU RoHS legal scope) <a href="#">EU RoHS Declaration</a>
Mercury free	Yes
RoHS exemption information	<a href="#">Yes</a>
China RoHS Regulation	<a href="#">China RoHS declaration</a>
Environmental Disclosure	<a href="#">Product Environmental Profile</a>
Circularity Profile	<a href="#">End of Life Information</a>
WEEE	The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins
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 <a href="http://www.P65Warnings.ca.gov">www.P65Warnings.ca.gov</a>
Upgradeability	<a href="#">Upgraded components available</a> 

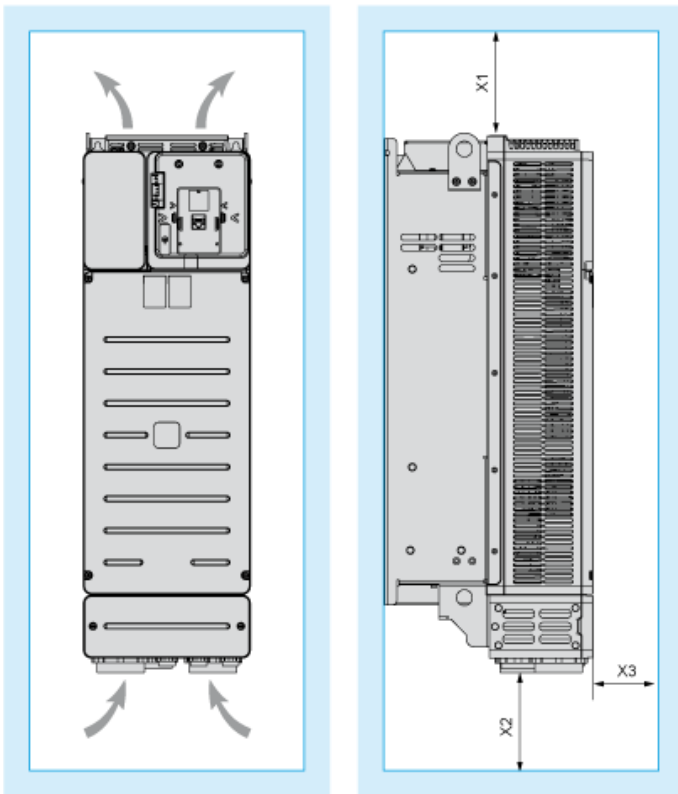
Dimensions

Views: Front - Left - Rear

mm  
in



**Clearance**



**Dimensions in mm**

X1	X2	X3
≥ 100	≥ 100	≥ 10

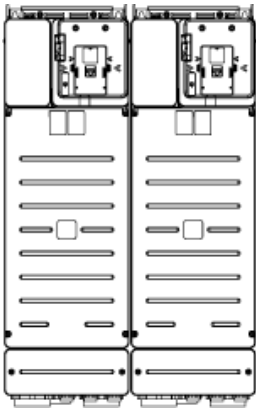
**Dimensions in in.**

X1	X2	X3
≥ 3.94	≥ 3.94	≥ 0.39

**Mounting Types**

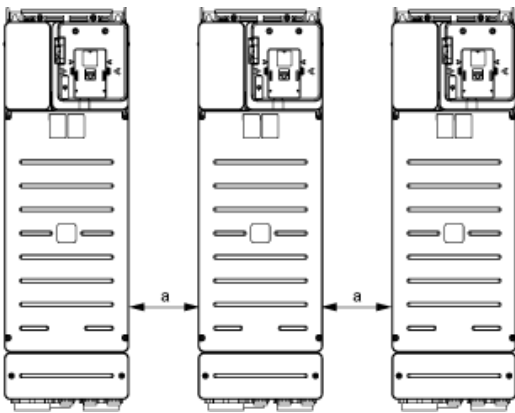
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**Mounting Type A: Side by Side IP20**



Possible, up to 50 °C, 2 drives only

**Mounting Type B: Individual IP20**



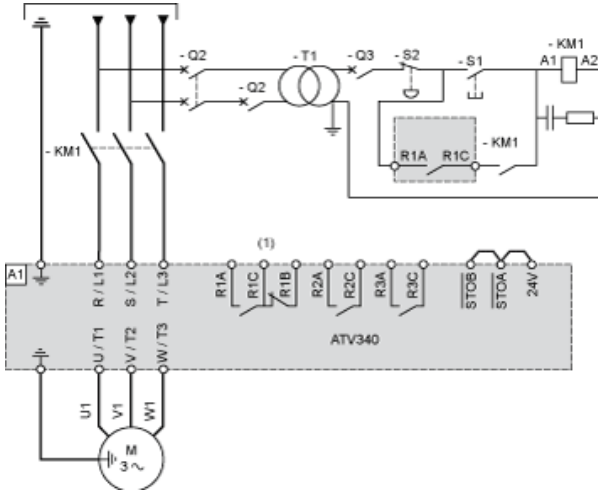
**a**  $\geq$  110 mm (4.33 in.)



**Connections and Schema**

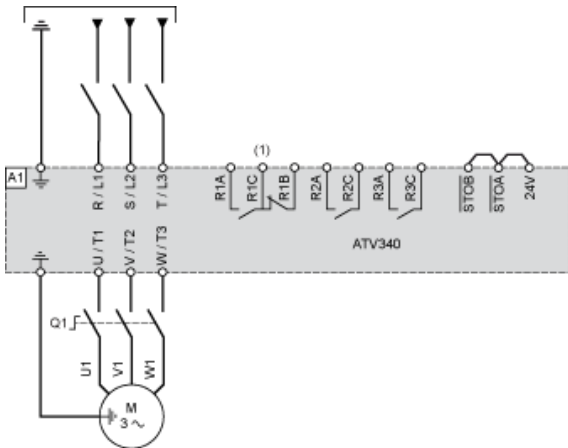
**Three-Phase Power Supply with Upstream Breaking via Line Contactor Without Safety Function STO**

Connection diagrams conforming to standards ISO13849 category 1 and IEC/EN 61508 capacitySIL1, stopping category 0 in accordance with standard IEC/EN 60204-1.



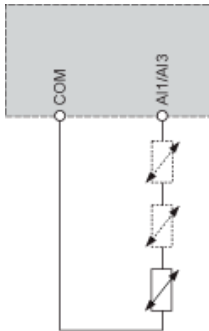
- (1) Use relay output R1 set to operating state Fault to switch Off the product once an error is detected.
- A1 : Drive
- KM1 : Line Contactor
- Q2, Q3 : Circuit breakers
- S1 : Pushbutton
- S2 : Emergency stop
- T1 : Transformer for control part

**Three-Phase Power Supply with Downstream Breaking via Switch Disconnecter**



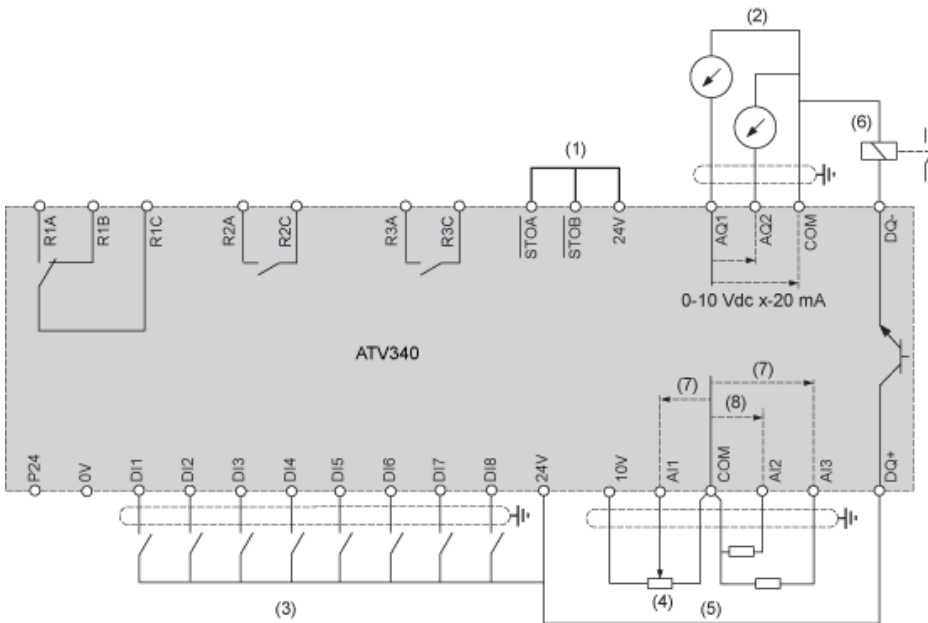
- (1) Use relay output R1 set to operating state Fault to switch Off the product once an error is detected.
- A1 : Drive
- Q1 : Switch disconnecter

**Sensor Connection**



It is possible to connect either 1 or 3 sensors on terminals A1/AI3.

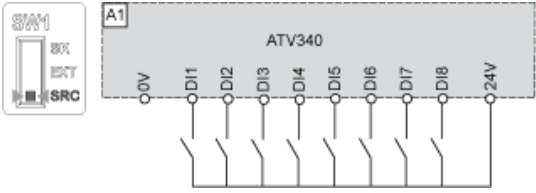
**Control Block Wiring Diagram**



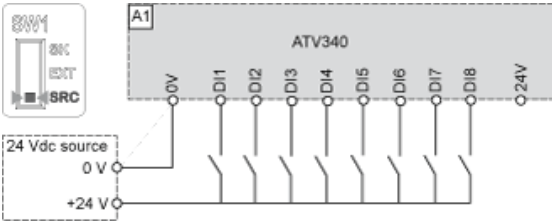
- (1) Safe Torque Off
  - (2) Analog Output
  - (3) Digital Input
  - (4) Reference potentiometer
  - (5) Analog Input
  - (6) Digital Output
  - (7) 0-10 Vdc, x-20 mA
  - (8) 0-10 Vdc, -10 Vdc...+10 Vdc
- A1 : ATV340 Drive  
**R1A, R1B, R1C** Relay  
**R2A, R2C** Sequence relay  
**R3A, R3C** Sequence relay

Digital Inputs Wiring

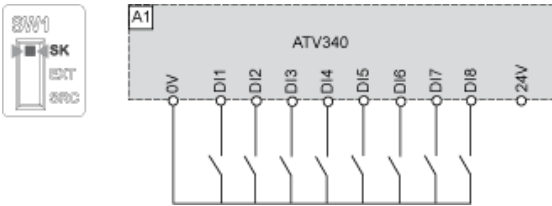
Switch Set to SRC (Source) Position Using the Output Power Supply for the Digital Inputs



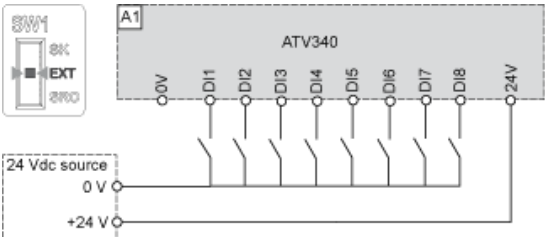
Switch Set to SRC (Source) Position and Use of an External Power Supply for the DIs



Switch Set to SK (Sink) Position Using the Output Power Supply for the Digital Inputs



Switch Set to EXT Position Using an External Power Supply for the DIs



**Digital Outputs Wiring**

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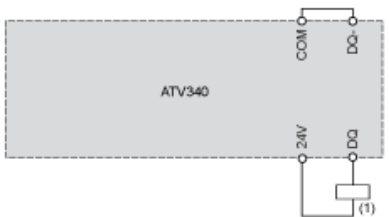
**Digital Outputs: Internal Supply**

Positive Logic, Source, European Style, DQ switches to +24V



(1) Relay or valve

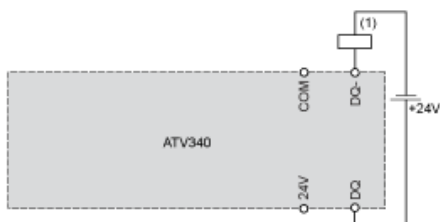
Negative Logic, Sink, Asian Style, DQ switches to 0V



(1) Relay or valve

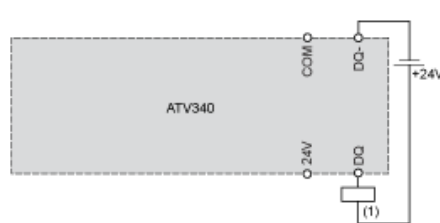
**Digital Outputs: External Supply**

Positive Logic, Source, European Style, DQ switches to +24V



(1) Relay or valve

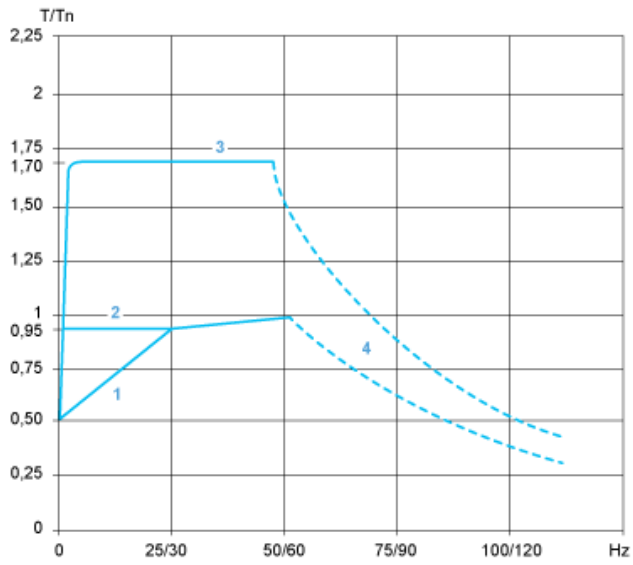
Negative Logic, Sink, Asian Style, DQ switches to 0V



(1) Relay or valve

Open Loop Applications

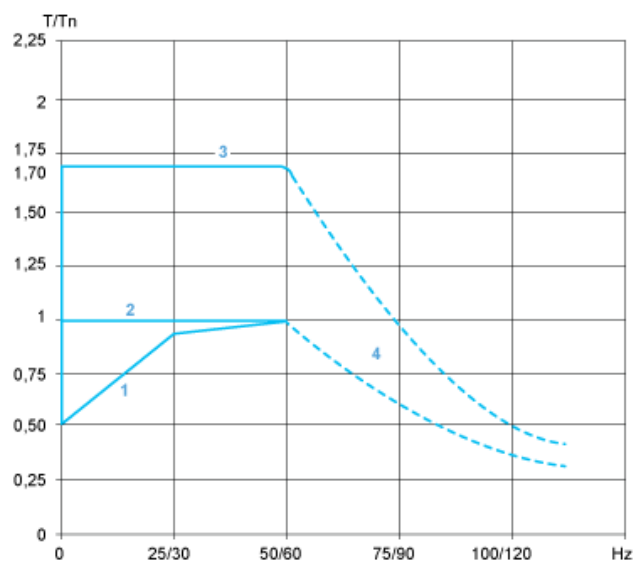
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- 1 : Self-cooled motor: continuous useful torque
- 2 : Force-cooled motor: continuous useful torque
- 3 : Overtorque for 60 s maximum
- 4 : Torque in overspeed at constant power

Closed Loop Applications

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