

Product Brief

MSB

**Motorola Standard
Buildings**



quality enclosures



As the world moves into the wireless age, the reliability of wireless systems to provide dependable communications during normal and emergency situations has become a crucial need of wireless customers. A key ingredient for ensuring reliability is

the environment in which the equipment is installed. To improve the uptime for equipment operation and enhance the life of equipment, it is imperative that the following aspects be carefully considered in the design of the equipment enclosure:

- It is properly designed for the electrical requirements of the proposed equipment;
- The equipment can be installed in the most efficient configuration while meeting the manufacturer recommendations;
- Optimal equipment environmental conditions (heating, ventilation and air-conditioning - HVAC) within the enclosure can be consistently maintained;
- Backup power sources, such as Uninterruptible Power supply (UPS), DC Power plant and generators have been correctly sized to handle the designed equipment loads;
- Alarming capabilities have been adequately designed for diagnosing and alerting failures of critical components;
- Grounding and Transient Voltage Surge Suppression (TVSS) systems have been designed to provide protection from high voltage anomalies; and
- Cable entry and routing facilities have been properly designed for the proposed equipment inter-connections

Equipment enclosures designed to meet the foregoing requirements would help enhance system performance and reliability for the fixed equipment by minimizing downtime due to equipment malfunction and susceptibility to lightning. Also, customers can realize savings in maintenance expenditures due to lower requirement for service and spares.

To provide its customers with an enclosure that meets the foregoing requirements, Motorola has developed high quality Motorola Standard Buildings (MSB) keeping the Motorola's equipment needs in mind.

STANDARDS

In order to provide internal guidelines and requirements for the installation of communications equipment, infrastructure and facilities, Motorola has developed "Quality Standards for Fixed Network Equipment Installations", also known as R56. The R56 Standards form the minimum standards that Motorola considers are required to provide the expected system performance, reliability and equipment longevity.

The MSB equipment enclosure design meets the Motorola's R56 standards, and the equipment layout and component design follows the recommended equipment installation standards. Moreover, the cabling facilities, backup power sources, grounding, receptacles, and surge suppression have been pre-planned with location of Motorola equipment in mind. As a result the MSB equipment enclosure provides optimum environment for housing the Fixed Network Equipment.



Interior view

FLOOR PLAN

Motorola's Site Design Team worked with its Core Engineering Group (CEG) and Customer Center for Systems Integration (CCSI) to develop the standard racking configurations that would allow equipment to be installed in most efficient manner.

Standard equipment layouts have been designed to help ensure interior space can be optimally utilized and equipment can be placed on the floor plan in the most optimum configuration, while meeting Motorola's R56 and equipment installation standards.

ELECTRICAL CONFIGURATION

To determine the power requirements, the electrical design for each MSB enclosure is based on the load calculations for the system configuration that has been designed for each building type. Accommodations have been made in the design for up to 20% growth in future power requirements.



Typical electrical power wall

In order to prevent a differential ground potential between different grounding points in the building, components have been arranged in such a way that the conductors entering into the building are close to the main ground bar. This will

facilitate single point grounding of the building equipment. Also, building electrical entry points have been protected with appropriate surge protection to protect the equipment from outside surges and spikes.



In order to allow easy distribution of electrical power to the equipment, individual load distribution centers have been planned for each row of equipment. This allows easy identification of the breakers for powering off the equipment during repair or maintenance (above left). For convenient powering of the equipment, individual receptacles with dedicated circuits have been installed in a raceway system above the equipment racks (above right).

BACKUP POWER

Depending on the power requirements of each equipment configuration, backup power sources have been designed to allow uninterrupted operation of the critical equipment. This has been accomplished with an Uninterruptible Power Supply (UPS) that instantaneously picks up the equipment load in case of power failure. The UPS carries the load until a stable source of power is available.

Double conversion type UPSs have been used to supply properly regulated and filtered AC power for the critical loads. The UPSs have built in static bypass switches as well as over-current protection to provide maximum system reliability. Single phase UPSs have been provided for buildings that have power requirements less than 40KW. These UPSs are scalable



Uninterruptible Power Supply(s)

and provide parallel redundancy for a fault-tolerant network of power protection. Three phase UPSs used for larger loads (greater than 30KW), provide efficient power handling. UPSs come with a field startup by a factory trained technician after the building has been installed.

Each building configuration has been sized with an outdoor standby generator based on the selected equipment load configuration. Each generator is also supplied with an automatic transfer switch to allow switching of power to generator power in case of utility power failure. Generators come with field startup by a factory trained technician after the building has been installed.



Indoor Generator Room (optional)

As a space saving option, MSB enclosures with power requirements up to 24KW can also be configured with an AC PowerPac that combines UPS, Emergency Back-up Power, and a sophisticated control and communication system with a high capacity fuel tank (up to 14 days runtime) in a single enclosure allowing the replacement of the UPS, emergency back-up generator, fuel tank and automatic transfer switch.



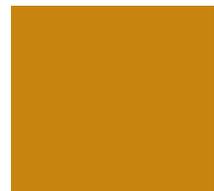
AC PowerPac (optional)

BENEFITS TO CUSTOMER

- **ALL-INCLUSIVE PACKAGE:** The MSB enclosure includes completely designed systems for generator, UPS, Automatic Transfer Switch, HVAC, power distribution, grounding and electrical distribution for the selected equipment configuration. As a result, the MSB enclosure provides a complete solution for equipment requirements of the communications system.
- **RAPID DEPLOYMENT:** Construction and design drawings for the MSB enclosure have already been designed and drafted by building manufacturers. These drawings have also been pre-approved to meet state building codes, thereby reducing the custom design drawing drafting, approval and state certification process (typically 3-4 weeks).
- **READY FOR EQUIPMENT:** Building systems have been pre-designed with Motorola's equipment needs in mind. While the site is getting ready for the building installation, the fixed network equipment can be installed in the MSB enclosure at the building manufacturing plant. As a result, when this building is installed at the site, the equipment is ready for optimization. This can save 2-3 weeks of field installation time for each site.
- **CONVENIENT LOCATIONS:** MSB enclosures have been designed with the cooperation of four leading prefabricated building manufacturers in the US. Building manufacturing plants are typically located close to customer locations, cutting down on freight costs and providing prompt warranty support.
- **COST EFFECTIVE SOLUTION:** Because of Motorola's relationships with its vendors and standardization of designs, MSB enclosures offer a significant cost reduction for Motorola and its customers.
- **QUALITY CONSTRUCTION:** MSB enclosures are manufactured to meet Motorola's R56 Quality Standards and therefore ensure that customers receive a quality product to house its fixed equipment.

STANDARD BUILDING FEATURES

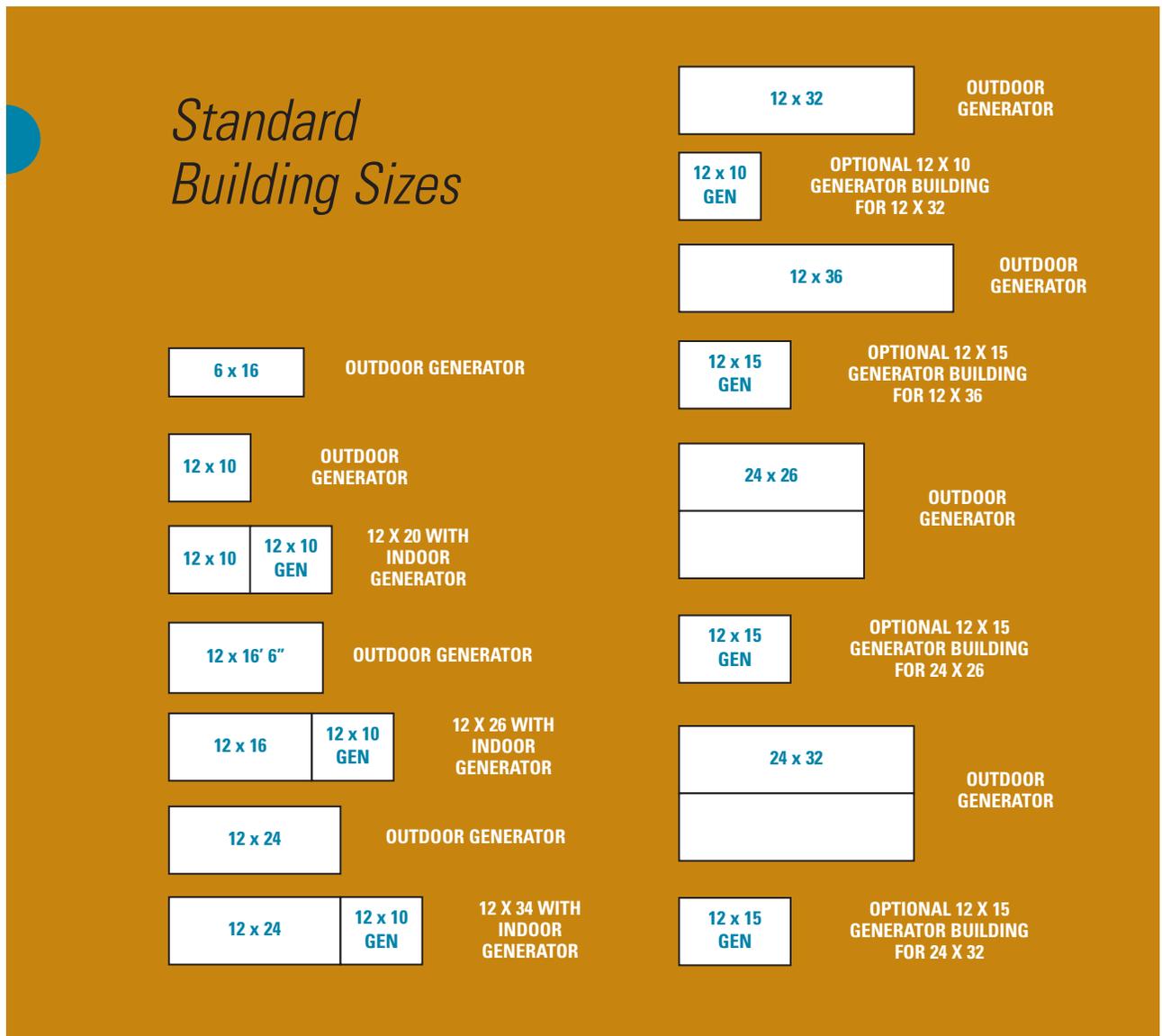
- **DESIGN LOAD:** Floor: 300 psf. and concentrated floor load 2800 pounds over any 2.5 square foot area., Roof: 150 psf., Walls: 150 mph
- **SEISMIC DESIGN:** Group 1 – Category D of International Building Code (IBC)
- **BULLETPROOFING:** Exterior walls/roof – Ballistics tested for UL-752 Level 4 D (High Powered Rifle – 30.06 – point blank range)
- **FIRE RATING:** Exterior walls/roof – 2 hr. fire rated
- **INSULATION:** Walls: R-11, Ceiling: R-19
- **SURGE PROTECTION:** Type 1A and Type 2 surge protection for main electrical power and primary surge protection for control wiring to tower lights and generator.
- **EXTERIOR OUTLETS:** (1) 20A GFI duplex mounted between the air conditioners and (1) by door.
- **EMERGENCY LIGHTING:** (1) Twin bulb with battery exit sign located over doorway.
- **EXTERIOR LIGHTING:** Security: (1) 100W incandescent with photo-cell on switch.
- **ALARMS:** Smoke, Power Fail, High/Low temp, intrusion, tower lights, HVAC, TVSS, Generator, Automatic Transfer Switch and UPS alarms on dry terminal 66 block with amphenol connector
- **GROUNDING:** Single point interior ground system with perimeter ground. All grounding meets or exceeds Motorola's R56 specifications.
- **CABLE LADDER:** 24" wide cable ladder over equipment racks to the cable entrance location.
- **FIRE PROTECTION:** (1) each wall mounted 20lb. ABC and 10lb. CO2 extinguishers
- **WARRANTY:** 2 years parts and labor from the date of shipment



OPTIONAL FEATURES

All new buildings are available with the following options to further meet specific customer requirements:

- FM200 Fire suppression
- Bullet Resistant Doors
- Indoor generator room
- HVAC economizer
- Type 3 surge suppression for receptacles
- Upgraded building structure for seismic rated design
- Fiberglass or lightweight metal construction
- Bullet resistant walls for fiberglass or lightweight metal construction
- Alternate fuels for the generator
- External generator receptacle and manual transfer switch
- Replace generator, transfer switch and UPS with space saving AC PowerPac
- Additional alarming capability





Motorola's Commercial, Government and Industrial Solutions Sector is a recipient of the prestigious 2002 Malcolm Baldrige National Quality Award. This honor demonstrates our commitment to performance excellence and quality achievement.



*Customer Site
Developed by Motorola
Systems Integration*



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Specifications subject to change without notice.