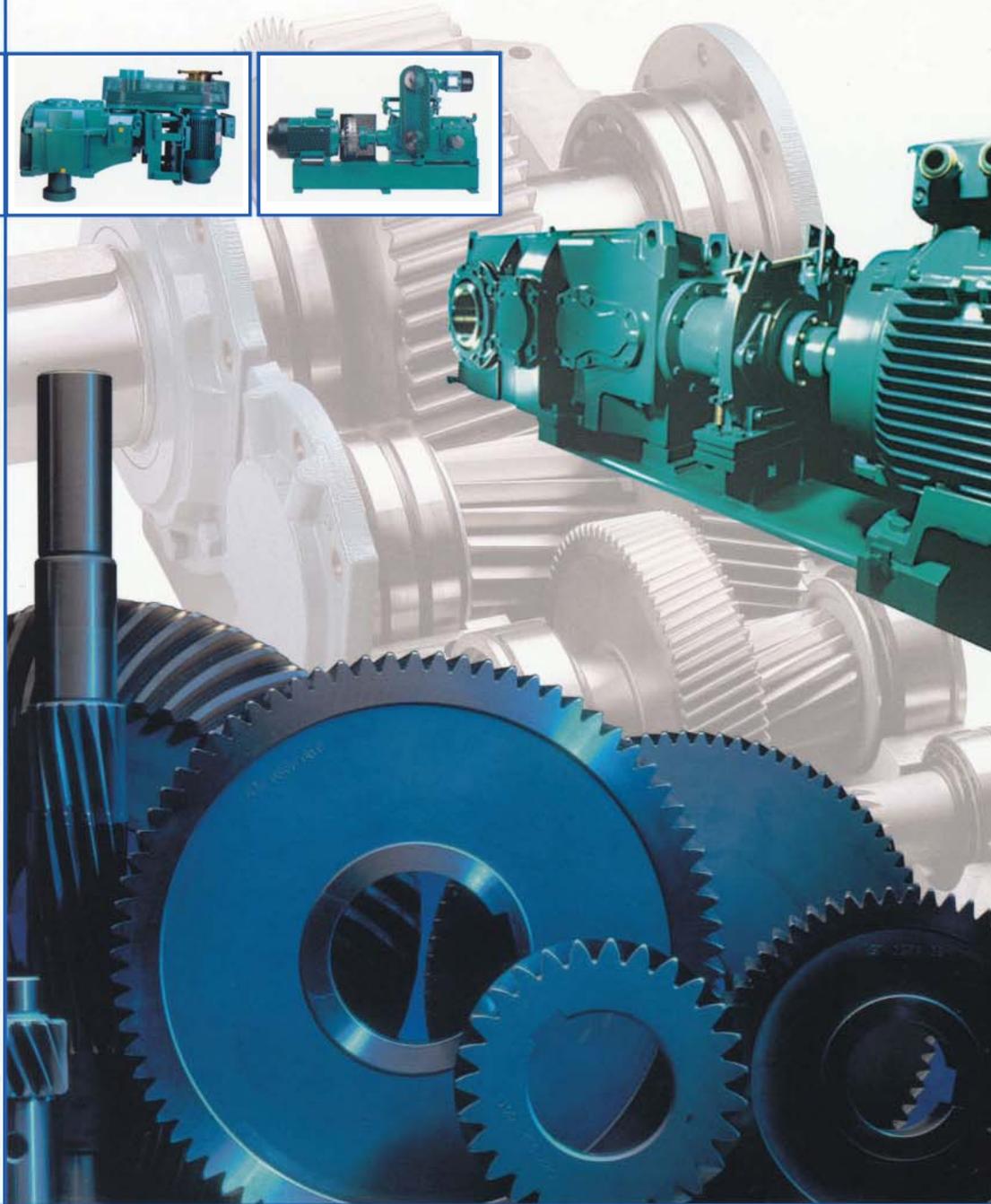


a complete product range
offering drive package solutions





David Hansen

In the late 1940s, any companies producing industrial transmission drive systems were faced with a problem that at the time seemed insoluble. No company had succeeded in standardizing the production of gear units. Expensive, custom-made solutions – time-consuming to produce, assemble and maintain – were the norm.

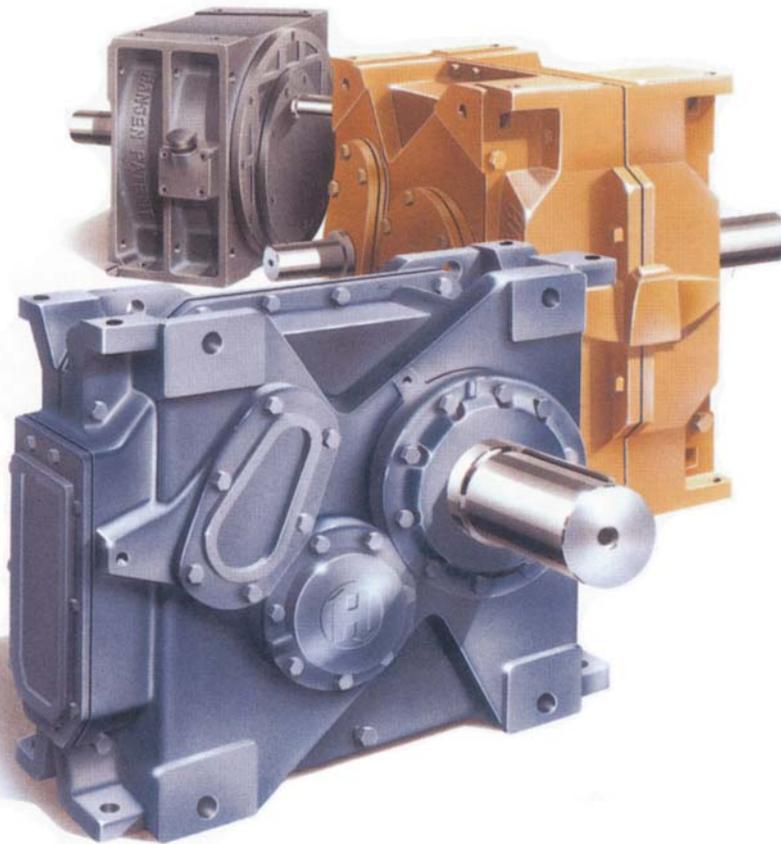
David Hansen, however, was a born innovator who tackled the problem through original thinking based on scientifically researched concepts. The result, launched in 1950, was the Hansen Patent-I – a revolutionary new concept for the design and manufacture of standard gear units. As David Hansen himself stated with understandable pride: “The Hansen Patent-I speed reducer constitutes an original and complete answer to the problem of standardization, meeting the requirements of application selling, mass production, quality and competitive prices.”

Hansen Transmissions – a history of c o n t i n u o u s

Moving from customized to serial manufacturing led to a number of important benefits:

- *Production costs were reduced*
- *Improved quality control procedures could be implemented*
- *The number of spare parts was reduced*
- *Delivery times were slashed*

Gear units were never the same again as other manufacturers followed Hansen's lead. Since then Hansen has consistently been at the forefront of transmission technology.



i n n o v a t i o n

Hansen Patent I (1950)

■ HANSEN PATENT-I

Common gear sets allowed Hansen Patent-I gear units to be inter-related, as one size of gear unit determined the preceding and following sizes. This is expressed in the "law of center distances," a principle which is still applied today in the latest Hansen products.

Hansen Patent II (1970)

■ HANSEN PATENT-II

In 1970 the product line was reevaluated to respond to changing market requirements and to take advantage of new technologies such as improved hardening and grinding techniques. Based on the Hansen Patent-I principles of standardization of housings and gearings, Hansen Patent-II established new standards with the concept of market adequacy of the torque scale. The launch of Hansen Patent-II confirmed Hansen's position as the worldwide leader in transmission drive systems.

Hansen Power Plus (1980)

■ HANSEN POWER PLUS

By 1980 Hansen took another step ahead of the competition with Power Plus. The objective was to incorporate new technologies and achieve the highest performance and reliability in this area. Emphasis was placed on the introduction of new rigid housings, in line with the high stiffness requirements for load distribution and low noise behavior.

application focused



■ WATER TREATMENT

- Common aerators
- Brush aerators
- Carrousel aerators
- Screw pumps



■ COOLING TOWERS

- Wet-Dry cooling tower drives



■ MATERIAL HANDLING

- Conveyors
- Bucket elevators
- Travel drives



■ MIXERS & AGITATORS

- Chemical industry
- Petro-chemical
- Food & beverage



■ GRAIN

- Screw presses
- Extraction
- Bucket elevators



■ PULP & PAPER

- Digesters
- Chippers
- Calenders
- Winders
- Pumps



■ WIND ENERGY

- Capacities 50 to 600 kw



Hansen P4

single & multi-stage gear units

The P4 range offers the highest power rating in the market for a given size; excels in low noise and vibration levels as well as in minimum weight. For a given output, a Hansen P4 is just one-fifth of the weight of its 1950 ancestor. Hansen P4 multi-stage units come in 18 sizes from 5,000 to 10,000,000 in. lbs. The Hansen P4 single stage range comes in 5 sizes in two mounting positions for mechanical power ratings of 185 hp up to 10,000 hp.

Hansen P4 (1995)

"Compliance with application requirements"

The launch of the Hansen P4 range in 1995 revealed new standards in how gear units are matched to market applications: simplified product selection; gear units fine-tuned to specific applications; accessories more easily integrated; special features included as standard.

"An innovative approach to user-friendliness"

Through creative industrial design techniques, lower noise levels, 100% oil-tightness (Oil-Lock™ as a new standard), easy handling and simplified maintenance procedures were established.

"A balanced line-up of components for excellence in service"

Reduced number of pinion shafts; fewer spare parts; standardized components; proven well-known brands for accessories created a greater

availability of spare parts and unparalleled commitment to customer service.

"Power and reliability through quality and technology"

State-of-the-art technology resulted in the most powerful gear units available today.

Development and manufacturing according to ISO 9001 standards leads to quality in all aspects.

To complement its current range of standardized multi-stage gear units, Hansen

Transmissions introduced an innovative range of single stage gear units for various applications requiring small reduction ratios, e.g., paper machines, pumps, compressors, etc.

The new range of single stage gear units has been designed from scratch: every existing

Hansen P4 single stage (1999)

multi-stage assumption has been questioned and alternatives have been developed and evaluated.

A typical example of this approach is the use of variable center distances in a given housing size. In "traditional" designs, with fixed center distance and torque ratings, the reduction ratio of a single stage gear unit has a major effect on the power rating. This means that for small reduction ratios, very large powers can be transmitted, which may lead to thermal limitations.

At the other end, for large ratios, gear casings become oversized for the transmitted power. For a given size of unit this leads to inefficient compromises on bearing selection and mechanical and thermal rating.

Hansen P4

g e a r t e c h

■ NOISE AT A MINIMUM

Minimal noise contributes to the comfort of the workplace and is therefore an important criteria when selecting industrial gear units.

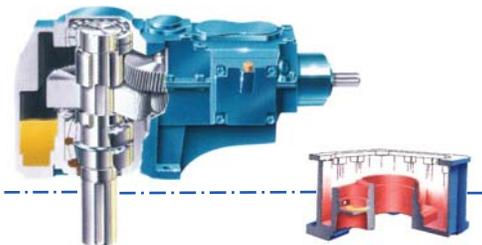
The Hansen P4 is designed to generate as little noise as possible; the basic design rules guarantee maximum stiffness of all gear unit components under load. Together with the most rigid pinion shafts and housings, the gear units

transmit exceptional high power and a minimum of noise. Standard manufacturing processes help to minimize noise: precise machining of the housing on advanced CNC machines guarantees that the bores of the gear units are exact; an imperative for optimal gear mesh. Precision grinding of the gears and adapted gear geometry in the high-speed gear sets diminishes vibration levels; this “low-noise geometry” is applied to both bevel and helical gears.



■ FIRM ON ITS FEET

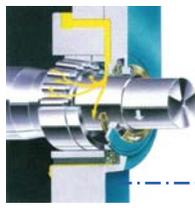
The rigid gear casing design of the Hansen P4 series maintains a correct gear alignment. The vertical P4 housing has been designed to ensure smooth transition of forces from the center bore to the mounting feet, which are positioned concentric to the low speed shaft. An important feature for mixers and agitators, or surface aerators.



■ INTEGRATED DRYWELL

The integrated drywell is a standard feature for all vertical Hansen P4 gear units. It guarantees oil-tightness for life. A highly appreciated feature in many industries, including food processing, water treatment and mixers.

n o l o g y



■ **NEVER A DRY START-UP**

Centralized oil fitting in Hansen P4 gear units guarantees initial oil lubrication and circulation through all bearings, thus avoiding any risk of a dry start-up. This results in minimized wear on the bearings, simplified overall maintenance and a longer bearing life.

■ **100% OIL TIGHT**

Hansen Transmissions' unique Oil-Lock™ system offers a maintenance-free seal on high speed shaft extensions, and is standard on all Hansen P4 units. Its operating principle is that of centrifugal fling-off of oil, followed by drain-back to the oil sump. Flexible lips, which lift off during operation, are an integral part of the labyrinth construction, designed to keep the oil in and dirt out. At standstill, the flexible lips close and ensure additional seating.

For application requirements such as tilted or inclined operation, Hansen Transmissions also provides a unique solution: the Hansen OilGuard™. The system consists of a tapered ring, rotating close to the machined housing and functioning as a centrifugal pump. It is located between the oil and a radial seal. During operation, even in submerged conditions, the Hansen Oil-Guard™ ensures leak-free running conditions.



UniMiner

heavy duty drives for
mining and material handling



P4 UniMiner offers powerful solutions
for the most severe applications!

Features & Benefits/Applications

Features & Benefits

- Alignment-free drive package
- Very user-friendly for ease of installation
- Versatile "flippable" housing provides different mounting options
- Horizontally split housing design facilitates easy maintenance and ability to make in-field repairs
- Patented design maintains positive lubrication
- Specially designed geometry improves strength and reliability
- Tilt angles of +/- 3 degrees
- Grease purged seals at both the high and low speed shafts
- Oil drainback provides superior oil flow to bearings
- Carburized and ground gearing provides quieter operation

- Above and below-ground mining
- Mineral processing
- Cement
- Material handling

Standard UniMiner/Specifications

Ratios: 10-40

HP: up to 1200

Output torque: up to 550,000 in. lbs.

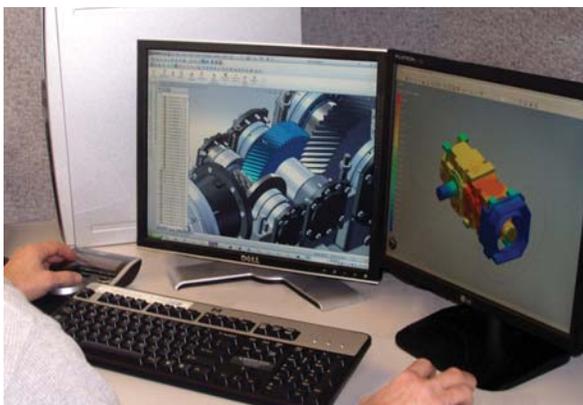
New "Z" Series UniMiner/Specifications

Ratios: 10-71

HP: up to 2300

Output torque: up to 900,000 in. lbs.

Applications



Engineering Services

installation/field support, analysis, testing

Hansen's full-service engineering department is ready to help you evaluate and integrate off-the-shelf products. We're also equipped to custom-engineer solutions for special applications. Our engineering staff is standing by to deliver:

Premium Engineering Services

Product dimensional data:

- 2D drawings and 3D models.
- Standard CAD formats.

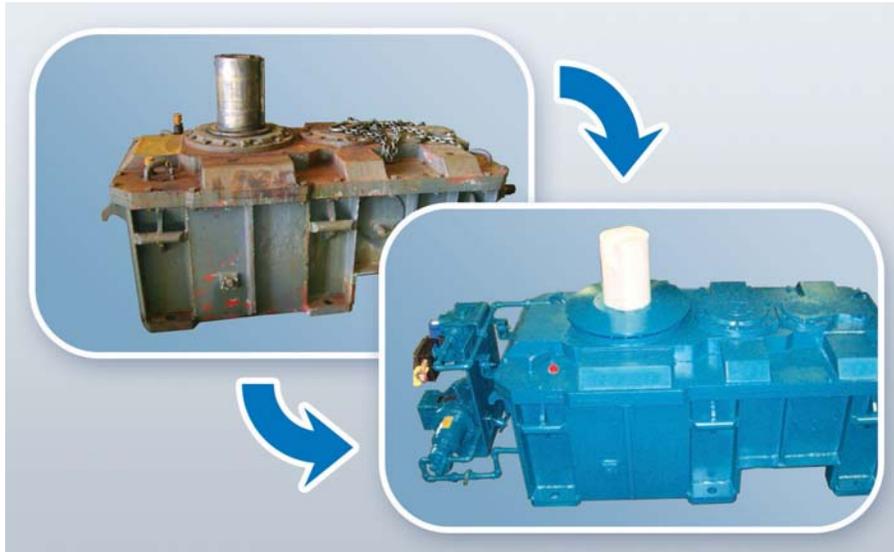
Application-specific design:

- Transition bed plates to adapt existing units.
- Lubrication systems for high temperatures, non-catalog mounting positions and speeds.
- Motor lanterns, scoops and bed plates to fit most any customer motor.

- Turn-key drive package designs incorporating all standard PT components (motor, brake, backstop, clutch, coupling, heat exchanger, various sensors).

Advanced analytic support:

- Gearing calculations to AGMA standards.
- Finite element analysis (FEA) for fabricated accessories.
- Bearing life analysis.



Hansen Services

repair & service parts

Hansen Services is your support team for every aspect of the transmission life-cycle – from installation to maintenance, diagnostics and repair. Choose Hansen Services and enjoy maximum uptime at a predictable cost, along with:

- Factory-certified repair centers located throughout North America
- Maintenance and repair for Hansen and enclosed non-Hansen gear drives
- Standard and expedited service options
- Budgetary estimates prior to inspection (upon request)
- Certified warranty
- Application upgrades
- Technical and maintenance expertise
- Field service

Service Resources:

- Service parts available for Hansen Patent, PowerPlus, Uniminer, and P4 models
- \$10 million service parts inventory
- Suppliers throughout North America
- Recommendations for stocking critical spares
- 24 hour on-call service
- Dedicated manufacturing cell for shorter lead-times

Contact the Hansen Team . . . your one-stop source for drive package solutions, in-depth engineering support, and complete documentation before and after your order.





Hansen Transmissions, Inc.
 Location: **Verona, Virginia, USA**



Hansen Transmissions, Inc.
 Location: **Mississauga, Ontario, Canada**

facilities

Hansen Transmissions today

Corporate Headquarters

Hansen Transmissions International nv

Location: **Edegem - Antwerp - Belgium**

International sites

Hansen Transmissions Pty. South Africa



Hansen Transmissions Ltd. UK



Hansen Transmissions Pty. Ltd. Australia



Hansen Transmissions is a pioneering innovator. The production of high performance gear units stems from an interactive partnership with our clients, the end users and the actively engaged manpower of our global enterprise. Embracing design, manufacturing and customer service, Hansen Transmissions has grown into a world leader in its field. Today, we set high standards for product and working environment, and for seizing every opportunity offered by new, environmentally friendly technologies.

Visit our worldwide
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www.hansentransmissions.com



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