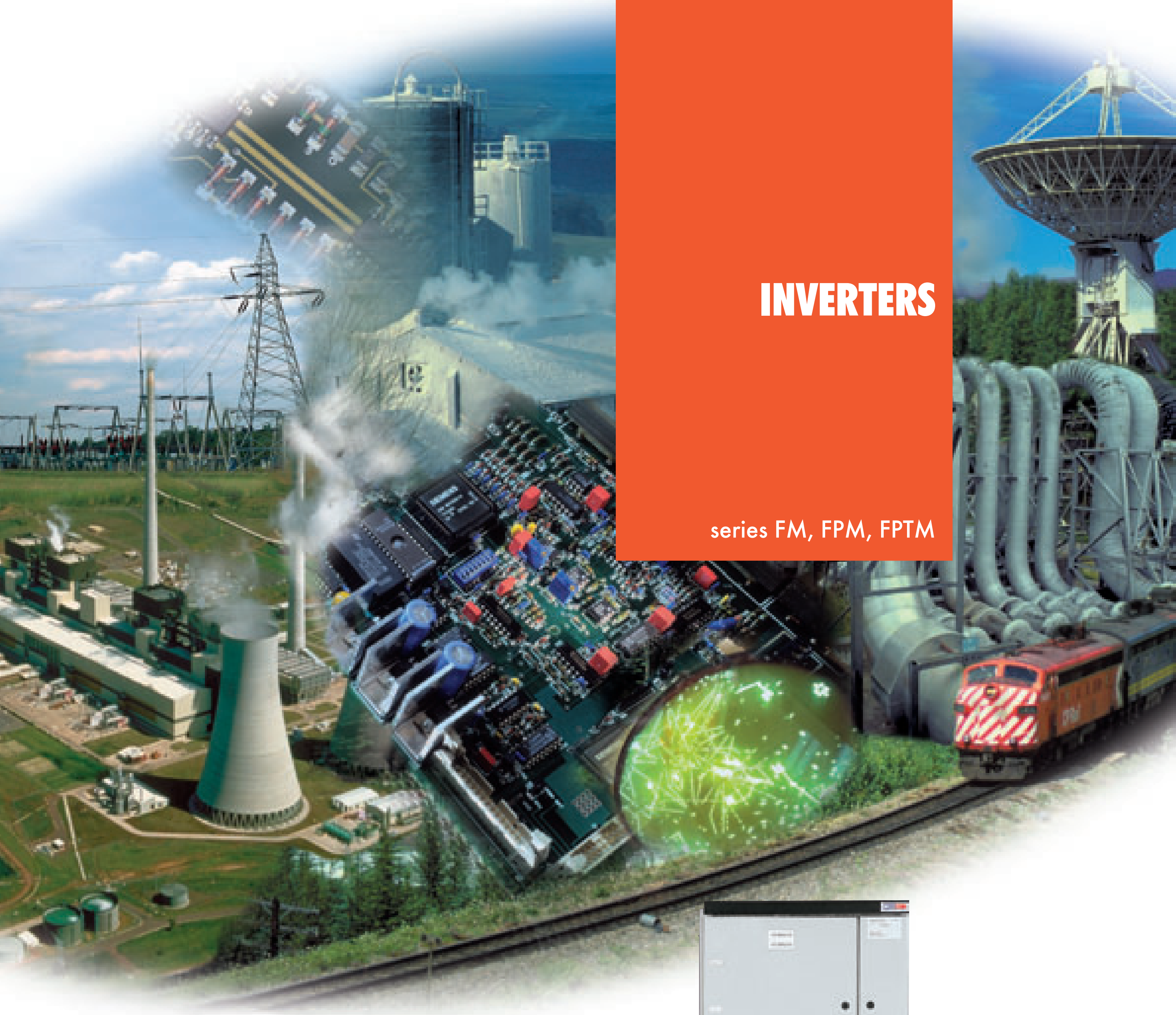


INVERTERS

series FM, FPM, FPTM

INVERTERS

MEDCOM

AC & DC POWER SOLUTIONS
TRACTION CONVERTERS

DESIGNATION

The modern industrial and power engineering inverters designed to co-operate with an external 220 V (340 V) battery, ensuring the uninterruptible operation of 230V and 3×400 V (50 Hz) receivers, even in case of a mains power cut.

- They can work in different configurations with the possibility of redundancy
- In case of the parallel connection there is a possibility of operation with current compensation
- They are characterised by higher resistance for disturbance (from the mains and load)
- Overvoltage and short circuit resistant
- Ensure power supply with stabilised voltage containing low harmonics
- They can be used in conjunction with static switches
- They can be used in conjunction with modern remotely--operated monitoring and control systems
- They work in a fully automatic mode and are easy to operate

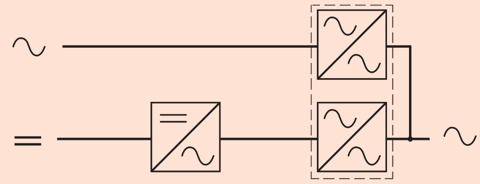
FEATURES:

- High reliability
- Small size and weight
- Easy installation and operation
- Sine voltage wave shape
- Parallel operation mode
- Microprocessor operated (high voltage stability, high frequency stability, low level of harmonic)
- Equipment tested in the industry and in power engineering with very good result

The quality system has an ISO9001:2001 certificate, which covers research and development, design, production and servicing of industrial electronic products.

INVERTER (FM) + "STATIC SWITCH"

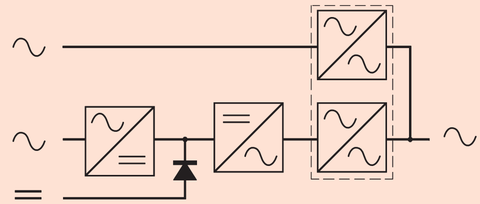
- ON-LINE mode at main power supply from a battery
- OFF-LINE mode if load is supplied mainly from the AC mains (time of switching period the supply from the line battery-inverter depends on the used switch) the AC mains (time switching to the power supply from the line battery-inverter depends on)



inverter (FM) + "static switch"

INVERTER WITH RECTIFIER (FPM, FPTM) + "STATIC SWITCH"

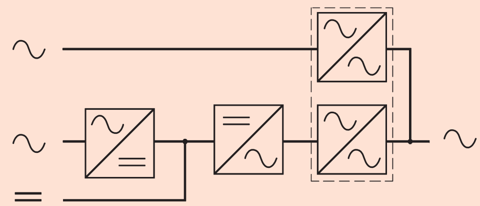
- supplied by the AC mains; in the event of mains failure the device is powered by battery automatically (ON-LINE mode with zero switching time); possibility of an additional BYPASS



inverter with rectifier (FPM, FPTM) + "static switch"

INVERTER WITH POWER SUPPLY (FPTM) + "STATIC SWITCH"

- power supply the same as above; since no blocking diode is used, charging may be performed through an internal power supply of the battery that co-operates with the device; (usually in systems with output power above 25 kVA with higher battery voltage)



inverter with power supply (FPTM) + "static switch"

MEDCOM AC & DC POWER SOLUTIONS TRACTION CONVERTERS

BUILT-IN BYPASS AS A STANDARD

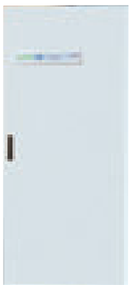
BYPASS (connecting the loads directly to the mains) is turned on automatically in the event of power cut in the main line and in case of an overload, short circuit or inverter failure.
Semiconductor static switches or contactors of parameters given below are used for connecting the BYPASS or the reserve power supply line (see: system configurations):

- thyristors (switching time 20ms, overloading 1000 % /100 ms acceptable)
- contactors (switching time depends on the power of the inverter and the contactors that were used)

GENERAL SPECIFICATION

Power supply parameters	
Voltage	230 V single phase devices 10 % [1] 3×400 V three phase devices 10% [1]
Frequency	50 Hz ±2 Hz [1]
Output parameters	
Voltage	230 V single phase [1] 3×400 V single phase [1]
Frequency	50 Hz ±0.2 Hz [1]
Voltage stability	3 %
Impulse response	±10 % in 60 ms
Power factor	0.7
Efficiency	88 ÷ 95 %
Crest factor	3:1
Over-current factor	125 % In / 10 s
Level of harmonic	<3 %
Protection	
Overvoltage	Shut down or switch to bypass [2]
Undervoltage	Shut down or switch to bypass [2]
Short circuit	Shut down after 10 s or switch to bypass [2]
Operating conditions	
Audible noise	53 dB ÷ 66 dB
Operating temperature	0 ÷ 40 °C [1) 3)]
Storage temperature	5 ÷ 40 °C
Relative Humidity	98 % non-condensing
Cooling	forced
Casings [4]	
Protection class	IP20
Materials	Steel sheet 1 mm, 1,5 mm, 2 mm
Finish	Powder coating RAL 7032 [1]
Accessibility	From the front
Cables connection	Through the bottom of the cabinet [1]

S5
h: 1800 mm
w: 1200 mm
d: 500 mm



S4
h: 1800 mm
w: 800 mm
d: 500 mm

S1 (S2)
h: 1000 mm
w: 800 mm
d: 300 mm
(400 mm)

W
h: 490 mm
w: 440 mm
d: 300 mm

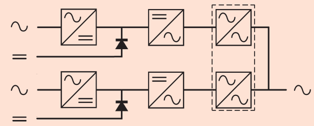
[1] a power supply of different parameters can be manufactured on demand
[2] depends on the circuit configuration
[3] does not apply to the battery working with the power supply
[4] casings of given dimensions do not have a transformer of the BYPASS

INVERTERS SERIES FM, FPM, FPTM

EXAPMPLES OF CONFIGURATIONS OF THE SYSTEM WITH REDUNDANCY

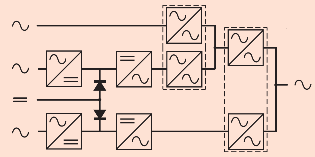
SYSTEM WITH REDUNDANCY 1 from 2
The system consists of two rectifier-inverter sets and a static switch. Under operation, one of power supply lines is defined as a primary, another one - as a secondary. If the primary line fails, static switch automatically switches over the power supply line. It happens at any case of inverter failure or discharging of the batteries.

A



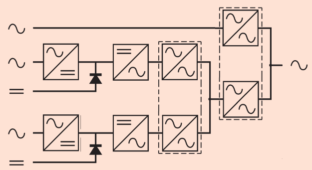
SYSTEM WITH REDUNDANCY 1 from 2 IN THE CASCADE CONNECTION
The system consists of two rectifier-inverter sets and a static switch connected in a cascade. Under operation, one of power supply lines is defined as a primary, another one - as a secondary. The secondary power supply line is connected directly to the load. BYPASS is turned ON automatically in the case of overload, short circuit or failure of both power supply lines or - manually - for maintenance.

B



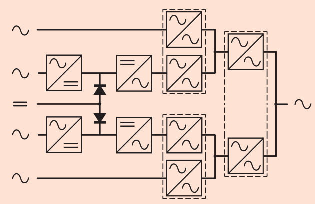
SYSTEM WITH REDUNDANCY 1 from 2 and BYPASS
The system consists of two rectifier-inverter sets, a static switch and an additional BYPASS switch. Under operation, one of power supply lines is defined as a primary, another one - as a secondary. If the primary line fails, static switch automatically switches over the power supply line. It happens at any case of inverter failure or discharging of the batteries. BYPASS is turned ON automatically in the case of overload, short circuit or failure of both power supply lines or - manually - for maintenance.

C



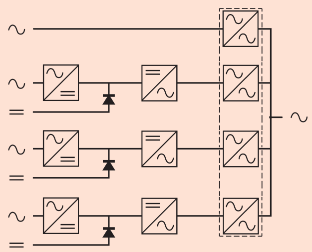
SYSTEM WITH REDUNDANCY 1 from 2 and an ADDITIONAL STATIC SWITCH
The system consists of two rectifier-inverter sets and a static switch. The load is connected to the inverter via additional static switch. Under operation, one of power supply lines is defined as a primary, another one - as a secondary. If the primary line fails, static switch automatically switches over the power supply line. It happens at any case of inverter failure or discharging of the batteries. The configuration allows to perform all maintenance work with uninterruptible power supply to the load.

D

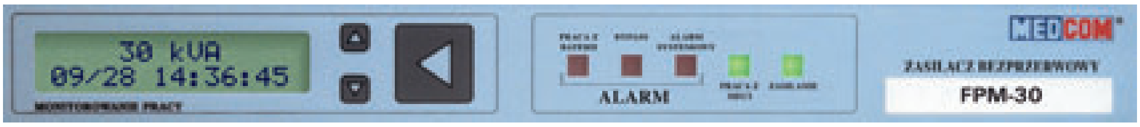


SYSTEM WITH REDUNDANCY 1 from 3 and a BYPASS
The system consists of three rectifier-inverter sets and a 4-line static switch. Under operation, one of lines is selected as primary line. BYPASS is automatically turned ON in the case of an overload, short circuit or line failures or - manually - for maintenance.

E



Microprocesor based driving and control system of every power supplies creates a set of alarm signalls. Device is equippted with control panel with an alphanumeric LCD display, keyboard and signal LEDs.



Messages on the LCD display	DATE, TIME; OUTPUT VOLTAGE and CURRENT; INPUT VOLTAGE; OUTPUT POWER
Signalling (LEDs)	BATTERY OPERATION; BYPASS OPERATION; SYSTEM ALARM LINE OPERATION; POWER SUPPLY
Transmitter alarms	ALARM 1 LOW BATTERY; ALARM 2 BATTERY OPERATION; ALARM 3 OUTPUT CIRCUIT FAILURE
System alarm	AC LINE HIGH; BYPASS LINE HIGH; AC LINE LOW; BYPAS LINE LOW; BYPASS OPERATION; BATTERY OPERATION; BATTERY LOW; BATTERY END-OFF; OVERLOAD (CURRENT); OVERLOAD (POWER); INVERTER FAILURE

Inverter type	Power output	Input voltage (50 Hz)	Output voltage (50Hz)	Fuses		Casing				Weight	Battery
				AC line	DC line	type	height	width	depth		
	kVA	V	V	A	A	–	mm	mm	mm	kg	V
FM-1	1	230 [1]	230	10 [1]	10	W (R)	490 (222)	440 (483)	300 (490)	25	220
FM-2	2	230 [1]	230	16 [1]	16	W (R)	490 (222)	440 (483)	300 (490)	35	220
FM-3	3	230 [1]	230	20 [1]	20	S1	1000	800	300	110	220
FM-5	5	230 [1]	230	35 [1]	35	S1	1000	800	300	140	220
FM-8	8	230 [1]	230	63 [1]	63	S1	1000	800	300	160	220
FM-10	10	230 [1]	230	80 [1]	80	S3	1600	800	400	220	220
FM-16	16	230 [1]	230	100 [1]	100	S3	1600	800	400	300	220
FM-20	20	230 [1]	230	160 [1]	160	S3	1600	800	400	400	324 (220)
FM-25	25	230 [1]	230	200 [1]	200	S4	1800	800	500	430	324 (220)
FM-30	30	230 [1]	230	250 [1]	250	S4	1800	800	500	480	324 (220)
FPM-1	1	230	230	10	10	W (R)	490 (222)	440 (483)	300 (490)	35	220
FPM-2	2	230	230	16	16	S1	1000	800	300	120	220
FPM-3	3	230	230	20	20	S1	1000	800	300	150	220
FPM-5	5	230	230	35	35	S1	1000	800	300	180	220
FPM-8	8	230	230	63	63	S2	1000	800	300	210	220
FPM-10	10	230	230	80	80	S3	1600	800	400	350	220
FPM-16	16	230	230	100	100	S3	1600	800	400	480	220
FPM-20	20	3×400	230	50 [2]	160	S3	1600	800	400	510	324 (220)
FPM-25	25	3×400	230	63 [3]	200	S4	1800	800	500	550	324 (220)
FPM-30	30	3×400	230	80 [4]	250	S4	1800	800	500	560	324 (220)
FPTM-3	3	3×400	3×400	10	20	S2	1600	800	400	150	220
FPTM-5	5	3×400	3×400	16	35	S3	1600	800	400	185	220
FPTM-8	8	3×400	3×400	20	63	S3	1600	800	400	300	220
FPTM-10	10	3×400	3×400	25	80	S3	1600	800	400	360	220
FPTM-15	15	3×400	3×400	40	100	S5	1800	1200	500	480	220
FPTM-20	20	3×400	3×400	50	125	S5	1800	1200	500	550	220
FPTM-25	25	3×400	3×400	63	125 (160)	S4 (S5)	1800	800 (1200)	500	380 (600)	324 (220)
FPTM-30	30	3×400	3×400	80	160 (200)	S4 (S5)	1800	800 (1200)	500	440 (650)	324 (220)
FPTM-40	40	3×400	3×400	100	200 (315)	S4 (S5)	1800	800 (1200)	500	500 (750)	324 (220)
FPTM-60	60	3×400	3×400	160	250 (315)	S5	1800	1200	500	670	396 (324)
FPTM-80	80	3×400	3×400	200	400 (315)	S5	1800	1200	500	820	396 (324)
FPTM-100	100	3×400	3×400	250	400	S6	2000	1200	800	950	396
FPTM-120	120	3×400	3×400	315	500	S6	2000	1200	800	1000	396
FPTM-150	150	3×400	3×400	400	630	S6	2000	1200	800	1150	396
FPTM-200	200	3×400	3×400	500	800	2×S6	2000	1200+1200	800	1500	396
FPTM-250	250	3×400	3×400	630	1000	2×S6	2000	1200+1200	800	1600	396

1) only in case of a BYPASS
2) for BYPASS 160A fuse
3) for BYPASS 200A fuse
4) for BYPASS 250A fuse

AC & DC POWER SOLUTIONS
TRACTION CONVERTERS

MEDCOM Sp. z o.o.
Founded in 1988, active in the design, manufacture, installation and servicing of modern electronic devices, aimed mainly at the power industry, military, railway and tramway transport, industry and health service customers. The use of latest technologies and system solutions, the services of highly experienced structural designers and the introduction of an ISO9001:2001 Quality Assurance System, ensure that the devices produced are state-of-the-art and highly reliable. The technical design for all products is carried out in-house. In 2001 the company was awarded a prize The Polish President's Economy Award for THE BEST POLISH SMALL ENTERPRISE.

The most important products in the company's offer:

- **DC power supplies**
- **Uninterruptible power systems**
- **High-voltage power supplies**
- **Power supplies (MIL standards)**
- **Static converters for railway and tramway applications**
- **Power supplies for industrial applications**
- **Power active filters**
- **Traction battery chargers**
- **Static switches**
- **"Fail-safe" power supplies**
- **Motor driving systems: AC and DC motors**
- **Measurement devices: battery ground-fault meters, battery operation monitors**
- **Wind power converters**

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Due to constant introduction of newest technological advances, our products may be subject to modifications.
For that reason, the above-presented description may be partially outdated.

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