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ES3 SERIES SWINGER TM

INSTRUCTION MANUAL

DOCUMENT:	ES3 Series Swinger
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CAUTION

This equipment can be dangerous unless it is used in accordance with the rules laid down in this manual.

Read this manual completely before installing and operating the equipment.

Ensure all safety instructions and procedures are correctly followed and that all operators are fully trained.

IMPORTANT: All other manuals relevant to components and equipment of the installation must be followed.

EC Declaration of Conformity

We, Eurotec Finishing Systems Limited declare that the following product,

Description: Swinger Gun Manipulator

Model: ES3

Use: Electrostatic Powder Coating Application

Was manufactured by ourselves and conforms with the following standard (s) and/or other normative document (s):

EC Machinery Directive 89/392/EEC

EC Low Voltage Directive 73/23/EEC

EC Directive of Electromagnetic Compatibility 89/336/EEC

Signed on behalf of Eurotec Finishing Systems Ltd, by



Mr. D.H. Campbell
Technical Manager

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Company No. 3008563 Registered in England

ES3 SERIES SWINGER TM

ES3 SERIES GUN MANIPULATOR

The Eurotec Swinger TM is an electrically driven spray gun manipulator designed to carry multiple spray guns performing in the same or several different motions. The spray guns are mounted in swivelling clamps and the end of support bars which usually swing through an adjustable arc. The maximum sweep of the arc is dependent upon the orientation of the gun mounting clamps and is variable through an inclusive angle of 30 to 100 degrees. The spray guns can also reciprocate vertically over a short stroke which is variable up to 280mm. Alternatively guns can be mounted in fixed positions. Guns can even be mounted in the same position but on either side of the vertical fixed and reciprocating bars. This allows one gun to move over a short sweep coating a complex or difficult area of a product, whilst another gun mounted next to it covers a large sweep of the entire product. The distance of the spray gun from the workpiece and the vertical and horizontal orientation of the gun may be varied by virtue of the Eurotec swivelling gun mounting clamps. In addition the stroke and speed of the reciprocating gun mount bar is infinitely variable. Any combination of these methods of mounting may be used together to obtain the optimum coating performance for any given product. The heavy duty ground wheels are fitted with parking brakes for stable operation and the structure is fabricated from heavy gauge steel.

SPECIFICATION

Electrical Data

Input Voltage:

100/130 volts 50/60 Hz. Single Phase (or Phase to Phase of a three phase supply)

Input Current:

10A at 115v.

Power Consumption:

0.37kW.

Motor:

0.37kW. AC fan cooled, driving through a heavy duty worm gearbox.

Speed Controller:

Variable Frequency Invertor Drive.

Stroke Speed:

0-30 Cycles / Minute

Protection:

Control Cases IP 65

Motor IP65

Mechanical Data

Maximum Stroke (Vertical Reciprocating Bar):

Adjustable up to 280mm.

Maximum Angle of Swing (Gun Support Bar):

Adjustable up to 100 deg. Inclusive.

Maximum Number of Guns:

The suit application – Must be specified when ordering.

Dimensions

Length:- 0.5M

Width:- 0.5M

Height:- 1.5M; 2.1M; 2.7M.

SETUP AND OPERATING INSTRUCTIONS

All installation work must be carried out by a qualified electrician.

IMPORTANT WARNING

These machines are fitted with a powerful AC electric motor which is capable of delivering a very high force, even when travelling at a low speed.

TO AVOID INJURY PERSONNEL MUST NOT COME INTO CONTACT WITH MOVING PARTS.

Care must be taken when setting up and operating the Swinger to prevent any moving parts and/or guns from crashing into the spray booth. If it is not done, the swinger could be overturned or the guns or spray booth and its services damaged.

If the motor is stalled for any reason, the inverter will “trip out” to prevent damage or burn out of the motor. If this happens, the main switch on the control bezel must be turned off for fifteen seconds and then on again to reset the system.

If the machine is run at very low speeds, the cooling effect of the motor fan will be reduced causing the motor to overheat. This will also cause the inverter to “trip out”. Reset as above.

To stop the machine in an emergency, press the emergency stop push-button switch either on the control bezel on the rear of the machine or the system control unit. This will rapidly stop the motor. The switch will latch closed and must be twisted clockwise to reset.

WARNING!

Never operate the door interlock switch whilst the door is open. Serious injury to personnel may result.

Do not adjust the positions of the spray guns or their mounting clips with the machine running. Injury to personnel may result. Set the inhibit switch to “INHIBIT”, this will prevent accidental operation of the machine.

Full schematic wiring diagrams, connector diagrams and assembly drawings are shown toward the rear of this manual.

1. If the swinger is delivered without the vertical poles in place then they should be fitted as follows:
 - a) Remove any mains electrical power connection to the Swinger until after the poles have been correctly fitted.
Open the adjustment cover on the left hand side of the Swinger base, this is held in place by two screws.
 - b) Inside the base four square pole mounts will be found, three form part of the chassis attached to the roof and the fourth located on the end of the lower swinging arm. With pole mount has three tapped holes into which clamping screws are to be fitted. Before mounting the poles locate the M6 grub screws provided into the holes ensuring that they don't protrude into the inner section of the pole mount.
 - c) Each pole is fitted individually by lowering in through the top of the Swinger base and holding its lower face flush with the lower face of the pole mount. The screws may then be tightened to clamp the pole in place.
 - d) The longer of the vertical poles (the moving pole) is fitted into the pole mount on the swinger arm. This is best achieved with the swinging arm positioned slightly below the horizontal. The moving pole isn't mounted flush with the bottom of the pole mount but should instead, be held clear of the nut and bolt on the lower half of the pole mount before clamping in position.
 - e) When all four poles have been positioned the top brace may be mounted on the poles. As for the Swinger base the top base also has four pole mounts one of which is on a swinging arm. Again, partially fit the clamping screws and then mount the brace flush with the top of the poles before clamping in position. The pole mount for the moving pole is fitted in the same manner as its lower counterpart.
 - f) Close the adjustment cover and replace the access cover.
2. The vertical poles should be checked to ensure that they are mounted vertically and square. They may be adjusted by loosening the clamping screws (item 1 indicates which screws and access to them) to allow the poles to be moved into the correct position before finally tightening the screws.
3. Ensure that the controls are set as follows:
 - “Off On” switch is set to “Off”
 - “Emergency Stop” switch is not activated (twist the body clockwise to reset).
 - “Run Inhibit” switch is set to “Run”
 - The “Speed” potentiometer is set to “0”

4. Make the following connections to the Control Bezel (refer to the Schematic Diagram at the rear of this manual)
 - 1) Mains Lead Pt No. 4070078 to the three way and earth supply plug.
 - 2) Trigger Lead Pt. No. 4076021 to the four way and earth trigger plug.Note: The Trigger lead is only connected when remote triggering of the Swinger is required.

5. Connect the other end of the Mains Lead (Pt. No. 4070078) to a 115v 50-60 Hz mains supply fused at 13A. This supply may be single phase or derived from two phases of a three phase supply.
Note: The mains Lead is colour coded as follows:
Live – L - Brown
Neutral – N – Blue
Earth - E – Green / Yellow
Important: The Earth (grounding wire) contact must be made

6. If the Trigger Lead is to be used connect is other end to the Robot 1 (or 2) connector on the Eurotec System Control Module (SCM)

7. The Swinger may be remotely triggered from an alternative source although it should be noted that the switching voltage is 115V. If other voltages are required they should be specified upon ordering.

8. Ensure that the adjustment cover on the side of the Swinger base is latched closed.

9. Position the Swinger adjacent to and facing the booth opening. Apply the wheel brakes.

10. Set the machine such that the top linkage is in a horizontal position.

11. Mount the gun support bars in their adjustable clamps, the positions of which may be varied. Set the bars and clamps in suitable vertical and horizontal positions likely to give full coverage of the product to be sprayed. Each bar should be supported by two clamps, one of which will be fitted with a clamping screw. This enables the horizontal bar to slide through the clamp to allow for differential movement.
Note: Guns may also be mounted on the oscillating or centre fixed pole in order to give a short stroke reciprocating motion or a fixed gun.

12. Mount the guns in the gun clamps on the end of each horizontal bar and secure the gun services such that they will not become trapped, chaffed or snag and pull when the machine is in operation. The spray gun angle may be set by utilising the swivelling gun mounting clamp on the end of the mounting bar.

13. Set the oscillation stroke by opening the hinged access door on the left hand side of the body, and slackening the hand knob. Slide the pivot point towards the gearbox shaft and reduce the stroke or away from the gearbox shaft to increase the stroke. Re-tighten the hand knob and close the access door.

14. Switch the mains switch on the control bezel “ON”
Note: The guns and horizontal bars will immediately commence operation. Turning the speed potentiometer clockwise will increase the speed of operation. With the machine running at low speed ensure that all moving parts do not interfere with each other, the booth, or the product. Otherwise damage or injury may result.
15. Set the optimum oscillating speed likely to evenly coat the desired product. Generally slower speeds give better results.
16. Further adjustment of the above settings and / or spray guns may be required during operation otherwise the machine is ready for use.

Note: Under no circumstances should the door interlock switch be operated whilst the door is open as injury to personnel may result.

Do not adjust the gun clamps and the gun support bar clamps with the machine running. Set the “INHIBIT” switch to inhibit to prevent accidental operation of the machine.

MAINTENANCE

The gearbox is grease filled for life and should require no further attention. Periodically check that all fixings are tight. Do not allow the Swinger to become excessively dirty or covered in powder, as this may result in wear or damage to moving parts.

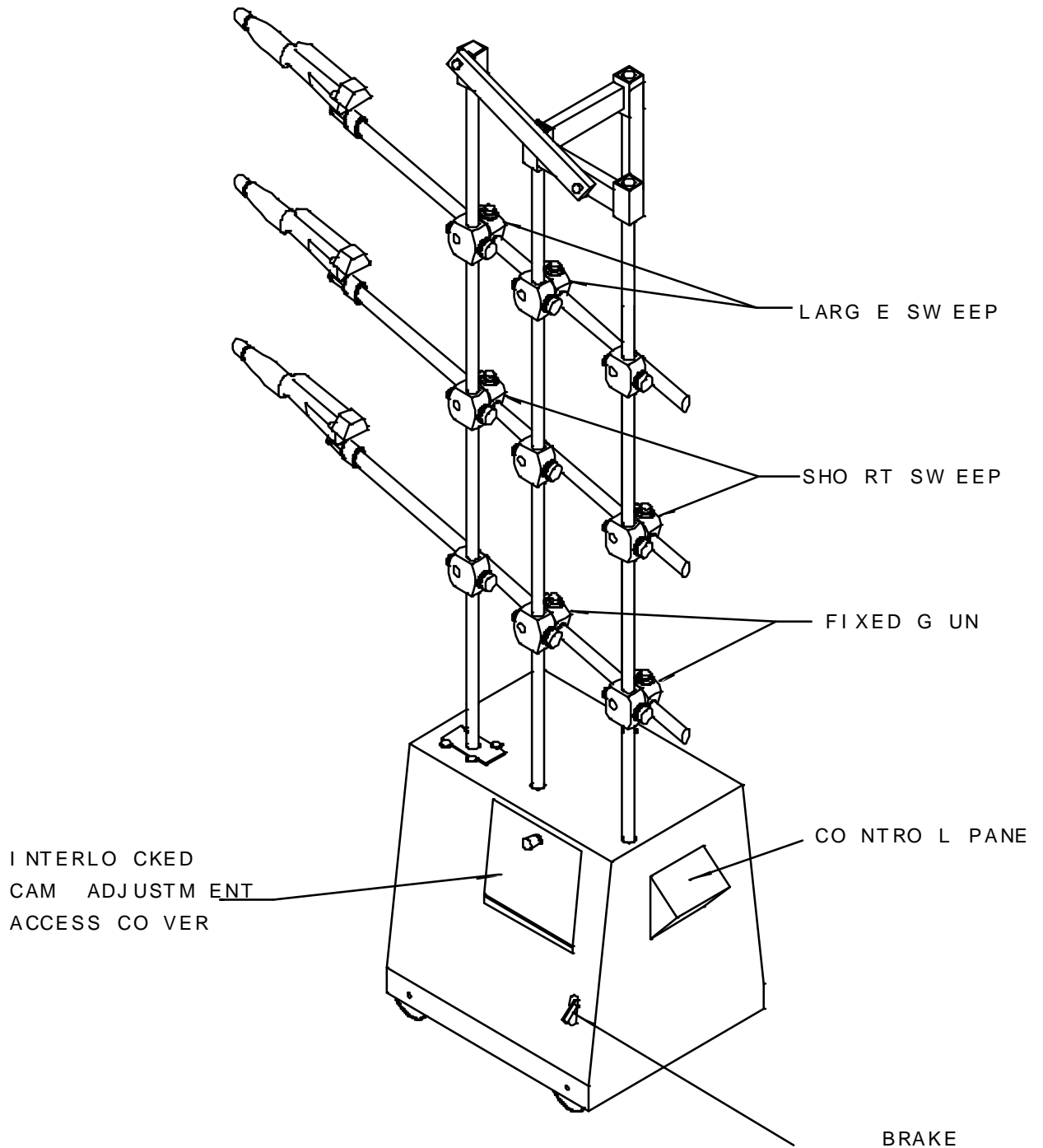
Important Note:-

1. The drive motor is interlocked with the access door so that the motor will stop if the door is opened. Under no circumstances should the door interlock switch be operated whilst the door is open as injury to personnel may result.
2. Before carrying out any maintenance work set the “INHIBIT” switch to inhibit to prevent accidental operation.
3. Do not attempt to adjust the positions of spray guns, mounting poles or mounting clamps whilst the machine is running as injury to personnel may result.
4. After altering the positions of spray guns or mounting clamps, restart the machine at low speed and carefully observe the gun movement to ensure that the gun and support poles do not interfere with each other or with the booth or product. If so damage may result.
5. Carefully route the gun services (powder hose, supply cables and airline) such that they will not become trapped, tangled, strained or chaffed by the movement of the guns, and secure them in position using suitable straps or ties.

ASSEMBLY DRAWINGS & PARTS LISTS

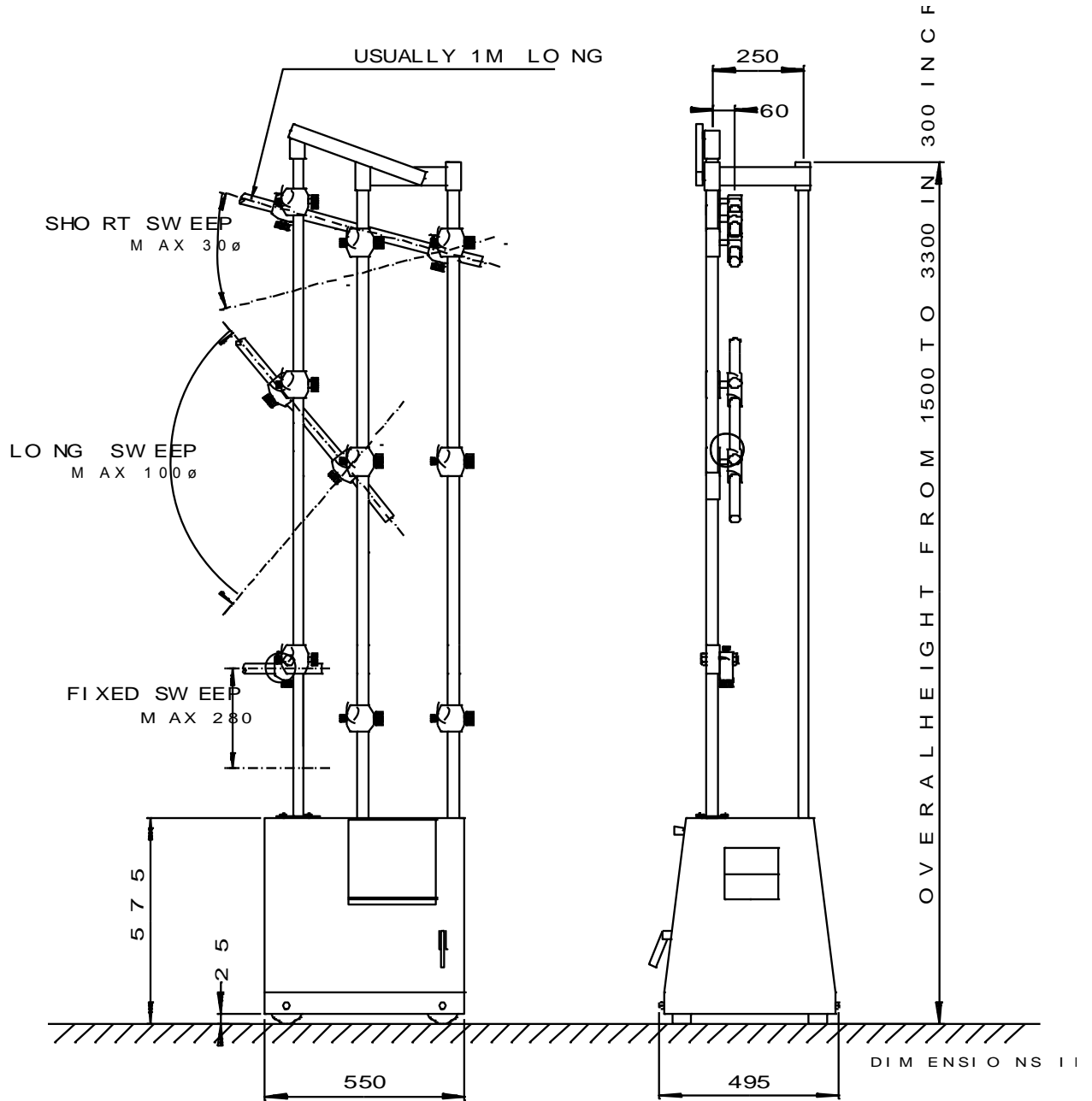
Basic Pole Arrangement

Illustration No. 6000193

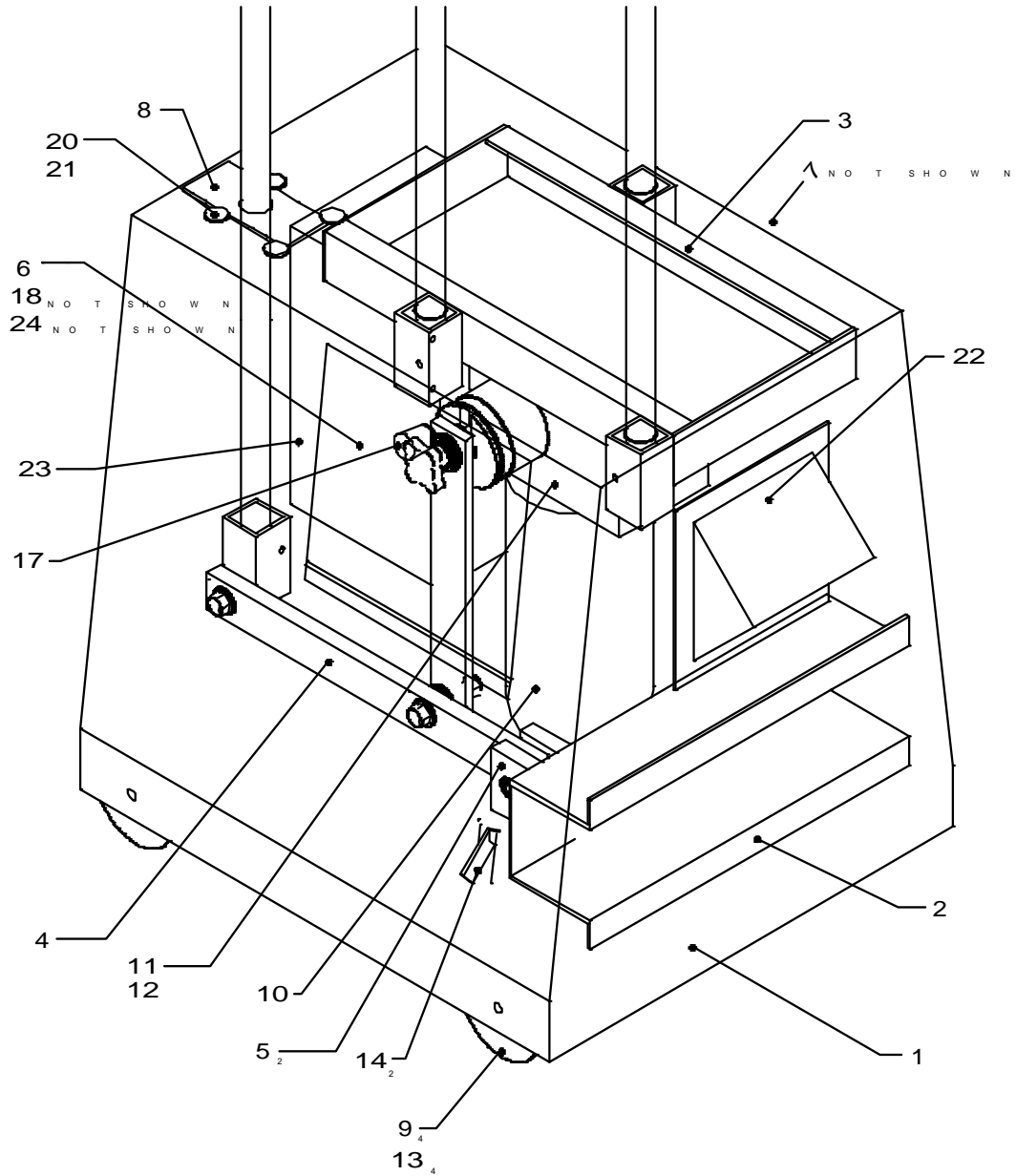


Sweep Arcs & Dimensions

Illustration No. 6000120



Base Assembly
Part No. 4076002
 Illustration No. 6000127

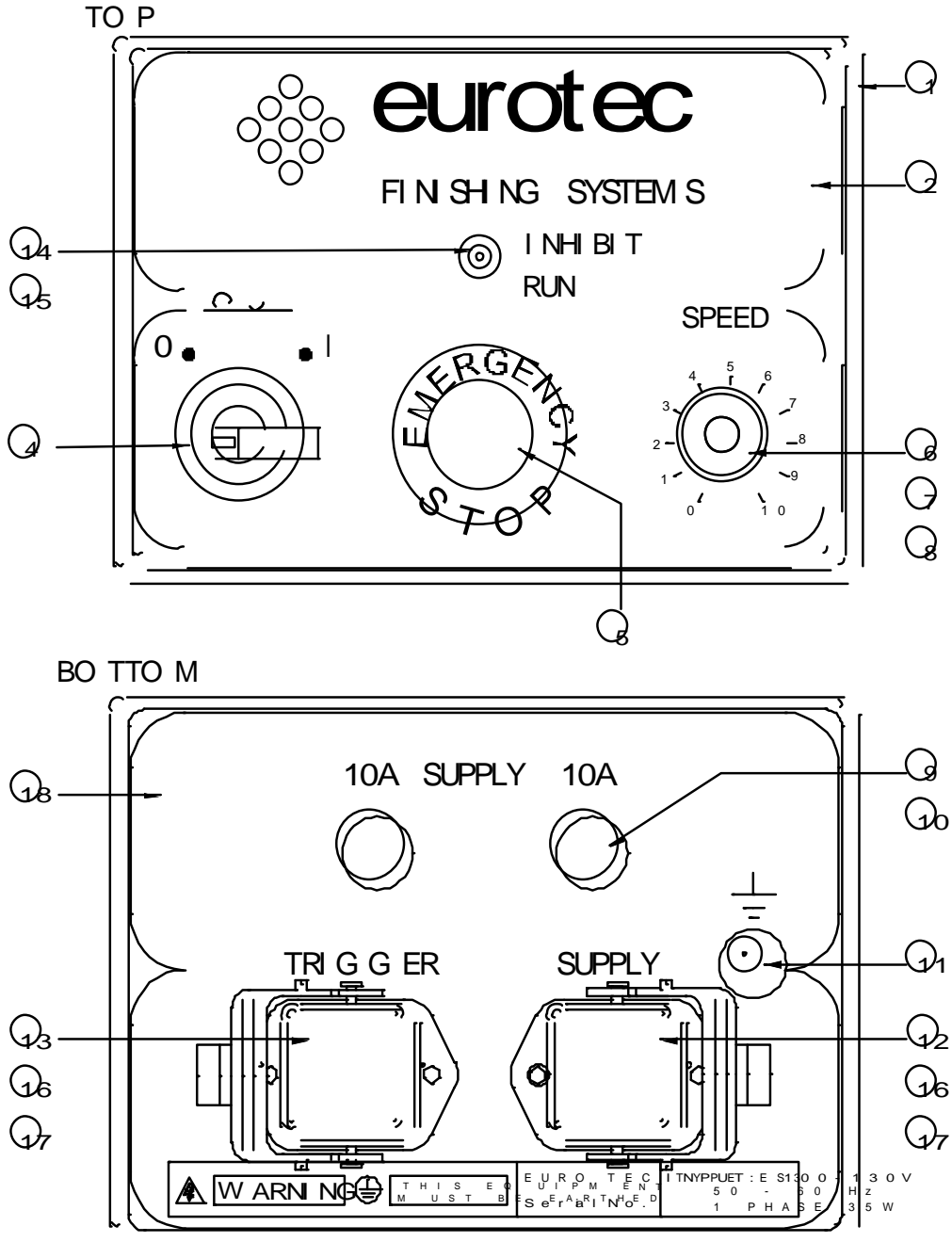


Base Assembly PARTS LIST

Item No.	Part No.	Description	Qty.
1	4076015	Swinger Body, ES3	
2	4076018	Chassis, Swinging Arm, ES3	
3	4075016	Chassis, Swinger	
4	N/A	Swinger Drive Mechanism (Shown Later)	
5	4075025	Bearing Block, Swinger	
6	4075032	Adjustment Cover	
7	4075031	Access Cover (Not shown)	
8	4075036	Finger Plate	
9	4050035	Wheel Spacer	
10	9001287	Motor 2 Pole 3 Phase 0.37 kW	
11	9001270	Gear Box 100:1	
12	9001259	Output Shaft	
13	9000181	Wheel, Cast Iron	
14	9000177	Toggle Latch	
15	9000385	Flexible Conduit (Not Shown)	
16	9000386	Conduit Adapter (Not Shown)	
17	9001197	Rotary Latch	
18	9001346	Limit Switch, Sealed (Not Shown)	
19	9000388	Conduit Adaptor Nut (Not Shown)	
20	9000856	Washer Nylon Stepped	
21	9000857	Washer Nylon Large	
22	4076004	Control Bezel Assembly	
23	4076025	Invertor Unit Assembly	
24	4076022	Door Spigot (Not Shown)	

Control Bezel Assembly

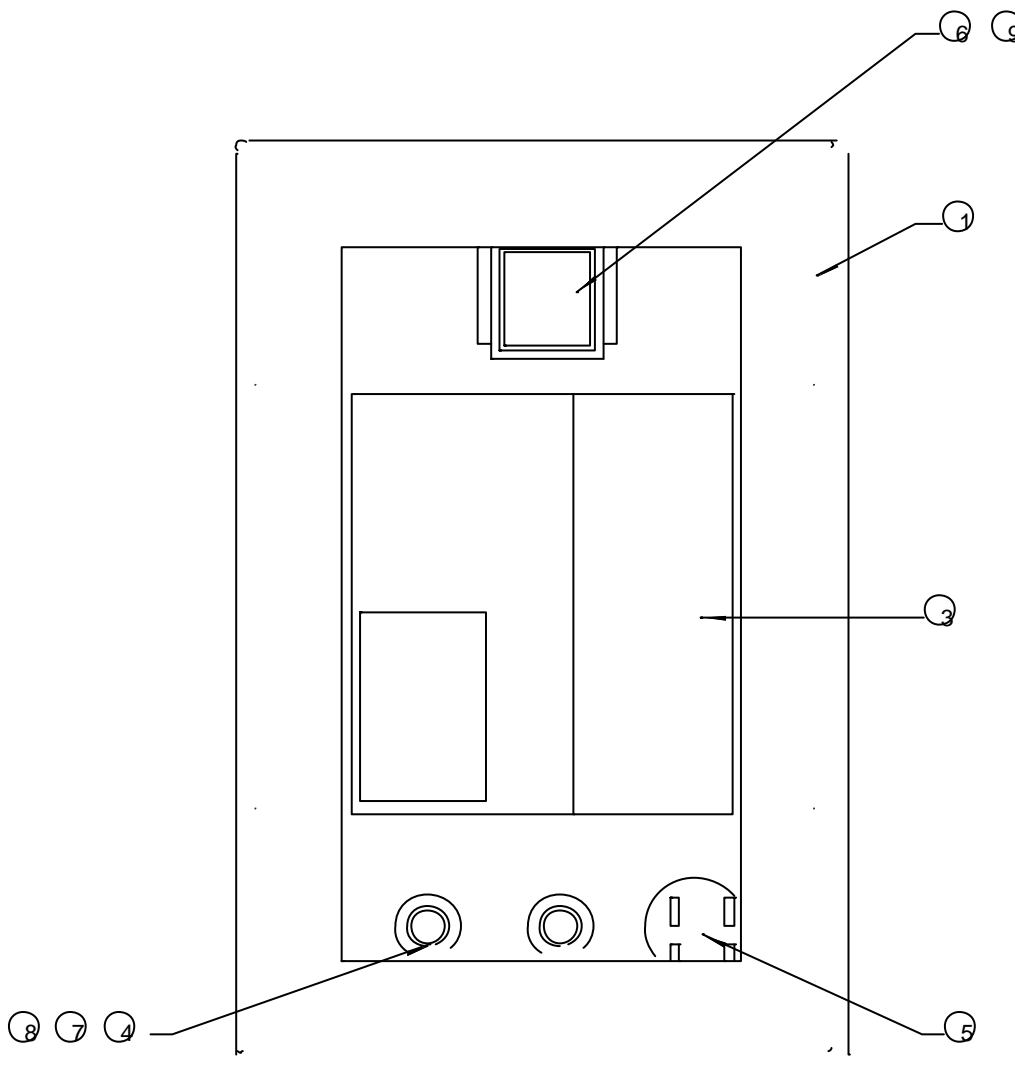
Illustration No 6000118



Control Bezel Assembly PARTS LIST

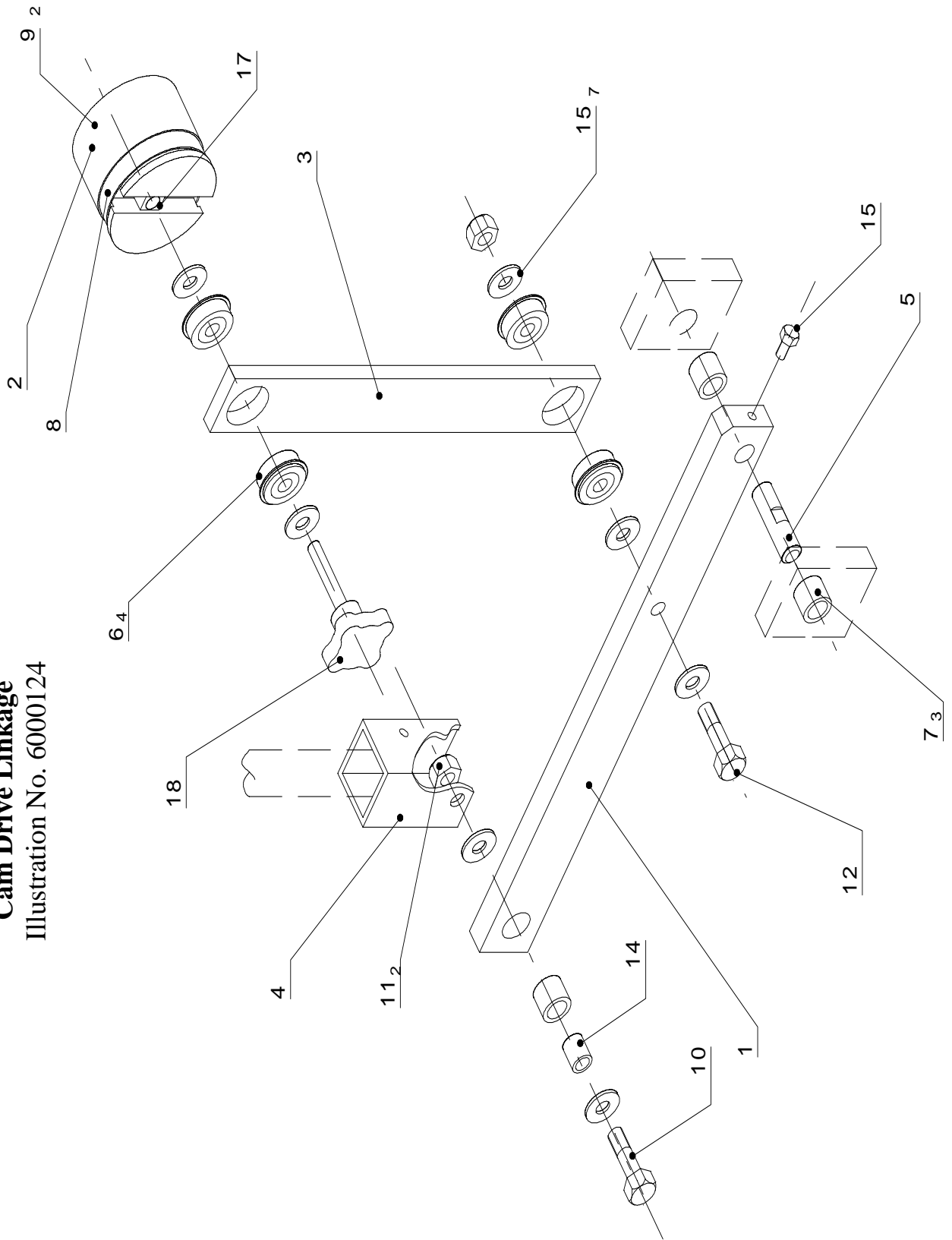
Item No	Part No.	Description	Qty
1	4076019	Control Bezel ES3	
2	4076020	Control Panel Overlay, ES3	
3			
4	9000000	Rotary Switch 2 Pole	
5	9000233	Push Button Switch, Latching	
6	9001199	Knob Collett	
7	9001200	Knop Cap	
8	9000277	Potentiometer, 1k	
9	9000103	Miniature Circuit Breaker 10A	
10	9000019	Boot, Circuit Breaker	
11	9000021	Earth Post Terminal	
12	9000011	Connector, Plug 3 + E	
13	9000135	Connector, Plug 4 + E	
14	9001292	Toggle Switch	
15	9001248	Boot, Toggle Switch	
16	9000120	Connector Base	
17	9000014	Connector Cover	
18	4076023	Bottom Overlay	

Invertor Assembly
Part No. 4076025
 Illustration No. 6000121



Item	Part No.	Description	Qty
1	4076016	Inverter Box, ES3	
2	4076017	Inverter Cover	
3	9001502	Invertor 0.4kw, 110V	
4	9000386	Conduit Adapter	
5	9001345	Mains Filter, 13a	
6	9000197	Relay Base, 8 Pin	
7	9000388	Conduit Adapter Nut	
8	9000385	Flexible Conduit	
9	9001359	Relay, 115v, 2 Pole	
10	9000021	Earth Post	

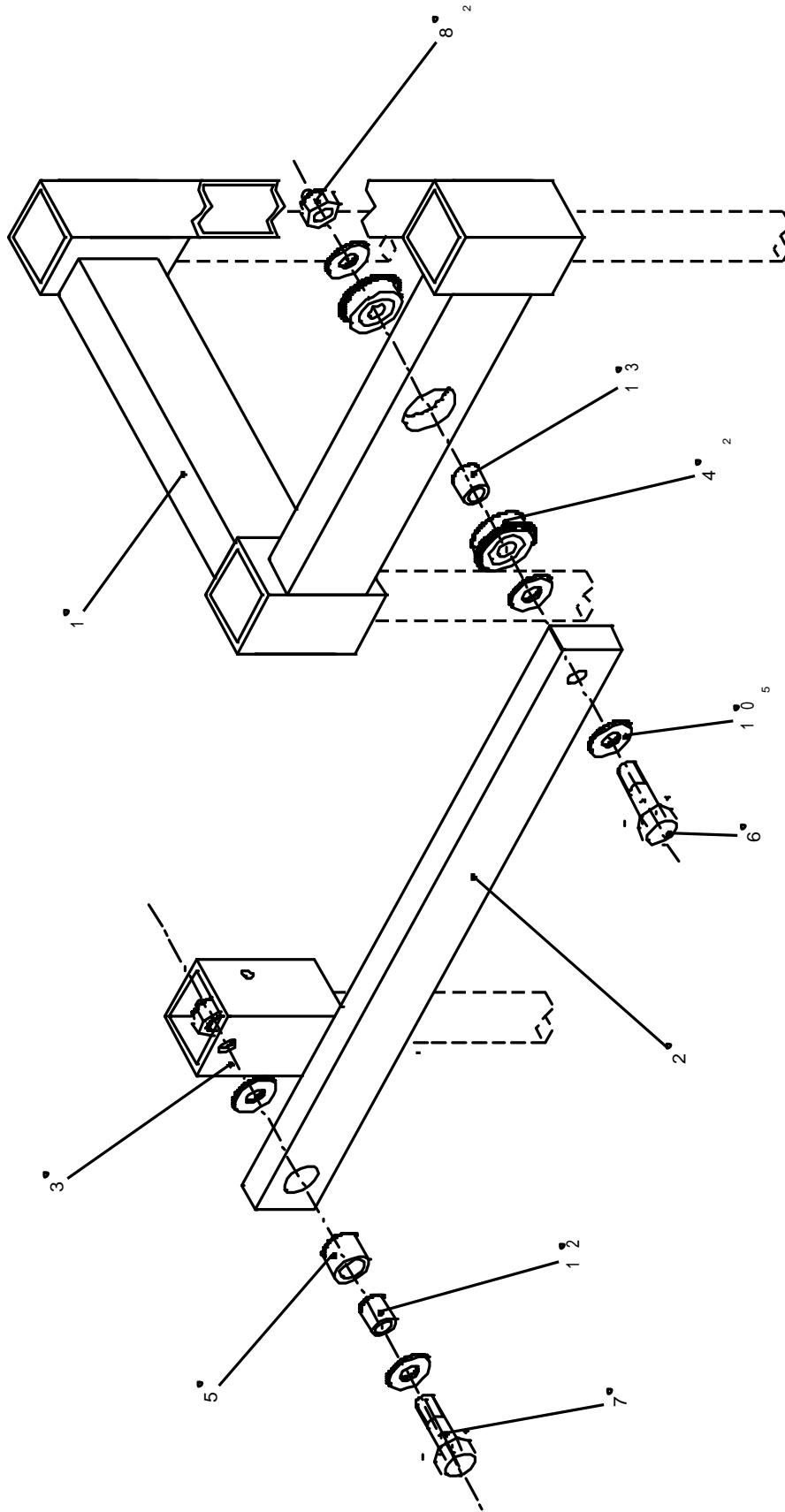
**Swinger Drive Mechanism
Cam Drive Linkage**
Illustration No. 6000124



Swinger Drive Assembly PARTS LIST

Item No	Part No	Description	Qty
1	4075019	Lower Swinging Arm	
2	4075021	Cam	
3	4075022	Connecting Rod	
4	4075023	Pole Mount	
5	4075027	Bearing Spindle	
6	9000174	Bearing Ball	
7	9000175	Bearing Needle	
8	9000210	Worm Drive Clip	
9	9000753	Screw M10	
10	9000758	Screw M10	
11	9000808	Nut M10	
12	9000756	Bolt M10	
13			
14	9001198	Bearing Inner Ring	
15	9000708	Screw M8	
16	9000836	Washer M10	
17	9000187	“T” Nut	
18	9000092	Hand Knob	

Swinger Top Assembly
Illustration No.6000128

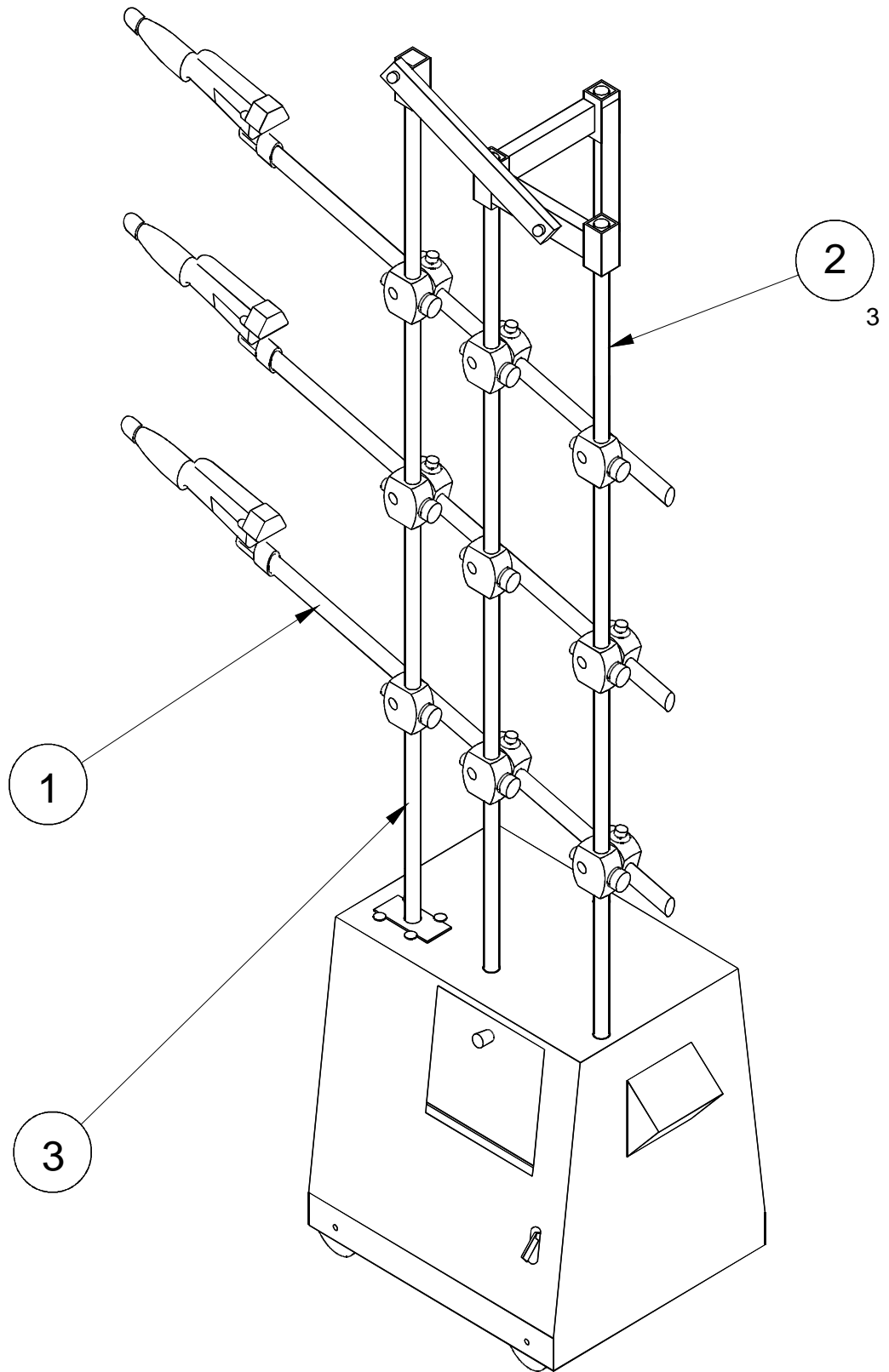


Swinger Top Assembly PARTS LISTS

Item No	Part No	Description	Qty.
1	4075017	Top Brace	
2	4075020	Upper Swinging Arm	
3	4075023	Pole Mount	
4	9000174	Ball Bearing	
5	9000175	Needle Bearing	
6	9000756	Bolt, M10	
7	9000758	Screw, M10	
8	9000808	Nut, M10	
9			
10	9000836	Washer, M10	
11			
12	9001198	Bearing Inner Ring	
13	4075037	Spacer, Bearing	

Swinger Poles & Gun Bars

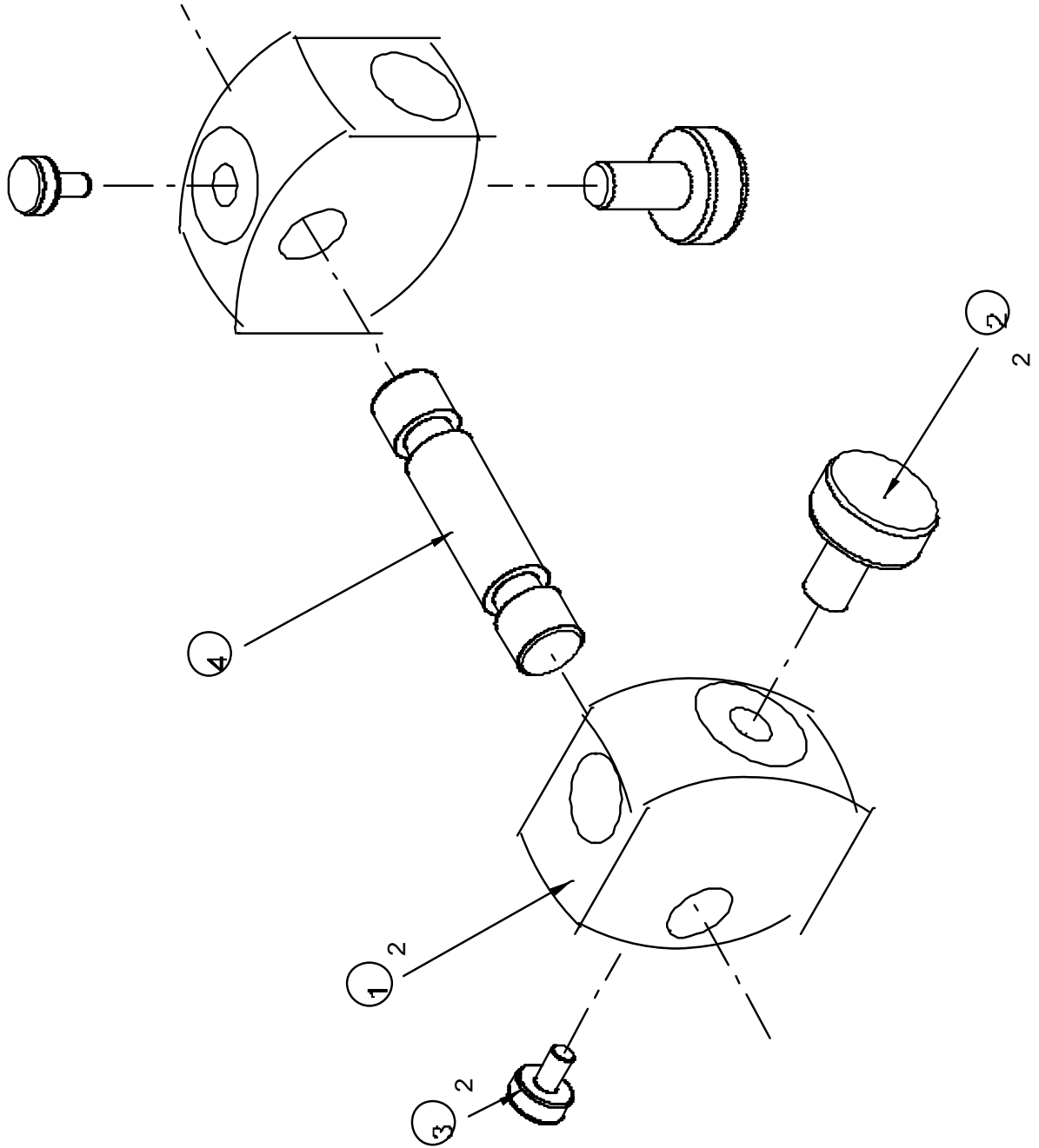
Illustration No. 6000116



Swinger Poles & Gun Supports PARTS LIST

Item No	Part No	Description	
1	9001209	1mtr Gun Support Bar	
Swinger Height	Part No	Item 2	Item 3
1.5mtr	4075007	4075040	4075061
1.8mtr	4075008	4075041	4075062
2.1mtr	4075009	4075041	4075063
2.4mtr	4075010	4075043	4075064
2.7mtr	4075011	4075044	4075065
3.0mtr	4075012	4075045	4075066
3.3mtr	4075013	4075046	4075067

Gun Support Clamps – Moving
Illustration No. 6000129

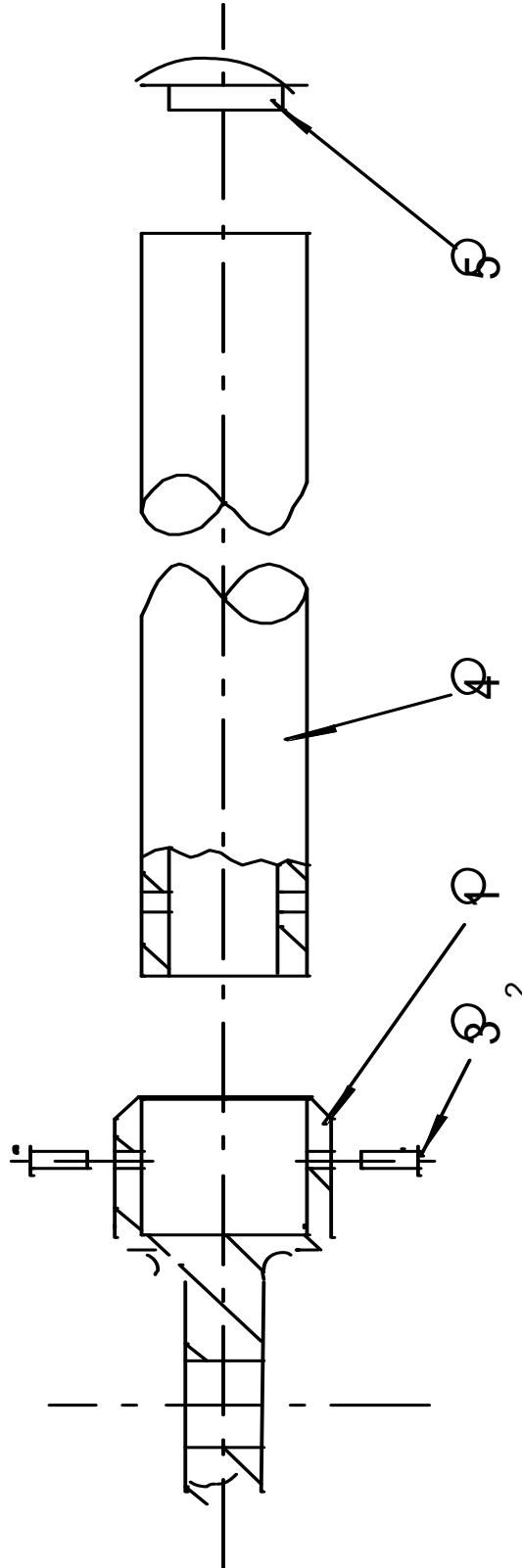


Gun Support Clamps PARTS LIST

Item No.	Part No.	Description	Qty
<u>Mounting</u>			
1	4075026	Gun Support Clamp	2
2	4075027	Clamping Screw	2
3	4075028	Clamp Retaining Screw	2
4	4075030	Clamp Spindle	1

Gun Clamp Arrangement Part No 3001022

Item No	Part No	Description	Qty.
1	3001009	Gun Clamp Spigot	
3	9000484	Rivet	
4	9001209	Mounting Tube	
5	9001211	End Cap	



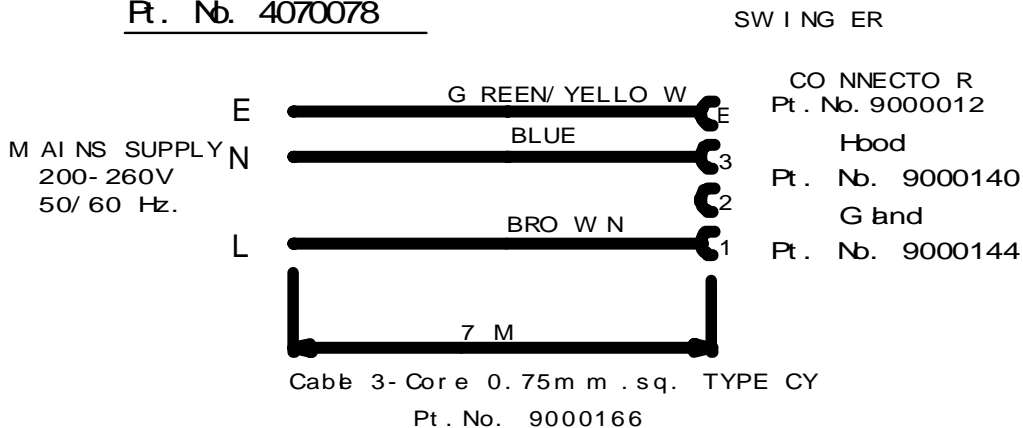
Main Lead Assembly & Trigger Lead Assembly

Part No. 4076021

Illustration No. 6000123

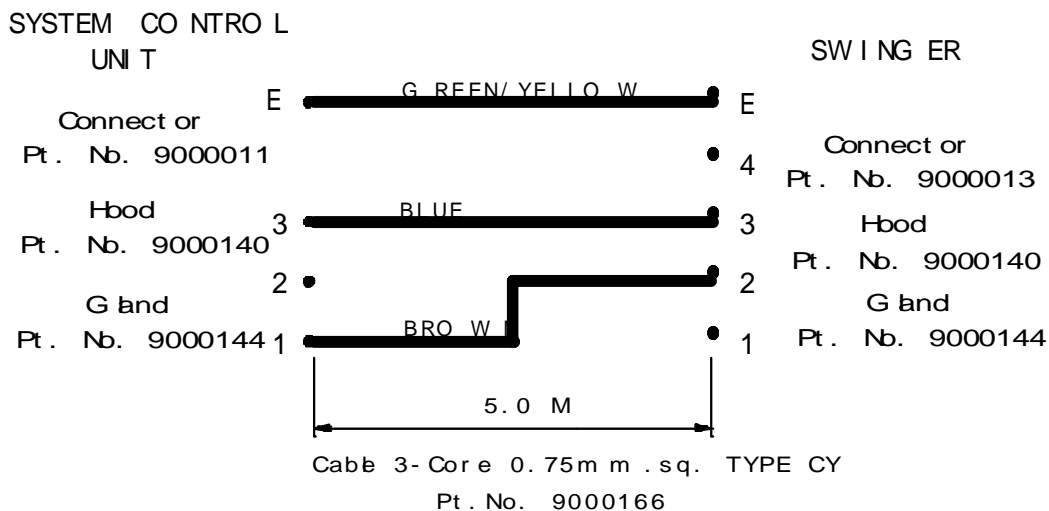
MAI NS LEAD ASSY.

Pt. No. 4070078



TRI G G E R LEAD ASSY

Pt. No. 4076021



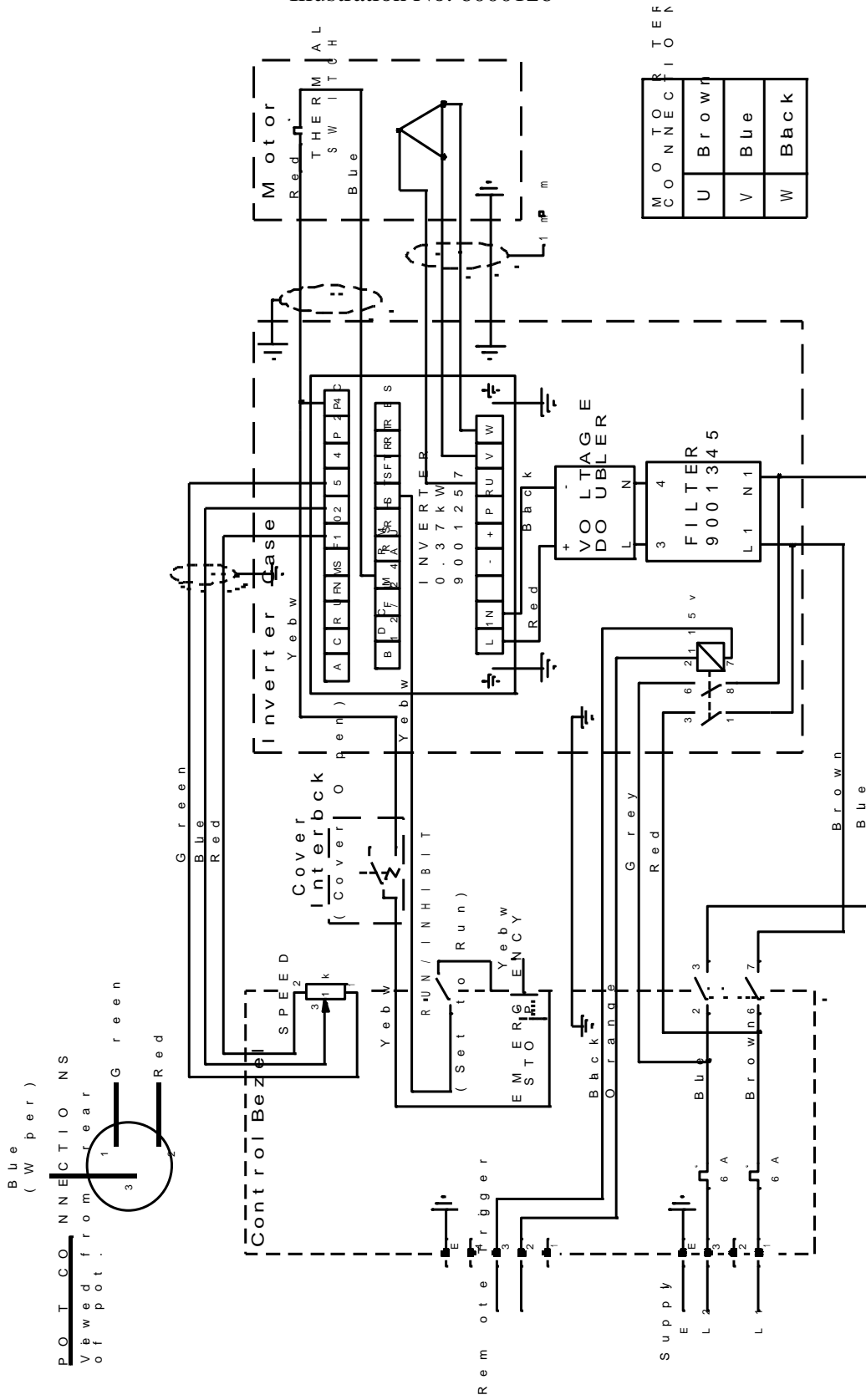
APPENDIX (ii)

SCHEMATIC DIAGRAMS

Wiring Diagram

Swinger ES3 115v

Illustration No. 6000126



NOTES:

NOTES: