

# Motor Controllers AC Variable Frequency Drives Type Variflex<sup>3</sup> RVLF Advance



- AC variable frequency drive for use with AC induction motors
- V/F + Sensorless Vector (SLV)
- Input voltage ranges: 100-120V, 200-240V, 380-480V
- Conforms to EMC standard EN 61800-3
- PTC input provide motor temperature protection
- PID regulation function available on board
- Built-in Class A filter
- Panel mounting (optional DIN-rail accessory)
- Built-in Modbus and BACNET
- Optional communication interface modules for Profibus/DeviceNet/Ethernet (TCP/IP)/CANopen

## Product Description

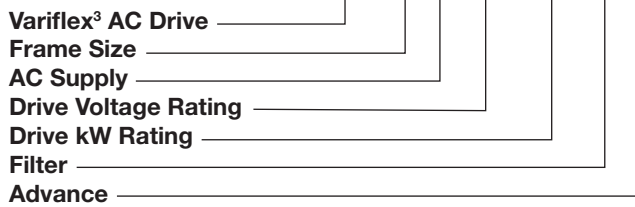
The RVLF is the economical and compact AC variable frequency drive for use with 3-phase AC induction motors. The drives have compact dimensions and can be installed side by side to save space. The full range of products

covers various voltage ratings: single-phase 100V or 200V, as well as, three-phase 200V or 480V. The RVLF Advance comes with sensorless vector control as well as onboard BACnet and Modbus communication.

Specifications are stated at 40°C at 5kHz unless otherwise noted.

## Ordering Key

**RVLF A 1 20 075 F A**



## Approvals



## Type Selection

Frame Size	AC Supply Phase	Drive Voltage Rating	Drive kW Rating	Filter	Advance
A: Size 1 B: Size 2 C: Size 3 D: Size 4	1: 1-Phase 3: 3-Phase	10: 100-120VAC 20: 200-240VAC 40: 380-480VAC	040: 0.4kW, 0.5HP	F: Built-in EMI filter	A: Advance
			075: 0.75kW, 1.0HP		
			150: 1.5kW, 2.0HP		
			220: 2.2kW, 3.0HP		
			370: 3.7kW, 5.0HP		
			550: 5.5kW, 7.5HP		
			750: 7.5kW, 10HP		
			1100: 11kW, 15HP		

## Selection Guide

Voltage Rating	AC Supply Phase	Motor Rating		Ordering Code
		kW	HP	
100 - 120VAC (+10% / -15%)	1-Phase	0.4kW	0.5HP	RVLFA110040A
		0.75kW	0.75HP	RVLFA110075A
200 - 240VAC (+10% / -15%)	1-Phase	0.4kW	0.5HP	RVLFA120040FA
		0.75kW	0.75HP	RVLFA120075FA
		1.5kW	2.0HP	RVLFB120150FA
		2.2kW	3.0HP	RVLFB120220FA
200-240VAC (+10%/-15%)	3 Phase	0.4kW	0.5HP	RVLFA320040A
		0.75kW	0.75HP	RVLFA320075A
		1.5kW	2.0HP	RVLFB320150A
380 - 480VAC (+10% / -15%)	3-Phase	2.2kW	3.0HP	RVLFB320220A
		0.75kW	0.75HP	RVLFB340075FA
		1.5kW	2.0HP	RVLFB340150FA
		2.2kW	3.0HP	RVLFB340220FA
		3.7kW	5.0HP	RVLFC340370FA
		5.5kW	7.5HP	RVLFC340550FA
		7.5kW	10HP	RVLFD340750FA
		11kW	15HP	RVLFD3401100FA

## Input / Output Data

### 100V Class: Single phase

Model	RVLFA110040A	RVLFB110075A
Horse power rating	0.5HP	1HP
Nominal motor power	0.4kW	0.75kW
Rated output current	2.6A	4.3A
Rated capacity	1.00kVA	1.65kVA
Input voltage range	Single phase: 100~120VAC (+10% / -15%), 50/60Hz	
Output voltage range	Three phase 0~240VAC	
Input current	13A	19A
Allowable momentary power loss time	1.0 s	1.0 s
Ingress protection class	IP20	

### 200V Class: Single phase

Model	RVLFA120040FA	RVLFA120075FA	RVLFB120150FA	RVLFB120220FA
Horse power rating	0.5HP	1HP	2HP	3HP
Nominal motor power	0.4kW	0.75kW	1.5kW	2.2kW
Rated output current	2.6A	4.3A	7.5A	10.5A
Rated capacity	1.0kVA	1.65kVA	2.90kVA	4.0kVA
Input voltage range	Single phase: 200~240VAC (+10% / -15%), 50/60Hz			
Output voltage range	Three phase 0~240VAC			
Input current	7.2A	11A	15.5A	21A
Allowable momentary power loss time	1.0s	1.0s	2.0s	2.0s
Ingress protection class	IP20			

## Input / Output Data cont.

### 200V Class: Three Phase

Model	RVLFA320040A	RVLFA320075A	RVLFB320150A	RVLFB320220A
Horse power rating	0.5HP	1HP	2HP	3HP
Nominal motor power	0.4kW	0.75kW	1.5kW	2.2kW
Rated output current	2.6A	4.3A	7.5A	10.5A
Rated capacity	1.0kVA	1.65kVA	2.90kVA	4.0kVA
Input voltage range	Three phase: 200~240VAC (+10% / -15%), 50/60Hz			
Output voltage range	Three phase 0~240VAC			
Input current	4A	6.4A	9.4A	12.2A
Allowable momentary power loss time	1.0s	1.0s	2.0s	2.0s
Ingress protection class	IP20			

### 400V Class: Three phase

Model	RVLFB340075FA	RVLFB340150FA	RVLFB340220FA	RVLFC340370FA
Horse power rating	1HP	2HP	3HP	5HP
Nominal motor power	0.75kW	1.5kW	2.2kW	3.7kW
Rated output current	2.3A	3.8A	5.2A	9.2A
Rated capacity	1.7kVA	2.9kVA	4.0kVA	7.0kVA
Input voltage range	Three phase: 380~480VAC (+10% / -15%), 50/60Hz			
Output voltage range	Three phase 0~480VAC			
Input current	4.2A	5.6A	7.3A	10.1A
Allowable momentary power loss time	2.0s	2.0s	2.0s	2.0s
Ingress protection class	IP20			

Model	RVLFC340550FA	RVLFD340750FA	RVLFD3401100FA
Horse power rating	7.5HP	10HP	15HP
Nominal motor power	5.5kW	7.5kW	11kW
Rated output current	13.0A	17.5A	24A
Rated capacity	9.91kVA	13.34kVA	18.29kVA
Input voltage range	Three phase: 380~480VAC (+10% / -15%), 50/60Hz		
Output voltage range	Three phase 0~480VAC		
Input current	14.3A	19.3A	26.4A
Allowable momentary power loss time	2.0s	2.0s	2.0s
Ingress protection class	IP20		

## Environmental Data

<b>Installation Location</b>	Indoor (protected from corrosive gases and dust)	<b>Shock and Vibration</b>	0.075mm Amplitude for 10Hz to 57Hz 1G for 57Hz to 150Hz
<b>Operating Temperature</b>	-10~+50°C / -14 ~+122°F (De-rating from 40°C/10°F up to 50°C/122°F)	<b>EMC Compliance</b>	EN61800-3, first environment
<b>Storage Temperature</b>	-20~+60°C / -4°~+140° F	<b>LVD Compliance</b>	EN61800-5-1
<b>Humidity</b>	Under 95% RH (no condensation)	<b>Electrical Safety</b>	UL508C
		<b>Ingress Protection Level</b>	IP20

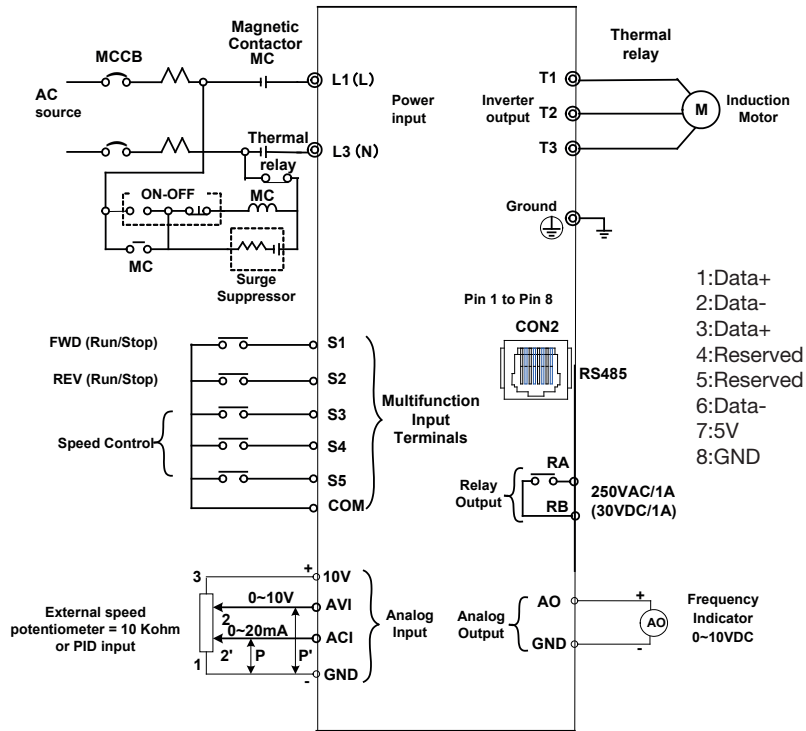
## General Data

<b>Control Mode</b>	V/F Control + SLV Control	<b>Display</b>	Display: parameter/ parameter value/frequency/ speed/DC voltage/ output voltage/output current/PID feedback/input and output terminal status/ heat sink temperature/ program version/fault log. For run/stop/forward and reverse.
<b>Frequency</b>	0.01 ~ 599Hz.	7 segment display (LED)	
Range	0.01 ~ 599Hz.	LED status Indicator	Integrated motor and inverter overload protection. (150% rated current for 60sec, every 10 minutes) 100V/200V models: Over 410VDC, 400V models: Over 820VDC. 100V/200V models: Under 190VDC, 400Vmodels: Under 380V. Inverter auto-restart after a momentary power loss. Stall prevention for acceleration/deceleration/ and continuous run. Electronic circuit protection. Electronic circuit protection. Heatsink over temperature protection, auto carrier frequency reduction with temperature rise, fault output, reverse prohibit, number of auto restart attempts, parameter lock, over voltage protection (OVP), motor PTC over-temperature protection.
Speed accuracy (100% torque)	V/F: 3% SLV: 1%		
Starting torque	V/F: 3Hz / 100% SLV: 3Hz / 150%		
Setting resolution	Digital input: 0.01Hz. Analog input: 0.015Hz/60Hz		
Setting	• Keypad: Set directly with ▲▼ keys or the VR (potentiometer) on the keypad. • External input terminals: AVI (0/2~10V), ACI (0/4~20mA) input. Multifunction input up/down function (Group3). • Setting frequency by communication method.		
Frequency limit	Lower and upper frequency limits, 3 skip-frequency settings.	<b>Protection Functions</b>	
<b>Run</b>		Overload protection	
Operational settings	• Keypad: run, stop button. • External terminals: Multi-operation-mode 2/3 wire selection. • Communication method.	Over voltage	
<b>Drive Functions</b>		Under voltage	
V/F curve setting	6 fixed curve and one customized curve.	Momentary power loss restart	
Carrier frequency	1~16KHz (default 5KHz).	Stall prevention	
Acceleration and deceleration control	2 Acc/Dec time parameters, 4 S curve parameters.	Short-circuit output terminal	
Multifunctional input	19 functions (refer to description on group3).	Grounding fault	
Multifunctional output	16 functions (refer to description on group3).	Additional protective functions	
Multifunctional analog output	5 functions (refer to description on group4).	<b>Internation Certification</b>	CE/cULus
Main Features	Overload detection, 8 preset speeds, Auto-run, Acc/Dec switch (2 stages), Main/Alt run command select, Main/Alt frequency command select, PID control, torque boost, V/F start frequency, fault reset.	<b>Communication</b>	RS485 (Modbus) built in, with one-to-one or one-to-many control. Built-in BacNet communication

## Connection Diagrams

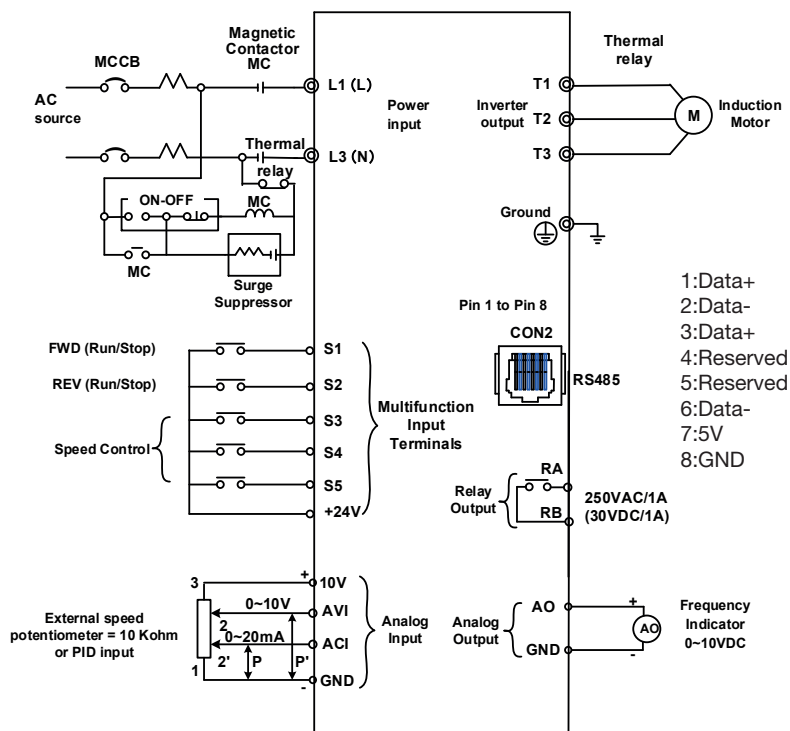
### Model: Single Phase (NPN)

100V: RVLFA110040A, RVLFA110075A



### Model: Single Phase (PNP)

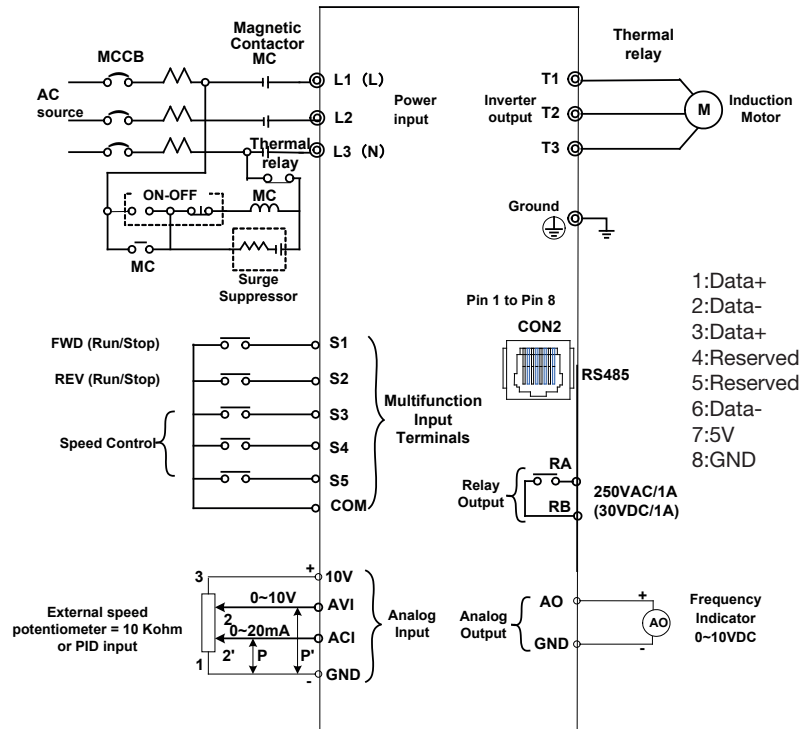
200V: RVLFA120040FA, RVLFA120075FA, RVLFB120150FA, RVLFB120220FA



## Connection Diagrams cont.

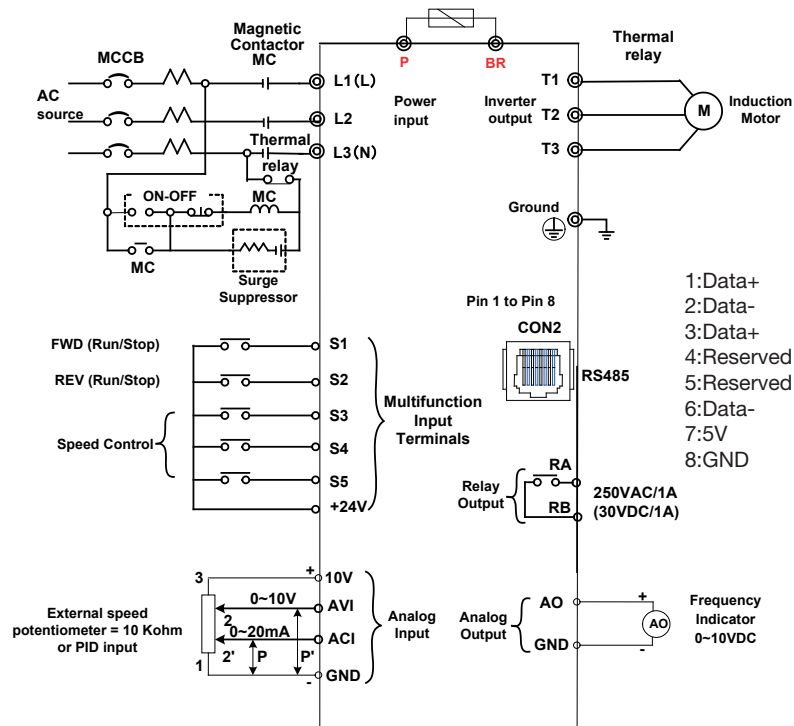
### Model: Three Phase (NPN)

200V: RVLFA320040A, RVLFA320075A, RVLFB320150A, RVLFB320220A



### Model: Three Phase (PNP)

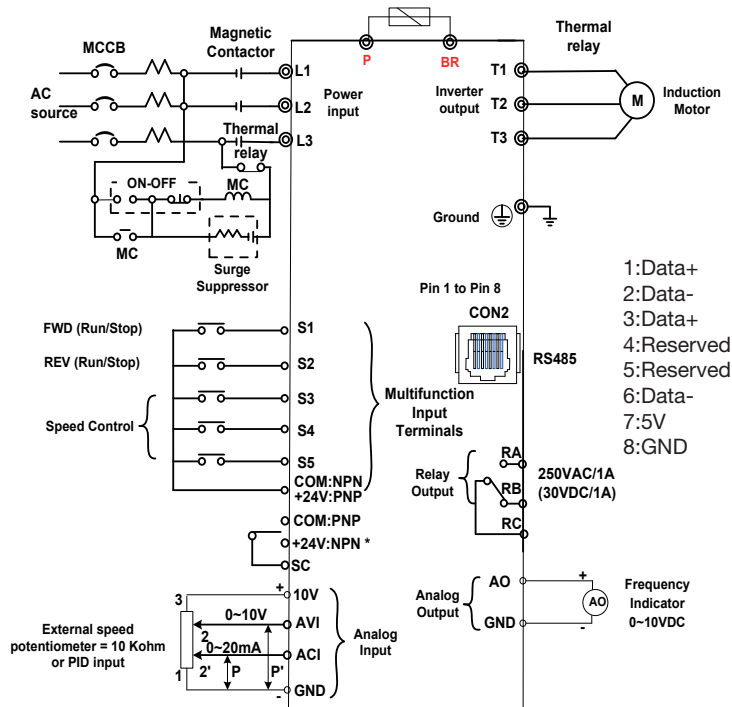
400V: RVLFB340075FA, RVLFB340150FA, RVLFB340220FA



## Connection Diagrams cont.

### Model: Three Phase (PNP/ NPN)

400V: RVLFC340370FA, RVLFC3405500FA, RVLFD340750FA, RVLFD3401100FA



### NPN/PNP input type selection

- PNP: 1.Link SC and COM terminal  
 2.Use +24v terminal for S1~S5 common point
- NPN: 1.Link SC and +24V terminal  
 2.Use COM terminal for S1~S5 common point

Please ensure correct connection before setting parameter group3 digital inputs.

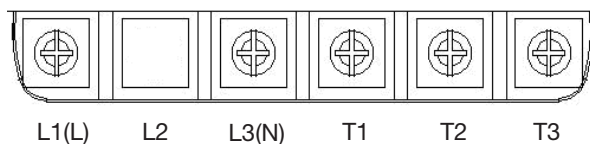
## Terminal Description

Terminal symbol	TM1 Function description
L1(L)	Main power input, single phase: L1(L) / L3(N) three phase (200V): L1(L) / L2 / L3(N) three phase (400V): L1 / L2 / L3
L2	
L3 (N)	
P*	Externally connected braking resistor
BR*	
T1	Inverter output, connect to U, V, W terminals of motor
T2	
T3	
⊕	Ground terminal

\* P, BR for three phase 400V models

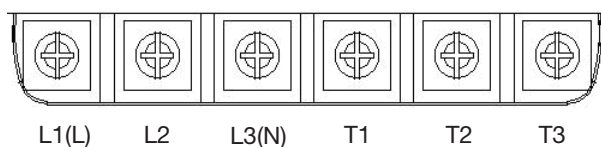
## Terminal Description cont.

### Single phase (100V & 200V)

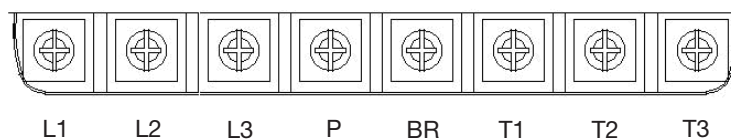


Note: the screw on L2 terminal is removed for the single phase input supply models

### Three phase (200V)



### Three phase (400V)



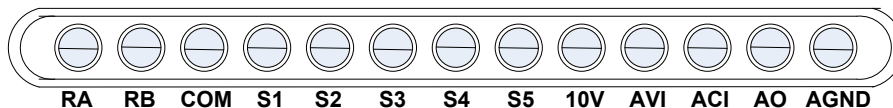
### Frame A & Frame B

Terminal symbol	TM2 Function description	Signal Level
RA	Relay output terminal, specification: 250VAC/1A (30VDC/1A)	240VAC/1A (30VDC/1A)
RB		
COM	Voltage reference point for S1~S5	+/- 15%, Max output current 30mA
+24	S1~S5 (Common) [PNP]	
S1~S5	Multi-function input terminals (refer to group3)	24 VDC, 4.5 mA, optical coupling isolation (Max, voltage 30VDC, input impedance 6kΩ)
10V	Built in power for an external speed potentiometer	10V, (Max current:20mA)
AVI	Analog voltage input, Specification: 0/2~10VDC (choose by parameter 04-00)	0~10V (Input impedance 200kΩ)
ACI	Analog current input, Specification: 0/4~20mA (choose by parameter 04-00)	0~20mA (Input impedance 499Ω)
AO	Multi-function analog output terminal. Maximum output 10VDC/1mA	0~10V (Max current 2mA)
AGND	Analog ground terminal	

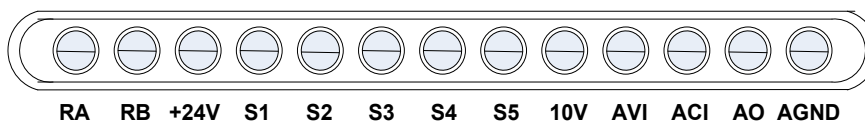


## Terminal Description cont.

### NPN:



### PNP:

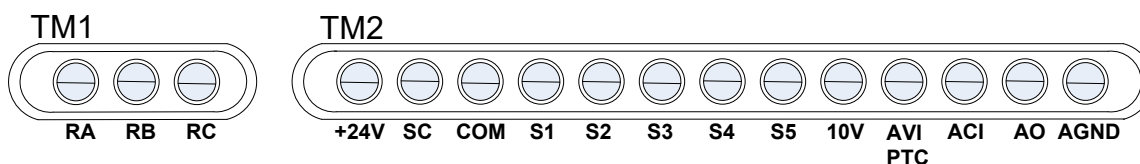


### Frame C & Frame D

Terminal symbol	TM1 Function description
RA	Relay output terminal, specification: 250VAC/5A (30VDC/5A) RA: Normally open, RB: Normally close, RC: Common point
RB	
RC	

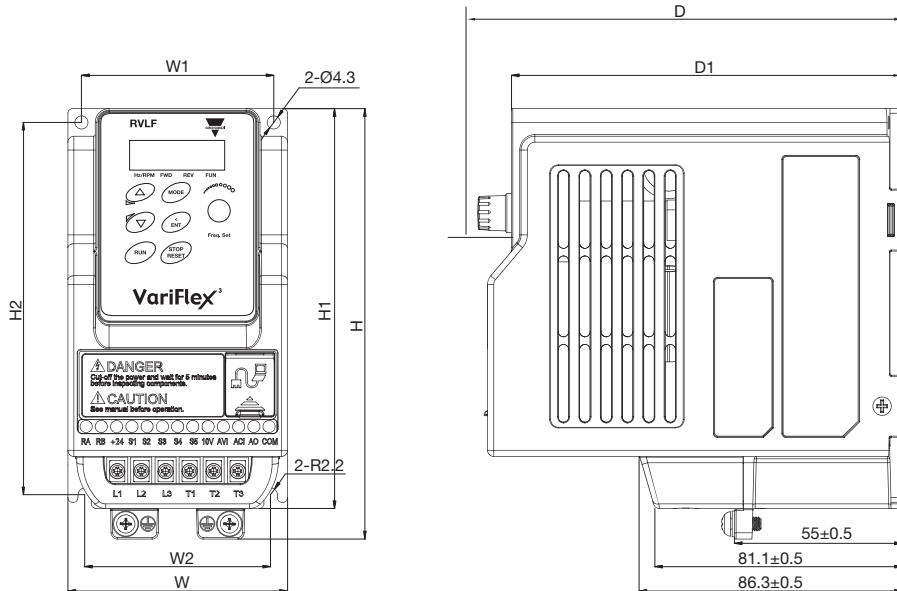
Terminal symbol	TM2 Function description	Signal Level
+24V	Common point of PNP input	+/- 15%, Max output current 30mA
SC	NPN/PNP selectable terminal. NPN input: +24V&SC need to be shorted. PNP input: COM&SC need to be shorted.	
COM	Voltage reference point for S1~S5	
S1~S5	Multi-function input terminals (refer to group3)	24 VDC, 4.5 mA, optical coupling isolation (Max, voltage 30VDC, input impedance 6kΩ)
10V	Built in power for an external speed potentiometer (Max output : 20mA)	10V, (Max current:20mA)
AVI / PTC	Analog voltage input/motor over temperature protection signal input, Specification: 0/2~10VDC	0~10V (Input impedance 200kΩ)
ACI	Analog current input, Specification: 0/4~20mA (choose by parameter 04-00)	0~20mA (Input impedance 499Ω)
AO	Multi-function analog output terminal. Maximum output 10VDC/1mA	0~10V (Max current 2mA)
AGND	Analog ground terminal	

### NPN/PNP control terminals:



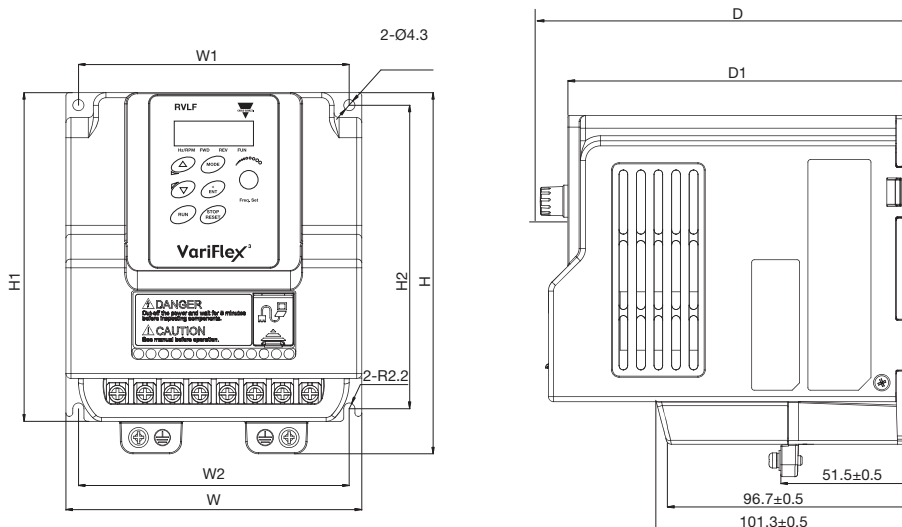
## Dimensions (mm/inches)

### Frame A



RVLFA	W	W1	W2	H	H1	H2	D	D1	D2	E	E1	E2	Weight kg (lbs)
110040A	72/ 2.83"	63/ 2.48"	61/ 2.4"	141/ 5.55"	131/ 5.16"	122/ 4.8"	139.2/ 5.48"	136/ 5.35"	128.2/ 5.05"	86.3/ 3.40"	81.1/ 3.19"	55/ 2.17"	0.85 (1.87)
110075A													1.35 (2.98)
120040FA													0.95 (2.09)
120075FA													
320040A													
320075A													

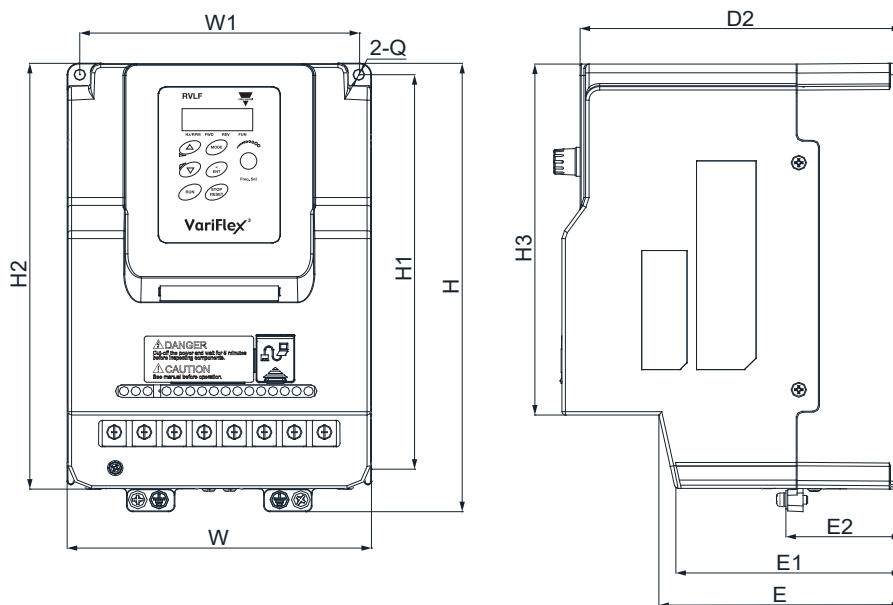
### Frame B



RVLFB	W	W1	W2	H	H1	H2	H3	D	D1	D2	E	E1	E2	Weight kg (lbs)
120150FA	118/ 4.65"	108/ 4.25"	108/ 4.25"	144/ 5.67"	131/ 5.16"	121/ 4.76"	114/ 4.49"	150/ 5.91"	144.2/ 5.68"	136.4/ 5.37"	101.32/ 3.99"	96.73/ 3.81"	51.5/ 2.03"	1.45 (3.2)
120220FA														1.35 (2.98)
320150A														1.45 (3.20)
320220A														
340075FA														
340150FA														
340220FA														

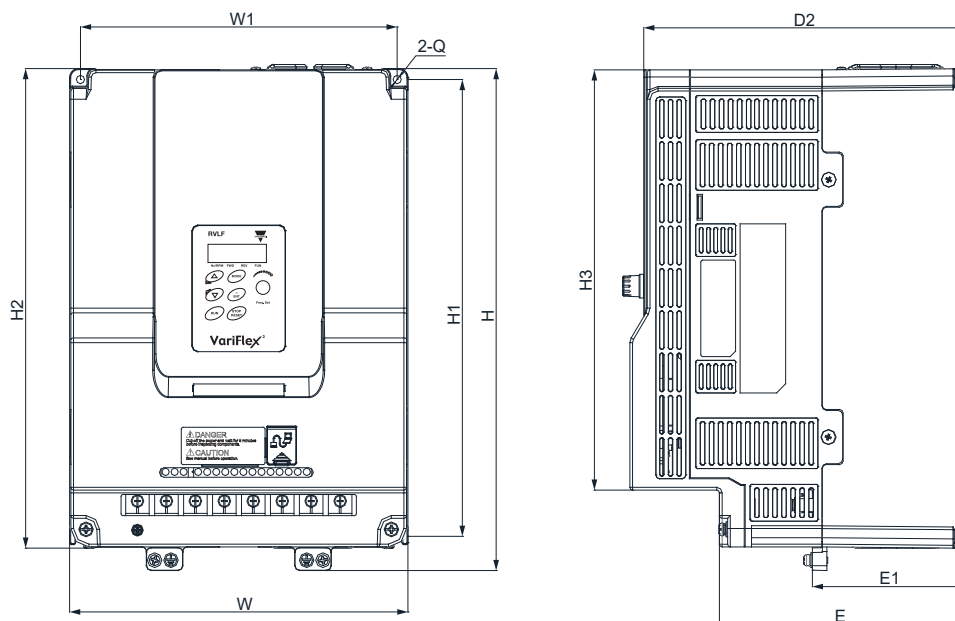
## Dimensions cont. (mm/inches)

### Frame C



RVLFC	W	W1	H	H1	H2	H3	D	D1	D2	E	E1	E2	Weight kg (lbs)
340370FA	129/	118/	197.5/	177.6/	188/	154.7/	148/	143.7/	136/	102.6/	96/	48.2/	2.7 (5.95)
340550FA	5.08"	4.65"	7.78"	6.99"	7.4"	6.09"	5.83"	5.66"	5.35"	4.04"	3.78"	1.9"	

### Frame D



RVLFD	W	W1	H	H1	H2	H3	D	D1	D2	E	E1	Weight kg (lbs)
340750FA	187/	176/	273/	249.8/	261/	228.6/	190/	185.6/	177.9/	136/	84.7/	6.3 (13.89)
3401100FA	7.36"	6.93"	10.75"	9.83"	10.28"	9"	7.48"	7.31"	7"	5.35"	3.33"	

## Accessories

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### Communication Modules



#### TCP-IP Module

- Ordering Code: RV-TCPIP
- Communication Protocol: TCP-IP



#### Profibus-DP Module

- Ordering Code: RV-PDP
- Communication Protocol: Profibus



#### CANopen Module

- Ordering Code: RV-CAN
- Communication Protocol: CANopen



**DeviceNet Module**

- Ordering Code: RV-DNET
- Communication Protocol: DeviceNet



**USB-to-RS485 Connection Cable**

**Type 1**

- Ordering Code: RV-USB
- Cable Length: 1.8m

**Type 2**

- Ordering Code: RV-USB3
- Cable Length: 3.0m

### Copy module



- Ordering Code: RV-CU
- Plug'n'play design
- Remote keypad
- Copy and Keypad functions

### Copy module extension cable



#### Type 1

- Ordering Code: RV-CAB01
- Cable Length: 1.0m

#### Type 2

- Ordering Code: RV-CAB02
- Cable Length: 2.0m

#### Type 3

- Ordering Code: RV-CAB03
- Cable Length: 3.0m

#### Type 4

- Ordering Code: RV-CAB05
- Cable Length: 5.0m

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