



Vertiv™ Utilitysure™  
Industrial DC Power System



## Typical Applications

Power plant & Transmission



Cement



Oil extraction



Pipeline



(Coal) chemical industry



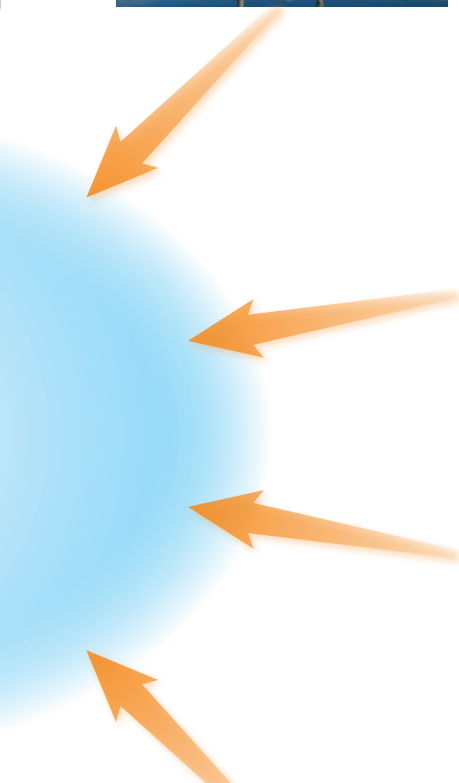
Rail transportation



Metallurgy



Manufacturing



## Product introduction and features

### Product introduction

Based on the continuous investment and experience accumulation in power electronics field, Vertiv has developed a high reliable and high adaptable industrial DC power system for the applications in Industrial field; the product can meet the severe electric and environment conditions in industrial environment, and can be fully customized to meet the different technical requirements of customers.

### Main loads of industrial DC power system

- Signal lights, indicators and relays
- Control, protection, and monitoring systems
- Circuit breaker operating mechanism
- Pump motor
- Lighting
- AC UPS
- DC / DC convertors

### Typical applications in petrochemical industry

- Most of the raw materials to be processed are flammable, explosive, toxic and corrosive substances. The production process should be highly continuous and a very destructive accident may occur with a slight mistake
- High anti-corrosion and dust-proof requirements for equipment

### Typical applications in the metallurgical industry

- Big voltage fluctuations in power grid
- Conductive metal dust in the air

### Typical application in rail transportation industry

- Power grid voltage fluctuates and surges occur when the train arrives
- (Underground) Wet control room
- Poor construction conditions



### Typical Applications in Overseas Industrial EPC Projects

- Different regional power grid voltages: Three-phase 380/400/415/480 VAC
- Continuous operation at high temperature is often required (e.g. EPC project in unstable power grid, frequent blackouts, which may cause the power system to work at high temperature for a long time)
- Need to adapt to lead-acid / nickel-cadmium batteries, chargers are required to meet the requirements of the initial charging of flooded battery

### DC power supplies for industrial applications need to meet a variety of customized requirements to adapt to different application environments

- IP grade can be customized
- Wide input voltage range
- Extraordinary surge protection capability at input side
- Wide input voltage range meets the requirements of the initial charging of flooded battery
- Provide all kinds of optional parts needed, such as heater, color, incoming cabling mode, diode dropper, DC / AC inverter, and DC / DC converter.

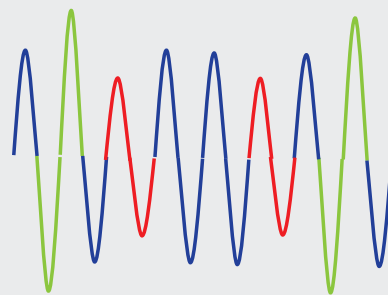
## Features

### DC power supply system designed for industrial applications

For different industrial applications, such as petrochemical, metallurgy, rail transportation, cement, Vertiv can provide customized products, such as high IP rating, input surge protection, natural cooling in both systems and modules and so on.

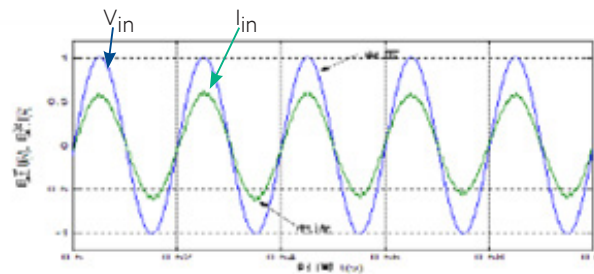
#### Wide input voltage range

The input voltage range of the charging module can be as wide as 260 ~ 530 VAC <sup>(1)</sup>, adapting to the 380/400/415/480 VAC grid standard; and can ensure the normal operation of the charging module in the system under harsh conditions. The battery will not frequently charge and discharge, which prolongs battery life, improve system reliability.



#### High power factor, low harmonic current

Charging module <sup>(1)</sup> uses APFC technology to ensure that the input power factor is higher than 0.99, and THDi current is less than 3% to reduce investment



#### Charging Module N + n redundant backup

Charging Module N + n redundant hot backup with hot swap function and improved system reliability (n = 1, 2, 3...)



Remark <sup>(1)</sup>: When using ER22020 / T or ER11040T5 charging module to form the system

## Features

### Adapt to a variety of battery types

The system can work with the maintenance-free battery and flooded battery; when working with the battery inspection device, it can also complete the data acquisition of battery cell voltage and battery temperature.



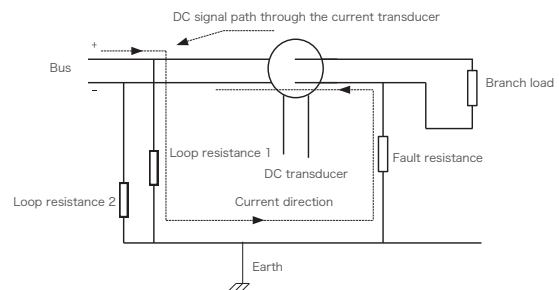
### 7-inch touch screen displayer

Use 7-inch touch screen display unit with built-in industrial grade CPU and LINUX operating system. The man-machine interface is friendly and easy-to-operate. The interface can display various types of system information and signals.



### Insulation monitoring device

The insulation monitoring device that uses master-slave structure can detect the insulation status of the DC bus and each feeder branch to the ground.



### Battery inspection device

Battery inspection device is adaptive to lead-acid / nickel-cadmium batteries, and can measure battery cell voltages, 2-route temperature, 1-route current signal.



## Parameters

Output DC voltage (VDC)		220(240)					
Rated output current (A)		20	30	40	50	60	20*k, k=4,5,...50
Input parameters							
Rated input voltage (VAC)		400[380,415] 3ph+N					
Rated input voltage range (VAC)		260 - 530 <sup>(1)</sup>					
Input power factor		0.99 <sup>(1)</sup>					
THDi		3% <sup>(1)</sup>					
Frequency (Hz)		45 ~ 65					
AC input circuit		Two or one AC input					
Soft start time (s)		3 ~ 8					
Input SPD		CLASS C + D					
Input protection		MCCB OR MCB					
Output parameters							
Rated output current		20	30	40	50	60	20*k, k=4,5,...50
Nominal output voltage (V)		220-240					
Float charging voltage (@2.25V cell) <sup>(2)</sup> (V)		243					
Boost charging voltage(@2.35V cell) <sup>(2)</sup> (V)		253.8					
Voltage regulation		≤±0.5%					
Current regulation		≤±0.5%					
Ripple coefficient		≤0.2%					
Current imbalance between modules		≤±3%					
Battery parameters							
Battery types		Lead-acid or nickel-cadmium, including open type and maintenance-free type					
Battery charging current limit		According to customer requirements; Typical values: 0.1C10 (lead-acid), 0.2C5 (nickel-cadmium)					
System parameters							
Heat dissipation		Natural cooling					
Efficiency		≥92%					
IP level		IP20 ~ IP42					
Noise (dB)		≤55					
Cabinet color		RAL 7035 (other colors available)					
Input cabling mode		Bottom cabling (top cabling is available)					
Maintenance methods		Front access					
Communication port		RS485/RS232/ Ethernet					
Communication protocol		Modbus, CDT91, IEC61850(optional)					
Operating environment							
Operating temperature range (°C)		0 ~ 45(can work with full load for long term at 45°C)					
Physical specifications							
Height (mm)		1800/2260					
Width (mm)		Single cabinet 800, when system capacity is large, multiple cabinets shall be configured					
Depth (mm)		600					
Footprint (m <sup>2</sup> )		0.48 for single cabinet					
Weight (kg)		≤200 (single cabinet, excluding charging modules)					

Note<sup>(1)</sup>: Parameters of ER22020/T

<sup>(2)</sup>: Assume the battery is 108-cell lead acid type, float charging voltage of each cell =2.25V, boost charging voltage of each cell =2.35V

# Vertiv™ Utilitysure™ Industrial DC Power System

Output DC voltage (VDC)		110(120)					
Rated output current (A)		40	60	80	100	120	40*k, k=4,5,..50
Input parameters							
Rated input voltage (VAC)		400[380,415] 3ph+N					
Rated input voltage range (VAC)		260 - 530 <sup>(1)</sup>					
Input power factor		0.99 <sup>(1)</sup>					
THDi		3% <sup>(1)</sup>					
Frequency (Hz)		45 ~ 65					
AC input circuit		Two or one AC input					
Soft start time (s)		3 ~ 8					
Input SPD		CLASS C + D					
Input protection		MCCB OR MCB					
Output parameters							
Rated output current		40	60	80	100	120	40*k, k=4,5,..50
Nominal output voltage (V)		110-120					
Float charging voltage (@2.25V cell) <sup>(2)</sup> (V)		121.5					
Boost charging voltage (@2.35V cell) <sup>(2)</sup> (V)		126.9					
Voltage regulation		±0.5%					
Current regulation		±0.5%					
Ripple coefficient		≤0.2%					
Current imbalance between modules		±3%					
Battery parameters							
Battery types		Lead-acid or nickel-cadmium, including open type and maintenance-free type					
Battery charging current limit		According to customer requirements; Typical values: 0.1C10 (lead-acid), 0.2C5					
System parameters							
Heat dissipation		Natural cooling					
Efficiency		≥92%					
IP level		IP20 ~ IP42					
Noise (dB)		≤55					
Cabinet color		RAL 7035 (other colors available)					
Input cabling mode		Bottom cabling (top cabling is available)					
Maintenance methods		Front access					
Communication port		RS485/RS232/ Ethernet					
Communication protocol		Modbus, CDT91, IEC61850 (optional)					
Operating environment							
Operating temperature range (°C)		0 ~ 45 (can work with full load for long term at 45°C)					
Physical specifications							
Height (mm)		1800/2260					
Width (mm)		Single cabinet 800, when system capacity is large, multiple cabinets shall be configured					
Depth (mm)		600					
Footprint (m <sup>2</sup> )		0.48 for single cabinet					
Weight (kg)		≤200 (single cabinet, excluding charging modules)					

Note<sup>(1)</sup>: Parameters of ER11040/T5

<sup>(2)</sup>: Assume the battery is 54-cell lead acid type, float charging voltage of each cell =2.25V, boost charging voltage of each cell =2.35V



# Architects of continuity™



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