

Product description

Potable water station

HE 2.0 cascade



> **VARIO fresh-nova 2.0 cascade** // Description and structure

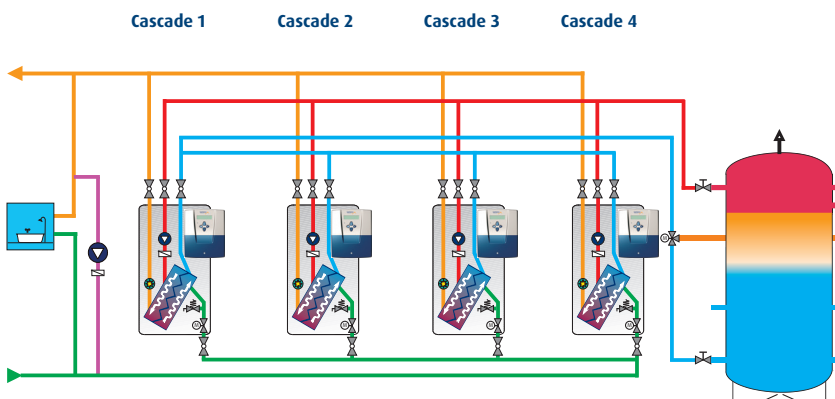
Area of application:

5th generation cascaded potable water technology
 > convenient
 > hygienic
 > energy-saving
 for medium to large central potable water heating systems.

The VARIO fresh-nova 2.0 cascade devices are cascaded water-to-water instantaneous water heaters with VarCon211 electronic controllers for use in domestic installations for central potable water heating. The standard functions include
 > potable water heating,
 > circulation pump control,
 > cascade function and
 > configurable switching function.

Potable water cascades are ideal for use in apartment buildings and commercial properties in new buildings and refurbished heating systems with high hot water demand, taking into account hygiene and energy saving considerations. They are typically supplied with heating water = heat by standard buffer storage tanks or stratified storage tanks.

Structure of the potable water cascade



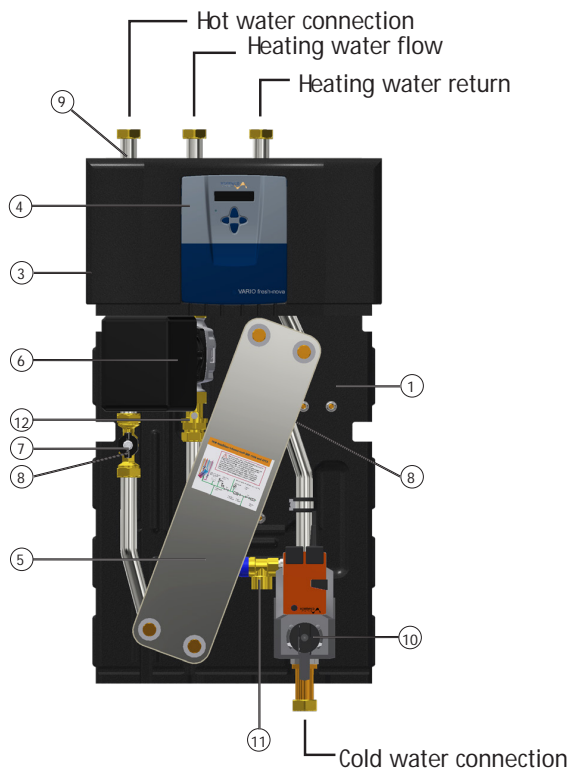
The primary flow and return are connected to a buffer tank via the shortest possible pipe run to Tichelmann. A separate connection must be selected for each component to ensure hydraulic separation from other components. The return can optionally be fed into the middle storage area via a temperature-dependent return switch. The switch is controlled by the switching function of a device controller.

For reasons of convenience, a circulation device is recommended.

> **VARIO fresh-nova 2.0 cascade** // Structure and operation

Structure of the cascade devices

Type Vfnxx-2.0-KmV



The **VARIO fresh-nova 2.0 cascade** units consist of

1. EPP rear wall
2. Lower EPP insulation cover (not shown) upper
3. EPP insulation cover
4. Controller housing
5. Plate heat exchanger with flush connections
6. High-efficiency exchanger charging pump in ventilation duct
7. Volume flow sensor
8. Temperature sensor
9. Piping, all connections (TWK, TWW, VL prim./sec.) flat sealing with 1" union nut
10. Cold potable water valve (TWK valve)
11. Potable water safety valve 3/4" IG
12. Gravity brake (can be set up)

Operation

Everything under control with four buttons

Each device has its own controller. The LC display and the four control buttons are located on the front of the controller housing. It displays the current operating status in two lines of plain text and shows the menu and input windows during operation.

Since each controller can operate independently, care must be taken to ensure that the settings are the same for all controllers.



> VARIO fresh-nova 2.0 cascade // Functions

Functions

Potable water heating

The **VARIO fresh-nova 2.0 cascade** heats potable water using a flow-through process. When cold water flows through the device, the integrated controller registers this via the volume flow sensor and activates the speed-controlled charging pump at the correct dosage. This pump pumps water from the storage tank through the stainless steel plate heat exchanger in the quantity that exactly covers the heating requirement for hot water preparation.

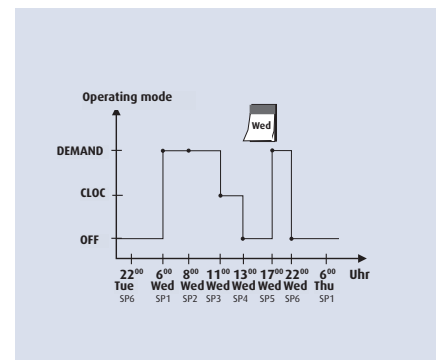
The hot water temperature can be adjusted to your needs via 6 switching points per weekday.

Important information for potable water heating is continuously stored and processed in the controller's neural network. This makes it „adaptive“ and allows it to adjust its behaviour to the respective operating conditions.



Circulation mode

The first device in the cascade system controls the circulation pump. Possible operating modes are „demand-based“ or „Time-dependent“. „Demand-dependent“ means that the circulation pump is started by briefly drawing hot potable water (shot glass tap). A sensor in the circulation return pipe causes the pump to switch off when the desired temperature is reached. The operating modes can be defined to suit your needs via 6 switching points per weekday.



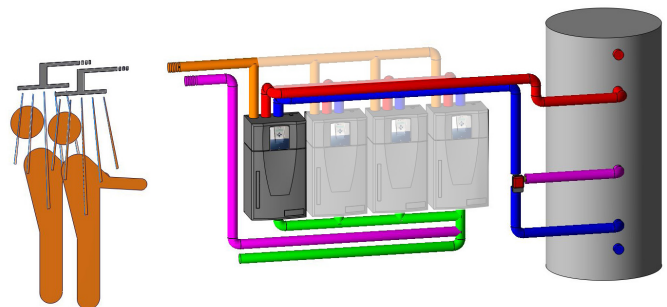
> VARIO fresh-nova 2.0 cascade // Functions

Functions

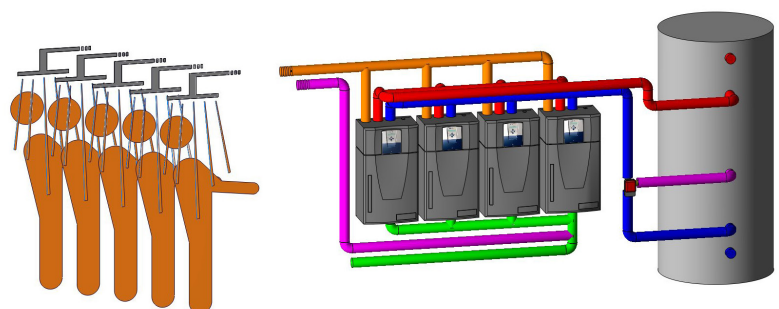
Cascade connection:

The cascade function is implemented by opening the cold water motor valve of the next device in the sequence, starting with the first device and increasing with the load. As the load decreases, the motor valves are closed again in reverse order. This means that the last device to be switched on is the first to be switched off again (last-in-first-out). The devices switch on and off automatically at certain threshold flow rates. These depend on the switching direction and the desired hot water and storage tank temperature. This prevents unwanted oscillations between two switching states.

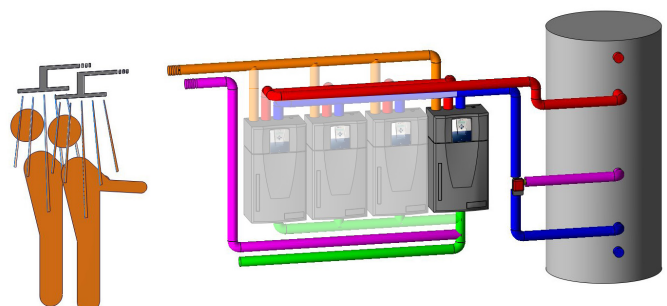
Partial load: The cold water valve of the device with rank 1 is always open. When flow begins, the device takes over the heating of potable water on its own. If the hot water load continues to increase, the cold water valve of the device with rank 2 is opened once a limit flow rate is reached. The device registers the flow and takes over the heating of the potable water in parallel.



Full load: Under full load, all cold water valves are open and all devices operate in parallel. If the hot water load decreases, the valves are closed again according to their priority.



Cascade rotation: The ranking of the devices is rotated according to definable flow rates. The previous device with rank 1 relinquishes this position and another device takes its place. This ensures that all devices are used evenly and that the water exchange required by the Potable Water Ordinance is achieved.



> VARIO fresh-nova 2.0 cascade // Functions

Optional functions

A06 functions for additional tasks

The A06 function of the VarCon211 compact controller extends the range of functions to include a signal to the potential-free output A06 in the event of either:

- **FAULT** or
- **Disinfection mode** or
- **Potable hot water preparation.**

The signal functions on output A06 of the VarCon211 compact controller can be used independently of the solar or switching function. If several controllers are available in a VARIO fresh-nova cascade, different A06 functions can be implemented per controller.

Example: 3-stage cascade VARIO fresh-nova

- First controller (master): FAULT signalling function
- Second controller: Disinfection mode signal function

Malfunction signal function

This function closes output A06 when the controller internal status is:

- **Collective fault**
 - This is activated by the individual fault messages:
 - Sensor defect
 - No RS485/Modbus communication
 - DHW temperature not reached

Note on cascades:

If this function is used on the cascade master (controller with master functionality), the collective fault includes the faults of all controllers in the cascade network. These are therefore forwarded via the internal bus. If this function is used on a secondary (controller with secondary functionality), the collective fault only includes the faults of this secondary.

Signalling function for disinfection mode

This function closes output A06 when the controller is in the following state:

- **Thermal disinfection active**
 - from the start of phase 1 (see operating instructions for the Thermal Disinfection software add-on)

Signalling function for potable hot water preparation (FWE valve function)

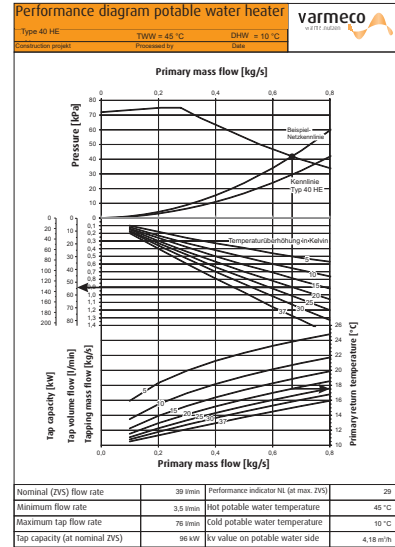
This function closes output A06 when the controller is in the following state:

- **Potable hot water preparation (including circulation mode), equivalent to flow at the volume flow meter**

> VARIO fresh-nova 2.0 cascade // Performance data

Performance data

The key performance data is provided in the table below. In addition, we maintain a comprehensive catalogue of performance diagrams for our devices in the partner area at www.varmeco.de/downloads.html. This catalogue shows the performance values and return temperatures for different storage tank temperature increases. Please contact us!



Designation	Number of	Single device	Potable hot water temperature [°C]	tap volume flow			Performance coefficient NL	kv value Primary / secondary (primary = heating side) [m³/h] / [m³/h]	
				Nomin	Minimum *	Maximum			
				at 10 Kelvin Storage temperature increase		at 82 °C storage temperature			
				[l/min]	[l/min]	[l/min]	[l/min]	[l/min]	[l/min]
2-stage cascade VARIO fresh-nova 30	2	Vfn30-KmV	45	68	3	134	73	3,6 / 3,44	
			50	64		114	70		
			55	62		98	66		
			60	58		84	61		
			65	58		-	-		
2-stage cascade VARIO fresh-nova 40	2	Vfn40-KmV	45	80	4	156	92	4,46 / 4,18	
			50	76		134	89		
			55	72		114	83		
			60	70		100	80		
			65	70		-	-		
2-stage cascade VARIO fresh-nova 50	2	Vfn50-KmV	45	100	5	192	124	5,02 / 4,62	
			50	94		164	120		
			55	92		142	115		
			60	88		122	108		
			65	88		-	-		
2-stage cascade VARIO fresh-nova 60	2	Vfn60-KmV	45	140	6	276	207	6,56 / 6,32	
			50	132		234	198		
			55	128		204	193		
			60	124		174	179		
			65	123		-	-		
2-stage cascade VARIO fresh-nova 80	2	Vfn80-KmV	45	180	10	342	276	7,68 / 7,32	
			50	174		296	272		
			55	168		254	259		
			60	164		222	249		
			65	158		-	-		
70	155	-	-						

> VARIO fresh-nova 2.0 cascade // Performance data

Designation	Number of	Single device	Potable hot water temperature	tap volume flow			Performance coefficient NL	kv value
				Nomin	Minimum *	Maximum		
				at 10 Kelvin Storage temperature increase		at 82 °C storage temperature		Primary / secondary (primary = heating side)
				[°C]	[l/min]	[l/min]	[l/min]	
3-stage cascade VARIO fresh-nova 30	3	Vfn30-KmV	45	102	3	201	133	3,6 / 3,44
			50	96		171	127	
			55	93		147	121	
			60	87		126	113	
			65	87		-	-	
			70	87		-	-	
3-stage cascade VARIO fresh-nova 40	3	Vfn40-KmV	45	120	4	234	164	4,46 / 4,18
			50	114		201	160	
			55	108		171	151	
			60	105		150	145	
			65	105		-	-	
			70	105		-	-	
3-stage cascade VARIO fresh-nova 50	3	Vfn50-KmV	45	150	5	288	219	5,02 / 4,62
			50	141		246	212	
			55	138		213	204	
			60	132		183	192	
			65	132		-	-	
			70	129		-	-	
3-stage cascade VARIO fresh-nova 60	3	Vfn60-KmV	45	210	6	414	354	6,56 / 6,32
			50	198		351	340	
			55	192		306	331	
			60	186		261	309	
			65	184,5		-	-	
			70	180		-	-	
3-stage cascade VARIO fresh-nova 80	3	Vfn80-KmV	45	270	10	513	466	7,68 / 7,32
			50	261		444	459	
			55	252		381	439	
			60	246		333	423	
			65	237		-	-	
			70	232,5		-	-	
4-tier cascade VARIO fresh-nova 40	4	Vfn40-KmV	45	160	4	312	244	4,46 / 4,18
			50	152		268	238	
			55	144		228	224	
			60	140		200	217	
			65	140		-	-	
			70	140		-	-	
4-tier cascade VARIO fresh-nova 50	4	Vfn50-KmV	45	200	5	384	321	5,02 / 4,62
			50	188		328	311	
			55	184		284	301	
			60	176		244	283	
			65	176		-	-	
			70	172		-	-	
4-tier cascade VARIO fresh-nova 60	4	Vfn60-KmV	45	280	6	552	511	6,56 / 6,32
			50	264		468	491	
			55	256		408	479	
			60	248		348	448	
			65	246		-	-	
			70	240		-	-	

> VARIO fresh-nova 2.0 cascade // Performance data

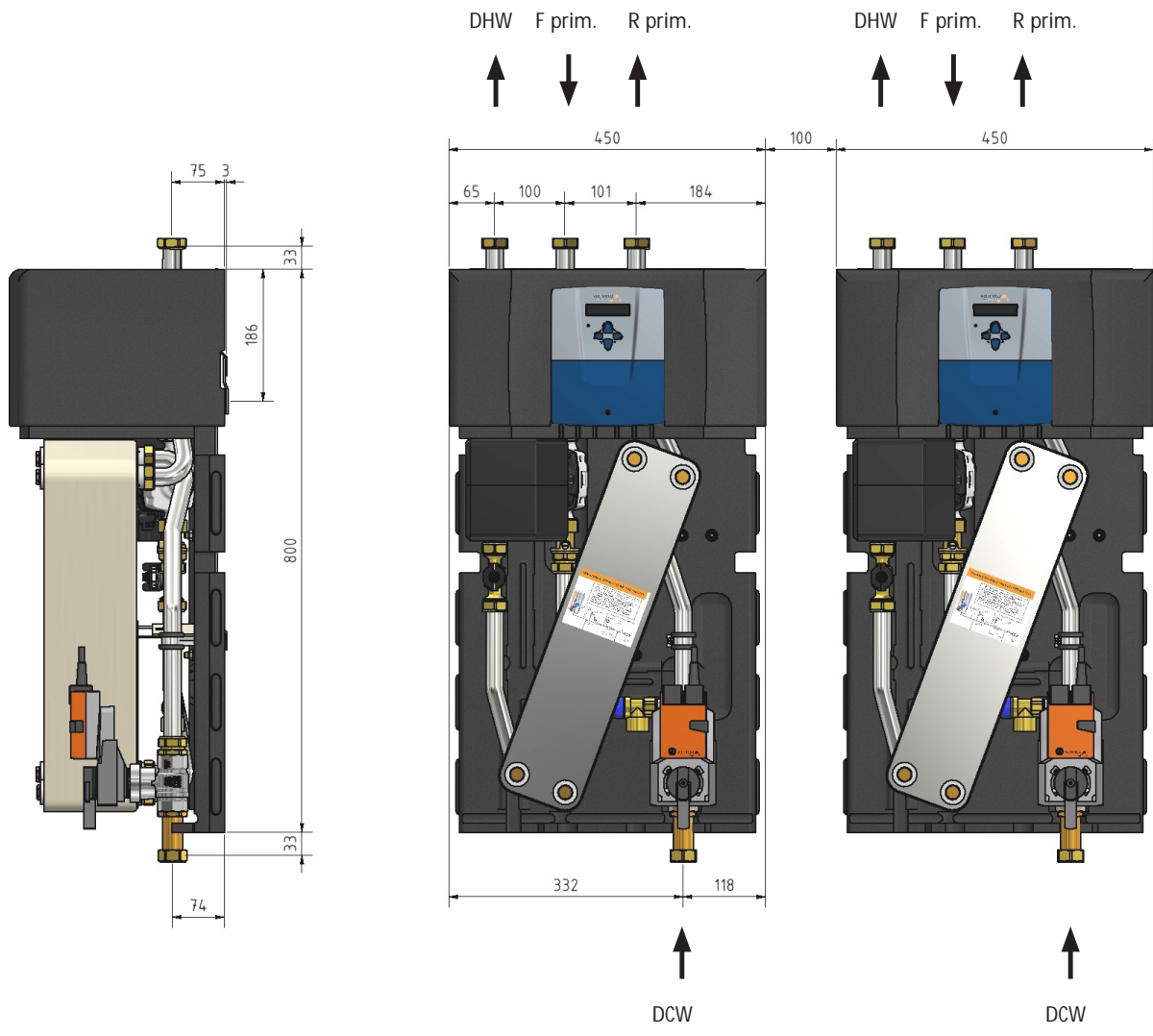
Designation	Number of	Single device	Potable hot water temperature	tap volume flow			Performance coefficient NL	kv value Primary / secondary (primary = heating side)	
				Nomin	Minimum . *	Maximum			
				at 10 Kelvin Storage temperature increase		at 82 °C storage temperature			
				[°C]	[l/min]	[l/min]	[l/min]	[-]	[m3/h] / [m3/h]
4-tier cascade VARIO fresh-nova 80	4	Vfn80-KmV	45	360	10	684	667	7,68 / 7,32	
			50	348		592	658		
			55	336		508	630		
			60	328		444	607		
			65	316		-	-		
			70	310		-	-		
5-stage cascade VARIO fresh-nova 50	5	Vfn50-KmV	45	250	5	480	428	5,02 / 4,62	
			50	235		410	415		
			55	230		355	401		
			60	220		305	378		
			65	220		-	-		
			70	215		-	-		
5-stage cascade VARIO fresh-nova 60	5	Vfn60-KmV	45	350	6	690	674	6,56 / 6,32	
			50	330		585	648		
			55	320		510	633		
			60	310		435	592		
			65	307,5		-	-		
			70	300		-	-		
5-piece cascade VARIO fresh-nova 80	5	Vfn80-KmV	45	450	10	855	805	7,68 / 7,32	
			50	435		740	805		
			55	420		635	805		
			60	410		555	798		
			65	395		-	-		
			70	387,5		-	-		

> VARIO fresh-nova 2.0 cascade // Technical data

Technical data

Technical data VARIO fresh-nova 2.0 cascade					
	Type 30 2.0 KmV	Type 40 2.0 KmV	Type 50 2.0 KmV	Type 60 2.0 KmV	Type 80 2.0 KmV
Tap flow rate *) [l/min]	3,5 - 33	4 - 40	5 - 50	6 **) - 70	10 **) - 90
Adjustable DHW temperature range [°C]	30...60				
Maximum operating temperature on heating side [°C]	95,0				
Maximum operating pressure [bar]	10,0 (potable water)				
Maximum operating pressure [bar]	10,0 (heating)				
Dimensions					
Width [mm]	450				
Height [mm]	800				
Depth [mm]	315				
Weight [kg]	approx. 28	approx. 30	approx. 35	approx. 36	approx. 39
Insulation	EPP, black				
Temperature sensors	Pt 1000				
Electrical power consumption					
- of the exchanger charging pump [W]	2 - 60	2 - 60	2 - 75	3 - 140	3 - 180
*) At TWW = 45 °C and storage temperature increase of 10 Kelvin					
**) Valid for 10 Kelvin storage temperature increase. For each additional 5 Kelvin increase, the minimum ZVS must be increased by 2 l/min.					

> VARIO fresh-nova 2.0 cascade // Technical data



Scope of delivery

Included in delivery per device:

- Potable water devices, fully wired
- Control system for potable water preparation, circulation pump control, switching function and cascade connection
- PT-1000 storage tank temperature sensor (internally wired, 7 m)
- Wall mounting rail with screws and dowels

Accessories

Available as accessories:

- Circulation pump and temperature sensor Absperrets
- Shut-off sets
- A06 function
- Software packages for GLT connection

Optional

Device equipped with heat exchanger

- Non-ferrous metal-free soldering
- in full stainless steel

2020-08

BMS-Energietechnik AG
International Competence Center for Energy Efficiency
Bönigstrasse 11 A
CH-3812 Wilderswil

+41 (0)33 826 00 12

info@bmsspower.com
www.bmsspower.com