

FUKUDA

POWER BACK UP SYSTEM

AC UPS



TEGAS KOMBINASI
TEKNOLOGI SDN. BHD. (473781-D)

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FUKUDA

POWER BACK UP SYSTEM

INTRODUCTION

In **1996**, Petronas has launched Malaysia's Cost Reduction Alliance (CORAL) Initiative with the objective of reducing development costs, production costs and project lead time by 30% from 1995 cost base, by year 2000, without compromising quality, health, safety or the environment.

Hence, in **December 1998**, Tegas Kombinasi Teknologi Sdn Bhd, was incorporated to meet the challenge set by CORAL Initiative by becoming the first local company to manufacture and supply the power back-up system for the Oil and Gas industry.

In **March 2000**, Petronas recognized Tegas Kombinasi Teknologi Sdn Bhd's effort. It has been granted the license as a manufacturer of power back-up system under the registered trademark of **FUKUDA**.

FUKUDA is derived from a combination of two words:-

- **"FU"** is from Chinese word means "rich in resources", and
- **"KUDA"** is from a Malay word "Kuasa Kuda" or "Horse-Power" which is related to electrical discipline.

Therefore **FUKUDA** means
"Rich in Power"



FUKUDA SERIES – THE PREFERRED CHOICE

FUKUDA series is designed to offer a cost effective product with the most advanced technology in power supply applications. FUKUDA AC UPS system is “online” double conversion UPS, designed to protect AC loads from any disturbances from the AC mains power supply. The power conversion to AC stabilized voltage is monitored by means of IGBT modules, assuring high performance in terms of efficiency, harmonic distortion and voltage stability.

The modular and flexible design allows easy configuration of the system according to the customer technical requirements. The system is provided with a digital mimic control panel, displaying the operational status of the equipment (signal, alarms, meters). Serial interfaces are available for remote control of the UPS.



THE MAJOR FEATURES

- IGBT technology Digital control
- True on-line double conversion
- All components accessible from front
- Large charger for use with DC loads and charging large batteries.
- EMI filter
- Integrated static and manual bypass switch
- 110/220 VDC battery voltage
- Low noise and heat rejection
- Microprocessor controlled LCD mimic and control
- RS232 and RS485 communication ports



COMMUNICATION PANEL

The standard communication panel offers all the critical alarms and indication needed. The status of the UPS is available at a glance thanks to the integrated graphic and LCD panel alarm and metering functions in clear text and different languages.

- Measurement of voltages, currents and frequency
- Startup, operation, alarms and history via LCD display
- Operation mode LED's
- Emergency power off (EPO)
- Alarm battery discharged
- Automatic battery test and failure alarm
- Battery boost charge (option)
- SNMP interface for remote monitoring and control via PC



APPLICATION

- Petrochemical plants
- Refineries, offshore platform
- Oil and gas pipeline
- Power generation plants



PETROCHEMICAL
PLANTS



REFINERIES
OFFSHORE PLATFORM



OIL AND GAS
PIPELINE



POWER GENERATION
PLANTS



RELIABLE
PERFORMANCE

FUKUDA

POWER BACK UP SYSTEM



OPTIONS

- Parallel Redundant Operation
- Hot Standby Operation
- Bypass Isolation Transformer and/or AC Voltage Stabilizer
- Remote Monitoring Panel
- Remote Monitoring Software
- Potential-Free Contacts (AS400)
- AC Distribution System
- External Service Bypass Switch
- Input and Output Filters
- Emergency Power Off (EPO)
- Special Meters and Alarm Functions
- 50/60 Hz Frequency Converter
- Custom DC Voltages up to 400 VDC



COMPONENT STANDARDS



POWER COMPONENTS

- Power Transformers IEC 76
- Circuit Breakers IEC 947-2
- Switches IEC 947-3
- Contactors IEC 947-4-1
- Fuses IEC 269
- Measuring Instruments IEC 51-1



LOW VOLTAGE ASSEMBLIES

- IEC 439-1
- IEC 439-2
- IEC 439-3



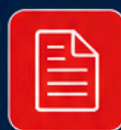
SEMICONDUCTOR CONVERTERS

- IEC 146-1-1
- IEC 146-1-3
- IEC 146-2



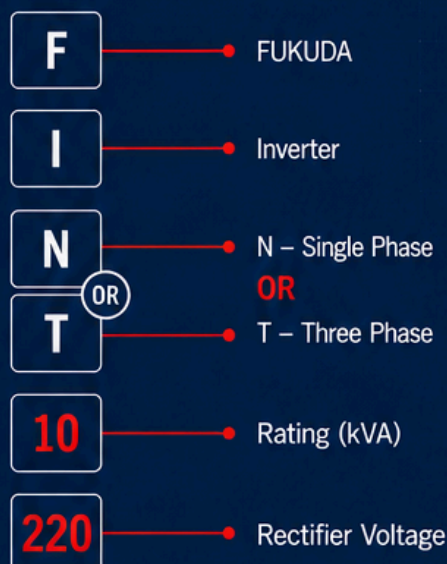
PROTECTION & COMPLIANCE

- Degree of Protection IEC 529
- Safety (CE Marking) EN 50091-1
- Electromagnetic Compatibility (CE Marking) IEC 50091-3



MODEL DESCRIPTION

MODEL: **FIN10220**



ENGINEERED FOR RELIABILITY.
BUILT FOR CRITICAL POWER.



**HIGH
RELIABILITY**



**MAXIMUM
PROTECTION**



**SUPERIOR
EFFICIENCY**

TECHNICAL
SPECIFICATIONS

FIT SERIES : 10KVA – 160KVA UPS
3-PHASE INPUT / 3-PHASE OUTPUT



RECTIFIER

KVA	10	20	30	40	50	60	80	100	120	160
INPUT VOLTAGE	380 / 400 / 415 VAC 3-Phase 4-Wire									
INPUT RANGE	307 – 520V									
INPUT FREQUENCY	50 / 60 Hz ± 7%									
INPUT POWER FACTOR	0.8									
NORMAL INPUT CURRENT (A)	18	36	54	72	90	108	144	180	216	288
MAXIMUM INPUT CURRENT (A)	24	45	68	90	113	136	180	225	270	360
POWER WALK-IN	0% – 100% : 20 sec									
EFFICIENCY	99%									
VOLTAGE REGULATION	1%									
CURRENT LIMIT (A)	27	54	81	108	135	162	216	270	324	432
RIPPLE VOLTAGE	0.5%									



BATTERY

BATTERY TYPE	SEALED LEAD ACID / NICKEL CADMIUM									
VOLTAGE RANGE	165 – 285 VDC									
MAXIMUM CHARGE CURRENT (ADC) (can be customized)	5	10	15	20	25	30	40	50	60	80
BATTERY LOW VOLTAGE	180 VDC (can be customized)									
BATTERY LOW STOP VOLTAGE	165 VDC (can be customized)									
BOOST CHARGE	228 VDC (can be customized)									
FLOAT CHARGE	220 VDC (can be customized)									



INVERTER

DC INPUT RANGE		165 – 285 VDC	
WAVE FORM		SINUSOID	
OUTPUT VOLTAGE		380 / 400 / 415 VAC 3-Phase 4-Wire	
INPUT POWER FACTOR		0.8	
VOLTAGE REGULATOR (100% UNBALANCE LOAD)		±1%	
FREQUENCY LOCK RANGE		45 – 55 Hz / 55 – 65 Hz	
OUTPUT FREQUENCY (FREE RUNNING)		50 / 60 Hz ±0.1%	
PHASE SHIFT UNDER 100% UNBALANCE LOAD		120% ±0.5%	
THD (LINEAR LOAD)		<3%	
OVERLOAD	< 110%	CONTINUOUS	
	110 – 125%	15 mins	
	125 – 150%	10 mins	
	> 150%	60 sec	
EFFICIENCY (100% LOAD)		88%	



ENGINEERED FOR RELIABILITY.
BUILT FOR CRITICAL POWER.



HIGH
RELIABILITY



MAXIMUM
PROTECTION



SUPERIOR
EFFICIENCY



OVERALL CHARACTERISTICS



STATIC SWITCH

Voltage Range	173 – 277 VAC (Line-to-Neutral)
Frequency Range	45 – 55 Hz / 55 – 65 Hz
Efficiency	99.5%



TRANSFER TIME

Mains to Inverter	0 ms
Inverter to Mains	0 ms



OVERLOAD CAPACITY

100% Load	30 seconds
300% Load	1 second



ISOLATION

Isolation with Output Transformer	Yes
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OPERATING ENVIRONMENT

OPERATING ENVIRONMENT

Operating Temperature	0 – 40°C (32 – 104°F)
Humidity	0% – 90% (Non-Condensing)
Altitude	< 1500 m Above Sea Level

MAXIMUM HEAT DISSIPATION (kW)

KVA	10	20	30	40	50	60	80	100	120	160
kW	0.65	1.3	1.9	2.6	2.6	3.0	4.6	5.4	6.5	8.7

WEIGHT (kg)

KVA	10	20	30	40	50	60	80	100	120	160
kg	290	350	450	450	550	650	970	1100	1500	2000



PHYSICAL DIMENSIONS

DIMENSIONS (mm)

KVA RANGE	HEIGHT (mm)	WIDTH (mm)	DEPTH (mm)
10 – 40 kVA	2000	550	800
50 – 100 kVA	2000	1100	800
120 – 160 kVA	2000	2200	800



AUDIBLE NOISE
< 65 dBA
(at 1 meter)



STANDARDS

- EN50091-1
- EN50091-2
- FCC Class A



PROTECTION FEATURES

■ Short Circuit Protection	Rectifier, Reserve & Bypass NFB
■ Lightning Protection	MOV
■ EMC Filter	Input & Output
■ Galvanic Isolation	Between Input & Output
■ LCD Data Display	Yes



MONITORING & INDICATION

■ LED, LCD & Buzzer	Yes
■ Dry Contact Interface	Yes
■ Battery Start Function	Yes



OPERATING ENVIRONMENT



MAXIMUM HEAT DISSIPATION (kW)
0.65



WEIGHT (from)
290 kg



TEGAS

YOUR ENGINEERING PARTNER

TECHNICAL
SPECIFICATION

FIN SERIES : 10KVA - 50KVA UPS
3-Phase Input / 1-Phase Output



RECTIFIER	10	20	30	40	50
INPUT VOLTAGE	380 / 400 / 415VAC 3 Phase 4 Wire				
INPUT RANGE	307 - 520V				
INPUT FREQUENCY	50 / 60Hz +/- 7%				
INPUT POWER FACTOR	0.8				
NORMAL INPUT CURRENT (A)	18	36	54	72	90
MAXIMUM INPUT CURRENT (A)	24	45	68	90	113
POWER WALK IN	0% - 100% : 20sec				
EFFICIENCY	99%				
VOLTAGE REGULATION	1%				
CURRENT LIMIT (A)	27	54	81	108	135
RIPPLE VOLTAGE	0.5%				



BATTERY	SEALED LEAD ACID / NICKEL CADMIUM				
VOLTAGE RANGE	165 - 285VDC				
MAXIMUM CHARGE CURRENT (ADC) (can be customized)	5	10	15	20	25
BATTERY LOW VOLTAGE	180VDC (can be customized)				
BATTERY LOW STOP VOLTAGE	165VDC (can be customized)				
BOOST CHARGE	228VDC (can be customized)				
FLOAT CHARGE	220VDC (can be customized)				



INVERTER	165 - 285VDC
DC INPUT RANGE	SINUSOID
WAVE FORM	380 / 400 / 415vac 3 Phase 4 Wire
OUTPUT VOLTAGE	0.8
INPUT POWER FACTOR	+/- 1%
VOLTAGE REGULATION 0 - 100% UNBALANCE LOAD	
FREQUENCY LOCK RANGE	45 - 55Hz / 55 - 65Hz
OUTPUT FREQUENCY (FREE RUNNING)	50 / 60Hz +/- 0.1%
PHASE DIFFERENCE WITH RESERVE OUTPUT	+/- 0.5%
THD (LINEAR LOAD)	<3%



OVERLOAD CAPACITY	
< 110%	CONTINUOUS
110 - 125%	15 minutes
125 - 150%	10 minutes
>150%	60 seconds

HIGH RELIABILITY

ADVANCED TECHNOLOGY

MAXIMUM EFFICIENCY

GLOBAL SUPPORT



OVERALL
CHARACTERISTICS



STATIC SWITCH

Voltage Range	173 – 277 VAC (Line-to-Neutral)
Frequency Range	45 – 55 Hz / 55 – 65 Hz
Efficiency	99.5%



TRANSFER TIME

Mains to Inverter	0 ms
Inverter to Mains	0 ms



OVERLOAD CAPACITY

100% Load	30 seconds
300% Load	1 second



ISOLATION

Isolation with Output Transformer	YES
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OPERATING ENVIRONMENT

Operating Temperature	0 – 40°C (32 – 104°F)
Humidity	0% – 90% (Non-Condensing)
Altitude	< 1500 m Above Sea Level

MAXIMUM HEAT DISSIPATION (kW)

KVA	10	20	30	40	50
kW	0.65	1.3	1.9	2.6	4.6

WEIGHT (kg)

KVA	10	20	30	40	50
kg	290	350	450	550	650



PHYSICAL DIMENSIONS

KVA RANGE	HEIGHT (mm)	WIDTH (mm)	DEPTH (mm)
10 – 20 kVA	1600	550	800
30 – 40 kVA	1600	1100	800
50 kVA	1600	1100	800



AUDIBLE NOISE

< 65 dBA
(at 1 meter)



STANDARDS

- EN50091-1
- EN50091-2
- FCC CLASS A



PROTECTIONS

Short Circuit	Rectifier, Reserve, Bypass NFB
Lightning	MOV
EMC Filter	Input & Output
Galvanic Isolation	Between Input & Output
Data Display by LCD	YES



MONITORING & INDICATION

LED, LCD, Buzzer	YES
Dry Contact	YES
Battery Start	YES



OPERATING ENVIRONMENT

Temperature	0 – 40°C (32 – 104°F)
Humidity	0% – 90% (Non-Condensing)
Altitude	< 1500 m Above Sea Level



MAXIMUM HEAT
DISSIPATION

0.65 – 4.6 kW



WEIGHT
(50 kVA)

650 kg



ISOLATION WITH OUTPUT
TRANSFORMER

YES



FUKUDA

POWER BACK UP SYSTEM

DELIVERING NON-STOP POWER THROUGH **FUKUDA**

FUKUDA AC UPS – FIN/FIT SERIES
PROVEN AND INSTALLED ON
ONSHORE PLANTS / OFFSHORE PLATFORMS
SINCE 1998.

AC UPS – FIN/FIT SERIES



RELIABLE POWER PROTECTION

Ensures continuous and clean power for critical applications.



PROVEN PERFORMANCE

Trusted in mission-critical environments onshore and offshore.



HIGH EFFICIENCY & STABILITY

Advanced technology for maximum uptime and energy efficiency.



ROBUST & DURABLE DESIGN

Engineered for demanding industrial conditions and long service life.



ONSHORE PLANTS



OFFSHORE PLATFORMS



PROVEN SINCE 1998



TRUSTED RELIABILITY