

ELMA

Your Solution Partner

QUALITY ASSURANCE PLAN



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Department: Quality Assurance

1.0 OBJECTIVE

This document governs the Quality Assurance plan currently in place at ELMA Electronic Inc.

2.0 SCOPE :

This document defines and is applicable for the QA plan in place at EEI.

3.0 RESPONSIBILITY :

EEI's Vice President- QA/ Director- QA / Mgr-QA is responsible for developing and implementing the QA plan.

4.0 REFERENCES & ACRONYMS:

- QM- Quality Manual
- QMS- Quality Management System
- QMIS- Quality Management information system
- EESP- ELMA Electronic operating procedure
- EF- ELMA form
- C of C – Certificate of Conformance
- FAI- First article inspection
- FAT – First Article test
- ATP – Acceptance test procedure
- PAT – production acceptance test.
- CA- Corrective action
- PLM- Precision lifecycle management system

5.0 EEI's Quality Assurance Plan

EEI is an ISO 9001 company and the QA program at ELMA complies with the requirement of the ISO STD. The Quality manual provides an overview of the Quality Management system .The QA plan is best described under the following headings

5.1 Management approach to control and assure program quality

- Pre and Post Contract reviews to ensure compliance to customer specifications

- Project schedule and periodic monitoring
- Design verification / validation reviews
- Ensuring customer's quality requirement flow downs wherever applicable.
- Diligent implementation of EEI's inspection processes.
- Process control and applicable documents.
- Standard Part and Product inspection
- FAT and ATP where applicable.

5.2 Management system for Sub tier suppliers

- Vendor qualification (vendor survey or onsite audits)
- Purchase orders
- Quality requirement flow downs
- Pre expedite reports by purchasing dept
- In coming inspection
- Supplier Score cards
- Vendor visits and audits

5.3 EEI's spectrum of Inspection process at various stages.

ELMA's quality system addresses all inspection needs required during the conversion and integration of raw material into finish products. These can be summarized at various stages as explained below. The details of the inspection processes at ELMA are documented in.

- Raw Material to be environmental compliant and traceable. I.e. CofC's from the vendor.
- Component parts procured as commodity items to manufacturers specification (data sheets) are inspected to verify part number and qty against the specific PO on which the part was procured .Whenever specified in the PO , the supplier provided C of C is maintained as quality records
- Component parts purchased to ELMA's Engineering spec are initially inspected to verify part number and qty and is routed to Incoming QC for inspection to drawing requirements. Whenever specified in the PO, the supplier provided C of C is maintained as quality records.
- Customized mechanical piece parts are inspected during the fabrication process at the ELMA Sheet Metal shop (See inspection methods EF-374) and at the finished stage by QC dept. Sampling inspection per Mil Std is used. If contractually agreed FAI reports for piece parts are provided. See attached for more details

- Assembled product is inspected at the assembly line by the operator and /or line leads. Inspection is done per general or customized checklists. See attached for more details.
- Functional tests are carried out by the assembly line, QC and /or by Engineering dept. Results of functional tests are recorded in appropriate EF formats
- Final inspection is carried out at final QC stage. Sampling or 100% inspections are performed per customer requirement.
- EEI's standard ATP consists of the following QA records
 - AWO checklist (one per WO) in EF-243
 - Standard mfg checklists recorded in EF-243
 - Power test report in EF-218
 - Configuration sheet - xxx for integrated product (CAI)
- When contractually agreed detailed First article dimension inspections (FAI) are carried out and documented for custom designed piece parts for prototype projects only. These reports are available in EF-118 format.
Also, when contractually agreed FAI is also carried for completed assemblies and documented in EF-118 format.
- Special FAT, ATP and PAT tests are carried out in specific cases when contractually agreed upon. These tests procedures are developed by the Engineering dept and are derived from the customer's product specification / Source control documents or a requirements matrix. The formats for these reports are customized and are released as DCA # (document control number) that is stored and controlled in EEI's PLM system.

The methods specified in the ATP/FAT/PAT for verifying the product's compliance to customer's specification is listed below. Any of this is applied to each of the product's parameter being inspected /tested.

- A : Analysis – Engineering analysis that demonstrates compliance
- I : Inspection – Visual inspection of the parameter
- T: Testing - With recorded results. Testing can be within ELMA's premises or at an outside lab (ESS and QUAL tests)

5.4 Process control :

At EEI process control is achieved as below

Sales processes - Through Conformance to various SOP's

Design Process - Through Contract reviews, design and development plan, conducting PDR's and CDR's, ECN reviews before release.

Procurement Process – Through PO's with automatic flow downs from the PLM system to the ERP system. Periodic review of requirements and schedules.

Manufacturing process –

Sheetmetal parts – By mfg personnel following Work order instructions, Routers, conducting part self inspection to drawings.

Assembled product – Through conformance to engg documentation. Checklists, schematics, photos etc.

Quality process – Through applicable inspections , recording results , data reporting on EEI's QMIS system .Monthly review and analysis of data ,monitoring of results against defined quality objectives/goals, implementing continuous improvements and CA's wherever applicable .

Annual Management reviews are conducted in accordance with the requirements of the ISO 9001:2008 standard.

5.5 Corrective Action System.

EEI has an established process EESP -110 for Corrective and preventive actions

6.0 Elma's manufacturing Portfolio

- ELMA shop manufactures all sheet metal parts and machined parts
- Wiring Harness and cables are manufactured in house
- Backplane is designed and manufactured by ELMA Bustronic
- Parts like fans, power supplies, Line filters, Power entry modules, and other electrical parts are procured from specific and qualified suppliers.
- Product assemblies, System Integration and testing are carried out at the Fremont plant.