1. Purpose

This document describes Rotek's process for evaluating and revising Rotek slewing ring bearing designs against customer technical documentation.

2. Background

Slewing ring bearings are ready-to-install component assemblies which simultaneously transmit axial and radial forces and tilting moments. Rotek slewing ring bearings are engineered products based on Rotek standards. Rotek has been engineering and selling slewing bearings in North America for over 55 years. Rotek products are branded as Rotek, PSL and Rothe Erde. All product brands are part of the thyssenkrupp Rothe Erde Group.

Slewing ring bearings are produced as various design types including:

- Four-point contact bearings
- Double four-point contact bearings
- Three-row roller bearings

These slewing ring bearings are used worldwide in various applications under different climate conditions. Examples include, handling equipment, excavators, cranes, wind energy turbines and many others.

Rotek slewing ring bearings are developed to satisfy unique customer requirements, including bearing external dimensions, loading requirements, and performance criteria. It is not always possible for Rotek to satisfy every customer requirement. Therefore, a process has been established by Rotek to identify exceptions to customer requests and to handle customer change requests. Rotek will always quote and deliver a Rotek part number, based on Rotek drawings, design and manufacturing standards. The Rotek drawing is always the primary design control document.

3. Customer Input

Customer input to Rotek is communicated in both written and verbal format. Written formats may include technical specifications and drawings.

As a prerequisite for Rotek to accept any warranty, all customers are required to furnish complete details of the following information: application information, load data, and operating conditions.

Requests for design changes must be specific regarding each individual change to be made.

4. Rotek Response

Rotek supplies a written technical response to a customer's request for quote. Technical responses are prepared by Rotek's Application Engineering department. These are referred to as Technical Proposals, and they are developed during the Sales Order Acquisition Process.

Technical Proposals may include a proposed Rotek bearing design, comments on the suitability of the bearing for given loads and application information, and may include a Rotek DED (Design Exception Document).

A Rotek DED identifies formal customer technical documents with their revision level, the proposed Rotek drawing and its revision level, and highlights areas where the Rotek proposal does not conform to the customer's technical requirements. Rotek DED exceptions are general in nature and are not meant to be exhaustive. They are exclusively a communication tool during the Sales Order Acquisition Process to help the customer identify the differences between the final Rotek design and the technical documentation as provided by the customer. It is the responsibility of the customer to update their technical information to the Rotek primary design control document. Rotek will only confirm Orders against a Rotek part number. It is also the customer's responsibility to inform Rotek in writing about any Engineering Changes that may impact form, fit or function of the Rotek bearing. Rotek reserves the right to continuously improve its manufacturing process and internal standardization in a manner that drives costs and/or quality improvements as long as the result satisfies form, fit and function of the Rotek bearing.

5. Process Steps

- All customer technical input provided by the customer is reviewed by a Rotek Application Engineer.
- The Rotek Application Engineer will select or create a Rotek bearing model that best satisfies the customer's technical requirements, loading conditions and application criteria.
- The Rotek Application Engineer will create a DED against the customer's technical documents.
- The Rotek Application Engineer will provide the customer with a Technical Proposal, including a proposed bearing design, the DED (as applicable), and comments regarding load and

application suitability. If a suitable bearing design cannot be provided by Rotek, then the Rotek Application Engineer will advise accordingly.

- The customer is required to review the bearing design proposal, the DED (as applicable) and comments regarding load and application suitability. It is the customer's responsibility to review Rotek documents in full detail.

- If bearing design changes are required, the customer must notify Rotek of the required changes. Drawing changes are best communicated to Rotek with methods such as highlighting, mark-ups, and red-lining. If a formal customer drawing is revised, the customer must inform Rotek of the specific changes made. Only changes clearly identified by the customer to Rotek will be reviewed.

- After customer changes are received by Rotek, the Rotek Application Engineer will review the change and advise if any changes cannot be met. The Rotek DED is updated when either a customer's technical document or Rotek proposal drawing is revised. For document changes, Rotek's DED will only reflect changes clearly identified by the customer to Rotek.

- Rotek will proceed with a formal commercial quote after the Rotek bearing design has been established and all technical issues are resolved. The customer is requested to sign the Rotek DED in acknowledgement of the comparison document review. Rotek will always quote a Rotek part number based on Rotek drawing and Rotek technical specifications.

- Customer Purchase Orders received by Rotek are subject to a Contract Review process. Rotek's Contract Review process is closed with an Order Acknowledgement to the customer. Rotek acknowledges against a Rotek part number (dictating primary design control) and refers to Rotek's Terms & Conditions.

- Rotek's manufacturing and inspection will proceed based on the Rotek proposal drawing as the controlling document.

Revisions

Revision Number	Description	Edited By Name	Checked by Name	Release Date
0	Initial Release	MDG	DFK	08/03/2018