

INDRIVETEC
Innovative Drive Technologies AG

INDRIVETEC AG

"bricks up" flexible energy storage systems

25 Years experience in power electronics

600 Megawatt worldwide experience and installations

102 Members in Switzerland, Bulgaria and Germany

305 Projects confirms the international standards for quality

INDRIVETEC AG

Power Conversion System

FlexConvert-PCS-1100

Battery Inverter In-/Outdoor up to 1100 VDC

FlexConvert-PCS-1500

Battery Inverter In-/Outdoor up to 1500 VDC

FlexConvert-PCSU

Power Conversion System Unit
Containerized Battery Inverter + EMS

FlexConvert-PCS-1100

Battery Inverter In-/Outdoor with 1100 VDC

Power capability table

Nom. AC voltage VAC	Min. DC voltage VDC	Max. DC voltage VDC	Rated active power at cos phi: 0,9					
			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
480	780	1100	320	500	750	1000	1500	2000
600	980	1100	400	650	950	1300	1950	2600
690	1100	1100	460	750	1075	1500	2250	3000

FlexConvert-PCS-1500

Battery Inverter In-/Outdoor with 1500 VDC

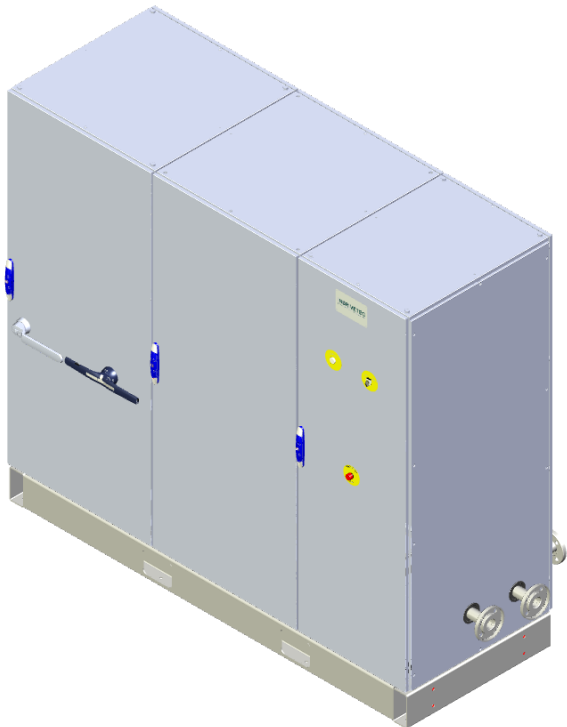
Power capability table

Nom. AC voltage VAC	Min. DC voltage VDC	Max. DC voltage VDC	Rated apparent power				
			FC1440-ML	FC2160-ML	FC2880-ML	FC3600-ML	FC4320-ML
400 VAC	650 VDC	1500 VDC	840 kVA	1260 kVA	1680 kVA	2100 kVA	2520 kVA
500 VAC	820 VDC	1500 VDC	1040 kVA	1560 kVA	2080 kVA	2600 kVA	3120 kVA
550 VAC	900 VDC	1500 VDC	1150 kVA	1725 kVA	2300 kVA	2875 kVA	3450 kVA
600 VAC	975 VDC	1500 VDC	1250 kVA	1875 kVA	2500 kVA	3125 kVA	3750 kVA
660 VAC	1075 VDC	1500 VDC	1380 kVA	2070 kVA	2760 kW	3450 kVA	4140 kVA
690 VAC	1120 VDC	1500 VDC	1440 kVA	2160 kVA	2880 kVA	3600 kW	4320 kVA
730 VAC	1190 VDC	1500 VDC	1520 kVA	2275 kVA	3035 kVA	3795 kVA	4550 kVA

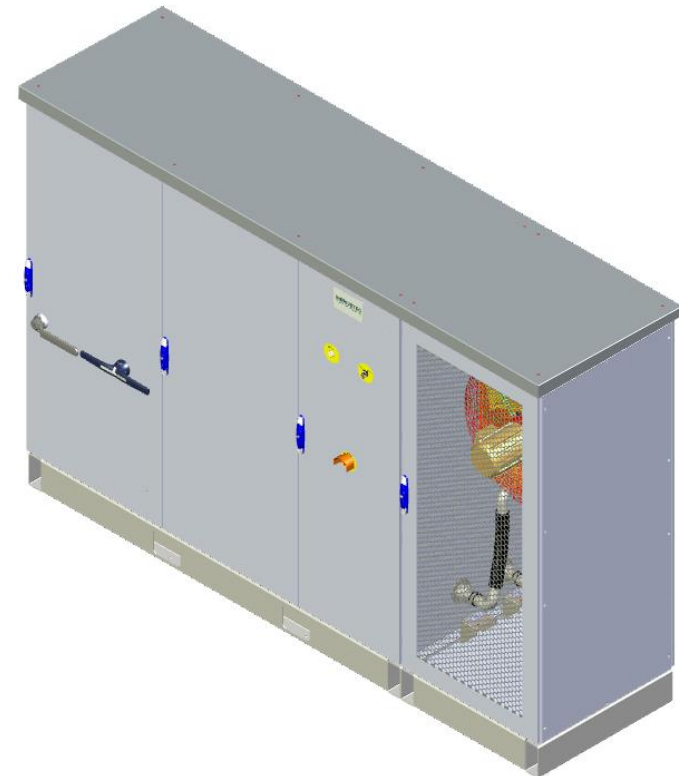
FlexConvert-PCS

Battery Inverter In-/Outdoor

PCS-Indoor

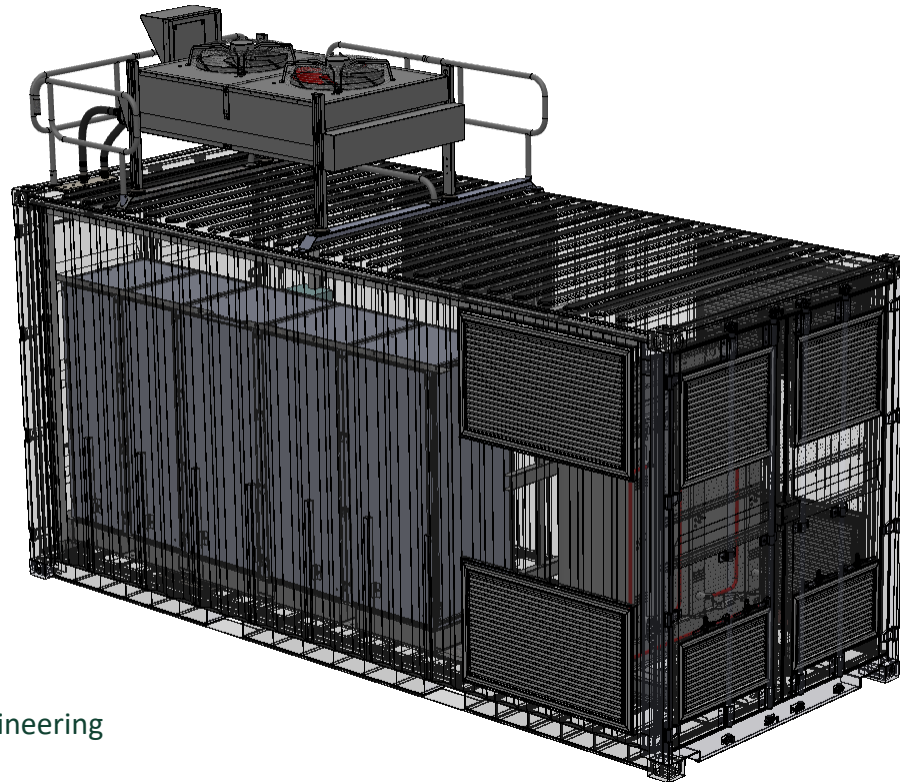



PCS-Outdoor



FlexConvert-PCSU Containerized Battery Inverter + EMS

FC-PCSU-2000-MV





INDRIVETEC AG

Energy Storage Systems

FlexConvert-BESS-Single

One container energy storage system

FlexConvert-BESS-Dual

Two container energy storage system PCSU + Battery

FlexConvert-BESS-Triple

Stand-alone Outdoor PCS + Battery + EMS

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-320 Container, up to 4 x 150 kWh racks and one inverter FC320

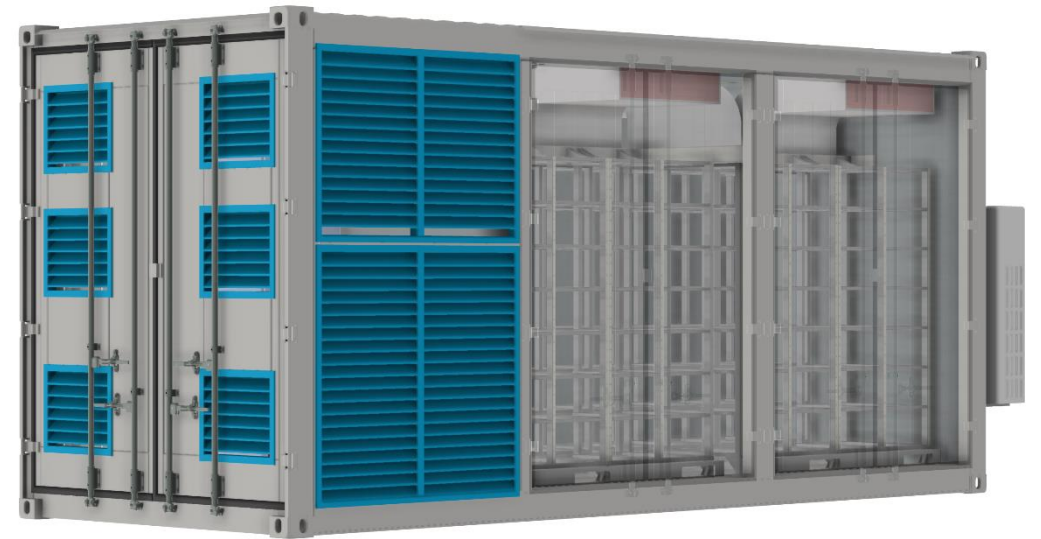
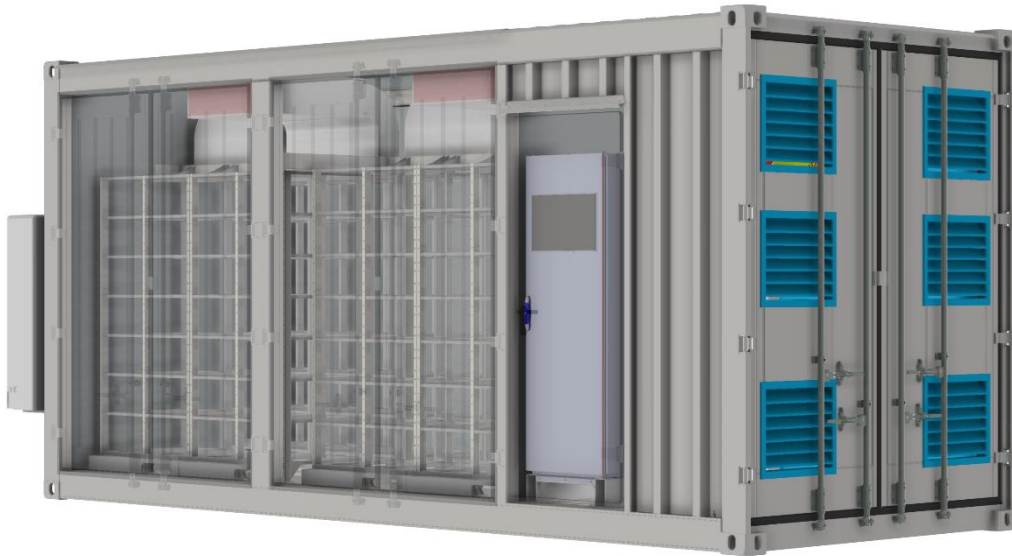
FC-BESS-1000 20 ft. Container, up to 8 x 150 kWh racks and
one Inverter FC320, FC500, FC750 or FC1000

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

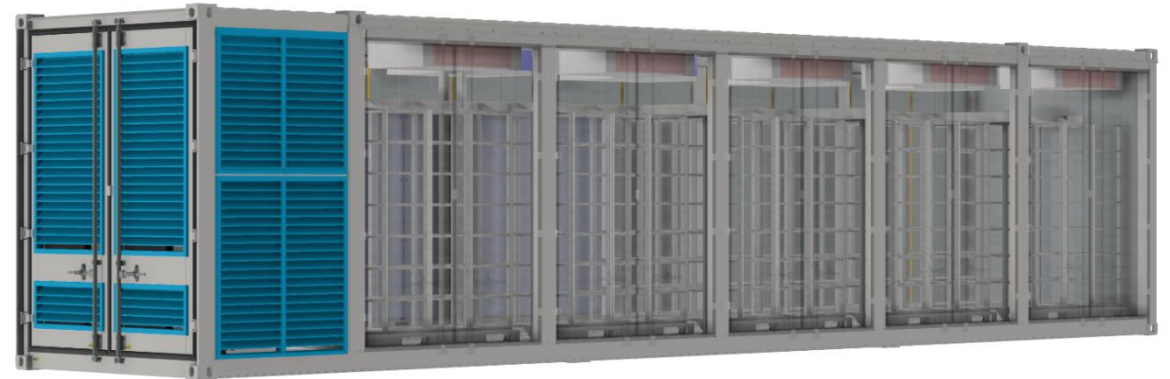
FC-BESS-1000



FlexConvert-BESS-Single

One container energy storage system

FC-BESS-2000



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	-20... +45°C (extended range upon request)		

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	-20... +45°C (extended range upon request)		

FlexConvert-BESS-Dual

Two container energy storage system

Two container energy storage system solution for **LFP battery**
PCSU container, battery container, HVAC, EMS and Control

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

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

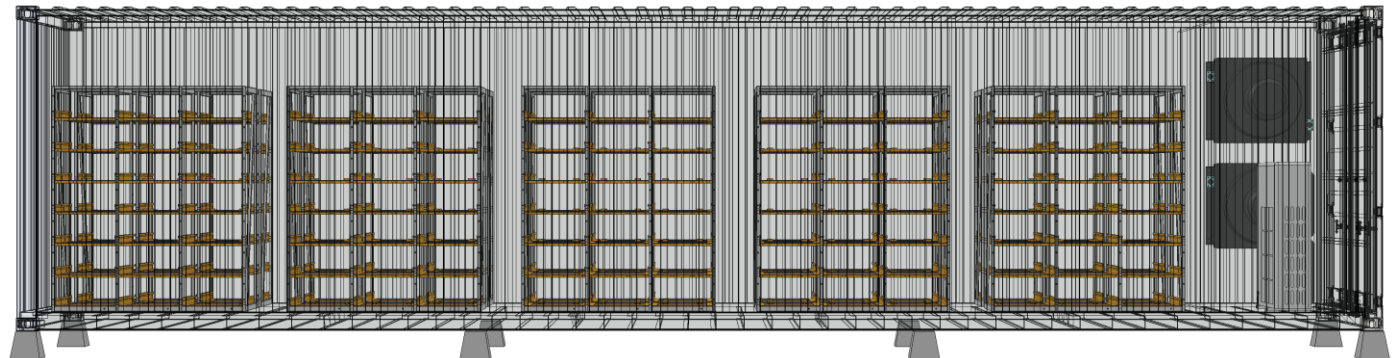
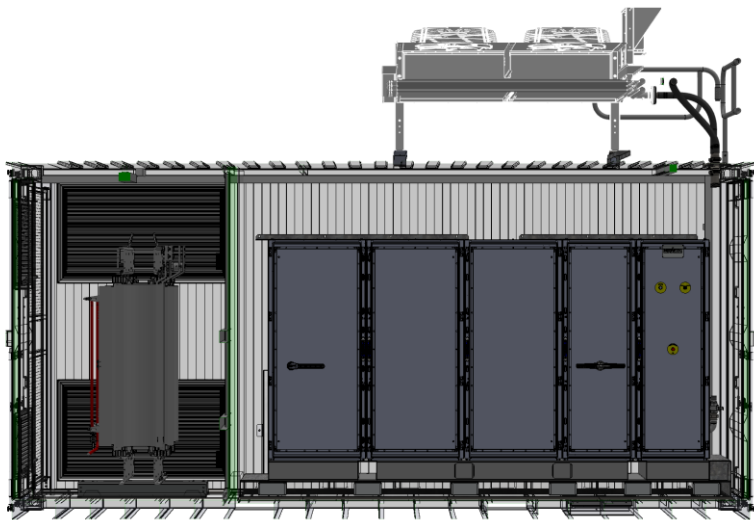
IDT BESS-1200 20 ft. Container up to 8 x 150 kWh LFP battery racks

IDT BESS-3000 40 ft. Container up to 20 x 150 kWh LFP battery racks

FlexConvert-BESS-Dual

Two container energy storage system

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



FlexConvert-BESS-Dual

Two container energy storage system

Two container energy storage system solution for **NAS[®] Battery**
PCSU container, battery container, HVAC, EMS and Control

FC-PCSU-250 20 ft. Container, for 250 kW – 1450 kWh NAS[®] Battery

FC-PCSU-500 20 ft. Container, for 500 kW – 2900 kWh NAS[®] Battery

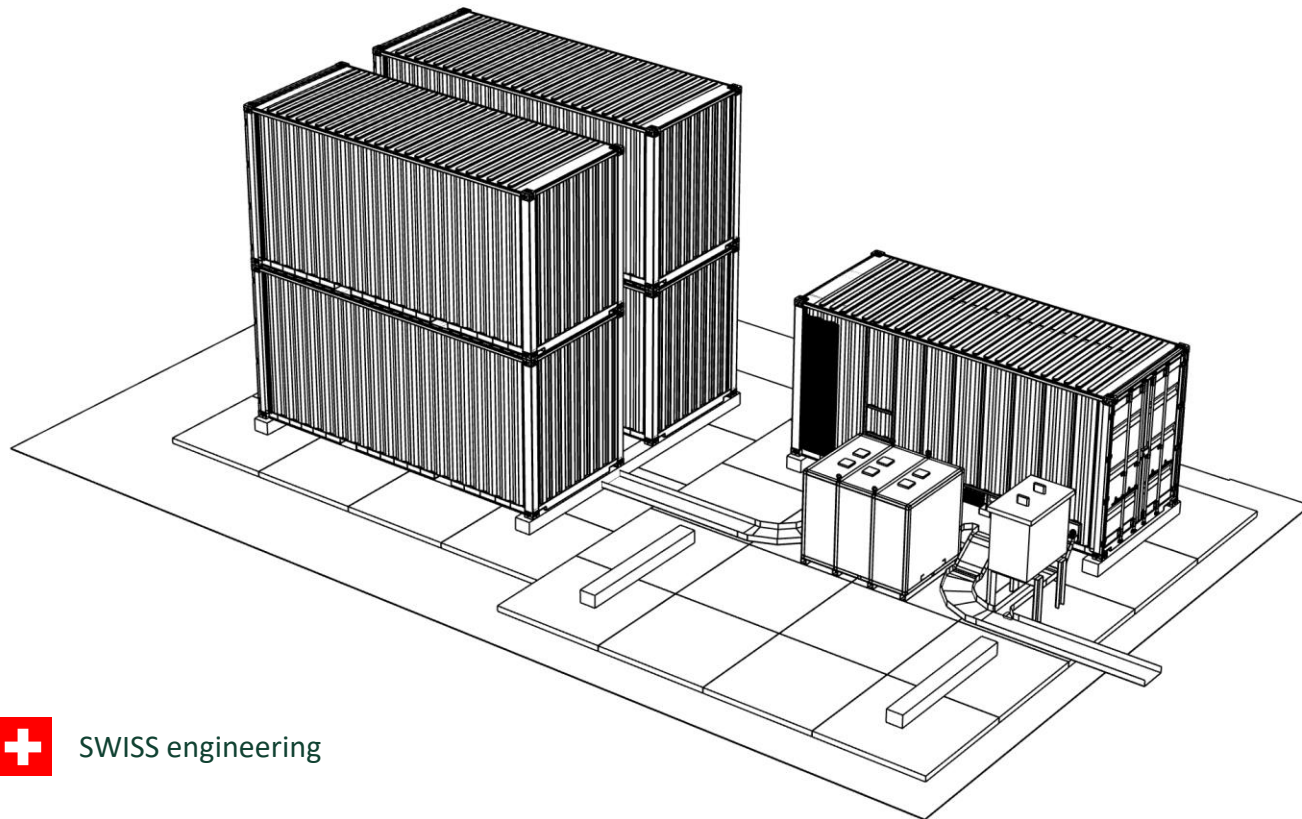
FC-PCSU-750 20 ft. Container, for 750 kW – 4350 kWh NAS[®] Battery

FC-PCSU-1000 20 ft. Container, for 1000 kW – 5800 kWh NAS[®] Battery

FlexConvert-BESS-Dual

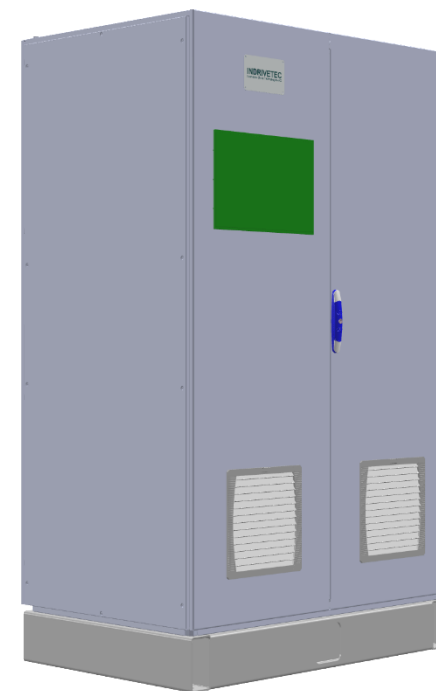
Two container energy storage system

FC-PCSU-1000 + 5800 kWh NAS[®] Battery + EMS



FlexConvert-BESS-Triple

Stand-alone Outdoor cabinets PCS + Battery + EMS



FlexConvert-BESS-Triple

Stand-alone Outdoor cabinets PCS + Battery + EMS



example FC-BESS-Triple configurations at cos phi: 0.9

1300 kW – 2980 kWh

1950 kW – 4470 kWh

2600 kW – 5960 kWh

3250 kW – 7450 kWh

3900 kW – 8940 kWh

FlexConvert-BESS-Triple Configuration

PCS-1100 + 279.5 kWh Battery Rack + EMS

FC-BESS-Triple configurations at cos phi: 0.9			
550 kW – 1400 kWh	1100 kW – 2520 kWh	1650 kW – 3920 kWh	2200 kW – 5040 kWh
550 kW – 1680 kWh	1100 kW – 3360 kWh	1650 kW – 5040 kWh	2200 kW – 6440 kWh
550 kW – 1960 kWh	1100 kW – 3920 kWh	1650 kW – 5880 kWh	2200 kW – 7560 kWh
550 kW – 2520 kWh	1100 kW – 5040 kWh	1650 kW – 7560 kWh	2200 kW – 10080 kWh
General data			
Nominal AC voltage	520 V		
Power factor cos (φ)	$\pm 0 - 1.0$ (four-quadrant operation)		
DC voltage range	873.6 VDC — 1092 VDC		
Battery performance	6000 cycles 90%DoD, 0.5C		
System efficiency	RTE > 88%		
Cell Chemistry	Lithium Iron Phosphate LiFePO4		
Ambient temperature	-20... +45°C (extended range upon request)		

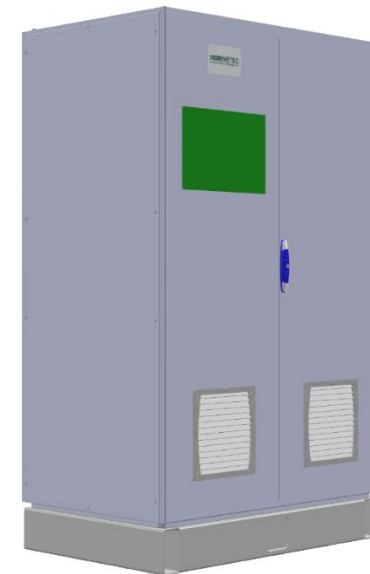
FlexConvert-BESS-Triple Configuration

PCS-1500 + 372.7 kWh Battery Rack + EMS

FC-BESS-Triple configurations at cos phi: 0.9			
1300 kW – 2980 kWh	1950 kW – 4470 kWh	2600 kW – 5960 kWh	3250 kW – 7450 kWh
1300 kW – 3720 kWh	1950 kW – 5960 kWh	2600 kW – 7450 kWh	3250 kW – 9300 kWh
1300 kW – 4470 kWh	1950 kW – 6700 kWh	2600 kW – 8940 kWh	3250 kW – 11180 kWh
1300 kW – 5960 kWh	1950 kW – 8940 kWh	2600 kW – 11900 kWh	3250 kW – 14900 kWh
General data			
Nominal AC voltage	690 V		
Power factor cos (φ)	$\pm 0 - 1.0$ (four-quadrant operation)		
DC voltage range	1164.8 VDC — 1476.8 VDC		
Battery performance	6000 cycles 90%DoD, 0.5C		
System efficiency	RTE > 88%		
Cell Chemistry	Lithium Iron Phosphate LiFePO4		
Ambient temperature	-20... +45°C (extended range upon request)		

FlexConvert-BESS-Triple-CON

PCS-1500 Outdoor + 3.4 MWh CON + Outdoor EMS



FlexConvert-BESS-Triple-CON

PCS-1500 Outdoor + 3.4 MWh CON + Outdoor EMS



example FC-BESS-Triple-CON configurations at cos phi: 0.9

1260 kW – 3440 kWh

1890 kW – 6880 kWh

2520 kW – 10320 kWh

3150 kW – 13760 kWh

3780 kW – 17200 kWh

FlexConvert-BESS-Triple-CON

PCS-1500 Outdoor + 3.4 MWh CON + Outdoor EMS

FC-BESS-Triple-CON configurations at cos phi: 0.9			
1260 kW – 3440 kWh	1260 kW – 6880 kWh	1890 kW – 6880 kWh	1890 kW – 10320 kWh
2520 kW – 6880 kWh			
1260 kW – 6880 kWh	1890 kW – 10320 kWh	2520 kW – 10320 kWh	3150 kW – 10320 kWh
3150 kW – 13760 kWh	3780 kW – 13760 kWh	3780 kW – 17200 kWh	
General data			
Nominal AC voltage	660 V		
Power factor cos (φ)	$\pm 0 - 1.0$ (four-quadrant operation)		
DC voltage range	1164.8 VDC – 1476.8 VDC		
Battery performance	6000 cycles 90%DoD, 0.5C		
System efficiency	RTE > 88%		
Cell Chemistry	Lithium Iron Phosphate LiFePO4		
Ambient temperature	-20... +45°C (extended range upon request)		

FlexConvert-BESS

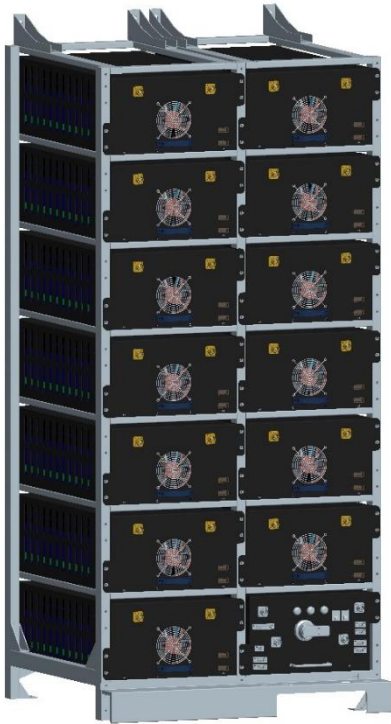
Battery Rack In-/Outdoor

Battery System Parameter	150 kWh Standard Rack Indoor		279.5 kWh Outdoor Rack	372.7 kWh Outdoor Rack
Nominal capacity	150 Ah		280 Ah	
C-rate	up to 1 C	up to 0.5 C		
Series and parallel	1P312S LFP cells			1P416S LFP cells
Battery performance	4000 cycles 90%DoD	6000 cycles 90%DoD		
Nominal voltage	998.4 VDC			1331.2 VDC
Work voltage range	873.6 VDC – 1092 VDC			1164.8 VDC —1476.8 VDC
Nominal energy	149.76 kWh		279.5 kWh	372.7 kWh
Rated current	150 A	75 A	140 A	
Maximum current	160 A	80 A	160 A	
Dimension D x W x H	835 x 930 x 2057 mm		1300 x 1360 x 2400 mm	
Weight	1.6 tons		3.2 t	4 t

FlexConvert-BESS

Battery Rack In-/Outdoor

150 kWh Rack Indoor



279.5 kWh Rack Outdoor



372.7 kWh Rack Outdoor



FlexConvert-BESS

3440 kWh liquid-cooled 20HC container



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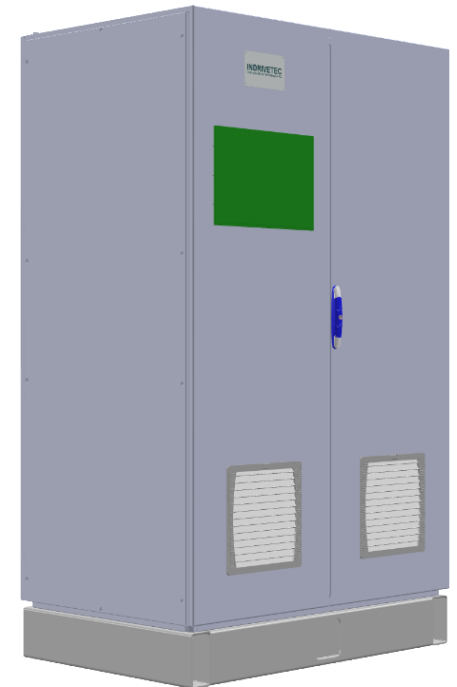
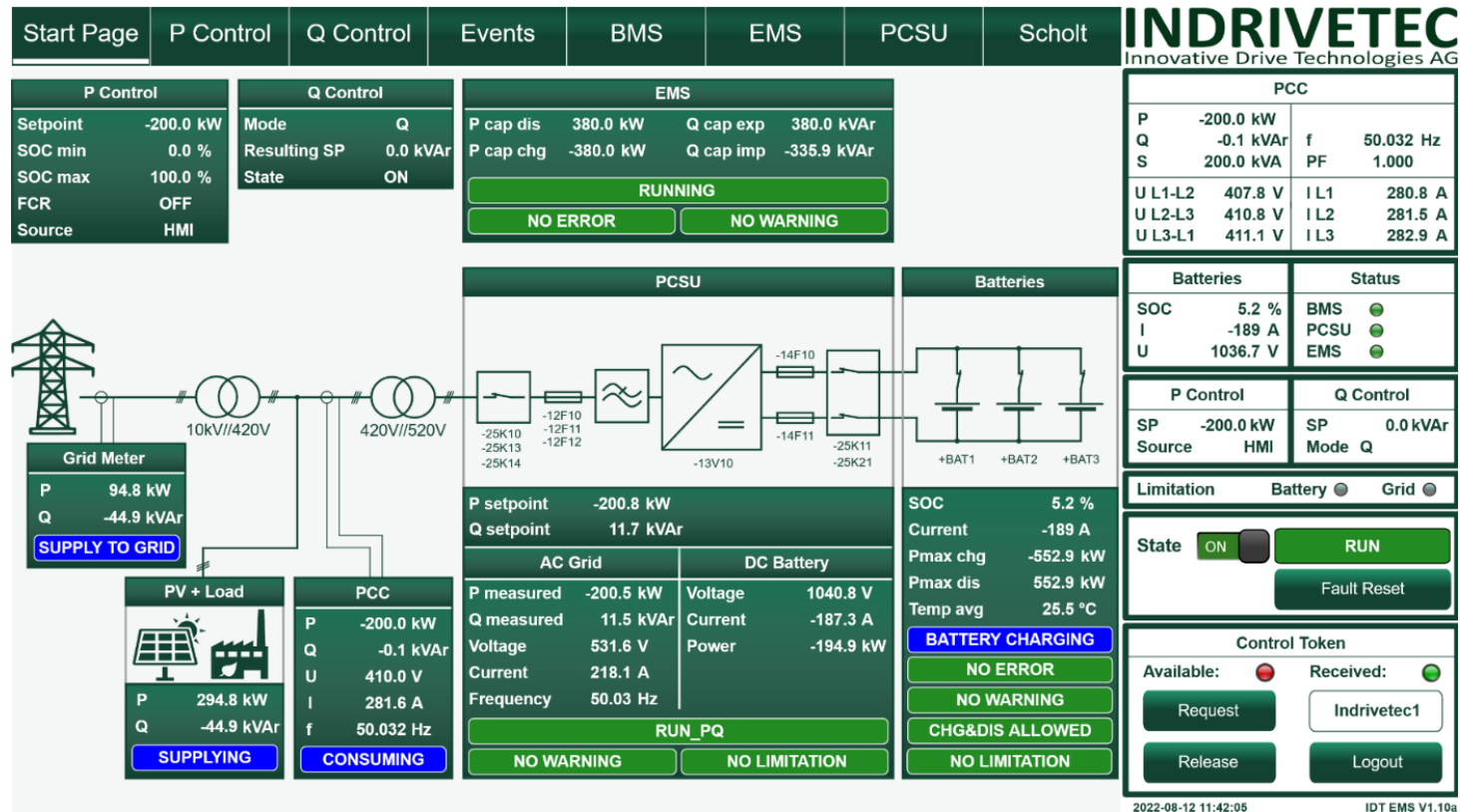


SWISS engineering

Battery System Parameter	3440 kWh liquid-cooled 20HC battery container
Nominal capacity	280 Ah
C-rate	up to 0.5 C
Battery racks	10 x 344.064 kWh battery racks with 1P384S LFP cells
Battery performance	6000 cycles 95%DoD
Nominal voltage	1228.8 VDC
Work voltage range	1075.2 VDC — 1363.2 VDC
Nominal energy	3.440.64 kWh
Rated current	1400 A
Maximum current	1730 A <small>(25±5 °C 5min)</small>
Dimension D x W x H	6058 x 2438 x 2896 mm
Weight	36 tons

Technical data are subject to change, even for reasons on country-specific deviations.
Indrivetec assumes no liability for errors and omissions.

IDT-Energy Management System



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

Production

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

Prototype assembling, functional and type testing,
customer acceptance

Production

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

Prototype assembling, functional and type testing, customer acceptance

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° C, customized testing , factory acceptance test

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

Training



Maintenance



Monitoring



Service Program

Inspection



Support



Repairs





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

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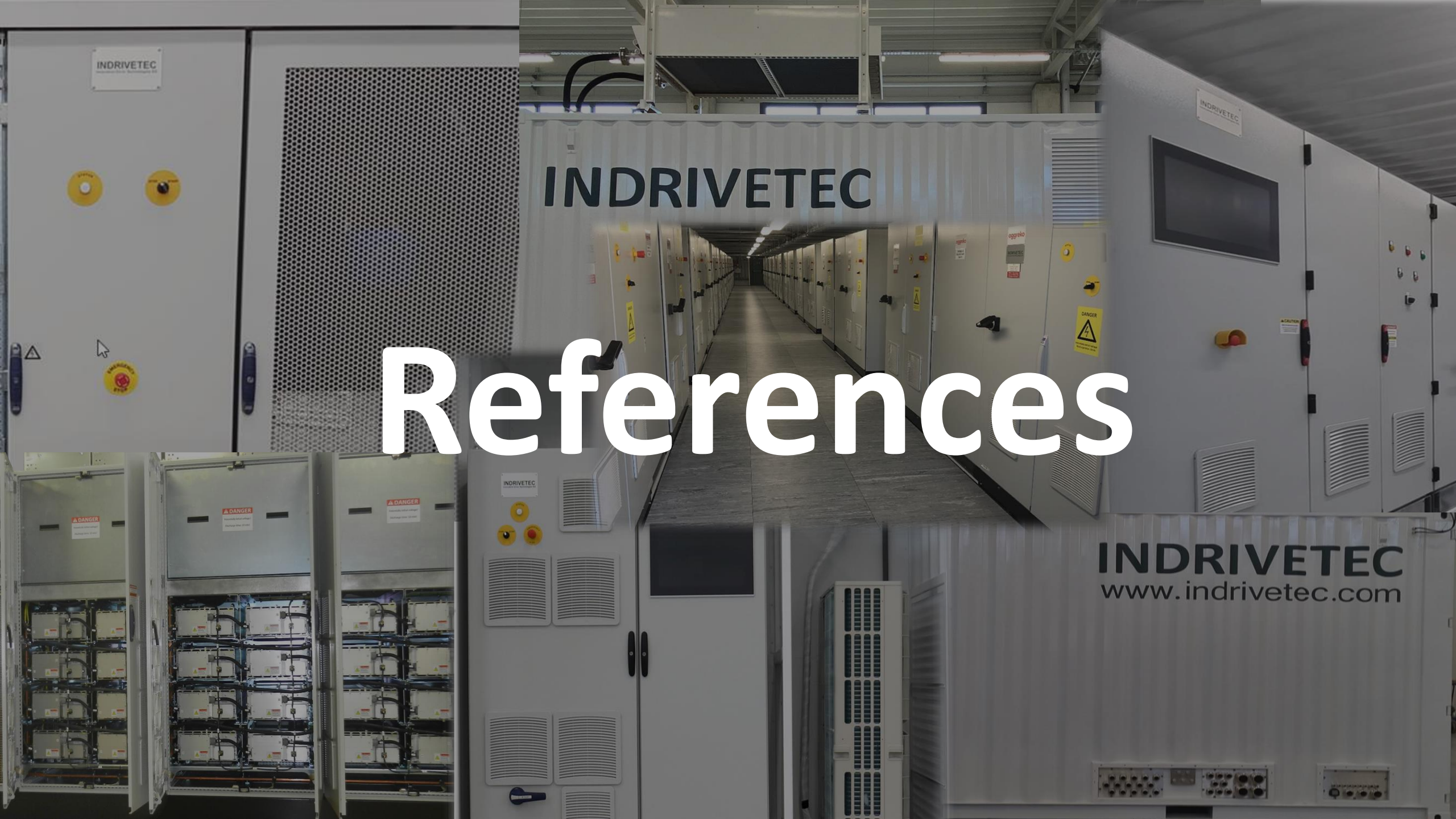
Innovative Drive Technologies AG

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

has passed the FlexConvert Level 2 - training.



INDRIVETEC

References

INDRIVETEC
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)

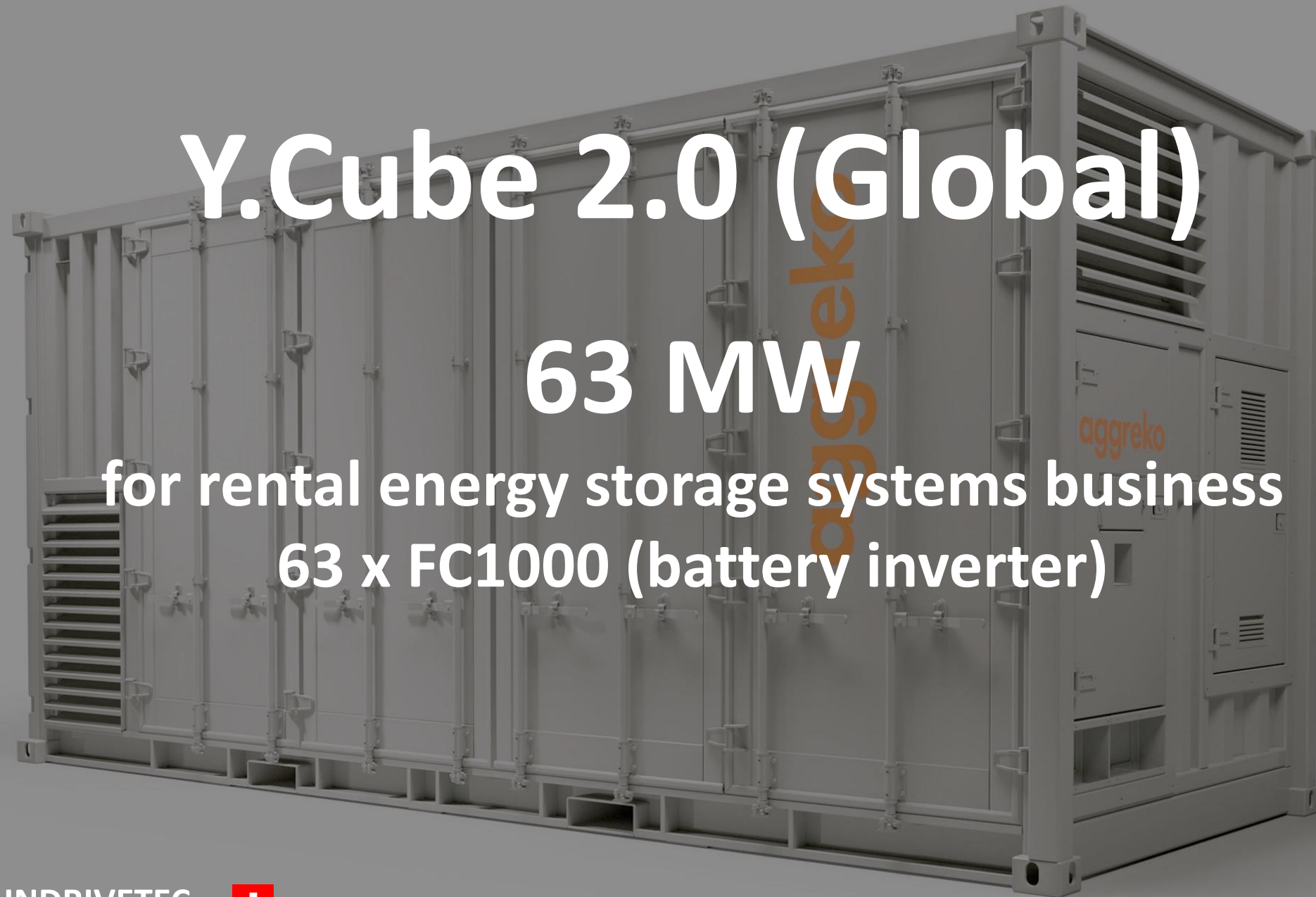
1000 kW

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)

FC320 (CH)

220 kW

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

FC320 (battery inverter)



FC320 (DE)

250 kW

reduction of the facility's electricity
consumption with LFP battery storage system

FC320 (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

FC-PCSU-1000 (BE)

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950 kW

5.8 MWh NAS[®] battery storage system
long-term energy storage use cases

FC-PCSU-1000 (DE)

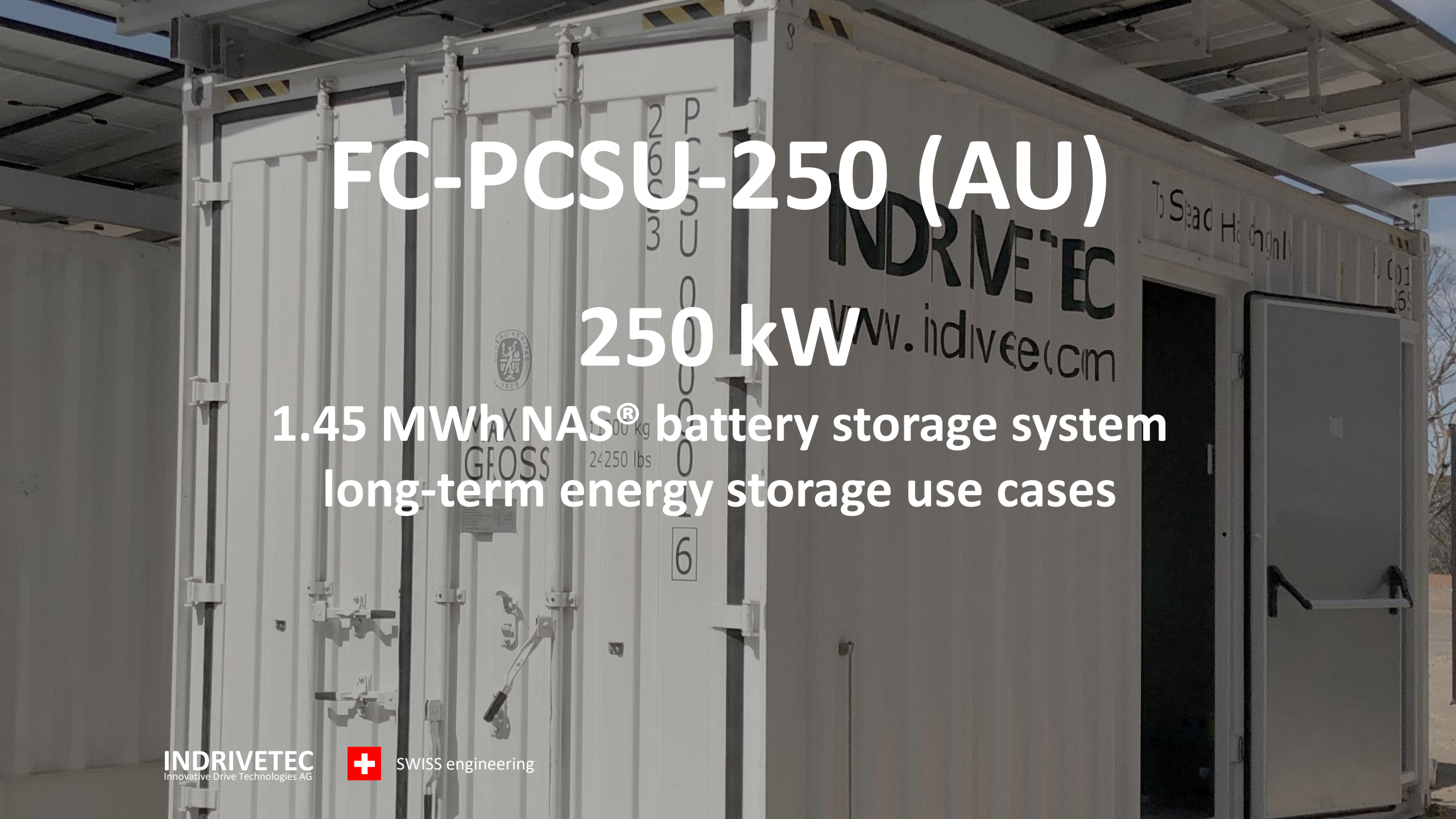
1000 kW

5.8 MWh NAS[®] battery storage system long-term
energy storage for CO₂ neutral energy supply

FC-PCSU-500 (BG)

500 kW

2.9 MWh NAS[®] battery storage system
long-term energy storage use cases



FC-PCSU-250 (AU)

250 kW

1.45 MWh NAS[®] battery storage system
long-term energy storage use cases

FC-PCSU-250 (HU)

250 kW

1.45 MWh NAS[®] battery storage system
long-term energy storage use cases

FC-PCSU-250 (TD)

250 kW

1.45 MWh NAS[®] 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-BESS-1000 (LT)

360 kW

for the Lithuanian energy storage market
FC-BESS-1000 with 900 kWh LFP battery storage
system

FC-BESS-1000 (NL)

500 kW

electrical vehicle charging stations

FC-BESS-1000 with 737 kWh LFP battery
storage system

FC-BESS-1000 (NL)

1000 kW

frequency control reserve + energy trading

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

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

FC-BESS-2000 (SK)

1500 kW

ancillary services

**FC-BESS-2000 with 2400 kWh LFP battery
storage system**

FC-BESS-2000 (NL)

 HMB
Storage System
INDRIVETEC AG

3000 kW

electrical truck charging stations

2 x FC-BESS-2000 with 2400 kWh

1 x FC-BESS-1000 with 1200 kWh

1.8 MW solar roof power plant

FC-BESS-2000 (NL)

1000 kW

frequency control reserve + energy trading

FC-BESS-2000 with 2100 kWh LFP battery
storage system

FC-BESS-2000 (DE)

2000 kW

for the German energy storage market
WBS2000 with 2100 kWh LFP battery storage
system

FlexConvert-PCS

speed controlled low noise heat exchanger