

SUPER GUIDE STANDARD

SEAM TRACKER

MODEL WSG-1100

PARTS LIST

AND

OPERATING INSTRUCTIONS

Distributed by:



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OPERATION AND PARTS MANUAL FOR SUPER GUIDE MODEL WSG-1100

1.	Safety Instructions	2 - 3
2.	Introduction	4
3.	Specification	5
4.	Component Parts	
	4-1: Model WS-110, Control Box	6 - 9
	4-2: Model WS-410, Remote Control Pendant	10
	4-3: Model SG-110CL-2, Motorized Cross Slide Assembly	11
	4-4: Model WS-210, Sensing Probe	12
	4-5: Model WS-310, Probe Mount	13
5.	Preparation before Operation	
	5-1: Definition	14
	5-2: Weld Tack Detection	15
	5-3: Work End Detection (Auto Cycle)	15
	5-4: Left/Right, Auto tracking	16
	5-5: Correction Rate	16
6.	Operation	
	6-1: Initial Set-Up	17
	6-2: Control Box Model WS-110	17
	6-3: Sensing Probe Model WS-210	17
	6-4: Remote Control Pendant Model WS-410	17
	6-5: Operation	17
7.	List of Drawings	
	7-1: Parts List, Sensing Probe Model WS-210	18
	7-2: Parts List, Guide Tips	19
	7-3: Parts List, Single Slide Assembly Model SG-110CL	20 - 22
	7-4: Parts List, Limit Switch Case Assembly, P/N. SG-16	23
	7-5: Dimensions, Motorized Cross Slide Assembly Model SG-110CL-2	24
	7-6: Assembly Drawing	25
	7-7: Dimensions, Control Box Model WS-110	26
	7-8: Dimensions, Sensing Probe Model WS-210	27
	7-9: Dimensions, Probe Mount Model WS-310	28
	7-10: Micro Slide Assembly	29
	7-11: Technical Probe Interface Signals/Slide Functions	30 - 31
	7-12: Printed Circuit Board Parts Location Diagram	32
	7-13: Super Guide Model WSG-1100, Wiring Diagram	33

SAFETY INSTRUCTIONS

Although the **Super Guide Seam Tracker** is manufactured for a safe and dependable operation, it is impossible to anticipate those combinations of circumstances which could result in an accident. An operator of the **Super Guide Seam Tracker** 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 the equipment. Become familiar with the machine's operation, application and limitations.

Keep the Operation Manual in a clean area and always at a readily available location for quick reference.

The **Super Guide Seam Tracker** is an accessory item for automatic arc welding. Arc welding is a safe process, if properly done, but arc welding equipment carries high current at significant voltage. Arc is very bright and hot, sparks fly, fume rises, ultra-violet and infra-red energy radiate, weldments are hot, and compressed gas may be used. All safety practices developed from experience in the use of welding and cutting equipment should be followed carefully.

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

ELECTRICAL SHOCK PREVENTION

- ◆ Avoid contact with electrically hot lines and equipment, exposed hot conductors and bare metal parts in welding circuit.
- ◆ Do not stand, sit down, lie, lean on or touch a wet surface when welding.
- ◆ Keep body and clothing dry. Never work in a damp area without adequate insulation against electrical shock.
- ◆ Check welding cables for wear, damages, and replace such cables if badly worn or damaged.
- ◆ Disconnect power main positively to prevent electrical shock before installation, repair and services of the equipment.

EYE AND SKIN PROTECTION:

The welding arc is intense and very bright and it's radiation can burn eyes and skin.

- ◆ Protect eyes and skin from exposure to the arc, and never look at the welding arc without protection.
- ◆ Always use welding helmet or shield with a dense filter plate glass, and wear adequate protective clothing, leather gloves, safety shoes, etc. Replace them immediately if worn or damaged.
- ◆ Never wear wet clothing, gloves and shoes when welding.
- ◆ Always allow for free air circulation at a welding shop.
- ◆ In an open area, surround welding area with low reflective and non-combustible screens or panels.

FIRE AND EXPLOSION PREVENTION:

Causes of fire and explosion are combustibles reached by welding arc, flame, flying sparks, hot slag or heated materials, misuse of compressed gas and cylinders, and short circuits, etc.

- ◆ Do not weld or cut if combustibles are present in welding area. Move work pieces, if practical, to an area free of any combustibles.
- ◆ If work pieces cannot be moved, move combustibles at least thirty-five (35) feet (10 m) away out of reach of sparks or heat from welding.
- ◆ A fire watcher should be standing by with suitable fire extinguishers during and sometime after welding or cutting, when appreciable combustibles are within thirty-five feet (35') (10 m) of welding area.

OTHER SAFETY PRECAUTIONS

Severe discomfort, illness or even death can result from welding fumes, vapors, heat or oxygen enrichment or depletion that welding may produce.

- ◆ Provide adequate ventilation in welding area, but never ventilate with oxygen.
- ◆ Avoid welding operation in a confined area, unless the area is well ventilated, or an operator wears an air-supplied respirator.

ALL SAFETY PRECAUTIONS MAY NOT BE GIVEN IN WRITING. SOME ARE BASED ON COMMON SENSE, BUT OTHERS MAY REQUIRE TECHNICAL BACKGROUND TO EXPLAIN. ALWAYS FOLLOW SAFETY RULES AND PRACTICES ESTABLISHED AT EACH WELDING SHOP.

SUPER GUIDE SEAM TRACKER

MODEL WSG-1100

2. INTRODUCTION

Super Guide Model WSG-1100 offers a practical solution to weld seam tracking and torch positioning in the automation of welding, where a constant torch position, both vertically and horizontally, is required in relation to the joint being welded.

Super Guide Model WSG-1100 allows welding torch position corrected automatically to the accuracy of plus/minus 0.012 inch (0.3 mm) for the variations of weld seam sensed by the system.

The system is compact and light in weight at 42.1 lbs. or 19.2 kg (net total weight without mounting brackets), and is ready for installation to a "KAT" carriage, any other existing carriages or to welding head manipulators.

The system consists of the following main component parts as shown in Fig 1:

- | | |
|-----------------------------------|--|
| 1) Control Box | 2) Remote Control Pendant |
| 3) Motorized Cross Slide Assembly | 4) Sensing Probe and Micro Cross Slide |

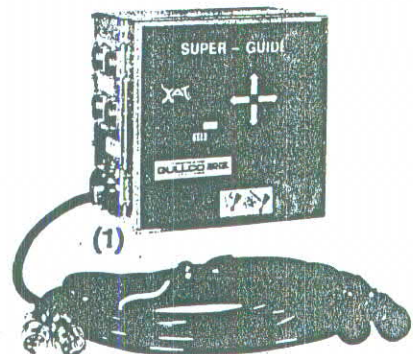
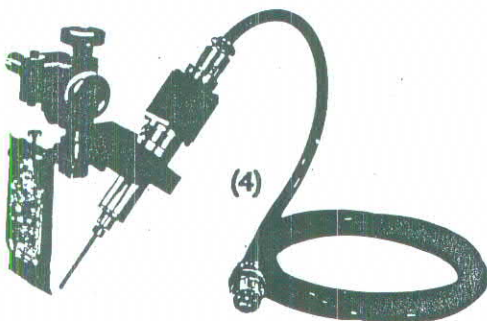
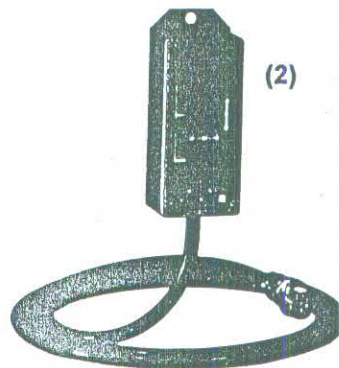
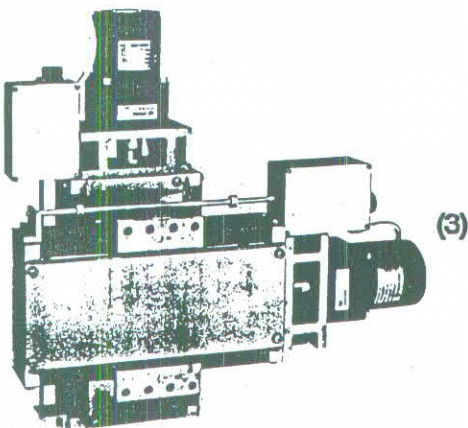


FIG. 1

3. SPECIFICATIONS

- POWER SOURCE:** AC, 115V, Single Phase, 2 amp, 50/60 Hz.
- LOADING CAPACITY:** 55 lbs (25 kg) at 4 inch (100 mm) extension from face plate of slide SG-110CL.
- STROKE LENGTH OF SLIDE:** Standard 4 inch (100 mm) vert. x 4 inch (100 mm) horizontal. (2" (50 mm) and 6" (150 mm) slides available as an option.)
- STROKE SPEED:** Constant speed at 9.4 in/min (240 mm/min) at 60 Hz.
- TRACKING ACCURACY:** Plus/minus 0.012 inches (0.3 mm).
- CONTROL MODE:** **MANUAL:** Up/Down and Left/Right
(All the system functions should be checked at **manual mode** before operating the system at **automatic mode**).
- AUTOMATIC MODE:**
- A. Tracking to both directions
 - B. Tracking to left side (preloaded)
 - C. Tracking to right side (preloaded)
 - D. Tack detection
 - E. Work End Detection.

CROSS SLIDE DRIVE SYSTEM: Ball bushing slides on case hardened steel shaft 1/2" (13 mm) diameter driven through screw shaft by an AC constant speed motor.

MOTOR: 6W reversible motor

NET WEIGHT:

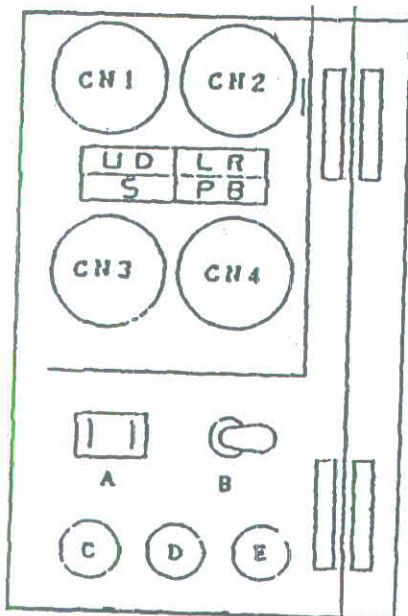
Model WS-110, Control Box with 10 ft. (3 m) power cord	15.4 lbs	(7.0 kg)
Model SG-110CL-2, Motorized Cross Slide Assembly with two (2) 5 ft. (1.5 m)	22.0 lbs	(10.0 kg)
Model WS-410, Remote Control Pendant with a 6.6 ft. (2 m) Control Cable	1.9 lbs	(0.9 kg)
Model WS-210, Sensing Probe with a 6.6 ft. (2 m) control cable	1.1 lbs	(0.5 kg)
Model WS-310, Probe Mount	1.7 lbs	(0.8 kg)
Total System Net Weight Without Mounting Brackets	<u>42.1 Lbs.</u>	<u>(19.2 kg)</u>

4) COMPONENT PARTS

MODEL WS-110 - CONTROL BOX

All solid state controls are used for trouble-free service for many years. Control Box is supplied with a 10 ft. (3 m) power cord for connection to AC, 115V, single phase, 2 amp, 50/60 Hz.

All the control cables should be connected to the Control Box at the initial system set-up before operation. Control box receives signals picked up by Sensing Probe Model WS-210, and drives Motorized Cross Slide Assembly Model SG-110CL-2 for compensations in weld seam, weld tack and work end.



On the side of the control box, four (4) cable receptacles are provided for the system inter-connection as shown on the left.

CN1	:	Up/down slide
CN2	:	Left/Right slide
CN3	:	Sensing Probe
CN4	:	Remote Control Pendant
A	:	Outlet supply, AC, 115V, 1A
B	:	Power on/off switch
D	:	Power Cord
E	:	Fuse, 2A.

4-1-1 FUNCTION

- | | | |
|----|--|--|
| A) | Up/down, left right signal lights: | Each signal light shows the moving direction of slides. |
| B) | Auto/Man - Left/Right, Up/Down: | "Auto" shows automatic mode - "Man" shows Manual Mode. |
| C) | Auto-Cycle (Work End Detection):
Signal Lights: | This light is on while sensing probe detects work face, but when the centering signal light is on, auto-cycle signal light is off. |
| D) | Tac-cut-off (Tack Detection) Light: | This light is on when sensing probe detects a tack. |
| E) | Centering Signal Light: | This light is on when sensing probe has detected weld joint (When sensing probe is at the medium position). |
| F) | Pilot Light: | This light is on when on/off switch is turned on. |
| G) | Tack Detecting On/Off Switch: | Placed in the control box (S2 = Tac on/off). With this switch on, when sensing probe detects a tack the tracking switches from "auto" to "man" automatically, and when sensing probe climbs over a tack the tracking switches from "man" to "auto" automatically. When this switch is turned off, above operation does not function. |

H) **Work End Detecting Switch**

Placed in the control box: (S1 = CY on/off). With this switch on, when sensing probe detects work end, auto tracking switches to manual tracking automatically. With this switch off, operation does not function and the slide goes down without stopping.

I) **Left/right, auto on/off switch**

Placed in the control box: (S3 = L/R auto on/off). With this switch on, when tracking switches to "auto", "up/down" slide goes down automatically first, and then after sensing probe detects work face, "left/right" slide moves automatically.

4-1-2: TIMER SWITCHES IN THE CONTROL BOX MODEL WS-110

a) : In the control box are four timer switches. Each switch has sixteen steps, and the following are time chart.

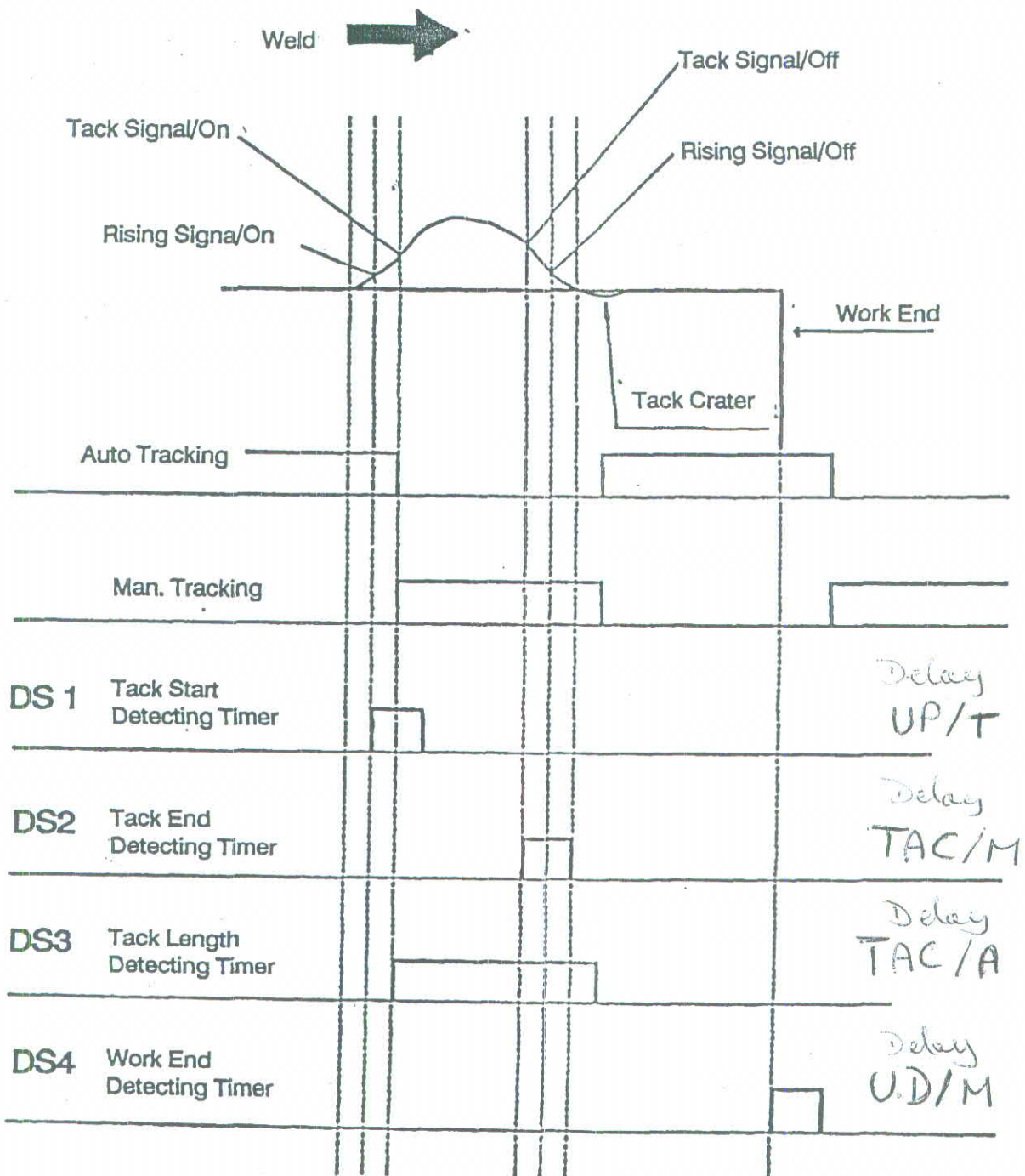
Marking \ Switch Description	Tack Start Rising Timer DS1 = UP/T x 0.1S	Tack End Detecting timer DS2 = Tac/M x 0.1S	Tack Length Detecting timer DS3 = Tac/A x 1S	Work End Timer DS4 = U.D./M x 0.1S
0	0	0	0	0
1	0.1 Sec	0.1 Sec	1 Sec	0.1 Sec
2	0.2	0.2	2	0.2
3	0.3	0.3	3	0.3
4	0.4	0.4	4	0.4
5	0.5	0.5	5	0.5
6	0.6	0.6	6	0.6
7	0.7	0.7	7	0.7
8	0.8	0.8	8	0.8
9	0.9	0.9	9	0.9
A	1.0	1.0	10	1.0
B	1.1	1.1	11	1.1
C	1.2	1.2	12	1.2
D	1.3	1.3	13	1.3
E	1.4	1.4	14	1.4
F	1.5	1.5	15	1.5

b) : The four timer switches are set-up as below at time of shipment:

Tack Rising Timer (DS1) = Scale 3 (0.3 sec)
 Tack End Detecting Timer (DS2) = Scale 5 (0.5 sec)
 Tack detecting timer (DS3) = Scale A (10 sec)
 Work end detecting (up/down) timer (DS4) = Scale 1 (0.1 sec)

NOTE: Setting times to be adjusted according to the welding speed

RELATION OF TACK AND WORK END TIMERS



4-1-3 FUNCTIONS AND ADJUSTMENTS OF THE TIMERS

IN THE CONTROL BOX MODEL WS-110

A) TACK START TIMER (DS1 = UP/T X 0.01S) : Up-Slope Sensitivity

This timer controls the time from rising signal transferred from the sensing probe to the slide movement. Tack is detected during the preset time.

* In case this timer is preset short against welding speed, the tack signal light is on and the tack detecting operation is done even where there is no tack.

* In case this timer is preset long against the welding speed, the sensing probe climbs over the tack without detecting the tack.

B) TACK END TIMER (DS2 = TAC/M X 0.1S) : Down slope Sensitivity

This timer controls the time to switch again the tracking to "auto" mode, after the sensing probe climbs over a tack (when the tack detecting signal turns to "off").

* In case this timer is preset long against welding speed, the tack signal may stay on after tack ends, because switching from tack detecting signal "off" to the tracking "auto" is delayed.

* In case the timer is preset short against welding speed, the slide may move at the end of the tack, because the tack detecting signal switches the tracking to "auto" too quickly after the tack detecting signal turns off.

C) TACK LENGTH DETECTING TIMER (DS3 = TAC/A X 1S) :

This timer is used for setting tack length against welding speed.

FOR EXAMPLE: **WELDING SPEED** - **420 mm/min**
 TACK LENGTH - **10 mm**

420 mm/min divided by 60 seconds = 7 mm/sec

$\frac{10 \text{ (Tack Length)}}{7} = 1.42 \text{ seconds} = 2 \text{ seconds}$

The timer to be adjusted to two (2) seconds.

Note: one second must always be added.

Therefore the setting time is 3 seconds.

Note: refer to the chart 4-1-2A

Continued on next page.....

Functions & Adjustments of the Timers in the Control Box Model WS-110, Cont'd...

* In case the timer is set long against welding speed the tracking keeps climbing over a tack and the switch to "auto" delays.

* In case the timer is set short against welding speed, the tracking switches to "auto" while the tack is detected.

D) WORK END DETECTING TIMER UP/DOWN/MAN (DS4 = U.D/M X 0.1S) :

This timer controls the time to switch up/down tracking from "auto" to "man" with the probe sensor detecting work end (when work end detecting signal switches from "off" to "on").

* In case the timer is set long, up/down slide goes down with the probe sensor detecting work end.

* In case the timer is set short, the tracking may switch from "auto" to "man" with the probe sensor climbing over a tack.

4-2: MODEL WS-410 REMOTE CONTROL PENDANT

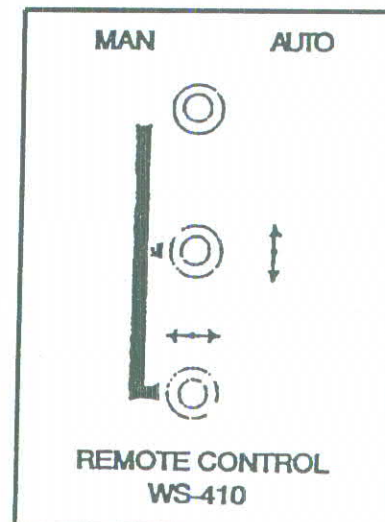
Remote control pendant is supplied with a 6.6 ft (2 m) control cable for connection to control box.

The control panel has the following control switches:

- * **Manual/Automatic Selector Switch (Man/Auto)**
- * **Up/Down Selector Switch (Manual Only)**
- * **Left/Right Selector Switch (Manual Only).**

With Man/Auto selector switch turned to manual, when each switch is turned on, corresponding lamp is lit and the slide moves.

When this switch is turned to "auto" slides move automatically.



NOTE: Remote Control Pendant should be kept ready at hand with an operator for an immediate operation control. All control will be made by remote control pendant after the initial system set-up and control panel switch setting.

MODEL SG-110CL-2 - MOTORIZED CROSS SLIDE ASSEMBLY

(MODEL SG-110CL, SINGLE SLIDE ASSEMBLY)

Cross slide assembly is a light and compact unit with two (2) single motorized slide assemblies combined for the X - Y positioning of a welding torch and sensing probe.

The slide frame is made of bottom and end plates (aluminum) and sheet metal panels (stainless steel) to reduce the weight to the maximum, but it is made robust enough to carry the rated load.

The slide assembly is driven through precision ball bushing on case hardened slide shafts by a screw shaft and AC constant speed motor with reducing gear. Two (2) limit switches are provided in the limit switch case to prevent slide base from over-running against end plates at both ends of the stroke. The two overrun stop dogs are provided on stop rod, which are preset at the factory to the full stroke length.

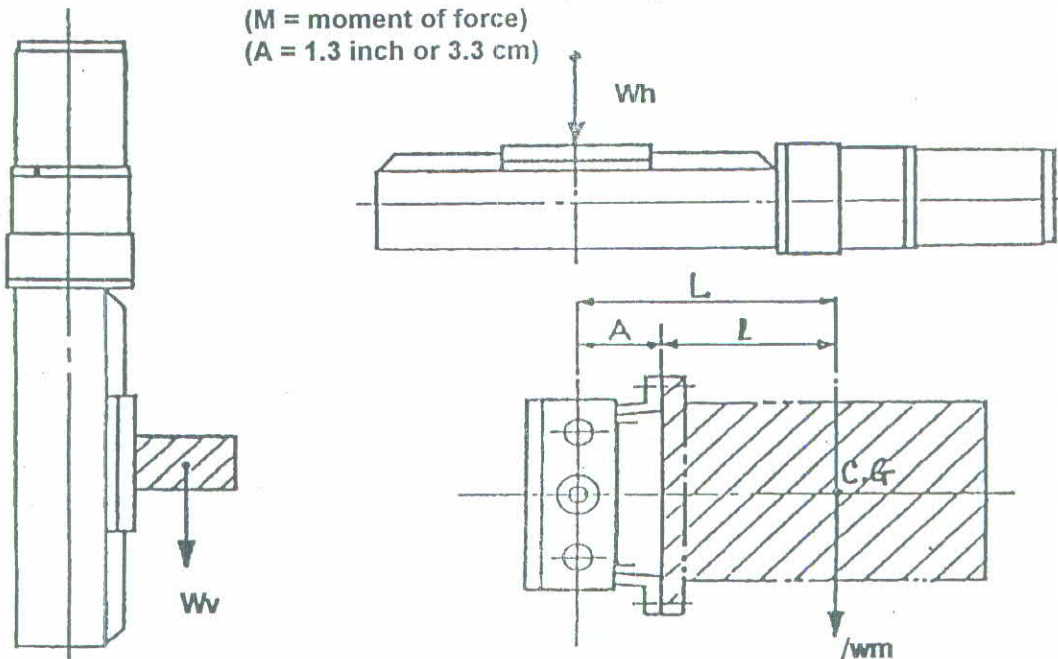
CAUTION: The limit switch function should always be checked before a day's operation for a safe operation. Drive motor may be damaged, if slide base overruns against the end plates.

STANDARD STROKE: 4 inch vertical x 4 inch horizontal (100 mm vert. x 100 mm horiz.) 2 inch (50 mm) and 6 inch (150 mm) stroke. Length available as an option. Refer to Drawings for slide assemblies)

STROKE SPEED: 9.4 inc/min. (240 mm/min) at 60 Hz.

LOADING CAPACITY: 55 lbs. (25 kg) at 4 inch (100 mm) extension from the face plate. (216 lb.in = 250 kg/cm). Refer to the sketch below for loading capacity.

W_v = Vertical load at 55 lbs. (25 kg) maximum
 W_h = Horizontal load at 88 lbs. (40 kg) maximum
 1 = $M/W = 1.3$ inch (3.3 cm)
(M = moment of force)
($A = 1.3$ inch or 3.3 cm)



4-4: MODEL WS-210, SENSING PROBE

Sensing probe is supplied with a 6 foot (2 m) control cable. Sensing probe is both up/down and left/right directions detecting device, and will be energized for the signal pick-up, when a light pressure of 4 oz. (960 grm) is applied on top of a sensing tip.

Sensing probe is highly sensitive to variations in the weld seam to plus/minus 0.012 inch (0.3 mm).

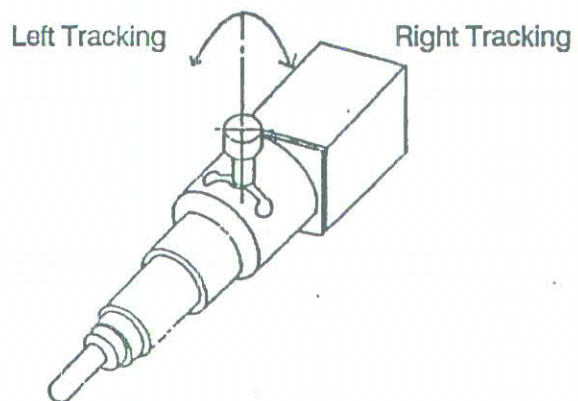
All signals picked up by sensing probe are transferred to control box, and are amplified to drive motorized cross slide assembly in X - Y direction to compensate variations in the weld seam.

The length of tip assembly from sensing probe end to tip end is 2-1/4" (58 mm). If the sensing tip assembly is longer than 2-1/4" (58 mm), it will lower the detecting accuracy.

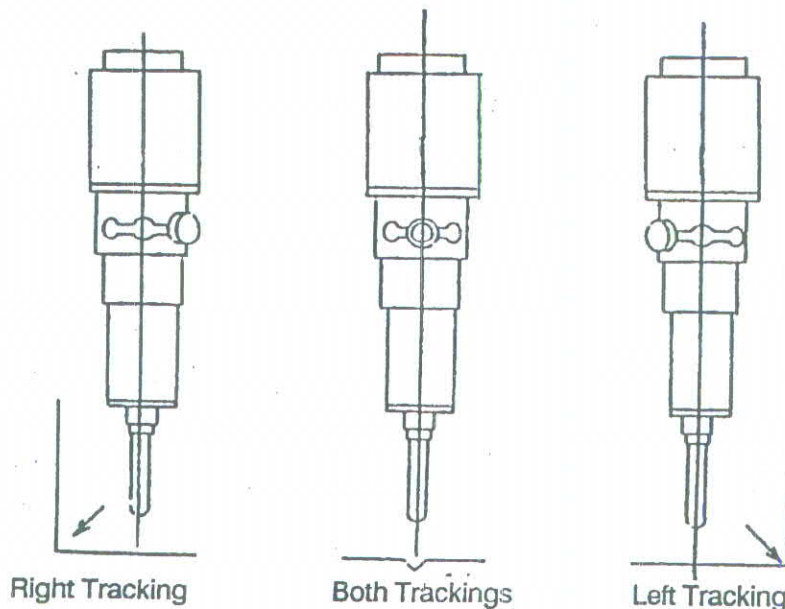
TRACKING DIRECTIONS SELECTION

Both Trackings:

Tracking Directions can be selected as below:



Control knob should be loosened then moved in left/right or center and tightened again.



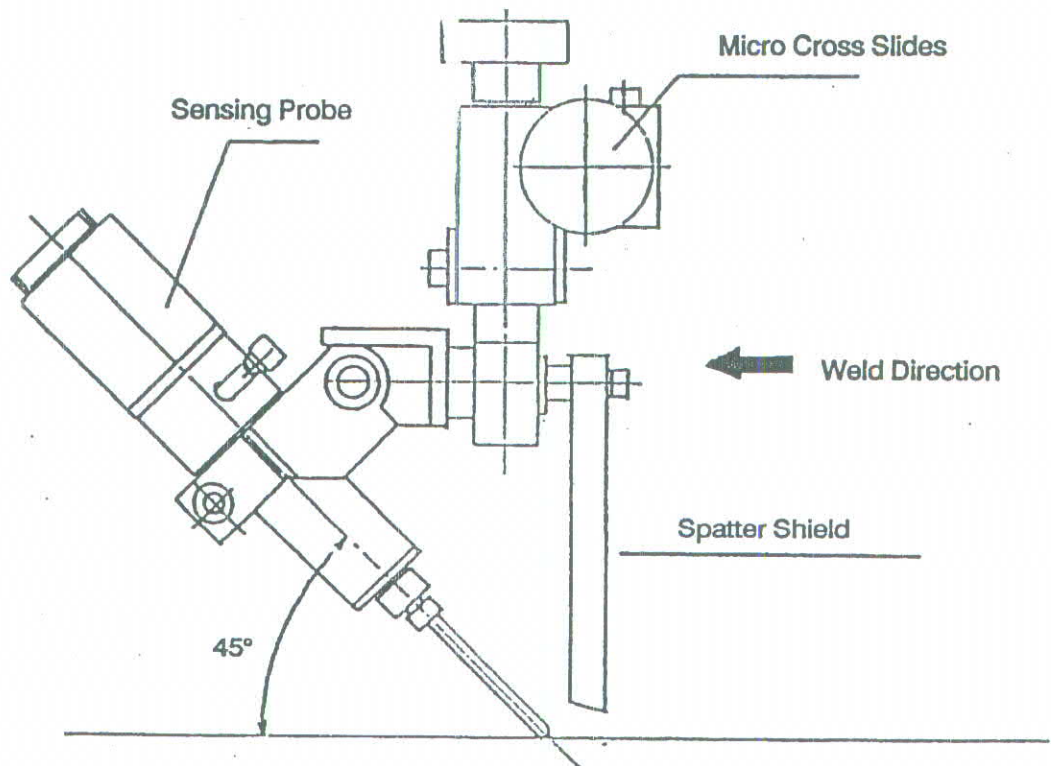
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4-5: MODEL WS-310, PROBE MOUNT

This is a miniature manual cross slide combined with probe holder for the fine adjustment of the sensing probe to the stroke of 3/4 inches (20 mm) vertically and horizontally for the torch positioning.

Probe holder is included to 45° to base metal, when the vertical axis is set perpendicular.

Please refer to the sketch below:



630-50

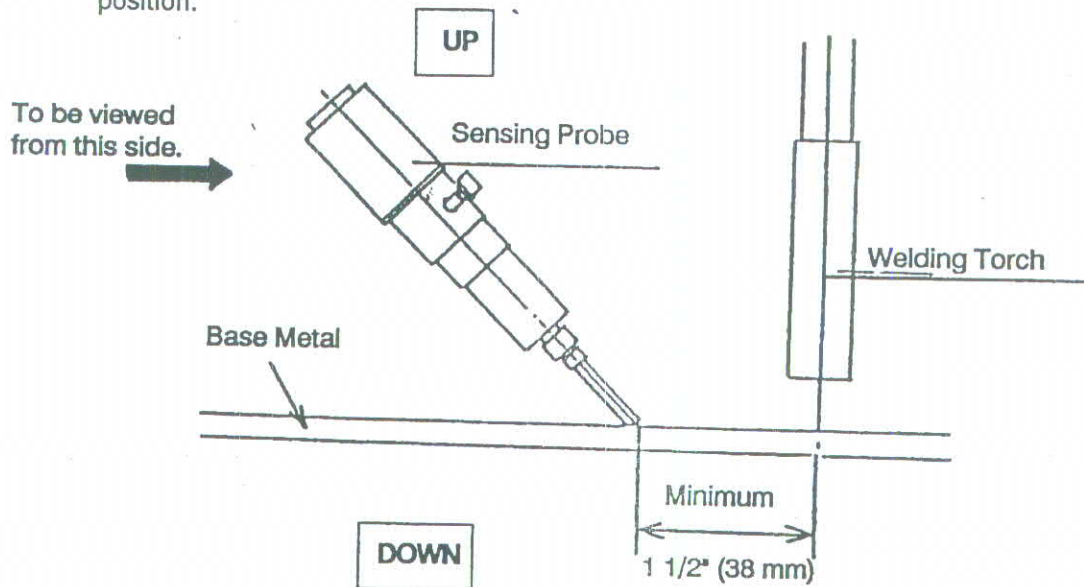
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5. PREPARATION BEFORE OPERATION

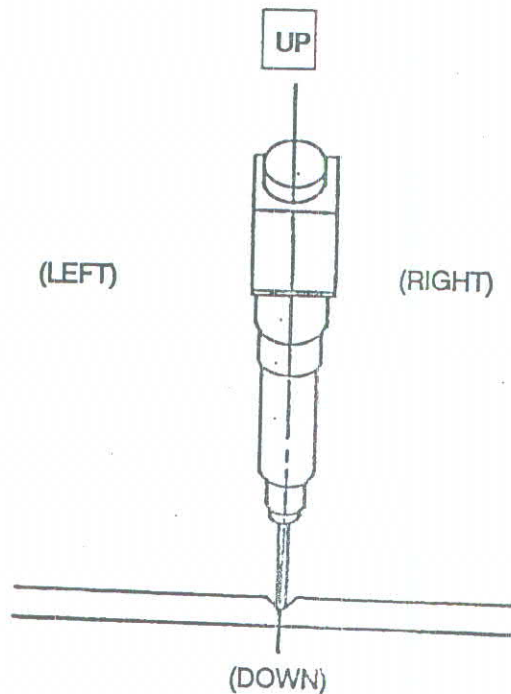
5-1: DEFINITION

When operating the Super Seam Tracker, positioning of sensing probe such as up/down and left/right in relation to weld torch is important.

- a) "Down" means any movement of slide coming closer to weld seam. And "Up" means any movement going away from weld seam, regardless of welding position.

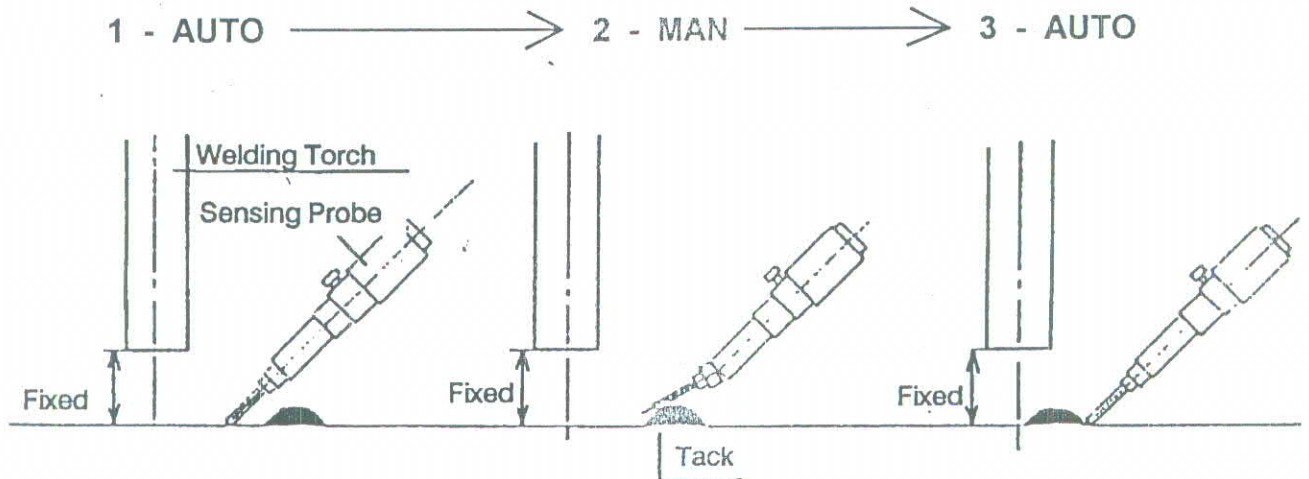


- b) Left/Right "Left/Right" should be viewed from the rear of sensing probe as shown in the sketch below:



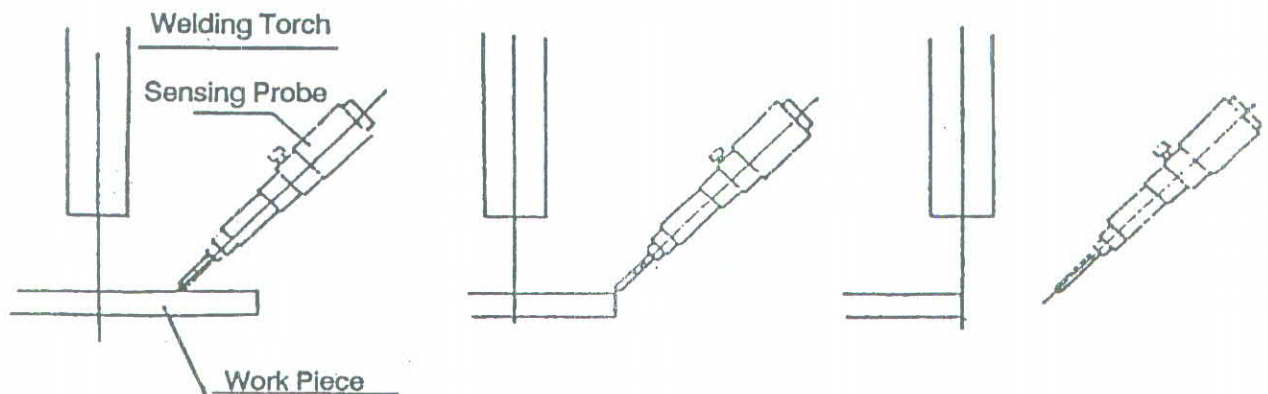
5-2: WELD TACK DETECTION (Tack Cut-Off)

This function means that sensing probe detects a tack, stops tracking movement during the time, and after sensing probe climbs over the tack, it recovers tracking function again.



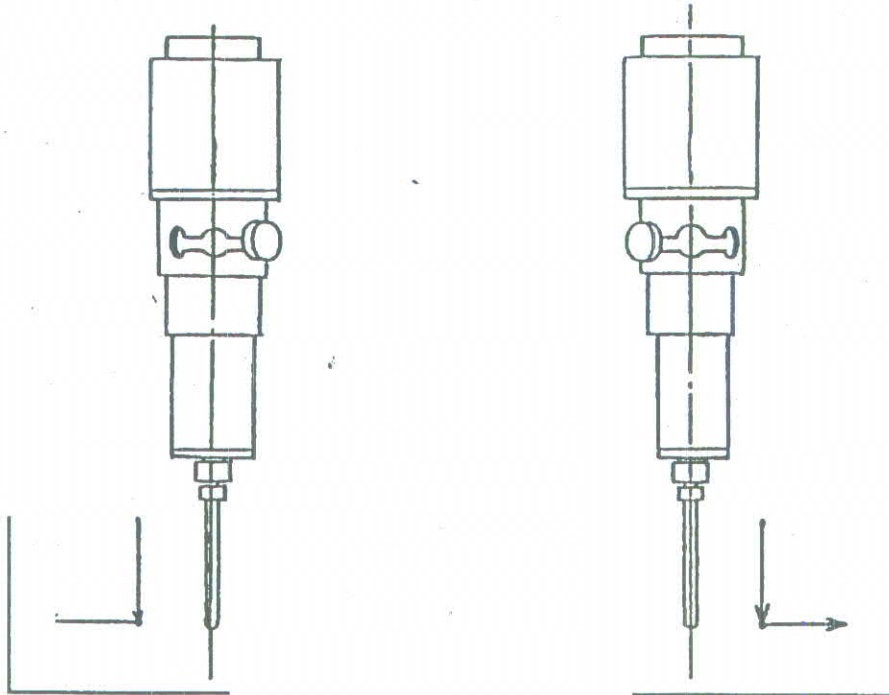
5-3: WORK END DETECTION (Auto Cycle)

This function is to detect end of work piece, then the seam tracker goes into "man" (hold) cycle to enable welding to continue until work end.



5-4: LEFT/RIGHT, AUTO TRACKING

When this control knob is positioned as shown, left or right tracking is automatic.



5-5: CORRECTION RATE

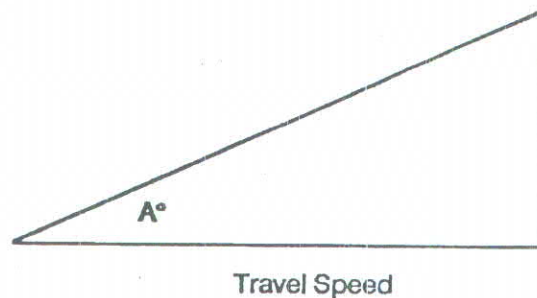
The maximum deflection that can be tracked is dependent upon the travel speed.

SLOWER TRAVEL SPEED
FASTER TRAVEL SPEED

-
-

MORE DEFLECTION CAN BE TRACKED
LESS DEFLECTION CAN BE TRACKED

The following information is given as a guideline for the correction rate that this system can achieve.



Stroke Speed
9.4 in/min (239 mm/min)

THE MAXIMUM CORRECTION RATE $A^\circ = \tan^{-1} \times \frac{\text{SLIDE STROKE SPEED}}{\text{TRAVEL SPEED}}$

See an example:

Travel Speed:

23 inch/min (584 mm/min)

Slide Stroke Speed:

9.4 in/min (239 mm/min)

Maximum Correction Rate:

$A^\circ = 22^\circ$ or less within the system stroke

6. OPERATION

6-1: INITIAL SET-UP

Mount cross slide assembly on "KAT" carriage, any other traveling carriage or a welding head manipulator. Locate control box at an appropriate position convenient for operation.

Keep remote control pendant ready at hand, and prepare a traveling system ready at the starting position for welding.

6-2: CONTROL BOX MODEL WS-110

- a) Connect all control cables to the control box. Refer to 4-1: Control box of this manual for the connection.
- b) Connect power cord to power main, AC, 115V, 50/60 Hz., single phase.
- c) Turn power switch on, and pilot lamp will turn on.
- d) Select tracking mode, side tracking or both directional tracking as desired, on selector switch.
- e) Select right side tracking or left side tracking when side tracking is selected. Right side/left side tracking selector switch will not work when both directional tracking mode is selected.
- f) Tracking functions are displayed on four (4) function indicating lights.

6-3: SENSING PROBE MODEL WS-210

Install sensing probe as shown in 4-4: Sensing Probe of this manual.

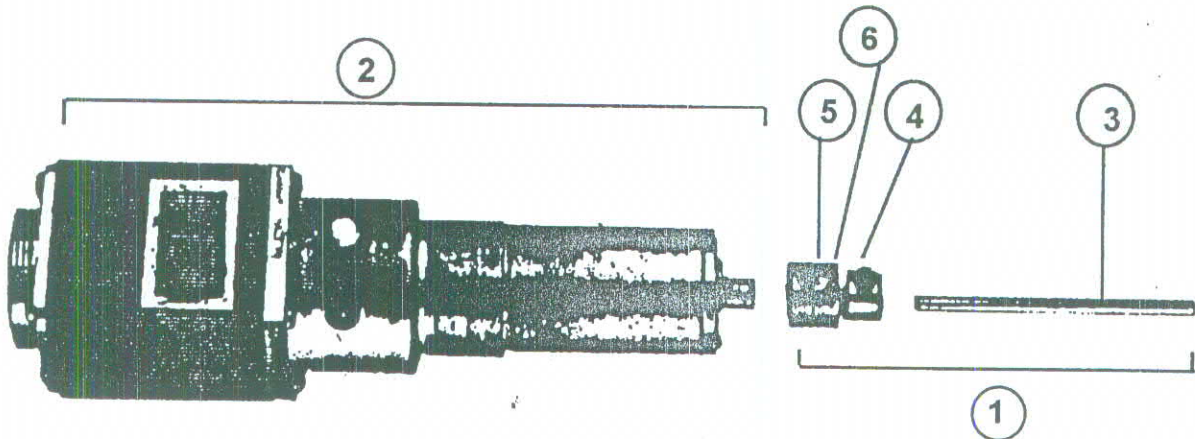
6-4: REMOTE CONTROL PENDANT MODEL WS-410

Turn "man/auto" selector switch to "man" position and align welding torch and sensing probe to a weld seam. Cross slide assembly should be at the center position before starting the system for automatic operation.

6-5: OPERATION

- a) Turn "man/auto" selector switch in remote control pendant to "auto" position, and now the system is ready for operation. Start arc for automatic welding with "KAT" carriage or any other traveling system.
- b) Turn selector switch to "man" position when welding is finished at the end of welding seam and lift up welding torch and sensing probe off base material by up/down toggling switch in remote control pendant. Return to the starting position for the next welding cycle with welding torch and sensing probe lifted up off the base material.

PARTS LIST FOR MODEL WS-210 SENSING PROBE



PARTS LIST FOR MODEL WS-210 SENSING PROBE

REF	P/N	DESCRIPTION	QTY
1.	WS-1	Shock Protector and Guide Tip Assembly	
2.	WS-2	Sensor Body Assembly	1
3.	WS-3	Steel Rod, 3.2 mm diameter x 45 mm long	1
4.	WS-4	Set Screw, M4 x 4	1
5.	WS-5	Set Screw, M4 x 4	1
6.	WS-6	Shock Protector	1

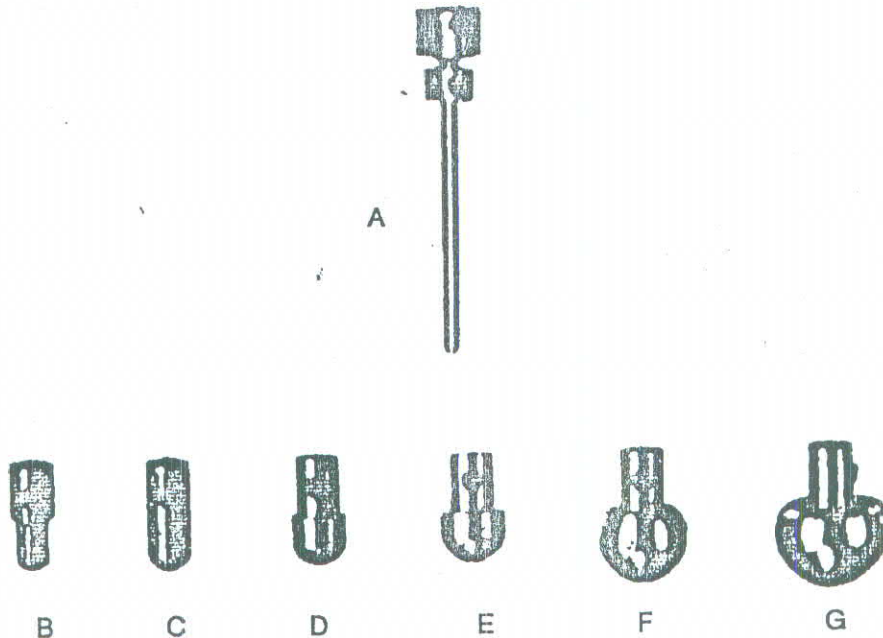
NOTE: The Shock protector, WS-6, may break to protect other components when the guide tip runs into too big disturbances.

CAUTION: The sensor body assembly, WS-2, should not be disassembled by a customer.

WARRANTY WILL BE VOID IF THE SENSOR BODY IS DISSASSEMBLED.

PARTS LIST FOR GUIDE TIPS FOR MODEL WS-210 SENSING PROBE

The following guide tips are available as standard tips for use with Model WS-210 sensing probe.



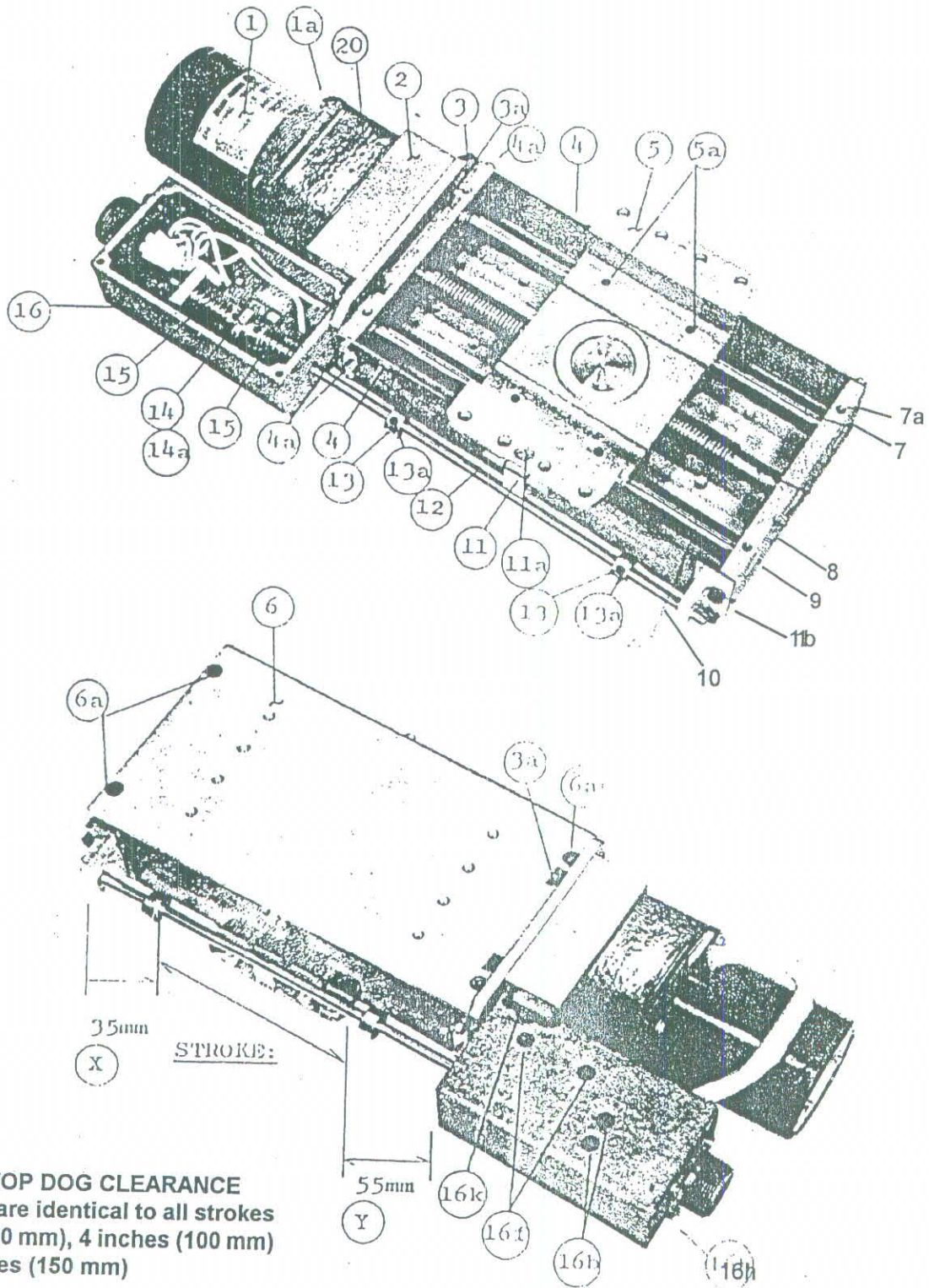
PARTS LIST FOR STANDARD GUIDE TIPS

REF	P/N	DESCRIPTION
A	WS-1	Shock Protector and Guide Tip Assembly
B	TP-6-KC	Standard ball type Guide Tip, made of stainless steel, 0.236 inches (6 mm) dia.
C	TP-8-KC	Standard ball type Guide Tip, made of stainless steel, 0.314 inches (8 mm) dia.
D	TP-10-KC	Standard ball type Guide Tip, made of stainless steel, 0.393 inches (10 mm) dia.
E	TP-12-KC	Standard ball type Guide Tip, made of stainless steel, 0.472 inches (12 mm) dia.
F	TP-16-KC	Standard ball type Guide Tip, made of stainless steel, 0.629 inches (16 mm) dia.
G	TP-20-KC	Standard ball type Guide Tip, made of stainless steel, 0.787 inches (20 mm) dia.

PARTS LIST MODEL SG-110CL

MOTORIZED SINGLE SLIDE ASSEMBLY

(STROKE: 4 INCHES OR 100 MM)



NOTE: STOP DOG CLEARANCE
"X and Y" are identical to all strokes
2 inches (50 mm), 4 inches (100 mm)
and 6 inches (150 mm)

PARTS LIST FOR MOTORIZED SLIDE ASSEMBLY

MODEL SG-110-CL

REF.	P/N	DESCRIPTION	QTY
1.	SG-1	AC Motor (2RK6GK-A2)	1
	SG-1a	Round head screw M4 x 55	4
2.	SG-2	Motor Mounting Base (A1)	1
3.	SG-3	Front End Plate (A1)	1
	SG-3a	Socket Head Screw, M4 x 15	4
4.	SG-4-110	Side Panel (Stainless Steel)*	2
	SG-4a	Round Head Screw, M4 x 6	6
	SG-4b	Round Head Screw, M4 x 14	2
5.	SG-5	Slide Base (A1)	1
	SG-5a	Set Screw, M4 x 5	4
	SG-5b	Ball Bushing, BM13232UU	4
	SG-5c	Spacer	2
6.	SG-6-110	Base Plate (A1)*	1
	SG-6a	Socket Head Screw, M4 x 12	4
7.	SG-7-110	Slide Shaft*	2
	SG-7a	Set Screw, M4 x 5	4
	SG-7b	Retainer Ring, 10 mm diameter	2
8.	SG-8-110	Screw Shaft*	1
	SG-8a	Front Bearing, 6201ZZ	1
	SG-8b	Rear Bearing, L-627ZZ	1
9.	SG-9	Rear End Plate (A1)	1
10.	SG-10	Stop Rod Support	1
11.	SG-11	Stop Rod Striker	1
	SG-11a	Screw (plus), M4 x 10	1
12.	SG-12-110	Stop Rod (Stainless Steel Tubing)*	1

NOTE:

*Those parts marked * are with "-110" in the part number for 100 mm stroke. Specify "105" for 50 mm stroke and "115" for 150 mm stroke.*

PARTS LIST FOR MOTORIZED SLIDE ASSEMBLY

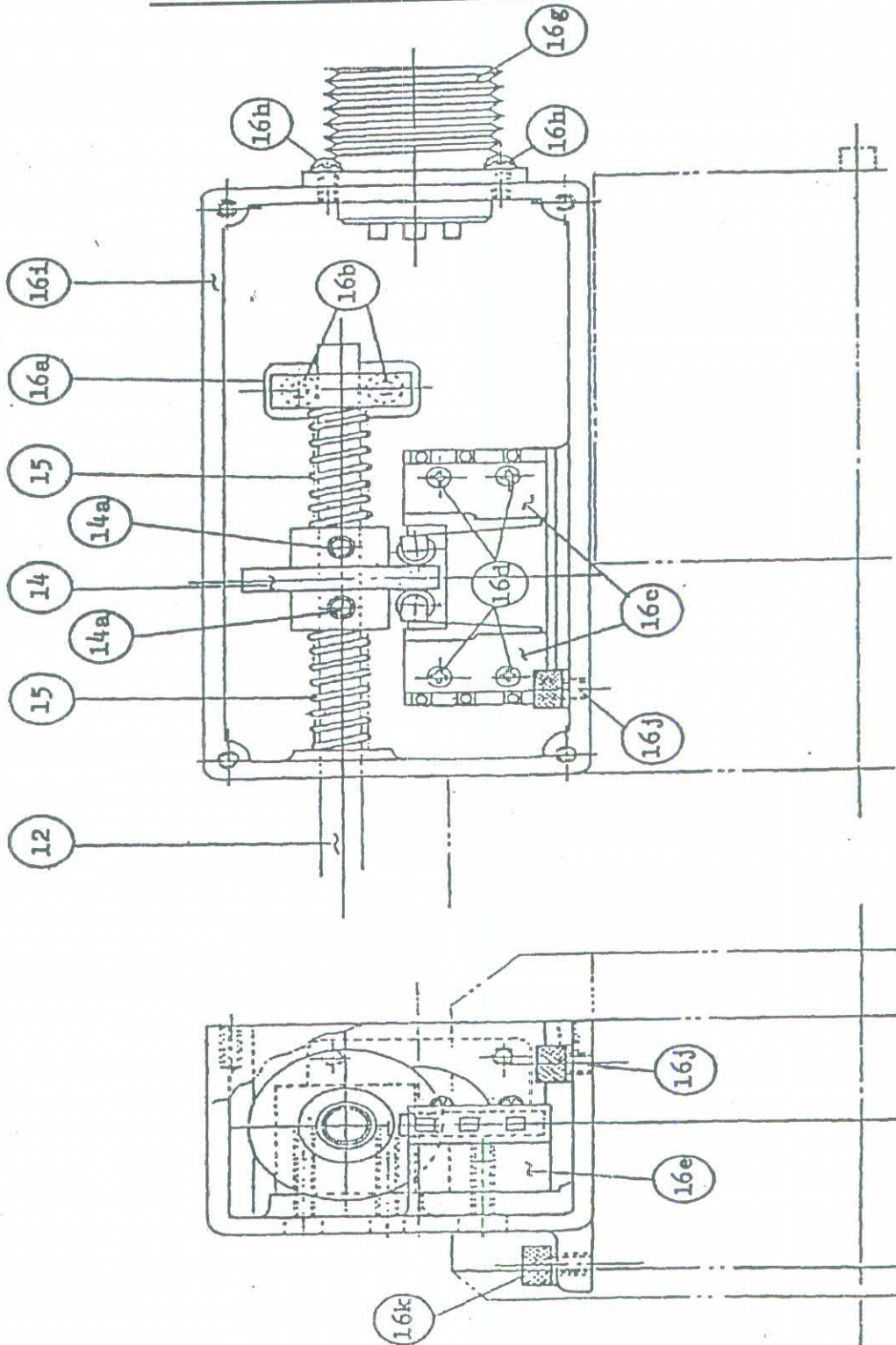
MODEL SG-110CL

REF	P/N	DESCRIPTION	QTY
13.	SG-13	Overrun stop dog	2
	SG-13a	Set Screw	2
14.	SG-14	Limit Switch Dog	1
	SG-14a	Set Screw, M4 x 5	2
15.	SG-15	Limit Switch Dog Spring	2
16.	SG-16	Limit Switch Case Assembly	1
	SG-16a	Stop Rod Support	1
	SG-16b	Socket Head Screw, M3 x 10	2
	SG-16c	Limit Switch, S-5GL2	2
	SG-16d	Round Head Screw, M2 x 12	4
	SG-16e	Limit Switch Insulator (Bakelite)	1
	SG-16f	Socket Head Screw, M3 x 10	2
	SG-16g	Receptacle, MS3102AS16S-1P	1
	SG-16h	Round Head Screw, M3 x 8	4
	SG-16i	Limit Switch Case (A1)	1
	SG-16j	Socket Head Screw, inside, M4 x 12	1
	SG-16k	Socket Head Screw, outside, M4 x 14	1
17.	SG-17	Front Cover (Stainless Steel)	1
	SG-17a	Round Head Screw, M4 x 6	4
18.	SG-18	Limit Switch Case Cover (Stainless Steel)	1
	SG-18a	Round Head Screw, M3 x 8	4
19.	SG-19	Limit Switch Case & Stop Rod Assembly, including items REF 12 through 18 as a complete assembly	1
20.	2GK-18	Gear Head for AC Motor, Speed Ratio: 18:1	1
		(Other speed ratio available as an option)	

PARTS LIST - 2,

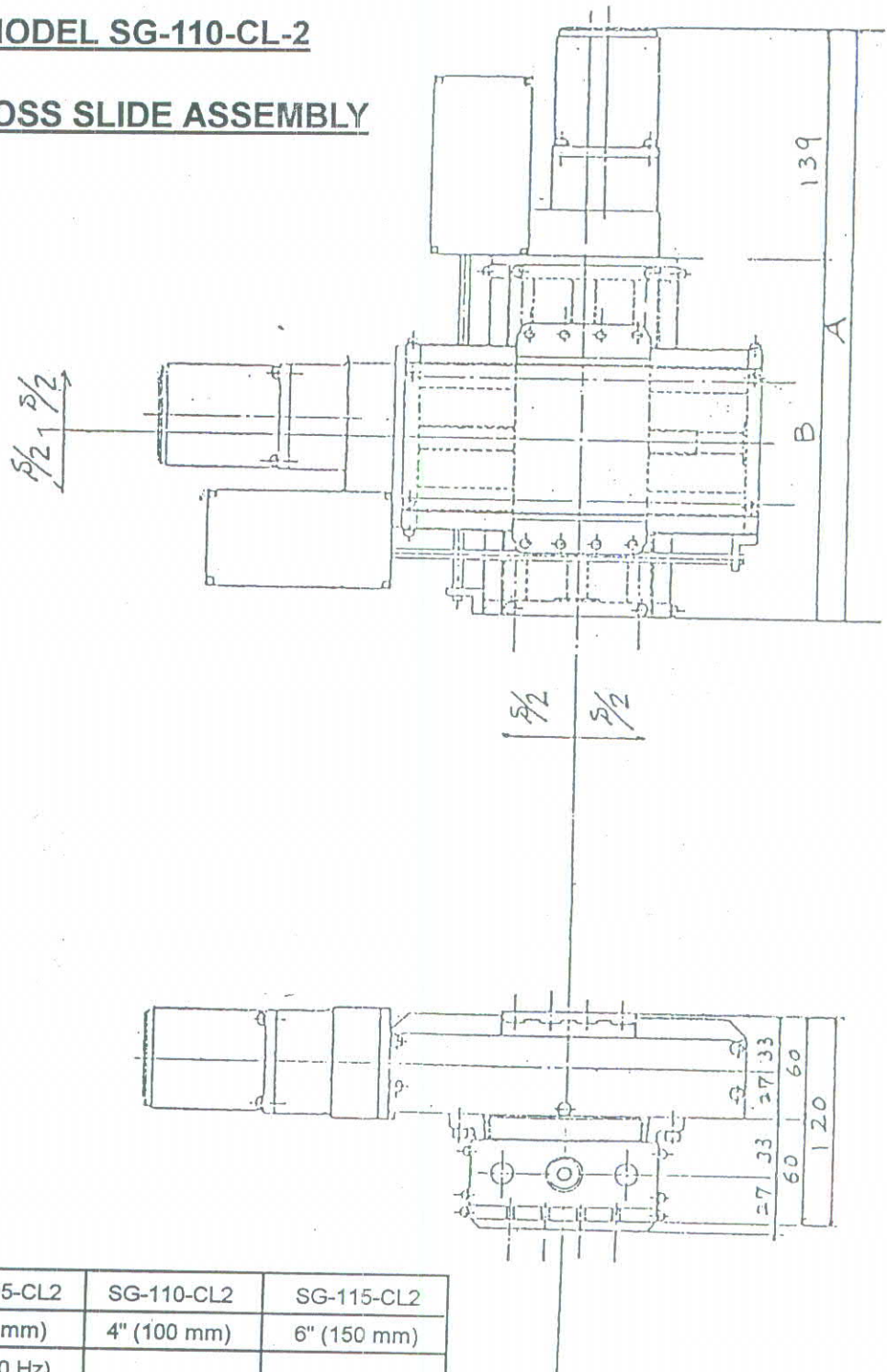
P/N SG-16 LIMIT CASE ASSEMBLY

FOR SG-110CL SLIDE ASSEMBLY



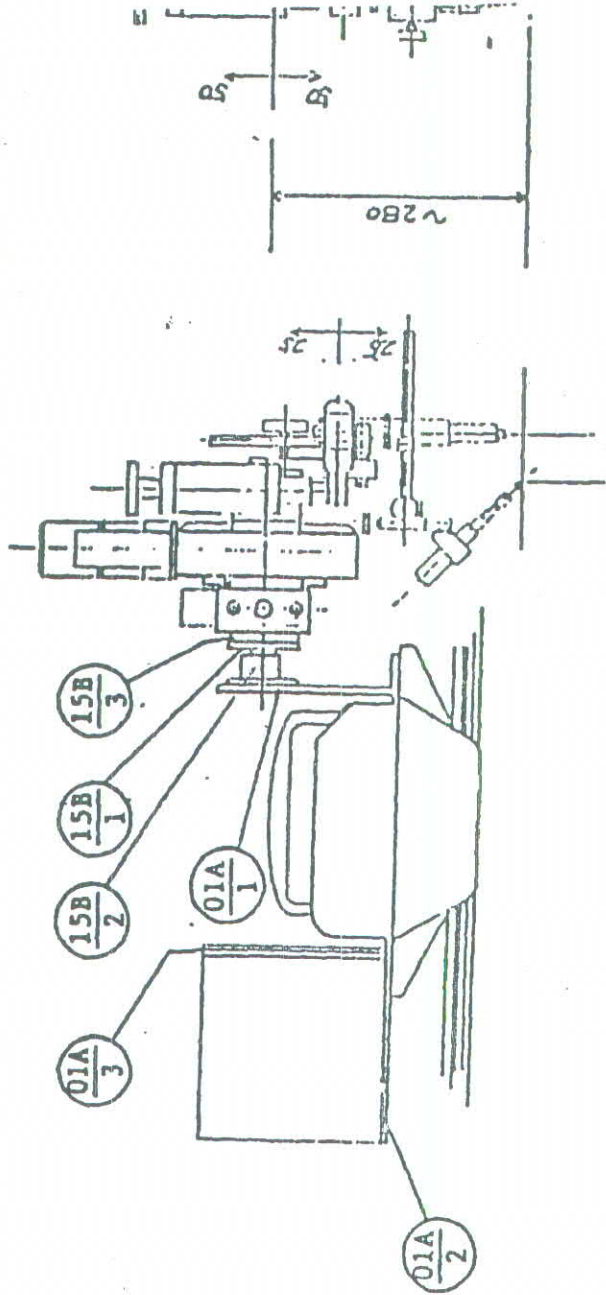
DIMENSIONS - MODEL SG-110-CL-2

MOTORIZED CROSS SLIDE ASSEMBLY



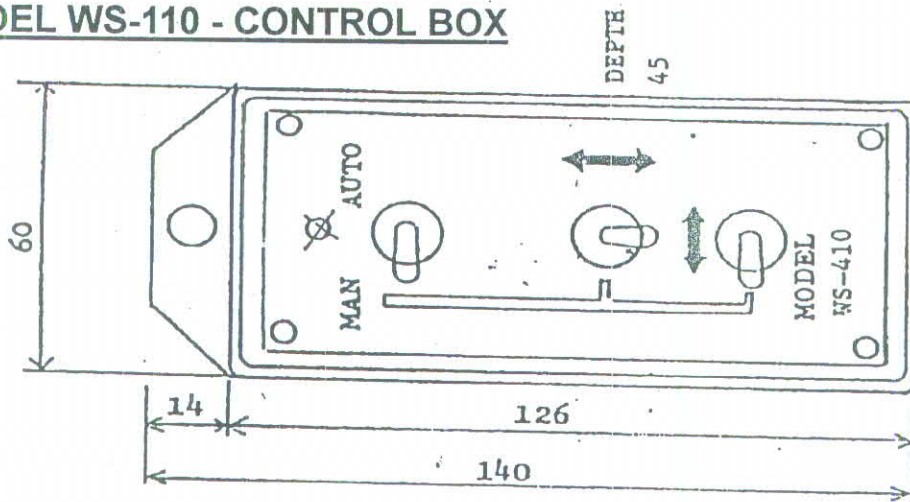
MODEL	SG-105-CL2	SG-110-CL2	SG-115-CL2
Stroke	2" (50 mm)	4" (100 mm)	6" (150 mm)
Speed (mm/min)	240 (60 Hz)		
A (mm)	289	339	389
B (mm)	150	200	250
Max. Load (kg)	25	25	25
Moment (kg/cm)	400	250	100
Net Weight	7.4 kg	8.4 kg	10.0 kg

DRAWING NO: SG-110-CL-02A-1

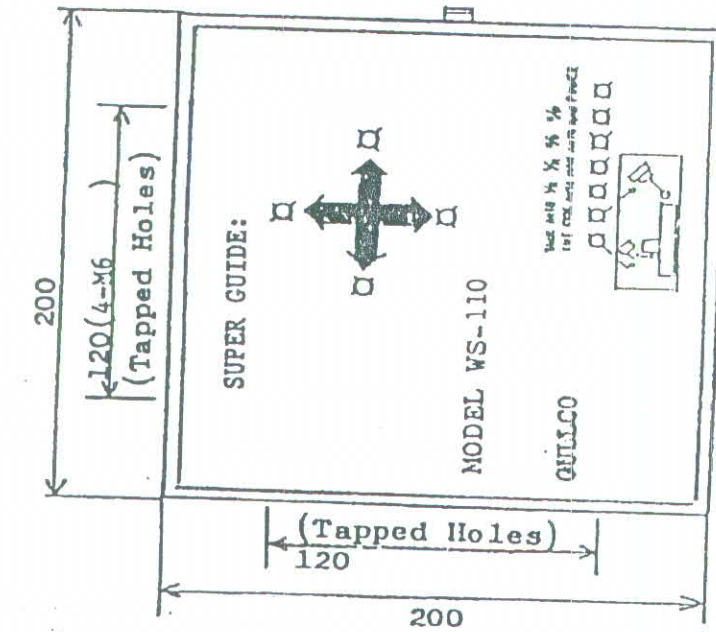


DIMENSIONS SKETCH MODEL WS-410 REMOTE CONTROL PENDANT

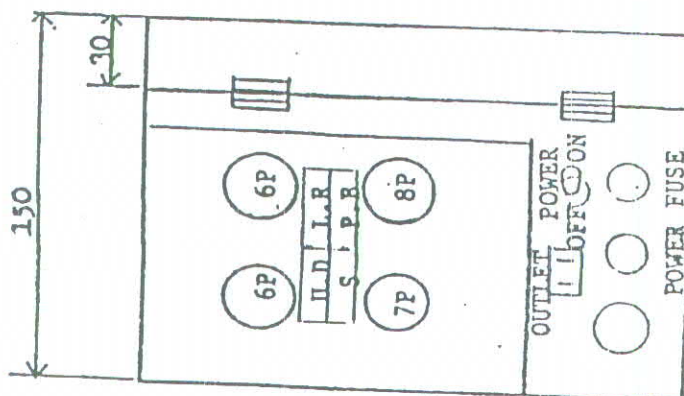
MODEL WS-110 - CONTROL BOX



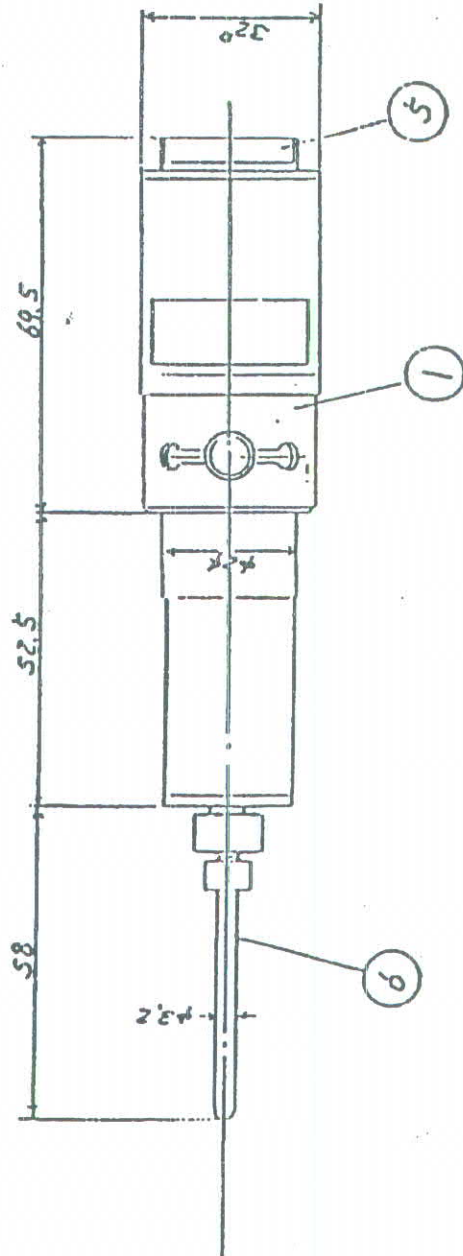
MODEL WS-410 REMOTE CONTROL PENDANT



MODEL WS-110 CONTROL BOX

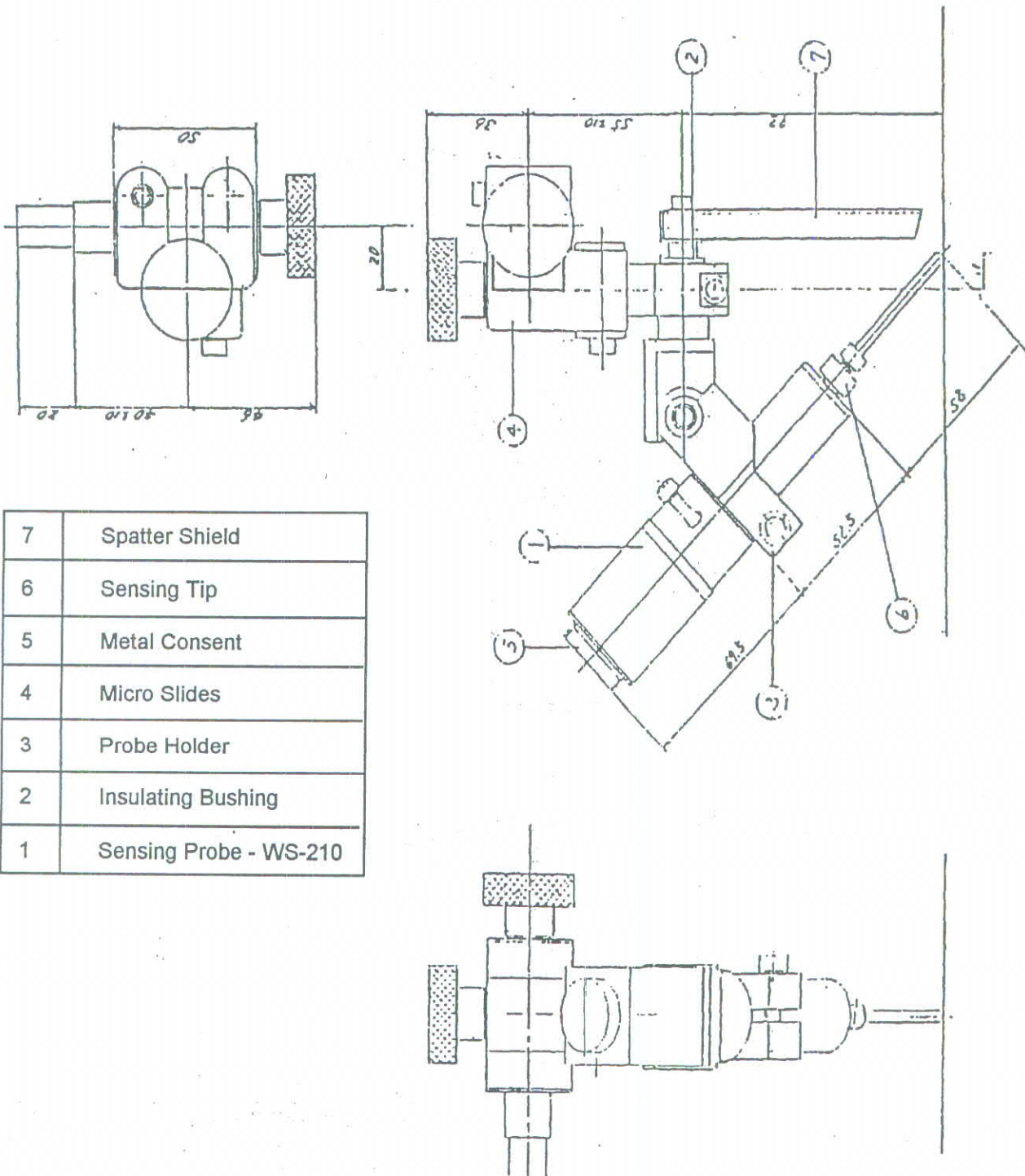


SENSING PROBE WS-210



GULLCO INTERNATIONAL LIMITED	
6	Sensing Tip
1	Sensor Body
5	Receptical for Control Cable

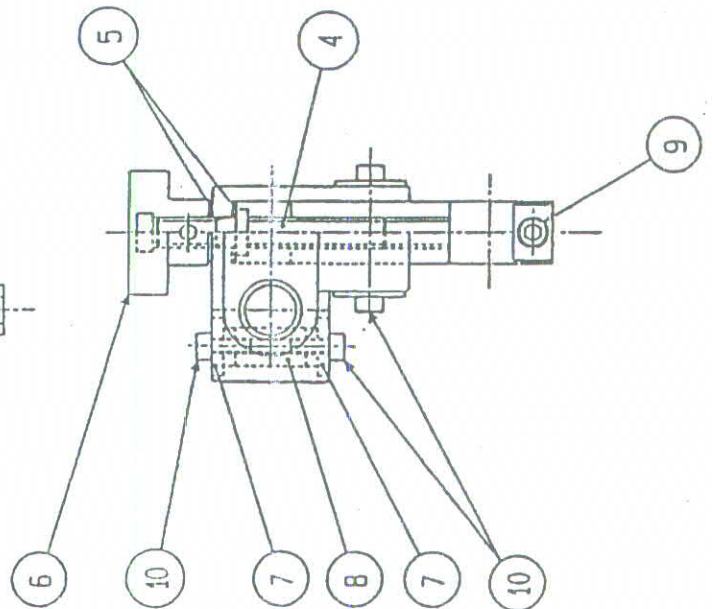
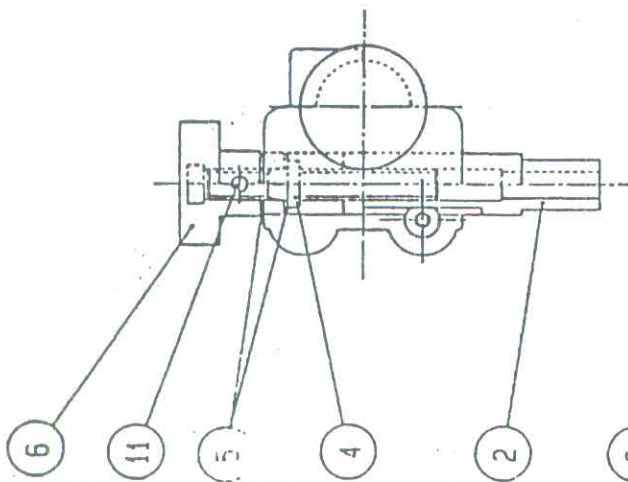
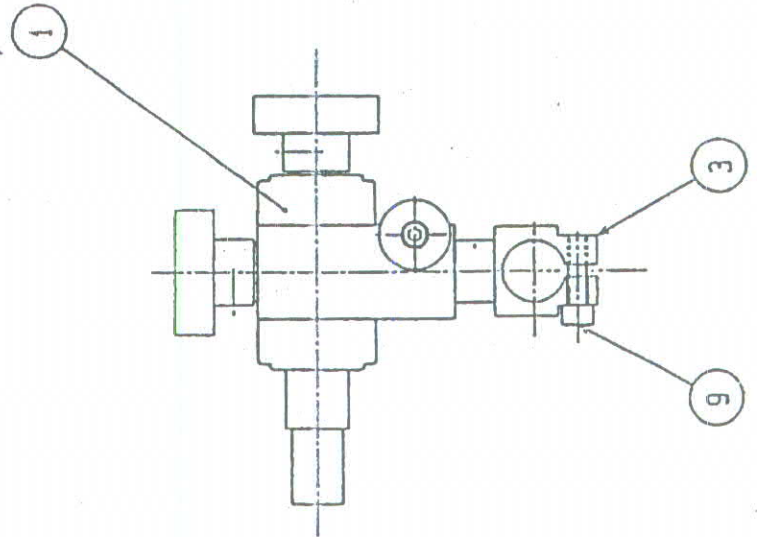
MODEL WS-310 - PROBE MOUNT



7	Spatter Shield
6	Sensing Tip
5	Metal Consent
4	Micro Slides
3	Probe Holder
2	Insulating Bushing
1	Sensing Probe - WS-210

MICRO SLIDE ASSEMBLY - PART NO. TH-300-RA

No.	Description	Qty
11	Roll Pin	2
10	S.H. Screw - M4 x 10	4
9	S.H. Screw - M5 x 20	1
8	Cotter Pin	2
7	Washer	4
6	Thumb wheel	2
5	Thrust Washer	4
4	Slide Screw	2
3	Slide Shaft (B)	1
2	Slide Shaft (A)	1
1	Mount Block	1

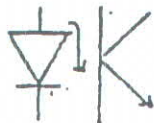


TECHNICAL BULLETIN "PROBE INTERFACE SIGNALS"

OPTIONAL FUNCTION:

The following signals can be picked up to interface Super Guide with another electric equipment.

- (a) The signals stated below are provided with the Connector **CN10** on the printed circuit board **SP-1X-A**.
1. Signal showing that **sensing probe** is at "Centering Position"
.....Pick up Pins Nos. 1 and 2 on the Connector.
 2. Signal showing that **sensing probe** is under "tack detection".
.....Pick up Pins Nos. 3 and 4 on the Connector.
 3. Signal showing that **sensing probe** is under "Work End Detection".
.....Pick up Pins Nos. 5 and 6 on the Connector.
- (b) Rated output is DC 25V., 40 mA and do not overload.
- (c) Output is earned by means of "open collector".

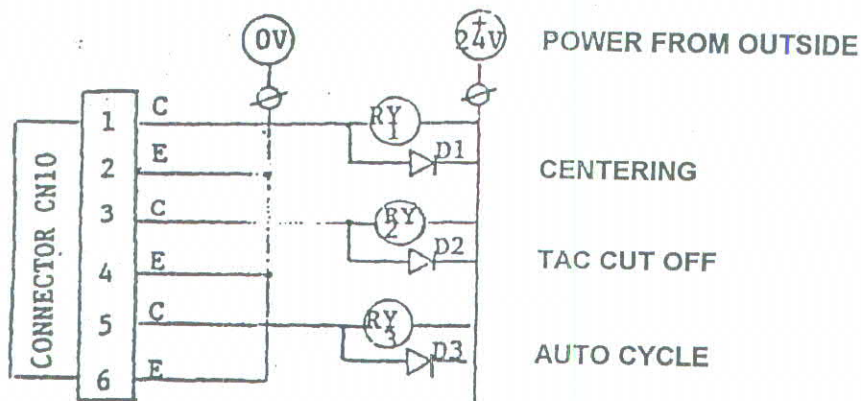


COLLECTOR PINS NOS: 1, 3 AND 5

EMITTER PINS NOS: 2, 4 AND 6

- (D) Get Power Supply outside to drive other equipments.

WIRING EXAMPLE:



CAUTION:

1. Outside power supply to be less than DC 24 volt.
2. Relays to be identified as MY4, HH54P.
3. Do not fail to equip diodes.

TECHNICAL BULLETIN: "SLIDE FUNCTIONS"

SWITCHES IN THE CONTROL BOX MODEL WS-110

(a) When the L/R auto on/off switch in the control box (S3 = L/R auto on/off) is on, and the tracking is switched to "auto", the up/down slide first goes down automatically and then, after the sensing probe detects the work face, the left/right slide starts to move automatically, either left or right depending on the direction switch setting.

(b) The L/R on/off switch placed in the control box (S3) will not work under the following conditions:

- * Guide tip does not slide smoothly on the work surface due to roughness of the surface.
- * The work surface is slant up toward moving direction.
- * CY on/off switch (auto cycle) is turned to "off". The sensing probe will be moved down, but not left/right when the switch is turned to "off".

(c) Up/Down change-over switch - Placed in the control box - (S1).

Change-over of up/down is made with this switch when up/down slide is fitted conversely. Note that the switch has three steps, the second is for neutral position and the slide is not moved.

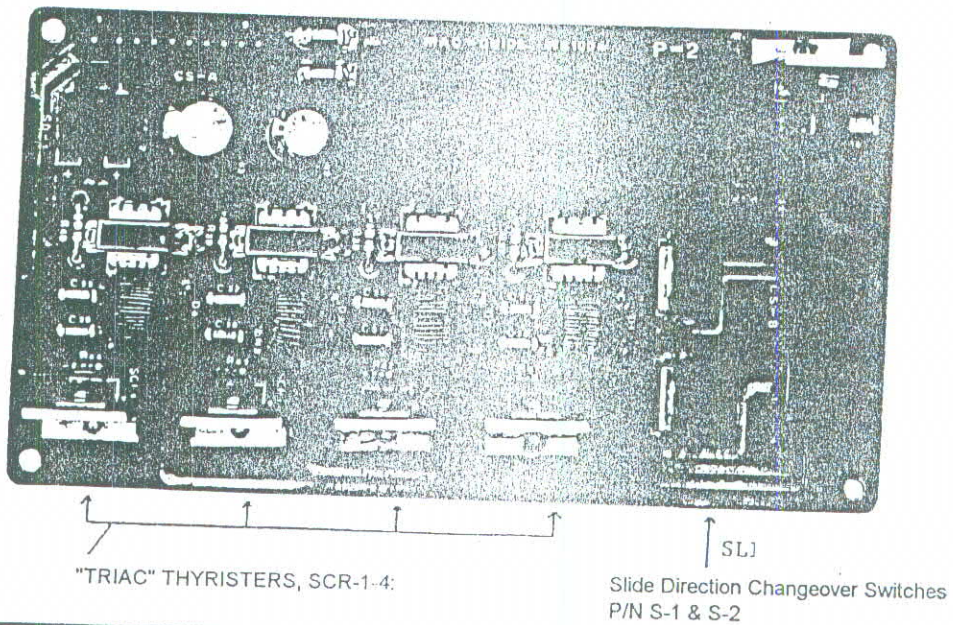
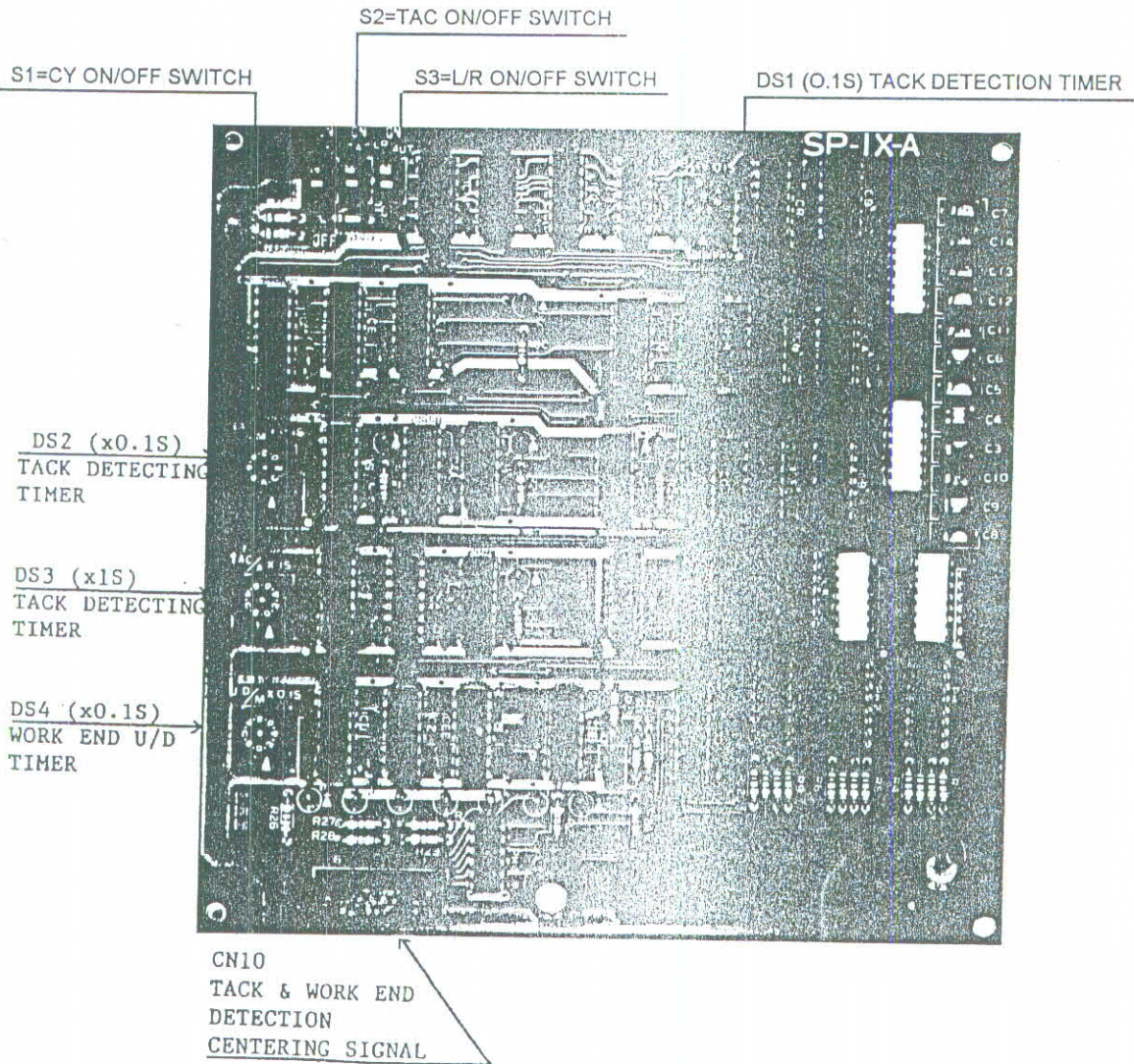
(d) The left/right change-over switch = Placed in the control box - (S2).

Change-over of left/right is made with this switch as stated above.

Switches stated in g), h) and i) are located on the P.C. Board, SP-1a-a.

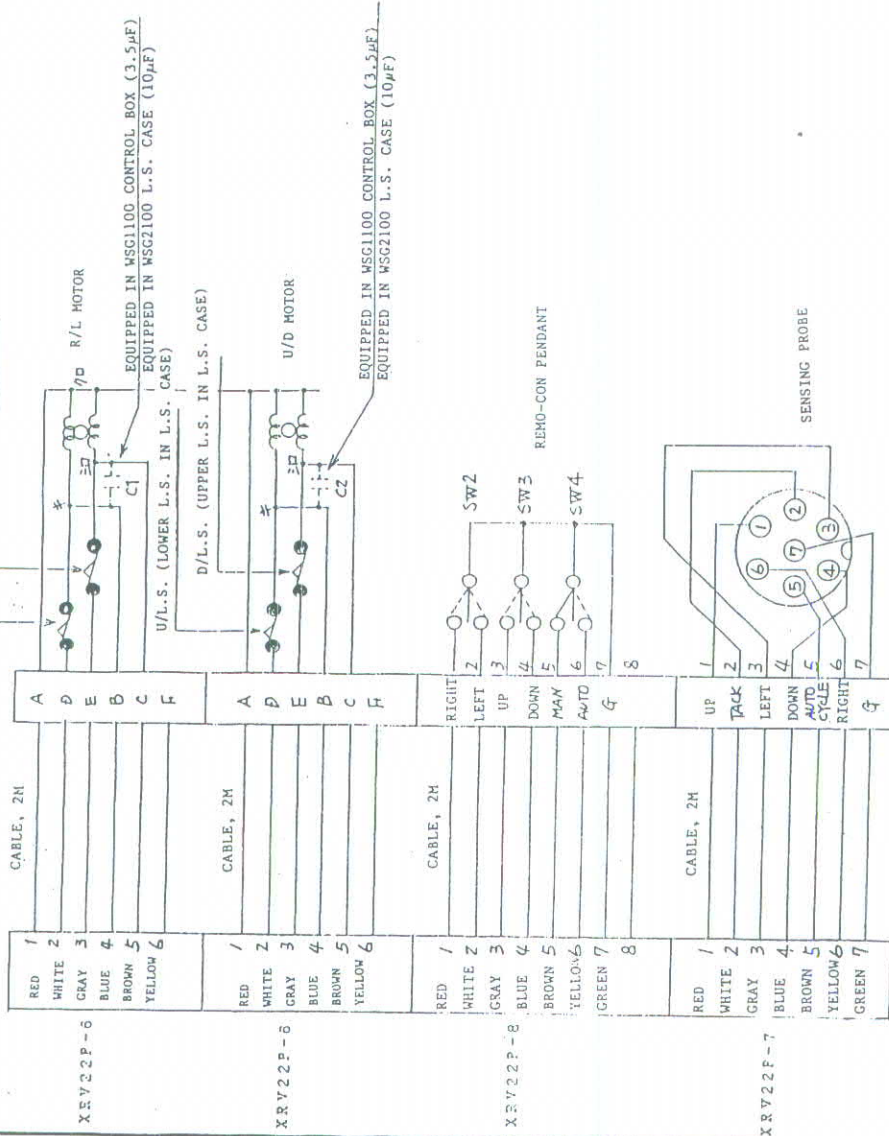
Switches stated in j) and k) are located on the P.C. Board P-2.

6-7: PRINTED CIRCUIT BOARDS

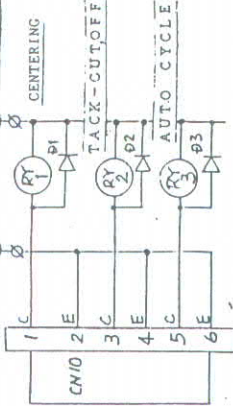


R/L.S. (LOWER L.S. IN L.S. CASE)

L/L.S. (UPPER L.S. IN L.S. CASE)



ANOTHER POWER INPUT



REMARKS:

1. POWER INPUT: LESS THAN DC24V.
2. USE MY4, HH54P FOR RY, RELAYS.
3. EQUIP DIODES.

SP-1XA WIRING OF OUTSIDE CONNECTION (OPTION):

