WE MOVE the WORLD

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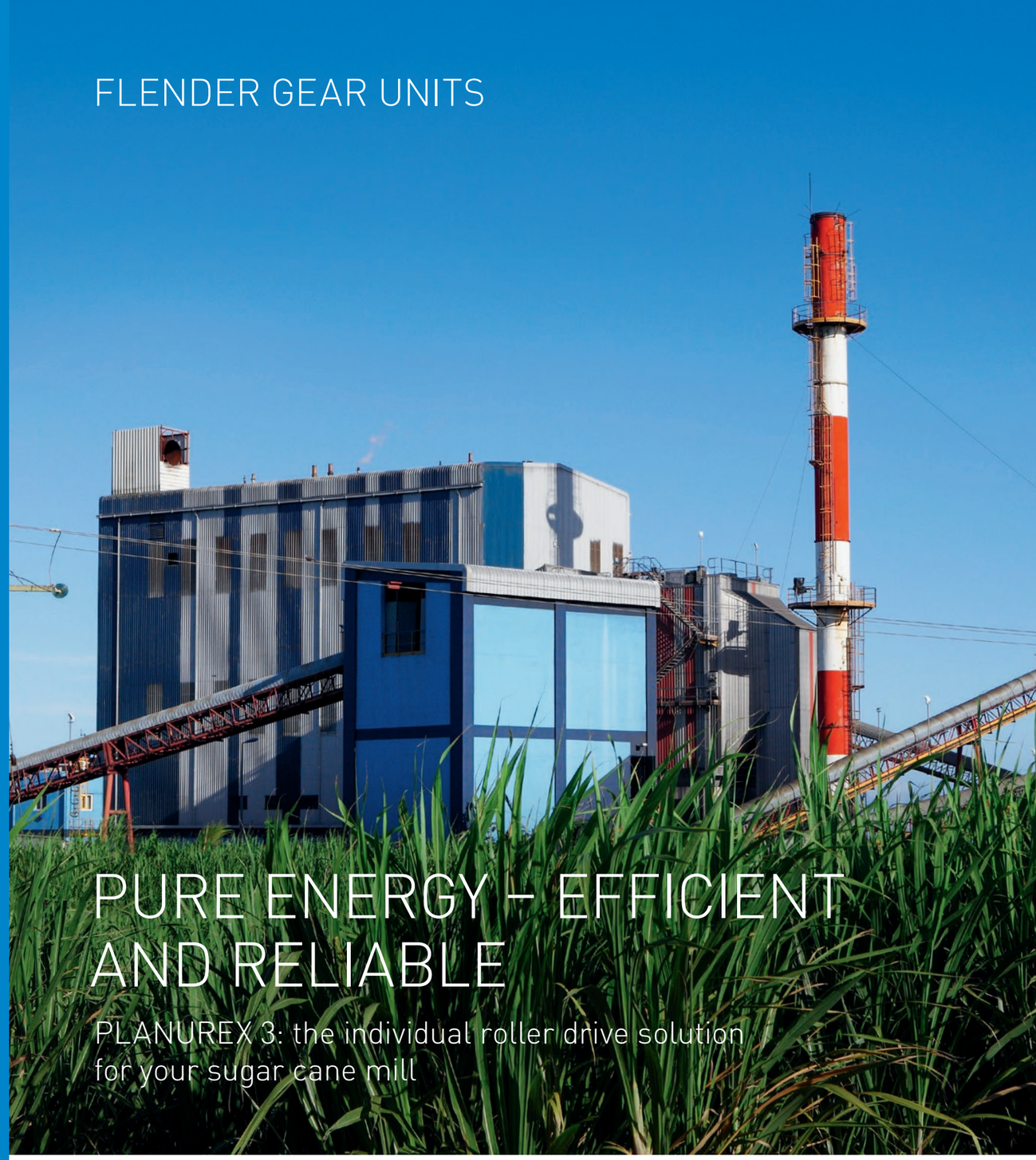
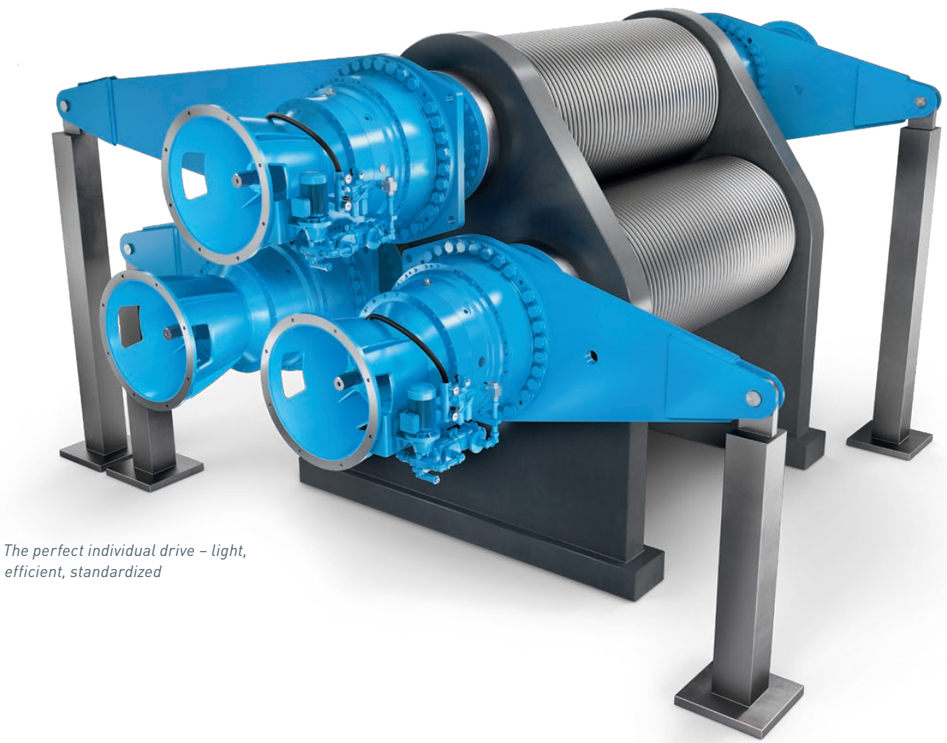
FLENDER GEAR UNITS



PURE ENERGY – EFFICIENT AND RELIABLE

PLANUREX 3: the individual roller drive solution for your sugar cane mill

FLENDER



The perfect individual drive – light, efficient, standardized

HIGHEST POWER DENSITY FOR YOUR SUGAR CANE MILL – FROM FLENDER.

EXTREMELY STRONG.
EXTREMELY COMPACT.
EXTREMELY EFFICIENT.

The standard solution PLANUREX® 3 was developed for applications that place high demands on compactness, quality and price-performance ratio. This makes PLANUREX 3 the perfect individual drive for your sugar cane mill. The high torque density of the design allows for very small roller spacing – its low weight reduces the loading on the gear unit and machine significantly. The high overload capacity provides for operational reliability and stabilizes your process.

Flender gear units have been proving their worth in the sugar industry for decades. Energy efficiency, reliability and efficient use of the available space are the most important factors that motivate our customers.

On the basis of the most extensive planetary gear unit experience in the world and our know-how as the leading manufacturer of wind turbine gear units, we develop unique solutions for the sugar industry which guarantee you a high level of availability, productivity and efficiency.

The immediate advantages of using PLANUREX 3 gear units lie in the cost benefits for drive systems and driven machines. These advantages are influenced by various factors: Our gear units with a high power density are light and compact and thus reduce the load acting on the driven machine. Optimized gear geometries and gear meshing reduce the friction and increase the energy efficiency. New gear design and top manufacturing quality increase the reliability and service life and optimize the maintenance costs.

Compact gear units allow smaller and more economical driven machines and drive motors to be used. The rolling bearings on the input and output shafts are protected by high-performance seals as standard in order to achieve maximum plant availability in conjunction with low maintenance costs.

PLANUREX 3 L

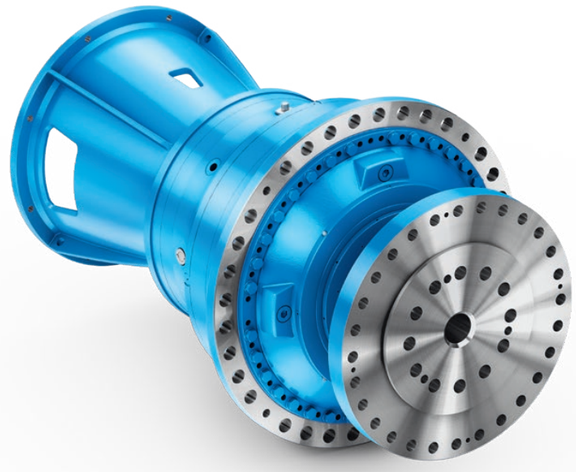
Nearly 2 billion tons of sugar cane need to be processed every year

YOUR BENEFITS

- **Space-saving installation** without specific requirements on a foundation and oil supply system optionally mounted directly on the gear unit
- **Low running costs and high efficiency** due to optimized gear geometries and the high level of manufacturing quality
- **A maximum of variability for the connection to the grinding roller** through a number of different design options for the output shaft
- **Maximum flexibility for the mill design** through maximum power density
- **Long service life** through application-oriented design and top-class quality
- **Maximum plant availability** through the use of high-performance seals as standard

OPTIMUM COORDINATION OF THE DRIVE SYSTEMS

With top performance, minimum weight and the highest level of reliability, they meet the exacting requirements.



Our drive concepts are efficient and standardized solutions that maximize the availability of your plant. The components are perfectly coordinated with each other and optimized for the milling of sugar cane.

Flender drive systems enjoy by far the best reputation in the industrial manufacturing sector. Flender draws its expertise and technological leadership from decades of experience and hundreds of components installed. Here, top quality is the basis for durable and reliable drives. At the same time, state-of-the-art product design and the best engineering always guarantee the highest level of productivity for your plant.

Flender offers highly standardized and perfectly coordinated drive systems for sugar cane mills from a single supplier. The main advantages for you are a high level of plant availability and low interface risks.

We guarantee both the security of your investment and your comfort, because we offer you the entire PLANUREX 3 drive concept from a single source.

OUR DRIVE SYSTEM EXPERTISE

Consultancy

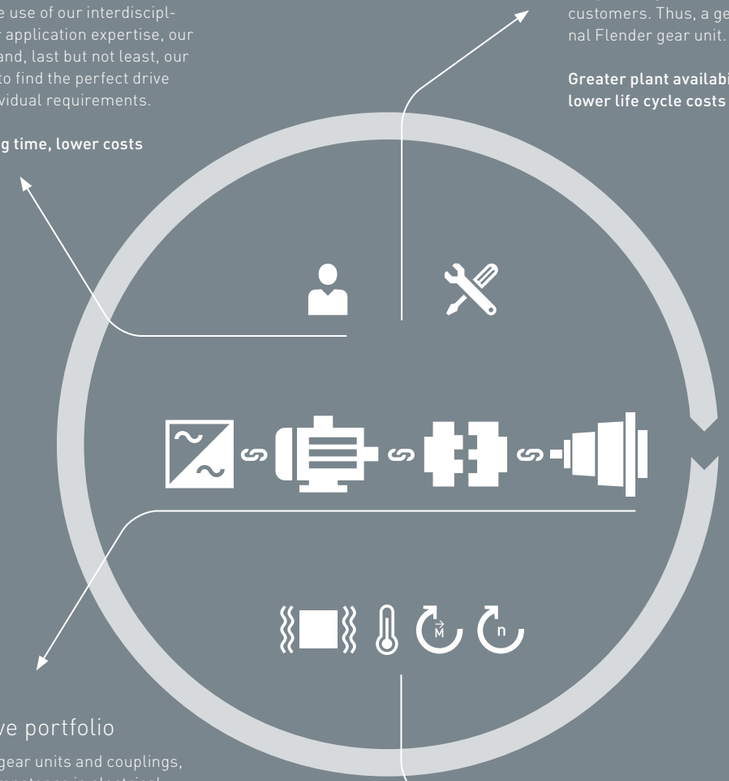
Our customers make use of our interdisciplinary know-how, our application expertise, our innovative strength and, last but not least, our experience in order to find the perfect drive system for their individual requirements.

Reduced engineering time, lower costs

Flender-Services

From diagnostics and support to spare part and repair services to maintenance and retrofitting services – the Flender service portfolio enables individual solutions to be created that are precisely tailored to meet the needs of our customers. Thus, a gear unit remains an original Flender gear unit.

Greater plant availability, lower life cycle costs



Integrated drive portfolio

We not only provide gear units and couplings, but also have the competence in electrical drive technology that enables us to offer the entire drive train – perfectly integrated, with optimal interaction between all components, as a standard or individual solution.

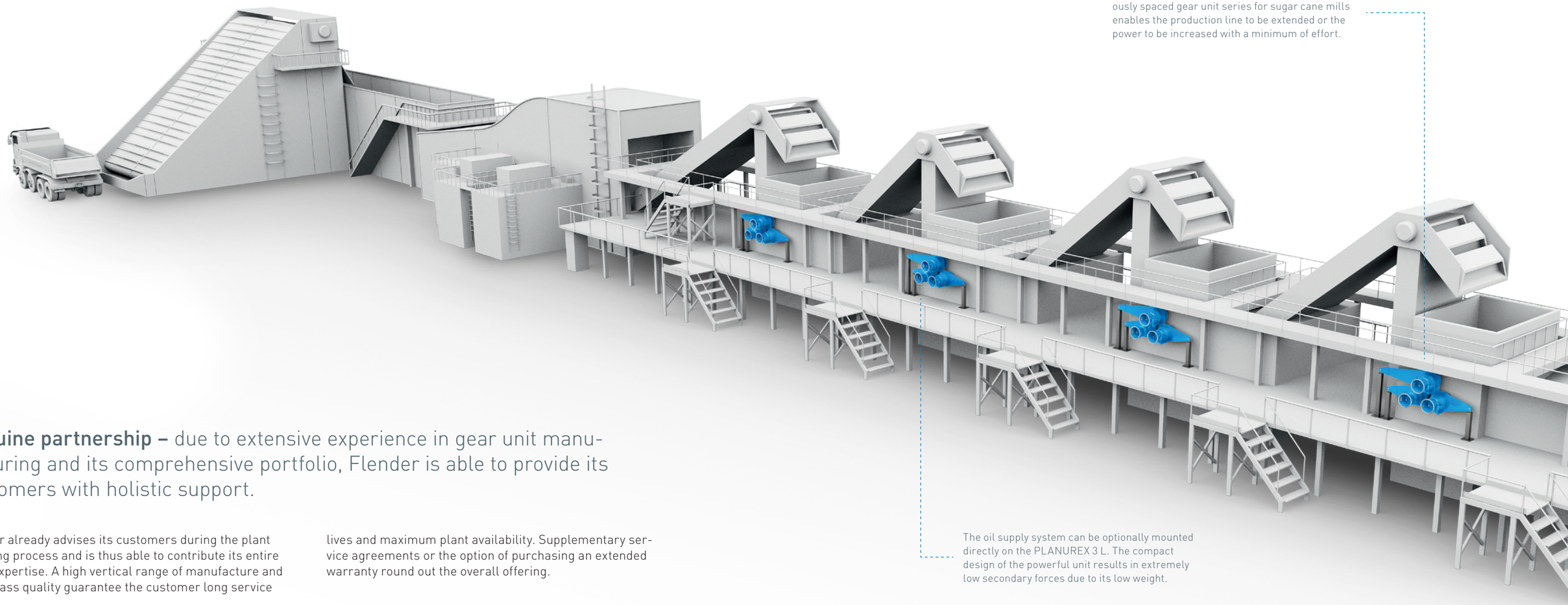
Fewer interface risks, greater efficiency

DIAGNOSTEX

The perfect drive precisely fulfills the torque requirement and is energy-efficient and cost-effective – in a nutshell: it is tailor-made for the application. Flender DIAGNOSTEX makes our gear units digital. It paves the way for these perfect solutions and at the same time forms the basis for condition-based maintenance.

Industry 4.0, lower costs

EFFICIENT, COMPACT, WEIGHT-SAVING DRIVE SOLUTION FOR MAXIMUM EXTRACTION



The high degree of standardization of our harmoniously spaced gear unit series for sugar cane mills enables the production line to be extended or the power to be increased with a minimum of effort.

The oil supply system can be optionally mounted directly on the PLANUREX 3 L. The compact design of the powerful unit results in extremely low secondary forces due to its low weight.

Genuine partnership – due to extensive experience in gear unit manufacturing and its comprehensive portfolio, Flender is able to provide its customers with holistic support.

Flender already advises its customers during the plant planning process and is thus able to contribute its entire drive expertise. A high vertical range of manufacture and first-class quality guarantee the customer long service lives and maximum plant availability. Supplementary service agreements or the option of purchasing an extended warranty round out the overall offering.

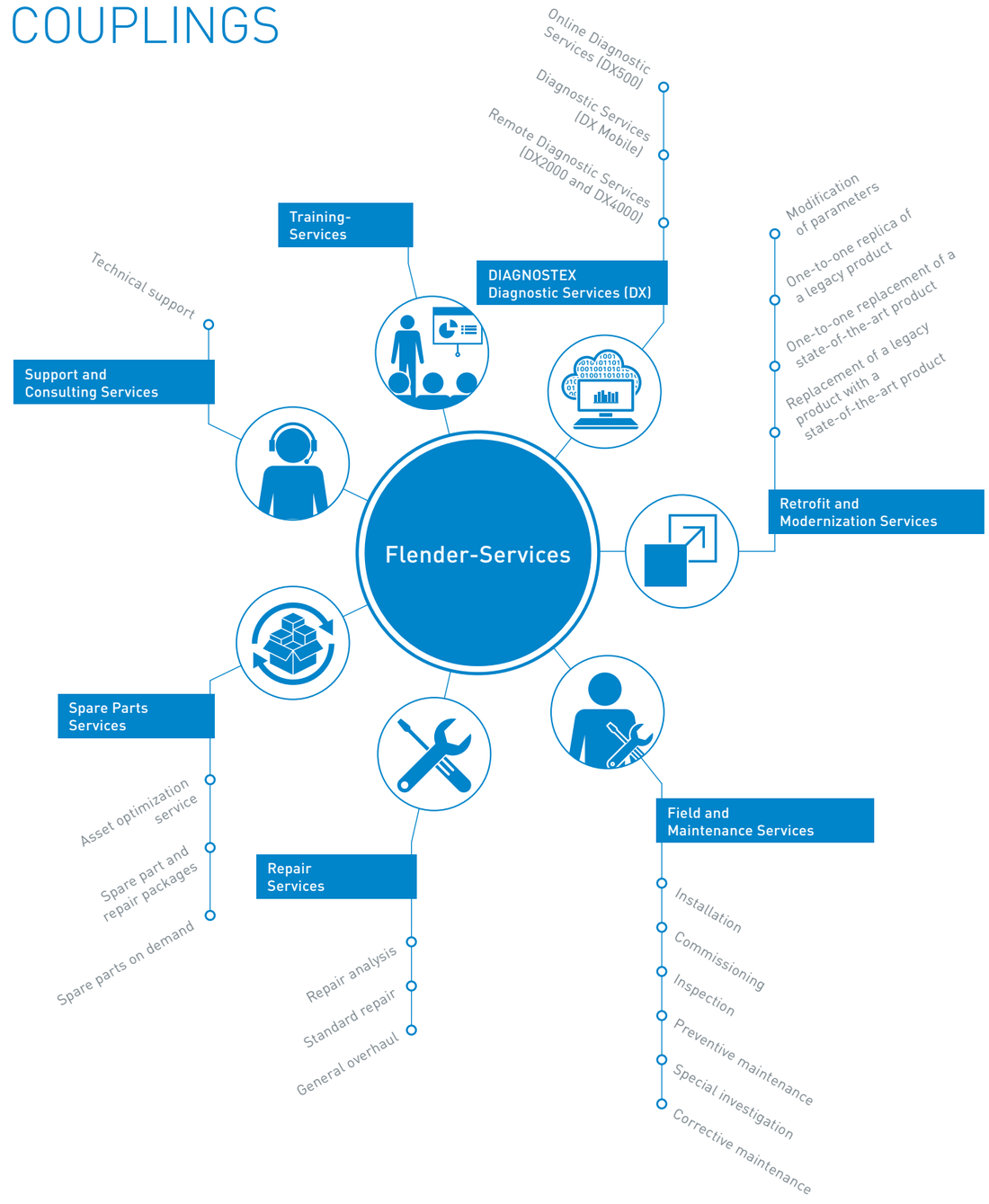
SERVICES

Increasing complexity and the aspiration to achieve maximum production plant availability make process-oriented thinking and acting necessary in the sugar industry. Constantly increasing demands make it more and more important for sugar-processing plants to work at maximum productivity and efficiency. Flender services offer you important competitive advantages for your production processes as well as for power generation.

Let our service experts help you, from the planning and development to the operation to the modernization of your plant, and profit from our experience and our in-depth know-how of your application – in more than 100 countries, seven days a week and around the clock.

Reduce standstills, minimize downtimes and increase the productivity, flexibility and cost efficiency of your plant.

OUR SERVICE PORTFOLIO FOR GEAR UNITS AND COUPLINGS



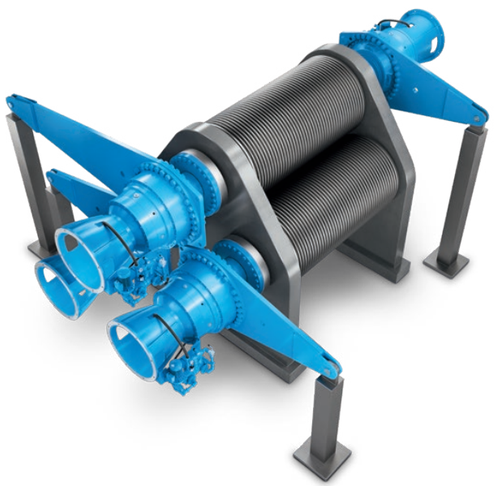
PROCESS RELIABILITY

Benefit from the top plant performance made possible by the efficiency of the PLANUREX 3 gear units. Rely on a very high power density and take advantage of the design options provided by the exceedingly compact gear unit series. Save installation space, weight and costs.

The series' harmoniously spaced torque steps avoid an oversized design, ensure that the solution is very close to the operating point of your application and make it easier to select the most suitable gear unit solution. PLANUREX 3 was developed using the state-of-the-art technology based on many years of experience in the field.

3-D CAD design and the use of the latest FE methods are a matter of course. At least with PLANUREX 3.

Use our data when designing your plant and profit from greater flexibility. Increase the reliability of your plant to ensure fail-safe operation under overload conditions. Due to the high overload capacity of PLANUREX 3, you benefit from the best gear unit for safe processes.

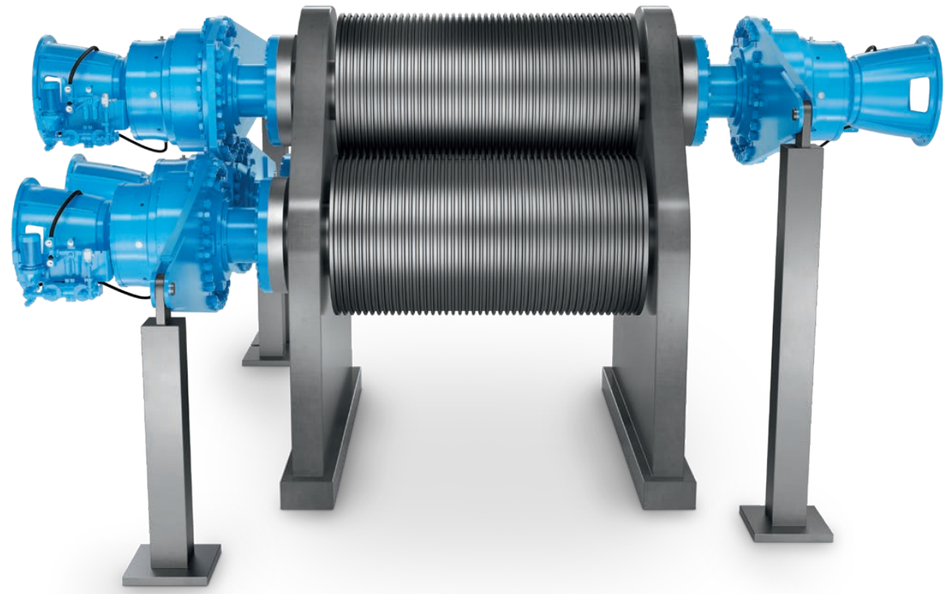


PLANUREX 3 AT A GLANCE

DIMENSIONS AND WEIGHTS OF THE PLANUREX 3 GEAR UNIT FOR SUGAR CANE MILLS

Size	Reference torque	Shaft end, drive side		Flanged shaft, output side														Flange screws		Torque arm	Weight (approx.)	Oil quantity (approx.)
P3FP	T2Ref 1)	d1 m6	l1	b1	b2	d2	d3 h6	d5	d7 H7	Qty.	c	da	d4 h7	d6	G1	G2	k	z	s	Qty.	LTmin	2)
	Nm	mm	mm	mm	mm	mm	mm	mm	mm		mm	mm	mm	mm	mm	mm	mm	mm	mm		mm	t	l
345	735,000	70	120	70	14	860	460	760	44	20	45	1,045	890	885	1,037	468	975	29.5	39	36	1,450	3.0	80
370	920,000	70	120	80	16	900	500	800	44	22	45	1,108	953	948	1,072	513	1,035	29.5	39	40	1,500	3.6	90
395	1,115,000	80	140	80	16	940	540	840	44	24	50	1,210	1,020	1,015	1,144	529	1,125	24.5	45	36	1,700	4.4	115
420	1,335,000	80	140	90	18	1,000	590	890	50	22	53	1,265	1,080	1,074	1,180	576	1,180	25	45	36	1,900	5.1	135
445	1,615,000	90	160	90	18	1,050	640	940	50	24	57	1,360	1,150	1,143	1,281	597	1,265	30	52	32	2,000	6.0	165
475	1,935,000	100	180	100	20	1,100	690	990	50	28	58	1,470	1,225	1,218	1,361	629	1,360	27.5	62	28	2,100	7.2	190
500	2,250,000	100	180	100	20	1,150	740	1,040	50	28	63	1,515	1,282	1,274	1,404	655	1,408	30	62	32	2,500	8.1	210

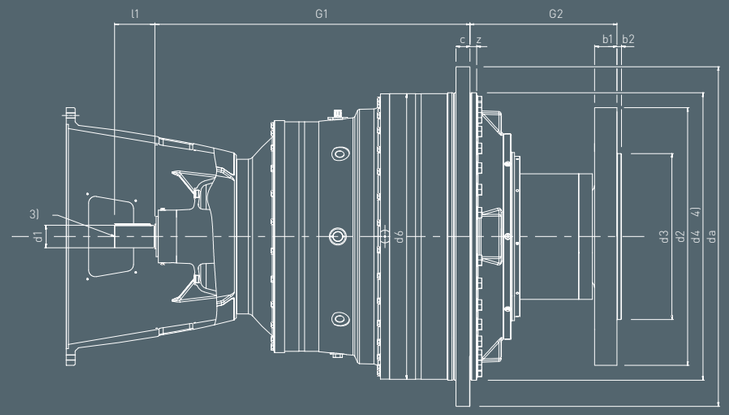
1) For up to 30 load peaks per hour.
2) Weight including motor lantern and without oil filling.



BENEFIT FROM:

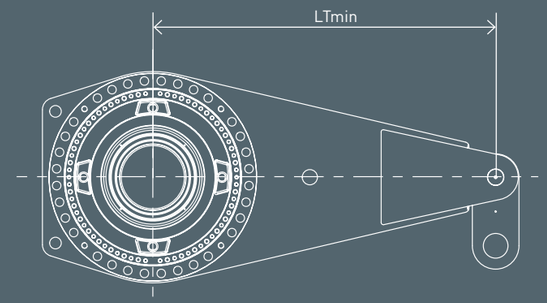
- Minimum achievable roller distance
- A harmonious standard modular system
- Flexible connection geometries

RANGE OF TRANSMISSION RATIOS FROM 1:150 TO 1:300

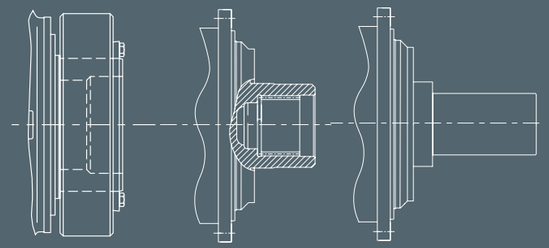


3) Shaft end d1 with parallel key according to DIN 6885, part 1 and centering hole.
4) Minimum possible roller distance under load = d4 (due to flattened section on the outside diameter).

TORQUE ARM



FURTHER OUTPUT SHAFT DESIGNS AVAILABLE



Hollow shaft for shrink disc

Hollow shaft with involute splines

Solid shaft