## >Lightnin<sup>®</sup>



# 980 SERIES

**High-Torque Top Entry Mixers** 







# LIGHTNIN 980 SERIES – GEARED FOR THE LONG RUN

We understand that when it comes to efficient process plant operations, equipment reliability is of paramount importance. As a long-standing member of AGMA (American Gear Manufacturers Association) SPX FLOW's Lightnin brand recognizes that multipurpose commercial gearboxes are poorly suited to agitator service.

For more than 100 years the Lightnin products have utilized proprietary, purpose designed agitator gear drives to ensure dependability and low cost of ownership. With more than 1 million units in the field our operating experience is unsurpassed.

The new 981 size units joins our 980 size unit to form the beginning of a unified series of parallel gear drives. The 980 is our new name for our previous 98 size unit.

#### 980 Series Features

- Parallel shaft, double reduction design provides enhanced installation flexibility where there are space limitations on top of the vessel.
- Carburized and ground helical gearing helps ensure quiet operation and extended gear life.
- Dry well oil dam is integrated into the gear housing to prevent lubrication from leaking down the mixer shaft.
- Integral positive displacement pump driven off the input shaft provides continuous lubrication whenever the mixer motor is operating. Separate lubrication motor instrumentation and heat exchanger is provided when needed or on request. Filters can be added to the lubrication system to increase oil life.
- Compact drive design requires significantly less oil for lubrication - eliminates need for large oil sump.
- Standard flanged motors and pedestal mounted reduces assembly time while eliminating high-speed coupling alignment and the need for outboard motor support.
- Integral mounting plate eliminates the need for an additional bolted plate.
- Optional seal cartridge can be removed easily in four simple steps without having to move the gear drive or motor, and without having to loosen any mixer shaft bearings.



## 980 SIZE FEATURES

## Chose Lightnin's seal unit adds the exclusive Lightnin IsoLoad design for longer gear life.

Traditionally, internal gear drive components are subject to large axial and bending loads which are the primary source of unwanted gear deflection and misalignment. Left unchecked, these dynamic loads can significantly reduce gear life or cause sudden gear-drive failure. These loads are attributed to the fluid forces which are applied perpendicular to the mixer shaft at the impellers.

**The solution. Lightnin's IsoLoad feature** isolates the gearing from the effects of these fluid forces through the following combination of design advantages:

- A bronze bushing acting as a radial bearing transfers reaction force loads into the upper quill shaft bearing.
- The lower quill shaft bearing experiences no external loading and does not support the mixer shaft in any way.
- Clearance between the mixer shaft and quill shaft ensures that no bending loads are imposed on the quill shaft, effectively isolating the gearing from the mechanical effects created by the fluid forces.
- The fixed bearing located below the gear drive in the seal cartridge absorbs radial reaction forces in addition to the axial loads. As a result, they are prevented from being transferred to the gear drive.
- The precise positioning of the fixed bearing within millimeters of the mixer seal faces minimizes shaft runout and dynamic deflection to maximize seal life.

### **Expanding Our Range with Advanced Parallel Drive Gearboxes**

Introducing the 980 Series: Building on the 98, we have created a new line of larger parallel drive gearboxes. The 98 is now the 980 size, and we've added the 981 to achieve higher power and speed. More sizes will be added to the series soon.

#### **Standard Range**

- 20 175 HP (15 130kW)
- IEC or NEMA Motors
- 50Hz or 60Hz
- 20 to 100 RPM
- Open Tank, Stuffing Box or Mechanical Seal Options



## 981 SIZE FEATURES

## Introducing the 981 Parallel Drive: The Next Evolution in Mixer Gear Drives for Mining and Chemical Process Industries

Building on our extensive knowledge of designing legendary mixer gear drives for both our Lightnin and Philadelphia Mixer brands, we have developed the 981.

This new parallel drive takes the best of reliability and renowned strength in our established 781 size low speed gearboxes and adds a new parallel drive input option – the 981 is born.

Designed to suit the most rigorous of applications in Mining and Chemical Process Industries, the 981 is set to become a new work horse in our range.

Taking advantage of 4, 6 and 8 pole motors we can offer a wide range of speeds and accommodate a wide range of motor powers. The designs are particularly suited to pen tanks and pressurized applications such as HPAL, Autoclaves, and Chemical Polymer Reactions.

The bearing lives of 100,000 Hrs L10 on the output shaft. In most selections these design points are greatly exceeded.

The 981 design is completely interchangeable with the 781, as a whole drive, or replacing the old input gearbox with a new parallel shaft input gearbox. The design is deliberately modular and interchangeable to offer new and existing customers the same great options.

#### **Standard Range**

- 75 300HP (55 200kW)
- IEC or NEMA, ATEX or XP Motors
- 50Hz or 60Hz
- 25 to 125 RPM
- Open Tank, Stuffing Box or Mechanical Seal Options



#### **Motor Pedestal**

Suits IEC or NEMA Frame Flange motors. Has integral cooling fan as standard. High Strength and low deflection motor pedestal fabrication

#### **Bearing Housings**

Rigid cast bearing locations minimize gearbox deflection helping to improve bearing and gear life

#### High Speed Gear & Bearing Assembly

Offers high ratio flexibility to offer multiple output speeds

#### Integral Lube Pump

Integral shaft driven pump to ensure gear and bearing lubrication. A flow switch is provided for protection. A cooling fan is included

#### High Strength Shaft Coupling

Our high strength cast shaft coupling can accommodate very high bending moments, making the Series very strong for its size

### Flange & Pedestal Mounting (Optional)

Cast mounting pedestals are available Pedestal is Guarded. Additionally, the pedestal can accommodate a mechanical seal, or our face seals. Seal Puller available

Flanges are available in ANSI, DIN, or special dimensions. Where provided flanges incorporate a shaft catcher to hold the shaft during maintenance where the gearbox is removed



#### **Electric Motor**

Suits Regional Voltage
Requirements (230/460, 380, 400, etc.)
Flange mounted, V1
IE3 Premium Efficiency or IE4
Super Premium Efficiency Motors
Safe Area or ATEX (to 2G IIc T4
/ 2D IIIc T125) or XP
Unit can be provided with IEC or
NEMA motor

4, 6, or 8 pole motor speeds

#### **Gearbox Housing**

High strength gearbox housing. Tried and tested low-speed housing with more than 30 years proven operation

#### **High Quality Helical Gears**

Designed to AGMA. The gear quality and the innovative design leads to a very low noise gearbox. Gear deflection is minimized by our design which extends the life of the gears and the bearings

### External Lubrication System (Option)

External lubrication system (shown) with additional cooling is available on request or provided when required

#### True Dry Well

The True Dry Well is cast into the gearbox housing, this prevents oil leakage down the mixer shaft into customers' product. No lower shaft bearing shields, labyrinths, or lip seals to perish or wear leading to oil loss

#### Mechanical Seal (Option)

The trusted Lightnin S Seal Cartridge can be fitted within the machine assembly and be removable from the unit without removing the gearbox. In addition, other mechanical seal arrangements can be included exceeding 435psi (30 bar) for high pressure applications

# **APPLICATION KNOWLEDGE**

## SPX FLOW has a process solution for a wide variety of mixing applications.

Mixing applications can be broken down into the following mixing duties: liquid-liquid, liquid-solid, gas-liquid, gas-liquid-solid and fluid motion. Many applications are often a combination of these duties and thus having a full understanding of each of these areas is crucial to recommending an optimized design that is also economical.



LIQUID-LIQUID	Solvent extraction of copper and other metals Blending of additives in chemical processes
LIQUID-SOLID	Draft tube crystallizers, used in the production of alumina High pressure acid leach autoclave mixers Suspension of slurries in large tanks at slurry pipeline facilities
FLUID MOTION	Homogenization and suspension
GAS-LIQUID	Flue-Gas desulfurization for municipal and industrial power plants Hydrogenation and other gas dispersion for chemical and petrochemical industries
GAS-LIQUID-SOLID	Pressure oxidation autoclave mixers Fermentation, a key process step in many biopharma and biofuel plants

## EXPERIENCE AND INNOVATION IN MIXING TECHNOLOGY



SPX FLOW was the first to use computational fluid dynamics (CFD)



Select SPX FLOW Mixing equipment and you get more than an efficient and cost-effective process. You get over 100 years of experience in superior processing technology. Adding our sister Brands of Philadelphia, Stelzer, and Uutechnic to Lightnin our experience level and industry knowledge has expanded to another level. Our operational footprint cannot be surpassed for mixing knowledge and accessibility wherever your operations are globally.

We were the first to use computational fluid dynamics (CFD). This experience has enabled us to design and develop products specifically for oil storage into the 21st century.

Our laboratory is a standard for the art of mixing technology, and allows us to optimize your process, from pilot to full-scale testing. Your benefits are higher reliability, lower production costs, greater output, resulting in higher profits.

Processing.....we perfected it.



## >Lightnin<sup>®</sup>

#### **GLOBAL LOCATIONS**

#### Americas

#### USA

135 Mt. Read Blvd. Rochester, NY 14611 USA P: +1 (888) 649-2378 (MIX-BEST), or +1 (585) 436-5550

#### **Brazil**

Rua João Daprat 231 São Bernardo do Campo SP 09600-010, Brazil P: +55 11 2127 8278

#### Chile

Av. Ricardo Lyon 222 of. 503 Providencia - Santiago, Chile P: +56 2 8969 320

#### Mexico

Amargura # 60 Primer Piso Col. Lomas de La Herradura 52785 Huixquilucan, Edo de Mexico P: +52 55 5293 9048

#### **EMEA**

#### **United Kingdom**

Alexander House, 4 Station Road, Cheadle- Hulme SK8 5AE, UK P: +44 161 249 1170

#### **South Africa**

Unit 12B Growthpoint Office Park, Tonetti Street, Midrand, South Africa P: +27 11 207 3700

#### U.A.E.

P.O Box 299745, Downtown Jebel Ali The Galleries 4 Dubai, U.A.E. P: +971 4 8143400

#### **APAC**

#### **Australia**

Level 2, Quad 3 102 Bennelong Parkway Sydney Olympic Park, NSW, 2127 Australia P: +61 2 9763 4900

#### China

6F No.1568 Huashan Road Shanghai 200052, China P: +86 (21) 22085889

#### **Singapore**

20 Pioneer Crescent #06-01 Singapore 628555 P: +65 6264 4366



SPX FLOW, Inc. reserves the right to incorporate our latest design and material changes without notice or obligation. Design features, materials of construction and dimensional data, as described in this bulletin, are provided for your information only and should not be relied upon unless confirmed in writing. Please contact your local sales representative for product availability in your region. The green " " is a trademark of SPX FLOW, Inc.

For more information, visit www.spxflow.com/lightnin or lightnin@spxflow.com