MTS Power Products
MIAMI FL 33142

ATS-22AG

Automatic Transfer Switch Control PLC Operator's Manual

For Use with Cutler Hammer ATS with Motor Break Boards ONLY

Dedicated Single Phase Transfer Switch

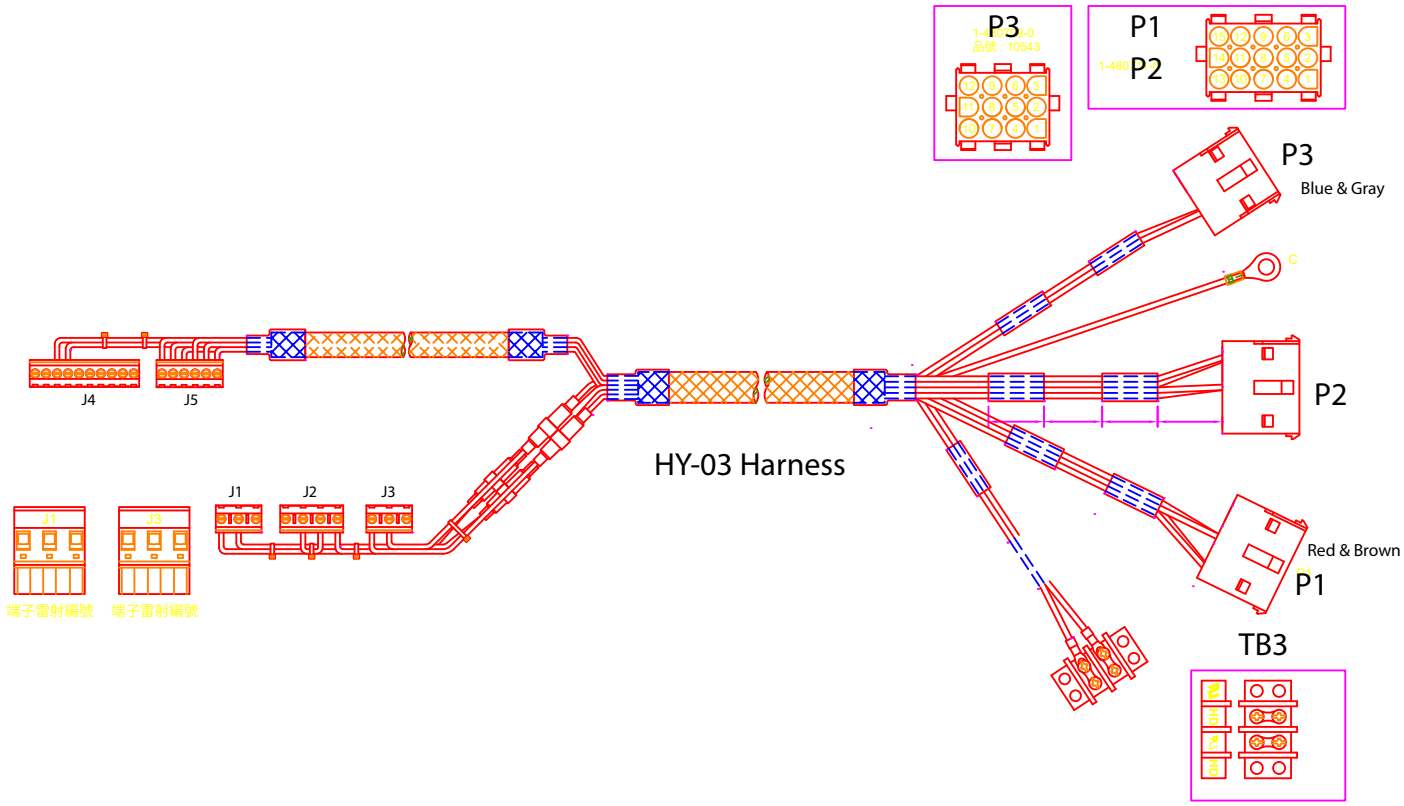
To begin, you need to determine which harness to use based on the number of pins on the plugs P1, P2, and P3. If you have two plugs with 15 and one plug with 12 pins, you need to use the HU-03 harness. If you have three plugs with 15 pins, you need to use the HU-04 harness.

Plug P1 is the Normal voltage sensing plug that connects to Terminal J1 on the controller. The red and brown wires are voltage sensing wires, typically connected to 240Vac. The other three wires, white/blue, brown, and yellow, are connected to one of the limit switches inside the breaker on the normal side. There are three limit switches inside each breaker, but only one is used to run the controller. If the first limit switch is defective, you can move to the next limit switch by moving the three wires pins down in the same order.

Plug P2 is the Emergency voltage sensing plug that connects to Terminal J3 on the control using the Black and Pink wires. It also connects to one of the limit switches inside the emergency breaker.

Plug P3 only has two wires, Blue and Yellow, which connect directly to the Motor Break Board.

To summarize, you need to select the appropriate harness, connect the voltage sensing and limit switch wires to the appropriate terminals on the controller for the Normal and Emergency voltage sensing plugs, and connect the blue and yellow wires to the Motor Break Board via Plug P3.



INTRODUCTION

1.1 Preliminary Comments and Safety Precautions

This manual provides information on how to properly install, operate, and maintain the device to ensure it functions properly and safely. It's important to follow the instructions in the manual to avoid any potential hazards and to ensure the device operates as intended.

WARNING

High voltages can kill.

1.2 Overview

An Automatic Transfer Switch (ATS) helps ensure an uninterrupted power supply by automatically switching the electrical load to a backup power source, such as a generator, during a power outage. Once the main power is restored, the ATS transfers the load back to the normal power source.

1.3 Product Overview

The ATS-22AG is a programmable automatic transfer switch Controller. It's suitable for single phase systems only, and including all necessary monitoring and protections.

The ATS-22AG features:

- Smart touch screen (touch sensor) design.
- Compact size with user-friendly LED display.
- All programming and operations are done from the front screen interface.
- Monitors grid and emergency for over and under voltage anomalies.
- Monitors grid and emergency for over and under frequency anomalies.
- Programmable exerciser with Load.
- Exerciser set for one time per week wih load.
- Emergency position contacts for Auto-Dialer
- Simple programming on-site
- Auto-saved settings (memory preserved throughout all power disconnects and resets).
- Front panel display provides source status and fail alarm indications.

1.4 Functions / Features

The primary function of ATS-22AG controller is to monitor grid / normal street power and provide the necessary intelligence to operate the ATS switch

1.4.1 Operational Simplicity

A user-friendly interface and design of this ATS controller can make it easier for authorized personnel to install, program, and use the device, which can help ensure it functions properly and is properly maintained.

Line 1: Time Delay Emergency to Normal (TDEN)

TDEN delays the transfer from the emergency back to the grid, permitting the stabilization of the grid before returning. Timing begins when the grid becomes available.

Adjustable TDEN time range: 00 to 990 sec

Line 2: Time Delay Normal to Emergency (TDNE)

TDNE delays the transfer from normal to emergency to permit stabilization of the generator before the transfer is made. Timing begins when the generator becomes available. (sometimes called the warm-up timer)

Adjustable TDEN time range: 0.0 to 250 sec

Line 3: Time Delay Engine Start (TDES)

This timer prevents nuisance start because of momentary electrical glitches. If power normalizes before the countdown ends, the controller skips the engine start and resets the timer.

Adjustable TDES time range: 0 to 30 sec

Line 4: Time Delay Engine Cool-down (TDEC)

TDEC permits the generator to run unloaded after the ATS return to the grid. Timing begins when the ATS connects back to grid power *(If you already have cool-down on the Generator Controler this time is also added to the ATS cool-down timer)*

Adjustable TDEC range: 0 to 999 sec

Line 5: Time Delay Center OFF Position

This timer temporally stops the switch in the center OFF position (completely cut off) before proceeding to normal. Useful is some computerizes system that need time in OFF to reset.

Adjustable time delay range: 0 to 99 sec

Lines 6, 7, 8, & 9: Over / Under Voltage and Loss of one wire sensing

The controller monitors the voltage from grid and the generator. The client can program over & under voltage window. (Refer to program table line 6, 7, 8, & 9

O/V adjustment range : 110VAC to 300VAC

O/V reset value: –10VAC (Not adjustable)

U/V adjustment range: 80VAC to 240VAC

U/V reset value: +10VAC (Not adjustable)

Programmable exerciser

It can be set to exercise one time per week at any day and time, with load. The length of the exercise is also set. (Refer programming lines 10, 11, 12, 13, 14 & 15)

NOTICE

COMMON ALARM provides AN auxiliary dry contact for use when the ATS is in Emergency position (Its ON only for 60 sec)

1: LED Test

Touch & hold the OFF button , all LEDs light up.

2: OPERATION

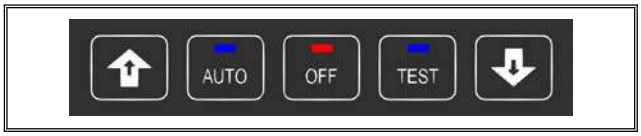
2.1 Display Window

The ATS-22AG controller has a 4-digit, 7-segment displayer to monitor all parameters, setting and messages. The screen displays:

- Voltage / frequency
- Current Time HH:MM (In OFF only)
- Sec. delay countdown
- Program setting parameters

2.3 Operate Touch Buttons

The front panel has 5 sensitive capacitive touch buttons.



2.3.1 Increase (▲) Button

When programming the up (▲) button increases the displayed parameter by one unit. If held, the up (▲) button continues to scroll.

2.3.2 Decrease (▼) Button

When programming touching the down (▼) button decreases by one unit. If held, the down (▼) button continues to scroll.

2.3.3 Auto Button

In AUTO, the ATS-22AG runs in automatic mode lighting the corresponding LED to indicate the ATS is in AUTO. In AUTO controller automatically starts the generator, transfer and retransfers from grid to generator as commanded.

2.3.4 Test Button

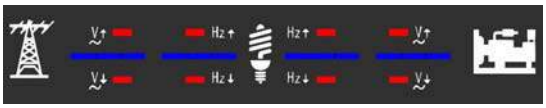
Touching the TEST button simulates a power failure and begins a testing sequence. for 20 min and then return to AUTO.
If at any time the generator fails in TEST mode the ATS returns to AUTO if Normal power is available.

2.3.5 OFF Button

Touching the OFF turns the ATS-22AG OFF engaging a flashing red LED disabling all functions and the screen shows the Time of Day

2.4 Panel LED Outputs

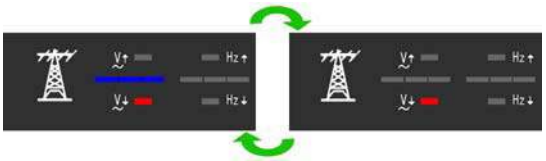
Eight individual red and blue LEDs light bars perform or indicating each function.



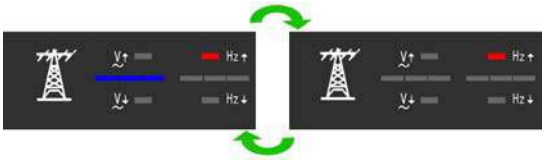
Information concerning the LEDs output

Power available display normal / grid & emergency

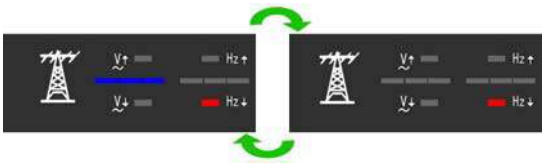
Normal / grid over voltage



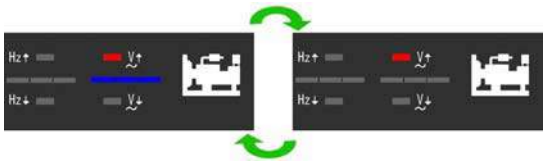
Normal / grid under voltage



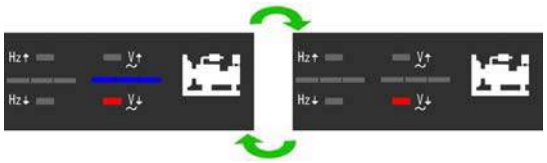
Normal / grid over frequency



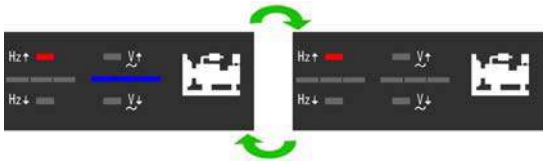
Normal / grid under frequency



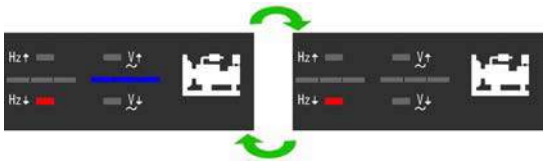
Emergency over voltage



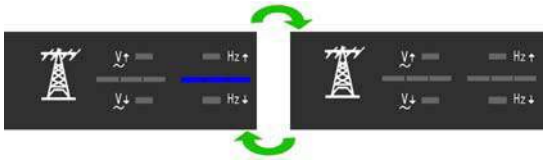
Emergency under voltage



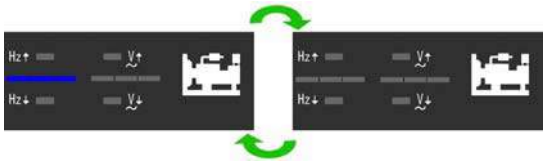
Emergency over frequency



Emergency under frequency



Normal / grid transfer failure



Emergency transfer failure

SECTION 3: OPERATION

3.1 General

The four functions of the ATS-22AG:

- In AUTO
- In OFF
- In TEST mode
- Programming

The practical use of each operation under each category is explained in this section. It is assumed that prior sections are understood, and the operator has a basic understanding of the hardware.

3.2 IN AUTO

The AUTO mode of the ATS-22AG controller provides automatic engine start, stop, and power transfer and retransfers from source to source as dictated by the values previously programmed.

The ATS-22AG constantly monitors the condition of both the grid and/or generator providing the intelligence for the transfer operations.

In AUTO the ATS can starts the generator, using a normally open dry remote start connection. Next to the remote is the connections for the Common Alarms which are activated only for 60 sec. when the ATS moves to the Emergency Position

3.3 IN OFF

The ATS-22AG controller has an OFF button that disables all transfers and protection functions, with the display screen showing only the time of day. Touching the OFF button can be used to test the LED indicators. The clock should be reset once a year to prevent it from affecting the schedule exerciser. The controller can maintain the clock for up to a week without power. In programming mode, the OFF button allows the user to move to the next program line and change values using the up and down buttons.

3.4 Manual TEST (TEST)

Touching TEST simulate a loss of normal/grid power. Permitting the controller to start the engine and carry out a power transfer UNDER load for 20 min.

After 20 Minutes the Control automatically return to AUTO.
If at anytime the Generator stops when under TEST and NORMAL Power is available the ATS return to Normal.

3.5 Programming Instruction

You program the ATS-22AG from the front faceplate.

the ATS-22AG controller can be programmed using the line-by-line programming sequence.

To start, set the controller to OFF and hold the OFF button for 5 seconds to view the software version. Touch the OFF button to move to the next line and use the up and down arrows to change parameters. Touch the OFF button to move to the next line or hold it down for 4 seconds to exit programming.

If an error is made or you need to return to factory settings, enter programming mode and hold the AUTO keys down for 4 seconds until "Au.Po" appears on the screen, indicating a factory reset. The line-by-line programming table in the manual provides the factory settings for the ATS-22AG.

3.7 To enter the Line by Line Programming Table – Simply touch and hold the OFF button for 5 sec. and after the screen flashes 3 times – remove finger

To go from one line to the next touch OFF each time & change values by using the UP/Down Arrows.

LINE	DISCRIPTION	VALUE	FACTORY SETTING
1	TDEN Time Delay Emergency to Normal	00 to 999 sec	**10sec**
2	TDNE Time Delay Normal to Emergency	00 to 250 sec	**10sec**
3	TDES Time Delay Engine Start	00 to 30 sec	**05sec**
4	TDEC Time Delay Engine Cool-down	00 to 999 sec	**00sec**
5	Time Delay in the OFF Position	00 to 25 sec	**02sec**
6	Normal over voltage protection setting	11 to 30 (110V to 300V)	**27(270V)**
7	Normal Under voltage protection setting	08 to 24 (80V to 240V)	**18 (180V)**
8	Generator over voltage protection setting	11 to 30 (110V to 300V)	**27(270V)**
9	Generator Under voltage protection setting	08 to 24 (80V to 240V)	**18 (180V)**
10	Set today's day of the week– Day	1 to 7 (Monday to Sunday)	**current**
11	Set today's hour – Hour	00 to 23	**current**
12	Set today's minutes	00 to 59	**current**
13	Set day of week to do the engine exercise	1 to 7 (Monday to Sunday)	**6**
14	Set the time to start the exercise	00 to 23 (24 Hr Clock)	**12**
15	Exercising duration	00 to 99 Minutes (0 = Do not exercise)	**00**
16	Exercise with load or without load	00) Without load 01) With load	**01**
17	Install & Enable Remote Ethernet Module KCU-30.	00) Disable 01) Enable	**01**
18	Restore Passwords to factory settings Monitor & Control-0000, Monitor only-9999	00) No 01) Yes	**00**

In case a KCU-30 is not installed Line 18 vanishes & is not used.
Line 18 comes in handy if you forget your password for the KCU-30 when using remote monitoring software on your PC or Smart Phone. After a password reset remember to use a new password on your PC or Smart Phone App for your protection.
To EXIT programming, press OFF for 5 sec.

3.8 Specification Summary

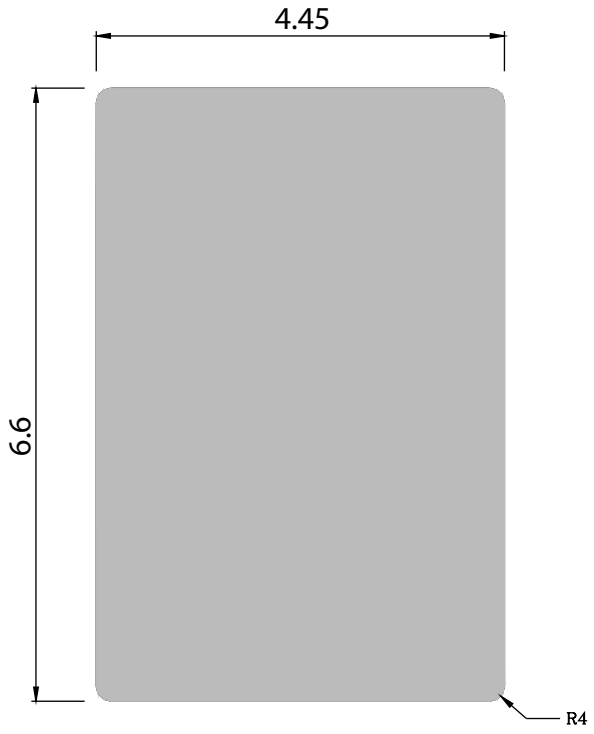
PARAMETER	SPECIFICATION
AC Voltage Measurement Range	50 VAC to 300 VAC 50/60 HZ
Frequency Measurement Range	40HZ to 75HZ
Remote Start Contact	7A @ 250VAC Max
Normal ON Contact	7A @ 250VAC Max
Emergency ON Contact	7A @ 250VAC Max
Auxiliary Contact Output	7A @ 250VAC Max
Operating Temperature	-4F to 160F
Storage Temperature	-4F to 160F
Operating Humidity	Maximum 90% relative humidity
Weight	0.55lbs 2%

SECTION 4: INSTALLATION INSTRUCTIONS

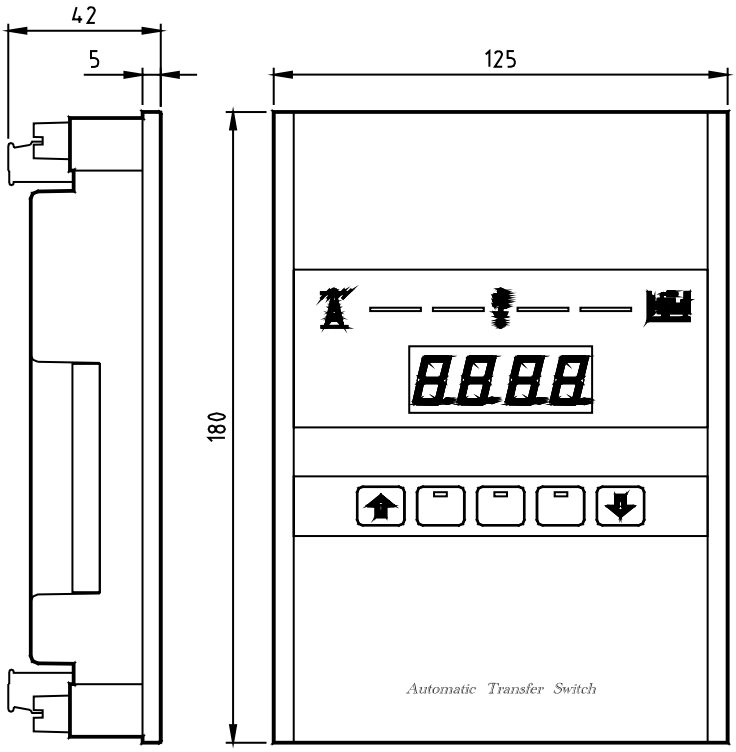
4.1 General

The ATS-22AG is made for front panel mounting.

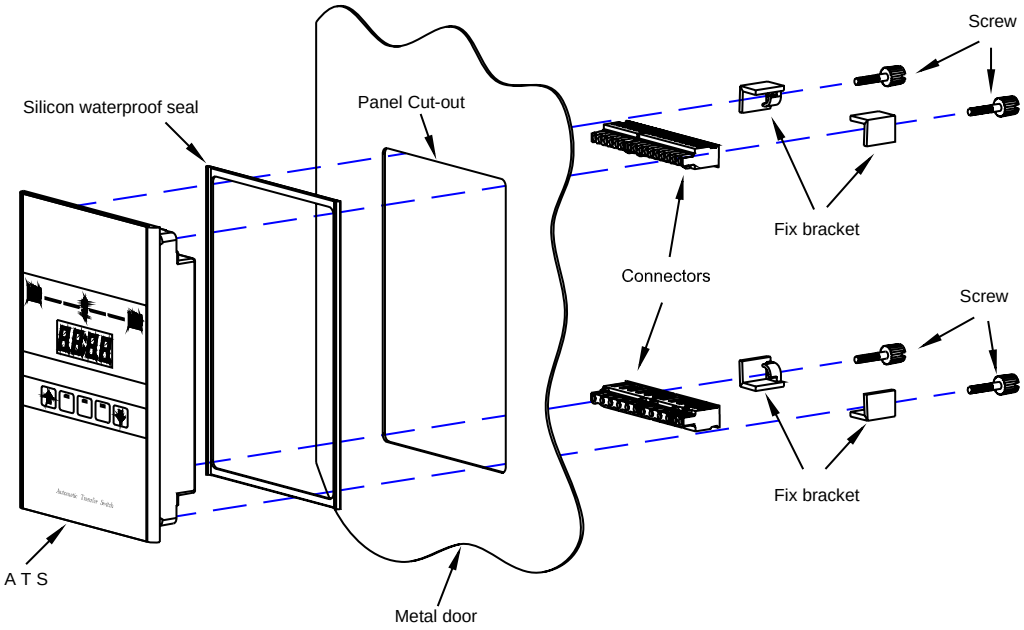
4.2 Panel Cut-Out (All Dimensions in Inches)

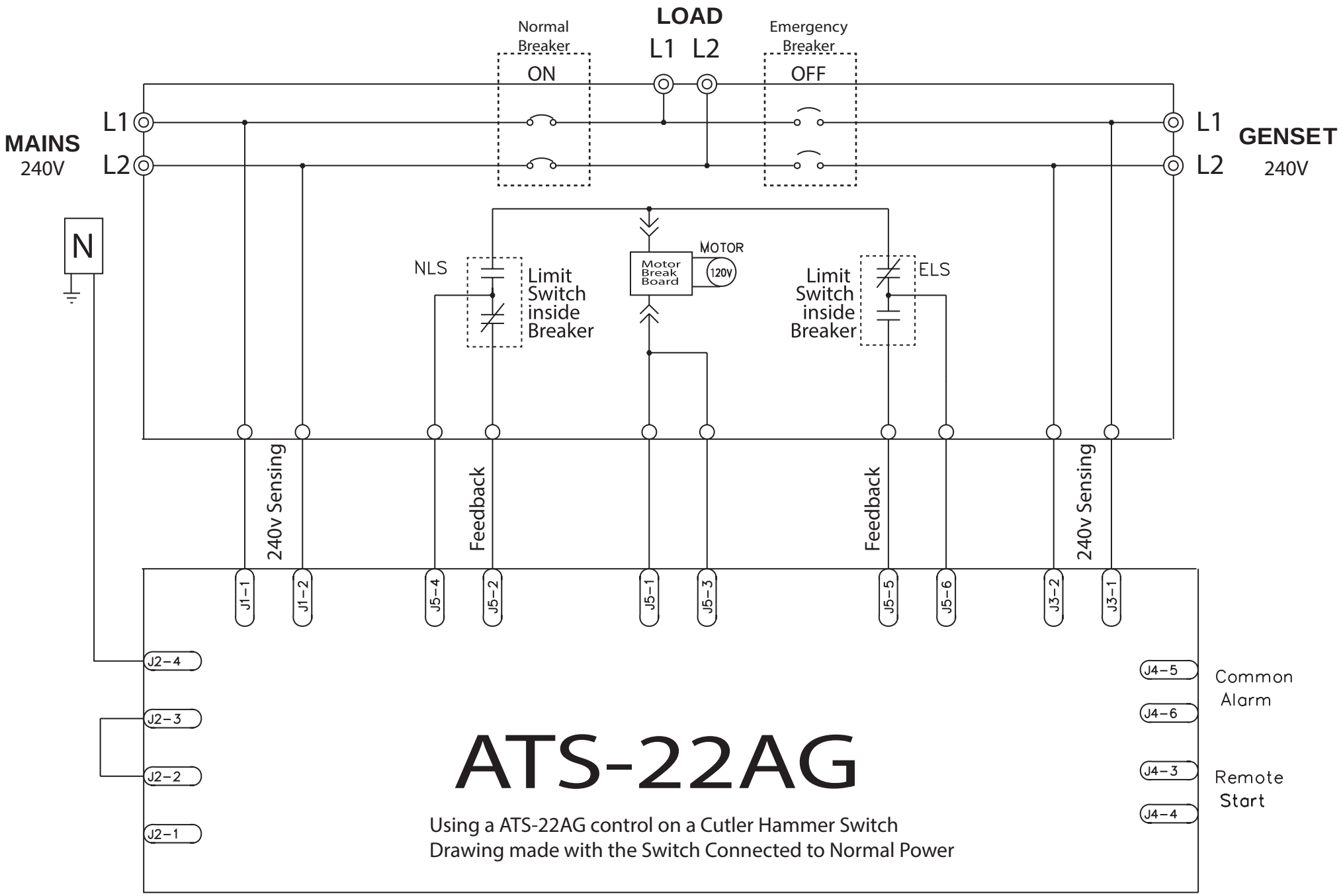


4.3 Unit Dimensions (All Dimensions in MM.)



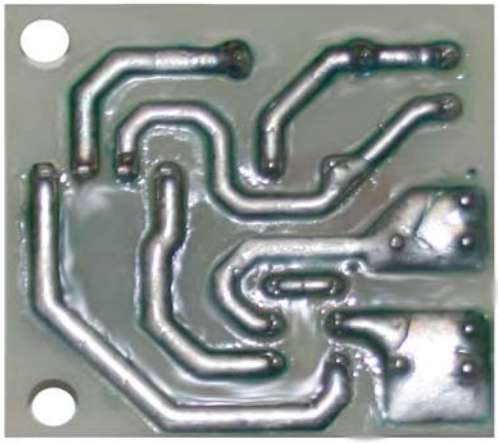
4.4 Installation Reference




LOAD
L1 L2
Normal Breaker
ON
Emergency Breaker
OFF
MAINS
240V
L1
L2
GENSET
240V
L1
L2
N
NLS
Limit Switch inside Breaker
Motor Break Board
MOTOR
120V
Limit Switch inside Breaker
ELS
240v Sensing
Feedback
Feedback
240v Sensing
J1-1
J1-2
J5-4
J5-2
J5-1
J5-3
J5-5
J5-6
J3-2
J3-1
J2-4
J2-3
J2-2
J2-1
J4-5
J4-6
J4-3
J4-4
Common Alarm
Remote Start
ATS-22AG
Using a ATS-22AG control on a Cutler Hammer Switch
Drawing made with the Switch Connected to Normal Power

The McPherson Motor Break Board

Update your old C.H. M.... Break Board with a brand new MTS/ McPherson *Motor Stop Board* that is fully compatible with the original equipment. The big difference is quality and price.



a.- Heavy Duty “Printed Circuit Board” with oversize connections.

b.- Flywheel Diode Added to prevent back current flashing of shorting relay

c.- Same Installation Procedure

d.- Economical