RISHABH

Data Sheet

RADIUS APV-S

PHOTOVOLTAIC STRING INVERTERS

Technology from
GEFRAN, *Italy*

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DESCRIPTION

Rishabh, a leader in industrial sector with vast experience and knowhow, presents the new Radius APVS string inverter. Conforming to the most advanced international standards, the APVS satisfies the applicatio n demands of a market in constant technological evolution.
The RADIUS range of PV inverters represents the most advanced technology in the sector for controlling stateof theart industrial and civil PV plants. Maximum energy efficiency, long term reliability, plant mo nitoring and high level professional service are the cornerstones of the RADIUS range.
These inverters feature cuttingedge power components and advanced system controls that deliver sup erior performance with rapid returns on investments.

RADIUS -APV-S

FEATURES

- Maximum efficiency up to 98.3%
- IP 65 structure suitable for both indoor & outdoor installation
- Full power without derating up to 50°C ambient temperature.
- Natural ventilation minimizes breakdown & maintenance
- Robust design and latestgeneration power components with SiC technology
- Maximum power point tracking, up to 3 MPPT trackers
- Wide MPPT voltage range 350 to 800V
- Large graphical display provides a easy, userfriendly operator interface
- "Transformerless" versions for enhanced efficiency
- String fault detection & DC fuses on both poles of string
- Integrated DC circuit breaker under load
- Tool free & maintenance free terminals on both DC & AC side
- Integrated datalogger for operation and fault data logging
- USB port for quick & handy saving of production and operation data
- Integrated protections against overcurrent, overtemperature, reverse dc polarity, AC & DC overvoltage
- Wire Box to allow separate access for easy and quick installation.
- 2 Rs485 ports for communication interface
- Integrated inputs/outputs: 3 analog inputs, 2 digital inputs, 2 digital outputs
- Auxiliary 24 VDC out (500mA max) for connection of environmental sensors

VERY HIGH CONVERSION EFFICIENCY LEVEL

Maximum efficiency up to 98.3% makes the APVS string inverter one of the highest performing products on the market.
The use of SiC technology achieves high efficiency even with low input voltages.
Choice of cuttingedge power components and its intelligent design of the conversion system demonstrate its attention to performance and ensure users the fastest and highest return on their investments.

SiC Silicon Carbide Technology

PERFECT IN EVERY INSTALLATION CONDITION

Full power up to 50°C
The ability to work at high ambient temperatures without derating makes the APVS ideal even in the harshest environments. See specifications for details.

IP 65
APVS is suitable for both indoor and outdoor installations thanks to its IP65 structure.

Natural ventilation up to 25kW
The absence of cooling fans not only increases conversion efficiency, it also minimizes breakdowns and maintenance related to their operation in harsh environments.

RIGHT ANSWER TO ALL ENGINEERING NEEDS

With a very wide range of modular configurations, the APVS line of inverters ensures users not only the best technical solution but also the best price/performance ratio for every plant engineering need:

- Ac power with variable cos phi: 10-50kW

The offer is completed with a wide range of options, accessories, and services that make RADIUS the ideal partner for the entire life of the PV system.

APPLICATIONS

ADVANCED ENERGY SeriesAPVS...k AE (10-50)kW

Maximum flexibility and performance even in systems with complex structure.

CODE DESCRIPTION

APVS -XXk XX-TL-XX X X X-XX

Display	KA = advanced display
Grounding kit	X = not included
Interface protection system to CEI021 standard and AC3 contactor or AC SPD	X = not included
DC fuses and Broken string recognition	F = included
DC circuit breaker under load	S = included
MPPT numbers	1 = 1 MPPT 2 = 2 MPPT 3 = 3 MPPT
Transformer:	TL = not included
Model	AE = Advanced Energy
Inverter power in kW:	20k = 20 kW 18k = 18 kW 25k = 25 kW 15k = 15 kW 34k = 34 kW 12k = 12 kW 50k = 50 kW 10k = 10 kW
Photovoltaic string inverter, APVS series	

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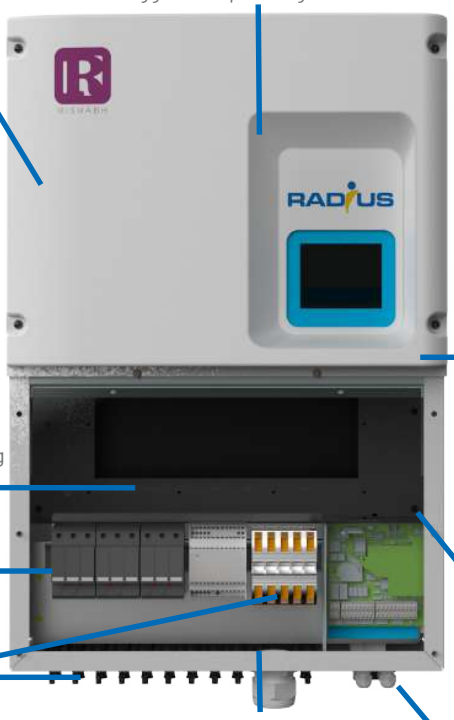
GENERAL CHARACTERISTICS

Integrated datalogger
APV-S is equipped with an integrated logger for operating and fault data.

Integrated protection
Overtemperature protection
Overcurrent protection
DC and AC Overvoltage protection
Reverse DC polarity protection
Ground fault monitoring
Anti-islanding
Interface protection
DC Injection control.



Wide screen display
Large display gives instantaneous view of all the relevant information

Integrated string fault detection
Current sensors for each string and indication of string fault.

Pluggable Type II DC and AC SPD
Integrated Type II DC and Type II AC SPD

Rapid installation
Tool-free and maintenance-free terminals on output side and MC-4 Terminals on DC side

Wire Box
Wiring zone with separate access designed to allow quick and easy installation.

DC circuit breaker under load

USB port
Quick and handy for saving production and operating data to update software.

Communication interfaces
2 RS485 ports
USB (standard)

Integrated Inputs / Outputs
3 analog inputs (environmental sensors)
2 digital inputs (0-24V)
2 digital outputs (0-24V)
24VDC OUT (500 mA MAX)
relays with open contact (single contact).

CHOOSING THE INVERTER - TECHNICAL DATA

APVS..AE				RADIUS Range of Inverters Technology from Gefran Italy								Designed on the Technology Platfrom of Radius		
				10kAETL1	10kAETL2	12kAETL1	12kAETL2	15kAETL2	18kAETL2	20kAETL2	20kAETL3	25kAETL2	34kAETL2	50kAETL3
Input data	Maximum DC voltage	V_{DC} max	[V]	1000										
	MPPT Operating Range		[V]	350..800										
	MPPT Range(@ maximum power)		[V]	350..800		390..800	350..800	390..800	470..800	350..800		450..800	520..800	
	Nominal Voltage		[V]	600V										
	Max. Recommended PV Power (balanced input)		[kWp]	12		14.4		18	21.6	24		30	40.8	60
	MPPT number	No. MPPT		1	2	1	2	2	2	2	3	2	2	3
	Number of strings per each MPPT	No.		2	1	2	1	2/1	2	2	2/1/1	3/2	3	4/3/3
	Maxm DC current per MPPT/ Maxm Short Circuit Current	Imax/Isc	[A]	33.7/42	22.5/28	33.7/42	22.5/28	22.5/28	22.5/28	33.7/42	22.5/28	33.7/42	33.7/42	33.7/42
Output data	Rated AC Power	$P_{NOM\ AC}$	[kW]	10	10	12	12	15	18	20	20	25	34	50
	AC rated current/Max current	I_{AC} max	[A]	13.9/16	13.9/16	16.6/19.2	16.6/19.2	20.8/24	25.0/28.9	27.8/32	27.8/32	34.8/37	47.3/50	69.5/79
	AC voltage	V_{AC}	[V]	{(239V_{LN} /415V_{LL} 3-phases + Neutral)/(230V_{LN} /400V_{LL} 3-phases + Neutral)} {output voltage Range (320 ... 480V_{LL}) / (184...277V_{LN})}(1)										
	Rated AC frequency	f_{AC}	[Hz]	50/60Hz (Output frequency range 47..53/57..63)(1)										
	Grid connection			TN-C/TN-S/TN-C-S/TT										
	THDi	THD grid	[%]	≤3										
	Power factor (settable)	cosphi		+/ 0.8										
	Maximum efficiency		[%]	98.1	98.1	98.1	98.1	98.2	98.3	98.3	98.3	98.3	98.1	98.1
	European efficiency (Euro ETA)		[%]	97.7	97.7	97.7	97.7	97.8	98	98	97.6	97.6	97.6	97.6
Efficiency / Protections	Interface protections(grid monitor)			Integrated										
	Antiislanding			Integrated (Where required by local regulations)										
	Insulation control			Integrated										
	Residual current monitoring			Integrated										
	Reverse DC polarity protection			Integrated										
	AC/DC overvoltage			AC SPD Type 2 Pluggable and Type 3 SPD standard with thermal protections Optional: Type 2 pluggable DC SPD										
	DC injection control			Integrated										
	DC circuit breaker			Circuit breaker under load										
	DC fuses & string failure detection			20A/15A/12A fuses(2) + current sensors for each string										
	Night Consumption(Standby loss)			<1W										

(1) The output voltage and frequency interval may vary according to the network connection standard.
(2) Applicable only for 10-25kW model, for 34-50kW model (MC4 with Inline fuses) are available as an option.

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CHOOSING THE INVERTER - TECHNICAL DATA

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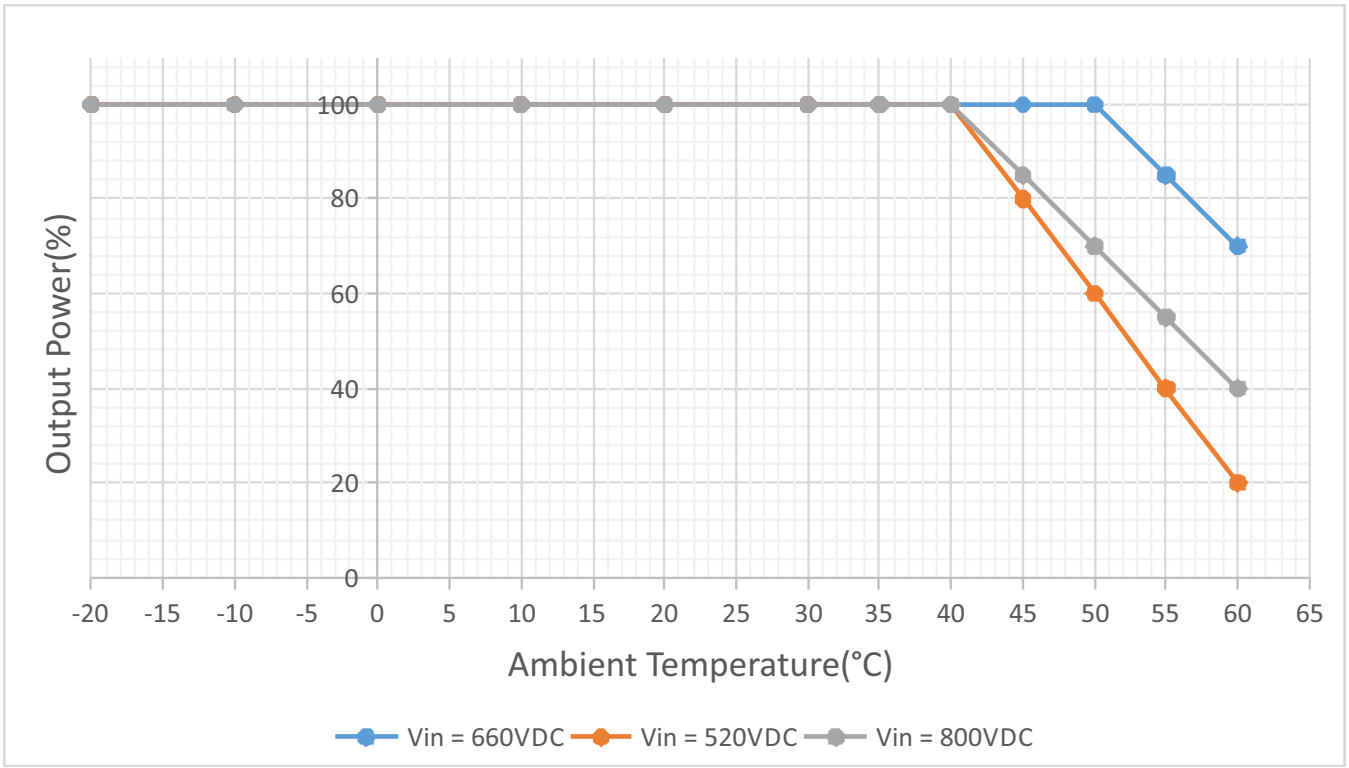
Interface	Display	KA										
		KA = 100 x 100mm graphic display with keypad										
	Communications	2 Rs485 ports (both with separate in/out) 1 standard USB port (only for firmware updates and downloading of historical data In built GSM based remote monitoring system(optional)										
	Inputs/Outputs	3 analog inputs (environment sensors 0..10V) 2 Digital inputs (0-24V) 2 Digital outputs (0-24V) 24V OUT (500mA MAX) 2 relays single contact (30Vdc, 250Vac/2A)										
	Cooling	Natural Convection										Forced Convection
Environmental Data	Temperature Range	-20...+60°C[6]										
	Noise Emission (Typical)	40db(A)										50db(A)
	Vibration	1G										
	IP protection degree	IP 65										
	Environmental conditions	4K4H										
	Maximum permissible value for relative humidity, non condensing	100%										
	Pollution degree	EN 6072134, free from direct solar radiation To avoid increase in the internal temperature of the inverter and cause a reduction of the output power (derating)										
	Altitude	Up to 2000m with derating (1.2% each 1000m above 1000m)										
Dimension & Weight	Dimensions	Width x Height x Depth: 551 x 770 x 325mm										WxHxD: 551 x 864 x 377mm
	Weight(Kg)	66	72	66	72	72	72	76	76	76	94	115
Standards	Approvals	IEC 6006821/2/14/30, IEC 61727, IEC 621091/2, IEC 62116, IEC 61683, IEC 60529, IEC 6100063/2, CE, VDE V 012611, VDEARN 4105; CEI 021, CEI 016 ed. III; RD 661 - Rd1699; South African Grid code, NRS 09721.(1)								IEC 6006-8-2-1/2/14/30, IEC 61727, IEC 62116, IEC 61683, IEC 60529, IEC 6100063/2, CE, VDE-V-0126-1-1, IEC 62109-1/2,		

(4) All the above models up to 20kW are available in PVSyst software under manufacturer name Gefran. The complete series of Radius including new models (25-50kW) is available under manufacturer name Rishabh.

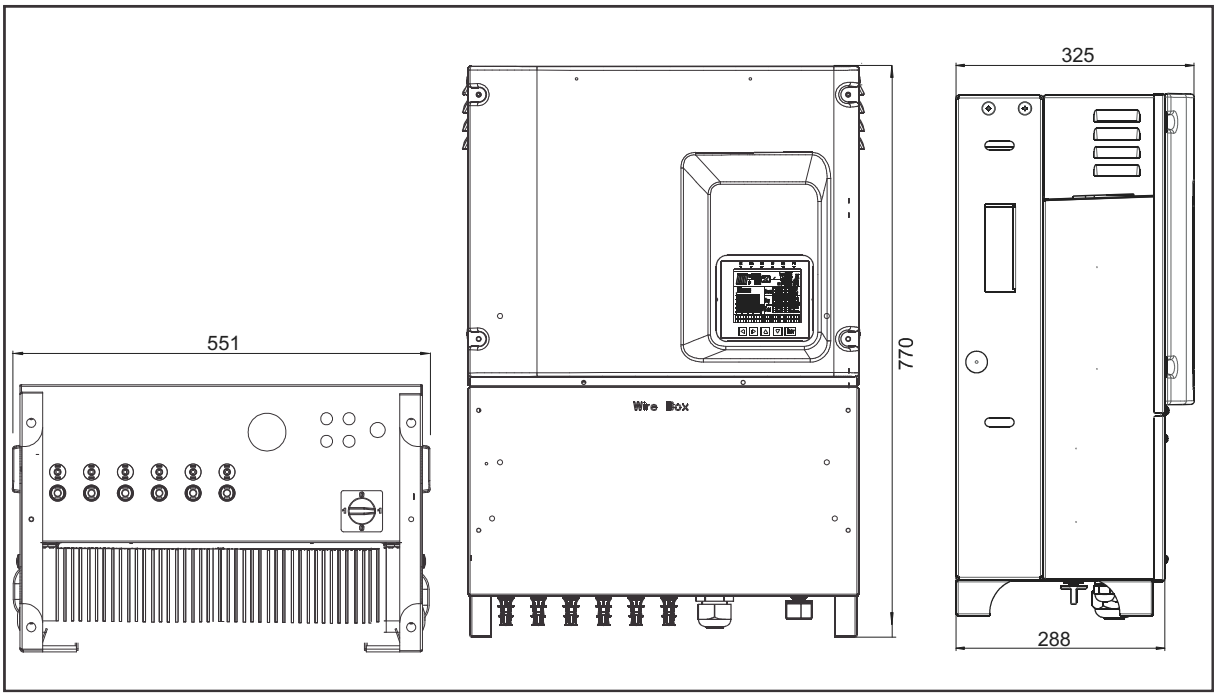
(5) For 50kW model VDE-V-0126-1 is available on request .

(6) Refer power derating versus temperature curves

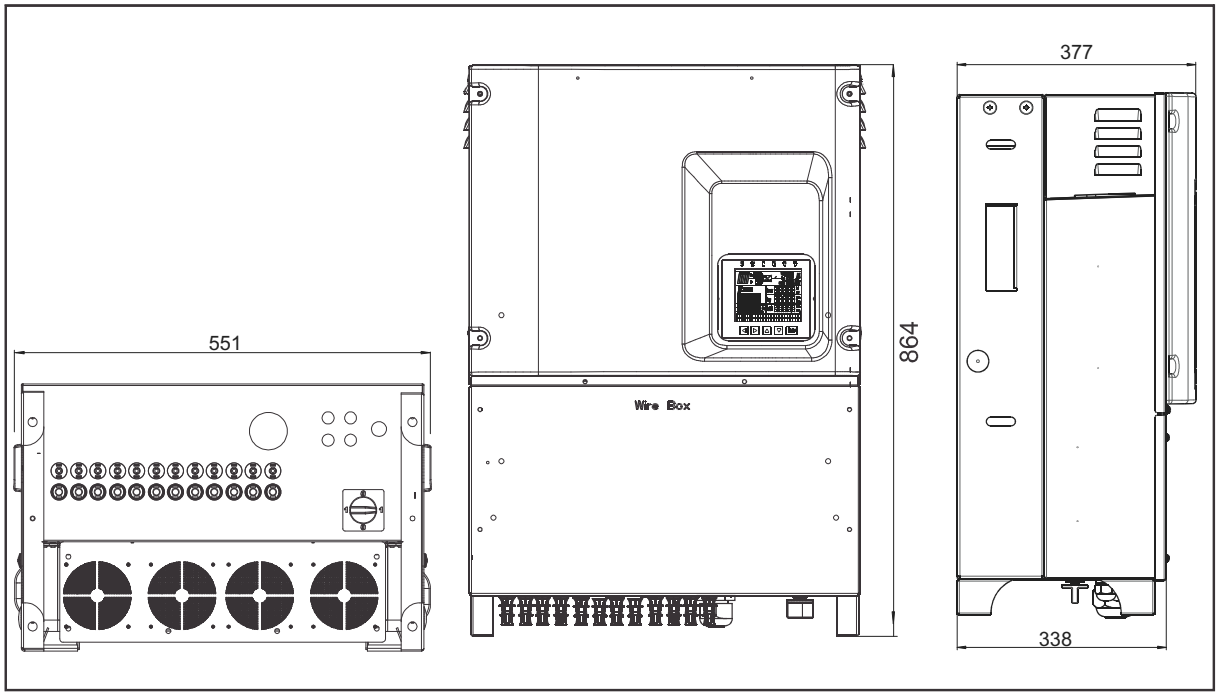
APV-S TEMPERATURE DERATING CURVE



APV-S-AE (10-25kW) DIMENSION



APV-S-(34-50)kW-AE DIMENSION



RADIUS

SOLAR ON-GRID INVERTERS
from

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These specifications may be changed without notice.

Version No: 3 4/22