

Power Dry™ II

Dry-Type, Small Power Transformers
112.5–13,000 kVA three-phase
600V through 35 kV primary voltage
120V through 15 kV secondary voltage



FLEXIBILITY FOR EVERY

IMAGINABLE APPLICATION



Power-Dry II Transformers

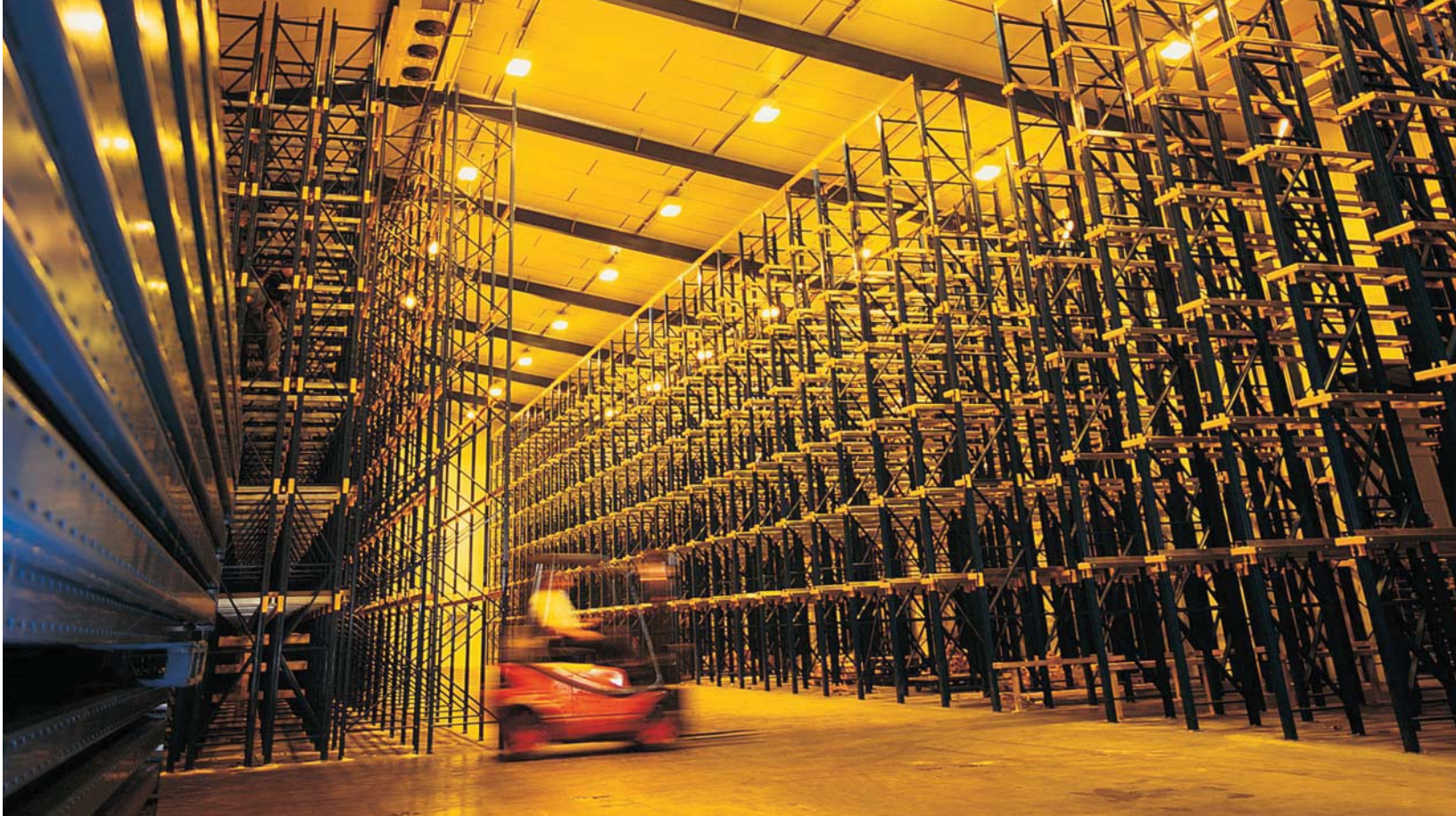
Schneider Electric is a recognized market leader, offering a full range of distinctively Square D®-designed transformer products such as the Power-Dry II transformer. Like all of our transformers, it is manufactured in ISO-registered facilities that use the industry's leading manufacturing technology, ensuring products of the highest quality and performance.

At Schneider Electric, we are committed to excellence. Our Power-Dry II transformers are built and tested to stringent Square D brand specifications, and meet or exceed applicable ANSI/IEEE, CSA and NEMA standards. These transformers may be UL or cUL labeled upon request.

Medium-Voltage, Conventional Dry-Type

Power-Dry II is a medium-voltage, dry-type, world-class distribution transformer. Dry-type transformers are a solid investment, providing excellent mechanical and short-circuit strength, no danger of fire or explosion, no liquids to leak, less weight than comparable cast-coil units, step-lap mitered cores, low total ownership costs and low initial costs.

For more information about Power-Dry II transformers or other products, please visit www.us.SquareD.com or call 1-888-SquareD.



Cost-Efficient

Power Dry II transformers offer an efficient design with low installation, maintenance and energy costs. Their design flexibility makes them ideal for power upgrades, retrofit designs and every other imaginable application.

Flexible Design

Power Dry II transformers use a UL-listed 220° C insulation system, regardless of temperature rating. This provides an optional reserve overload capacity.

The transformer coils are vacuum-pressure impregnated in high-temperature polyester varnish. The process includes oven drying to remove moisture, complete submersion in varnish under vacuum and pressure, and regulated curing using statistically process-controlled equipment to ensure consistency.

The core is manufactured from high permeability, cold-rolled, grain-oriented, precision-cut, silicon steel. Magnetic flux densities are kept well below the saturation point. The step-lap mitered core construction reduces joint fringing, which in turn reduces core losses and exciting current, ensuring optimum performance and minimal sound levels.

Custom designs are available to suit customer preferences. The transformers feature dry powder, state-of-the-art paint that keeps them looking new for years. Special colors are also available.

Varied Applications

Power Dry II transformers meet the requirements for most industrial and commercial applications. Because their finished coils are effectively protected against moisture, dirt and most other industrial contaminants, they are suitable for use in areas where people work and breathe, both indoors and outdoors.

Environmental Information

Power Dry II transformers are intended for use within relatively clean environments. However, the transformer's finished core is coated with a corrosion-resistant sealant, making it well-suited to withstand the harshest environments imaginable.

Because these dry-type transformers do not require fluids, they pose a low fire risk. They are an excellent upgrade option when replacing PCB-filled or gas-filled transformers.

Power Dry II transformers do not require any special waste-disposal considerations.

Power-Dry II Transformer Ratings

112.5–13,000 kVA three-phase (fan cooling allows higher kVA ratings)
Primary voltages: 600V to 35 kV
Primary BIL: Up to 150 kV
Secondary voltages: 120V to 15 kV
Secondary BIL: Up to 75 kV
Temperature rise: 80/115/150° C
ISO 9001 registered
Optional UL and CSA certification



Special Design Options

Seismic qualifications
Special sound requirements
Low X/R ratios
Higher overload capacity
Special altitude requirements
Retrofit designs
Higher efficiency requirements
Special ambient conditions

Applicable Standards

IEEE C57.12.01™

Standard general requirements for dry-type distribution and power transformers including those with solid cast and/or resin-encapsulated windings.

ANSI C57.12.50

Requirements for ventilated, dry-type distribution transformers, 1–500 kVA single-phase and 15–500 kVA three-phase, with high-voltage 601–34,500 volts, low-voltage 120–600 volts.

ANSI C57.12.51

Requirements for ventilated, dry-type power transformers, 501 kVA and larger three-phase, with high-voltage 601–34,500 volts, low-voltage 208Y/120–4160 volts.

ANSI C57.12.55

Conformance standard for transformers — dry-type transformers used in unit installations, including unit substations.

IEEE C57.12.56™

Standard test procedure for thermal evaluation of insulation systems for ventilated, dry-type power and distribution transformers (ANSI).

IEEE C57.12.58™

Guide for conducting a transient voltage analysis of a dry-type transformer coil (ANSI).

IEEE C57.12.59™

Guide for dry-type transformer through-fault current duration (ANSI).

IEEE C57.12.70™

Terminal markings and connections for distribution and power transformers.

IEEE C57.12.80™

Standard terminology for power and distribution transformers (ANSI).

IEEE C57.12.91™

Test code for dry-type distribution and power transformers.

IEEE C57.94™

Recommended practice for installation, application, operation, and maintenance of dry-type general purpose distribution and power transformers.

IEEE C57.96™

Guide for loading dry-type distribution and power transformers (ANSI).

1-888-SQUARED
www.us.SquareD.com

Schneider Electric – North American Operating Division

1415 S. Roselle Road
Palatine, IL 60067
Tel: 847-397-2600
Fax: 847-925-7500

**Standard Transformer Ratings, Primary Voltage Class
2.3–46 kV, 80 °C Rise, 30 °C Ambient**

kVA 3-Phase			Secondary Voltage		
Self-Cooled	Fan-Cooled Ventilated Dry	Fan-Cooled Weather Resistant Ventilated	208Y/120 V 240 V Delta	480Y/277 V 480 V Delta	4160Y/2400 V 4160 V Delta 2400 V Delta
225			X	X	
300	400	400	X	X	
500	667	667	X	X	X
750	1000	1000	X	X	X
1000	1333	1333	X	X	X
1500	2000	2000	X	X	X
2000	2666	2666		X	X
2500	3333	3333		X	X
3750	4687	4687			X
5000	6250	6250			X
7500	9375	9375			X
10000	12000	12000			X

The above combinations are based on standard designs. Other than standard designs may place further restrictions on the availability of voltage and kVA combinations. Consult the factory for final determination.

Altitude Derating Factor ¹

Altitude (FT)	kVA Correction		BIL Correction
	VPI (AA)	Forced Air (FA)	
3300	1.00	1.00	1.00
4000	0.994	0.989	0.98
5000	0.985	0.974	0.95
6000	0.975	0.959	0.92
7000	0.966	0.944	0.89
8000	0.957	0.929	0.86
9000	0.948	0.914	0.83
10,000	0.939	0.898	0.80
11,000	0.930	0.883	0.77
12,000	0.921	0.868	0.75
13,000	0.912	0.853	0.72
14000	0.903	0.838	0.70
15,000	0.894	0.823	0.67

¹ 3.28 feet = 1 meter

Audible Sound Levels

Self-Cooled		Forced Air-Cooled	
Equivalent Two-Winding kVA	Class AA Rating	Equivalent Two-Winding kVA	Class FA/AFA Rating
0–9	40	0–1167	67
10–50	45	1168–1667	68
51–150	50	1668–2000	69
151–300	55	2001–3333	71
301–500	60	3334–5000	73
501–700	62	5001–6667	74
701–1000	64	6668–8333	75
1001–1500	65	8334–10000	78
1501–2000	66	10001–13333	82
2001–3000	68		
3001–4000	70		
4001–5000	71		
5001–6000	72		
6001–7500	75		
7501–10000	79		
10001–15000	82		

System Voltages and Transformer BIL Ratings

Nominal System Voltage (kV)	Standard and Optional Transformer BIL Ratings									
	10	30	45	60	75	95	110	125	150	200
1.2	S	1	1							
2.5		S	1	1						
5.0			S	1	1					
8.7				S	1	1				
15.0					S	1	1			
25.0						2	S	1	1	
34.5								2	S	1

S = Standard value.

1 = Optional higher levels where exposure to overvoltage occurs and improved protective margins are required.

2 = Lower levels where protective characteristics of applied surge arresters have been evaluated and found to provide appropriate surge protection.

Performance Data

Typical Performance Data					Regulation			
kVA	%IZ	%IR	%IX	X/R Ratio	1.0 PF	0.9 PF	0.8 PF	0.7 PF
225	4.50	1.46	4.26	2.92	1.56	3.23	3.76	4.08
300	4.50	1.33	4.30	3.23	1.43	3.13	3.68	4.02
500	5.50	1.20	5.37	3.64	1.34	3.51	4.24	4.72
750	5.75	1.05	5.60	5.34	1.21	3.52	4.31	4.83
1000	5.75	1.00	5.66	5.66	1.16	3.48	4.27	4.80
1500	5.75	0.88	5.68	6.45	1.04	3.38	4.19	4.73
2000	5.75	0.80	5.69	7.11	0.96	3.32	4.14	4.68
2500	5.75	0.77	5.70	7.40	1.00	3.29	4.12	4.67
3000	5.75	1.07	5.65	5.28	1.29	3.58	4.36	4.87
3750	5.75	0.99	5.66	5.72	1.15	3.47	4.27	4.79
5000	5.50	0.80	5.44	6.80	0.95	3.20	3.98	4.50

Typical Performance Data: High Voltage—15 kV Class; Low Voltage—600 V Class

kVA	No Load Losses (Watts)	Full Load Losses (Watts)	Total Losses (Watts)	Efficiency						
				133%	125%	100%	75%	50%	25%	Maximum
225	800	3300	4100	97.83	97.93	98.21	98.45	98.58	98.24	98.58 @ 50% load
300	1000	4000	5000	98.02	98.10	98.36	98.58	98.68	98.36	98.68 @ 50% load
500	1300	6000	7300	98.24	98.32	98.56	98.77	98.89	98.68	98.90 @ 45% load
750	2000	7900	9900	98.42	98.49	98.70	98.87	98.95	98.69	98.95 @ 50% load
1000	2400	10000	12400	98.51	98.58	98.78	98.94	99.03	98.80	99.03 @ 50% load
1500	3300	13200	16500	98.68	98.74	98.90	99.06	99.13	98.91	99.13 @ 50% load
2000	4100	16000	20100	98.80	98.85	99.08	99.13	99.20	98.99	99.20 @ 50% load
2500	4800	19300	24100	98.84	98.89	99.05	99.17	99.24	99.05	99.24 @ 50% load
3000	7500	34000	41500	98.33	98.41	98.64	98.83	98.94	98.73	99.94 @ 50% load
3750	9500	37000	46500	98.52	98.58	98.78	98.93	99.01	98.76	99.01 @ 50% load
5000	11500	40000	51500	98.78	98.83	98.98	99.10	99.15	98.89	99.15 @ 50% load

Standard % Impedance

kVA	IEEE Standard (Nominal)	Square D (Nominal)	Optional Range
225	Not specified	4.00–5.00	3.00–6.00
300	Not specified	4.00–5.00	3.00–6.00
500	Not specified	4.00–6.00	4.00–7.00
750–5000	5.75	5.75	4.50–8.00
5000	5.50	5.50	5.50–8.00

Standard Enclosure Design Dimension and Weights ¹

kVA	Dimensions (inches)			Weight (lbs)
	Height	Width	Depth	
225	94.0	66.0	54.0	5500
300	94.0	66.0	54.0	6000
500	94.0	78.0	54.0	6250
750	94.0	72.0	54.0	7000
1000	94.0	84.0	54.0	7500
1500	94.0	90.0	54.0	9500
2000	100.0	96.0	54.0	10200
2500	100.0	102.0	54.0	11000
3000	100.0	108.0	66.0	14200
3750	100.0	108.0	66.0	19200
5000	124.0	144.0	66.0	23000

¹ Values listed are typical and should not be used for construction purposes.

Loading

Power-Dry II transformers are designed to operate at rated load with rated voltage and frequency applied in “usual service” conditions. It is possible to carry overloads without loss of life expectancy. The following table shows the permissible overloads that may be carried without loss of transformer life expectancy only if occurring once in any 24-hour period given a 150 °C rise transformer in a 30 °C ambient.

ANSI/IEEE Loading Guide

Daily loads above rating to give normal life expectancy. Following and followed by a constant load of:

Peak Load Time in Hours	Times Rated kVA		
	90%	70%	50%
0.5	1.33	1.43	1.49
1	1.21	1.25	1.28
2	1.14	1.15	1.16
4	1.09	1.10	1.10
8	1.05	1.06	1.06

Heat Contribution

Heat contribution is the heat a transformer may contribute to its environment. This may represent additional air conditioning burden in summer months, or may be used in calculating heating requirements during winter months. This heat is the result of transformer losses and is a function, in part, of loading. The following table demonstrates the effect of loading on heat contribution.

**Typical Heat Contribution: High Voltage—15 kV Class;
Low Voltage—480Y/277 V**

kVA	% Load	BTU/Hour	kVA	% Load	BTU/Hour
225	25	3440	2000	25	17420
	50	5550		50	27600
	75	9070		75	44740
	100	14000		100	68640
	125	20340		125	99380
	133	22670		133	110655
300	25	4270	2500	25	20510
	50	6830		50	32870
	75	11100		75	53470
	100	17075		100	82300
	125	24760		125	119375
	133	27580		133	132980
500	25	5720	3000	25	32840
	50	9560		50	54590
	75	15965		75	90840
	100	24930		100	141600
	125	36455		125	206850
	133	40685		133	230790
750	25	8520	3750	25	40260
	50	13575		50	63975
	75	22005		75	103420
	100	33810		100	158660
	125	48985		125	229670
	133	54550		133	255730
1000	25	10330	5000	25	47770
	50	16735		50	73360
	75	27405		75	116010
	100	42350		100	175720
	125	61550		125	252490
	133	68600		133	280640
1500	25	14090			
	50	22540			
	75	36625			
	100	56350			
	125	81705			
	133	91010			

Shop Drawing Submittal Review

Transmitted To: Cannon Design

Date: July 19, 2016

Attention: stl-cac@cannondesign.com

Contact Person / WTA Field Inspector:
Patrick Garner

Project Name: Webster University-**ISB**

Reviewed by: Bill Shaw

Project No. WT 14127.01

☐

UPS

☐

Courier

☒

Email

Copies	No.	Description
1 PDF	264000E01	(Submittal No. 264000-001) Electrical Distribution

Submittal Review Comments

Circuit breaker size and position shall match panel schedules on sheets E0503, 504, 505, & 506.

c: Kelvin Patel
Kpatel@cannondesign.com

☐ Furnish as Submitted

☐ Furnish as Noted

☐ Rejected

☒ ***Revise & Resubmit**

☐ Reviewed

☐

Corrections or comments made on shop drawings during this review do not relieve contractor from compliance with requirements of drawings and specifications. This check is only for review of general conformance with the design concept of project and general compliance with information given in contract documents. Contractor is responsible for: confirming and correlating all quantities and dimensions; selecting fabrication processes and techniques of construction; coordinating his work with that of all other trades; and performing his work in a safe and satisfactory manner.

WTASHOP - Webster ISB - 26 4000-001

From: STL-CAC <STL-CAC@CANNONDESIGN.COM>
To: 'Patrick Garner' <pgarner@wmtao.com>, WTASHOP <wtashop@wmtao.com>
Date: 7/5/2016 11:40 AM
Subject: Webster ISB - 26 4000-001
Cc: "Patel, Kelvin" <kpatel@CANNONDESIGN.COM>, "Grossman, Lynn" <lgrossman@C...>
Attachments: 264000-001 Electrical Distribution.pdf

Attached for review.

Melissa Pirtle
Construction Admin

CANNONDESIGN

1100 Clark Ave
St. Louis, Missouri 63102
T [314.425.8797](tel:314.425.8797) • M
cannondesign.com

SUBMITTAL IDENTIFICATION SHEET

To be completed by Contractor/CM

PROJECT NAME	
ADDRESS	
NUMBER	
OWNER	
ARCHITECT / ENGINEER	
SUBMITTED BY	
CONTRACTOR / CM SUBMITTAL NO.	CANNON DESIGN SUBMITTAL NO.
DRAWING / DETAIL REFERENCE	SPECIFICATION SECTION / PARAGRAPH
MANUFACTURER / SUPPLIER	ITEM / PRODUCT ID
REQUIRED DATE	PRIORITY
CRITICALITY	

To be completed by Reviewer

CANNON DESIGN SUBMITTAL NUMBER
RECEIVED DATE

- ☐ **A. No Exceptions Taken**
No further review of submittal is required.
- ☐ **B. Make Corrections Noted**
Incorporate corrections in work;
resubmission is not required.
- ☐ **C. Revise and Resubmit**
Revise as noted, and resubmit for review.
- ☐ **D. Rejected**
Submittal is not in compliance with Contract Documents;
provide new submittal.
- ☐ **E. For Record / Information Only**
Submittal was reviewed for Record / Information
purposes only.
- ☐ **F. Not Required for Review**
Submittal is not required by Contract Documents
and has not been reviewed.

Review is for conformance with the design concept of this project and for general compliance with contract documents. Contractor is responsible for quantities, dimensions and compliance with contract documents and for information that pertains to fabrication processes, construction techniques and coordination of this work with all trades which will be affected thereby. This review is null and void if submittal deviates from contract documents and does not indicate or note deviations.

ITEM BEING SUBMITTED (check only one)

- ☐ Shop Drawings ☐ Certification / Qualifications ☐ Coordination Drawing
☐ Samples ☐ Record Documents ☐ Calculations
 (_____ copies) ☐ Product Data ☐ Schedules
☐ LEED Submittal ☐ O&M Manuals
☐ Other

ITEM BEING SUBMITTED FOR (check only one)

- ☐ Action ☐ Information Only ☐ Record

REMARKS OR DEVIATIONS

CONTRACTOR / CM CERTIFICATION
(SUBMITTALS NOT CERTIFIED WILL BE RETURNED WITHOUT REVIEW)



PARIC CORPORATION
SUBMITTAL STAMP

THIS SHOP DRAWING HAS BEEN REVIEWED BY PARIC CORPORATION

Subcontractor remains responsible for dimensions, quantities, coordination with other trades and compliance with contract documents.

Ry:

By: **Devin D. Gates**

REVIEWED BY	DATE

A/E COMMENTS

- ☐
- See attached sheet(s) for additional comments

REVIEWED BY	DATE



77 Westport Plaza
Suite 250
St. Louis, MO 63146

TRANSMITTAL

No. 15051-0114

Paric Corporation

PROJECT: 15051-Webster University Interdisciplinary Science Building

DATE: 07/05/2016

TO: Cannon Design
1100 Clark Ave
St Louis MO 63102

RE: Electrical Distribution

ATTN: Kelvin Patel

JOB: 15051

WE ARE SENDING:	SUBMITTED FOR:	ACTION TAKEN:
☐ Shop Drawings	☒ Approval	☐ Approved as Submitted
☐ Letter	☐ Your Use	☐ Approved as Noted
☐ Prints	☐ As Requested	☐ Returned After Loan
☐ Change Order	☐ Review and Comment	☐ Resubmit
☐ Plans		☐ Submit
☐ Samples	SENT VIA:	☐ Returned
☐ Specifications	☐ Attached	☐ Returned for Corrections
☒ Other: Product Data	☐ Separate Cover Via:	☐ Due Date:

Item	Package	Code	Rev.	Copies	Date	Description	Status
Submittal		264000-001	1		07/05/2016	Electrical Distribution	Submitted

NOTES:

CC: Paric Corporation, Kathy Bathe

Project Coordinator: Paric Corporation, Kathy Bathe

Signed: _____
Devin Gates

Transmittal

To Paric Corporation

Date 7/1/16

Job Number 11317

Job Name Webster Univ. ISB Building

Attention Devin Gates

Transmittal Number 11317-005

We are sending you:

☒ Attached

☐ Under separate cover, the following:

☐ Preliminary Drawings

☐ Samples

☐ Construction Drawings

☐ Copy of Letter

☐ Specifications

☐ Other _____

Quantity	Drawing #	Date/Revision	Description
1			Submittal for Distribution - Spec Section
			26 40 00

These are transmitted as checked:

☒ For Your Review & Comment

☐ Approved As Noted

☒ For Approval

☐ Returned For Corrections

☐ For Your File

☐ Approved As Submitted

☐ As Requested

☐

Copy:

Transmittal

Enclosure

Rick Branstetter

Signed: Rick Branstetter, Project Manager

Webster University ISB

Approval Drawing Package

Factory Order #: 37999262

06/13/2016

Distributor:
Graybar

Contractor/Installer:
Guarantee Electric / TD4

Consulting Engineer:
Wm Tao & Associates

Lou Feldhaus
Sales Representative

Jake Kaufman
Project Manager
North American Operating Division
(636) 329-2265
jacob.kaufman@schneider-electric.com

Life Is On

Schneider
Electric

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UNIT SUBSTATION LITERATURE

Unit Substation Brochure

HVL 5...38 kV Load Interrupter Switchgear - Brochure

Power Dry II- Dry-Type, Small Power Transformer Brochure

Model 98A Digital Temperature Controller For Medium Voltage Transformers

Power-Style QED-2 Switchboard Brochure

Internal Modular SPD Brochure

PowerLogic PM8000 Series Intermediate Metering Technical Data Sheet

NW Breaker Brochure

Micrologic Trip Units for Masterpact Circuit Breakers Brochure

INTEGRATED POWER CENTERS

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SB1

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1EH1 - 1EL1

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LITERATURE

Integrated Power Center 2 (IPC2)

PANELBOARDS

PANELBOARD SCHEDULE AND DRAWINGS

LITERATURE

I-Line Panelboard Handout

NF Panelboard Handout

NQ Panelboard Handout

I-Line SPD

Internal Modular SPD Brochure

SurgeLoc SPD for NQ Panelboards

CONTACTORS AND STARTERS

BILL OF MATERIALS AND DRAWINGS

8538SCG

8538SCA - EF-1

8538SCA - KEF-1

2510FG

LITERATURE

Manual Starters - Type F

Manual Starters - Type M and T

8538 Combination Starter Catalog

SAFETY SWITCHES

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D211N

H365

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POWER MONITORING AND CONTROL

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MCTAS-485 Terminator

FUSE

BILL OF MATERIALS

LITERATURE

LPJ Fuses 1 - 60 Amps

LPJ Fuses 70 - 600 Amps