



# QUALITY MANUAL



## About Power Innovation

The company Power Innovation Stromversorgungstechnik GmbH belongs to the leading developers and producers of innovative power supplies for industrial applications. Amongst others our customers are from the telecommunication and the railway sector.

Power Innovation was founded 1987 in Bremen as medium-sized business. At the present time about 40 employees work in the new company building in Achim.

From the very first developed uninterruptible power supply to our current modular and intelligent inverter systems, which can be parameterized and electrically controlled during operation, we have systematically extended our competence and have achieved widespread acceptance and confidence from our longtime customers.

Each new step in technology results in increasing power demands and additional reliability - it is our ambition to be always one step ahead.

Quality management, including this manual, depends on proposals and remarks for continuous improvement, but also on suggestions concerning mistakes and ambiguities. Information referring to this is expressively requested.

For questions and remarks please contact:

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## Management commitment

The top management of the company has the direct responsibility for the Power Innovation quality management system. This quality manual formulates the general principles, the objectives and the evaluation procedures of the system, that corresponds to DIN EN ISO 9001:2008 and is mandatory for all employees and processes of the company.

The top management commits all employees to perform their functions corresponding to the defined processes, process instructions and further applicable documents. Motivation and training of the employees shall guarantee comprehension, realization and continual improvement of the quality policy on all levels of the company.

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**Bernhard Böden**  
(Director)

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## 1 Structure and amendment of the quality manual

### 1.1 Structure of the quality manual

The quality manual (QMH) formulates the quality objectives given by the management, describes the implemented quality management system and defines the quality relevant processes.

Chapter 2 describes the quality management systems objectives and implementation, chapters 3 to 5 explain the quality relevant processes, differentiated in managing processes, main processes and supporting processes and finally the appendix lists the corresponding process instructions.

### 1.2 Amendment and distribution of the QMH

The management approved original quality manual is archived by the quality management representative, who is also responsible for writing and updating the quality manual.

The quality manual's latest revision is accessible as a pdf-file in the intranet for all employees and is regularly updated.

Printed quality manuals are not subject to change services. In-house print versions can be replaced upon request, the affected departments will be informed about updates.

The revision history is documented separately.

## 2 Quality management system

### 2.1 Quality policy

Any company activity focusses on the management's commitment to guarantee process and product quality and continuous improvement.

The main issue of quality politics and maintenance is the customer's satisfaction which results from process and product quality.

All employees take part in the realization of quality policy which represents a personal responsibility for the customer's satisfaction.

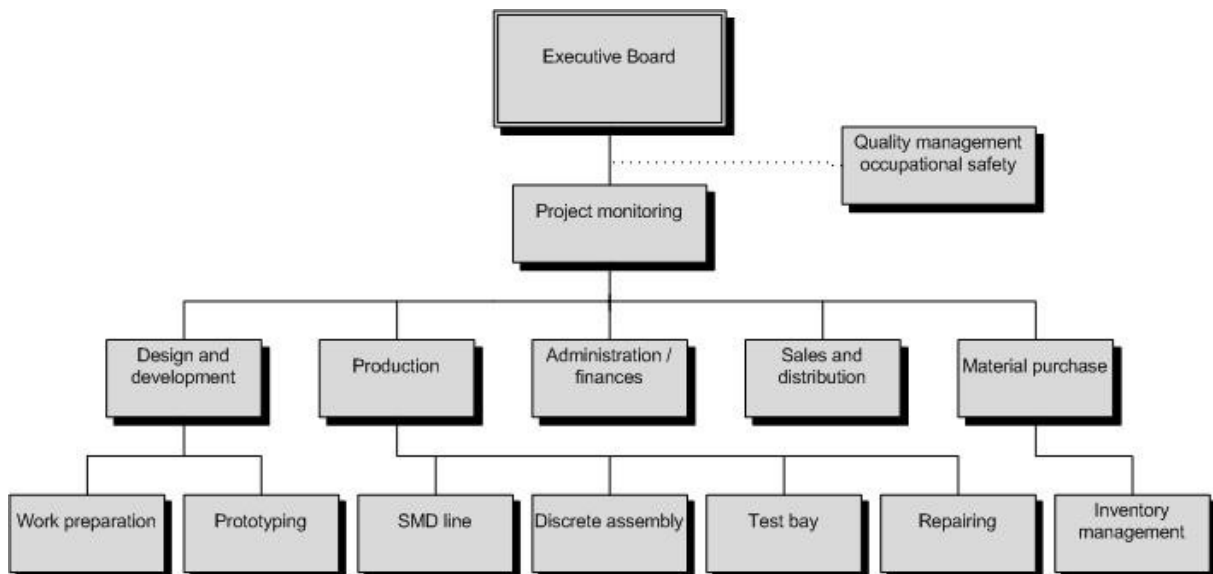
### 2.2 Quality management representative (QMB)

The management assigns the accomplishment of quality policy to the quality management representative. This includes authoring the process instructions and the organization of employee trainings as well as the implementation of preventive and control actions.

The quality management representative is authorized to give directives to the departments. He gives regular reports to the top management about the quality management's development .

## 2.3 Company organization

The chart below shows the company's organizational structure. It is laid out as a flat hierarchy, which enables the employees to communicate directly with the management and to take part in the continuous improvement of the work processes, especially concerning quality management and policy.

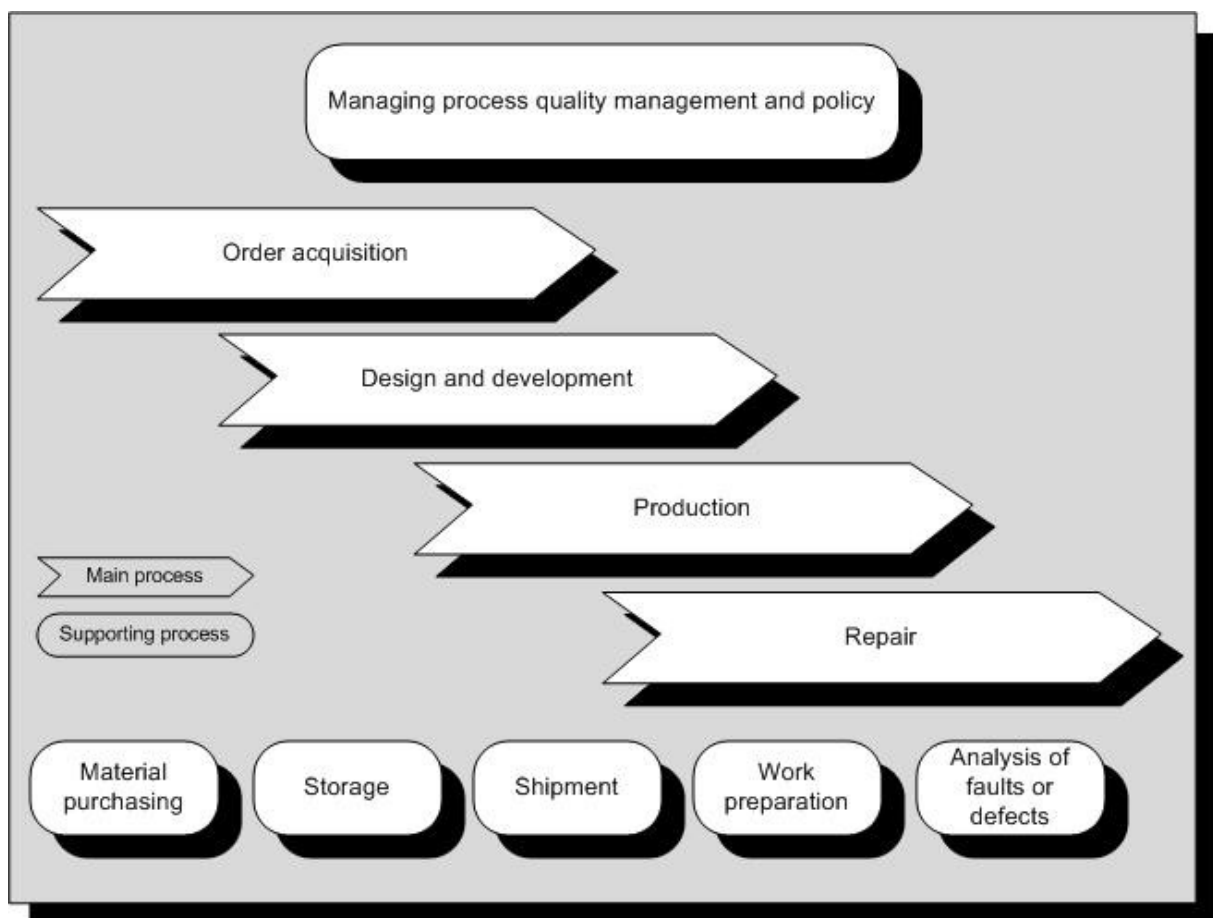


## 2.4 Main processes of the quality management system

Different from the organizational structure shown above, the company's structure is process orientated for the quality management system.

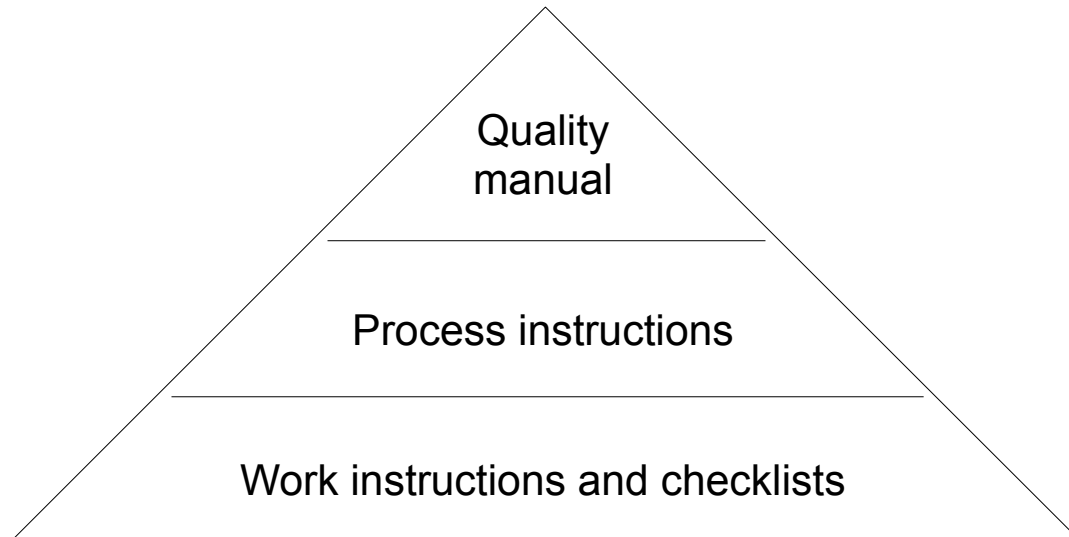
The company's processes are classified into three categories, the managing processes, which control process development and continuous improvement, the main processes and the supporting processes, which have an indirect impact on the company's added value. All processes include necessary definitions for identification and traceability.

The process flow chart below shows the quality relevant processes of the company. The process objectives and contents are described in the following chapters.



## 2.5 Quality management system documentation

The documentation of the quality management system is structured as follows:



The quality manual describes general aims and structures of the quality management, they are concretized by the subordinated process instructions. On the third level, special requisitions or work steps are specified by work instructions and check lists as well as possible test instructions, standard forms or other documents.

The control of quality relevant internal and external documents is defined in the work instructions.

The realization of the identification and traceability principle is fundamental for the product and process quality. Due to the company-wide scope, this principle is embedded in the main processes as well as in the work instructions and other documents.

## 3 Managing process quality management and policy

The managing process quality management and policy is divided into four sections, which form a PDCA cycle for continuous improvement of the process quality.

- Definition of quality objectives (and nomination of the QMB)
- Development and documentation of the quality processes
- Quality process control
- Inspection and update of the quality objectives

The main tools for process verification are the annual internal system audit, the analysis of the repair data base, the customer survey and the supplier rating as well as the employees training plan. The management review brings the conclusions together and defines the quality objectives and measurements for the upcoming business year.



## 4 Main processes

Four main processes are directly involved in the customer service, order acquisition, design and development, production and repair.

### 4.1 Order acquisition

The order acquisition consists of four sub-processes.

#### RFQ processing

Incoming requests should be checked economically and answered in written form within 24 hours. Depending on the request, the sales department coordinates the integration of other departments, such as the design and development, the production planning and the material purchasing. The standardized RFQ guarantees clearly defined customer specifications.

#### Commercial offer

The sales department is responsible for commercial offers, based on the RFQ processing. The objective is to create the optimum offer for the customer within the time given.

#### Order processing

Incoming orders are checked for correctness and completeness of the data in the order processing. After consultation of the production planning, the customer gets a confirmation of the order and of the delivery date.

#### Production planning and control

The production planning creates internal production orders for the production and test bay departments and determines the delivery dates. Within this schedule, the production management arranges the production order and the personnel allocation.

### 4.2 Design and development

By this process internal and external design and development requests are managed. The process starts with the project initialization and ends with the technical release for production of the finished product. The design and development process is divided into hardware development, software development and sample production and testing.

#### Hardware development

The hardware development includes the project initialization, the feasibility study, the basic device construction and the prototype development. If required, the hardware development will initialize a software development.

#### Software development

The software development includes software planning and source code generation and is completed by the technical verification of the hardware developer responsible.

#### Sample production and testing

The sample production and testing follow subsequent to hard- and software development. A batch series is produced in the production department. This includes the draw-up of the final manufacturing instructions.

#### Technical release for production

The completion of the project results in the successful batch series production and the conclusion of all obligatory test required.

### 4.3 Production

The production process manages the organization and handling of production orders of external and internal customers, such as the sales or the design and development department. Besides general requirements, the process defines the sub-processes SMD mounting, discrete mounting, lacquering and electrical and functional testing. Each sub-process includes a complete identification and traceability and control of all production steps.

#### **SMD mounting**

SMD mounting includes mounting and soldering of SMD modules (surface mounted devices).

#### **Discrete mounting**

The discrete mounting includes all production steps of boards and modules, including subassembly, discrete mounting, PCB soldering and visual inspection and rework.

#### **Electrical and functional test**

The electrical and functional test include the mechanical assembly and the functional testing of the products. Each product passes through a 100 % functional test and a final long-term test before release for shipment.

### 4.4 Repair

The processing of conversion and repair orders has three sub-processes:

- the receipt and registration of repair orders in the inventory management department
- the order processing in the sales department
- the repair and electrical and functional testing in the repair department

The incoming goods inspection follows the process for incoming materials but requires the generation of a repair order. This order is processed in the sales department, after consulting the customer, and released for the repair department. The objective of this process is a return to the customer within 14 work days.

## 5 Supporting processes

The main processes are supported by four additional processes.

### 5.1 Material purchasing

The material purchasing department buys the need of components planned and services and administrates the material database. Based on the delivery faults documented, the material purchasing department carries out an annual supplier rating.

### 5.2 Storage

This process contains the sub-processes of the incoming inspection, the storage treatment, picking of production orders and the return of residual material.

#### **Incoming inspection**

The incoming inspection guarantees that all material shipments comply with the purchase orders. Defective shipments will either not be accepted or will otherwise be documented and processed in accordance with regulations.

### **Storage treatment**

The storage is based on a random storage system and guarantees strict batch splitting. This sub-process defines the required electrical data processing and the basic principles of traceable storage treatment.

### **Picking of production orders**

This sub-process defines the picking of production orders, including handing over of the material to the producing departments.

### **Return of residual material**

The basic principles processing the return of residual material are defined in this sub-process, including batch splitting and traceability.

## **5.3 Shipment**

The shipment process is subdivided into the shipment organization by the sales department and into packing and commissioning of the deliveries by the storage department. The shipment objective is a reliable and fast delivery of products, goods for resale and repaired devices.

## **5.4 Work preparation**

The work preparation administrates the material list in the EDP system and supports the design and development department in the draw-up of technical documentation. Furthermore, the work preparation creates technical documentation for the production process.

## **5.5 Analysis of faults or defects**

The project monitoring coordinates the central process of analysis of faults or defects.

# **6 Basic quality management principles**

There are some general principles in the quality management system which are defined and implemented within the processes and work instructions concerned.

## **6.1 Management and control of documents**

Because of the different requirements of each process the handling and specification of documents and records is defined within corresponding process and work instructions. The identification and distribution of external documents is particularly defined in each individual case.

## **6.2 Control of measuring and test equipment and maintenance**

The control of measuring and test equipment and maintenance defines regular procedures and employees responsible for them. A company-wide maintenance plan is the main tool and lists all the equipment in its maintenance cycle.

## **6.3 Corrective and preventive actions**

The corrective and preventive actions contain processes which enable the employees to describe technical as well as organizational defeats in order to initiate their correction. Besides the supplier rating, the repair data base and the customer survey, which are defined in the main processes, this includes the process for analysis of faults and defeats.

## 7 Exhibit

### 7.1 List of quality processes

Since the process instructions are not translated into English, the register refers to the German documentation.

01\_Führungsprozess\_Qualitätsmanagement\_und\_politik

02\_Kernprozess\_Auftragsgewinnung

03\_Kernprozess\_Entwicklung

04\_Kernprozess\_Produktion

05\_Kernprozess\_Reparatur

06\_Hilfsprozess\_Einkauf

07\_Hilfsprozess\_Lagerung

08\_Hilfsprozess\_Versand

09\_Hilfsprozess\_Arbeitsvorbereitung

10\_Hilfsprozess\_Mängelbearbeitung\_und\_Sperrungen

### 7.2 List of abbreviations

AA work instruction (**A**rbeits**a**nweisung)

QM quality management (**Q**ualitäts**m**anagement)

QMB quality management representative (**Q**ualitäts**m**anagement**b**eauftragter)

QMH quality manual (**Q**ualitäts**m**anagement**h**andbuch)

QMS quality management system (**Q**ualitäts**m**anagement**s**ystem)