

GN Ball Injector

Overview

The GN Ball Injector story began in the late 1970's. Since then, GN has made a commitment to continually improve and change its Ball Injectors to meet their clients needs.

In fact, GN product enhancements and modifications are the result of client feedback. It is that relationship that has allowed GN and its clients to grow in the dynamic global oil industry.

GN offers complete customer solutions of ball injector equipment and accessories. Our Ball Injectors are uniquely designed to fit customer requirements and to operate in a variety of conditions.

Our ball injectors are manufactured to a quality program standard that meets the latest ISO 9001 and AS9100D requirements as well as following all relevant industry standards.

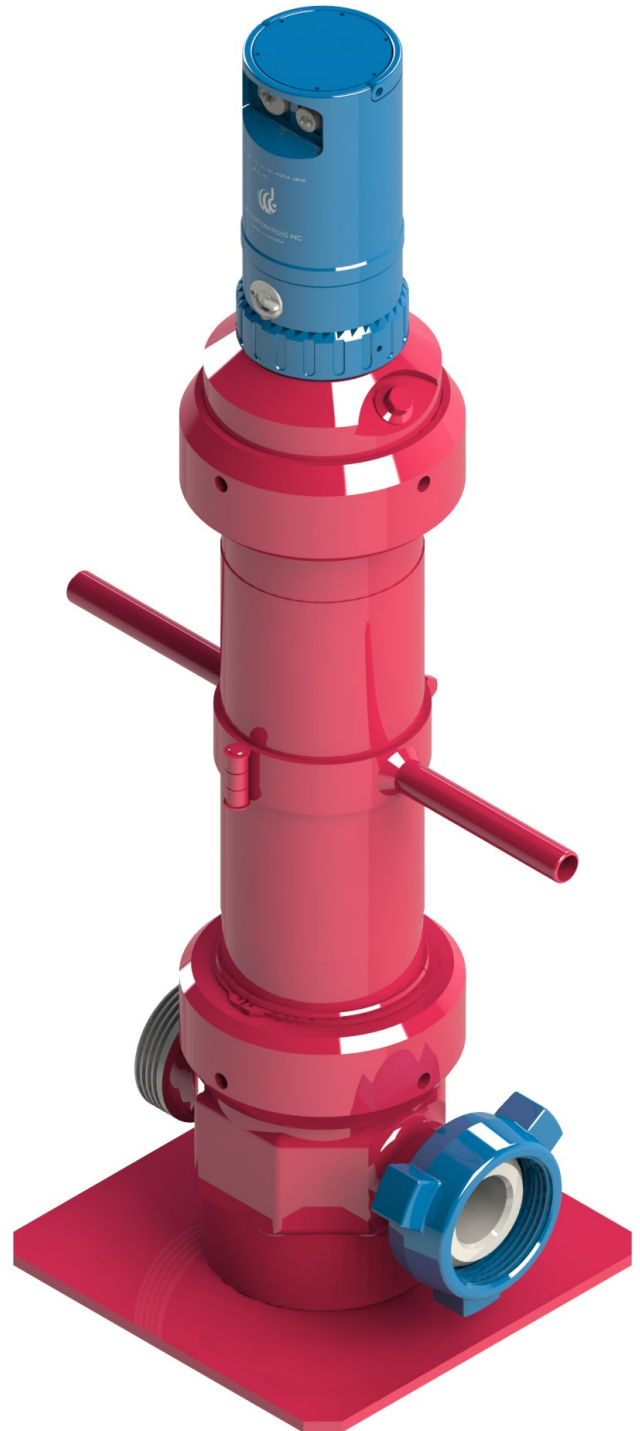


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GN Ball Injectors Worldwide

For over 55 years, GN has been committed to providing our customers with innovative, quality products and services that meet or exceed their expectations.

Our vision is to be the manufacturing solution that will ensure competitiveness in the global marketplace for our customers and allow us to strategically grow together.

Our GN team is experienced in engineering specialized tool designs and manufacturing unique solutions. We are dedicated to continuous improvement, providing excellent service, worldwide support and close collaboration in order to realize our customers needs.

With multiple GN Ball Injectors working globally every year, our equipment has been proven in a variety of challenging conditions across the world.

Our products have been recognized by customers for their performance, reliability and quality and have found a strong presence in the competitive stimulations market.

We are proud to have GN Ball Injectors working in all parts of the world.



Design Considerations

GN Ball Injectors can be designed and configured according to customer requirements based on some of the following considerations:

- **Ball Size:** To determine the size of balls required to be injected into the flow stream.
- **Ball Capacity:** To determine the quantity of balls required to be injected into the flow stream.
- **Base Compatibility:** To determine the treating irons mounting requirement. Base mounted or direct attachment to treating irons.
- **Size of Base:** Such as 2" 1502, 3" 1502, 4" 602, 4" 1002.
- **Motor Drive:** Requirements for motor drive and specific functionality requirements.
- **Safe operation requirements:** Such as length of cables.
- **Working pressure requirements**
- **Additional accessories**

Upon customer request, GN can also provide third party inspection/certification and pressure testing.

Previously Produced GN Ball Injector Sizes

Ball Size (Ø in)	Ball Capacity	Working Pressure (psi)	Base Compatibility
1/2	255	15,000	Inline & Offline 2" 1502 3" 1502 4" 602 4" 1002
5/8	255	15,000	
7/8	200, 255	15,000	
1	184	15,000	
1 1/4	152	15,000	

Additional ball sizes and capacities available upon customer request.

Design Features and Enhancements

GN Ball Injectors incorporate many design features for increased job safety and performance:

Main Body Design

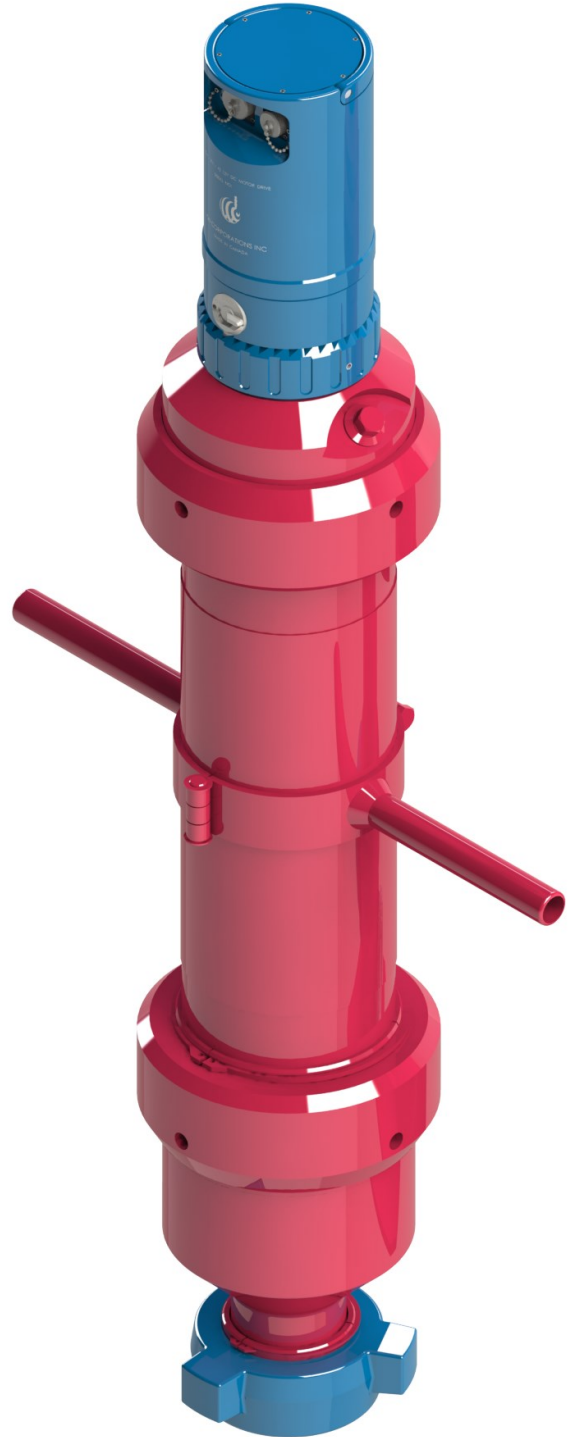
- Ball drop area (base) designed to minimize sand build-up which allows for an easier release balls into the flowline.
- Easy access for ball loading.
- Container cap designed to accept smaller size drive and reduce total size and weight.

Motor Drive Design

- New motor drive components have a greater resistance to vibration.
- Antivibration spring-loaded nut with assembly to avoid any possible loosening of motor drive from the main body during operation.
- Working temperature range has increased from -40°C to 70°C .
- Corrosion protection using an anodized aluminum body. All metal parts are either plated or made of stainless steel.
- Overall size is 6 3/8" OD x 13" length (162mm OD x 330mm length). Weight of 22lbs (10kg).
- Retractable motor drive carrying handle.

Remote Control Enhancements

- Redesigned remote-control unit with an increased working temperature range of -20°C to 50°C without the use of internal heaters.
- Synchronized injecting commands included for precise control over ball release.



*1" Ball Injector with Motor
and 3" 1502M Offline Base*

GN Ball Injector

Description

The GN Ball Injector is used to inject plastic balls into the flow line of a well during acidizing. It can be operated manually or with an attached motor.

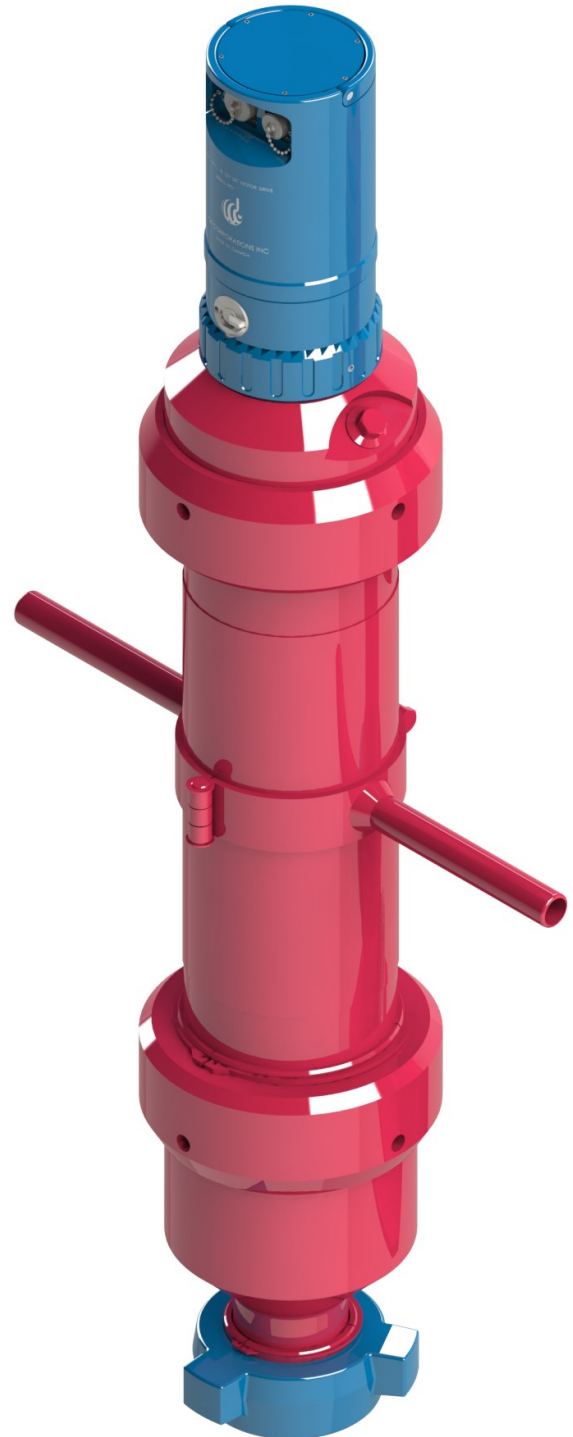
The unit is equipped with a motor drive and remote control unit which controls the loading of the balls into the injector canister, indexing the balls to the bottom of the canister and finally injecting the balls into the well.

Once rigged up on the field, it can be attached to the flow line treating irons using either an inline or offline base with a hammer union connection.

When the Ball Injector is attached to the flow line its internals are exposed to working flow pressure and is rated for operation of up to 15,000 psi.

Advantages

- Automatic or manual injection of balls.
- The GN Ball Injector allows multiple units to be lined up for increased ball injection capacity.
- Precise ball injection speed control using remote
- Able to operate in environments of varying pressures and temperatures.
- Designed for maximum flexibility and ease of transport on the field.

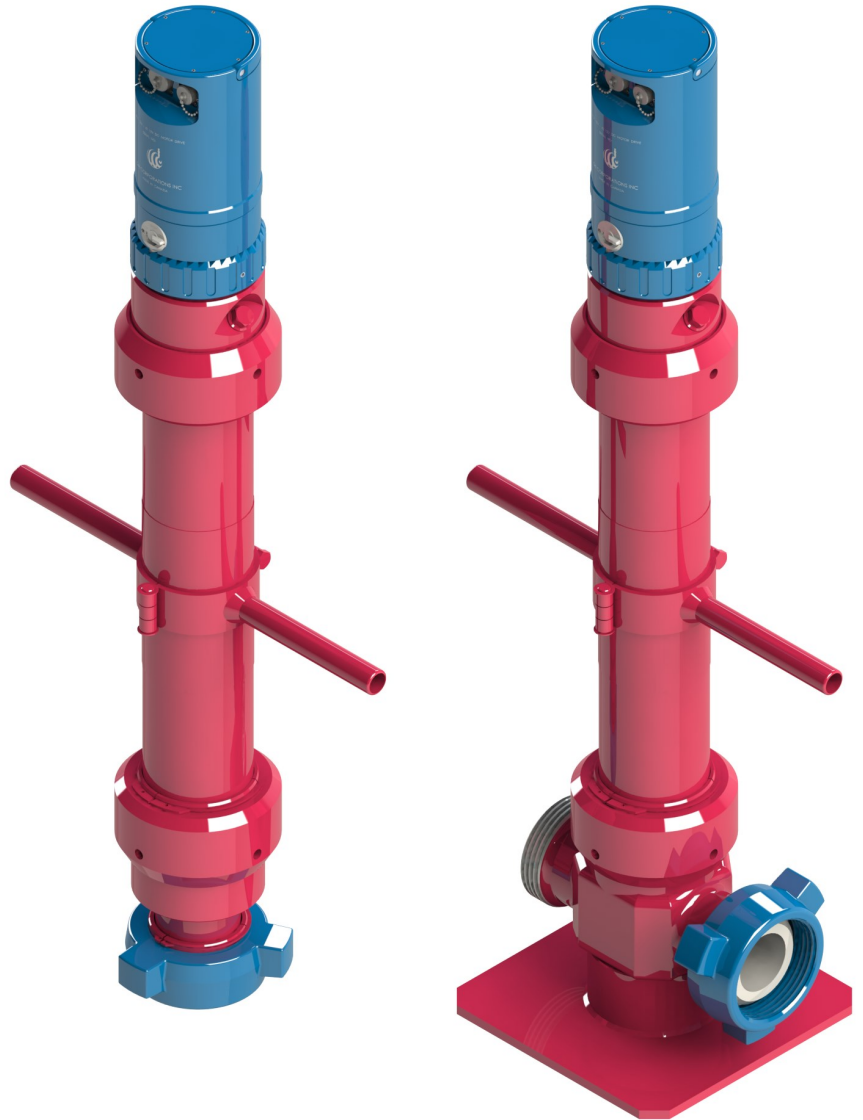


*1" Ball Injector with Motor
and 3" 1502M Offline Base*

GN Ball Injector 1/2" 255 Balls

Technical Specifications

- Able to hold and discharge 255 Balls with a diameter of 1/2"
- Maximum Working Pressure of 15,000 psi.
- Motor designed for maximum corrosion resistance using anodized aluminum, stainless, and plated steel.
- Support for manual operation using hand crank.
- 3" 1502M inline base in standard configuration.
- Compatible inline & offline bases: 2" 1502, 3" 1502, 4" 602, and 4" 1002
- Lifting cap for ease of transportation.
- Multi-function remote control with backlit display.
- Accessories: Remote Control Cable 100 ft, Power Supply Cable 25 ft, Carrying Case, Carrying Handle, and Platform Stand.

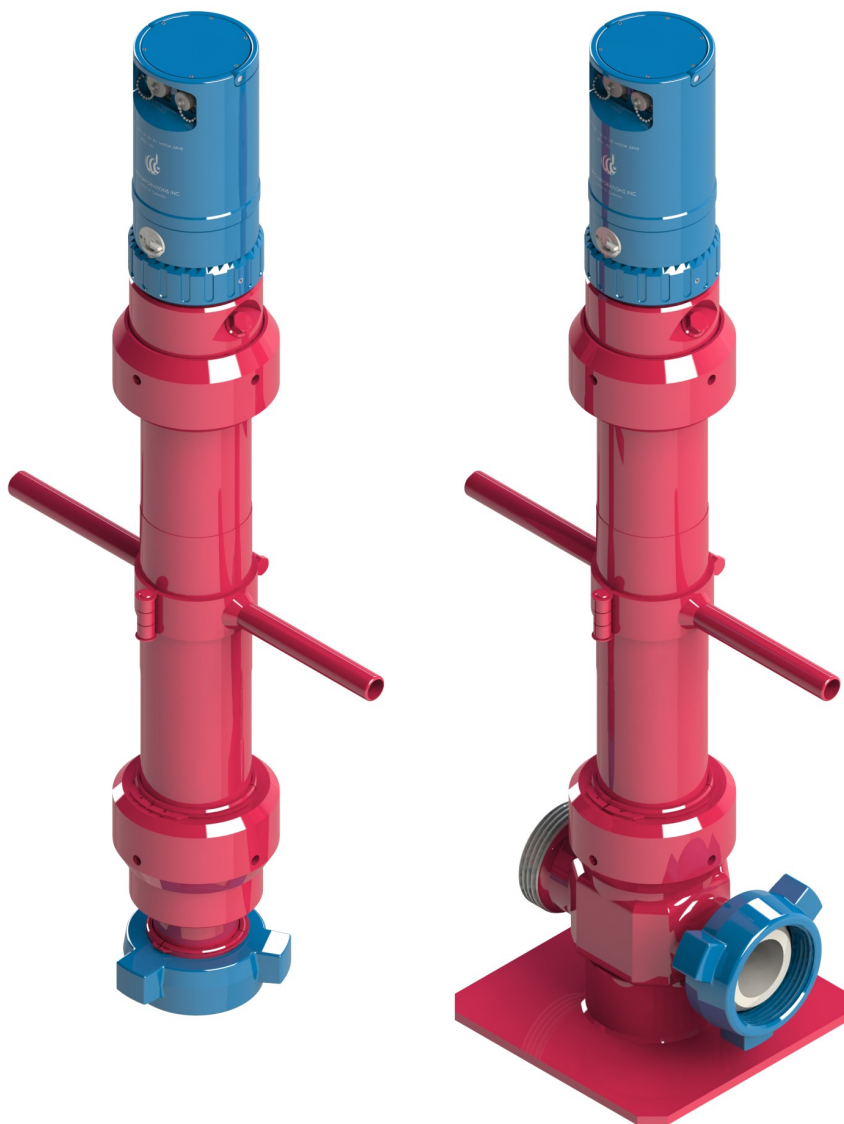


1/2" Ball Injector with 3" 1502M Offline and Inline Bases

GN Ball Injector 5/8" 255 Balls

Technical Specifications

- Able to hold and discharge 255 Balls with a diameter of 5/8"
- Maximum Working Pressure of 15,000 psi.
- Motor designed for maximum corrosion resistance using anodized aluminum, stainless, and plated steel.
- Support for manual operation using hand crank.
- 3" 1502M inline base in standard configuration.
- Compatible inline & offline bases: 2" 1502, 3" 1502, 4" 602, and 4" 1002
- Lifting cap for ease of transportation.
- Multi-function remote control with backlit display.
- Accessories: Remote Control Cable 100 ft, Power Supply Cable 25 ft, Carrying Case, Carrying Handle, and Platform Stand.



5/8" Ball Injector with 3" 1502M Offline and Inline Bases

GN Ball Injector 7/8" 200 and 255 Balls

Technical Specifications

- Able to hold and discharge 200 or 255 Balls with a diameter of 7/8"
- Maximum Working Pressure of 15,000 psi.
- Motor designed for maximum corrosion resistance using anodized aluminum, stainless, and plated steel.
- Support for manual operation using hand crank.
- 3" 1502M inline base in standard configuration.
- Compatible inline & offline bases: 2" 1502, 3" 1502, 4" 602, and 4" 1002
- Lifting cap for ease of transportation.
- Multi-function remote control with backlit display.
- Accessories: Remote Control Cable 100 ft, Power Supply Cable 25 ft, Carrying Case, Carrying Handle, and Platform Stand.

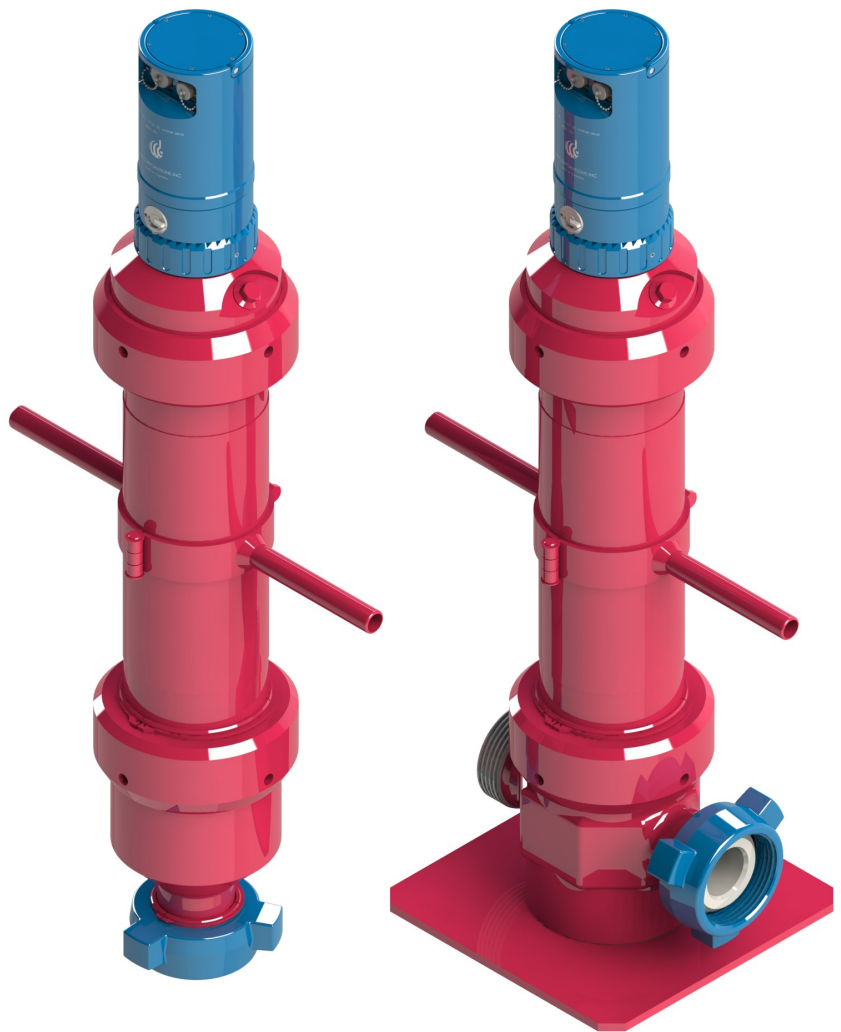


*7/8" Ball Injector 200 & 255 Balls Version
with 3" 1502M Inline Bases*

GN Ball Injector 1" 184 Balls

Technical Specifications

- Able to hold and discharge 184 Balls with a diameter of 1"
- Maximum Working Pressure of 15,000 psi.
- Motor designed for maximum corrosion resistance using anodized aluminum, stainless, and plated steel.
- Support for manual operation using hand crank.
- 3" 1502M inline base in standard configuration.
- Compatible inline & offline bases: 2" 1502, 3" 1502, 4" 602, and 4" 1002
- Lifting cap for ease of transportation.
- Multi-function remote control with backlit display.
- Accessories: Remote Control Cable 100 ft, Power Supply Cable 25 ft, Carrying Case, Carrying Handle, and Platform Stand.

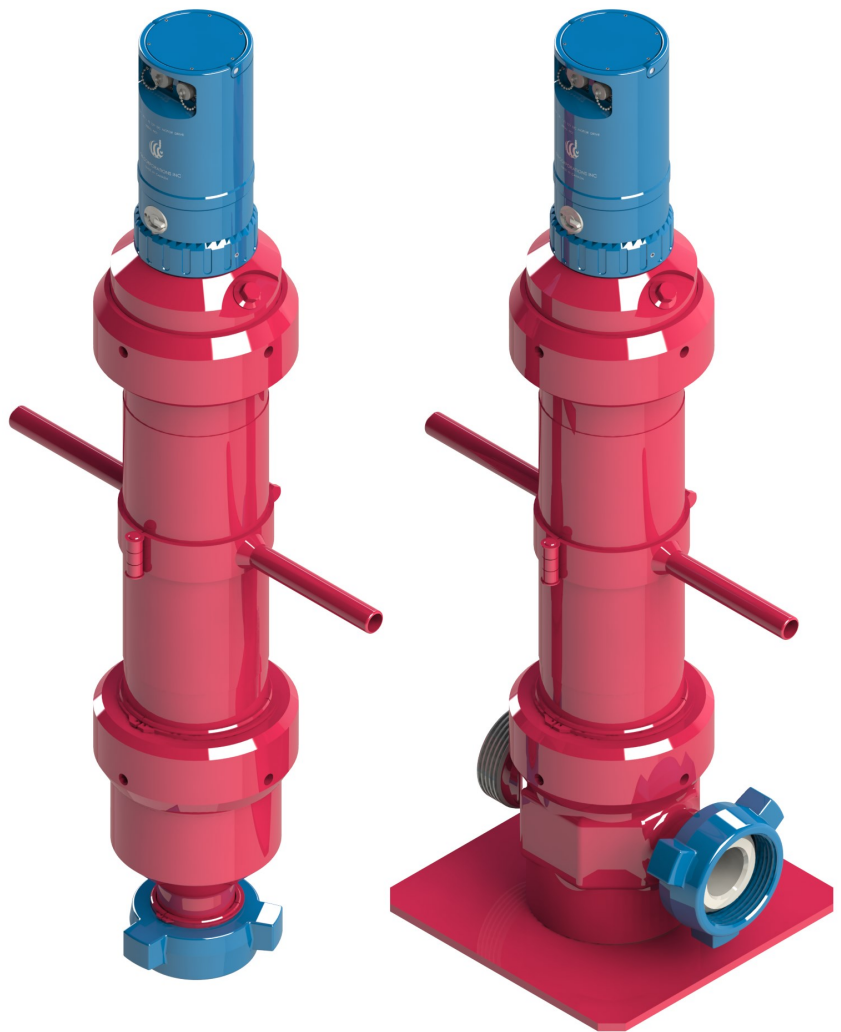


1" Ball Injector with 3" 1502M Offline and Inline Bases

GN Ball Injector 1 1/4" 152 Balls

Technical Specifications

- Able to hold and discharge 152 Balls with a diameter of 1 1/4"
- Maximum Working Pressure of 15,000 psi.
- Motor designed for maximum corrosion resistance using anodized aluminum, stainless, and plated steel.
- Support for manual operation using hand crank.
- 3" 1502M inline base in standard configuration.
- Compatible inline & offline bases: 2" 1502, 3" 1502, 4" 602, and 4" 1002
- Lifting cap for ease of transportation.
- Multi-function remote control with backlit display.
- Accessories: Remote Control Cable 100 ft, Power Supply Cable 25 ft, Carrying Case, Carrying Handle, and Platform Stand.



1 1/4" Ball Injector with 3" 1502M Offline and Inline Bases

GN Ball Injector Accessories

GN Inline Bases

The GN Inline Base allows the Ball Injector to be attached with treating irons to both ends.

Our Ball injectors are usually configured with some of the following inline and offline bases.

We can also design and manufacture custom bases as per customer specifications.

GN manufactures a variety of bases for our Ball Injectors, We can also design and manufacture any base our customer may request.



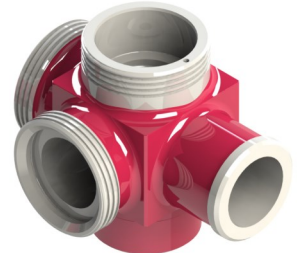
*3" 1502
Inline Base*



*3" 1502
Inline Base*



*3" 1502 w/ Lateral
Connection Inline Base*



*4" 602 w/ Lateral
Connection Inline Base*

GN Offline Bases

The GN Offline Base allows the Ball Injector to be attached using a single lockdown union to the treating irons.

Allows for an uninterrupted connection to the treating irons. Easy removal from the treating irons and flexibility during injection operations.



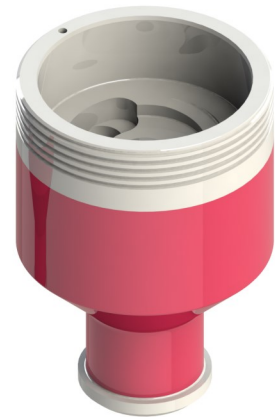
*3" 1502
Offline Base*



*4" 1002
Offline Base*



*2" 1502
Offline Base*



*3" 1502
Offline Base*

GN Ball Injector Motor

The GN Ball Injector Motor allows personnel to conveniently operate all functions of the ball injector from a safe distance using the attached remote control.

The motor drive features three modes of operations: Loading, Indexing and Ejecting whose speed rates can be independently controlled.

Accurate ball count across all modes of operation.

The motor can be directly connected to a 12V battery on the field, supplying it with ample power for multiple injection cycles.

The supplied remote control cable gives operators the flexibility to control the injection of balls from a safe distance.

Technical Specifications

- 1.3 HP compact motor design
- 12V DC power compatible
- Durable corrosion resistant housing
- Convenient carrying handle
- Multi-function remote control
- Pressure equalizing valve
- Secure locknut design
- 25, 100, 200 and 300 ft cables available



GN Ball Injector Motor

GN Ball Injector Motor Remote Control

The GN Ball Injector Motor Remote Control allows personnel to conveniently operate all functions of the ball injector at a safe distance.

Its durable design ensures long lasting performance across all field environments.

Technical Specifications

- Working temperature range of -20°C to 50°C
- Synchronized injection command for precise control over ball release
- Totalizer counter lock in alarm reverse mode
- Automatic speed range can precisely control (within 1/10th) the release of balls (from 0.1 min to 100.1 max balls per minute)
- Automatic speed adjustment with 10 turn counting dial and display readout simultaneously
- Single printed circuit board design
- Backlit display allowing for better visibility
- Main power switch

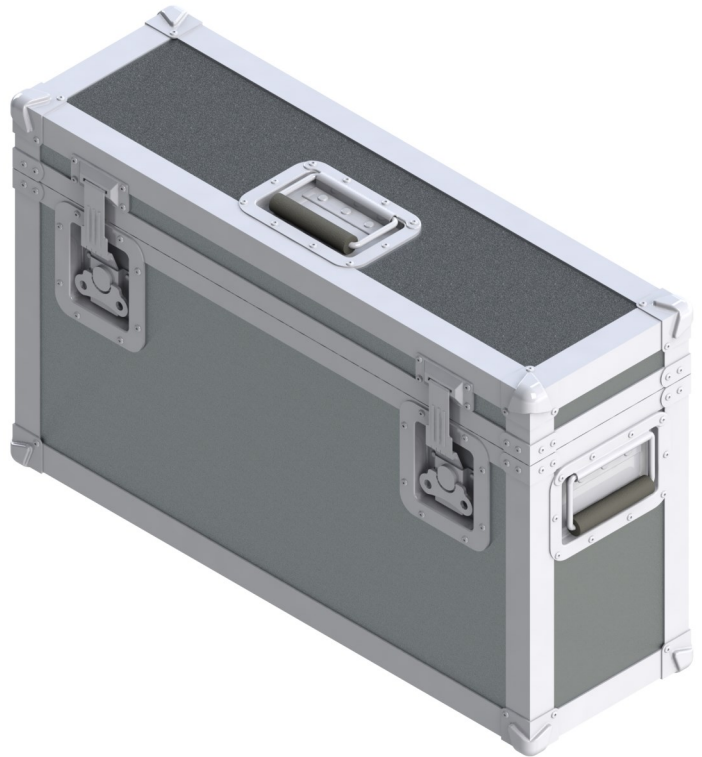


*GN Ball Injector Motor
Remote Control*

GN Ball Injector Motor Carrying Case

GN Ball Injectors come standard with a convenient carrying case that holds the motor, remote control, power and remote control cables.

Durable and cushioned design offering maximum protection to the motor inside.



GN Carrying Case

Additional Accessories and Appearances

- Additional Hand Tools
- GN Ball Injectors and accessories can be painted in any color combination as requested by customers.

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