



“KAT”[®] CARRIAGE COMPACT OSCILLATOR SYSTEM



MODELS:

GK-200-RL*-L / GK-200-RM*-L / GK-200-RH*-L
GK-200-RL*-R / GK-200-RM*-R / GK-200-RH*-R
GK-200-FL*-L / GK-200-FM*-L / GK-200-FH*-L
GK-200-FL*-R / GK-200-FM*-R / GK-200-FH*-R

(indicates voltage reference)*

OPERATING INSTRUCTIONS

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SAFETY INSTRUCTIONS

Although the “KAT”[®] Carriage/Compact Oscillator is manufactured for safe and dependable operation, it is impossible to anticipate those combinations of circumstances which could result in an accident. An operator of the “KAT”[®] Carriage/Compact Oscillator is cautioned to always practice "**Safety First**" during each phase of operation, set-up and maintenance.

Read and understand the operation manual before operating or performing service of this equipment. Become familiar with the machines operation, applications and limitations. Keep the operation manual in a clean and readily available location.

This equipment is normally used to automate / semi-automate welding or cutting processes. These processes usually have any combination of the following; bright and hot arcs, flying sparks, fumes, ultraviolet and infrared radiated energy, hot work-pieces, compressed gases, etc.. The onus is on the operator of this equipment to know, understand and follow all the safety precautions associated with the process being used.

A careless operator invites trouble, and failure to follow safety practices may cause serious injury or even death. Important safety precautions are given in the following:

Electrical Shock Prevention

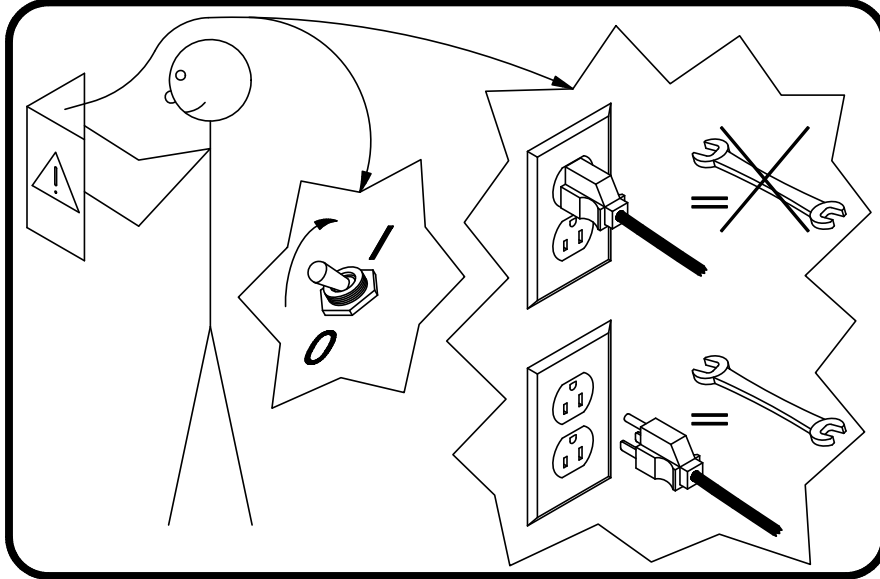
- ❖ Do not use this equipment in damp or wet locations.
- ❖ Do not expose this equipment to rain.
- ❖ Never carry this equipment by the cables or pull the cables to disconnect from the receptacle.
- ❖ Keep all cables from heat, oil and sharp edges.
- ❖ Inspect all cables periodically and replace if damaged.
- ❖ Inspect the security of all cables periodically and repair if loose.
- ❖ Disconnect the power cord when not in use.
- ❖ Disconnect the power cord **positively** to prevent electrical shock before repair and service of the equipment.

Bodily Injury Prevention

- ❖ Do not wear loose clothing, jewelry and loose, long hair which may get caught into automatic systems or moving parts.
- ❖ Ensure that the track is well secured when installed in any other position than flat on a surface.
- ❖ The track must have a method of safety back-up from falling when suspended, i.e. chained at the ends, welded to work-piece, etc.
- ❖ Keep lifting handle dry, clean and free from oil and grease.
- ❖ Keep hands away from the underside of the “KAT”[®] carriage when there is the slightest possibility of it moving.
- ❖ If flex track is used, exercise extreme caution when mounting and handling the track, as it is made of spring steel, and therefore poses a potential hazard of injury due to “whipping”.
- ❖ If flex track is used, always wear protective gloves when handling the track, to prevent injury from sharp edges.

SAFETY PRECAUTIONS

The following cautionary/warning label is attached to each “KAT”[®] carriage:-



The above label pictorially represents the following:

“Warning:-

*Read the manual before turning the unit on and before performing service.
Also, positively disconnect the unit from all power supplies before servicing!”*

IMPORTANT

READ THIS BEFORE OPERATING THE “KAT”[®] CARRIAGE/COMPACT OSCILLATOR

WARNING! Always turn the main power off before connecting/disconnecting the oscillator head cable to/from the “KAT”[®] carriage. Failure to comply may result in control damage.

Ensure that an adequate and well-maintained weld return path is provided with good electrical contact. Failure to do so may result in the welding current passing through the carriage and damaging the wiring and electrical components.

Important information regarding safety and operation of the “GSP” motor control used in the “KAT”[®] carriage is contained in a supplemental manual attached at the end of the Technical Manual. It is equally important to read, understand and apply the information contained within the manual. The supplemental manual (GD-031) has a title “Technical Information For The Gullco “GSP” Micro-Processor Based, 24 Volt DC Motor Control”, and it’s pages are numbered with a prefix of “T-“.

ALL THE SAFE PRACTICES AND PRECAUTIONS MAY NOT BE GIVEN IN WRITING. SOME ARE BASED ON COMMON SENSE, BUT OTHERS MAY REQUIRE TECHNICAL BACKGROUND TO EXPLAIN.



“KAT”® CARRIAGE/COMPACT OSCILLATOR COMBINATION

This manual covers the operation instructions of the following “KAT”® Carriage/Compact Oscillator systems, using Rigid or Flex “KAT”®, all position, variable speed travel carriages and either Linear or Radial Oscillator heads (* indicates input voltage: ‘A’ = 42 VAC; ‘B’ = 115 VAC; ‘C’ = 230 VAC):

GK-200-RL*-L / GK-200-RM*-L / GK-200-RH*-L
GK-200-RL*-R / GK-200-RM*-R / GK-200-RH*-R
GK-200-FL*-L / GK-200-FM*-L / GK-200-FH*-L
GK-200-FL*-R / GK-200-FM*-R / GK-200-FH*-R



GENERAL DESCRIPTION

This advanced Gullco oscillation package combines the Gullco “KAT”® all position, travel carriage with either the Linear or Radial compact oscillator head and oscillator control which is incorporated into the carriage.

The Gullco “KAT”® is a heavy duty, all position travel carriage. It is an electrically powered, self propelled carriage that travels in a forward or reverse direction, at precisely controlled speeds, along a special track. The self aligning wheel system of the carriage grips the top and bottom of the track, enabling it to travel along any plane. The bogey wheel assembly keeps the carriage snug to the track, while allowing it to be easily mounted and removed from the track at any point. The positive drive of the “KAT”® is obtained from either a pinion that engages with the rack of the rigid track, or a spherical sprocket gear that engages with slots in the flex track. Both of these systems are driven by a low voltage permanent magnet motor and gear-head power unit assembly. Safety is greatly enhanced by the use of Gullco’s low voltage (24 V), highly advanced control/power supply system that is available in three line voltage inputs... 42, 115 and 230 VAC, single phase, 50/60 Hz,

or any unregulated 24 VDC power supply at 220 watts of power. The micro-processor carriage motor control offers operator interface of forward, stop, reverse and infinitely variable control of the speed, within the range of the model, as well as an L.E.D. display indicating speed in either in/min. or cm/min.

The Gullco Linear and Radial oscillator heads are compact, light weight, yet durable, reciprocating devices with high torque, high resolution and low vibration stepper motors. They impart a linear, pendulum or tangential motion to the welding gun. The low voltage Oscillator Control provides a large, easy to read, multi-page graphical display and offers programmable and electronic adjustment over the following functions:

- Oscillation width
- Oscillation speed
- Independent Left, centre and right dwells
- Oscillation centre positioning (steering)
- Automatic wire feed activation
- Automatic and Manual carriage travel activation
- Weld travel start delay and weld crater fill delay
- Standard (angular) or step (square) pattern oscillation
- Multiple oscillation program storage

These features enable precise control over the automated cycle generating accurate and repetitive weld oscillation.

Adjustable bracketry as well as vertical and horizontal Micro Fine Adjustable Rack Boxes, allow the welding gun and the oscillator head to be easily mounted, adjusted and accurately positioned, in virtually any plane, off the front or back of the "KAT"® carriage.

INTENDED / FORESEEN USAGE

The Gullco "KAT"® Carriage/Compact Oscillator combination is used throughout the world to automate and improve the quality and efficiency of the weld produced in automatic mechanized welding operations. This is achieved through minimizing weld defects such as poor penetration, incomplete fusion, overlap and undercut. Also, detrimental factors such as poor or awkward accessibility, operator fatigue, or inconsistent workmanship are eliminated. Required quality levels are consistently attained and productivity and profitability increased.

Welding guns are readily mounted on the oscillator head and either a linear, pendulum or tangential motion is used to produce either a standard angular or step (square) weld pattern. The track that the "KAT"® carriage is going to travel along, is positioned so that the "KAT"® will move the oscillator head and welding gun along the desired path and then securely held in place using magnetic or vacuum activated mounting devices. Safety back-up devices such as chains at the ends of the track; or welding some track mounting devices to the work-piece; must be implemented whenever there is a possibility that the equipment may fall due to gravity. By combining welding gun oscillation movement with the precision controlled travel speed of the "KAT"® carriage, a wide range of weld patterns can be produced....as described on the following pages.

OPERATION

The electrical and mechanical installation of the "KAT"® Carriage/Compact Oscillator system is explained in the Technical Manual (GD-057-T).

Local Control Devices



The Power On/Off switch is used to disconnect the power to the rest of the control circuitry.

I = On, O = Off.

WARNING! Always turn the main power off before connecting/disconnecting the oscillator head cable to/from the "KAT"® carriage. Failure to comply may result in control damage.

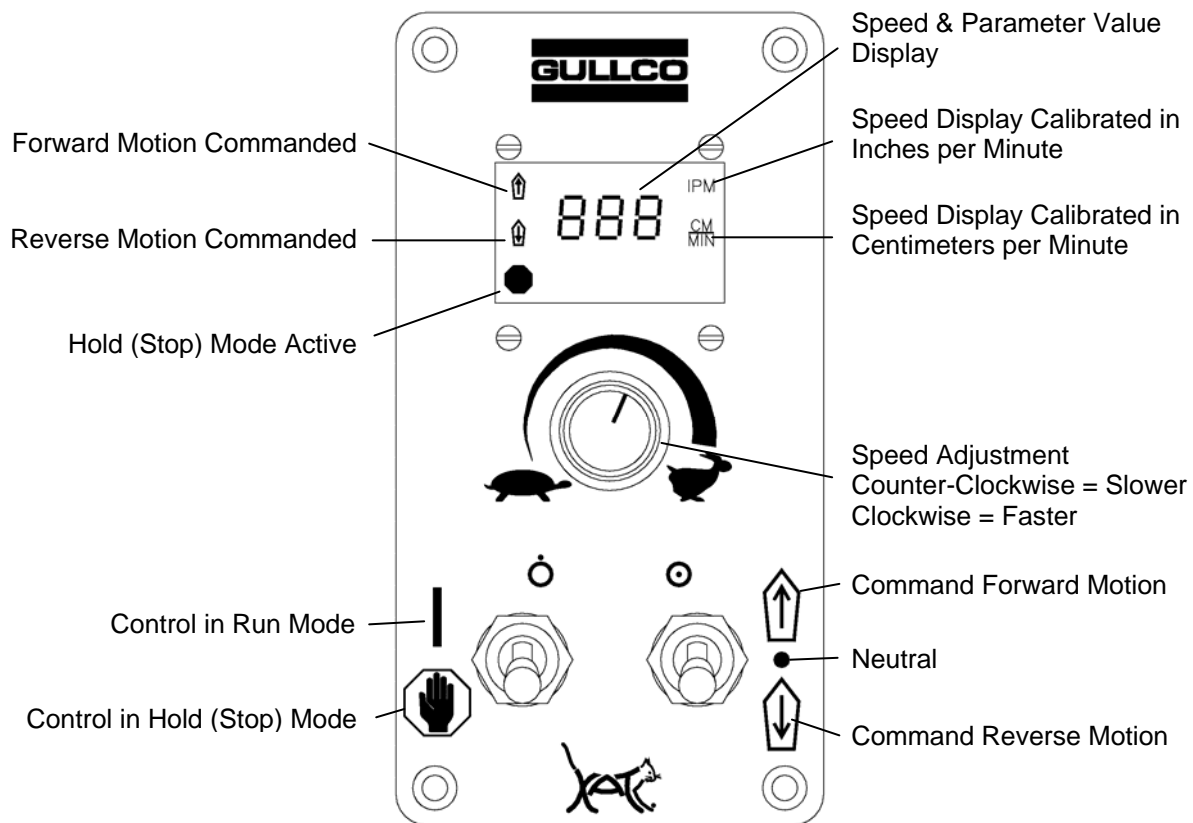
WARNING! The motor and oscillator controls must not be continually started and stopped by the removal and reapplying of power to the controls. Turning the power off to the controls will not provide instant braking and continued use will damage the controls. Allow ten (10) seconds after the removal of power before reapplying the power to the equipment.

The Fuse Holder allows accessibility to the main fuse by pushing the cap in towards the main body and twisting in a counter-clockwise direction.

The Arc Activation Signal Connector is used to interface with the trigger signal of the customers welding equipment and is used to start/stop the welding process.

Either the Linear or Radial model of compact oscillator head can be plugged into the Oscillator Head Connector (control needs to be calibrated to suite the type of head).

"KAT"® CONTROL



The L.E.D. Display

The control has an L.E.D. display that indicates the travel speed in either inches per minute or centimetres per minute. The display also shows the travel direction accessed as well as the status of the Stop command.



The Forward and Reverse L.E.D.'s indicate the "KAT"® carriage motor direction commanded.



The "Hold" (stop) L.E.D. will illuminate whenever there is a "Hold" (stop) command present. This could be any combination of either the "KAT"® Control Run/Stop switch or the Oscillator Control Auto/Stop/Run switch being in the Stop position.

Externally, the Gullco "KAT"® Control has switching for Forward/Neutral/Reverse & Run/Stop, as well as a rotary encoder for speed control.



= "STOP" - This over-rides all other controls and when activated will apply regenerative braking to the carriage motor to bring it to a dead stop, and will disallow any further operation of the carriage while ever it is in this state. This position will also reset an error code once the fault has been rectified. The Oscillator Control will also access this command when it is in the "STOP" mode.



= "RUN" - This removes the "STOP" command and allows the control to assume an operational status, allowing carriage motion when permitted by the oscillator control. This command will be ignored if the Oscillator Control is in the "STOP" mode.



= "FORWARD" - When the switch is in this position, Forward motion is selected as the desired "KAT"® carriage travel direction.



= "NEUTRAL" - When the switch is in this position, the control will not drive the "KAT"® carriage motor in either direction.



= "REVERSE" - When the switch is in this position, Reverse motion is selected as the desired "KAT"® carriage travel direction.



= "SPEED ADJUSTMENT" - By turning the multi turn rotary encoder knob in a clockwise direction, the carriage motor speed will be increased. When rotated in the counter-clockwise direction, the carriage motor speed will decrease. The speed of the carriage travel can be preset, prior to any motion, by placing the Forward/Neutral/Reverse switch of the "KAT"® control to "Neutral". Then by turning the variable Speed Adjustment knob, the travel speed can be set to the required value, as indicated in the L.E.D. display.

OSCILLATOR CONTROL

A highly sophisticated, yet easy to use, multi-processor based control drives a high torque, high resolution, low vibration stepper motor located in the Oscillator Head, allowing the welding gun to be moved in a precise reciprocative manner. The control interfaces with the "KAT"® carriage travel and the trigger signal of the welding equipment. By controlling the oscillation width, speed, positioning and dwell patterns as well as the timed activation/deactivation of the "KAT"® carriage travel and the welding process, the quality and appearance of the weld can be tuned to perfection.

**A
B
C**

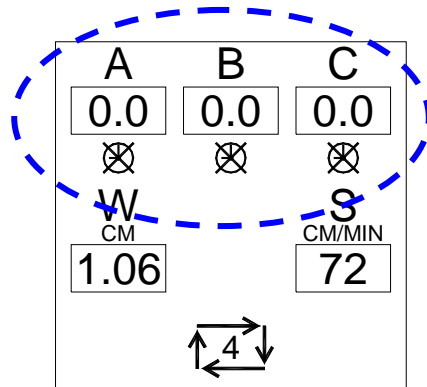
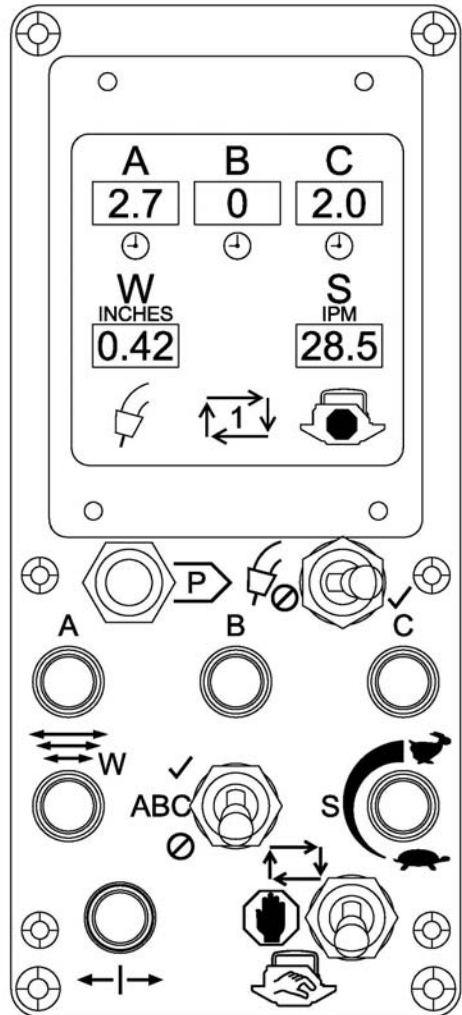
The A, B & C rotary switches will increase (clockwise adjustment) or decrease (counter-clockwise adjustment) the A, B & C location dwells respectively by 0.1 second increments, from a minimum of zero up to a maximum of 9.9 seconds. The current values are displayed on the LCD screen. These adjustments can be changed at any time before, or during, operation and will take effect on the next relevant dwell location. The orientation of the ABC locations of the Oscillator Head can be altered (programmed) to match the orientation of the control (see the Technical Manual, GD-057-T for details).

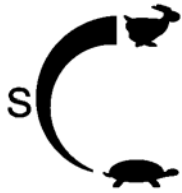
**✓
ABC
⊘**

The Dwell Enable/Disable switch will allow the oscillator to perform the A, B & C location dwell timing cycles while running when Enabled (✓) or will not perform the dwells when Disabled (⊘). This Enable/Disable selection can be made at any time and will take effect immediately. When disabled the LCD screen will show all dwell times as zero and the dwell disabled icons crossed-out, as shown adjacent:

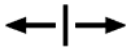
**⇄
⇄
W**

The W rotary switch increases (clockwise adjustment) or decreases (counter-clockwise adjustment) the total width of the oscillation stroke (A to C). The increments of adjustment and the minimum and maximum allowable stroke widths are dependent on the type of Oscillator Head used and the preferred units of measurement (see the Technical Manual, GD-057-T for details). The current value is displayed on the LCD screen. Width adjustments can be changed at any time before or during operation and will take effect on the next travel past the B location. Note:- there is a width range where the oscillation stroke is too small to permit A, B & C dwells to work.





The S rotary switch increases (clockwise adjustment) or decreases (counter-clockwise adjustment) the oscillation stroke speed. The increments of adjustment and the minimum and maximum allowable stroke speeds are dependent on the type of Oscillator Head used and the preferred units of measurement (see the Technical Manual, GD-057-T for details). The current value is displayed on the LCD screen. Speed adjustments can be changed at any time before or during operation and will take effect immediately.



The Center Position Adjustment rotary switch will allow the operator to jog the center position (B location) either to the left or to the right. This rotary switch can be used to position the welding gun prior to oscillation when the Manual/Hold/Auto switch is in the Manual position. To make adjustments (steering) while welding, rotate the Center Position Adjustment rotary switch in the appropriate direction until the centre of the oscillation has moved to the desired location. The size of these centre adjustment (steering) increments can be programmed to be as large or small as preferred (see the Technical Manual, GD-057-T for details).



The Arc Enable/Disable switch will allow the operator to either Enable (✓) or Disable (⊘) the arc activation signal to the welding equipment. This Enable/Disable selection can be made at any time and will take effect immediately.

When Enabled (✓), the arc activation signal will be energized while-ever the oscillator is running. When the arc activation signal is energized, the arc activation signal icon in the lower left corner of the LCD screen will appear as follows:



When Disabled (⊘), the arc activation signal will de-energize (if applicable) and remain de-energized. While ever the arc activation signal is de-energized, the arc activation signal icon in the lower left corner of the LCD screen will appear as follows:



The Manual/Hold/Auto switch is used to start and stop the oscillator equipment as well as interfacing with the “KAT”[®] travel carriage.

In the Manual position (), the arc activation signal and the oscillator head are inactive, and the “KAT”[®] carriage will operate manually. The carriage release icon on the lower right corner of the LCD screen will appear as follows:



The Hold position (), over-rides all other controls and when activated will apply the Hold (stop) signal to the “KAT”[®] carriage control, and will disallow any further operation of the “KAT”[®] while ever it is in this state. The arc activation signal and the Oscillator Head remain inactive in this mode. The carriage hold icon on the lower right corner of the LCD screen will appear as follows:



When placed in the Auto cycle position (), the arc activation signal will energize (only if the Arc Enable/Disable switch is in the Enable state) and the Oscillator Head will start its oscillation motion. After the programmable Travel Start time delay the oscillator control will deactivate its Hold (stop) command to the “KAT”[®] carriage control, thus allowing it to travel. While ever the Hold (stop)

command is released to the “KAT”[®] carriage, the carriage release icon on the lower right corner of the LCD screen will appear as follows:



The Program push button changes the control state from running (operational) mode to programming mode, and back to running mode. While-ever the control is in programming mode, the program icon on the lower right corner of the LCD screen will appear as follows:



AUTOMATIC CYCLE OPERATION

To perform an automatic welding cycle:



1. Place the Oscillator control Manual/Hold/Auto switch in the Hold position.
2. Place the “KAT”[®] carriage control Run/Stop switch in the Run position.
3. Set the “KAT”[®] carriage travel speed by placing the “KAT”[®] carriage control Forward/Neutral/Reverse switch in the Neutral position then rotate the Speed Adjustment knob until the desired speed is displayed.
4. Place the “KAT”[®] carriage control Forward/Neutral/Reverse switch to the desired weld travel direction.
5. Using the devices on the Oscillator control, set the desired oscillation width, oscillation speed and dwells.
6. When the Oscillator control Manual/Hold/Auto switch is placed in the Auto position, the programmable audible warning buzzer duration elapses while the optional buzzer is energized (if the optional buzzer is not installed this timing cycle is usually programmed off). Then the oscillation motion will commence and the arc activation signal will be energized (if the Arc Enable/Disable switch is in the Enable position). Following the Travel Motion Delay, the Hold (stop) signal to the “KAT”[®] carriage control is released and the carriage starts its weld travel.
7. When the Oscillator control Manual/Hold/Auto switch is placed in the Hold position, the Hold (stop) signal to the “KAT”[®] carriage control is energized again, stopping the “KAT”[®] carriage travel, and the Oscillator Head motion is stopped. After a programmable Crater Fill Delay the arc activation signal is de-energized and the automatic cycle is completed.


The following are some notes on the operation of the control.

1. When the oscillation is to start, the Oscillator control will always assume that the oscillator head/slide is resting at the “Oscillation Rest Location” (4th Field of the Features & Setup screen, described later in this manual) and will travel in the appropriate direction accordingly. I.e. if the “Oscillation Rest Location” field is set to C, the oscillator will start its oscillation cycle by moving in the relevant direction toward the B (center) location by a distance of half the width value (W).


PROGRAMMING

There are two levels of programming mode:


- General Programming Mode: this first level of programmable features is meant to be easily accessible to the operator and requires that the Program push button () be pressed for a minimum of two (2) seconds, but no more than ten (10) seconds, while the Manual/Hold/Auto switch is either in the Manual or Hold position. The screens that are accessible under this mode are:
 - Feature/Set-up screen and;
 - 10 x Auto cycle storage screens.
- Advanced Programming Mode: this second level of programmable features is meant only to be used by higher level and/or qualified users and requires that the Program push button () be pressed for more than ten (10) seconds while the Manual/Hold/Auto switch is either in the Manual or Hold position. The screen that is accessible under this mode is:
 - Motor Setup screen (see the Technical Manual, GD-057-T for details)

To change state from programming mode (any screen) to running (operational) mode, press the Program push button () once (it does not need to be pressed for any specific duration). The various values and settings will be saved.

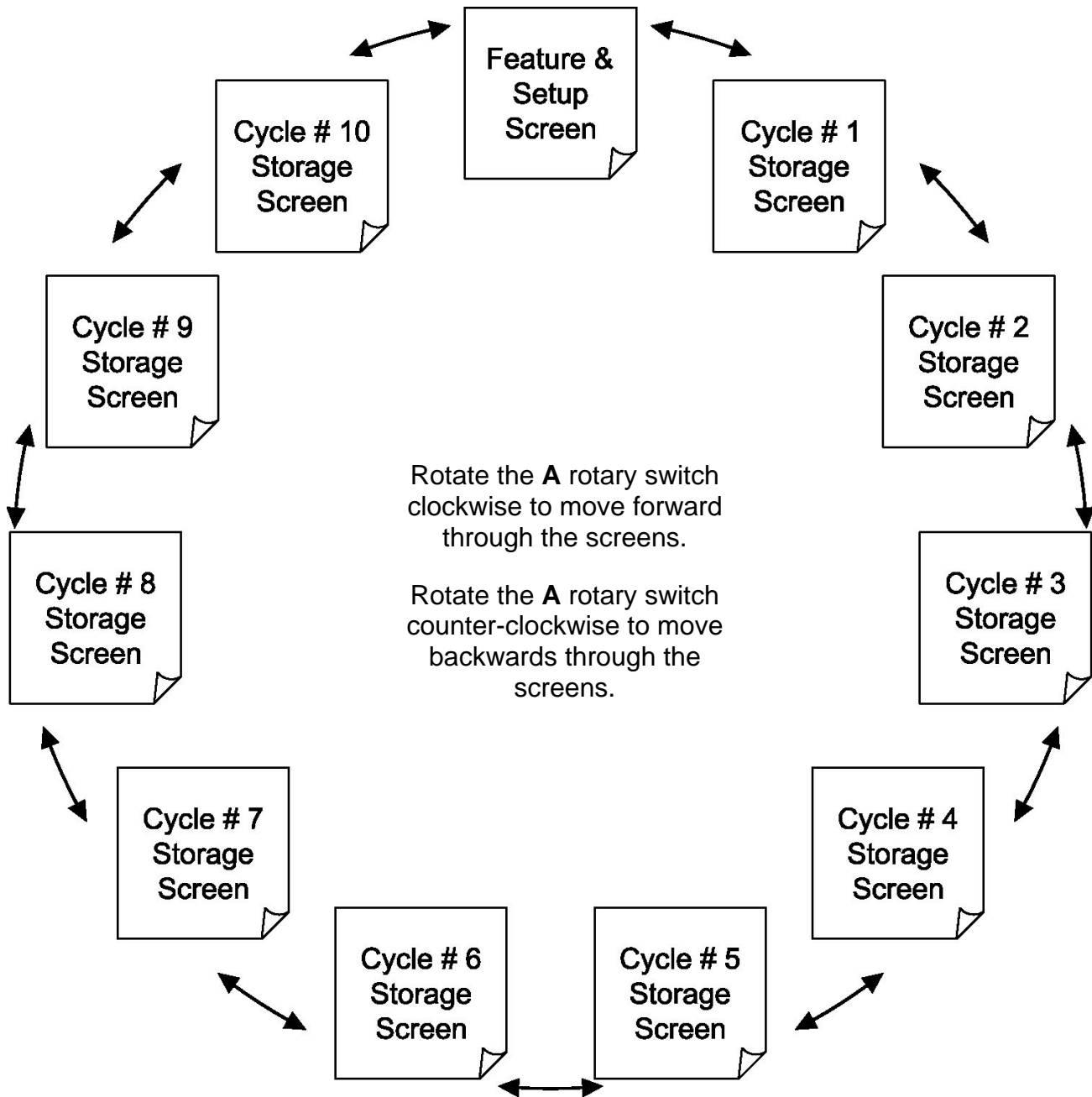
When in the programming mode, only the A, B & C rotary switches and the Program push button will be used. All other toggle and rotary switches will be ignored.

- The A rotary switch is used to navigate forward and backward between screens (pages).
- The B rotary switch is used to navigate forward and backward between adjustable fields of the current screen (page). The contents of the selected field will flash to indicate which field is currently selected.
- The C rotary switch is used to change the value/setting of the currently selected adjustable field.
- The Program push button () is used to save all values and settings, exit programming mode and return to the running (operational) mode.

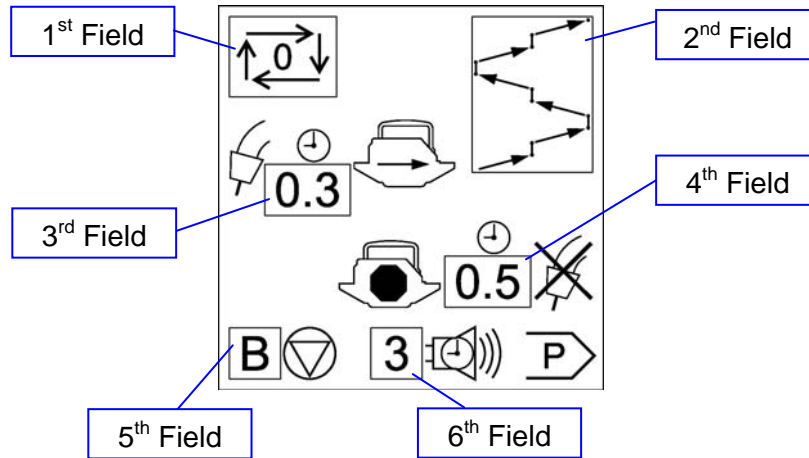
Note: If the Manual/Hold/Auto switch is placed in the Auto position when the control is in the programming mode, the arc signal relay will not energize, the oscillator will not start to run and the carriage Hold (stop) signal will not be de-energized. If the switch remains in the Auto position when the control returns to the running (operational) mode, the system will remain display “ER.1”, requiring the switch to be placed in the Hold position to reset.

While-ever the control is in programming mode, the program icon is displayed in the lower right hand corner of the LCD screen as follows: 

The sequence of level 1 (General Programming Mode) program screen displays is as follows:



The Features & Setup Screen

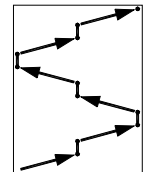


The Features & Setup Screen has the following features:

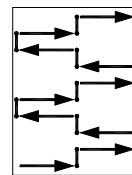
1st Field = The Auto Cycle storage number to be recalled. The number shown in this field will be the program that will be copied from storage and applied to the running (operational) mode values when exited from programming mode. The choices are 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10 (surrounded by the auto cycle symbol). When the value is 0, the existing oscillation values last used will not be over-written. Each time the Features and Setup screen is opened, the value in this field defaults to 0.

2nd Field = The Oscillation mode. There are three pictorial modes to choose from:

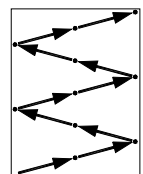
➤ **Normal Oscillation.** This is where the travel carriage is allowed to run continuously through the oscillation cycles. This is the factory default setting.



➤ **Step during Dwells.** This is where the travel carriage is only allowed to run during each of the A, B or C location dwells. This mode will only work effectively if the dwell times are not too small.



➤ **Step during Oscillation stroke.** This is where the travel carriage is only allowed to run during each oscillation stroke (i.e. carriage is not permitted to run during each of the A, B or C location dwells). This mode will only work effectively if the dwell times and the oscillation width are not too small.



3rd Field = Travel Motion Delay. This sets a timing delay at the start of an automatic cycle, from the time that the arc activation signal is energized until the time that the travel carriage Hold (stop) signal is de-energized. I.e. a timing cycle to allow the arc to strike and establish, before carriage motion. The choices available are from 0.0 to 9.9 seconds in 0.1 second increments. The factory default setting is 0.3 seconds.

4th Field = Crater Fill Delay. This sets a timing delay at the end of an automatic cycle, from the time that the travel carriage Hold (stop) signal is re-energized and the oscillation motion stops until the arc activation signal is de-energized. I.e. a timing cycle to allow the welding to continue after the welding motion ceases. The choices available are from 0.0 to 9.9 seconds in 0.1 second increments. The factory default setting is 0.5 seconds.

5th Field = Oscillation Rest Location. This setting dictates where the oscillator stops at the end of an oscillation cycle (and therefore assumed location at the start of an oscillation cycle). The choices are A, B or C. The factory default setting is B.

6th Field = Audible Warning Buzzer Duration. This sets the timing cycle for the optional audible warning prior to the start of each Auto cycle. The choices are from 0 to 9 seconds in 1 second increments.

➤ When the value is greater than 0, the following icon is displayed:



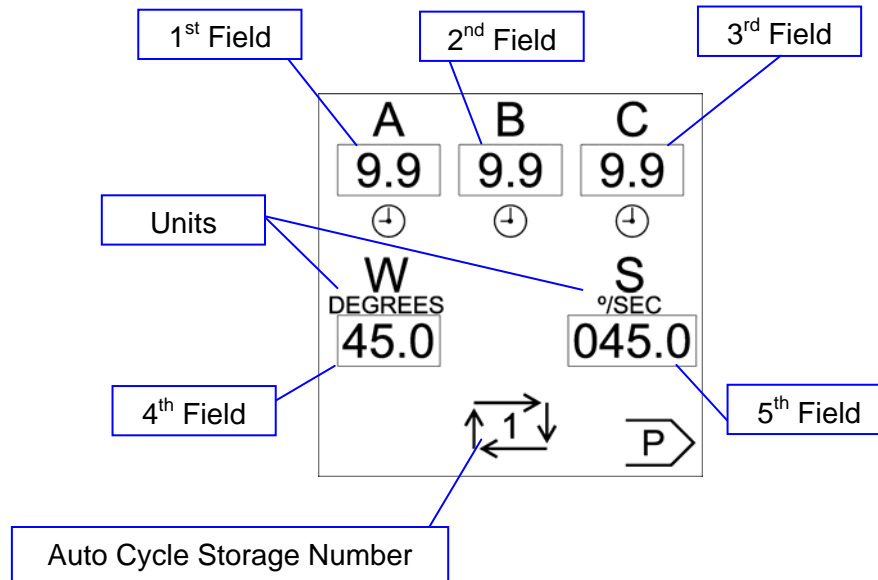
➤ When the value is 0, the following icon is displayed:



Notes: All fields except the 1st Field retain the last value entered.

Auto Cycle Storage Screens

There are a total of ten (10) Auto Cycle Storage Screens, and each screen is identified by the “Auto Cycle Storage Number” (numbered 1 to 10) as shown in the following image. The units of measure for the oscillation width (W) and the oscillation speed (S) are programmable (level 2 - Advanced Programming Mode). If the units of measure change, all width and speed fields will need to be manually converted. To make changes to these screens/fields use the A, B & C rotary switches as described [on page 11](#). All the Auto Cycle Storage Screens have the following features:



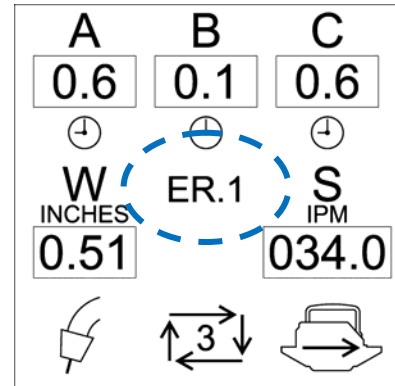
- 1st Field = The A Location Dwell Time. This sets the time duration that the oscillation stroke will dwell (pause) each time the A location is reached. The choices available are from 0.0 to 9.9 seconds in 0.1 second increments.
- 2nd Field = The B Location Dwell Time. This sets the time duration that the oscillation stroke will dwell (pause) each time the B (center) location is reached. The choices available are from 0.0 to 9.9 seconds in 0.1 second increments.
- 3rd Field = The C Location Dwell Time. This sets the time duration that the oscillation stroke will dwell (pause) each time the C location is reached. The choices available are from 0.0 to 9.9 seconds in 0.1 second increments.
- 4th Field = The Oscillation Width. The value of this field sets the total width of the oscillation stroke (A to C). The increments of adjustment and the minimum and maximum allowable stroke widths are dependent on the type of Oscillator Head used and the preferred units of measurement (see the Technical Manual, GD-057-T for details). Note:- there is a width range where the oscillation stroke is too small to permit A, B & C dwells to work.
- 5th Field = The Oscillation Speed. The value of this field sets the oscillation stroke speed. The increments of adjustment and the minimum and maximum allowable stroke speeds are dependent on the type of Oscillator Head used and the preferred units of measurement (see the Technical Manual, GD-057-T for details).

ERROR CODES

Error codes are displayed on the LCD screen as shown adjacent.

ER.1

If the Oscillator Controls' Manual/Hold/Auto switch is in the Auto position on power-up, the control will display ER.1 and not permit an automatic cycle to start. This prevents the undesirable start of an automatic cycle on power-up. To reset the error, place the switch in the Hold position.



ER.2

When the Oscillator Control is programmed to operate a Linear Oscillator Head (preferred units of measurement are either Inches or CM), the control monitors limit switches located within the Oscillator Head to prevent over-travel. If either, or both, of these limit switches are open circuit, the control will display ER.2 and not permit normal operation. This situation could include the following possibilities:

- Manually jogging the slide too far. To reset, manually jog the slide in the opposite direction.
- The over-travel occurred during Oscillation. This could be due; to the oscillation width being set too large for the stroke of the slide; the starting location of the oscillator slide relative to the oscillation width and direction; or through making center position adjustments (steering), resulting in slide over-travel. To reset, make the necessary manual and/or programming adjustments and restart the automatic cycle. It is recommended that the oscillator be set so that the oscillation occurs in the centre of the slides stroke to permit center position adjustments (steering) without activating the over-travel limit switches.
- Powering up the “KAT”[®] Carriage/Compact Oscillator without having a Linear Head connected. To reset, either power down and attach a Linear Oscillator Head or connect a Radial Oscillator Head and reprogram the Oscillator Control accordingly.
 - **WARNING!** Always turn the main power off before connecting/disconnecting the oscillator head cable to/from the “KAT”[®] carriage. Failure to comply may result in control damage.

OPTIONAL ACCESSORIES

GK- 201-121 Optional Audible Buzzer Kit – Includes audible buzzer and wiring harness to interface with the Oscillator Control, providing a programmable duration for the audible warning buzzer to activate before starting an automatic cycle.

REVISIONS LIST

July, 2008

Overall General revision.

Aug, 2010

Title Page Updated Gullco contact details.

Page 9 Updated description of The Center Position Adjustment rotary switch, was a 3 position center maintained toggle switch.

Back Page Updated back page.

Feb, 2013

Title Page Updated Gullco [U.K.] e-mail contact details.

ADDITIONAL NOTES

Specifications and products are subject to change without notice.

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GULLCO



LINEAR or RADIAL
HIGH DEPOSIT RATE
QUICK SETUP TIME

KAT® OSCILLATOR

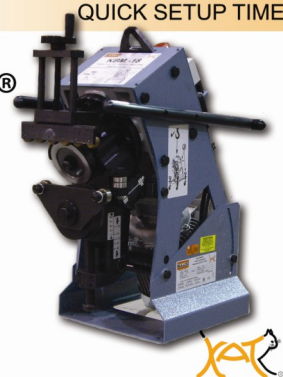
- Motorized weld center line adjustment
- Motorized stroke width
- Oscillation speed control
- Store up to 10 welding programs



PORTABLE PLATE EDGE
BEVELLING MACHINE
QUICK SETUP TIME

KBM®

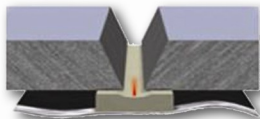
- Produce clean bevels with no thermal distortion
- Bevels angles 22° to 55° (other angles available)
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- Bevels Mild Steel, Stainless Steel, and Aluminium
- Reduce cost and save time by minimising defects and poor fit up



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KATBAK® CERAMIC WELD BACKING

- Eliminate Defects And Rework
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MORE ARC ON TIME

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