

SOLID SET

Applications

the original
BIG GUN®
 SPRINKLER

Why choose a Nelson Big Gun®

- The **Nelson name** is synonymous with the best quality available.
- **Heavy-duty construction** ensures long wear life & reliability.
- **Greatest range of options.** Full & part-circle sprinklers available in a variety of trajectory, nozzle & coating options.
- **Valve combinations available** for maximum system efficiency.
- **Easy to operate, maintain and repair** with readily available parts and documentation.

Advantages for Solid Set Applications

- Adaptable to most field shapes and terrain conditions
- Few risers to farm around
- High degree of portability/flexibility
- Reasonable initial cost
- Simple to automate for low labor requirement
- Ideal for sugar cane, pineapple, pasture & effluent

IT'S THE ONE FOR THE JOB



Nelson Big Gun® Sprinklers are a great option for portable, solid set, and permanent set systems in the following instances:

- Irregular field shapes
- Terrain difficulties
- Small fields
- Poor water quality
- Client preference
- Fewest sprinkler risers
- Sprinklers mounted out of growing area

A Solid Set Big Gun system is comprised of a grid of Big Gun positions fed by a network of pipes. An example grid is 150' x 150' (45m x 45m). Although systems can be designed with one Big Gun per position, it is very common for a system to use one or a few Big Guns which are moved from position to position. Usually only one Big Gun operates on a lateral pipe at one time in order to reduce the required pipe diameter.

Portable systems may use just a few lateral pipes which are constantly moved. Solid set systems may have a full field of pipe laid out and then moved after harvest or when the system is required for another field.

Permanent systems are similar to solid set systems, except the piping is buried pipe. While both solid set and permanent set systems are commonly used and are both acceptable, they each have unique features.

COMMON RECOMMENDATIONS:

The 75 Series and 100 Series Big Guns are the most commonly used models for these types of systems. The 75 Series and 100 Series Big Guns offer the best balance of required pipe diameters, application rate, operating pressure and sprinkler spacing. The 150 Series and 200 Series Big Guns have larger nozzles which allow for a wider grid pattern, however the required flow per position increases to a greater degree than the increased spacing. Higher pressures and larger diameter pipes are required increasing the overall cost. When it is desirable to use the larger models of Big Gun, often support stands are used which are strong enough to withstand the thrust forces. These support stands or carts can be moved or towed using farm ATVs or tractors.

BIG GUN® SPRINKLERS for Solid Set Applications

PORTABLE SYSTEMS:

- Pipe can be removed from the field for cultural practices which eliminates the necessity of farming around sprinkler risers.
- Because the pipe is not permanently fixed in one location on portable move systems, it is possible for successive sets to be offset from the previous position in order to even out the overall uniformity.
- In its most basic form the portable gun concept is one of the lowest cost systems available.
- Portable systems can be rotated to different fields to follow the crop rotation.
- Portable systems make system leasing programs practical.

PERMANENT SYSTEMS:

- Selection of the sprinkler spacing is not limited by pipe length multiples.
- There is less irrigation labor involved, as the pipe does not have to be moved out of the field for cultural practices.
- It is possible to loop the piping system which affords some economies through pipe size reduction.
- Supporting the sprinkler riser is less complicated than with above-ground pipe.

A hybrid system, utilizing buried mainlines with portable laterals has been found to combine many of the good features of both system types.

TYPICAL EXAMPLES INCLUDE:

75 Series Big Gun with 0.6" nozzle @ 60 psi (4 bar) on a grid of 120' x 150' (36m x 45m). Flow per unit is 77 gpm (17.5 m3/hr), application rate is 0.4 "/hr (10 mm/hr). Lateral pipe diameter is 3" (80mm)

100 Series Big Gun with 0.8" nozzle @ 70 psi (5 bar) on a grid of 160' x 180' (48m x 54m). Flow per unit is 155 gpm (35 m3/hr), application rate is 0.5 "/hr (13 mm/hr). Lateral pipe diameter is 4" (100mm).

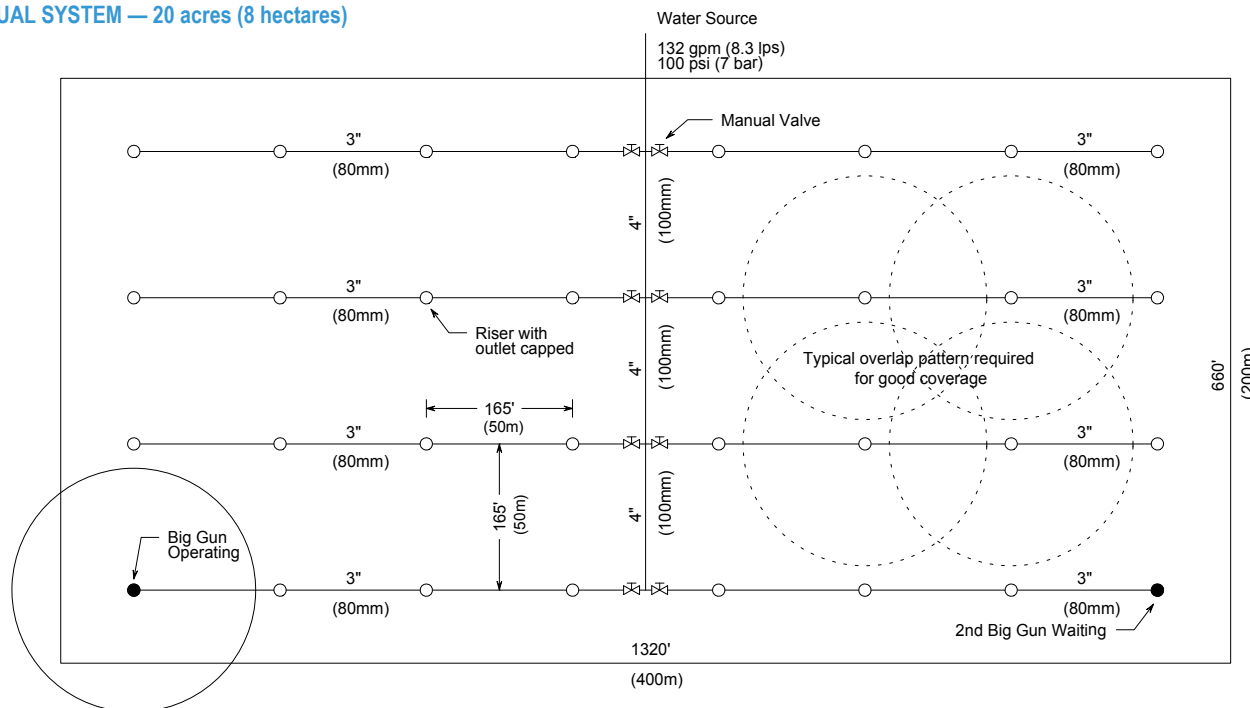
TYPICAL BIG GUN DESIGNS COMPARING MANUAL, SEMI-AUTOMATIC AND FULLY AUTOMATIC SYSTEMS

For purposes of comparing the various types of Big Gun® system operation, three typical designs are illustrated on 20 acre (8 ha) areas. While any of the four models of Big Guns are an option, the 100 Series is used in the examples. Actual selection of the Big Gun model and nozzle size depends upon the flow and pressure available, the size and shape of the field, wind conditions and crop.

Nelson 100 Series Big Gun sprinkler specifications for the examples shown.

Model	F100 24° x 2" with 0.7" 100T Nozzle and 7/32" secondary nozzle.	
Performance	132 gpm @ 70 psi, 275' diameter (8.3 lps @ 5 bar, 84 m diameter)	
Spacing	165' x 165' (50 m x 50 m)	
Application rate	$\frac{132 \text{ gpm} \times 96.3}{165' \times 165'} = 0.5 \text{ in/hr}$	$\frac{8.3 \text{ lps} \times 3600}{50 \text{ m} \times 50 \text{ m}} = 12 \text{ mm/hr}$

MANUAL SYSTEM — 20 acres (8 hectares)

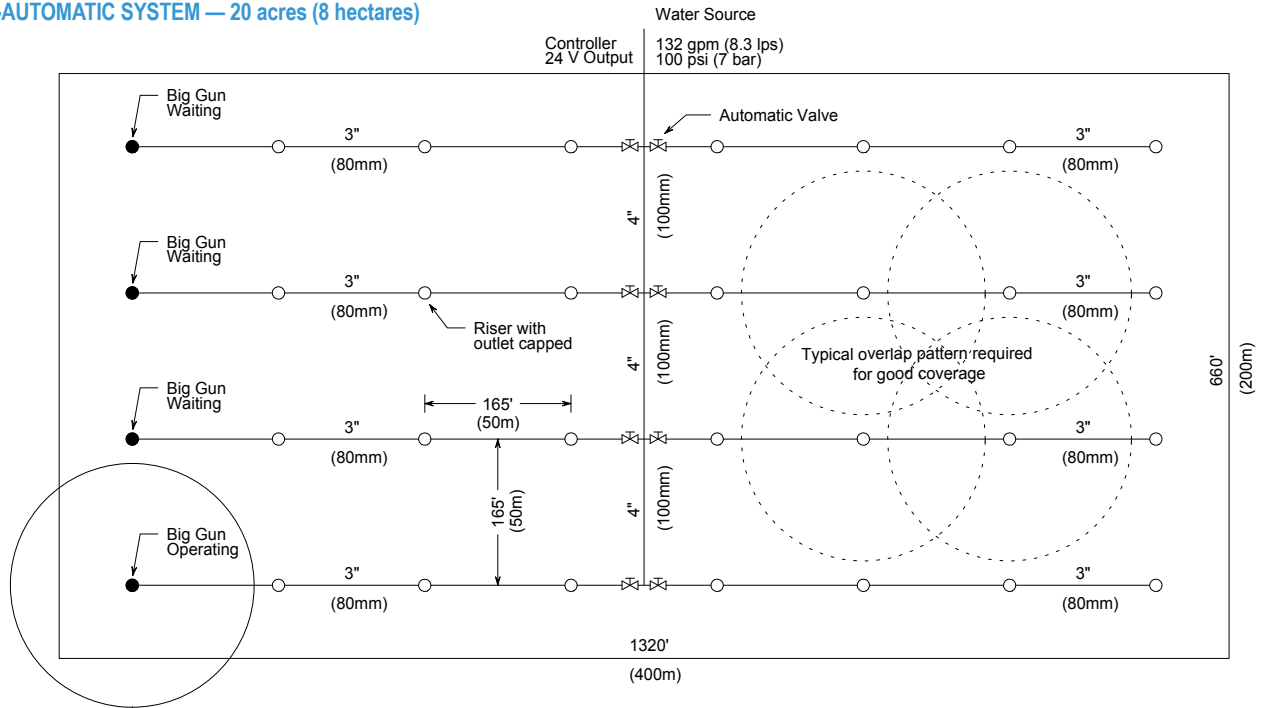


A manual control valve is located at the start of each lateral. One Big Gun is operated while the other Big Gun is moved into the next position. After the desired amount of water has been applied, the valve to the working Big Gun is turned off and the valve to the waiting Big Gun is turned on. Only one Big Gun is operated at any one time. This process is repeated until the entire field has been irrigated. An option to this system is to install 2" manual valves on every riser in place of the 3" valves on each lateral.

BILL OF MATERIALS

- 580' (180m) x 4" (100mm) Pipe
- 4640' (1410m) x 3" (80mm) Pipe
- 2 x F100 24° x 2" Big Guns with 0.7" 100T Nozzle and 7/32" secondary nozzle kit
- 8 x 3" (80mm) Manual Valves (or 32 x 2" (50mm) Manual Valves)
- 32 x Riser Assemblies
- Fittings as required

SEMI-AUTOMATIC SYSTEM — 20 acres (8 hectares)

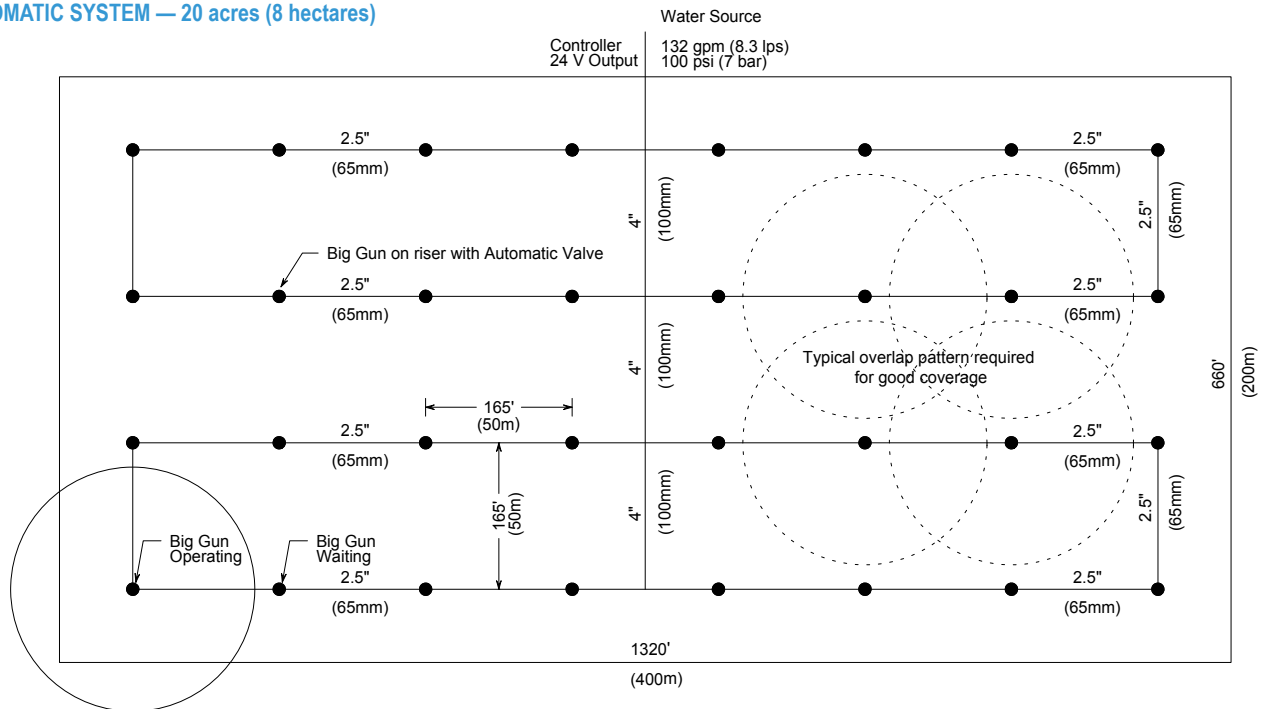


Automatic valves are placed at the start of each lateral. Four Big Guns (one on each lateral) are placed in position and an irrigation controller operates the valves in order to turn the Big Guns on and off in sequence. Alternatively 8 Big Guns can be used (one on each lateral) which will allow a longer period of automated operation. At the end of an irrigation cycle, all Big Guns are moved to the next riser on the lateral pipes. The controller once again sequences through the operation of the valves. The advantage of the semi automatic system over the manual system is that it can operate unattended for a much greater period of time.

BILL OF MATERIALS

- 580' (180m) x 4" (100mm) Pipe
- 4640' (1410m) x 3" (80mm) Pipe
- 4 (or 8) x F100 24" x 2" Big Guns with 0.7" 100T Nozzle & 7/32" secondary nozzle kit
- 8 x 3" (80mm) Automatic Valves
- 32 x Riser Assemblies
- 3300' (1000m) #14 UF Wire
- 1 x 8 Station Irrigation Controller
- Fittings and wire connectors as required

AUTOMATIC SYSTEM — 20 acres (8 hectares)



The fully automatic system has an automatic control valve and a Big Gun installed at each riser. The controller sequences through all the valves and repeats the sequence whenever it is programmed to begin a new cycle. Except for adjustments to meet variations in plant water requirements, there is no labor required to operate this system.

BILL OF MATERIALS

- 580' (180m) x 4" (100mm) Pipe
- 5300' (1614m) x 2.5" (65mm) Pipe
- 32 x F100 24" x 2" Big Guns with 0.7" 100T Nozzle & 7/32" secondary nozzle kit
- 32 x 2" (50mm) Automatic Valves
- 32 x Riser Assemblies
- 26,250' (8000m) #14 UF Wire
- 1 x 32 Station Irrigation Controller
- Fittings and wire connectors as required

BIG GUN® SPRINKLERS for Solid Set Applications

OPTIMIZE BIG GUN® SYSTEM PERFORMANCE

For the best system performance use conservative sprinkler spacings. Spacings should generally be from 50% to 65% of the sprinkler diameter with the tighter spacings recommended in high wind conditions and for crops requiring the best uniformity. When using a rectangular spacing place the closer spacings perpendicular to the prevailing winds to improve coverage. Stagger the sprinkler for better distribution in windy conditions. Use the lower trajectory angle models or the variable trajectory models of Big Gun in windy conditions. While a 27° trajectory will give maximum radius in no wind conditions, the 24° trajectory or 21° trajectory will perform better in the wind. Note that higher trajectory angles give more desirable droplet patterns. When using lower trajectory angles use slightly higher operating pressures to enhance the droplet pattern.

Always use adequate pressure. Big Guns require higher operating pressures than small sprinklers to produce good uniformity and desirable droplet characteristics. For best results:

GPM	PSI	LPS	BAR
40-100	60	2.5-6	4
100-200	70	6-12	5
200-300	80	12-19	5.5
300-500	90	19-30	6
over 500	100	over 30	7

Lower operating pressure does not necessarily reduce operating cost. Lower pressure results in reduced radius of throw and lower uniformity which require closer sprinkler spacing, greater labor, and longer run times to apply the net water requirements.

The application rate of well designed, overlapped Big Gun systems can be in the range of 0.3 to 0.7 inches/hour (7.5 to 18 mm/hour). Make sure that the soil will accept the application rate or that the Big Guns can be moved to their next position before run off occurs. The following formulas can be used to calculate the gross application rate of an overlapped pattern.

GROSS APPLICATION RATE

$$(\text{in/hr}) = \frac{\text{nozzle gpm} \times 96.3}{\text{sprinkler spacing (ft.)} \times \text{pipe spacing (ft.)}}$$

$$(\text{mm/hr}) = \frac{\text{nozzle lps} \times 3600}{\text{sprinkler spacing (m)} \times \text{pipe spacing (m)}}$$

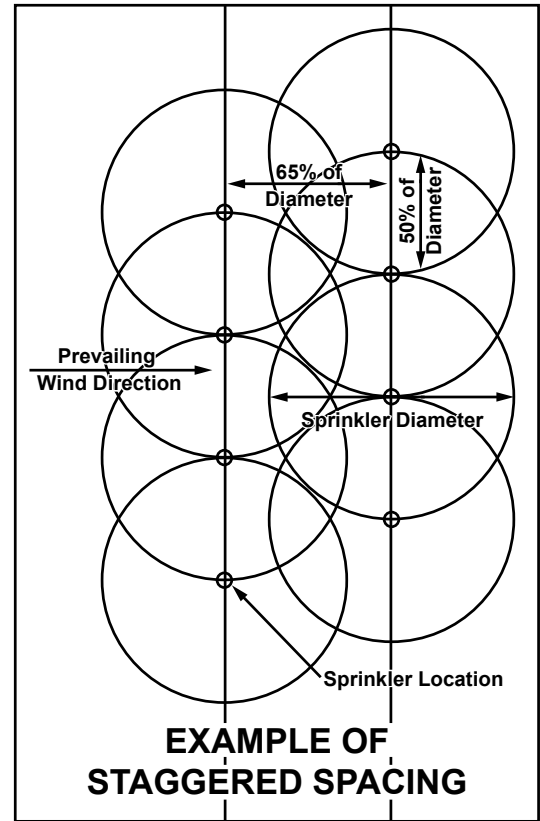
$$(\text{mm/hr}) = \frac{\text{nozzle m}^3/\text{hr} \times 1000}{\text{sprinkler spacing (m)} \times \text{pipe spacing (m)}}$$

Be certain that the Big Gun riser is adequately stabilized. The thrust generated by the Big Gun can be substantial and provisions must be made to prevent tipping of the riser. For example, the horizontal thrust of a 24° 150 Series Big Gun with a 0.9" nozzle operated at 70 psi (5 bar) is 79 lbs (355 Newtons). The horizontal thrust of a 24° 200 Series Big Gun with a 1.5" nozzle operated at 90 psi (6 bar) is 285 lbs (1268 Newtons).

As with any sprinkler irrigation system, your unique field and crop situation must be considered in the planning of your Big Gun system. For best results, see your local dealer for professional planning.

WARRANTY AND DISCLAIMER: Nelson Big Gun® Sprinklers are warranted for one year from date of original sale to be free of defective materials and workmanship when used within the working specifications for which the products were designed and under normal use and service. The manufacturer assumes no responsibility for installation, removal or unauthorized repair of defective parts. The manufacturer's liability under this warranty is limited solely to replacement or repair of defective parts and the manufacturer will not be liable for any crop or other consequential damages resulting from defects or breach of warranty. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSES AND OF ALL OTHER OBLIGATIONS OR LIABILITIES OF MANUFACTURER. No agent, employee or representative of the manufacturer has authority to waive, alter or add to the provisions of this warranty, nor to make any representations or warranty not contained herein.

This product may be covered by one or more of the following U.S. Patent Nos. 3,744,720, 3,559,887 and other U.S. Patents pending or corresponding issued or pending foreign patents.



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