

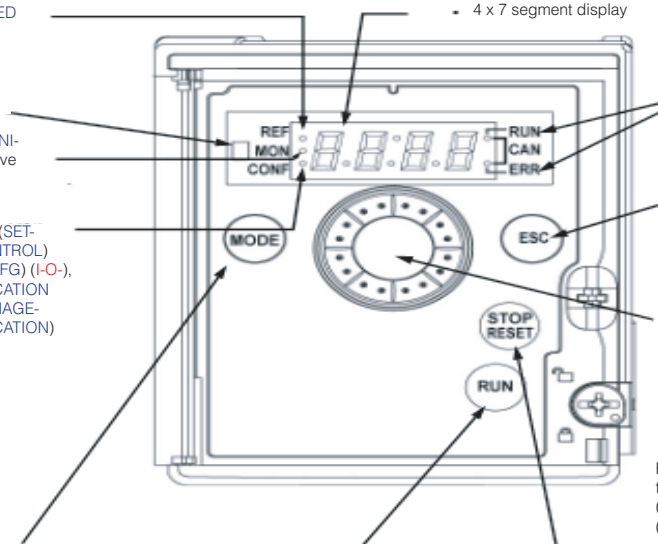
Note: Please refer to the Altivar 312 Installation Manual (BBV46391) and the Altivar 312 Programming Manual (BBV46385) for complete installation and programming instructions.



ATV312H●●●●●●●●

KEYPAD OPERATION

- REF LED, illuminated if (SPEED REFERENCE) (rEF-) menu is active
- Load LED
- MON LED, illuminated if (MONITORING) (SUP-) menu is active
- CONFLD, illuminated if the (SETTINGS) (SEt-), (MOTOR CONTROL) (drC-), (INPUTS/OUTPUTS CFG) (I-O-), (COMMAND) (CtL-), (APPLICATION FUNCT) (FU n-), (FAULT MANAGEMENT) (FLt-) or (COMMUNICATION) (COM-) menus are active



- 2 CANopen status LEDs
- Used to quit a menu or parameter or to clear the value displayed in order to revert to the value in the memory
- In LOCAL configuration, 2s press on ESC button switches between the control/programming modes
- Jog dial- can be used for navigation by turning it clockwise or counter-clockwise - pressing the jog dial enables the user to make a selection or confirm information



Functions as a potentiometer in LOCAL configuration and in REMOTE configuration if (Ref. 1 channel) (Fr1-) in the (COMMAND) (CtL-) menu is set to (Image input AIV1) (AIV1)

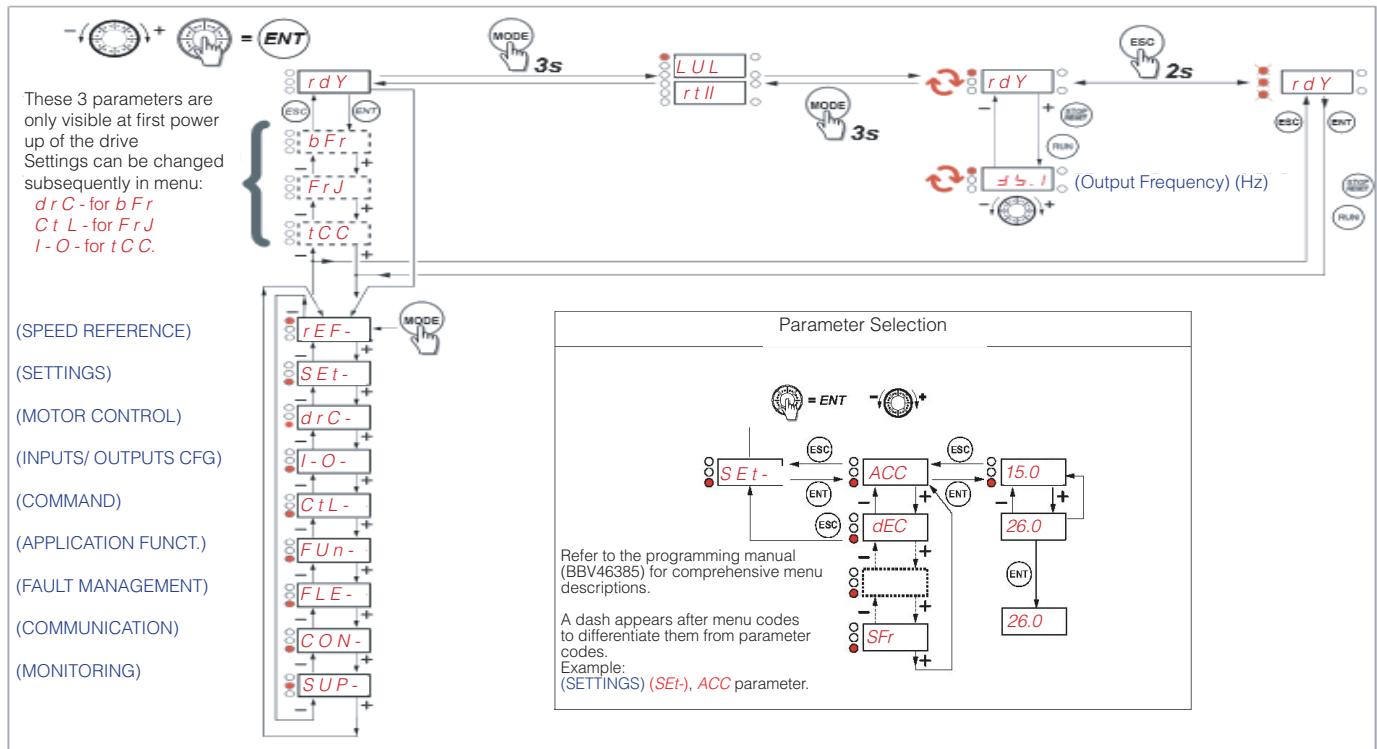
MODE button (1): 3s press on MODE button switches between the REMOTE/LOCAL configurations. If (SPEED REFERENCE) (rEF-) is displayed, this will take you to the (SETTINGS) (SEt-) menu. If not, it will take you to the (SPEED REFERENCE) (rEF-) menu.

RUN button: Controls powering up of the motor for forward running in LOCAL configuration and in REMOTE configuration if the (2/3 wire control) (tCC) parameter in the (INPUTS/OUTPUTS CFG) (I-O-) menu is set to (Local) (LOC). page 47 (could be hidden by door if function disabled)

STOP/RESET button

- Enables detected fault to be reset
- Can be used to control motor stopping
 - * If (2/3 wire control) (tCC) is not set to (Local) (LOC), freewheel stop
 - * If (2/3 wire control) (tCC) is set to (Local) (LOC), stop on ramp or freewheel stop during DC injection braking

ACCESS TO MENUS



rEF- SPEED REFERENCE Menu

Parameter		Code	Factory Setting
Standard Motor Frequency	-Hz	bFr	50hz
Ref. 1 Channel (analog input source)		Fr1	AI1
2/3 Wire control		tcc	2C
HMI Freq. Reference (trim of input)	-Hz	LFr	0-500hz
Image Input-Jog Dial adjustment	-%	A1U1	0-100%
Freq. Ref (read only)	-Hz	FrH	LSP to HSP Hz

SET- SETTINGS Menu

Parameter		Code	Factory Setting
Speed ref. from remote	-Hz	LFr	
Internal PI regulator ref.	-Hz	rPI	0 Hz
Acceleration ramp time	-s	ACC	3 s
Acceleration ramp time 2	-s	AC2	5 s
Deceleration ramp time 2	-s	dE2	5 s
Deceleration ramp time	-s	dEC	3 s
Start custom accel. Ramp	-%	tA1	10%
End custom accel. Ramp	-%	tA2	10%
Start custom decel. Ramp	-%	tA3	10%
End custom decel. Ramp	-%	tA4	10%
Low speed	-Hz	LSP	0 Hz
High speed	-Hz	HSP	50 Hz
Drive Thermal current	-A	ItH	Drive nameplate
IR compensation	-%	UFR	20%
Gain	-%	FLG	20%
Stability	-%	StA	20%
Slip comp.	-%	SLP	100%
DC injection curr	-A	IdC	0.7 In
DC injection time	-s	tdC	0.5 s
Auto. DC injection time	-s	tdC1	0.5 s
Auto. DC injection curr	-A	SdC1	0.7 In
Auto. DC injection time 2	-s	tdC2	0 s
Auto. DC injection curr 2	-A	SdC2	0.5 In
Skip freq.	-Hz	JPF	0 Hz
Skip freq. 2	-Hz	JF2	0 Hz
Jog operating freq.	-Hz	JGF	10 Hz
PI regulator prop. gain		rPG	1
PI regulator int. gain	-/s	rIG	1/s
PID coeff		FbS	1
PID inversion		PIC	nO
2nd preset PI reference	-%	rP2	30%

SET- SETTINGS Menu Cont.

Parameter		Code	Factory Setting
3rd preset PI reference	-%	rP3	60%
4th preset PI reference	-%	rP4	90%
Preset speed 2	-Hz	SP2	10 Hz
Preset speed 3	-Hz	SP3	15 Hz
Preset speed 4	-Hz	SP4	20 Hz
Preset speed 5	-Hz	SP5	25 Hz
Preset speed 6	-Hz	SP6	30 Hz
Preset speed 7	-Hz	SP7	35 Hz
Preset speed 8	-Hz	SP8	40 Hz
Preset speed 9	-Hz	SP9	45 Hz
Preset speed 10	-Hz	SP10	50 Hz
Preset speed 11	-Hz	SP11	55 Hz
Preset speed 12	-Hz	SP12	60 Hz
Preset speed 13	-Hz	SP13	70 Hz
Preset speed 14	-Hz	SP14	80 Hz
Preset speed 15	-Hz	SP15	90 Hz
Preset speed 16	-Hz	SP16	100 Hz
Current limit	-A	CL1	1.5 In
Current limit 2	-A	CL2	1.5 In
Low speed oper. Time	-s	tLS	0 -no time limit
Restart error threshold		rSL	0
Motor 2 IR compen.	-%	UFR2	20%
Motor 2 freq. loop gain	-%	FLG2	20%
Motor 2 freq. loop stabil.	-%	StA2	20%
Motor 2 slip compen.	-%	SLP2	100%
Frequency Lev.Att	-Hz	Ftd	bFr
Thermal Level Att.	-%	ttd	100%
Current Level Att.	-A	Ctd	In
Display para. scale factor		SdS	30
Sw. Freq	-kHz	SFr	4 kHz

drC- DRIVE CONTROL Menu

Parameter		Code	Factory Setting
Standard Motor frequency	-Hz	bFr	50 Hz
Nom. motor volt	-V	UnS	Varies w/ rating
Nom. motor frequency	-Hz	FrS	50 Hz
Nom. motor current	-A	nCr	Varies w/ rating
Nom. motor speed	-RPM	nSP	Varies w/ rating
Motor CosPhi motor power factor		CoS	Varies w/ rating
Cool state stator resistance		rSC	nO
Auto tuning		tUn	nO
Auto tuning status		tUS	tAb
Voltage/frequency ratio		UFt	n

drC- DRIVE CONTROL Menu Cont.

Parameter		Code	Factory Setting
Noise reduction		nrd	YES
Switching frequency	-kHz	SFr	4 kHz
Maximum frequency	-Hz	tFr	60 hZ
Suppress speed loop filter		SrF	nO
Save the configuration		SCS	nO
Macro Configuration		CFG	Std
Return to factory settings		FCS	nO

Varies w/ rating- means it is dependent on the drive rating

I-O - Input Output Menu

Parameter		Code	Factory Setting
Terminal strip config		tCC	2C
Type 2 wire		tCt	trn (transition)
Reverse assignment		rrS	LI2
AI3 low speed	-mA	CrL3	4 mA
AI3 high speed	-mA	CrH3	20 mA
Analog output AO1 config.		AOIt	oA
Analog output Logic source		dO	nO
Relay R1		r1	FLt (No fault detected)
Relay R2		r2	nO
Save the configuration		SCS	nO
Macro Configuration		CFG	Std
Return to factory settings		FCS	nO

CTL- Control Menu

Parameter		Code	Factory Setting
Function access level		LAC	L1
Ref. 1Channel (analog input source)		Fr1	AI1
Ref. 2 config (analog in adjustment)		Fr2	nO
Ref switching		rFC	Fr1
Separate ctrl/ref channels		CHCF	SIM
Ctrl channel 1 config.		Cd1	tEr
Ctrl channel 2 config.		Cd2	Mdb
Ctrl channel switching		CCS	Cd1
Copy channel 1 to channel 2		COP	nO
Control via keypad		LCC	nO
Stop button on keypad priority		PSt	YES
Rotational Direction on keypad Run		rOt	dFr
Save the configuration		SCS	nO
Macro Configuration		CFG	Std
Return to factory settings		FCS	nO

Note: The key drive settings to monitor are highlighted in yellow. Refer to the Altivar™ 312 programming manual for additional programming instructions.

FUn- APPLICATION FUNCTIONS Menu

Parameter		Code	Factory Setting
rPC (ramp adj) submenu			
Ramp type		rPt	LIn
Start CUS accel ramp	-%	tA1	10%
End CUS accel ramp	-%	tA2	10%
Start CUS decel ramp	-%	tA3	10%
End CUS decel ramp	-%	tA4	10%
Ramp Increment		Inr	0.1
Accel. ramp time	-s	ACC	3 s
Decel. ramp time	-s	dEC	3 s
Ramp switching		rPS	nO
Ramp switch. Thresh	-Hz	Frt	0 hz
Accel. ramp time 2	-s	AC2	5 s
Decel. ramp time 2	-s	dE2	5 s
Decel. ramp adaptation		brA	YES
StC (Stop mode) submenu			
Type of stop		Stt	rMP
Fast stop		FSt	nO
Ramp Divider		dCF	4
DC injection stop		dCI	nO
DC injection current	-A	IdC	0.7 in
DC injection time	-s	tdC	0.5 s
Freewheel stop		nSt	nO
AdC (auto dc inj) submenu			
Auto DC injection (standstill inj)		Adc	YES
Auto inject. time	-s	tdC1	0.5 s
Auto inject. level	-A	SdC1	0.7 in.
Auto inject. time 2	-s	tdC2	0 s
Auto inject. level 2	-A	SdC2	0.5 in
SAI (summing input) submenu			
Summing input 2		SA2	AI2
Summing input 3		SA3	nO
PSS (Preset spd) submenu			
2 preset speeds		PS2	LI3
4 preset speeds		PS4	LI4
8 preset speeds		PS8	nO
16 preset speeds		PS16	nO
If presets selected then SP2 thru SP16 allow values to be adjusted			
JOG submenu			
Jog operation		JOG	nO
Jog Frequency	-Hz	JGF	10 Hz
UPd submenu			
Plus speed		USP	nO
Minus speed		dSP	nO
Save spd reference on power down		Str	nO
PI regulator submenu			
PI feedback assignment (source)		PIF	nO
PI regul. proport. Gain (response)		rPG	1
PI regul. integral gain (stability)		rIG	1
PI feedback scale factor		FbS	1
Reverse PI of signal		PIC	nO
2 preset PI references		Pr2	nO
4 preset PI references		Pr4	nO

FUn- APPLICATION FUNCTIONS Menu Cont.

Parameter		Code	Factory Setting
Preset Ref PID 2		rP2	30%
Preset Ref PID 3		rP3	60%
Preset Ref PID 4		rP4	90%
PID wakeup threshold		rSL	0%
PID Acting Internal reference		PII	nO
Internal PID Reference		rP1	0%
bLC brake logic submenu			
Brake assignment		bLC	nO
Brake release freq.	-Hz	brL	Varies w/ rating
Release current thresh.	-A	lbr	Varies w/ rating
Brake release time	-s	brt	0.5 s
Low Speed		LSP	0 LSP
Brake engagement freq. thresh.		bEn	nO
Brake engage time	-s	bEt	0.5 s
Brake release pulse		bIP	nO
LC2 submenu			
Current limit 2 switching		LC2	nO
Current limit 2	-A	CL2	1.5 in
Motor switching submenu			
CHP Motor Switching		CHP	nO
Nominal Motor 2 Voltage	-V	UnS2	Varies w/ rating
Nominal Motor 2 Frequency	-Hz	FrS2	Varies w/ rating
Nominal Motor 2 Current	-A	nCr2	Varies w/ rating
Nominal Motor 2 speed		nSP2	Varies w/ rating
Motor 2 CosPhi		COS2	Varies w/ rating
V/F Motor 2 selection		UFt2	SVC
IR compensation motor 2	-%	UFR2	20%
Frequency Loop gain motor 2	-%	FLG2	20%
Frequency Loop Stability motor 2	-%	StR2	20%
Slip Compensation Motor 2	-%	SLP2	100%
Limit Switch submenu			
Stop Forward Limit Switch		LRF	nO
Stop Reverse Limit Switch		LRr	nO
Stop Type for Limit Switch input		LRs	nSt
ATV31 emulation (not312)		RrE	nO
Save the configuration		SCS	nO
Macro Configuration		CFG	Std
Return to factory settings		FCS	nO
FLT- FAULT Management Menu			
Parameter		Code	Factory Setting
Automatic restart		Atr	nO
Max restart time for detected fault		tAr	5 min
Reset fault (assignable to LIX)		rSF	nO
Catch on fly		FLr	nO

FLT- FAULT Management Menu Cont.

Parameter		Code	Factory Setting
External fault input assign		EIF	nO
External fault type config.		Let	HIG (Active high)
External fault stop mode		EPL	Yes (Free-wheel)
Motor phase loss fault config.		OPL	YES
Line phase loss fault config.		IPL	YES
Drive overheat fault stop mode		OHL	YES
Mtr overload fault stop mode		OLL	YES
Modbus serial link fault stop		SLL	YES
CANopen serial link fault stop		COL	YES
Auto-tune fault config.		tnL	YES
4-20ma loss fault stop options		LFL	Yes (Free-wheel)
Fallback speed with input loss	-Hz	LFF	10 Hz
Undervoltage derated oper.		drn	nO
Undervoltage drive response		StP	nO
Fault inhibit assignment		InH	nO
Reset oper. time to zero		rPr	nO
Product Reset		rP	nO

CON- COMMUNICATION Menu

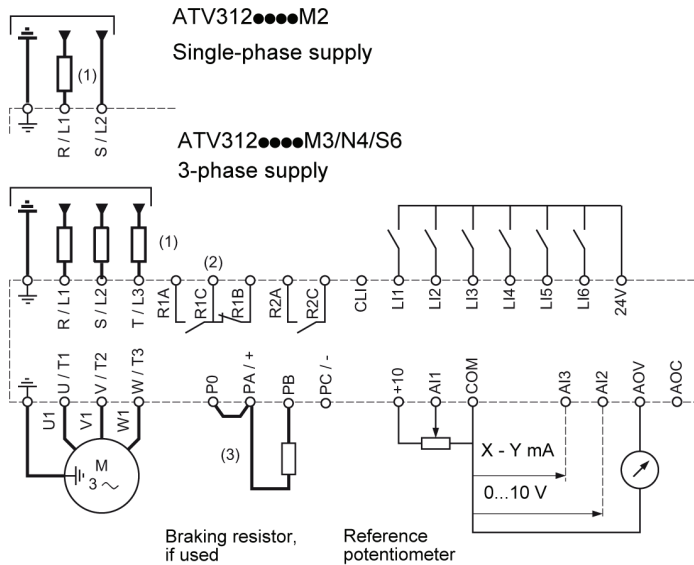
Parameter		Code	Factory Setting
Modbus drive address		Add	1
Modbus transmission speed		tbr	19200
Modbus commun. format		tFO	8E1
Modbus timeout	-s	ttO	10 s
CANopen drive address		AdCO	0
CANopen transmission speed		bdCO	125
CANopen error registry		ErCO	
Forced local input assignment		FLO	nO
Forced local analog reference		FLOC	AI1

SUP- Monitoring and Display Menu

Parameter		Code	Factory Setting
Speed reference from HMI		LFr	
Internal PI feedback reference		rPI	
Freq. ref before ramp	-Hz	rFr	
Output freq. at motor	-Hz	rFr	
Output value in cust. units		SPd1	
(function of SdS in Set Menu)		SPd2	
(you select which value d1, d2, d3)		SPd3	
Current in motor est.	-A	LCr	
Motor power calculated	-%	OPr	
Line voltage coming to drive	-V	ULn	
Motor thermal state	-%	tHr	
Drive thermal state	-%	tHd	
Last fault		LFt	
Motor torque	-%	Otr	
Operating time		rTH	
PIN Code 1		COd	
Autotuning State		tUS	
Drive Software Version		UdP	

Denotes a 2 second hold requirement to change value

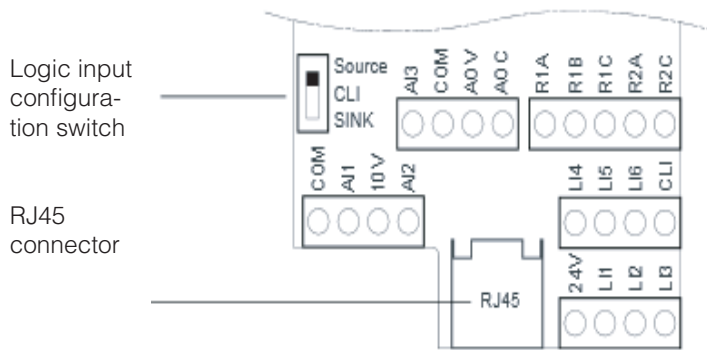
General Wiring Diagram



- (1) Line choke, if used (single phase or 3-phase)
- (2) Fault relay contacts, for remote indication of the drive status
- (3) If a braking resistor is connected, set (Dec ramp adapt.) (brA) parameter to (No) (nO) (refer to the programming manual).

Note: This diagram is for the standard ATV 312 products. Optional communication cards may change the control wiring of the product. See the associated documentation for the option cards for details.

Control Terminals



Terminal	Function	Electrical Characteristics
R1A R1B R1C	Common point C/O contact (R1C) of programmable relay R1	<ul style="list-style-type: none"> Min. switching capacity: 10 mA for 5 Vdc Max. switching capacity on resistive load (cos φ = 1 and L/R = 0 ms): 5 A for 250 Vac and 30 Vdc Max. switching capacity on inductive load (cos φ = 0.4 and L/R = 7 ms): 1.5 A for 250 Vac and 30 Vdc Sampling time 8 ms Service life: 100,000 operations at max. switching power 1,000,000 operations at min. switching power
R2A R2C	N/O contact of programmable relay R2	
COM	Analog I/O common	0 V
AI1	Analog input voltage	Analog input 0 + 10 V (max. safe voltage 30 V) <ul style="list-style-type: none"> Impedance 30 kΩ Resolution 0.01 V, 10-bit converter Precision ± 4.3%, linearity ± 0.2%, of max. value Sampling time 8 ms Operation with shielded cable 100 m max.
10V	Power supply for reference potentiometer	+10 V (+ 8 - 0%), 10 mA max, protected against short-circuits and overloads
AI2	Analog input voltage	Bipolar analog input 0 ± 10 V (max. safe voltage ± 30 V) The + or - polarity of the voltage on AI2 affects the direction of the setpoint and therefore the direction of operation. <ul style="list-style-type: none"> Impedance 30 kΩ Resolution 0.01 V, 10-bit + sign converter Precision ± 4.3%, linearity ± 0.2%, of max. value Sampling time 8 ms Operation with shielded cable 100 m max.
AI3	Analog input current	Analog input X - Y mA. X and Y can be programmed from 0 to 20 mA <ul style="list-style-type: none"> Impedance 250 Ω Resolution 0.02 mA, 10-bit converter Precision ± 4.3%, linearity ± 0.2%, of max. value Sampling time 8 ms
COM	Analog I/O common	0 V
AOV AOC	Analog output voltage AOV or Analog output current AOC or Logic output voltage AOV or AOC can be assigned (either, but not both)	Analog output 0 to 10 V, min. load impedance 470 Ω or Analog output X - Y mA. X and Y can be programmed from 0 to 20 mA, max. load impedance 800 Ω <ul style="list-style-type: none"> Resolution 8 bits (1) Precision ± 1% (1) Linearity ± 0.2% (1) Sampling time 8 ms This analog output can be configured as a 24 V logic output on AOC, min. load impedance 1.2 kΩ. (1) Characteristics of digital/analog converter.
24 V	Logic input power supply	+ 24 V protected against short-circuits and overloads, min. 19 V, max. 30 V Max. customer current available 100 mA
L1 L2 L3 L4 L5 L6	Logic inputs	Programmable logic inputs <ul style="list-style-type: none"> + 24 V power supply (max. 30 V) Impedance 3.5 kΩ State 0 if < 5 V, state 1 if > 11 V (voltage difference between LI- and CLI) Sampling time 4 ms
CLI	Logic input common	See page 19 of Installation Manual
RJ45	Communication port	Connection for SoMove software, Modbus, and CANopen network, remote display, configuration loader tools,

Terminal	Function	For Altivar 312
	Ground terminal	All ratings
R/L1 - S/L2	Power Supply	ATV312●●●●M2
R/L1 - S/L2 - T/L3		ATV312●●●●M3 ATV312●●●●N4 ATV312●●●●S6
PO	DC bus + polarity	All ratings
PA+	Output to braking resistor (+ polarity)	All ratings
PB	Output to braking resistor	All ratings
PC-	DC bus - polarity	All ratings
U/T1 - V/T2 - W/T3	Outputs to the motor	All ratings