Functional safety handbook, training courses and certificates
Performance Level, MTTFd values, B10 values
Current standards and guidelines require the calculation of a Performance Level (PL) for machines, among other requirements. If you need characteristic safety ratings for this calculation, we would be happy to provide them, such as in the form of SISTEMA libraries for selected products and technologies.

www.boschrexroth.com/safety

Always on the safe side
Our electrical, hydraulic, pneumatic and mechanical components fit seamlessly into safety-related control systems to ensure compliance with standards. Whether certified safety or standard components, we will always give you the support you need. We also offer a comprehensive range of tried-and-tested solutions that will help you meet the requirements for functional safety simply and cost effectively.
Drive & Control Academy

As the Drive & Control Company, Rexroth offers end-to-end expertise in functional safety across all automation technologies. The Drive & Control Academy passes this knowledge on and supports the customized training and further development as well as the qualification of technical experts.

Rexroth is your partner for functional safety. The handbook “10 Steps for the Performance Level” provides a detailed and systematic guide for designing optimal safety technology solutions delivering a high degree of legal certainty. The package offered by the Drive & Control Academy also includes hands-on training courses in machine safety. The product range is complemented by eLearning modules on functional safety that can be taken at any location and at any time.

▲ Rexroth offers end-to-end expertise in functional safety covering all automation levels and technologies.

▲ In the Drive & Control Academy Rexroth offers an extensive portfolio of knowledge products for all drive and control technologies.
The handbook provides a general overview of international and European guidelines and directives as well as national legislation. It explains the scope of validity and requirements of European Machinery Directive 2006/42/EC. It also covers harmonized standards for the functional safety of machinery such as ISO 12100, IEC 62061 and ISO 13849. Find out how these standards interact and when you have to apply which standard.
This section takes a detailed look at the interpretation and assessment of safety functions in accordance with ISO 13849. The design and evaluation are divided into ten working steps – the 10 steps to the Performance Level. The handbook describes each step in detail and offers key guidance for designing safety solutions with a high degree of legal certainty.
This section provides a practical guide to realizing functional safety using a variety of examples. Find out how to implement selected safety functions of electrical, pneumatic or hydraulic subsystems, e.g. in machine tools or injection molding machinery. Take a peek "over the shoulder" of specialists in all 10 steps to the Performance Level. Practical tips will explain how to proceed efficiently in order to save time without neglecting important safety principles.
The handbook for realizing functional safety in accordance with ISO 13849

The handbook is a practical guide for the design of safe machines. It significantly reduces the expense of configuring safe machine controls. The handbook includes hands-on experience from countless projects in real-life applications and the latest findings from various standards institutes and industry associations. Current standards on functional safety consider the progress of automation technologies as they interweave together and therefore require an integrated approach that crosses technology boundaries.

Risk assessment, safety functions, required Performance Levels, diagnosis and reliability values for all electrical, hydraulic, mechanical and pneumatic components are key stations along the way to configuring safety-related control systems.

Rexroth has issued this safety handbook to ensure the efficient implementation of legal and normative requirements. Our experts have attached great importance to not only communicating existing knowledge from standards, guidelines and directives but also translating these into practical know-how using examples.

The handbook is divided into three thematic areas. Part A provides a general explanation of the principles and standards. Part B offers a systematic approach to the design of safe machine controls. Part C vividly illustrates the realization of this systematic approach using a variety of application examples.

Safe machine design with the handbook for realizing functional safety in accordance with ISO 13849.
264 pages, order number for the English version R961006999, €49.90

The handbook explains the design and evaluation of safety functions in 10 steps.
Hands-on training: Fast, systematic, target-driven

Our didactically trained instructors provide face-to-face instruction in all the knowledge required for functional safety. You decide the time, the place and the topic. Why not take advantage of our experience in all automation technologies? Depending on the task in question, our training can be tailored to individual technologies or explain the optimal interaction in systems. The focus is always on the practical application.

In face-to-face classes, our specialists teach the skills and know-how required to realize the relevant machine safety standards and the Machinery Directive: from producing a risk assessment to installation, commissioning and conformity assessment.

The principles of functional safety are learnt in a basic training course – further, more in-depth knowledge is acquired in our special training courses.

**Basic training: Basics of functional safety**

From planning through design to safe operation. The basic training in functional safety that Rexroth offers in cooperation with SICK AG is aimed at all technical experts who have to assess, ensure and guarantee the functional safety of machinery.

The seminar presents practical applications of the latest standards and explains how to achieve their optimal potential. At the end of the training, an optional examination can be taken by the participant, on successful completion of which the participant is given a "Certified Expert – Functional Safety in Accordance with EN ISO 13849" certificate from TÜV NORD CERT GmbH, Bosch Rexroth and SICK.

**Duration: 5 days, 2012 price: €2,030 plus certification costs**

**Special training in functional safety:**

Deepen your knowledge of functional safety with these special training courses:

- Practical functional safety seminar – EN ISO 13849 with SISTEMA, the software for control safety
- Risk assessment and reduction in accordance with ISO 12100
- IndraDrive – commissioning and parameterization of safety technology
- Project planning/programming the SafeLogic compact product family

Take advantage of our experience to realize cost-effective, standard-compliant solutions quickly!

Extensive information about our functional safety training courses and the whole training package offered by Rexroth can be obtained online at:

[www.boschrexroth.com/academy](http://www.boschrexroth.com/academy)
Rexroth offers a comprehensive package of internet-based eLearning modules that provide a highly cost-effective means of in-depth technical training and further development.

In the eFSI eLearning modules in functional safety we provide learning content on the subjects of "Principles of machine safety" and "10 steps to the Performance Level" delivered in a multimedia format incorporating the latest didactical topics. These will take you to clearly defined learning objectives. The students determine their own individual learning speeds and allocate their time to suit themselves. Rexroth’s online range in the Drive & Control Academy already includes more than 1,500 pages of training content and documentation in German, English and Chinese.

To give you a flavour of the eLearning modules, a free test account can be accessed at: www.boschrexroth.com/elearning

The first study module covers the principles for the application of the new Machinery Directive 2006/42/EC. The second teaches the 10 steps to the Performance Level.

With an attractive price/performance ratio, the multiple license is particularly suitable for the further development of employees and students in industrial companies, further education providers, schools and universities. The license duration is 12 months after release.

### Price list for Europe (subject to change)

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All prices exclude VAT at the prevailing rate
The data specified above only serve to describe the product. As our products are constantly being further developed, no statements concerning a certain condition or suitability for a certain application can be derived from our information. The information given does not release the user from the obligation of own judgment and verification. It must be remembered that our products are subject to a natural process of wear and aging.