

**INDRIVETEC**  
Innovative Drive Technologies AG

# INDRIVETEC AG

"bricks up" flexible energy storage systems

25 Years experience in power electronics

560 Megawatt worldwide experience and installations

95 Members in Switzerland, Bulgaria and Germany

285 Projects confirms the international standards for quality





# **INDRIVETEC AG**

## **WELL-ESTABLISHED SYSTEMS**

### **FlexConvert-PCS**

Battery Inverter in-/outdoor

### **FlexConvert-BESS-Single**

One container energy storage system

### **FlexConvert-BESS-Dual**

Two container energy storage system

### **FlexConvert-SCES**

SuperCap Energy Storage Systems

# FlexConvert-PCS

## Battery Inverter in-/outdoor

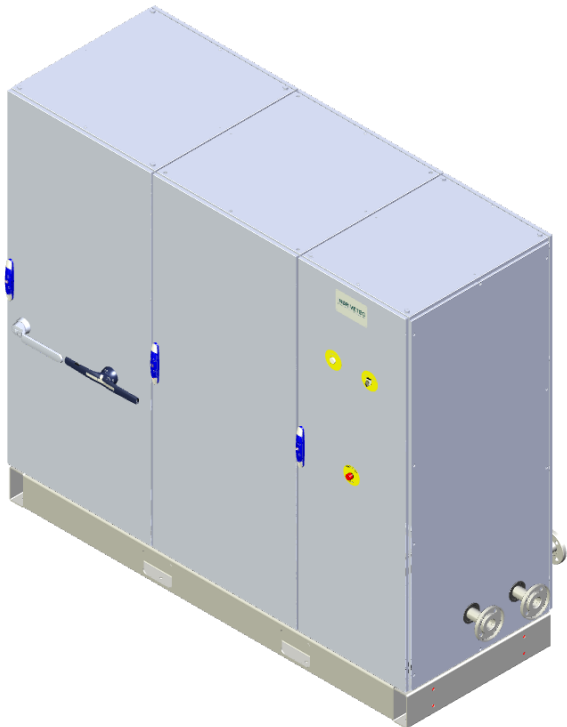
### Power capability table

Nom. AC voltage VAC	Min. DC voltage VDC	Max. DC voltage VDC						
			FC320	FC500	FC750	FC1000	FC1500	FC2000
180	300	1100	120	200	300	400	600	800
330	540	1100	220	350	525	700	1050	1400
400	650	1100	270	450	675	900	1350	1800
<b>480</b>	<b>780</b>	<b>1100</b>	<b>320</b>	<b>500</b>	<b>750</b>	<b>1000</b>	<b>1500</b>	<b>2000</b>
600	980	1100	400	650	950	1300	1950	2600
690	1100	1100	460	750	1075	1500	2250	3000

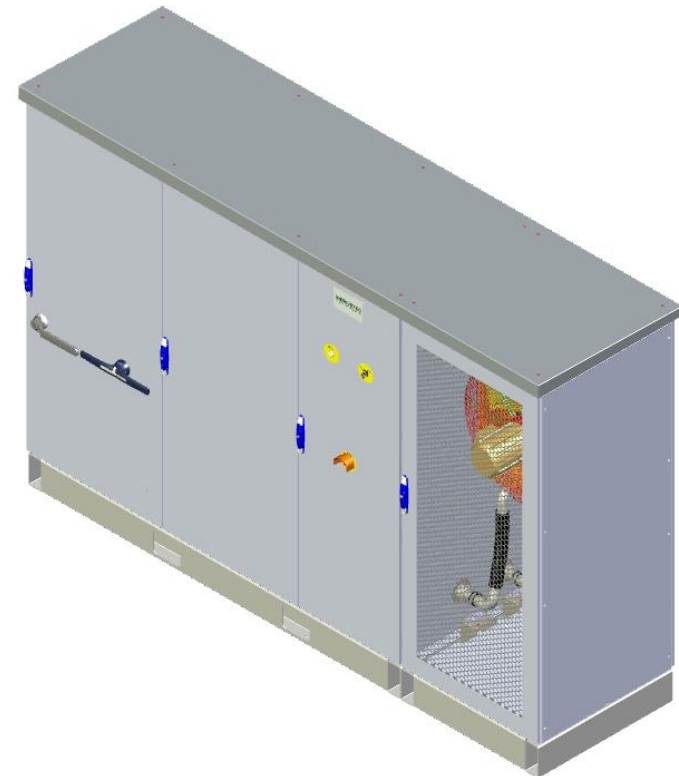
# FlexConvert-PCS

## Battery Inverter in-/outdoor

**FC-1000**



**FC-1000-Outdoor**

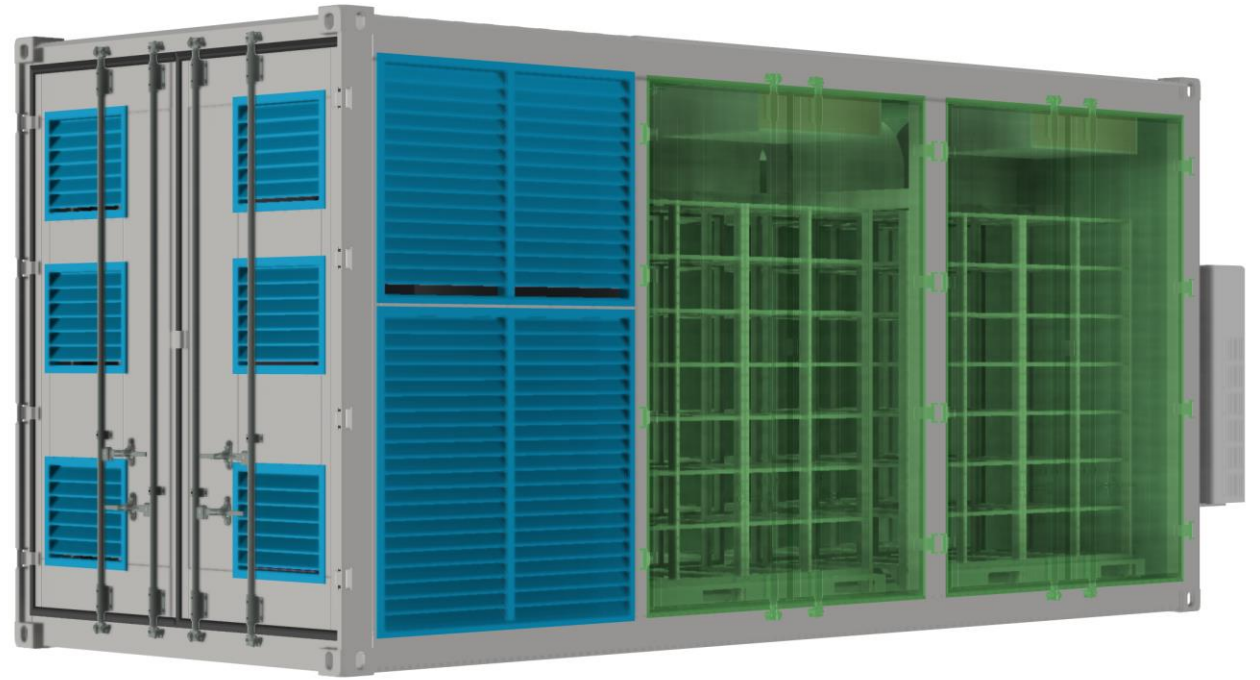
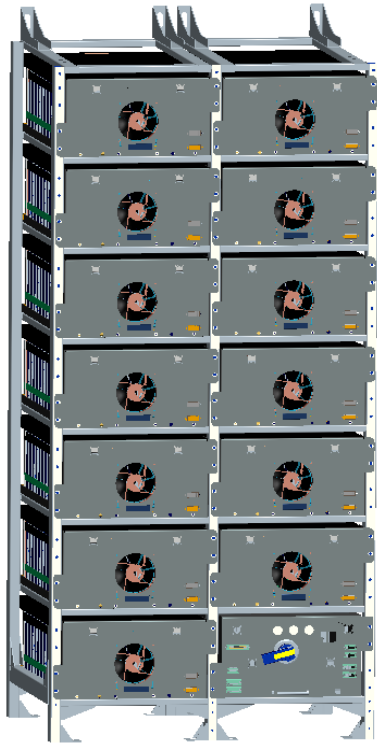


# FlexConvert-BESS Battery Rack

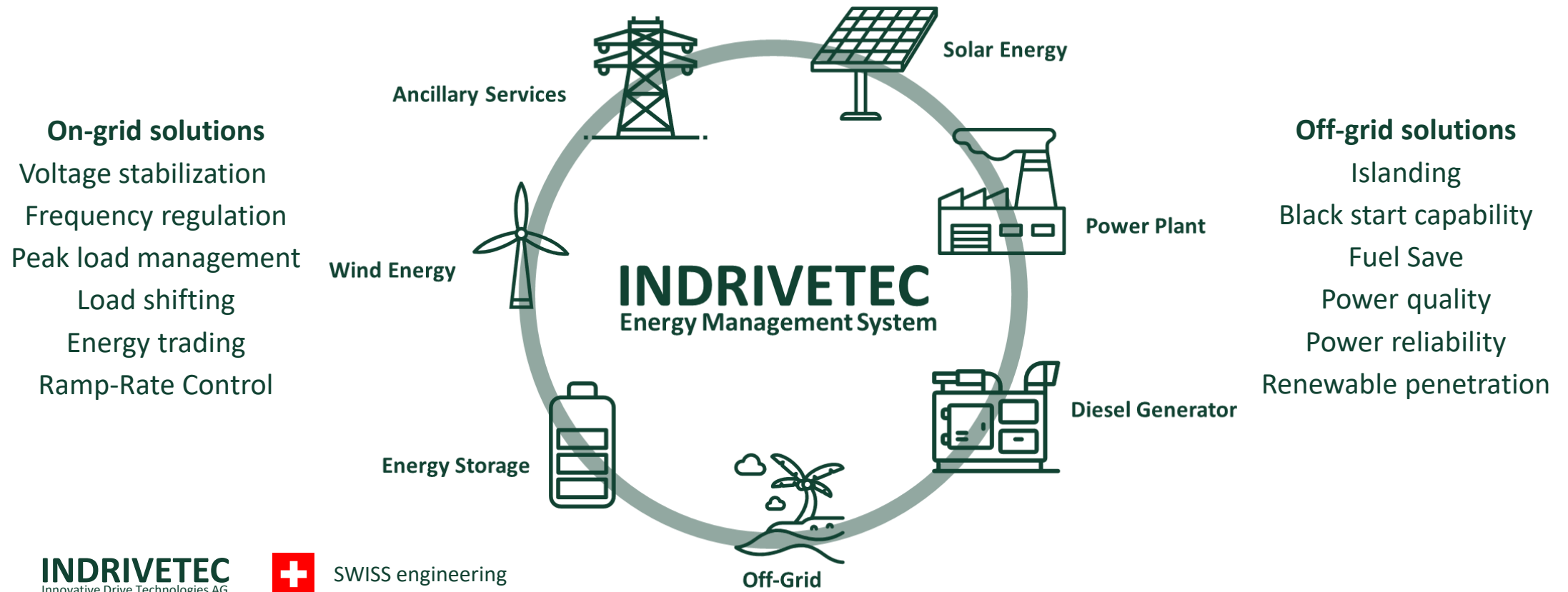
Battery System Parameter	150 kWh LFP Standard Rack	
Nominal capacity	150 Ah	
C-rate	1 C	0.5 C
Series and parallel	1P312S	
Battery performance	4000 cycles 90%DoD	6000 cycles 90%DoD
Nominal voltage	998.4 VDC	
Work voltage range	873.6 VDC – 1092 VDC	
Nominal energy	149.76 kWh	
Rated charging / discharge current	150 A	75 A
Maximum charge / discharge current	160 A	80 A
Dimension D x W x H	835 x 930 x 2057 mm	
Weight	1.6 tons	



# FlexConvert-BESS Battery Rack

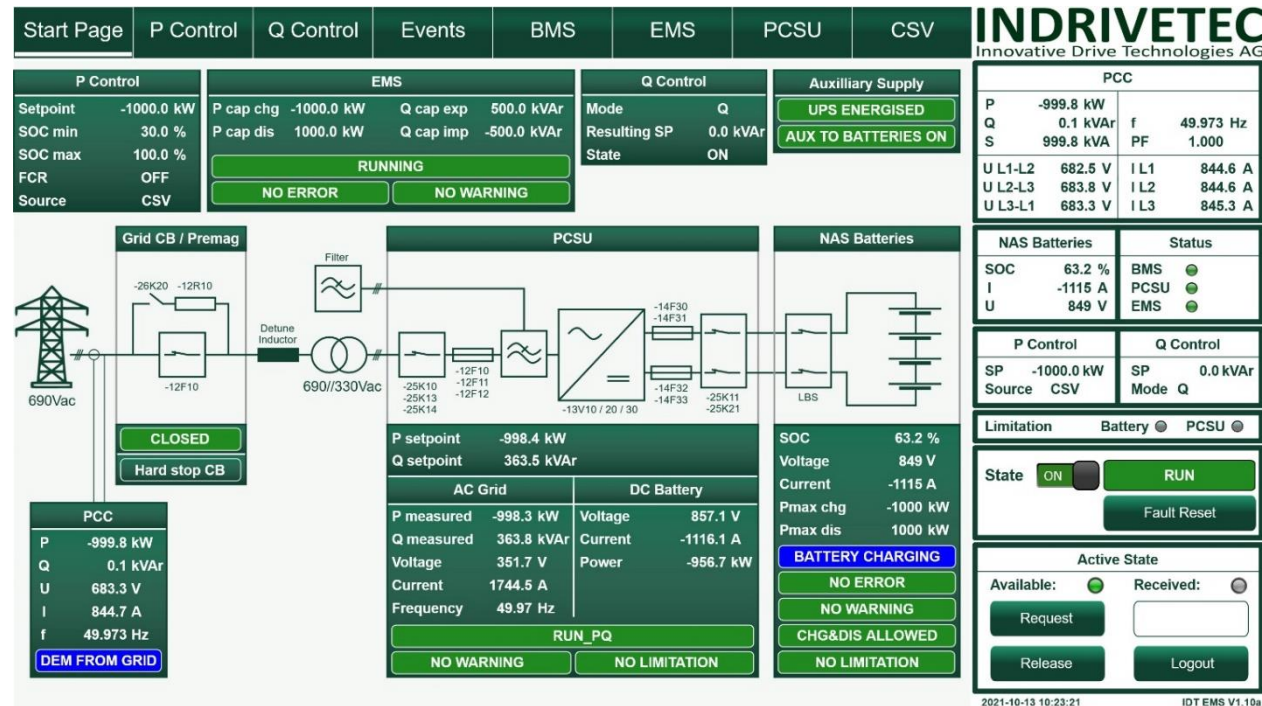
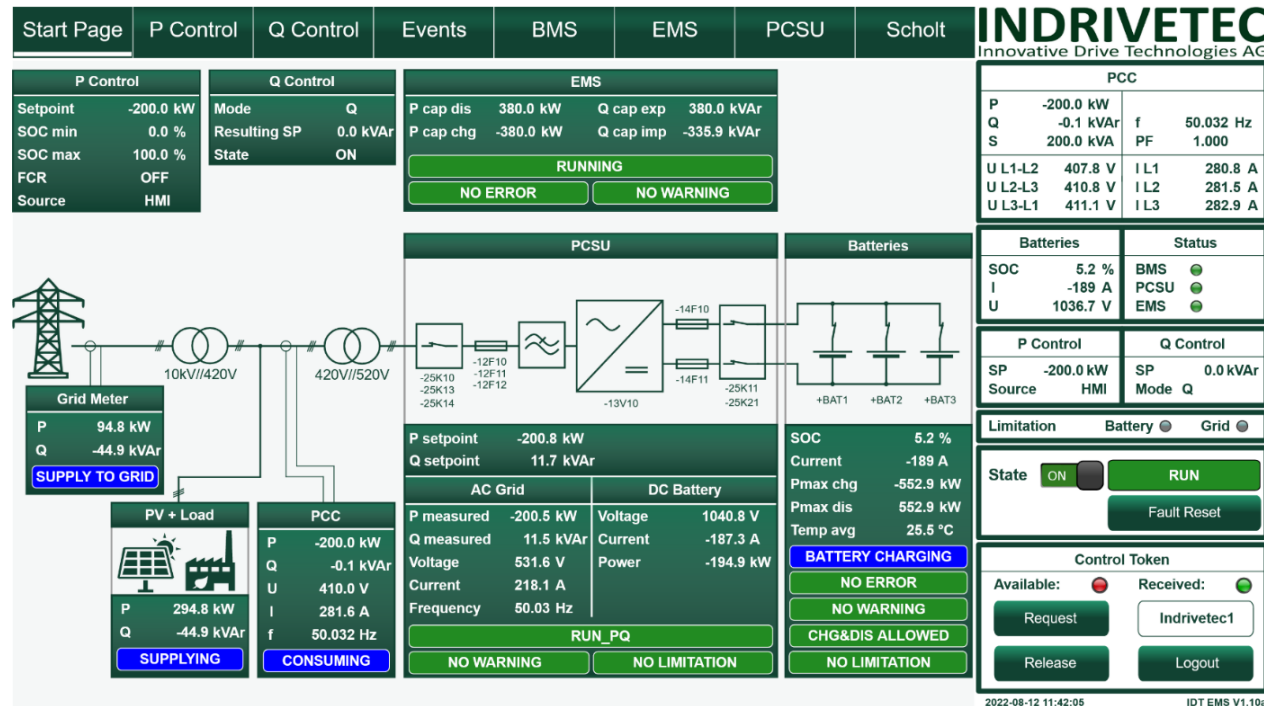


# IDT-Energy Management System





# IDT-Energy Management System



# FlexConvert BESS-Single

## One container energy storage system

**One** container energy storage system solution including:  
Enclosure, Inverter, battery racks, HVAC, EMS and Control

**FC-BESS-1000** 20 ft. Container, up to 8 x 150 kWh racks and  
one Inverter FC320, FC500, FC750 or FC1000

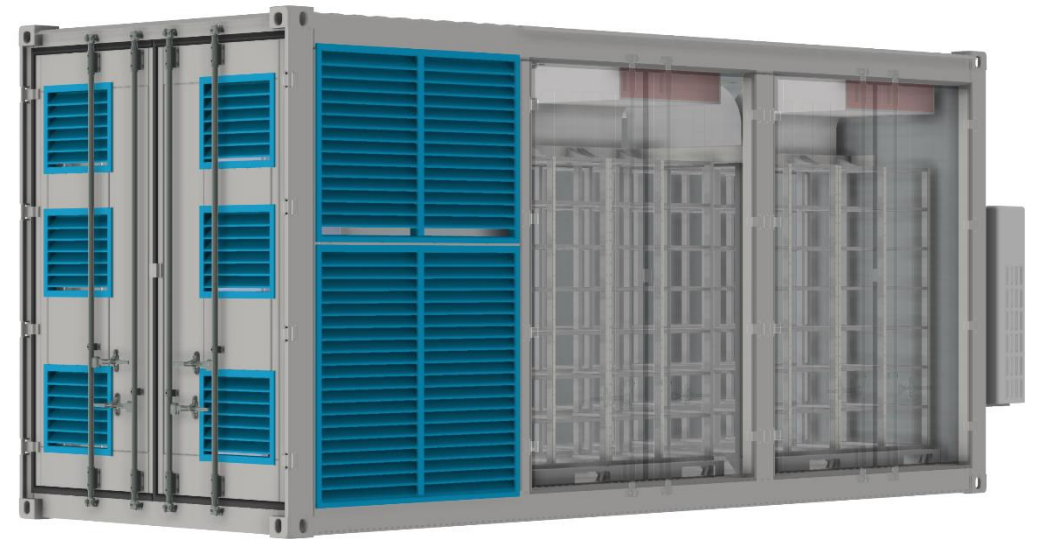
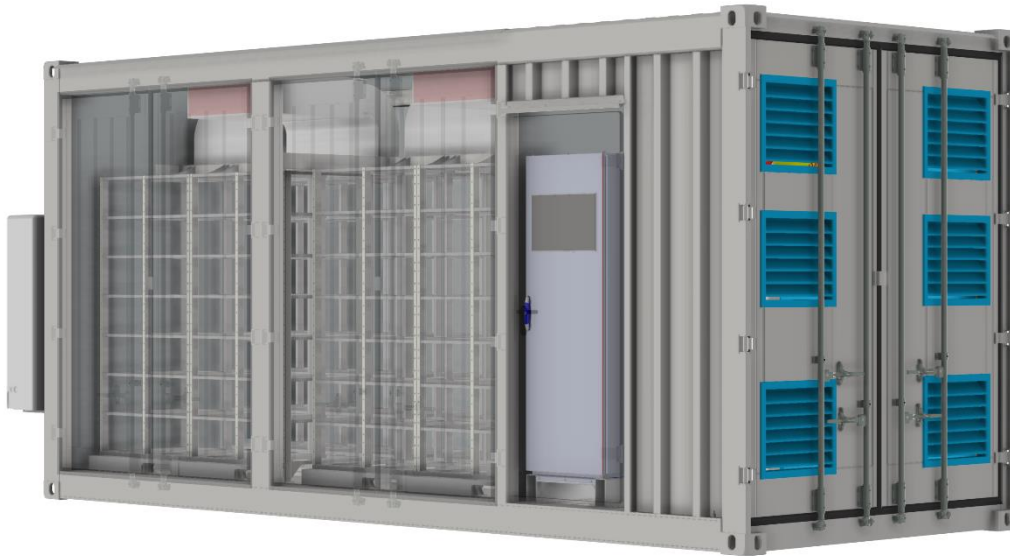
**FC-BESS-2000** 40 ft. Container, up to 16 x 150 kWh racks and  
one Inverter FC320, FC500, FC750, FC1000, FC1500 or FC2000



# FlexConvert BESS-Single

## One container energy storage system

**FC-BESS-1000**





# FlexConvert BESS-Single

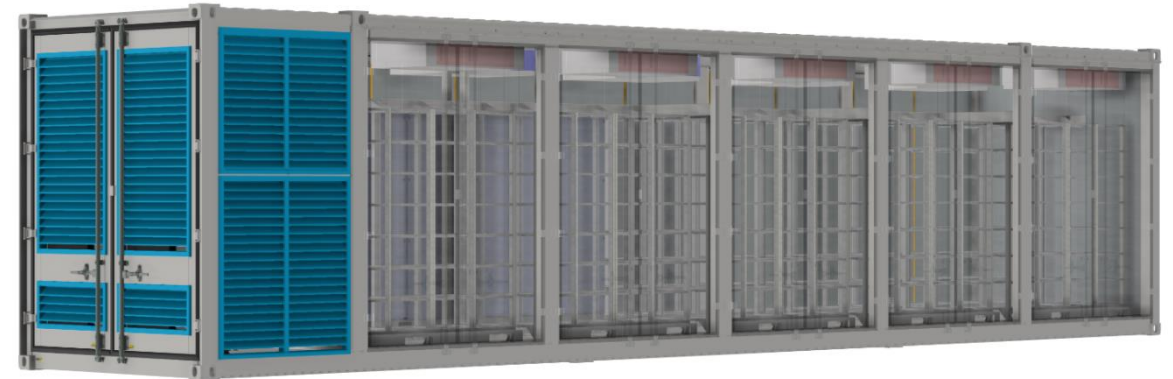
## FC-BESS-1000 Single Configuration

FC-BESS-1000 configurations at cos phi: 0,9			
320 kW – 600 kWh	320 kW – 750 kWh	320 kW – 900 kWh	320 kW – 1200 kWh
500 kW – 600 kWh	500 kW – 750 kWh	500 kW – 900 kWh	500 kW – 1200 kWh
	750 kW – 750 kWh	750 kW – 900 kWh	750 kW – 1200 kWh
			1000 kW – 1200 kWh
320 kW – 1050 kWh	500 kW – 1050 kWh	750 kW – 1050 kWh	1000 kW – 1050 kWh
Battery performance	6000 cycles 90%DoD, 0.5C and 4000 cycles 90%DoD, 1C		
System efficiency (round-trip)	> 88%		
Cell Chemistry	Lithium Iron Phosphate LiFePO4		
General data			
Dimensions (L x W x H)	20 ft. 6100x2500x2900 mm		
Ambient temperature	-25... +50°C (extended range upon request)		

# FlexConvert BESS-Single

## One container energy storage system

**FC-BESS-2000**



# FlexConvert BESS-Single

## FC-BESS-2000 Single Configuration

FC-BESS-2000 configurations at cos phi: 0,9			
320 kW – 1500 kWh	320 kW – 1800 kWh	320 kW – 2100 kWh	320 kW – 2400 kWh
500 kW – 1500 kWh	500 kW – 1800 kWh	500 kW – 2100 kWh	500 kW – 2400 kWh
750 kW – 1500 kWh	750 kW – 1800 kWh	750 kW – 2100 kWh	750 kW – 2400 kWh
1000 kW – 1500 kWh	1000 kW – 1800 kWh	1000 kW – 2100 kWh	1000 kW – 2400 kWh
1500 kW – 1500 kWh	1500 kW – 1800 kWh	1500 kW – 2100 kWh	1500 kW – 2400 kWh
			2250 kW – 2400 kWh
Battery performance	6000 cycles 90%DoD, 0.5C and 4000 cycles 90%DoD, 1C		
System efficiency (round-trip)	> 88%		
Cell Chemistry	Lithium Iron Phosphate LiFePO4		
General data			
Dimensions (L x W x H)	40 ft. 12200x2500x2900 mm		
Ambient temperature	-25... +50°C (extended range upon request)		



# FlexConvert BESS-Dual

## Two container energy storage system

**Two** container energy storage system solution including:  
PCSU container, battery container, HVAC, EMS and Control  
FC-PCSU + IDT BESS or NAS<sup>®</sup> Battery

**FC-PCSU-1260** 20 ft. Container, up to 1150 kW, EMS and Control

**FC-PCSU-2500** 20 ft. Container, up to 2250 kW, EMS and Control

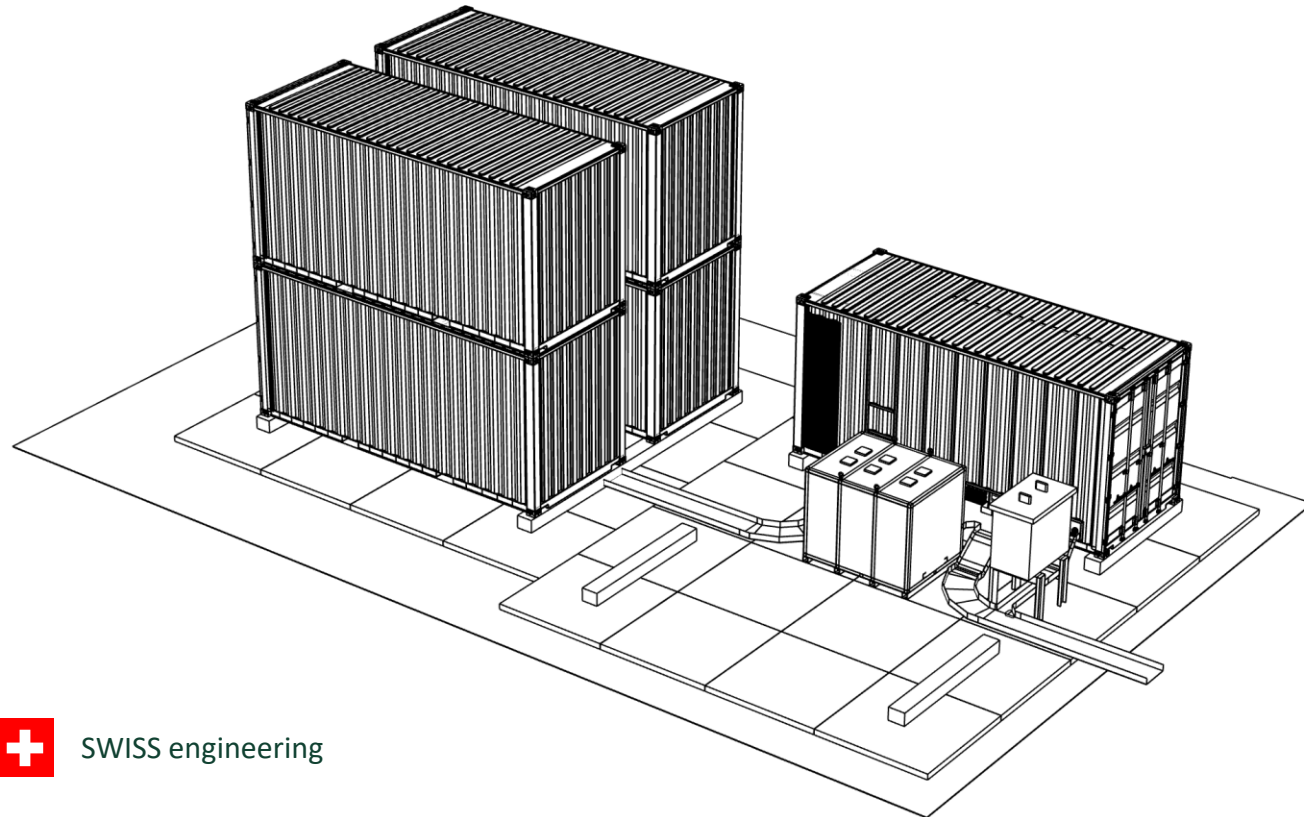
**FC-PCSU-6300** 40 ft. Container, up to 5675 kW, EMS and Control

**Battery container** IDT BESS-1200, IDT BESS-3000 or NAS<sup>®</sup> Battery

# FlexConvert BESS-Dual

## Two container energy storage system

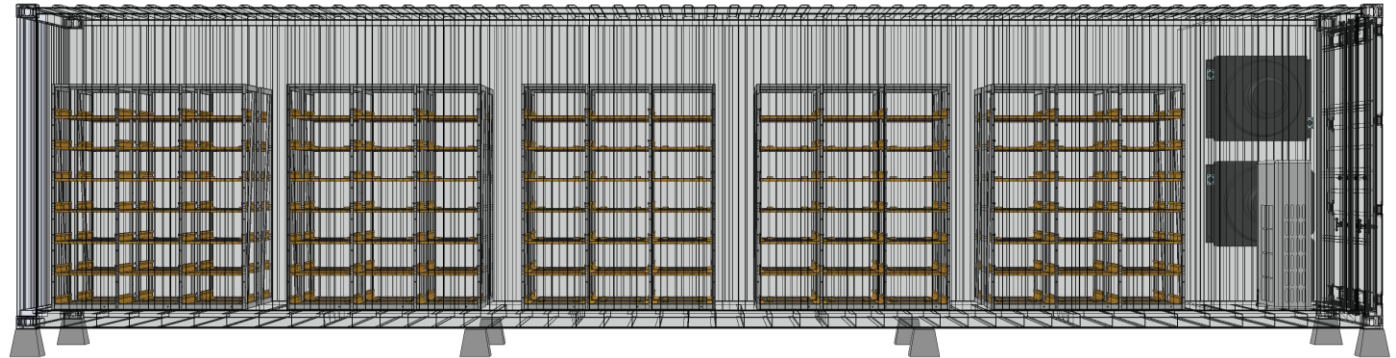
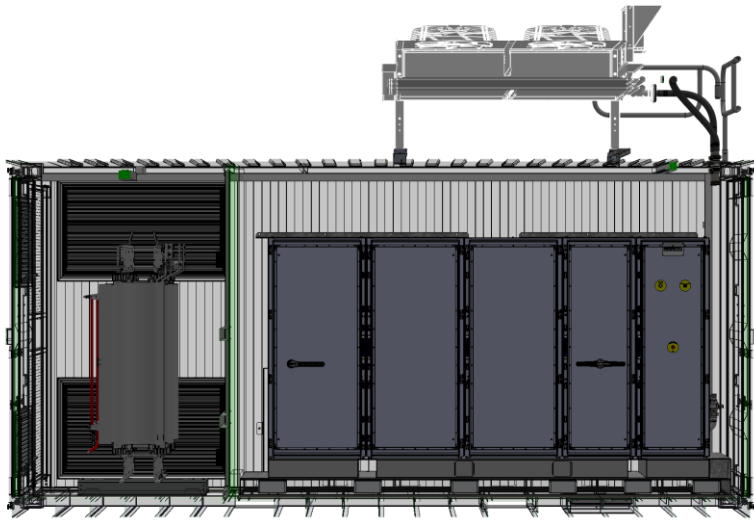
**FC-PCSU-1000 + 5800 kWh NAS<sup>®</sup> Battery + EMS**



# FlexConvert BESS-Dual

## Two container energy storage system

FC-PCSU-2000-MV + IDT BESS-3000





# FlexConvert-SCES

## SuperCap Energy Storage Systems

DC connection	SCES300-DC	SCES600-DC	SCES900-DC
Nominal DC power	300 kW	600 kW	900 kW
Maximum DC power	600 kW	1200 kW	1800 kW
DC nominal voltage range	900 VDC – 1100 VDC		
Minimum DC voltage	500 VDC		
Electrical isolation	no		
Useable energy	2,5 MJ	5 MJ	7,5 MJ
Dimensions (W x D x H)	1600 x 1000 x 2500 mm	2600 x 1000 x 2500 mm	3600 x 1000 x 2500 mm
Weight	2300 kg	3000 kg	3800 kg
Operation temperature	+5... +35°C (extended range upon request)		
Storage temperature	-15... +45°C (extended range upon request)		
Enclosure type according EN60529	IP40 indoor		
Cooling	air-cooled		
Standards	EN61000-62, EN61000-6-4, EN62477-1, IEC62103		
FlexConvert for AC-connection	FC500	FC1000	FC1500



# INDRIVETEC AG

## INNOVATIONS 2023

### **FlexConvert-BESS-PPS**

Power Protection System (UPS) with integrated ESS

### **FlexConvert-PCS-1500**

Battery inverter with 1500 VDC

### **FlexConvert-DC-PV-1500**

DC-DC Converter with 1500 VDC MPPT

# FlexConvert-BESS-PPS Power Protection System (UPS)

**FlexConvert BESS-PPS corrects all nine IEEE defined power problems**

Power Failure



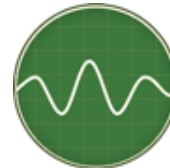
Under Voltage



Frequency Variation



Power Surge



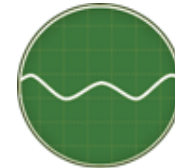
Over Voltage



Switching Transient



Power Sag



Electrical Line Noise



Harmonic Distortion





# FlexConvert-BESS-PPS

## Power Protection System (UPS)

Output	FC-PCS-580	FC-PCS-1160	FC-PCS-1740	FC-PCS-2320
Rated Power	580 kVA	1160 kVA	1740 kVA	2320 kVA
Rated apparent power	464 kW	928 kW	1392 kW	1856 kW
Maximum current	700 A	1400 A	2100 A	2800 A
Rated voltage	480 V			
Frequency	50 Hz / 60 Hz			
Power factor	0.8			
Input				
Rated voltage	480 V			
Frequency	50 Hz / 60 Hz			
Power factor	0.99			

# FlexConvert-PCS-1500

## Battery inverter with 1500 VDC

**Power capability table**

			Rated active power at cos phi: 0,9					
Nom. AC voltage VAC	Min. DC voltage VDC	Max. DC voltage VDC	FC720	FC1440	FC2160	FC2880	FC3600	FC4320
550 VAC	900 VDC	1500 VDC	525 kW	1050 kW	1575 kW	2100 kW	2625 kW	3150 kW
600 VAC	975 VDC	1500 VDC	575 kW	1150 kW	1725 kW	2300 kW	2875 kW	3450 kW
630 VAC	1025 VDC	1500 VDC	600 kW	1200 kW	1800 kW	2400 kW	3000 kW	3600 kW
660 VAC	1075 VDC	1500 VDC	630 kW	1260 kW	1890 kW	2520 kW	3150 kW	3780 kW
<b>690 VAC</b>	<b>1120 VDC</b>	<b>1500 VDC</b>	<b>650 kW</b>	<b>1300 kW</b>	<b>1950 kW</b>	<b>2600 kW</b>	<b>3250 kW</b>	<b>3900 kW</b>
750 VAC	1220 VDC	1500 VDC	720 kW	1440 kW	2160 kW	2880 kW	3600 kW	4320 kW
800 VAC	1300 VDC	1500 VDC	760 kW	1520 kW	2280 kW	3040 kW	3800 kW	4560 kW
900 VAC	1450 VDC	1500 VDC	860 kW	1720 kW	2580 kW	3440 kW	4300 kW	5160 kW

# FlexConvert-DC-PV-1500

## DC-DC Converter with 1500 VDC MPPT

Input - PV	FC-DC500-PV	FC-DC1000-PV
Maximum PV Power	500 kWp @ 1000 VDC DC Bus	1000 kWp @ U > 1000 VDC
Maximum PV voltage	1500 VDC	1500 VDC
Maximum current	500 A	1000 A
Maximum efficiency	98,6 %	
MPP(T) voltage range	700 VDC – 1500 VDC	
Output – DC-Bus/ESS		
DC-Bus-voltage range	400 VDC – 1500 VDC	
General data		
Dimensions (L x W x H)	1200 x 800 x 2000 mm	1800 x 800 x 2000 mm
Weight	650 kg	1150 kg
Ambient temperature	-20... +45°C (extended range upon request)	



# Production

ISO 9001 certified production in Bulgaria and Switzerland,  
serial production for high volume orders

Prototype assembling, functional and type testing,  
customer acceptance



# Test Infrastructure

3 MW test bay for active power testing, 6 MVA test bay for reactive power testing

High voltage testing, heat chamber up to 60°, customized testing

# Test Infrastructure FC-BESS

Charging and discharging test, cycling test and communication test

Full power test of FC-BESS and air conditioning and factory acceptance test



# Service Agreement

Maintenance

E-mail support with IDT support hotline

Phone support +41 55 515 3737 or +49 40 87 407 340

Weekend and public holiday support from 08:00 – 19:00 CET

Training of operator staffs and training on the job for  
customer's service technicians



# Service Agreement

Spare parts

Support of scheduling all works related to service and maintenance of energy storage systems

Monitoring and availability of help desk based on Indrivetec standards

Indrivetec supply qualified technicians to work at site

Certification to an authorized service partner

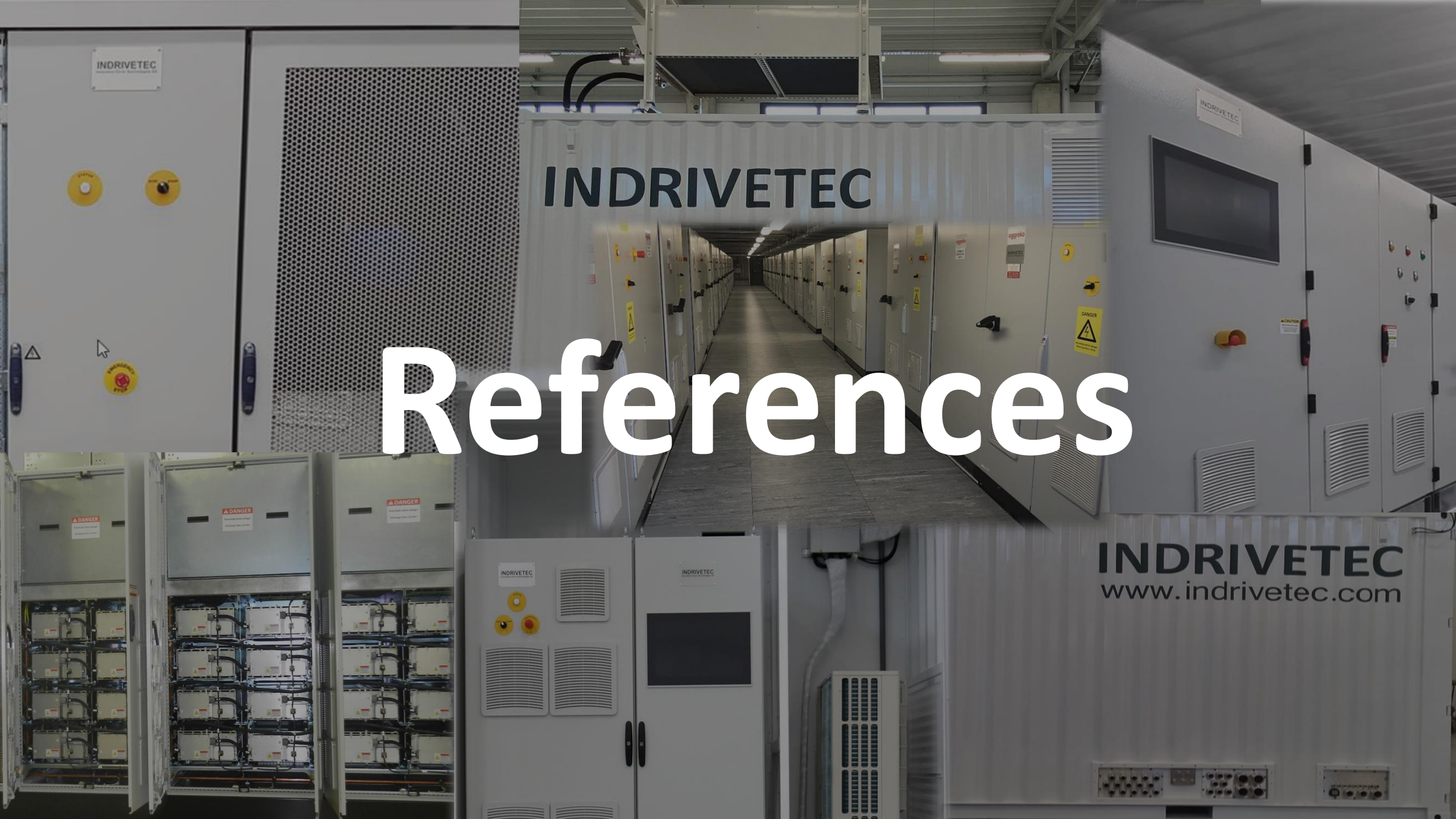


# Training Program

**Level 1 – “basic knowledge”, safety functions of PCS, coolant system, visual checks and low-level maintenance**

**Level 2 - “authorized service partner”, cold commissioning, hot commissioning, alarm handling, high-level maintenance, troubleshooting with IDT support hotline**





**INDRIVETEC**

# References

**INDRIVETEC**  
[www.indrivetec.com](http://www.indrivetec.com)

# WEMAG (DE)

## 15 MW

primary control reserve power plant  
10 x Solo S and 8 x FC750 (battery inverter)





# Rosecote (UK)

## 49 MW

primary battery storage facilities

63 x FC750 (battery inverter)



# WEMAG WBS (DE)

## 23 MW

ancillary services and island operation

3 x FC750 (battery inverter)

3 x FC250 (battery inverter)

10 x FC2000 (battery inverter)

# TWL (DE)

## 9 MW

controlled power plant battery + gas turbine

9 x FC1000 (battery inverter)

# Tilos (GR)

800 kW

island operation PV + Wind + ESS

2 x FC750 (battery inverter)



# Drogenbos (BE)

3 MW

frequency regulation service for batteries

12 x FC250 (battery inverter)

# Peterhead (UK)

## 1000 kW

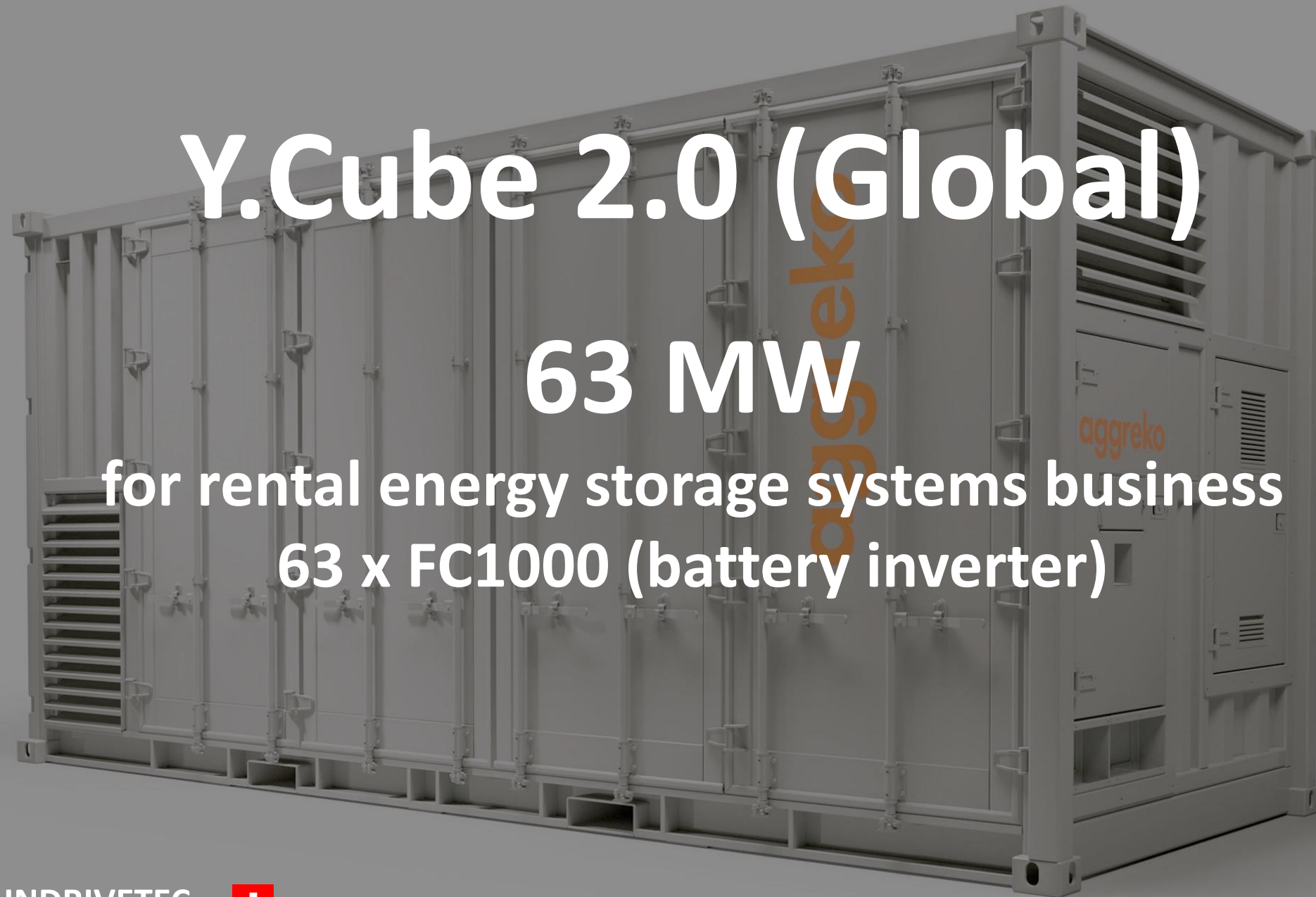
World's first battery for offshore wind  
4 x FC250 (battery inverter)



# Terna (IT)

2 x 1000 kW

part of Storage Lab, globally unique in terms of  
the variety of energy storage  
4 x Solo S (battery inverter)



# Y.Cube 2.0 (Global)

## 63 MW

for rental energy storage systems business

63 x FC1000 (battery inverter)



# FC-PCSU-2000 (CH)

## 2 MW

to optimize the local use of the region's  
abundant solar production

1 x FC2000 (battery inverter) + MV-transformer

# FC320 (CH)

## 220 kW

reduction of the facility's electricity  
consumption with saltbattery storage system

### FC320 (battery inverter)



# FC-PCSU-1000 (BE)

INDRIVETEC  
www.indrivetec.com

## 950 kW

5.8 MWh NAS<sup>®</sup> battery storage system  
long-term energy storage use cases

# FC-BESS-1000 (NL)

## 320 kW

frequency control reserve + energy trading

FC-BESS-1000 with 1106 kWh LFP battery  
storage system



# FC-BESS-1000 (NL)

360 kW

Electrical vehicle charging stations  
FC-BESS-1000 with 737 kWh LFP battery  
storage system

# FC-PCSU-250 (AU)

## 250 kW

1.45 MWh NAS<sup>®</sup> battery storage system  
long-term energy storage use cases



# FC-BESS-1000 (NL)

500 kW

Electrical vehicle charging stations  
FC-BESS-1000 with 737 kWh LFP battery  
storage system

# FC-PCSU-250 (TD)

## 250 kW

1.45 MWh NAS<sup>®</sup> battery storage system  
long-term energy storage use cases



# FC-BESS-1000 (NL)

2 x 1000 kW

frequency control reserve + energy trading

2 x FC-BESS-1000 with 1200 kWh LFP battery  
storage system