

CSH™ Series

Cold Shrink
Hammerhead
2022 PRODUCT GUIDE



15/25/28kV	35kV
Class	Class

CSH™ Series

INTRODUCTION & PRODUCT RATINGS

A proven design. A game-changing transformation.

For over 70 years, Richards has remained dedicated to manufacturing high-quality, innovative products for electrical distribution systems. The Cold Shrink Hammerhead epitomizes this legacy by introducing a truly unique, robust solution for terminating and splicing medium voltage power cable. We've taken our industry-leading 600/900A Deadbreak Elbow design and given it a cutting-edge transformation.

- **All-In-One Solution:** The CSH is range-taking and includes an integral jacket seal, providing a complete solution in a simple package. Three separate components have been elegantly combined into a single design.
- **100% EPDM:** Richards Cold Shrink Products are molded from 100% EPDM, a proven material in underground electrical applications for decades. This proprietary formulation of Cold Shrink EPDM is produced in-house. To achieve maximum durability in underground environments, the CSH features a fully-integrated, oil-resistant EPDM jacket that provides outstanding mechanical impact/tear resistance.
- **Easy Installation:** We've optimized our design to minimize installation time, complexity, and overall cost. No more cable adapter and no more separate jacket seal kit. The cold shrink Cable Entrance eliminates problems that arise when sliding traditional interference-fit Deadbreak elbows into position. This ergonomic improvement substantially simplifies positioning/aligning the lug in the CSH housing.
- **Designed, Molded & Tested in the USA:** Our team is intimately involved in everything from material development, product and mold design, and production. This allows us to control every aspect of the design, down to the smallest detail.

IEEE 386 - Industry Minimum Requirements

For your reference, IEEE ratings are provided below. Many of our products exceed these ratings. For product-specific information, see appropriate Product Data Sheet or contact the factory.

Voltage Ratings			
Voltage Class, Phase-to-Phase	15kV	25kV	35kV*
Maximum Operating Voltage – (phase-to-ground)	8.3kV	15.2kV	21.1kV
Corona Voltage Level – (partial discharge extinction voltage)	11kV	19kV	26kV
AC Withstand – (1 minute)	34kV	40kV	50kV
Impulse-Withstand Voltage – (BIL)	95kV	125kV	150kV

Continuous Current Ratings	
Aluminum	600A
Copper	900A

Short-Time Current Ratings	
Aluminum	25kA, 10c. and 10kA, 3s.
Copper	40kA, 10c. and 10kA, 3s.

OUR TESTING EXCEEDS INDUSTRY REQUIREMENTS. IEEE REQUIRES PARTIAL DISCHARGE PLUS A CHOICE OF AC OR IMPULSE WITHSTAND. RICHARDS RUNS ALL THREE TO ENSURE THE HIGHEST QUALITY.

Designed and tested per the following industry standards:

- IEEE Std 386: For Separable Insulated Connector Systems
- IEEE Std 592: For Semiconducting Shields

* Available in "200kV BIL Class" – Rated to 200kV BIL Impulse and 70kV AC Withstand. See data sheet for more information.

To Schedule a Demonstration
Contact Your Local Sales Rep



IEEE 386 Interface



Conductor Lugs



Capacitive Test Point

EPDM Jacket

Easy-to-Remove Core

Cable Entrance

Integral Jacket Seal

CSH™ Series

DESIGN & FEATURES



Scan QR code to watch
installation video

1. Conductor Lugs

The CSH Series is available with a variety of conductor lugs. We offer a range-taking shear bolt option as well as the traditional 600 or 900A compression connector. One of the most impressive improvements of the CSH is the ease with which the housing can be installed onto the prepared cable/installed lug. Without having to overcome any interference-fit (remember, we've obsoleted the cable adapter), positioning the lug properly is incredibly easy.

2. IEEE 386 Interface

The 600/900A Deadbreak interface accepts the appropriate IEEE Interface (15/25kV IEEE 386 Interface 11 or 35kV IEEE 386 Interface 13) components, such as Apparatus Bushings, Elbow Tap Plugs, Hammerhead Insulating Plugs (HIPs) and more.

3. Capacitive Test Point

The CSH Series is available with an optional capacitive test point. This enables system operators to utilize suitable equipment to test for voltage, or install a faulted circuit indicator (FCI).

4. EPDM Jacket

The entire CSH Series is molded from a proprietary EPDM formulation. This material has excellent mechanical impact/tear resistance—an important trait given the often harsh conditions of the underground environment. The bonded outer jacket is semi-conductive, making the CSH fully shielded.

5. Cable Entrance

The Cable Entrance of the CSH is shrinkable, obsoleting the cable adapter. This eliminates the performance risk associated with cable adapter positioning and makes installation markedly more ergonomic. This cold shrink Cable Entrance also allows the CSH to cover a range of cable sizes, as laid out in our Use Range-CSH Table. With fewer components and range-taking capabilities, customers are able to reduce inventory.

6. Easy-to-Remove Core

Hold-out cores that rely on grease or a ribbon/spiral design can be unreliable and messy. Spiral holdouts can be difficult to remove and may prematurely collapse. Richards product development engineers created a compact core design that is easy to eject, and performs consistently across a variety of installation environments. Once ejected, the Core separates into halves which can be recycled.

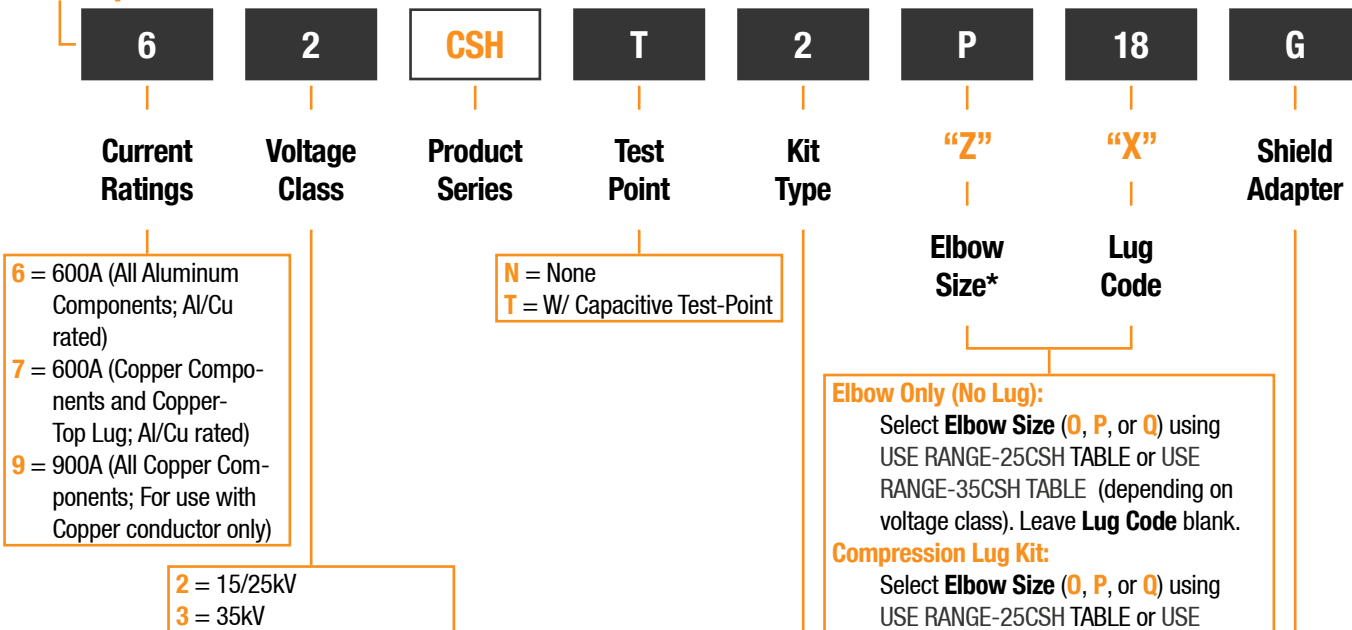
7. Integral Jacket Seal

Once the core is removed, a jacket seal is deployed over sealing mastic, completing the jacket restoration without the need for a separate component.

CSH™ Series

ORDERING INFORMATION

Sample Part Number



Elbow Only (No Lug):

Select **Elbow Size** (0, P, or Q) using USE RANGE-25CSH TABLE or USE RANGE-35CSH TABLE (depending on voltage class). Leave **Lug Code** blank.

Compression Lug Kit:

Select **Elbow Size** (0, P, or Q) using USE RANGE-25CSH TABLE or USE RANGE-35CSH TABLE (depending on voltage class). Select **Lug Code** using TABLE X.

Range Taking Kit w/ Shear Bolt Lug**:

Select **Elbow Size** + **Lug Code** using TABLE XRA-25CSH or TABLE XRA-35CSH (depending on voltage class).

1 = CSH Housing and Stud
2 = CSH Housing, Stud, and Insulating Plug

Note: Leave blank if Shield Adapter is not needed.

G = Tinned Copper Braid w/ Solder Block and Constant Force Spring
Braid size is #6 for housing size "O" and #4 for housing sizes "P" and "Q".

Table X - Compression Lug Selection

Conductor Size	Strd/Compr "X"	Cmpt/Sol "X"
#2	7	6
#1	8	7
1/0 AWG	9	8
2/0 AWG	10	9
3/0 AWG	11	10
4/0 AWG	12	11
250 kcmil	13	12
300 kcmil	14	13
350 kcmil	15	14
400 kcmil	16	15
450 kcmil	17	16
500 kcmil	18	17
550 kcmil	20	18
600 kcmil	20	18
650 kcmil	211 [†]	20
700 kcmil	22	20
750 kcmil	23	211 [†]
800 kcmil	24	22
900 kcmil	26	23
1000 kcmil	28	26
1100 kcmil	285	contact factory
1250 kcmil	29	contact factory
1500 kcmil	30	contact factory

[†] For copper P9CU Series Lugs, use code 21 instead.

* 35kV CSH is available in sizes P and Q only.

** Range Taking Shear Bolt Lugs are only available in 600A aluminum (Al/Cu rated).

AVAILABLE IN 200V BIL IMPULSE/70KV AC WITHSTAND RATING. SEE DATA SHEET FOR MORE INFORMATION.

Sample Part Number is a 15/25kV 600A CSH kit. Kit includes Size "P" CSH (with Test Point), Stud, Insulating Plug, Aluminum Compression Lug for 500 kcmil Strd/Compr, and a PCRK-GA-05 Shield Adapter kit.

CSH™ Series

SIZING OPTIONS

The following product sizing information is based on AEIC/ICEA dimensional ranges. The true range of the CSH Series on a particular cable construction may vary. To confirm sizing on non-standard cables, or to check sizing on cables that fall just outside our min or max, contact the factory.

15/25/28kV Sizing Options

Table XRA-25CSH - Range Taking Lug Selection†			
Elbow Size + Lug Code	Voltage Class	Kit Conductor Range	
		MIN	MAX
OR1	15kV (175 mil)	1/0 AWG‡	300 kcmil
	15kV (220 mil)	#2 AWG‡	
	25kV (260 mil)	#3 AWG	
OR2	15kV (175/220 mil)	1/0 AWG‡	450 kcmil
	25kV (260 mil)		350 kcmil
PR3	15kV (175/220 mil)	350 kcmil‡	600 kcmil
	25kV (260 mil)	4/0 AWG	
PR4	15kV (175/220 mil)	350 kcmil‡	750 kcmil
	25kV (260 mil)		
QR4	15kV (175 mil)	750 kcmil	750 kcmil
	15kV (220 mil)	600 kcmil	
	25kV (260 mil)	500 kcmil‡	
QR5	15kV (175 mil)	750 kcmil	1250 kcmil
	15kV (220 mil)	600 kcmil	
	25kV (260 mil)		

† Range Taking Shear Bolt Lugs are only available in aluminum (Al/Cu rated).

‡ May not fit some compact/compressed cables. See USE RANGE table below.

Use Range-25CSH Table			
Elbow Size	Voltage Class	Conductor Size	
		MIN	MAX
O	15kV (175 mil)	1/0 AWG**	500 kcmil
Minimum Insulation Diameter = 0.725"	15kV (220 mil)	#2 AWG***	
	25kV (260 mil)	#4 AWG	350 kcmil
P	15kV (175/220 mil)	350 kcmil****	750 kcmil
Minimum Insulation Diameter = 0.990"	25kV (260 mil)	4/0 AWG	
Q	15kV (175 mil)	750 kcmil	1500 kcmil
Minimum Insulation Diameter = 1.268"	15kV (220 mil)	600 kcmil	
	25kV (260 mil)	500 kcmil*****	

* 15kV cables with insulation diameter above 0.640 can be accommodated with Size 'O' with shim kit. Contact the factory for more information.

** May not fit some 1/0 AWG compressed/compact 100% (175mil) insulated power cables. Check minimum insulation diameter to confirm.

*** May not fit some #2 AWG compact 133% (220 mil) insulated power cables. Check minimum insulation diameter to confirm.

**** May not fit some 350 kcmil compact 100% (175 mil) insulated power cables. Check minimum insulation diameter to confirm.

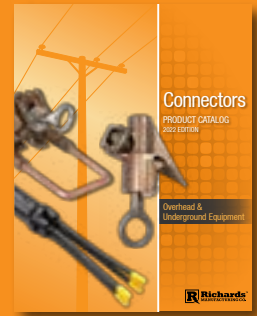
***** May not fit some 500 kcmil compact insulated power cables. Check minimum insulation diameter to confirm.

35kV Sizing Options

Table XRA-35CSH - Range Taking Lug Selection†			
Elbow Size + Lug Code	Voltage Class	Kit Conductor Range	
		MIN	MAX
PR1	35kV (345 mil)	1/0 AWG	300 kcmil
PR2	35kV (345 mil)	1/0 AWG	500 kcmil
PR3	35kV (345 mil)	3/0 AWG	600 kcmil
PR4	35kV (345 mil)	350 kcmil	500 kcmil
QR4	35kV (345 mil)	350 kcmil	750 kcmil
QR5	35kV (345 mil)	600 kcmil	1250 kcmil
QR6	35kV (345 mil)	1500 kcmil	1500 kcmil

† Range Taking Shear Bolt Lugs are only available in aluminum (Al/Cu rated).

Use Range-35CSH Table			
Elbow Size	Voltage Class	Conductor Size	
		MIN	MAX
P	35kV (345 mil)	1/0 AWG	500 kcmil
Minimum Insulation Diameter = 0.990"			
Q	35kV (345 mil)	350 kcmil	1500 kcmil
Minimum Insulation Diameter = 1.268"			



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