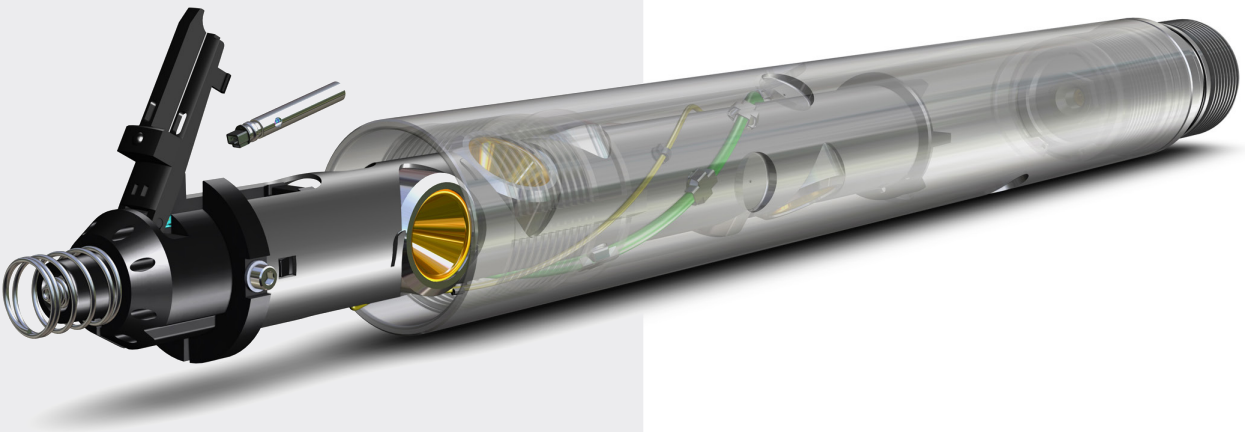


H-3 Perforating System



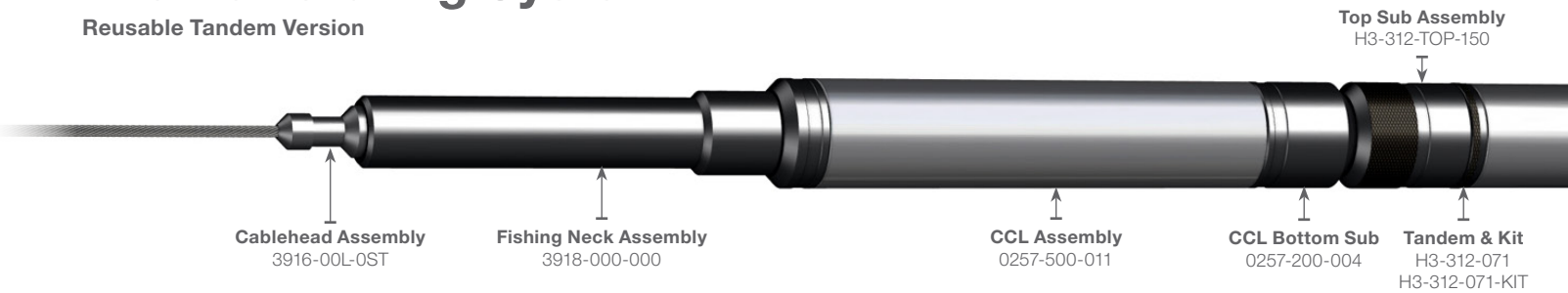
Fully Modular Guns

Reusable Tandem Version

Modular Detonator

H-3 Perforating System

Reusable Tandem Version



The H-3 Perforating System is Hunting's latest plug-and-play perforating gun which integrates ControlFire® Recon switch technology directly into the charge tube assembly.

ControlFire Recon switches allow for the detonator of the perforating gun to be checked downhole with ControlFire Software or at surface with the VeriFire®, assuring all components are in place and in working order when running in hole.

In addition to advanced switch technology, the H-3 Perforating System utilizes Hunting's new patent-pending modular detonator to eliminate all wiring in the field. The RF Safe system is fully assembled at Hunting's manufacturing center to ensure the highest quality and reliability.

Features

- V3.0 ControlFire Recon Switch embedded in charge tube
- Pre-wired and pre-assembled guns
- Compatible with industry standard shaped charges
- Armed with Hunting's patent pending modular detonator
- Available in a pre-loaded and delivered offering

Benefits

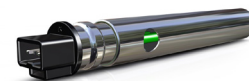
- Cost-effective, fully modular, premium perforating system
- Allows detonator resistance check downhole using ControlFire Software or at surface using VeriFire
- Eliminates wiring during gun assembly and arming
- Pairs with PowerSet Recon - the first and only addressable power charge for complete tool string integration
- Reusable tandem version for further cost reductions

H-3 Gun Specifications

MECHANICAL	
Nominal O.D. (in)[mm]	3-1/8 [79]
Nominal Thickness (in)[mm]	0.31 [7.9]
Typical Gun Swell (in)[mm]	3.28 [83]
Ambient Liquid Conditions	
Min. I.D. Running Restriction (in)[mm]	3.58 [91]
Drift Gauge O.D. for Gun Body I.D. (in)[mm] using Gauge Length 12in [305]	2.44 [62]
Min. Washover Pipe Clearance: Casing Drift I.D. to Nominal Washover O.D.	0.38 [10]
Drift I.D. to Nominal Gun O.D.	0.31 [8]
Min. Detonating Cord Velocity (ft/s)[m/s]	22,000 [6,700]
Upper & Lower Head Connection	2-3/4"-6 Acme
Max. Tension (lbf) [kN]	100,000 [445]
ENVIRONMENTAL	
Temperature Rating (°F)[°C]	350 [177]
Pressure Rating (psi)[MPa]	20,000 [138]

ELECTRICAL	
Firing Capability	ControlFire®
Maximum Voltage Rating	Forward 550V / 15 sec Reverse 550V / 30 sec
Maximum Firing Current	Forward (Nominal) 1A / 12 sec Forward (Maximum) 1.5A - 5 sec

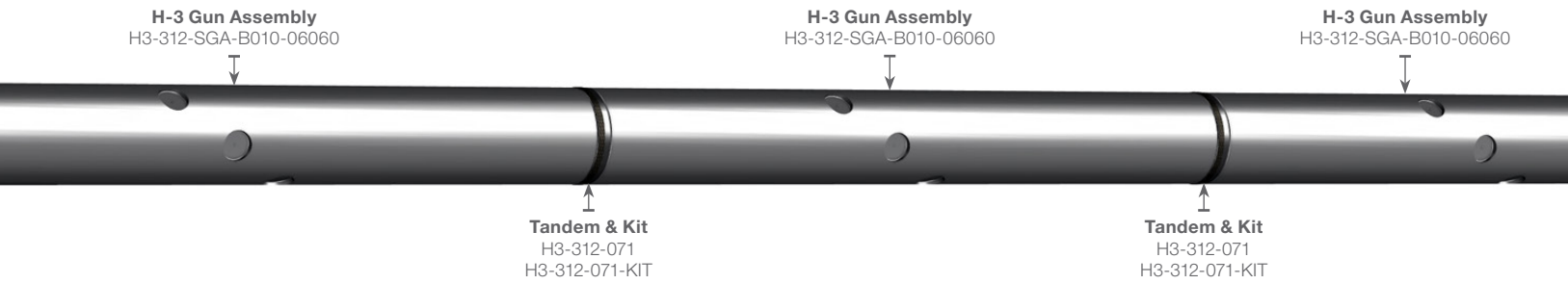
Modular Detonator



Expendable

DESCRIPTION	PART NUMBER
Modular Detonator	DETO-HT7101-HK
Detonator Removal Tool	H3-DETO-500
Detonating Cord 80 g. (RDX)	CORD-80RDX-T
Detonating Cord 80 g. (RDX LS)	CORD-80RDX-LS-T

H-3 Perforating System - Specifications and Part Numbers



H-3 Gun Specifications Continued

Shot Density	Shots	Phase	Part Number	Make-up Length (in)[mm]	Shot Length (in)[mm]	Weight Unloaded (lb)[kg]
6 SPF	3	120°	H3-312-SGA-B003-06120	18.5 [470]	4.00 [102]	25.5 [12]
	4	60°	H3-312-SGA-B004-06060	20.5 [521]	6.00 [152]	27.1 [12]
		90°	H3-312-SGA-B004-06090			
	6	60°	H3-312-SGA-B010-06060	24.5 [622]	10.00 [254]	30.5 [14]
		120°	H3-312-SGA-B010-06120			
	8	90°	H3-312-SGA-B012-06090	28.5 [724]	14.00 [356]	33.8 [15]
	9	60°	H3-312-SGA-B013-06060	30.5 [775]	16.00 [406]	35.5 [16]
	12	60°	H3-312-SGA-B020-06060	36.5 [927]	22.00 [559]	40.6 [18]
		90°	H3-312-SGA-B020-06090			
	18	60°	H3-312-SGA-B030-06060	48.5 [1232]	34.00 [864]	50.7 [23]
24	60°	H3-312-SGA-B040-06060	60.5 [1537]	46.00 [1168]	60.8 [28]	
30	60°	H3-312-SGA-B050-06060	72.5 [1842]	58.00 [1473]	70.9 [32]	
36	60°	H3-312-SGA-B060-06060	84.5 [2146]	70.00 [1778]	81.0 [37]	

Note: Part number reflects the Gun only. Make-up Length and Weight include Tandem Sub. Zero phase oriented options available in the disposable H-3 gun system offering.

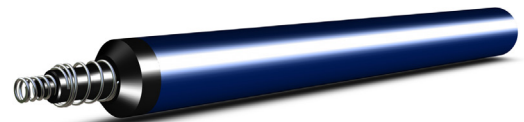
Hardware

DESCRIPTION	PART NUMBER
CCL Bottom Sub	0257-200-004
Top Sub	H3-312-TOP-150
Contact Kit; Top Sub	H3-TOP-152
Tandem Sub	H3-312-071
Contact Kit; Tandem	H3-312-071-KIT
PowerSet® #10	H3-312-PSA-510
Recon PSA #20	H3-312-PSA-520
Contact Kit; PSA	H3-PSA-512A
Installation Tool	H3-PSA-500

Tandem Sub
& Contact Kit

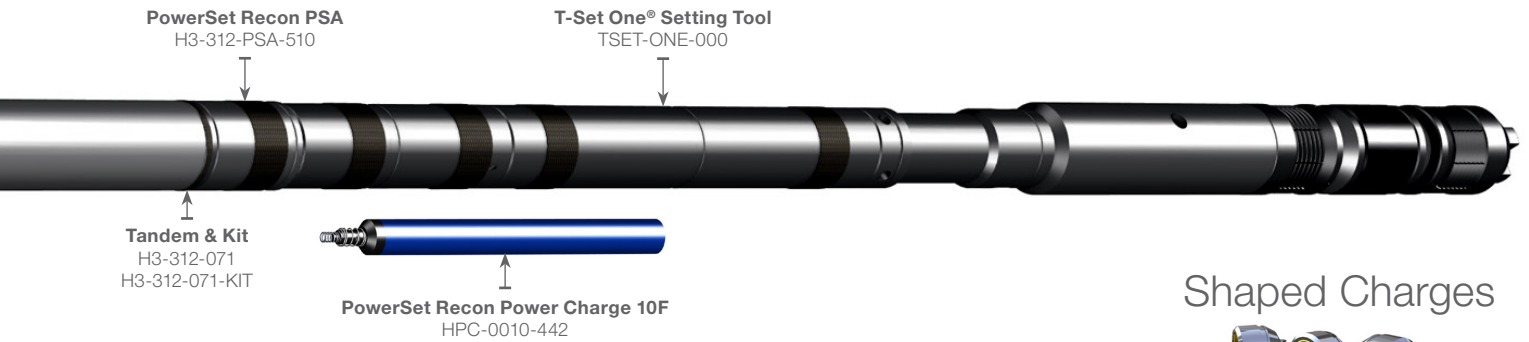


PowerSet® Recon Power Charge



SETTING TOOL COMPATIBLE T-SET PART NUMBER	PowerSet® Recon Power Charge	
	#10F HPC-0010-442	#20 HPC-0020-541
T-Set One TSET-ONE-000	✓	
#10 WST-BK10-001	✓	
#10 Non-Ported WST-BK10-201	✓	
#10 High Pressure WST-BK10-002	✓	
#20 WST-BK20-001		✓
#20 Non-Ported WST-BK20-201		✓
#20 High Pressure WST-BK20-002		✓

H-3 Perforating System - Associated Hardware and Shaped Charges



Compatible Shaped Charges

Gun O.D. (in)[mm]	Charge Part Number	Class	Exp. Type	Weight (g)	Tested Gun O.D. (in)[mm]	Shot Density (spf)[spm] Phase	Entry Hole (in)[mm]	Penetration (in)[cm]
3-1/8 [79]	EXP-3323-471T	EQF	HMX	23.0	3-1/8 [79]	6 [20] 60°	0.40 [10.16]	24.75 [62.87]
	EXP-3321-372T	EQF	RDX	21.0	3-1/8 [79]	6 [20] 60°	0.32 [8.13]	34.30 [87.12]
	EXP-3319-423T	SDP	HMX	19.0	3-1/8 [79]	6 [20] 60°	0.38 [9.65]	45.89 [116.56]
	EXP-3319-302	DP	RDX	19.0	3-3/8 [86]	6 [20] 60°	0.41 [10.41]	22.04 [55.98]
	EXP-3319-331	GH	RDX	19.0	3-1/8 [79]	6 [20] 60°	0.55 [13.97]	29.18 [74.12]
	EXP-3321-421T	SDP	HMX	21.0	3-1/8 [79]	6 [20] 60°	0.42 [10.67]	44.19 [112.24]
	EXP-3321-431	GH	HMX	21.0	3-1/8 [79]	6 [20] 60°	0.56 [14.22]	29.23 [74.24]
	EXP-3323-401T	DP	HMX	22.7	3-1/8 [79]	6 [20] 60°	0.43 [10.92]	23.54 [59.79]
	EXP-3323-423T	SDP	HMX	22.7	3-3/8 [86]	6 [20] 60°	0.45 [11.43]	42.21 [107.21]
	EXP-3323-461T	SDP	HMX	22.7	3-3/8 [86]	6 [20] 60°	0.36 [9.14]	35.63 [90.50]
	EXP-3323-302	DP	RDX	22.0	3-3/8 [86]	6 [20] 60°	0.44 [11.18]	21.25 [53.98]
	EXP-3323-431	GH	HMX	22.7	3-3/8 [86]	6 [20] 60°	0.59 [14.99]	29.42 [74.73]

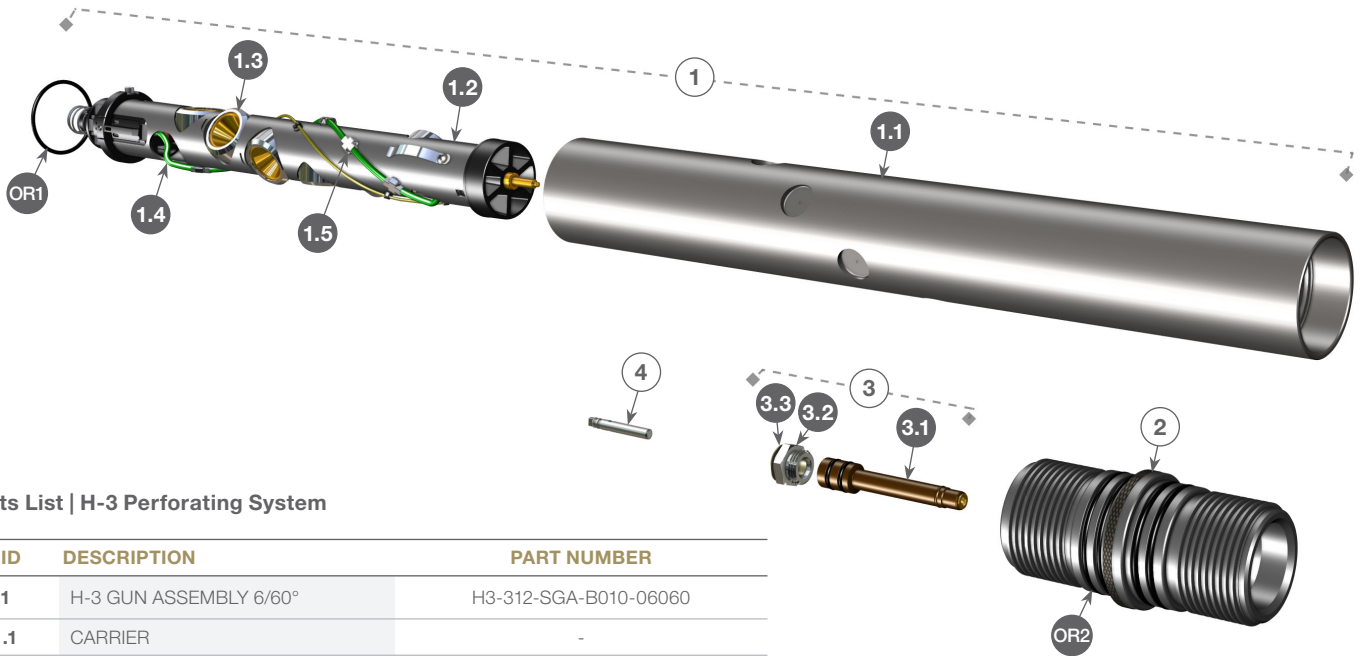
EQUAfrac® Limited: Super-Consistent Hole (SCH), Limited Penetration Shaped Charges

Gun O.D. (in)[mm]	Charge Part Number	Target Type	Weight (g)	Avg. Entry Hole (in)[mm]	Entry Hole Range (in)[mm]	Decentralized EHD Variation	Penetration (in)[cm]
3-1/8 [79]	SCH-3113-372	4-1/2 Inch OD, 13.5#, P110	13	0.27 [6.86]	.25-.29 [6.35-7.37]	4.8%	6.5 [16.51]
	SCH-3113-372	5-1/2 Inch OD, 20#, P110	13	0.26 [6.60]	.25-.29 [6.35-7.37]	5.2%	6.5 [16.51]
	SCH-3113-372	5-1/2 Inch OD, 23#, P110	13	0.26 [6.60]	.24-.28 [6.10-7.11]	4.4%	6.5 [16.51]
	SCH-3113-371	4-1/2 Inch OD, 13.5#, P110	13	0.30 [7.62]	.28-.32 [7.11-8.13]	4.3%	5.5 [13.97]
	SCH-3113-371	5-1/2 Inch OD, 20#, P110	13	0.31 [7.87]	.29-.33 [7.37-8.38]	4.0%	5.5 [13.97]
	SCH-3113-371	5-1/2 Inch OD, 23#, P110	13	0.32 [8.13]	.29-.35 [7.37-8.89]	5.4%	5.5 [13.97]
	SCH-3118-371	4-1/2 inch OD, 13.5#, P110	18	0.35 [8.89]	0.34-0.37 [8.63-9.39]	2.6%	7.5 [19.05]
	SCH-3118-371	5 inch OD, 18#, P110	18	0.37 [9.39]	0.33-0.40 [8.38-10.16]	4.8%	7.5 [19.05]
	SCH-3118-371	5-1/2 inch OD, 20#, P110	18	0.38 [9.65]	0.35-0.40 [8.89-10.16]	5.3%	7.5 [19.05]
	SCH-3118-371	5-1/2 inch OD, 23#, P110	18	0.37 [9.39]	0.35-0.40 [8.89-10.16]	5.2%	7.5 [19.05]
	SCH-3121-371	4-1/2 inch OD, 13.5#, P110	21	0.39 [9.90]	0.38-0.40 [9.65-10.16]	2.5%	7.5 [19.05]
	SCH-3121-371	5 inch OD, 18#, P110	21	0.42 [10.66]	0.40-0.46 [10.16-11.68]	3.8%	7.5 [19.05]
	SCH-3121-371	5-1/2 inch OD, 20#, P110	21	0.42 [10.66]	0.39-0.45 [9.90-11.43]	4.2%	7.5 [19.05]
	SCH-3121-371	5-1/2 inch OD, 23#, P110	21	0.41 [10.41]	0.38-0.44 [9.65-11.17]	4.7%	7.5 [19.05]
	SCH-3121-371	6 inch OD, 24.5#, P110	21	0.41 [10.41]	0.39-0.45 [9.90-11.43]	5.1%	7.5 [19.05]
	SCH-3123-371	5-1/2 inch OD, 20#, P110	23	0.53 [13.46]	0.46-0.59 [11.68-14.99]	7.7%	8.0 [20.32]

Additional Chart Information: Class = SCH, Exp. Type = RDX, Shot Density = 6/60°, Test Type = Gun/QC Spec

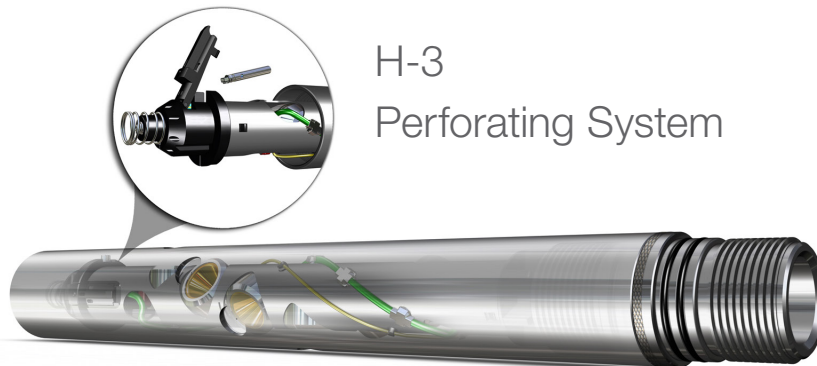
H-3 Perforating System - Gun Assembly Part List

The H-3 Perforating System is available with a reusable tandem for further cost reductions. A pre-loaded and delivered gun offering is available (1.1 - 1.5, OR1).



Parts List | H-3 Perforating System

ID	DESCRIPTION	PART NUMBER
1	H-3 GUN ASSEMBLY 6/60°	H3-312-SGA-B010-06060
1.1	CARRIER	-
1.2	CHARGE TUBE ASSEMBLY	-
1.3	SHAPED CHARGE	Multiple Options
1.4	CHARGE CLIP	24-1501-04
1.5	DETONATING CORD	CORD-80RDX-T
OR1	O-RING; 070 DURO	0111-229-070
2	TANDEM	H3-312-071
OR2	O-RING; VITON	0111-230-V95
3	TANDEM CONTACT KIT	H3-312-071-KIT
3.1	SOLID FEED THRU ASSEMBLY	H3-312-HW-100A
3.2	RETAINER NUT	H3-HW-005
3.3	INSULATOR INSERT	H3-HW-006
4	MODULAR DETONATOR	DETO-HT7101-HK



H-3
Perforating System

Products and Services

- ▶ Hunting's mission is to innovate and manufacture quality oil/gas extraction equipment and distribute it across our global supply chain.
- ▶ Hunting's energetics division produces the greatest number of shaped charges in the world.
- ▶ Hunting's instrument division produces the most widely used addressable switch in the world.

Proprietary Technology

Hunting owns and develops proprietary patented products with a full range of applications below the wellhead including mud motors, premium connections, well perforating, logging and intervention tools.

Geographic Footprint

Manufacturing and distribution locations are strategically located in the key energy producing regions of the world.



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'Excellence in **Energy Services** for over 100 years'