Power Generation

mtu KINETIC POWERPACK

Product data for dynamic UPS solutions

Edition 1/24, valid from 02/2024

A Rolls-Royce solution

Ready for a new perspective on dynamic UPS?

mtu KINETIC POWERPACK

Our ***mtu*** Kinetic PowerPack provides dynamic uninterruptible power supply through kinetic energy and is engineered to withstand the most demanding power supply challenges.

Lower TCO
At medium and higher power ratings, ***mtu*** Kinetic PowerPacks are more cost-effective, reducing consumable electricity cost and maintenance.

Smaller footprint
Its component count and monobloc structure give the ***mtu*** Kinetic PowerPack a compact design, reducing its footprint to 40% of an equivalently rated static UPS system – making it the smallest in the market.

Units up to 3000 kVA
The current-carrying capability of electronic components does not limit ***mtu*** Kinetic PowerPacks. Their per unit ratings are considerably more significant, leading to a much lower component count on higher power installations.

Power conditioning
In addition to providing instantaneous back-up power, the ***mtu*** Kinetic PowerPack serves as a power conditioner, filtering spikes or transient interferences and regulating load voltages within a tolerance range, providing clean power to the consumers.

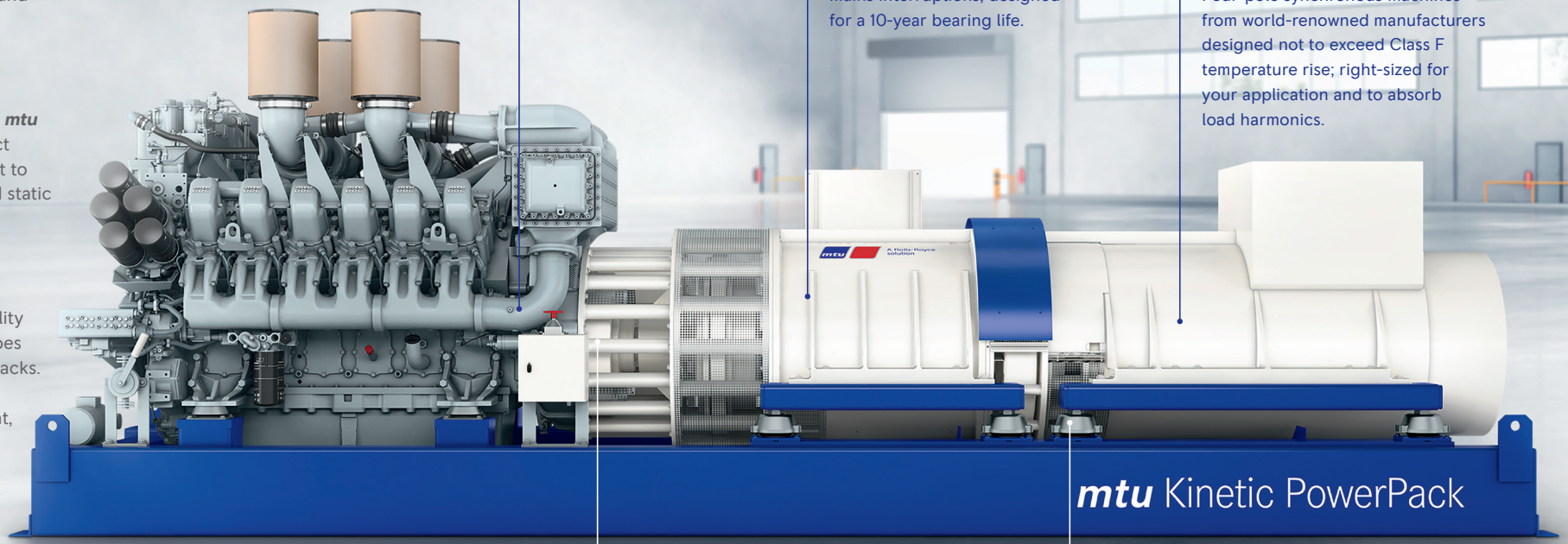
Lower environmental impact
Dynamic UPS systems do not require heavy batteries and do not generate chemical waste. The energy is immediately available from the kinetic energy storage unit to provide power until the diesel engine is activated.

Medium voltage systems
mtu Kinetic PowerPacks are the perfect solution for medium voltage critical loads or when more considerable distribution distances need to be covered.

mtu diesel engine
Complying with the latest emissions standards; preheated; pre-lubricated; quick start and not running during conditioning mode.

Kinetic energy module
Patented accu provides stored kinetic energy to ride through mains interruptions; designed for a 10-year bearing life.

Synchronous machine
Four-pole synchronous machines from world-renowned manufacturers designed not to exceed Class F temperature rise; right-sized for your application and to absorb load harmonics.



Electromagnetic clutch
The prime starter system consists of standard engine starting motors. The clutch is maintenance-free and guarantees the diesel engine to start at all times, thanks to the redundant start feature.

Vibration isolation
Thanks to the solid base frame with isolators between frame and equipment and direct floor installation, vibrations are reduced >97%.

Standby power – dynamic uninterruptible power supply systems

STANDBY POWER (3D) – 50 HZ/1500 RPM.

	Power output[1]				Available voltages		Emissions					Accu arrang.	Certifications				Perform. class[2]		Uptime Institute		Housing	
	no-break kVA	no-break kWe	short-break kVA	short-break kWe	low voltage 380 - 415V (3 Phase)	medium voltages 6 - 36 kV (3 Phase)	Fuel consumption optimized	NOx emission optimized	NEA Singapore for ORDE	US EPA Tier 2 compliant	EU Nonroad Stage II compliant (97/68/EC)		ISO 8528	CE/IEC	NFPA 110	VDE-AR-N 4110 (German Grid Code)	ISO 8528-5 - G3	ISO 8528-5 - G4	Tier I & Tier II	Tier III & Tier IV	Enclosure	Container
mtu KP5	500	400			x	x	x	x				single		x				x	x	x[16]		x
	630	504			x	x	x	x	x			single		x				x	x	x[16]		x
	800	640			x	x	x	x				single		x				x	x	x[16]		x
	1000	800			x	x	x	x				single		x				x	x	x[16]		x
	1200	960			x	x	x	x				single		x				x	x	x[16]		x
	1250	1000			x	x	x	x	x			single		x				x	x	x[16]		x
	1500	1200			x	x	x	x	x			single		x				x	x	x[16]		x
	1650	1320	600	480	x	x	x	x	x			single		x				x	x	x[16]		x
	1700	1360			x	x	x	x	x			single		x				x	x	x[16]		x
	1875	1500	625	500	x	x	x	x	x			single		x				x	x	x[16]		x
	2000	1600			x	x	x	x	x			single		x				x	x	x[16]		x
mtu KP7	2250	1800			x	x	x	x	x			single		x				x	x	x[16]		x
	2500	2000			x	x	x	x	x			single		x				x	x	x[16]		x
	2750	2200			x	x	x	x	x			single		x				x	x	x[16]		x

Standby power – dynamic uninterruptible power supply systems

STANDBY POWER (3D) – 60 HZ/1800 RPM.

	Power output [1]				Available voltages		Emissions					Accu arrang.	Certifications				Uptime Institute		Housing	
	no-break kVA	no-break kWe	short-break kVA	short-break kWe	low voltage 208 - 480V (3 Phase)	medium voltages 4 - 36 kV (3 Phase)	US EPA stationary EMERG Tier 3 (40 CF 60)	US Nonroad Tier 3 compliant	US EPA stationary EMERG Tier 2 (40 CF 60)	US Nonroad Tier 2 compliant	Fuel consumption optimized		ISO 8528	UL2200	NFPA 110	IBC 2012	Tier I & Tier II	Tier III & Tier IV	Enclosure	Container
mtu KP5	500	400			x	x			x	x		single			x		x	x [16]		x
	625	500			x	x			x	x		single			x		x	x [16]		x
	1000	800			x	x			x	x	x	single			x		x	x [16]		x
	1250	1000			x	x			x	x	x	single			x		x	x [16]		x
	1500	1200			x	x			x	x	x	single			x		x	x [16]		x
	1700	1360			x	x			x	x	x	single			x		x	x [16]		x
	1875	1500	1125	900	x	x			x	x	x	single			x		x	x [16]		x
	2000	1600			x	x			x	x	x	single			x		x	x [16]		x
	2000	1600	500	400	x	x			x	x	x	single			x		x	x [16]		x
mtu KP7	2500	2000			x	x			x	x	x	single			x		x	x [16]		x
	3000	2400			x	x			x	x	x	single			x		x	x [16]		x
	3000	2400	300	240	x	x			x	x	x	single			x		x	x [16]		x

Standby power – dynamic uninterruptible power supply systems

DATA CENTER CONTINUOUS POWER (3F) – 50 HZ/1500 RPM.

	Power output [1]				Available voltages		Emissions					Accu arrang.	Certifications				Perform. class [2]		Uptime Institute		Housing	
	no-break kVA	no-break kWe	short-break kVA	short-break kWe	low voltage 380 - 415V (3 Phase)	medium voltages 6 - 36 kV (3 Phase)	Fuel consumption optimized	NOx emission optimized	NEA Singapore for ORDE	US EPA Tier 2 compliant	EU Nonroad Stage II compliant (97/68/EC)		ISO 8528	CE/IEC	NFPA 110	VDE-AR-N 4110 (German Grid Code)	ISO 8528-5 - G3	ISO 8528-5 - G4	Tier I & Tier II	Tier III & Tier IV	Enclosure	Container
mtu KP5	480	384			x	x	x	x	x			single		x	x			x	x	x		x
	630	504			x	x	x	x	x			single		x	x			x	x	x		x
	1250	1000			x	x	x	x	x			single		x	x			x	x	x		x
	1500	1200			x	x	x	x	x			single		x	x			x	x	x		x
	1650	1320	600	480	x	x	x	x	x			single		x	x			x	x	x		x
	1700	1360			x	x	x	x	x			single		x	x			x	x	x		x
	1875	1500	625	500	x	x	x	x	x			single		x	x			x	x	x		x
	2000	1600			x	x	x	x	x			single		x	x			x	x	x		x
mtu KP7	2250	1800			x	x	x	x	x			single		x	x			x	x	x		x
	2500	2000			x	x	x	x	x			single		x	x			x	x	x		x
	2750	2200			x	x	x	x	x			single		x	x			x	x	x		x

Standby power – dynamic uninterruptible power supply systems

DATA CENTER CONTINUOUS POWER (3F) – 60 HZ/1800 RPM.

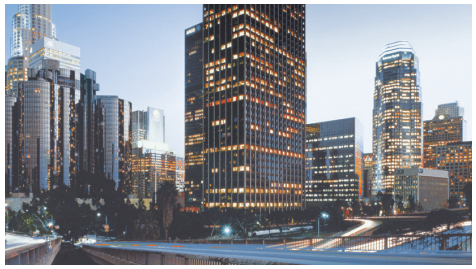
	Power output [1]				Available voltages		Emissions					Accu arrang.	Certifications				Uptime Institute		Housing	
	no-break kVA	no-break kWe	short-break kVA	short-break kWe	low voltage 208 - 480V (3 Phase)	medium voltages 4 - 36 kV (3 Phase)	US EPA stationary EMERG Tier 3 (40 CF 60)	US Nonroad Tier 3 compliant	US EPA stationary EMERG Tier 2 (40 CF 60)	US Nonroad Tier 2 compliant	Fuel consumption optimized		ISO 8528	UL2200	NFPA 110	IBC 2012	Tier I & Tier II	Tier III & Tier IV	Enclosure	Container
mtu KP5	625	500			x	x			x	x		single			x		x	x		x
	1500	1200			x	x			x	x	x	single			x		x	x		x
	1700	1360			x	x			x	x	x	single			x		x	x		x
	1875	1500	1125	900	x	x			x	x	x	single			x		x	x		x
	2000	1600			x	x			x	x	x	single			x		x	x		x
mtu KP7	2500	2000			x	x			x	x	x	single			x		x	x		x
	3000	2400			x	x			x	x	x	single			x		x	x		x

Rating definitions

FOR POWER SOLUTIONS.

Standby power
Standby power (3D)

Standby power applies to installations served by a reliable utility source. The standby ratings are applicable to varying loads for the duration of a power outage.



Data center continuous power (3F)

Data center continous power is a specific mission critical application. It is especially designed for the use in data centers as emergency standby units. “Data center continous power” offers an economic and customer friendly solution to comply to the Uptime Institute* Tier III and Tier IV standards.

OVERVIEW

Standby power		
Standby power (3D)	***mtu* Power Generation**	**ISO 8528-1 (ESP)**
Load	variable	variable
Load factor	**≤ 85 %**	≤ 70 %
10 % overload (ICXN)	no	not specified
Max. operating hours (per year)	**500 h**	200 h
Uptime compliant	Tier I & Tier II Tier III & Tier IV [16)]	not specified

Data center continuous power (3F)	***mtu* Power Generation**	**ISO 8528-1 (DCP)**
Load	continuous	continuous or variable
Load factor	≤ 100 %	≤ 100%
10 % overload (ICXN)	**yes**	not specified
Max. operating hours (per year)	unlimited [(B)]	unlimited
Uptime compliant	Tier I - Tier IV	not specified

FOOTNOTES.

Application descriptions, e.g. load factor, applies to *mtu* powered equipment.

(1) Power output based on 400V, fuel consumption opt. emission level and standard or optional generator. For arrangements with other emissions, voltages and/or optional generators, ratings may vary. Series 4000 without cooling package.

(2) Ambient conditions and load application acc. to ISO 8528

(3) Cooling variants:
A2A: air-to-air charge air cooling (TD)
W2A: water-to-air charge air cooling (TB)

50Hz – Power available up to:
Standard:
Site altitude above sea level: 400 m
Intake air temperature: 40° C

NOx emission optimized:
Site altitude above sea level: 100 m
Intake air temperature: 25° C

NEA Singapore:
Site altitude above sea level: 100 m
Intake air temperature: 40° C

60Hz – Power available up to:
Standard:
Site altitude above sea level: 400 m
Intake air temperature: 25° C

Classification for data center continuous power

ACCORDING TO THE UPTIME INSTITUTE.

Tier I
Tier I is composed of a single path for power and cooling distribution, without redundant components.

Tier II
Tier II is composed of a single path for power and cooling distribution, with redundant components.

Tier III
Tier III is composed of multiple active power and cooling distribution paths, but only one active path has redundant components and is concurrently maintainable.

Tier IV
Tier IV is composed of multiple active power and cooling distribution paths, has redundant components and is fault tolerant.

	Tier I	Tier II	Tier III	Tier IV
Delivery paths	One	One	One active + one passive	Two active
Redundant components	No	Yes	Yes (for active path)	Yes (for two active path)
Simultaneously maintainable	No	No	Yes	Yes
Fault tolerance (single event)	No	No	No	Yes
Compartmentalisation	No	No	No	Yes
Suitable ***mtu*** power generation application	Standby power (3D) Prime power for stationary emergency (3E) Prime power (3B) Grid stability power (3G)		Data center continuous power (3F) Continuous power (3A)	

For complete definition see http://uptimeinstitute.com/

Conversion table

NUMBERS TO BACK YOU UP.

1 kW	= 1.360 PS	g	= 9.80665 m/s²
1 kW	= 1.341 bhp	Л	= 3.14159
1 bhp	= 1.014 PS	e	= 2.71828
1 oz	= 28.35 g		
1 lb	= 453.59 g	1 lb	= 16 oz
1 short ton	= 907.18 kg	1 short ton	= 2000 lbs
1 lb/bhp	= 447.3 g/PSh	1 ft lb	= 1.356 Nm
1 lb/bhp	= 608.3 g/kWh	1 ft/min	= 0.00508 m/s
1 gal/bhp (US)	= 4264 g/kWh	pDiesel	= 0.83 kg/l
1 kWh	= 860 kcal	1 lb/sqin	= 0.069 bar (1 psi)
1 cal	= 4.187 J	1 mm Hg	= 1.333 mbar (133.3 Pa)
1 BTU	= 1.055 kJ	1 mm H_2O	= 0.0981 mbar (9.81 Pa)
1 inch	= 2.540 cm	T (K)	= t (°C) + 273.15
1 sq. inch	= 6.542 cm²	t (°C)	= 5/9 x (t (°F) -32)
1 cu. inch	= 16.387 cm³	t (°C)	= 5/4 x t (°R)
1 foot	= 3.048 dm	1 foot	= 12 inches
1 sq. foot	= 9.290 dm²	1 yard	= 3 feet
1 mile	= 1.609 km	1 mile	= 5280 feet
1 naut. mile	= 1.853 km	1 naut. mile	= 6080 feet
1 UK Gallon	= 4.546 l	1 US Barrel	= 0.159 m³
1 US Gallon	= 3.785 l		= 42 US Gallons
Energy:	1 J = 1 Ws = 1 VAs = 1 Nm		
Power:	1 W = 1 VA = 1 Nm/s		
Force:	1 N = 1 kgm/s²		
Pressure:	1 Pa = 1 N/m² (1 bar = 10^5 Pa)		
MEP (bar)	$= \frac{P_{cyl}(kW) \times 1200}{n(1/min) \times V_{cyl}(l)}$		
Torque (Nm)	$= \frac{P_{ges}(kW) \times 30000}{n(1/min) \times \pi}$		

Subject to change. | 16120885 | Edition 01/24 | BMC 2024-02 | Printed in Germany on chlorine-free bleached paper.

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