

Online Double Conversion UPS

# **Falcon x7**

UPS 60-80-100-120-160-200-250-300-400-500-600KVA



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Fuji Electric's Falcon X7 Series is an unique and innovative UPS with competitive benefits of low ownership cost, high efficiency and is designed to operate in harsh environments with higher availability.

## Highlights of Falcon X7 UPS at a Glance

### Flexibility

- Flexible configuration for optional inbuilt transformer
- Compatible with multiple battery technologies including Lithium Ion batteries
- Common battery option for optimised selection of Battery for UPS in parallel or Independent configurations
- Wide input voltage from +20% to -40%
- Genset compliant with adaptive progressive walk-in and rectifier delay start options.
- 3 Phase 3 wire rectifier fully compatible with existing infrastructure
- Parallel upto 8 units for capacity or redundancy

### Reliability

- Operating temperature of 0-40°C with special attention in component selection and design to improve reliability
- Input phase sequence correction provided as standard
- Advanced battery management techniques to improve battery life with three stage charging and with auto equalizing charge at predefined intervals
- Monitoring runtime of critical component such as fans, capacitors, batteries for predictive life estimation.

### Total Cost of Ownership

- Efficiency of upto 96.5% in online double conversion mode
- Intelligent Eco mode operation with an efficiency of upto 99%



### Applications

- Infrastructure
- Data Center
- IT/ITES & Commercial Buildings
- Engineering Industry
- Telecom
- Electronics Manufacturing
- Process Industry
- Food & Beverage Manufacturing
- Textiles

### Innovative & Unique Technology in UPS System

Power walk-in and delayed start of rectifier gives the flexibility to install the UPS in all kinds of electrical infrastructure without any changes or oversizing of infrastructure.

The wide input voltage tolerance of the UPS (-40% to +20%) enables the UPS to work in online mode without using battery support for wide input voltage variations and even if there is a input phase reversal.

The UPS is fully accessible from the front side, no additional rear or side clearance is required, optimizing the area required for UPS installation.

Falcon X7 has the flexibility to add an internal isolation transformer which can be connected either at the input, output or on static bypass based on the installation requirement.

### Optimised & Flexible Battery Configuration

Battery configuration can be adapted between 40-44 no's of 12V battery blocks which gives flexibility for optimised battery selection.

Battery configuration can be optimised with independent battery bank for each UPS or shared battery bank for multiple UPS which helps to optimise the selection of battery, space required for battery installation and the cost of installation.

### Advanced 3 Level Topology

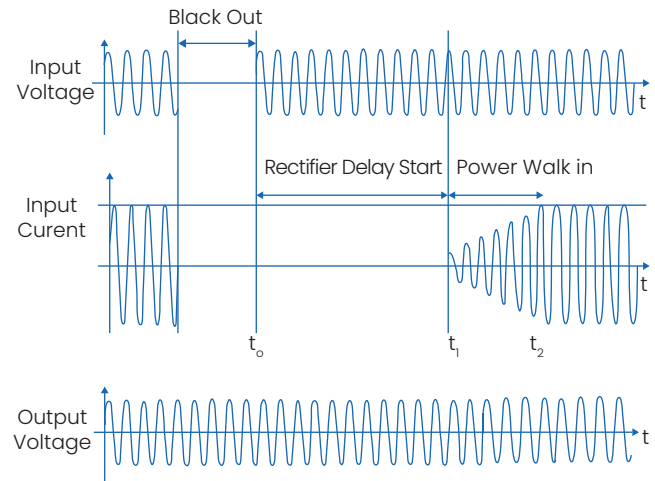
Falcon X7 series incorporates advanced 3 level technology. The Fuji Electric 3 level topology is more advantageous than conventional 3 level topology as the losses can be reduced.

### Fault Tolerant Architecture

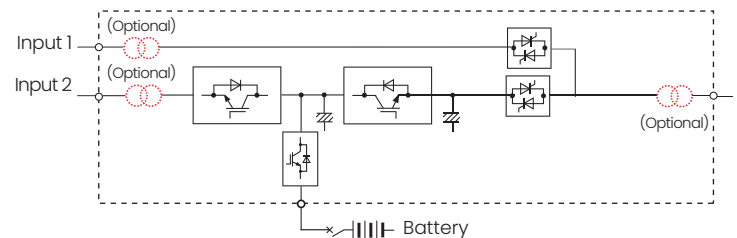
High inverter short circuit current handling capacity to clear faults which occur between phase and neutral or phase to phase - phase on the load side.

Independent three phase control enables handling of unbalanced three phased loads without any unbalance of output voltages.

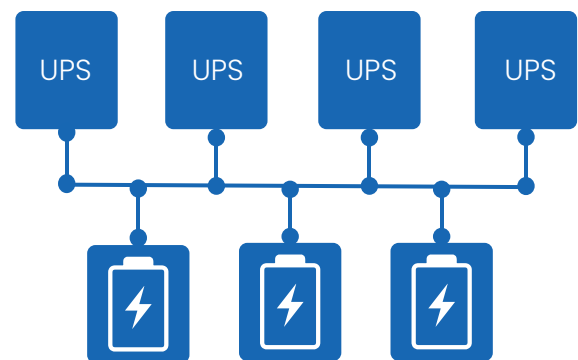
### ■ Rectifier Delay Start



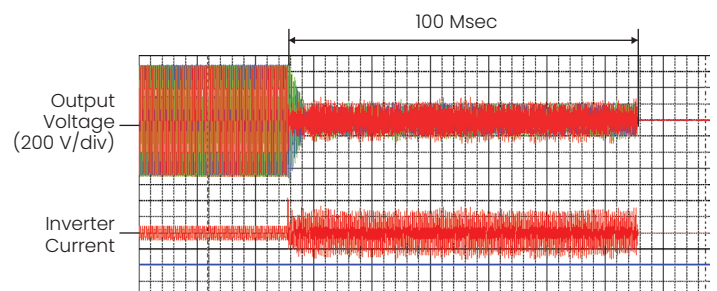
### ■ UPS Block Diagram



### ■ Shared Battery Configuration



### ■ Short Circuit Current of UPS



**Designed for Better Reliability, Maintainability & Serviceability**

Falcon X7 series UPS is based on Fuji Electric’s proven UPS technology and uses state-of-the art power devices and power electronic technologies to offer better Reliability, Maintainability and serviceability for large capacity UPS system.

**Advanced Parallel Configuration**

Falcon X7 uses advanced Fuji Electric "Individual-Independent" parallel redundant architecture using looped communication method. This system has no single point of failure and each unit monitors all the other units with loop communication lines to ensure high reliability in parallel UPS systems.

**Advanced Thermal Management**

Falcon X7 is designed to operate continuously at 40oC ambient temperature and uses forced air cooling with suction from front and exhaust from top. Special consideration in airflow design to isolate PCB from power devices for higher reliability. UPS is suitable to be installed in a well ventilated room without any air conditioner.

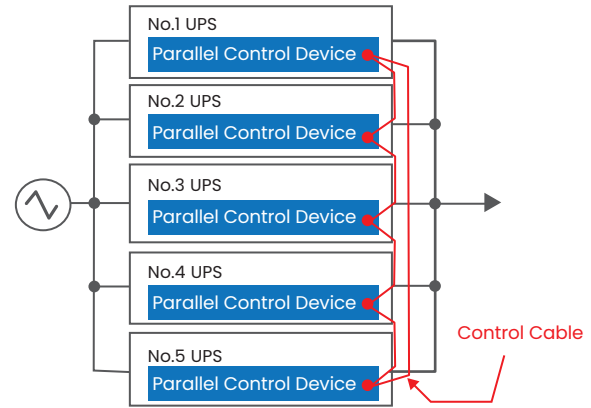
**Ease of Access & User Friendliness**

Falcon X7 maintenance requires only front access and back to back installation of UPS systems is possible to optimize space usage in UPS rooms.

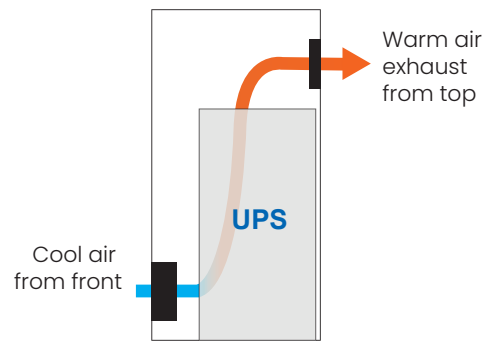
The Human Machine Interface (HMI) is intuitive and user friendly with a LCD screen and LED mimics. Easy Identification of UPS working Status with the LED Glow bar.

- Green LED → Normal Operation
- Yellow LED → Mains Failure or Battery Mode of Operation
- Red LED → Critical Alarms Inverter Tripped

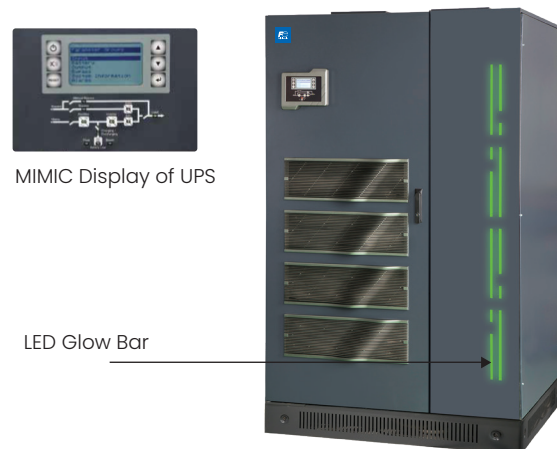
■ **Parallel Control Logic**



■ **Ventilation Arrangement of UPS Room**



■ **User-Friendly HMI**



### Energy Efficient UPS System

Falcon X7 is an online double conversion UPS fully meeting the requirements of IEC62040-3.

The Eco mode operation of Falcon X7 guarantees an overall AC-AC efficiency of 99% and an efficiency of upto 96.5% in online double conversion mode of operation offering the highest efficiency.

### Optimised Cost of Ownership

Falcon X7 can be operated upto 40oC (Ambient Temperature) without any precision air conditioner as required by most UPS. This along with high efficiency helps large saving in CAPEX and OPEX cost associated with UPS.

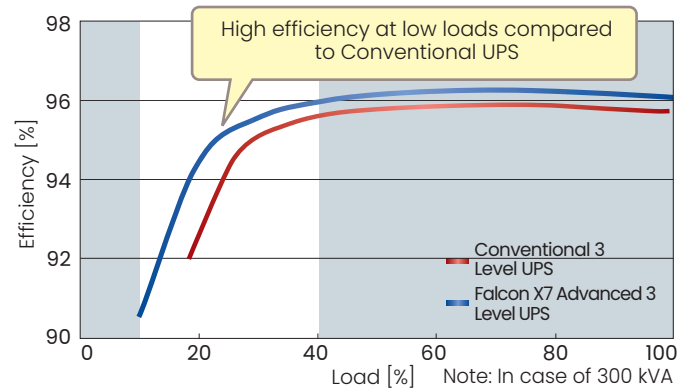
Long life power Electronic grade capacitors are being used in the UPS which doesn't warrant for the replacement of capacitors during its lifetime.

### Intelligent Eco Mode of Operation

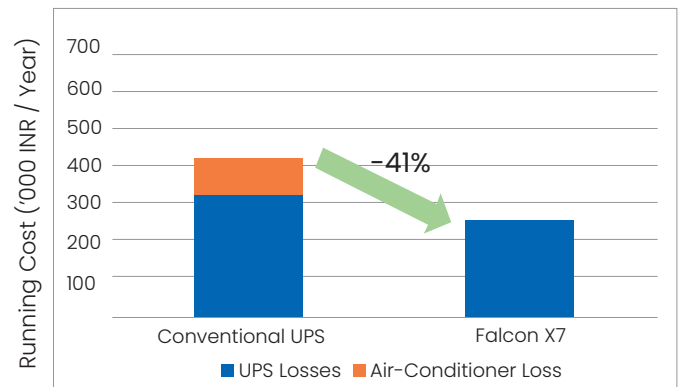
Falcon X7 has a intelligent high efficiency Eco Mode operations which can be enabled for energy savings (99% Efficiency).

The Firmware, tested to Indian power conditions monitors the quality of the input power, and enables the Eco-Mode operations on bypass only when input power conditions are stable. Otherwise the UPS transfers back to double conversion mode in less than 5ms whereby the reliability of power is ensured to the critical load.

### Efficiency

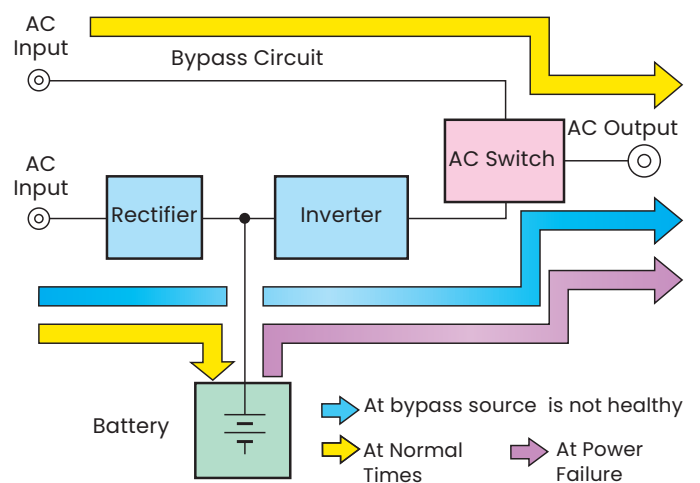


### Energy Saving



Calculation Conditions:  
Total annual running cost at Rs.7/kWh and 30% (100 kW) load

### Eco-Mode Operation of UPS

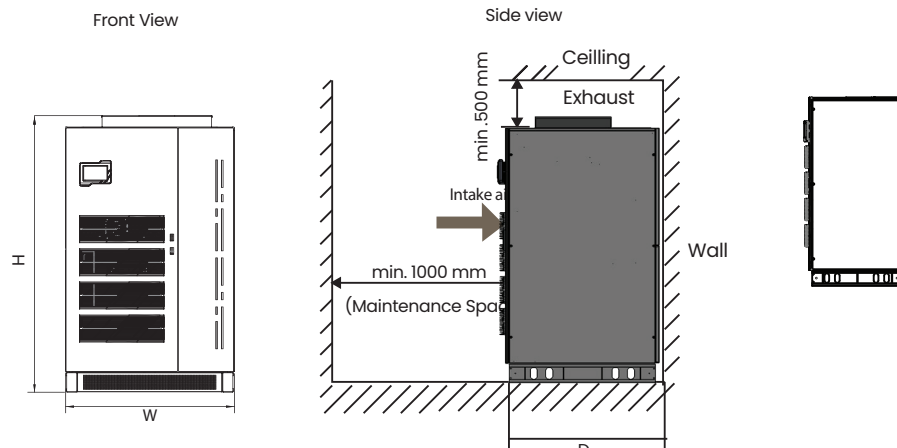


**Technical Specification**
**Falcon x7**

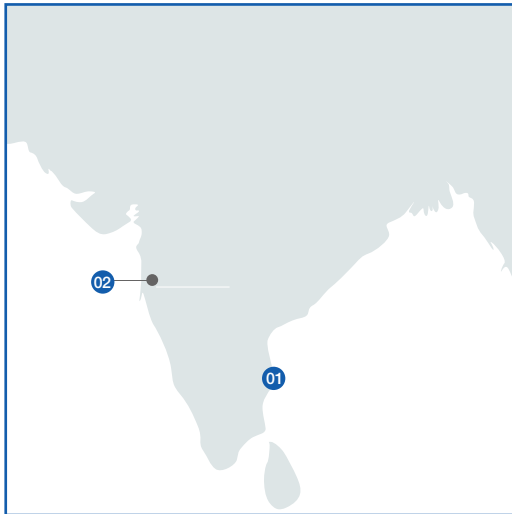
UPS 60-80-100-120-160-200-250-300-400-500-600 KVA

Model		Falcon X7										
Series	UPS Rating (KVA)	60	80	100	120	160	200	250	300	400	500	600
	UPS Rating (KW)	60	80	100	120	160	200	250	300	400	500	600
Input Parameters	Rated Voltage	400 V, 3 Phase + PE										
	Rated Voltage Tolerance	+20%, -40%*										
	Rated Frequency	50/60 Hz										
	Current Harmonic Distortion (THD)**	<3% at Load 100%										
Bypass Parameters	Rated Voltage	400 V $\pm$ 10%, 3 Phase + N + PE										
	Rated Frequency	50 or 60 Hz (Configurable)										
Output Parameters	Rated Voltage	400 V (Settable 380/415 V), 3 Phase + N + PE										
	Rated Frequency	50 or 60 Hz (Configurable)										
	Voltage Variation - Static Load	$\pm$ 1%										
	Crest Factor	3:1										
	Voltage Distortion at Linear Load	$\leq$ 1% (Typical)										
	Voltage Distortion at Non-Linear Load (as per IEC62040)	$\leq$ 3%										
	Frequency Stability with Inverter Synchronized to the By-Pass Mains	$\pm$ 2% (Settable from $\pm$ 1% to $\pm$ 6%)										
	Voltage Phase Shift with Balanced and Unbalanced Load	120 $\pm$ 10										
	Overload Capacity at 40°C	110% for 60 mins, 125% for 10 mins, 150% for 1 min										
	Load Power Factor	0.7 Leading to 0.5 Lagging without Derating										
	Efficiency	Upto 99% in Eco Mode and upto 96.5% in Online Mode										
Battery Parameters	Nominal Battery Voltage	480 Vdc										
	Compatibility	Compatible with SMF, Tubular, Ni-Cd, Li-Ion Battery										
Environmental Parameters	Ambient Temperature for the UPS	0 to 40°C										
	Range of Relative Humidity	upto 95% max (without Condensing)										
	Maximum Operating Altitude	Up to 1000 above MSL										
	Storage Temperature	From -25°C up to 60°C (UPS)										
	Acoustic Noise at 1m from Panel Front (Ref ISO3746)	< 65 dBA										
Mechanical Parameters	Width (in mm)	800	800	800	840	1000	1000	1200	1200	1700	1700	1700
	Depth (in mm)	900	900	900	900	1000	1000	1000	1000	1000	1000	1000
	Height (in mm)	1700	1700	1700	1800	2090	2090	2090	2090	2000	2000	2000
	Weight (in Kgs)	400 kgs		500 kgs		850 kgs		900 kgs		1100 kgs	1300 kgs	1400 kgs

\*at Part Load  
\*\*THDv @ <1%

**UPS Main Unit**






### South Asia

#### ● Fuji Electric India Pvt. Ltd.

- 01 Head Office & Chennai Factory  
119,120,120A,  
Electrical and Electronics Industrial Estate,  
Perungudi, Chennai - 600 096,  
Tamil Nadu, India
- 02 Pune Factory  
Survey No. 36/1/1,36/3/1,27/1/3,  
Taluka Haveli, Landmark - Handewadi Chowk  
Pune - 412308  
Maharashtra, India



### Southeast Asia

#### 03 Fuji Electric (Thailand) Co., Ltd.

43 Thai CC Tower, 11th FL.  
Room 1<sup>st</sup>14-9, South Sathorn Road,  
Yannawa, Sathorn, Bangkok , 10120,  
Thailand  
Tel : +66-2210-0615  
Website: <https://www.th.fujielectric.com>

#### 04 Fuji Electric Manufacturing (Thailand) Co. Ltd

118/2 Moo 18 Klong Nueng, Klong Luang,  
PathumThani 12120 Thailand  
Website: <https://www.th.fujielectric.com>

#### 05 Fuji Electric Sales Malaysia Sdn. Bhd.

Unit #13A-15, Menara Q Sentral, No. 2A,  
Jalan Stesen Sentral 2, Kuala Lumpur Sentral,  
50470 Kuala Lumpur W.P., Malaysia  
Tel : +60-(0)3-2780-9980  
Website : <https://www.my.fujielectric.com>

#### 06 Fuji Electric Asia Pacific Pte. Ltd.

151 Lorong Chuan #03-01/01A,  
New Tech Park Lobby A,  
Singapore 556741  
Tel : +65-6533-0014  
Website : <https://www.sg.fujielectric.com>

#### 07 Fuji SMBE Pte. Ltd.

No.15 Senoko Avenue  
Singapore 758305  
Tel: +65 756 0988  
website: <http://smbe.fujielectric.com>

#### 08 PT Fuji Electric Indonesia

Wisma 46 - Kota BNI , 12TH Floor Suite #12.05-07,  
Jalan Jenderal Sudirman Kav.1 Jakarta Pusat 10220,  
Indonesia  
Tel : +62-21-574 4571  
Website : <https://www.id.fujielectric.com>

#### 09 Fuji Electric Vietnam Co., Ltd.

Room 401,41h Floor , Corner Stone Building,  
16 Phan Chu Trinh, Hoan Kiem, Ha Noi , Vietnam  
Tel : +84-24-3935-1593  
Website : <https://www.vn.fujielectric.com>

#### 10 Fuji Electric Sales Philippines Inc.

Unit F , 8TH Floor, Inoza Tower, Lot 8 & 11, Block 32 ,  
40th Street, North Bonifacio, BGC, Tagig City  
Tel :+63-2-541-8321  
Website : <https://www.ph.fujielectric.com>

#### 11 Fuji Electric Co., Ltd.(Myanmar Branch Office)

Room No.311, 3rd Floor, Prime Hill Business Square,  
No. 60, Shwe Dagon Pagoda Road, Dagon Township,  
Yangon, Myanmar  
Tel : +95-1-8382714  
Website : <https://www.fujielectric.com>

#### 12 Fuji Electric Co., Ltd.

7th Floor Vattanac Capital, No. 66 Preah Manivong Blvd,  
Sangkat Wat Phnom, Khan Daun Penh, Phnom Penh,  
Cambodia  
Tel :+855-(0)23-964-070  
Website : <https://www.fujielectric.com>