



Envelope Spreader ES 6-3



Instruction Manual

The company reserves the right to change equipment specifications and models without notice. Pictures are representative and may not be part of the standard equipment.

Elgi Rubber Company Limited

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Foreword

The Envelope Spreader ES 6-3 is a simple and unique machine which facilitates the operator to envelope and de-envelope the tyre easily. This machine functions pneumatically and ensures a uniform expansion of envelope. This extends the life of the envelope.

The machine is built to custom specifications and can be manufactured with a lifting arrangement or as a stand-alone.

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01 Description

The envelope spreader ES 6-3 consists of the following major components:

Main Frame

The main frame houses all the main components of the machine; like lifting arrangements, claw arrangements and airline assembly.

Lifting and Opening Controls

This machine is provided with 3 levels of preset lift and opening to position the opening of the envelope to the centre of the casing depending on tyre size. This prevents over stretching of the envelope.

Air Line Assembly

This is provided with a shut off valve, filter cum regulator, solenoid valve and pneumatic cylinders.

02 Specifications

Model	ES 6-3
Catalogue Number	MA51 63 - A
Tyre Range	6.50 - 14 to 12.00 - 24.5
Air Pressure Requirement (kPa / kg/cm ³)	720 / 7.2
Dimensions (L x W x H) (mm)	2800 x 1000 x 2600
A in Cat. No. denotes power supply specifications (V / Hz / ph)	110/220 / 50/60 / 1
Weight (kg)	~800
Installation	To be fixed to the floor

03 Assembly and Commissioning Tools

Accessories

Standard	Installation kit
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Tools

Spanners: Double end 10 - 32	1 Set each
Screw driver - 8"	1 No.
Allen keys (mm)	1 Set
Cutting plier - 8"	1 No.
Circlip plier - 6" (internal and external)	1 No. each
Nylon hammer	1 No.
Grease gun	1 No.
Adjustable spanner - 12"	1 No.

Materials

Lubricating oil (SAE 20)	¼ L
Multi purpose grease	¼ kg
Electric cable 4 core, 1.5 sq.mm	Length as per installed position

04 Installation and Commissioning

Positioning

The machine does not need a foundation. It is sufficient if it is fixed to the ground. Position the machine in the desired location on a level surface.

The area where the machine is located should be well illuminated.

Place the machine at one meter distance from the wall and ensure that machine has sufficient space around it (if used as stand alone).

Place the machine below the in-house monorail if it comes with a lifting facility.

Connection

From the nearest air point, draw a line using a PU14 hose. Connect both ends with the help of an air connector which fits into the coupler.

Setting

- Set the regulator at 8 kg/cm² by rotating the knob clockwise and then lock it.
- Fill the lubricator with SAE 20 oil to its level.

05 Pre-Operation Checks

- Remove the shipment clamps that are provided below the table, which are marked and painted red / orange (2 Nos. on either side).
- Check for the free movement of all moving parts.
- Check if all nuts and bolts are properly tightened.
- Check if the insert locking of the claws is uniformly fitted.
- Check and ensure no twists, or crush in air line.
- Check for any air leakage on the pneumatic lines.

06 Operation

1. Before mounting the envelope on the claws, ensure that the claws are in released position. Select the switch to close position.
2. Based on the tyre size, adjust the height of the machine in three levels by using the switch in the operating panel.
3. Mount the appropriate envelope.
4. Turn the switch to the right position to match with your envelope size (1 - Passenger, 2 - LCV, 3 - Truck and Heavy Truck). This limits over expansion of smaller size envelopes.
5. Move the tyre to be enveloped by the in-house monorail to the enveloping side of the machine.
6. Release the switch to close position and allow the envelope to seat on the tyre.
7. Release the envelope from the claws.
8. Move the tyre out of the machine through the monorail or through the tyre stand to the next retreading operation.

07 Do's and Don'ts

Do's

- Place the machine in an open space where there is ample light and ventilation.
- Ensure that there is no leakage in the pneumatic valve and cylinder.
- All locking nuts are to be tightened firmly.
- Move the operator panel position to the operator's convenience. This ensures easy operation of electrical switches while holding the tyre / envelope.
- Ensure proper electrical grounding of machinery for human safety.

Don'ts

- Do not operate the machine until the shipment locks are removed.
- Do not load the tyre without ensuring the claws are expanded.
- Do not select wrong envelope size. This may damage the envelope or if the expansion is not sufficient, it may not fit in the tyre.
- Do not select wrong lifting position when used with monorail. This may damage the claws / cylinders badly.
- Do not replace the parts which is not recommended by manufacturer.

08 Troubleshooting

Symptoms / Problems	Possible Causes	Remedies
Arms not spreading	<ol style="list-style-type: none"> 1. No air supply 2. Air pressure less 3. Kinked hoses 4. Claw spread chain cut 5. Seals damaged in claw spreading cylinder 	<ol style="list-style-type: none"> 1. Check main air line and correct if required 2. Check the input air line and set it to 8 kg/cm² 3. Check and replace 4. Connect with chain-link or replace it 5. Check and replace
Arm spreading but unevenly	<ol style="list-style-type: none"> 1. Leakage of air / less supply 2. Chain tension loose 3. Guide rollers damaged 	<ol style="list-style-type: none"> 1. Rectify the leakage and set the air pressure to 8 kg/cm² 2. Check and adjust 3. Check and replace
Either expanding or closing	<ol style="list-style-type: none"> 1. Solenoid not getting actuated 2. No air supply at direction control valve 	<ol style="list-style-type: none"> 1. Check and replace the seal kit 2. Check the main line to valve and replace if needed
Machine does not lift	<ol style="list-style-type: none"> 1. No air supply to the hand operated valve 2. Kinked hoses 3. Seals damaged in lifting cylinder 4. Machine lift chain cut 	<ol style="list-style-type: none"> 1. Check the input air line and set it to 8 kg/cm² 2. Check and replace 3. Check and replace 4. Connect with chain link or replace

09 Preventive Maintenance

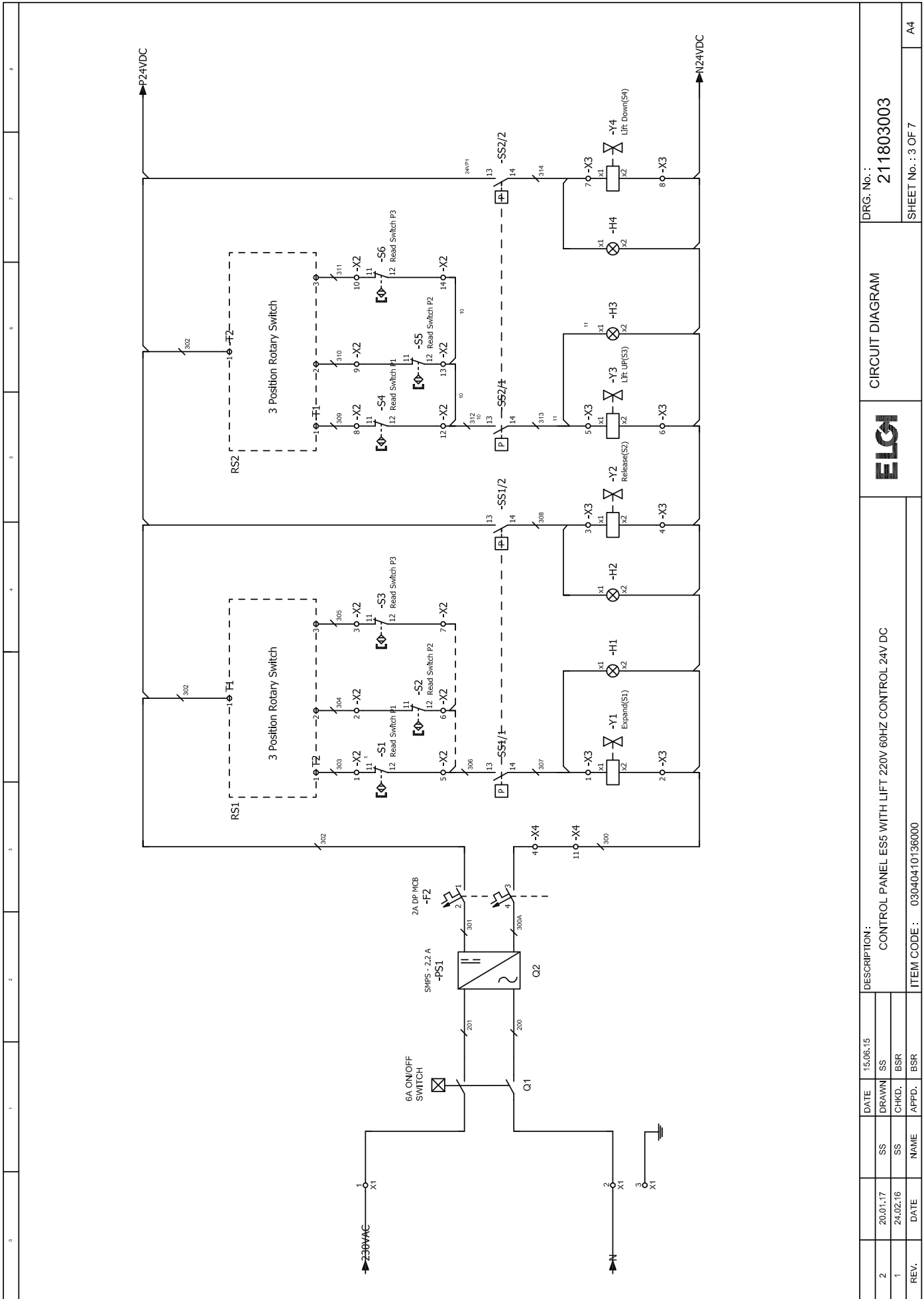
Name of the Post	Enveloping / De-enveloping
Name of the Equipment	Envelope Spreader
Model No.	ES 6-3

S. No.	Activity	Frequency	Acceptance Criteria
1	Clean the machine	Daily	Dust free
2	Drain the water from the air filter	Daily	No water in the filter unit
3	Check air pressure is 8 kg/cm ²	Daily	Pressure in-between 8 ± 0.5 kg / cm ²
4	Check air line and fitting for any leakage	Daily	No leakage
5	Check arm bushes	Monthly	No damage / wear / tear
6	Grease the chain and bearings	Monthly	Smooth movement of spacer device

10 Electrical Drawings

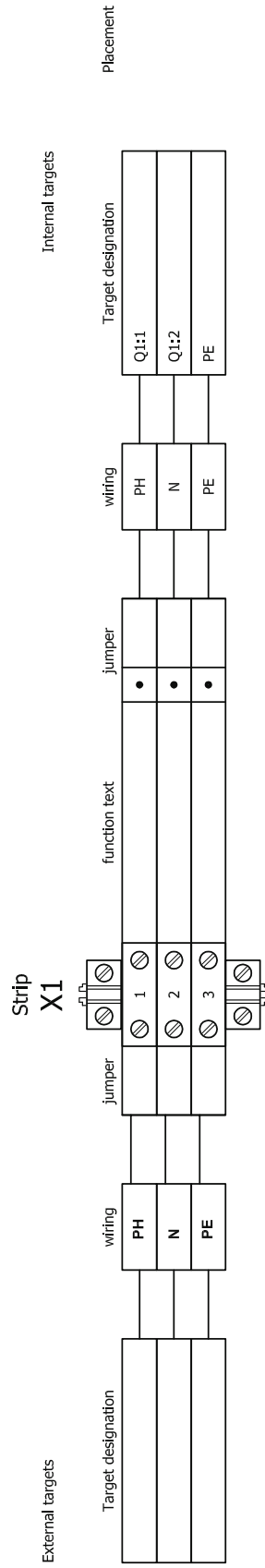
6	1	2	3	4	5	6	7	8	
<p>Elgi Rubber Company Limited</p> <p>641005 Coimbatore Phone. 9894510000</p>									
<p>Company / customer Project description Drawing number Commission</p> <p>ENVELOPE SPREADER ES5 - WITH LIFT 220V 1 PH 60 HZ 24V DC 211803003 Elgi</p>									
<p>Item code & Description</p> <p>03040410136000 CONTROL PANEL ES5 -WITH LIFT 220V 60 HZ CONTROL 24V DC</p>									
<p>Created on Edft date</p> <p>13.06.15 Number of pages 7</p>									
<p>DESCRIPTION : CONTROL PANEL ES5 WITH LIFT 220V 60HZ CONTROL 24V DC</p> <p>ITEM CODE : 03040410136000</p>									
		DATE 15.06.15		DESCRIPTION :		DRG. No. : 211803003		TITLE PAGE	
2		20.01.17		SS		DRAWN		SS	
1		24.02.16		SS		CHKD.		BSR	
REV.		DATE		NAME		APPD.		BSR	
<p>SHEET No. : 1 OF 7</p> <p>A4</p>									

TECHNICAL INFORMATION									
ALL DIEMENSIONS ARE IN MM DOORS ARE ONLY AT FRONT SIDE					PAINT SHADE : PEBBEL GRAY PAINT SHADE : PEBBEL GRAY				
PANELS CONSTRUCTION					230V AC				
PANEL MAKE RITTAL					0.75 SQMM X 3 CORE				
PART NO AE 1030500					24V DC				
WIDTH 380					0.75 SQMM BLUE				
HEIGHT 300					EARTHING TO BE PROVIDED AS PER STANDARD SHROUDING TO BE PROVIDED AS PER STANDARD				
DEPTH 155									
DOOR SINGLE DOOR									
REV.		DATE		NAME		APPD.		BSR	
2		20.01.17		SS		SS		SS	
1		24.02.16		SS		CHKD.		BSR	
DESCRIPTION :								DRG. No. :	
CONTROL PANEL ES5 WITH LIFT 220V 60HZ CONTROL 24V DC								211803003	
ITEM CODE : 03040410136000								SHEET No. : 2 OF 7	
ELGI								DISIGN INSTRUCTION	

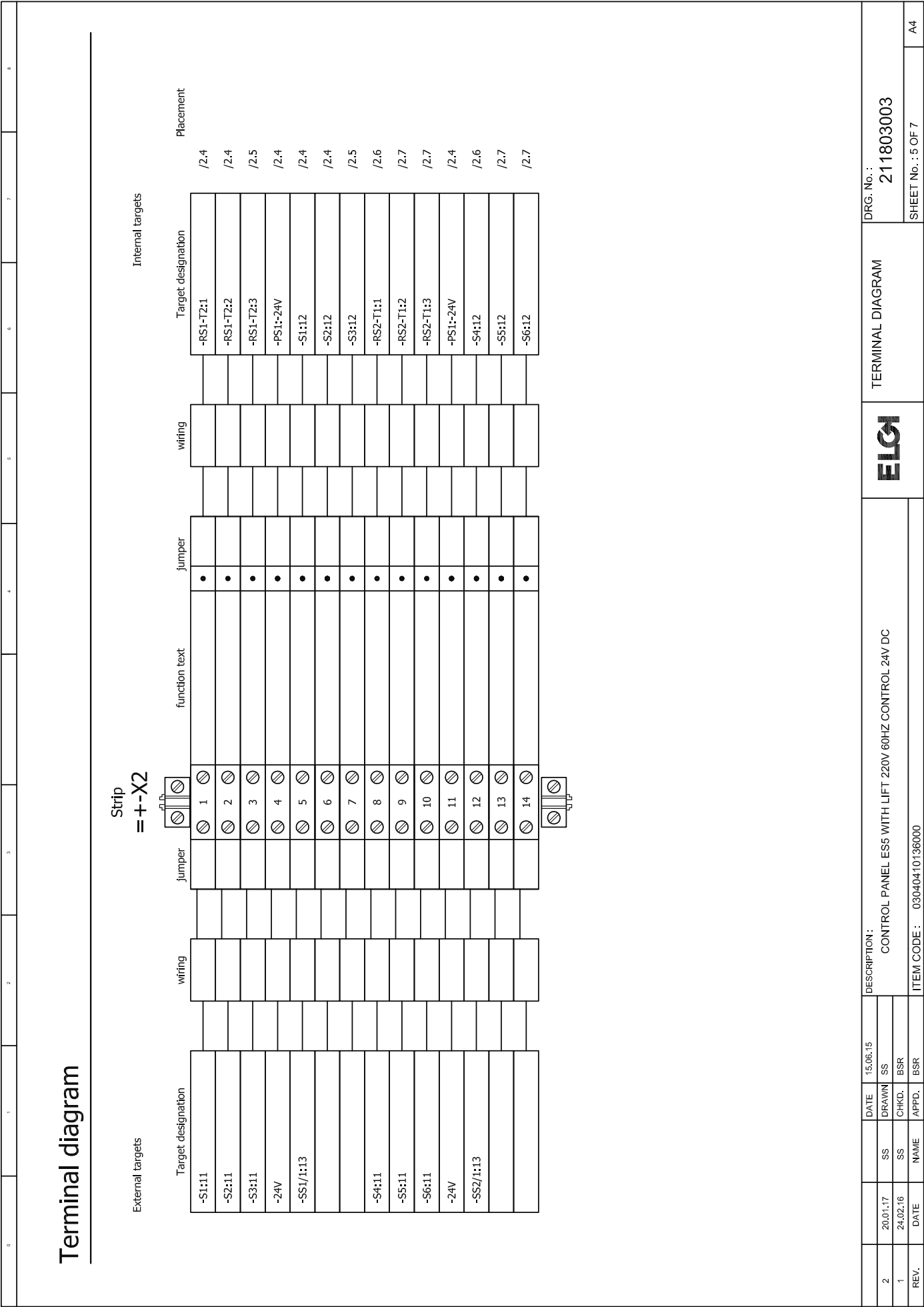


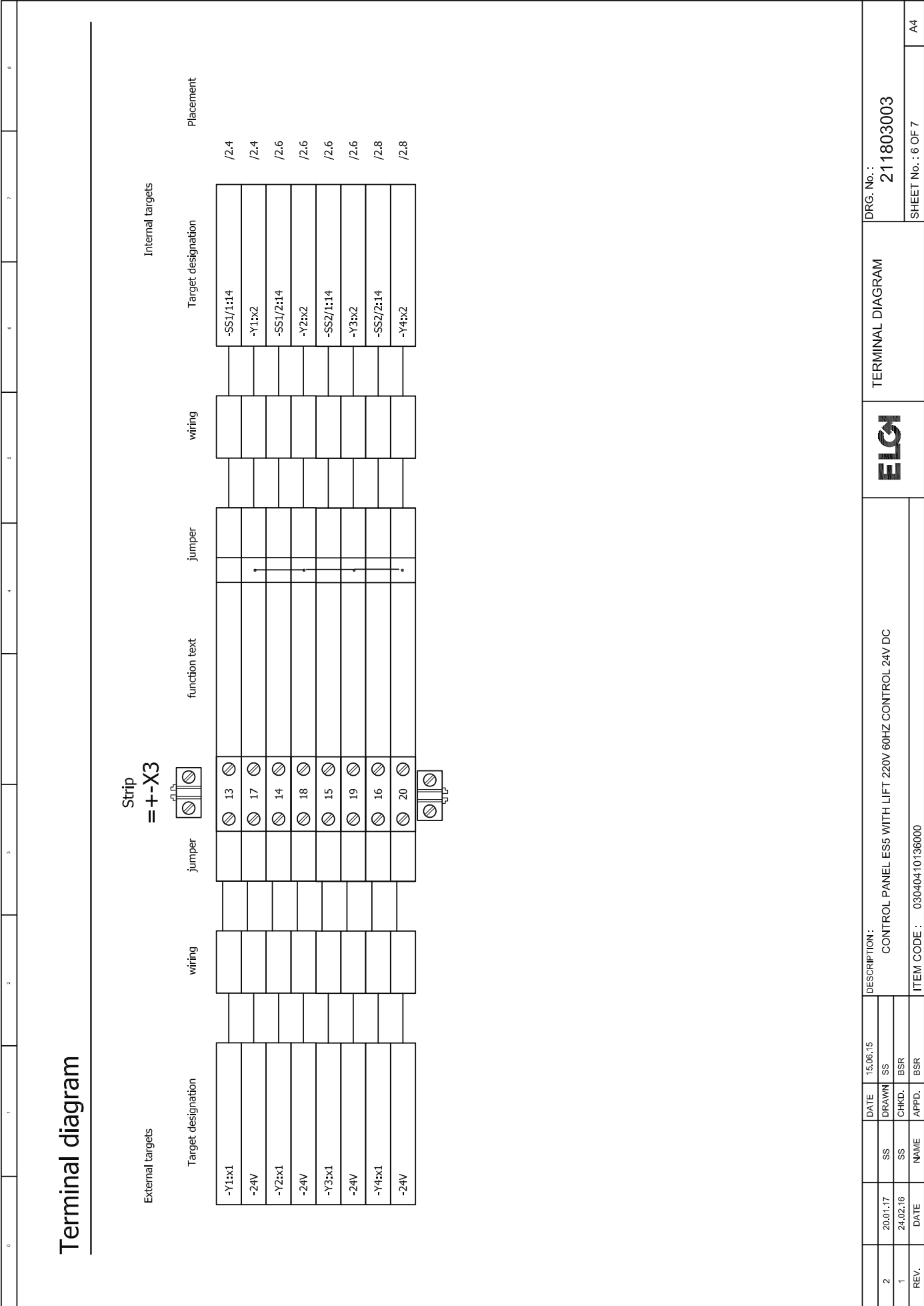
REV.		DATE	NAME	APPD.	BSR	DESCRIPTION: CONTROL PANEL ESS WITH LIFT 220V 60HZ CONTROL 24V DC	ELGI	CIRCUIT DIAGRAM	DRG. No. : 211803003	SHEET No. : 3 OF 7	A4
2	20.01.17	SS	SS	SS	BSR						
1	24.02.16	SS	CHKD.	SS	BSR						
ITEM CODE : 03040410136000											

Terminal diagram - X1



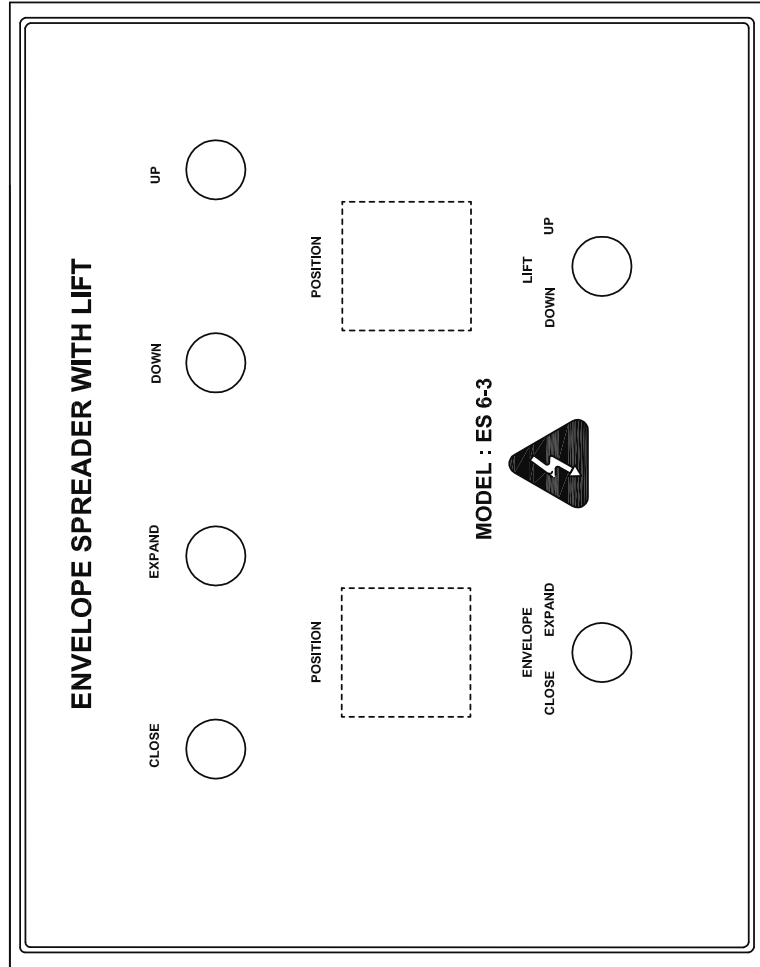
2	20.01.17	SS	DATE	15.06.15	DESCRIPTION :	CONTROL PANEL ES5 WITH LIFT 220V 60HZ CONTROL 24V DC	DRG. No. :	211803003
1	24.02.16	SS	DRWIN	SS				
REV.	DATE	NAME	CHKD.	BSR	APPD.	BSR	ITEM CODE :	03040410136000
ELGI							TERMINAL DIAGRAM	SHEET No. : 4 OF 7
							A4	





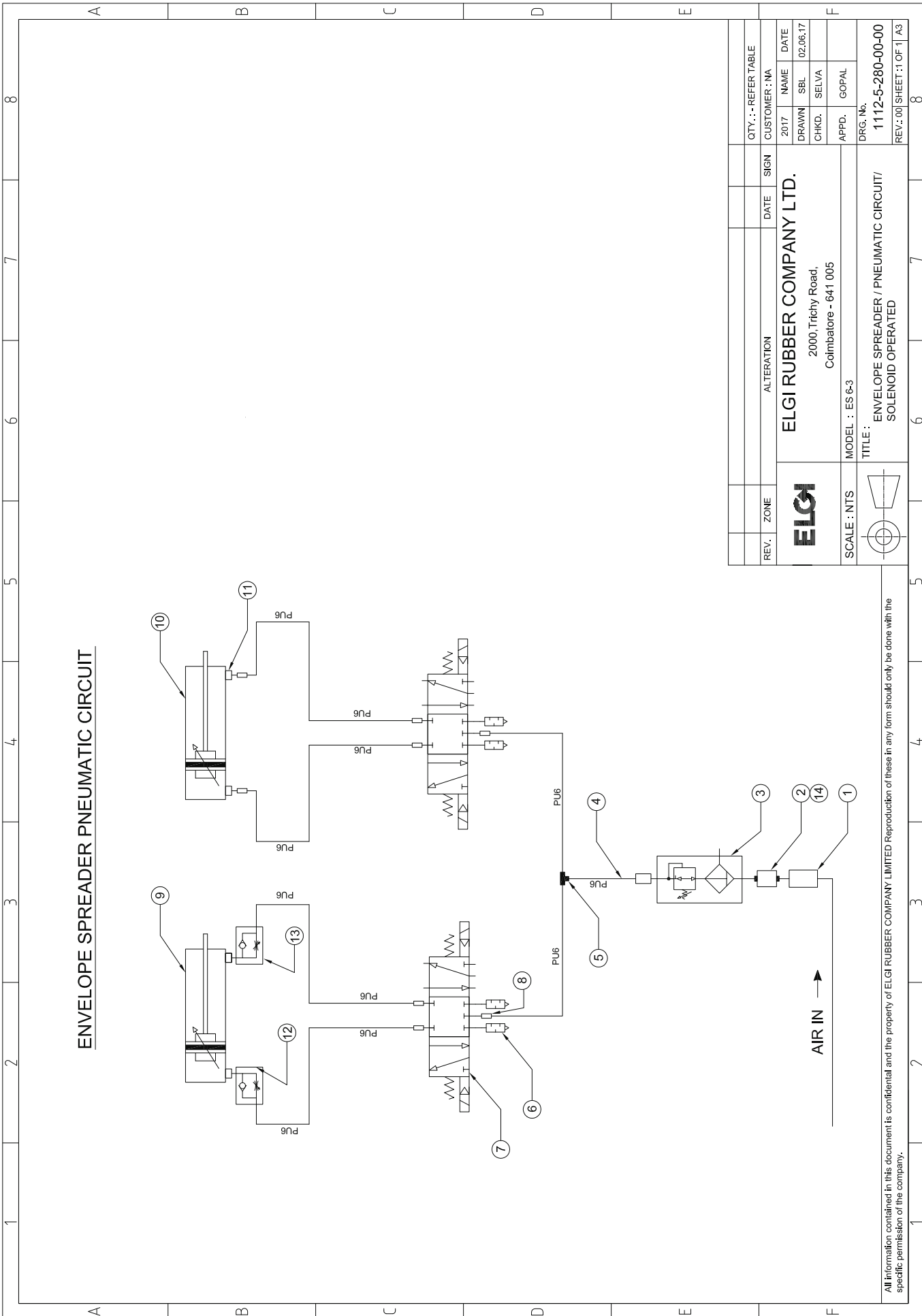
TERMINAL DIAGRAM				ELGI		DRG. No. : 211803003	
CONTROL PANEL ES5 WITH LIFT 220V 60HZ CONTROL 24V DC				ITEM CODE : 03040410136000		SHEET No. : 6 OF 7	
DESCRIPTION :				DATE		15.06.15	
CONTROL PANEL ES5 WITH LIFT 220V 60HZ CONTROL 24V DC				DRAWN		SS	
ITEM CODE : 03040410136000				CHKD.		BSR	
DATE				NAME		APPD.	
REV.				DATE		APPD.	
1				24.02.16		BSR	
2				20.01.17		SS	
A4				A4		A4	

Panel Layout



REV.		DATE	NAME	DATE	15.06.15	DESCRIPTION	TITLE :		DRG. No. :	A3
2		20.01.17	SS	SS	SS	CONTROL PANEL ES5 WITH LIFT 220V 60 HZ CONTROL 24V DC	PANEL LAYOUT		211803003	
1		24.02.16	SS	CHKD.	BSR					
				APPD.	BSR	ITEM CODE : 03040410136000			SHEET No. : 7 OF 7	

11 Pneumatic Circuit



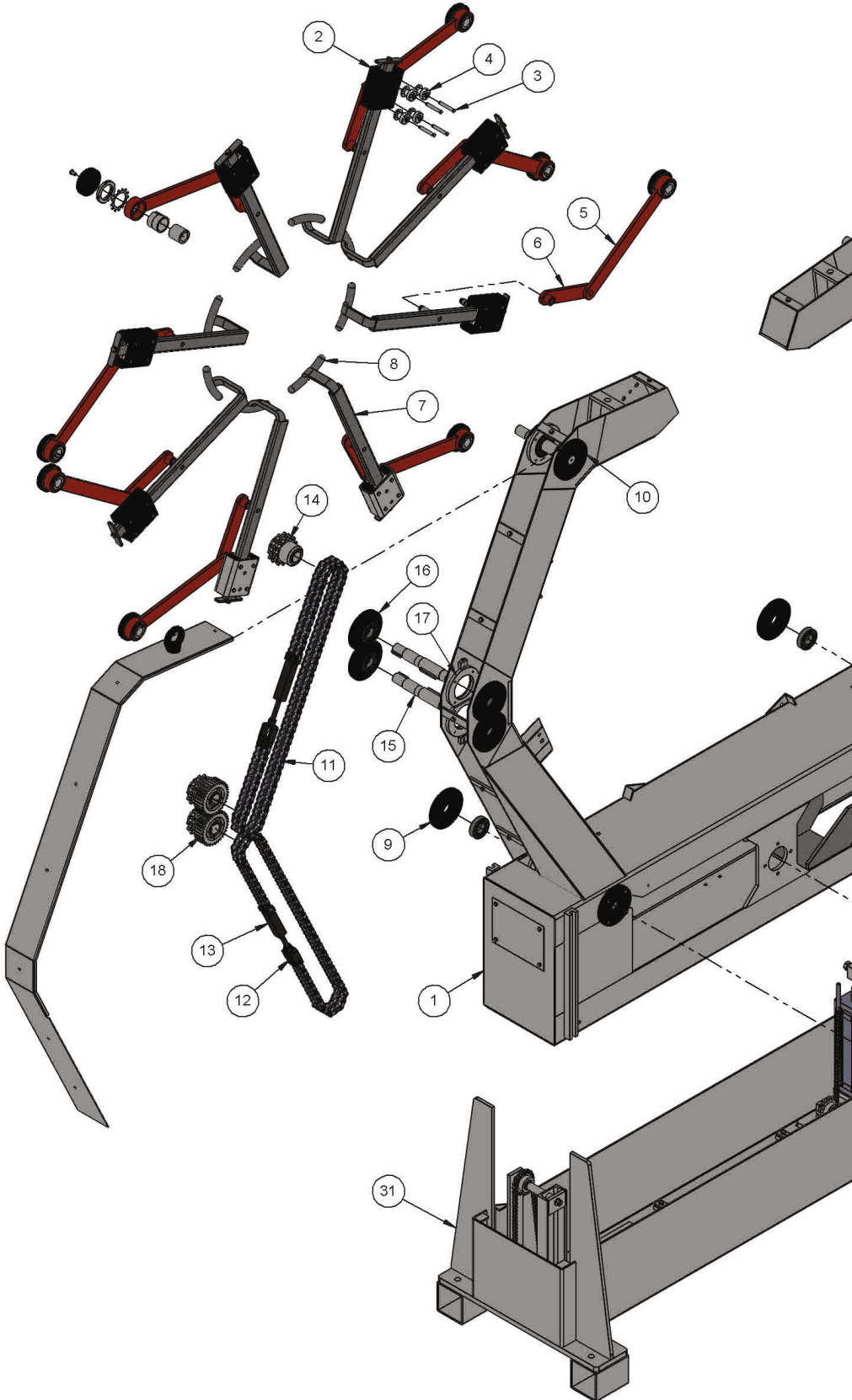
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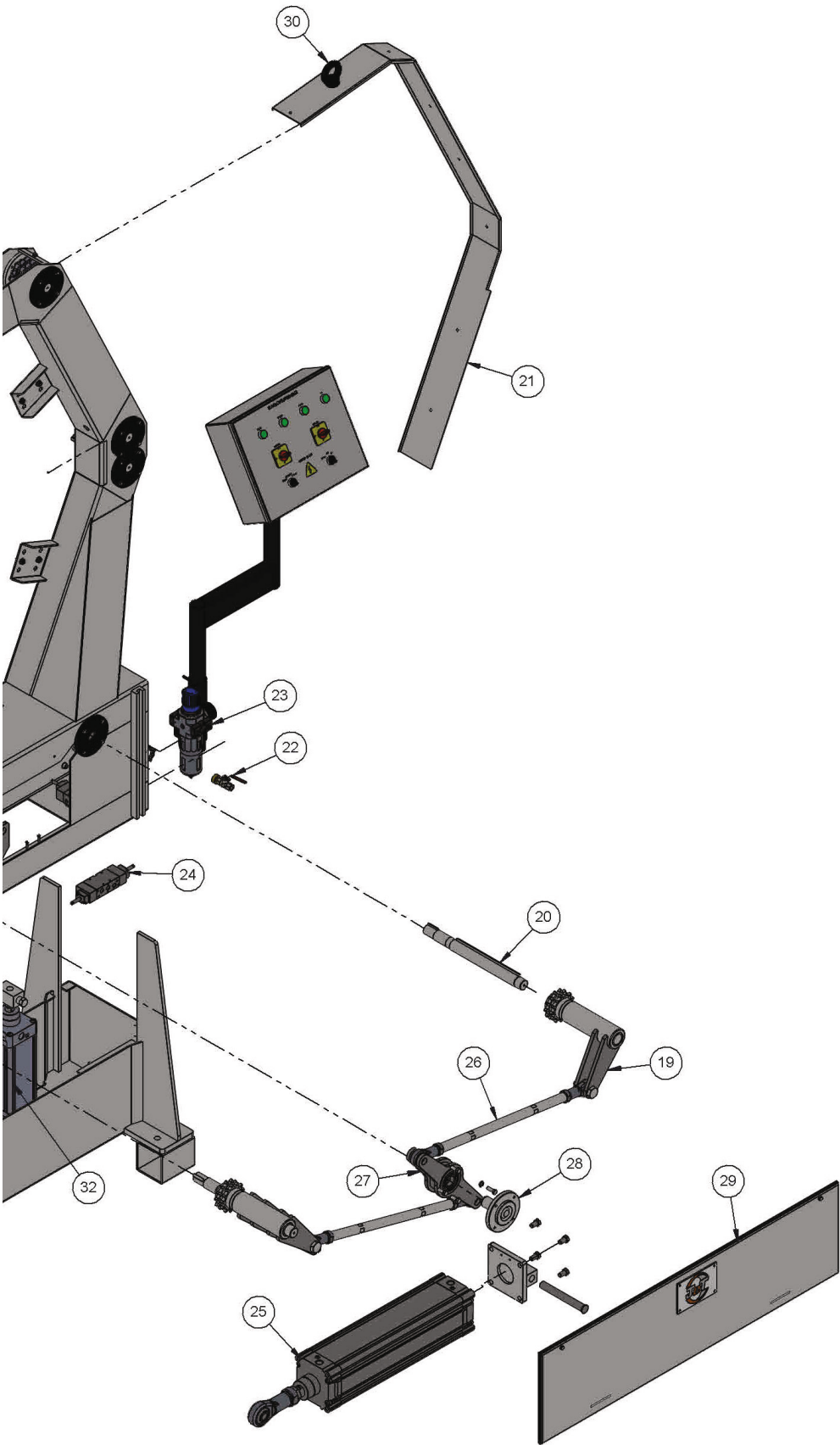
REV. ZONE		ALTERATION		DATE	SIGN	QTY. :- REFER TABLE		
						CUSTOMER : NA		
		ELGI RUBBER COMPANY LTD.				2017	NAME	DATE
		2000, Trichy Road, Coimbatore - 641 005				DRAWN	SBL	02.06.17
						CHKD.	SELVA	
						APPD.	GOPAL	
SCALE : NTS		MODEL : ES-6-3				DRG. No.		
						1112-5-280-00-00		
						REV.: 00 SHEET: 1 OF 1 A3		

Pneumatic Circuit - BOM

S. No.	Description	UOM	Qty.
1	QUICK COUPLER 1/4" BSP	Nos	1
2	BALL VALVE-1/4"	Nos	1
3	AIR FILTER CUM REGULATOR LFR-1/4-D-MIN/P.NO159631/FESTO	Nos	1
4	POLYURETHENE TUBING PUN-6 x 01-BL/P.NO: 159664/FESTO	Mtrs	-
5	UNION TEE 1/4" 6MM / P.NO.300606/JANATICS NOS	Nos	1
6	SILENCER UC -1/4 / P.NO.165004 / FESTO	Nos	4
7	SOLENOID VALVE MFH-5/3G-1 /4-B/P .NO: 19787/FESTO	Nos	2
8	SWIVEL ELBOW LCK-1/4-PK-6/P.NO.4472	Nos	8
9	PNEUMATIC CYLINDER- DNC 100-160 PPV/P.NO:163485/FESTO	Nos	1
10	PNEUMATIC CYLINDER- DNC125-400/PPV-A/P.NO:163507/ FESTO	Nos	1
11	BUSH NUT (BRASS) 1/2"X1/4"	Nos	4
12	FLOW CONTROL VALVE 1/4"/GR1 02 51 06/JANATICS	Nos	1
13	FLOW CONTROL VALVE 1/4"/GR5 02 51 06/JANATICS	Nos	1
14	HEX NIPPLE (BRASS) 1/4"	Nos	4

12 Parts List





Parts List - BOM

S. No.	Order Code	Description	UOM	Qty.
1	MA5163/1	MAIN FRAME	NOS	1
2	MA5163/2	SLIDE BRACKET	NOS	8
3	MA5163/3	PIN - GUIDE ROLLER	NOS	32
4	MA5163/4	GUIDE ROLLER FOR SLIDING ARM	NOS	32
5	MA5163/5	TAPER BUSH ARM	NOS	8
6	MA5163/6	BUSH LINK ARM	NOS	8
7	MA5163/7	SLIDING ARM	NOS	8
8	MA5163/8	CLAW HOLDER	NOS	8
9	MA5163/9	BEARING FLANGE - A	NOS	8
10	MA5163/10	LOCK FLANGE - A	NOS	8
11	MA5163/11	CHAIN DUPLEX 3/4" X 7/16" - DR1911/ROLLON	MTR	6.1
12	MA5163/12	CHAIN TENSIONER MALE	NOS	4
13	MA5163/13	CHAIN TENSIONER FEMALE	NOS	4
14	MA5163/14	DRIVEN SPROCKET	NOS	6
15	MA5163/15	DRIVEN SHAFT	NOS	6
16	MA5163/16	BEARING FLANGE - B	NOS	8
17	MA5163/17	LOCK FLANGE - B	NOS	8
18	MA5163/18	GEAR WITH SPRACKET	NOS	4
19	MA5163/19	DRIVE SPROCKET	NOS	2
20	MA5163/20	DRIVE SHAFT	NOS	2
21	MA5163/21	COVER SIDE ARM	NOS	2
22	MA5163/22	BALL VALVE 1/4"	NOS	1
23	MA5163/23	AIR FILTER CUM REGULATOR	NOS	1
24	MA5163/24	SPOOL VALVE	NOS	1
25	MA5163/25	PNEUMATIC CYLINDER	NOS	1
26	MA5163/26	EQUALIZER ROD	NOS	2
27	MA5163/27	BALANCER CENTRE ARM	NOS	1
28	MA5163/28	EQUALISHER BEARING PIN	NOS	1
29	MA5163/29	COVER BOTTOM	NOS	1
30	MA5163/30	EYE BOLT M20	NOS	2
31	MA5163/31	LIFT FRAME ASSEMBLY	NOS	1
32	MA5163/32	"PNEUMATIC CYLINDER DNC-100-160-PPV / P.No. : 163485 / FESTO"	NOS	1

13 Essential Spares List

S. No.	Order Code	Description	UOM	Qty.
1	MA5163/ES/1	Seal Kit for Pneumatic Cylinder DNC125 x 400 PPV-A / Festo	Nos	1
2	MA5163/ES/2	Seal Kit for Pneumatic Cylinder DNC -100 -160 PPV / Festo	Nos	1
3	MA5163/ES/3	Seal Kit for Solenoid Operated Valve MFH -5/3G-1/4-B / Festo	Nos	2
4	MA5163/ES/4	Guide Roller For Sliding Arm / EE5 5	Nos	32
5	MA5163/ES/5	Bush Link Arm - EE 5	Nos	8
6	MA5163/ES/6	Bush Pivot Sliding Arm / EE 5	Nos	16
7	MA5163/ES/7	MCB 2P 2A / 5SL6202-7RC / Siemens - F2	Nos	1
8	MA5163/ES/8	Indication Lamp Green 220V AC / 3SB5285-6HD03 / Siemens - H1-4	Nos	1
9	MA5163/ES/9	3 Position Selector Switch / 3SB5000-2DB01 / Siemens - SS1,SS2	Nos	1
10	MA5163/ES/10	No Element / 3SB54 00-0B / Siemens - SS1	Nos	1
11	MA5163/ES/11	Power Isolator / 6A,2POLE / Salzer - Q1	Nos	1
12	MA5163/ES/12	3 Position Rotary Switch / 6A,3 Pole / Salzer - RS1, RS2	Nos	1
13	MA5163/ES/13	Power Supply 2.1A / 230VAC/24VDC / Meanwell - PS1	Nos	1