



F. GANO CHANCE
RESEARCH LABORATORY
Centralia, MO

TEST REPORT NO.: R180206-S1
REPORT DATE: 02/19/2018
SHEET 1 OF 5

MASTER TEST FILE: G2
DATE TESTED: 01/04/2018
TEST REQUEST NO: R18-02-06

Product Family: HPS/CHANCE Temporary Protective Grounding

Item Tested: HPS / Chance ASTM Grade 5H 3-Way Ball Stud Clamp
- PSC6003626 3-Way Ball Stud Ground Clamps with 30mm Ball Studs
o PSC6003491 30mm Ball Studs
o (10') S3714 4/0 Copper Ground Cable

Type of Test: Momentary Current Test & Clamp Torque Test

Scope of Test: Verify Temporary Protective Ground meets ASTM F855 – Grade 5H & ASTM F855 Clamp Torque Requirement

Applicable Stds: ASTM F855-15: Standard Specifications for Temporary Protective Grounds to Be Used on De-energized Electric Power Lines and Equipment


Related Cat No: None

3rd Party Witness: Powertech Laboratories

The numbers in parenthesis are instrument control numbers. Refer to the record of performance for instrument details.¹

¹
* Reproduce this report in its entirety only.
* Test data presented is within ±3% unless otherwise specified.
* Sample identification was provided by the Customer Identified Above
* This report applies only to the item(s) tested, as representatives of current product design.
* All instruments and recording devices used in this testing program are within a valid calibration period.
* All samples were new and in excellent condition when tested, except as otherwise noted in the "Item Tested:" section above.
* Data from tests performed for HPS shall not be released to non-HPS personnel unless it has been reviewed, converted to an S1, signed by the Laboratory Manager and Engineering Manager of the subject product line.

Tested by: Powertech Labs Inc.
Report by: Larry Bereswill, Product Engineer Mgr

Approved by: 
Title: Product Engineering Mgr.
Date: 02/19/2018

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The HPS / Chance 3-Way Ball Stud Ground Clamp was tested as a single assembled ground set (Procedure 1) and as a single assembled ground set attached to the ball stud of a mounted 3-Way Ball Stud Clamp (Procedure 2).

Procedure 1:

Single-phase short circuit tests in accordance with ASTM Specification F855-15 for a Grade 5H (47kA) rated assembly were conducted on Chance assembled temporary protective safety ground sets. One PSC6003626 3-Way Ball Stud Ground Clamp was attached to a 1.5" diameter energized buss bar and the other 3-Way Ball Stud Ground Clamp was attached to a ground PSC6003491 30mm ball stud. The clamps were mounted with the ball stud between the clamp forks. All clamps were tightened to 300 in-lbs. The test position of the cable was in a J-shape and the clamps facing directly away from one another as shown in ASTM F855, Figure 1. The test current was applied for a minimum of 250 ms (15 cycles @ 60 Hz) with the timing of fault initiation adjusted for maximum asymmetry for an ASTM Grade 5H ground set.



Photo 1: Single Setup



Photo 2: Energized Clamp



Photo 3: Ball Stud Ground

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Procedure 2:

Single-phase short circuit tests in accordance with ASTM Specification F855-15 for a Grade 5H (47kA) rated assembly were conducted on Chance assembled temporary protective safety ground sets. One PSC6003626 3-Way Ball Stud Ground Clamp with a 30mm ball stud was mounted to a 1.5" diameter energized buss bar. A ground set comprising of PSC6003626 3-Way Ball Stud Ground Clamps and 4/0 grounding cable was attached to the mounted clamps ball stud. The other ground set end was attached to another PSC6003626 3-Way Ball Stud Ground Clamp which was mounted to a ground PSC6003491 30mm ball stud. The clamps were mounted with the ball stud between the clamp forks. All clamps were tightened to 300 in-lbs. The test position of the cable was in a J-shape and the clamps facing directly away from one another as shown in ASTM F855, Figure 1. The test current was applied for a minimum of 250 ms (15 cycles @ 60 Hz) with the timing of fault initiation adjusted for maximum asymmetry for an ASTM Grade 5H ground set.



Photo 4: Double Setup



Photo 5: Double Energized Setup



Photo 6: Double Ground Setup

Mechanical Clamp Torque Test:

A PSC6003626 3-Way Ball Stud Ground Clamp was attached to a 30mm Ball Stud and a 1.5" diameter buss bar. A measured torque was applied to the eyescrew until failure.

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Photo 7: Ball Stud Torque Setup



Photo 8: 1.5" Buss Bar Torque Setup

Electrical Short Circuit Results:



Photo 7: Single Final Result



Photo 8: Double Final Result



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Sample	Cycle Current Peak Values (kA)															Duration - ms (Calc Cycles)	I ² t (Mega amps ² -s)
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
ASTM Grade 5H Requirement (Min)	127	116	108	99	93	88	84	81	78	76	74	73	72	71	70	250 (15)	728
Procedure 1-1	128	117	108	100	94	89	85	82	78	76	74	73	72	71	70	262 (15.7)	777
Procedure 1-2	130	118	109	101	95	90	86	82	79	77	75	74	72	71	71	263 (15.8)	794
Procedure 2-1	129	117	108	100	94	89	85	81	79	76	74	73	72	71	70	263 (15.8)	781
Procedure 2-2	130	119	110	102	95	90	86	82	79	77	75	74	73	72	71	262 (15.7)	800

Mechanical Torque Results:

Conductor Type	Yield (Min 330 in-lbf)	Ultimate (Min 400 in-lbf)	Results
30mm Ball Stud	No Damage	No Damage	Exceed 1.5X Rating
1.5" Buss Bar	No Damage	No Damage	Exceed 1.5X Rating

Conclusion:

HPS/Chance Catalog Number PSC6003626 3-Way Ball Stud Ground Clamp with 30mm Ball Studs meet or exceed the withstand ratings for ASTM F855-15 Grade 5H Temporary Protective Grounding.