

PROTIME



## Mini Futuro

AMF 3-Phase Generator

AMF-N96/3\*

### Special Features

- Most Compact & simplest AMF controller
- Designed using latest Micro - controller technology
- MIMIC type of front fascia makes it easy to use, even for an unskilled person
- INDICATIONS for Mains ON, Gen-set ON, Load on Mains/Gen-set and all faults (Mains Fail, Low Lube Oil Pr., Batt. Low, Set Fails to Start, Alternator Fail, HWT, O/L & Low Fuel level)
- NO PROGRAMMING required
- ANNUNCIATION with flasher & buzzer both; including ACCEPT, RESET & TEST facility.
- Facility for connection of external HOOTER.
- Design facilitates easy and quick installation
- Virtually MAINTENANCE FREE
- Existing non-AMF panels (standard panel) can be easily converted into AMF panels using Mini-Futuro
- RS 232/485 Connectivity (Optional)
- Totally separate Manual Mode (external wiring) possible along with integrated manual mode.
- Potential Free Contacts for external integration (Optional)

### INTRODUCTION

The Mini-Futuro is the easy to use and futuristic "AUTO MAINS FAILURE SOLUTION" for Diesel Generator sets. Mini-futuro is designed using latest Micro-controller technology to achieve reliable and accurate START-STOP Operation of Gen-set, Auto LOAD Changeover from MAINS to GEN-SET & Vice versa and FAULT ANNUNCIATION for SAFETY of Gen-set. Mini-futuro is innovatively designed keeping user's point of view in fore-front there by achieving reduced number of components, more reliability, very good accuracy & interlocks and excellent flexibility. Due to less number of components, major part of cost & time required for fabrication & interlocks and saved, thus making Mini-futuro economically viable to use it for Diesel Generator sets up to any capacity.

### OPERATION

Mini-futuro works on terminal voltage of Battery i.e. 12V or 24V. It gives starting pulses to Engine starter (Start Solenoid), when it gets signal of main abnormality or failure from Mains sensing Voltage relay (VR3-4 Relay), the Mini futuro gives three attempts to start the Engine with ON & OFF Time intervals (Settable on front). If Engine does not start within three attempts, an alarm for "SET FAILS TO START" will come. If Engine starts, but alternator does not develop the voltage or it is not reaching to the panel (due to fuse fail or cable fault) "Alternator Fail" will come.

After Alternator develops its rated voltage, which is sensed by Mini futuro, then only the Command to energise DG Contactor/ ACB is given. Thus the power is supplied to load from Generator without any initial surges. During Engine running period, if any fault on the Engine side occurs, Generator will be stopped automatically and fault is indicated by a respective fault LED & buzzer. Fault can be acknowledged by pressing ACCEPT push button. When fault is acknowledged the buzzer stops but the fault LED remains ON. After fault rectification & resetting the system the fault LED is also gets off & Generator set will be started once again if Mains supply is not resumed yet.

When mains supply resumes, Mains Voltage Sensing relay gives command to energise a Mains Contactor / ACB. Thus the load is changed over to mains instantly, & engine gets stop command from Mini futuro through Fuel Solenoid after pre-decided idle run time (settable on front).

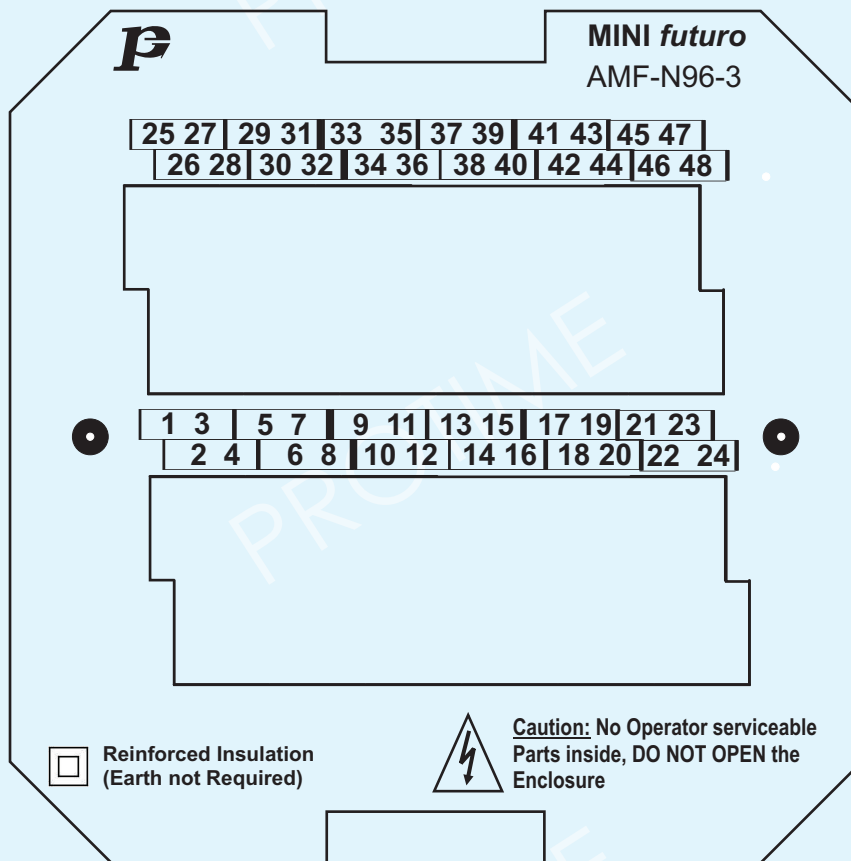
The Manual operation is integrated now in the same unit for manual operations of DG Start/Stop, & DG Close/Trip. An isolated Manual operation can be achieved with external wiring by in co-operating few push buttons and one AUTO/MAN switch.

### Technical Specifications

1	Supply Voltage		12V / 24V	5	Parameters (Setting)	Cranking(A)	On Time – 1,2,4,6 Sec Off Time –4,6,8,10 Sec
2	Annunciation	Faults	Low Oil Set Fail To Start Alternator Fail Batt. Low Mains Fail Low Fuel O / L Hwt			Stop Solenoid(B)	15 / 30 Sec
		Others	Crank On Fuel Gen – Set On Load On Gen-Set Mains On Load on Mains			Gen-Set	Voltage-180-220V(Fac-Set)
						Fuel solenoid (LOGIC)	Start / Stop solenoid
						Idle run time	1,2,4,8 Min.
3	Control		Accept Reset Test	6	Contacts	Input	
						Mains Sensing	C-NO
						Low Oil	C-NO or +12/24V DC
						Low Fuel	C-NO or +12/24V DC
						O / L	C-NO or +12/24V DC
						Hwt	C-NO or +12/24V DC
						Mains Aux	C-NO for Mains Contactor ON
						DG Aux Contact	C-NO for DG Contactor ON
						Crack	12V / 24V-6A
						Fuel	12V / 24V-10A
						Buzzer	C-NO
						*Fault	C-NO for all the faults
4	Mounting	Panel Cutout Depth	92mm(L) X 92mm(H) 110mm	7	Power	Input	
						Gen-Set sensing	1-Ph. 230V AC
						Battery	12V / 24V DC

Note:- Design & specification may change to our continuous developmental efforts

## Connection Details

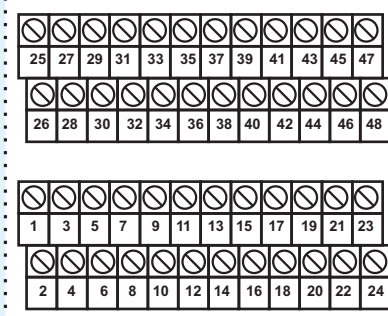
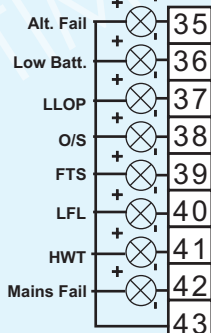


### MINI futuro

MODEL : AMF-N96-3

#### CONNECTION DETAILS

##### EXTERNAL LAMPS (12V)



- 1,2 - BATT (+Ve, -Ve)
- 3,4 - Mains Sensing(C-NO)
- 5,6 - DG Sensing (P-N)
- 7,8 - LOAD on Mains Contactor (C-NO)
- 9,10 - LOAD on DG Contactor (C-NO)
- 11 - + Ve CRANK
- 12 - + Ve FUEL
- 13,14 - LLOP (C-NO)or 13 - +ve / Gnd.
- 15,16 - LFL (C-NO)or 15 - +ve / Gnd.
- 17,18 - O/S (C-NO)or 17 - +ve / Gnd.
- 19,20 - HWT (C-NO)or 19 - +ve / Gnd.
- 21,22 - Spare-1 (C-NO)or 21 - +ve / Gnd.
- 23,24 - Spare-2 (C-NO)or 23 - +ve / Gnd.
- 25,26 - O/L (C-NO)or 25 - +ve / Gnd.
- 27,28 - FAULT RLY (C-NO)
- 29,30 - Mains Contactor Feedback (C-NO)
- 31,32 - DG Contactor Feedback (C-NO)
- 33,34 - Hooter (C-NO)



Note: Use NC/NO dip switch settings in reverse for +ve fault Inputs

Source: 12V / 24V DC

Sr.No.: PE/



Manufactured By :- Protech Engg. & Controls Pvt. Ltd. Mumbai-72

Note:- Design & specification may change to our continuous developmental efforts

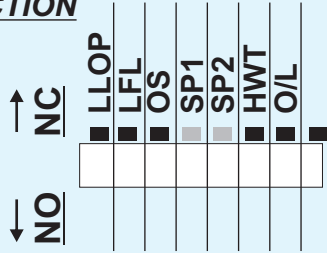
## Setting Details

### MINI futuro

MODEL : AMF-N96-3

#### INPUT CONTACT LOGIC SELECTION

Note: Use NC/NO dip switch settings in reverse for +ve fault inputs



#### SETTING DETAILS

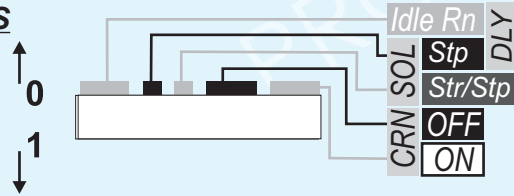
##### Idle Run Delay

1	2	Min.
1	1	1
1	0	5
0	1	3
0	0	8

STOP SOL. DELAY	
3	Sec.
0	30
1	15

FUEL SOLENOID LOGIC	
4	LOGIC
0	START
1	STOP

#### FUEL LOGIC SELECTION & TIME DELAYS



CRANK OFF/ON TIME SETTING					
5	6	OFF(Sec)	7	8	ON (sec)
0	0	4	0	0	1
1	0	6	1	0	2
0	1	8	0	1	4
1	1	10	1	1	6

Source: 12V / 24V DC



Manufactured By :- Protech Engg. & Controls Pvt. Ltd. Mumbai-72 , India

Note:- Design & specification may change to our continuous developmental efforts