

# ALTIVAR® 11 AC Drives



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The ALTIVAR 11 AC drive incorporates sensorless flux vector control (SFV) for improved low-speed torque – and speed regulation over traditional volts per Hertz drives – while offering excellent drive reliability and performance.

ALTIVAR 11 drives additionally feature adjustable switching frequencies up to 16 kHz and can operate in ambient temperatures from -10° to +50°C without derating.

Developed for small machine applications, the multi-functional ALTIVAR 11 drive can also be configured for use as a substitute for two-speed motor applications or as a replacement for DC speed control applications.

Ratings available for the ALTIVAR 11 AC drive include:

- 110/115 V 1-Phase – 1/4 to 1 hp
- 200/230 V 1-Phase – 1/4 to 3 hp
- 200/230 V 3-Phase – 1/4 to 3 hp

### Key Benefits

#### Flexibility

- Compact design in an IP20 enclosure available in three unit sizes ranging from 10 to 16.6 kmm<sup>2</sup>.
- Mounting options include wall mount, DIN rail, heatsinkless and side-by-side (up to 40°C).

#### Reliability

- Designed to conform to the following standards: UL, CSA, NOM, CE and C-Tick.
- Features built-in drive and motor overload thermal protection.
- Operates in an ambient temperature range of -10° to 50°C without derating.

#### Ease of Use

- Small size allows for quick installation.
- Contactor style through wiring simplifies installation and saves space.
- Compact design and side-by-side mounting reduces panel space requirements.
- Built-in keypad with LED display.

### Product Applications

- Conveyors/material handling
- Packaging machines
- Process machines
- Control panels
- HVAC/air handling equipment
- Pumps and fans

### Options

- POWERSUITE™ products for easy commissioning and file transfer
- EMC filters and mounting plate
- DIN-rail kit
- Braking module
- Replacement fan kits



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## Details Make a Difference — ALTIVAR® 11 AC Drive

- **Sensorless flux vector (SFV)**
- **More compact than ALTIVAR 28 drive**
- **POWERSUITE™ compatible to allow commissioning and file transfer**
- **Rated to 50°C**
- **CE compliant (with EMC filter options)**
- **Screw clamp terminals for easy wiring**
- **DIN-rail mount**
- **Analog output**
- **Internal radio frequency interference (RFI) filters**
- **Top and bottom style power wiring (contactor style)**
- **Adjustable switching frequency (2 to 16 kHz)**
- **Internal keypad display standard**
- **IP20 design**



## Selection Guide — ALTIVAR® 11 AC Drive\*

Voltage +10%/-15% 50/60 Hz ±5%			Motor	Nominal Current Rating
Input	Output	Catalog Number	HP	Amp
115 V single phase	230 V three phase	ATV11HU05F1U	0.25	1.6
		ATV11HU09F1U	0.5	2.4
		ATV11HU18F1U	1	4.6
		ATV11PU09F1U	0.5	2.4
230 V single phase	230 V three phase	ATV11HU05M2U	0.25	1.6
		ATV11HU09M2U	0.5	2.4
		ATV11HU18M2U	1	4.6
		ATV11HU29M2U	2	7.5
		ATV11HU41M2U	3	10.6
		ATV11PU09M2U	0.5	2.4
		ATV11PU18M2U	1	4.6
230 V three phase	230 V three phase	ATV11HU05M3U	0.25	1.6
		ATV11HU09M3U	0.5	2.4
		ATV11HU18M3U	1	4.6
		ATV11HU29M3U	2	7.5
		ATV11HU41M3U	3	10.6
		ATV11PU09M3U	0.5	2.4
		ATV11PU18M3U	1	4.6

\*for asynchronous motors from .25 to 3 hp (0.18 to 2.2 kW)



### Environmental Specifications

Electromagnetic compatibility (EMC)	IEC/EN 61000-4-2 Level 3 IEC/EN 61000-4-3 Level 3 IEC/EN 61000-4-4 Level 4 IEC/EN 61000-4-5 Level 3 (POWER ACCESS) IEC/EN 61800-3, Environments 1 and 2
Conducted and radiated emissions for drive controllers	ATV11HU05**U: HU41**U and ATV11HU05**A; HU41**A: With additional EMC filter: EN 55011, En 55022 Class B, 2 to 16 kHz for motor cable ≤ 5 m and Class A (Group 1), 2 to 16 kHz for motor cables ≤ 20 m
CE markings/standards	The drive controllers are CE marked on the basis of European directives relating to low voltage (73/23/EEC and 93/68/EEC and EMC (89/336/EEC) UL, CSA, NOM 117 and C-TICK
Degree of protection	IP20
Vibration resistance <sup>1</sup>	Per IEC/EN 60068-2-6 • 1.5 mm peak from 3 to 13 Hz • 1 gn from 13 to 200 Hz
Shock resistance	15 gn for 11 ms per IEC/EN60068-2-27
Maximum relative humidity	5: 93% non-condensing and without dripping, per IEC 60068-2-3
Maximum ambient temperature	Storage -25: +65°C (-13 to +156°F) Operating: -10: +50°C (14 to +122°F) by removing the protective cover from the top of the drive controller. Up to +60°C, derate the current by 2.2% for every °C above 50°C
Maximum altitude	1000m (3280 ft.) without derating Above 1000m, derate the current by 1% for each additional 100m (328 ft.)

### Electrical Characteristics

Output frequency	0: 200 Hz
Switching frequency	2: 16 kHz
Speed range	1: 20
Transient overtorque	150% of rated motor torque
Braking torque	• 20% of nominal motor torque without dynamic braking (typical value). Up to 150% with optional dynamic braking resistor.
Maximum transient current	150% of rated drive controller current for 60 seconds
Input	Frequency (Hz) Voltage (V) Fault withstand (A)
	50 ±5% or 60 ±5% ATV 11**U**F1•, 1-phase: 110 -15% 120 +10% ATV 11•U**M2•, 1-phase: 200 -15% 240 +10% ATV11•U**M3•, 3-phase: 200 -15% 230 +15% ≤ 1000 (prospective short-circuit current at connecting point) for 1-phase power supply ≤ 5000 (prospective short-circuit current at connecting point) for 3-phase power supply
Output voltage	Maximum 3-phase voltage equal to: the supply network voltage for ATV11•U**M2• twice the supply network voltage for ATV11•U**F1•
Galvanic isolation Protection	Galvanic isolation between power and control (inputs, outputs, power supplies) Protected against short circuits and overloads: +5 V (0/_5%) for speed reference potentiometer (2.2 at 10 k ohms, max. 10 mA +15 V (±15%) for control inputs, max. 100 mA
Analog input, AI1	1 programmable analog input Max. sampling time: 20 ms, resolution 0.4%, linearity ±5% • voltage 0 to 5 V or 0 to 10 V, impedance 40 k ohms • current 0 to 20 mA or 4 to 20 mA (without added resistance), impedance 250 ohms

[1] Pulse with modification

continued

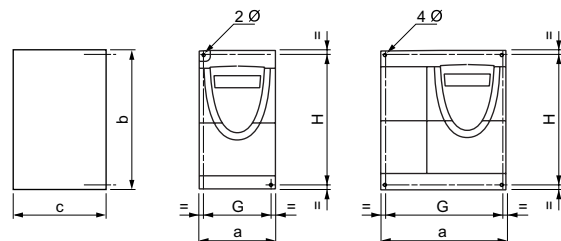
## Specifications, continued — ALTIVAR® 11 AC Drive

### Electrical Characteristics, continued

Logic inputs, LI	Four programmable logic inputs, impedance 5 k ohms Power supply: + internal 15 V or external 24 V (min. 11V, max. 30 V) With multiple assignments, several functions can be combined on a single input (example: LI1 assigned to forward and preset speed 2, LI3 assigned to reverse and preset speed 3)
Output, DO/AO	Factory set as an analog output: <ul style="list-style-type: none"> <li>• PWM-type (1) open collector output at 2 kHz. Can be used on a meter</li> <li>• maximum current 10 mA</li> <li>• impedance 1 k ohm, linearity <math>\pm</math>1% max. sampling time, 20 ms</li> </ul> Can be configured as logic output: <ul style="list-style-type: none"> <li>• open collector logic output: impedance 100 ohms, max. 50 mA,</li> <li>• internal voltage (see available internal supplies above)</li> <li>• external voltage max. 30 V: 50 mA</li> </ul>
Relay outputs, RA-RC	One relay (contact open if there is a fault) Min. switching capacity: 10mA for 24 V, ----- Max. switching capacity: B on resistive load (power factor = 1 and L/R = 0 ms): 5 A for 250 V or 30 V B on inductive load (power factor = 0.4 and L/R = 7 ms): 2 A for 250 V or 30 V
Drive controller protection	Thermal protection against overheating Short circuit protection between output phases Overcurrent protection between output and ground phases at power-up only Overvoltage and undervoltage protection Single-phasing protection, in 3-phase
Motor protection	Thermal protection integrated in the drive controller by I <sup>2</sup> t calculation Thermal memory erased at power-up
Frequency resolution	Display: 0.1 Hz Analog inputs: 0.1 Hz for max. 200 Hz

## Dimensions and Weights — ALTIVAR® 11 AC Drive

Frame		Width		Height		Depth		Weight	
		a		b		C			
	<b>ATV11H*****</b>	in.	mm	in.	mm	in.	mm	kg	lbs.
1	U05**U	2.8	72	5.6	142	4.0	101	0.70	1.55
	U09**U					5.0	125	0.85	1.88
2	U18M*U	2.8	72	5.8	147	5.4	138	0.95	2.10
3	U18F1U	4.6	117	5.6	142	6.1	156	1.6	3.54
	U29**U U41**U								
1	<b>ATV11P</b> All ratings	2.8	72	5.6	142	4.0	101	0.67	1.48



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