

Duke Energy Carolinas Distribution Construction Standards Reference Guide

The Duke Energy Carolinas (DEC) Distribution Construction Standards are available on the My Duke Energy Contractor Portal. Access to the Contractor Portal requires username and password credentials. Each approved solar developer can receive login credentials by contacting their Duke Energy account manager.

The DEC Distribution Construction Standards consist of the following standards manuals:

- DEC-Enterprise Wide
- DEC-DEM Distribution Standards Manual - Part 1
- DEC-DEM Distribution Standards Manual - Part 2
- DEC-DEM Distribution Standards Manual - Part 3
- DEC-DEM Distribution Standards Manual - Part 4

These manuals contain over 2,100 pages of standards, not all of which are applicable to utility scale solar farms. In addition to these current standards, older Duke Energy standards are available for reference in the DE Legacy Carolinas Distribution Manuals section of the Contractor Portal.

Following is a list of selected standards that, based on Advanced Energy's experience, are frequently applicable to utility scale solar farms. **This list is not all inclusive of the standards Advanced Energy may reference in an interconnection inspection, but serves as a guide to help navigate the standards.**

DEC-Enterprise Wide

- 01-Overhead
 - 01.01 General
 - 01.06 Standing Orders
- 02-Poles, Guys and Anchors
 - 02.02 Poles
 - 02.03 Grounds
 - 02.04 Guys and Anchors
 - 02.05 Guy Tables
- 03-Primary Construction Overhead
 - 03.00 General
 - 03.02 Services and Neutrals
 - 03.03 Deadend Clamps and Extension Links
 - 03.04 Preformed Ties and Composite Ties
 - 03.06 Insulators and Shunting Clips
 - 03.07 Crossarms
 - 03.11 Horizontal Construction
 - 03.11-100 Standard Crossarm Installation Comparison

- 03.11-103 Three-Phase Horizontal Construction - Tangent Crossarm
 - 03.11-107 Three-Phase Horizontal Construction - Small Angle
 - 03.11-112 Three-Phase Horizontal Construction - Medium Angle
 - 03.11-116 Three-Phase Horizontal Construction - Large Angle
 - 03.11-119 Three-Phase Horizontal Construction - Buck Arm - Right Angle
 - 03.11-120 Three-Phase Horizontal Construction - Double Deadend Guyed
 - 03.11-127 Three-Phase Horizontal Construction - Deadend Crossarm Guyed
 - 03.11-128 Three-Phase Horizontal Construction - Tangent Arrester Only Station
 - 03.11-147 Three-Phase Horizontal Construction - Two Pole Corners
- 04-Overhead Primary Connectors
 - 04.00 General
 - 04.02 Splices
 - 04.06 Compression Connectors
 - 04.08 Bolted Connectors
 - 04.09 Connector Application Guide
- 05-Conductors Overhead
 - 05.00 General
 - 05.01 Wire and Cable Data
 - 05.02 Sag and Tension
 - 05.06 Slack Spans
- 06-Pole Mount Transformers
 - 06.01 Fault Tamer Fuses
- 08-Switches and Protective Devices
 - 08.00 Arresters General
 - 08.01 Cutouts
 - 08.06 Reclosers - Three Phase Configurations
- 10-Clearances
 - 10.06 Miscellaneous Applications
 - 10.06-01 Minimum Guy Clearances
- 15-Distributive Energy
 - 15.06 DER Electronic Reclosers
- 20-Underground General
 - 20.00 Underground General
 - 20.02 Basic Design Requirements
 - 20.04 Grounding
- 21-OH-UG Transition
 - 21.00 General Riser Construction Information
 - 21.01 Conduit and U-Guard Risers
 - 21.02 Single-Phase Risers
 - 21.02-110 Single-Phase Reverse Riser
 - 21.03 Three-Phase Horizontal Construction - 200 Amp Primary Risers
 - 21.05 Three-Phase Horizontal Construction - 600 Amp Primary Risers
- 22-Trenching and Conduit
 - 22.00 General
 - 22.01 Trenching
 - 22.02 Directional Boring

- 22.03 Conduit Use
- 22.04 Conduit and Conduit Accessories
- 22.07 Cable Pulling
- 23-Underground Cables
 - 23.01 Primary Cable Data
- 26-Cable Accessories
 - 26.00 General
 - 26.02 200 Amp Loadbreak Elbows and Components
 - 26.06 600 Amp Deadbreak Elbow Connectors (T-bodies)
 - 26.10 Primary Splices
 - 26.14 Termination Grounding Devices and Submersible Applications
- 27-Pad Mount Transformers
 - 27.02 Cable and Conduit Entrances

DEC-DEM Distribution Standards Manual - Part 1

- General Information
 - 10001DUK Equipment Mounting Position
 - 10003DUK Electric Distribution Pole Structures
 - 10004DUK Fiberglass Equipment Mounting Bracket for Cutouts
- Overhead
 - 23210DUK 4kV - 25kV 600 Amp Line Tension Disconnect Switch
 - 23211DUK 4kV - 25kV 600 Amp Vertical Disconnect Switch
 - 88420DUK 4kV - 25kV Primary Metering Overhead WYE Construction
- Transformers
 - 26120DUK 4kV - 25 kV Single Transformer on Single Phase Lines
 - 26140DUK 4kV - 25 kV Single Transformer on Multiphase Lines

DEC-DEM Distribution Standards Manual - Part 2

- Fusing
 - 99603DUK Overhead & Padmounted Transformer Fusing

DEC-DEM Distribution Standards Manual - Part 3

- Padmount Transformers
 - 27025DUK Single Phase Transformer Flat Pad Cable and Ground Rod Zones
 - 27110DUK 4 kV - 25 kV Single Phase Padmount Transformer
 - 27300DUK 15kV - 25kV Three Phase Padmount Transformer - 4 Wire
 - 27310DUK 15kV - 25kV Three Phase Padmount Transformer - 3 Wire Delta
Secondary
 - 71030DUK Flat Pad for Single Phase Padmount Transformers
- Switchgear
 - 27600DUK 15kV and 25kV Class, 600A Dead Front Padmounted Switchgear

- Underground Metering
 - 88512DUK 15kV and 25kV Padmounted Primary Metering
- Underground Sectionalizing Equipment
 - 27502DUK 15kV - 25kV 200 Amp Three Phase Junction Cabinet
 - 27503DUK 15kV - 25kV 600 Amp Three Phase Junction Cabinet

DEC-DEM Distribution Standards Manual - Part 4

- Pads
 - 71033DUK 15kV & 25kV 200 Amp & 600 Amp Three-Phase Junction Cabinet Foundations

DE Legacy Carolinas Distribution Manuals

For standards related needs not covered in the DEC-Enterprise Wide or DEC-DEM Standards manuals, refer to the DE Legacy Carolinas Distribution Manuals. For example:

- Gang operated air break switches are covered in the System Protection Legacy Manual, Section 3.10 Three Phase Unitized Gang Operated 600 Amp Loadbreak Switch
- MV terminations are covered in the Underground Design Standards Legacy Manual, Chapter 6-Terminations
- MV elbow connectors are covered in the Underground Design Standards Legacy Manual, Chapter 4-Elbows and Accessories

Note: Where requirements of the DEC-Enterprise Wide and DEC-DEM Distribution Standards manuals differ from the DE Legacy Carolinas Distribution Manuals, the DEC-Enterprise Wide and DEC-DEM Distribution Standards manuals shall apply.

Duke Energy Progress Distribution Construction Standards Reference Guide

The Duke Energy Progress (DEP) Distribution Construction Standards are available on the My Duke Energy Contractor Portal. Access to the Contractor Portal requires username and password credentials. Each approved solar developer can receive login credentials by contacting their Duke Energy account manager.

The DEP Distribution Construction Standards consist of the following standards manuals:

- DEP OH Sections 1-4 Distribution Standards
- DEP OH Sections 5-13 Distribution Standards
- DEP UG Distribution Standards

These manuals contain over 1,900 pages of standards, not all of which are applicable to utility scale solar farms. Following is a list of selected standards that, based on Advanced Energy's experience, are frequently applicable to utility scale solar farms. **This list is not all inclusive of the standards Advanced Energy may reference in an interconnection inspection, but serves as a guide to help navigate the standards.**

DEP OH Sections 1-4 Distribution Standards

- 01-Overhead
 - 01.01 General
 - 01.06 Standing Orders
- 02-Poles, Guys and Anchors
 - 02.02 Poles
 - 02.03 Grounds
 - 02.04 Guys and Anchors
 - 02.05 Guy Tables
- 03-Primary Construction Overhead
 - 03.00 General
 - 03.02 Services and Neutrals
 - 03.03 Deadend Clamps and Extension Links
 - 03.04 Preformed Ties and Composite Ties
 - 03.06 Insulators and Shunting Clips
 - 03.07 Crossarms
 - 03.11 Horizontal Construction
 - 03.11-100 Standard Crossarm Installation Comparison
 - 03.11-103 Three-Phase Horizontal Construction - Tangent Crossarm
 - 03.11-107 Three-Phase Horizontal Construction - Small Angle
 - 03.11-112 Three-Phase Horizontal Construction - Medium Angle
 - 03.11-116 Three-Phase Horizontal Construction - Large Angle
 - 03.11-119 Three-Phase Horizontal Construction - Buck Arm - Right Angle
 - 03.11-120 Three-Phase Horizontal Construction - Double Deadend Guyed

- 03.11-127 Three-Phase Horizontal Construction - Deadend Crossarm Guyed
 - 03.11-128 Three-Phase Horizontal Construction - Tangent Arrester Only Station
 - 03.11-147 Three-Phase Horizontal Construction - Two Pole Corners
- 04-Overhead Primary Connectors
 - 04.00 General
 - 04.02 Splices
 - 04.06 Compression Connectors
 - 04.08 Bolted Connectors
 - 04.09 Connector Application Guide

DEP OH Sections 5-13 Distribution Standards

- 05-Conductors Overhead
 - 05.00 General
 - 05.01 Wire and Cable Data
 - 05.02 Sag and Tension
 - 05.06 Slack Spans
- 06-Pole Mount Transformers
 - 06.01 Fault Tamer Fuses
 - 06.02 Fusing
 - 06.03 Conductors and Connections
 - 06.04 Cutouts and Mounting Brackets
 - 06.06 Installation and Policies
- 08-Switches and Protective Devices
 - 08.00 Arresters General
 - 08.01 Cutouts
 - 08.06 Reclosers - Three Phase Configurations
 - 08.10 Switches - Manual
 - FMO Drawings
 - 08.10-37 600 Amp Horizontal Air Break Switch Handle Operated 25kV (FMO)
- 10-Clearances
 - 10.06 Miscellaneous Applications
 - 10.06-01 Minimum Guy Clearances
- 11-Metering
 - 11.00 General
 - 11.01 Distributed Generation Metering
 - 11.09 Transformer-Rated Metering, Primary, Three-Phase
 - 11.11 Transformer-Rated Metering, Primary, Three-Phase - UG

DEP UG Distribution Standards

- 20-Underground General
 - 20.00 Underground General
 - 20.02 Basic Design Requirements

- 20.04 Grounding
- 21-OH-UG Transition
 - 21.00 General Riser Construction Information
 - 21.01 Conduit and U-Guard Risers
 - 21.02 Single-Phase Risers
 - 21.02-110 Single-Phase Reverse Riser
 - 21.03 Three-Phase Horizontal Construction - 200 Amp Primary Risers
 - 21.05 Three-Phase Horizontal Construction - 600 Amp Primary Risers
- 22-Trenching and Conduit
 - 22.00 General
 - 22.01 Trenching
 - 22.02 Directional Boring
 - 22.03 Conduit Use
 - 22.04 Conduit and Conduit Accessories
 - 22.07 Cable Pulling
- 23-Underground Cables
 - 23.01 Primary Cable Data
- 24-Pad and Pull Boxes
 - 24.01 Transformer Pads
 - FMO Drawings
 - 24.01-11 Pour in Place Transformer Pads
 - 24.01-12 Pour in Place Transformer Pads
- 25-Enclosures and Pedestals
 - 25.01 Primary Enclosures
- 26-Cable Accessories
 - 26.00 General
 - 26.01 Primary Splices
 - 26.03 T-Bodies/Bolted Elbows
 - 26.04 Loadbreak Elbows
 - 26.05 Deadbreak Elbows
 - 26.06 Cable Terminators
 - 26.10 Primary Splices
- 27-Pad Mount Transformers
 - 27.00 General
 - 27.01 Grounding
 - 27.02 Fusing
 - 27.03 Elbow Arresters
 - 27.05 Cable and Conduit Entrances
 - 27.06 Three-Phase Pad-Mounted Transformers
- 28-Switchgear
 - 28.00 Pad-Mounted Switchgear General
 - 28.01 PME Three-Phase Enclosed Switchgear
- 34-Transformer Rated Metering
 - 34.09 Transformer-Rated Metering, Primary, Three-Phase
- 34.11 Transformer-Rated Metering, Primary, Three-Phase - UG