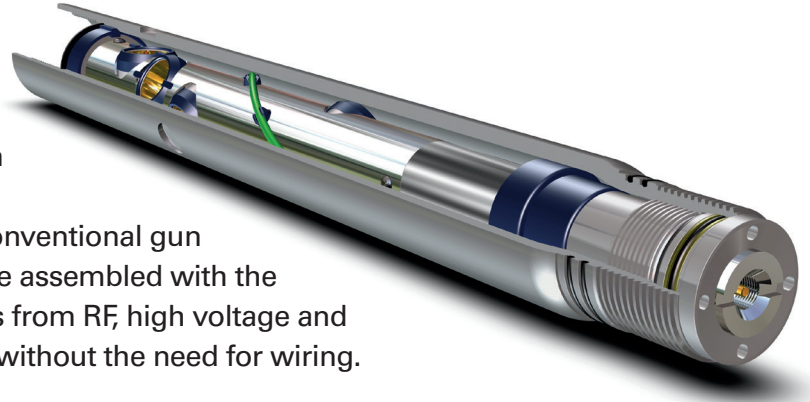


Ultra-efficient Plug-and-Play Perforating Gun System and Shaped Charges

GR Energy Services offers efficient select-fire perforating with the Hunting H-1™ Perforating Gun System and H-Lok™ charges. On surface, the system is simple and quick to assemble without the highly technique-sensitive process required when wiring conventional gun systems. Electrically prewired, all components can be assembled with the highest level of safety to prevent surface detonations from RF, high voltage and ESD, and assembly is faster with fewer connections without the need for wiring.



Downhole, the system employs integrated real-time addressable communication with skip-over capability, produces high-density perf clusters and performs reliably for reduced lost time due to misruns. In addition, the H-1 gun string is shorter and more lightweight than conventional systems for use in extended laterals.

When returned to surface, the expendable carrier system eliminates ports and subs and does not require time-wasting inspection that increases rig-up time.

Perforating for optimum results

Consistent perforation entrance hole (EH) diameters are a key component of optimizing fracturing efficiency. Perforating EH diameters must be large enough to prevent proppant bridging and consistent in size for accurate limited-entry designs. With conventional 60-degree systems, a 40% variation in EH can result in a 120% increase in pressure drop. GR Energy Services recommends the use of EQUAfrac® charges, which create an ideal hole size with little variation regardless of perforating gun position.

By using fit-for-purpose charge technology, your well can experience improved fracture placement with uniform distribution of treating fluids and greater production from increased cluster stimulation.

Specifications	Gun Diameter		
	2.75 in.	3.125 in.	3.375 in.
Shot density	Up to 6 spf		
Phasing	60°		
Temperature	350°F		
Pressure	20,000 psi		
Shot length	Up to 20 ft		
H-Lok charges	SDP, BH, GH, EQUAfrac, KinetiX		

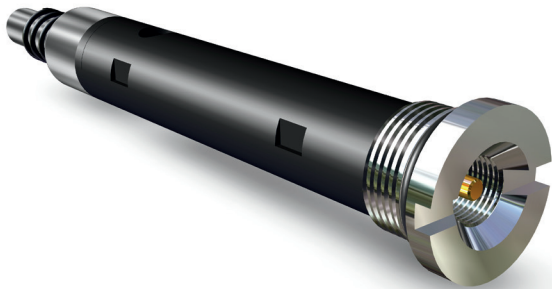
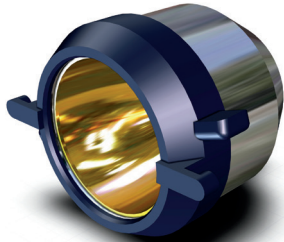


Top: Highly variable entrance hole sizes at 60° phasing, which can cause a 120% drop in near-wellbore pressure. Bottom: Consistent entrance hole sizes, which produce overall improved stimulation results.

Ultra-efficient Plug-and-Play Perforating Gun System and Shaped Charges

The GR Energy Systems Ultra-efficient Plug-and-Play Perforating Gun system is fully compatible with the GR Tension Monitoring and Downhole Release tools.

Call your GR Energy Services representative today for more details about perforating for optimum results with the Ultra-efficient Plug-and-Play Perforating Gun System and Shaped Charges.



2.75-in. H-1 Gun System	
Components	Compatible H-Lok Charges
2¾-in. H-1 gun assembly, 6/60°	
CCL bottom sub	RTG-2512-321T-H1
Quick-change assembly	EXP-2716-321T-H1
Top sub assembly	EXP-2716-371T-H1
Initiation cartridge assembly	EXP-2716-372T-H1
Plug-and-shoot cartridge assembly	EXP-2818-321T-H1
2¾-in. plug-and-shoot assembly #10	FLO-2715-310B-H1
Top booster transfer insert	

3.125-in. H-1 Gun System	
Components	Compatible H-Lok Charges
3¼-in. H-1 gun assembly, 6/60°	
CCL bottom sub	
Quick-change assembly	EXP-3319-323T-H1
Top sub assembly	EXP-3319-302-H1
Initiation cartridge assembly	EXP-3319-331-H1
Plug-n-shoot cartridge assembly	EXP-3321-321T-H1
3¼-in. plug-n-shoot assembly #10 or #20	EXP-3321-331-H1
Top booster transfer insert	

3.375-in. H-1 Gun System	
Components	Compatible H-Lok Charges
3⅝-in. H-1 gun assembly, 6/60°	EXP-3323-301T-H1
CCL bottom sub	EXP-3323-323T-H1
Quick-change assembly	EXP-3323-361T-H1
Top sub assembly	EXP-3323-371T-H1
Initiation cartridge assembly	EXP-3323-302-H1
Plug-n-shoot cartridge assembly	EXP-3323-331-H1
3⅝-in. plug-n-shoot assembly #20	FLO-3323-310B-H1
Top booster transfer insert	FLO-3323-311CF-H1

Additional Components H-1 Gun System	
	6-min fuse time delay
	Fuse igniter
	HMX bidirectional booster
	Percussion initiator