

HOKKIM DIGITAL AUTOMATIC MAINS FAILURE CONTROLLER MANUAL FOR MODEL DAMF-5.

INTRODUCTION

Thank you for purchasing the Hokkim Digital Automatic Mains Failure Controller model; DAMF-5. We will do our utmost to provide you with the best service in terms of technical support, stock and parts replacement. This manual should be read through before attempting to install the unit in order to avoid damage due to wrong connections. You need to be familiar with this manual in order to fully understand the functions and features the DAMF-5 can provide for you. A copy should be handed to the owner's maintenance team for future reference with a briefing on how to operate it.

The design and development of the Hokkim Digital DAMF-5 Controller comes from many years of studying the traditional **AMF** boards hard wired with relays and timers. The heart of the DAMF-5 is Micro Controller based. It is very flexible, compact, easy to use and comes with many features to suit most **AMF** needs. Due to our policy of continuous development, we welcome suggestions for improvements. Thus, there may be changes after this manual is produced. If in doubt, do not hesitate to call for our technical support or information on our latest models.

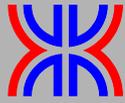
PARTS IDENTIFICATION

We are briefly going through the physical markings of the DAMF-5 so that you can easily locate them when needed.

1. Front Face Diagram 1. Refer to page 4. It shows the front face of the DAMF-5. There are 6 nos. red LED to indicate; 1) STARTER. 2) RUN. 3) FUEL SOLENOID. 4) ENERGIZED STOP. 5) 24V. and 6) 12V. During operation, these LEDs give a quick indications of what the DAMF-5 is doing.

Next is the 3 digit 7-segment display. This display is the most important interface as you will receive a host of information from it. To help you understand, we have provided the 3 digit abbreviations at the front face for easy reference. You need to familiarize yourself with the abbreviations as during operation, the display flashes at half second rate, you have to be quick to catch what function the DAMF-5 is performing.

2. Terminal Diagram 2. Refer to page 5. It shows the back terminals from T01 to T24 with the terminal abbreviations. Note that some of the abbreviations are the same beside different terminal number. This is the part where you have to be careful during connection. The top row of terminals T01 to T08 has a mixture of inputs, outputs, and auxiliary supply inputs. Beside T08 is marked 12V or 24V, you can connect an auxiliary supply of 12VDC or 24VDC and the DAMF-5 will automatically switches to the correct voltage. The front face LED voltage indicator should correspond with the auxiliary supply connected. The middle row of terminals T09 to T16 is clearly marked INPUTS. This is where you terminate the inputs from selector switches or alarm contacts. The bottom row of terminals T17 to T24 is clearly marked OUTPUTS. This is where you terminate the outputs to relays or lamps. Lastly, at the bottom right is a tiny button marked SET. This button allows you to change default settings of the DAMF-5.



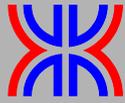
3. Terminal Abbreviations Diagram 3. Refer to page 7. On one side of the DAMF-5 is the Abbreviations For Terminals sticker. It shows what you are suppose to connect to each terminal. After familiarizing yourself with it, it speeds up connection work as you don't need to keep referring to the Connection Diagram 5.
4. Default Settings Diagram 4. Refer to page 7. It shows how to change the default factory setting of a range of parameters. It is advisable to view first the setting to confirm which parameters needs to be changed. Press the **SET** button follow by the **MFB** button to effect the change. This function can only be performed in the **OFF** mode.
5. Terminal Connection Diagram 5. Refer to page 7. On the other side of the DAMF-5 is the Terminal Connection Diagram. Note that the terminals number are not in order, so be careful when connecting the wires. It is easier to separate out the inputs from the outputs when drawing the diagram. Always refer to the terminal number together with the abbreviation to avoid mistake.
6. Dimension Diagram 6. Refer to page 12. It shows the physical shape and dimensions of the DAMF-5. The body is made of heat resistant ABS plastic and the front face and terminal is made of high impact PC (Poly Carbonate).

FRONT FACE.

Refer to Front Face Diagram 1. The 6 nos. red LEDs indicates to you what the DAMF-5 is doing during operation. They are as follows;

1. **STARTER**-When the **STR** relay energize, this LED lights, and the starter should be cranking to start the gen-set.
2. **RUN**- When gen-set runs, its output voltage energizes the **GRR** relay, this LED lights and the starter should stop cranking.
3. **FUEL SOLENOID**- To begin starting, the **FSR** relay energize, this LED lights and fuel solenoid valve open to feed diesel to the engine.
4. **ENERGIZE STOP**- To stop the gen-set, the **ESR** relay energize, this LED lights and fuel is cut from the engine. Note; gen-sets use either Fuel Solenoid or Energize Stop.
5. **24V** - When auxiliary supply is 20VDC and above, this LED lights. Maximum allowable voltage is 32VDC.
6. **12V** - When auxiliary supply is 15VDC and below, this LED lights. Minimum allowable voltage is 7VDC.

IMPORTANT NOTE : THE AUXILIARY SUPPLY SHOULD NOT BE ALLOWED TO RISE FROM BELOW 15VDC TO BELOW 20VDC. BUT, MAY FALL FROM ABOVE 20VDC TO ABOVE 15VDC. If you do not understand this statement, contact our technical personnel. Other wise damage may occur to the DAMF-5.

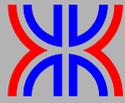


HOKKIM
Giving You Control

Control & Protection Relays

You need to study the 3 digit 7-segment display abbreviation and familiarize yourself with it as it is the most important interactive interface of the DAMF-5. The display tells you what function is being performed. If there is a count down timer, the display flashes between the count down time and the abbreviation at half second rate. A total of 20 abbreviations is listed below in alphabetical order;

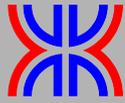
1. **Att** Attempts - This display shows the number of set attempts of crank and rest before fail to start alarm occurs. It can be set from 1 to 9 attempts in 1 attempt increments. Default is 6.
2. **Aut** Automatic - This display shows the automatic mode being selected. In this mode press the **MFB** button to perform lamp test.
3. **Crt** Crank Starter Timer - This display shows cranking timer has started. The timer can be set from 1 to 20 seconds in 1 second increments. Default is 6 seconds.
4. **EFA** External Fault Alarm - This display shows external alarm has occur and gen-set stopped and cannot be started. After **ESt** count down, press the **MFB** once to accept the alarm. After clearing the fault, press the **MFB** again to reset the alarm.
5. **ESt** Energized Stop Timer - This display shows energized stop timer has started. The timer can be set from 5 to 60 seconds in 5 seconds increments. Default is 10 seconds. Note; when the energized stop timer is running, the alarm cannot be accept or reset.
6. **FtS** Fail To Start - This display shows fail to start alarm has occur and gen-set stopped and cannot be started. After **ESt** count down, press the **MFB** once to accept the alarm. After clearing the fault, press the **MFB** again to reset the alarm.
7. **Hot** High Water Temperature - This display shows high water temperature alarm has occur and gen-set stopped and cannot be started. After **ESt** count down, press the **MFB** once to accept the alarm. After clearing the fault, press the **MFB** again to reset the alarm.
8. **LFL** Low Fuel Level - If the Low Fuel Level setting is '1', This display shows low fuel level alarm has occur and gen-set stopped and cannot be started. After **ESt** count down, press the **MFB** once to accept the alarm. After clearing the fault, press the **MFB** again to reset the alarm. If the setting is '0', display does not show, shutdown does not occur and gen-set can be started. Alarm bell sound and Low Fuel Level fault lamp flashes. Alarm can be accepted.
9. **LOP** Low Oil Pressure - This display shows low oil pressure alarm has occur and gen-set stopped and cannot be started. After **ESt** count down, press the **MFB** once to accept the alarm. After clearing the fault, press the **MFB** again to reset the alarm.
10. **LPt** Lamp Test - This display shows lamp test is being perform. All alarm fault lamps should be lighted. To do this, press the **MFB** button in the **Aut** mode.
11. **OFF** This display shows the **OFF** mode being selected. In this mode press and release the **MFB** button to view the parameter settings. Repeat to toggle through all the settings. 10 seconds of inactivity revert the display back to **OFF**.



12. **OPt** Oil Pressure Timer - This display shows oil pressure timer has started. The timer can be set from 1 to 20 seconds in 1 second increments. Default is 10 seconds. After count down, low oil pressure fault becomes active.
13. **OSP** Over Speed - This display shows over speed alarm has occur and gen-set stopped and cannot be started. After **ESt** count down, press the **MFB** once to accept the alarm. After clearing the fault, press the **MFB** again to reset the alarm.
14. **rdy** Manual Ready - This display shows the manual mode being selected. In this mode press the **MFB** button to start the gen-set. To off the gen-set switch to **OFF** mode.
15. **rSt** Rest Starter Timer - This display shows rest starter timer has started. The timer can be set from 1 to 20 seconds in 1 second increments. Default is 10 seconds.
16. **run** Generator Run - This display shows the gen-set is running. The moving **_ . _ . _** indicates normal condition.
17. **Sdt** Shutdown Timer - This display shows shutdown timer has started. The timer can be set from 30 to 990 seconds in 30 seconds increments. Default is 120 seconds.
18. **SEt** Set Mode - This display shows set mode is active. To do this, press the **SET** button at the back in the **OFF** mode. To change the default settings, press and release the **MFB** button to toggle to the desire parameter. Press and HOLD to change the setting, when the desired value is shown, quickly release the button. Press and release the **MFB** button again to toggle to the next parameter. 10 seconds of inactivity and the new value will be burn into the memory. The **- - -** display is shown when this is taking place. In case auxiliary supply failure occurs in this stage, the memory burning may not be complete and you may have to repeat the process.
19. **SFC** Supply Fail Contact - If the supply fail contact setting is '1', then the supply fail timer start when supply fail contacts closes. If the setting is '0'. then the supply fail timer start when supply fail contacts opens. This give you the flexibility to choose either 'close contacts' or 'open contacts' to start.
20. **SFt** Supply Fail timer - This display shows supply fail timer has started. The timer can be set from 1 to 10 seconds in 1 second increments. Default is 5 seconds.



Diagram 1: Terminal



TERMINALS

Refer to Terminal Diagram 2. These terminals allows you to wired up the DAMF-5 to external relays, push buttons, selector switch, bell, fault inputs, lamps, etc. to complete the AMF Control Board. A detailed description of the terminals is given below;

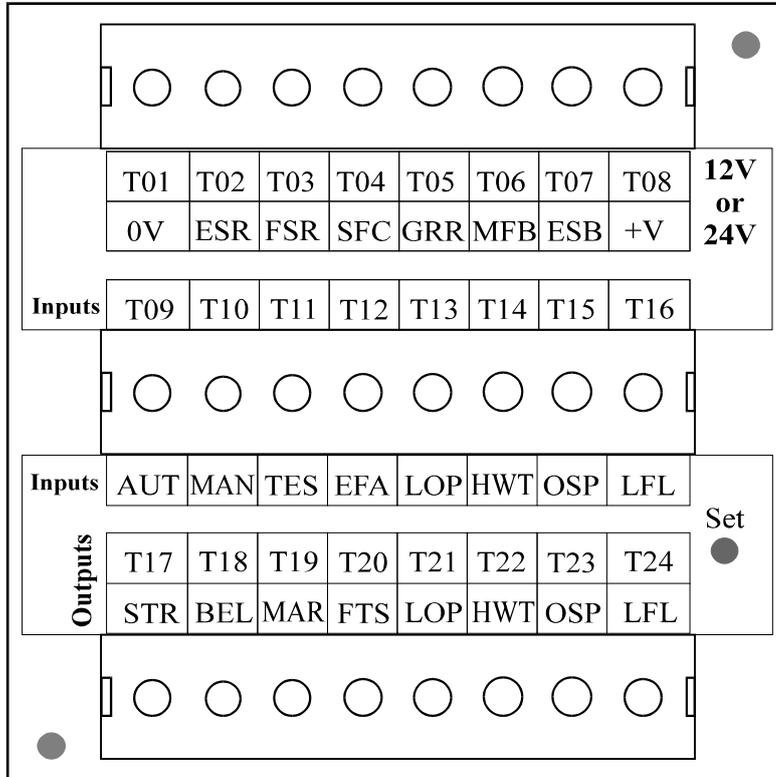
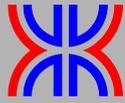


Diagram 2: Terminal

TERMINALS T01 TO T24

<u>No.</u>	<u>Abbrev.</u>	<u>Details.</u>
T01	0V	Negative of auxiliary supply.
T02	ESR	Energized Stop Relay output to relay coil. Type; open collector to negative. The relay energize to stop the gen-set.
T03	FSR	Fuel Solenoid Relay output to relay coil. Type; open collector to negative. The relay energize to run the gen-set.
T04	SFC	Supply Fail Contact input from free contacts to negative. When mains supply fail, the contacts close or open to start the gen-set.
T05	GRR	Generator Run Relay input from free contacts to negative. When gen-set has started, its output voltage energizes this relay to close the contacts and stop the starter cranking. Other wise also known as AFR , AC Fail Relay.
T06	MFB	Multi Function Button input from free contacts to negative. This button is indeed used for many functions. In fact it is the only button use to perform most required functions other then the Emergency Stop Button.
T07	ESB	Emergency Stop Button input from free contacts to negative. When this button is pressed, the auxiliary supply is cut from the Micro Controller. All outputs ceases to operate except the Energized Stop Relay which energizes for approximately 45 seconds before releasing.



No.	Abbrev.	Details.
T08	+V	Positive of auxiliary supply. 12VDC or 24VDC.
T09	AUT	Automatic mode input from free contacts to negative.
T10	MAN	Manual mode input from free contacts to negative.
T11	TES	Test mode input from free contacts to negative.
T12	EFA	External Fault Alarm input from free contacts to negative. When additional faults are required, an external alarm annunciator is added to provide the contacts to shutdown the gen-set when external faults occurs.
T13	LOP	Low Oil Pressure alarm input from free contacts to negative.
T14	HWT	High Water Temperature alarm input from free contact to negative.
T15	OSP	Over Speed alarm input from free contacts to negative.
T16	LFL	Low Fuel Level alarm input from free contacts to negative.
T17	STR	Starter Relay output to relay coil. Type; open collector to negative. This relay energize to crank the gen-set starter.
T18	BEL	Bell output to alarm bell coil. Type; open collector to negative. The bell sound when fault occurs.
T19	MAR	Master Alarm Relay output to relay coil. Type; open collector to negative. This relay energizes when <u>any</u> fault occurs. It is use for remote signaling or BAS Building Automation System.
T20	FTS	Fail To Start alarm output to lamp. Type; open collector to negative. Flashes when Fail To Start fault occurs.
T21	LOP	Low Oil Pressure alarm output to lamp. Type; open collector to negative. Flashes when Low Oil Pressure fault occurs.
T22	HWT	High Water Temperature alarm output to lamp. Type; open collector to negative. Flashes when High Water Temperature fault occurs.
T23	OSP	Over Speed alarm output to lamp. Type; open collector to negative. Flashes when Over Speed fault occurs.
T24	LFL	Low Fuel Level alarm output to lamp. Type; open collector to negative. Flashes when Low Fuel Level fault occurs.
-	SET	Set button to allow changing of default factory settings of a range of parameters to suit your requirements. Operates only in OFF mode.

INSTALLATION AND WIRING

The DAMF-5 is 96 x 96 DIN size front panel mounted. After fixing it together with all related items, commence wiring by referring to diagram 5. If possible, mark the wires according to the terminal numbers. This allows for easier trouble shooting. Some of the terminations will not be required as the unit allows for various possibilities. Use a 6A fuse or **MCB** (Miniature Circuit Breaker) for the DAMF-5 auxiliary supply to protect against accidental shorting. A separate 20A fuse or **MCB** for fuel solenoid and starter supply. Note that the **GRR** relay coil must be 240VAC and the supply taken from incoming side of main **MCCB** (Molded Case Circuit Breaker). Only one **R1** relay is use, for either Energized Stop or Fuel Solenoid. So, connect to either T02 or T03, which ever suit the gen-set.



Abbreviations For Terminals

- 0V-** Supply Negative
- +V-** Supply Positive
- AUT-** Automatic Mode
- BEL-** Alarm Bell
- EFA-** External Fault Alarm
- ESB-** Emergency Stop Button
- ESR -** Energized Stop Relay
- FSR -** Fuel Solenoid Relay
- FTS-** Fail To Start
- GRR-** Generator Run Relay (AFR)
- HWT-** High Water Temp.
- LFL-** Low Fuel Level
- LOP-** Low Oil Pressure
- MAN-** Manual Mode
- MAR-** Master Alarm Relar
- MFB-** Multi Function Button
- OSP-** Over Speed
- SFC-** Supply Fail Contact
- STR -**Starter Relay
- TES-** Test Mode

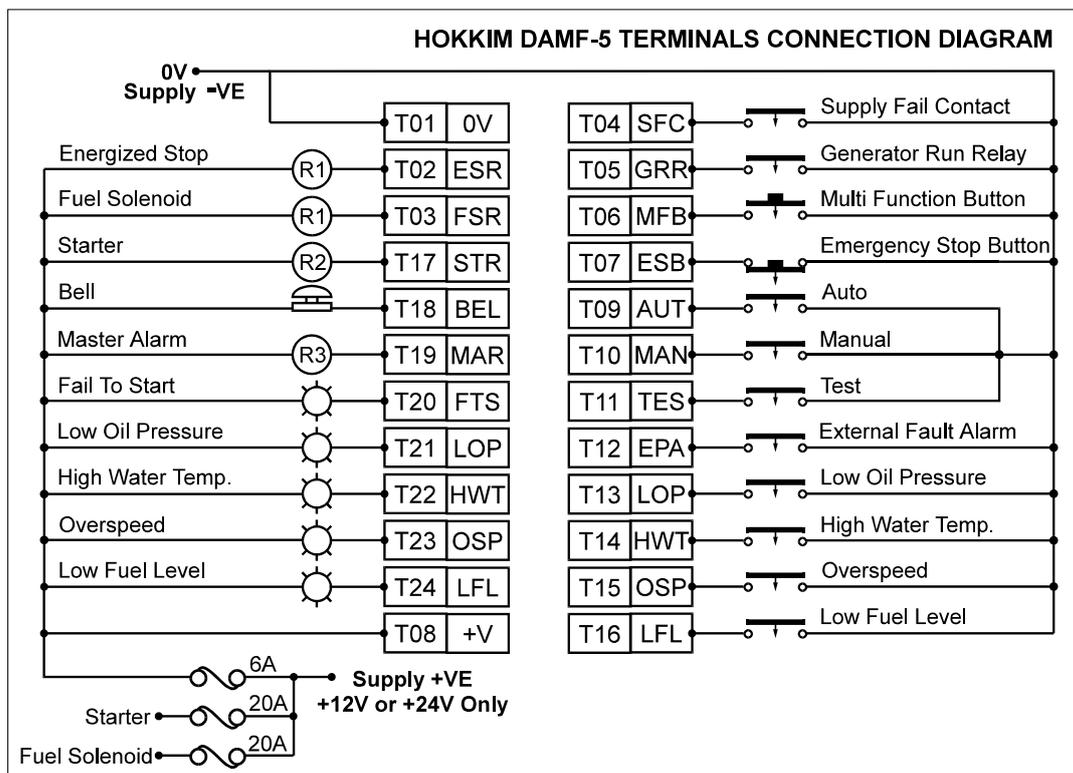
Diagram 4: Terminal Abbreviations

DAMF-5 Default Parameters.

Parameters	Range	Default
SFC Supply Fail Contact	'0' or '1'	'1'
SFT Supply Fail Timer	1 to 10 secs	5
CRT Crank Starter Timer	1 to 20 secs	6
RST Rest Starter Timer	1 to 20 secs	10
ATT No. of Attempts	1 to 9 times	6
OPT Oil Pressure Timer	1 to 20 secs	10
SDT Shutdown Timer	30 to 990 secs	120
EST Energized Stop Timer	5 to 60 secs	10
LFL Low Fuel Level	'0' or '1'	'0'

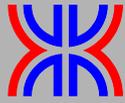
To change the default parameters, select to **OFF** mode and press and releases the **SET** button. When display shows **SEt**, press and releases the **MFB** button and repeat to toggle to the desired parameter. Then press and HOLD the **MFB** button, when the desired value is shown, quickly releases the button. Repeat the process to change the next parameter or wait 10 seconds and the new value will be burn into the memory. During the burning process display shows **---** Burning is complete when display shows **OFF**.

Diagram 3: Default Settings



Note: Lamp Test can be only be performed in the Aut Mode

Diagram 5: Terminal Connection



TESTING

After completing the wiring, use a continuity tester to check that the wiring are properly done and the unit is ready for testing. IMPORTANT NOTICE; it is of the assumption that the testing is done in the factory and not at site where wirings are connected and the gen-set ready to start.

1. It should be noted that the DAMF-5 is designed for both 12VDC and 24VDC. Do Not feed 240VAC mains supply into any part of the unit as it will definitely be damaged. All the DAMF-5 outputs are open collector type, Do Not connect a positive source direct to them, always connect in series relays, bell or lamps from source before connecting to the output. As the testing process is long, it is broken into steps, at any time feel free to repeat the steps, as follows:

1. Check Voltage

Check the charger and battery voltage. It should be around 27VDC or 13.5VDC depending on the battery type used. Both voltage is suitable as an auxiliary power source. Do Not use a power source that is between 15VDC and 20VDC. It is not healthy for the DAMF-5 and may cause damage. If an 18VDC source is connected, it will select 12VDC power input and that is 150% higher. The internal relay will overheat and fail after prolong period.

2. Switch On

Select to Off mode and switch on the circuit breaker. Notice that the display shows **H H H** for one second before displaying **OFF**. Confirm that the supply voltage LED correspond with the auxiliary voltage.

3. Emergency Stop

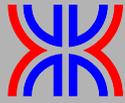
Press the emergency stop button. The display should goes off and the Energize Stop LED lighted. If in use, check that the Energize Stop relay energizes. Wait for about 45 seconds until the LED goes off and the relay de-energizes. All other relays or lamps should be off but the supply LED remain lighted. This confirms the Emergency Stop is functioning. Reset the button to continue.

4. View Default Settings

Remain in the Off mode, press and release the **MFB** button to view the parameter settings. Repeat to toggle through the range of parameters. The display flashes between the parameter and its value at half second interval. 10 seconds of inactivity at any stage reverts the display back to **OFF**. The range of parameters and default value should be as follows; **SFC - 1, Sft - 5, CrT - 6, rSt - 10, Att - 6, OPt - 10, Sdt - 120, ESt - 10, LFL - 0 and OFF**.

5. Change Default Parameter Settings.

Remain in the Off mode, press and release the **SET** button. When the display shows **Set**, press and releases the **MFB** button and repeat to toggle to the desired parameter. Then press and HOLD the **MFB** button, when the desired value is shown, quickly releases the button. Repeat the process to change the next parameter or wait 10 seconds and the new value will be burn into the memory. During the burning process display shows - - - . Burning is complete when display shows **OFF**. View the parameters again to confirm the new settings.



6. Lamp Test

Select to Automatic mode and the display shows **Aut**. Press and HOLD the **MFB** button, the display should show **LPT** and all the fault lamps lighted. Release the button and display reverts back to **Aut** and all fault lamps off. Repeat if desired. The only time you can perform lamp test is in the Automatic mode.

7. Fault Stimulation

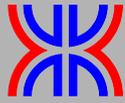
Remain in the Automatic mode. Using a short wire with both ends strip of insulation, connect one end to negative terminal T01. Touch the other end to Low Fuel Level alarm input T16. If the **LFL** parameter is set to '0', then the display remain at **Aut** but alarm bell sounds and Low Fuel Level fault lamp flashes. If the **LFL** parameter is set to '1', then the display flashes **LFL**, alarm bell sounds and Low Fuel Level fault lamp flashes. Press and release the **MFB** button once to accept the alarm. Bell is silenced and Low Fuel Level fault lamp remain lighted.

Next, touch the Over Speed alarm input T15. Notice how the display shows **LFL** but flashes the **OSP**, the same with the fault lamps. Alarm bell sounds again. The DAMF-5 can differentiate a new fault once the old fault was accepted. Press and release the **MFB** button once to accept the alarm.

Now, touch the High Water Temperature alarm input T14 follow by External Fault Alarm alarm input T12. Notice again how the display shows **LFL** follow by **OSP** but flashes **HWT** and **EFA**, the same with the fault lamps. **HWT** and **EFA** are treated as new faults.

Note; **EFA** does not have fault indicating lamp. Its fault lamp or lamps is located at the external alarm annunciator unit which is added when the local fault indication in the DAMF-5 is insufficient. Press and release the **MFB** button twice to accept and reset the alarm. The display reverts back to **Aut**.

To stimulate Fail To Start, you have to prepare a jumper wire from **SFC** input T04 to negative. This jumper connection can be done at the Termination Connectors side. If this test is done at site where the gen-set is connected and ready to start, remember to switch off the Starter Control **MCB**. Assuming that all parameter are set at default, to begin Fail To Start test, connect the jumper wire to negative. The display shows the **Sft** count down follow by the **Crt** count down and **rSt** count down. The **Crt** count down and **rSt** count down is repeated 6 times before Fail To Start alarm is triggered. Notice the followings before the alarm is triggered, the Fuel Solenoid LED is lighted, **FSR** relay is energized, when **Crt** count down begins, the Starter LED is lighted and **STR** relay energizes, when **rSt** count down begins, the Starter LED is off and **STR** relay de-energizes. Once the alarm is triggered, the display flashes **FtS**, alarm bell sounds and Fail To Start fault lamp flashes. Press and release the **MFB** button twice to accept and reset the alarm The display reverts back to **Aut**. At this stage the **LOP** fault cannot be tested because the gen-set did not start. **LOP** fault test is only done after Automatic Run. Do not remove the **SFC** input T04 jumper wire.



8. Automatic Run

Remain in the Automatic mode. To stimulate Generator Run, you have to prepare another jumper wire from **GRR** input T05 to negative. To begin, connect the **SFC** input T04 jumper to negative. The display shows the **Sft** count down follow by the **Crt** count down. During the **Crt** count down, connect the **GRR** input T05 to negative. The display shows the **OPt** count down follow by **run** with the moving **_ . _ . _**. Note, the Fuel Solenoid LED is lighted. At this stage the **LOP** fault can be tested. Use the negative T01 wire and touch the **LOP** alarm input T13. The display shows the **ESt** count down, Fuel Solenoid LED off, Energize Stop LED lighted and **LOP** fault lamp flashes. After count down, the Energize Stop LED is off and the display flashes **LOP**. Disconnect the **SFC** input T04 and **GRR** input T05 jumper wires from negative. Press and release the **MFB** button twice to accept and reset the alarm. During the **ESt** count down, the alarm cannot be accept or reset.

9. Automatic Shutdown

Remain in the Automatic mode. Repeat the Automatic Run until the display shows **run**. To begin, disconnect the **SFC** input T04 jumper from negative. The display shows the **Sdt** count down follow by the **ESt** count down. Notice, when **ESt** count down starts, Fuel Solenoid LED off, Energize Stop LED lighted. After **ESt** count down, the display shows **Aut**. Shutdown completed. Disconnect the **GRR** input T05 jumper from negative.

10. Manual Run

Select to Manual mode and the display shows **rdy**. To begin, press and release the **MFB** button. The **FSR** relay energizes, the **STR** relay energizes when button is pressed and de-energize when button is released. The display shows **Crt** when button is pressed and **rdy** when released. Repeat as you like. Next, press the **MFB** button and touch the **GRR** input jumper to negative. The display begin the **OPt** count down and when finished, displays **run** to indicate gen-set has started.

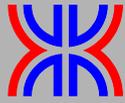
11. Manual Stop

After the manual run is complete and the display shows **run**, to begin manual stop, you can do one of the followings;

- a. Press the Emergency Stop Button.
- b. Select to Off mode.
- c. Do a fault stimulation.
- d. Select to Automatic mode (**SFC** input T04 not connected) for automatic shutdown.

12. Test Run

Select to Test mode and the test run begin with the display showing **Sft** count down. After **Sft** count down, the **Crt** count down and **rSt** count down is repeated until you touches the **GRR** input T05 to negative. If not, the Fail To Start alarm will be triggered. After the **GRR** input T05 touches negative, the display shows **OPt** count down and when finished, displays **run** to indicate gen-set is running. Remember to note the usual, when **Crt** count down begins, the Fuel Solenoid Relay and Starter Relay energizes, when **rSt** count down begins Fuel Solenoid Relay remain energized while Starter Relay de-energizes.



13. Test Stop

The test stop is the same as manual stop, you can do one of the followings; a) Press the Emergency Stop Button. b) Select to Off mode. c) Do a fault stimulation. d) Select to Automatic mode (SFC input T04 not connected) for automatic shutdown.

14. Conclusion

After finishing all the steps mentioned above, you have completed testing the DAMF-5. You can repeat some of the test, if you like, with different and unusual combinations not normally done in actual operation. For example, you can trigger different faults at different stages of count downs or change to different modes during count downs. We have already done a comprehensive test to ensure that the software is robust and can withstand abuse. If you have discover some weird combinations of unusual test or switching over that causes the DAMF-5 software to freeze, we would appreciate it if you can inform us so that we can fix it. Thanks.

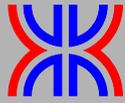
SUMMARY

The DAMF-5 is designed in such a way that it can take abuse to a certain extend. If damage is done, its internal parts can easily be replace by us the manufacturer. Do not attempt to replace the DAMF-5's internal parts yourself. Send it to us for repair. To avoid this hassle, take preventive measures by following the guide lines;

1. Switch off the auxiliary power before attempting to connect or disconnect any wiring to avoid accidental short circuiting.
2. Do not allow water to enter the DAMF-5 through the back terminals. The front is splash proof.
3. Do not over tighten the terminal screw but test for loose connection by slightly tugging the connected wire.
4. Use a screw driver of correct size. Over or under size drivers will damage the terminals.
5. Double check your wiring with a meter to ensure that the open collector outputs are not shorted to positive of auxiliary supply.
6. Make sure the alarm inputs resistance to negative is less then 500 ohms. Higher resistance and the faults may not be triggered.
7. Should alarm inputs give problem, disconnect the wire from the DAMF-5 and test directly with jumper wire to negative.
8. Do not connect power source to the inputs, voltage higher then 12VAC will cause the internal fusible protection resistance to be blown to save the micro controller.
9. Make sure your relays R1, R2 and R3 coil voltage are of the same voltage as the battery source and the **GRR** generator run relay coil is 240VAC.
10. When connecting wires to the DAMF-5, make sure the wires does not block the terminal's number.

You should eliminate faults caused by external sources and if you still suspect the DAMF-5 is faulty, you can contact us for assistance or demonstration of our demo. unit at these numbers:

Tel: 03-90 805 498, 03-90 805 630, 90 805 992, 90 801 192 and Fax: 03-90 851 191.



20 GREAT FEATURES:

- ü Interactive 3-digit 7-segment display interface for easy understanding of operation.
- ü 9 digitally adjustable parameters to suit individual requirements.
- ü 6 nos. digital count down timers.
- ü 4 LEDs to indicate important relays function.
- ü Automatic dual auxiliary power supply selection, 12VDC and 24DVC, with LEDs.
- ü Reverse polarity protected.
- ü 4,000uF capacitor reservoir to limit sudden voltage drop.
- ü Very compact in size. (L)130mm x (W) 96mm x (H) 96mm.
- ü Only one Multi Function Button to perform all operations.
- ü 5 nos. flashing fault lamp indicators. Lamp Test available.
- ü Low Fuel Level selectable shutdown '1' or no shutdown '0' when fault occurs.
- ü Mains Supply Fail Contact selectable close '1' or open '0' to start.
- ü Standard 5 nos. fault alarms.
- ü Expandable fault alarms using external annunciator to External Fault Alarm input.
- ü First Fault Alarm - new faults differentiated from old.
- ü Alarm cancel does not cancel siren from next fault.
- ü Master Alarm Relay output (MAR) for Building Automation system (BAS) etc.
- ü New Hokkim JKM terminals for easier connections.
- ü Easy wiring reduces labor cost, time and mistakes.
- ü Local manufacturer's support for parts and free technical advice.

TECHNICAL DATA

Auxiliary Power Supply	:	12VDC or 24VDC
Current Consumption	:	20mA or 30mA
Inputs Type	:	Negative to trigger.
Input Current	:	500uA
Input Voltage Withstand	:	80VDC or 12VAC.
Output Type	:	Open Collector to negative.
Output Current	:	1 Ampere
Output Voltage Withstand	:	80VDC or 48VAC.

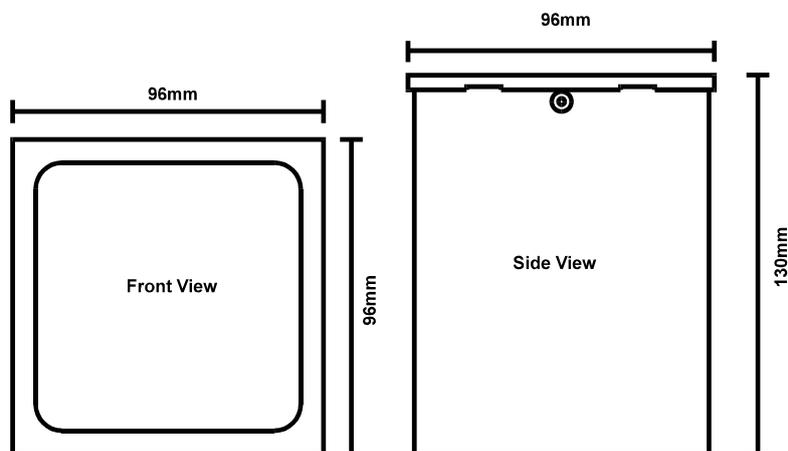


Diagram 6: Dimension