

ABB monitoring and communications VSN600 String Combiner Box



ABB's VSN600 String Combiner Box is a feature-rich junction box for central inverter-based PV plants.

When used in conjunction with the Aurora Vision® Plant Management Platform, this smart combiner provides a cost-effective and intelligent solution for uptime and performance optimization.

The VSN600 String Combiner Box features efficient DC isolation with fully rated DC disconnect switches for safe maintenance. Access to local and remote disconnect switching is available with the use of a DC contactor. The open standard communication interfaces and SunSpec Alliance certification enable convenient use with any third-party logger or gateway.

The VSN600 String Combiner Box is available with several options to meet any project or budget need

The arc fault detect and interrupt feature satisfies NEC 2011 requirements for roof top installations. The smart combiner options enable DC current monitoring at the string level to help localize problems and minimize energy loss.

The Wi-Fi Certified™ wireless communication option, featuring Modbus TCP, significantly improves the performance of the monitoring system

The VSN600 String Combiner Box can be equipped with a self-powering option that uses the PV string power instead of an external 24 V power supply. Combine the self-powering option with the wireless-communication function to save time and reduce installation costs.

Highlights

- Manual 1000 V output disconnect with lock-out tag-out
- Touch-safe fuse holders and live component shields
- NEMA 4 / IP65 metal enclosure
- Code compliant and certified to either UL 1741 or IEC 50178
- Wire management back plate
- SunSpec Alliance compliant Modbus communication interface
- Valid for all markets accepting US or EU market certifications
- Simple end-user UI using Aurora Vision® Plant Viewer

Additional highlights

Available options include

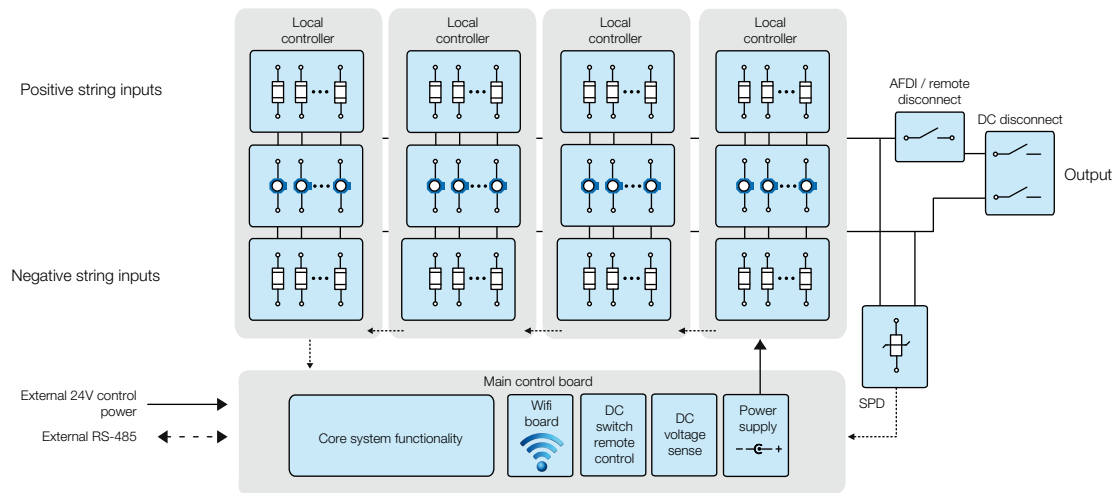
- Wi-Fi Certified™ high-speed communication interface
- Current monitoring
- Voltage monitoring
- Surge protection for Type 2 application
- Polymeric IEC Insulation Class II
- Self-powering from DC strings
- H4 or cable gland entry
- Floating or grounded array
- Arc fault detection and interruption sensors



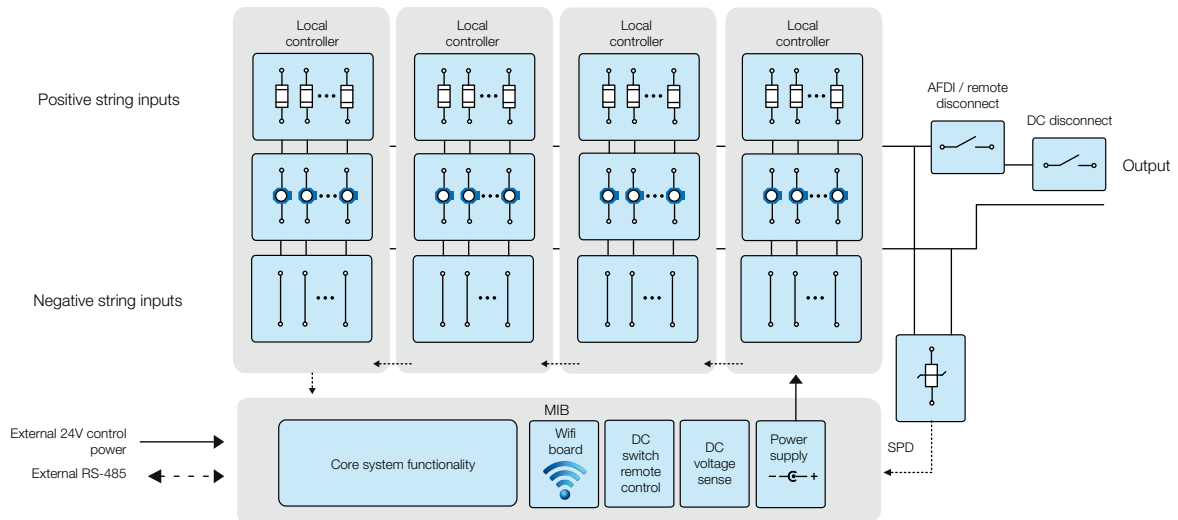
Technical data and types

Type code	VSN600 String Combiner Box		
	VSN600-16	VSN600-24	VSN600-32
Electrical specifications			
Input strings	16	24	32
Max DC voltage UL/IEC	1000 V		
Maximum input fuse rating	15 A (other sizes are special order)		
Recommended fuse	10x38 gPV		
Max string I _{sc}	11.25 A		
Maximum output current (derating above 50°C)	250 A	250 A or 400 A	400 A
String current accuracy error	<1% above 4 A, absolute error <0.05 A (<0.02 A above 1 A)		
String current steady-state/ measurement maximum	10 A		
Terminals and sizing			
Non-fused string input	#14 - #6 AWG (2.08 mm ² - 13.29 mm ²) spring clamp (90°C terminals, copper only)		
Fused string input	#14 - #6 AWG (2.08 mm ² - 13.29 mm ²) spring clamp (90°C terminals, copper only)		
Combined output (90°C terminals, Cu or Al) compression lug for single or dual hole (metric/ imperial)	Up to 1 x 300 mm ² or 2 x 180 mm ² / Up to 1 x 600 MCM or 2 x 350 MCM	Up to 2 x 300 mm ² / Up to 2 x 600 MCM	Up to 2 x 300 mm ² / Up to 2 x 600 MCM
Cable lugs optional	1/2 inch (M12) hole provided for single or dual-hole compression lug		
Ground busbar small inputs	16	24	32
Small ground	14 AWG - 4 AWG (2.08 mm ² - 21.14 mm ²)		
Ground busbar large input	1		
Large ground	Up to 3/0 (95 mm ²)		
Disconnect			
Disconnect rating	250 A only	250 A or 400 A	400 A only
Maximum panel isc	180 A	200 A or 270 A	320 A
Environmental protection rating			
Ambient temperature range	-25°C to 50°C (-40°C without power supply or arc fault options)		
Storage temperature range	-40°C to 65°C		
Elevation	< 3000 m		
Environmental rating	NEMA 4X, IP65		
Humidity	0 to 100% Condensing		
Physical parameters			
Dimensions (H x W x D) polymeric	914 mm x 635 mm x 356 mm 36" x 25" x 14"	914 mm x 635 mm x 356 mm 36" x 25" x 14"	1346 mm x 800 mm x 368 mm 53" x 31.5" x 14.5"
Dimensions (H x W x D) metallic	762 mm x 648 mm x 356 mm 30" x 25.5" x 14"	914 mm x 648 mm x 356 mm 36" x 25.5" x 14"	1105 mm x 648 mm x 356 mm 43.5" x 25.5" x 14"
Enclosure options	Polymetric, powder-coated, oil-treated steel		
Polymeric weight	105 lbs (47.6 kg)	107 lbs (48.5 kg)	165 lbs (74.8 kg)
Metallc weight	105 lbs (47.6 kg)	123 lbs (55.8 kg)	148lbs (67.1 kg)
Mounting orientation	Upright, rotated on side, on back* (Thermal derating for back-mounted application)		
DC switch handle	External (front) access, lockable in "open" position		
Opening	Hinged door, quarter turns used to seal the door, pad-lock provision		
Vent	NEMA 4/IP65 rated humidity protection vent		
Color	RAL 7035		
Touch safe	Touch-safe fuse holders and a shield over live components		
Compliance			
Safety	Options: UL 1741; or IEC 50178 and AS/NZS 3001-2008		
Marking	cTUV _{us} / CE		
EMC	Options: FCC class A (47 CFR 15); or EN61000-6-1, 61000-6-3 and ASNZ 60950.1		
Wireless option	Wi-Fi Certified™		
Class II combiner	Polymeric enclosure option only		

Block diagram of VSN600 String Combiner Box with floating ground



Block diagram of VSN600 String Combiner Box with negative ground



Technical data and types

Type code	VSN600 String Combiner Box		
	VSN600-16	VSN600-24	VSN600-32
Communication (Smart Combiner options only)			
Protocol	RS-485 2 wire, Modbus RTU, SunSpec Alliance compliant register set (legacy Aurora Protocol available)		
Terminal block	#28 - #16 AWG (0.08 mm ² - 1.5 mm ²)		
Recommended cable	Belden #1120 A or # 3106 A for 3 conductors or equivalent		
Wireless option	Wi-Fi Certified™ (IEEE 802.11.b/g/n 2.4 GHz) (Modbus TCP)		
Monitored parameters	String current, array voltage ¹⁾ , internal temperature, surge protection status ¹⁾ , arc fault status ¹⁾		
Power supply			
DC power supply input	24 V Nominal, 22-30 V, 1 A		
Terminal block	AWG #22 - #14 (0.325 mm ² - 2.08 mm ²)		
Self power option (smart combiner options)	24V transformed from DC string 200 V to 1000 V (no external power needed)		
Surge protection option			
Replaceable cartridge	Class II		
Entry options			
Conduit	Drill templates		
MC4 connectors	H4 on inputs, cable glands for output and communication		
Cable glands	Multi-entry glands, (3) inputs for every string (Positive, Negative, Ground)		
Arc fault detection and interrupt option			
Certification	UL 1699B (Type 1)		
Alarm	Red light on top of cabinet and alarm over communication link. Output power removed in case of fault		
Inverter tuning	Tuned to ABB inverters only		
Array fusing and grounding options			
Fusing	Single fusing or dual fusing		
Array grounding	Positive, negative or floating		

¹⁾ Option dependent

Remark. Features not specifically listed in the present data sheet are not included in the product

Support and service

ABB supports its customers with dedicated, global service organization in more than 60 countries and strong regional and national technical partner networks providing complete range of life cycle services.

For more information please contact your local ABB representative or visit:

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