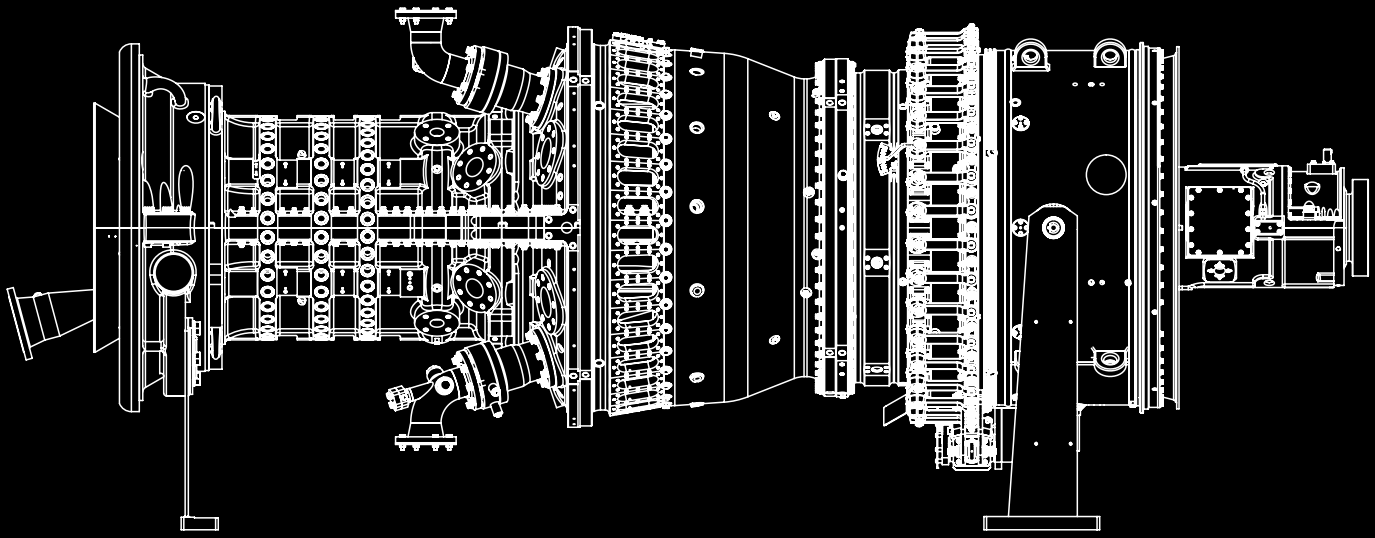
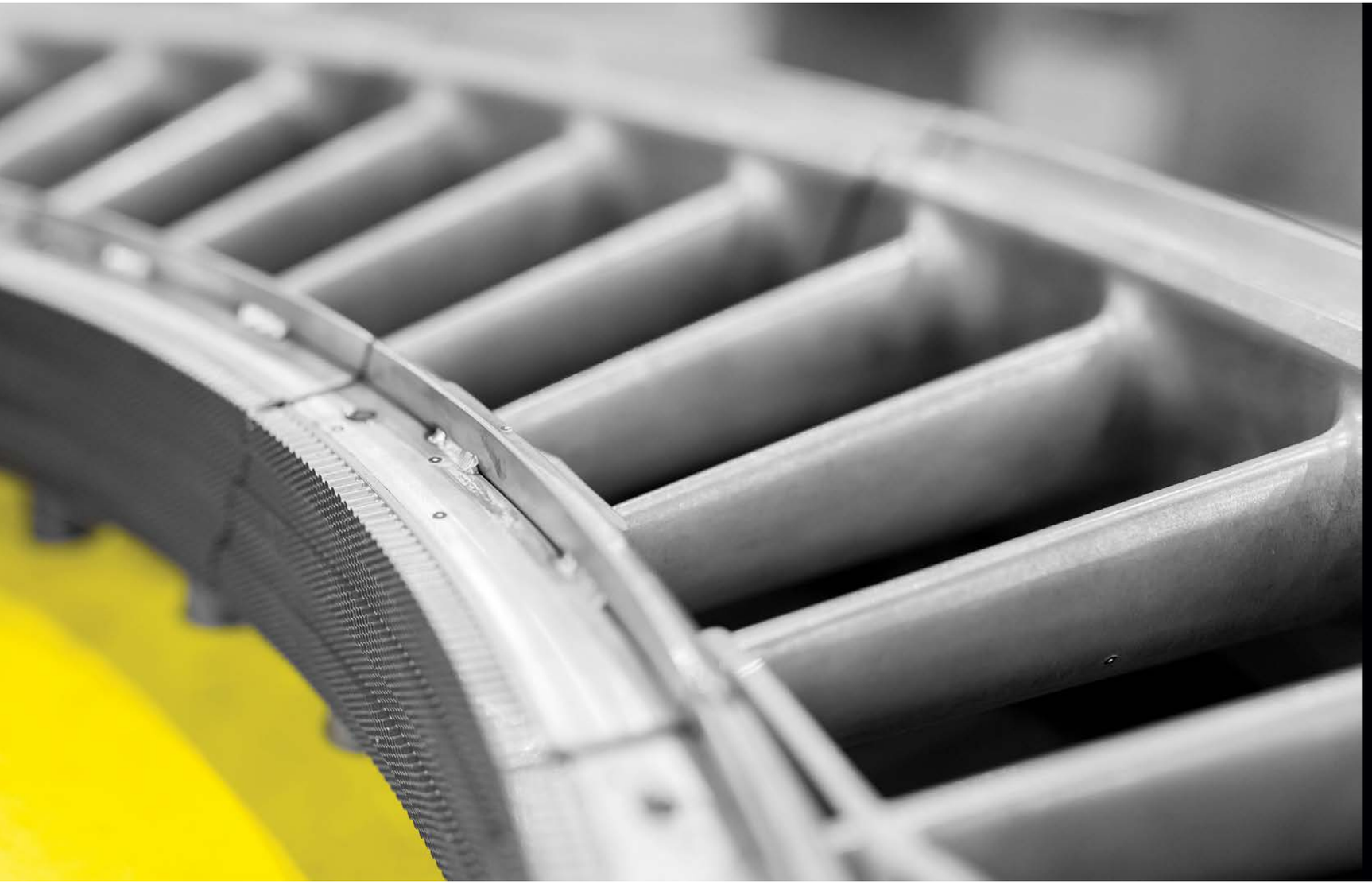
REP HOLDING



T16

NEW GENERATION HEAVY-DUTY GAS TURBINE

EFFICIENT.
RELIABLE.
ENVIRONMENTAL
FRIENDLY



NEW GAS TURBINE UNIT
RATED AT 16 MW

IN SERIAL PRODUCTION
SINCE 2016

T16 — A NEW STANDARD OF 16 MW HEAVY-DUTY GAS TURBINES

T16 IS THE FIRST RUSSIAN HEAVY-DUTY GAS TURBINE RATED AT 16 MW

- T16 is a new energy-efficient gas turbine unit fully complying with up-to-date market requirements on increased efficiency, reduced harmful emissions and extended operational life.
- T16 provides 37% efficiency, raising reliability standards for heavy-duty GTU within the power range of 10 MW to 20 MW.
- T16 turbine has been developed by REP Holding engineers in cooperation with GE Oil & Gas to perfectly match Russian market requirements.

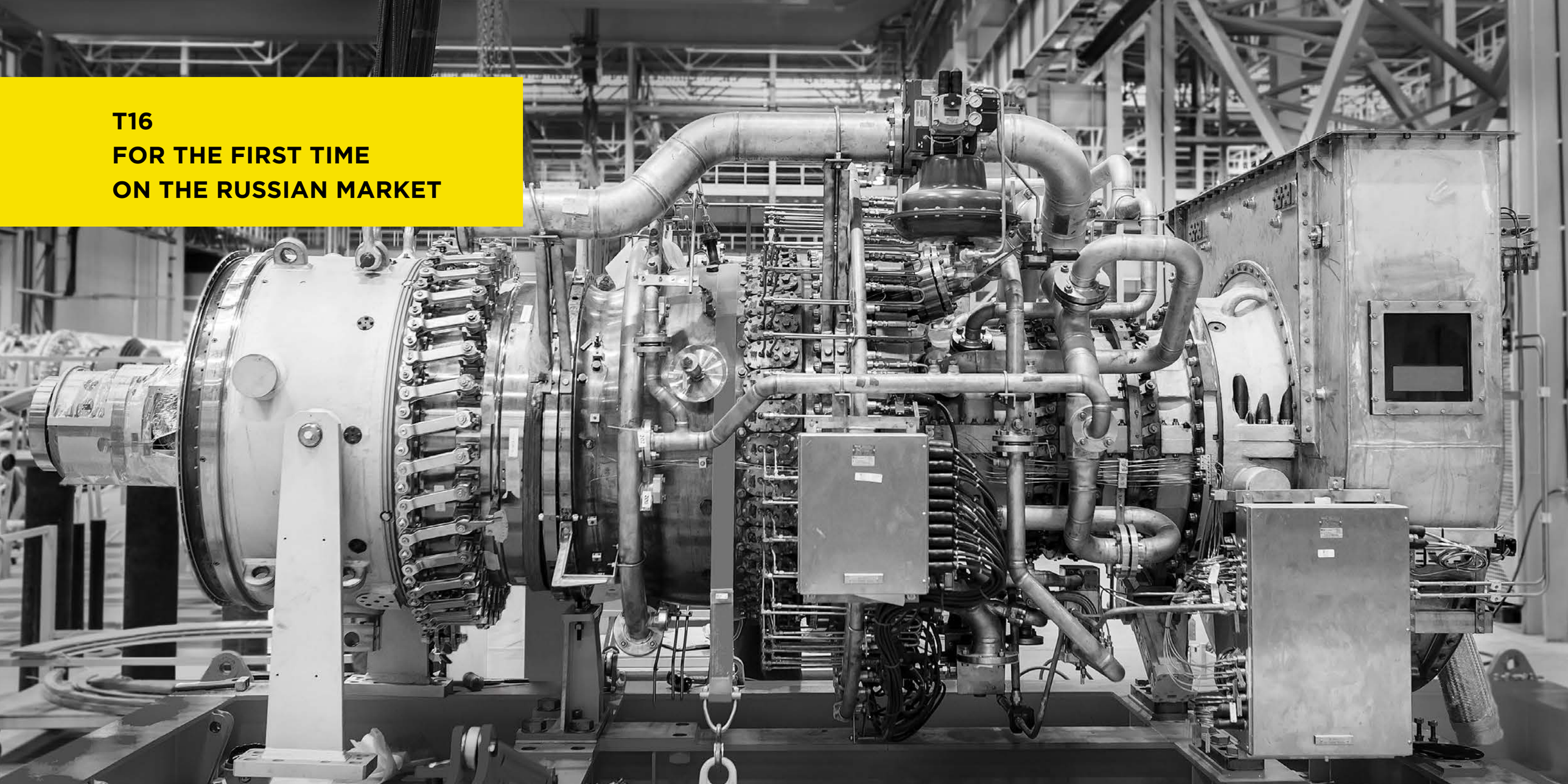
ADVANCED TECHNOLOGIES. GLOBAL STANDARDS

GTU T16 DESIGN SOLUTIONS

- High efficiency
- Excellent environmental performance
- Reliability
- On-site maintenance
- Efficient performance in various operating conditions
- Transportability

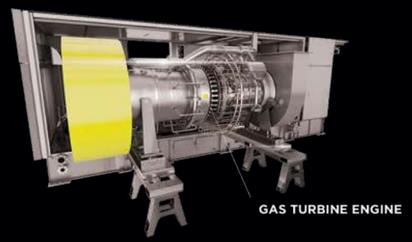
THE BEST ECONOMIC AND OPERATIONAL PERFORMANCE IN ITS CLASS

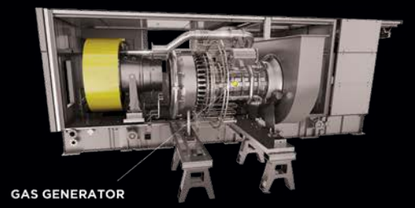
- Rated capacity — 16.5 MW
- Life cycle — 200 000 hours
- Efficiency — 37%
- NOx emission ≤25 ppm

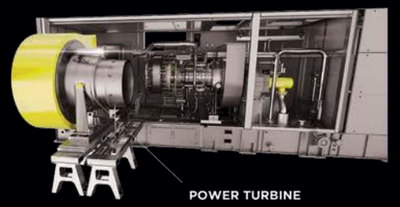


T16
FOR THE FIRST TIME
ON THE RUSSIAN MARKET

T16 ARRANGEMENT ON THE BASE PLATE ALLOWS LATERAL ROLL-OUT OF THE HIGH & LOW PRESSURE PARTS, AS WELL AS THE ENTIRE TURBO-UNIT, WHICH MAKES IT EAZY TO PERFORM PROPER MAINTENANCE





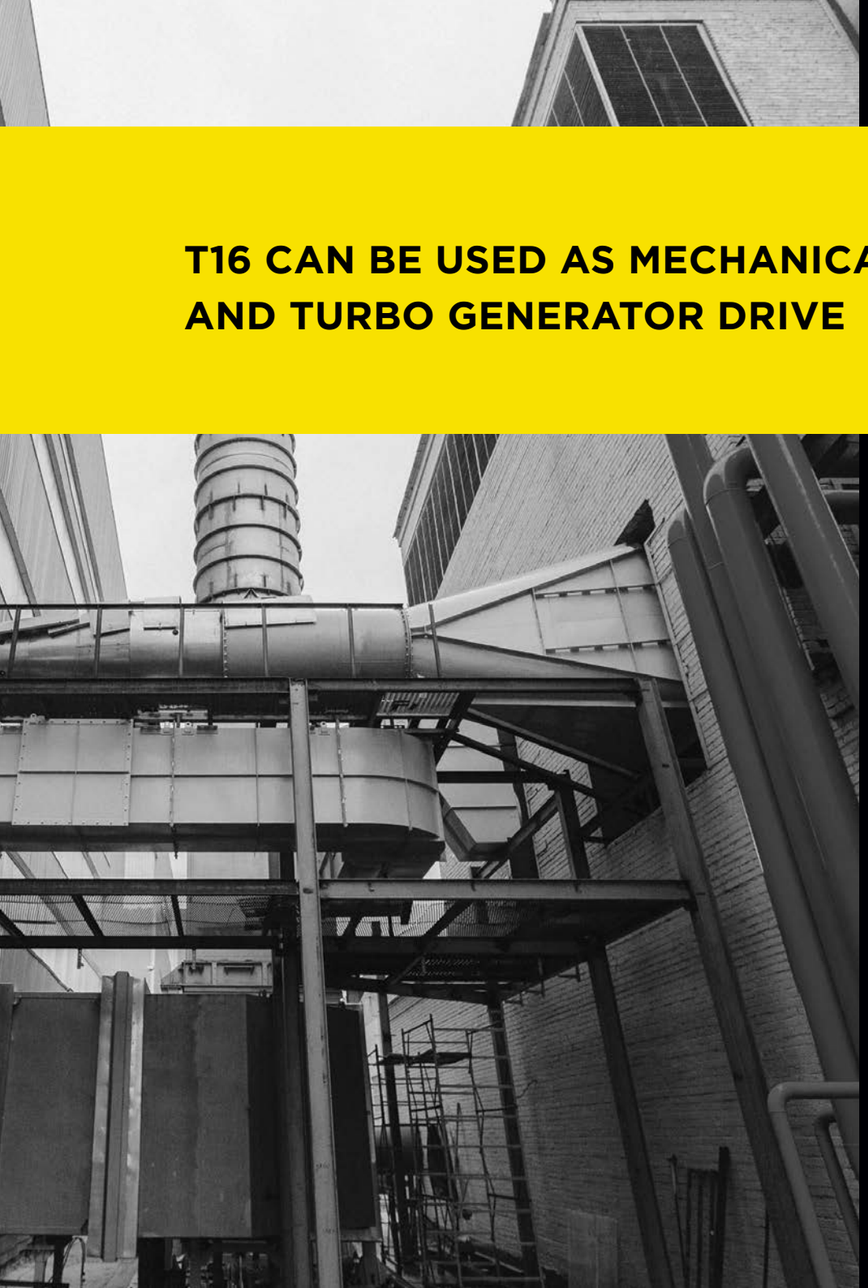


GTU DESIGN

- Heavy-duty two-shaft GTU
- Two-stage high-pressure turbine with cooled blading
- The two-stage low-pressure turbine with the 1st stage variable nozzles maintains high efficiency over a wide operating range.
- 12-stage axial compressor with pressure ratio of 19
- Low-emission combustion chamber

OPERATING FEATURES

- T16 features operational flexibility over a wide range of loads from 20% to 100%.
- The unit design enables operations in any climatic zones and provides high on-site repairability.
- T16 is a heavy-duty GTU, with a prolonged life cycle and high flexibility for on-site service maintenance due to the modular service concept.
- The gas turbine contains built-in devices for remote monitoring and diagnostics to collect and transmit integrated data to the control panel.
- A compact design allows fully shop-assembled GTU transportation.



T16 CAN BE USED AS MECHANICAL AND TURBO GENERATOR DRIVE

GAS TRANSMISSION

Due to its power rating (16.5 MW) and output shaft speed (7800 rpm) T16 is perfect for modern compressor stations in gas transmission via the gas pipeline system with working pressure of 5.5 to 12.0 MPa.

GPA-16 “Ladoga” can be used both for reconstruction of the existing and construction of the new gas pipeline compressor stations.

T16 is supplied as part of the gas-pumping unit in the self-contained hangar-type building as ready-to-use modules.

POWER GENERATION

T16 can be used for construction and modernization of power-generating units either in Combined or Open Cycle.

T16 GTU is designed to generate electric and thermal power.

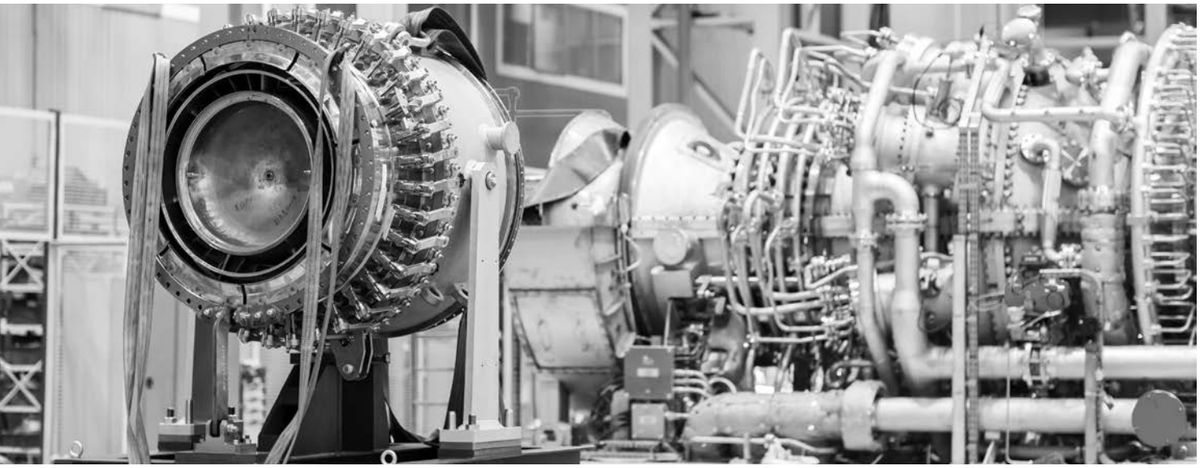
T16 GTU can be installed in the main building or in easy-to-assemble hangar-type power plant building.

REP Holding can provide the customer with an optimal layout solutions to ensure a competitive cost of the whole equipment package.

UNIQUE TECHNICAL SOLUTIONS. CUSTOM-TAILORED APPROACH

TURBINE CHARACTERISTICS

Shaft power, no less than	16,5 MW
Turbine efficiency, no less than	37,0%
Exhaust gas flow	54,3 kg/s
Exhaust gas temperature	490 °C
Pressure ratio	19,0
Gas generator rotor speed, maximum	10 200 rpm
Output shaft rotor speed, nominal	7 800 rpm
Emission (at 15% O_2 in dry combustion products): — nitric oxide — carbon monoxide	 ≤50 mg/m³ ≤40 mg/m³
Overall dimensions of the engine (without piping)	11,6 × 3,6 × 4,2 m
Weight of the gas turbine module on the base plate	69 t
Total life cycle	~ 200 000 h



On June 20, 2013 REP Holding and GE Oil & Gas signed a License Agreement on co-development and production of a new industrial gas turbine rated at 16 MW for oil & gas and power generating companies.

The entire GTU production cycle, including assembly and tests, is carried out on REP Holding manufacturing sites in Saint-Petersburg. The new gas turbine unit has been released into serial production in 2016

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