7ea. Pratt and Whitney FT4 Gas Turbines Power Plants

7ea. (Seven) Pratt & Whitney FT4 GT Power Plants - $14,000,000.00 usd Each

Note: This price includes scope of supply listed. Equipment is offered in original condition with factory warranty and a 15 year parts supply guarantee.

Not included in this price are the following:

- Additional transformers and Switchgear
- Installation (Provided in a separate proposal)
- Distribution and Transmission lines and equipment
- Cables
- Fuel or fuel pipelines
- Marine Freight and Ground Transportation

Payment Terms:

30% down payment required to hold equipment and remove from open market Balance due within 30 days of down payment date. All funds to be held in escrow by a licensed 3rd party Georgia attorney. Details provided in a Buy/Sell agreement and Escrow Agreement. Note – Equipment cannot exit works until paid in full.

The FT4 Gas Turbine Power Plant

The FT4 modular industrial gas turbine is the heart of Pratt and Whitney's power systems. It consists of a gas generator that provides high energy gas to the free turbine, which converts it into useful mechanical work.

Operating in harsh conditions ranging from frigid arctic climates to remote desert locations where temperatures can exceed 130°F, the FT4 has proven itself in atmospheres laden with sand, iron oxide, salt and other undesirable elements.

Ongoing engineering studies and improvements have been made over the years, resulting in a proven, durable design, capable of providing users with dependable service in a wide variety of applications.

HISTORY

This efficient aero-derivative engine was originally developed by the Pratt & Whitney division of United Technologies Corporation, where it established a notable record for dependability in both military and commercial aviation. In a joint development program, which started in the early 1960's, TPM and P&W converted the JT4 flight engine into an industrial gas generator and designed a new power turbine which today is the mature, fully developed FT4 industrial gas turbine. Its design concept is based upon proven technology with primary goals of maintainability, efficient operation and lo life-cycle costs.

DESCRIPTION

The gas generator consists of a multistage axial flow compressor, a can-annular combustion section and a three-stage axial flow reaction turbine. High pressure ratios are achieved by use of a reliable fixed geometry dual compressor “twin spool” design in preference to the more complex variable geometry stators. The free turbine is a three-stage axial flow reaction turbine with an exhaust collector box to redirect the exhaust gas flow, and a drive shaft which includes a flexible coupling to absorb alignment variations.

The twin spool and free turbine concept means that minimum power is required for starting. Only the high compressor needs to be driven by a small starter turbine which operates on compressed air or gas. Black start capability is standard on all units.

INSTALLATION

Erection of an FT4 station has been accomplished in less than two months. The compactness and relatively light weight of the FT4 simplify site selection, and for most soil conditions a concrete slab foundations is sufficient.

The modular industrial gas generator can be trucked to the station site or flown in by helicopter. The gas generator and free turbine are factory tested and prepackaged to assure on-time operation.

FT4 Advantages

Durability – The FT4 has been proven in more than 10 million hours of operating experience. As new materials and coatings are developed, modifications are made in the FT4 design to incorporate them. The result has been a continual improvement in operating life and structural integrity. Conservatively designed air-cooled turbine blades and vanes allow low turbine metal temperatures without the risk of clogged air passages due to dirty air.

Availability—Surveys of various gas turbines have consistently revealed the FT4 to have the highest availability. Long periods between maintenance actions, fast change-outs, and module replacement capability are key factors in the fT4's superior availability.

Modular Design/Modular Maintenance—A Chief advantage of the FT4 is easy maintainability made possible by modular design. The six basic gas generator modules are: Low pressure compressor, High pressure compressor, High pressure turbine, Low pressure turbine, Exhaust Case and Gearbox. The most difficult of these modules can be exchanged in four working days and easiest within four hours. For maximum availability, the complete gas generator can be changed out within eight hours. Hot section inspections are routinely accomplished in less than eight hours.

Site Flexibility—The FT4 does not require an on-site water or electric power supply. Inlet air filters and demister systems are available to adapt the unit to any desert or marine environment.

Fast Starting—FT4 systems can reach full generating power in less than three minutes from a cold start, and there is no maintenance penalty for starts and shutdowns. The shut-down cycle is sequenced automatically and takes approximately 20 minutes for generator countdown. Except for one-minute period following fuel cut-off, the unit may be restarted during the shut-down sequence.

Training—A wide variety of courses is available for customer training in the operations and maintenance of the units. This can be accomplished at our Service School in the United States or on site.

SUPPORT SERVICES

Total support and maintenance of the FT4 industrial gas turbine is available with a complete service network is in place to assure maximum availability.

Spare Parts—Over $100 million parts inventory. Were expedited delivery is important; parts can be shipped in 24 hours.

Exchange Program—Components can be exchanged for repaired unites in our rotatable pool at significant savings.

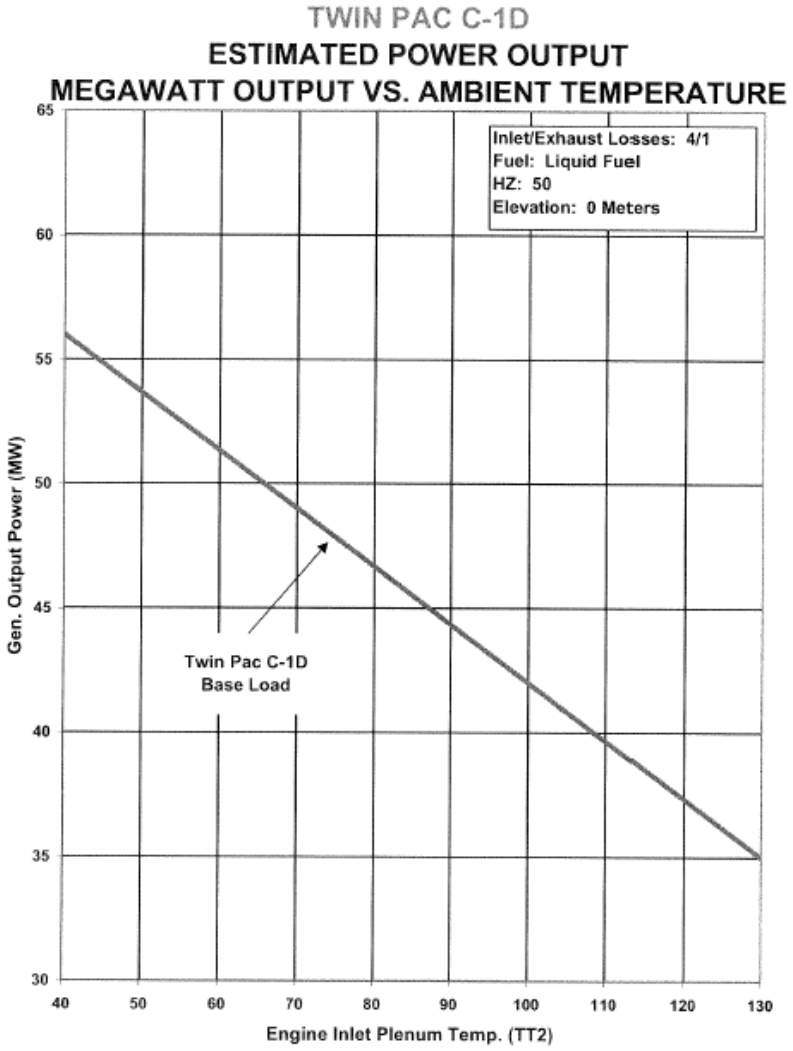
Audits—An audit service is available which provides an in-depth on-site inspection and assessment of equipment and a written report of the results to the customer with recommendations.

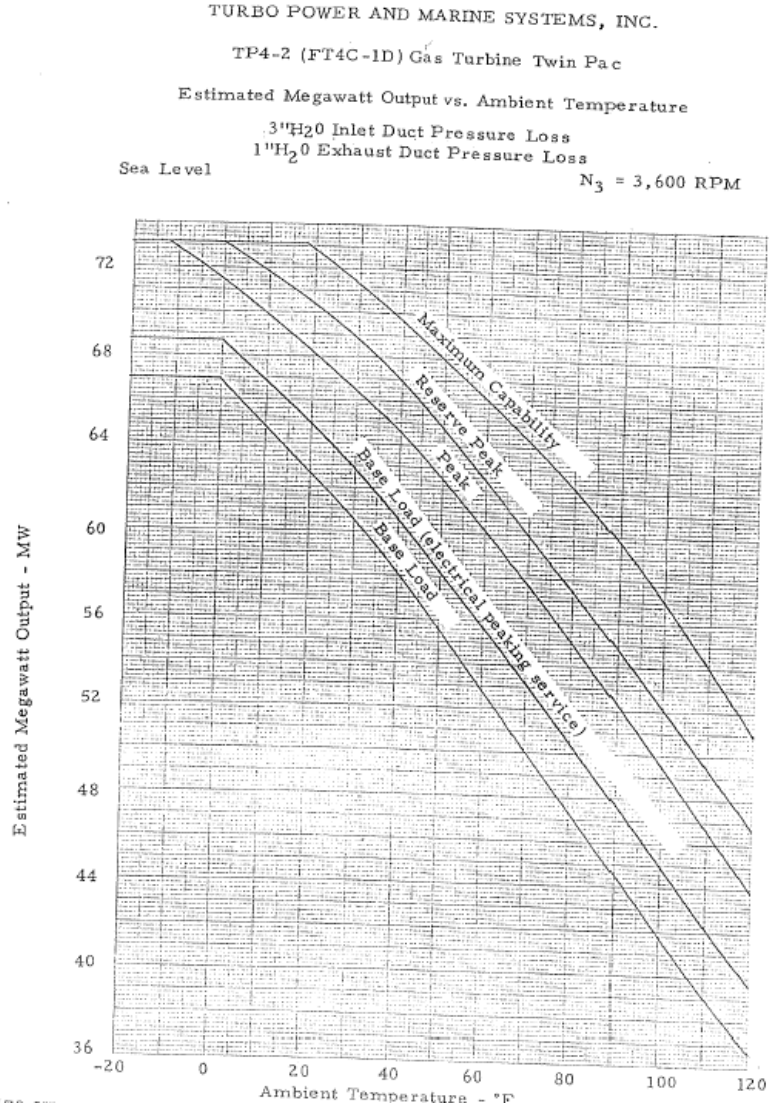
Authorized Maintenance—A guaranteed authorized maintenance program is available to provides customer assurance that recommended standards are maintained. This includes work performed in shop as well as on site.

Modular Shop Design—Should a customer desire a small shop for disassembly of a gas generator into modules, technical guidance is available in the layout of the shop and recommend required equipment.

Field Service—A 24-hour phone service is available, allowing customers to request assistance or a visit from one of our field service representatives to help solve problems.

Performance Curves





Scope of Supply

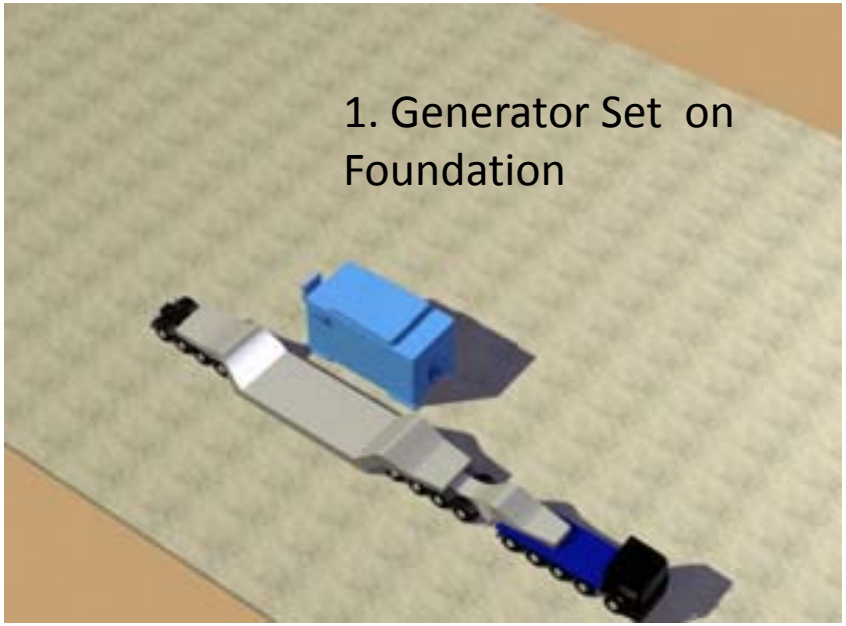
Installation	Notes	Item	Description
		I.	GAS TURBINE POWER ISLAND
C			1 GAS TURBINE PACKAGE
C			Gas Generator (GG4C-1D Core Engine)
C	FT4C-1D		Power Turbine
C			Exhaust elbow
C			Exhaust transition
C			Fabricated gas turbine base and mount
C			Coupling connecting power turbine and
C			Air starter
C			Ignition system
C			GG & FT lube oil systems
C			* Oil-to-air coolers
C	One gearbox and one DC driven		* Oil pumps
C			* Carbon steel piping
C			* Enclosure
C			Fuel supply systems
C			* Liquid fuel filter
C			* Liquid fuel forwarding skid
C			* Last chance liquid fuel fire valve
C			Gas turbine enclosure
C			* Secondary cooling air system with louvers
C			* Vents and drains
C			* Interior AC/DC lighting
C	CO_2 Bottles supplied by Customer		* CO_2 Fire Suppression System
C	NA		* Sound attenuation estimate
C			* Air inlet filter
C	One inlet section		Inlet silencing
C	3 section residential sound treatment		Exhaust Stack
C			2 AIR START PAC
C	60 to 50 HZ conversion optional		3 GENERATOR PACKAGE
C	13.8Kv, 3 phase, 60 HZ, 74,500 kVA, 0.9 PF 2 pole		EM Open Ventilated Air Cooled Synchronous Generator
C	With pilot exciter		Brushless Exciter Assembly
C			Stator Heaters
C			Neutral ground transformer/resistor
C			Current transformers
C			Stator temperature detection
C			Bearing temperature detection
C			Generator and exciter air temperature detection
C			Rotor ground detection
C	Air cooled		Lube oil System
C			* Oil filter
C	AC and DC		* Motor driven pumps
C	Prime painted		Enclosure

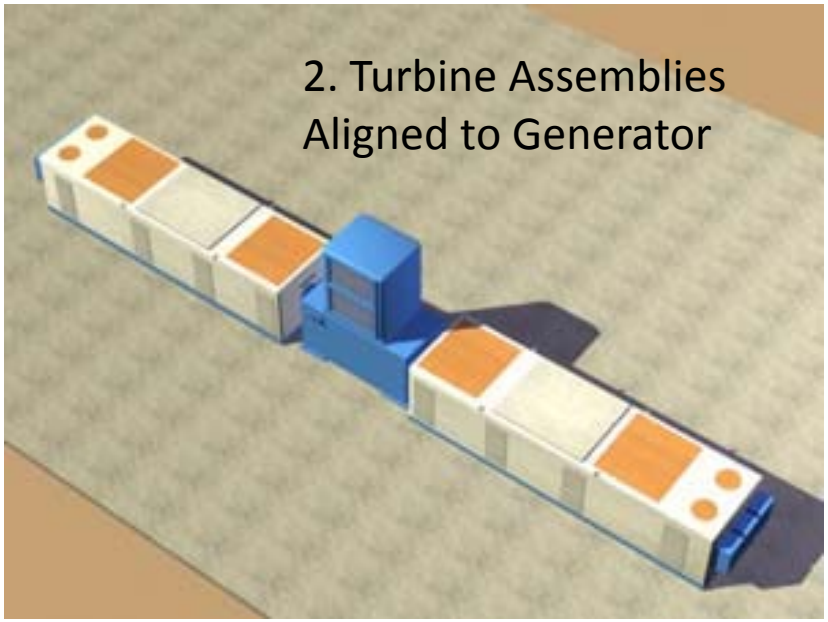
Item	Description	Installation	Notes
	* Inlet air filter	C	
	* Inlet and exhaust silencing	C	
	* Interior AC/DC lighting	C	
	* Fire detection system	C	
	4 CONTROL PACKAGE	C	
	Prefabricated steel enclosure	C	
	* HVAC	C	
	* Fluorescent lighting	C	
	* DC emergency lighting	C	
	* AC power outlets	C	
	* Smoke detector	C	
	Operator control cabinet	C	
	* Starting and operating controls	C	Manual and automatic
	* Speed indication	C	
	* Voltmeters and frequency meters	C	Bus and generator
	* Ammeter	C	
	* Wattmeter	C	
	* VAR meter	C	
	* Synchroscope	C	
	Instrument Cabinet	C	
	* Automatic voltage regulator	C	
	* Synchronizer	C	
	* Vibration monitor	C	Gas turbine
	* Fire protection system power supplies	C	
	* Static inverter	C	
	Unit control cabinet	C	
	* Woodward Netcon 5000 control system for automatic starting, running, loading, unloading and shutdown of the unit.	C	
	Generator protective relay panel	C	
	* Generator protective relays	C	
	* Lockout relays	C	
	* Watt hour meter	C	
	Motor Control Center	C	
	* AC and DC distribution panels	C	
	* Motor starters	C	
	* AC distribution transformer	C	
	* Breakers as required	C	
	* Manual transfer switch	C	
	* Field termination blocks	C	
	* Power supplies	C	
	Ventilated cubicle with rack mounted lead acid batteries	C	125 VDC
	Battery charger	C	
	Switchgear module 15 kV Class	C	
	* Metalclad switchgear compartment	C	
	* Circuit breaker	C	3000 Amp/ 1000 MVA, 15kV class totally enclosed
	* Non-segregated insulated 3 phase bus duct	C	
	* Lightning arresters and surge capacitors	C	
	* Current transformers and potential transformer	C	
	* 3 phase station auxiliary transformer	C	

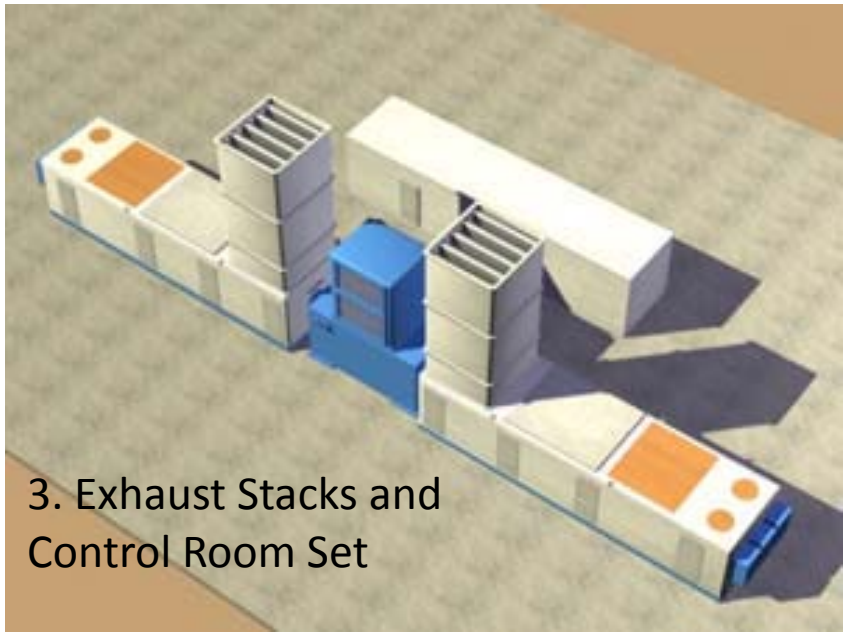
The Pratt & Whitney FT4 Gas Turbines – 52MW each at 50hz and designed to run on LFO, natural gas or distillate. These units are ready for immediate delivery and installation.

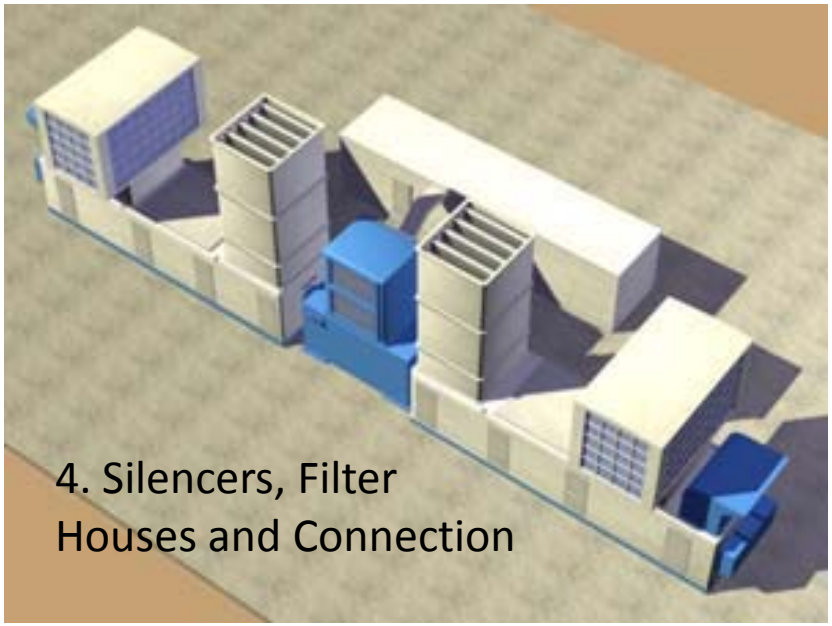
The FT4 units are sub-skid mounted and designed for rapid deployment and installation. The FT4's have Dual Fuel and Duel Frequency capabilities

The FT4's modular design allows for quick installation









North American FT4 Installation Site

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