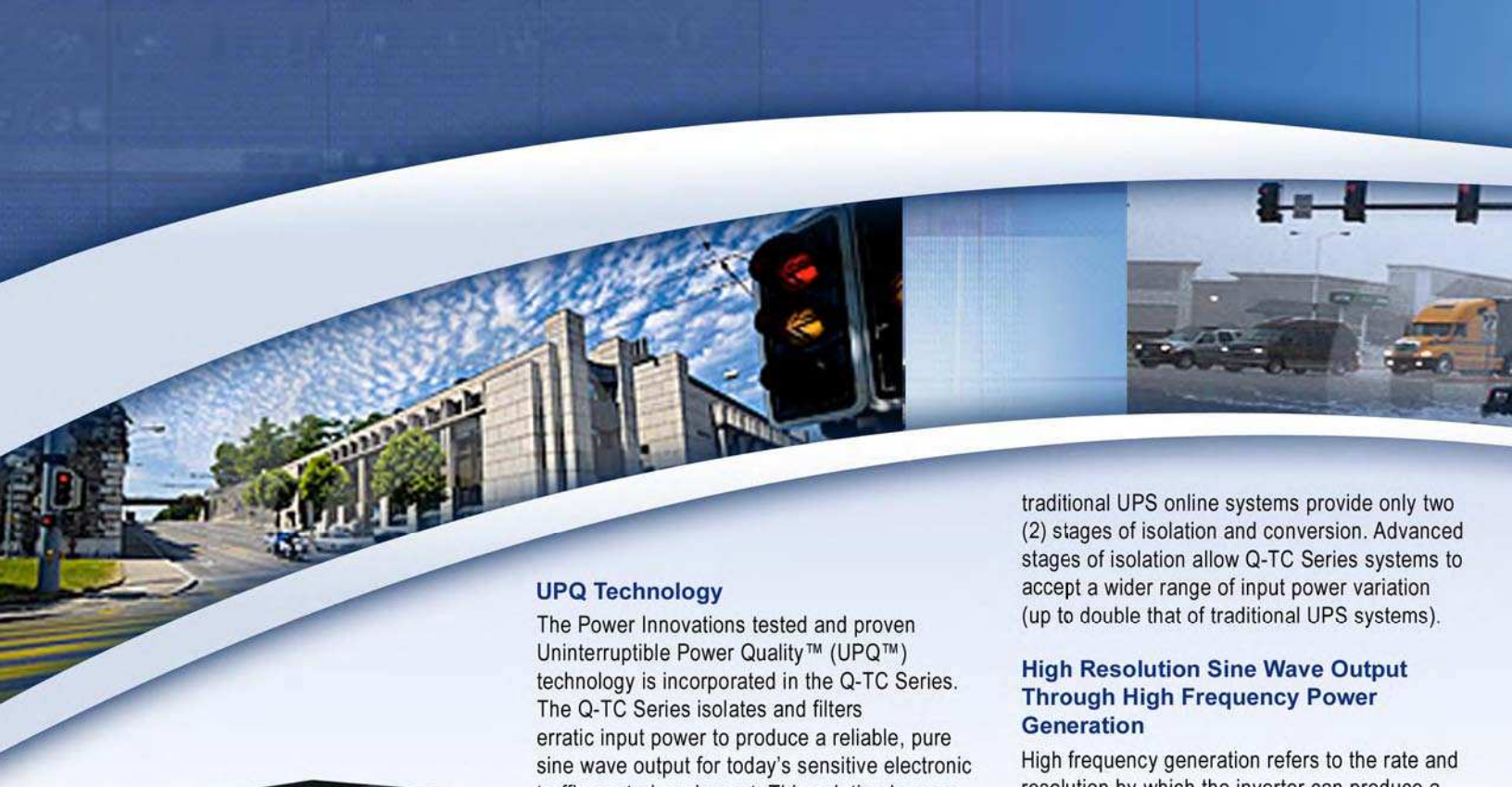
Q-TC™ Q-Series Traffic Controller

Uninterruptible Power Quality™ (UPQ™) Systems

Powering Life Today and Tomorrow

The Traffic Control Uninterruptible Power Quality™ (UPQ™) system by Power Innovations International, Inc. has been specifically designed to power traffic control systems worldwide. The Q-TC Series meets and exceeds domestic and international traffic system standards.

Power Innovations
INTERNATIONAL



UPQ Traffic Controller Front

UPQ Traffic Controller Back

UPQnet-agent III

UPQ Technology

The Power Innovations tested and proven Uninterruptible Power Quality™ (UPQ™) technology is incorporated in the Q-TC Series. The Q-TC Series isolates and filters erratic input power to produce a reliable, pure sine wave output for today's sensitive electronic traffic control equipment. This solution is more efficient, increasing backup times while decreasing heat dissipation. The Q-TC Series has been created for global application (120 or 230 VAC).

Complete Isolation and Protection from Input Power Problems

Q-TC Series systems provide five (5) stages of isolation and conversion. In comparison, traditional UPS online systems provide only two (2) stages of isolation and conversion. Advanced stages of isolation allow Q-TC Series systems to accept a wider range of input power variation (up to double that of traditional UPS systems).

Power Quality Condition	Conditioning Technology: Line Interactive*	Standby UPS*	On-Line UPS*	The Q-Series Digital Power
FILTERING				
Transient Voltage Surge — Common Mode	●	●	●	●
Transient Voltage Surge — Normal Mode	●	●	●	●
Noise — Common Mode	●	●	●	●
Noise — Normal Mode	●	●	●	●
Notches			●	●
Voltage Distortion			●	●
REGULATION				
Sag	●	●	●	●
Swell	●	●	●	●
Undervoltage	●	●	●	●
Overvoltage	●	●	●	●
Frequency Variation	●	●	●	●
Momentary Interruption	●	●	●	●
Long-Term Interruption	●	●	●	●
ISOLATION	●	●	●	●
Pure High Resolution Sine Wave	●	●	●	●

● It is reasonable to expect that the indicated condition will be corrected by the indicated power conditioning technology.*

● There is a significant variation of power conditioning product performance. The indicated condition may or may not be fully correctable by the indicated technology.*

*Source for the evaluation of line-interactive and on-line UPSs is the Electric Power Research Institute (EPRI).

High Resolution Sine Wave Output Through High Frequency Power Generation

High frequency generation refers to the rate and resolution by which the inverter can produce a sine wave. Q-TC Series systems generate at 50 KHz, more than twice that of most traditional UPS systems. Some advantages include smaller size for equal output, less weight, less heat dissipation, longer run time, and higher reliability.

Air Filtering

Q-TC Series systems incorporate negative flow cooling. Utilizing this airflow configuration, the Power Innovations filtering process keeps vital components clean over time. This feature enables cooler and more reliable operation.

Expandable Backup Time

All battery modules are external to the standard systems. Q-TC Series battery modules provide approximately five (5) minutes of backup time at full load. Backup time can be expanded with additional battery modules. Cabinets are available to house and protect any configuration of battery backup modules, and may be directly connected to the system via custom Anderson Quick Disconnect Connectors (QDC) or hardwire terminal strips.

Advanced Protection

The Q-TC Series incorporates technologies that preserve the life of the system and connected equipment. Advanced features include:

- Overload bypass
- Short-circuit protection
- Over temperature shutdown

Q-TC Series Features

- Always online
- Five (5) stages of isolation and conversion
- Bypass load protection
- Full feature display

Empowering people through Innovation and Technology - The Q-TC Series of Power Perfection *by Power Innovations International*

- High efficiency
- Extended battery backup
- Auto-start selectable
- DC start
- Auto frequency detect
- Fused modular branch circuits
- Continuous regulation and filtering
- RS-232 & SNMP advanced communications

Full Remote Management - UPQnet-agent III™

UPQnet-agent III™ provides a comprehensive, easy-to-understand, secure Web-based interface to monitor and control any UPQ system—via a network or dial-up connection. The net-agent is a programmable web server that assigns the UPQ an IP address. Through a custom web page, the net-agent provides vital information from the Q-TC Series system. The information is available locally and may be accessed via a computer interface. UPQnet-agent III also allows the user the ability to set TRAPs for email notifications regarding system status (See UPQnet-agent III brochure).

Environmental Extremes

The Q-TC Series has been built to withstand the harshest climates and changes in the environment. Internal cooling fans are contained within the Q-TC system, allowing safe operation in conditions from -40° to 74°C. Batteries, however, can only withstand temperatures ranging from -20° to 40°C. Heat pads can be added to extend the range of low temperature tolerance for the batteries. Temperature sensors are available through the UPQnet-agent III for additional internal and external sensor points.

Multiple Outputs for Traffic Controller Functions

The Q-TC Series has two AC outputs, plus an additional utility tap. One output is routed via a PTS (power transfer switch) and the other is located on the back of the Q-TC system. The utility TPT (temporary power tap) is provided via a NEMA 5-15 for additional equipment connection. A terminal block is also available for direct wired connection.

Status Communications

The Q-TC system comes with a contact closure terminal block and an RS-232 communication port. The following contact closures are provided via the RS-232 DB-9 port: AC power failure, dual low battery, dual timer, self-test, and PTS (power transfer switch).

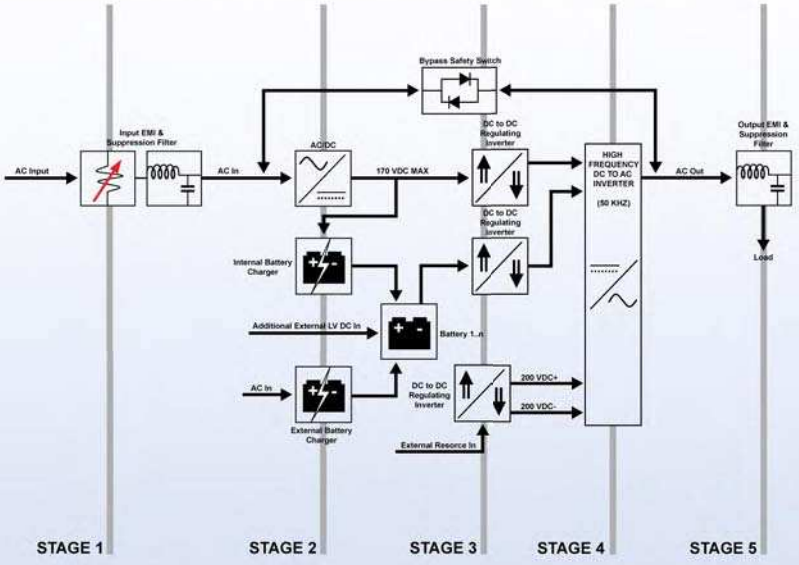
Tri-Function Display

The Q-TC system has a tri-function LED display. The LED display shows the operating status of the system, load percentage, and the level of the battery.

Counter & Timer

A counter and timer have been incorporated into the Q-TC to show how many times the system has gone into backup mode and how long it remains in backup mode.

5 Stages of Isolation and Conversion Topology



Q-TC Series Product Specifications

	Q-TC 1000	Q-TC 1500	Q-TC 2000	Q-TC 3000
Output				
Capacity (VA)	1000	1500	2000	3000
Capacity (Watts)	700	1050	1400	2000
Current (peak Amp) 120/230 VAC	9.1 / 4.3	13.7 / 6.4	18.2 / 8.7	27.3 / 13
Waveform	High resolution, pure sine wave			
Outlets	2 NEMA / 2 Hardwire			
Input				
Current (max Amp) 120/230 VAC	12 / 5	18 / 8	20 / 10	30 / 16
Power Factor	> .95	> .95	> .95	> .95
Frequency	50/60 Hz (auto) / 45/65 Hz (inverter phase lock range)			
General				
UPQ power conditioning topology	5 Stages Isolation & Conversion / High Frequency, True On-Line Digital Sine Wave			
Voltage Regulation				
Input voltage range:				
Full load without using battery	North America 80 to 140 VAC International 165 to 270 VAC			
Half load without using battery	North America 75 to 140 VAC International 160 to 270 VAC			
Output voltage regulation	± 2%			
Suppression				
IEEE 587/ANSI 62.41 3KA/6KV surge let-through (NA)	170 V normal mode (L or N) / 230 V common mode (L+N to G)			
IEEE 587/ANSI 62.41 3KA/6KV surge let-through (international)	340 V normal mode (L or N) / 450 V common mode (L+N to G)			
Joules (energy absorption)	300 Joules			
Peak surge current (Amp)	80,000 Amps			
Multi-stage protection	Yes			
Normal & common mode certified	Yes			
Conditioning	Yes			
Output total harmonic distortion	Less than 3% under linear load, less than 5% under non-linear load			
Output frequency regulation	50/60 Hz ± 0.1 Hz (except the synchronization to line during brownout)			
Input frequency regulation	45-60 Hz			
High Frequency Online Inverter				
Inverter driver frequency	50 KHz			
Overload capacity	<110% continuous			
Crest factor	3:1			
Transfer time	Zero			
Efficiency	AC to AC > 95% DC to DC > 80%			
UPQ to bypass/bypass to UPQ	Zero cross transfer, less than 4 mSec. (2 mSec. minimum)			
External Battery				
Full load run time	≥ 9 min	≥ 5 min	≥ 6 min	≥ 5 min
DC voltage	36	36	72	96
Recharge time	5 to 8 hrs			
Recharge current (Amps)	1.5 Amps			
Temperature	-20 to 40 C° (adjustable with heat pads)			
Number of batteries	3	3	6	8
Power Connector				
Output of 120 V units	(2x) NEMA			
Additional output	(2) Terminal Block			
NEMA with Branch Bank Protection	Yes			
Audible Alarm				
Battery discharge	1) 2 to 10 sec. 2 beeps - battery level 2) 1 sec. 2 beeps - low battery			
Overload	2 beeps every second			
Fault	Beep continuously			
Physical				
WxDxH	17 x 9 x 5.2 in		17 x 10 x 5.2 in	
Weight in lbs/kg	55 / 25		66 / 30	
Battery Size	19 x 20.4 x 3.5 in (48.3 x 51.8 x 8.9 cm)			
Battery size (rack mount units)	2 U			
Battery pack in lbs/kg	40 / 18	40 / 18	66 / 30	77 / 35
Isolation				
Common-mode noise rejection	Yes			
Normal-mode noise rejection	Yes			
Battery Charger				
Microprocessor controller	Yes			
Expansion	Yes			
Extended pack option	Yes			
Connect / disconnect	Yes			
Front Panel Display				
System status information	Yes			
Inverter status	Yes			
Bypass status	Yes			
Load status	5 segment			
Battery status	5 segment			
Diagnostic status	Yes			

Diagnostics	
POST	Yes
Bypass	Yes
Line to output sync	Yes
Battery status	Yes
Inverter error	Yes
AC input failure	Yes
Overload	Yes
Monitoring	
Remote shutdown	Yes
Remote diagnostics	Yes
Scheduled shutdown	Yes
Input voltage	Yes
Input frequency	Yes
Output voltage	Yes
Output frequency	Yes
Output load	Yes
Reporting	Yes
Graphing	Yes
Plotting	Yes
Auto Restart (Input Voltage)	
110 / 120 VAC	90 - 120 VAC
220 VAC	100 - 200 VAC
DC	Yes
Environment	
Audible noise	< 50 dBA at 1 meter
Temperature	-40 to 74 degrees C
Relative humidity	0 to 95% non-condensing
Approvals	
EMI	FCC Class A
Warranty	1 year
Protection	
Overload	< 110% full load for 3 min.
Short circuit	Yes
Over temperature	Yes
PTS (Power Transfer Switch)	
Dimensions WxDxH	4.7 x 6.5 x 4.6 in
Transfer time	150 mSec.
Weight	7.7 lbs

Power Innovations
INNOVATIONS, INC.

Empowering People
Through Innovation and Technology

tel 801-785-4123 **fax** 801-785-6999
www.power-innovations.com

333 South 520 West
Lindon, UT 84042