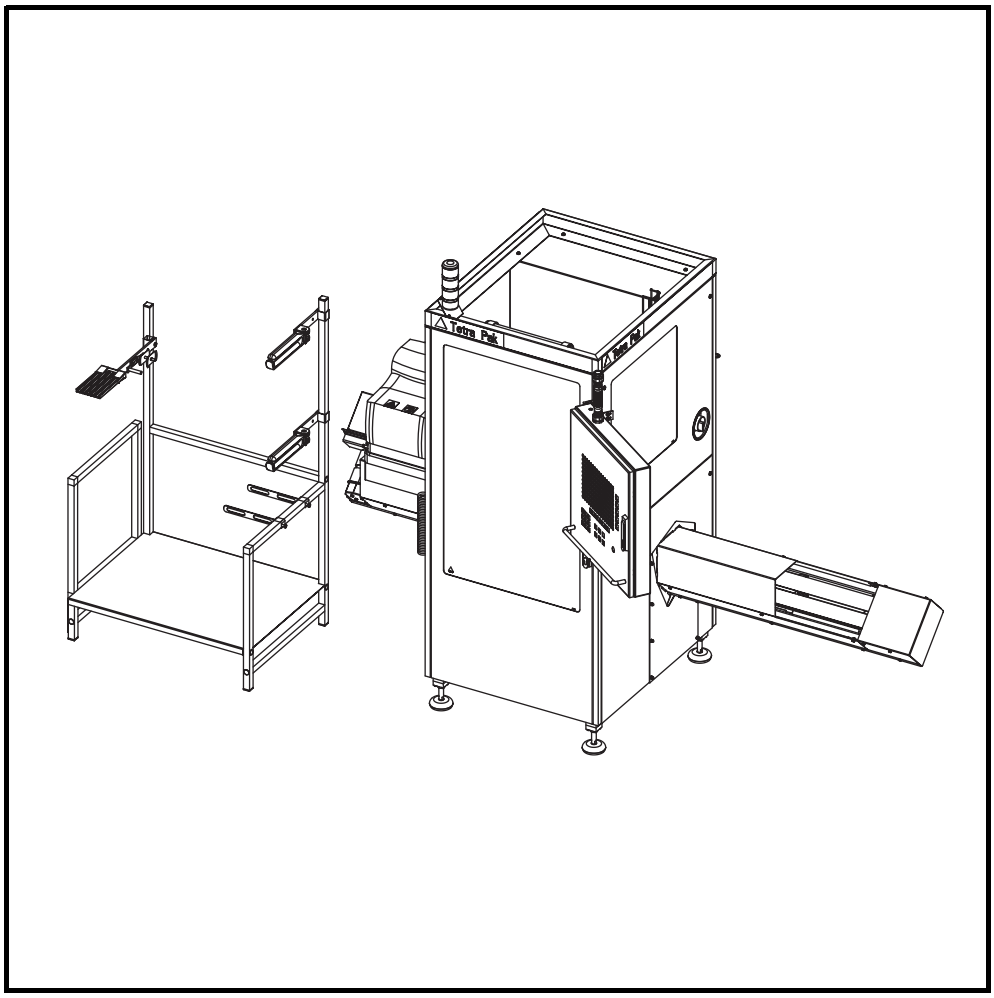
EM

Electrical Manual

Straw Applicator 1 - TCA

662651-0100 - CE

TechPub_2614345_0103 - EM_2646179_0101_fro.fm



WARNING

Read and follow all safety precautions before working on or near this equipment.

Read all safety precautions throughout this manual and on safety signs attached to this equipment. Failure to follow all safety precautions could result in death or serious injury.

Tetra Pak

Doc. No. EM-2646179-0101

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The content of this manual is in accordance with the design and construction of the machine or equipment at the time of publishing. Tetra Pak reserves the right to introduce design modifications without prior notice.

This document was produced by:

Tetra Pak Carton Ambient AB
Ruben Rausings gata
SE-221 86 Lund
Sweden

Additional copies can be ordered from Tetra Pak Parts or the nearest Tetra Pak office. When ordering additional copies, always provide the document number. This can be found in the machine specification document. It is also printed on the front cover and in the footer on each page of the manual.

Doc. No. EM-2646179-0101

Issue 2004-06

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This manual is valid for:

Series No./ Machine No. Sign.

EM
Electrical Manual

Straw Applicator 1 - TCA
662651-0100 - CE

i Introduction

ii Safety Precautions

1 Electrical Systems Description

2 Document List

3 Position Summary

4 Circuit Diagrams

5 Line Summary

6 Cabinet Terminal Summary

7 Terminal Strip Overview

8 Cable Connection List

9 Mains Connection Diagrams

10 Program Documents

A list of all optional equipment, optional kits, and rebuilding kits that this manual is valid for is found on the next page.

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Tetra Pak Carton Ambient AB

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Update Log for Doc. No. EM-2646179-0101

This table shows all changes made to this manual, such as kits installed and pages added or removed.

Date	Installed Kit	Added Pages (Doc. No.)	Removed Pages	Signature

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Date	Installed Kit	Added Pages (Doc. No.)	Removed Pages	Signature

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i Introduction

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About the Introduction Chapter

This chapter contains basic information about this manual and related Tetra Pak equipment.

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Manual Information

Tetra Pak recommends reading all delivered manuals carefully. Make sure that the delivered manuals are available to personnel who operate or maintain the equipment.

It is important to keep this manual for the lifetime of the equipment and to pass the manual on to any subsequent holder or user.

Tetra Pak will not be held responsible for any damage to the equipment caused by not following the instructions given in this manual.

Delivered Documentation

The documents delivered with this machine or equipment include

- Electrical Manual (EM)
  This manual provides technicians with information about the equipment's electrical system.
- Installation Manual (IM)
  This manual provides technicians with information required to safely install the equipment.
- Maintenance Manual (MM)
  This manual provides technicians with information on maintaining the equipment.
- Operation Manual (OM)
  This manual provides the operator with information on handling and operating the equipment before, during, and after production.
- Spare Parts Catalogue (SPC)
  This manual provides the information necessary to order spare parts from Tetra Pak

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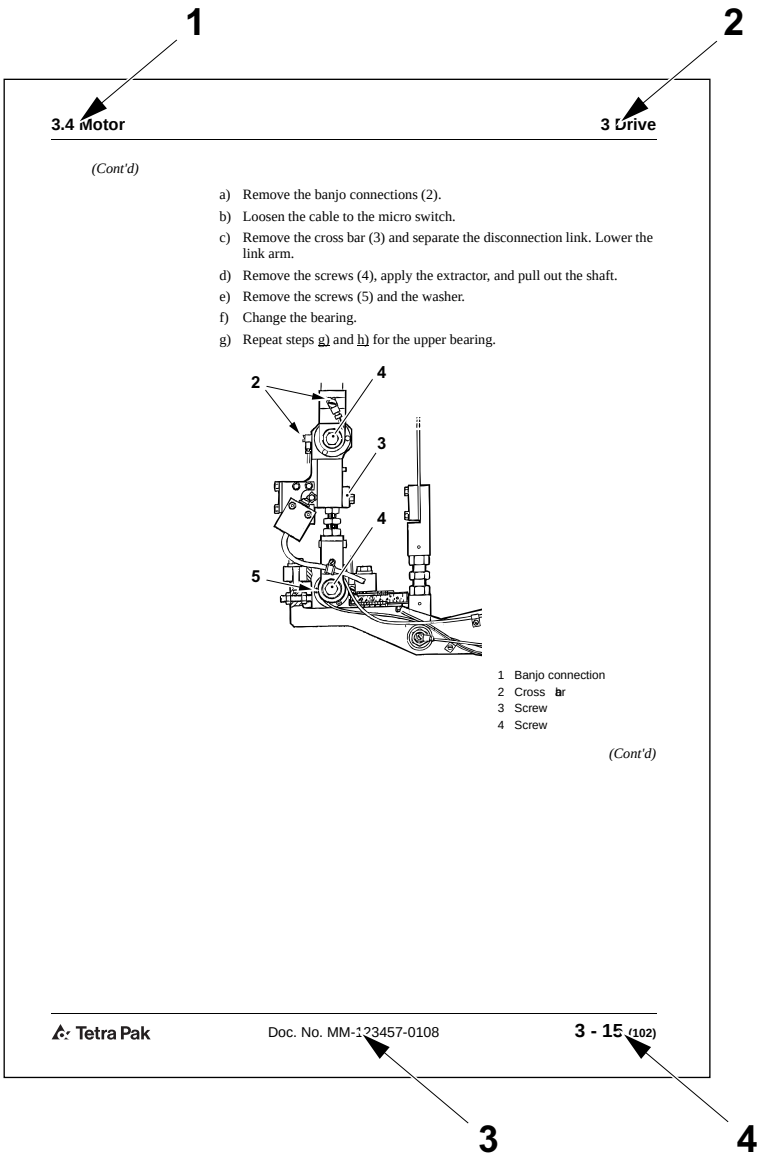
Page Layout

Every main page in a manual contains a header and a footer. The page header contains the section name (1) and the chapter name (2). The page footer contains the manual's document number (3), and the page number (4). See also Section Page Numbering.



1 Section name
2 Chapter name
3 Document number
4 Page number

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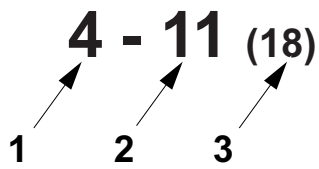
Page Numbering

A page number has three parts:

- chapter number (1)
- consecutive page number (2) within the chapter
- total number of pages (3) in the chapter.



1 Chapter number
2 Consecutive page number
3 Total number of pages

Typographical Conventions

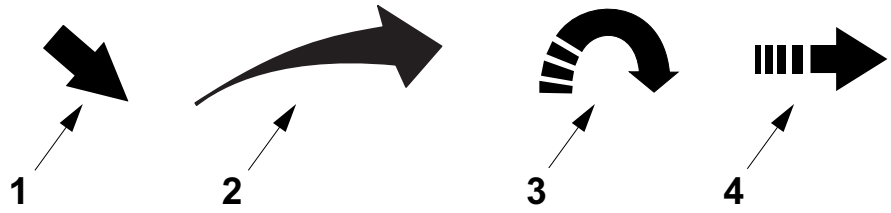
Controls on the operator panel, emergency stop devices, and program steps are printed in CAPITAL LETTERS

Cross-references are underlined.

Symbols

The following symbols are used in illustrations:

- A pointer arrow (1) indicates the position of an object.
- A zoom arrow (2) indicates that an object view is enlarged. The arrow points towards the enlarged view of the object.
- A rotation movement arrow (3) indicates rotational movement of an object. The arrow points in the direction of rotation.
- A straight movement arrow (4) indicates movement of an object. The arrow points in the direction of movement.



1 Pointer arrow
2 Zoom arrow
3 Rotation movement arrow
4 Straight movement arrow

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Machine Introduction

Intended Use of the Machine or Equipment

The intended use of this Tetra Pak equipment is to apply drinking straws to Tetra Pak packages.

All other use is prohibited. Tetra Pak will not be held responsible for injury or damage if the machine or equipment is used for any other purpose.

Manufacturer

This Tetra Pak machine or equipment has been manufactured by

Tetra Pak Carton Ambient AB
Ruben Rausings gata
SE-221 86 Lund
Sweden

Service

If you encounter problems when operating this machine or equipment, contact the nearest Tetra Pak office.

Contact the Liaison with other inquiries, comments, or suggestions for improvement regarding the machine or equipment and its documentation.

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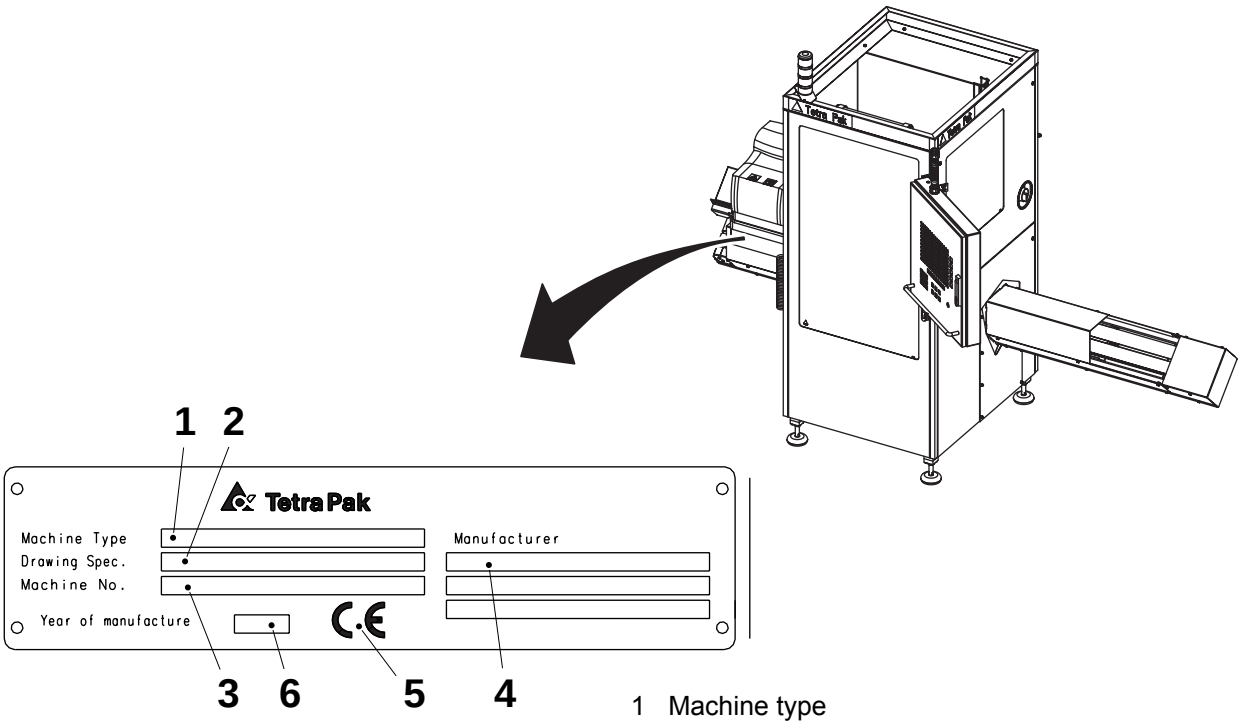
Identification

CE Classification

This equipment complies with the basic health and safety regulations of the European Economic Area (EEA).

Machine Plate

The illustration below shows an example of the machine plate and its location on the equipment. The machine plate carries data needed when contacting Tetra Pak concerning this specific equipment.



1 Machine type
2 Drawing specifications
3 Machine serial number
4 Manufacturer
5 CE mark
6 Year of manufacture

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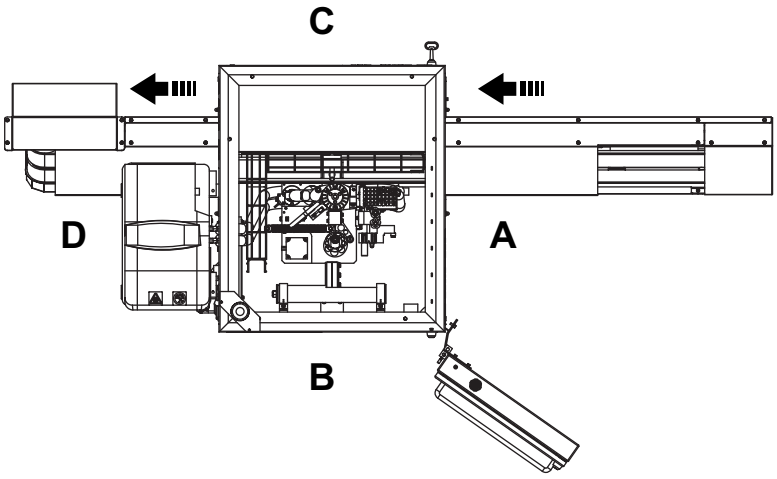
Orientation

The illustration below shows the orientation of the equipment. This orientation information will be used throughout this manual.



A Front
B Left-hand side
C Right-hand side
D Back

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Hygiene

- Keep your hands and gloves clean.
- Always wear some type of hair protection (cap or hairnet) and clean clothes (preferably white).
- Do not wear a watch, ring, necklace, earrings, or any other exposed jewellery.

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Abbreviations and Terminology

Abbreviation/ Terminology	Meaning	Translation
CE	Communautés Européennes / European Communities	
EEA	European Economic Area	
IEC	International Electrotechnical Commission	
EM	Electrical Manual	
OM	Operation Manual	
MM	Maintenance Manual	
IM	Installation Manual	
SPC	Spare Parts Catalogue	
PLC	Programmable Logic Controller	

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How to Use This Electrical Manual

General

The chapters following Introduction and Safety Precautions are divided as follows.

Chapter	Name	Drawing No.
1	Electrical Systems Description	
2	Document List	xxxxxxx-0001
3	Position Summary	xxxxxxx-0002
4	Circuit Diagrams	xxxxxxx-0003
5	Line Summary	xxxxxxx-0004
6	Cabinet Terminal Summary	xxxxxxx-0005
7	Terminal Strip Overview	xxxxxxx-0006
8	Cable Connection List	xxxxxxx-0007
9	Mains Connection Diagrams	xxxxxxx-0008
10	Program Documents	

The **Document List** is a Table of Contents for chapters 3 to 9, listing all drawings included.

In the **Circuit Diagrams**, the first pages are reserved for distribution terminals and the last pages are reserved for pre-connected cables (cables connected to spare terminals and reserved for future use).

The **Mains Connection** diagram shows how the machine should be connected to the local supply, the dimensions of the connection cable, and the connection of the matching transformer (when used).

The **Program Documents** consist of the PLC listings for this machine.

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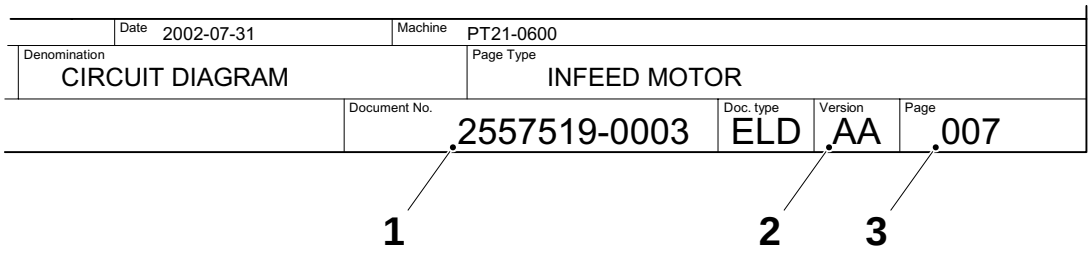
The documents and drawings in chapters 3 to 9 are identified by a drawing group number (1), a version code (2), and a page number (3).



1 Drawing number
2 Version code
3 Page number

The page number is the consecutive numbering of the pages that belong to the main number and is used as a reference in the diagrams.

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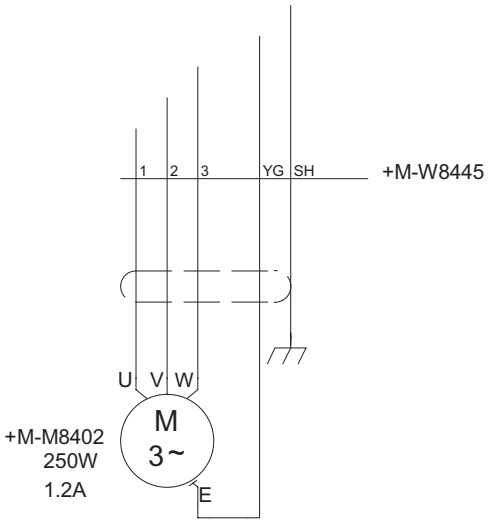
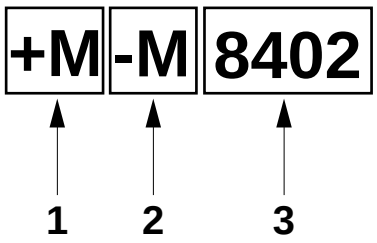
Numbering System for Components

The position number has three parts: a prefix (1), a function designation (2), and a running number (3). These parts are described in detail in the sections below.





1 Prefix
2 Function designation
3 Running number

Prefix

The prefix shows the location of the component:

- +M indicates that the component is fitted on the machine, outside the electrical cabinet.
- +C indicates that the component is fitted on the electrical cabinet, on the TPOP, or on the process panel.

Note! The location +C is considered as default and is omitted on all **circuit diagram** pages.

(Cont'd)

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(Cont'd)

Function Designation

The function designation is indicated in accordance with international standards. See the table below.

Designation	Signification in Electrical Diagram
A	Assemblies, Sub-assemblies
B	Transducers
C	Capacitors
D	Binary element, Delay devices, Storage devices
E	Miscellaneous
F	Protective devices
G	Generators, Power supplies
H	Signalling devices
K	Relays, Contactors
L	Inductors, Reactors
M	Motors
N	Analogue elements
P	Measuring equipment, Testing equipment
Q	Switching devices for power circuits
R	Resistors
S	Switching devices for control circuits selectors
T	Transformers
U	Modulators, Changers
V	Tubes, Semiconductors
W	Transmission paths, Waveguide aerials
X	Terminals, Plugs, Sockets
Y	Electrically operated mechanical devices
Z	Terminations, Hybrids, Filters, Equalizers, Limiters

Running Number

The electrical components are numbered in a consecutive non-logical order.

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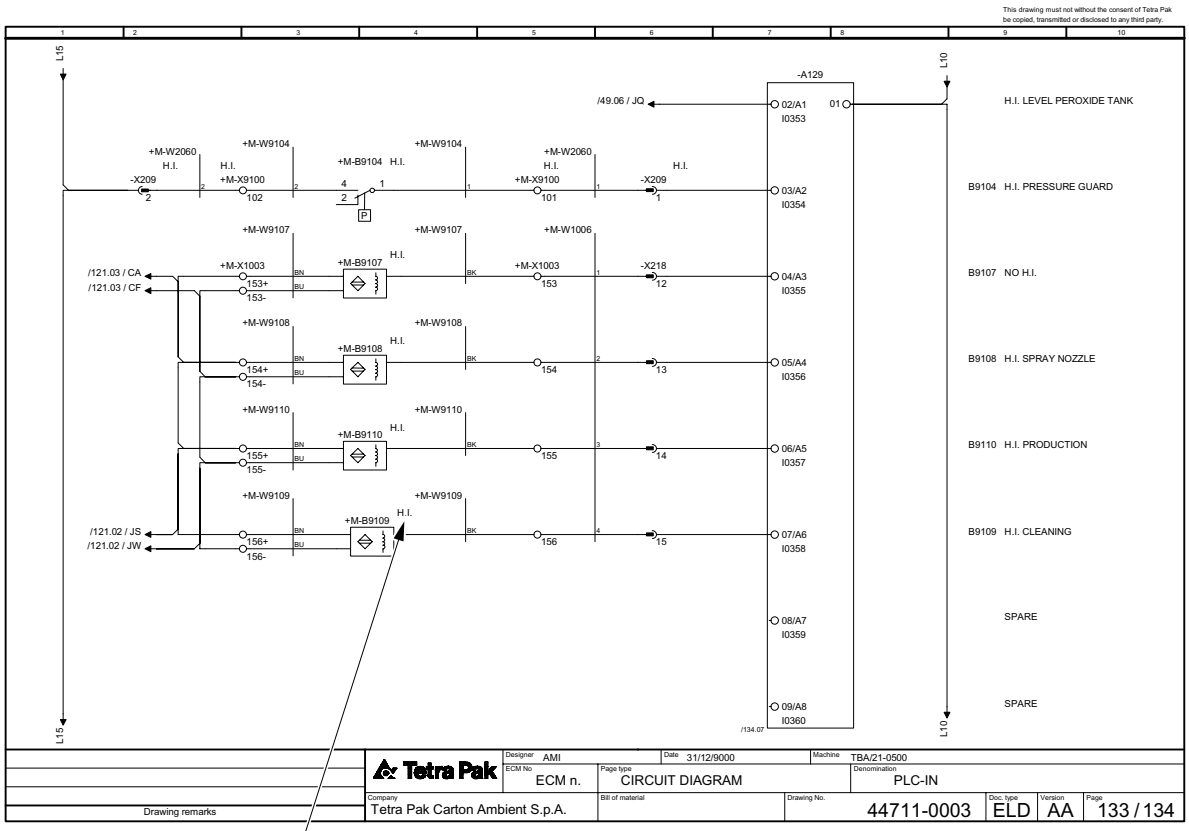
Optional Equipment

An optional equipment designation (1) indicates that the component belongs to specific optional equipment.



1 Optional equipment designation

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How to Trace a Component

Example 1: How to trace sensor +M-B8405

a) Go to the **Position summary**. See the illustration on the next page.

b) On the right side of the table, find the circuit diagram reference page where the component +M-B8405 is located (page 035, column 4).

c) Go to page 035 in the **Circuit diagram**. See the illustration on the next page.

d) Find the component +M-B8405.

e) Note the connections +M-X8402 :1, :2, :3.

f) Note the cable +M-W8423.

(Cont'd)

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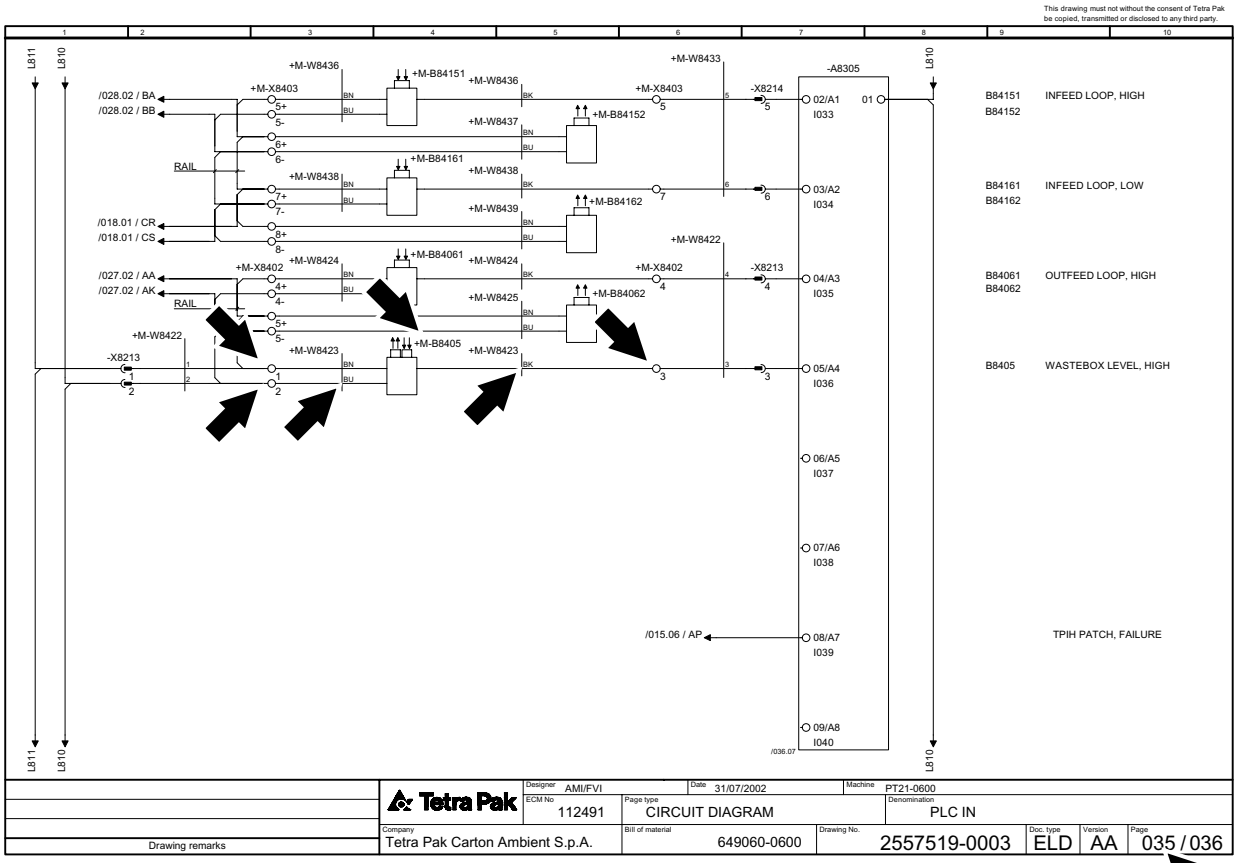
(Cont'd)

Position summary of 2557519-0003

Component	Page .Col.	Opt.	Component	Page ./	Opt.
+C-A8201	006 .7		+M-B8405	035 .4	
+C-A8202	021 .7		+M-B8408	037 .5	
+C-A8205	015 .4		+M-B8409	028 .4	
+C-A8210	016 .3		+M-B8411	028 .4	
+C-A8211	017 .4		+M-B8413	037 .5	
+C-A8212	017 .4		+M-B8414	028 .4	
+C-A8216	007 .5		+M-B8421	027 .4	
+C-A8233	008 .7		+M-B8422	028 .4	
+C-A8250	018 .7		+M-B8423	027 .4	
+C-A8251	017 .8		+M-B8424	027 .4	
+C-A8252	022 .6		+M-B8426	034 .3	
+C-A8301	028 .7		+M-B8427	041 .3	

Position summary



Circuit diagram

(Cont'd)

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(Cont'd)

g) Go to the **Terminal strip overview**. See the illustration.

h) Find the connections +M-X8402 :1, :2, :3 (on the right side of the table, find the circuit diagram reference page where the connections are located).

Note! The **Terminal strip overview** shows how the sensor is connected (in this case via a connection box).

Terminal strip of 2557519-0003

+M-X8402

From	Cable	Int. Jun.	Terminal	Ext. Jump.	Cable	To	Page.Col.	Option	Function text
+C-X8213:1	+M-W8422:1		1		+M-W8423:BN	+M-B8405:	035 .3		WASTEBOX LEVEL, HIGH
+C-X8213:2	+M-W8422:2		2		+M-W8423:BU	+M-B8405:	035 .3		WASTEBOX LEVEL, HIGH
+C-X8213:3	+M-W8422:3		3		+M-W8423:BK	+M-B8405:	035 .6		WASTEBOX LEVEL, HIGH
+C-X8213:4	+M-W8422:4		4		+M-W8424:BK	+M-B84061:	035 .6		OUTFEED LOOP, HIGH
			4+		+M-W8424:BN	+M-B84061:	035 .3		OUTFEED LOOP, HIGH
			4-		+M-W8424:BU	+M-B84061:	035 .3		OUTFEED LOOP, HIGH
			5						
			5+		+M-W8425:BN	+M-B84062:	035 .3		OUTFEED LOOP, HIGH
			5-		+M-W8425:BU	+M-B84062:	035 .3		OUTFEED LOOP, HIGH
+C-X8213:5	+M-W8422:5		6		+M-W8426:BK	+M-B84071:	027 .5		OUTFEED LOOP, LOW
			6+		+M-W8426:BN	+M-B84071:	027 .2		OUTFEED LOOP, LOW
			6-		+M-W8426:BU	+M-B84071:	027 .2		OUTFEED LOOP, LOW
			7						
			7+		+M-W8427:BN	+M-B84072:	027 .2		OUTFEED LOOP, LOW
			7-		+M-W8427:BU	+M-B84072:	027 .2		OUTFEED LOOP, LOW
+C-X8213:6	+M-W8422:6		8				040 .6		
			8+				040 .4		
			8-				040 .4		
+C-X8213:7	+M-W8422:7		9				040 .6		
			9+				040 .4		
			9-				040 .4		
+C-X8213:8	+M-W8422:8		10				040 .6		
			10+				040 .4		
			10-				040 .4		
+C-X8213:9	+M-W8422:9		11		+M-W8431:WH	+M-B8411:	028 .6		BLACK TAPE, DETECTED
			11+		+M-W8431:RD	+M-B8411:	028 .3		BLACK TAPE, DETECTED
			11-		+M-W8431:BK	+M-B8411:	028 .3		BLACK TAPE, DETECTED
+C-X8213:10	+M-W8422:10		12				040 .6		
			12+				040 .4		
			12-				040 .4		

Terminal strip overview

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Note! When a cable is supplied with the component, such as sensors and photocells, the pin configuration is removed from the symbol in the **Circuit diagram**. The connection information is kept separately from the cable cores.

i) The location +M indicates that the component is fitted on the machine.

j) Locate the component using the SPC, see Section How to Find Electrical Components using the Spare Parts Catalogue.

(Cont'd)

(Cont'd)

Example 2: How to trace contactor +C-K8201

a) Go to the **Position summary**. See the illustration below.

b) On the right side of the table, find the circuit diagram reference page where the component +C-K8201 is located (page 043, column 4).

c) Go to page 043 in the **Circuit diagram**. See the illustration below.

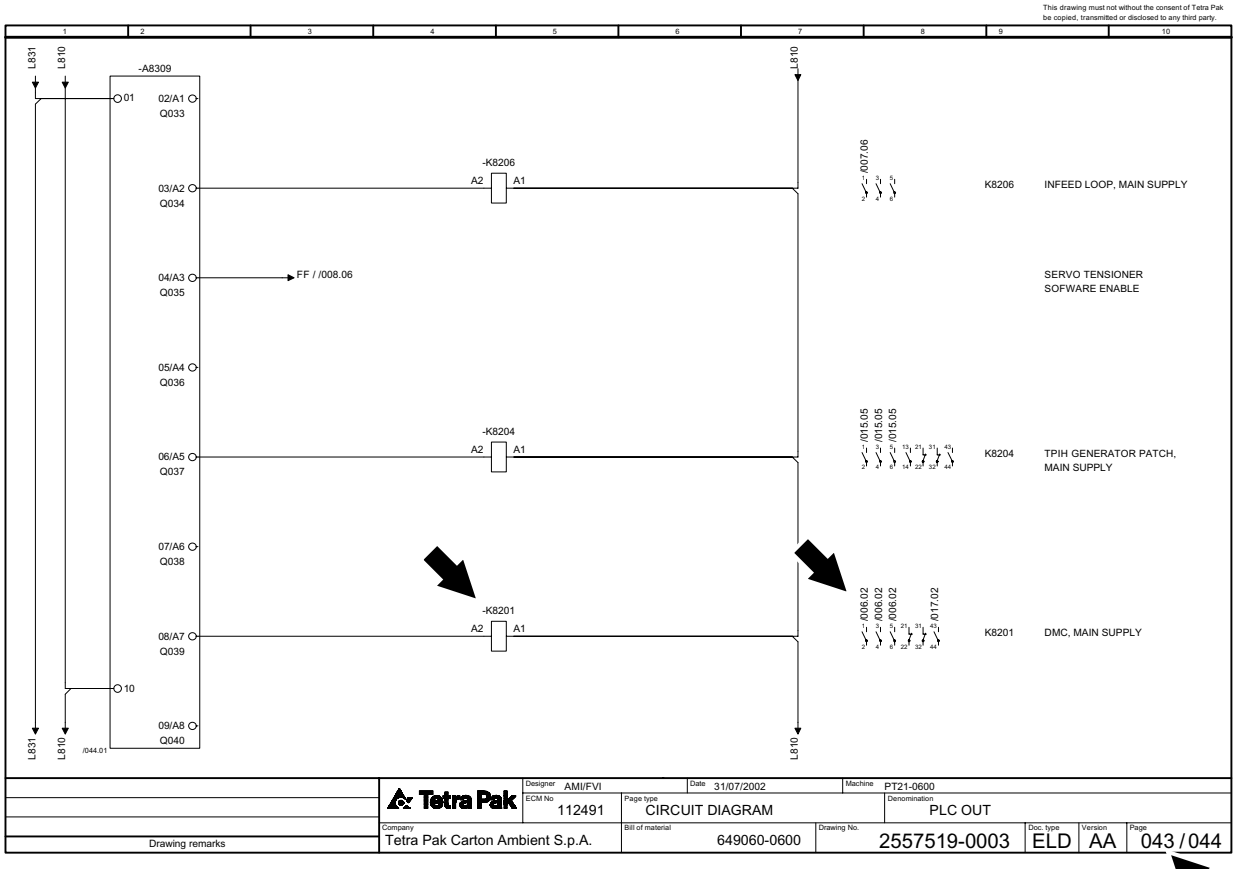
d) Find the component +C-K8201.

e) Note the contact image on the right side and find the page references for the related contacts.

+C-A8311	047 .1	+M-B8457	018 .3	+C-F8252	012 .6	+C-P8201	045 .4
+C-A8313	051 .1	+M-B84061	035 .4	+C-F8253	012 .9	+C-Q8201	006 .2
+C-B8201	041 .3	+M-B84062	035 .5	+C-G8301	010 .1	+C-R8301	025 .3
+C-B8202	033 .4	+M-B84071	027 .4	+C-G8302	010 .4	+M-R8401	012 .3
+M-B8401	021 .5	+M-B84072	027 .4	+C-G8303	010 .7	+M-R8452	012 .6
+M-B8402	021 .2	+M-B84151	035 .4	+M-H8401	011 .1	+M-R8453	012 .9
+M-B8403	021 .2	+M-B84152	035 .5	+C-HS8201	045 .5	+C-S8201	038 .4
+M-B8404	033 .4	+M-B84161	035 .4	+C-K8201	043 .4	+C-S8202	021 .5

Tetra Pak | Designer AMI/FVI | Date 31/07/2002 | Machine PT21-0600
ECM No 112491 | Page type POSITION SUMMARY | Denomination POSITION SUMMARY
Company Tetra Pak Carton Ambient S.p.A. | Bill of material 649060-0600 | Drawing No. 2557519-0002 | Doc. type ELD | Version AA | Page 001 / 002
Drawing remarks

Position summary



Circuit diagram

(Cont'd)

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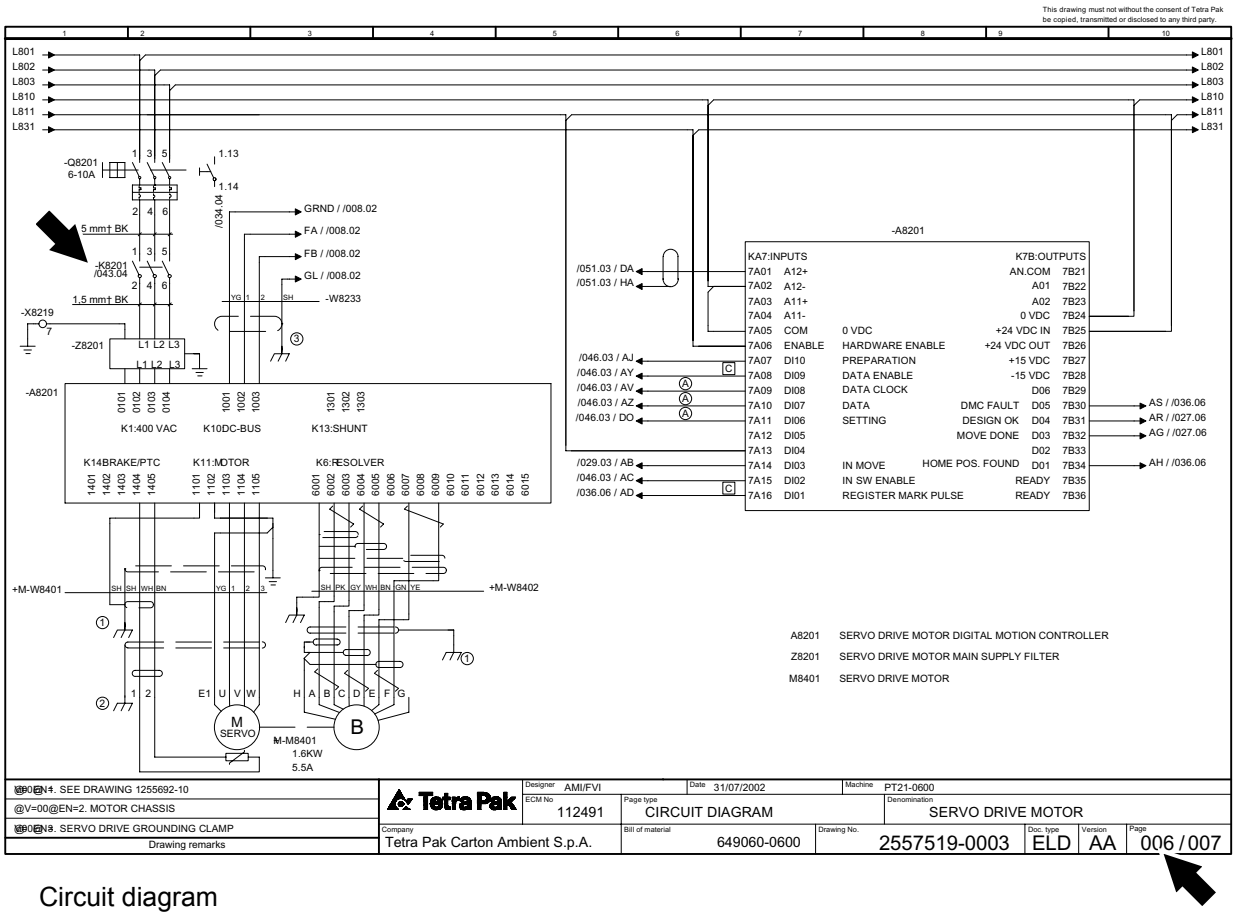
(Cont'd)

f) Go to page 006, column 2 in the **Circuit diagram**. See the illustration below.

g) Find the contacts +C-K8201.

Note! For master and slave components, such as coils and contacts, only the master is reported in the **Position summary**. The slave shows the page and column references of the master.



Circuit diagram

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How to Trace a Cable

Example: How to trace cable No. +M-W8202

a) Go to the **Cable Connection list**. See the illustration on the next page.

b) On the right side of the table, find the circuit diagram reference page where the cable +M-W8202 is located (page 005, column 5).

Note! The cables are listed in alphanumerical order.

c) Go to page 005 in the **Circuit diagram**. See the illustration on the next page.

d) Find the cable +M-W8202.

Note! The spare cores are shown in the cable connection list.

(Cont'd)

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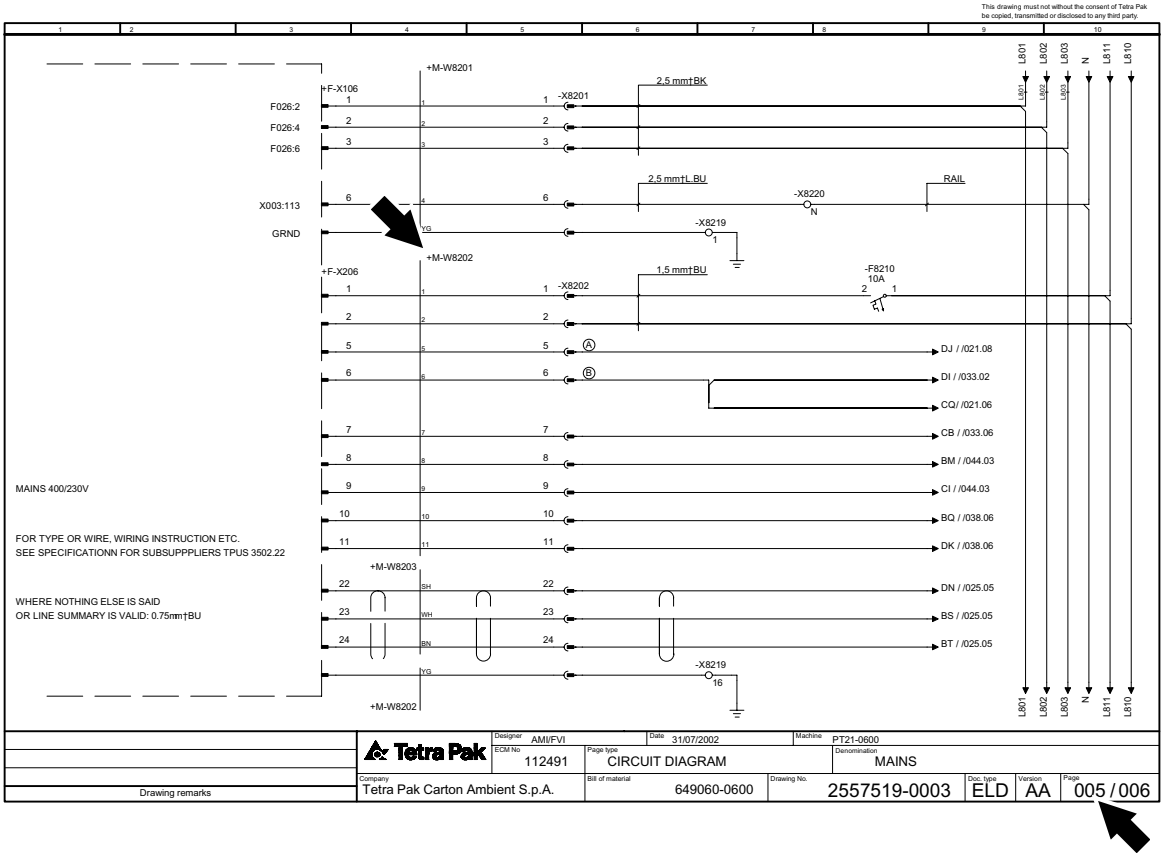
(Cont'd)

Cable Connection List of 2557519-0003

Cable	Core	From	To	Page.Col.	Option
+M-W8201	4	+F-X106:6	+C-X8201:6	005 .5	
+M-W8201	YG	+F-X106:	+C-X8201:	005 .5	
+M-W8202	1	+F-X206:1	+C-X8202:1	005 .5	
+M-W8202	2	+F-X206:2	+C-X8202:2	005 .5	
	3				
	4				
+M-W8202	5	+F-X206:5	+C-X8202:5	005 .5	
+M-W8202	6	+F-X206:6	+C-X8202:6	005 .5	
+M-W8202	7	+F-X206:7	+C-X8202:7	005 .5	
+M-W8202	8	+F-X206:8	+C-X8202:8	005 .5	
+M-W8202	9	+F-X206:9	+C-X8202:9	005 .5	
+M-W8202	10	+F-X206:10	+C-X8202:10	005 .5	
+M-W8202	11	+F-X206:11	+C-X8202:11	005 .5	
+M-W8202	YG	+F-X206:	+C-X8202:	005 .5	
+M-W8203	WH	+F-X206:23	+C-X8202:23	005 .5	

Cable connection list



Circuit diagram

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Supply Voltage/Line Connection Order

The supply voltage in the electrical cabinet has power voltage and control voltage designations:

- Power voltage: lines with designations **ending** with 01 to 09, for example, L03 and L803
- Control voltage: lines with designations **ending** with 10 to 99, for example, L12 and L812

The line connection order is shown in the **Line summary**.

How to Trace a Line

Example: Line connection L810 to the component +C-A8305

a) Go to the **Circuit diagram**. See the illustration on the next page.

b) Find the component +C-A8305 (input module).

c) Note which terminal of +C-A8305 is connected to the line connection L810 (pin 01).

d) Go to the **Line summary.** See the illustration on the next page.

e) Find the component terminal +C-A8305:01.

f) Note the relative upward line terminal connection order +C-XL810:7.

(Cont'd)

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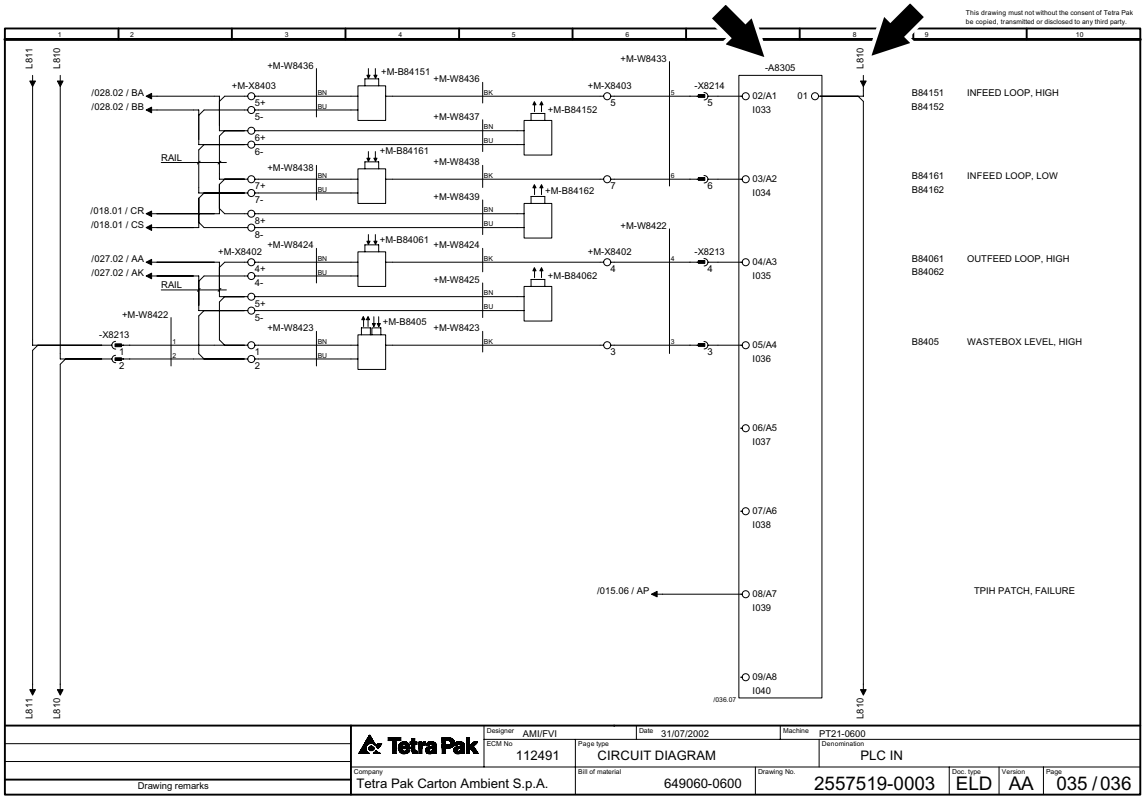

Circuit diagram

Line summary of 2557519-0003

Line	From	Page.Col.	To	Page.Col.	Area/Color	Opt.
L801	+C-X8201:1	005 .5	+C-F8201:1	007 .6	2.5 mm†BK	
L801	+C-F8201:1	007 .6	+C-F8207.1:1	015 .5		
L801	+C-F8207.1:1	015 .5	+C-F8211:1	010 .2		
L801	+C-F8211:1	010 .2	+C-Q8201:	006 .2		
L801	+C-Q8201:1	006 .2	+C-F8250:1	012 .3		
L802	+C-X8201:2	005 .5	+C-F8202:1	011 .1	2.5 mm†BK	
L802	+C-F8202:1	011 .1	+C-F8207.2:1	015 .5		
L802	+C-F8207.2:1	015 .5	+C-Q8201:3	006 .2		
L803	+C-X8201:3	005 .5	+C-F8203:1	011 .7	2.5 mm†BK	
L803	+C-F8203:1	011 .7	+C-F8207.3:1	015 .5		
L803	+C-F8207.3:1	015 .5	+C-F8206:1	015 .3		
L803	+C-F8206:1	015 .3	+C-Q8201:5	006 .2		
L810	+C-XL810:1	001 .1	+C-X8202:2	005 .5	1.50 mm†BU	
L810	+C-XL810:2	001 .1	+C-A8252:A2	022 .6	0.75 mm†BU	
L810	+C-A8252:A2	022 .6	+C-A8252:S24	022 .6		
L810	+C-XL810:3	001 .2	+C-XL810:4	001 .2	1.50 mm†BU	
L810	+C-XL810:5	001 .2	+C-A8211:18	017 .4	0.75 mm†BU	
L810	+C-A8211:18	017 .4	+C-A8301:01	027 .8		
L810	+C-A8301:01	027 .8	+C-A8211:20	017 .4		
L810	+C-A8211:20	017 .4	+C-A8212:18	017 .4		
L810	+C-A8212:18	017 .4	+C-A8212:20	017 .4		

	From	Page.Col.	To	Page.Col.	Area/Color	Opt.
	+C-A8303:10		+C-A8303:20	032 .1		
L810	+C-XL810:7	00	+C-A8304:01	033 .8	0.75 mm† BU	
L810	+C-A8304:01	033 .8	+C-A8305:01	035 .8		
L810	+C-A8305:01	035 .8	+C-A8306:01	037 .8		
L810	+C-XL810:8	001 .3	+C-A8309:10	043 .1	0.75 mm† BU	
L810	+C-A8309:10	043 .1	+C-A8309:20	044 .1		
L810	+C-A8309:20	044 .1	+C-A8310:10	045 .1		
L810	+C-A8310:10	045 .1	+C-A8310:20	046 .1		
L810	+C-A8310:20	046 .1	+C-A8313:18	051 .1		
L810	+C-A8313:18	051 .1	+C-A8311:10	047 .1		
L810	+C-A8311:10	047 .1	+C-A8311:20	048 .1		
L810	+C-XL810:9	001 .3	+C-K8206:A1	043 .4	0.75 mm† BU	
L810	+C-K8206:A1	043 .4	+C-K8207:10	044 .4		
L810	+C-K8207:10	044 .4	+C-K8208:10	044 .4		
L810	+C-K8208:10	044 .4	+C-K8209:10	044 .4		
L810	+C-K8209:10	044 .4	+C-K8214:10	045 .4		
L810	+C-K8214:10	045 .4	+C-K8250:10	047 .4		
L810	+C-XL810:10	001 .4	+C-K8213:4	012 .3	0.75 mm† BU	
L810	+C-K8213:4	012 .3	+C-K8252:4	012 .5		
L810	+C-K8252:4	012 .5	+C-K8253:4	012 .8		
L810	+C-XL810:11	001 .4	+C-K8201:A1	043 .4	0.75 mm† BU	

Line summary

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How to Trace a Terminal

Example 1: Terminal in the electrical cabinet +C-X8213:3

a) Go to the **Cabinet terminal summary**. See the illustration on the next page.

b) Find the terminal +C-X8213:3.

c) On the right side of the table, find the circuit diagram reference page where the terminal +C-X8213:3 is located (page 035, column 7).

d) Go to the **Circuit diagram**. See the illustration on the next page.

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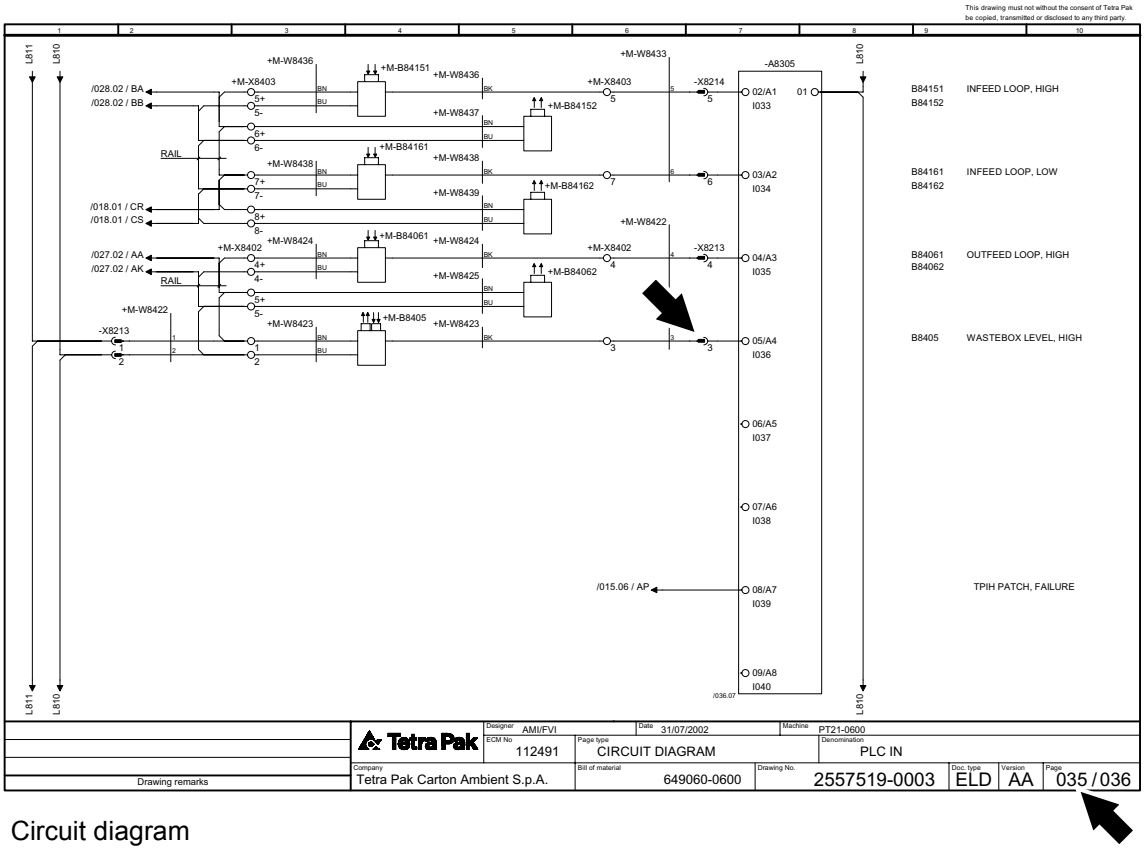

Circuit diagram

Cabinet terminal summary of 2557519-0003

Terminal	Page .Col.	Opt.
+C-X8212:15	032 .4	
+C-X8212:16		
+C-X8212:17	031 .3	
+C-X8212:18	031 .3	
+C-X8212:19	032 .8	
+C-X8212:20	039 .7	
+C-X8212:21	031 .7	
+C-X8212:22	031 .7	
+C-X8212:23	034 .2	
+C-X8212:24	034 .5	
+C-X8212:	031 .7	
+C-X8213:1	035 .1	
+C-X8213:2	035 .7	
+C-X8213:3	035 .7	
+C-X8213:4	035 .7	
+C-X8213:5	027 .6	
+C-X8213:6	040 .7	
+C-X8213:7	040 .7	
+C-X8213:8	040 .7	
+C-X8213:9	028 .6	
+C-X8213:10	040 .7	

Terminal	Page .Col.	Opt.
+C-X8214:7	018 .5	
+C-X8214:8	040 .7	
+C-X8214:9	040 .7	
+C-X8214:10	040 .7	
+C-X8214:	040 .7	
+C-X8215:1	011 .7	
+C-X8215:2	011 .8	
+C-X8215:3	011 .4	
+C-X8215:4	011 .4	
+C-X8215:5	011 .10	
+C-X8215:6	011 .9	
+C-X8215:	011 .9	
+C-X8216:1	027 .2	
+C-X8216:2	027 .2	
+C-X8216:3	027 .6	
+C-X8217:+	041 .4	
+C-X8217:-	041 .4	
+C-X8219:1	005 .7	
+C-X8219:2	053 .4	
+C-X8219:3	053 .4	
+C-X8219:4		

Cabinet terminal summary

(Cont'd)

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(Cont'd)

Example 2: Terminal outside the electrical cabinet +M-X8402:1, :2, :3

a) Go to the **Terminal strip overview**. See the illustration on the next page.

b) Find the terminal strip page where +M-X8402 is located.

c) On the right side of the table, find the circuit diagram reference page where the terminals +M-X8402:1, :2, :3 are located (page 035, column 3).

d) Go to the **Circuit diagram**. See the illustration on the next page.

e) Note the component connected +M-B8405.

f) The location +M indicates that the component is fitted on the machine.

g) Locate the component using the SPC. See Section How to Find Electrical Components using the Spare Parts Catalogue.

(Cont'd)

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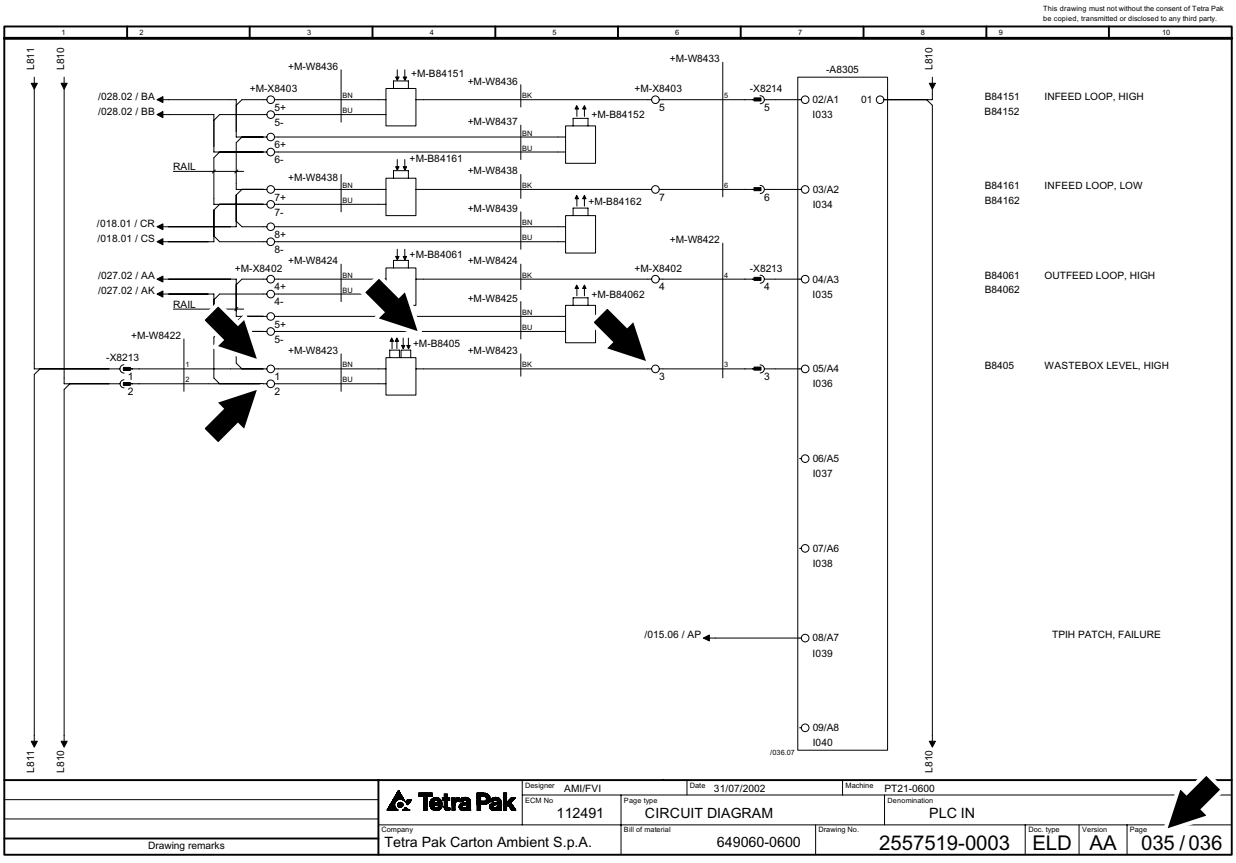
(Cont'd)

Terminal strip 2557519-0003
+M-X8402

From	Cable	Internal Jumper	Terminal	External Jumper	Cable	To	Page.Col.	Option	Function text
+C-X8213:1	+M-W8422:1		1		+M-W8423:BN	+M-B8405:	035 .3		WASTEBOX LEVEL, HIGH
+C-X8213:2	+M-W8422:2		2		+M-W8423:BU	+M-B8405:	035 .3		WASTEBOX LEVEL, HIGH
+C-X8213:3	+M-W8422:3		3		+M-W8423:BK	+M-B8405:	035 .6		WASTEBOX LEVEL, HIGH
+C-X8213:4	+M-W8422:4		4		+M-W8424:BK	+M-B84061:	035 .6		OUTFEED LOOP, HIGH
			4+		+M-W8424:BN	+M-B84061:	035 .3		OUTFEED LOOP, HIGH
			4-		+M-W8424:BU	+M-B84061:	035 .3		OUTFEED LOOP, HIGH
			5						
			5+		+M-W8425:BN	+M-B84062:	035 .3		OUTFEED LOOP, HIGH
			5-		+M-W8425:BU	+M-B84062:	035 .3		OUTFEED LOOP, HIGH
+C-X8213:5	+M-W8422:5		6		+M-W8426:BK	+M-B84071:	027 .5		OUTFEED LOOP, LOW
			6+		+M-W8426:BN	+M-B84071:	027 .2		OUTFEED LOOP, LOW
			6-		+M-W8426:BU	+M-B84071:	027 .2		OUTFEED LOOP, LOW
			7						
			7+		+M-W8427:BN	+M-B84072:	027 .2		OUTFEED LOOP, LOW
			7-		+M-W8427:BU	+M-B84072:	027 .2		OUTFEED LOOP, LOW

Terminal strip overview



Circuit diagram

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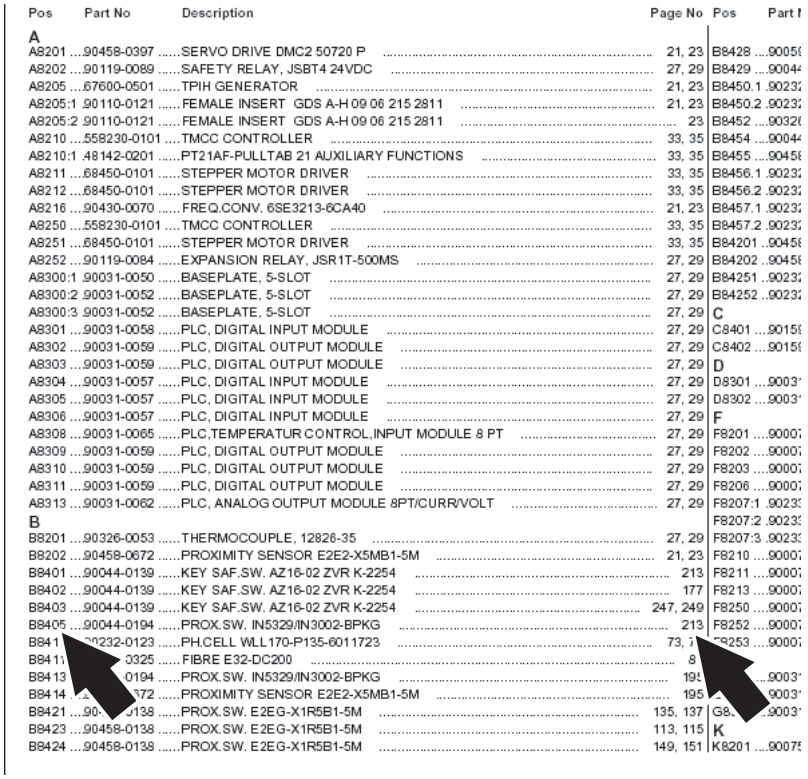
How to Find Electrical Components using the Spare Parts Catalogue

One of the chapters in the Spare Parts Catalogue (SPC) is the **Electrical Parts Index**. This index is used to locate electrical parts.

a) Go to the Electrical Parts Index of the SPC and locate, for example component B8405, and the SPC page on which it can be found.



Pos	Part No	Description	Page No
A			
A8201	90458-0397	SERVO DRIVE DMC2 50720 P	21, 23
A8202	90119-0089	SAFETY RELAY, JSBT4 24VDC	27, 29
A8205	67600-0501	TPIH GENERATOR	21, 23
A8205:1	90110-0121	FEMALE INSERT GDS A-H 09 06 215 2811	21, 23
A8205:2	90110-0121	FEMALE INSERT GDS A-H 09 06 215 2811	23
A8210	558230-0101	TMCC CONTROLLER	33, 35
A8210:1	48142-0201	PT21AF-PULLTAB 21 AUXILIARY FUNCTIONS	33, 35
A8211	68450-0101	STEPPER MOTOR DRIVER	33, 35
A8212	68450-0101	STEPPER MOTOR DRIVER	33, 35
A8216	90430-0070	FREQ.CONV. 6SE3213-6CA40	21, 23
A8250	558230-0101	TMCC CONTROLLER	33, 35
A8251	68450-0101	STEPPER MOTOR DRIVER	33, 35
A8252	90119-0084	EXPANSION RELAY, JSR1T-500MS	27, 29
A8300:1	90031-0050	BASEPLATE, 5-SLOT	27, 29
A8300:2	90031-0052	BASEPLATE, 5-SLOT	27, 29
A8300:3	90031-0052	BASEPLATE, 5-SLOT	27, 29
A8301	90031-0058	PLC, DIGITAL INPUT MODULE	27, 29
A8302	90031-0059	PLC, DIGITAL OUTPUT MODULE	27, 29
A8303	90031-0059	PLC, DIGITAL OUTPUT MODULE	27, 29
A8304	90031-0057	PLC, DIGITAL INPUT MODULE	27, 29
A8305	90031-0057	PLC, DIGITAL INPUT MODULE	27, 29
A8306	90031-0057	PLC, DIGITAL INPUT MODULE	27, 29
A8308	90031-0065	PLC,TEMPERATUR CONTROL,INPUT MODULE 8 PT	27, 29
A8309	90031-0059	PLC, DIGITAL OUTPUT MODULE	27, 29
A8310	90031-0059	PLC, DIGITAL OUTPUT MODULE	27, 29
A8311	90031-0059	PLC, DIGITAL OUTPUT MODULE	27, 29
A8313	90031-0062	PLC, ANALOG OUTPUT MODULE 8PT/CURR/VOLT	27, 29
B			
B8201	90326-0053	THERMOCOUPLE, 12826-35	27, 29
B8202	90458-0672	PROXIMITY SENSOR E2E2-X5MB1-5M	21, 23
B8401	90044-0139	KEY SAF.SW. AZ16-02 ZVR K-2254	213
B8402	90044-0139	KEY SAF.SW. AZ16-02 ZVR K-2254	177
B8403	90044-0139	KEY SAF.SW. AZ16-02 ZVR K-2254	247, 249
B8405	90044-0194	PROX.SW. IN5329/IN3002-BPKG	213
B841	90232-0123	PH.CELL WLL170-P135-6011723	73, 1
B841	0325	FIBRE E32-DC200	8
B8413	0194	PROX.SW. IN5329/IN3002-BPKG	19
B8414	372	PROXIMITY SENSOR E2E2-X5MB1-5M	195
B8421	90- 0138	PROX.SW. E2EG-X1R5B1-5M	135, 137
B8423	90458-0138	PROX.SW. E2EG-X1R5B1-5M	113, 115
B8424	90458-0138	PROX.SW. E2EG-X1R5B1-5M	149, 151

Pos	Part I
B8428	90059
B8429	90044
B8450.1	90232
B8450.2	90232
B8452	90326
B8454	90044
B8455	90458
B8456.1	90232
B8456.2	90232
B8457.1	90232
B8457.2	90232
B84201	90458
B84202	90458
B84251	90232
B84252	90232
C	
C8401	90159
C8402	90159
D	
D8301	90031
D8302	90031
F	
F8201	90007
F8202	90007
F8203	90007
F8206	90007
F8207:1	90235
F8207:2	90235
F8207:3	90235
F8210	90007
F8211	90007
F8213	90007
F8250	90007
F8252	90007
F8253	90007
G8	90031
K	
K8201	90075

Electrical Parts Index

(Cont'd)

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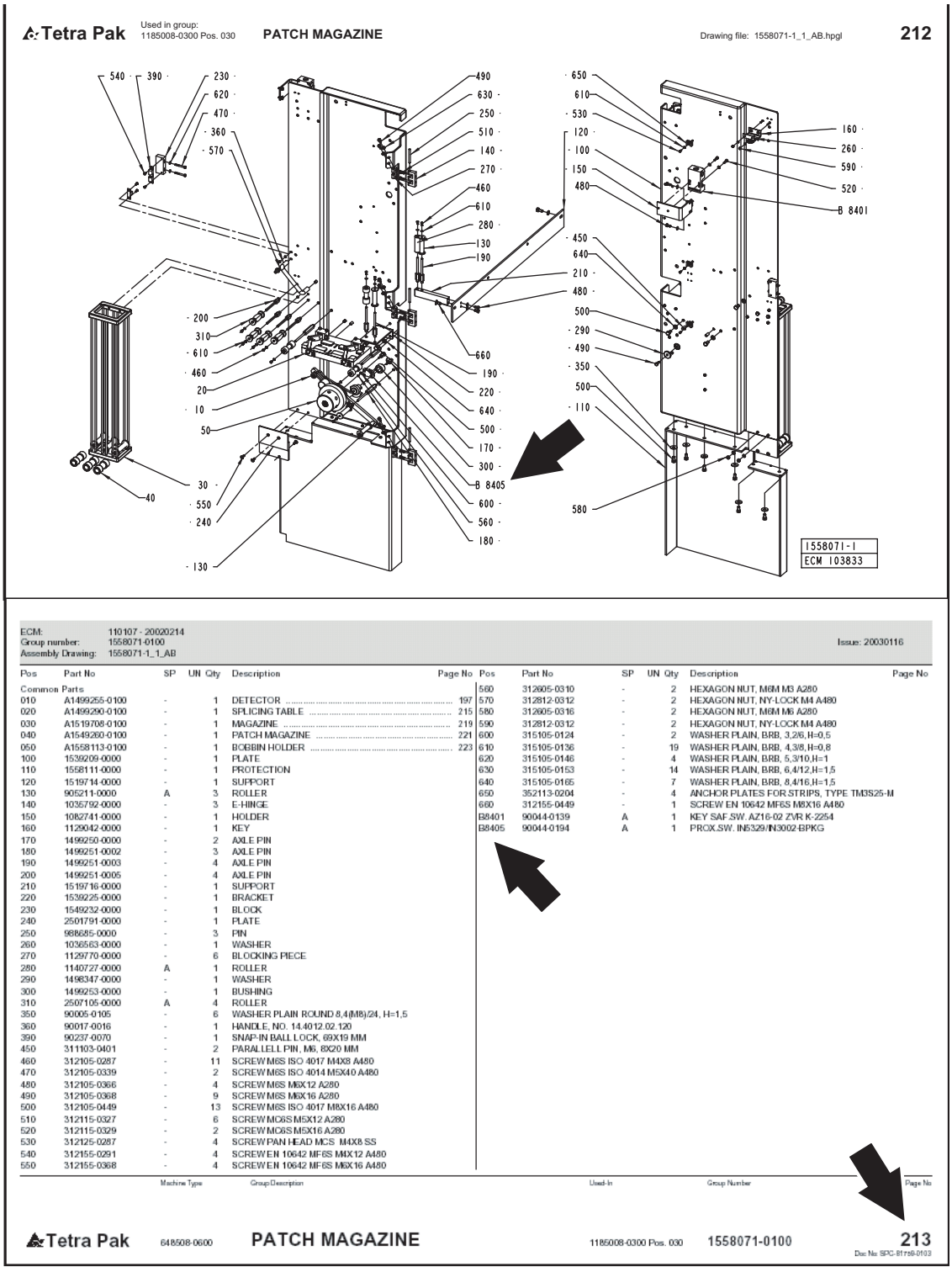
b) Go to the page of the SPC on which the component is located. The position number of the component is the same as the component number. That position number is found on the drawing above the list. The drawing shows where the component is located.



Tetra Pak Used in group: 1185008-0300 Pos. 030 PATCH MAGAZINE Drawing file: 1558071-1_1_AB.hpgl 212

ECM: 110107 - 20020214
Group number: 1558071-0100
Assembly Drawing: 1558071-1_1_AB
Issue: 20030116

Pos	Part No	SP	UN	Qty	Description	Page No
Common Parts						
010	A1499255-0100	-		1	DETECTOR	197
020	A1499290-0100	-		1	SPLICING TABLE	215
030	A1519708-0100	-		1	MAGAZINE	219
040	A1549260-0100	-		1	PATCH MAGAZINE	221
050	A1558113-0100	-		1	BOBBIN HOLDER	223
100	1539209-0000	-		1	PLATE	
110	1558111-0000	-		1	PROTECTION	
120	1519714-0000	-		1	SUPPORT	
130	905211-0000	A		3	ROLLER	
140	1035792-0000	-		3	E-HINGE	
150	1082741-0000	-		1	HOLDER	
160	1129042-0000	-		1	KEY	
170	1499250-0000	-		2	AXLE PIN	
180	1499251-0002	-		3	AXLE PIN	
190	1499251-0003	-		4	AXLE PIN	
200	1499251-0005	-		4	AXLE PIN	
210	1519716-0000	-		1	SUPPORT	
220	1539225-0000	-		1	BRACKET	
230	1549232-0000	-		1	BLOCK	
240	2501791-0000	-		1	PLATE	
250	988685-0000	-		3	PIN	
260	1036563-0000	-		1	WASHER	
270	1129770-0000	-		6	BLOCKING PIECE	
280	1140727-0000	A		1	ROLLER	
290	1498347-0000	-		1	WASHER	
300	1499253-0000	-		1	BUSHING	
310	2507105-0000	A		4	ROLLER	
350	90005-0105	-		6	WASHER PLAIN ROUND 8,4(M8)/24, H=1,5	
360	90017-0016	-		1	HANDLE, NO. 14.4012.02.120	
390	90237-0070	-		1	SNAP-IN BALL LOCK, 69X19 MM	
450	311103-0401	-		2	PARALLELL PIN, M6, 8X20 MM	
460	312105-0287	-		11	SCREW M6S ISO 4017 M4X8 A480	
470	312105-0339	-		2	SCREW M6S ISO 4014 M5X40 A480	
480	312105-0366	-		4	SCREW M6S M6X12 A280	
490	312105-0368	-		9	SCREW M6S M6X16 A280	
500	312105-0449	-		13	SCREW M6S ISO 4017 M8X16 A480	
510	312115-0327	-		6	SCREW MC6S M5X12 A280	
520	312115-0329	-		2	SCREW MC6S M5X16 A280	
530	312125-0287	-		4	SCREW PAN HEAD MCS M4X8 SS	
540	312155-0291	-		4	SCREW EN 10642 MF6S M4X12 A480	
550	312155-0368	-		4	SCREW EN 10642 MF6S M6X16 A480	

Pos	Part No	SP	UN	Qty	Description	Page No
560	312605-0310	-		2	HEXAGON NUT, M6M M3 A280	
570	312812-0312	-		2	HEXAGON NUT, NY-LOCK M4 A480	
580	312605-0316	-		2	HEXAGON NUT, M6M M6 A280	
590	312812-0312	-		2	HEXAGON NUT, NY-LOCK M4 A480	
600	315105-0124	-		2	WASHER PLAIN, BRB, 3,2/6, H=0,5	
610	315105-0136	-		19	WASHER PLAIN, BRB, 4,3/8, H=0,8	
620	315105-0146	-		4	WASHER PLAIN, BRB, 5,3/10, H=1	
630	315105-0153	-		14	WASHER PLAIN, BRB, 6,4/12, H=1,5	
640	315105-0165	-		7	WASHER PLAIN, BRB, 8,4/16, H=1,5	
650	352113-0204	-		4	ANCHOR PLATES FOR STRIPS, TYPE TM3S25-M	
660	312155-0449	-		1	SCREW EN 10642 MF6S M6X16 A480	
B8401	90044-0139	A		1	KEY SAF.SW. AZ16-02 ZVR K-2254	
B8405	90044-0194	A		1	PROX.SW. IN5329/IN3002-BPKG	

Machine Type | Group Description | Used-In | Group Number | Page No

Tetra Pak 648508-0600 PATCH MAGAZINE 1185008-0300 Pos. 030 1558071-0100 213
Doc No SPC-81768-0103

Spare Parts Catalogue spread

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ii Safety Precautions

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Read the Safety Precautions

WARNING

Read and follow all safety precautions before working on or near this equipment.

Read all safety precautions throughout this manual and on safety signs attached to this equipment. Failure to follow all safety precautions could result in death or serious injury.

Definitions

Energy Isolating Device. A mechanical device that physically prevents transmission or release of energy.

Power Supply Disconnector. The energy isolating device for the electrical power supply to the equipment.

Lockout. The use of a device, such as a padlock, to make sure that an energy isolating device, such as a power supply disconnector, cannot be operated.

Lockout Procedure. A procedure to put each necessary energy isolating device in its safe position to prevent the energising of the equipment, such as when a maintenance procedure should be carried out.

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Safety Messages Description

A safety message is always accompanied by a safety alert symbol and a signal word.



This is the **safety alert symbol**. It is used to alert about potential personal injury hazards. To avoid hazards, obey all safety messages that follow this symbol.

The following safety alert symbols and **signal words** are used in this manual to inform the user of hazards.



DANGER

Danger indicates an imminently hazardous situation which, if not avoided, **will** result in **death or serious injury**.



WARNING

Warning indicates a potentially hazardous situation which, if not avoided, **could** result in **death or serious injury**.



CAUTION

Caution indicates a potentially hazardous situation which, if not avoided, **may** result in **minor or moderate injury.** It may also be used to alert against unsafe practices.

CAUTION

Caution without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, **may** result in **property damage**.

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Personnel Requirements

Note! Personnel includes all persons working on or near this equipment.

Only skilled or instructed persons are allowed to work with this equipment.

Skilled Person

A skilled person must have relevant education and experience to enable him or her to identify hazards, analyse risks, and avoid hazards which electricity, machinery, chemicals, other energies, and supply systems on this equipment can create.

Skilled persons must meet local regulations, such as certifications and qualifications for working with electricity, mechanical systems, and so on.

Instructed Person

An instructed person must be adequately advised or supervised by a skilled person. The skilled person enables the instructed person to identify hazards, analyse risks, and avoid hazards which electricity, machinery, chemicals, other energies, and supply systems on this equipment can create.

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Safety Signs

WARNING

Damaged or missing safety signs increase the risk of death or serious injury.

Replace all missing or damaged safety signs immediately.

There are two types of safety sign

- ISO signs are used worldwide
- ANSI signs are used in the United States only

The table shows all safety signs that are located on this equipment.

Note! The position numbers (Pos.) in the table refer to the positions in the illustration(s) in the Locations of Safety Signs section.

Pos.	ISO sign	ANSI sign
1		
	Hazardous voltage. Can shock, burn, or cause death. Read Maintenance Manual before using this socket outlet.	
2		
	Hazardous voltage. Will shock, burn, or cause death. Follow lockout procedure before maintenance.	
3		
	Risk of equipment damage. Do not let water into this area.	

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Pos.	ISO sign	ANSI sign
4		
	Burn hazard. Trapped heat energy. Do not touch.	
5		
	Hot surface. Do not touch. Follow lockout procedure before maintenance.	

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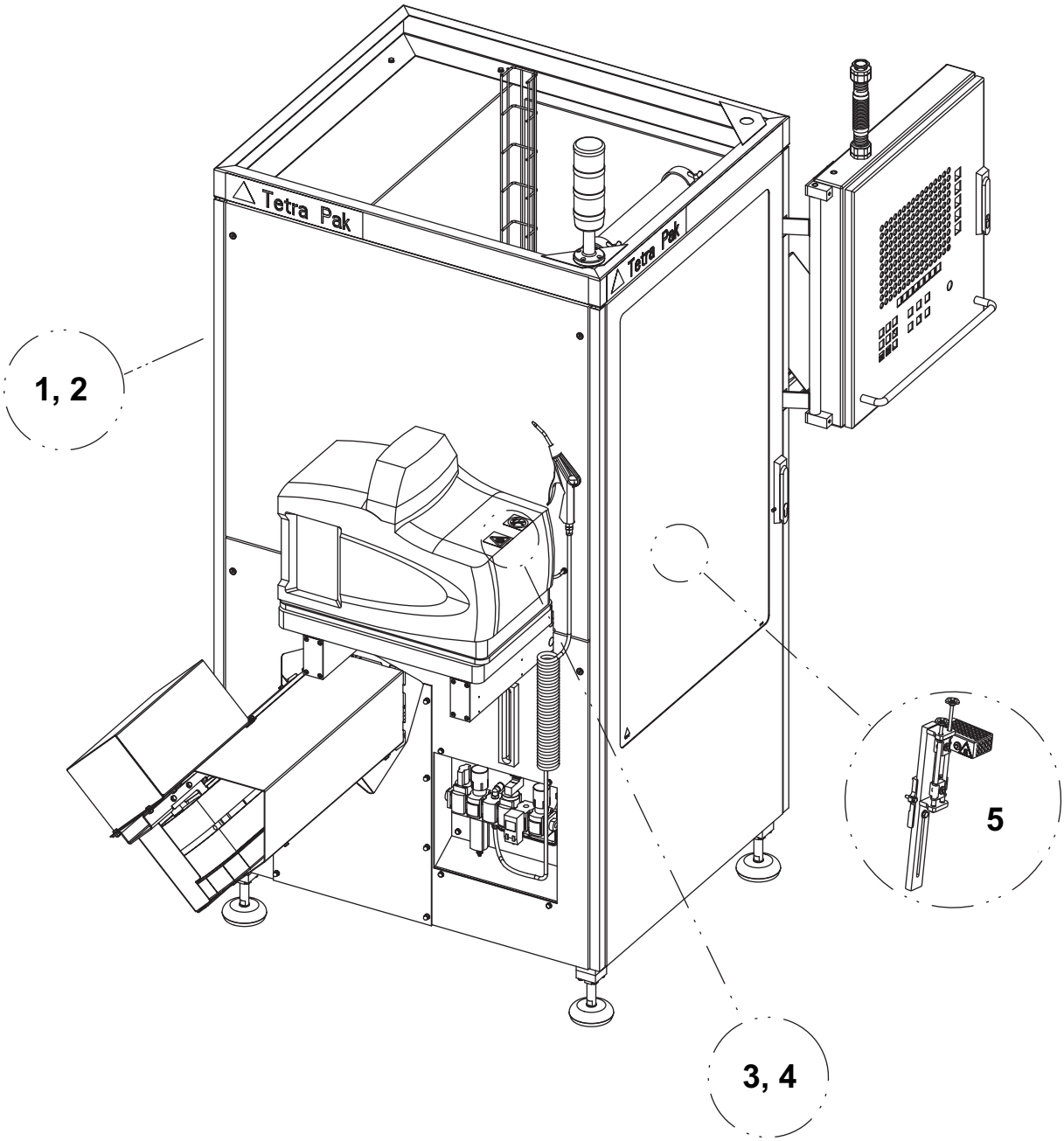
Locations of Safety Signs

Note! Make sure that each safety sign is undamaged and in its correct position after installation and maintenance. Replace all missing or damaged safety signs immediately.

The illustration shows where the safety signs are located. The position numbers refer to the table in the Safety Signs section.



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Safety Devices

WARNING
Unshielded hazards.
Never inch or run this equipment if any safety device is inoperative.

Change inoperative components of the safety system immediately.

WARNING
Hazardous Voltage.
Activating a safety device, such as pressing an EMERGENCY STOP push-button or opening a door, does not disconnect the power supply from this equipment.

Emergency Stop

Emergency stop devices are used to stop this equipment immediately in an emergency. Learn the positions of all emergency stop devices and how to use them.

Instructions for a normal production stop are included in the Stop chapter of the Operation Manual.

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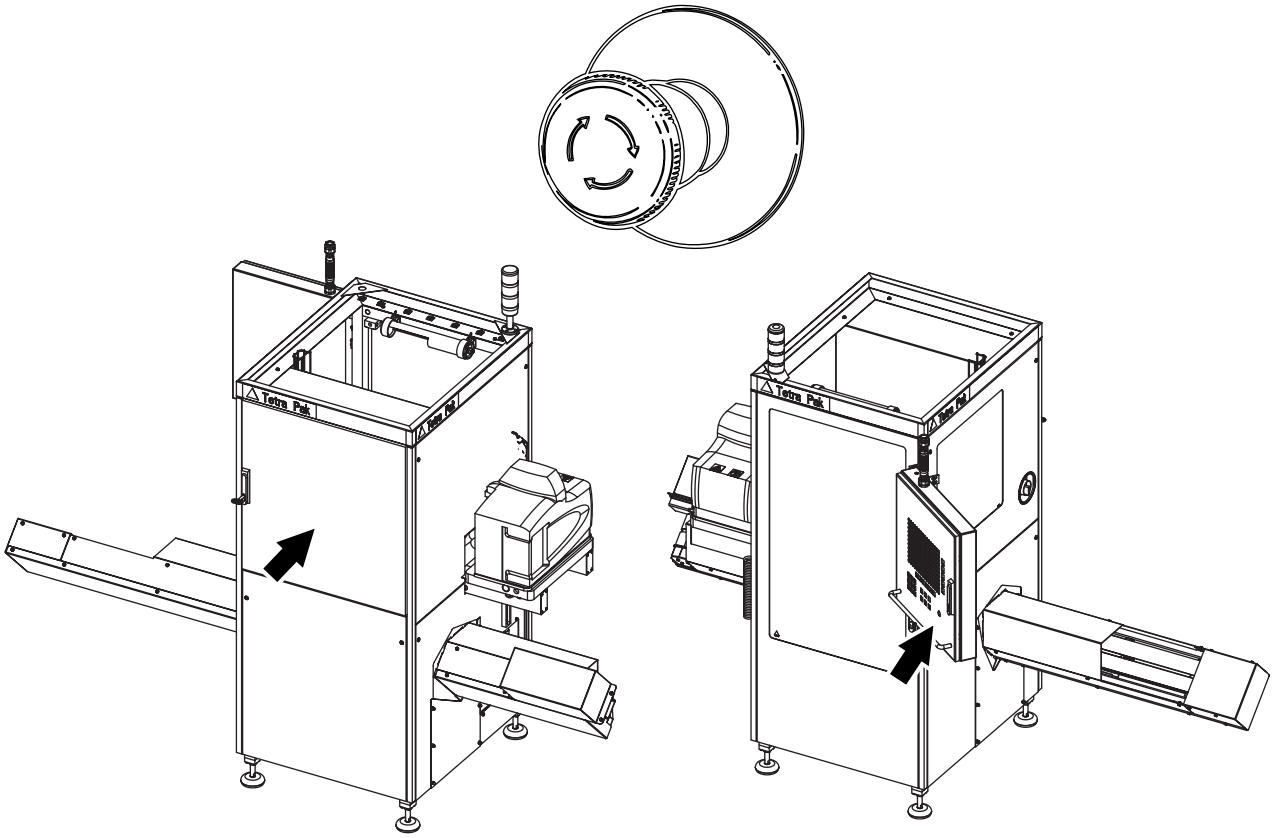
EMERGENCY STOP Push-Buttons

Push one of the EMERGENCY STOP push-buttons to stop this equipment immediately.

The illustration shows an EMERGENCY STOP push-button. The location of each EMERGENCY STOP push-button is shown by an arrow.



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Safeguards

WARNING
Moving machinery.
Never defeat or bypass the interlocking devices.

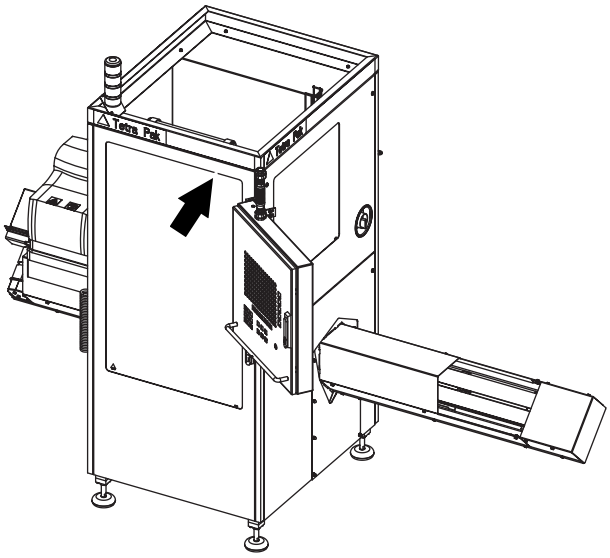
All movable guards, such as doors and covers, leading to hazardous areas are fitted with interlocking devices, usually electric safety switches. These devices are part of the safety system and must never be defeated, bypassed, or otherwise made inoperative.

CAUTION
Burn hazard.
Parts of this equipment protected by safeguards may be thermally hot after operation.

After installation and maintenance, and before this equipment is inched or run, check that all safeguards are in place and that they operate correctly.

CAUTION
Equipment damage.
Never stop this equipment by opening a movable guard.

The location of each movable guard is shown by an arrow.



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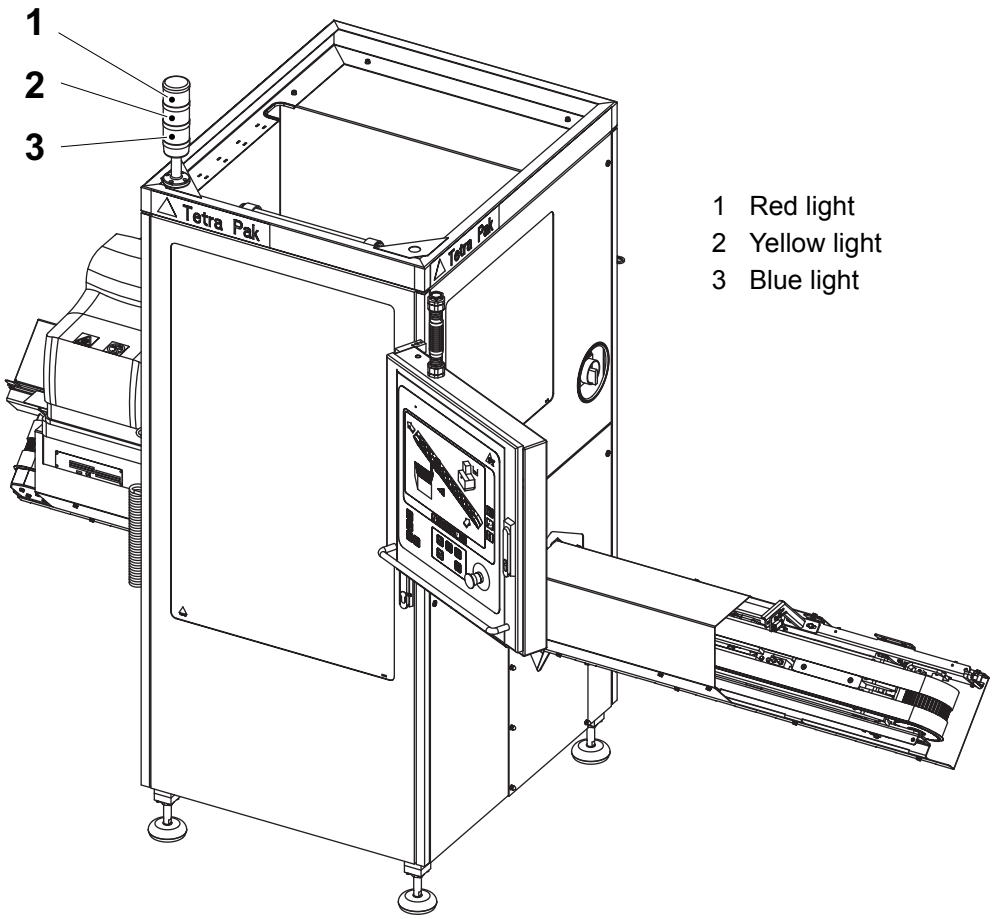
Warning Lamp

A warning lamp is a column of warning lights:

- A red light (1) indicates a hazardous condition. This is an emergency situation that requires immediate action.
- A yellow light (2) indicates an abnormal condition. This is an impending critical condition calling for action by the operator.
- A blue light (3) indicates that operator action is required.

Note! If the yellow and blue colours are flashing at the same time, this indicates a queue on the outfeed side.



1 Red light
2 Yellow light
3 Blue light

A warning light flashes when operator action is required. The light stops flashing and remains lit when the alarm is acknowledged. After the fault is corrected or the operator takes the appropriate action, the warning light goes off.

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Personal Protection

This section applies to all personnel at all times when this equipment is in operation.

Noise Hazard

CAUTION

Hazardous noise.

Risk of impaired hearing.

Hearing protection is recommended whenever this equipment is in operation.

Entanglement Hazard

WARNING

Risk of entanglement.

Do not wear jewellery or loose clothing when working on or near this equipment. Long hair may not be loose.

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Supply Systems

Electrical Cabinet

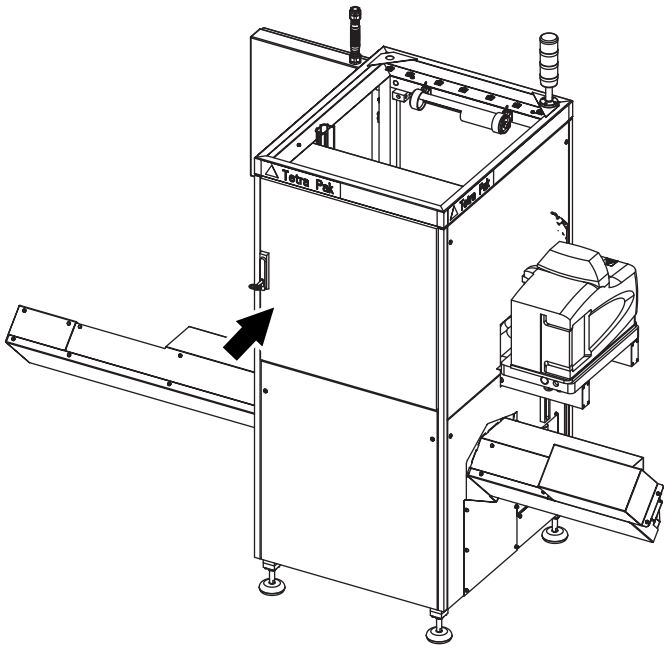
DANGER

Hazardous voltage.
Will shock, burn, or cause death.
The power supply disconnector must be switched off and secured with a lock before maintenance inside the electrical cabinet.

Note! The key to the lock must be removed by the technician and retained in his/her possession until all work is completed.

Make sure that the electrical cabinet doors are closed after working inside the electrical cabinet. Doors with lock must be locked.

The location of each electrical cabinet is shown by an arrow.



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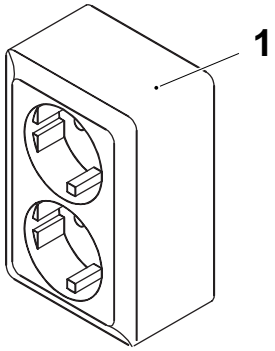
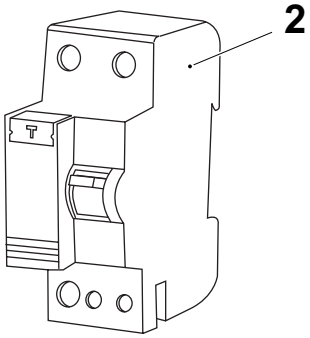
Socket Outlet

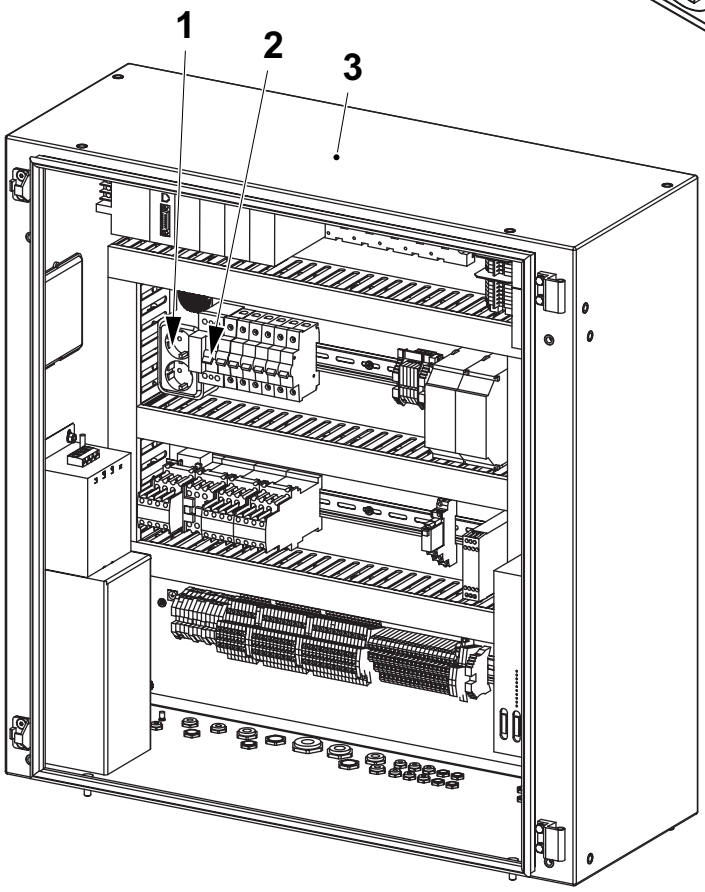
WARNING
Hazardous voltage.
Can shock, burn, or cause death.
Read the Maintenance Manual before using this socket outlet.

The illustrations show the socket outlet (1) and the residual current device (2). Their locations in the electrical cabinet (3) are shown by arrows.

1 Socket outlet
2 Residual current device F024
3 Electrical cabinet







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Power Supply

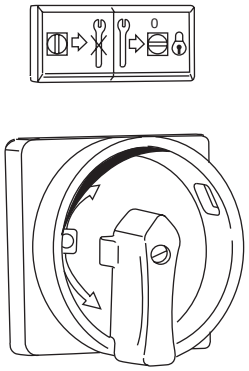
DANGER

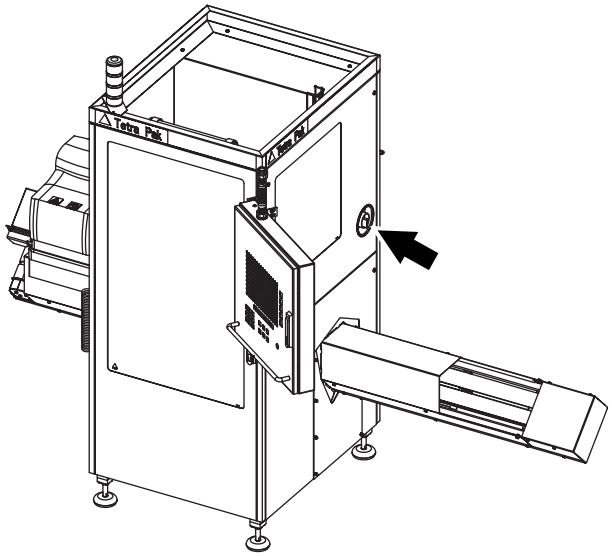
Hazardous voltage and moving machinery.
The power supply disconnector must be switched off and secured with a lock before any maintenance.

Note! The key to the lock must be removed by the technician and retained in his/her possession until all work is completed.

Certain maintenance procedures may require power supply systems to be on. These exceptions are clearly stated in the Maintenance Manual.

The illustration shows the power supply disconnector. The arrow shows its location on this equipment.





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Air Supply

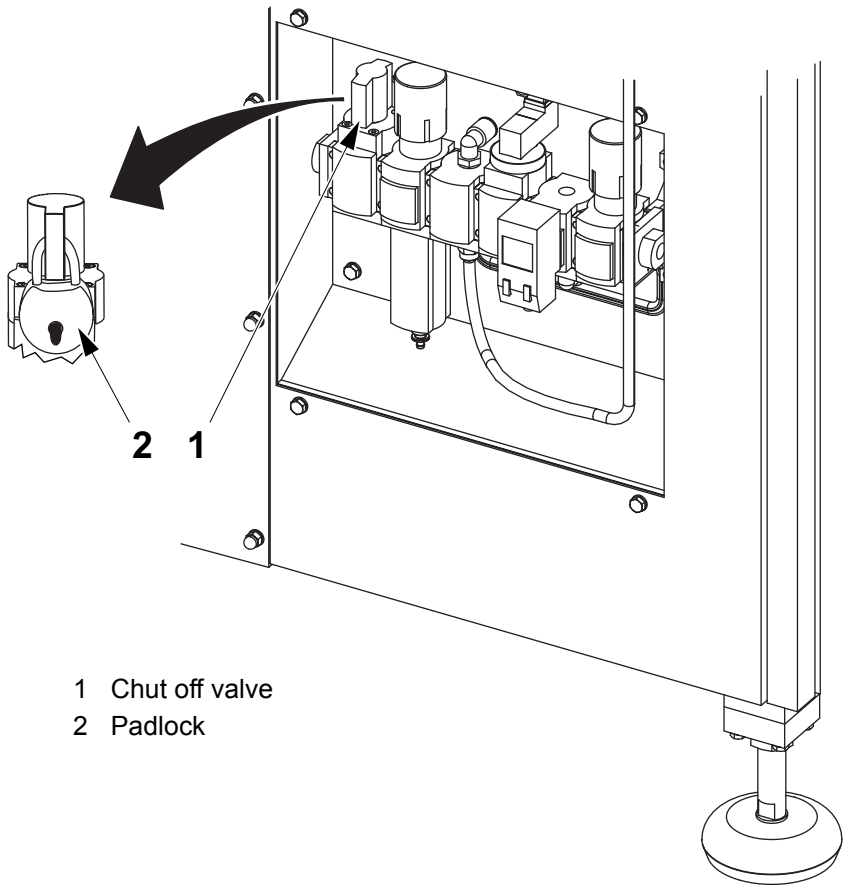
WARNING
Compressed air and moving machinery.
Close the chut off valve and secure it with a lock before any maintenance.

Note! The key to the lock must be removed by the technician and retained in his/her possession until all work is completed.

Certain maintenance procedures may require air supply systems to be on. These exceptions are clearly stated in the Maintenance Manual.

The illustrations show the chut off valve (1) and the lock (2). Their locations are shown by arrows.

In the illustration below the chut off valve is turned OFF.



1 Chut off valve
2 Padlock

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Hotmelt Equipment

DANGER

The voltage is 400V inside the hotmelt unit. Risk of immediate danger to life through electrical shock.

Never flush water or any other liquid towards the hotmelt unit when cleaning the machine. Failure to obey will result in danger to your life.

WARNING

All service work on the hotmelt unit must be carried out by authorized personnel. Always wear safety glasses, protective gloves, and other protective clothing to avoid injuries caused by splashing adhesive.

Never remove any part or component until air and the electrical supply to the machine have been disconnected and the pressure of the adhesive in the system has been relieved.

Failure to relieve any remaining air or liquid (adhesive) pressure may cause serious injuries from burning when the hotmelt filter is detached or flushed.

During heating and production the unit gets hot. The hotmelt tank contains heated adhesive which can cause serious injuries. Do not touch the adhesive!

During tank drainage never touch the drain shut!

(Cont'd)

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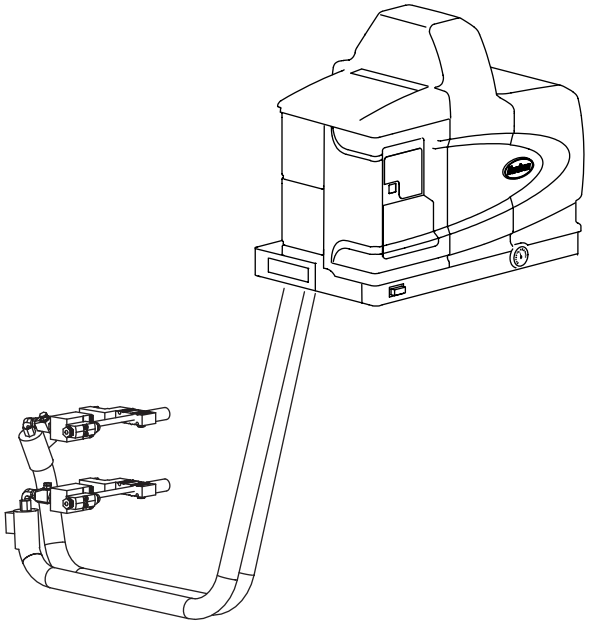
(Cont'd)

WARNING

The hotmelt nozzles and their covers are very hot and there is risk of severe burns. Never touch the hotmelt nozzles or their covers!

Note! The section **Hotmelt equipment** in this manual only deals with what is specific for this machine.

Always refer to the documentation provided from Nordson Corporation (is included in the delivery from Tetra Pak) before doing any kind of work on the hotmelt equipment.



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1 Electrical Systems Description

TechPub_2614345_0103 - 2656884_01.fm

Description

This chapter contains a description of the electrical system in the machine or equipment.

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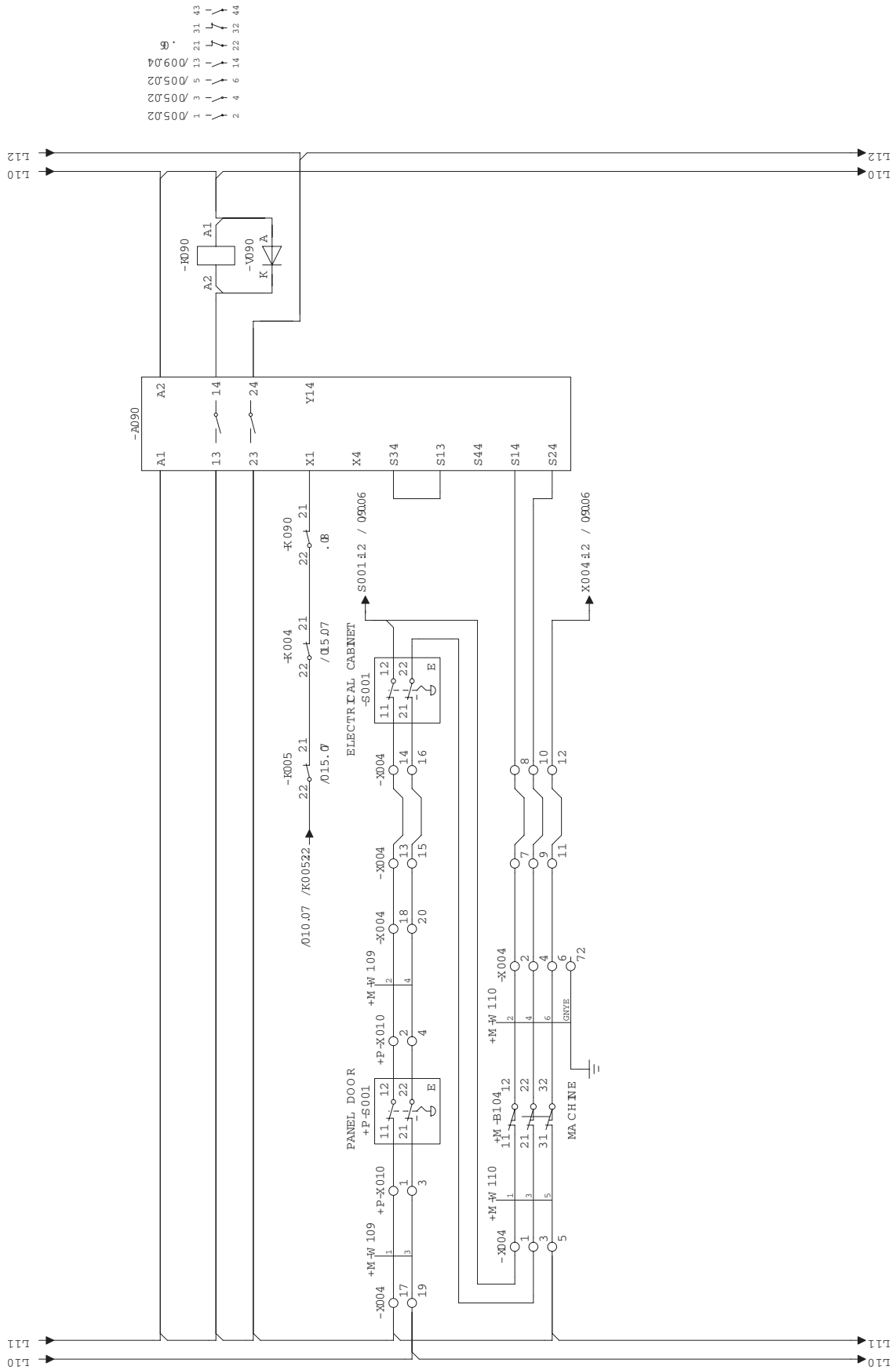
1.1 Safety Relay Circuit



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2 Document List

TechPub_2614345_0103 - 2656885_01.fm

Description

This chapter is a table of contents that includes the drawing specification for each electrical document valid for the equipment.

TechPub_2614345_0103 - 2656885_01.fm

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Documents list

Drawing No	Page	Denomination	Page type	Version
2594074-0001	001	DOCUMENT LIST	Table of contents: (001 - 002)	AA
2594074-0002	001	POSITION SUMMARY	Device list: (+C-A002 - +C-Z100)	AA
2594074-0003	001	CIRCUIT DIAGRAM	DISTRIBUTION TERMINALS XL10-XL12	AA
2594074-0003	002	CIRCUIT DIAGRAM	MAIN CONNECTION	AA
2594074-0003	003	CIRCUIT DIAGRAM	HOT MELT UNIT , MACHINE LAMP	AA
2594074-0003	004	CIRCUIT DIAGRAM	POWER SUPPLY , PLC	AA
2594074-0003	005	CIRCUIT DIAGRAM	APPLICATOR SERVO MOTOR	AA
2594074-0003	006	CIRCUIT DIAGRAM	APPLICATOR SERVO CONTROLLER	AA
2594074-0003	007	CIRCUIT DIAGRAM	CONVEYOR MOTOR	AA
2594074-0003	008	CIRCUIT DIAGRAM	SAFETY RELAY	AA
2594074-0003	009	CIRCUIT DIAGRAM	PLC INPUT %I001-%I008	AA
2594074-0003	010	CIRCUIT DIAGRAM	PLC INPUT %I009-%I016	AA
2594074-0003	011	CIRCUIT DIAGRAM	PLC INPUT %I017-%I024	AA
2594074-0003	012	CIRCUIT DIAGRAM	PLC INPUT %I025-%I032	AA
2594074-0003	013	CIRCUIT DIAGRAM	PLC OUTPUT %Q001-%Q008	AA
2594074-0003	014	CIRCUIT DIAGRAM	PLC OUTPUT %Q009-%Q016	AA
2594074-0003	015	CIRCUIT DIAGRAM	PLC OUTPUT %Q017-%Q024	AA
2594074-0003	016	CIRCUIT DIAGRAM	PLC OUTPUT %Q025-%Q032	AA
2594074-0003	017	CIRCUIT DIAGRAM	P.A072	AA
2594074-0003	018	CIRCUIT DIAGRAM	P.A072	AA
2594074-0003	019	CIRCUIT DIAGRAM	P.A071 , P.A072	AA
2594074-0003	020	CIRCUIT DIAGRAM	P.A071 , P.A072	AA
2594074-0003	021	CIRCUIT DIAGRAM	P.A071 , P.A072	AA
2594074-0003	022	CIRCUIT DIAGRAM	P.A071 , P.A072	AA
2594074-0003	023	CIRCUIT DIAGRAM	LINE COMMUNICATION	AA
2594074-0004	001	LINE SUMMARY	LINE SUMMARY	AA
2594074-0004	002	LINE SUMMARY	LINE SUMMARY	AA
2594074-0005	001	CABINET TERMINAL SUMMARY	CABINET TERMINAL SUMMARY	AA
2594074-0005	002	CABINET TERMINAL SUMMARY	CABINET TERMINAL SUMMARY	AA
2594074-0006	001	TERMINAL STRIP OVERVIEW	Terminal diagram: +P-X010 (1 - E1)	AA
2594074-0006	002	TERMINAL STRIP OVERVIEW	Terminal diagram: +M-X101 (1 - A)	AA
2594074-0006	003	TERMINAL STRIP OVERVIEW	Terminal diagram: +M-X102 (4 - 6)	AA
2594074-0007	001	CABLE CONNECTION LIST	CABLE CONNECTION LIST	AA
2594074-0007	002	CABLE CONNECTION LIST	CABLE CONNECTION LIST	AA
2594074-0007	003	CABLE CONNECTION LIST	CABLE CONNECTION LIST	AA
2594074-0008	001	MAINS CONNECTION	MAINS CONNECTION	AA
2594074-0008	002	MAINS CONNECTION	MAINS CONNECTION	AA

Tetra Pak

Designer MANL
ECM No 167302

Date 05/27/04
Denomination DOCUMENT LIST

Machine TSA A1-TCA
Page Type Table of contents: (001 - 002)

Document No. 2594074-0001
Doc. type ELD
Version AA
Page 001

Company Tetra Pak Carton Ambient AB

Drawing remarks

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3 Position Summary

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Description

This chapter is a list of all electrical components that are shown in the electrical drawings, with page references to the drawings where they are located.

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Position summary

Component	Opt.	Page ref.	Col.
+C-A002		2594074-0003:009	7
+C-A003		2594074-0003:011	7
+C-A004		2594074-0003:013	1
+C-A005		2594074-0003:015	1
+C-A060		2594074-0003:004	5
+P-A071		2594074-0003:010	3
+P-A072		2594074-0003:017	4
+C-A090		2594074-0003:008	6
+C-A100		2594074-0003:006	5
+M-B100		2594074-0003:009	4
+M-B103		2594074-0003:006	3
+M-B104		2594074-0003:008	2
+M-B105		2594074-0003:012	4
+M-B106		2594074-0003:012	4
+M-B108		2594074-0003:012	4
+M-B109		2594074-0003:012	4
+M-B110		2594074-0003:012	4
+M-B112		2594074-0003:012	4
+C-D001		2594074-0003:004	5
+C-E001		2594074-0003:006	4
+C-E002		2594074-0003:007	6
+M-E100		2594074-0003:003	6
+C-F001		2594074-0003:003	3
+C-F002		2594074-0003:003	6
+C-F003		2594074-0003:004	2
+C-F004		2594074-0003:005	3
+C-F005		2594074-0003:007	5
+C-G001		2594074-0003:004	5

Component	Opt.	Page ref.	Col.
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+C-G012		2594074-0003:004	3
+P-H001		2594074-0003:017	7
+P-H001S		2594074-0003:019	6
+P-H002		2594074-0003:017	7
+P-H002S		2594074-0003:019	6
+P-H003		2594074-0003:017	7
+P-H003S		2594074-0003:019	6
+P-H004		2594074-0003:017	7
+P-H004S		2594074-0003:019	6
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+P-H005S		2594074-0003:019	6
+P-H006		2594074-0003:017	7
+P-H006S		2594074-0003:019	6
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+P-H007S		2594074-0003:020	7
+P-H008		2594074-0003:017	7
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+P-H009S		2594074-0003:020	7
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+P-H013		2594074-0003:019	6
+P-H014		2594074-0003:019	6
+P-H015		2594074-0003:019	6
+M-H101		2594074-0003:014	5

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+C-K004		2594074-0003:015	7
+C-K005		2594074-0003:015	7
+C-K020		2594074-0003:013	7
+C-K090		2594074-0003:008	8
+C-K098		2594074-0003:014	7
+C-K099		2594074-0003:014	7
+C-M001		2594074-0003:003	9
+M-M101		2594074-0003:005	6
+M-M102		2594074-0003:007	8
+C-Q000		2594074-0003:002	2
+C-Q070		2594074-0003:003	8
+M-R101		2594074-0003:003	3
+C-S001		2594074-0003:008	5
+P-S001		2594074-0003:008	2
+C-U001		2594074-0003:007	5
+C-V090		2594074-0003:008	8
+M-Y100		2594074-0003:016	4
+M-Y101.1		2594074-0003:016	4
+M-Y101.2		2594074-0003:016	4
+M-Y102		2594074-0003:016	4
+C-Z000		2594074-0003:002	5
+C-Z001		2594074-0003:007	5
+C-Z002		2594074-0003:007	5
+C-Z003		2594074-0003:007	4
+C-Z004		2594074-0003:004	9
+C-Z005		2594074-0003:007	6
+C-Z100		2594074-0003:005	3

Component	Opt.	Page ref.	Col.

Drawing remarks

Tetra Pak

Designer MANL | Date 05/27/04 | Machine TSA A1-TCA

ECM No 167302 | Denomination POSITION SUMMARY | Page Type Device list: (+C-A002 - +C-Z100)

Company Tetra Pak Carton Ambient AB | Document No. 2594074-0002 | Doc. type ELD | Version AA | Page 001

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4 Circuit Diagrams

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Description

All component drawings, such as programmable logic controller (PLC) modules, terminals, and cables, are included in this chapter. Other chapter lists are generated from these pages.

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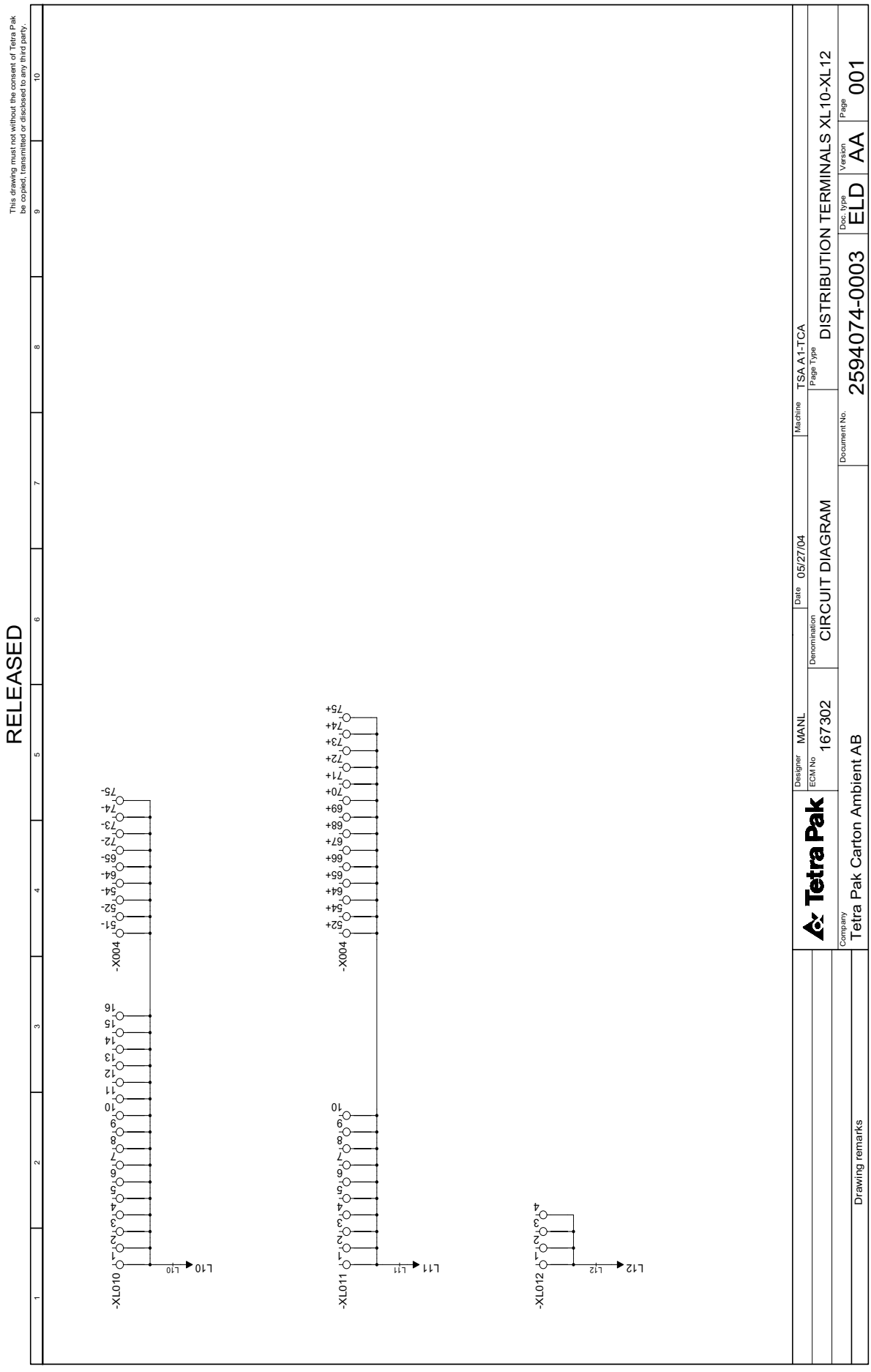

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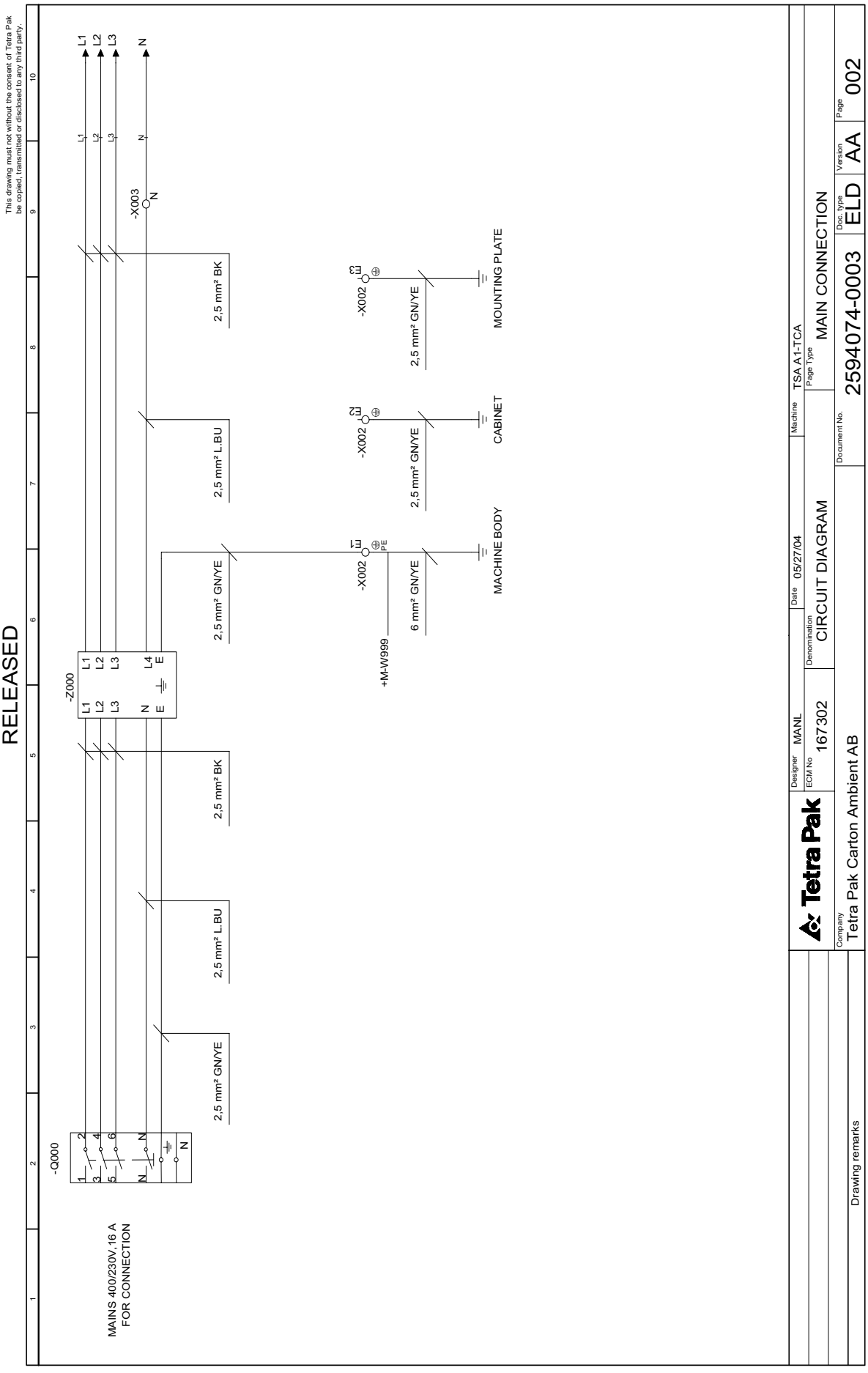

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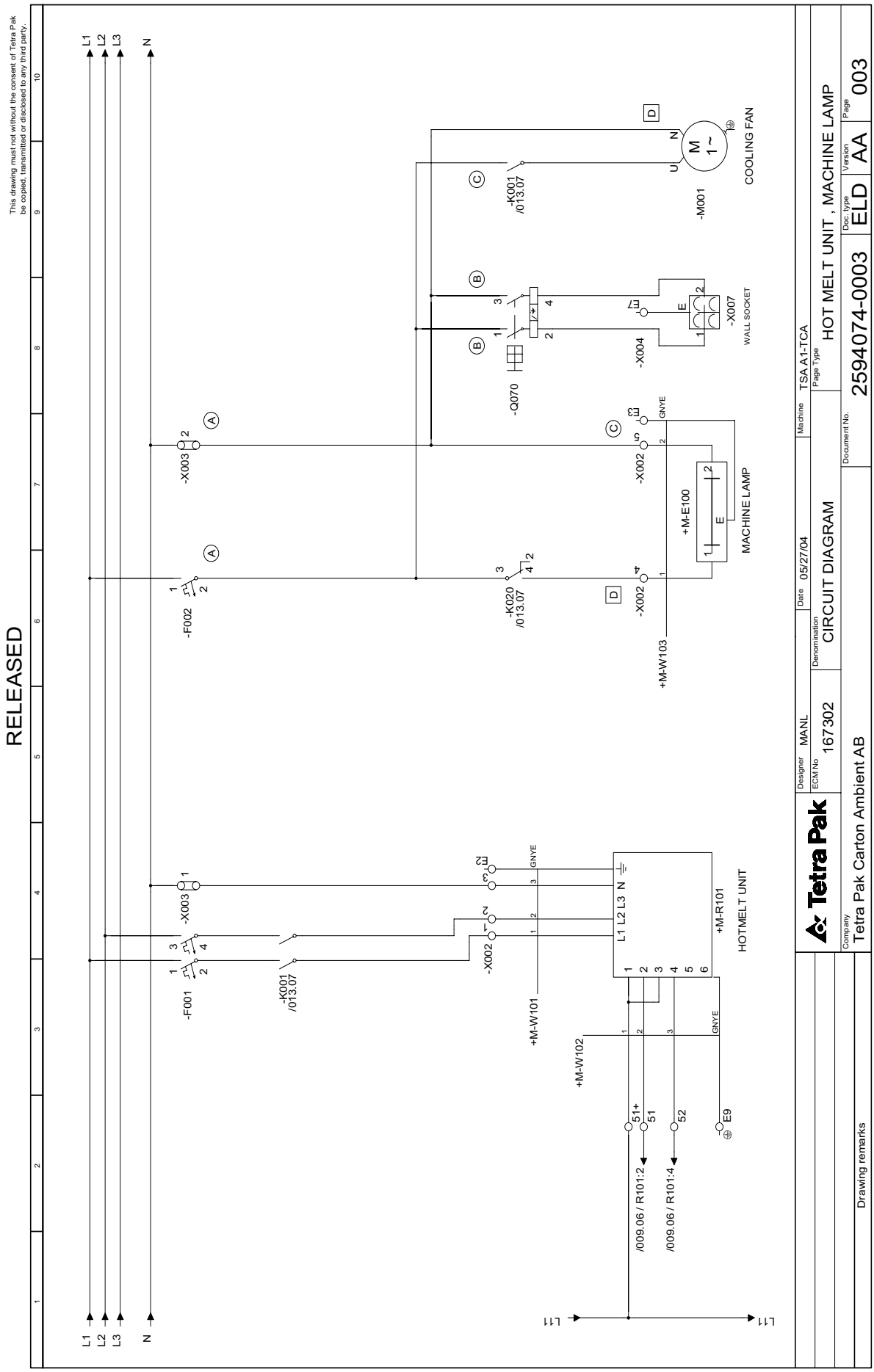

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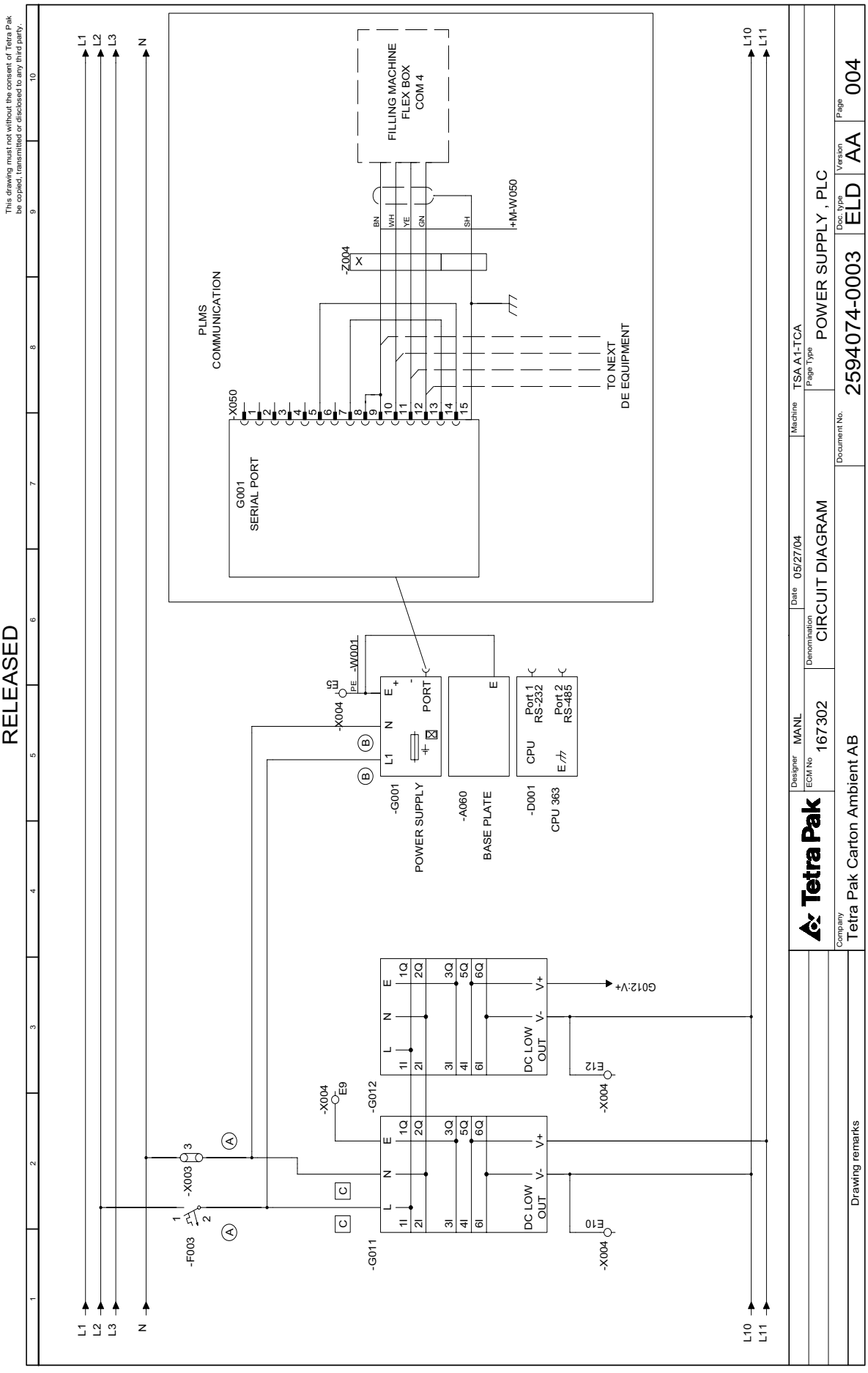

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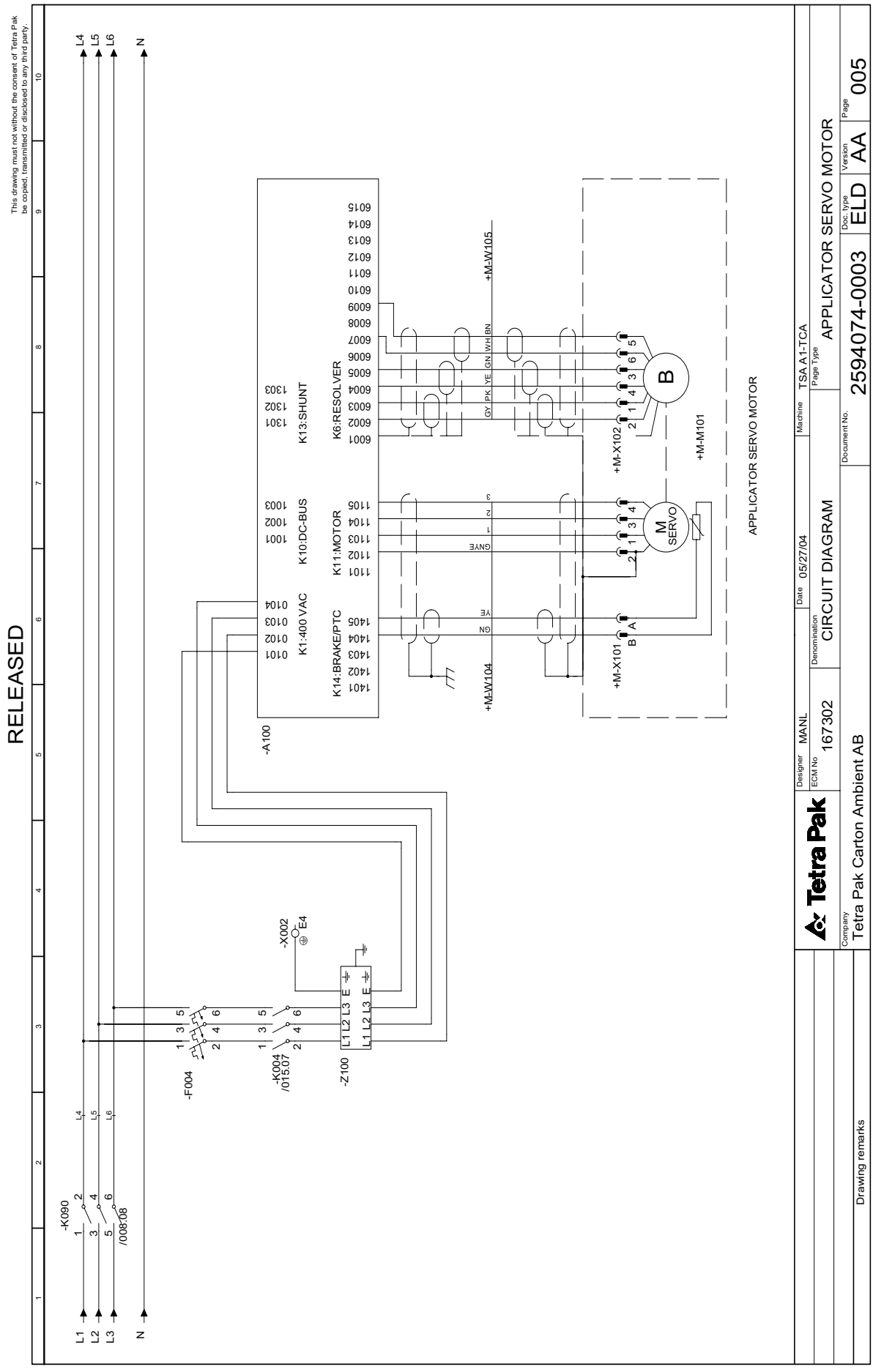

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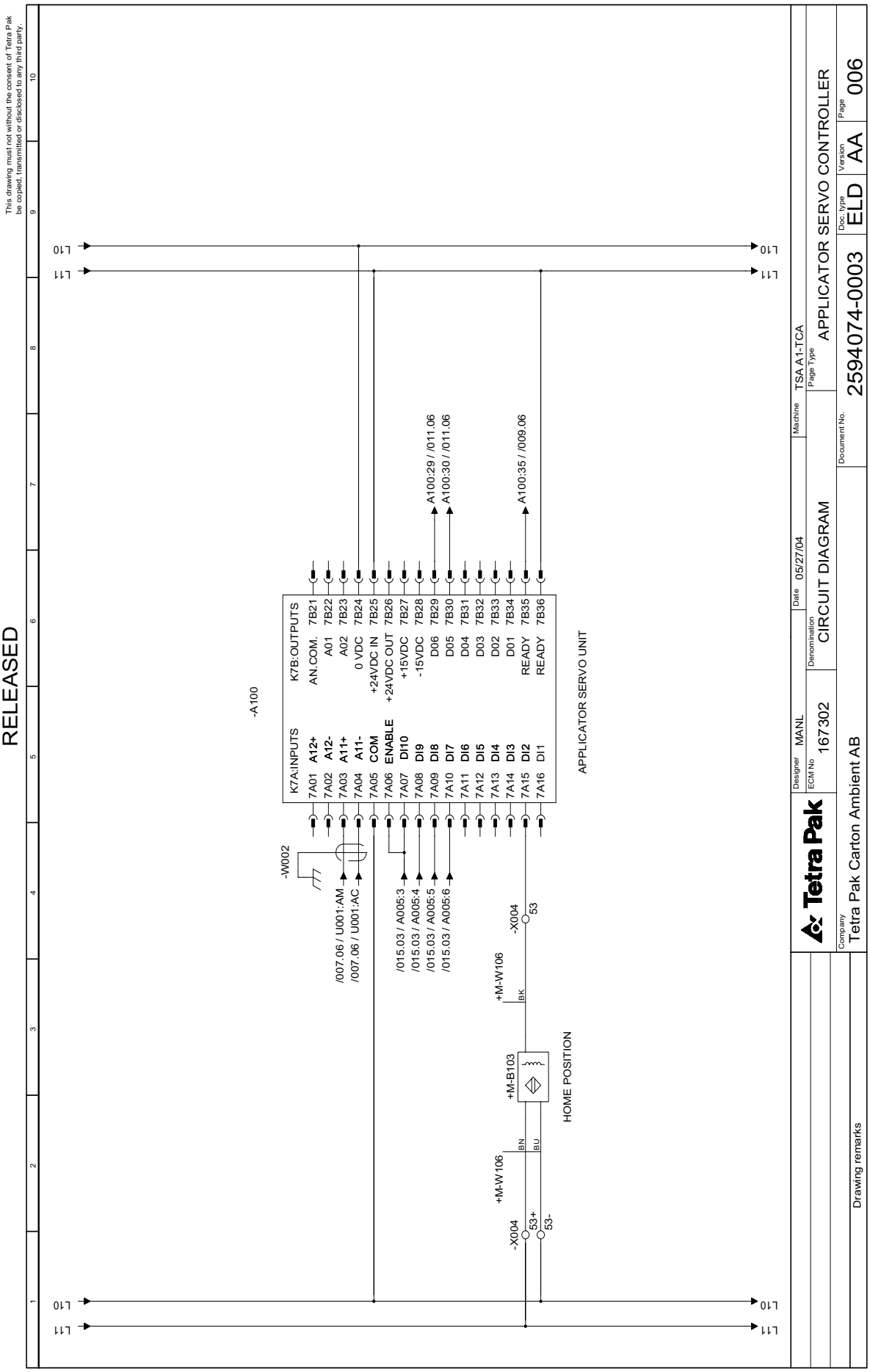

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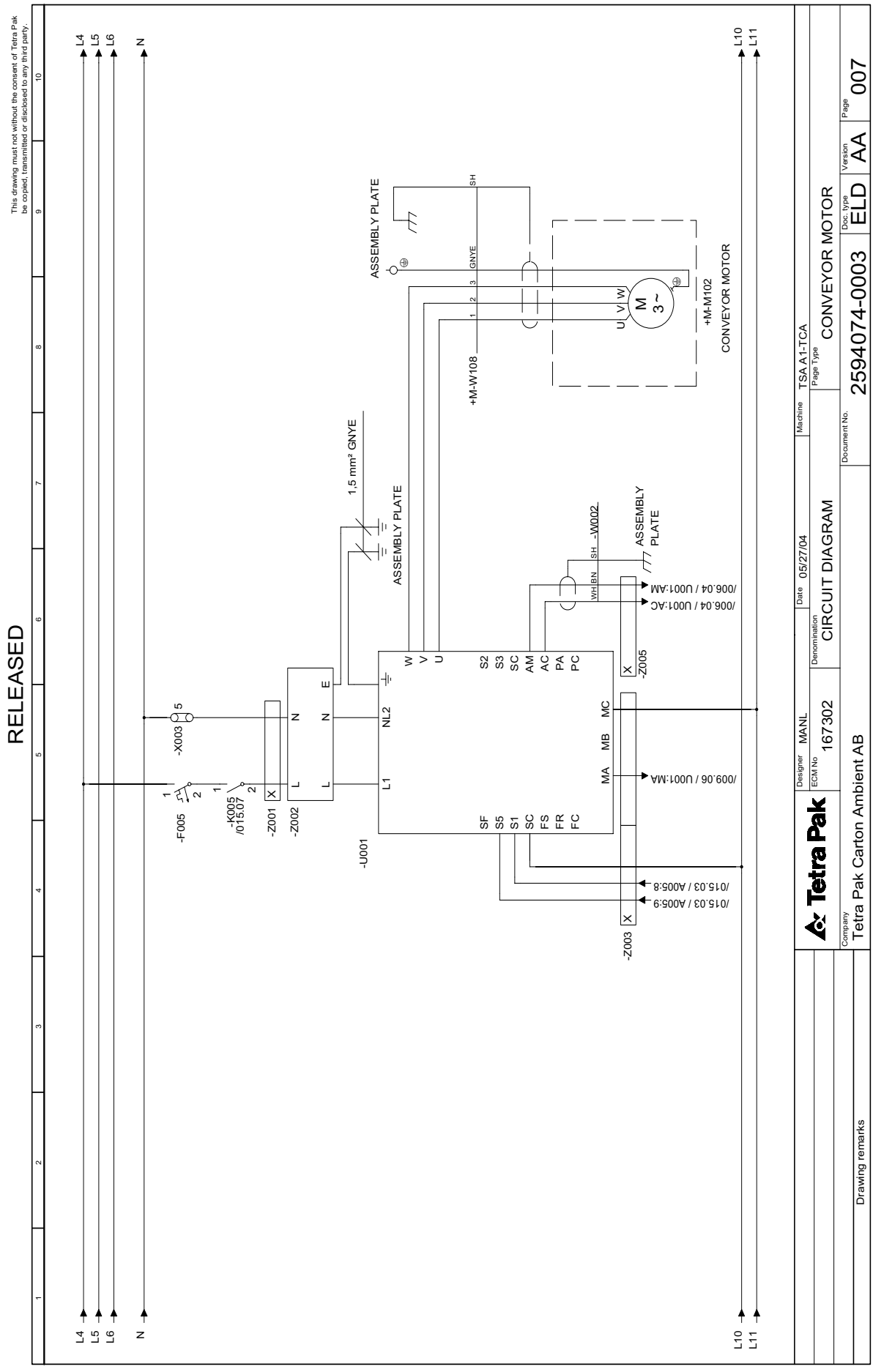

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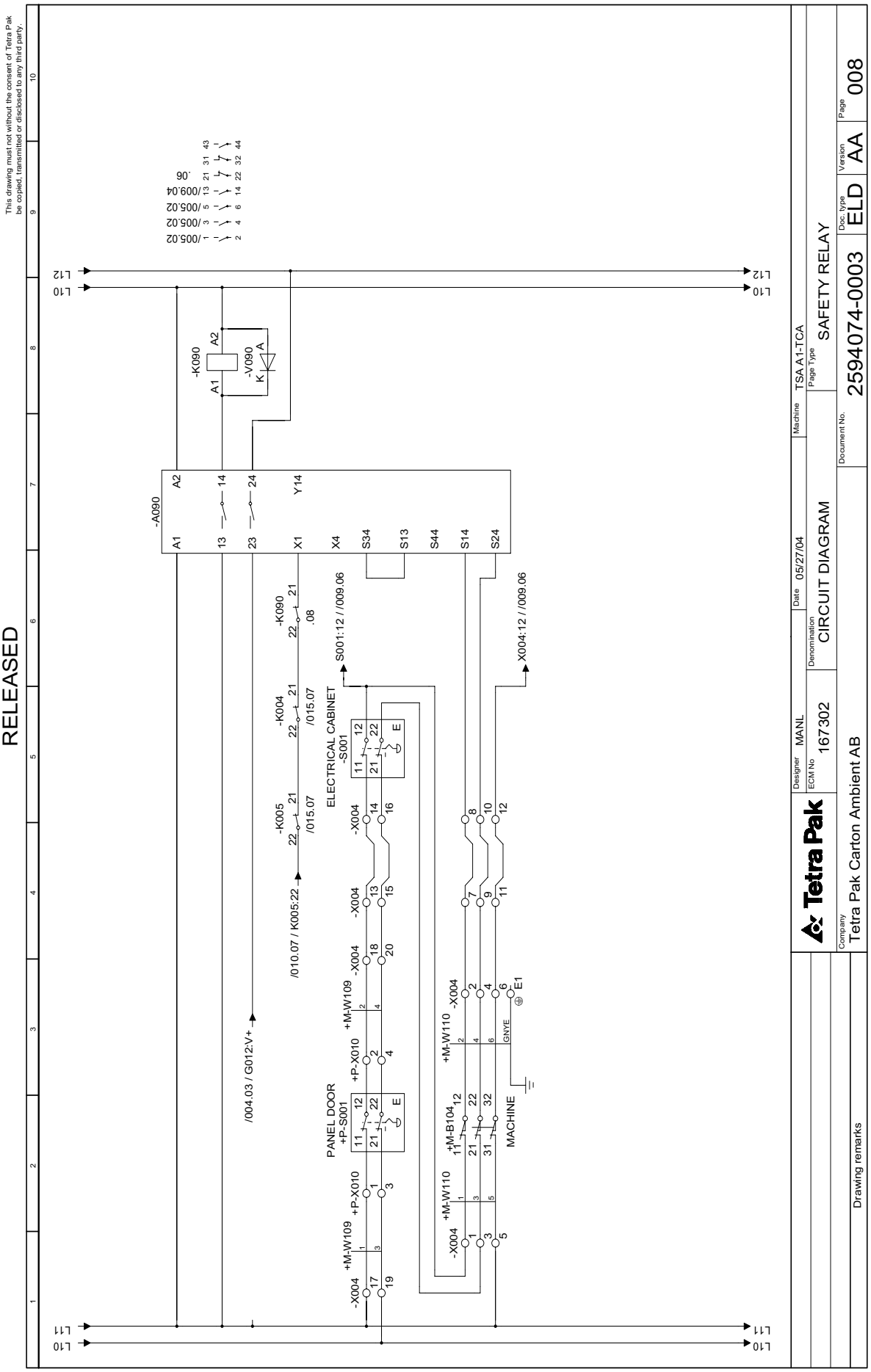

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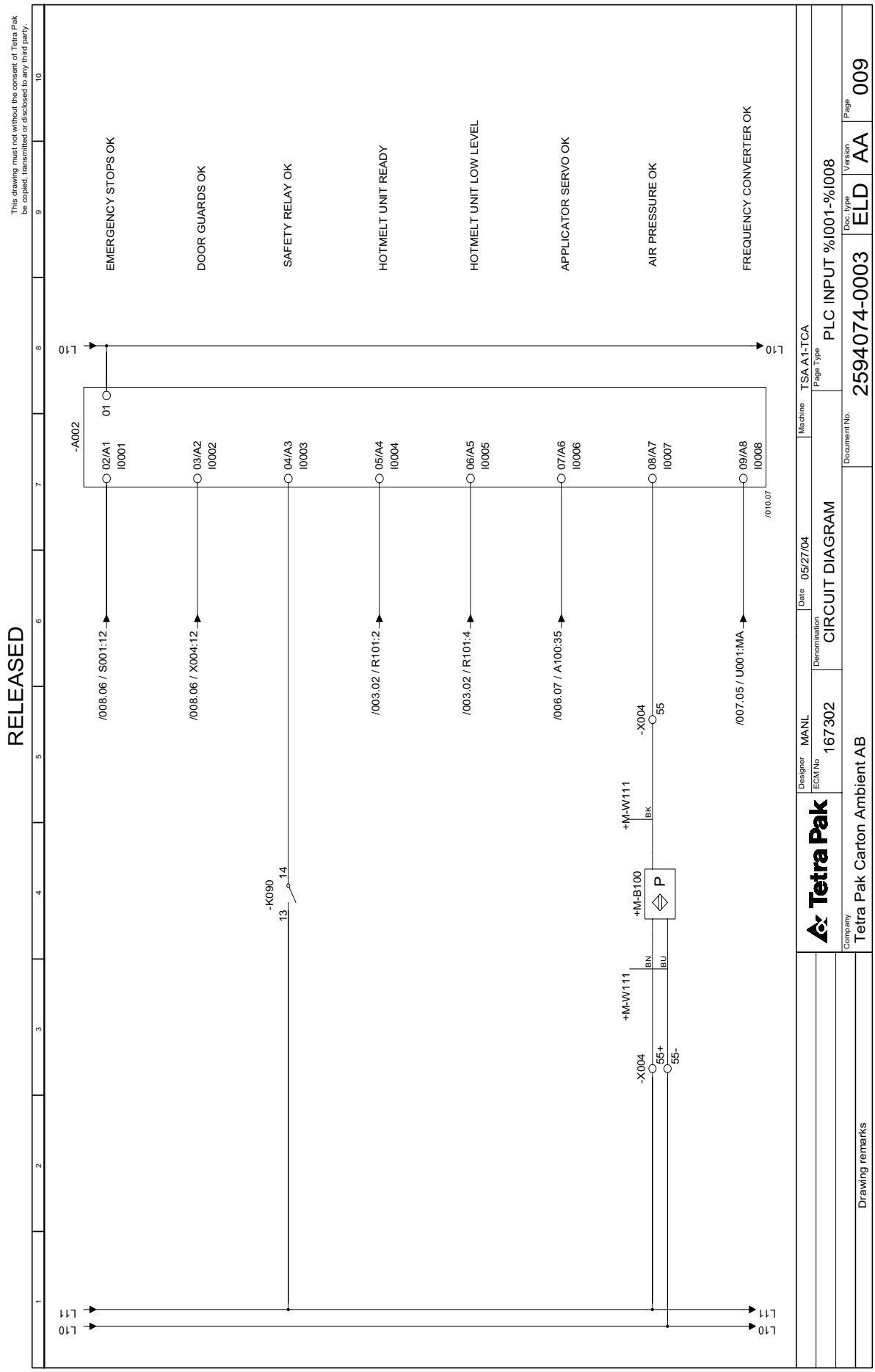

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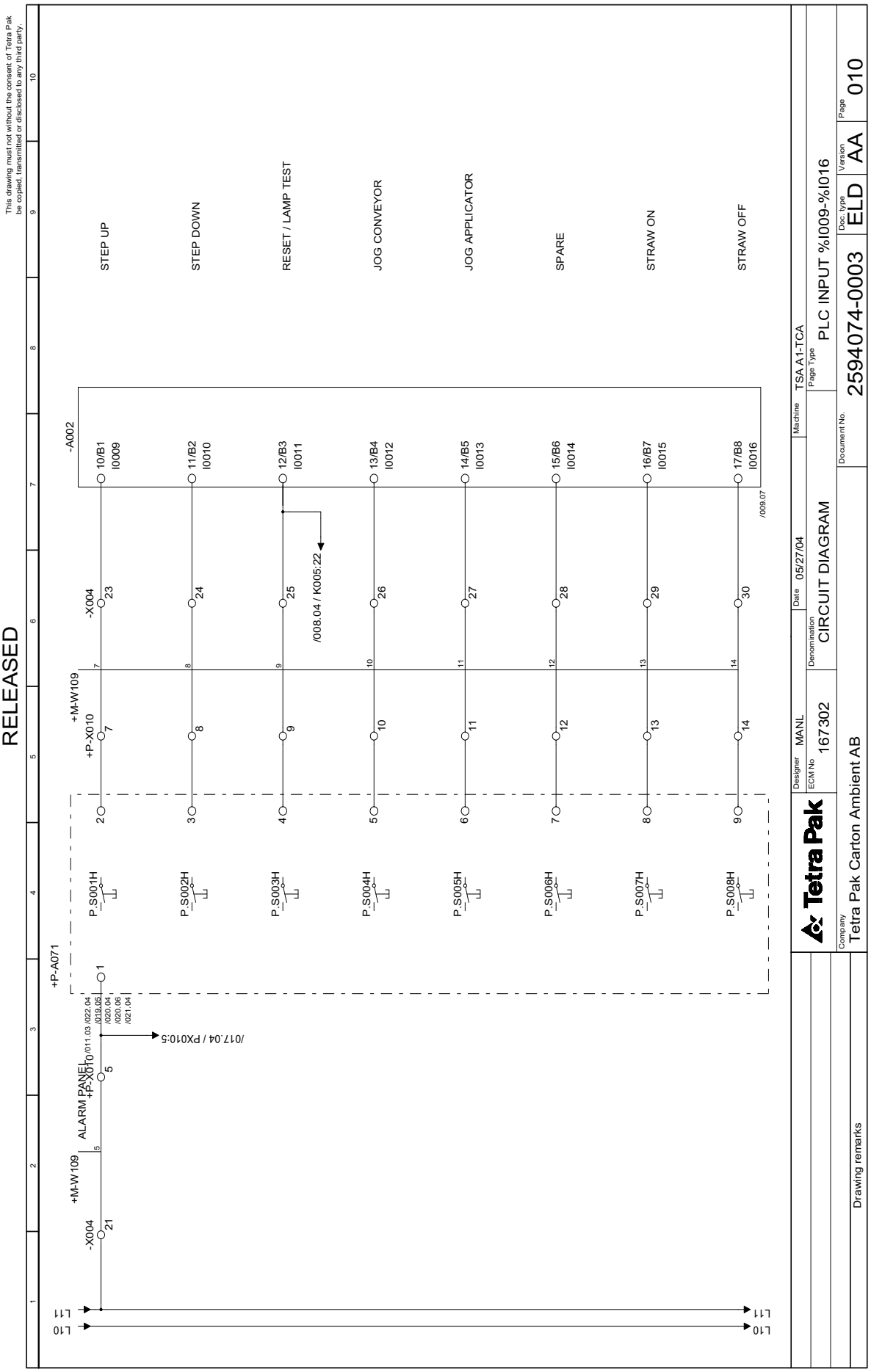

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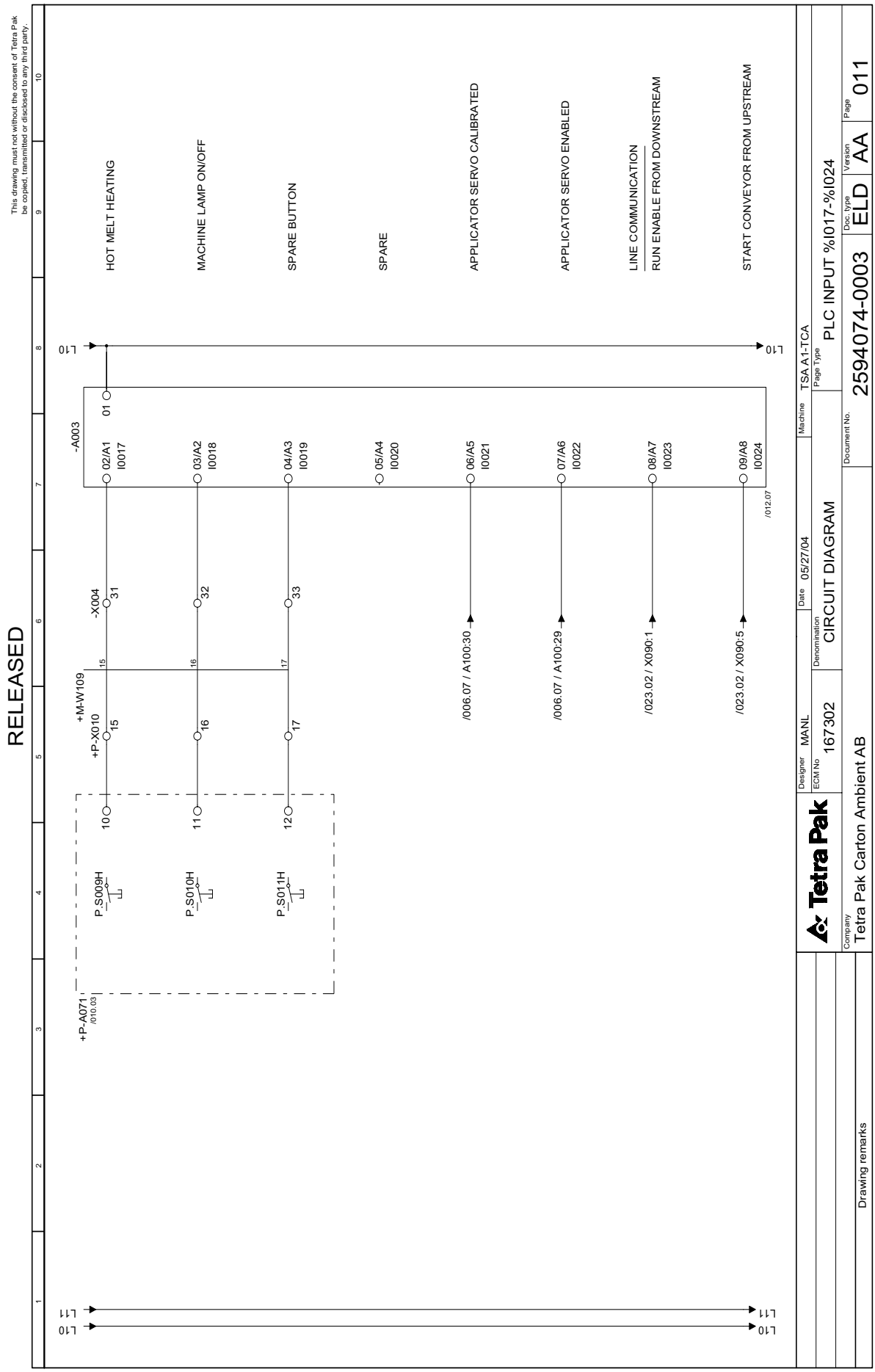
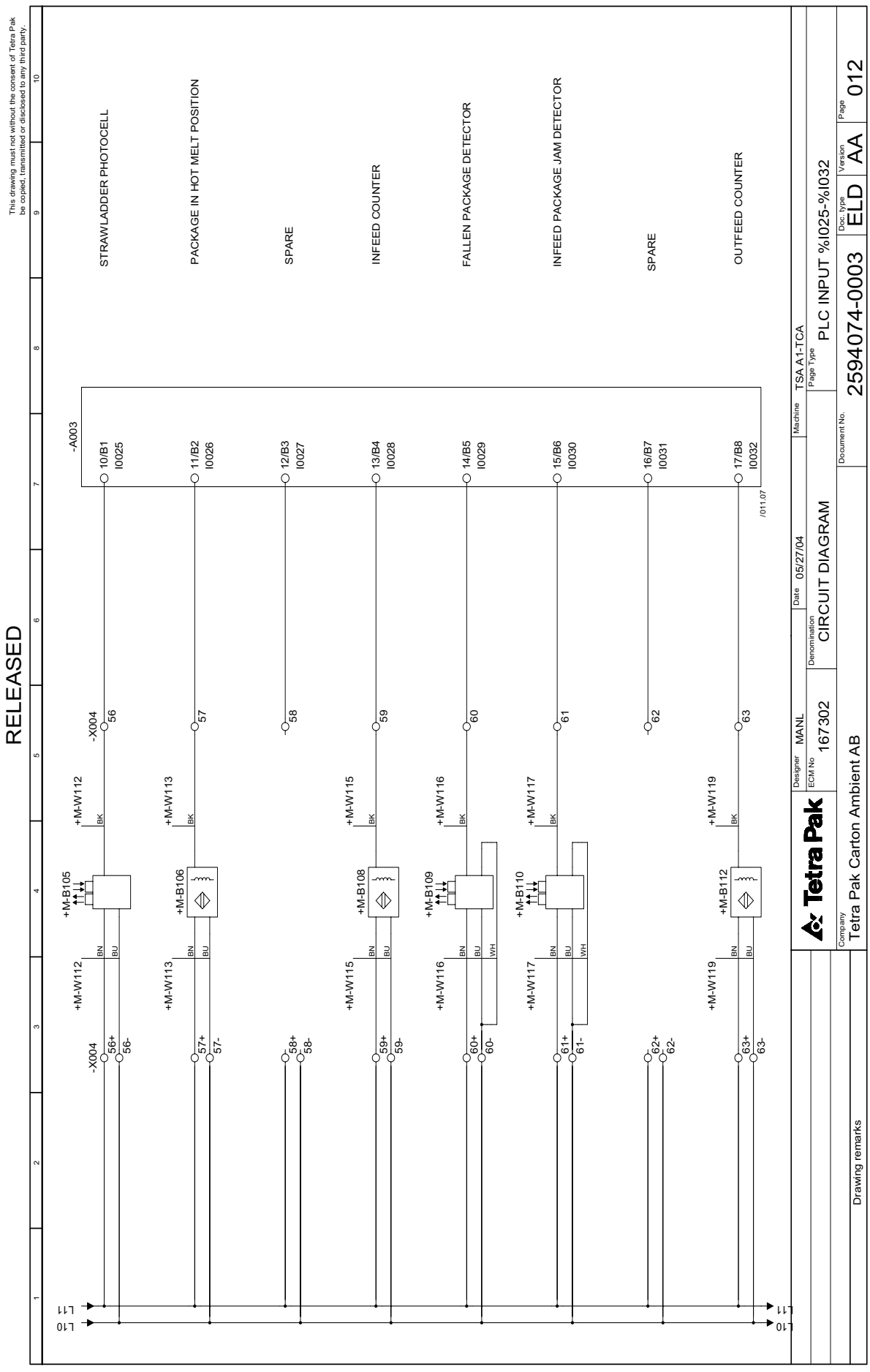
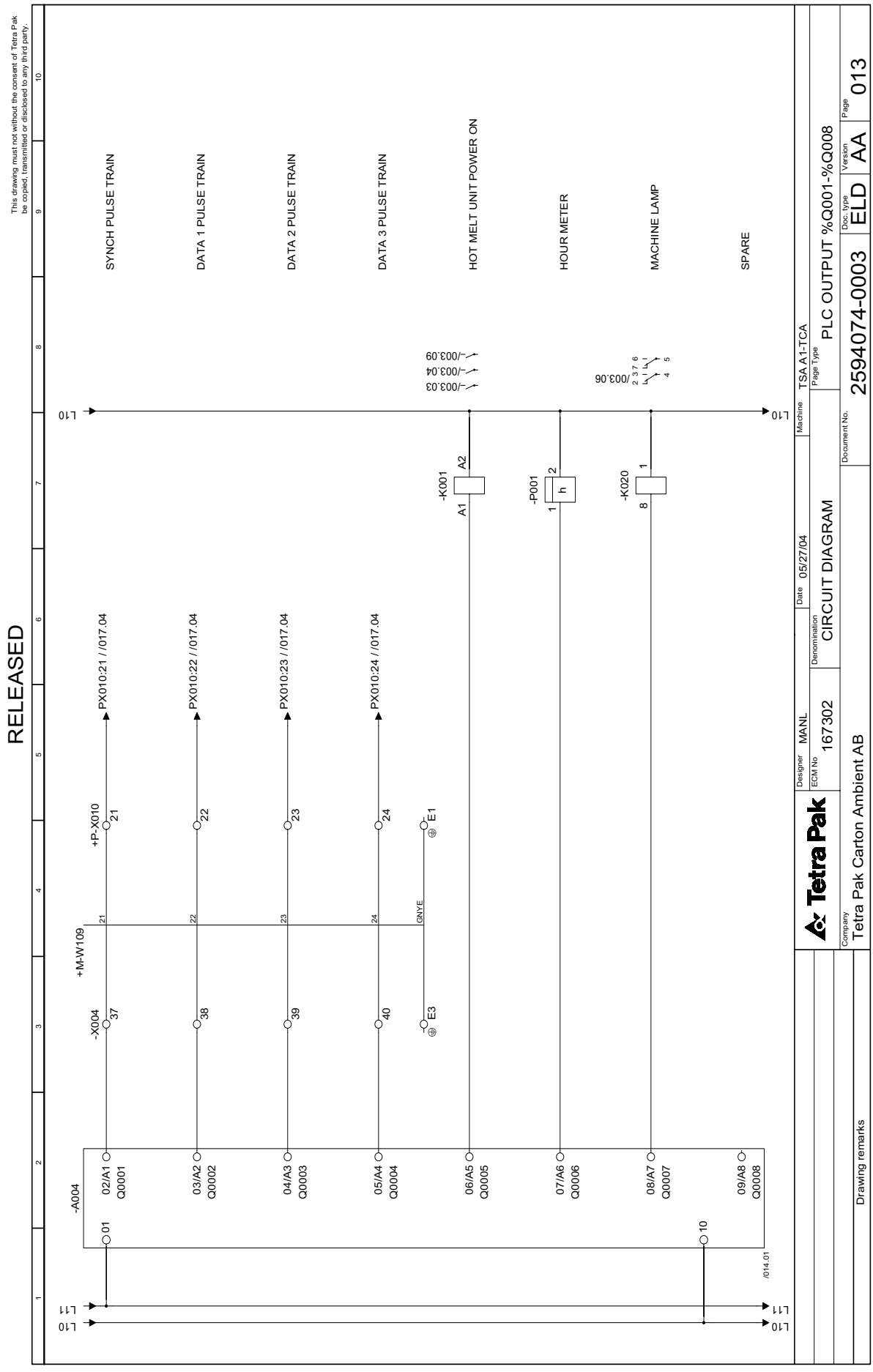


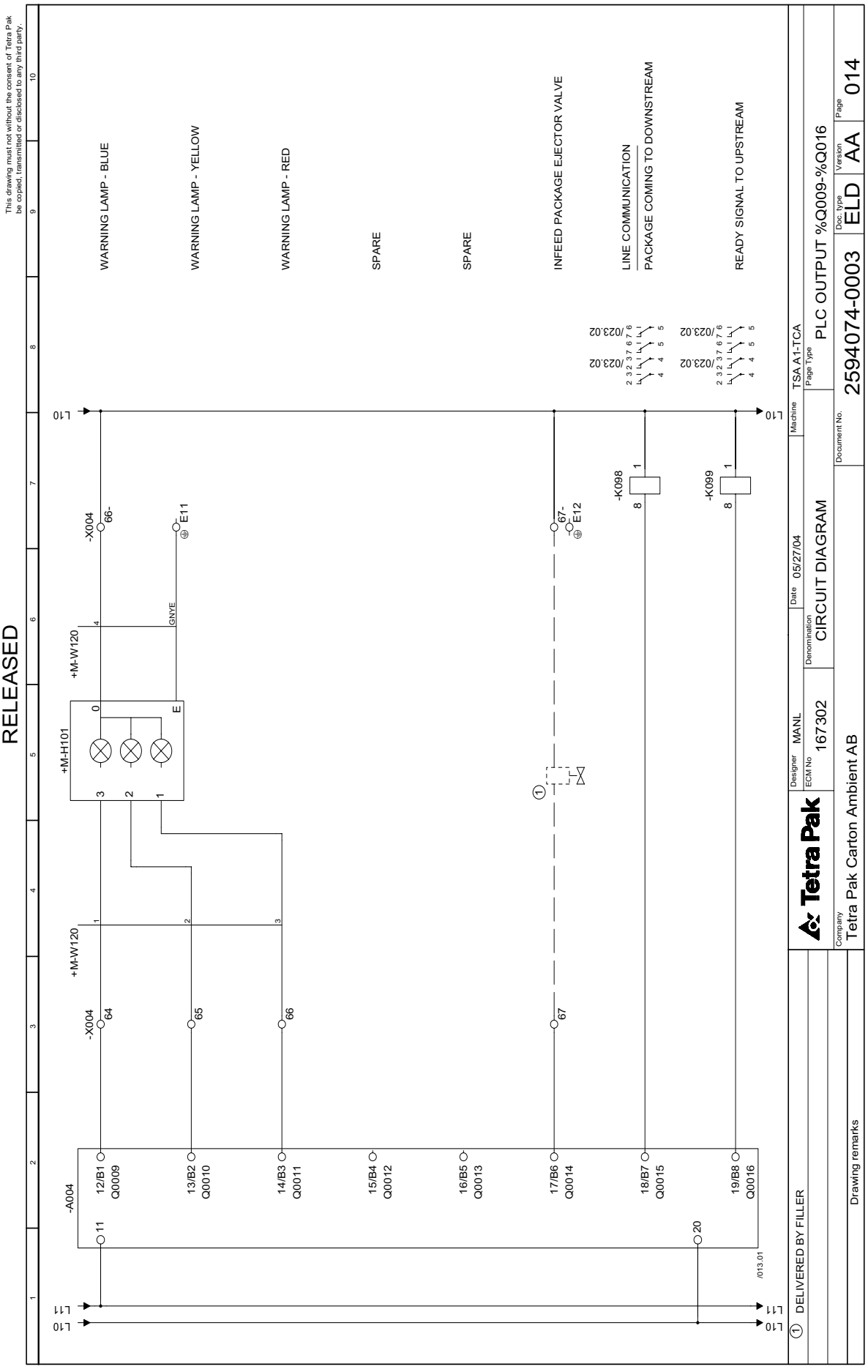
TechPub_2614345_0103 - 2656887_01.fm



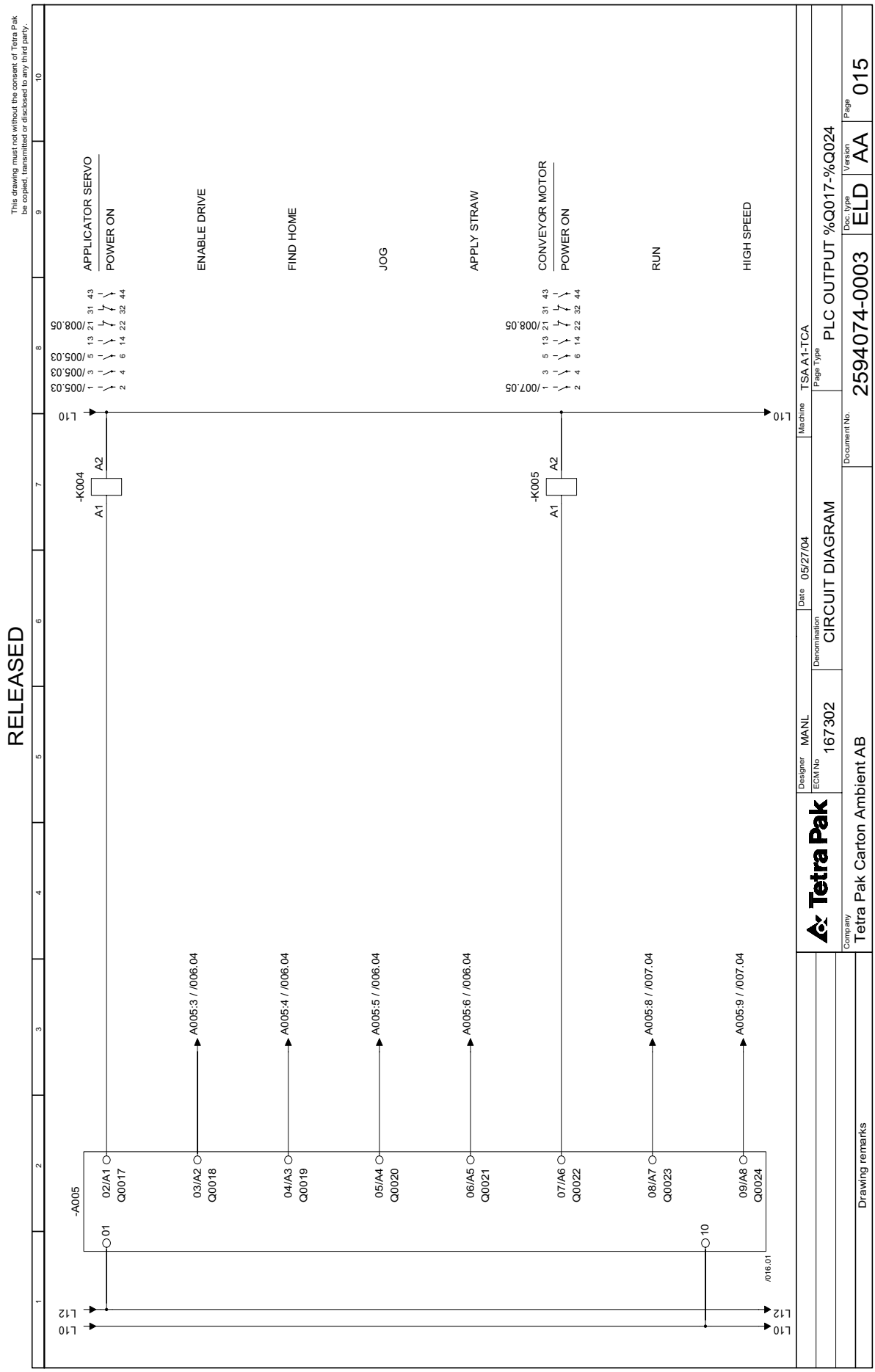
TechPub_2614345_0103 - 2656887_01.fm



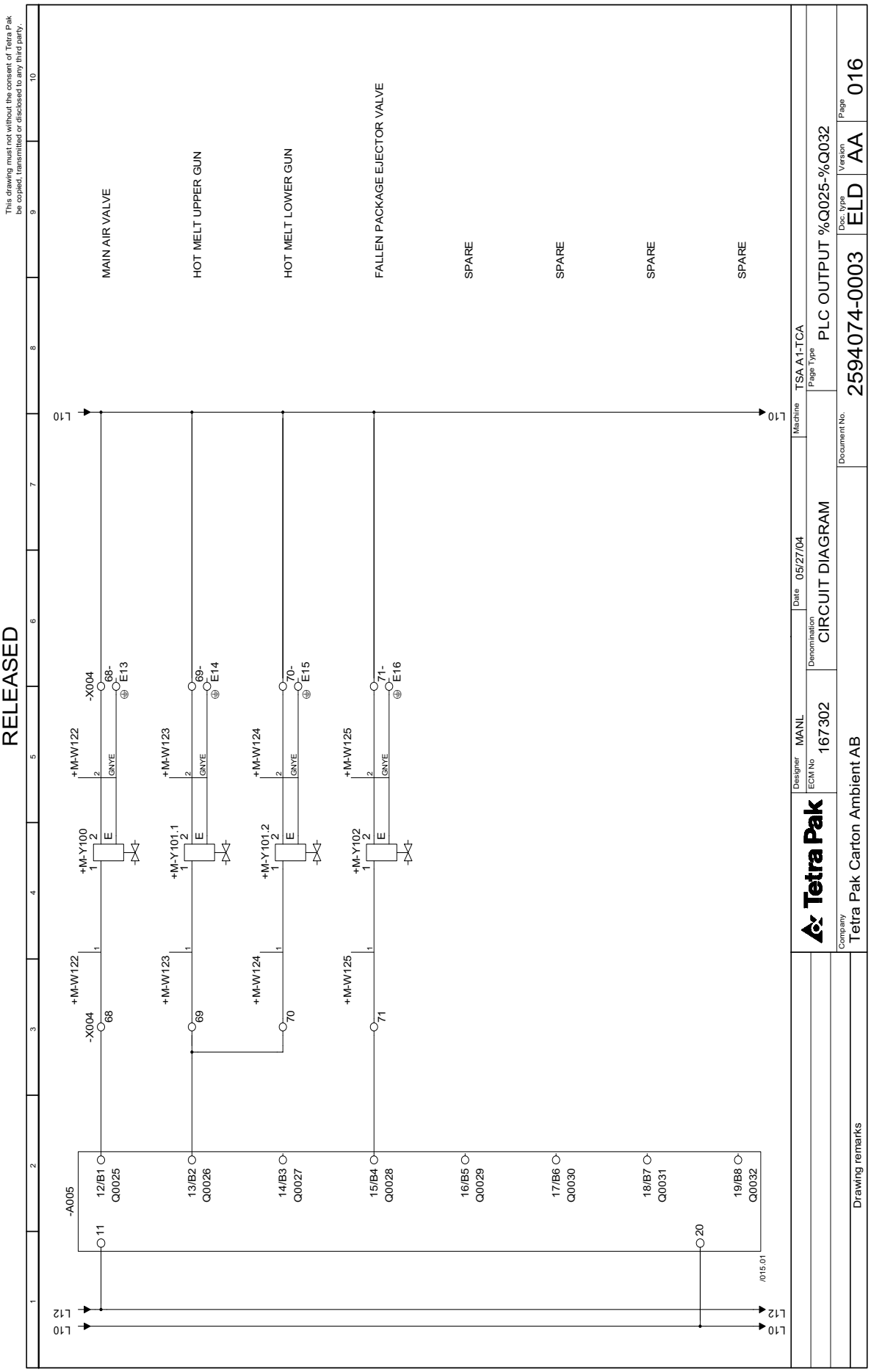
TechPub_2614345_0103 - 2656887_01.fm



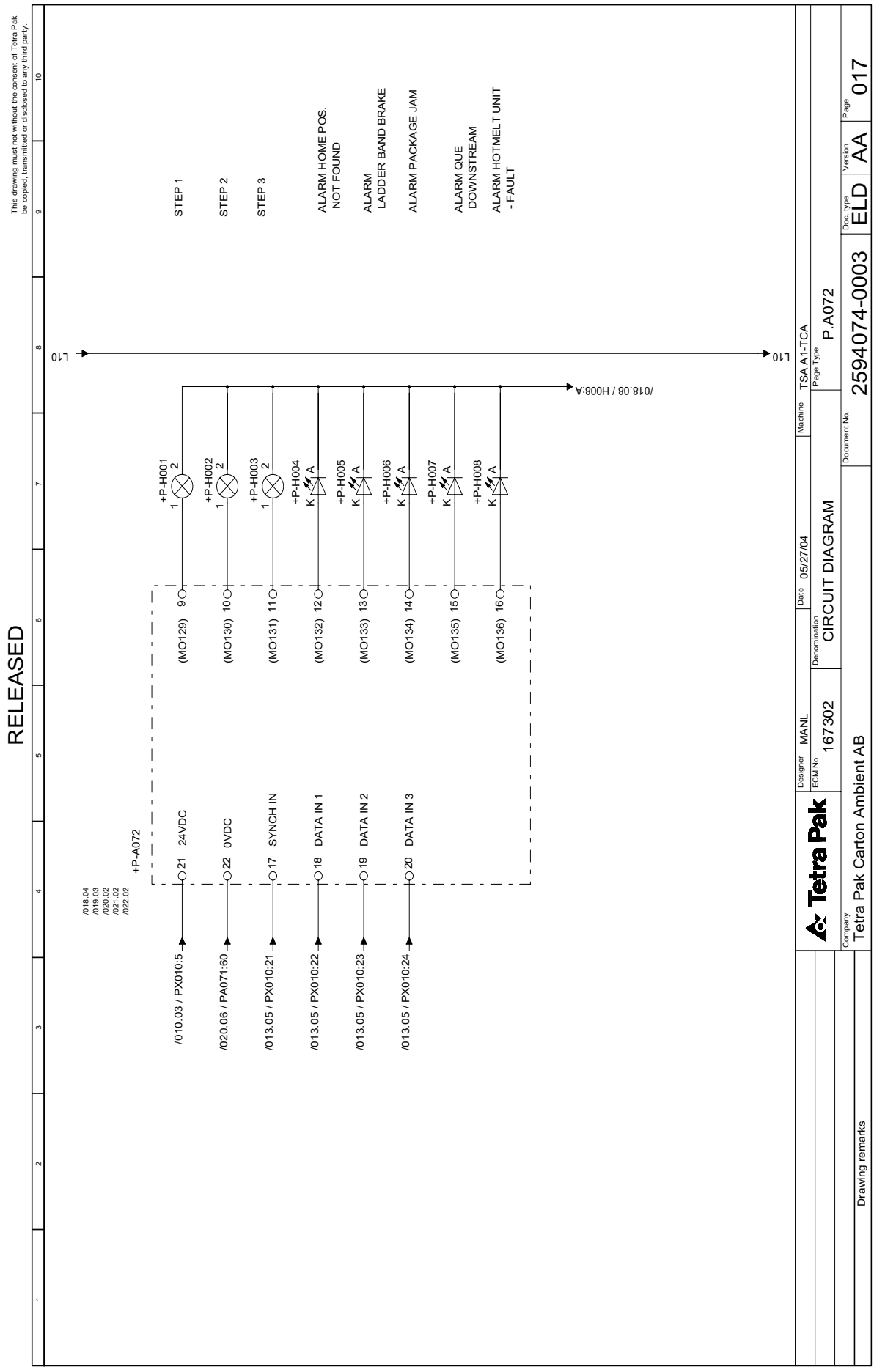
TechPub_2614345_0103 - 2656887_01.fm



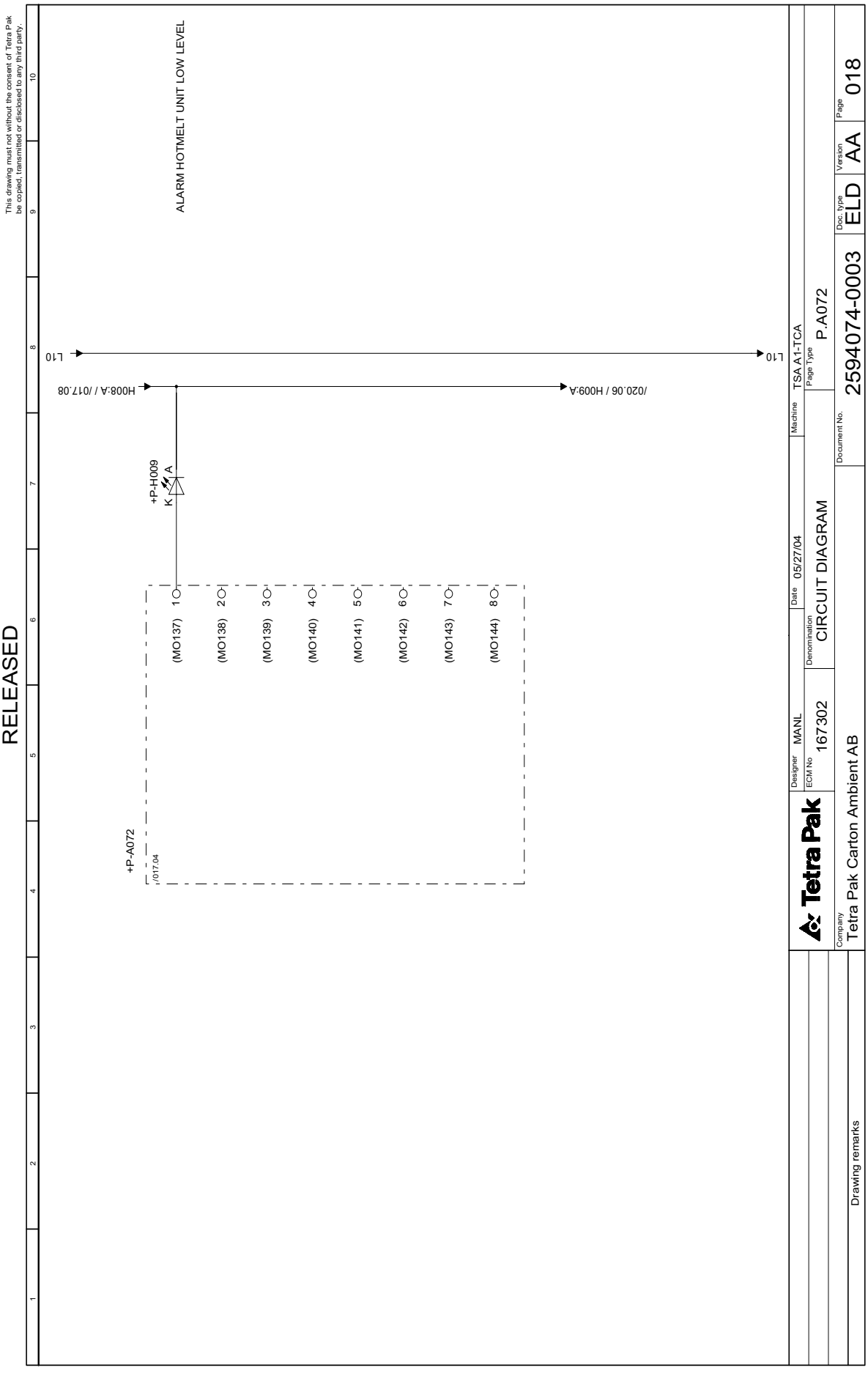
TechPub_2614345_0103 - 2656887_01.fm



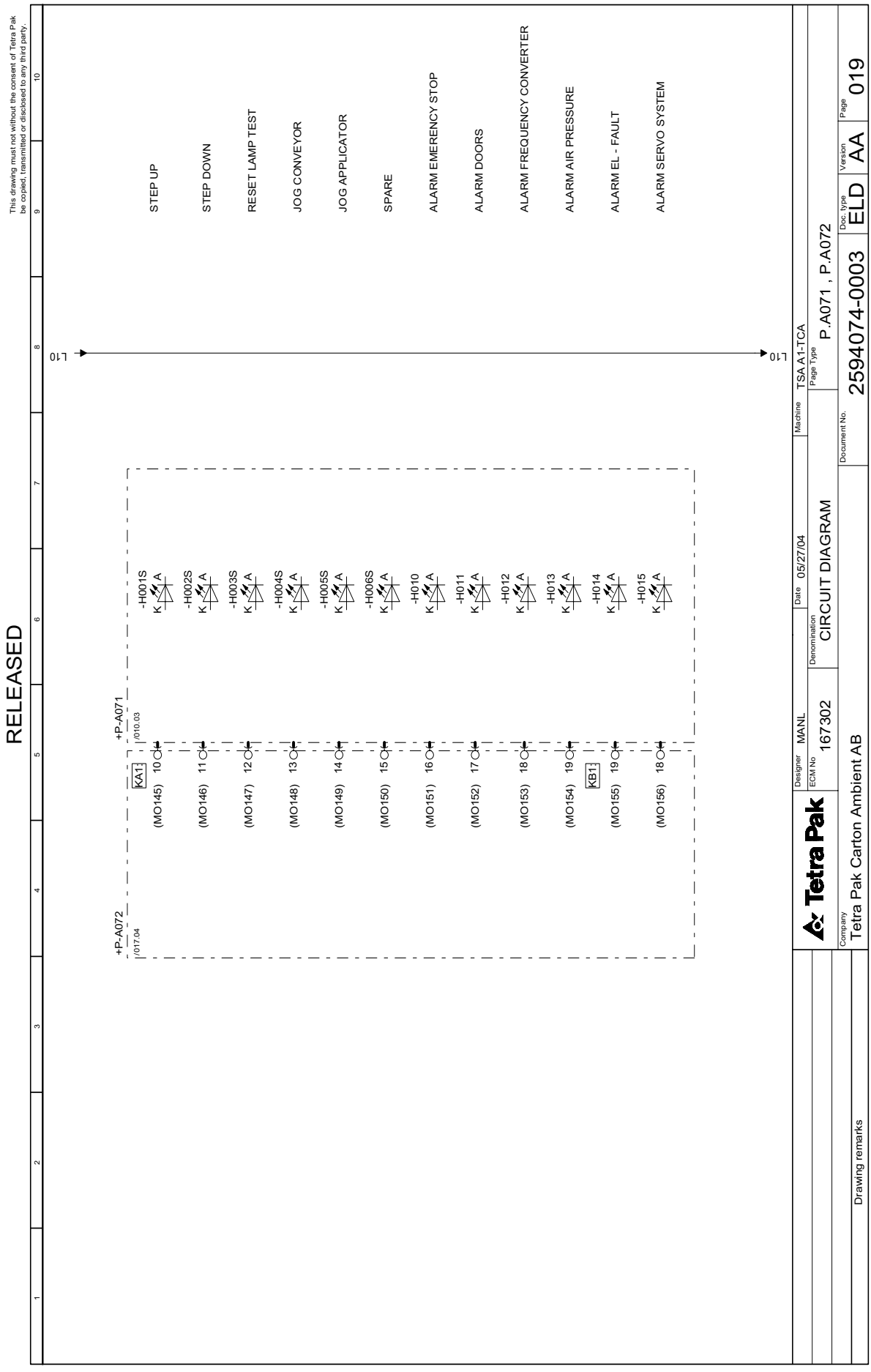
TechPub_2614345_0103 - 2656887_01.fm



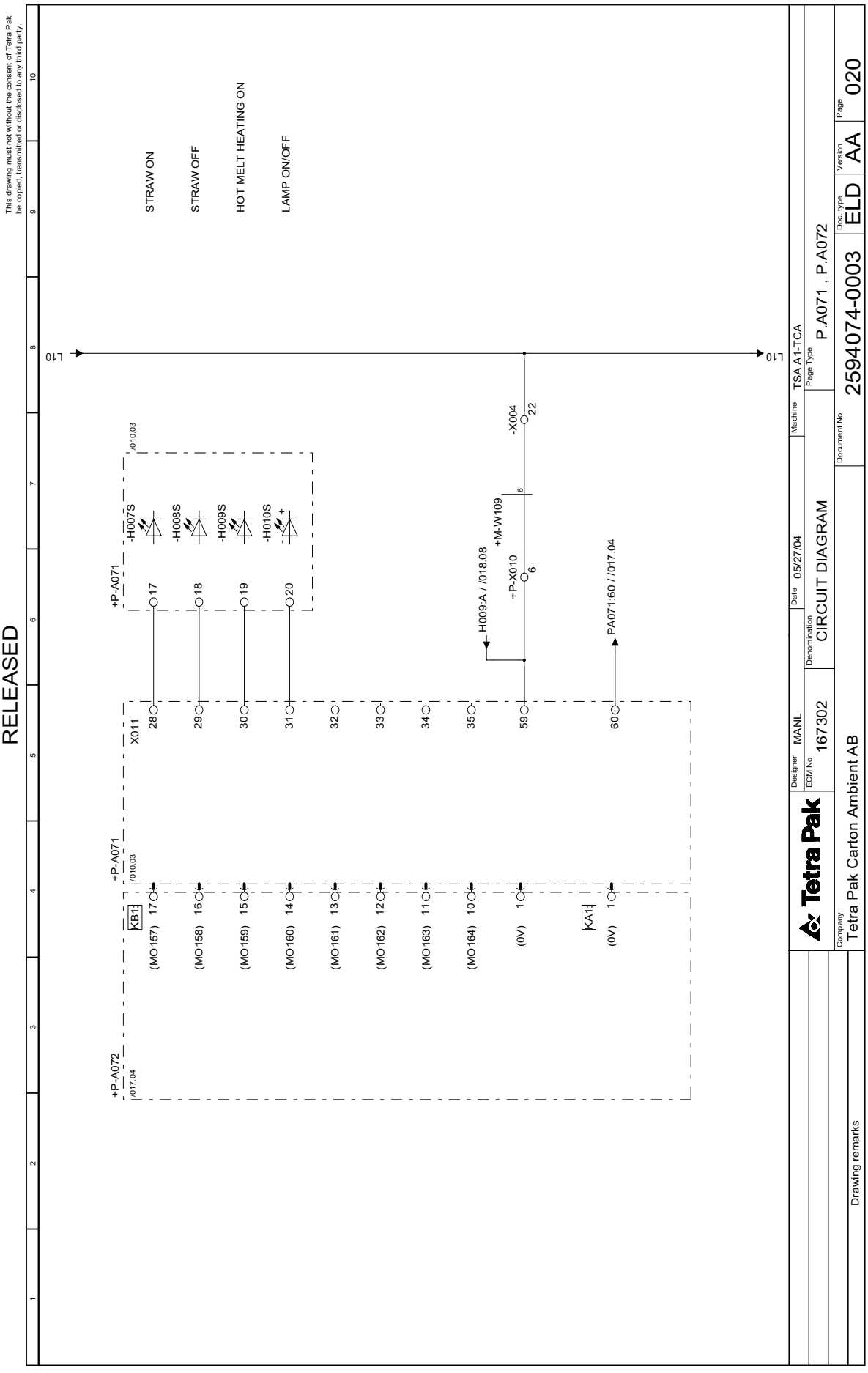
TechPub_2614345_0103 - 2656887_01.fm



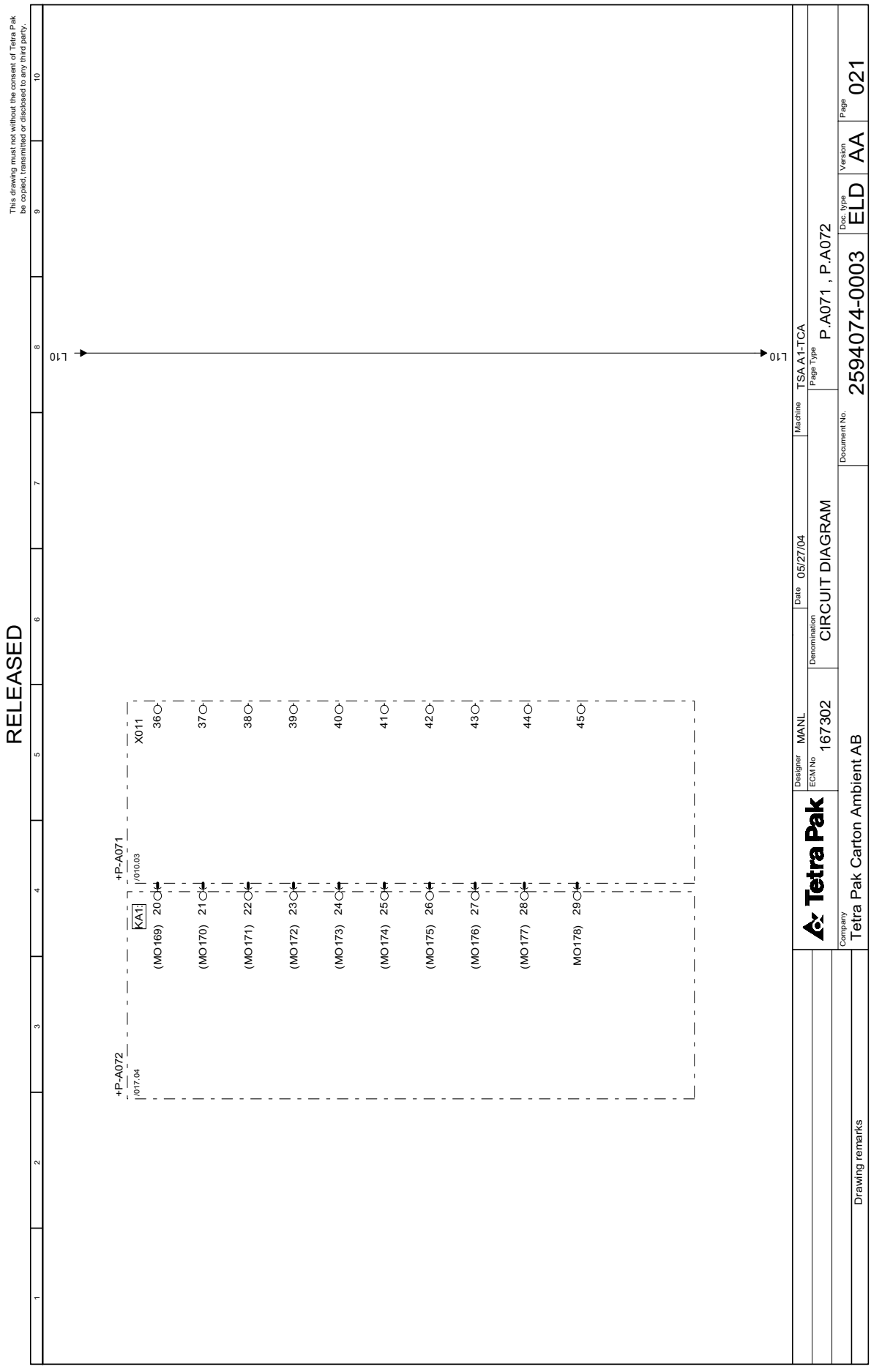
TechPub_2614345_0103 - 2656887_01.fm



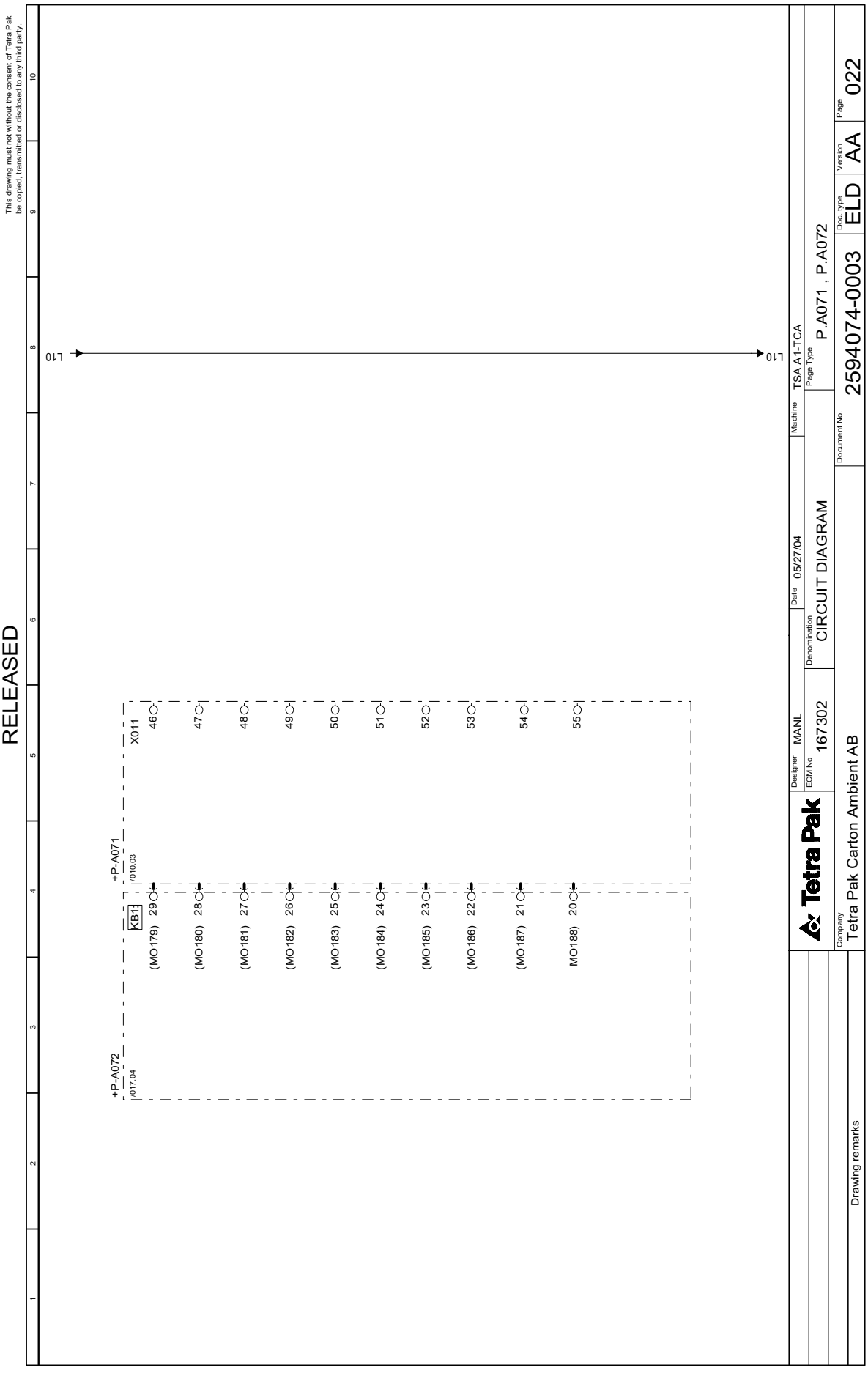
TechPub_2614345_0103 - 2656887_01.fm



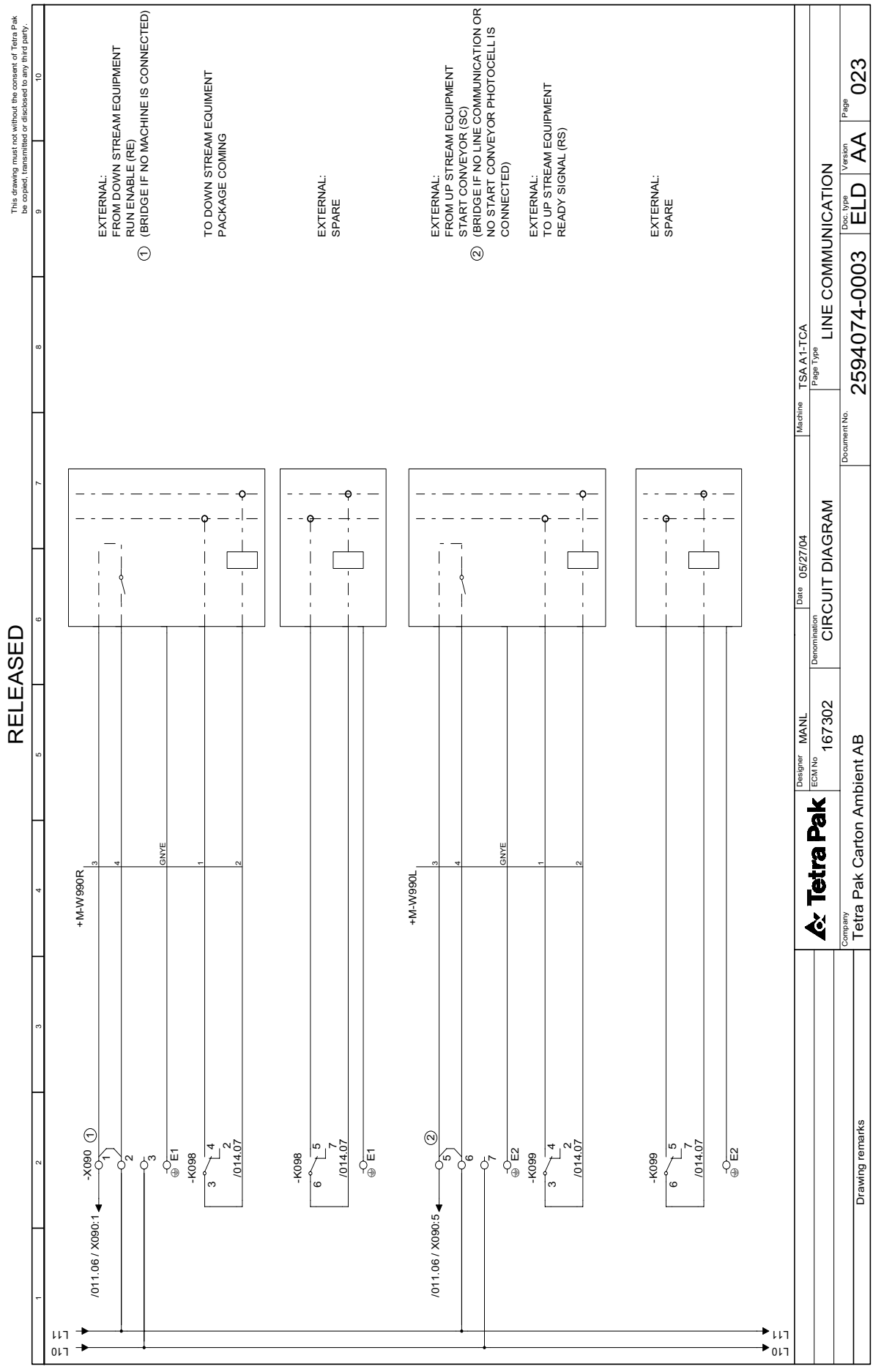
TechPub_2614345_0103 - 2656887_01.fm



TechPub_2614345_0103 - 2656887_01.fm



TechPub_2614345_0103 - 2656887_01.fm



TechPub_2614345_0103 - 2656887_01.fm

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TechPub_2614345_0103 - 2656887_01.fm

5 Line Summary

TechPub_2614345_0103 - 2656888_01.fm

Description

All connections inside the electrical cabinet are listed in this chapter.

TechPub_2614345_0103 - 2656888_01.fm

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1 2 3 4 5 6 7 8 9 10

Line summary of 2594074-0003

Line	From	Page.Col.	To	Page.Col.	Area/Color	Opt.
L1	+C-Z000:L1	002 .5	+C-K090:1	005 .2		
L1	+C-K090:1	005 .2	+C-F001:1	003 .3		
L1	+C-F001:1	003 .3	+C-F002:1	003 .6		
L2	+C-Z000:L2	002 .5	+C-K090:3	005 .2		
L2	+C-K090:3	005 .2	+C-F001:3	003 .4		
L2	+C-F001:3	003 .4	+C-F003:1	004 .2		
L3	+C-Z000:L3	002 .5	+C-K090:5	005 .2		
L4	+C-K090:2	005 .2	+C-F004:1	005 .3		
L4	+C-F004:1	005 .3	+C-F005:1	007 .5		
L5	+C-K090:4	005 .2	+C-F004:3	005 .3		
L6	+C-K090:6	005 .2	+C-F004:5	005 .3		
L10	+C-XL010:1	001 .1	+C-G011:V-	004 .2		
L10	+C-G011:V-	004 .2	+C-X004:E10	004 .1		
L10	+C-XL010:2	001 .1	+C-G012:V-	004 .3		
L10	+C-G012:V-	004 .3	+C-X004:E12	004 .3		
L10	+C-XL010:3	001 .1	+C-A002:01	009 .8		
L10	+C-XL010:4	001 .2	+C-A003:01	011 .8		
L10	+C-XL010:5	001 .2	+C-A004:10	013 .1		
L10	+C-A004:10	013 .1	+C-A004:20	014 .1		
L10	+C-XL010:6	001 .2	+C-A005:10	015 .1		
L10	+C-A005:10	015 .1	+C-A005:20	016 .1		
L10	+C-XL010:7	001 .2	+C-K090:A2	008 .8		
L10	+C-K090:A2	008 .8	+C-V090:A	008 .8		
L10	+C-V090:A	008 .8	+C-K001:A2	013 .7		
L10	+C-K001:A2	013 .7	+C-K004:A2	015 .7		
L10	+C-K004:A2	015 .7	+C-K005:A2	015 .7		
L10	+C-K005:A2	015 .7	+C-K020:1	013 .7		
L10	+C-K020:1	013 .7	+C-A090:A2	008 .6		

Line	From	Page.Col.	To	Page.Col.	Area/Color	Opt.
L10	+C-A090:A2	008 .6	+C-P001:2	013 .7		
L10	+C-XL010:8	001 .2	+C-X090:3	023 .2		
L10	+C-X090:3	023 .2	+C-X090:7	023 .2		
L10	+C-X090:7	023 .2	+C-K098:1	014 .7		
L10	+C-K098:1	014 .7	+C-K099:1	014 .7		
L10	+C-XL010:9	001 .2	+C-A100:7A05	006 .5		
L10	+C-XL010:10	001 .2	+C-A100:7B24	006 .5		
L10	+C-XL010:11	001 .2	+C-U001:SC	007 .5		
L10	+C-XL010:12	001 .3	+C-X004:19	008 .1		
L10	+C-X004:19	008 .1	+C-X004:22	020 .7		
L10	+C-X004:22	020 .7	+C-X004:75-	001 .5		
L10	+C-X004:75-	001 .5	+C-X004:74-	001 .5		
L10	+C-X004:74-	001 .5	+C-X004:73-	001 .4		
L10	+C-X004:73-	001 .4	+C-X004:72-	001 .4		
L10	+C-X004:72-	001 .4	+C-X004:71-	016 .6		
L10	+C-X004:71-	016 .6	+C-X004:70-	016 .6		
L10	+C-X004:70-	016 .6	+C-X004:69-	016 .6		
L10	+C-X004:69-	016 .6	+C-X004:68-	016 .6		
L10	+C-X004:68-	016 .6	+C-X004:67-	014 .7		
L10	+C-X004:67-	014 .7	+C-X004:66-	014 .7		
L10	+C-X004:66-	014 .7	+C-X004:65-	001 .4		
L10	+C-X004:65-	001 .4	+C-X004:64-	001 .4		
L10	+C-X004:64-	001 .4	+C-X004:63-	012 .3		
L10	+C-X004:63-	012 .3	+C-X004:62-	012 .3		
L10	+C-X004:62-	012 .3	+C-X004:61-	012 .3		
L10	+C-X004:61-	012 .3	+C-X004:60-	012 .3		
L10	+C-X004:60-	012 .3	+C-X004:59-	012 .3		
L10	+C-X004:59-	012 .3	+C-X004:58-	012 .3		

Drawing remarks

Tetra Pak

Designer	Date	Machine
MANL	05/27/04	TSA A1-TCA

ECM No	Denomination	Page Type
167302	LINE SUMMARY	LINE SUMMARY

Company	Document No.	Doc. type	Version	Page
Tetra Pak Carton Ambient AB	2594074-0004	ELD	AA	001

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Line summary of 2594074-0003

Line	From	Page.Col.	To	Page.Col.	Area/Color	Opt.
L10	+C-X004:58-	012 .3	+C-X004:57-	012 .3		
L10	+C-X004:57-	012 .3	+C-X004:56-	012 .3		
L10	+C-X004:56-	012 .3	+C-X004:55-	009 .3		
L10	+C-X004:55-	009 .3	+C-X004:54-	001 .4		
L10	+C-X004:54-	001 .4	+C-X004:53-	006 .1		
L10	+C-X004:53-	006 .1	+C-X004:52-	001 .4		
L10	+C-X004:52-	001 .4	+C-X004:51-	001 .4		
L11	+C-XL011:1	001 .1	+C-G011:V+	004 .2		
L11	+C-G011:V+	004 .2	+C-A004:01	013 .1		
L11	+C-A004:01	013 .1	+C-A004:11	014 .1		
L11	+C-XL011:3	001 .1	+C-K090:13	009 .4		
L11	+C-K090:13	009 .4	+C-A090:A1	008 .6		
L11	+C-A090:A1	008 .6	+C-A090:13	008 .6		
L11	+C-A090:13	008 .6	+C-X090:2	023 .2		
L11	+C-X090:2	023 .2	+C-X090:6	023 .2		
L11	+C-XL011:4	001 .2	+C-A100:7B25	006 .5		
L11	+C-XL011:6	001 .2	+C-A100:7B36	006 .5		
L11	+C-XL011:7	001 .2	+C-U001:MC	007 .5		
L11	+C-XL011:8	001 .2	+C-X004:5	008 .1		
L11	+C-X004:5	008 .1	+C-X004:17	008 .1		
L11	+C-X004:17	008 .1	+C-X004:21	010 .1		
L11	+C-X004:21	010 .1	+C-X004:75+	001 .5		
L11	+C-X004:75+	001 .5	+C-X004:74+	001 .5		
L11	+C-X004:74+	001 .5	+C-X004:73+	001 .5		
L11	+C-X004:73+	001 .5	+C-X004:72+	001 .5		
L11	+C-X004:72+	001 .5	+C-X004:71+	001 .5		
L11	+C-X004:71+	001 .5	+C-X004:70+	001 .5		
L11	+C-X004:70+	001 .5	+C-X004:69+	001 .5		

Line	From	Page.Col.	To	Page.Col.	Area/Color	Opt.
L11	+C-X004:69+	001 .5	+C-X004:68+	001 .4		
L11	+C-X004:68+	001 .4	+C-X004:67+	001 .4		
L11	+C-X004:67+	001 .4	+C-X004:66+	001 .4		
L11	+C-X004:66+	001 .4	+C-X004:65+	001 .4		
L11	+C-X004:65+	001 .4	+C-X004:64+	001 .4		
L11	+C-X004:64+	001 .4	+C-X004:63+	012 .3		
L11	+C-X004:63+	012 .3	+C-X004:62+	012 .3		
L11	+C-X004:62+	012 .3	+C-X004:61+	012 .3		
L11	+C-X004:61+	012 .3	+C-X004:60+	012 .3		
L11	+C-X004:60+	012 .3	+C-X004:59+	012 .3		
L11	+C-X004:59+	012 .3	+C-X004:58+	012 .3		
L11	+C-X004:58+	012 .3	+C-X004:57+	012 .3		
L11	+C-X004:57+	012 .3	+C-X004:56+	012 .3		
L11	+C-X004:56+	012 .3	+C-X004:55+	009 .3		
L11	+C-X004:55+	009 .3	+C-X004:54+	001 .4		
L11	+C-X004:54+	001 .4	+C-X004:53+	006 .1		
L11	+C-X004:53+	006 .1	+C-X004:52+	001 .4		
L11	+C-X004:52+	001 .4	+C-X004:51+	003 .2		
L12	+C-XL012:1	001 .1	+C-A090:24	008 .6		
L12	+C-XL012:2	001 .1	+C-A005:01	015 .1		
L12	+C-A005:01	015 .1	+C-A005:11	016 .1		
N	+C-X003:N	002 .9	+C-X003:1	003 .4		
N	+C-X003:1	003 .4	+C-X003:2	003 .7		
N	+C-X003:2	003 .7	+C-X003:3	004 .2		
N	+C-X003:3	004 .2	+C-X003:5	007 .5		

Drawing remarks

Tetra Pak

Designer	Date	Machine
MANL	05/27/04	TSA A1-TCA

ECM No	Denomination	Page Type
167302	LINE SUMMARY	LINE SUMMARY

Company	Document No.	Doc. type	Version	Page
Tetra Pak Carton Ambient AB	2594074-0004	ELD	AA	002

6 Cabinet Terminal Summary

TechPub_2614345_0103 - 2656889_01.fm

Description

All terminals inside the electrical cabinet are listed in this chapter. The field *Opt.* specifies if the terminal is reserved for an option.

TechPub_2614345_0103 - 2656889_01.fm

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Cabinet terminal summary of 2594074-0003

Terminal	Page .Col.	Opt.
+C-X002:1	003 .4	
+C-X002:2	003 .4	
+C-X002:3	003 .4	
+C-X002:4	003 .6	
+C-X002:5	003 .7	
+C-X002:E1	002 .6	
+C-X002:E2	002 .7	
+C-X002:E2	003 .4	
+C-X002:E3	002 .8	
+C-X002:E3	003 .7	
+C-X002:E4	005 .4	
+C-X003:1	003 .4	
+C-X003:2	003 .7	
+C-X003:3	004 .2	
+C-X003:4		
+C-X003:5	007 .5	
+C-X003:N	002 .9	
+C-X004:1	008 .1	
+C-X004:2	008 .3	
+C-X004:3	008 .1	
+C-X004:4	008 .3	
+C-X004:5	008 .1	
+C-X004:6	008 .3	
+C-X004:7	008 .4	
+C-X004:8	008 .5	
+C-X004:9	008 .4	
+C-X004:10	008 .5	
+C-X004:11	008 .4	

Terminal	Page .Col.	Opt.
+C-X004:12	008 .5	
+C-X004:13	008 .4	
+C-X004:14	008 .5	
+C-X004:15	008 .4	
+C-X004:16	008 .5	
+C-X004:17	008 .1	
+C-X004:18	008 .3	
+C-X004:19	008 .1	
+C-X004:20	008 .3	
+C-X004:21	010 .1	
+C-X004:22	020 .7	
+C-X004:23	010 .6	
+C-X004:24	010 .6	
+C-X004:25	010 .6	
+C-X004:26	010 .6	
+C-X004:27	010 .6	
+C-X004:28	010 .6	
+C-X004:29	010 .6	
+C-X004:30	010 .6	
+C-X004:31	011 .6	
+C-X004:32	011 .6	
+C-X004:33	011 .6	
+C-X004:34		
+C-X004:35		
+C-X004:36		
+C-X004:37	013 .3	
+C-X004:38	013 .3	
+C-X004:39	013 .3	

Terminal	Page .Col.	Opt.
+C-X004:40	013 .3	
+C-X004:41		
+C-X004:42		
+C-X004:43		
+C-X004:44		
+C-X004:45		
+C-X004:46		
+C-X004:47		
+C-X004:48		
+C-X004:49		
+C-X004:50		
+C-X004:51	003 .2	
+C-X004:51+	003 .2	
+C-X004:51-	001 .4	
+C-X004:52	003 .2	
+C-X004:52+	001 .4	
+C-X004:52-	001 .4	
+C-X004:53	006 .4	
+C-X004:53+	006 .1	
+C-X004:53-	006 .1	
+C-X004:54		
+C-X004:54+	001 .4	
+C-X004:54-	001 .4	
+C-X004:55	009 .5	
+C-X004:55+	009 .3	
+C-X004:55-	009 .3	
+C-X004:56	012 .5	
+C-X004:56+	012 .3	

Terminal	Page .Col.	Opt.
+C-X004:56-	012 .3	
+C-X004:57	012 .5	
+C-X004:57+	012 .3	
+C-X004:57-	012 .3	
+C-X004:58	012 .5	
+C-X004:58+	012 .3	
+C-X004:58-	012 .3	
+C-X004:59	012 .5	
+C-X004:59+	012 .3	
+C-X004:59-	012 .3	
+C-X004:60	012 .5	
+C-X004:60+	012 .3	
+C-X004:60-	012 .3	
+C-X004:61	012 .5	
+C-X004:61+	012 .3	
+C-X004:61-	012 .3	
+C-X004:62	012 .5	
+C-X004:62+	012 .3	
+C-X004:62-	012 .3	
+C-X004:63	012 .5	
+C-X004:63+	012 .3	
+C-X004:63-	012 .3	
+C-X004:64	014 .3	
+C-X004:64+	001 .4	
+C-X004:64-	001 .4	
+C-X004:65	014 .3	
+C-X004:65+	001 .4	
+C-X004:65-	001 .4	

Drawing remarks

Tetra Pak

Designer MANL | Date 05/27/04 | Machine TSA A1-TCA

ECM No 167302 | Denomination CABINET TERMINAL SUMMARY | Page Type CABINET TERMINAL SUMMARY

Company Tetra Pak Carton Ambient AB | Document No. 2594074-0005 | Doc. type ELD | Version AA | Page 001

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Cabinet terminal summary of 2594074-0003

Terminal	Page .Col.	Opt.
+C-X004:66	014 .3	
+C-X004:66+	001 .4	
+C-X004:66-	014 .7	
+C-X004:67	014 .3	
+C-X004:67+	001 .4	
+C-X004:67-	014 .7	
+C-X004:68	016 .3	
+C-X004:68+	001 .4	
+C-X004:68-	016 .6	
+C-X004:69	016 .3	
+C-X004:69+	001 .5	
+C-X004:69-	016 .6	
+C-X004:70	016 .3	
+C-X004:70+	001 .5	
+C-X004:70-	016 .6	
+C-X004:71	016 .3	
+C-X004:71+	001 .5	
+C-X004:71-	016 .6	
+C-X004:72+	001 .5	
+C-X004:72-	001 .4	
+C-X004:73		
+C-X004:73+	001 .5	
+C-X004:73-	001 .4	
+C-X004:74		
+C-X004:74+	001 .5	
+C-X004:74-	001 .5	
+C-X004:75		
+C-X004:75+	001 .5	

Terminal	Page .Col.	Opt.
+C-X004:75-	001 .5	
+C-X004:E1	008 .3	
+C-X004:E2		
+C-X004:E3	013 .3	
+C-X004:E4		
+C-X004:E5	004 .5	
+C-X004:E6		
+C-X004:E7	003 .8	
+C-X004:E8		
+C-X004:E9	004 .2	
+C-X004:E9	003 .2	
+C-X004:E10	004 .1	
+C-X004:E11	014 .7	
+C-X004:E12	004 .3	
+C-X004:E12	014 .7	
+C-X004:E13	016 .6	
+C-X004:E14	016 .6	
+C-X004:E15	016 .6	
+C-X004:E16	016 .6	
+C-X004:E17		
+C-X004:E18		
+C-X004:E19		
+C-X004:E20	007 .9	
+C-X050:1	004 .8	
+C-X050:2	004 .8	
+C-X050:3	004 .8	
+C-X050:4	004 .8	
+C-X050:5	004 .8	

Terminal	Page .Col.	Opt.
+C-X050:6	004 .8	
+C-X050:7	004 .8	
+C-X050:8	004 .8	
+C-X050:9	004 .8	
+C-X050:10	004 .8	
+C-X050:11	004 .8	
+C-X050:12	004 .8	
+C-X050:13	004 .8	
+C-X050:14	004 .8	
+C-X050:15	004 .8	
+C-X090:1	023 .2	
+C-X090:2	023 .2	
+C-X090:3	023 .2	
+C-X090:5	023 .2	
+C-X090:6	023 .2	
+C-X090:7	023 .2	
+C-X090:E1	023 .2	
+C-X090:E1	023 .2	
+C-X090:E2	023 .2	
+C-X090:E2	023 .2	

Terminal	Page .Col.	Opt.

Drawing remarks

Tetra Pak

Designer	Date	Machine
MANL	05/27/04	TSA A1-TCA

ECM No	Denomination	Page Type
167302	CABINET TERMINAL SUMMARY	CABINET TERMINAL SUMMARY

Company	Document No.	Doc. type	Version	Page
Tetra Pak Carton Ambient AB	2594074-0005	ELD	AA	002

7 Terminal Strip Overview

TechPub_2614345_0103 - 2656890_01.fm

Description

All terminals used in the equipment except for those in the electrical cabinet are listed in this chapter.

TechPub_2614345_0103 - 2656890_01.fm

RELEASED

This drawing must not without the consent of Tetra Pak be copied, transmitted or disclosed to any third party.

1	2	3	4	5	6	7	8	9	10

Terminal strip of 2594074-0003 +P-X010

From	Cable	Internal Jumper	Terminal	External Jumper	Cable	To	Page.Col.	Option	Function text
+C-X004:17	-W109 :1		1			+P-S001:11	008 .2		PANEL DOOR
+P-S001:12			2		-W109 :2	+C-X004:18	008 .3		
+C-X004:19	-W109 :3		3			+P-S001:21	008 .2		PANEL DOOR
+P-S001:22			4		-W109 :4	+C-X004:20	008 .3		
+C-X004:21	-W109 :5		5			+P-A071:1	010 .3		PUSHBUTTON BOARD
						+P-A072:21			MULTIPLEXER CARD
			6			+P-A071:59	020 .6		PUSHBUTTON BOARD
					-W109 :6	+C-X004:22			
+P-A071:2			7		-W109 :7	+C-X004:23	010 .5		
+P-A071:3			8		-W109 :8	+C-X004:24	010 .5		
+P-A071:4			9		-W109 :9	+C-X004:25	010 .5		
+P-A071:5			10		-W109 :10	+C-X004:26	010 .5		
+P-A071:6			11		-W109 :11	+C-X004:27	010 .5		
+P-A071:7			12		-W109 :12	+C-X004:28	010 .5		
+P-A071:8			13		-W109 :13	+C-X004:29	010 .5		
+P-A071:9			14		-W109 :14	+C-X004:30	010 .5		
+P-A071:10			15		-W109 :15	+C-X004:31	011 .5		
+P-A071:11			16		-W109 :16	+C-X004:32	011 .5		
+P-A071:12			17		-W109 :17	+C-X004:33	011 .5		
			18						
			19						
			20						
+C-X004:37	-W109 :21		21			+P-A072:17	013 .4		MULTIPLEXER CARD
+C-X004:38	-W109 :22		22			+P-A072:18	013 .4		MULTIPLEXER CARD
+C-X004:39	-W109 :23		23			+P-A072:19	013 .4		MULTIPLEXER CARD
+C-X004:40	-W109 :24		24			+P-A072:20	013 .4		MULTIPLEXER CARD
+C-X004:E3	-W109 :GNYE		E1				013 .4		

Drawing remarks

Tetra Pak

Designer	Date	Machine
MANL	05/27/04	TSA A1-TCA

ECM No	Denomination	Page Type
167302	TERMINAL STRIP OVERVIEW	Terminal diagram: +P-X010 (1 - E1)

Company	Document No.	Doc. type	Version	Page
Tetra Pak Carton Ambient AB	2594074-0006	ELD	AA	001

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1 2 3 4 5 6 7 8 9 10

Terminal strip of 2594074-0003 +M-X101

From	Cable	Internal Jumper	Terminal	External Jumper	Cable	To	Page.Col.	Option	Function text
+C-A100:1103	-W104 :1		1				005 .7		
+C-A100:1102	-W104 :GNYE		2				005 .6		
+C-A100:1104	-W104 :2		3				005 .7		
+C-A100:1105	-W104 :3		4				005 .7		
+C-A100:1404	-W104 :GN		B				005 .6		
+C-A100:1405	-W104 :YE		A				005 .6		

Drawing remarks

Tetra Pak

Designer MANL	Date 05/27/04	Machine TSA A1-TCA	
ECM No 167302	Denomination TERMINAL STRIP OVERVIEW	Page Type Terminal diagram: +M-X101 (1 - A)	
Company Tetra Pak Carton Ambient AB	Document No. 2594074-0006	Doc. type ELD	Version AA	Page 002

8 Cable Connection List

TechPub_2614345_0103 - 2656891_01.fm

Description

All cable connections used in the equipment are listed in this chapter.

TechPub_2614345_0103 - 2656891_01.fm

RELEASED

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1 2 3 4 5 6 7 8 9 10

Cable Connection List of 2594074-0003

Cable	Core	From	To	Page.Col.	Option
+C-W001	PE	+C-X004:E5	+C-G001:E	004 .5	
+C-W002	WH	+C-U001:AC	+C-A100:7A04	006 .5	
+C-W002	BN	+C-U001:AM	+C-A100:7A03	006 .5	
+C-W002	SH	+C-E001:	+C-W002:	006 .4	
+C-W002	SH	+C-W002:	+C-E002:	007 .6	
+M-W050	WH		+C-X050:11	004	
+M-W050	BN		+C-X050:9	004	
+M-W050	YE		+C-X050:12	004	
+M-W050	GN		+C-X050:13	004	
+M-W050	SH	+M-W050:	+C-J004:	004 .9	
+M-W101	1	+C-X002:1	+M-R101:L1	003 .4	
+M-W101	2	+C-X002:2	+M-R101:L2	003 .4	
+M-W101	3	+C-X002:3	+M-R101:N	003 .4	
+M-W101	GNYE	+C-X002:E2	+M-R101:	003 .4	
+M-W102	1	+C-X004:51+	+M-R101:1	003 .3	
+M-W102	2	+C-X004:51	+M-R101:2	003 .3	
+M-W102	3	+C-X004:52	+M-R101:4	003 .3	
+M-W102	GNYE	+C-X004:E9		003	
+M-W103	1	+C-X002:4	+M-E100:1	003 .6	
+M-W103	2	+C-X002:5	+M-E100:2	003 .7	
+M-W103	GNYE	+C-X002:E3	+M-E100:E	003 .7	
+M-W104	1	+M-X101:1	+C-A100:1103	005 .6	
+M-W104	2	+M-X101:3	+C-A100:1104	005 .6	
+M-W104	3	+M-X101:4	+C-A100:1105	005 .6	
+M-W104	GN	+M-X101:B	+C-A100:1404	005 .6	
+M-W104	YE	+M-X101:A	+C-A100:1405	005 .6	
	WH				
	BN				
+M-W104	GNYE	+M-X101:2	+C-A100:1102	005 .6	
+M-W104	SH	+C-J013:	+M-W104:	005 .6	
+M-W104	SH	+M-W104:		005	
+M-W104	SH	+M-W104:		005	
+M-W104		+C-J013:	+M-W104:	005 .6	
+M-W105	WH	+M-X102:6	+C-A100:6007	005 .6	
+M-W105	BN	+M-X102:5	+C-A100:6009	005 .6	
+M-W105	GY	+M-X102:2	+C-A100:6002	005 .6	
+M-W105	PK	+M-X102:1	+C-A100:6003	005 .6	
+M-W105	YE	+M-X102:4	+C-A100:6004	005 .6	
+M-W105	GN	+M-X102:3	+C-A100:6005	005 .6	
+M-W105	SH	+M-W105:	+C-A100:6001	005 .7	
+M-W105	SH		+M-W105:	.7	
	SH				
	SH				
+M-W106	BN	+C-X004:53+	+M-B103:	006 .3	
+M-W106	BU	+C-X004:53-	+M-B103:	006 .3	
+M-W106	BK	+C-X004:53	+M-B103:	006 .4	
+M-W108	1	+C-U001:U	+M-M102:U	007 .5	
+M-W108	2	+C-U001:V	+M-M102:V	007 .5	
+M-W108	3	+C-U001:W	+M-M102:W	007 .5	
+M-W108	GNYE	+C-X004:E20	+M-M102:⏚	007 .9	
+M-W108	SH	+C-J010:	+M-W108:	007 .9	
+M-W109	1	+C-X004:17	+P-X010:1	008 .2	
+M-W109	2	+C-X004:18	+P-X010:2	008 .3	
+M-W109	3	+C-X004:19	+P-X010:3	008 .2	

Drawing remarks

Tetra Pak

Designer	Date	Machine
MANL	05/27/04	TSA A1-TCA

ECM No	Denomination	Page Type
167302	CABLE CONNECTION LIST	CABLE CONNECTION LIST

Company	Document No.	Doc. type	Version	Page
Tetra Pak Carton Ambient AB	2594074-0007	ELD	AA	001

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Cable Connection List of 2594074-0003

Cable	Core	From	To	Page.Col.	Option
+M-W109	4	+C-X004:20	+P-X010:4	008 .3	
+M-W109	5	+C-X004:21	+P-X010:5	010 .3	
+M-W109	6	+C-X004:22	+P-X010:6	020 .7	
+M-W109	7	+C-X004:23	+P-X010:7	010 .6	
+M-W109	8	+C-X004:24	+P-X010:8	010 .6	
+M-W109	9	+C-X004:25	+P-X010:9	010 .6	
+M-W109	10	+C-X004:26	+P-X010:10	010 .6	
+M-W109	11	+C-X004:27	+P-X010:11	010 .6	
+M-W109	12	+C-X004:28	+P-X010:12	010 .6	
+M-W109	13	+C-X004:29	+P-X010:13	010 .6	
+M-W109	14	+C-X004:30	+P-X010:14	010 .6	
+M-W109	15	+C-X004:31	+P-X010:15	011 .6	
+M-W109	16	+C-X004:32	+P-X010:16	011 .6	
+M-W109	17	+C-X004:33	+P-X010:17	011 .6	
	18				
	19				
	20				
+M-W109	21	+C-X004:37	+P-X010:21	013 .4	
+M-W109	22	+C-X004:38	+P-X010:22	013 .4	
+M-W109	23	+C-X004:39	+P-X010:23	013 .4	
+M-W109	24	+C-X004:40	+P-X010:24	013 .4	
+M-W109	GNYE	+C-X004:E3	+P-X010:E1	013 .4	
+M-W110	1	+C-X004:1	+M-B104:11	008 .2	
+M-W110	2	+C-X004:2	+M-B104:12	008 .3	
+M-W110	3	+C-X004:3	+M-B104:21	008 .2	
+M-W110	4	+C-X004:4	+M-B104:22	008 .3	
+M-W110	5	+C-X004:5	+M-B104:31	008 .2	

Cable	Core	From	To	Page.Col.	Option
+M-W110	6	+C-X004:6	+M-B104:32	008 .3	
+M-W110	GNYE	+C-X004:E1	+C-J011:	008 .3	
+M-W111	BN	+C-X004:55+	+M-B100:	009 .4	
+M-W111	BU	+C-X004:55-	+M-B100:	009 .4	
+M-W111	BK	+C-X004:55	+M-B100:	009 .5	
+M-W112	BN	+C-X004:56+	+M-B105:	012 .4	
+M-W112	BU	+C-X004:56-	+M-B105:	012 .4	
+M-W112	BK	+C-X004:56	+M-B105:	012 .5	
+M-W113	BN	+C-X004:57+	+M-B106:	012 .4	
+M-W113	BU	+C-X004:57-	+M-B106:	012 .4	
+M-W113	BK	+C-X004:57	+M-B106:	012 .5	
+M-W115	BN	+C-X004:59+	+M-B108:	012 .4	
+M-W115	BU	+C-X004:59-	+M-B108:	012 .4	
+M-W115	BK	+C-X004:59	+M-B108:	012 .5	
+M-W116	BN	+C-X004:60+	+M-B109:	012 .4	
+M-W116	BU	+C-X004:60-	+M-B109:	012 .4	
+M-W116	WH	+C-X004:60-	+M-B109:	012 .4	
+M-W116	BK	+C-X004:60	+M-B109:	012 .5	
+M-W117	BN	+C-X004:61+	+M-B110:	012 .4	
+M-W117	BU	+C-X004:61-	+M-B110:	012 .4	
+M-W117	WH	+C-X004:61-	+M-B110:	012 .4	
+M-W117	BK	+C-X004:61	+M-B110:	012 .5	
+M-W119	BN	+C-X004:63+	+M-B112:	012 .4	
+M-W119	BU	+C-X004:63-	+M-B112:	012 .4	
+M-W119	BK	+C-X004:63	+M-B112:	012 .5	
+M-W120	1	+C-X004:64	+M-H101:3	014 .5	
+M-W120	2	+C-X004:65	+M-H101:2	014 .5	

Drawing remarks

Tetra Pak

Designer	Date	Machine
MANL	05/27/04	TSA A1-TCA

ECM No	Denomination	Page Type
167302	CABLE CONNECTION LIST	CABLE CONNECTION LIST

Company	Document No.	Doc. type	Version	Page
Tetra Pak Carton Ambient AB	2594074-0007	ELD	AA	002

RELEASED

This drawing must not without the consent of Tetra Pak be copied, transmitted or disclosed to any third party.

1 2 3 4 5 6 7 8 9 10

Cable Connection List of 2594074-0003

Cable	Core	From	To	Page.Col.	Option
+M-W120	3	+C-X004:66	+M-H101:1	014 .5	
+M-W120	4	+C-X004:66-	+M-H101:0	014 .7	
+M-W120	GNYE	+C-X004:E11	+M-H101:E	014 .7	
+M-W122	1	+C-X004:68	+M-Y100:1	016 .4	
+M-W122	2	+C-X004:68-	+M-Y100:2	016 .6	
+M-W122	GNYE	+C-X004:E13	+M-Y100:E	016 .6	
+M-W123	1	+C-X004:69	+M-Y101.1:1	016 .4	
+M-W123	2	+C-X004:69-	+M-Y101.1:2	016 .6	
+M-W123	GNYE	+C-X004:E14	+M-Y101.1:E	016 .6	
+M-W124	1	+C-X004:70	+M-Y101.2:1	016 .4	
+M-W124	2	+C-X004:70-	+M-Y101.2:2	016 .6	
+M-W124	GNYE	+C-X004:E15	+M-Y101.2:E	016 .6	
+M-W125	1	+C-X004:71	+M-Y102:1	016 .4	
+M-W125	2	+C-X004:71-	+M-Y102:2	016 .6	
+M-W125	GNYE	+C-X004:E16	+M-Y102:E	016 .6	
+M-W990L	1		+C-K099:4	023	
+M-W990L	2	+C-K099:3		.2	
+M-W990L	3		+C-X090:5	023	
+M-W990L	4		+C-X090:6	023	
+M-W990L	GNYE		+C-X090:E2	023	
+M-W990R	1		+C-K098:4	023	
+M-W990R	2	+C-K098:3		.2	
+M-W990R	3		+C-X090:1	023	
+M-W990R	4		+C-X090:2	023	
+M-W990R	GNYE		+C-X090:E1	023	
+M-W999	PE	+C-X002:E1	+C-J001:	002 .6	

Cable	Core	From	To	Page.Col.	Option

Drawing remarks

Tetra Pak

Designer	Date	Machine
MANL	05/27/04	TSA A1-TCA

ECM No	Denomination	Page Type
167302	CABLE CONNECTION LIST	CABLE CONNECTION LIST

Company	Document No.	Doc. type	Version	Page
Tetra Pak Carton Ambient AB	2594074-0007	ELD	AA	003

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TechPub_2614345_0103 - 2656891_01.fm

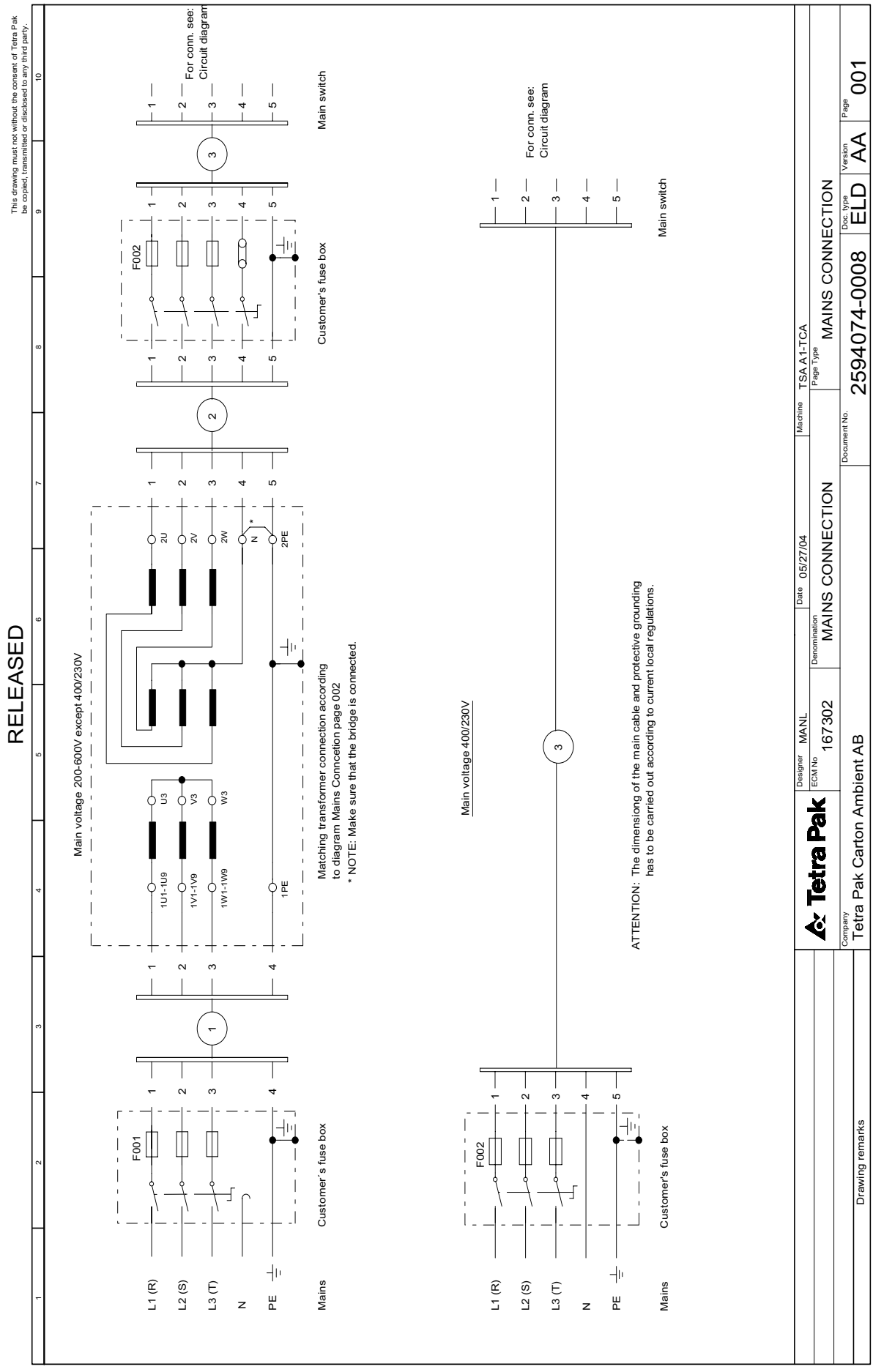
9 Mains Connection Diagrams

TechPub_2614345_0103 - 2656892_01.fm

Description

The drawings that show the connection from the mains power to the electrical cabinet are included in this chapter.

TechPub_2614345_0103 - 2656892_01.fm



TechPub_2614345_0103 - 2656892_01.fm

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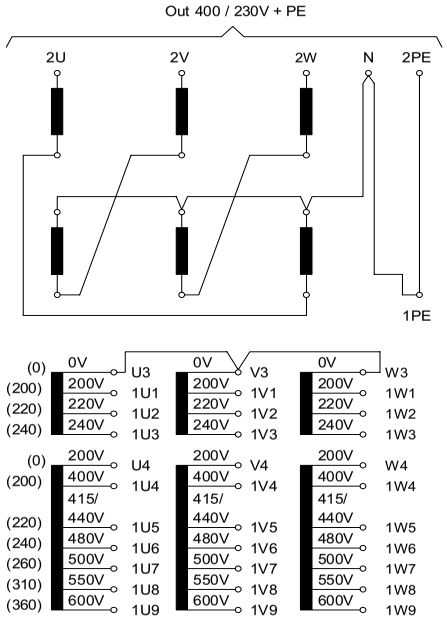
1	2	3	4	5	6	7	8	9	10

MAIN VOLTAGE	FUSES (SLOW) F001	FUSES (SLOW) F002	AREA TO COPPER (CU) CABLE WITH No. 1	2	3	CONNECTIONS ON MATCHING TRANSFORMER		
V	A	A	mm²	mm²	mm²	MAINS	TAP	CONNECT
600/347 3x600	25	16	3x2,5/2,5	4x4/4	4x2,5/2,5	L1 L2 L3 PE	1U9 1V9 1W9 ⏚	1U3 - U4 1V3 - V4 1W3 - W4
550/318 3x550	25	16	3x2,5/2,5	4x4/4	4x2,5/2,5	L1 L2 L3 PE	1U8 1V8 1W8 ⏚	1U3 - U4 1V3 - V4 1W3 - W4
500/289 3x500	25	16	3x2,5/2,5	4x4/4	4x2,5/2,5	L1 L2 L3 PE	1U7 1V7 1W7 ⏚	1U3 - U4 1V3 - V4 1W3 - W4
480/277 3x480	25	16	3x2,5/2,5	4x4/4	4x2,5/2,5	L1 L2 L3 PE	1U6 1V6 1W6 ⏚	1U3 - U4 1V3 - V4 1W3 - W4
440/254 3x440	25	16	3x4/4	4x4/4	4x2,5/2,5	L1 L2 L3 PE	1U5 1V5 1W5 ⏚	1U2 - U4 1V2 - V4 1W2 - W4
415/240 3x415	25	16	3x4/4	4x4/4	4x2,5/2,5	L1 L2 L3 PE	1U5 1V5 1W5 ⏚	1U1 - U4 1V1 - V4 1W1 - W4
3x400		16			4x2,5/2,5	L1 L2 L3 PE	1U4 1V4 1W4 ⏚	1U1 - U4 1V1 - V4 1W1 - W4
400/230								
380/220 3x380		16	3x10/10	4x4/4	4x2,5/2,5	L1 L2 L3 PE	1U9 1V9 1W9 ⏚	1U3 - 1U5 1V3 - 1V5 1W3 - 1W5
240/140 3x240	63	16	3x10/10	4x4/4	4x2,5/2,5	L1 L2 L3 PE	1U3 1V3 1W3 ⏚	U3 - U4 1U3-1U6 V3 - V4 1V3-1V6 W3 - W4 1W3-1W6
220/127 3x220	63	16	3x10/10	4x4/4	4x2,5/2,5	L1 L2 L3 PE	1U2 1V2 1W2 ⏚	U3 - U4 1U2-1U5 V3 - V4 1V2-1V5 W3 - W4 1W2-1W5
200/115 3x200	63	16	3x10/10	4x4/4	4x2,5/2,5	L1 L2 L3 PE	1U1 1V1 1W1 ⏚	U3 - U4 1U1-1U4 V3 - V4 1V1-1V4 W3 - W4 1W1-1W4

MATCHING TRANSFORMER



ATTENTION:

Cable areas are dimensioned according to Swedish regulations (ELSÄK-FS 1994:7 and SS4241424:6) 40 C ambient temp and cable on metal ladder with space between the cables.
National regulations have to be followed in each country.
Tetra Pak is not responsible for the dimensioning at installation.
Tetra Pak only provides recomendations.

	Tetra Pak	Designer MANL	Date 05/27/04	Machine TSA A1-TCA			
		ECM No 167302	Denomination MAINS CONNECTION	Page Type MAINS CONNECTION			
Drawing remarks		Company Tetra Pak Carton Ambient AB	Document No. 2594074-0008	Doc. type ELD	Version AA	Page 002	

10 Program Documents

TechPub_2614345_0103 - 2656893_01.fm

Description

The complete program for each programmable system used in the machine or equipment, such as a programmable logic controller, is included in this chapter.

TechPub_2614345_0103 - 2656893_01.fm

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%AI - Analog Input

%AQ - Analog Output

%G - Genius Global Data

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%GB - Genius Global Data B

%GC - Genius Global Data C

%GD - Genius Global Data D

%GE - Genius Global Data E

%I - Discrete Input

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%L - Local Register

%M - Discrete Internal

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			A1591000_1000 [LD Block,'DISPLAY': Rung 00040] NOCON FLASH
			A1591000_1000 [LD Block,'DISPLAY': Rung 00042] NOCON FLASH
			A1591000_1000 [LD Block,'DISPLAY': Rung 00044] NOCON FLASH
%M00017	FLASH	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00046] NOCON FLASH
			A1591000_1000 [LD Block,'MACHINE': Rung 00045] COIL HOTHEAT
			A1591000_1000 [LD Block,'MACHINE': Rung 00045] NOCON HOTHEAT
%M00018	HOTHEAT	✓	A1591000_1000 [LD Block,'MACHINE': Rung 00046] NOCON HOTHEAT
			A1591000_1000 [LD Block,'MACHINE': Rung 00016] NEGCOIL REQ_DONE
%M00019	REQ_DONE	✓	A1591000_1000 [LD Block,'MACHINE': Rung 00035] NCCON REQ_DONE
			A1591000_1000 [LD Block,'MACHINE': Rung 00051] NCCON LAMP_MEM
			A1591000_1000 [LD Block,'MACHINE': Rung 00051] COIL LAMP_MEM
			A1591000_1000 [LD Block,'MACHINE': Rung 00051] NOCON LAMP_MEM

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%M00020	LAMP_MEM	✓	A1591000_1000 [LD Block,'MACHINE': Rung 00052] NOCON LAMP_MEM
			A1591000_1000 [LD Block,'DISPLAY': Rung 00023] COIL STPUPOK
			A1591000_1000 [LD Block,'DISPLAY': Rung 00024] NOCON STPUPOK
%M00022	STPUPOK	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00024] NOCON STPUPOK
			A1591000_1000 [LD Block,'CONVEY': Rung 00007] COIL JOGCOOK
			A1591000_1000 [LD Block,'CONVEY': Rung 00010] NOCON JOGCOOK
			A1591000_1000 [LD Block,'DISPLAY': Rung 00030] NOCON JOGCOOK
%M00023	JOGCOOK	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00030] NOCON JOGCOOK
			A1591000_1000 [LD Block,'APPLIC': Rung 00009] COIL JOGAPOK
			A1591000_1000 [LD Block,'APPLIC': Rung 00010] NOCON JOGAPOK
			A1591000_1000 [LD Block,'DISPLAY': Rung 00032] NOCON JOGAPOK
%M00024	JOGAPOK	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00032] NOCON JOGAPOK
			A1591000_1000 [LD Block,'MACHINE': Rung 00010] NOCON READY_0
			A1591000_1000 [LD Block,'MACHINE': Rung 00010] NCCON READY_0
			A1591000_1000 [LD Block,'MACHINE': Rung 00011] NOCON READY_0
			A1591000_1000 [LD Block,'MACHINE': Rung 00032] NCCON READY_0
			A1591000_1000 [LD Block,'MACHINE': Rung 00032] COIL READY_0
			A1591000_1000 [LD Block,'MACHINE': Rung 00032] NOCON READY_0
			A1591000_1000 [LD Block,'MACHINE': Rung 00033] NOCON READY_0
			A1591000_1000 [LD Block,'MACHINE': Rung 00037] NOCON READY_0
			A1591000_1000 [LD Block,'MACHINE': Rung 00050] NOCON READY_0
			A1591000_1000 [LD Block,'MACHINE': Rung 00051] NOCON READY_0
			A1591000_1000 [LD Block,'MACHINE': Rung 00052] NOCON READY_0
			A1591000_1000 [LD Block,'DISPLAY': Rung 00003] NOCON READY_0
			A1591000_1000 [LD Block,'DISPLAY': Rung 00005] NOCON READY_0
			A1591000_1000 [LD Block,'DISPLAY': Rung 00023] NOCON READY_0
			A1591000_1000 [LD Block,'DISPLAY': Rung 00026] NCCON READY_0
			A1591000_1000 [LD Block,'DISPLAY': Rung 00028] NOCON READY_0
			A1591000_1000 [LD Block,'DISPLAY': Rung 00048] NOCON READY_0
			A1591000_1000 [LD Block,'DISPLAY': Rung 00048] NCCON READY_0
			A1591000_1000 [LD Block,'DISPLAY': Rung 00050] NOCON READY_0
			A1591000_1000 [LD Block,'DISPLAY': Rung 00050] NCCON READY_0
			A1591000_1000 [LD Block,'DISPLAY': Rung 00054] NCCON READY_0
			A1591000_1000 [LD Block,'PLMS': Rung 00005] NOCON READY_0
			A1591000_1000 [LD Block,'ALARM': Rung 00015] NOCON READY_0
			A1591000_1000 [LD Block,'ALARM': Rung 00017] NCCON READY_0
			A1591000_1000 [LD Block,'ALARM': Rung 00019] NOCON READY_0
			A1591000_1000 [LD Block,'ALARM': Rung 00021] NCCON READY_0
			A1591000_1000 [LD Block,'ALARM': Rung 00025] NCCON READY_0
			A1591000_1000 [LD Block,'ALARM': Rung 00029] NCCON READY_0
			A1591000_1000 [LD Block,'ALARM': Rung 00034] NCCON READY_0
			A1591000_1000 [LD Block,'ALARM': Rung 00038] NCCON READY_0
			A1591000_1000 [LD Block,'ALARM': Rung 00053] NCCON READY_0
			A1591000_1000 [LD Block,'ALARM': Rung 00055] NOCON READY_0
			A1591000_1000 [LD Block,'ALARM': Rung 00057] NCCON READY_0
			A1591000_1000 [LD Block,'ALARM': Rung 00066] NCCON READY_0
			A1591000_1000 [LD Block,'ALARM': Rung 00068] NOCON READY_0
			A1591000_1000 [LD Block,'ALARM': Rung 00070] NCCON READY_0
			A1591000_1000 [LD Block,'ALARM': Rung 00074] NCCON READY_0
			A1591000_1000 [LD Block,'ALARM': Rung 00093] NOCON READY_0
			A1591000_1000 [LD Block,'ALARM': Rung 00095] NOCON READY_0
%M00100	READY_0	✓	A1591000_1000 [LD Block,'ALARM': Rung 00097] NOCON READY_0
			A1591000_1000 [LD Block,'MACHINE': Rung 00025] NCCON HOTON_1
			A1591000_1000 [LD Block,'MACHINE': Rung 00026] NOCON HOTON_1
			A1591000_1000 [LD Block,'MACHINE': Rung 00030] NOCON HOTON_1
			A1591000_1000 [LD Block,'MACHINE': Rung 00032] NOCON HOTON_1
			A1591000_1000 [LD Block,'MACHINE': Rung 00033] COIL HOTON_1
			A1591000_1000 [LD Block,'MACHINE': Rung 00033] NOCON HOTON_1
			A1591000_1000 [LD Block,'MACHINE': Rung 00034] NOCON HOTON_1
			A1591000_1000 [LD Block,'MACHINE': Rung 00045] NOCON HOTON_1
			A1591000_1000 [LD Block,'MACHINE': Rung 00046] NOCON HOTON_1
			A1591000_1000 [LD Block,'CONVEY': Rung 00007] NOCON HOTON_1
			A1591000_1000 [LD Block,'CONVEY': Rung 00009] NOCON HOTON_1
			A1591000_1000 [LD Block,'APPLIC': Rung 00003] NOCON HOTON_1
			A1591000_1000 [LD Block,'APPLIC': Rung 00009] NOCON HOTON_1
			A1591000_1000 [LD Block,'DISPLAY': Rung 00003] NOCON HOTON_1
			A1591000_1000 [LD Block,'DISPLAY': Rung 00052] NCCON HOTON_1
			A1591000_1000 [LD Block,'PLMS': Rung 00020] NCCON HOTON_1
			A1591000_1000 [LD Block,'PLMS': Rung 00021] NOCON HOTON_1
			A1591000_1000 [LD Block,'PLMS': Rung 00023] NOCON HOTON_1
%M00101	HOTON_1	✓	A1591000_1000 [LD Block,'PLMS': Rung 00024] NCCON HOTON_1
			A1591000_1000 [LD Block,'MACHINE': Rung 00010] NCCON AIRON_2
			A1591000_1000 [LD Block,'MACHINE': Rung 00011] NCCON AIRON_2
			A1591000_1000 [LD Block,'MACHINE': Rung 00026] NCCON AIRON_2
			A1591000_1000 [LD Block,'MACHINE': Rung 00027] NOCON AIRON_2
			A1591000_1000 [LD Block,'MACHINE': Rung 00029] NOCON AIRON_2
			A1591000_1000 [LD Block,'MACHINE': Rung 00030] NCCON AIRON_2
			A1591000_1000 [LD Block,'MACHINE': Rung 00034] COIL AIRON_2
			A1591000_1000 [LD Block,'MACHINE': Rung 00034] NOCON AIRON_2

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			A1591000_1000 [LD Block,'MACHINE': Rung 00035] NOCON AIRON_2 A1591000_1000 [LD Block,'MACHINE': Rung 00039] NOCON AIRON_2 A1591000_1000 [LD Block,'MACHINE': Rung 00054] NOCON AIRON_2 A1591000_1000 [LD Block,'DISPLAY': Rung 00003] NCCON AIRON_2 A1591000_1000 [LD Block,'DISPLAY': Rung 00005] NOCON AIRON_2 A1591000_1000 [LD Block,'DISPLAY': Rung 00048] NOCON AIRON_2 A1591000_1000 [LD Block,'DISPLAY': Rung 00050] NOCON AIRON_2 A1591000_1000 [LD Block,'APPLIC': Rung 00007] NOCON AIRON_2
%M00102	AIRON_2	✓	A1591000_1000 [LD Block,'APPLIC': Rung 00009] NCCON AIRON_2
			A1591000_1000 [LD Block,'MACHINE': Rung 00014] NOCON PROD_3 A1591000_1000 [LD Block,'MACHINE': Rung 00015] NCCON PROD_3 A1591000_1000 [LD Block,'MACHINE': Rung 00027] NCCON PROD_3 A1591000_1000 [LD Block,'MACHINE': Rung 00028] NOCON PROD_3 A1591000_1000 [LD Block,'MACHINE': Rung 00029] NCCON PROD_3 A1591000_1000 [LD Block,'MACHINE': Rung 00035] COIL PROD_3 A1591000_1000 [LD Block,'MACHINE': Rung 00035] NOCON PROD_3 A1591000_1000 [LD Block,'MACHINE': Rung 00041] NOCON PROD_3 A1591000_1000 [LD Block,'MACHINE': Rung 00048] NOCON PROD_3 A1591000_1000 [LD Block,'CONVEY': Rung 00002] NCCON PROD_3 A1591000_1000 [LD Block,'CONVEY': Rung 00007] NCCON PROD_3 A1591000_1000 [LD Block,'CONVEY': Rung 00010] NOCON PROD_3 A1591000_1000 [LD Block,'CONVEY': Rung 00014] NOCON PROD_3 A1591000_1000 [LD Block,'t1t0001': Rung 00012] NOCON PROD_3 A1591000_1000 [LD Block,'DISPLAY': Rung 00005] NCCON PROD_3 A1591000_1000 [LD Block,'DISPLAY': Rung 00007] NOCON PROD_3 A1591000_1000 [LD Block,'LINECOM': Rung 00004] NOCON PROD_3 A1591000_1000 [LD Block,'PLMS': Rung 00007] NOCON PROD_3 A1591000_1000 [LD Block,'PLMS': Rung 00012] NOCON PROD_3 A1591000_1000 [LD Block,'PLMS': Rung 00023] NCCON PROD_3 A1591000_1000 [LD Block,'PLMS': Rung 00024] NOCON PROD_3 A1591000_1000 [LD Block,'PLMS': Rung 00026] NOCON PROD_3 A1591000_1000 [LD Block,'PLMS': Rung 00027] NCCON PROD_3 A1591000_1000 [LD Block,'PLMS': Rung 00062] NCCON PROD_3 A1591000_1000 [LD Block,'ALARM': Rung 00032] NOCON PROD_3 A1591000_1000 [LD Block,'ALARM': Rung 00059] NOCON PROD_3
%M00103	PROD_3	✓	A1591000_1000 [LD Block,'ALARM': Rung 00060] NOCON PROD_3
			A1591000_1000 [LD Block,'ALARM': Rung 00015] COIL ALMCND1
%M00201	ALMCND1	✓	A1591000_1000 [LD Block,'ALARM': Rung 00016] NOCON ALMCND1
			A1591000_1000 [LD Block,'ALARM': Rung 00019] COIL ALMCND2
%M00202	ALMCND2	✓	A1591000_1000 [LD Block,'ALARM': Rung 00020] NOCON ALMCND2
			A1591000_1000 [LD Block,'ALARM': Rung 00023] COIL ALMCND3
%M00203	ALMCND3	✓	A1591000_1000 [LD Block,'ALARM': Rung 00024] NOCON ALMCND3
			A1591000_1000 [LD Block,'ALARM': Rung 00027] COIL ALMCND4
%M00204	ALMCND4	✓	A1591000_1000 [LD Block,'ALARM': Rung 00028] NOCON ALMCND4
			A1591000_1000 [LD Block,'ALARM': Rung 00032] COIL ALMCND5
%M00205	ALMCND5	✓	A1591000_1000 [LD Block,'ALARM': Rung 00033] NOCON ALMCND5
			A1591000_1000 [LD Block,'ALARM': Rung 00036] COIL ALMCND6
%M00206	ALMCND6	✓	A1591000_1000 [LD Block,'ALARM': Rung 00037] NOCON ALMCND6
			A1591000_1000 [LD Block,'ALARM': Rung 00040] COIL ALMCND7
%M00207	ALMCND7	✓	A1591000_1000 [LD Block,'ALARM': Rung 00041] NOCON ALMCND7
			A1591000_1000 [LD Block,'ALARM': Rung 00051] COIL ALMCND8
%M00208	ALMCND8	✓	A1591000_1000 [LD Block,'ALARM': Rung 00052] NOCON ALMCND8
			A1591000_1000 [LD Block,'ALARM': Rung 00055] COIL ALMCND9
%M00209	ALMCND9	✓	A1591000_1000 [LD Block,'ALARM': Rung 00056] NOCON ALMCND9
			A1591000_1000 [LD Block,'ALARM': Rung 00060] COIL ALMCND10
%M00210	ALMCND10	✓	A1591000_1000 [LD Block,'ALARM': Rung 00061] NOCON ALMCND10
			A1591000_1000 [LD Block,'ALARM': Rung 00064] COIL ALMCND11
%M00211	ALMCND11	✓	A1591000_1000 [LD Block,'ALARM': Rung 00065] NOCON ALMCND11
			A1591000_1000 [LD Block,'ALARM': Rung 00068] COIL ALMCND12
%M00212	ALMCND12	✓	A1591000_1000 [LD Block,'ALARM': Rung 00069] NOCON ALMCND12
			A1591000_1000 [LD Block,'ALARM': Rung 00072] COIL ALMCND13
%M00213	ALMCND13	✓	A1591000_1000 [LD Block,'ALARM': Rung 00073] NOCON ALMCND13
			A1591000_1000 [LD Block,'MACHINE': Rung 00054] NCCON ALM1 A1591000_1000 [LD Block,'CONVEY': Rung 00007] NCCON ALM1 A1591000_1000 [LD Block,'CONVEY': Rung 00009] NCCON ALM1 A1591000_1000 [LD Block,'APPLIC': Rung 00003] NCCON ALM1 A1591000_1000 [LD Block,'APPLIC': Rung 00009] NCCON ALM1 A1591000_1000 [LD Block,'DISPLAY': Rung 00036] NOCON ALM1 A1591000_1000 [LD Block,'PLMS': Rung 00032] NOCON ALM1 A1591000_1000 [LD Block,'ALARM': Rung 00016] COIL ALM1 A1591000_1000 [LD Block,'ALARM': Rung 00016] NOCON ALM1 A1591000_1000 [LD Block,'ALARM': Rung 00017] NOCON ALM1 A1591000_1000 [LD Block,'ALARM': Rung 00068] NCCON ALM1 A1591000_1000 [LD Block,'ALARM': Rung 00077] NCCON ALM1 A1591000_1000 [LD Block,'ALARM': Rung 00078] NOCON ALM1
%M00217	ALM1	✓	A1591000_1000 [LD Block,'ALARM': Rung 00088] NCCON ALM1
			A1591000_1000 [LD Block,'MACHINE': Rung 00054] NCCON ALM2 A1591000_1000 [LD Block,'CONVEY': Rung 00007] NCCON ALM2

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			A1591000_1000 [LD Block,'CONVEY': Rung 00009] NCCON ALM2
			A1591000_1000 [LD Block,'APPLIC': Rung 00003] NCCON ALM2
			A1591000_1000 [LD Block,'APPLIC': Rung 00009] NCCON ALM2
			A1591000_1000 [LD Block,'DISPLAY': Rung 00038] NOCON ALM2
			A1591000_1000 [LD Block,'PLMS': Rung 00034] NOCON ALM2
			A1591000_1000 [LD Block,'ALARM': Rung 00020] COIL ALM2
			A1591000_1000 [LD Block,'ALARM': Rung 00020] NOCON ALM2
			A1591000_1000 [LD Block,'ALARM': Rung 00021] NOCON ALM2
			A1591000_1000 [LD Block,'ALARM': Rung 00068] NCCON ALM2
			A1591000_1000 [LD Block,'ALARM': Rung 00077] NCCON ALM2
			A1591000_1000 [LD Block,'ALARM': Rung 00078] NOCON ALM2
%M00218	ALM2	✓	A1591000_1000 [LD Block,'ALARM': Rung 00088] NCCON ALM2
			A1591000_1000 [LD Block,'ALARM': Rung 00024] COIL ALM3
			A1591000_1000 [LD Block,'ALARM': Rung 00024] NOCON ALM3
			A1591000_1000 [LD Block,'ALARM': Rung 00025] NOCON ALM3
			A1591000_1000 [LD Block,'ALARM': Rung 00080] NCCON ALM3
			A1591000_1000 [LD Block,'ALARM': Rung 00081] NOCON ALM3
			A1591000_1000 [LD Block,'ALARM': Rung 00088] NCCON ALM3
			A1591000_1000 [LD Block,'APPLIC': Rung 00003] NCCON ALM3
			A1591000_1000 [LD Block,'APPLIC': Rung 00009] NCCON ALM3
			A1591000_1000 [LD Block,'DISPLAY': Rung 00046] NOCON ALM3
%M00219	ALM3	✓	A1591000_1000 [LD Block,'PLMS': Rung 00044] NOCON ALM3
			A1591000_1000 [LD Block,'ALARM': Rung 00028] COIL ALM4
			A1591000_1000 [LD Block,'ALARM': Rung 00028] NOCON ALM4
			A1591000_1000 [LD Block,'ALARM': Rung 00029] NOCON ALM4
			A1591000_1000 [LD Block,'ALARM': Rung 00080] NCCON ALM4
			A1591000_1000 [LD Block,'ALARM': Rung 00081] NOCON ALM4
			A1591000_1000 [LD Block,'ALARM': Rung 00088] NCCON ALM4
			A1591000_1000 [LD Block,'CONVEY': Rung 00007] NCCON ALM4
			A1591000_1000 [LD Block,'DISPLAY': Rung 00040] NOCON ALM4
%M00220	ALM4	✓	A1591000_1000 [LD Block,'PLMS': Rung 00040] NOCON ALM4
			A1591000_1000 [LD Block,'ALARM': Rung 00033] COIL ALM5
			A1591000_1000 [LD Block,'ALARM': Rung 00033] NOCON ALM5
			A1591000_1000 [LD Block,'ALARM': Rung 00034] NOCON ALM5
			A1591000_1000 [LD Block,'ALARM': Rung 00080] NCCON ALM5
			A1591000_1000 [LD Block,'ALARM': Rung 00081] NOCON ALM5
			A1591000_1000 [LD Block,'ALARM': Rung 00088] NCCON ALM5
			A1591000_1000 [LD Block,'DISPLAY': Rung 00011] NOCON ALM5
%M00221	ALM5	✓	A1591000_1000 [LD Block,'PLMS': Rung 00038] NOCON ALM5
			A1591000_1000 [LD Block,'ALARM': Rung 00037] COIL ALM6
			A1591000_1000 [LD Block,'ALARM': Rung 00037] NOCON ALM6
			A1591000_1000 [LD Block,'ALARM': Rung 00038] NOCON ALM6
			A1591000_1000 [LD Block,'ALARM': Rung 00080] NCCON ALM6
			A1591000_1000 [LD Block,'ALARM': Rung 00081] NOCON ALM6
			A1591000_1000 [LD Block,'ALARM': Rung 00088] NCCON ALM6
			A1591000_1000 [LD Block,'DISPLAY': Rung 00017] NOCON ALM6
%M00222	ALM6	✓	A1591000_1000 [LD Block,'PLMS': Rung 00036] NOCON ALM6
			A1591000_1000 [LD Block,'ALARM': Rung 00041] COIL ALM7
			A1591000_1000 [LD Block,'ALARM': Rung 00041] NOCON ALM7
			A1591000_1000 [LD Block,'ALARM': Rung 00042] NOCON ALM7
			A1591000_1000 [LD Block,'ALARM': Rung 00083] NCCON ALM7
			A1591000_1000 [LD Block,'ALARM': Rung 00084] NOCON ALM7
			A1591000_1000 [LD Block,'DISPLAY': Rung 00019] NOCON ALM7
			A1591000_1000 [LD Block,'PLMS': Rung 00017] NOCON ALM7
%M00223	ALM7	✓	A1591000_1000 [LD Block,'PLMS': Rung 00018] NCCON ALM7
			A1591000_1000 [LD Block,'ALARM': Rung 00052] COIL ALM8
			A1591000_1000 [LD Block,'ALARM': Rung 00052] NOCON ALM8
			A1591000_1000 [LD Block,'ALARM': Rung 00053] NOCON ALM8
			A1591000_1000 [LD Block,'ALARM': Rung 00080] NCCON ALM8
			A1591000_1000 [LD Block,'ALARM': Rung 00081] NOCON ALM8
			A1591000_1000 [LD Block,'ALARM': Rung 00088] NCCON ALM8
			A1591000_1000 [LD Block,'PLMS': Rung 00042] NOCON ALM8
%M00224	ALM8	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00013] NOCON ALM8
			A1591000_1000 [LD Block,'DISPLAY': Rung 00042] NOCON ALM9
			A1591000_1000 [LD Block,'PLMS': Rung 00050] NOCON ALM9
			A1591000_1000 [LD Block,'ALARM': Rung 00056] COIL ALM9
			A1591000_1000 [LD Block,'ALARM': Rung 00056] NOCON ALM9
			A1591000_1000 [LD Block,'ALARM': Rung 00057] NOCON ALM9
			A1591000_1000 [LD Block,'ALARM': Rung 00080] NCCON ALM9
			A1591000_1000 [LD Block,'ALARM': Rung 00081] NOCON ALM9
%M00225	ALM9	✓	A1591000_1000 [LD Block,'ALARM': Rung 00090] NCCON ALM9
			A1591000_1000 [LD Block,'ALARM': Rung 00061] COIL ALM10
			A1591000_1000 [LD Block,'ALARM': Rung 00061] NOCON ALM10
			A1591000_1000 [LD Block,'ALARM': Rung 00062] NOCON ALM10
			A1591000_1000 [LD Block,'ALARM': Rung 00083] NCCON ALM10
			A1591000_1000 [LD Block,'ALARM': Rung 00084] NOCON ALM10
			A1591000_1000 [LD Block,'ALARM': Rung 00095] NOCON ALM10
			A1591000_1000 [LD Block,'MACHINE': Rung 00041] NCCON ALM10
			A1591000_1000 [LD Block,'CONVEY': Rung 00002] NCCON ALM10

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			A1591000_1000 [LD Block,'CONVEY': Rung 00005] NOCON ALM10 A1591000_1000 [LD Block,'DISPLAY': Rung 00015] NOCON ALM10 A1591000_1000 [LD Block,'LINECOM': Rung 00004] NCCON ALM10 A1591000_1000 [LD Block,'PLMS': Rung 00052] NOCON ALM10
%M00226	ALM10	✓	A1591000_1000 [LD Block,'PLMS': Rung 00062] NOCON ALM10
			A1591000_1000 [LD Block,'ALARM': Rung 00065] COIL ALM11 A1591000_1000 [LD Block,'ALARM': Rung 00065] NOCON ALM11 A1591000_1000 [LD Block,'ALARM': Rung 00066] NOCON ALM11 A1591000_1000 [LD Block,'ALARM': Rung 00080] NCCON ALM11 A1591000_1000 [LD Block,'ALARM': Rung 00081] NOCON ALM11 A1591000_1000 [LD Block,'ALARM': Rung 00088] NCCON ALM11
%M00227	ALM11	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00009] NOCON ALM11
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%M00228	ALM12	✓	A1591000_1000 [LD Block,'ALARM': Rung 00088] NCCON ALM12
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%M00234	ALMACK2	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00038] NOCON ALMACK2
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%M00238	ALMACK6	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00017] NOCON ALMACK6
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%M00239	ALMACK7	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00019] NOCON ALMACK7
			A1591000_1000 [LD Block,'ALARM': Rung 00052] NCCON ALMACK8 A1591000_1000 [LD Block,'ALARM': Rung 00053] COIL ALMACK8 A1591000_1000 [LD Block,'ALARM': Rung 00053] NOCON ALMACK8 A1591000_1000 [LD Block,'ALARM': Rung 00081] NCCON ALMACK8
%M00240	ALMACK8	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00013] NOCON ALMACK8
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%M00241	ALMACK9	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00042] NOCON ALMACK9
			A1591000_1000 [LD Block,'ALARM': Rung 00061] NCCON ALMACK10 A1591000_1000 [LD Block,'ALARM': Rung 00062] COIL ALMACK10 A1591000_1000 [LD Block,'ALARM': Rung 00084] NCCON ALMACK10 A1591000_1000 [LD Block,'ALARM': Rung 00095] NOCON ALMACK10

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%M00242	ALMACK10	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00015] NOCON ALMACK10
%M00243	ALMACK11	✓	A1591000_1000 [LD Block,'ALARM': Rung 00065] NCCON ALMACK11 A1591000_1000 [LD Block,'ALARM': Rung 00066] COIL ALMACK11 A1591000_1000 [LD Block,'ALARM': Rung 00066] NOCON ALMACK11 A1591000_1000 [LD Block,'ALARM': Rung 00081] NCCON ALMACK11 A1591000_1000 [LD Block,'DISPLAY': Rung 00009] NOCON ALMACK11
%M00244	ALMACK12	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00044] NOCON ALMACK12 A1591000_1000 [LD Block,'ALARM': Rung 00069] NCCON ALMACK12 A1591000_1000 [LD Block,'ALARM': Rung 00070] COIL ALMACK12 A1591000_1000 [LD Block,'ALARM': Rung 00070] NOCON ALMACK12 A1591000_1000 [LD Block,'ALARM': Rung 00081] NCCON ALMACK12
%M00245	ALMACK13	✓	A1591000_1000 [LD Block,'ALARM': Rung 00073] NCCON ALMACK13 A1591000_1000 [LD Block,'ALARM': Rung 00074] COIL ALMACK13 A1591000_1000 [LD Block,'ALARM': Rung 00074] NOCON ALMACK13 A1591000_1000 [LD Block,'ALARM': Rung 00081] NCCON ALMACK13 A1591000_1000 [LD Block,'DISPLAY': Rung 00013] NOCON ALMACK13
%M00265	BLUALM	✓	A1591000_1000 [LD Block,'ALARM': Rung 00083] NCCOIL BLUALM A1591000_1000 [LD Block,'ALARM': Rung 00093] NOCON BLUALM
%M00266	UNBLUALM	✓	A1591000_1000 [LD Block,'ALARM': Rung 00084] COIL UNBLUALM A1591000_1000 [LD Block,'ALARM': Rung 00093] NCCON UNBLUALM A1591000_1000 [LD Block,'ALARM': Rung 00093] NOCON UNBLUALM
%M00267	YELALM	✓	A1591000_1000 [LD Block,'ALARM': Rung 00080] NCCOIL YELALM A1591000_1000 [LD Block,'ALARM': Rung 00086] NCCON YELALM A1591000_1000 [LD Block,'ALARM': Rung 00093] NCCON YELALM A1591000_1000 [LD Block,'ALARM': Rung 00095] NOCON YELALM
%M00268	UNYELALM	✓	A1591000_1000 [LD Block,'ALARM': Rung 00081] COIL UNYELALM A1591000_1000 [LD Block,'ALARM': Rung 00095] NCCON UNYELALM A1591000_1000 [LD Block,'ALARM': Rung 00095] NOCON UNYELALM A1591000_1000 [LD Block,'DISPLAY': Rung 00028] NOCON UNYELALM
%M00269	REDALM	✓	A1591000_1000 [LD Block,'ALARM': Rung 00077] NCCOIL REDALM A1591000_1000 [LD Block,'ALARM': Rung 00086] NCCON REDALM A1591000_1000 [LD Block,'ALARM': Rung 00093] NCCON REDALM A1591000_1000 [LD Block,'ALARM': Rung 00095] NCCON REDALM A1591000_1000 [LD Block,'ALARM': Rung 00097] NOCON REDALM
%M00270	UNREDALM	✓	A1591000_1000 [LD Block,'ALARM': Rung 00078] COIL UNREDALM A1591000_1000 [LD Block,'ALARM': Rung 00097] NCCON UNREDALM A1591000_1000 [LD Block,'ALARM': Rung 00097] NOCON UNREDALM A1591000_1000 [LD Block,'DISPLAY': Rung 00028] NOCON UNREDALM
%M00271	NOALM	✓	A1591000_1000 [LD Block,'ALARM': Rung 00086] COIL NOALM A1591000_1000 [LD Block,'MACHINE': Rung 00025] NOCON NOALM A1591000_1000 [LD Block,'MACHINE': Rung 00026] NOCON NOALM A1591000_1000 [LD Block,'MACHINE': Rung 00027] NOCON NOALM A1591000_1000 [LD Block,'PLMS': Rung 00007] NOCON NOALM
%M00272	ALMSTP1	✓	A1591000_1000 [LD Block,'ALARM': Rung 00088] NCCOIL ALMSTP1 A1591000_1000 [LD Block,'MACHINE': Rung 00034] NCCON ALMSTP1 A1591000_1000 [LD Block,'MACHINE': Rung 00035] NCCON ALMSTP1
%M00273	ALMSTP2	✓	A1591000_1000 [LD Block,'MACHINE': Rung 00035] NCCON ALMSTP2 A1591000_1000 [LD Block,'ALARM': Rung 00090] NCCOIL ALMSTP2
%M00274	M00274	✓	A1591000_1000 [LD Block,'ALARM': Rung 00059] COIL M00274 A1591000_1000 [LD Block,'ALARM': Rung 00060] NOCON M00274
%M00275	M00275	✓	A1591000_1000 [LD Block,'ALARM': Rung 00005] COIL M00275 A1591000_1000 [LD Block,'ALARM': Rung 00023] NOCON M00275
%M00276	M00276	✓	A1591000_1000 [LD Block,'ALARM': Rung 00007] COIL M00276 A1591000_1000 [LD Block,'ALARM': Rung 00027] NOCON M00276
%M00278	M00278	✓	A1591000_1000 [LD Block,'ALARM': Rung 00045] COIL M00278 A1591000_1000 [LD Block,'ALARM': Rung 00051] NOCON M00278
%M00279	M00279	✓	A1591000_1000 [LD Block,'ALARM': Rung 00047] COIL M00279 A1591000_1000 [LD Block,'ALARM': Rung 00051] NOCON M00279
%M00280	M00280	✓	A1591000_1000 [LD Block,'ALARM': Rung 00049] COIL M00280 A1591000_1000 [LD Block,'ALARM': Rung 00051] NOCON M00280
%M00300	M00300	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00057] NCCON M00300 A1591000_1000 [LD Block,'DISPLAY': Rung 00057] COIL M00300 A1591000_1000 [LD Block,'DISPLAY': Rung 00058] NOCON M00300 A1591000_1000 [LD Block,'DISPLAY': Rung 00063] NOCON M00300
%M00301	M00301	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00058] COIL M00301 A1591000_1000 [LD Block,'DISPLAY': Rung 00058] NOCON M00301 A1591000_1000 [LD Block,'DISPLAY': Rung 00059] NOCON M00301
%M00302	M00302	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00061] COIL M00302 A1591000_1000 [LD Block,'DISPLAY': Rung 00063] NOCON M00302 A1591000_1000 [LD Block,'DISPLAY': Rung 00064] NOCON M00302 A1591000_1000 [LD Block,'DISPLAY': Rung 00065] NOCON M00302
%M00309	P_H001	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00003] COIL P_H001 A1591000_1000 [LD Block,'DISPLAY': Rung 00060] MOVE_BOOL P_H001 R00205
%M00310	P_H002	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00005] COIL P_H002
%M00311	P_H003	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00007] COIL P_H003
%M00312	P_H021	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00009] COIL P_H021
%M00313	P_H022	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00011] COIL P_H022
%M00314	P_H023	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00013] COIL P_H023
%M00315	P_H024	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00015] COIL P_H024
%M00316	P_H025	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00017] COIL P_H025

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%M00317	P_H026	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00019] COIL P_H026
%M00318	M00318	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00021] COIL M00318
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%M00320	M00320	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00021] COIL M00320
%M00321	M00321	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00021] COIL M00321
%M00322	M00322	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00021] COIL M00322
%M00323	M00323	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00021] COIL M00323
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%M00325	P_H001S	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00024] COIL P_H001S A1591000_1000 [LD Block,'DISPLAY': Rung 00060] MOVE_BOOL P_H001S R00207
%M00326	P_H002S	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00026] COIL P_H002S
%M00327	P_H003S	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00028] COIL P_H003S
%M00328	P_H004S	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00030] COIL P_H004S
%M00329	P_H005S	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00032] COIL P_H005S
%M00330	P_H006S	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00034] COIL P_H006S
%M00331	P_H006	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00036] COIL P_H006
%M00332	P_H007	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00038] COIL P_H007
%M00333	P_H008	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00040] COIL P_H008
%M00334	P_H009	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00042] COIL P_H009
%M00335	P_H010	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00044] COIL P_H010
%M00336	P_H011	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00046] COIL P_H011
%M00337	P_H007S	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00048] COIL P_H007S
%M00338	P_H008S	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00050] COIL P_H008S
%M00339	P_H009S	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00052] COIL P_H009S
%M00340	P_H010S	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00054] COIL P_H010S

%P - Program Register

%Q - Discrete Output

Address	Name	Retentive	References
%Q00001	A072_17	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00063] COIL A072_17
%Q00002	A072_18	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00064] COIL A072_18
%Q00003	A072_19	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00065] COIL A072_19
%Q00004	A072_20	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00066] COIL A072_20
%Q00005	K001	✓	A1591000_1000 [LD Block,'ALARM': Rung 00009] NOCON K001 A1591000_1000 [LD Block,'ALARM': Rung 00036] NOCON K001 A1591000_1000 [LD Block,'ALARM': Rung 00040] NOCON K001 A1591000_1000 [LD Block,'MACHINE': Rung 00046] COIL K001 A1591000_1000 [LD Block,'DISPLAY': Rung 00052] NOCON K001
%Q00006	P001	✓	A1591000_1000 [LD Block,'MACHINE': Rung 00048] COIL P001
%Q00007	K020	✓	A1591000_1000 [LD Block,'MACHINE': Rung 00052] COIL K020 A1591000_1000 [LD Block,'DISPLAY': Rung 00054] NOCON K020
%Q00009	H101_1	✓	A1591000_1000 [LD Block,'ALARM': Rung 00093] COIL H101_1
%Q00010	H101_2	✓	A1591000_1000 [LD Block,'ALARM': Rung 00095] COIL H101_2
%Q00011	H101_3	✓	A1591000_1000 [LD Block,'ALARM': Rung 00097] COIL H101_3
%Q00014	Q00014	✓	A1591000_1000 [LD Block,'CONVEY': Rung 00002] COIL Q00014
%Q00015	K098	✓	A1591000_1000 [LD Block,'LINECOM': Rung 00002] COIL K098
%Q00016	K099	✓	A1591000_1000 [LD Block,'LINECOM': Rung 00004] COIL K099
%Q00017	K004	✓	A1591000_1000 [LD Block,'APPLIC': Rung 00003] COIL K004 A1591000_1000 [LD Block,'APPLIC': Rung 00005] NOCON K004
%Q00017	Q00017	✓	A1591000_1000 [LD Block,'t1t0001': Rung 00016] DO_IO Q00017 Q00032 5
%Q00018	A101_11	✓	A1591000_1000 [LD Block,'ALARM': Rung 00005] NOCON A101_11 A1591000_1000 [LD Block,'APPLIC': Rung 00005] COIL A101_11 A1591000_1000 [LD Block,'APPLIC': Rung 00009] NOCON A101_11
%Q00019	A101_14	✓	A1591000_1000 [LD Block,'ALARM': Rung 00064] NOCON A101_14 A1591000_1000 [LD Block,'APPLIC': Rung 00007] COIL A101_14 A1591000_1000 [LD Block,'APPLIC': Rung 00007] NOCON A101_14
%Q00020	A101_13	✓	A1591000_1000 [LD Block,'APPLIC': Rung 00010] COIL A101_13
%Q00021	A101_16	✓	A1591000_1000 [LD Block,'t1t0001': Rung 00014] COIL A101_16
%Q00022	K005	✓	A1591000_1000 [LD Block,'ALARM': Rung 00007] NOCON K005 A1591000_1000 [LD Block,'CONVEY': Rung 00009] COIL K005
%Q00023	U001_S1	✓	A1591000_1000 [LD Block,'CONVEY': Rung 00002] NCCON U001_S1 A1591000_1000 [LD Block,'CONVEY': Rung 00010] COIL U001_S1 A1591000_1000 [LD Block,'CONVEY': Rung 00014] NOCON U001_S1 A1591000_1000 [LD Block,'t1t0001': Rung 00012] NOCON U001_S1 A1591000_1000 [LD Block,'LINECOM': Rung 00002] NOCON U001_S1 A1591000_1000 [LD Block,'ALARM': Rung 00032] NOCON U001_S1 A1591000_1000 [LD Block,'ALARM': Rung 00045] NOCON U001_S1 A1591000_1000 [LD Block,'ALARM': Rung 00045] NCCON U001_S1 A1591000_1000 [LD Block,'ALARM': Rung 00047] NOCON U001_S1 A1591000_1000 [LD Block,'ALARM': Rung 00047] NCCON U001_S1 A1591000_1000 [LD Block,'ALARM': Rung 00049] NOCON U001_S1 A1591000_1000 [LD Block,'ALARM': Rung 00072] NOCON U001_S1
			A1591000_1000 [LD Block,'CONVEY': Rung 00002] NCCON U001_S5 A1591000_1000 [LD Block,'CONVEY': Rung 00011] COIL U001_S5 A1591000_1000 [LD Block,'CONVEY': Rung 00014] NOCON U001_S5 A1591000_1000 [LD Block,'t1t0001': Rung 00012] NOCON U001_S5 A1591000_1000 [LD Block,'ALARM': Rung 00032] NOCON U001_S5 A1591000_1000 [LD Block,'ALARM': Rung 00045] NOCON U001_S5

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%Q00024	U001_S5	✓	A1591000_1000 [LD Block,'ALARM': Rung 00045] NCCON U001_S5 A1591000_1000 [LD Block,'ALARM': Rung 00047] NOCON U001_S5 A1591000_1000 [LD Block,'ALARM': Rung 00047] NCCON U001_S5 A1591000_1000 [LD Block,'ALARM': Rung 00049] NOCON U001_S5 A1591000_1000 [LD Block,'ALARM': Rung 00072] NOCON U001_S5
%Q00025	Y100	✓	A1591000_1000 [LD Block,'ALARM': Rung 00055] NOCON Y100 A1591000_1000 [LD Block,'ALARM': Rung 00055] NCCON Y100 A1591000_1000 [LD Block,'MACHINE': Rung 00054] COIL Y100
%Q00026	Y101	✓	A1591000_1000 [LD Block,'t1t0001': Rung 00012] COIL Y101 A1591000_1000 [LD Block,'t1t0001': Rung 00014] NOCON Y101 A1591000_1000 [LD Block,'LINECOM': Rung 00002] NOCON Y101 A1591000_1000 [LD Block,'PLMS': Rung 00011] NOCON Y101 A1591000_1000 [LD Block,'PLMS': Rung 00060] NOCON Y101 A1591000_1000 [LD Block,'PLMS': Rung 00061] NCCON Y101
%Q00028	Y102	✓	A1591000_1000 [LD Block,'CONVEY': Rung 00014] COIL Y102
%Q00032	Q00032	✓	A1591000_1000 [LD Block,'t1t0001': Rung 00016] DO_IO Q00017 Q00032 5

%R - Register Memory

Address	Name	Retentive	References
%R00001	R00001	✓	A1591000_1000 [LD Block,'MACHINE': Rung 00023] TMR_TENTHS R00001
%R00004	R00004	✓	A1591000_1000 [LD Block,'MACHINE': Rung 00008] TMR_TENTHS R00004
%R00007	R00007	✓	A1591000_1000 [LD Block,'ALARM': Rung 00011] TMR_THOUS R00007
%R00010	R00010	✓	A1591000_1000 [LD Block,'MACHINE': Rung 00044] TMR_TENTHS R00010
%R00013	R00013	✓	A1591000_1000 [LD Block,'PLMS': Rung 00061] TMR_TENTHS R00013
%R00016	R00016	✓	A1591000_1000 [LD Block,'CONVEY': Rung 00014] OFDT_THOUS R00016
%R00019	R00019	✓	A1591000_1000 [LD Block,'ALARM': Rung 00005] TMR_TENTHS R00019
%R00022	R00022	✓	A1591000_1000 [LD Block,'MACHINE': Rung 00011] TMR_TENTHS R00022
%R00025	R00025	✓	A1591000_1000 [LD Block,'ALARM': Rung 00055] TMR_TENTHS R00025
%R00028	R00028	✓	A1591000_1000 [LD Block,'CONVEY': Rung 00005] TMR_TENTHS R00028
%R00031	R00031	✓	A1591000_1000 [LD Block,'MACHINE': Rung 00041] TMR_TENTHS R00031
%R00034	R00034	✓	A1591000_1000 [LD Block,'PLMS': Rung 00004] TMR_TENTHS R00034
%R00037	R00037	✓	A1591000_1000 [LD Block,'MACHINE': Rung 00014] OFDT_TENTHS R00037 A1591000_1000 [LD Block,'MACHINE': Rung 00015] MOVE_INT 100 R00037
%R00040	R00040	✓	A1591000_1000 [LD Block,'LINECOM': Rung 00002] OFDT_TENTHS R00040
%R00043	R00043	✓	A1591000_1000 [LD Block,'ALARM': Rung 00012] TMR_THOUS R00043
%R00046	R00046	✓	A1591000_1000 [LD Block,'ALARM': Rung 00013] TMR_THOUS R00046
%R00049	R00049	✓	A1591000_1000 [LD Block,'ALARM': Rung 00023] TMR_TENTHS R00049
%R00052	R00052	✓	A1591000_1000 [LD Block,'ALARM': Rung 00064] TMR_TENTHS R00052
%R00055	R00055	✓	A1591000_1000 [LD Block,'ALARM': Rung 00011] OFDT_THOUS R00055
%R00058	R00058	✓	A1591000_1000 [LD Block,'ALARM': Rung 00007] TMR_TENTHS R00058
%R00061	R00061	✓	A1591000_1000 [LD Block,'ALARM': Rung 00012] OFDT_THOUS R00061
%R00064	R00064	✓	A1591000_1000 [LD Block,'ALARM': Rung 00013] OFDT_THOUS R00064
%R00067	R00067	✓	A1591000_1000 [LD Block,'ALARM': Rung 00068] TMR_TENTHS R00067
%R00070	R00070	✓	A1591000_1000 [LD Block,'ALARM': Rung 00045] UPCTR R00070
%R00073	R00073	✓	A1591000_1000 [LD Block,'ALARM': Rung 00047] UPCTR R00073
%R00076	R00076	✓	A1591000_1000 [LD Block,'ALARM': Rung 00049] TMR_TENTHS R00076
%R00082	R00082	✓	A1591000_1000 [LD Block,'APPLIC': Rung 00005] TMR_TENTHS R00082
%R00085	R00085	✓	A1591000_1000 [LD Block,'ALARM': Rung 00072] TMR_TENTHS R00085
%R00101	R00101	✓	A1591000_1000 [LD Block,'t1t0001': Rung 00008] ADD_INT R00101 1 R00101 A1591000_1000 [LD Block,'t1t0001': Rung 00008] ADD_INT R00101 1 R00101 A1591000_1000 [LD Block,'t1t0001': Rung 00010] BLK_CLR_WORD R00101 A1591000_1000 [LD Block,'t1t0001': Rung 00012] RANGE_INT 0 12 R00101
%R00107	R00107	✓	A1591000_1000 [LD Block,'ALARM': Rung 00032] UPCTR R00107
%R00201	R00201	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00056] MOVE_INT 18 R00201 A1591000_1000 [LD Block,'DISPLAY': Rung 00058] UPCTR R00201 A1591000_1000 [LD Block,'DISPLAY': Rung 00061] GE_INT R00201 1 R00201 16 A1591000_1000 [LD Block,'DISPLAY': Rung 00061] LE_INT R00201 16
%R00205	R00205	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00060] MOVE_BOOL P_H001 R00205 A1591000_1000 [LD Block,'DISPLAY': Rung 00064] SHIFTL_WORD R00205 1 R00205 A1591000_1000 [LD Block,'DISPLAY': Rung 00064] SHIFTL_WORD R00205 1 R00205
%R00207	R00207	✓	A1591000_1000 [LD Block,'DISPLAY': Rung 00060] MOVE_BOOL P_H001S R00207 A1591000_1000 [LD Block,'DISPLAY': Rung 00065] SHIFTL_WORD R00207 1 R00207 A1591000_1000 [LD Block,'DISPLAY': Rung 00065] SHIFTL_WORD R00207 1 R00207
%R00920	R00920	✓	A1591000_1000 [LD Block,'PLMS': Rung 00066] MOVE_INT R00926 R00920 A1591000_1000 [LD Block,'PLMS': Rung 00067] MOVE_INT R00920 R00926 A1591000_1000 [LD Block,'PLMS': Rung 00074] MOVE_INT 0 R00920
%R00921	R00921	✓	A1591000_1000 [LD Block,'PLMS': Rung 00070] MOVE_INT R00928 R00921 A1591000_1000 [LD Block,'PLMS': Rung 00071] MOVE_INT R00921 R00928
			A1591000_1000 [LD Block,'PLMS': Rung 00008] AND_WORD R00922 0 R00922 A1591000_1000 [LD Block,'PLMS': Rung 00008] AND_WORD R00922 0 R00922 A1591000_1000 [LD Block,'PLMS': Rung 00030] EQ_INT R00922 0 R00923 0 R00924 1024 R00925 0 A1591000_1000 [LD Block,'PLMS': Rung 00032] MOVE_WORD 1 R00922 A1591000_1000 [LD Block,'PLMS': Rung 00034] MOVE_WORD 2 R00922 A1591000_1000 [LD Block,'PLMS': Rung 00036] MOVE_WORD 4 R00922 A1591000_1000 [LD Block,'PLMS': Rung 00038] MOVE_WORD 16 R00922 A1591000_1000 [LD Block,'PLMS': Rung 00040] MOVE_WORD 32 R00922 A1591000_1000 [LD Block,'PLMS': Rung 00042] MOVE_WORD 64 R00922 A1591000_1000 [LD Block,'PLMS': Rung 00044] MOVE_WORD 128 R00922

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%R00922	R00922	✓	A1591000_1000 [LD Block,'PLMS': Rung 00047] EQ_INT R00922 0
%R00923	R00923	✓	A1591000_1000 [LD Block,'PLMS': Rung 00008] AND_WORD R00923 0 R00923 A1591000_1000 [LD Block,'PLMS': Rung 00008] AND_WORD R00923 0 R00923 A1591000_1000 [LD Block,'PLMS': Rung 00030] EQ_INT R00923 0 R00924 1024 R00925 0 A1591000_1000 [LD Block,'PLMS': Rung 00048] EQ_INT R00923 0
%R00924	R00924	✓	A1591000_1000 [LD Block,'PLMS': Rung 00005] BIT_TEST_WORD R00924 1 A1591000_1000 [LD Block,'PLMS': Rung 00009] AND_WORD R00924 1023 R00924 A1591000_1000 [LD Block,'PLMS': Rung 00009] AND_WORD R00924 1023 R00924 A1591000_1000 [LD Block,'PLMS': Rung 00012] BIT_SET_WORD R00924 2 A1591000_1000 [LD Block,'PLMS': Rung 00014] BIT_SET_WORD R00924 3 A1591000_1000 [LD Block,'PLMS': Rung 00015] BIT_CLR_WORD R00924 3 A1591000_1000 [LD Block,'PLMS': Rung 00017] BIT_SET_WORD R00924 4 A1591000_1000 [LD Block,'PLMS': Rung 00018] BIT_CLR_WORD R00924 4 A1591000_1000 [LD Block,'PLMS': Rung 00020] BIT_SET_WORD R00924 8 A1591000_1000 [LD Block,'PLMS': Rung 00021] BIT_CLR_WORD R00924 8 A1591000_1000 [LD Block,'PLMS': Rung 00023] BIT_SET_WORD R00924 9 A1591000_1000 [LD Block,'PLMS': Rung 00024] BIT_CLR_WORD R00924 9 A1591000_1000 [LD Block,'PLMS': Rung 00026] BIT_SET_WORD R00924 10 A1591000_1000 [LD Block,'PLMS': Rung 00027] BIT_CLR_WORD R00924 10 A1591000_1000 [LD Block,'PLMS': Rung 00030] LT_INT R00924 1024 R00925 0 A1591000_1000 [LD Block,'PLMS': Rung 00050] OR_WORD R00924 1024 R00924 A1591000_1000 [LD Block,'PLMS': Rung 00050] OR_WORD R00924 1024 R00924 A1591000_1000 [LD Block,'PLMS': Rung 00052] OR_WORD R00924 4096 R00924 A1591000_1000 [LD Block,'PLMS': Rung 00052] OR_WORD R00924 4096 R00924 A1591000_1000 [LD Block,'PLMS': Rung 00056] OR_WORD R00924 8192 R00924 A1591000_1000 [LD Block,'PLMS': Rung 00056] OR_WORD R00924 8192 R00924 A1591000_1000 [LD Block,'PLMS': Rung 00058] OR_WORD R00924 16384 R00924 A1591000_1000 [LD Block,'PLMS': Rung 00058] OR_WORD R00924 16384 R00924 A1591000_1000 [LD Block,'PLMS': Rung 00062] BIT_CLR_WORD R00924 2 A1591000_1000 [LD Block,'PLMS': Rung 00073] BIT_TEST_WORD R00924 1
%R00925	R00925	✓	A1591000_1000 [LD Block,'PLMS': Rung 00009] AND_WORD R00925 0 R00925 A1591000_1000 [LD Block,'PLMS': Rung 00009] AND_WORD R00925 0 R00925 A1591000_1000 [LD Block,'PLMS': Rung 00030] EQ_INT R00925 0
%R00926	R00926	✓	A1591000_1000 [LD Block,'PLMS': Rung 00065] ADD_DINT R00926 1 R00926 A1591000_1000 [LD Block,'PLMS': Rung 00065] ADD_DINT R00926 1 R00926 A1591000_1000 [LD Block,'PLMS': Rung 00066] MOVE_INT R00926 R00920 A1591000_1000 [LD Block,'PLMS': Rung 00067] MOVE_INT R00920 R00926 A1591000_1000 [LD Block,'PLMS': Rung 00074] MOVE_INT 0 R00926
%R00928	R00928	✓	A1591000_1000 [LD Block,'PLMS': Rung 00069] ADD_DINT R00928 1 R00928 A1591000_1000 [LD Block,'PLMS': Rung 00069] ADD_DINT R00928 1 R00928 A1591000_1000 [LD Block,'PLMS': Rung 00070] MOVE_INT R00928 R00921 A1591000_1000 [LD Block,'PLMS': Rung 00071] MOVE_INT R00921 R00928

%S - System Memory

Address	Name	Retentive	References
%S00001	#FST_SCN	✓	A1591000_1000 [LD Block,'MACHINE': Rung 00032] NCCON #FST_SCN A1591000_1000 [LD Block,'MACHINE': Rung 00033] NCCON #FST_SCN A1591000_1000 [LD Block,'MACHINE': Rung 00034] NCCON #FST_SCN A1591000_1000 [LD Block,'MACHINE': Rung 00035] NCCON #FST_SCN A1591000_1000 [LD Block,'DISPLAY': Rung 00056] NOCON #FST_SCN A1591000_1000 [LD Block,'DISPLAY': Rung 00057] NCCON #FST_SCN
%S00008	#ALW_OFF	✓	A1591000_1000 [LD Block,'CONVEY': Rung 00011] NOCON #ALW_OFF A1591000_1000 [LD Block,'DISPLAY': Rung 00021] NOCON #ALW_OFF A1591000_1000 [LD Block,'DISPLAY': Rung 00034] NOCON #ALW_OFF A1591000_1000 [LD Block,'DISPLAY': Rung 00064] NOCON #ALW_OFF A1591000_1000 [LD Block,'DISPLAY': Rung 00065] NOCON #ALW_OFF A1591000_1000 [LD Block,'DISPLAY': Rung 00066] NOCON #ALW_OFF

%SA - System Memory A

%SB - System Memory B

%SC - System Memory C

%T - Temporary Status

Address	Name	Retentive	References
%T00001	T00001	×	A1591000_1000 [LD Block,'MACHINE': Rung 00018] POSCOIL T00001 A1591000_1000 [LD Block,'MACHINE': Rung 00020] NOCON T00001 A1591000_1000 [LD Block,'MACHINE': Rung 00041] NCCON T00001
%T00002	T00002	×	A1591000_1000 [LD Block,'MACHINE': Rung 00019] POSCOIL T00002 A1591000_1000 [LD Block,'MACHINE': Rung 00021] NOCON T00002
			A1591000_1000 [LD Block,'ALARM': Rung 00003] POSCOIL T00003 A1591000_1000 [LD Block,'ALARM': Rung 00017] NOCON T00003 A1591000_1000 [LD Block,'ALARM': Rung 00021] NOCON T00003 A1591000_1000 [LD Block,'ALARM': Rung 00025] NOCON T00003 A1591000_1000 [LD Block,'ALARM': Rung 00029] NOCON T00003 A1591000_1000 [LD Block,'ALARM': Rung 00032] NOCON T00003

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%T00003	T00003	×	A1591000_1000 [LD Block,'ALARM': Rung 00034] NOCON T00003 A1591000_1000 [LD Block,'ALARM': Rung 00038] NOCON T00003 A1591000_1000 [LD Block,'ALARM': Rung 00053] NOCON T00003 A1591000_1000 [LD Block,'ALARM': Rung 00057] NOCON T00003 A1591000_1000 [LD Block,'ALARM': Rung 00066] NOCON T00003
%T00004	T00004	×	A1591000_1000 [LD Block,'ALARM': Rung 00009] POSCOIL T00004 A1591000_1000 [LD Block,'ALARM': Rung 00038] NOCON T00004
%T00005	T00005	×	A1591000_1000 [LD Block,'MACHINE': Rung 00005] POSCOIL T00005 A1591000_1000 [LD Block,'MACHINE': Rung 00006] NOCON T00005 A1591000_1000 [LD Block,'MACHINE': Rung 00006] NCCON T00005
%T00006	T00006	×	A1591000_1000 [LD Block,'ALARM': Rung 00031] POSCOIL T00006 A1591000_1000 [LD Block,'ALARM': Rung 00032] NOCON T00006
%T00007	T00007	×	A1591000_1000 [LD Block,'MACHINE': Rung 00003] NOCON T00007 A1591000_1000 [LD Block,'MACHINE': Rung 00003] NCCON T00007 A1591000_1000 [LD Block,'DISPLAY': Rung 00059] POSCOIL T00007 A1591000_1000 [LD Block,'DISPLAY': Rung 00060] NOCON T00007
%T00008	T00008	×	A1591000_1000 [LD Block,'MACHINE': Rung 00050] POSCOIL T00008 A1591000_1000 [LD Block,'MACHINE': Rung 00051] NOCON T00008 A1591000_1000 [LD Block,'MACHINE': Rung 00051] NCCON T00008
%T00009	T00009	×	A1591000_1000 [LD Block,'MACHINE': Rung 00033] NOCON T00009 A1591000_1000 [LD Block,'MACHINE': Rung 00037] POSCOIL T00009
%T00010	T00010	×	A1591000_1000 [LD Block,'ALARM': Rung 00011] POSCOIL T00010 A1591000_1000 [LD Block,'ALARM': Rung 00045] NOCON T00010 A1591000_1000 [LD Block,'PLMS': Rung 00065] NOCON T00010
%T00011	T00011	×	A1591000_1000 [LD Block,'ALARM': Rung 00013] POSCOIL T00011 A1591000_1000 [LD Block,'ALARM': Rung 00047] NOCON T00011 A1591000_1000 [LD Block,'LINECOM': Rung 00002] NOCON T00011 A1591000_1000 [LD Block,'PLMS': Rung 00069] NOCON T00011
%T00012	T00012	×	A1591000_1000 [LD Block,'CONVEY': Rung 00013] POSCOIL T00012 A1591000_1000 [LD Block,'CONVEY': Rung 00014] NOCON T00012
%T00013	T00013	×	A1591000_1000 [LD Block,'t1t0001': Rung 00006] POSCOIL T00013 A1591000_1000 [LD Block,'t1t0001': Rung 00010] NOCON T00013
%T00014	T00014	×	A1591000_1000 [LD Block,'ALARM': Rung 00012] POSCOIL T00014 A1591000_1000 [LD Block,'ALARM': Rung 00032] NOCON T00014 A1591000_1000 [LD Block,'ALARM': Rung 00045] NOCON T00014 A1591000_1000 [LD Block,'ALARM': Rung 00047] NOCON T00014
%T00015	T00015	×	A1591000_1000 [LD Block,'MACHINE': Rung 00044] POSCOIL T00015 A1591000_1000 [LD Block,'MACHINE': Rung 00045] NOCON T00015
%T00016	T00016	×	A1591000_1000 [LD Block,'MACHINE': Rung 00043] POSCOIL T00016 A1591000_1000 [LD Block,'MACHINE': Rung 00045] NCCON T00016
%T00017	T00017	×	A1591000_1000 [LD Block,'MACHINE': Rung 00039] POSCOIL T00017 A1591000_1000 [LD Block,'APPLIC': Rung 00007] NOCON T00017

%W - Bulk Memory

[Next] [All]

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Tetra Straw Applicator A1 TCA - 0100

MANL / 040324 1591000-1030 ELD 000 AA ECM 167303

1 TETRA STRAW APPLICATOR A1 TCA 0100

PROGRAM:	ECN:	DATE:	SIGN:
1591000-1000	167304(AA)	040324	MANL

PLMS / SNP ID: 7800

2 ALARM - Alarm handling

Output for %Q00009 - Alarm lamp - BLUE
%Q00010 - Alarm lamp - YELLOW
%Q00011 - Alarm lamp - RED

3 CALL ALARM

4 MACHINE - Machine Step Handling & aux. machine functions

Output for %Q00005 - Power to Hot melt unit / El.Cabinet cooling fan
%Q00006 - Hour meter
%Q00007 - Machine lamp
%Q00025 - Main air valve

5 CALL MACHINE

6 CONVEY - Conveyor through machine

Output for %Q00014 - Infeed package ejector valve
%Q00022 - Conveyor motor - POWER ON
%Q00023 - Conveyor motor - RUN
%Q00024 - Conveyor motor - HIGHSPEED
%Q00028 - Fallen package ejector valve

7 CALL CONVEY

8 1t0001 - Hotmelt / Servo pulses

Output for %Q00021 - Applicator motor - APPLY STRAW
%Q00026 - Hotmelt guns

Block: _MAIN
Project: 1591000-1000 Target: A1591000_1000 Page: 1

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Tetra Straw Applicator A1 TCA - 0100

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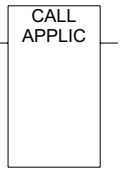
10 APPLIC - Applicator unit Servo motor

Output for %Q00017 - Applicator motor - POWER ON
%Q00018 - Applicator motor - ENABLE
%Q00019 - Applicator motor - FIND HOME
%Q00020 - Applicator motor - JOG

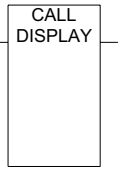
11



12 DISPLAY - Signals to Display multiplexing card

Output for %Q00001 - Synch pulse to multiplexer card
%Q00002 - Data bit 1 to multiplexer card
%Q00003 - Data bit 2 to multiplexer card
%Q00004 - Data bit 3 to multiplexer card

13



14 LINECOM - Line communication signals

Output for %Q00015 - Package coming (to next machine)
%Q00016 - Ready signal (to previous machine)

Block: _MAIN

Project: 1591000-1000 Target: A1591000_1000 Page: 2

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Tetra Straw Applicator A1 TCA - 0100

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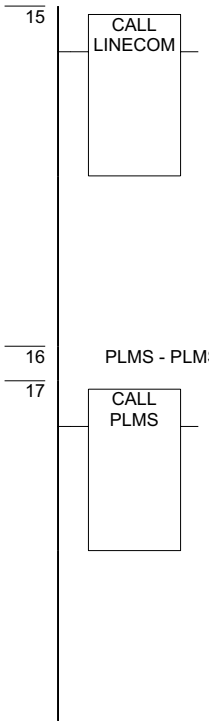

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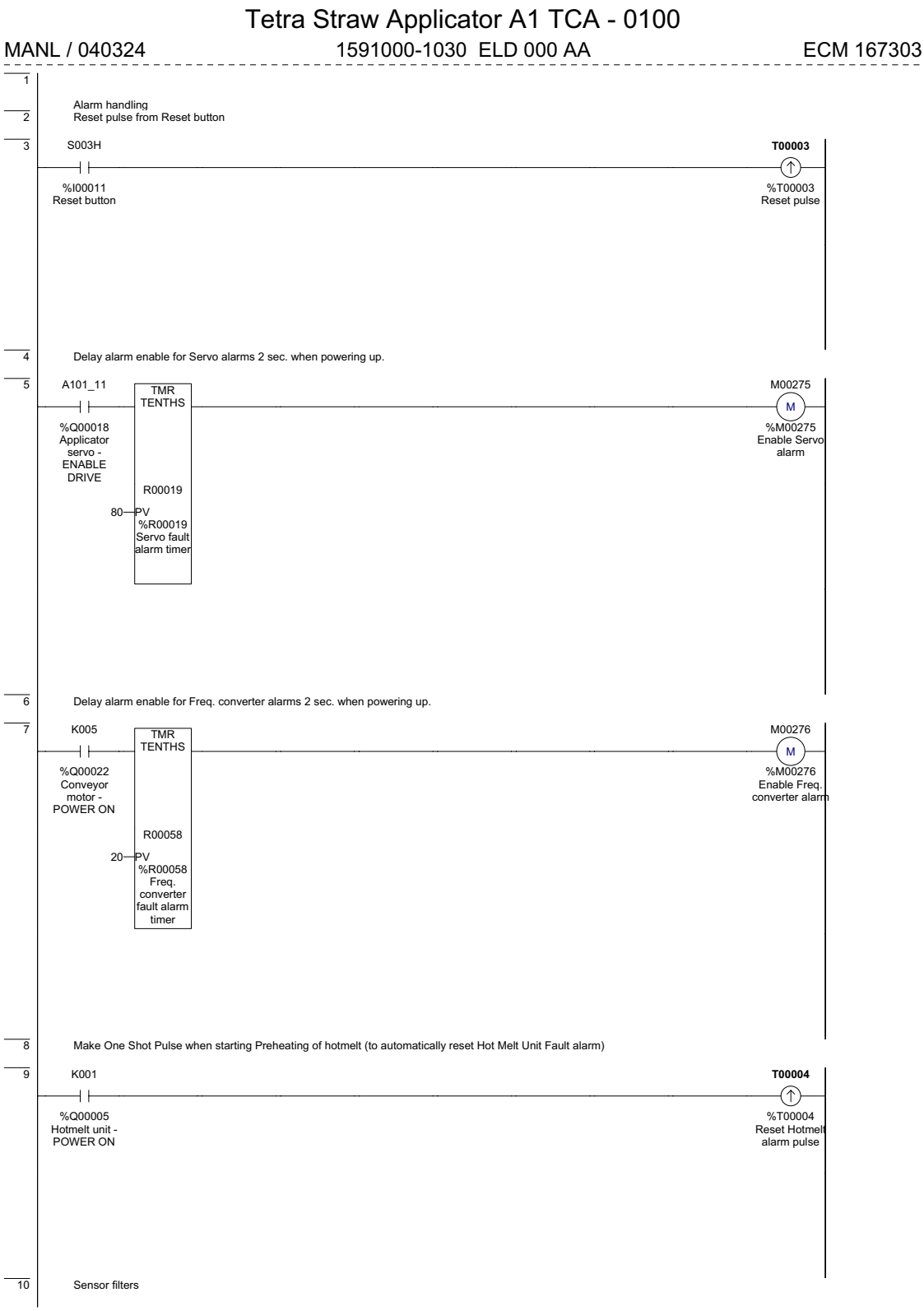
Block: _MAIN

Project: 1591000-1000 Target: A1591000_1000 Page: 3



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Tetra Straw Applicator A1 TCA - 0100

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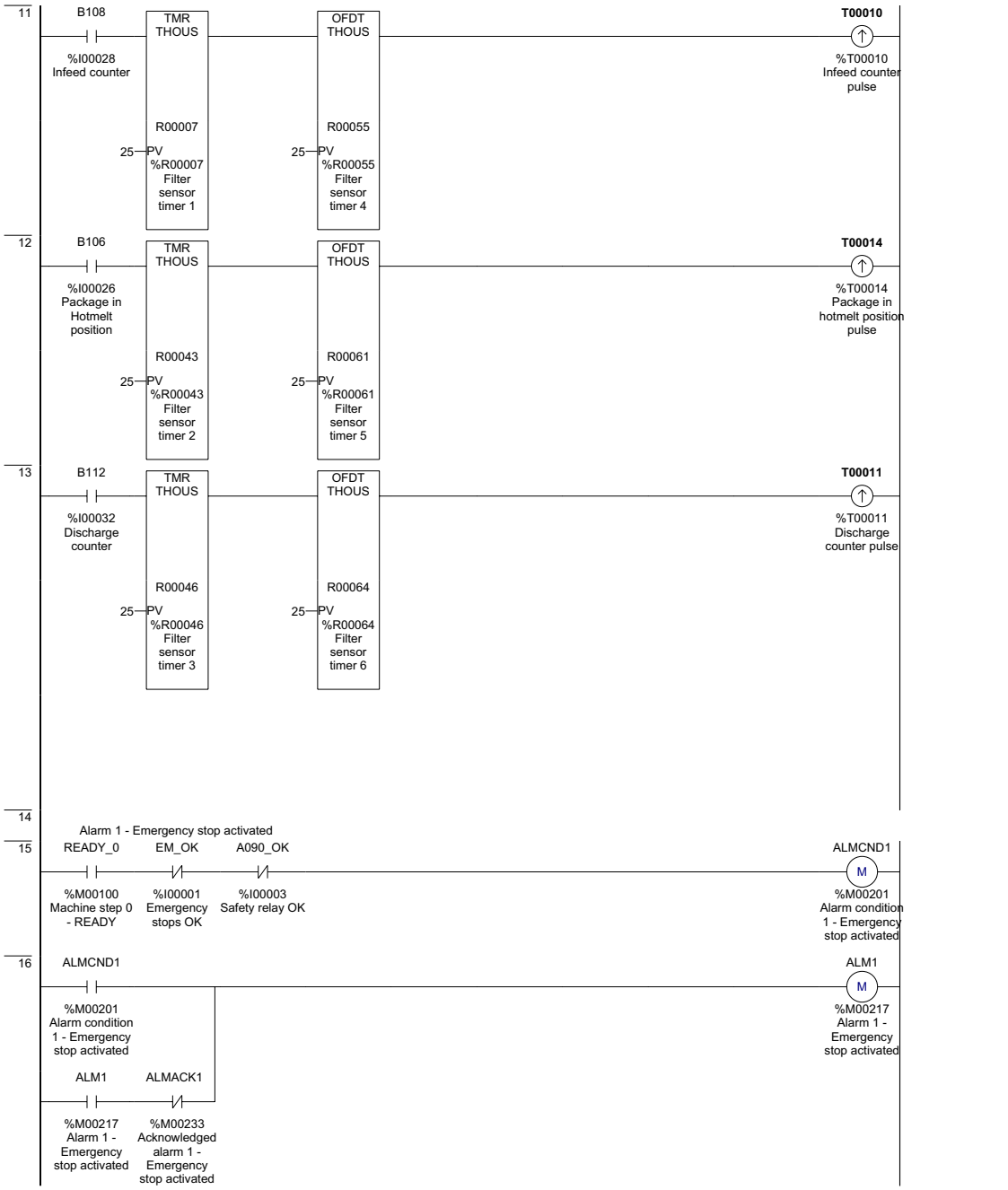

Block: ALARM

Project: 1591000-1000 Target: A1591000_1000 Page: 5

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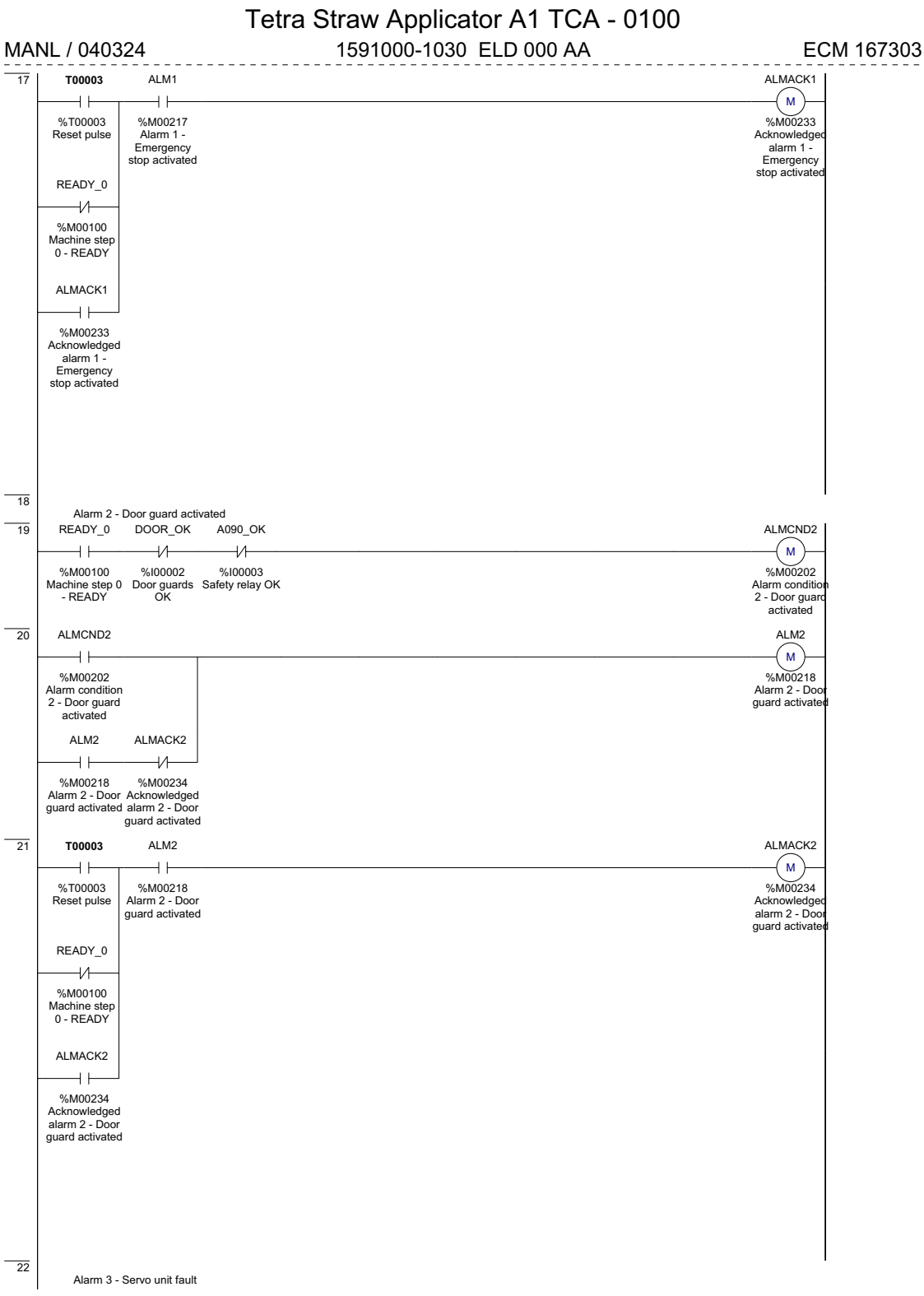

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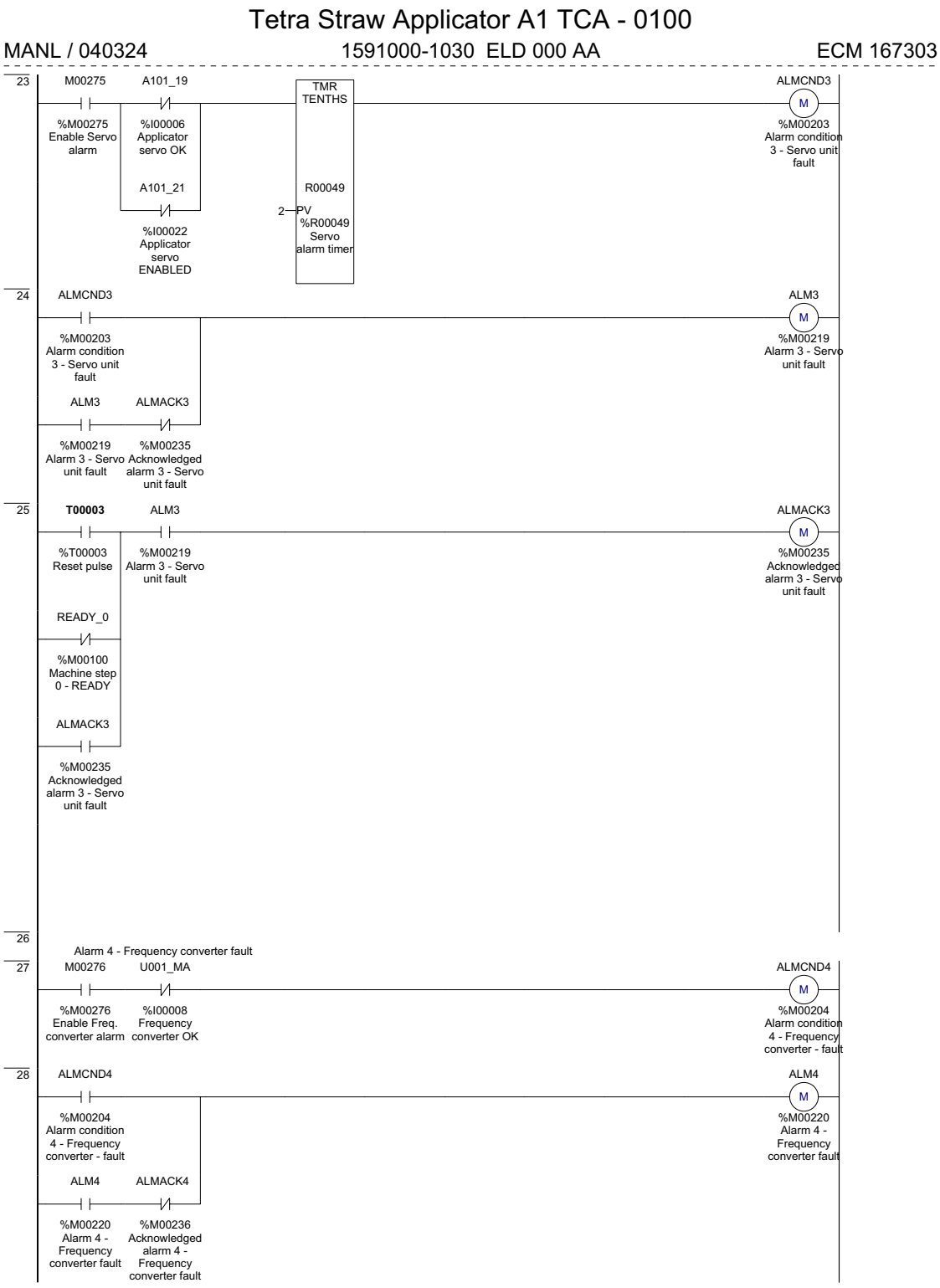

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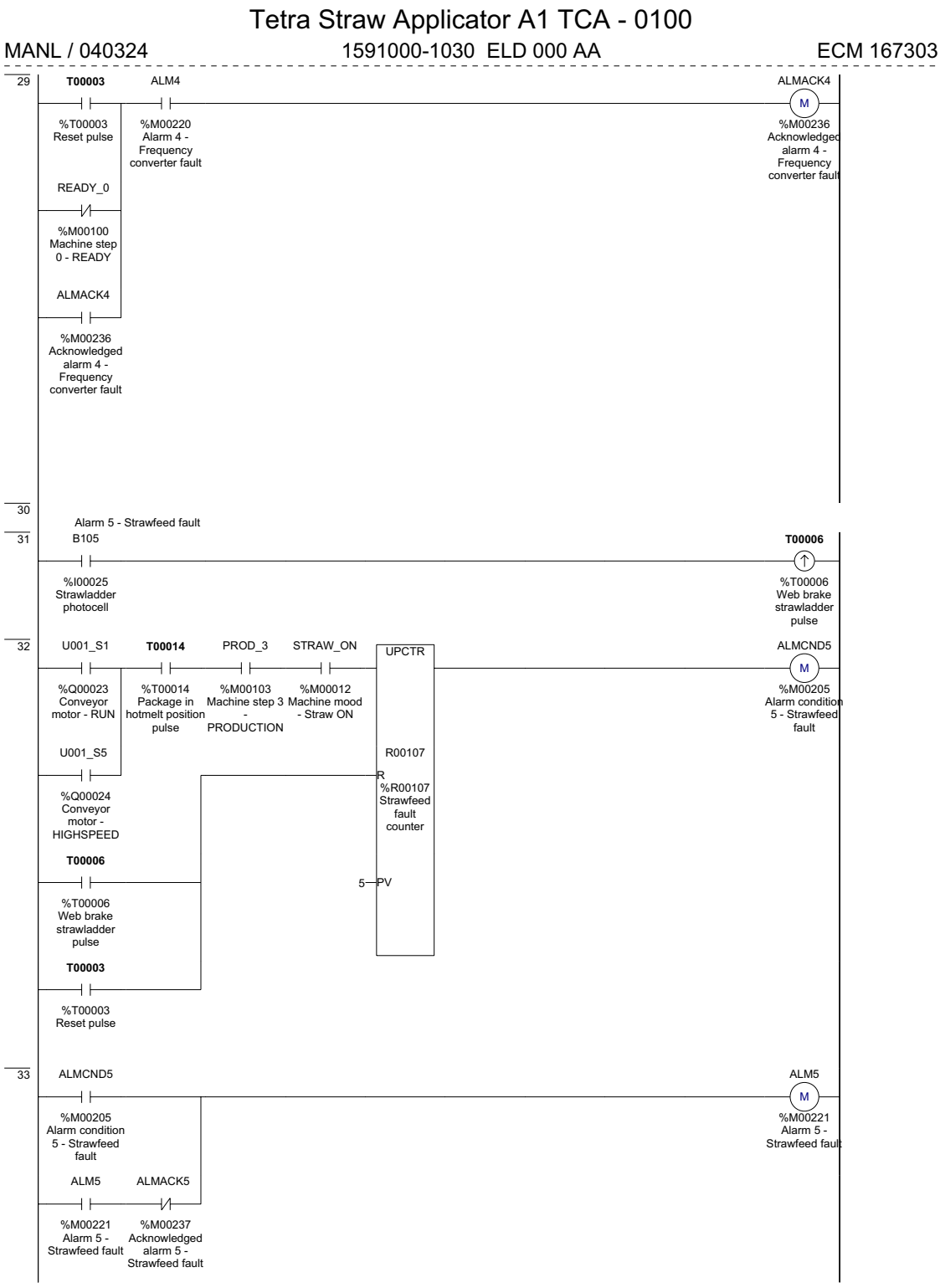

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Tetra Straw Applicator A1 TCA - 0100

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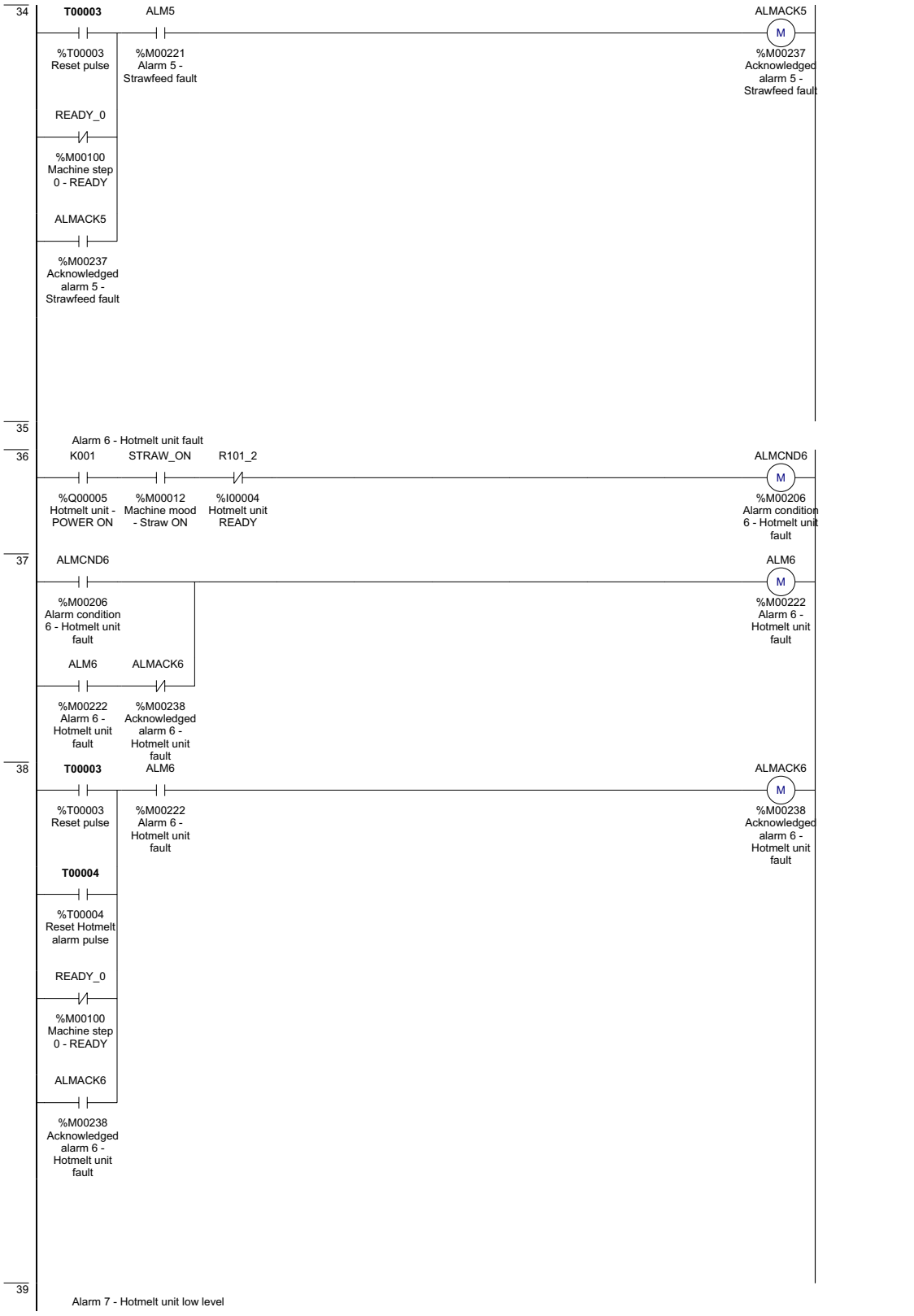

Block: ALARM

Project: 1591000-1000 Target: A1591000_1000 Page: 9

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Tetra Straw Applicator A1 TCA - 0100

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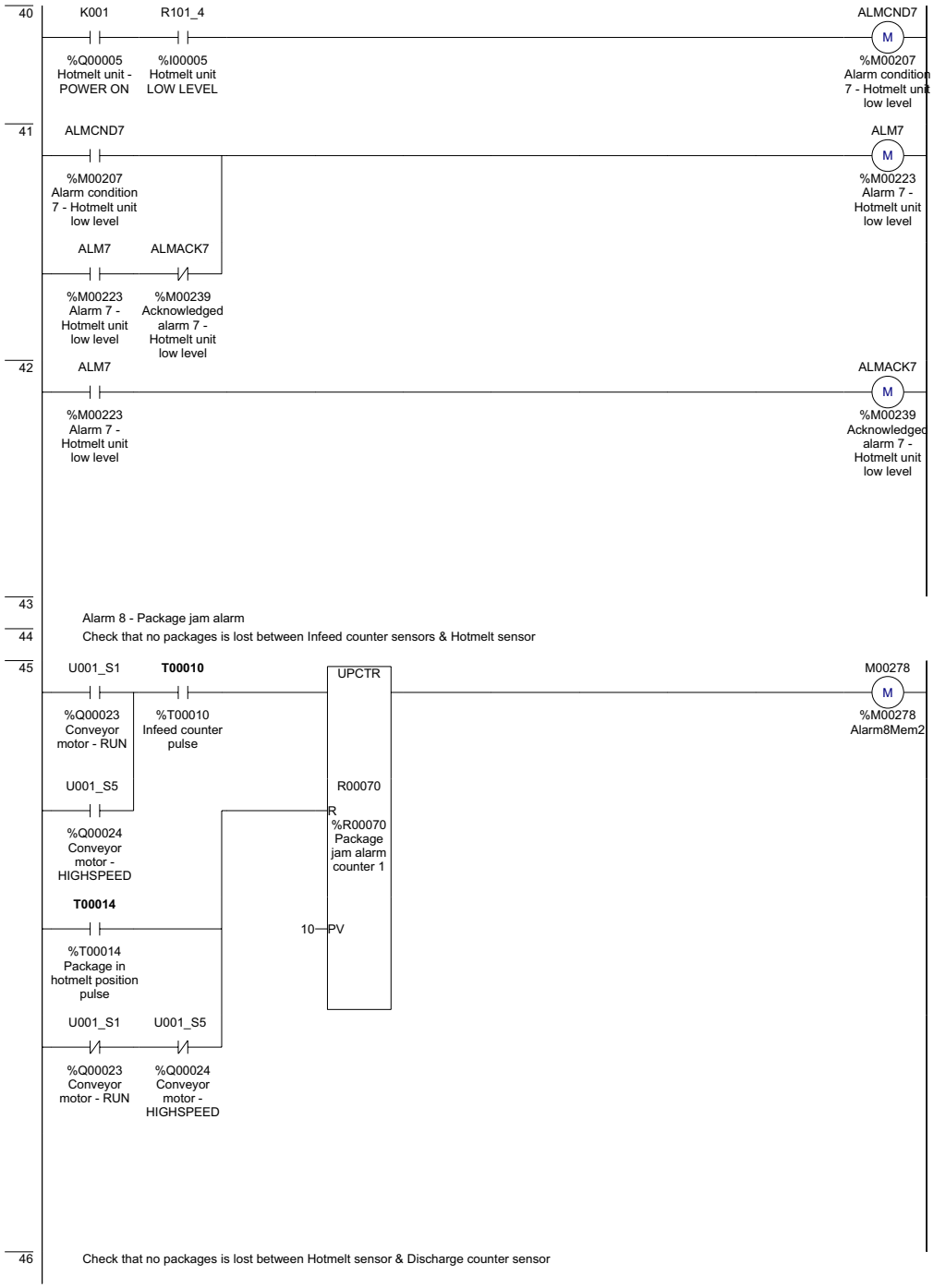

Block: ALARM

Project: 1591000-1000 Target: A1591000_1000 Page: 10

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Tetra Straw Applicator A1 TCA - 0100

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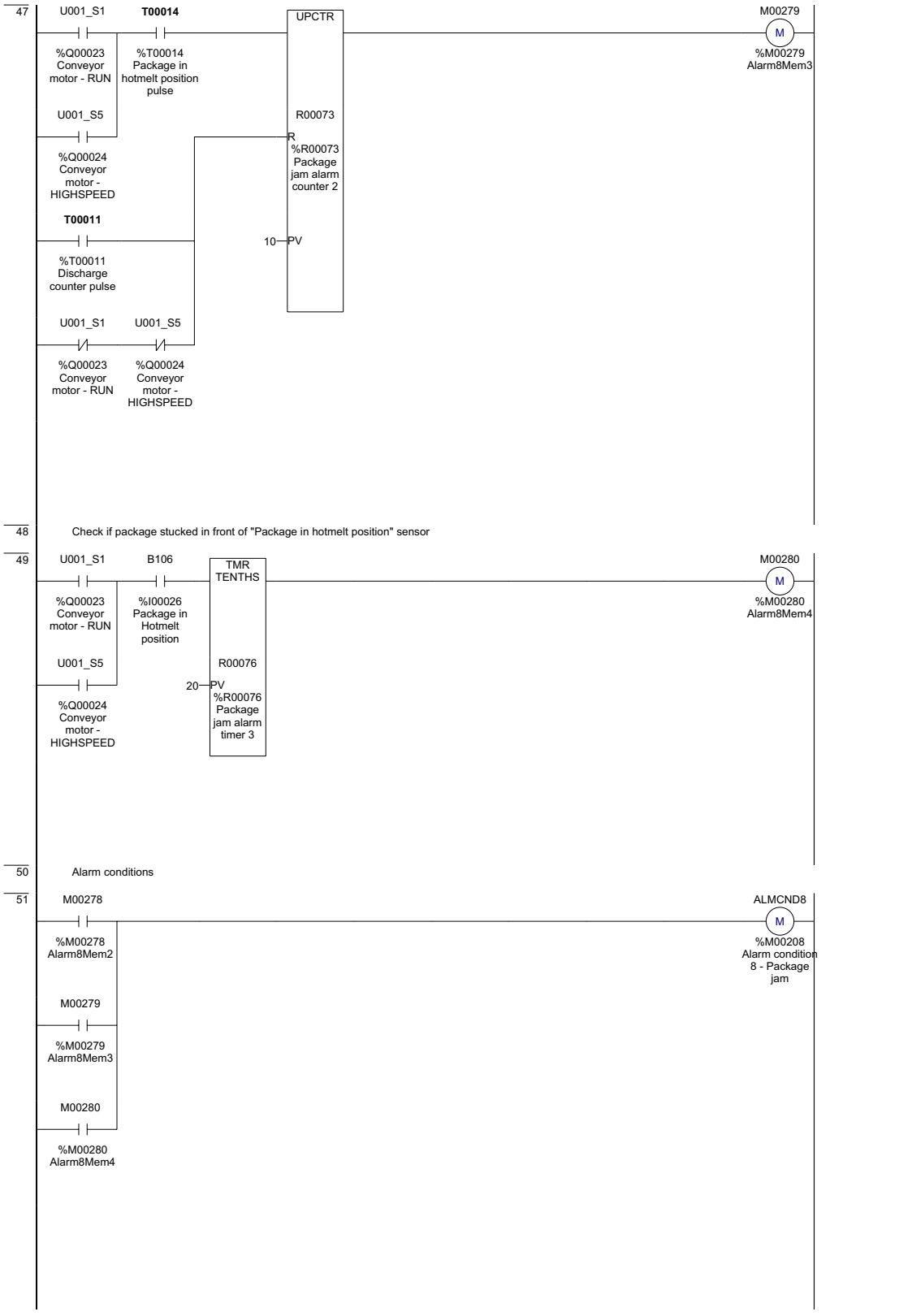

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Project: 1591000-1000 Target: A1591000_1000 Page: 11

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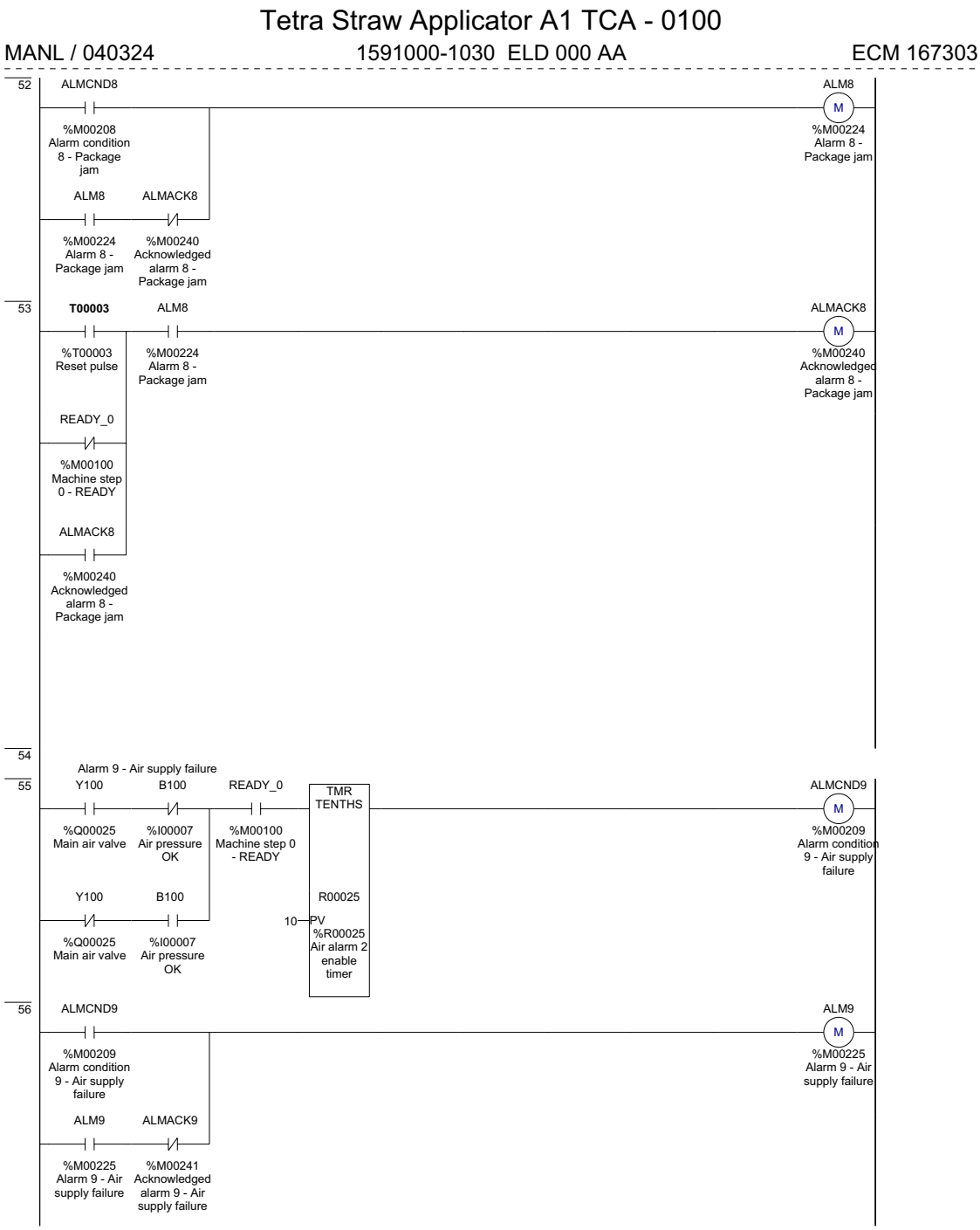

Block: ALARM
Project: 1591000-1000 Target: A1591000_1000 Page: 12

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Tetra Straw Applicator A1 TCA - 0100

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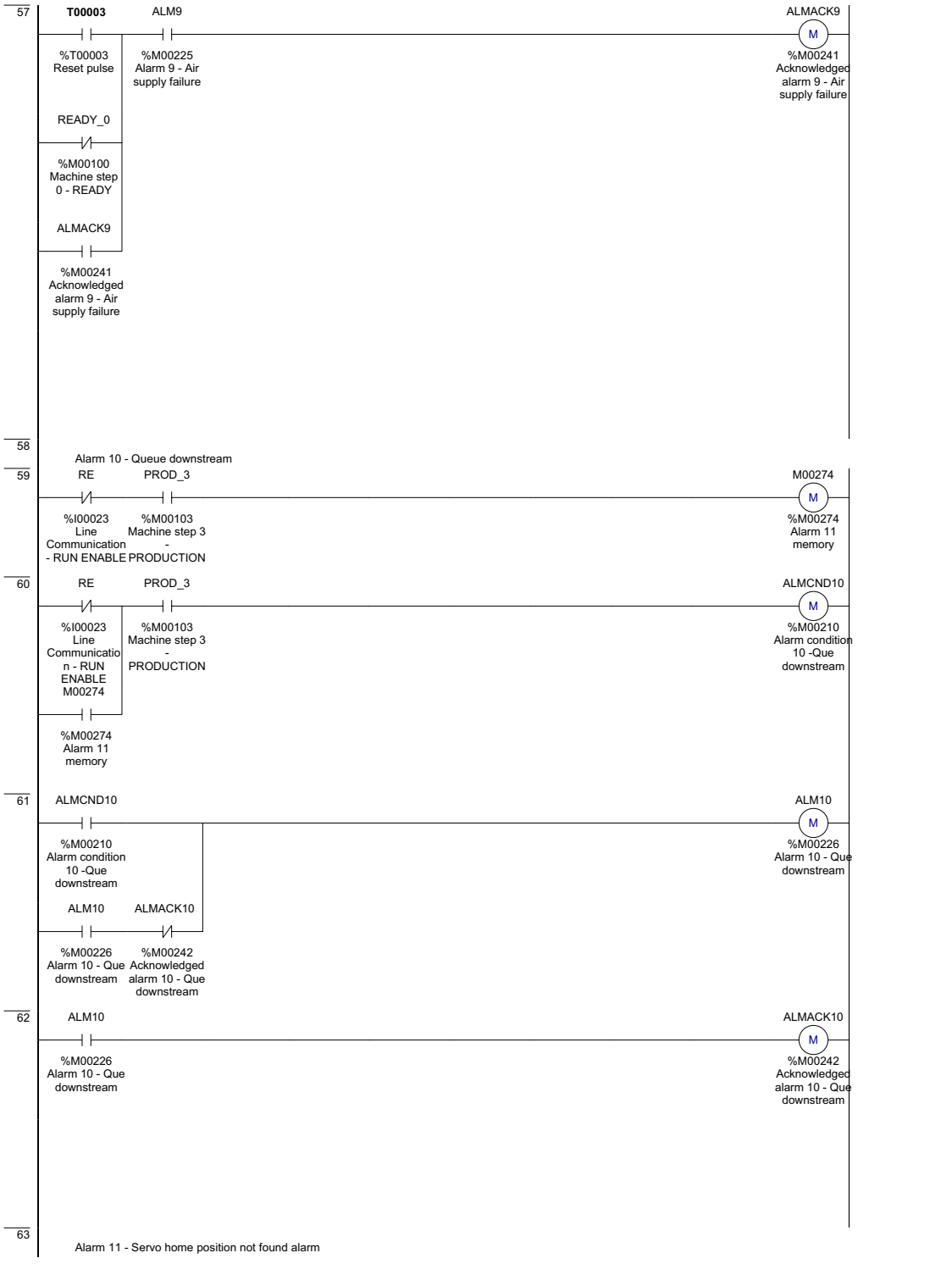

Block: ALARM

Project: 1591000-1000 Target: A1591000_1000 Page: 13

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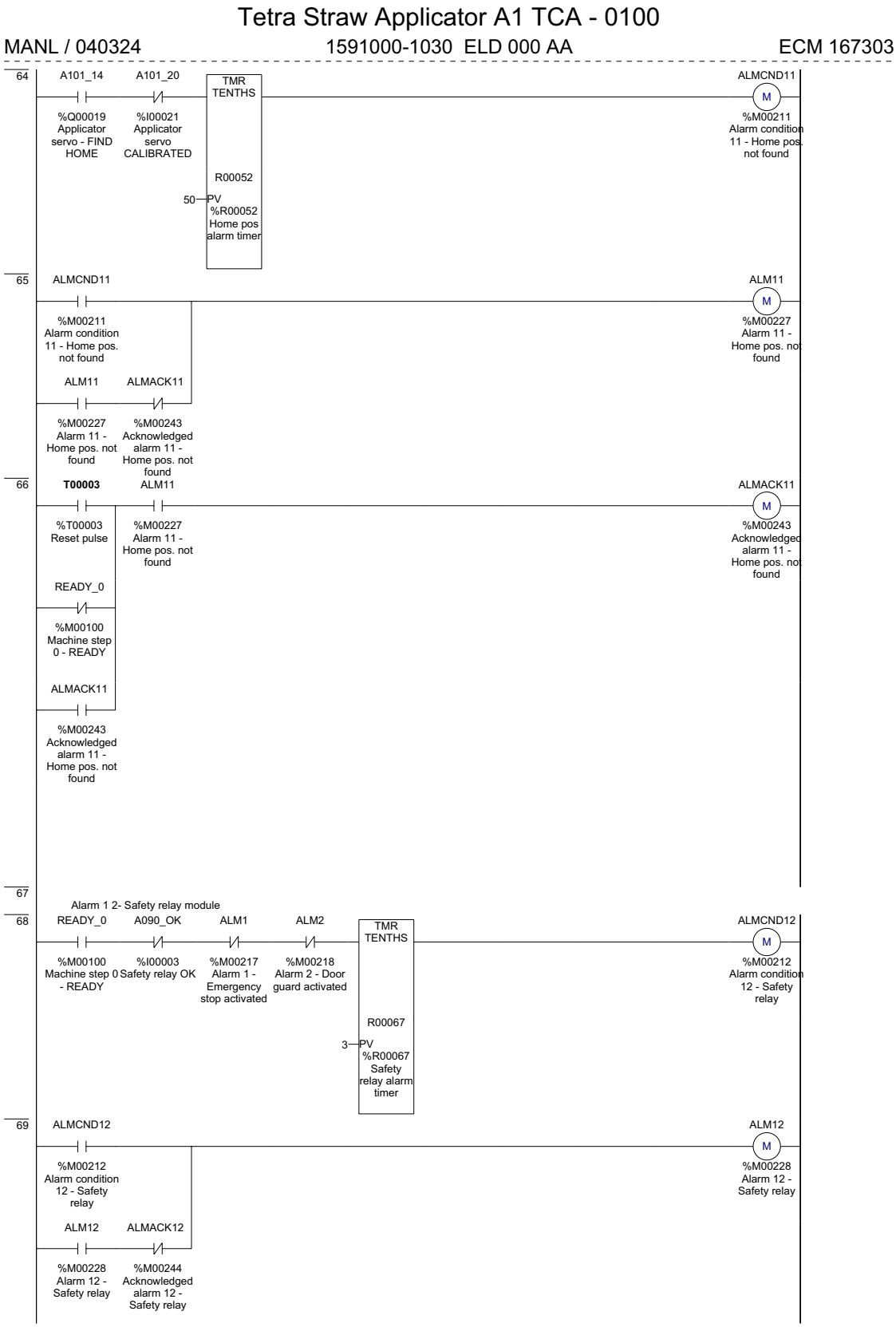

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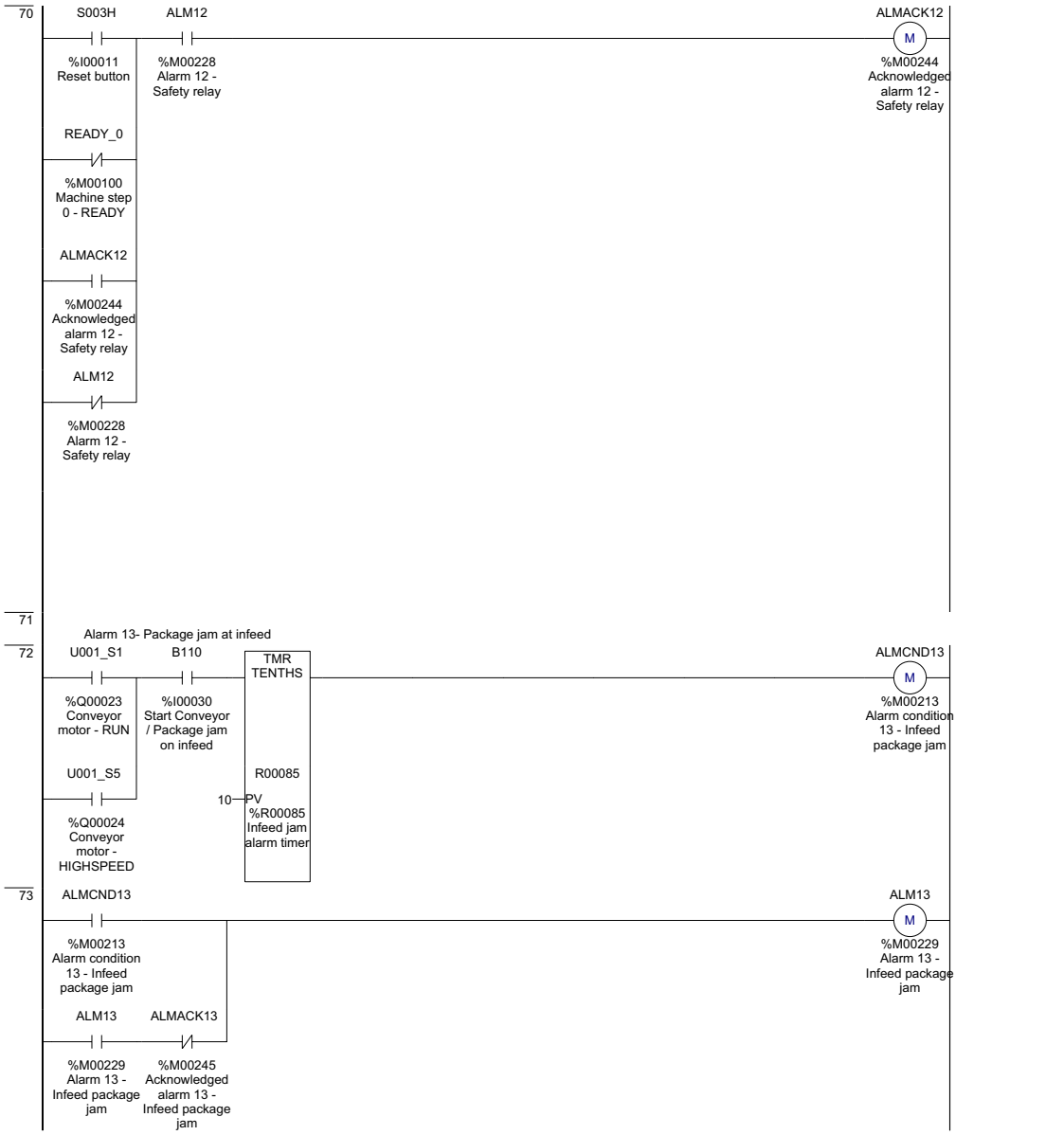

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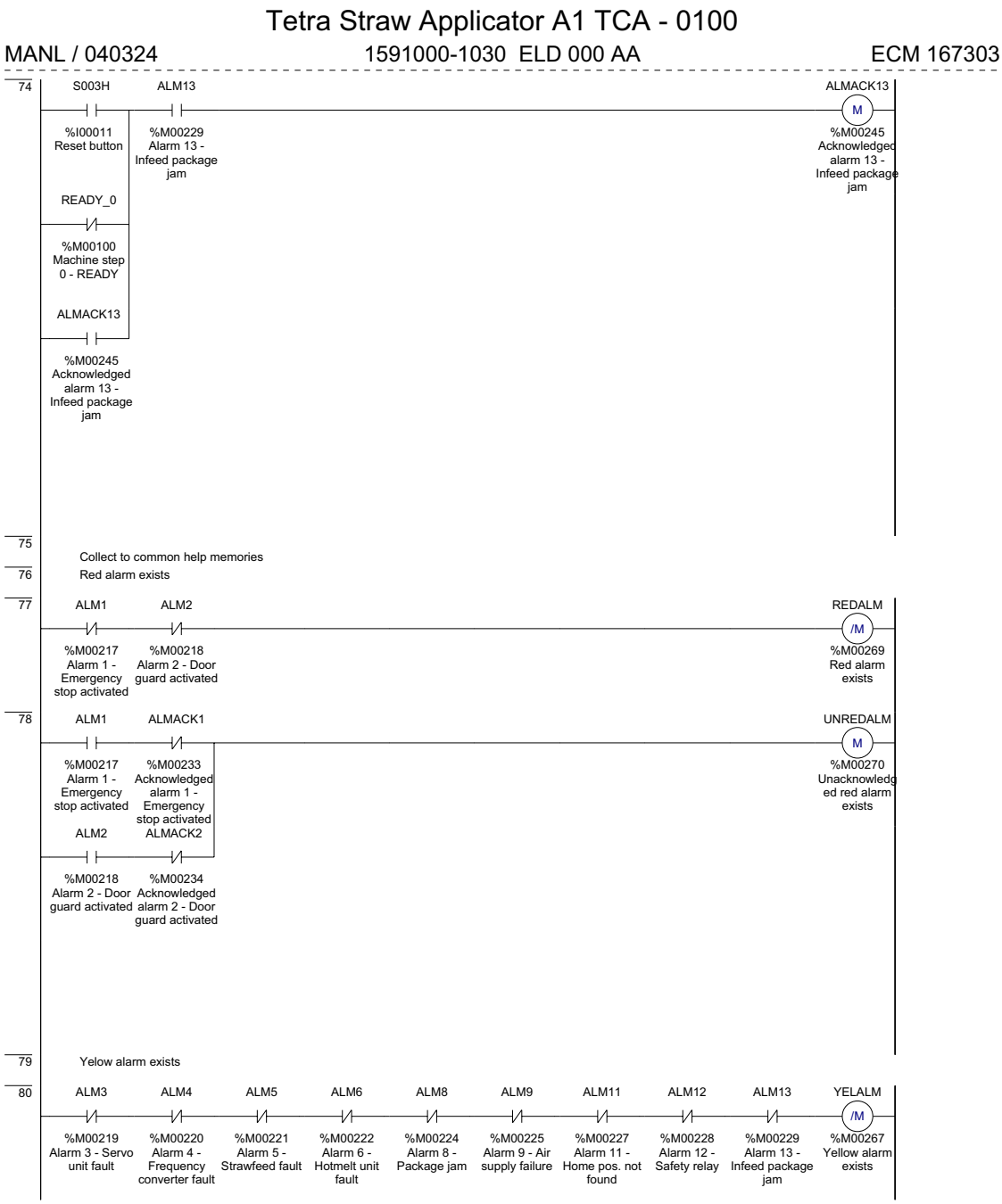

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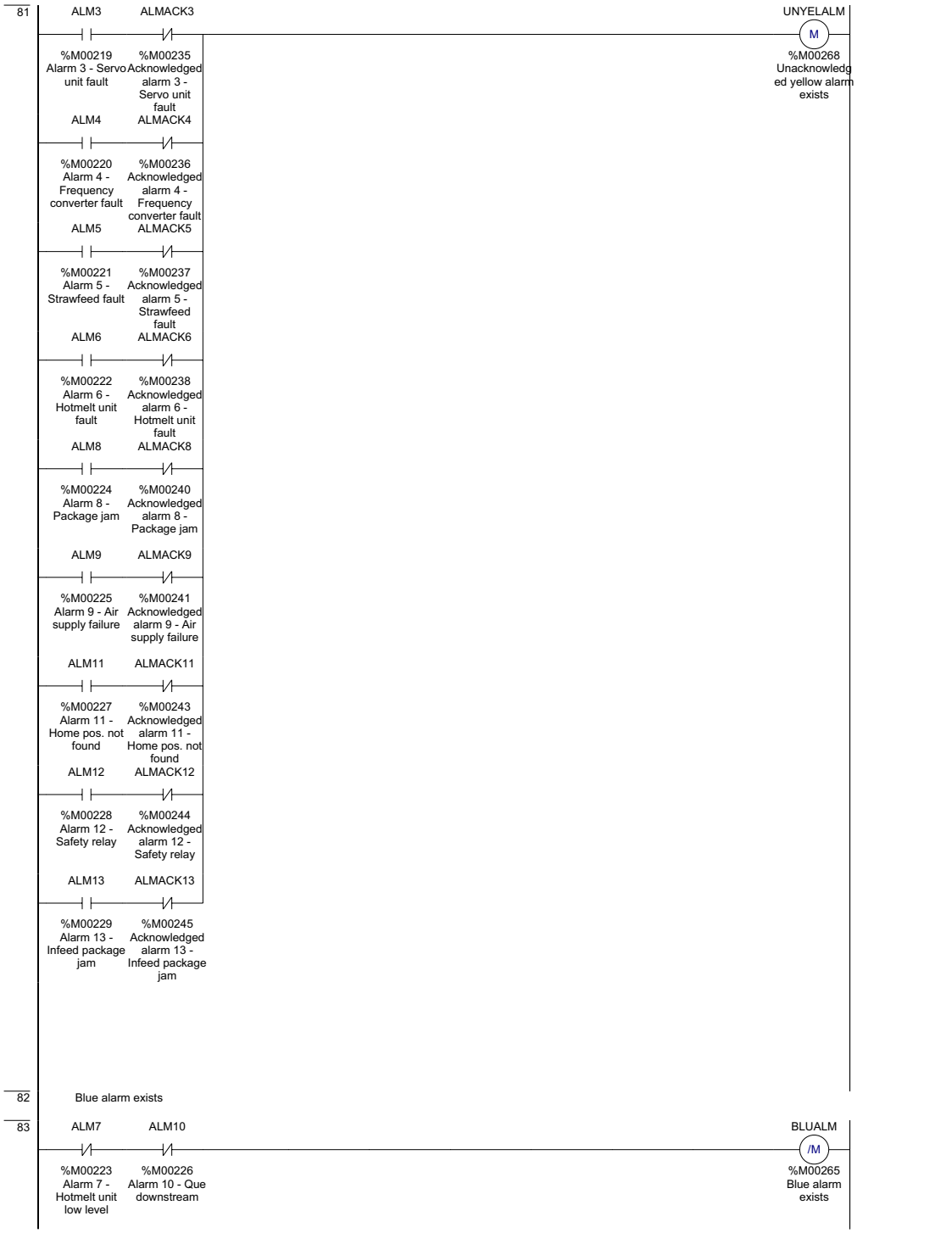
Tetra Straw Applicator A1 TCA - 0100

MANL / 040324 1591000-1030 ELD 000 AA ECM 167303



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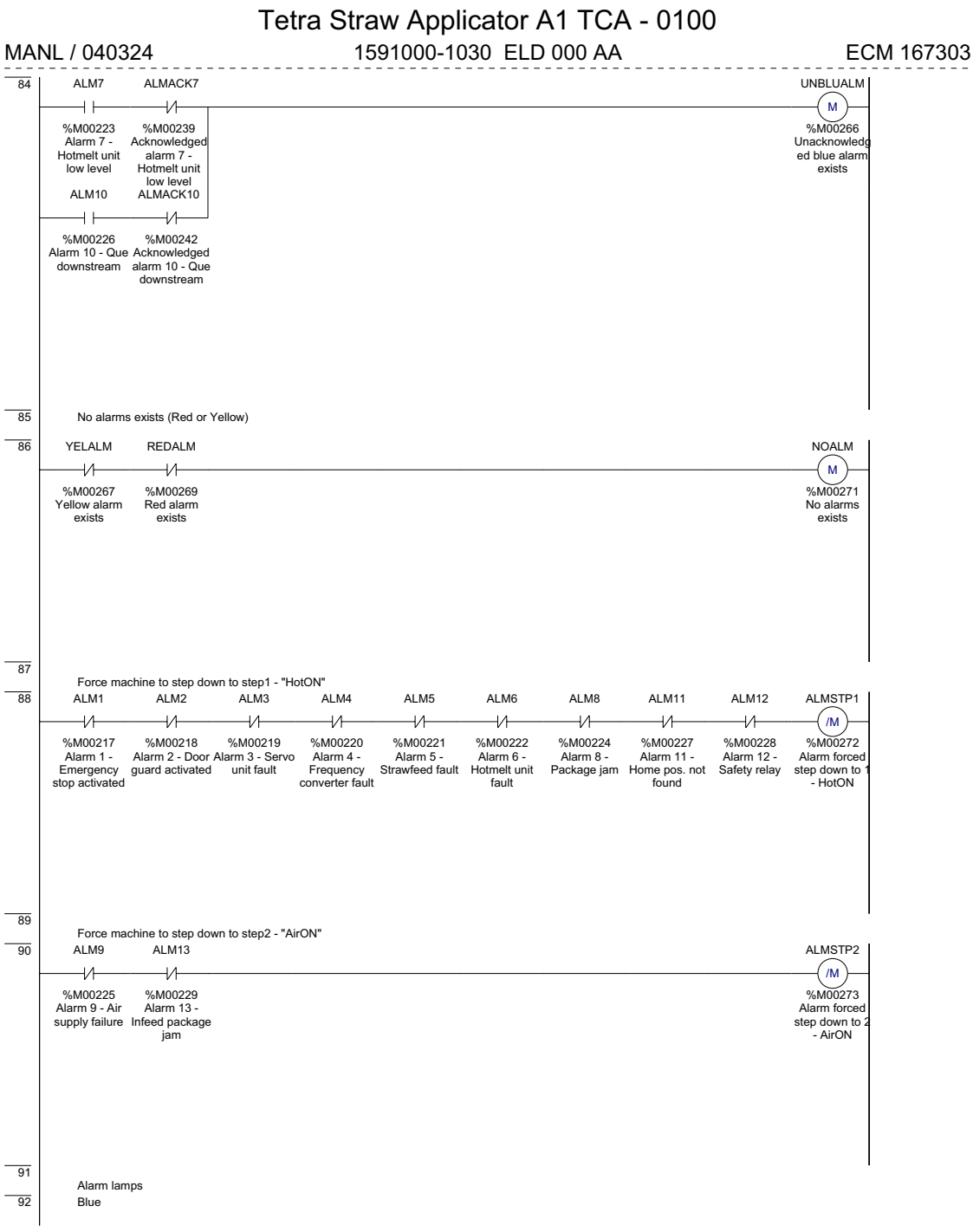

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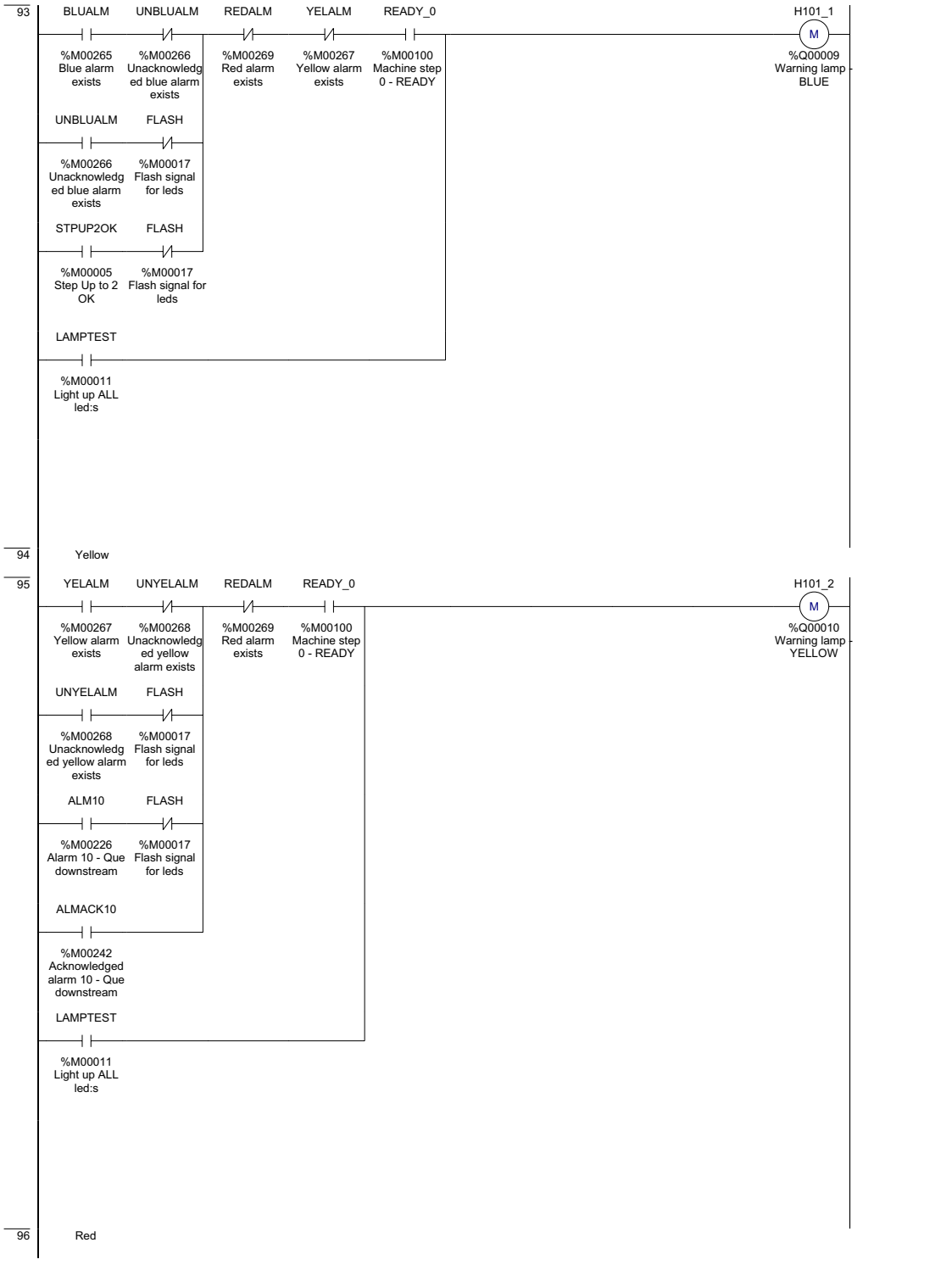

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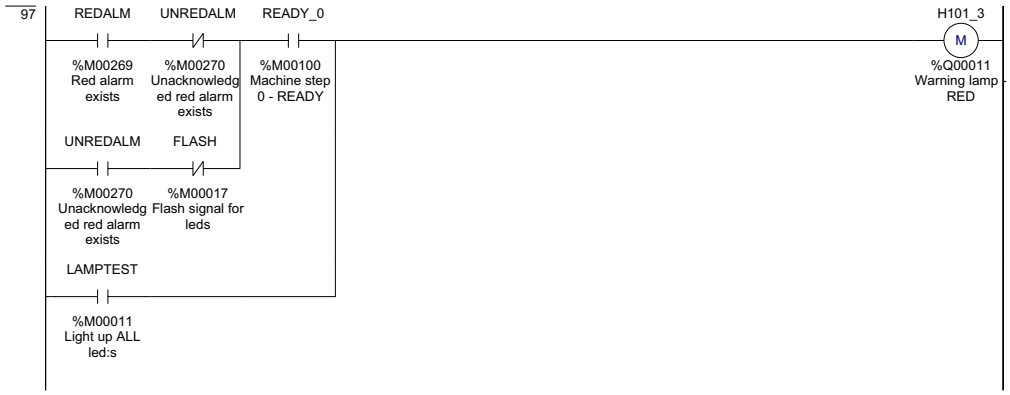

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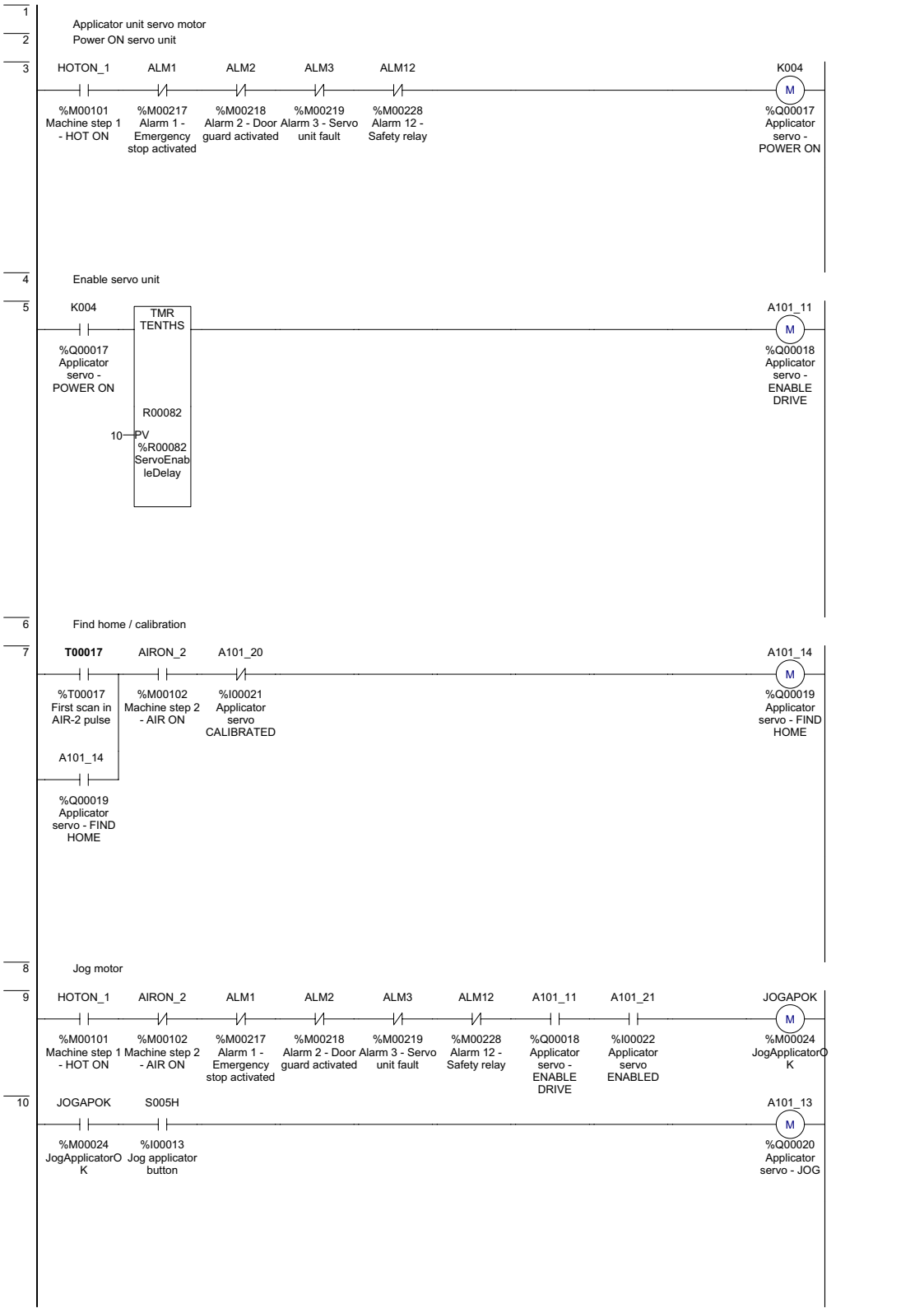

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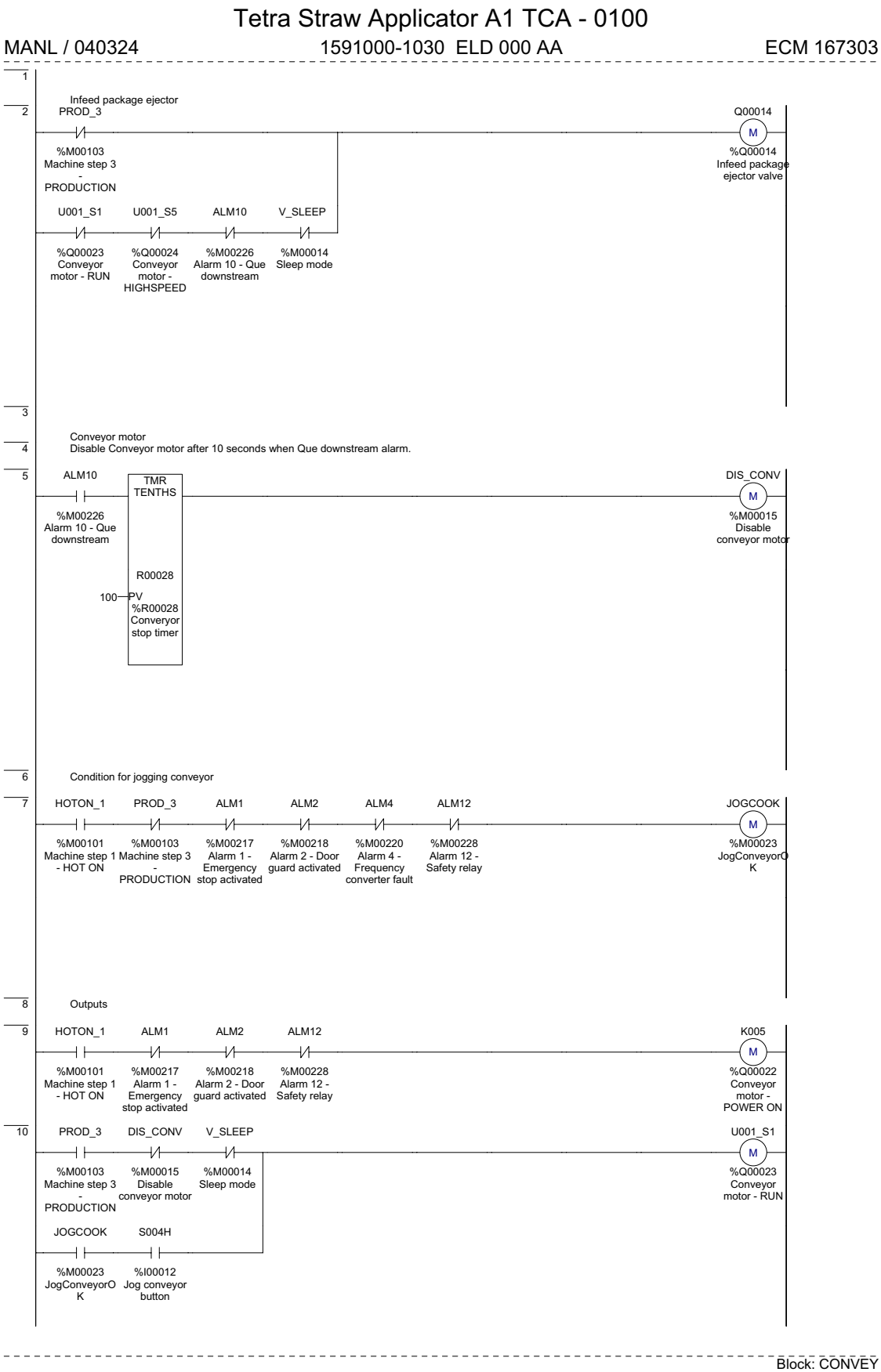

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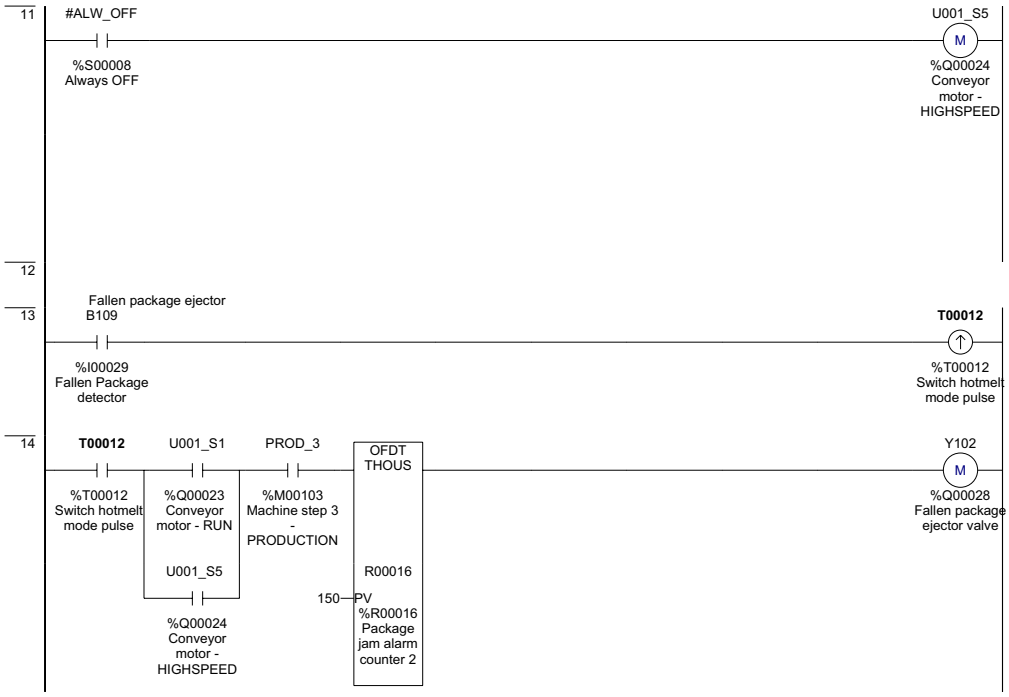

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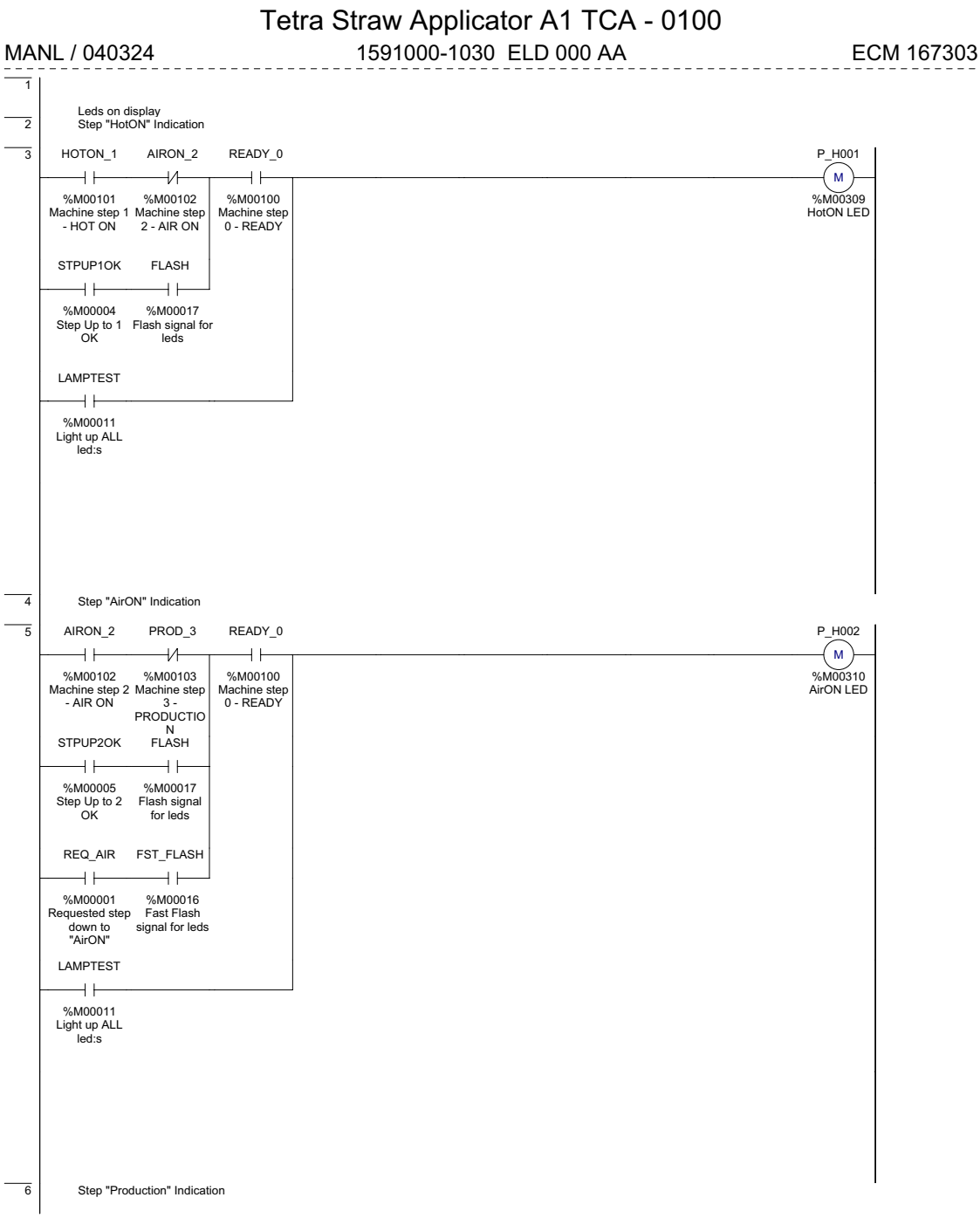

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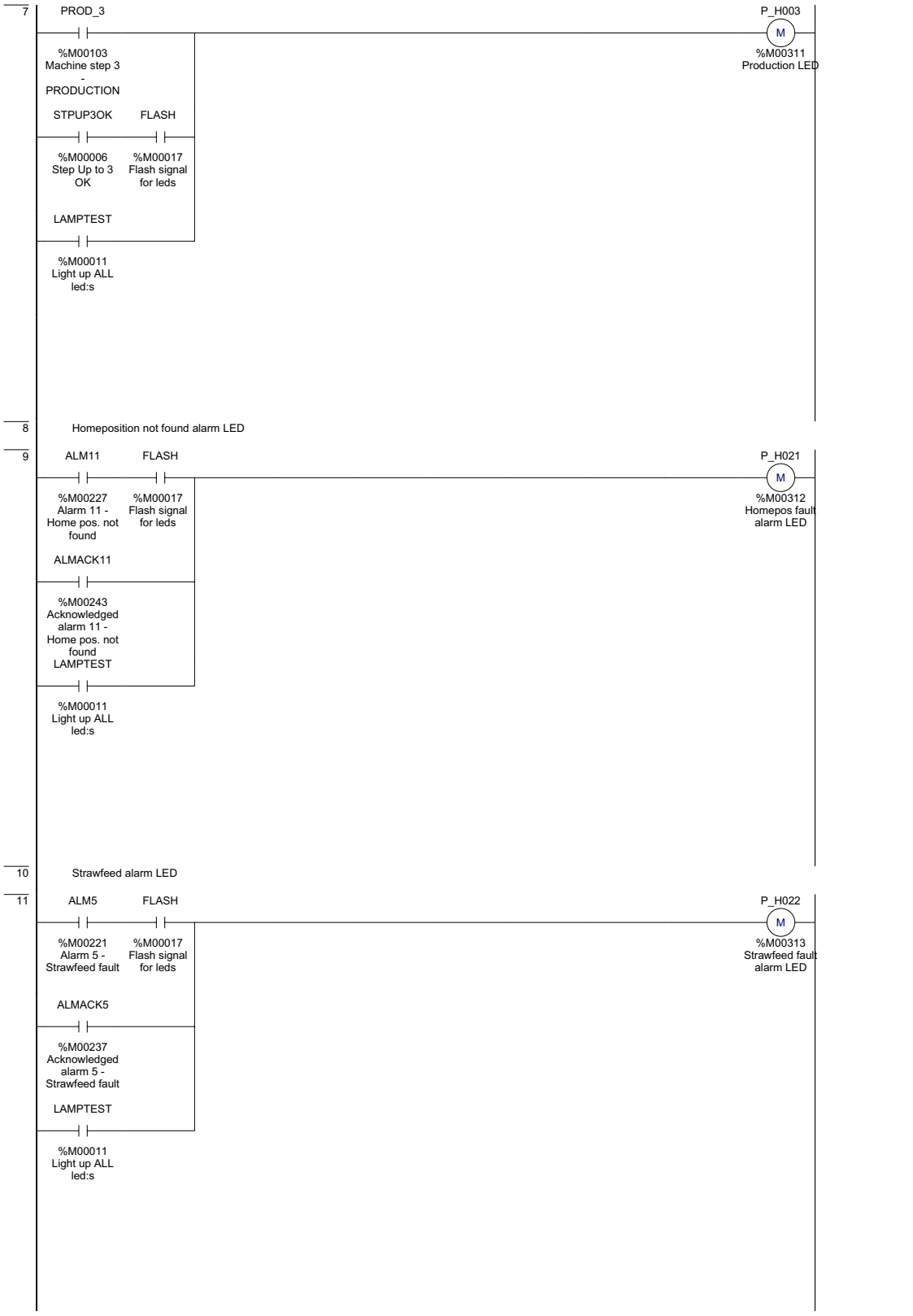

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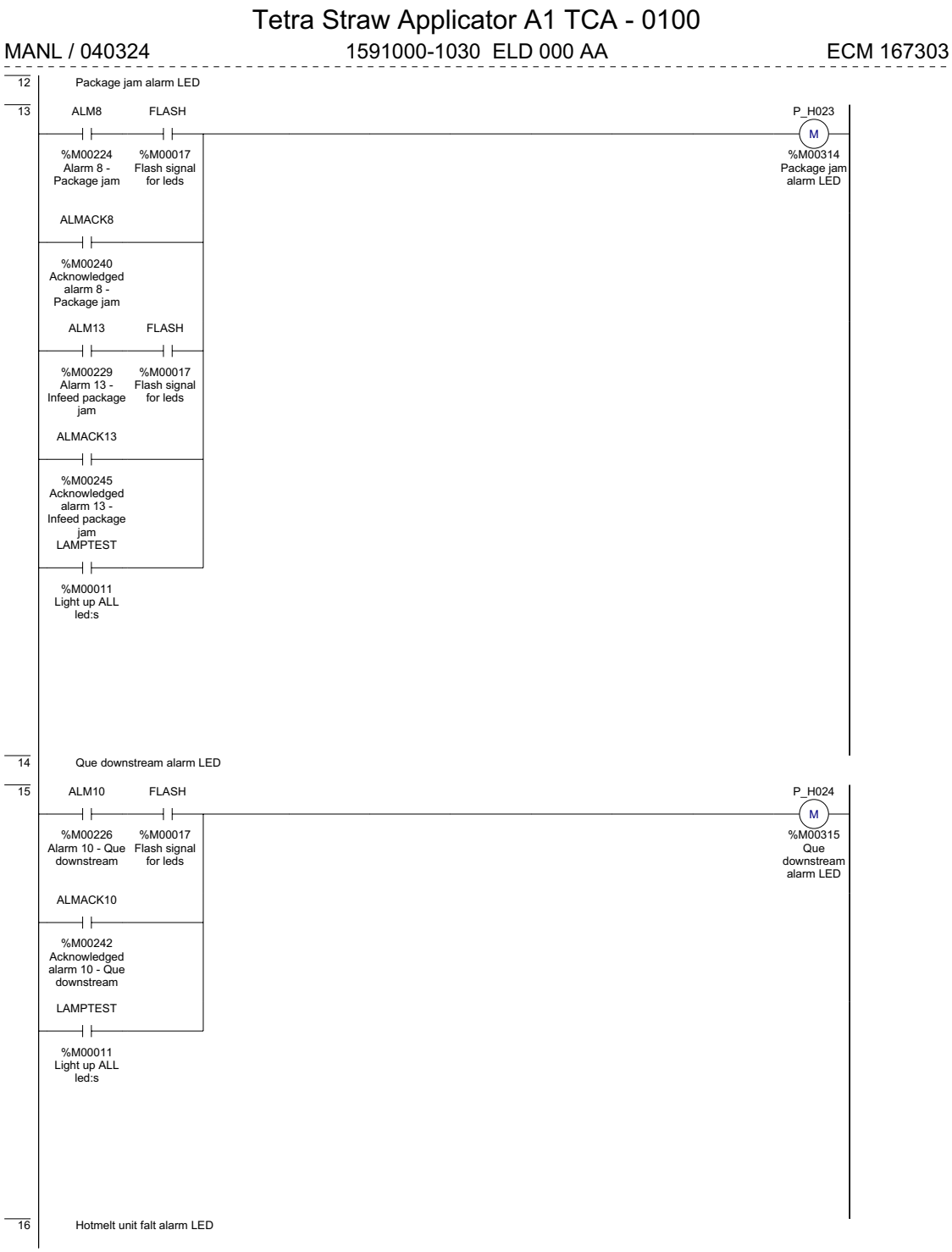

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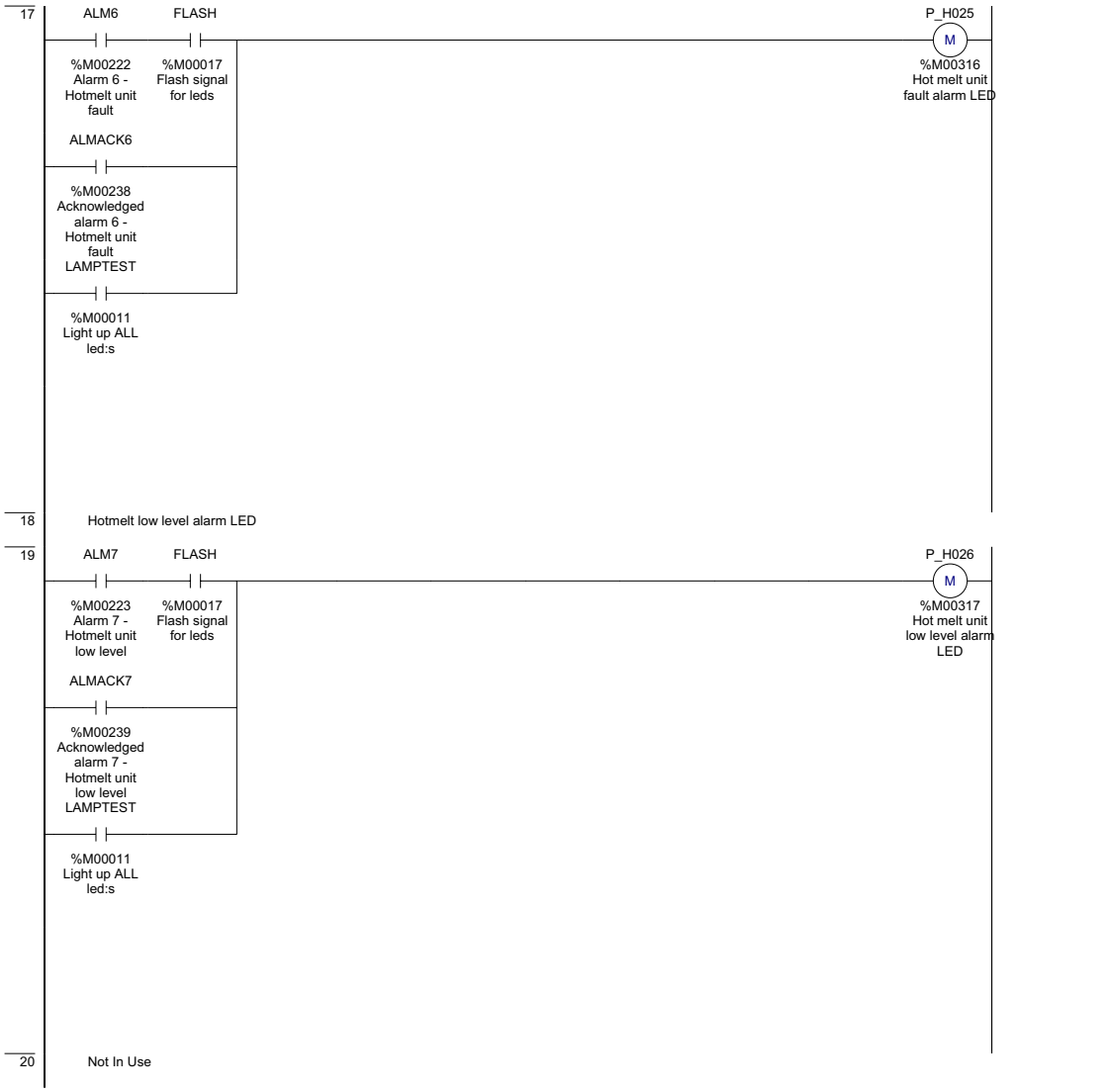

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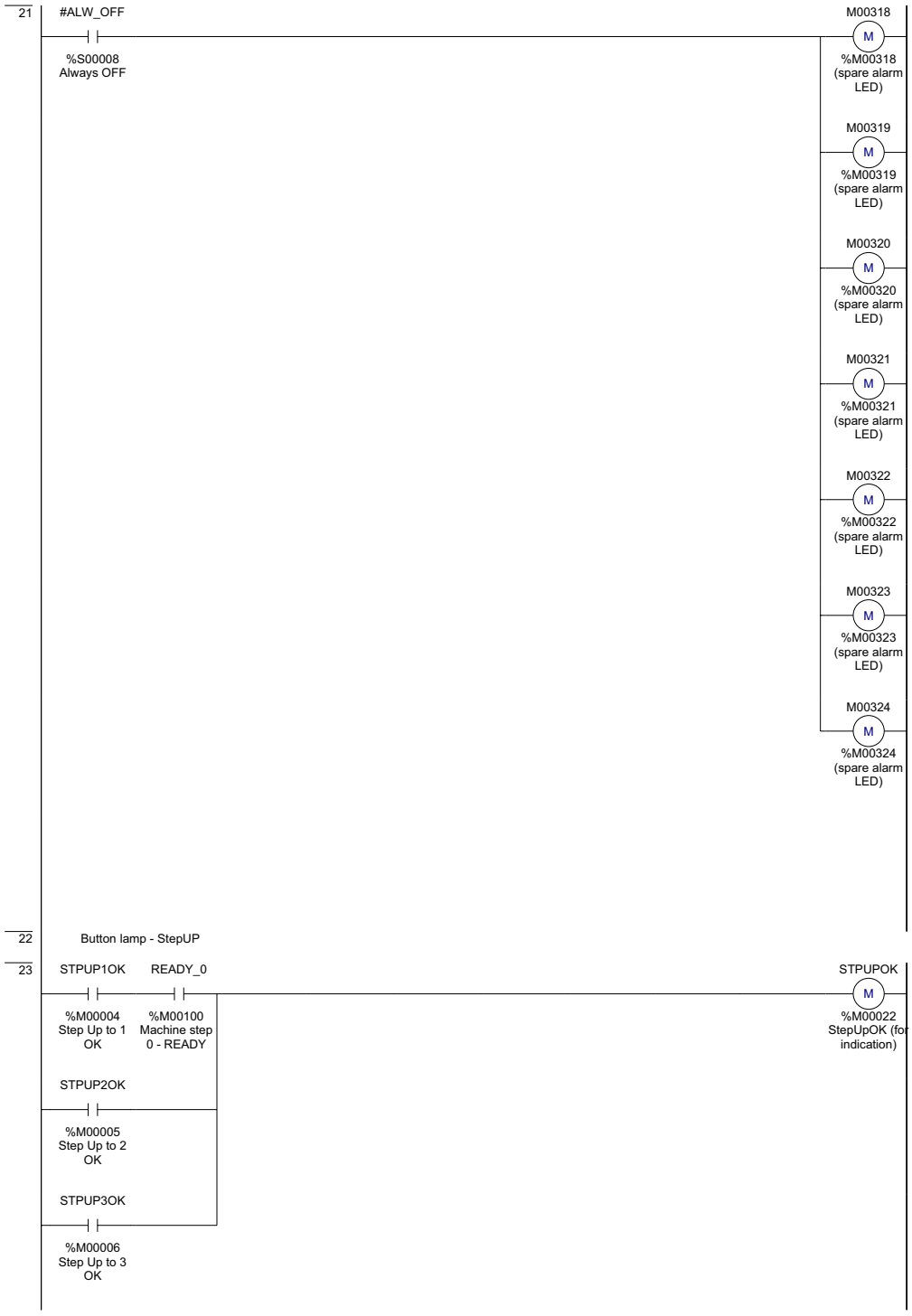

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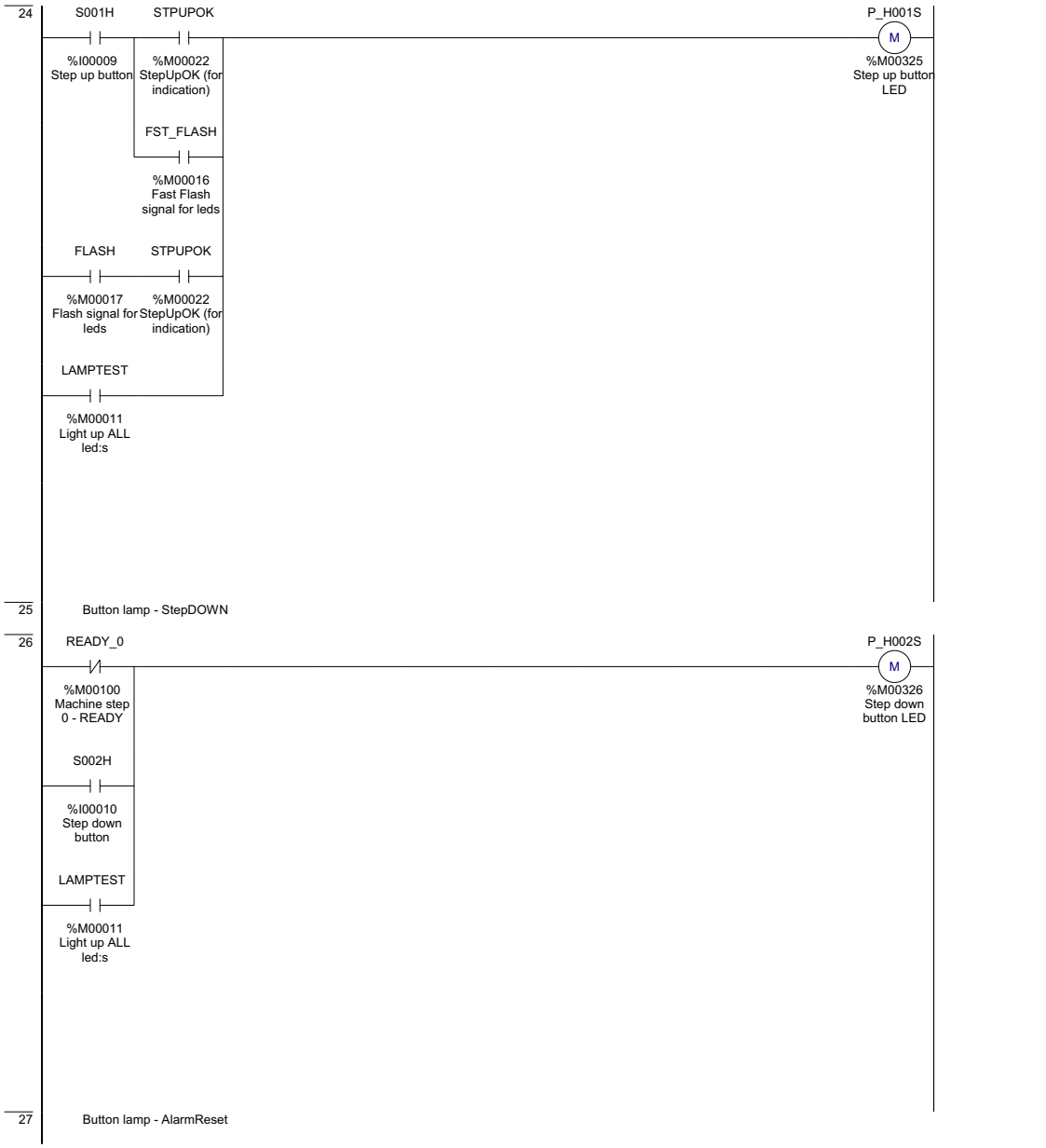

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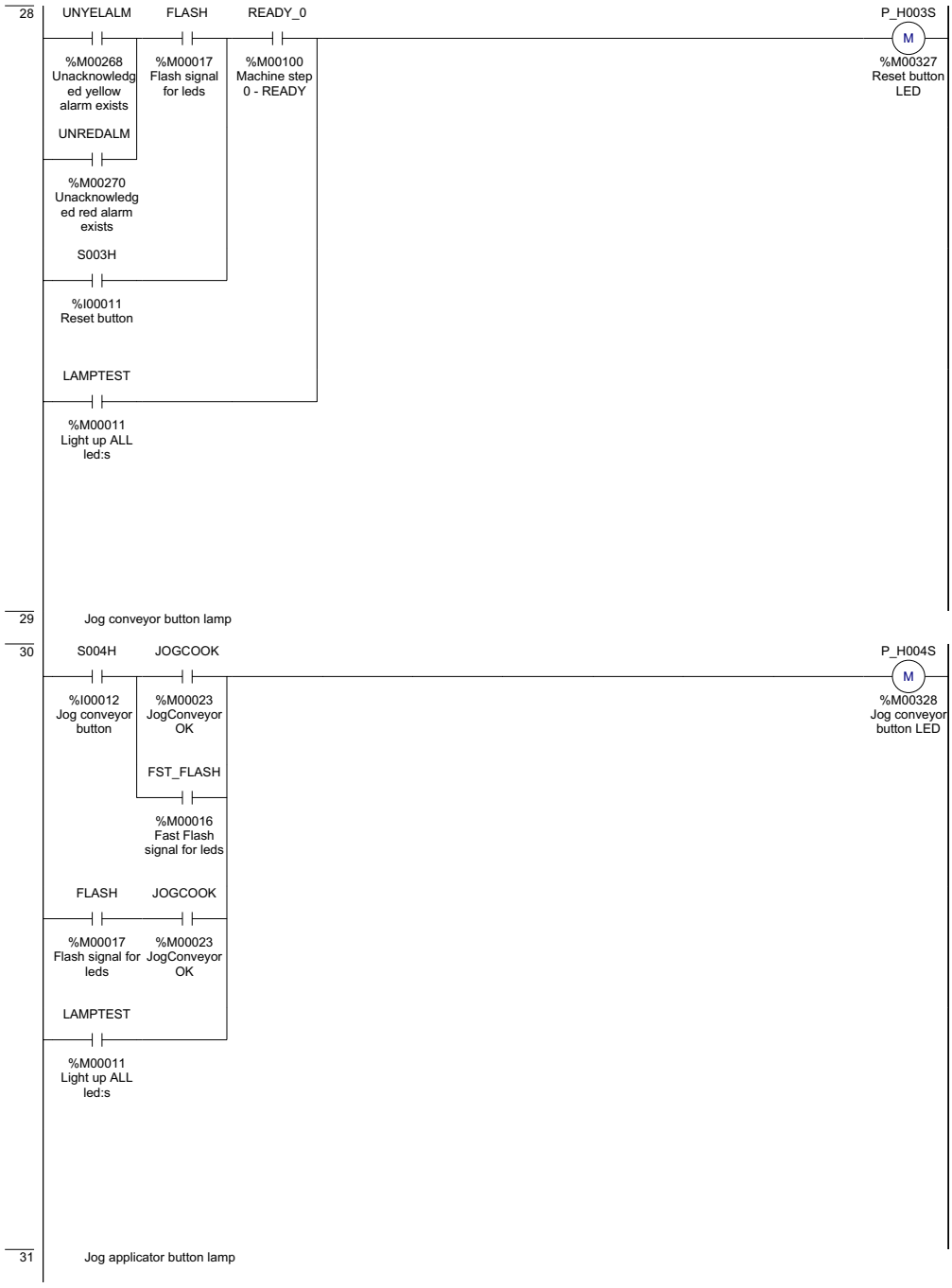

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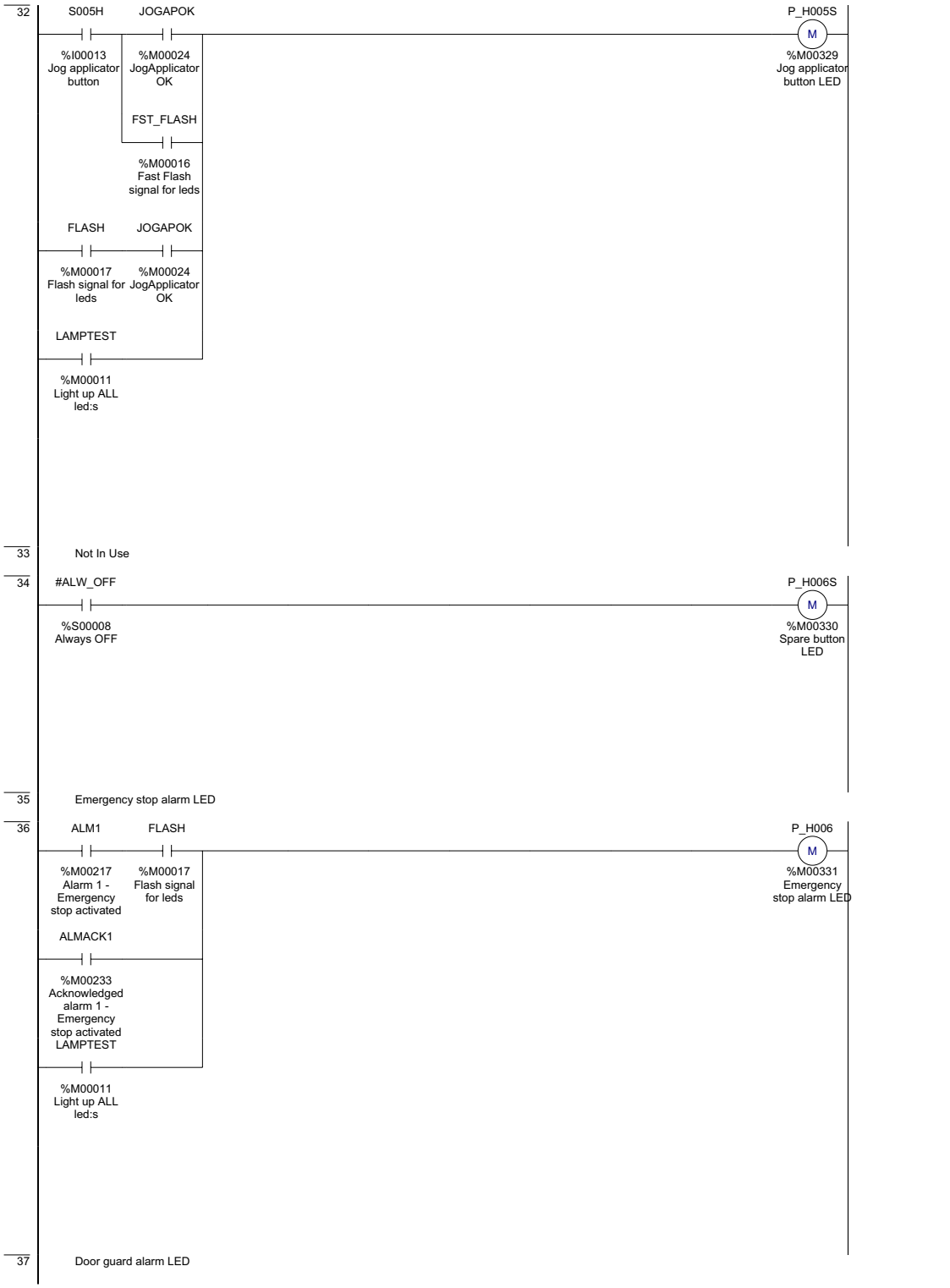

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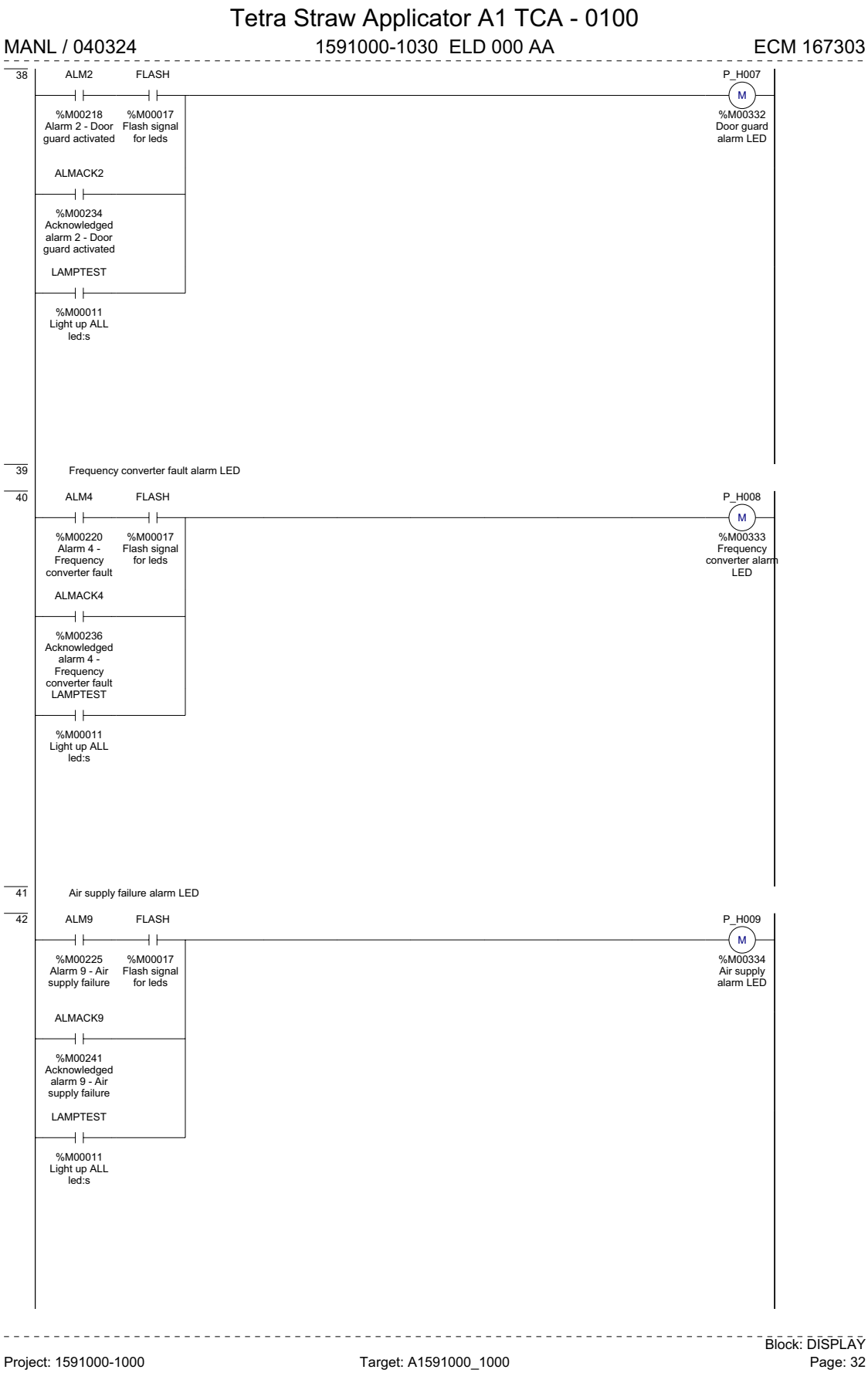

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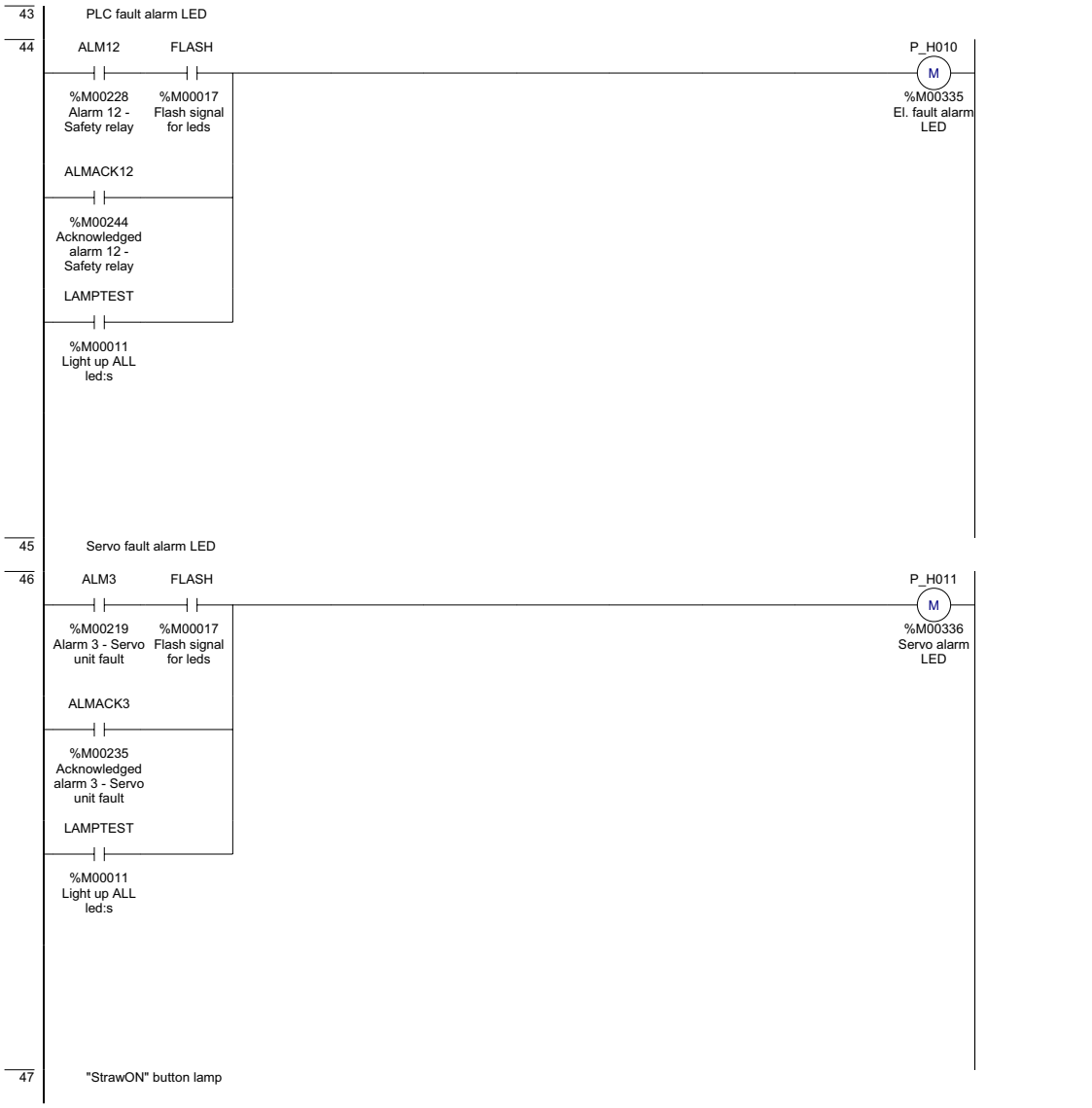

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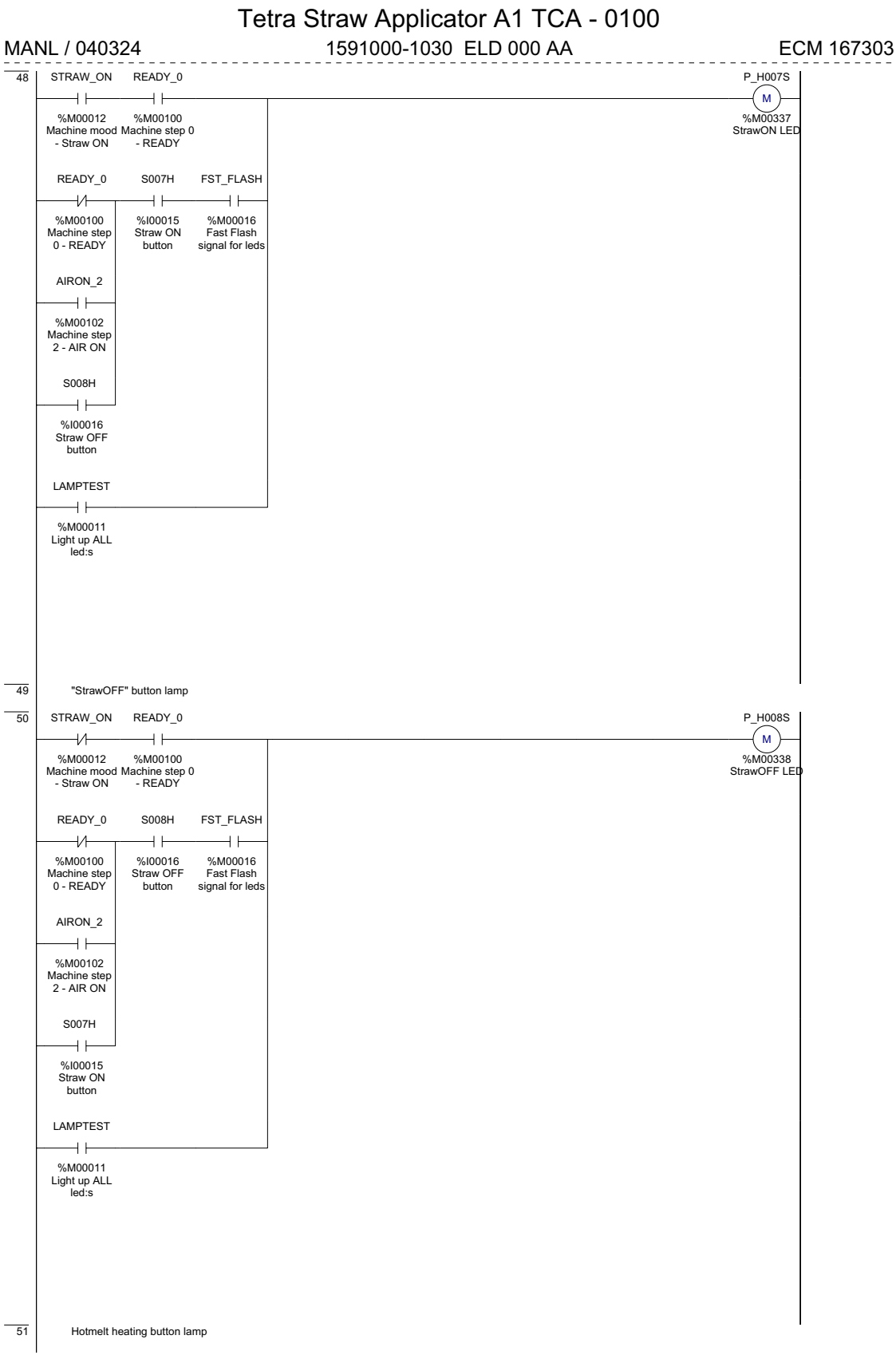

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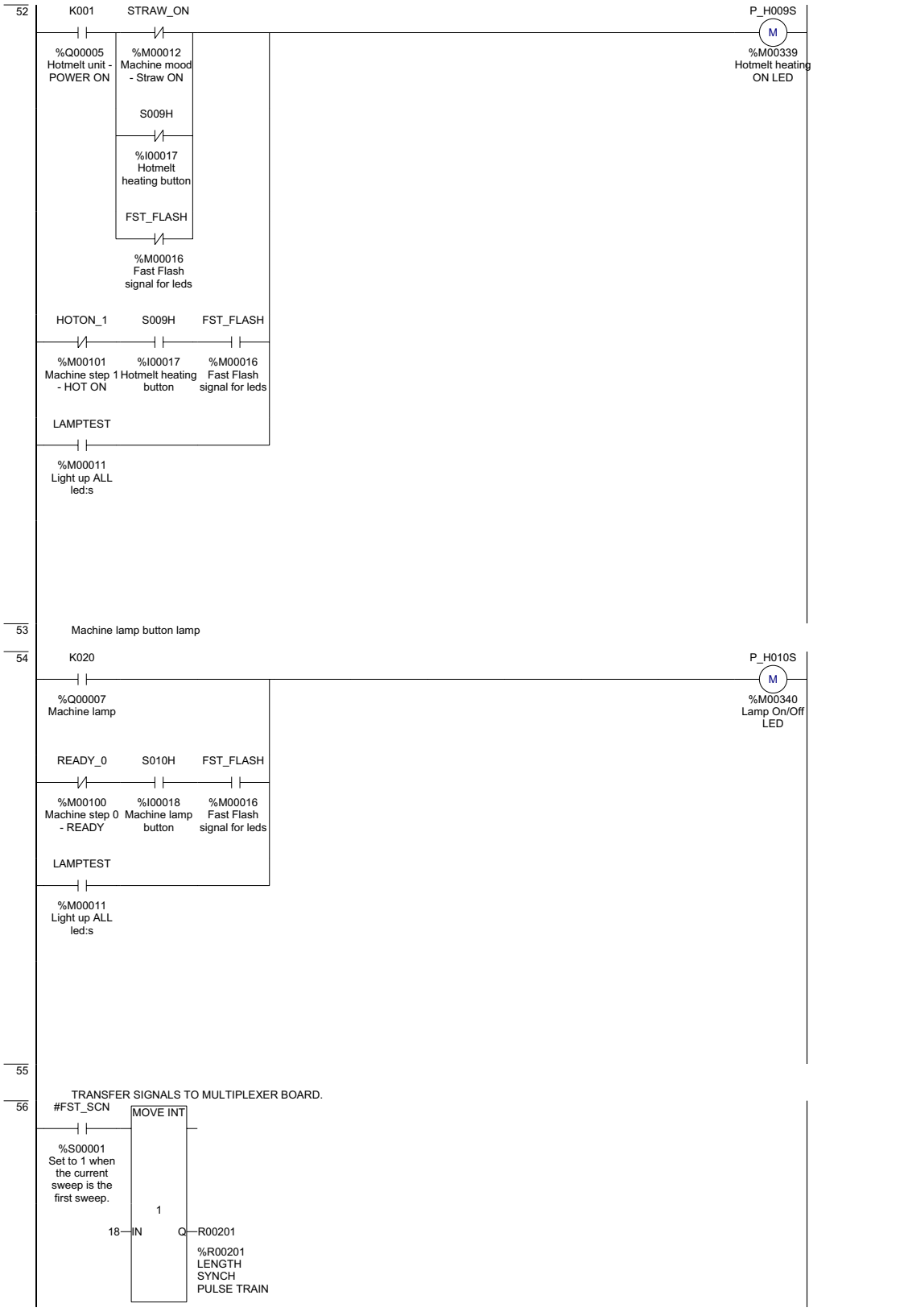

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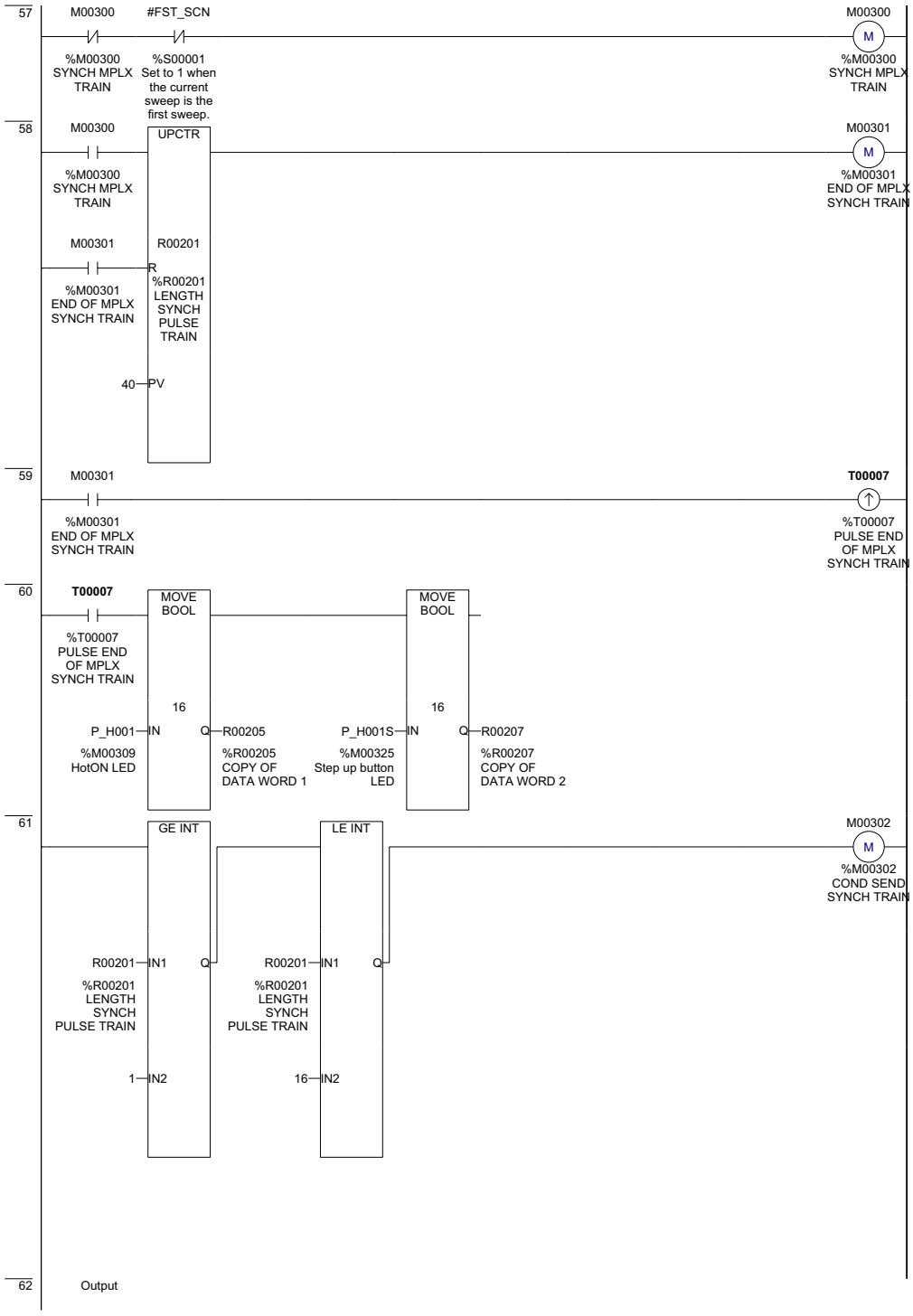

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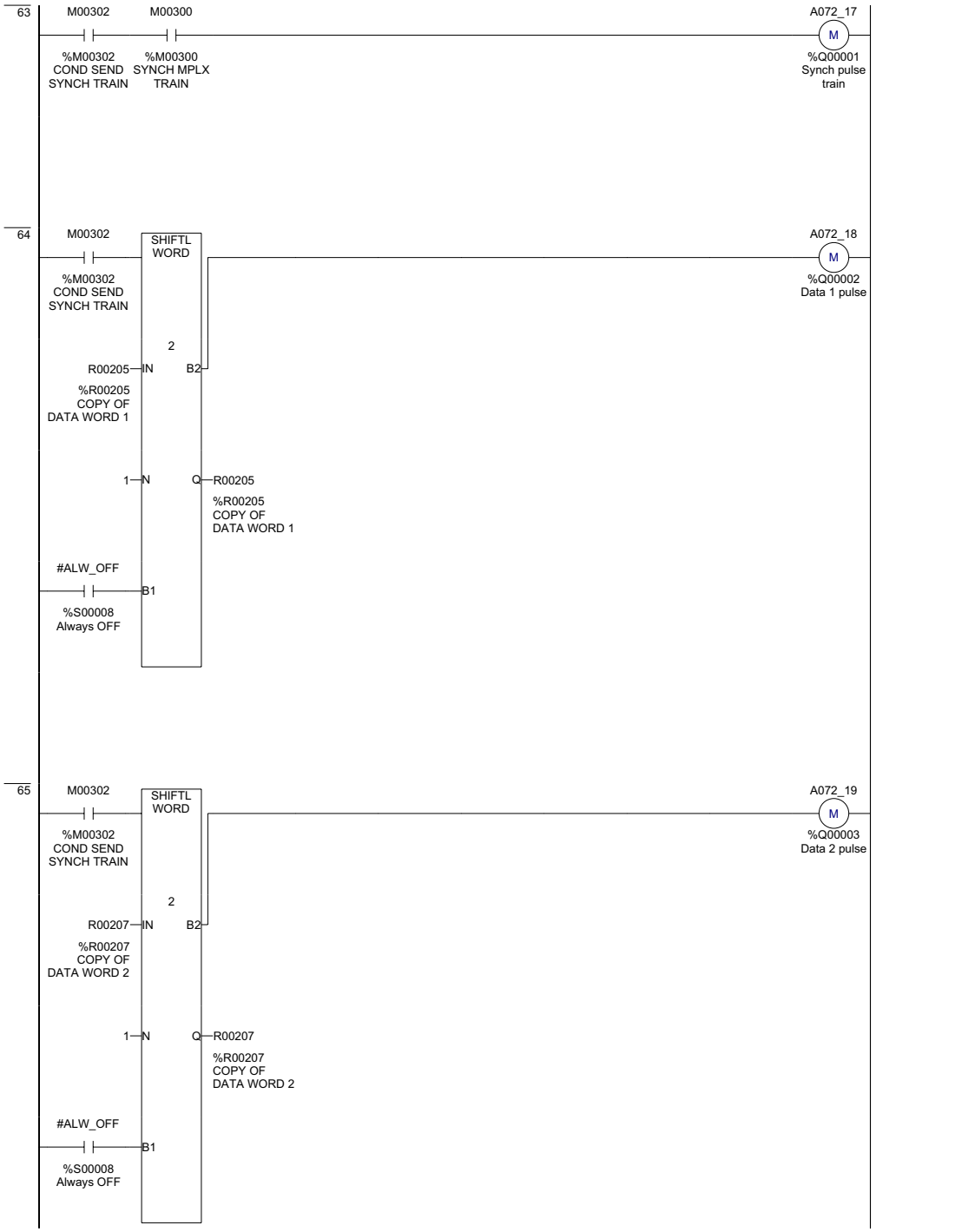

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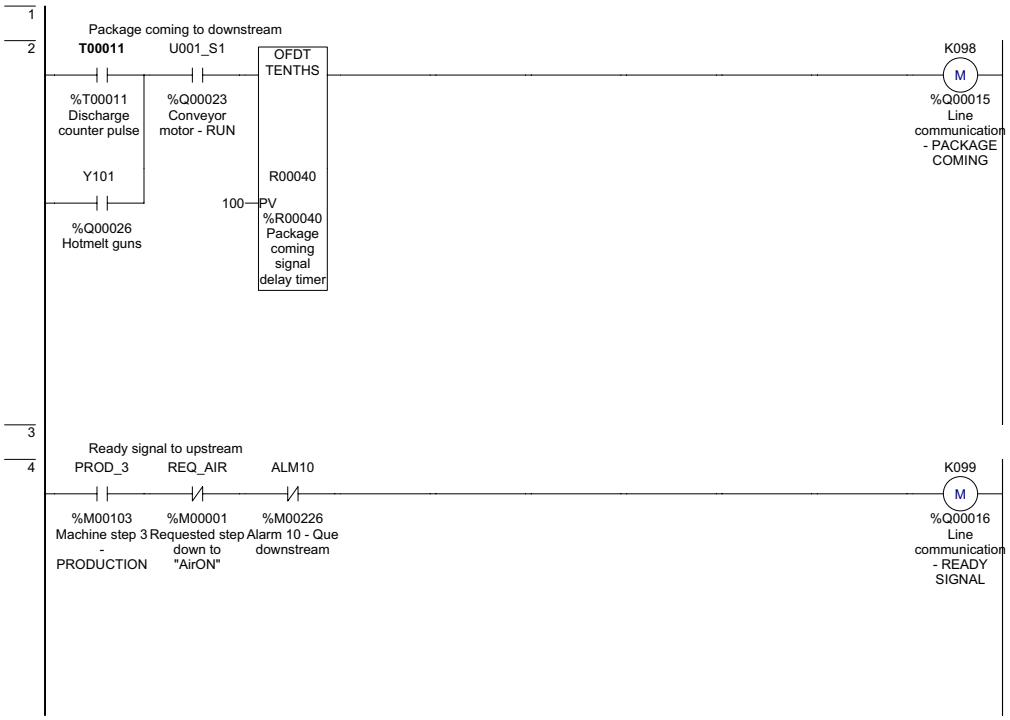

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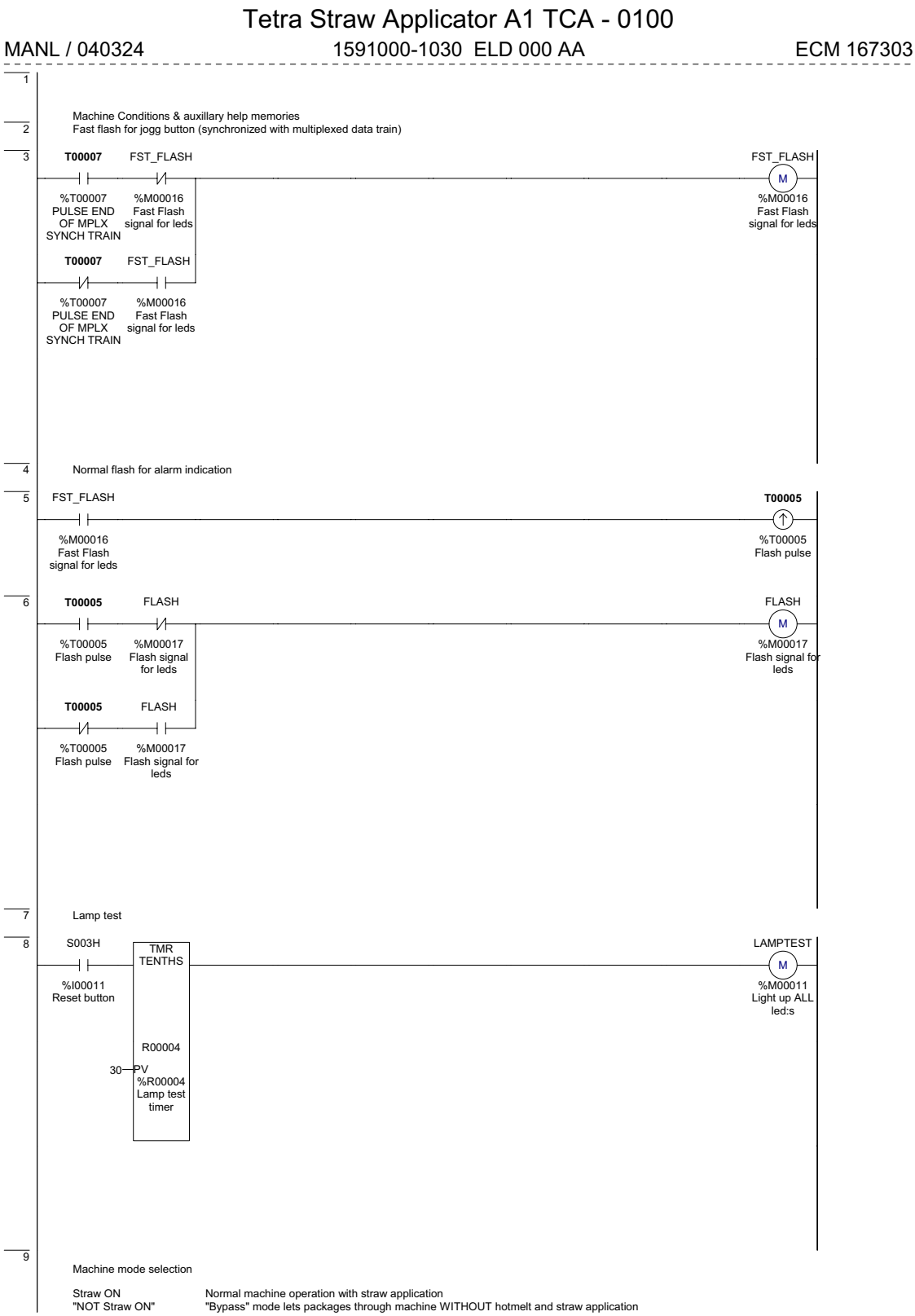

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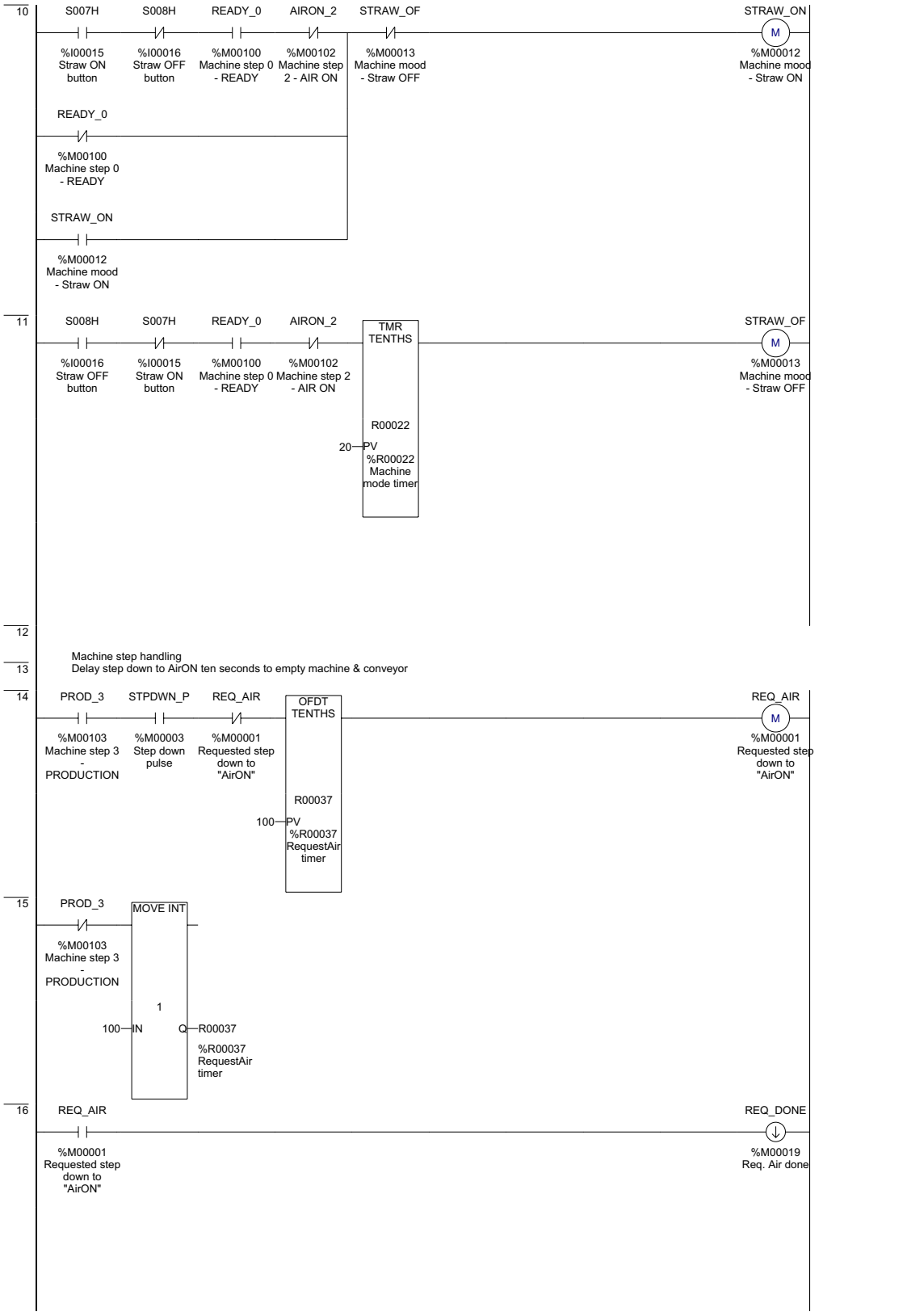

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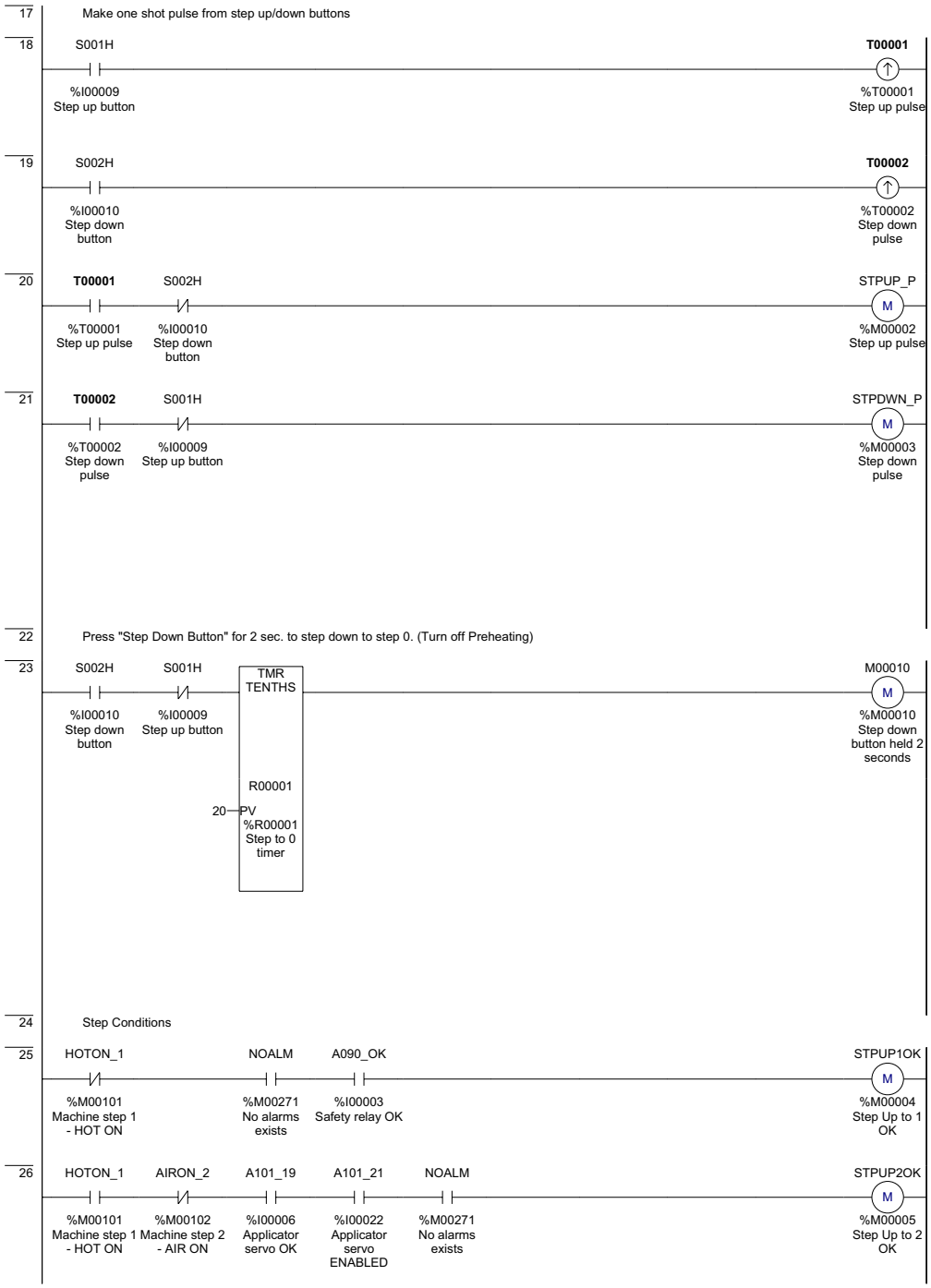

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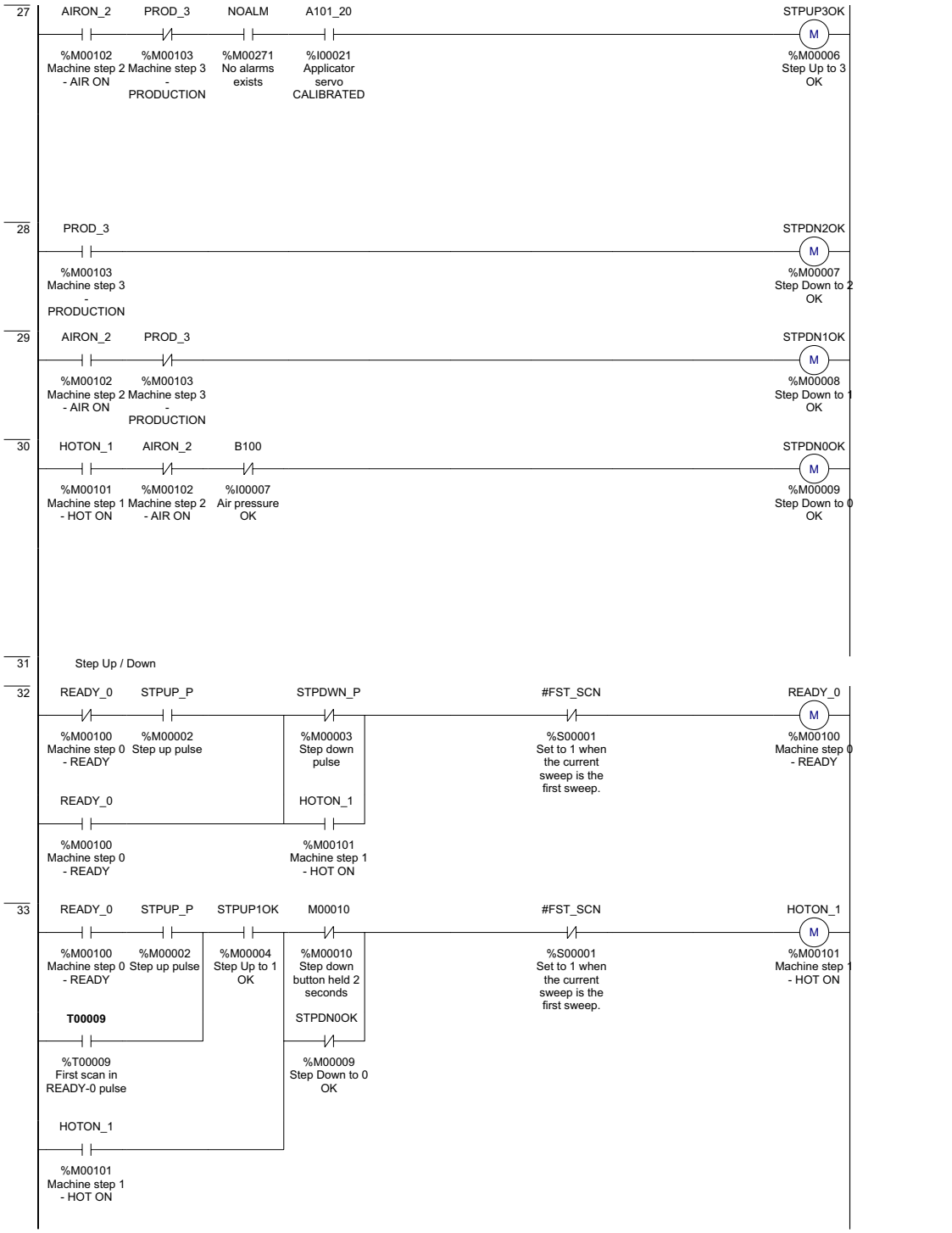

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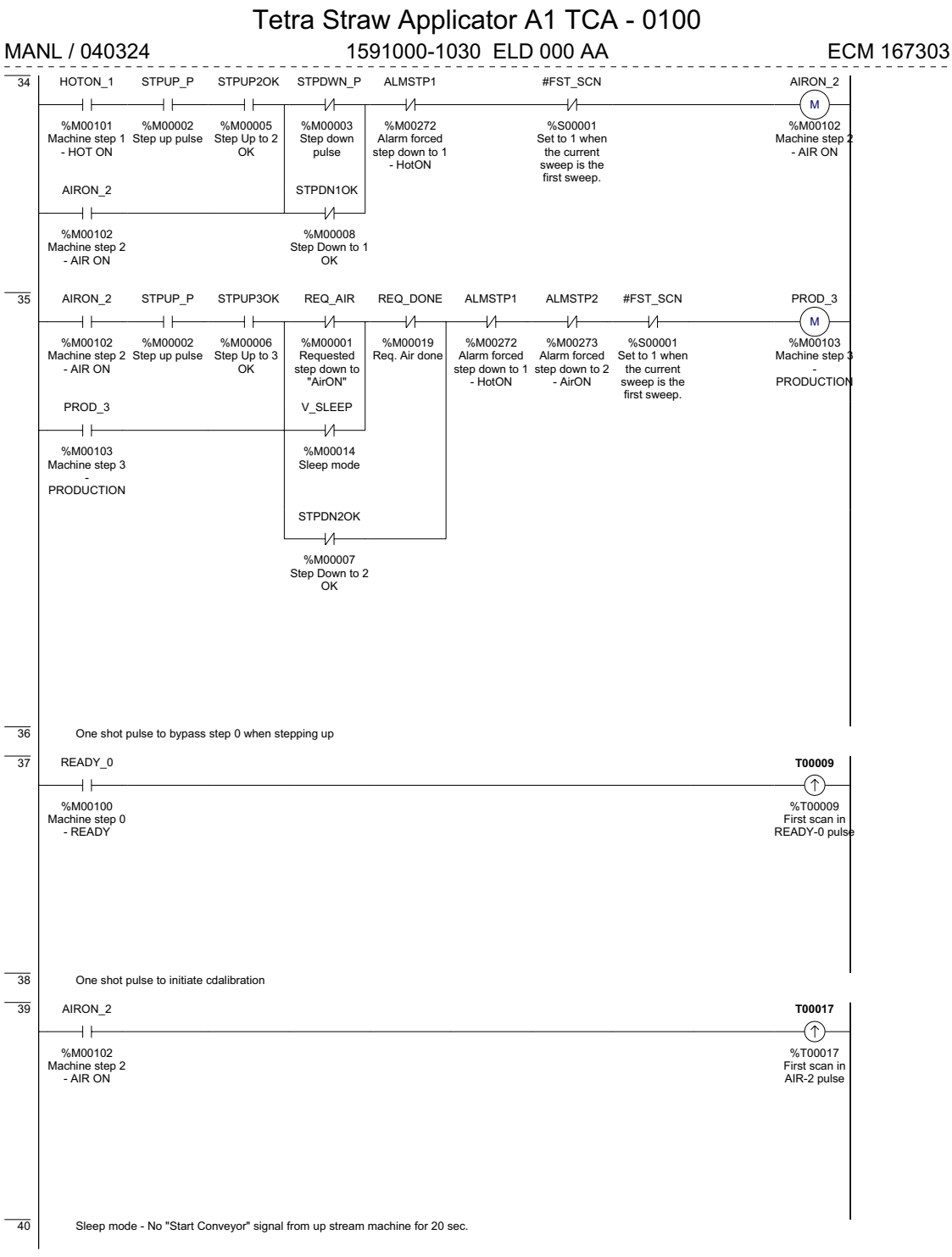

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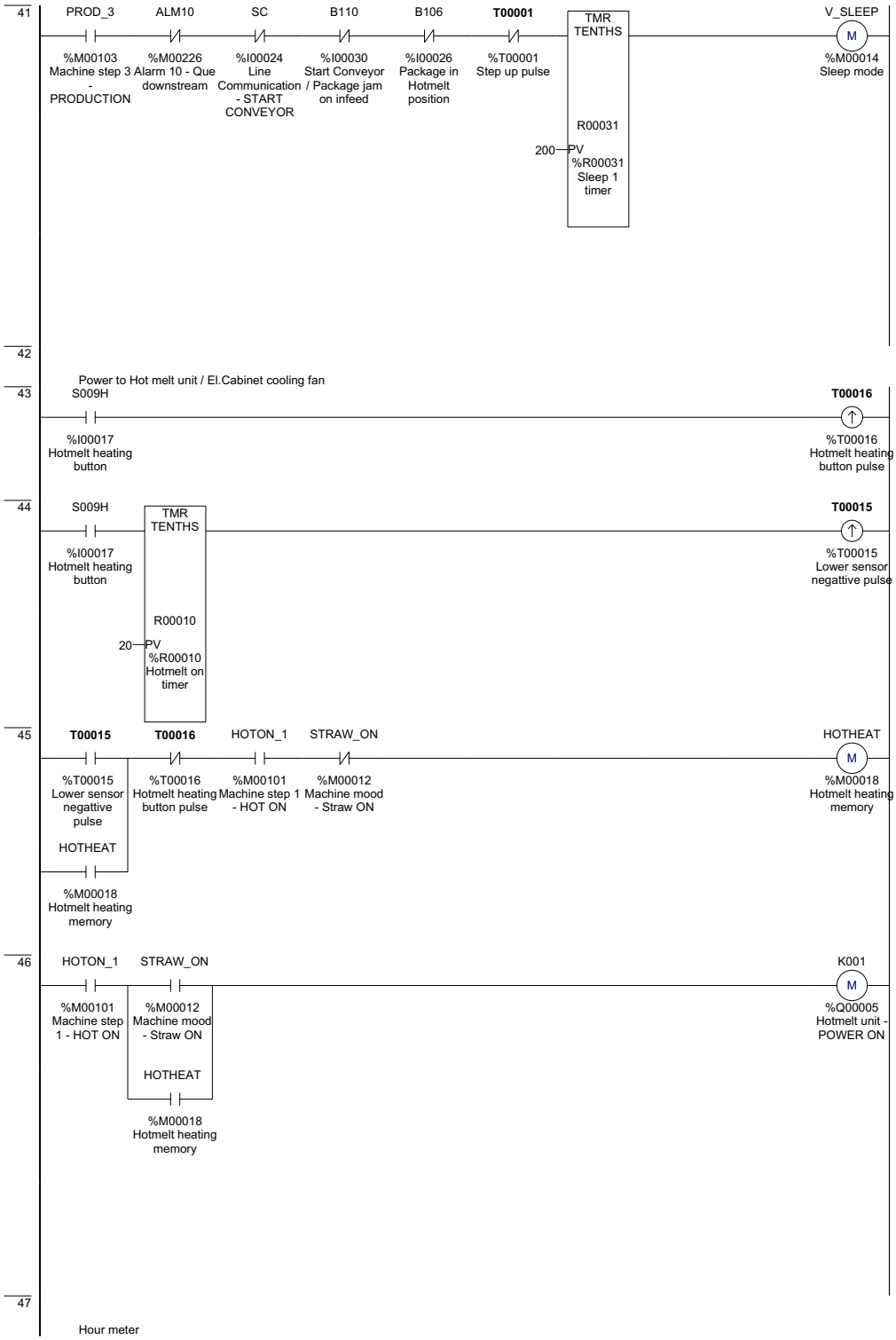

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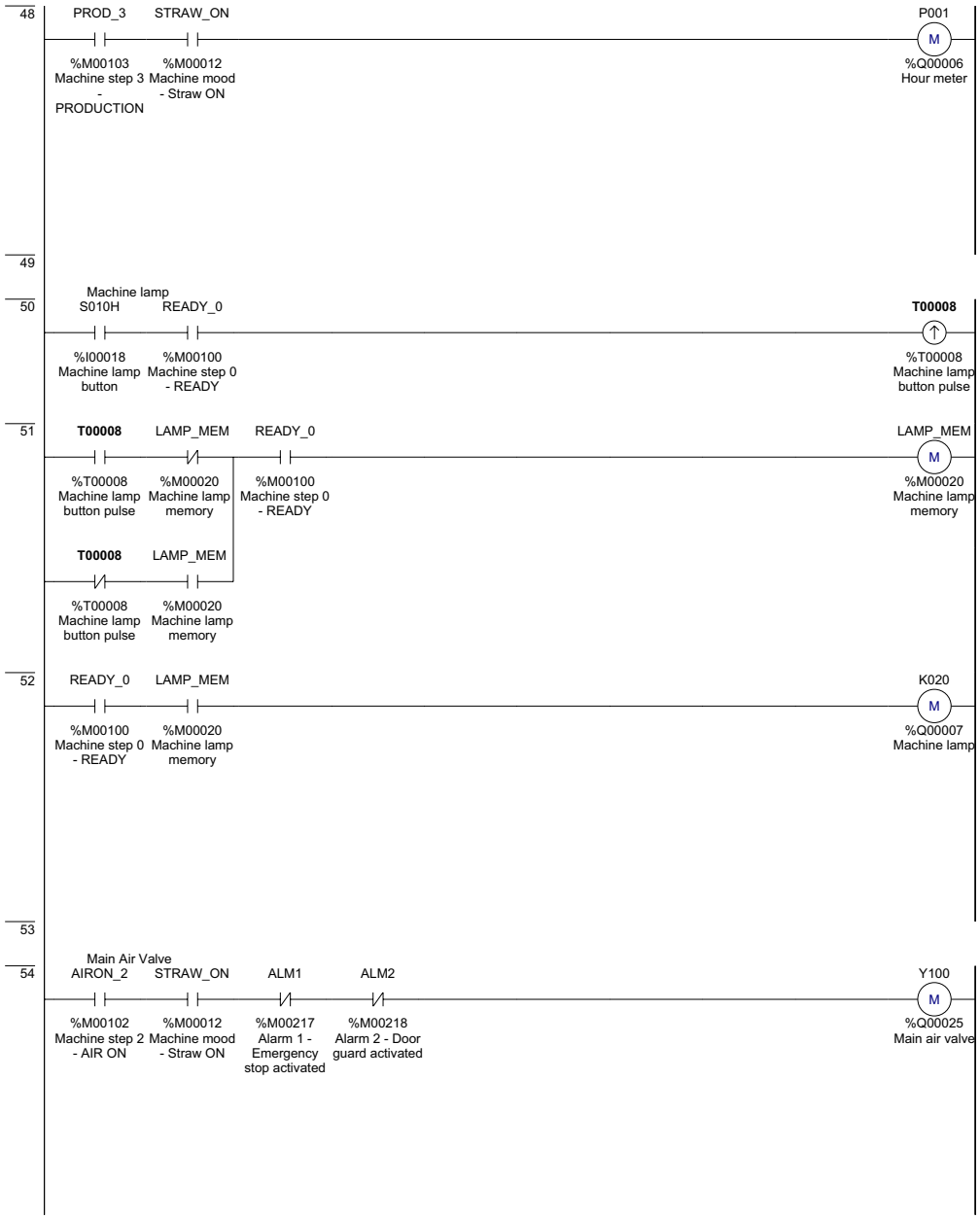

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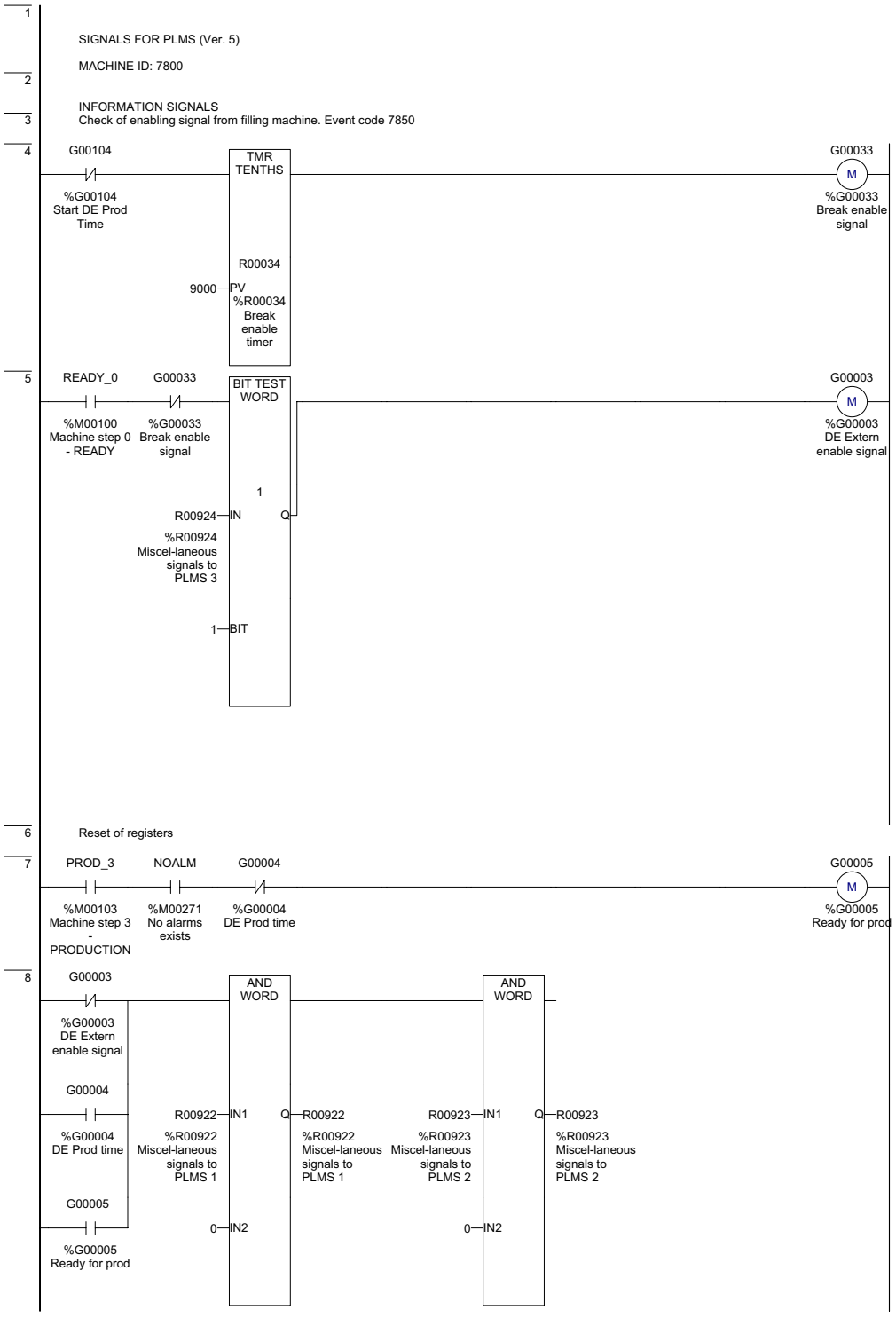

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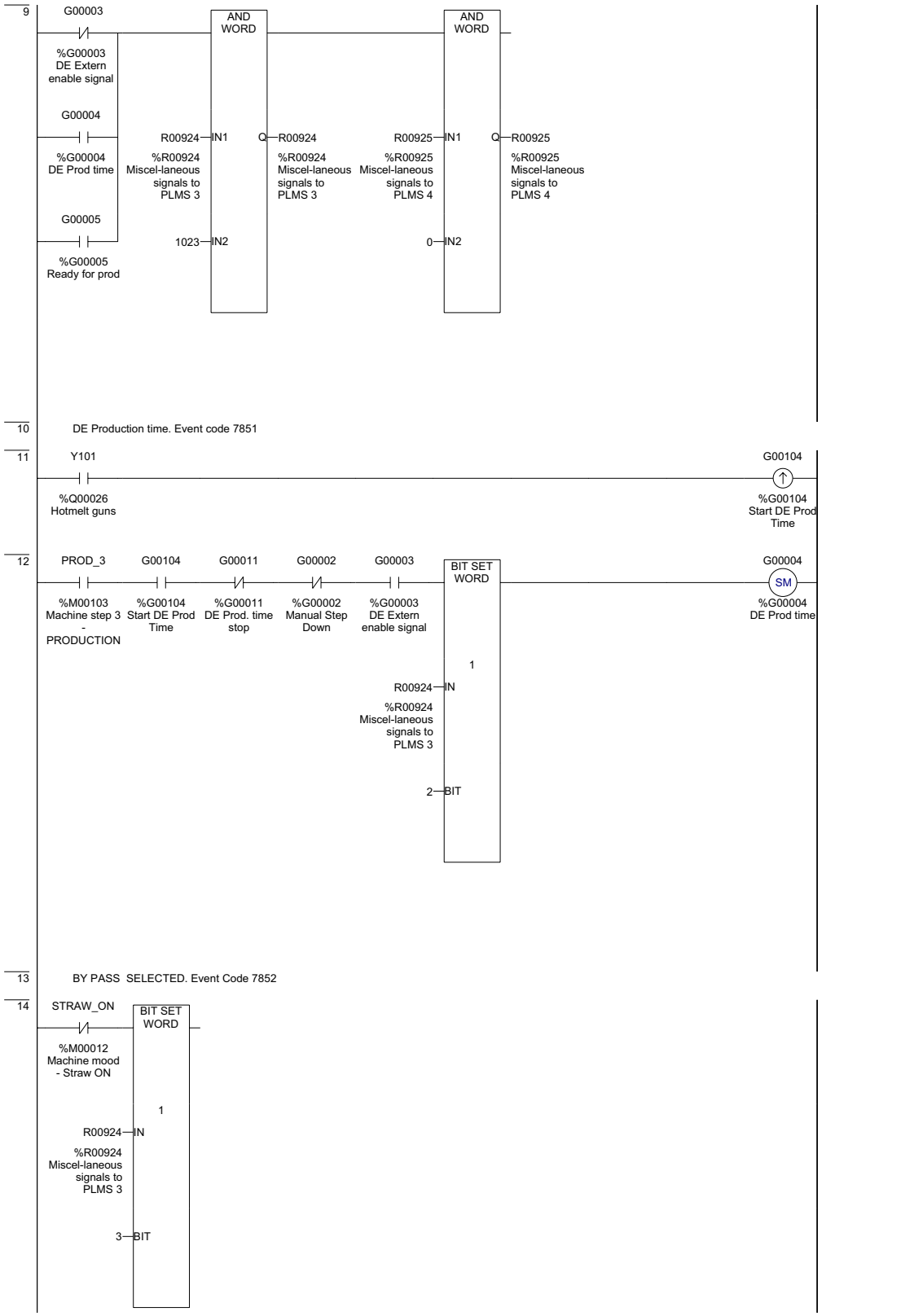

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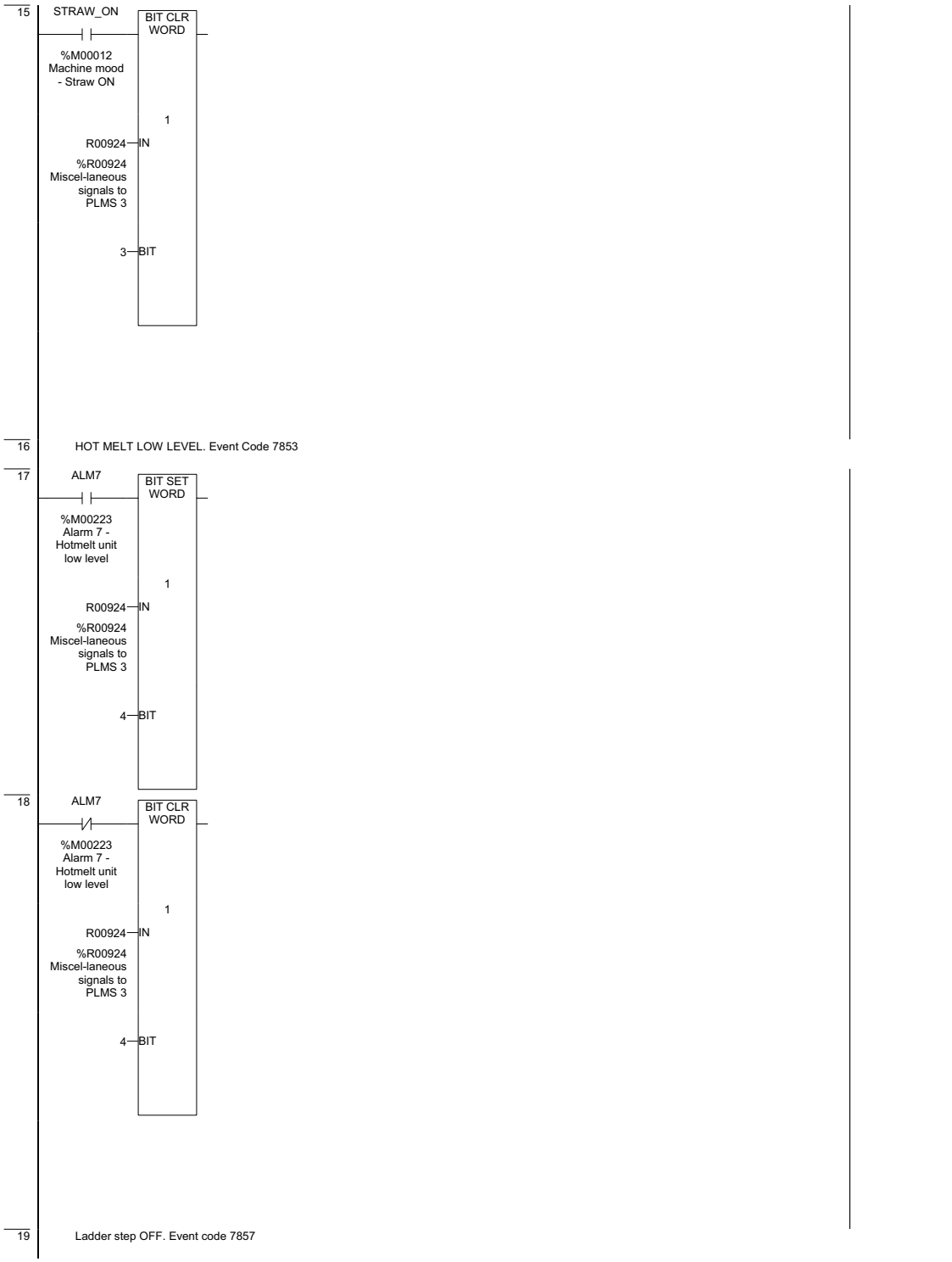

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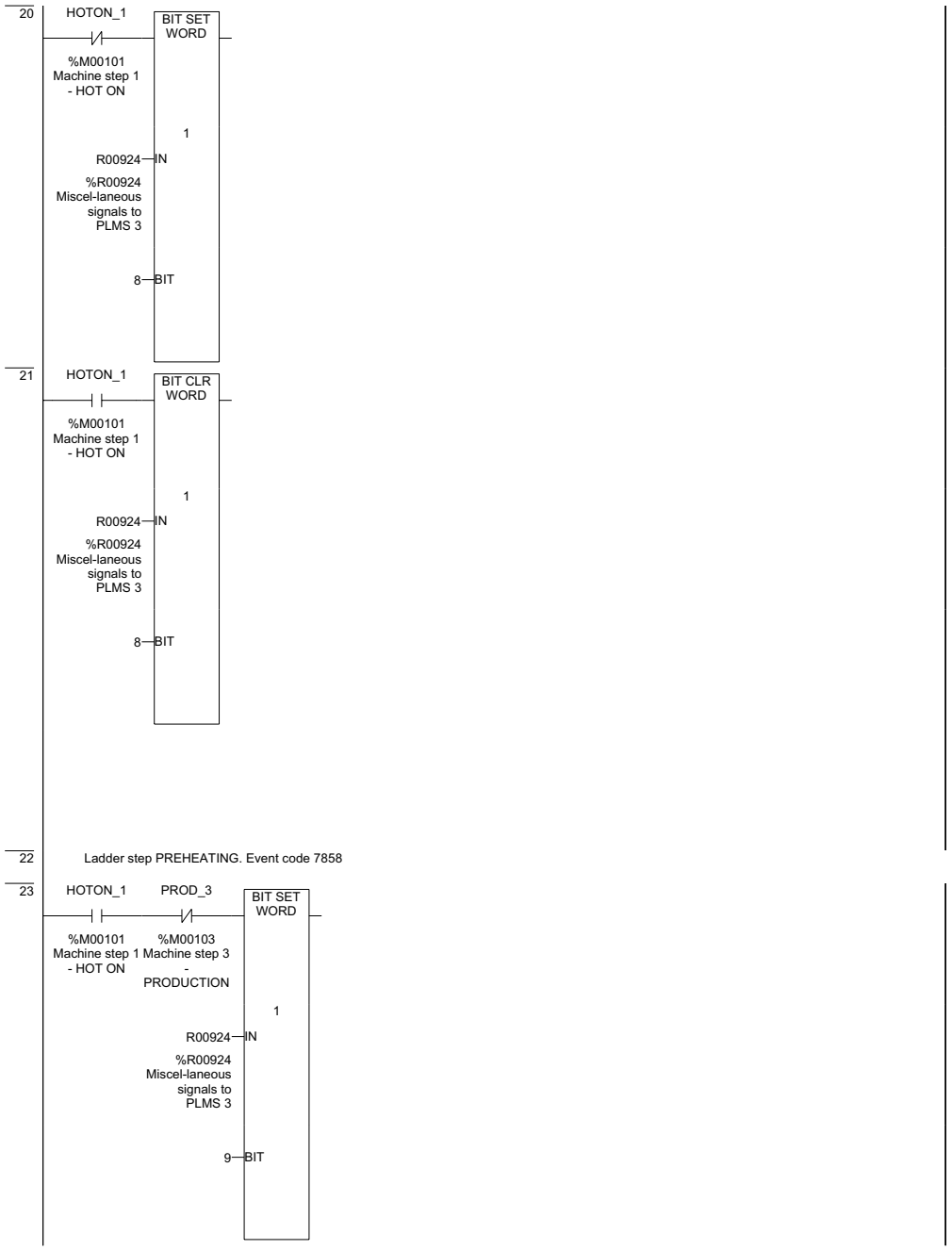

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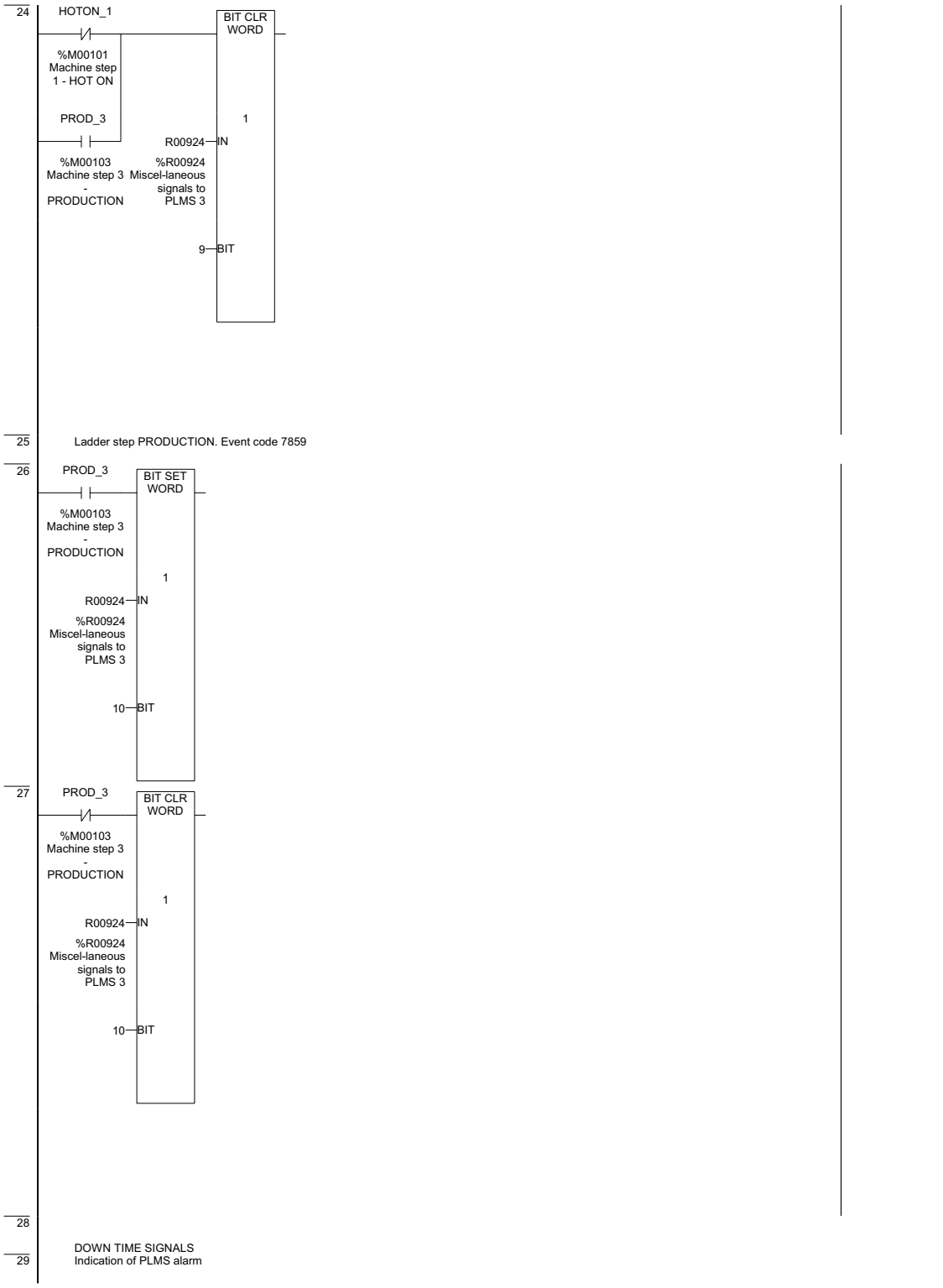

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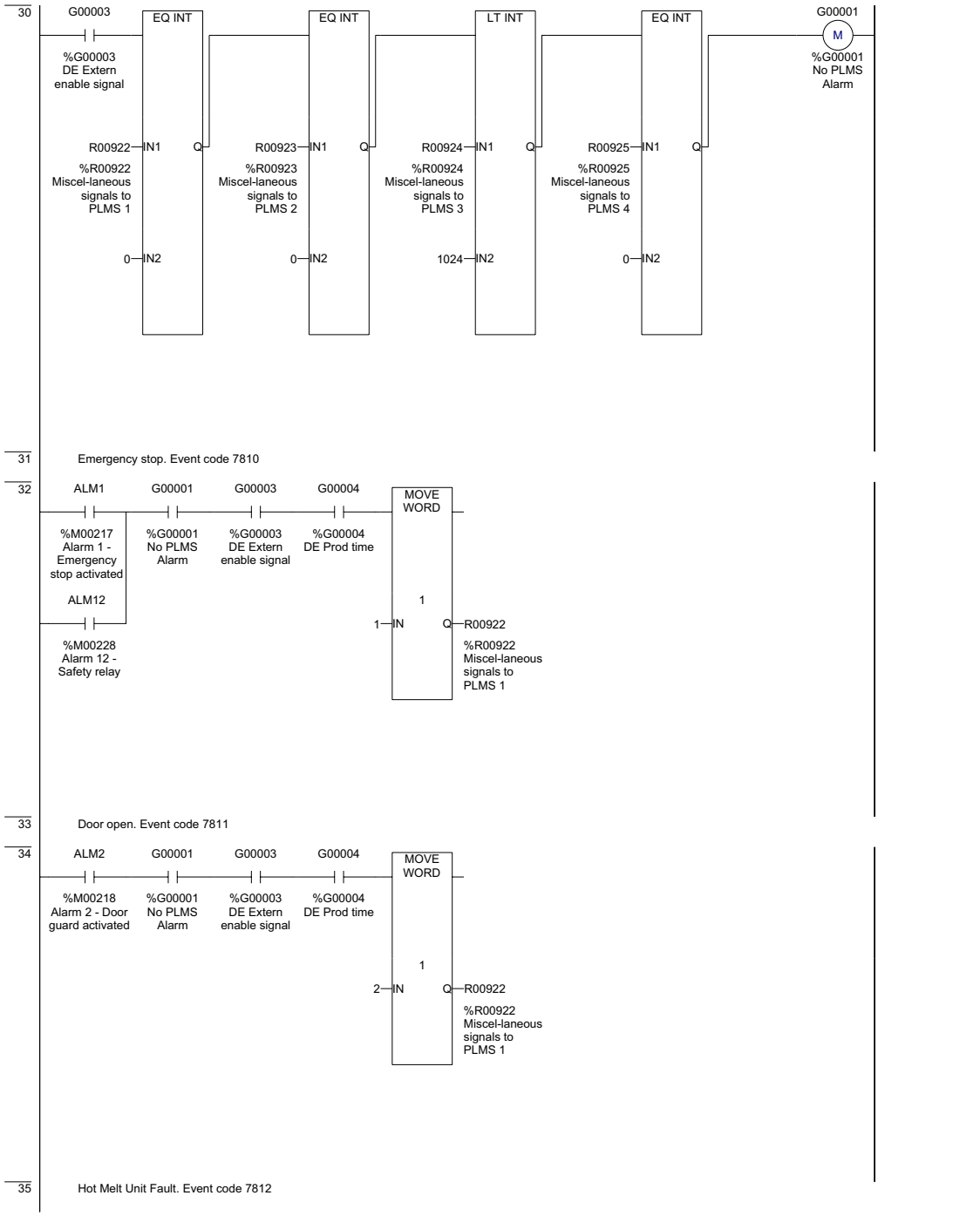

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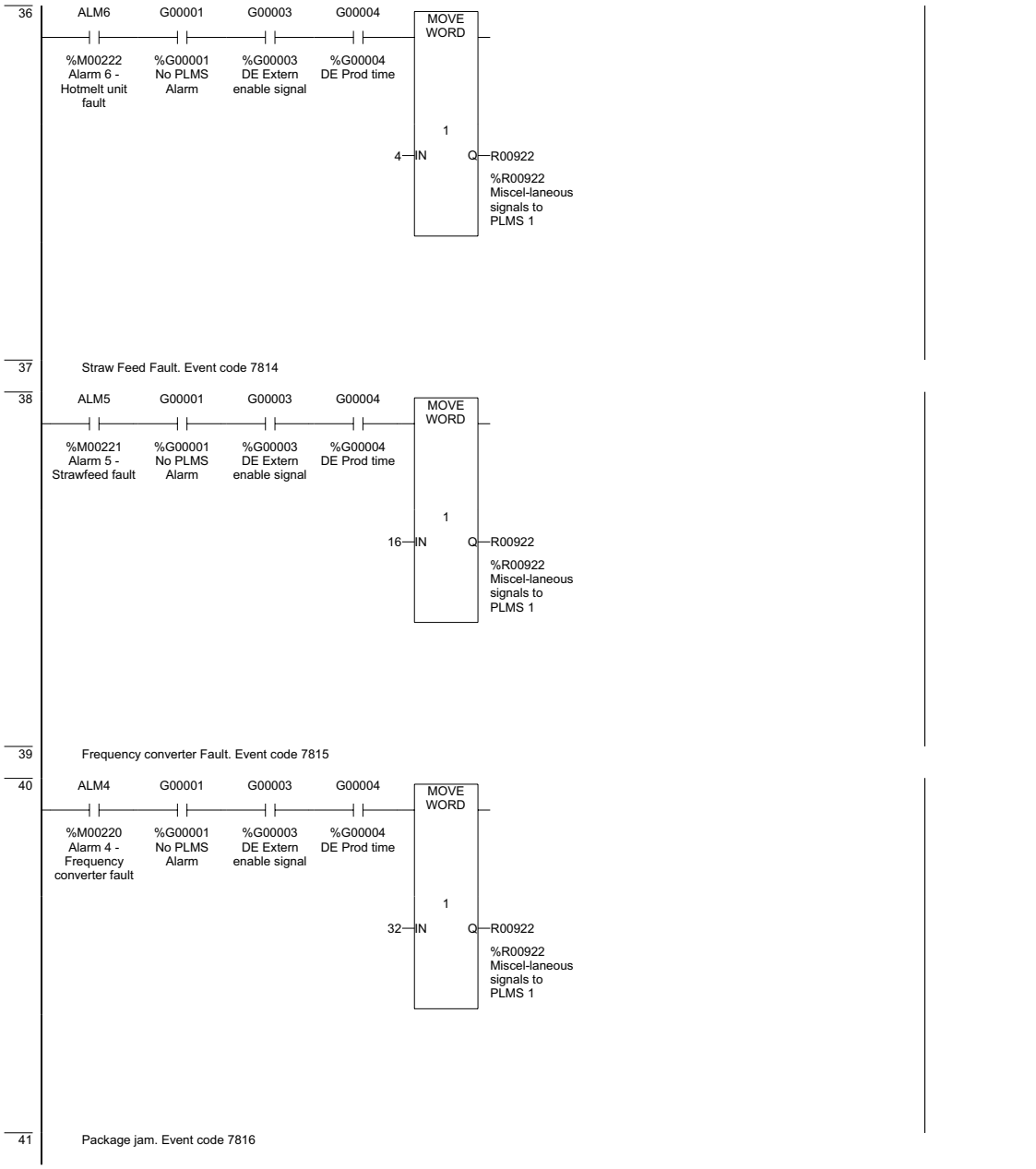

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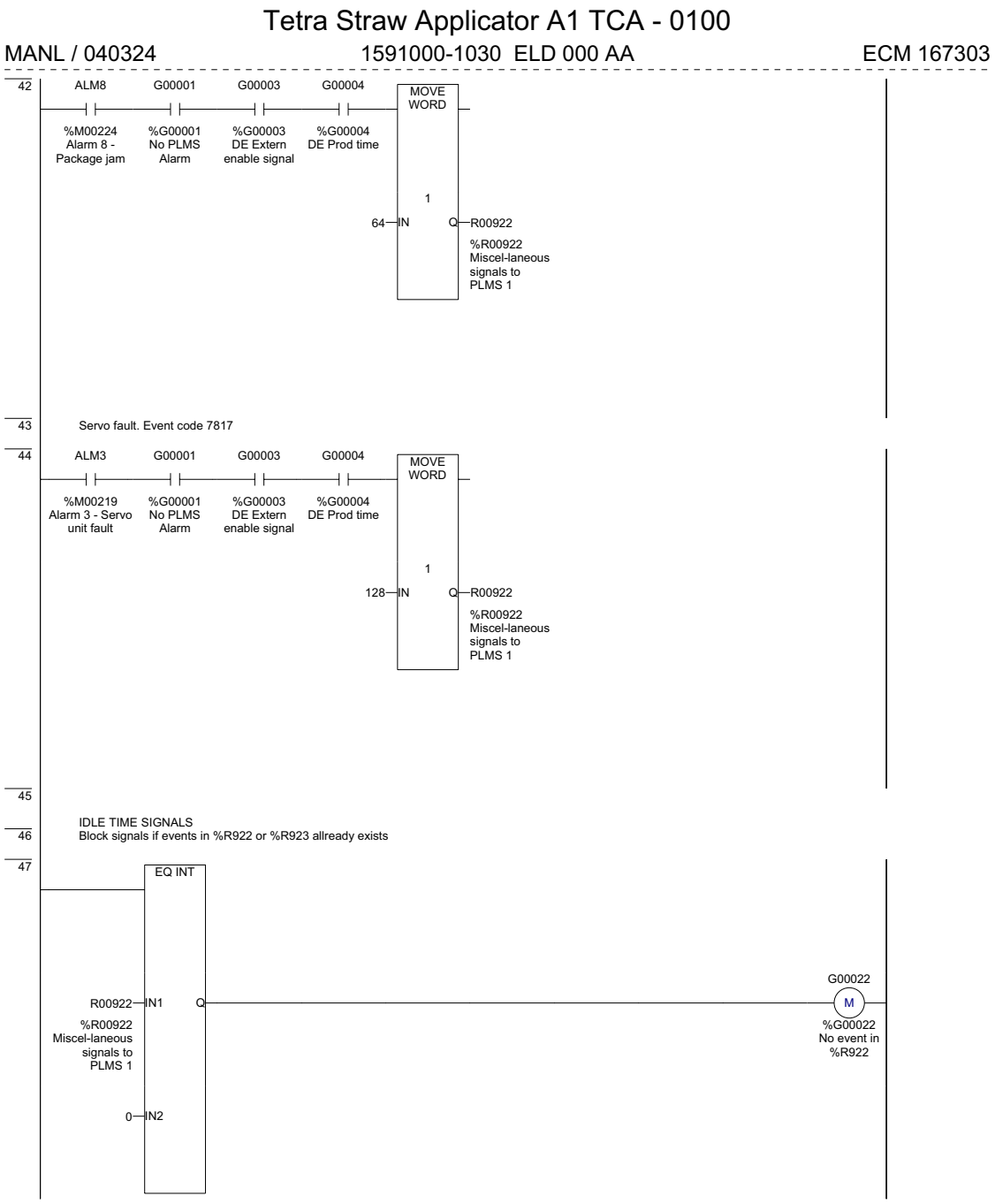

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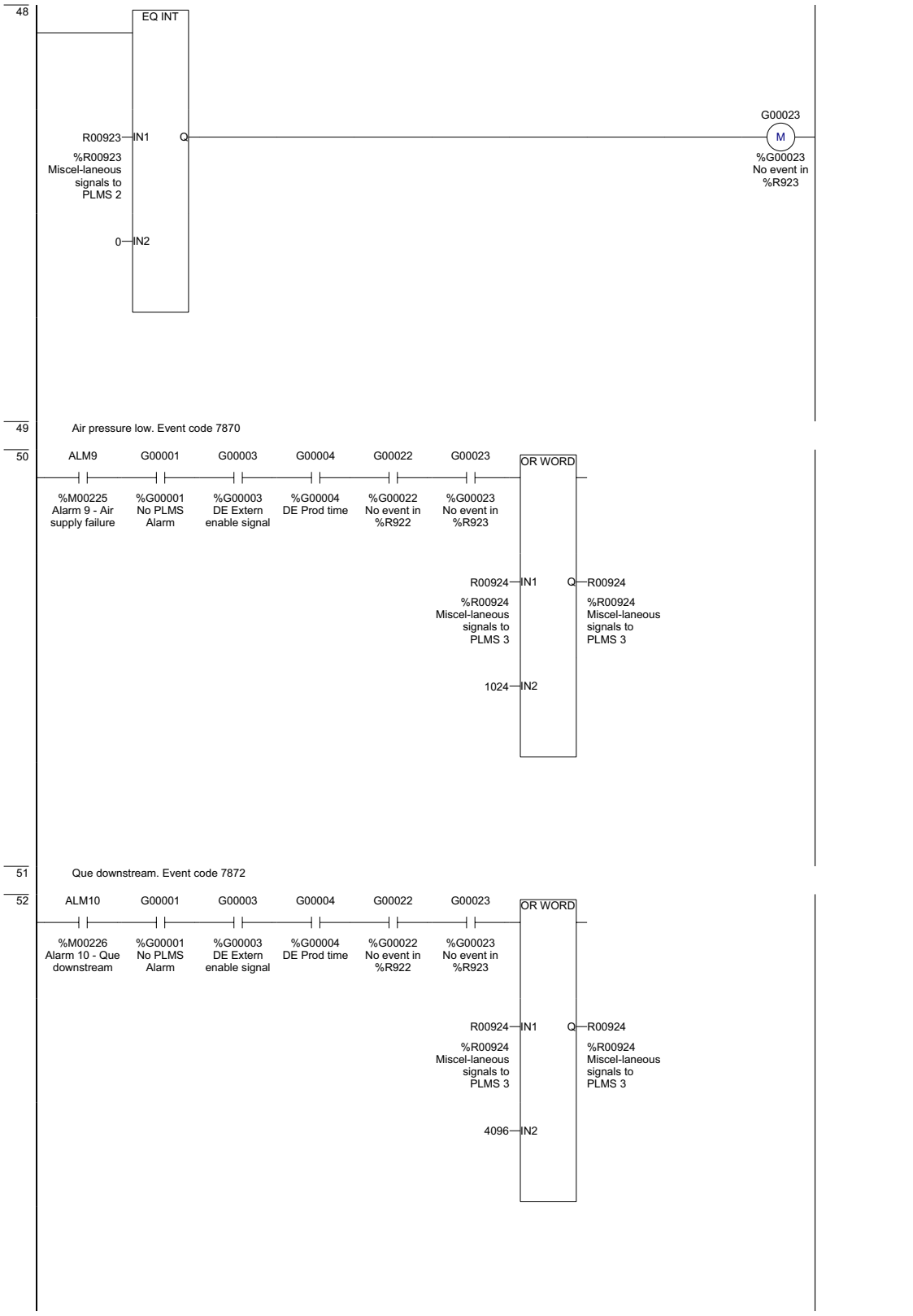

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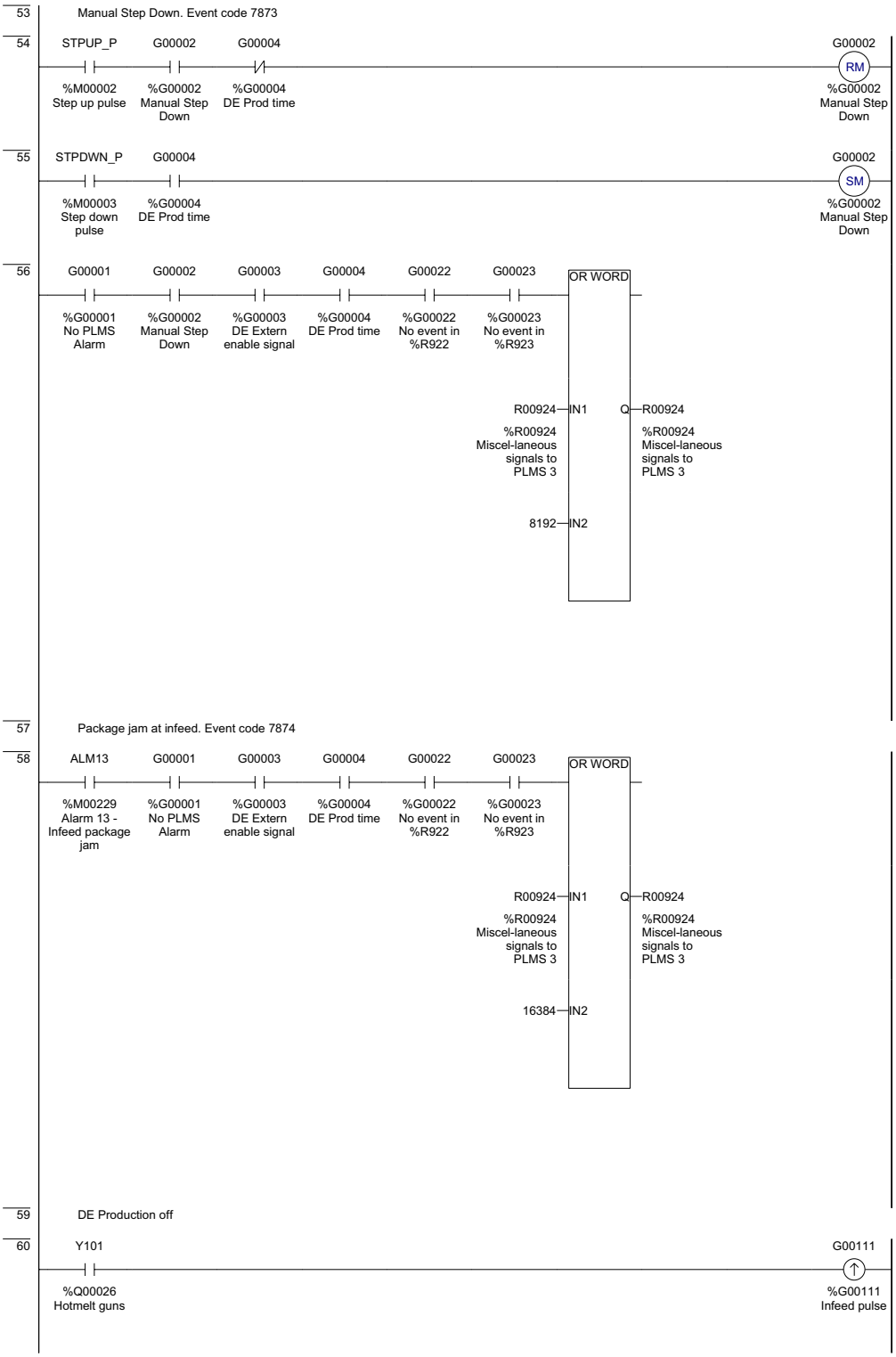

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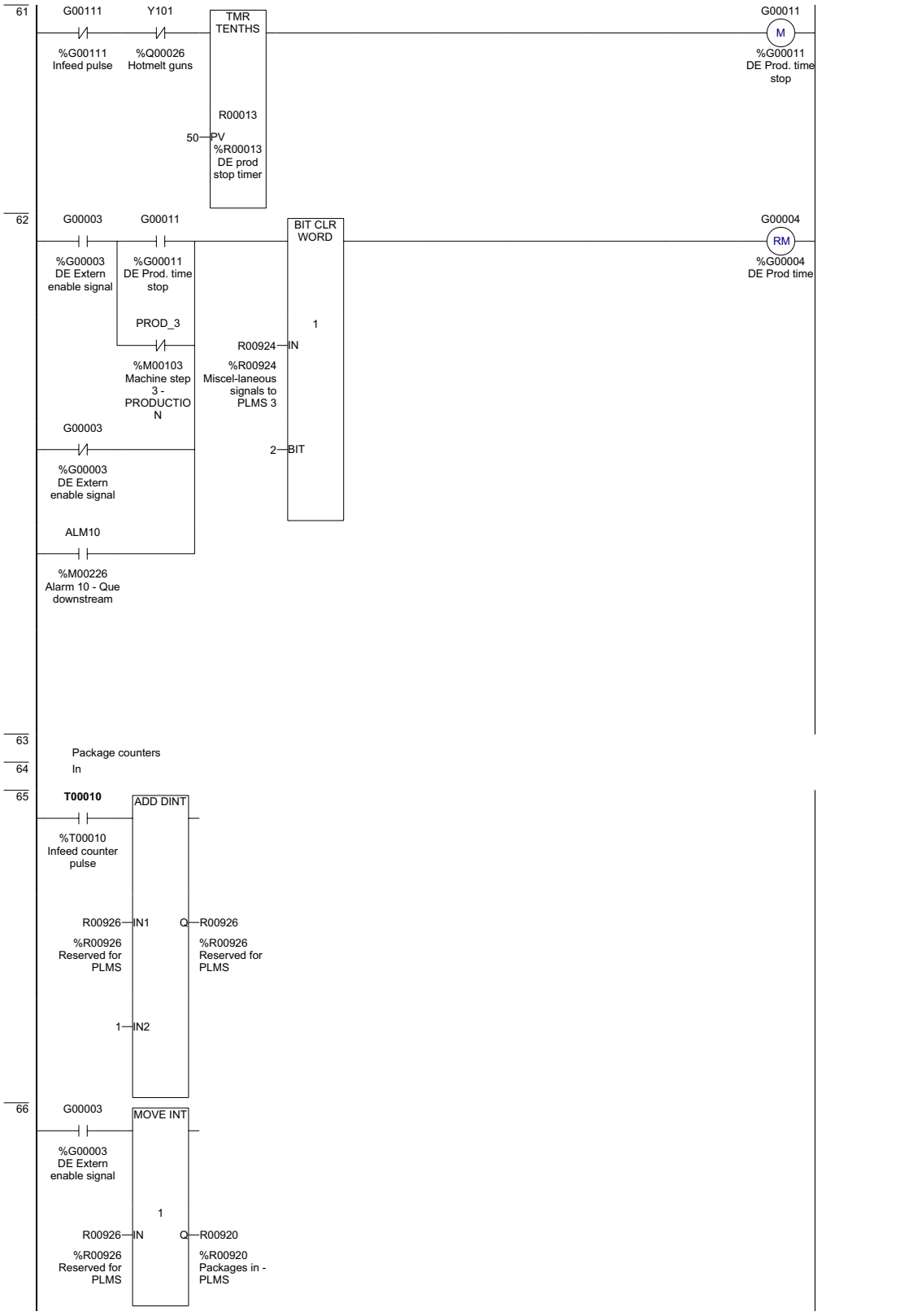

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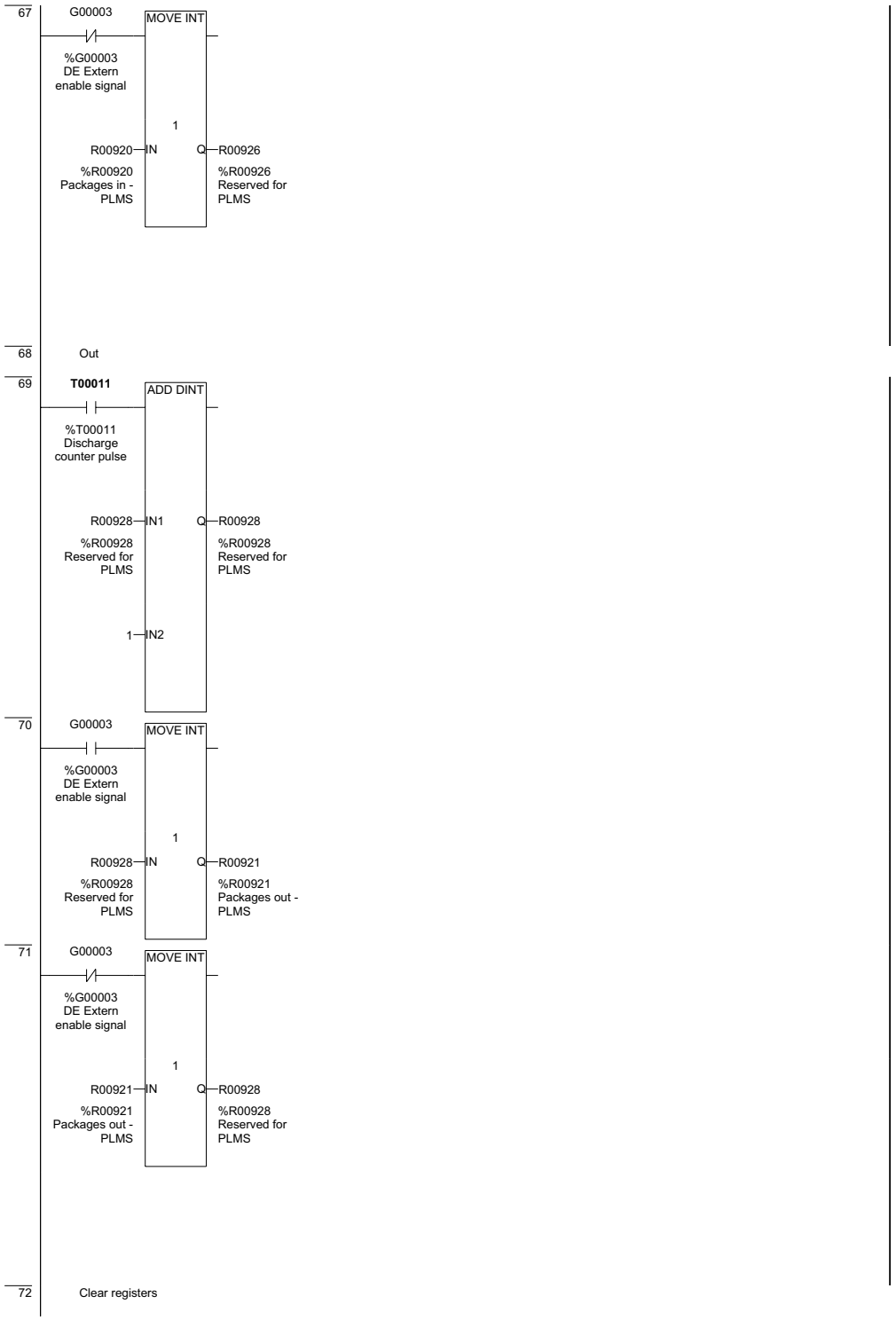

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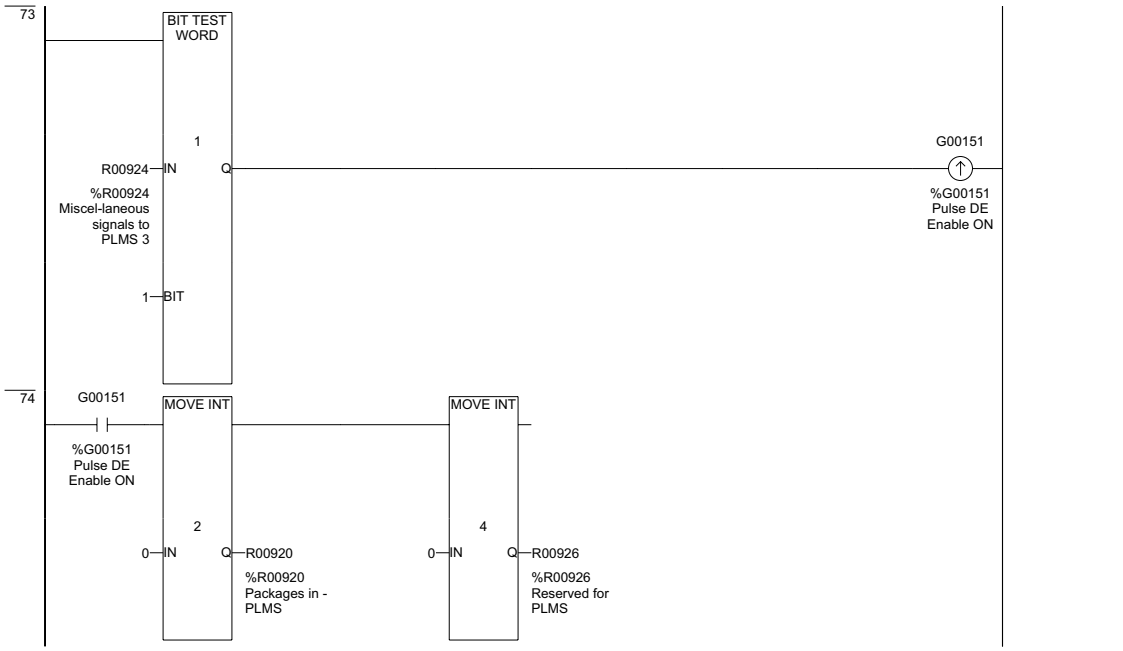
Tetra Straw Applicator A1 TCA - 0100

MANL / 040324 1591000-1030 ELD 000 AA ECM 167303



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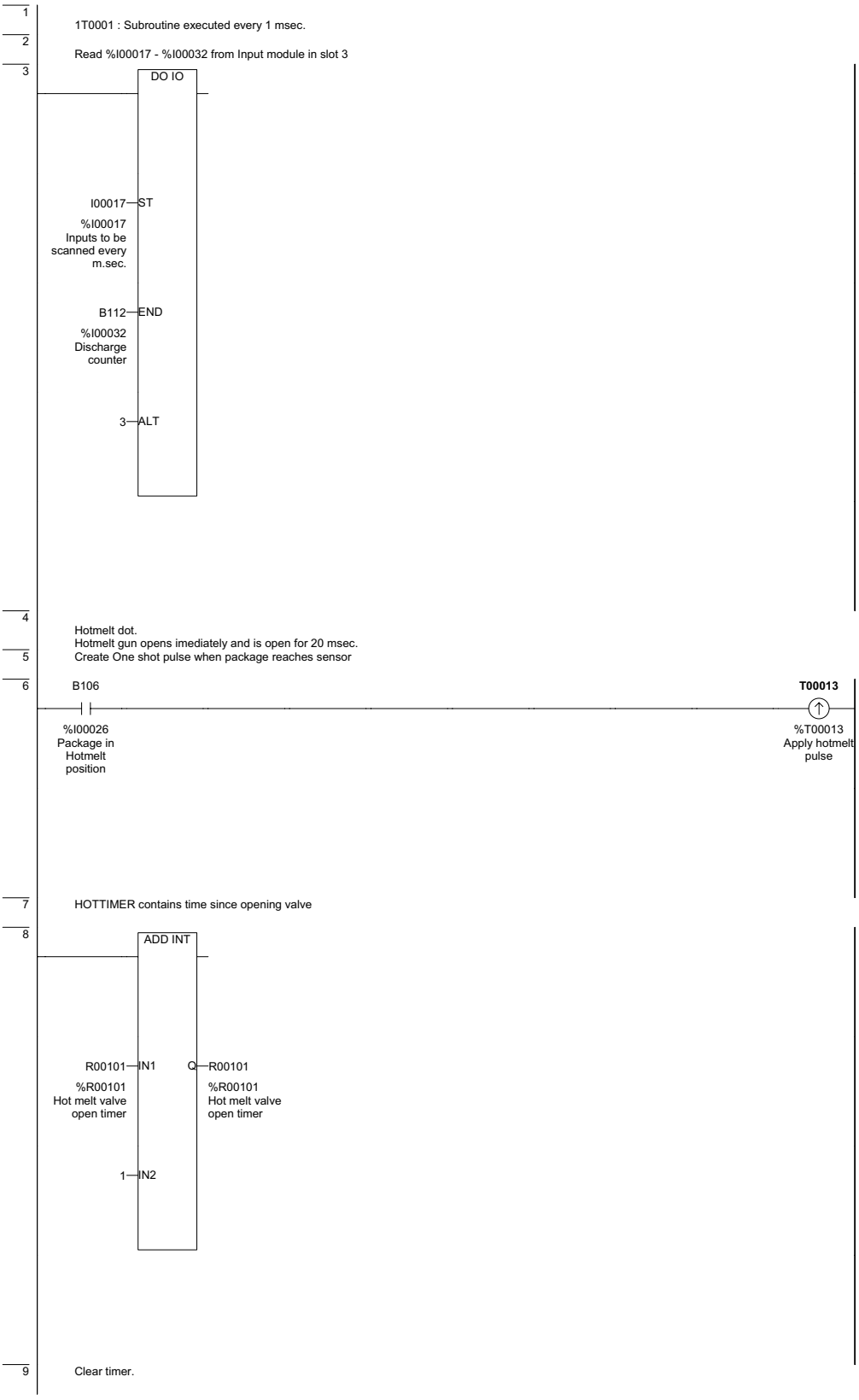
Block: PLMS

Project: 1591000-1000 Target: A1591000_1000 Page: 59

Tetra Straw Applicator A1 TCA - 0100

MANL / 040324 1591000-1030 ELD 000 AA ECM 167303



Block: t1t0001

Project: 1591000-1000 Target: A1591000_1000 Page: 60

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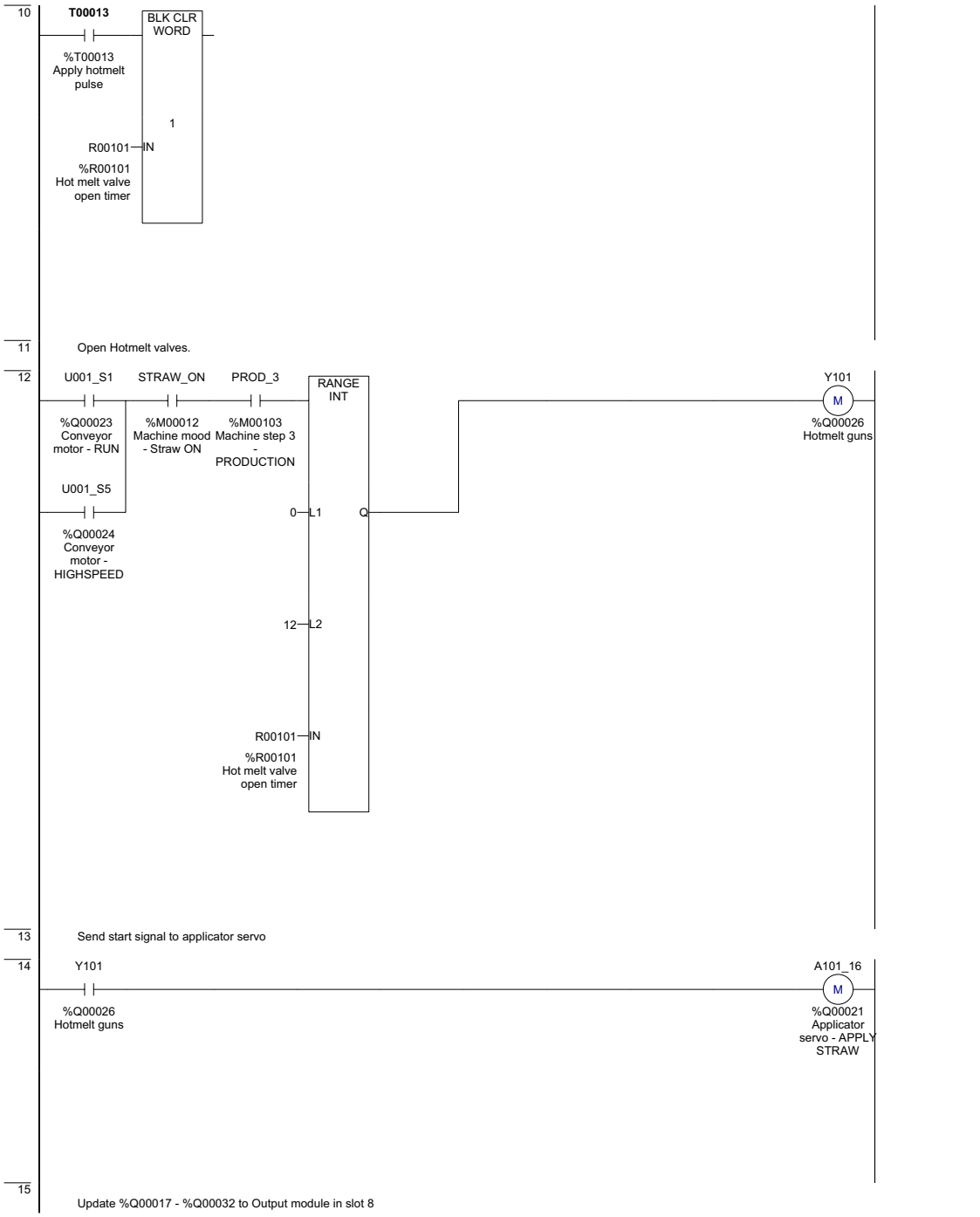
Tetra Straw Applicator A1 TCA - 0100

MANL / 040324 1591000-1030 ELD 000 AA ECM 167303



Block: t1t0001

Project: 1591000-1000 Target: A1591000_1000 Page: 61

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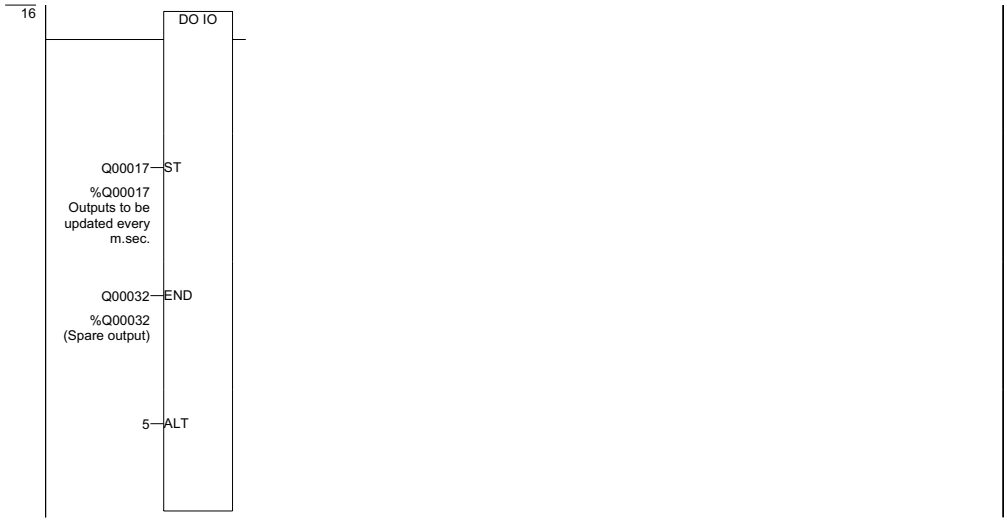
Tetra Straw Applicator A1 TCA - 0100

MANL / 040324 1591000-1030 ELD 000 AA ECM 167303



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Report Name: Hardware Configuration
Target Name: A1591000_1000
Report Time: 03/24/2004 10:28

Overview

Main Rack: IC693CHS391, Base 10 Slot

	+5VDC (Watts)	+24VDC Relay Power (Watts)	+24VDC Isolated (Watts)	Total System:
Used	8.160	0.000	0.000	8.160
Supplied	30.000	15.000	20.000	30.000
+24VDC Avl. Ext. (Watts)	0.000	0.000	20.000	0.000

Detailed View

Main Rack: Slot 0

IC693PWR330, Power Supply 120/240 VAC / 125 VDC 30W HI-CAP

Power Consumption

Voltages / Supplied
+5VDC (Watts) 30
+24VDC Relay Power (Watts) 15
+24VDC Isolated (Watts) 20
Total System: 30

Settings

Parameters / Values
Hand Held Programmer: No
Converter: 0

Main Rack: Slot 1

IC693CPU363, Series 90-30 CPU Model 363

Settings

Parameters / Values
I/O Scan-Stop: No
Power Up Mode: Last
Logic / Configuration From: RAM
Registers: RAM
Passwords: Disabled
Checksum Words: 8
Data Rate (bps): 19200
Parity: Odd
Stop Bits: 1
Modem Turnaround Time (.01 Sec / Count): 0
Idle Time (Sec): 10
Timer Faults: Disabled
SNP ID: 7800
Key Switch Run/Stop: Disabled
Memory Protect: Disabled
Ignore Fatal Faults: Disabled

Scan

Parameters / Values
Sweep Mode: Normal
Sweep Timer (mSec): N/A

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Port 1 (RS-232)

Parameters / Values
Port Mode: SNP
Port Type: Slave
Data Rate (bps): 19200
Flow Control: None
Parity: Odd
Stop Bits: 1
Timeout: Long
Turnaround Delay (.01 Sec / Count): 0
SNP ID: 7800

Port 2 (RS-485)

Parameters / Values
Port Mode: SNP
Port Type: Slave
Data Rate (bps): 19200
Flow Control: None
Parity: Odd
Stop Bits: 1
Timeout: Long
Turnaround Delay (.01 Sec / Count): 0
SNP ID: 7800
Converter Power Consumption (Watts): 0

Memory

Parameters / Values
%I Discrete Input: 2048
%Q Discrete Output: 2048
%S System Use: 128
%M Internal Discrete: 4096
%T Temporary Status: 256
%G Genius® Global: 1280
%AI Analog Input: 2048
%AQ Analog Output: 512
%R Register Memory: 32640

Power Consumption

Parameters / Values
+5VDC (Watts) 4.450
+24VDC Relay Power (Watts) 0
+24VDC Isolated (Watts) 0

Main Rack: Slot 2

IC693MDL646, 16 Circuit Input 24 VDC Positive / Negative Logic Fast

Settings

Parameters / Values
Reference Address: %I00001
Length: 16

Wiring

Terminal / Wiring Information
From Terminal 1 to Terminal 20 : No wiring information.

Power Consumption

Parameters / Values
+5VDC (Watts) 0.40
+24VDC Relay Power (Watts) 0
+24VDC Isolated (Watts) Modbus/TCP

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Main Rack: Slot 3

IC693MDL646, 16 Circuit Input 24 VDC Positive / Negative Logic Fast

Settings

Parameters / Values
Reference Address: %I00017
Length: 16

Wiring

Terminal / Wiring Information
From Terminal 1 to Terminal 20 : No wiring information.

Power Consumption

Parameters / Values
+5VDC (Watts) 0.40
+24VDC Relay Power (Watts) 0
+24VDC Isolated (Watts) Modbus/TCP

Main Rack: Slot 4

IC693MDL742, 16 Circuit Output 12/24 VDC 1A Positive

Settings

Parameters / Values
Reference Address: %Q00001
Length: 16

Wiring

Terminal / Wiring Information
From Terminal 1 to Terminal 20 : No wiring information.

Power Consumption

Parameters / Values
+5VDC (Watts) 0.65
+24VDC Relay Power (Watts) 0
+24VDC Isolated (Watts) 0

Main Rack: Slot 5

IC693MDL742, 16 Circuit Output 12/24 VDC 1A Positive

Settings

Parameters / Values
Reference Address: %Q00017
Length: 16

Wiring

Terminal / Wiring Information
From Terminal 1 to Terminal 20 : No wiring information.

Power Consumption

Parameters / Values
+5VDC (Watts) 0.65
+24VDC Relay Power (Watts) 0
+24VDC Isolated (Watts) 0

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Tetra Straw Applicator A1 TCA -0100

MANL / 2004-03-24 1591000-1900 ELD 000 AA ECM 167303

Reference Details

%I References

Overlap	Start	End	Addr	Mem Type	Cat Num
	1	16	(0.2)	Consumed	IC693MDL646
	17	32	(0.3)	Consumed	IC693MDL646
Total %I: 32	Highest Reference: 32				

%Q References

Overlap	Start	End	Addr	Mem Type	Cat Num
	1	16	(0.4)	Produced	IC693MDL742
	17	32	(0.5)	Produced	IC693MDL742
Total %Q: 32	Highest Reference: 32				

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Tetra Pak Carton Ambient AB

1591000-1990 ELD AA

Specification of Registers for PLMS, SNP Page 1/2

Machine type:	**Tetra Straw Applicator A1 TCA**
ECM No:	**167303**
Signature/date:	**40324**

Down time signals

Register: 922 Tag name, "intouch":DET 7800 Tag name, "intouch":DET

	Description	Tag Nbr. **)	Stop *)	PLC Bit Hex	PLC Bit Dec	Stop code TPOP	Memory Bit	Alarms Nick names
1	Emergency stop	00	DT	1	1	7810		
2	Door open	01	DT	2	2	7811		
3	Hotmelt unit fault	02	DT	4	4	7812		
4		03	DT	8	8	7813		
5	Strawfeed fault	04	DT	10	16	7814		
6	Frequency converter fault	05	DT	20	32	7815		
7	Package jam	06	DT	40	64	7816		
8	Servo fault	07	DT	80	128	7817		
9		08	DT	100	256	7818		
10		09	DT	200	512	7819		
11		10	DT	400	1024	7820		
12		11	DT	800	2048	7821		
13		12	DT	1000	4096	7822		
14		13	DT	2000	8192	7823		
15		14	DT	4000	16384	7824		
16		15	DT	8000	32768	7825		

Down time signals

Register: 923 Tag name, "intouch":DET 7800 _EVENTS1.xx

	Description	Tag Nbr. **)	Stop *)	PLC Bit Hex	PLC Bit Dec	Stop code TPOP	Memory Bit	Alarms Nick names
1		16	DT	1	1	7826		
2		17	DT	2	2	7827		
3		18	DT	4	4	7828		
4		19	DT	8	8	7829		
5		20	DT	10	16	7830		
6		21	DT	20	32	7831		
7		22	DT	40	64	7832		
8		23	DT	80	128	7833		
9		24	DT	100	256	7834		
10		25	DT	200	512	7835		
11		26	DT	400	1024	7836		
12		27	DT	800	2048	7837		
13	Equipment stop 1	28	DT	1000	4096	7838		
14	Equipment stop 2	29	DT	2000	8192	7839		
15	Equipment stop 3	30	DT	4000	16384	7840		
16	NOT USED	31	--	8000	32768	7841		

*) IS - Information signal
DT - Down time
IT - Idle time
AT - Ancillery time

**) Tag name for register 922, 923 ("Intouch"):
DET9900_Events1.XX (XX=Tag nbr.)

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Tetra Pak Carton Ambient AB

1591000-1990 ELD AA

Specification of Registers for PLMS, SNP **Page** 2/2

Machine type:	**Tetra Straw Applicator A1 TCA**
ECM No:	**167303**
Signature/date:	**40324**

Miscellaneous signals

Register: 924 Tag name, "intouch":DET 7800 Tag name, "intouch":DET

	Description	Tag Nbr. **)	Stop *)	PLC Bit Hex	PLC Bit Dec	Stop code TPOP	Memory Bit	Alarms Nick names
1	DE External enable signal	00	IS	1	1	7850		
2	DE production time	01	IS	2	2	7851		
3	Bypass mode selected	02	IS	4	4	7852		
4	Hotmelt unit low level	03	IS	8	8	7853		
5	Information signal 2	04	IS	10	16	7854		
6		05	IS	20	32	7855		
7		06	IS	40	64	7856		
8	Ladder step OFF	07	IS	80	128	7857		
9	Ladder step PREPARATION	08	IS	100	256	7858		
10	Ladder step PRODUCTION	09	IS	200	512	7859		
11	Supervision of air pressure (low)	10	IT	400	1024	7870		
12		11	IT	800	2048	7871		
13	Queue downstream	12	IT	1000	4096	7872		
14	Manual step down	13	IT	2000	8192	7873		
15		14	IT	4000	16384	7874		
16	NOT USED	15	--	8000	32768	7875		

Miscellaneous signals

Register: 925 Tag name, "intouch":DET 7800 _EVENTS1.xx

	Description	Tag Nbr. **)	Stop *)	PLC Bit Hex	PLC Bit Dec	Stop code TPOP	Memory Bit	Alarms Nick names
1		16	IT	1	1	7876		
2		17	IT	2	2	7877		
3		18	IT	4	4	7878		
4		19	IT	8	8	7879		
5		20	IT	10	16	7880		
6		21	IT	20	32	7881		
7	Idle stop 1	22	IT	40	64	7882		
8	Idle stop 2	23	IT	80	128	7883		
9	Idle stop 3	24	IT	100	256	7884		
10		25	AT	200	512	7885		
11		26	AT	400	1024	7886		
12		27	AT	800	2048	7887		
13		28	AT	1000	4096	7888		
14		29	AT	2000	8192	7889		
15		30	AT	4000	16384	7890		
16	NOT USED	31	--	8000	32768	7891		

*) IS - Information signal
DT - Down time
IT - Idle time
AT - Ancillery time

**) Tag name for register 924, 925 ("Intouch"):
DET9900_EVENTS2.XX (XX=Tag nbr.)

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```
Tetra Straw Applicator A1 TCA          2594080-0001 ELD 000 AA ECM 167303          2004-03-24
        ;#########################################################################
        ;#                                                                       #
        ;#      Straw Applicator A1 Servo Program                                #
        ;#                                                                       #
        ;#      Used components in this application:                             #
        ;#      - DMC2 50412P                          TPnr:90045-0405           #
        ;#      - Servomotor AKM4                      TPnr:90459-4248           #
        ;#      - Plinth                               TPnr:90045-0376           #
        ;#      - Contact unit                         TPnr:90045-0142           #
        ;#      - Cover                                TPnr:90045-0145           #
        ;#      - Filter, Schaffner 8A                 TPnr:90024-0037           #
        ;#                                                                       #
        ;#      Mechanical design:                                               #
        ;#      3 turns of the motorshaft(3*24576 pulses) is made when package   #
        ;#      is detected. The program is designed for continous movement of   #
        ;#      the applicator. Applicator does not have to stop between two     #
        ;#      packages.                                                        #
        ;#      3 turns of motorshaft moves the strawknife one cycle, the        #
        ;#      strawholder one turn and the applicatorhead 1/20 turn for        #
        ;#      straight straw or 1/14 turn for U-straw.                         #
        ;#                                                                       #
        ;# Program name:        2594076.pl2                                      #
        ;# Creation:            Mats Nilsson / 8&19 Lines / Distribution         #
        ;# Creation Date:       040308                                           #
        ;# Revisions:                                                           #
        ;#                                                                       #
        ;#########################################################################

        ;INPUT DEFINITION                       DESC.                   DMC-CONN.
        .define DI_SoftEnable   = In.Di10;      Software enable         K7A:07
        .define DI_FindHomePos  = In.Di9;       Go to Homeposition      K7A:08
        .define DI_Jog          = In.Di8;       Jog with slow speed     K7A:09
        .define DI_ApplyStraw   = In.Di7;       Apply straw             K7A:10
        ;.define DI_            = In.Di6;                               K7A:11
        ;.define DI_            = In.Di5;                               K7A:12
        ;.define DI_            = In.Di4;                               K7A:13
        ;.define DI_            = In.Di3;                               K7A:14
        .define DI_HomePosSensor= In.Di2;       Homeposition sensor     K7A:15
        ;.define DI_            = In.Di1;                               K7A:16


        ;OUTPUT DEFINITION                      DESC.                   DMC-CONN.
        ;                                       Ready relay             K7B:36
        .define DO_DMCEnabled   = Out.Do6;      DMC Enabled             K7B:29
        .define DO_HomePosFound = Out.Do5;      HomePosition found      K7B:30
        ;.define DO_            = Out.Do4;                              K7B:31
        ;.define DO_            = Out.Do3;                              K7B:32
        ;.define DO_            = Out.Do2;                              K7B:33
        ;.define DO_            = Out.Do1;                              K7B:34


        ; LED DEFINITION                        DESC.                   No./COLOR
        .define LED_ResError    = 128;          Resolver fault          8/Red
        .define LED_OverTemp    =  64;          Overtemp in system      7/Red
        ;.define LED_           =  32;                                  6/Red
        .define LED_EmStop      =  16;          Emergency stop          5/Red
        .define LED_CurrLim     =   8;          Currentlimit reached    4/Yellow
        ;.define LED_           =   4;                                  3/Yellow
        .define LED_HomePosFound=   2;          Homeposition is found   2/Yellow
        .define LED_Ready       =   1;          Ready                   1/Green


        ; GENERAL DEFINITION
                .define Set             = 1
                .define Reset           = 0
                .define True            = 1
                .define False           = 0
```

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```
Tetra Straw Applicator A1 TCA          2594080-0001 ELD 000 AA ECM 167303          2004-03-24
        ; APPLICATION PRE DEFINED VALUES
                .define MaxPosError     = 20000

        ; APPLICATION CONSTANTS
                .define ErrorReg        = R1    ;Error register
                .define Slask2          = R2    ;Temporary register
                .define ResAdjust       = R6    ;Resolver adjustement register
                .define CurrOk          = R7    ;Flag if currentlimit is reached
                .define MotorResOk      = R8    ;Flag if resolver is ok
                .define SlowSpeed       = R30   ;Speed for manual runing
                .define SlowAcc         = R31   ;Acc. for manual runing
                .define HomeFlag        = R33   ;Flag if motor is in synchron position
                .define HomeSpeed       = R34   ;Speed searching for synchposition
                .define HomeAcc         = R35   ;Acc. searching for synchposition
                .define NextPackTime    = R140
                .define PackTime        = R142
                .define Package         = R144
                .define ConveyorSpeed   = R146
                .define CorrDist        = R148
                .define CorrTime        = R150
                .define CorrTimeHalf    = R152
                .define CorrTime_t2     = R154
                .define LowSpeed        = R156
                .define CorrSpeed       = R158
                .define CorrAcc_1       = R160
                .define CorrAcc_2       = R162
                .define DecAcc          = R164
                .define TempReg1        = R166
                .define TempReg2        = R168
                .define SyncStart       = R170
                .define DecDist         = R172
                .define SensorOffs      = R174
                .define SensorRange     = R176
                .define SensorDist      = R178
                .define TempReg8        = R180
                .define TempReg9        = R182
                .define SmallPack       = R184

        ;*****************************************************************************
        ;* Start of program
        ;*****************************************************************************

                Comm.Mode       = 0                     ;Communication setting
                Comm.Baud       = 9600                  ;Communication setting
                Comm.Node       = 1                     ;Communication setting
                Comm.Tlines     = 22                    ;Communication setting
                Sysio.Led       = Reset                 ;Clear LEDs
                Sysio.Pout      = Reset                 ;Turn off system outputs
                Out.Fault       = Reset                 ;Turns off ready relay
                Int.Sysmask     = Reset                 ;Stop all system interrupts
                Int.Syspend     = Reset
                Int.Mask        = Reset                 ;Stop all input interrupts
                Int.Pend        = Reset
        Start0:
                Sysio.Pout      = Reset                 ;Turn off system outputs
                Int.Syspend     = Reset
                Int.Pend        = Reset
                Out.Level,255                           ;Positive logic on outputs
                In.Level        = Reset                 ;Positive logic on inputs
                Out.Pdo,0                               ;Clear outputs
                Let Slask2      = In.Pdi and 1020       ;Wait inputs to reset except
                                                        ;Di1,Di2 and hardware enable
                If Slask2       <> 0 then Start0
        Start1:
                If In.Enable    = 0 then Start1         ;Wait for hardware enable
                If DI_SoftEnable = 0 then Start1        ;Wait for software enable
                Int.Sysmask     = Reset                 ;Stop all system interrupts
                Int.Mask        = Reset                 ;Stop all input interrupts
                                        Page 2
```

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```
Tetra Straw Applicator A1 TCA          2594080-0001 ELD 000 AA ECM 167303          2004-03-24
                Sysio.Pout      = Reset
                Sysio.Pout,     (1+128)                 ;CpuOkLed + ResOffset=0
                Or Sysio.Pout,  4                       ;Power reset pulse
                Bclr Sysio.Pout,4                       ;
                Out.Fault       = Set                   ;Release fault line

        ; MOTOR RESOLVER SETTINGS
                Gosub ICAL                              ;Adjust Icals,Icalr
                Rd2.Mode,0                              ;Turn off RD2
                Gosub RESCAL                            ;Adjust Rd1
                If MotorResOk = true then Res_Ok
        Res_Fault:
                Sysio.Led = LED_ResError                ;LED Resolverfault on
                Goto Enable_Wait
        Res_Ok: Tmr.t1 = Reset
                Wait Tmr.t1>15
                Gosub MOTOR_PAR                         ;Motor parameters
                Pos mod off clr
                Pg.Speed        =      0                ;Clear regulator
                Pg.Aspeed       =      0
                Pg.Apos         = rd1.rpos              ;Clear poserror
                Pg.Rslope       =      0
                Pg.Proscale     =   1024

                Reg.Mode        =     71
                Reg.Pgain       =    300
                Reg.Igain       =      7
                Reg.Dgain       =   2500
                Reg.Perrlim     =  15000
                Reg.Ierrlim     , 600000
                Reg.Derrlim     =   2000
                Reg.Torqlim     =   2904
                Reg.Siscale     =      0
                Reg.SetTorq     =      0
        ;       Reg.InertiaP    =  12000
        ;       Reg.InertiaN    =  12000
        ;       Reg.InertSF     =     10
                Reg.Pole        =      0
                Reg.Zero        =      0
                Reg.TorqCLim    =    800
                Reg.TorqTime    =    500
        ;       Reg.Statfric    =    700

                Rd1.Mode = 49

        ;       ****Analog Outputs and Inputs measurment****

                Ana.Conntmr,0
                Connect Ana.Out1 to 0
                connect Ana.Out2 to 0
                Ana.Out1sf,-4                           ;+/-10 V = +/- 16384 pulses
                Ana.Out1offs,-32768
                ana.out1sign,1
                Ana.Out2sf,1                            ;+/-10 V = +/- 16384 pulses
                Ana.Out2offs,0
                Connect Ana.Out1 to moden3.pos
                Connect Ana.Out2 to reg.poserr
                Connect Ana.In1 to ConveyorSpeed
        ;       Connect Ana.In2 to
                Ana.In1Range,6802420                    ;10V=Ana.InRange+Ana.Inoffs
                Ana.In1offs,-3401210                    ;0V=0.5Ana.InRange+Ana.Inoffs
        ;       Ana.In2Range,xx                         ;-10V=Ana.Inoffs
        ;       Ana.In2offs,xx
                Ana.Conntmr,2                           ;Updating every 2msec

        ;       ****Interrupt settings****

                Vector.Fault,   @E_Stop3                ;System internal HW Fault
                                        Page 3
```

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```
Tetra Straw Applicator A1 TCA          2594080-0001 ELD 000 AA ECM 167303          2004-03-24
                Vector.Poserr,  @E_Stop4                ;Position error handling
                Vector.Ctrlc,   @E_Stop8                ;Control C
                Vector.Enable,  @E_Stop9                ;Enable signal
                Vector.SysErr,  @E_Stop16               ;System error
                Vector.TempErr, @E_Stop32               ;Temp error interrupt
                Vector.BleedErr,@E_Stop64               ;Error in bleeder resistor
                Vector.Resolverr,@ResolverErr           ;Error in resolver
                Vector.Cycint,  @Error_Check            ;Cycl timer event
        ;       Vector.Capint,  @                       ;
                Vector.Di10,    @E_Stop10               ;Software enable
                Vector.Di7,     @PackageComing          ;PackageComing signal
                Vector.Di2,     @Stopsynch              ;Homeposition sensor

        ;       Interrupt levels
                Int.Level,         0                    ;Reset all levels
                Bclr Int.Level, 4096                    ;Falling edge on fault inp.
                Or Int.Level,   2048                    ;Rising edge motor temp
                Bclr Int.Level, 1024                    ;Falling edge on Enable
                Bclr Int.Level,  512                    ;Falling edge on Estop
                Or int.level,     64                    ;Rising edge package coming
                Or Int.level,      2                    ;Rising edge home pos.sensor

        ;       Turn on interrupts
                Int.Pend,          0                    ;Remove pend.input inter.
                Int.Syspend,       0                    ;Remove pend.system inter.
                Int.Mask,       4096                    ;Turn on Fault
                Int.SysMask,     128                    ;Turn on Resolver error mask
                Or Int.SysMask,   64                    ;Turn on Bleeder error mask
                Or Int.SysMask,   32                    ;Turn on temp error mask
                Or Int.SysMask,   16                    ;Turn on System error mask
                Or Int.SysMask,    8                    ;Turn on Ctrl-C mask
                Tmr.Cycint,       20                    ;Set up Cyclical time 50msec
                Or Int.Sysmask,    1                    ;Turn on Cycl.timer
                Int.TempMask,     16                    ;Turn on tempfault DMC mask
                Or Int.TempMask,   8                    ;Turn on tempfault Motor mask

                Pg.Apos,        Rd1.Rpos                ;Clear poserror
                Tmr.t1,         0
                Wait Tmr.t1 > 5
                Pg.Dpos,        Pg.Apos                 ;Clear position
                Wait Tmr.t1 > 10
                Int.PosErr,     MaxPosError             ;Set up allowed pos. error
                sysio.chktmr,50
                rd1.chknom,14500
                rd1.chkthreshold,50
                rd1.chklowlim,12000

        ;*************************************************************************
        ;*      Main program                                                     *
        ;*************************************************************************

        Main:   If In.Enable    = 0 then Main           ;Wait for hardware enable
                If DI_SoftEnable = 0 then Main          ;Wait for software enable
                Sysio.Led,      LED_Ready               ;Ready for start order
                Or Int.Sysmask, 4                       ;Position error interrupt
                Int.Pend,       0                       ;Remove pend.input interrupts
                Int.Syspend,    0                       ;Remove pendsystem interrupts
                Or Int.mask,    (512+1024)              ;Soft-and hardware enable
                Or Sysio.Pout,  4                       ;Power reset pulse
                Bclr Sysio.Pout,4
                Pg.Apos,        Rd1.Rpos                ;Clear poserror
                Pg.Dpos,        Pg.Apos                 ;Clear position
                Or Sysio.Pout,  (1+2)                   ;CPU LED and softw. enable
                Ref Pos 0

        ;       ****Register settings****

                Let SlowSpeed,  -250000                 ;Jog speed
                                        Page 4
```

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```
Tetra Straw Applicator A1 TCA          2594080-0001 ELD 000 AA ECM 167303          2004-03-24
            Let SlowAcc,    3000000                 ;Jog acceleration
            Let HomeSpeed,  -100680                 ;Find home speed
            Let HomeAcc,    2553600                 ;Find home acceleration
            Let HomeFlag,   0                       ;Homepos. is found flag
            en3.source,     0                       ;moden3 source = rd1
            moden3.module,  196608                  ;module cycle = 3 motor turns
            moden3.mode,    3                       ;Enable
            Let SensorOffs, 200000000               ;Pulses from sensor to start
            Let SensorRange,3000000                 ;Pulses from sensor to start
                                                    ;(multiplied with 1000)
            Let SyncStart,  106496                  ;Appl. pos. when sync. start
            Let DecDist,    90112                   ;Appl.dist from sync. to stop
            Let LowSpeed,   30000                   ;Low speed limit
            Let SmallPack,  182095                  ;Smallest package size

        ;*************************************************************************

            DO_DMCEnabled,  Set                     ;System is enabled

        Startup:
            If DI_Jog then Manualruning             ;Go to Jog sequence
            If DI_FindHomePos then MechHomePos      ;Go to Find Home sequence
            Goto Production                         ;Got to Production Sequence
            Goto Startup

        ;*************************************************************************
        ;* Manual runing with Pushbutton on control panel                        *
        ;*************************************************************************
        Manualruning:
            Disp 100
            Capture.Enable,         0               ;No interrupts while jogging
            Bclr Sysio.Led,         LED_HomePosFound;Reset HomePosFound LED
            Let HomeFlag,           Reset           ;Reset HomePosFound flag
            Let DO_HomePosFound,    Reset           ;Reset HomeFoundSignal to PLC
            Pg.Acc,                 SlowAcc         ;Assign acceleration
            Pg.Ret,                 SlowAcc         ;Assign retardation
            Pg.Speed,               SlowSpeed       ;Assign speed
        SSpeed:
            If DI_Jog then SSpeed                   ;Loop whil signal is high
            Pg.Speed,               Reset           ;Set speed to zero
            Goto Startup

        ;*************************************************************************
        ;* Goto the mechanical homeposition                                      *
        ;*************************************************************************
        MechHomePos:
            Disp 101
            Bclr Sysio.Led, LED_HomePosFound        ;Reset HomePosFound LED
            Let HomeFlag,   Reset                   ;Reset HomePosFound flag
            Pg.Acc,         HomeAcc                 ;Assign acceleration
            Pg.Ret,         HomeAcc                 ;Assign retardation
            Pg.posspeed,    HomeSpeed               ;Assign speed
            Int.Pend,       0
            Pos Rel -1680000                        ;-210000

            Or Int.Mask,    2
            Wait Pg.Rdy = 1
            Pg.Posspeed,    Reset
            Goto Startup                    ;Alarm in machine because homepos.
                                            ;is not found.
        Stopsynch:                          ;Interrupt adress for HomePos sensor
            Disp 102

            Pos Rel 33333                   ;Go to synchronized position
            Wait Pg.Rdy = 1
            HomeFlag,       Set             ;system in synchronized position
            Do_HomePosFound,Set
            Or Sysio.LED,   LED_HomePosFound
                                    Page 5
```

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```
        Clr Tmr.t1
        Wait Tmr.t1 > 50
        ref pos 0
        moden3.pos,     196608          ;reference for moden3
        or int.mask,    64              ;normal interrupt on in1 filtered in
        Goto Startup

;*************************************************************************
;* Production when Mechanic are synchronized
;*************************************************************************
Production:
        ;Aux.
        IfNot Package then Startup              ;If no package has arrived.
        Package = False                         ;Reset start flag.
        if ConveyorSpeed < LowSpeed then Production;If conveyor stopped
        PackTime,       NextPackTime            ;Shift down time stamp

;******************************** DISTANCE AND TIME ************************
        ;Calculate applicator distance to "Start sync. pos." (pulses)
        CorrDist = moden3.pos-SyncStart         ;Dist. to correction middle
        if CorrDist > 0 then CorrCalc           ;Check if distance = OK
        Add CorrDist, moden3.module             ;Compensate for zero-nisse

CorrCalc:
        ;Calculate time before package is in "Start sync. pos." (msec.)

        TempReg1 = SensorRange*Identifier.Value
        SensorDist = TempReg1 + SensorOffs
        TempReg1 = SensorDist/ConveyorSpeed     ;Time from sensor/sync.start
        TempReg2 = Tmr.Abs-PackTime             ;Time since sensor mark
        CorrTime = TempReg1-TempReg2            ;Remaining time to sync.start
        CorrTimeHalf = CorrTime/2               ;Half of time above
        CorrTime_t2 = Tmr.abs + CorrTimeHalf    ;Timestamp for corr.2 start
;*************************************************************************

;******************************** CORRECTION PHASE 1 ************************
        ;Calculate pParameters
        CorrSpeed = 2000*CorrDist               ;Speed:
        CorrSpeed = CorrSpeed/CorrTime          ;CorrSpeed = Distance*2/Time
        TempReg1 = Pg.Aspeed/2                  ;          - ActualSpeed/2
        TempReg2 = ConveyorSpeed/2              ;          - ConveyorSpeed/2)
        Add CorrSpeed, TempReg1
        Sub CorrSpeed, TempReg2

        TempReg1 = CorrSpeed+Pg.Aspeed          ;Acceleration:
        abs TempReg1, 1                         ;Acc = SpeedDifference /
        TempReg1 = TempReg1*1000                ;       Time
        CorrAcc_1 = TempReg1/CorrTimeHalf

        ;Send parameters to servo (Accellerate/Deccelerate to mid speed v2)
        Pg.Acc,         CorrAcc_1
        Pg.Ret,         CorrAcc_1
        Pg.Speed=       0-CorrSpeed

;*************************************************************************

;******************************** CORRECTION PHASE 2 ************************
        ;Calculate parameters
        TempReg1 = ConveyorSpeed-CorrSpeed      ;Acceleration:
        abs TempReg1,   1                       ;Acc = SpeedDifference /
        TempReg1 = TempReg1*1000                ;       Time
        CorrAcc_2 = TempReg1/CorrTimeHalf

        ;Wait until correction phase 1 is done
        wait Tmr.Abs > CorrTime_t2

        ;Send parameters to servo(Accellerate/Deccelerate to sync.speed v3)
        Pg.Acc,         CorrAcc_2
```


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```
Tetra Straw Applicator A1 TCA          2594080-0001 ELD 000 AA ECM 167303          2004-03-24
            Pg.Ret,         CorrAcc_2
            Pg.Speed=       0-ConveyorSpeed

      ;*************************************************************************

      ;****************************** DECCELERATION PHASE ***********************
            ;Calculate parameters
            TempReg1 = ConveyorSpeed/50             ;Decceleration:
            TempReg2 = TempReg1*TempReg1            ;Dec = ActualSpeed² /
            DecAcc = TempReg2/DecDist               ;       (DistanceToStop/2)
            DecAcc = DecAcc*1250

            ;Wait until Synchronization phase is done
            wait moden3.pos > SyncStart
            wait moden3.pos <= DecDist

            ;Skip decceleration phase if new package has arrived
            if Package then Production

            ;Send parameters to servo(Deccelerate and stop at home pos.)
            Pg.Acc,         DecAcc
            Pg.Ret,         DecAcc
            Pg.Speed,       0
      ;*************************************************************************

      goto Production

      ;*************************************************************************
      ;* Interrupt when new package arrives                                    *
      ;*************************************************************************
      PackageComing:

            ;Input filter
            TempReg8 = Tmr.abs-PackTime             ;Time since last package
            TempReg9 = ConveyorSpeed/1000           ;Distance to last package
            TempReg9 = TempReg8*TempReg9
            if TempReg9 < 0 then goon               ;Long times - registers wrap
            if TempReg9 < SmallPack then PackExit   ;Exit if closer than 45mm.
      goon:
            ;Save package
            NextPackTime,   Tmr.abs                 ;Save time-stamp
            Package,        True                    ;Set flag: "Package arrived"

      PackExit:
            ;Hoppa tillbaka (och sätt upp interrupt)
            ireturn in 64

      ;*************************************************************************
      ;*      Cyclical timer interrupt                                         *
      ;*************************************************************************
      Error_Check:
            Gosub Currlim
            ErrorReg = Sysio.Pin and (1+8+16+128)   ;High voltage,temp etc.
            if reg.torque<r110 then NextTor
            r110,reg.torque
      NextTor:if reg.torque>r111 then NextTor2
            r111,reg.torque
      NextTor2:if reg.poserr<r112 then NextPos
            r112,reg.poserr
      NextPos:
            If ErrorReg <> (1+8+16+128) then E_Stop1
            Ireturn sys 1

      ;*************************************************************************
      ;*      Emergency stop                                                   *
      ;*************************************************************************
      E_Stop1: disp 1                 ;Cyclical interrupt
               disp ErrorReg
                                        Page 7
```

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```
Tetra Straw Applicator A1 TCA          2594080-0001 ELD 000 AA ECM 167303          2004-03-24
                goto E_Stop
        E_Stop3: disp 3                 ;Internal hardware fault
                goto E_Stop
        E_Stop4: disp 4                 ;Position error
                 disp Reg.PosErr
                 goto E_Stop
        E_Stop8: disp 8                 ;Control_C
                 goto E_Stop
        E_Stop9: disp 9                 ;Hardware Enable signal
                 goto E_Stop
        E_Stop10:disp 10                ;Software Enable signal
                 goto E_Stop
        E_Stop16:disp 16                ;System error
                 goto E_Stop
        E_Stop32:disp 32                ;Temperature error
                 Or Sysio.Led,LED_OverTemp
                 Goto E_Stop
        E_Stop64:Disp 64                ;Bleeder error
                 Goto E_Stop
        E_Stop128:
                 disp 128               ;Resolver error
                 goto E_Stop

        E_Stop:
                Int.Sysmask     = Reset         ;Stop all system interrupts
                Int.Syspend     = Reset
                Int.Mask        = Reset         ;Stop all input interrupts
                Int.Pend        = Reset
                Pos Abort                       ;Stop moving
                Pg.Speed        = Reset         ;Stop motion active
                Pg.Aspeed       = Reset
                Clr Tmr.t1
                Wait Tmr.t1 > 100
                Bclr Sysio.Pout,(2+8)           ;2+8 turn off power and brake
                Out.Pdo         = Reset
                Or Sysio.Led,   LED_EmStop
                Pg.Apos         = Rd1.Rpos
                Reg.Torqlim     = Reset
                Reg.Ierr        = Reset

        Enable_wait:
                Bclr Sysio.Led, LED_Ready
                DO_DMCEnabled   = Reset
                Let Slask2      = In.pdi and 512
                If Slask2 = 0 then Start0       ;Wait for software
                                                ;enable to be zero
                Goto Enable_Wait

        ;*************************************************************************
        ;*      Current limit detection                                          *
        ;*************************************************************************
        Currlim:If Di_SoftEnable=0 then CurrlimExit
                Currok= Reg.Mode and 3          ;Torqlim reached if not 3
                If currok = 3 then CurrlimExit
                Or Sysio.Led,   LED_CurrLim
                Return
        CurrlimExit:
                Bclr Sysio.Led, LED_Currlim
                Return

        ;*************************************************************************
        ;       Resolvererror detection, 15500 < rd1.ampl < 16000                 *
        ;*************************************************************************
        ResolverErr:
        ;       Add Sysio.pwm0, Rd1.AmplAdj
                If Sysio.pwm0 > ResAdjust then ResErrExit
        ;       Sysio.pwm0,     ResAdjust
                Or Sysio.Led,   LED_ResError
                                        Page 8
```

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```
        Goto E_Stop128
ResErrExit:
        Ireturn Sys 128

;*************************************************************************
;*      Adjustments of DMC,motor and resolver                            *
;*************************************************************************

;       ****Motor parameters****
;       FOR ELMO MOTOR PS
;       KAMAGAVA RESOLVER  POLES
MOTOR_PAR:
        Motor.Poles     =0
        Motor.Commpos   =0
        Rd1.Mode        =0
        Clr Tmr.t1
        Wait Tmr.t1>2
        Motor.Poles     = -10
        Motor.Ppr       , 65536 ;- Motor.Poles*4096
        Motor.Phalign   = 2700
;       Motor.PHdelay   = 2500
        Clr Tmr.t1
        Wait Tmr.t1>2
        Rd1.Mode,49
        Return

;*************************************************************************
;*      Adjust current offset                                            *
;*************************************************************************
;       Finds out the offsets in the Current references so
;       when Zero torque is ordered, the physical currents become Zero

Ical:   Bclr Sysio.Pout, (8+2)                  ; turn off power and brake
        Reg.Torqlim     =0                      ; And no SET value!
        Motor.Icals     =0                      ;
        Motor.Icalr     =0                      ;
        Let R1 ,        819                     ; Max 10% of offset
        R0 = Tmr.Abs                            ; Time reference.
Ical_1: Sub  Motor.Icalr,4
        Sub  Motor.Icals,4
        Add  R0,        2                       ;
        Wait Tmr.Abs > r0                       ; wait 2 msec.
        If   Sysio.Pin and 2 then Ical_2        ; If low
        Add  Motor.Icalr,8
Ical_2: If   Sysio.Pin and 4 then Ical_3        ; and next phase.
        Add  Motor.Icals,8
Ical_3: Loop R1,        Ical_1
        Disp Motor.Icalr
        Disp Motor.Icals
        Motor.Mode      = 0
        Motor.Comm      = 1
        Return

;*************************************************************************
;*      Test routine for resolver input 1                                *
;*************************************************************************
;       Finds out the optimal Exitation and Phase compensation for
;       Resolver 1
Rescal: MotorResOk=     True
        Gosub Midpoint
        Gosub Midpoint
        Return

;       Find midpoint for resolver 1
Midpoint:
        R1              =-150
        Rd1.Shadj       =R1                     ; Get ampl.-150 phase
        Clr Tmr.t1
```


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```
Tetra Straw Applicator A1 TCA          2594080-0001 ELD 000 AA ECM 167303          2004-03-24
               Wait Tmr.t1>100
               R2              =Rd1.Ampl              ; Get reference ampl.
               R1              =150
               Rd1.Shadj       =R1                    ; Get  150 us phase.
               Clr Tmr.t1
               Wait Tmr.t1>100
               R3=             Rd1.Ampl               ; Get reference ampl.
               If R3 > R2 then Mid_7                  ; Decide direction
               R1,             -150
               Add R1,         20
       Mid_5:  Rd1.Shadj       =R1                    ; R1 = Sample time.
               Clr Tmr.t1
               Wait Tmr.t1>5
               If Rd1.Ampl <= R2 then Mid_6           ; Found equal ampl.
               Add R1,         1
               Goto  Mid_5
       Mid_6:  Add  R1,        -130                   ; Calculate sample.
               R1              =R1 / 2
               Rd1.Shadj       =R1
               Return
       Mid_7:  Sub R1,         20
       Mid_8:  Rd1.Shadj =     R1                     ; R1 = Sample time
               Clr Tmr.t1
               Wait Tmr.t1>5
               If Rd1.Ampl <= R3 then Mid_9           ; Found equal ampl.
               Sub R1,         1
               Goto  Mid_8
       Mid_9:  Add R1,         130                    ; Calculate  point.
               R1              =R1 / 2
               Rd1.Shadj       =R1
               Return


       ;*******************************************************************************
       ;* End of program
       ;*******************************************************************************
```

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