

1 Scope

The Quality Management System in production of mechanical pressure gauges is based on the general Quality Management System of WIKA, Alexander Wiegand SE & Co. KG.
 This document is meant to give an overview of the major quality relevant processes used for production and control of pressure gauges. It should be viewed in combination with the Quality manual document as general information.

2 Documentation

Document	Definition
Data sheet (DS) Operating manual (OPM)	The data sheet defines technical features of a standard pressure gauge and can be downloaded from WIKA's website.
Number / type code of a single part or manometer	The part number of any part, component or pressure gauge is unique; it is kept under control through revision management.
Drawing (DRW)	The drawing is used to record technical details of parts, components, or pressure gauges and always refers to a part number. It is kept under control through revision management.
Standard operating procedure (SOP)	The SOP defines how to perform each step of a process. The SOP document is kept under control through revision management and only for internal use at WIKA.
Work instruction (WI)	The WI defines how to handle or work on parts/ production steps. The WI document is kept under control through revision management and only for internal use at WIKA.
Production workplan (WP)	The WP, which is elaborated by the Process Engineering department, defines the different production steps. Every production step is signed by the skilled employee during the production process. The WP document is kept under control through revision management and only for internal use at WIKA.
Bill of materials (BOM)	The BOM is a structured list of individual parts/ materials needed for the assembly of a part or product.
Welding procedure specification (WPS)	The WPS defines in detail how to handle the welding process. The WPS document is kept under control through revision management and only for internal use at WIKA.

WIKA's internal documents may be shown through customer visit/ audit upon request; copying for customer documentation or use is not allowed.

3 Quality Management procedures in production

3.1.1 Quality Management prior to series production

- New products and variation of existing products are developed and validated for series production capability according to the WP.
- Potential new suppliers are evaluated prior to series shipments.
- New parts have to pass the First Article Inspection (FAI) process according to the WIKA Global Guideline "Supplier Quality."
- Preventive quality tools (like FMEA, QFD, quality workshops...) are used to define quality specification items.

3.2 Quality Management during series production

- Incoming inspection of purchased parts from certified suppliers according to a control plan is done to verify incoming quality.
- Production tests (leakage, accuracy, isolation...) are documented in the WP to verify the production steps. Product inspections (construction, installation dimensions, identification, documentation, certificates, and completion documentation) are documented in the WP to ensure the product quality.

3.2.1 Quality Management of bourdon tube (BT) pressure gauges

Product / step	Process	Specification
Prepare components for BT system	Socket, BT, end cap or add. components are all washed in Per or water based medium	WI and maintenance instruction for cleaning of machine visual testing and test of surface tension acc. to WI
BT system	Welding or soldering of socket, BT and end cap	Drawing, BOM, welding procedure specification (WPS)
Leakage test	100% helium leakage test of BT systems	SOP or customer specification
Hydrostatic test	Optional pressure test	Customer specification
Autofrettage test	100% overpressure load	WI
Housing assembly	Welding or assembly of BT system into housing	WI, BOM
Leakage test	100% leakage test of welded housings	SOP
Dial printing	Printing of pressure range on the dial together with symbols, WIKAI/ customer logo and traceability marking	WI, production order
Preassembly	Assembly of movement, dial and pointer	WI, BOM
Calibration	Adjusting the pointer's transaction to the dial layout over the whole pressure range according to the accuracy required by the customer	WI; customer specification; international standard (EN 837 or the like)
Final assembly	Assembly of window and closing ring	WI, BOM
Leakage test	100% leakage test of closed housings	SOP
Liquid filling	Optional filling of the housing	WI, BOM, production order
Final inspection	100% check of produced gauges done by production operator	WI, Production order
Final inspection	Random sample check of produced gauges done by quality inspector	WI, Production order
Packing and shipping	Packaging of gauges into a transport box, sampling of all gauges of a customer order, shipping gauges to customer. Special packing with PE bags and cap for process connector for oxygen application	WI, BOM and customer specification if requested

3.2.2 Quality management of diaphragm pressure gauges

Product / step	Process	Specification
Prepare all wetted Elements like diaphragm for oxygen applications	Washing & degreasing of all wetted elements in specified Cleaning machine and program	WI
Diaphragm element	Stamping of shape, diameter	Drawing, BOM, specification
Assembly of diaphragm element	Fixing of the element according assembly construction either by welding or mechanical fixing	Drawing, BOM, specification, SOP, WPS
Autofrettage test	100% overpressure load	WI
Leakage test	100% helium leakage test of diaphragm systems	SOP or customer specification
Hydrostatic test	Pressure test with overload	WI
Housing assembly	Assembly of diaphragm system into housing	WI, BOM
Dial printing	Printing of pressure range on the dial together with symbols, WIKAI customer logo and traceability marking	WI, production order
Preassembly	Assembly of movement, dial and pointer	WI, BOM
Calibration	Adjusting the pointer's transaction to the dial layout over the whole pressure range according to the accuracy required by the customer	WI; customer specification; international standard (EN 837 or the like)
Final assembly	Assembly of window and closing ring and fittings	WI, BOM
Leakage test	100% leakage test of closed housings	SOP
Liquid filling	Optional filling of the housing	WI, BOM, production order
Final inspection	100% check of produced gauges done by production operator	WI, Production order
Final inspection	Random sample check of produced gauges done by quality inspector	WI, Production order
Packing and shipping	Packaging of gauges into a transport box, sampling of all gauges of a customer order, shipping gauges to customer. Special packing with PE bags and cap for process connector for oxygen application	WI, BOM and customer specification if requested

3.3 After sales service

Process gauges which are out of function or calibration can be returned to WIKAI for service; The procedure is described on the website of WIKAI under "service" (product return form) and can be individually handled.

The service procedure is fixed in a SOP and/or WI depending on the type of gauge.

WIKAI Alexander Wiegand SE & Co. KG

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