



Smart solutions.
Strong relationships.



VSR SERIES DRIVES

Advanced Solar Pumping Solutions
for Optimal Performance and Reliability



murugappa

VSR Series Drives:

Advanced Solar Pumping Solutions for Optimal Performance and Reliability



The VSR series drives deliver dependable, economical, and user-friendly performance tailored for solar pumping, with a soft start feature that prevents water hammering and enhances system longevity. The VSR series incorporates an advanced built-in MPPT algorithm, dynamically adjusting to ensure optimal power extraction and maximum water flow output with exceptional accuracy. VSR's compatibility with both AC and DC inputs provides users with the flexibility to optimize operations, enhancing overall reliability.

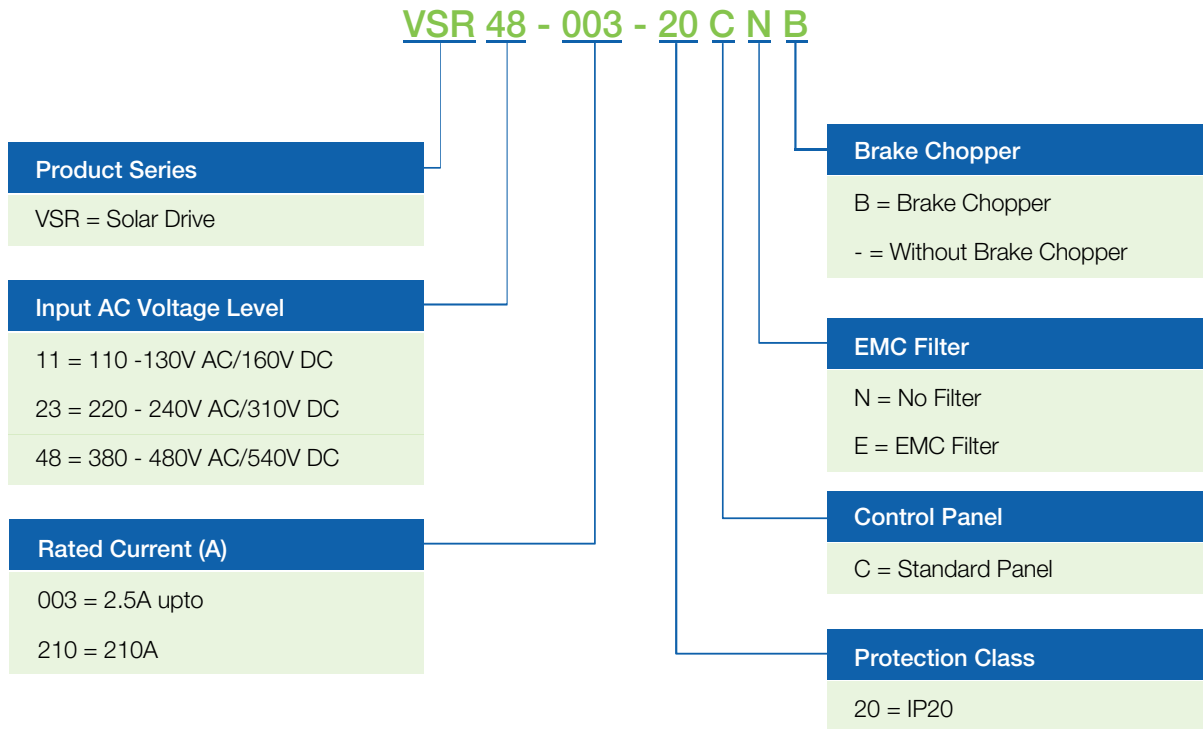
Main Features:

- Supports over-current, over-voltage, phase loss, short-circuit, and over-temperature protection.
- Incorporates a self-adaptive high-accuracy maximum power point tracking (MPPT) algorithm, enhancing daily water delivery and productivity.
- Achieves a solar power tracking efficiency of up to 99%.
- Includes specialized features such as tank level control, specifically designed for water pumping applications.
- Operates seamlessly with both DC solar panels and AC grid power sources.
- Provides built-in dry run protection, safeguarding the pump from damage and reducing maintenance costs and downtime.
- The inverter automatically enters dormancy mode and awakens according to sunlight intensity.
- Compatible with any remote monitoring system via Modbus RTU protocol.
- Capable of operating both induction and permanent magnet synchronous motors.



Model Explanation:

Model Shown on the Product Nameplate Showcases the Following Information.



Note: '-XS' suffix denotes drive with 7 segment LCD display

Types and Ratings - VSR Model:

Model No.	Recommended Solar Array Power kWp (kilowatt Peak)	Maximum Input DC Current	Output Current	Motor	
		A	A	kW	HP
VSR48 Series					
VSR48-003-20CNB	1.1	4.5	2.5	0.75	1
VSR48-004-20CNB	2.25	7.5	4.2	1.5	2
VSR48-006-20CNB	3.3	10	5.5	2.2	3
VSR48-009-20CNB	6	18	9.5	3.7, 4	5
VSR48-013-20CNB	8.25	20	13	5.5	7.5
VSR48-017-20CNB	11	30	17	7.5	10
VSR48-024-20CNB	16.5	31.7	25	11	15
VSR48-032-20CNB	22.5	42.2	32	15	20
VSR48-038-20CNB	27.5	52.8	37	18.5	25
VSR48-045-20CNB	33	63.4	45	22	30
VSR48-060-20CNB	45	95.0	60	30	40

VSR48-075-20CNB	55.5	116.2	75	37	50
VSR48-091-20CN-	67.5	137.3	91	45	60
VSR48-112-20CN-	82.5	169.0	112	55	70
<i>Larger rating available on request</i>					
VSRE48 Series					
VSRE48-003-20CNB	1.1	4.5	2.5	0.75	1
VSRE48-004-20CNB	2.25	7.5	4.2	1.5	2
VSRE48-006-20CNB	3.3	10	5.5	2.2	3
VSRE48-009-20CNB	6	18	9.5	3.7, 4	5
VSR23 Series					
VSR23-2p5-20CNB	0.6	4.5	2.5	0.37, 0.4	0.5
VSR23-4p2-20CNB	1.1	7.5	4.2	0.75	1
VSR23-7p5-20CNB	2.25	10	7.5	1.5	2
VSR23-9p5-20CNB	3.3	18	9.5	2.2	3
VSR23-017-20CNB	6	30	17	3.7, 4	5
VSR23-XXX-D Series					
VSR23-9p5-D	3.3	18	9.5	2.2	3
VSR11 Series					
VSR11-9p5-20CNB	1.6	18	9.5	1.1	1.5

Note: VSR23-9p5-D: Economical VSR drive 310V DC input



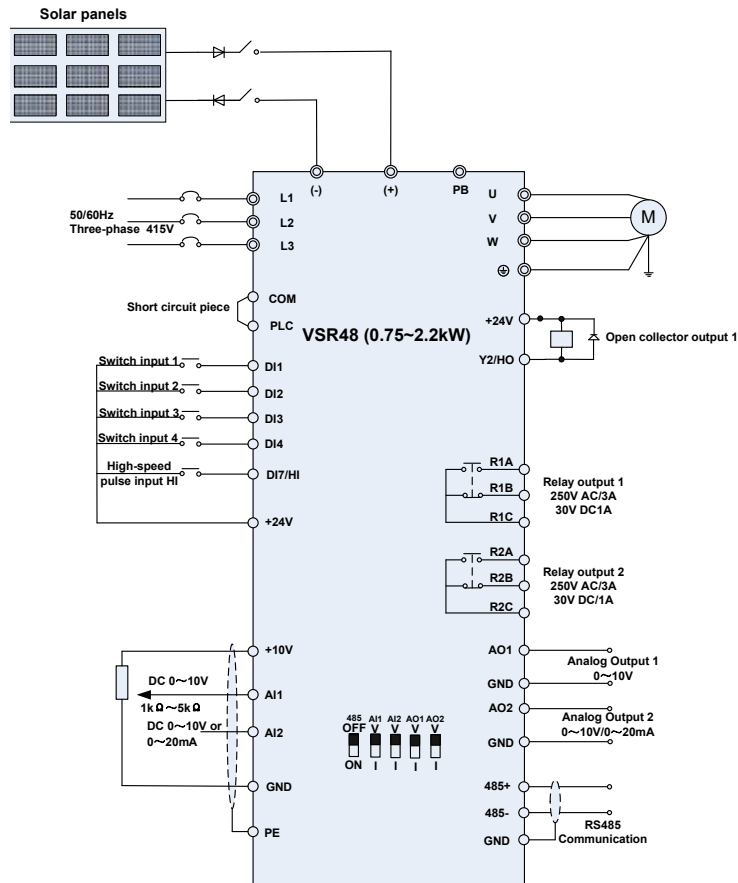
General Specifications of VSR Drives:

Model		VSR48/VSRE48 Series	VSR23 Series	VSR23-XXX-D Series	VSR11 Series
Maximum PV Input DC Voltage		800V DC	450V DC	450V DC	450V DC
Recommended Voc Range		500 ~ 700V DC	320 ~ 370V DC	360 ~ 430V DC	150 ~ 430V DC
Recommended MPPT Voltage Range		450 ~ 600V DC	250 ~ 350V DC	250 ~ 350V DC	130 ~ 350V DC
Starting Voltage Range		230 ~ 800V DC	60 ~ 450V DC	60 ~ 450V DC	60 ~ 450V DC
Recommended Input Work Voltage (V)		560V DC	310V DC	310V DC	155V DC
Grid or Backup Generator Input Voltage (V)		Three phase 415V (-20% ~ 20%)	Single phase 220V (-20% ~ 20%)	-	Single phase 110V (-15% ~ 20%)
Rated Output Voltage		3-Ph 415V	3-Ph 220V	3-Ph 220V	3-Ph 110V
Output Frequency		0 ~ 590Hz (default 0 ~ 50Hz)	0 ~ 590Hz (default: 0 ~ 50Hz)	0 ~ 590Hz (default: 0 ~ 50Hz)	0 ~ 590Hz (default: 0 ~ 50Hz)
Control Characteristics	V/f Patterns	V/f control Sensor-less vector control 1 and 2			
	Speed Range	1:50 (V/f control) 1:100 (sensor-less vector control 1) 1:200 (sensor-less vector control 2)			
	Speed Accuracy	±0.5% (V/f control) ±0.2% (sensor-less vector control 1 & 2)			
	Speed Fluctuation	±0.3% (sensor-less vector control 1 & 2)			
	Torque Response	< 10ms (sensor-less vector control 1 & 2)			
Basic Function	Overload Capability	150% rated current 60s, 180% rated current 10s, 200% rated current 1s.			
Environment	Place of Operation	Indoors, no direct sunlight, free from dust, corrosive gases, flammable gases, oil mist, water vapour, water drop, salt, etc.			
	Altitude	0 ~ 2000m De-rate 1% for every 100m when the altitude is above 1000m			
	Ambient Temperature	-10 °C ~ 50 °C			
	Relative Humidity	5 ~ 95%, no condensation			
	Vibration	Less than 5.9m/s ² (0.6g)			
	Storage Temperature	-20 °C ~ +70 °C			
Built-in Protection	Lightening Protection, Over-Current, Overvoltage, Output Phase-Lose, Under-Load, Under-Voltage, Short Circuit, Overheating, Water Pump Dry Run etc.				
Others	Efficiency	Rated Power Run ≥93%			
	Installation	Wall or Rail Mounting			
	IP Grade	IP20			
	Cooling Method	Forced Air Cooling			

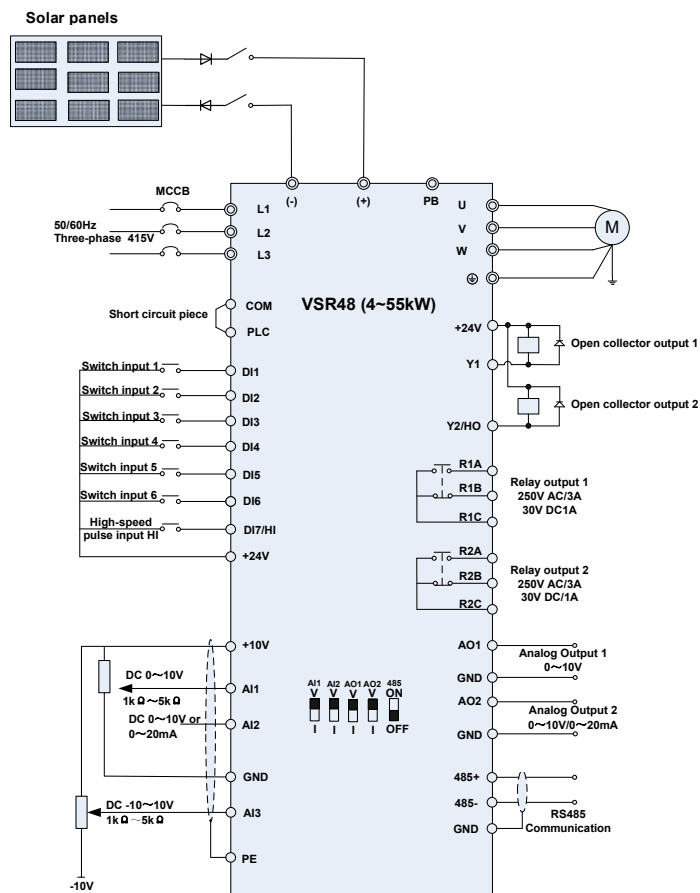
Note: Starting voltage range for VSR23-017: 100 ~ 450V DC

Wiring Diagram:

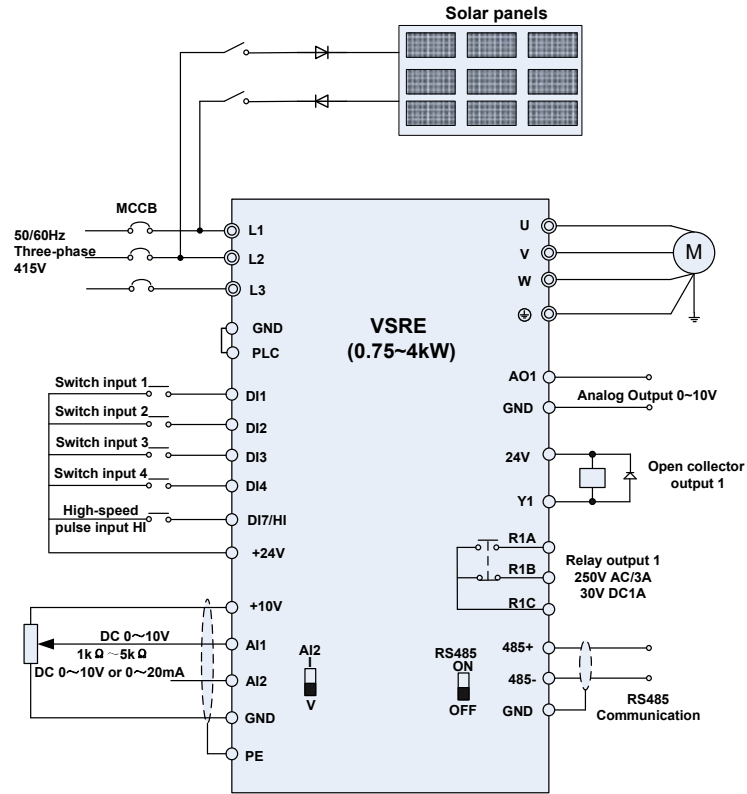
VSR48 (0.75~2.2kW)



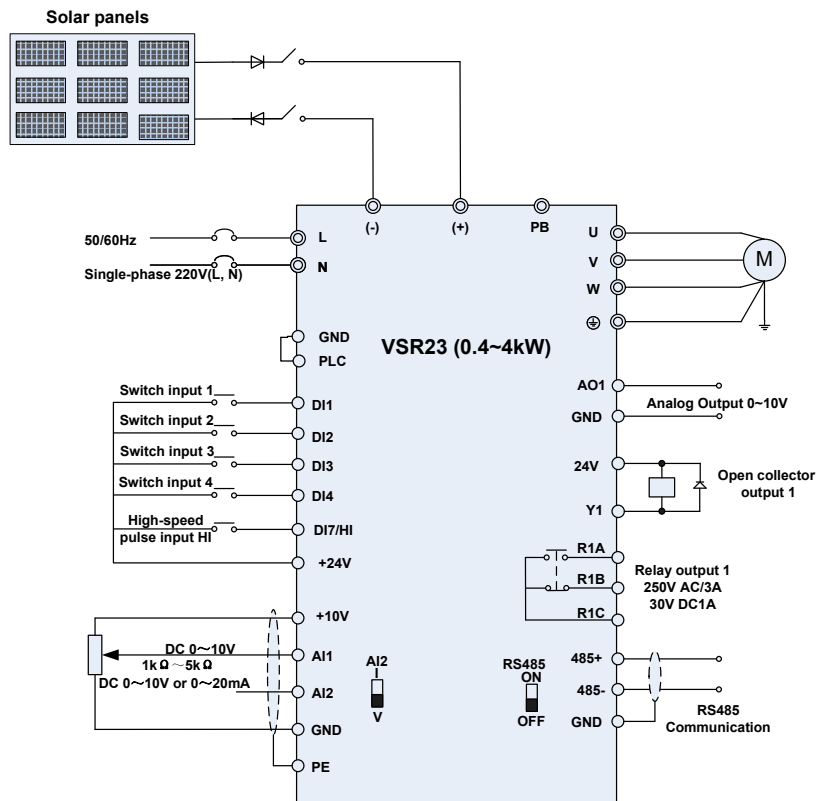
VSR48 (4~55kW)



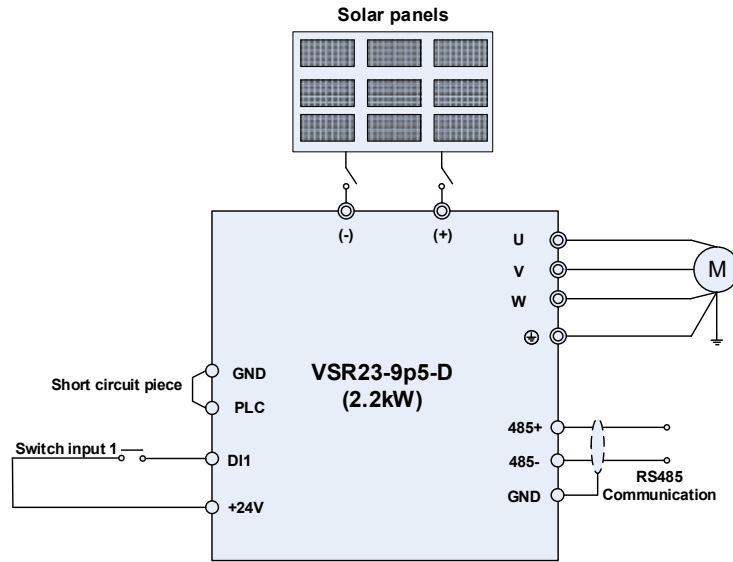
VSRE (0.75~4kW)



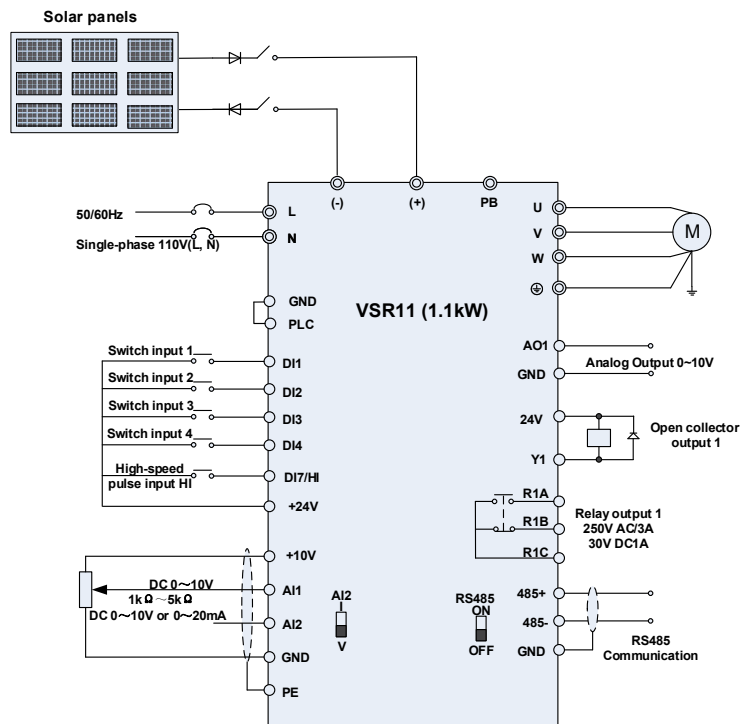
VSR23 (0.4~4kW)



VSR23-9p5-D (2.2kW)

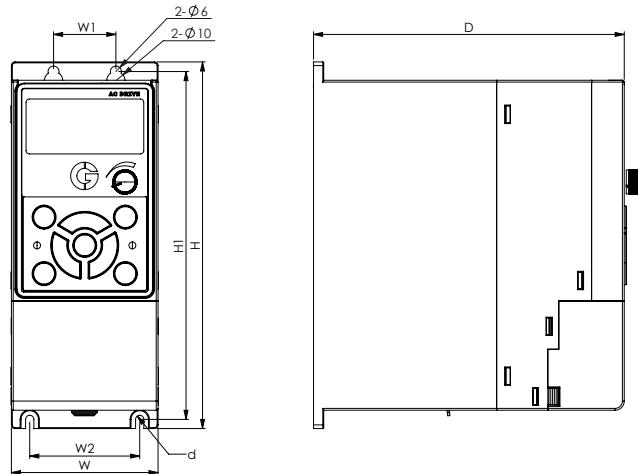


VSR11 (1.1kW)

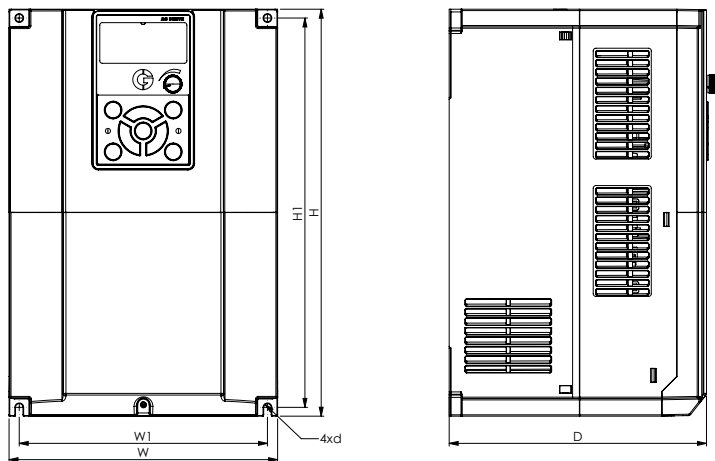


Model Mounting & Design:

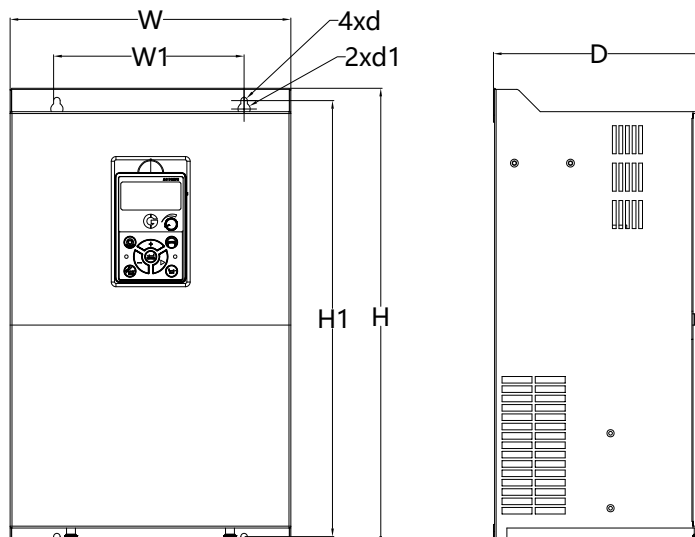
0.75 ~ 2.2kW Dimensions and Wall Mounting Dimensions (VSR48)



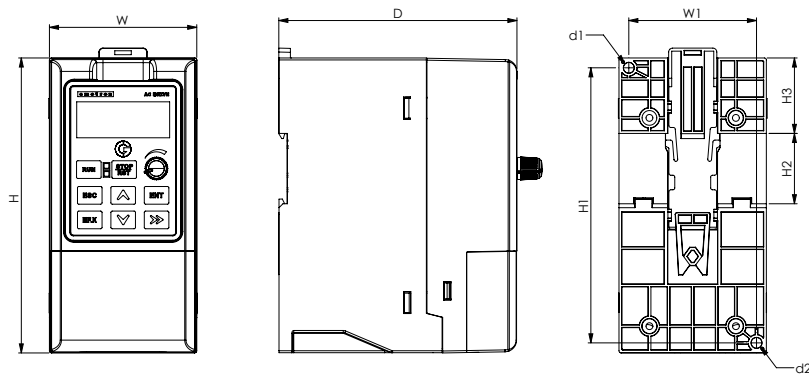
4 ~ 22kW Dimensions and Wall Mounting Dimensions (VSR48 / VSR23-017)



30 ~ 55kW Dimensions and Wall Mounting Dimensions (VSR48)



VSRE48/VSR23/VSR23-9p5-D/VSR11 Dimensions and Wall Mounting Dimensions



Mechanical Specifications for VSR Model:

Model No.	External and Installation Dimensions (mm)								Weight (kg)	Air Flow (CFM)
	W	H	D	W1	H1	W2	Install Hole (d)	Install Hole (d1)		
VSR48 Series										
VSR48-003-20CNB	80	200	170	34	190	60	4.5	-	1.45	10
VSR48-004-20CNB										10
VSR48-006-20CNB										14
VSR48-009-20CNB	116.6	186.6	175	106.6	176.6	-	4.5	-	2.45	25
VSR48-013-20CNB									2.5	25
VSR48-017-20CNB	146	249	181.7	131	236	-	5.5	-	3.4	42
VSR48-024-20CNB									3.5	73
VSR48-032-20CNB	198	300	189.7	183	287	-	5.5	-	6.35	80
VSR48-038-20CNB									6.45	120
VSR48-045-20CNB									6.45	120
VSR48-060-20CNB	250	432	227	200	411	-	7.0	13	12.9	147
VSR48-075-20CNB									209	
VSR48-091-20CN-	300	485	226	200	466	-	7.0	13	15.0	209
VSR48-112-20CN-									216	

Note:
 a) W1: Upside hole-to-hole width
 b) W2: Downside hole-to-hole width
 c) H1: Hole-to-hole height

Model No.	External and Install Dimensions (mm)									Weight (kg)	Air Flow (CFM)
	W	H	D	W1	H1	H2	H3	Install Hole (d1)	Install Hole (d2)		
VSRE48 Series											
VSRE48-003-20CNB	75	150	120	65	140	35	38.5	4.5	4.5	0.95	10
VSRE48-004-20CNB											10
VSRE48-006-20CNB	93	171	130	82	160	35	39	4.5	4.5	1.45	15
VSRE48-009-20CNB											15
VSR23 Series											
VSR23-2p5-20CNB	75	150	120	65	140	35	38.5	4.5	4.5	0.95	10
VSR23-4p2-20CNB											10
VSR23-7p5-20CNB	93	171	130	82	160	35	39	4.5	4.5	1.45	15
VSR23-9p5-20CNB											15
VSR23-017-20CNB	117	187	175	106.6	176.6	-	-	4.5	4.5	2.5	25
VSR23-XXX-D Series											
VSR23-9p5-D	93	171	130	82	160	35	39	4.5	4.5	1.45	15
VSR11 Series											
VSR11-9p5-20CNB	93	171	130	82	160	35	39	4.5	4.5	1.45	15



Recommended Solar Array Configuration:

Model	Panel Voc=45V		Panel Voc=49V		Panel Voc=50V		Panel Voc=50.5V		Panel Voc=48.5V	
	Panel Power (W)	Configuration (per string* strings)	Panel Power (W)	Configuration (per string* strings)	Panel Power (W)	Configuration (per string* strings)	Panel Power (W)	Configuration (per string* strings)	Panel Power (W)	Configuration (per string* strings)
VSR23-2p5	300	9*1	540	8*1	550	8*1	575	8*1	725	8*1
VSR23-4p2	300	9*1	540	8*1	550	8*1	575	8*1	725	8*1
VSR23-7p5	300	9*1	540	8*1	550	8*1	575	8*1	725	8*1
VSR23-9p5	300	9*1	540	8*1	550	8*1	575	8*1	725	8*1
VSR23-017	300	9*2	540	8*2	550	8*2	575	7*2	725	8*1
VSR48-003	300	15*1	540	14*1	550	13*1	575	13*1	725	14*1
VSR48-004	300	15*1	540	14*1	550	13*1	575	13*1	725	14*1
VSR48-006	300	15*1	540	14*1	550	13*1	575	13*1	725	14*1
VSR48-009	300	15*1	540	14*1	550	13*1	575	13*1	725	14*1
VSR48-013	300	15*2	540	14*1	550	14*1	575	14*1	725	14*1
VSR48-017	300	15*2	540	13*2	550	13*2	575	13*2	725	15*1
VSR48-024	300	15*3	540	14*2	550	14*2	575	14*2	725	14*2
VSR48-032	300	15*4	540	16*2	550	13*3	575	13*3	725	15*2
VSR48-038	300	15*5	540	14*3	550	14*3	575	14*3	725	14*3
VSR48-045	300	15*6	540	14*4	550	14*4	575	13*4	725	14*3
VSR48-060	300	15*8	540	15*5	550	15*5	575	14*5	725	14*4
VSR48-075	300	15*9	540	15*6	550	15*6	575	15*6	725	14*5
VSR48-091	300	15*11	540	16*7	550	14*8	575	15*7	725	14*6
VSR48-112	300	15*14	540	15*9	550	15*9	575	15*9	725	15*7
VSRE48-003	300	15*1	540	14*1	550	13*1	575	13*1	725	14*1
VSRE48-004	300	15*1	540	14*1	550	13*1	575	13*1	725	14*1
VSRE48-006	300	15*1	540	14*1	550	13*1	575	13*1	725	14*1
VSRE48-009	300	15*1	540	14*1	550	13*1	575	13*1	725	14*1
VSR23-9p5-D	300	9*1	540	8*1	550	8*1	575	8*1	725	8*1
VSR11-9p5	300	9*1	540	8*1	550	8*1	575	8*1	725	8*1

Note: Please contact the CG technical team for the grid-sharing application.

Accessories:

Standard Option	Part No.	Description	Connection Mode
Keypad - Standard	S-PPU-VS	LCD display	RJ45
Keypad - Graphic	G-PPU-VS	Graphical display	RJ45
Relay Card*	VSOPT-RL	Multi-pump relay card	Terminal connection
Profibus Card	VSPROFIBUS-DP	Profibus communication card	DB9
Profinet Card*	VSPROFINET-2P	2- Port profinet communication card	RJ45

*Available from $\geq 4.0kW$ rating

Application Software:

EmoWizard software helps in the easy commissioning and troubleshooting of VSR series drives, offering user-friendly tools for viewing, manipulation, and exchanging data with the drive. Statistics data can be plotted using the oscilloscope, and drive control with control panel.



Applications:



Agriculture Irrigation



Industrial Water Supplies



Domestic Water



Animal Husbandry



Desert Controls



Aquaculture

Other Products from CG Drives and Automation:



Emotron FDU & VFX 2.1

Variable / Constant Torque Drive Applications.

Rated Power	0.55-4,000 kW
Supply Voltage	230-690 V, 3-phase



Emotron Active Front End Drive (AFE)

Available as Low Harmonic or Regenerative Version.

Rated Power	55-2,200 kW (AC) / 200-4,000 kW
Supply Voltage	380-690 V (AC) / 380-690 V, 3-phase



Emotron VSS & VSM

Optimized Drive for Smaller Applications.

Rated Power	VSS23: 0.37–2.2 kW, 1-phase
	VSM48: 0.75–4 kW, 3-phase
Supply Voltage	230V 1-phase, 230-480V, 3-phase



Emotron VSX

Compact Machinery Drive with High Functionality.

Rated Power	VSX48: 0.75–55 kW, 3-phase
Supply Voltage	380–480 V, 3-phase



Emotron TSA

Starts, Stops and Protects.

Rated Power	5.5-1,000 kW
Supply Voltage	230-690 V, 3-phase



Emotron M20

Shaft Power Monitors

Rated Power	100-240/380-500/525-690 VAC
Supply Voltage	Up to 999A via current transformer

Registered Office

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