

Genus energizing lives	Standard Operating Procedure	Rev. No.: 00
IP-DAD-U-001	Title : Design and Development of Inverter/UPS	Date: 21.09.2015
	Reference: Quality Manual	Page: 02 of 08

1.0 Purpose: This procedure provides basic guidelines to ensure proper planning, control and verification of Design and Development of product and describes the procedures for Design of Electronic Circuitry, Mechanical Parts and Software for all types of Inverter/UPS and development of associated Components and Parts.

2.0 Scope: This document is applicable to all Design and Development Activities.

3.0 Responsibility: HOD (Design and Development)

4.0 Input:

S /N	Item/ Information	Source	Quality Parameter/ Metrics	Frequency
1.	Idea Vetting & (Voice of Customer) VOC as per IF-DAD-U-001.	Customer or Management	Change which improves/maintain the system	Whenever new requirement comes

5.0 Procedure:

Act. No.	Activity	Responsibility	Doc./ Record/Output	Frequency
5.1	Market Feasibility Stage			
5.1.1	Business Case is filled by Requester as per IF-DAD-U-002.	HOD	Business case	As & When Required
5.1.2	Feasibility is checked with the help of Business Case and presented to Management for approval.	HOD	Reviewed business case	As & When Required
5.1.3	Toll Gate 0 is reviewed as per IF-DAD-U-003. Approval is taken to move on for next stage.	HOD	Approved business case	As & When Required
5.2	Concept Feasibility Stage			
5.2.1	Kickoff Meeting is held to select Project Leader and Cross Function Team (CFT) as per IF-DAD-U-004. (PROJECT LEADER WILL BE RESPONSIBLE FOR ALL ACTIVITIES RELATED TO PROJECT).	HOD	Project leader, CFT finalized	As & When Required
5.2.2	Design Team is selected as per IF-DAD-U-005.	Project Leader	Design team	As & When Required

Genus energizing lives	Standard Operating Procedure	Rev. No.: 00
IP-DAD-U-001	Title : Design and Development of Inverter/UPS	Date: 21.09.2015
	Reference: Quality Manual	Page: 03 of 08

5.2.3	Initial Conceptual Design (Block Diagram, Schematic, Mechanical Concept, BOM, collection of Data Sheet and BOM cost)	Project Leader, Design Manager	Block Diagram, Mechanical Concept	As & When Required
5.2.4	K-1 Kaizen is done on VOC with CFT as per IF-DAD-U-006.	CFT	Scrutiny, Project plan	As & When Required
5.2.5.1	Scrutiny of Design Inputs as per IF-DAD-U-007.	CFT	Design inputs	As & When Required
5.2.5.2	Broad Requirements review.	CFT	Long Lead items	As & When Required
5.2.5.3	New Vendor development & evaluation	CFT	New vendor	As & When Required
5.2.6	Design FMEA as per IF-DAD-U-008.	Design Team	FMEA Action Plan	As & When Required
5.2.7	Project Planning and authorization to sub team / members as per IF-DAD-U-009.	CFT	Project plan	As & When Required
5.2.8	Toll Gate 1 is reviewed as per IF-DAD-U-010. Approval is taken to move on for next stage.	HOD	Approved project plan & design inputs	As & When Required
5.3	Product Design Stage			As & When Required
5.3.1	Detailed design (schematic, BOM, collection of data sheet)	Design Team	Inputs for prototype	As & When Required
5.3.2	Review as per IF-DAD-U-011.	Design Manager	Approved Inputs for prototype	As & When Required
5.3.3	Modules are developed and tested	Project Leader	Module Report	As & When Required
5.3.4	PCB layout is developed	Design Team	PCB Layout	As & When Required
5.3.5	Mechanical drawing are developed	Design Team	Mechanical Drawing	As & When Required
5.3.6	Review as per IF-DAD-U-011.	Design Manager	Approved Inputs for prototype	As & When Required
5.3.7	Design testing on board	Project Leader	Initial Design Testing Report	As & When Required

IP-DAD-U-001

**Title : Design and Development
of Inverter/UPS**

Date: 21.09.2015

Reference: Quality Manual

Page: 04 of 08

5.3.8	Review as per IF-DAD-U-011.	Design Manager	Approved Inputs for prototype	As & When Required
5.3.9	Design testing with enclosure	Project Leader	Final Design Testing Report	As & When Required
5.3.10	Review as per IF-DAD-U-011.	Design Manager	Approved Inputs for prototype	As & When Required
5.3.11	Design Verification (Hardware and Software) is performed as per IF-DAD-U-012.	Design Team	Verified Prototype Product	As & When Required
5.3.12	Identification and action on long lead Items.	Project Leader	List of Long Lead Items	As & When Required
5.3.13	Review as per IF-DAD-U-011.	Design Manager	Approved Inputs for prototype	As & When Required
5.3.14	Kaizen K2 is applied for final Design Inputs related to manufacturability of prototype and necessary actions taken as per IF-DAD-U-013.	CFT	DFMA Action Plan	As & When Required
5.3.15	Review as per IF-DAD-U-011.	Design Manager	Approved Inputs for prototype	As & When Required
5.3.16	Design Validation (Internal) as per IF-DAD-U-014.	PE	Validated Prototype Product	As & When Required
5.3.17	Changes done (if necessary) and affected areas are re-verified and re-validated.	Project Leader	Revalidated Prototype Product	As & When Required
5.3.18	Review as per IF-DAD-U-011.	Design Manager	Approved Inputs for prototype	As & When Required
5.3.19	Documentation is prepared to support CFT.	Project Leader/PE	Documents	As & When Required
5.3.20	Review as per IF-DAD-U-011.	Design Manager	Approved Inputs for prototype	As & When Required
5.3.21	Design FMEA as per IF-DAD-U-008.	Design Team	FMEA Action Plan	As & When Required

Genus energizing lives	Standard Operating Procedure	Rev. No.: 00
IP-DAD-U-001	Title : Design and Development of Inverter/UPS	Date: 21.09.2015
	Reference: Quality Manual	Page: 05 of 08

5.3.22	Design is released for Pilot Production as per IF-DAD-U-022.	PE	Released Document	As & When Required
5.3.23	Toll Gate 2 is reviewed as per IF-DAD-U-023. Approval is taken to move on for next stage.	HOD	Approval for Pilot Production	As & When Required
5.4	Pilot Production Stage			As & When Required
5.4.1	Engineering Documents are verified as per IF-DAD-U-024.	CFT	Verified Documents	As & When Required
5.4.2	Develop Production Process & Layout. (Including Zigs / Fixtures and other necessary equipments.)	CFT	Equipments for Pilot Production	As & When Required
5.4.3	Conduct Kaizen K3 for Pilot Production Preparation as per IF-DAD-U-025.	CFT	Pilot Production Process	As & When Required
5.4.4	Pilot Production	CFT	Pilot Products	As & When Required
5.4.5	Pilot Production Review as per IF-DAD-U-026.	CFT	Review Sheet	As & When Required
5.4.6	Necessary changes are done as per IF-DAD-U-027.	PE	Change Notes	As & When Required
5.4.7	Toll Gate 3 is Reviewed as per IF-DAD-U-028. Approval is taken to move on for next stage.	HOD	Approval for Field Validation	As & When Required
5.5	Mass production Stage			As & When Required
5.5.1	Field Validation as per IF-DAD-U-029.	PE	Field Validation Report	As & When Required
5.5.2	Field validation Report is reviewed as per IF-DAD-U-030.	CFT	Review Sheet	As & When Required
5.5.3	Define improvements in process	PE	Action Plan	As & When Required
5.5.4	Customer feedback is taken.	PE	Customer Feedback	As & When Required
5.5.5	Lesson learnt and implemented.	PE	Knowledge List	As & When Required
5.5.6	Toll Gate 4 is reviewed as per IF-DAD-U-031.	HOD	Approval for Mass Production	As & When Required