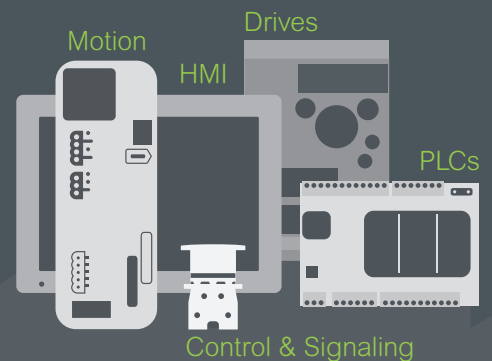




## Introducing the **Easy Series**

Essential automation & control products

*When just enough is just right!*



# Easy Altivar 310

## Variable speed drives

For applications from 0.37 to 22 kW / 0.5 to 30 HP

# General contents

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# Variable speed drives

## Easy™ Altivar 310

Presentation, applications, and functions



Textile machine

### Presentation

The Easy™ Altivar 310 drive is a frequency inverter for the following 380 to 460 V three-phase motors:

- Asynchronous motors rated from 0.37 to 22 kW/0.5 to 30 HP, heavy duty
- Synchronous motors rated from 0.37 to 11 kW/0.5 to 15 HP, heavy duty

The compact size of this drive, its robust design, ease of installation based on the principle of Plug & Play, its integrated functions, and macro configuration make it particularly suitable for applications involving industrial machines and certain consumer machines.

By taking account of the constraints governing installation and use at the product design stage, we have been able to offer a dependable, cost-effective solution to manufacturers of compact machines (OEMs).

The Easy Altivar 310 has been developed without compromising on quality.

### Applications

The Easy Altivar 310 drive incorporates functions that are suitable for the most common applications, including:

- Conveyor
- Textile machines
- Machine tools
- Woodworking machines
- Material handling
- Packaging and printing machines
- Ceramics machines



Packaging machine

### Functions

In addition to the functions usually available on this type of drive, the Easy Altivar 310 drive also features the following:

#### Motor control functions (1)

- Support both IM and PM motor control
- Motor control profiles: standard, performance, pump/fan, and synchronous motor control
- Cooling fan thermal control
- Switching frequency management
- Boost torque
- Motor noise reduction
- Current limitation
- Auto DC injection

#### Application functions (1)

- Frequency skip
- Preset speeds
- PID regulator
- S ramp, U ramp, ramp switching
- Jog operation
- +/- speed around reference
- Freewheel stop, fast stop
- Automatic catching a spinning load with speed detection and automatic restart

(1) For more information on how to implement functions, please refer to the User Manual on our [website](#).



Food and beverage line

# Variable speed drives

## Easy Altivar 310

### Functions, an optimized offer



Easy Altivar 310 range

#### Functions (continued)

##### Control functions (1)

- Channel configuration - separate mode or combined mode
- Reference channel selection
- Reverse inhibition
- Force local control
- Store customer parameter settings

##### Protection and maintenance functions (1)

- Protection of the installation by means of underload and overload detection
- Maintenance functions:
  - HMI password
  - Configuring the logic and analog I/O
  - Configuring how the parameters are displayed
  - Viewing the state of the logic inputs on the drive display
  - Displaying key parameters (drive power on/fan time/process elapsed time)
  - Displaying the last four detected faults, detected error log, etc.

#### An optimized offer

##### Environment

The entire range conforms to international standards IEC/EN 61800-5-1 and IEC/EN 61800-3 and has been developed to meet the requirements of directives relating to protection of the environment (RoHS, REACH, WEEE). With its innovative air flow design and thicker coating, which helps to protect the PCB, the range can be used in the harshest environments. It can withstand a 55 °C/131 °F ambient air temperature around the device without derating (2). It has an IP20 protection rating (IP40 on the top of the product).

##### Adaptability and performance

The Easy Altivar 310 has been designed with enhanced adaptability to different motors and loads.

One of its main features is its torque capacity for braking and starting:

- Braking capacity:
  - over 70% of the rated motor torque without braking resistor
  - 150% of the rated motor torque with braking resistor (see [page 12](#))
- Torque capacity:
  - starting torque: 150% at 3 Hz
  - overtorque: 170 to 200%, depending on model (3)
- Synchronous motor control
  - Dedicated references with ATV310●●●N4S
  - Supports both SPM and IPM type motors

##### Easy to integrate

The Easy Altivar 310 drive integrates the Modbus communication protocol as standard, which can be accessed via the RJ45 connector located on the underside of the drive with a 2-wire RS-485 physical interface. To communicate on the network, the Easy Altivar 310 drive uses the Modbus RTU transmission mode. For more information on the Modbus port characteristics (transmission speed, address, messaging, etc.), please consult our [website](#).

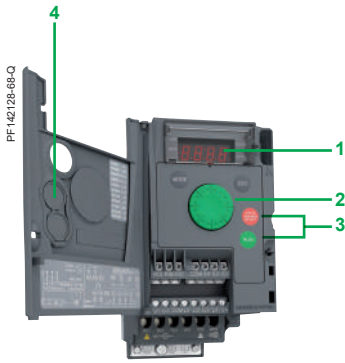
Logic inputs can be configured as source or sink by software, compatible with many PLCs.

(1) For more information on how to implement functions, please refer to the User Manual on our [website](#).  
 (2) For more information on temperature conditions and derating curves, please refer to the User Manual on our [website](#).  
 (3) For more information, please refer to our [website](#).

# Variable speed drives

## Easy Altivar 310

An optimized offer



ATV310H037N4E with door on front panel open



Remote terminal with cover closed



Remote terminal with cover open: RUN, FWD/REV and STOP buttons accessible



Multi-Loader configuration tool

### An optimized offer (continued)

#### Easy to install

Easy Altivar 310 drives can be easily and quickly installed as:

- they are easy and quick to wire due to their Plug & Play concept
- they can be identified on the front panel
- they can be mounted side by side to save cabinet space
- power terminal and connection labels are easily identified and differentiated
- a connection guide is shown inside the front cover

#### Easy to commission

##### Human-Machine Interface (integrated keypad)

The 4-digit display **1** can be used to display status and detected fault information, access parameters, and modify them via the navigation button **2**.

The RUN and STOP buttons **3** can be made accessible on the front panel by removing the blanking plate **4** from the door; they must be configured in order to be active.

##### Remote display terminal

The Easy Altivar 310 drive can be connected to a remote display terminal, available as an option. This terminal can be mounted on an enclosure door with IP54 or IP65 degree of protection. The maximum operating temperature is 50 °C/122 °F. It provides access to the same functions as the Human-Machine interface.

##### Simple Loader and Multi-Loader configuration tools

The Simple Loader tool enables one powered-up drive's configuration to be duplicated on another powered-up drive. Operation is very simple.

The Multi-Loader tool enables configurations from a PC or drive to be copied and duplicated on another drive; the drives do not need to be powered up. The configuration can be loaded onto the drive without taking it out of its packaging.

#### Easy to maintain

The drive alerts the user when it is necessary to clean the heatsink or replace the cooling fan. This fan, which is the only wearing part, can be changed without the need for any tools.

An access code allowing authorized people to configure applications and settings in Configuration mode helps to ensure system security. Non-authorized users are only able to use Monitoring mode (parameter display).

#### Main characteristics

##### Analog input AI1

One software-configurable voltage or current analog input:

- Voltage analog input: 0...5 V  $\overline{\text{DC}}$  (internal power supply only) or 0...10 V  $\overline{\text{DC}}$ , impedance 30 k $\Omega$
- Analog current input: X-Y mA by programming X and Y from 0–20 mA, impedance 250  $\Omega$

Sampling time: < 20 ms

Resolution: 10 bits

Accuracy:  $\pm 1\%$  at 25 °C/77 °F

Linearity:  $\pm 0.3\%$  of the maximum scale value

Factory setting: Input configured as voltage type

##### Logic input plus LIU

- When the inverter input is in positive logic connection (source mode), AI1 can be used as a logic input by setting the AI1 type to LIU and adding the pull-up resistor (15 k $\Omega$ ).
- When the inverter input is in negative logic connection (sink mode), AI1 does not support this use as the LIU logic input.
- When AI1 is used as a logic input, the input impedance is 30 k $\Omega$ ; the maximum input voltage of the AI1 port is 20 V (for internal or external power supply):
  - If  $\leq 3$  V, state 0
  - If  $\geq 7$  V, state 1

##### Analog output AO1

One software-configurable voltage or current analog output:

- Analog voltage output: 0...10 V  $\overline{\text{DC}}$ , minimum load impedance 470  $\Omega$
- Analog current output: 0–20 mA, maximum load impedance 800  $\Omega$

Sampling time: < 10 ms

Resolution: 8 bits

Accuracy:  $\pm 1\%$  at 25 °C/77 °F

##### Relay outputs R1A, R1B, R1C

One protected relay output, 1 NO contact and 1 NC contact with common point

Response time: 30 ms maximum

Minimum switching capacity: 5 mA for 24 V  $\overline{\text{DC}}$

Maximum switching capacity:

- On resistive load ( $\cos \varphi = 1$  and  $L/R = 0$  ms): 3 A at 250 V  $\sim$  or 4 A at 30 V  $\overline{\text{DC}}$
- On inductive load ( $\cos \varphi = 0.4$  and  $L/R = 7$  ms): 2 A at 250 V  $\sim$  or 30 V  $\overline{\text{DC}}$

##### Logic inputs LI1...LI4

Four programmable logic inputs, compatible with PLC level 1, standard IEC/EN 61131-2

24 V  $\overline{\text{DC}}$  internal power supply or 24 V  $\overline{\text{DC}}$  external power supply (min. 18 V, max. 30 V)

Sampling time: < 20 ms

Sampling time tolerance:  $\pm 1$  ms

Factory-set with 2-wire control in "transition" mode for machine usability reasons:

- LI1: forward
- LI2...LI4: not assigned

Multiple assignment makes it possible to configure several functions on one input (for example: LI1 assigned to forward and preset speed 2, LI3 assigned to reverse and preset speed 3)

Impedance 3.5 k $\Omega$

##### Logic output LO1

One 24 V  $\overline{\text{DC}}$  logic output assignable as positive logic (source) or negative logic (sink) open collector type, compatible with PLC level 1, standard IEC/EN 61131-2

Maximum voltage: 30 V

Linearity:  $\pm 1\%$

Maximum current: 100 mA (1)

Impedance: 1 k $\Omega$

Update time: < 20 ms

(1) The maximum current for logic output LO1 is 100 mA when the internal or external 24 V power supply powers LO1 only. If the internal 24 V power supply also powers the logic inputs, the maximum current is 80 mA.

# Variable speed drives

## Easy Altivar 310

### Drives for asynchronous motors



ATV310H037N4E



ATV310HU15N4E



ATV310HU30N4E



ATV310HU75N4E



ATV310HD15N4E



ATV310HD22N4E

#### Drives for asynchronous motors

Three-phase supply voltage: 380...460 V 50/60 Hz

Motor	Line supply		Easy Altivar 310						Reference (6)	Weight (3)
	Max. line current (2)		Apparent power	Maximum continuous output current (In) (1)	Maximum transient current for 60 s	Dissipated power at maximum output current (In) (1)				
	380 V	460 V	460 V	380 V						
	kW	HP	A	A	kVA	A	A	W		kg/lb
HD	0.37	0.5	2.1	1.8	1.4	1.5	2.3	22.7	ATV310H037N4E	0.800/1.760
HD	0.75	1	3.5	3.1	2.5	2.3	3.5	34.1	ATV310H075N4E	0.800/1.760
HD	1.5	2	6.5	5.4	4.3	4.1	6.2	60.4	ATV310HU15N4E	1.100/2.430
HD	2.2	3	8.8	7.2	5.7	5.5	8.3	75.5	ATV310HU22N4E	1.100/2.430
HD	3	4	11.1	9.2	7.3	7.1	10.7	90.8	ATV310HU30N4E	1.800/3.970
ND	4	5	14.2	11.6	9.3	8.9	9.8	120.4		
HD	4	5	13.7	11.4	9.1	9.5	14.3	115.1	ATV310HU40N4E	1.800/3.970
ND	5.5	7.5	18.0	14.9	15.1	12.1	13.3	158.3		
HD	5.5	7.5	21.3	14.3	11.4	12.6	18.9	162.4	ATV310HU55N4E	1.800/3.970
ND	7.5	10	23.0	19.0	15.1	16.0	17.6	201.9		
HD	7.5	10	26.6	22.4	17.8	17	25.5	241.2	ATV310HU75N4E	3.700/8.160
ND	11	15	29.5	24.8	19.4	22.8	25.1	317.8		
HD	11	15	36.1	30.4	24.2	24	36	337.1	ATV310HD11N4E	3.700/8.160
ND	15	20	38.6	32.5	25.4	30	33	407.0		
HD	15	20	46.5	38.5	30.7	33	49.5	416.0	ATV310HD15N4E	6.300/13.900
ND	18.5	25	46.6	38.8	31.2	36	39.6	451.7		
HD	18.5	25	55.3	45.8	36.5	39	58.5	515.9	ATV310HD18N4E	6.300/13.900
ND	22	30	54.1	45.1	35.7	43	47.3	539.4		
HD	22	30	64.2	53.2	46.2	46	69	568.8	ATV310HD22N4E	8.500/18.700
ND	30	40	71.2	59.2	47	60	66	735.6		
HD	15	20	46.5	38.5	30.7	33	49.5	424.4	ATV310HD15N4EF	6.700/14.800
ND	18.5	25	46.6	38.8	31.2	36	39.6	460.2		
HD	18.5	25	55.3	45.8	36.5	39	58.5	527.8	ATV310HD18N4EF	6.700/14.800
ND	22	30	54.1	45.1	35.7	43	47.3	550.9		
HD	22	30	64.2	53.2	46.2	46	69	593.5	ATV310HD22N4EF	9.700/21.400
ND	30	40	71.2	59.2	47	60	66	765.9		

#### Dimensions (overall)

Drives with heatsinks

	W x H x D	
	mm	in.
ATV310H037N4E	72 x 143 x 130	2.83 x 5.63 x 5.12
ATV310H075N4E	72 x 143 x 140	2.83 x 5.63 x 5.51
ATV310HU15N4E, ATV310HU22N4E	105 x 143 x 151	4.13 x 5.63 x 5.94
ATV310HU30N4E, ATV310HU40N4E, ATV310HU55N4E	140 x 184 x 151	5.51 x 7.24 x 5.94
ATV310HU75N4E, ATV310HD11N4E	150 x 232 x 171	5.91 x 9.13 x 6.73
ATV310HD15N4E, ATV310HD18N4E, ATV310HD15N4EF, ATV310HD18N4EF	180 x 330 x 191	7.09 x 12.99 x 7.52
ATV310HD22N4E, ATV310HD22N4EF	180 x 390 x 212	7.09 x 15.35 x 8.35

- These values are given for a nominal switching frequency of 4 kHz, for use in continuous operation. If operation above 4 kHz needs to be continuous, the nominal drive current should be derated by 10% for 8 kHz and 20% for 12 kHz. The switching frequency can be set between 2 and 12 kHz for all ratings. Above 4 kHz, the drive will reduce the switching frequency automatically in the event of an excessive temperature rise. See the derating curves in the User Manual, available on our [website](#).
- Typical value for the indicated motor power and maximum prospective line Isc:
  - ≤ 4 kW, network short circuit current Isc: ≤ 5 kA
  - > 4 kW, network short circuit current Isc: ≤ 22 kA for Heavy duty, ≤ 5 kA for Normal duty
- Weight of product without packaging.
- Values given for applications requiring significant overload (up to 150% for 60 s).
- Values given for applications requiring slight overload (up to 110% for 60 s).
- Easy Altivar ATV310●●●N4EF drives with integrated EMC filter category C3 with 25 m/82 ft shielded motor cable.



ATV310H037N4S



ATV310H075N4S



ATV310HU30N4S



ATV310HU75N4S

### Drives for synchronous motors

Three-phase supply voltage: 380...460 V 50/60 Hz

Motor	Line supply			Easy Altivar 310			Reference	Weight (3)	
	Power indicated on rating plate (1)	Max. line current (2)	Apparent power	Maximum continuous output current (In) (1)	Maximum transient current for 60 s	Dissipated power at maximum output current (In) (1)			
HD: Heavy duty (4) ND: Normal duty (5)	380 V 460 V		460 V	380 V					
	kW	HP	A	A	kVA	A	A	W	kg/lb
HD	0.37	0.5	2.1	1.8	1.4	1.5	2.3	22.7	ATV310H037N4S 0.800/1.760
HD	0.75	1	3.5	3.1	2.5	2.3	3.5	34.1	ATV310H075N4S 0.800/1.760
HD	1.5	2	6.5	5.4	4.3	4.1	6.2	60.4	ATV310HU15N4S 1.100/2.430
HD	2.2	3	8.8	7.2	5.7	5.5	8.3	75.5	ATV310HU22N4S 1.100/2.430
HD	3	4	11.1	9.2	7.3	7.1	10.7	90.8	ATV310HU30N4S 1.800/3.970
ND	4	5	14.2	11.6	9.3	8.9	9.8	120.4	
HD	4	5	13.7	11.4	9.1	9.5	14.3	115.1	ATV310HU40N4S 1.800/3.970
ND	5.5	7.5	18.0	14.9	15.1	12.1	13.3	158.3	
HD	5.5	7.5	21.3	14.3	11.4	12.6	18.9	162.4	ATV310HU55N4S 1.800/3.970
ND	7.5	10	23.0	19.0	15.1	16.0	17.6	201.9	
HD	7.5	10	26.6	22.4	17.8	17	25.5	241.2	ATV310HU75N4S 3.700/8.160
ND	11	15	29.5	24.8	19.4	22.8	25.1	317.8	
HD	11	15	36.1	30.4	24.2	24	36	337.1	ATV310HD11N4S 3.700/8.160
ND	15	20	38.6	32.5	25.4	30	33	407.0	

### Dimensions (overall)

Drives with heatsinks	W x H x D	
	mm	in.
ATV310H037N4S	72 x 143 x 130	2.83 x 5.63 x 5.12
ATV310H075N4S	72 x 143 x 140	2.83 x 5.63 x 5.51
ATV310HU15N4S, ATV310HU22N4S	105 x 143 x 151	4.13 x 5.63 x 5.94
ATV310HU30N4S, ATV310HU40N4S, ATV310HU55N4S	140 x 184 x 151	5.51 x 7.24 x 5.94
ATV310HU75N4S, ATV310HD11N4S	150 x 232 x 171	5.91 x 9.13 x 6.73

(1) These values are given for a nominal switching frequency of 4 kHz, for use in continuous operation.

If operation above 4 kHz needs to be continuous, the nominal drive current should be derated by 10% for 8 kHz and 20% for 12 kHz.

The switching frequency can be set between 2 and 12 kHz for all ratings.

Above 4 kHz, the drive will reduce the switching frequency automatically in the event of an excessive temperature rise.

See the derating curves in the User Manual, available on our [website](#).

(2) Typical value for the indicated motor power and maximum prospective line Isc:

• ≤ 4 kW, network short circuit current Isc: ≤ 5 kA

• > 4 kW, network short circuit current Isc: ≤ 22 kA for Heavy duty, ≤ 5 kA for Normal duty

(3) Weight of product without packaging.

(4) Values given for applications requiring significant overload (up to 150% for 60 s).

(5) Values given for applications requiring slight overload (up to 110% for 60 s).

#### Configuration tools

Description	For drives	Reference	Weight kg/ lb
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#### Simple Loader, Multi-Loader configuration tools and associated cordsets

<b>Simple Loader tool</b> For duplicating one drive configuration on another drive. The drives must be powered-up. The tool is supplied with a cordset equipped with 2 RJ45 connectors.	ATV310H●●●N4●	VW3A8120	—
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<b>Multi-Loader tool 1</b> For copying a configuration on a PC or drive and duplicating it on another drive. The drives do not need to be powered-up. Supplied with the tool: <ul style="list-style-type: none"> <li>■ 1 cordset equipped with 2 RJ45 connectors</li> <li>■ 1 cordset equipped with a USB type A connector and a USB Mini-B type connector</li> <li>■ 1x 2 GB SD memory card</li> <li>■ 1 female/female RJ45 adapter</li> <li>■ 4x AA/LR6 1.5 V batteries</li> </ul>	ATV310H●●●N4●	VW3A8121	—
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Configuring the drive in its packaging with the Multi-Loader tool VW3A8121

#### Remote display terminals and associated cordsets

Description	Degree of protection	For drives	Reference	Weight kg/ lb
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<b>Remote display terminals</b> For mounting the Human-Machine interface on an enclosure door with IP54 or IP65 degree of protection. A remote-mounting cordset VW3A1104R●● is also required.	IP54	ATV310H●●●N4●	VW3A1006	0.250/ 0.550
	IP65	ATV310H●●●N4●	VW3A1007	0.275/ 0.610

<b>Remote-mounting cordsets</b> equipped with 2 RJ45 connectors. For connecting the VW3A1 006 or VW3A1007 remote display terminal to the Easy Altivar 310 drive.	Length: 1 m/3.28 ft	ATV310H●●●N4●	VW3A1104R10	0.050/ 0.110
	Length: 3 m/9.84 ft	ATV310H●●●N4●	VW3A1104R30	0.150/ 0.330

#### Dimensions (overall)

Remote display terminal	W x H x D	
	mm	in.
VW3A1006	50 x 70 x 22.7	1.97 x 2.76 x 0.89
VW3A1007	66 x 106 x 26.7	2.6 x 4.17 x 1.05



VW3A1006 with cover open: RUN, FWD/REV and STOP buttons accessible

## Presentation

### EMC filters

The additional EMC input filters enable the drives to meet more stringent requirements:

- They are designed to reduce conducted emissions on the line supply below the limits of standard IEC 61800-3 category C3.
- They extend the maximum motor cable length for IEC 61800-3 category C3.



VW3A4422

## References

### EMC filters

Drive reference	380 V line input current (A)		EMC filter reference	EN 61800-3	
	HD	ND		Conducted emissions	Radiated emissions
ATV310H037N4●	2.1	–	<a href="#">VW3A4422</a>	C3	C3
ATV310H075N4●	3.5	–		maximum shielded cable length 25 m	maximum shielded cable length 5 m
ATV310HU15N4●	6.5	–			
ATV310HU22N4●	8.8	–			
ATV310HU30N4●	11.1	14.2	<a href="#">VW3A31406</a>		
ATV310HU40N4●	13.7	18			
ATV310HU55N4●	21.3	23			
ATV310HU75N4●	26.6	29.5	<a href="#">VW3A4425</a>		
ATV310HD11N4●	36.1	38.6			
ATV310HD15N4E	46.5	46.6			
ATV310HD18N4E	55.3	54.1	<a href="#">VW3A31410</a>		
ATV310HD22N4E	64.2	71.2			

### Presentation

#### Line chokes

A line choke can be used to provide improved protection against overvoltages on the line supply and to reduce harmonic distortion of the current produced by the drive. They are recommended for ATV310...N4E/N4S drives. The recommended chokes limit the line current. They have been developed in line with standard EN 50178 (VDE 0160 level 1 high energy overvoltages on the line supply).

The choke values are defined for a voltage drop between phases of between 3% and 5% of the nominal supply voltage. Values higher than this will cause loss of torque.

These chokes should be installed upstream of the drive.

The use of line chokes is recommended in particular under the following circumstances:

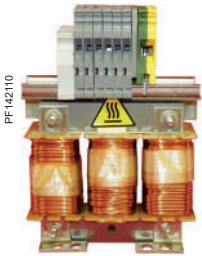
- Close connection of several drives in parallel
- Line supply with significant disturbance from other equipment (interference, overvoltages)
- Line supply with voltage imbalance between phases above 1.8% of the nominal voltage
- Drive supplied by a line with very low impedance (in the vicinity of a power transformer 10 times more powerful than the drive rating)
- Installation of a large number of frequency inverters on the same line
- Reducing overloads on the cosφ correction capacitors, if the installation includes a power factor correction unit

### References

#### Line chokes

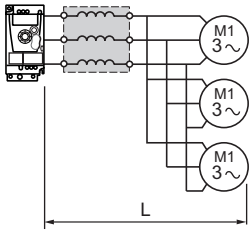
For drives

	Duty	Line current without choke		Line current with choke		Choke Reference	Weight
		380 V	460 V	380 V	460 V		
		A	A	A	A		
ATV310H037N4●	HD	2.1	1.8	1.1	1	VW3A4551	1.5/3.31
ATV310H075N4●	HD	3.5	3.1	1.9	1.7		
ATV310HU15N4●	HD	6.5	5.4	3.5	2.9	VW3A4552	3.7/8.16
ATV310HU22N4●	HD	8.8	7.2	5.1	4.4		
ATV310HU30N4●	HD	11.1	9.2	6.6	5.6		
	ND	14.2	11.6	8.5	7.1		
ATV310HU40N4●	HD	13.7	11.4	8.5	7.7	VW3A4553	4.1/9.04
	ND	18	14.9	11.6	9.9		
ATV310HU55N4●	HD	21.3	14.3	11.6	9.9		
	ND	23	19	15.3	12.8		
ATV310HU75N4●	HD	26.6	22.4	16.1	14.2	VW3A4554	6.15/13.23
	ND	29.5	24.8	22.2	18.8		
ATV310HD11N4●	HD	36.1	30.4	22	18.3		
	ND	38.6	32.5	29.9	25		
ATV310HD15N4E	HD	46.5	38.5	28.9	24.4		
	ND	46.6	38.8	29	29		
ATV310HD18N4E	HD	55.3	45.8	36.4	31.6	VW3A4555	11/24.25
	ND	54.1	45.1	41.8	35.3		
ATV310HD22N4E	HD	64.2	53.2	42.4	36.3		
	ND	71.2	59.2	57.2	48.3	VW3A4556	16/35.27
ATV310HD15N4EF	HD	46.5	38.5	28.9	24.4	VW3A4554	6/13.23
	ND	46.6	38.8	29	29		
ATV310HD18N4EF	HD	55.3	45.8	36.4	31.6	VW3A4555	11/24.25
	ND	54.1	45.1	41.8	35.3		
ATV310HD22N4EF	HD	64.2	53.2	42.4	36.3		
	ND	71.2	59.2	57.2	48.3	VW3A4556	16/35.27



VW3A455●

PF142110



VW3A455 ● motor choke

### Presentation

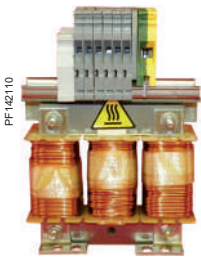
#### Motor chokes

Motor chokes are required:

- When connecting more than two motors in parallel
- When the motor cable length (L), including tap-offs, is:
  - 25 m/82 ft maximum for a shielded motor cable (1)
  - 50 m/164 ft maximum for an unshielded motor cable (1)

Motor chokes can be inserted between the Altivar ATV310 drive and the motor to:

- Limit the dv/dt at the motor terminals (500 to 1500 V/μs), for cables longer than 50 m/164 ft
- Filter interference caused by the opening of a contactor placed between the filter and the motor
- Reduce the motor ground leakage current
- Smooth the motor current wave form to reduce motor noise



VW3A455 ●

### References

#### Motor chokes (2)

Drive reference	Duty	Rated current A	Power loss W	Choke reference
ATV310H037N4●	HD	4	45	VW3A4551
ATV310H075N4●	HD			
ATV310HU15N4●	HD	10	65	VW3A4552
ATV310HU22N4●	HD			
ATV310HU30N4●	HD			
	ND			
ATV310HU40N4●	HD			
	ND	17	75	VW3A4553
ATV310HU55N4●	HD			
	ND			
ATV310HU75N4●	HD	31	90	VW3A4554
	ND			
ATV310HD11N4●	HD			
	ND			
ATV310HD15N4E	HD	60	94	VW3A4555
	ND			
ATV310HD18N4E	HD			
	ND			
ATV310HD22N4E	HD			
	ND	107	260	VW3A4556
ATV310HD15N4EF	HD	60	94	VW3A4555
	ND			
ATV310HD18N4EF	HD			
	ND			
ATV310HD22N4EF	HD			
	ND	107	260	VW3A4556

#### Dimensions (overall)

Line chokes or motor chokes	W x H x D	
	mm	in.
VW3A4551	100 x 135 x 60	3.94 x 5.31 x 2.36
VW3A4552, VW3A4553	130 x 155 x 90	5.12 x 6.1 x 3.54
VW3A4554	155 x 170 x 135	6.1 x 6.69 x 5.31
VW3A4555	180 x 210 x 160	7.1 x 8.27 x 6.30
VW3A4556	270 x 210 x 180	10.63 x 8.27 x 7.09

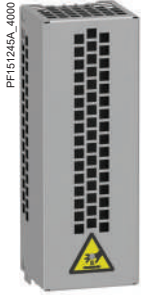
(1) Motor cable length given for a switching frequency of 4 kHz.

(2) With motor chokes, all the drives in the range can be used with a maximum cable length of 100 m/328 ft for shielded motor cables and 200 m/656 ft for unshielded motor cables.

# Variable speed drives

## Easy Altivar 310

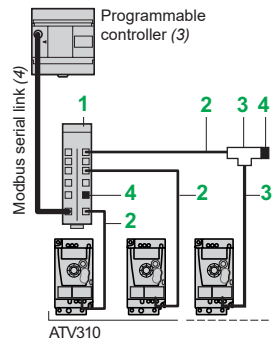
Options: braking resistors, Modbus serial link



VW3A7730

Braking resistors						
For drives	Minimum Ohmic value	Ohmic value at		Power available at	Reference	Weight
		20 °C/68 °F	50 °C/122 °F (1)			
	Ω	Ω	W			kg/lb
<b>Unprotected resistor (IP00) (2)</b>						
ATV310HU15N4●	80	100	28	VW3A7723		0.600/1.320
ATV310HU22N4●	60					
ATV310HU30N4●	36	100	35	VW3A7725		0.850/1.870
ATV310HU40N4●	36					
<b>Protected resistor (IP20 or IP23)</b>						
ATV310HU15N4●	80	100	100	VW3A7730		1.500/3.306
ATV310HU22N4●	60					
ATV310HU30N4●	36					
ATV310HU40N4●	36					
ATV310HU55N4●	28	60	160	VW3A7731		2.000/4.409
ATV310HU75N4●	28					
ATV310HD11N4●	28	28	300	VW3A7732		3.000/6.613
ATV310HD15N4E	16	16	960	VW3A7733		4.000/8.818
ATV310HD18N4E	10	16	960			
ATV310HD22N4E	10	16	960			
ATV310HD15N4EF	16	16	960			
ATV310HD18N4EF	10	16	960			
ATV310HD22N4EF	10	16	960			

Dimensions (overall)		
Braking resistors	W x H x D	
	mm	in.
VW3A7723	60 x 170 x 30	2.36 x 6.659 x 1.18
VW3A7725	62 x 212 x 36	2.44 x 8.35 x 1.42
VW3A7730	105 x 295 x 100	4.13 x 11.61 x 3.94
VW3A7731	105 x 345 x 100	4.13 x 13.58 x 3.94
VW3A7732	175 x 345 x 100	6.89 x 13.58 x 3.94
VW3A7733	190 x 570 x 180	7.48 x 22.44 x 7.09



Example of Modbus diagram with connection via splitter box and RJ45 connectors

Modbus serial link					
Description	Item no.	Length m/ft	Unit reference	Weight kg/lb	
<b>Connection via splitter box and RJ45 connectors</b>					
<b>Modbus splitter box</b> 10 RJ45 connectors and 1 screw terminal	1	–	LU9GC3	0.500/1.100	
<b>Cordsets for Modbus serial link</b> equipped with 2 RJ45 connectors	2	0.3/0.98	VW3A8306R03	0.025/0.060	
		1/3.28	VW3A8306R10	0.060/0.060	
		3/9.84	VW3A8306R30	0.130/0.290	
<b>Modbus T-junction boxes</b> (with integrated cable)	3	0.3/0.98	VW3A8306TF03	0.190/0.420	
		1/3.28	VW3A8306TF10	0.210/0.460	
<b>Line terminators (5) (6)</b> For RJ45 connector	4	R = 120 Ω C = 1 nf	VW3A8306RC	0.010/0.020	
		R = 150 Ω	VW3A8306R	0.010/0.020	

(1) Load factor for resistors: the value of the average power that can be dissipated at 50 °C from the resistor into the casing is determined for a load factor during braking that corresponds to the majority of normal applications.

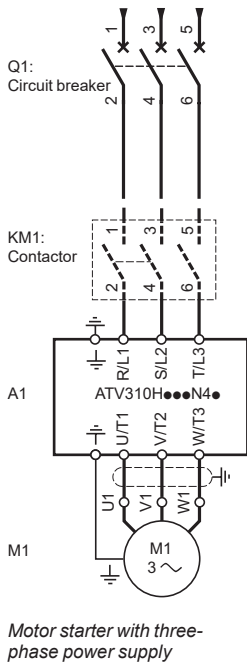
(2) For unprotected resistors, add a thermal overload device.

(3) Please refer to the programmable controller catalog on our [website](#).

(4) Cable depends on the type of controller or PLC.

(5) Order in multiples of 2.

(6) Depends on the bus architecture.



### Applications

The proposed combinations can:

- Help to protect people and equipment (when a short-circuit occurs)
- Maintain protection upstream of the drive in the event of a short-circuit on the power stage

Two types of combination are possible:

- Drive + circuit-breaker: Minimum combination
- Drive + circuit-breaker + contactor: Minimum combination with contactor when a control circuit is needed

### Motor starters: Circuit breaker + Contactor + Drive

Three-phase supply voltage: 380...460 V 50/60 Hz

Standard power ratings of 50/60 Hz 4-poles motors (1)		Variable speed drive Reference (2)	Circuit breaker		Contactor	
			Magnetic protection rating	Easy TeSys/TeSys (3)	TeSys	
kW	HP		A	Reference	I <sub>rm</sub> A	Reference (4)
Three-phase supply: 380...460 V, 50/60 Hz						
0.37	0.5	ATV310H037N4●	2.5	GZ1LE07	33.5	LC1E09●●●●
0.75	1	ATV310H075N4●	4	GZ1LE08	51	
1.5	2	ATV310HU15N4●	10	GZ1LE14	138	LC1E18●●●●
2.2	3	ATV310HU22N4●	14	GZ1LE16	170	LC1E32●●●●
3	4	ATV310HU30N4●	18	GZ1LE20	223	
4	5.4	ATV310HU40N4●				
5.5	7.4	ATV310HU55N4●	25	GZ1LE22	327	LC1E38●●●●
7.5	10	ATV310HU75N4●	32	GZ1LE32	416	LC1E50●●●●
11	15	ATV310HD11N4●	40	GV3L40	560	LC1D50A●●●●
15	20	ATV310HD15N4E●	50	GV3L50	700	
18.5	25	ATV310HD18N4E●	65	GV3L65	910	LC1D65A●●●●
22	30	ATV310HD22N4E●	73	GV3L73	1120	LC1D80●●●●

(1) Rated at 400/415 V.

(2) ATV310H●●●N4E and ATV310●●●N4S.

(3) Easy Tesys and Tesys magnetic motor circuit breakers.

(4) For 220 V, 50/60 Hz AC control circuit. For other control voltages, please refer to the [Easy TeSys catalog](#).

<b>A</b>		LC1D50ASD	13	LC1D80M7	13	LC1E1810F6	13	LC1E50B5	13
ATV310H037N4E	6	LC1D50AT7	13	LC1D80MD	13	LC1E1810F7	13	LC1E50B7	13
ATV310H037N4S	7	LC1D50AU7	13	LC1D80MW	13	LC1E1810M5	13	LC1E50E7	13
ATV310H075N4E	6	LC1D50AV7	13	LC1D80N7	13	LC1E1810M6	13	LC1E50F5	13
ATV310H075N4S	7	LC1D50AW7	13	LC1D80P5	13	LC1E1810M7	13	LC1E50F6	13
ATV310HD11N4E	6	LC1D50AX7	13	LC1D80P7	13	LC1E1810N5	13	LC1E50F7	13
ATV310HD11N4S	7	LC1D50AB5	13	LC1D80Q5	13	LC1E1810P7	13	LC1E50M5	13
ATV310HD15N4E	6	LC1D50AD5	13	LC1D80Q7	13	LC1E1810Q5	13	LC1E50M6	13
ATV310HD15N4EF	6	LC1D50AE5	13	LC1D80R7	13	LC1E1810Q7	13	LC1E50M7	13
ATV310HD18N4E	6	LC1D50AP5	13	LC1D80S5	13	LC1E1810U5	13	LC1E50N5	13
ATV310HD18N4EF	6	LC1D65AB6	13	LC1D80SD	13	LC1E1801BD	13	LC1E50P7	13
ATV310HD22N4E	6	LC1D65AB7	13	LC1D80SW	13	LC1E1810BD	13	LC1E50Q5	13
ATV310HD22N4EF	6	LC1D65ABD	13	LC1D80T6	13	LC1E3201B5	13	LC1E50Q7	13
ATV310HU15N4E	6	LC1D65AD7	13	LC1D80U5	13	LC1E3201B7	13	LC1E50U5	13
ATV310HU15N4S	7	LC1D65AE7	13	LC1D80U7	13	LC1E3201E7	13	LC1E50BD	13
ATV310HU22N4E	6	LC1D65AED	13	LC1D80V7	13	LC1E3201F5	13	LC1E506M7	13
ATV310HU22N4S	7	LC1D65AF7	13	LC1D80W6	13	LC1E3201F7	13	LU9GC3	12
ATV310HU30N4E	6	LC1D65AFE7	13	LC1D80X6	13	LC1E3201M5	13	<b>V</b>	
ATV310HU30N4S	7	LC1D65AG7	13	LC1E0901B5	13	LC1E3201M7	13	VW3A1006	8
ATV310HU40N4E	6	LC1D65AGD	13	LC1E0901B7	13	LC1E3201N5	13	VW3A1007	8
ATV310HU40N4S	7	LC1D65AJD	13	LC1E0901E7	13	LC1E3201P7	13	VW3A1104R10	8
ATV310HU55N4E	6	LC1D65AK7	13	LC1E0901F5	13	LC1E3201Q5	13	VW3A1104R30	8
ATV310HU55N4S	7	LC1D65AL7	13	LC1E0901F7	13	LC1E3201Q7	13	VW3A31406	9
ATV310HU75N4E	6	LC1D65ALE7	13	LC1E0901M5	13	LC1E3201U5	13	VW3A31410	9
ATV310HU75N4S	7	LC1D65AM7	13	LC1E0901M7	13	LC1E3210B5	13	VW3A4422	9
<b>G</b>		LC1D65AMD	13	LC1E0901N5	13	LC1E3210B7	13	VW3A4425	9
GV3L40	13	LC1D65AN7	13	LC1E0901P7	13	LC1E3210E7	13	VW3A4551	10
GV3L50	13	LC1D65AND	13	LC1E0901Q5	13	LC1E3210F5	13		11
GV3L65	13	LC1D65AP7	13	LC1E0901Q7	13	LC1E3210F6	13	VW3A4552	10
GV3L73	13	LC1D65AQ7	13	LC1E0901U5	13	LC1E3210F7	13		11
GZ1LE07	13	LC1D65AR7	13	LC1E0910B5	13	LC1E3210M5	13	VW3A4553	10
GZ1LE08	13	LC1D65AS7	13	LC1E0910B7	13	LC1E3210M6	13		11
GZ1LE14	13	LC1D65ASD	13	LC1E0910E7	13	LC1E3210M7	13	VW3A4554	10
GZ1LE16	13	LC1D65AT7	13	LC1E0910F5	13	LC1E3210N5	13		11
GZ1LE20	13	LC1D65AU7	13	LC1E0910F6	13	LC1E3210P7	13	VW3A4555	10
GZ1LE22	13	LC1D65AV7	13	LC1E0910F7	13	LC1E3210Q5	13		11
GZ1LE32	13	LC1D65AW7	13	LC1E0910M5	13	LC1E3210Q7	13	VW3A4556	10
<b>L</b>		LC1D65AX7	13	LC1E0910M6	13	LC1E3210U5	13		11
LC1D50AB6	13	LC1D65AB5	13	LC1E0910M7	13	LC1E3201BD	13	VW3A7723	12
LC1D50AB7	13	LC1D65AD5	13	LC1E0910N5	13	LC1E3210BD	13	VW3A7725	12
LC1D50ABD	13	LC1D65AE5	13	LC1E0910P7	13	LC1E3801B7	13	VW3A7730	12
LC1D50ACD	13	LC1D65AP5	13	LC1E0910Q5	13	LC1E3801E7	13	VW3A7731	12
LC1D50AD7	13	LC1D80B5	13	LC1E0910Q7	13	LC1E3801F7	13	VW3A7732	12
LC1D50AE7	13	LC1D80B7	13	LC1E0910R5	13	LC1E3801M5	13	VW3A7733	12
LC1D50AED	13	LC1D80BD	13	LC1E0910U5	13	LC1E3801M7	13	VW3A8120	8
LC1D50AF7	13	LC1D80BD	13	LC1E0901BD	13	LC1E3801N5	13	VW3A8121	8
LC1D50AFC7	13	LC1D80CW	13	LC1E0910BD	13	LC1E3801P7	13	VW3A8306R	12
LC1D50AFD	13	LC1D80D7	13	LC1E1801B5	13	LC1E3801Q7	13	VW3A8306R03	12
LC1D50AFE7	13	LC1D80E5	13	LC1E1801B7	13	LC1E3801U5	13	VW3A8306R10	12
LC1D50AG7	13	LC1D80E7	13	LC1E1801E7	13	LC1E3801U5	13	VW3A8306R30	12
LC1D50AGD	13	LC1D80ED	13	LC1E1801F5	13	LC1E3810B5	13	VW3A8306RC	12
LC1D50AJD	13	LC1D80F5	13	LC1E1801F7	13	LC1E3810B7	13	VW3A8306TF03	12
LC1D50AK7	13	LC1D80F7	13	LC1E1801M5	13	LC1E3810E7	13	VW3A8306TF10	12
LC1D50AL7	13	LC1D80FD	13	LC1E1801M7	13	LC1E3810F5	13		
LC1D50ALE7	13	LC1D80FE7	13	LC1E1801N5	13	LC1E3810F7	13		
LC1D50AM7	13	LC1D80FE7	13	LC1E1801N5	13	LC1E3810M5	13		
LC1D50AMD	13	LC1D80FW	13	LC1E1801P7	13	LC1E3810M6	13		
LC1D50AN7	13	LC1D80G6	13	LC1E1801Q7	13	LC1E3810M7	13		
LC1D50AND	13	LC1D80G7	13	LC1E1801R5	13	LC1E3810N5	13		
LC1D50AP7	13	LC1D80GD	13	LC1E1801U5	13	LC1E3810P7	13		
LC1D50AQ7	13	LC1D80K7	13	LC1E1810B5	13	LC1E3810Q5	13		
LC1D50AR7	13	LC1D80L6	13	LC1E1810B7	13	LC1E3810U5	13		
		LC1D80L7	13	LC1E1810E7	13	LC1E3801BD	13		
		LC1D80M5	13	LC1E1810F5	13	LC1E3810BD	13		

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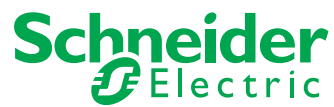
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