

F. WANKEL

ROTARY PISTON MACHINES

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**Classification of Design Principles
for Engines, Pumps and Compressors**

Felix Wankel

Translated and Edited by

R. F. Ansdale, A.M.I.Mech.E., M.S.A.E.

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Preface

Many years of work on sealing problems and rotating piston machine layouts, including rotary internal combustion engines, has focused attention on the need to classify this type of mechanism.

This classification is, therefore, intended to provide a comprehensive perspective of this vast and complex subject as well as a measure of guidance in the technicalities and unavoidable terminology. It should also facilitate a sensible sifting of the enormous amount of published information including the extraordinarily numerous patent specifications, so that individual designs may be readily traced.

Preparatory work was started in 1938 at the WVW – the Wankel Experimental Establishment – in Lindau, Germany, where it was continued in 1944. Unfortunately, all these preliminary studies were lost or destroyed in the aftermath of war, moreover the process of sorting out and classifying had to be resumed secretly in the privacy of home. Despite these formidable obstacles it was found possible to devise principles according to which the machines may be grouped relative to the movement imposed upon the centres of gravity of the respective moving parts; this facilitated the discovery of many new basic configurations. It was not until 1951 that these activities could be resumed openly in the newly formed TES – Technische Entwicklungsstelle – Engineers Wilhelm Hotzel, August Jarchow, Dankwart Eiermann and Walter Rogg, as well as draughtsmen Elisabeth Schwartz and Johanna Wolf, must be singled out for their valuable contributions.

Dipl.-Ing. Wolf Dieter Bensinger's valuable advice and suggestions with regard to this manuscript and his technical summary contained in the conclusion are much appreciated.

Similarly Professor Othmar Baier enriched the contents of this book by his meticulous and constructive checking, especially of the kinematic aspects of the various designs.

Because there is such a bewildering variety of rotary piston machines, few of which have been appraised in any detail, it was thought opportune to subject them to closer analysis, scrutinise their movements, bearing and drive arrangements, including the sealing systems of many already known and new designs. Gradually the general pattern of this classification began to emerge and many configurations fell simply into their logical places. Many gaps in the general pattern, thus revealed, could be filled in with designs which until then could not be placed with certainty; other gaps still remain because it proved impossible to obtain either patent specifications or published data. However, their characteristics could be deduced by reference to the adjacent configurations.

In this way and by repeated arranging and rearranging of the diagrammatic sketches into groups and categories there developed an almost natural, though partly incomplete, classification of rotary piston machines. This classification will need bringing up to date from time to time in much the same way as additions have been

made to the classifications of species and chemical elements. The Publisher and the author will, therefore, gratefully receive every suggestion for improving this book, adding other as yet unknown rotary piston engines and if attention is drawn to any errors which may have been included despite the greatest care.

Summer 1963 Felix Wankel

Publishers' Note

An International Conference of experts, held after the book had been printed, recommended that the term *Kämmeingriff* would be more appropriately translated as 'intermeshing engagement' than as 'cam engagement'. On this basis 'cam engagement' should be read as 'intermeshing engagement' and \bar{C} as \bar{I} throughout the book.

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