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Motor Controllers Variable Frequency AC Drives Type VariFlex² RVCF

CARLO GAVAZZI



- AC variable speed drive for use with AC induction motors
- Sensorless vector control or V/F mode, high starting torque
- Input voltage ranges: 1-ph 230VAC, 3-ph 230VAC, 3-ph 480VAC
- 150%/1Hz (Vector mode) starting torque
- Simple built-in PLC function
- PID function
- Conforms to EMI radio standard and EMS immunity standard EN 61800-3 (category C2)
- All Parameters accessible both via Keypad and PC
- RS232 or RS485 MODBus RTU/ASCII serial communication available on all models through option card
- Speed setting by keys and dial
- Built-in EMC filter versions up to 11kW
- Memory stick (Copy card) option for fast and accurate drive to drive parameter transfer and storage
- NPN/PNP digital inputs
- Keypad extension available on all models

Product Description

VariFlex² RVCF is a simple, compact general purpose AC variable speed drive for use with 3-phase AC induction motors. A full range of power rating is available from 0.4kW (0.5HP) up to 55kW (75HP) with single phase AC input 240VAC and 3-phase AC input up to 480VAC.

The drives allow sensorless or V/F control mode, the speed is adjustable through the keypad, analog input and

digital input (preset speeds).

The standard display can be removed by the extension cable and put outside the cabinet.

The drives are easily configurable; the parameters are logically divided in sixteen different groups according to the needs of the process.

The VariFlex² employs state of the art microprocessor digital technology which controls all drive functions.

Ordering key **RVCF B 3 40 0220 F**

Model	_____
Frame size	_____
AC supply phase	_____
Voltage rating	_____
Power rating kW	_____
Option	_____

Type Selection

Voltage rating	Output voltage	Power rating		Model	Housing size
		kW	HP		
200-240VAC (+10% -15%) 1-phase	0-240V 3-phase 0.1-650Hz	0.40	0.50	RVCFA1200040	A
		0.75	1.0	RVCFA1200075	A
		1.5	2.0	RVCFB1200150	B
		2.2	3.0	RVCFB1200220	B
0.40		0.50	RVCFA3200040	A	
0.75		1.0	RVCFA3200075	A	
1.5		2.0	RVCFA3200150	A	
2.2		3.0	RVCFB3200220	B	
3.7		5.0	RVCFB3200370	B	
5.5		7.5	RVCFC3200550	C	
7.5		10.0	RVCFC3200750	C	
11.0		15.0	RVCFD3201100	D	
15.0		20.0	RVCFD3201500	D	
18.5		25.0	RVCFD3201850	D	
22.0		30.0	RVCFE3202200	E	
30.0		40.0	RVCFE3203000	E	
380-480VAC (+10% -15%) 3-phase	0-480V 3-phase 0.1-650Hz	0.75	1.0	RVCFA3400075	A
		1.5	2.0	RVCFA3400150	A
		2.2	3.0	RVCFB3400220	B
		3.7	5.0	RVCFB3400370	B
		5.5	7.5	RVCFC3400550	C
		7.5	10.0	RVCFC3400750	C
		11.0	15.0	RVCFC3401100	C
		15.0	20.0	RVCFD3401500	D
		18.5	25.0	RVCFD3401850	D
		22.0	30.0	RVCFD3402200	D
		30.0	40.0	RVCFE3403000	E
		37.0	50.0	RVCFE3403700	E
		45.0	60.0	RVCFF3404500	F
55.0	75.0	RVCFF3405500	F		

Input/Output Specification

Model	Motor capacity			Current (A)	
	kW	HP	kVA	Input	Output
RVCFA1200040	0.40	0.50	1.2	8.5	3.1
RVCFA1200075	0.75	1.0	1.7	12	4.5
RVCFB1200150	1.5	2.0	2.9	16	7.5
RVCFB1200220	2.2	3.0	4.0	23.9	10.5
RVCFA3200040	0.40	0.50	1.2	4.5	3.1
RVCFA3200075	0.75	1.0	1.7	6.5	4.5
RVCFA3200150	1.5	2.0	2.9	11.0	7.5
RVCFB3200220	2.2	3.0	4.0	12.5	10.5
RVCFB3200370	3.7	5.0	6.7	20.5	17.5
RVCFC3200550	5.5	7.5	9.9	33.0	26.0
RVCFC3200750	7.5	10.0	13.3	42.0	35.0
RVCFD3201100	11.0	15.0	20.6	57.0	48.0
RVCFD3201500	15.0	20.0	27.4	70.0	64.0
RVCFD3201850	18.5	25.0	34.0	85.0	80.0
RVCFE3202200	22.0	30.0	41.0	108.0	96.0
RVCFE3203000	30.0	40.0	54.0	138.0	130.0
RVCFA3400075	0.75	1.0	1.7	4.2	2.3
RVCFA3400150	1.5	2.0	2.9	5.6	3.8
RVCFB3400220	2.2	3.0	4.0	7.3	5.2
RVCFB3400370	3.7	5.0	6.7	11.6	8.8
RVCFC3400550	5.5	7.5	9.9	17.0	13.0
RVCFC3400750	7.5	10.0	13.3	23.0	17.5
RVCFC3401100	11.0	15.0	19.1	31.0	25.0
RVCFD3401500	15.0	20.0	27.4	38.0	32.0
RVCFD3401850	18.5	25.0	34.0	48.0	40.0
RVCFD3402200	22.0	30.0	41.0	56.0	48.0
RVCFE3403000	30.0	40.0	54.0	75.0	64.0
RVCFE3403700	37.0	50.0	68.0	92.0	80.0
RVCFF3404500	45.0	60.0	82.0	112.0	96.0
RVCFF3405500	55.0	75.0	110.0	142.0	128.0

Fuse Type

Model	Motor rating		Max fuse rating (A)	
	kW	HP	Fuse RK5	Fuse CC or T
RVCFA1200040	0.40	0.50	10	20
RVCFA1200075	0.75	1.0	15	30
RVCFB1200150	1.5	2.0	20	40
RVCFB1200220	2.2	3.0	25	50
RVCFA3200040	0.40	0.50	8	10
RVCFA3200075	0.75	1.0	12	15
RVCFA3200150	1.5	2.0	15	20
RVCFB3200220	2.2	3.0	20	30
RVCFB3200370	3.7	5.0	30	50
RVCFC3200550	5.5	7.5	50	60
RVCFC3200750	7.5	10.0	60	70
RVCFD3201100	11.0	15.0	80	100
RVCFD3201500	15.0	20.0	100	125
RVCFD3201850	18.5	25.0	125	150
RVCFE3202200	22.0	30.0	160	200
RVCFE3203000	30.0	40.0	200	250
RVCFA3400075	0.75	1.0	6	10
RVCFA3400150	1.5	2.0	10	15
RVCFB3400220	2.2	3.0	10	20
RVCFB3400370	3.7	5.0	20	30
RVCFC3400550	5.5	7.5	25	35
RVCFC3400750	7.5	10.0	30	50
RVCFC3401100	11.0	15.0	50	60
RVCFD3401500	15.0	20.0	60	70
RVCFD3401850	18.5	25.0	70	80
RVCFD3402200	22.0	30.0	80	100
RVCFE3403000	30.0	40.0	100	125
RVCFE3403700	37.0	50.0	125	150
RVCFF3404500	45.0	60.0	150	200
RVCFF3405500	55.0	75.0	200	250

Input Specifications

Input supply	
1-phase	200-240V (+10% -15%)
3-phase	200-240V (+10% -15%) 380-480V (+10% -15%)
Frequency range	50-60Hz
Multifunctional input terminal	
Voltage input impedance	17.8 kΩ for 0.5~2HP 240V and 1~2HP 480V drives 330 kΩ for 3~30HP 240V and 3~75HP 480V drives
Current input impedance	253Ω for 0.5~2HP 240V and 1~2HP 480V drives 499Ω for 3~30HP 240V and 3~75HP 480V drives
Power factor	> 0.97

General Data

Mounting	Sizes A and B. Sizes C, D, E and F	DIN-rail and panel Panel
Integrated cooling fan		Yes
Frequency setting resolution	Digital Analog	0.01Hz 0.06Hz/60Hz
Carrier frequency		2~16kHz (factory setting 10kHz, >10kHz with derating)
Time accel./decel		Two stage acc/dec time (0.1~3.6s) and two stage S curve
Display		4 digit/7 segments
Keypad/LED		7 keypads/8 LEDs
Frequency setting mode		Set directly with UP/DOWN keys or by dial on keypad or setting through external analogue signal or up to 8 preset speeds (through external digital signal)
Options	Nil F	None Built-in filter

Output Specifications

Motor supply		
3-phase	240V 480V	0~mains voltage, 0.1~650Hz 0~mains voltage, 0.1~650Hz
Multifunctional output terminal		
Contact rating		1A@250VAC 1A@30VDC

Weight

Model	Weight (with built-in filter)	
	Kg	lb
RVCFA1200040	1.2 (1.3)	2.65 (2.87)
RVCFA1200075		
RVCFB1200150	1.5 (1.8)	3.31 (3.97)
RVCFB1200220	1.9 (2.3)	4.19 (5.07)
RVCFA3200040	1.2	2.65
RVCFA3200075		
RVCFA3200150		
RVCFB3200220	1.75	3.86
RVCFB3200370	1.9	4.19
RVCFC3200550	5.6	12.35
RVCFC3200750		
RVCFD3201100	15	33.01
RVCFD3201500		
RVCFD3201850		
RVCFE3202200	33	72.75
RVCFE3203000	34	74.96
RVCFA3400075	1.2 (1.3)	2.65 (2.87)
RVCFA3400150		
RVCFB3400220	1.8 (2.2)	3.97 (4.85)
RVCFB3400370		
RVCFC3400550		
RVCFC3400750	5.6 (6.6)	12.35 (14.55)
RVCFC3401100		
RVCFD3401500	15	33.01
RVCFD3401850		
RVCFD3402200		
RVCFE3403000	33	72.75
RVCFE3403700	50	110.23
RVCFF3404500		
RVCFF3405500		

Protection Functions

Overcurrent		
General load		150% of rated current for 1 min.
HVAC load		123% of rated current for 1 min.
Overvoltage	240V 480V	DC voltage > 410V DC voltage > 820V
Undervoltage	240V 480V	DC voltage < 190V DC voltage < 380V
Max. momentary power loss function		
Function		Stop for more than 15ms power loss can be restarted with speed search in max. momentary power loss time
Momentary power loss time		
RVCFA		1.0 s (except RVCFA3200150=2.0s)
RVCFB		2.0 s
RVCFC		2.0 s
RVCFD		2.0 s
RVCFE		2.0 s
RVCFF		2.0 s
Stall prevention		Acc/dec/operation stall prevention and stall prevention level
Output terminal short circuit		Electronic circuit protection
Other functions		Electronic circuit protection for earth fault, protection for heat sink overheating, overtorque detection, reverse prohibition, restriction for direct start after power up and error recovery, parameter lock-up

General Specifications

Operating temperature	From -10°C to +50°C (from +14°F to +122°F)
Storage temperature	From -20°C to +60°C (from -4°F to +140°F) for max 12 months
Max. relative humidity	95% (non-condensing)
Cooling	Forced ventilation with fans
Degree of protection	IP00 or IP20 (Nema 1 by external upper cover only for sizes "A" and "B")
Pollution degree	2
Installation category	
240V	Ground class III
480V	Special ground class
Max. altitude	1000m (3250ft)
Vibration	1G-9.8m/s ²
Approvals	CE, eUL _{us} listed
EMC	According to EN61800-3

General Functions

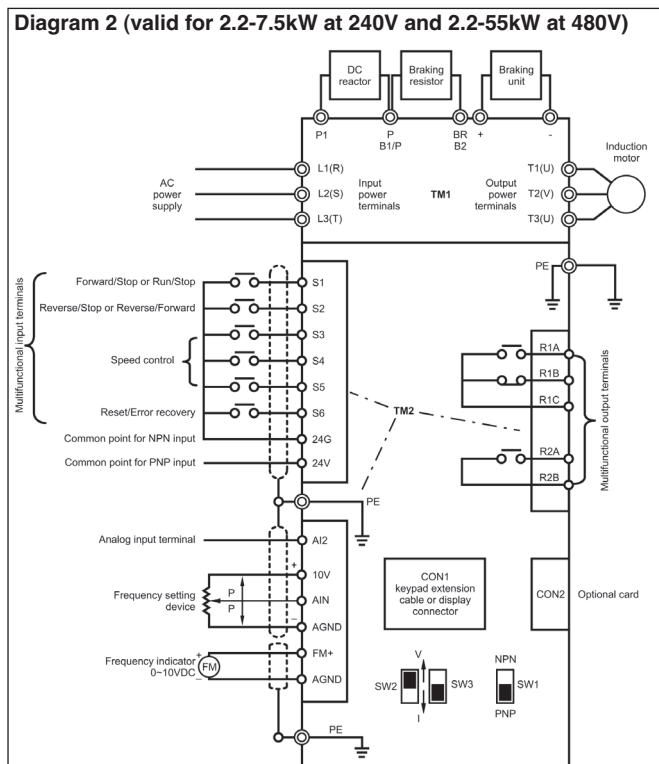
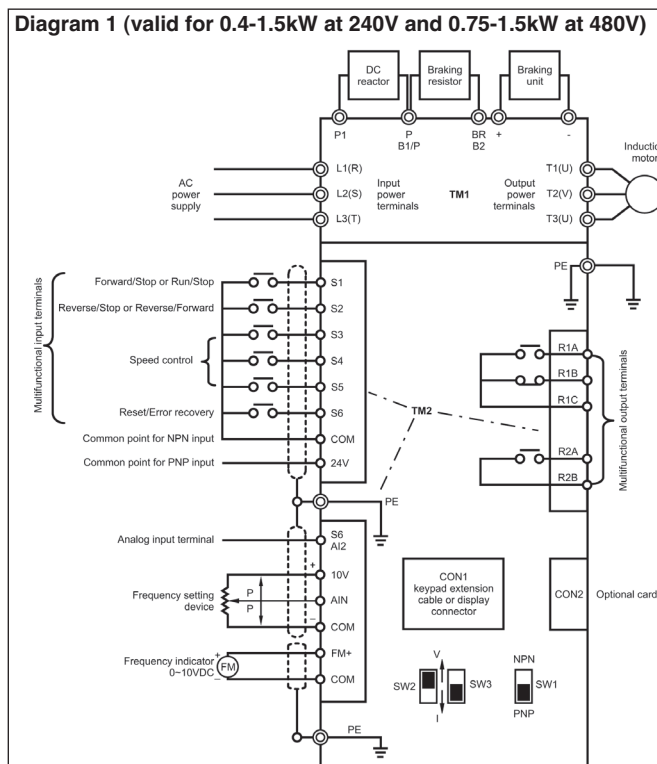
Control mode	Sensorless control (starting torque: 150%/1Hz in sensorless mode) or V/F control
Output frequency limit function	Respectively setting upper/lower frequency limits and two-stage prohibited frequencies
Control features	8 preset speeds, acc/dec switch (2 stages), S curve, 3-wire control, PID control, torque boost, slip compensation, frequency upper/lower limit, auto energy saving, MODBus slave and PC link, auto restart, built-in PLC.



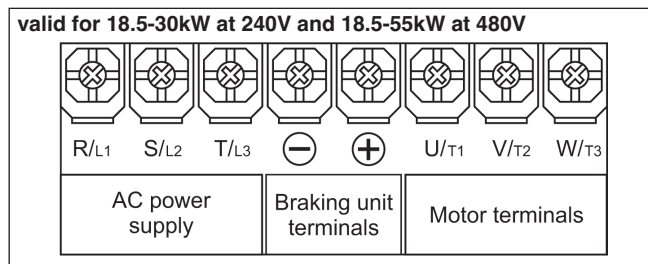
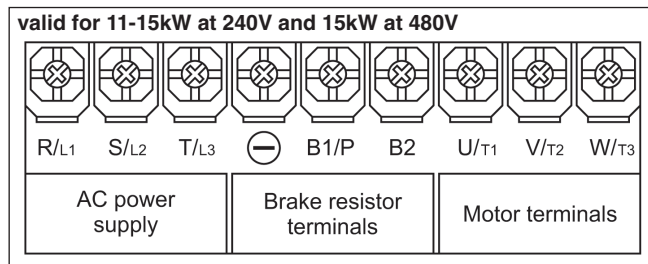
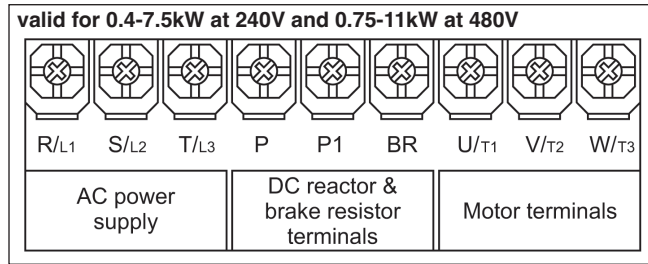
Wiring Description

Supply terminal 1-phase 3-phase	L1, L3(N) L1, L2, L3	Analog output terminal Output terminal Common terminal COM AGND	FM+ for all drives for 0.4~1.5kW at 240V and 0.75~1.5kW at 480V drives for 2.2~30kW at 240V and 2.2kW~55kW at 480V drives
Motor terminal	T1(U), T2(V), T3(W)	Braking resistor P, BR B1/P, B2 Through braking unit	for 0.4~7.5kW at 240V and 0.75~11kW at 480V drives for 11~15kW at 240V and 15kW at 480V drives for 18.5~30kW at 240V and 18.5~55kW at 480V drives
Multifunctional input terminal Input terminal Common terminal 24V COM 24G	S1~S6 (and AIN: High level >8V, low level <2V) PNP input NPN input (for 0.4~1.5kW at 240V and 0.75~1.5kW at 480V drives) NPN input (for 2.2~30kW at 240V and 2.2kW~55kW at 480V drives)	DC reactor P, P1 Not available	for 0.4~7.5kW at 240V and 0.75~11kW at 480V drives for 11~30kW at 240V and 15~55kW at 480V drives
Multifunctional output terminal R1A, R1B, R1C R2A, R2B	Change over relay contact NO relay contact	Braking unit +, -	for 18.5~30kW at 240V and 18.5~55kW at 480V drives
Analog input terminal Input terminal AIN AI2 S6 Common terminal COM AGND	for all drives for 2.2~30kW at 240V and 2.2kW~55kW at 480V drives for 0.4~1.5kW at 240V and 0.75~1.5kW at 480V drives for 0.4~1.5kW at 240V and 0.75~1.5kW at 480V drives for 2.2~30kW at 240V and 2.2kW~55kW at 480V drives		

Wiring Diagrams





Main Circuit Terminals (TM1)



Terminals layout



Description of SW1~SW3

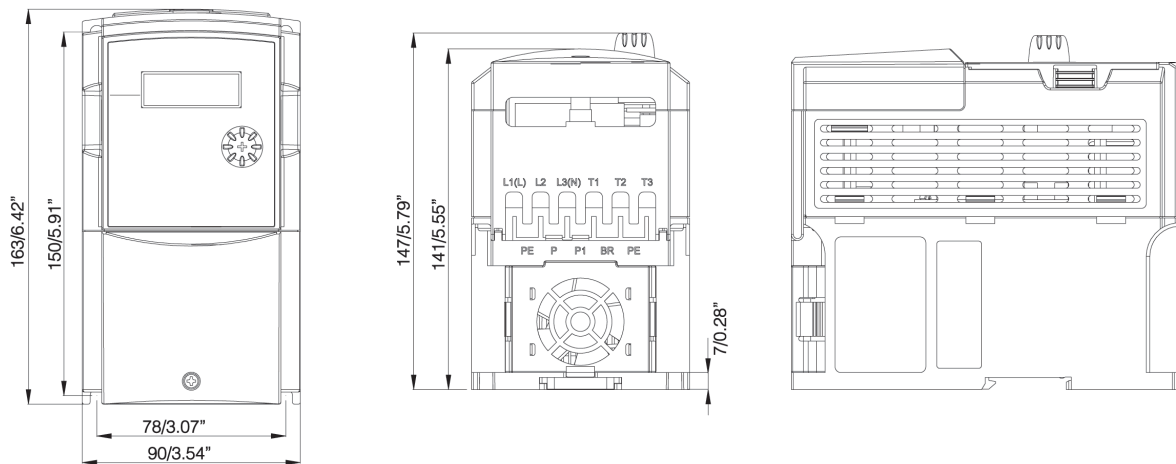
	SW1	SW2/SW3
	NPN input	0~10VDC analog signal
	PNP input	0~20mA analog signal

Accessories

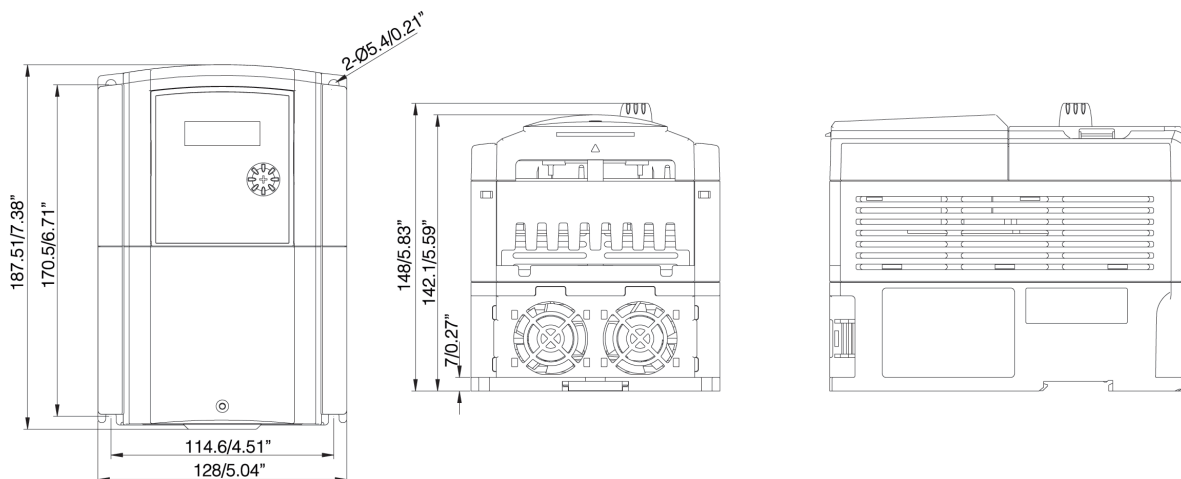
Code	Description
RVFSIF485	AC Drive RS485 option card
RVFSIF232	AC Drive RS232 adapter
RVFSIFMP	AC Drive Program copy unit
RVFSW3001	AC Drive Keypad extension cable 1m
RVFSW3003	AC Drive Keypad extension cable 3m
RVFSW3005	AC Drive Keypad extension cable 5m
RVCFTBU230	AC Drive RVCF 230VAC brake unit device
RVCFTBU430	AC Drive RVCF 480VAC brake unit device
RVFDEMO	AC Drive Demo Case

Dimensions (mm/inches)

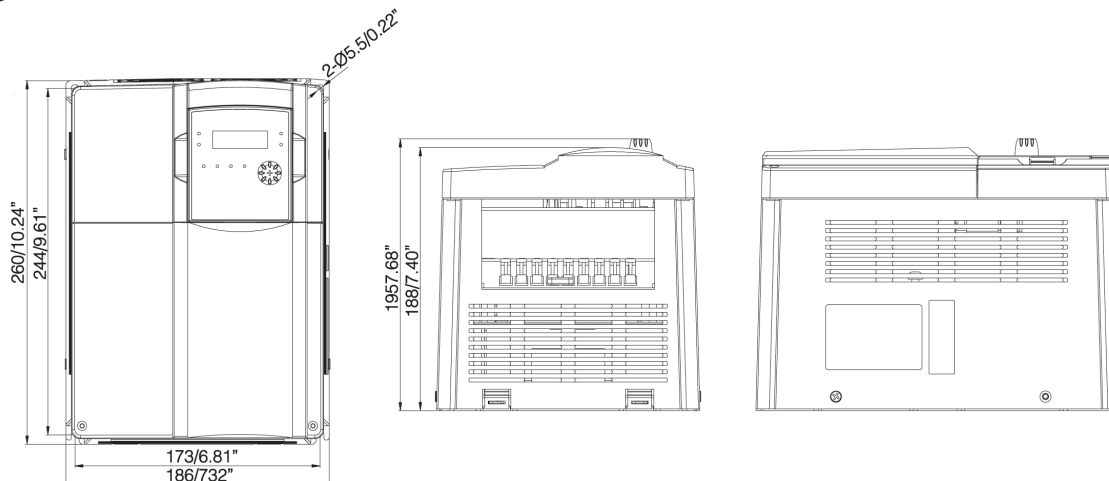
Size "A"



Size "B"



Size "C"



Dimensions (mm/inches) (cont.)

