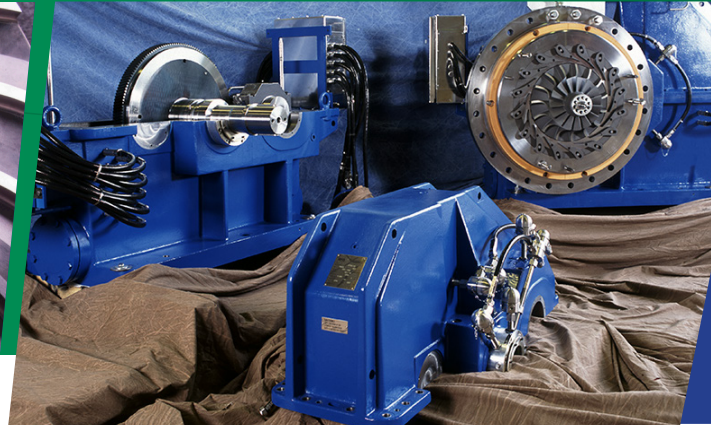


# ROTOFLOW TURBOMACHINERY

## *Integrally Geared Generator Turboexpanders*



### World-Class Performance

Rotoflow's integrally geared generator turboexpanders are the best match of efficiency and long-term capital investment. Power recovery is achieved by directly mounting the expander on a gearbox and loading it with an electric generator. Operability and maintainability have been optimized in our design as a result of millions of successful hours of operation. Our integrally geared generator turboexpanders are typically found around the world providing refrigeration and economic power recovery in air separation and liquefaction facilities.

Design/build expertise, operational insight, and unrivaled experience work together to create Rotoflow's comprehensive line of turboexpanders, serving the full spectrum of turbomachinery markets and applications.

### Typical Design Capabilities

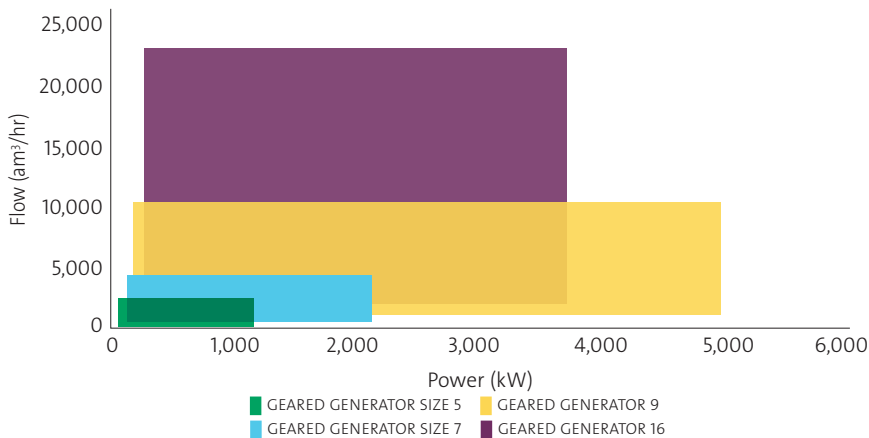
	ASU	Hydrocarbon
<b>Power</b>	4 to 5,000 kW (6 to 6,705 hp)	32 to 22,569 kW (43 to 30,265 hp)
<b>Speed</b>	Up to 40,000 rpm	Up to 50,000 rpm
<b>Inlet Pressure</b>	4 to 100 barg (60 to 1,450 psig)	1.7 to 210 barg (25 to 3,045 psig)
<b>Temperature</b>	-200 to +150°C (-320 to +300°F)	-270 to +340°C (-454 to +644°F)
<b>Outlet Flow</b>	57 to 12,000 am <sup>3</sup> /hr (33 to 12,360 ACFM)	56 to 163,173 am <sup>3</sup> /hr (33 to 96,040 ACFM)
<b>Impellers</b>	89 to 483 mm (3.5 to 19.0 in.)	70 to 1270 mm (2.75 to 50 in.)

### Benefits

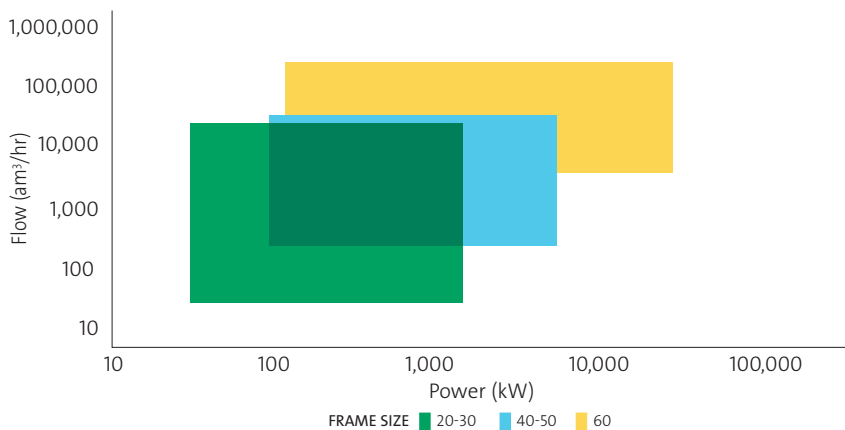
- Broad operating ranges from a portfolio spanning over 70 years
- High-efficiency turboexpanders directly mounted to a parallel shaft gearbox eliminates the need for high-speed couplings and additional high-speed bearings
- Single or multiple stages can be configured on a single gearbox
- Equipment aerodynamically optimized to the customer's process
- Zero clearance inlet guide vanes generate accurate flows and efficiencies
- Custom-designed precision helical gearing manufactured to AGMA Q12/ DIN Class 5 standards provides a long service life, with low vibration and low noise levels
- Horizontally split gearbox provides easy access to gears and bearings, resulting in minimal downtime for inspection and maintenance
- ISO 9001 certified since 1997 (currently ISO 9001:2015)

# Integrally Geared Generator Turboexpanders

## ASU Product Operating Range



## Hydrocarbon Product Operating Range



Engineered to order for customer-specific applications. Represented is an overview of our turbomachinery capabilities. Please contact us to discuss your specific needs.

## Experience more. Together.

Rotoflow, an Air Products business, combines one of the industry's most trusted names in turbomachinery with world-leading industrial gas expertise. We're transforming the hydrocarbon, LNG, petrochemical, and industrial gas markets with superior equipment performance and unrivaled reliability, safety, and value. Our combined capabilities are the key to this new level of quality. Technological innovations expertly integrated with decades of know-how are the foundation for Rotoflow's valued products, proven performance, and world-class service. This synergy helps customers around the world reach their unique technology and operational targets more efficiently than ever before.

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## Technical Highlights

- Fully skidded accessory system incorporates the motor-generator
- Simplified start-up and shutdown sequence allows for smooth machine operation
- Exceeds API 617 Rotordynamic requirements
- Proven high-speed and high-load tilt pad bearings handle steady state and transient thrust loads
- Electric actuator provides precision control of inlet guide vanes over a wide operating range
- Selected high-strength, wear-resistant materials and anti-friction coatings
- Robust impeller attachment and torque transmission design for high reliability

## Options

- Expander and gearbox spare assembly
- International code compliance
- API compliant on request
- Safe area or hazard area location
- Package control system
- Purged enclosure
- Inlet strainers
- Inlet trip valve

**ROTOFLOW**  
An Air Products Business

Experience more. Together.

[www.rotoflow.com](http://www.rotoflow.com)