



**DRIESCHER Y WITTJOHANN, S.A.**  
MEDIUM VOLTAGE SOLUTIONS

**TECHNICAL SPECIFICATIONS**

**METAL ENCLOSED SUBSTATIONS  
“PP” TYPE**



SUBESTACIONES COMPACTAS EN MEDIA TENSION  
AISLADAS EN AIRE  
MODELO PP

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## 1. General Description

**DRIWISA™ “PP” compact substations** are used in distribution networks of medium voltage from 4.16 kV to 38 kV, rated current of 400 or 630 Amps to operate in conjunction with transformers and distribution panels.

**DRIWISA™ “PP” compact substations** meet with the following applications:

- Connection and disconnection operations of medium voltage distribution networks under load conditions.
- Connection and disconnection of medium voltage distribution transformers.
- As medium voltage feeders switchgears in industrial and commercial business.

**DRIWISA™ “PP” compact substations** operation meet with the following characteristics:

- Freestanding switchgear, dead front, and hermetically sealed tank prevent access to live parts.
- Direct manual operation to the switch's drive mechanism, with out mechanical transmission systems or additional mechanisms of operation.
- Mechanical interlocks prevent simultaneous operations of the switches.
- Mechanical interlocks prevent opening the door when load break switch is closed.
- Mechanical interlocks prevent operating the load break switch when the door is open.
- Burned out fuse extraction by pliers.
- Overvoltage protection by surge arresters
- Short-circuit protection by current limiting fuses (DRS).
- The following equipment are delivered together with the substations:
  - a) Non-Load Switch type DTP,
  - b) Load Break Switch type LDTP,
  - c) Resin Standoff Insulators for bus support type DWA
  - d) Electrolytic copper bus bars for 400 and 630 A,
  - e) Overload Protection with Lightning Arresters,
  - f) Short Circuit protection with Current Limiting fuses type DRS.

**DRIWISA™ “PP” compact substations** are offered in the following protections:

- NEMA 1 protection: indoor service avoid accidental contacting with internal equipments.
- NEMA 12 protection: indoor service, dust-proof, sealed with industrial polyurethane adhesive between sheets and rubber seal at doors.
- NEMA 3R protection: for outdoor service rainproof, sealed with industrial polyurethane adhesive between the sheets, rubber seal at doors, and heaters.

The installer must have experience in operation and installation of medium voltage equipments.

## 2. Standards

**DRIWISA™ “PP” compact substations** meet with the following standards:

NMX-J-098

Sistemas eléctricos de potencia-suministro-tensiones eléctricas normalizadas

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NMX-J-564	Equipos de desconexión y su control - parte 1: especificaciones comunes
NMX-J-323	Cuchillas seccionadoras de operación con carga para media tensión - especificaciones y métodos de prueba
NMX-J-068	Tableros de alta tensión
NMX-J-149/1	Fusibles alta tensión-parte 1: cortacircuitos - fusibles limitadores de corriente
IEC 62271-1	Common specifications
IEC 62271-103	Switches for rated voltages above 1 kv and less than 52 kv
IEC 62271-105	Alternating current switch-fuse combinations
IEC 62271-200	Ac metal-enclosed switchgear and controlgear for rated voltages above 1 kv and up to and including 52 kv
IEC 60273	Characteristics of indoor and outdoor post insulators for systems with nominal voltages greater than 1000 v
IEC 60282-1	High-voltage fuses - Part 1: Current-limiting fuses
ANSI-IEEE STD C37.20.3	Standard for metal-enclosed interrupter switchgear
ANSI C37.22	Preferred ratings and related required capabilities for indoor ac medium-voltage switches used in metal-enclosed switchgear
IEEE STD C37.20.4-2001	Standard for indoor ac switches (1 kv–38 kv) for use in metal-enclosed switchgear

### 3. Operating Conditions

**DRIWISA™ “PP” compact substations** are able to operate within the range of the following environmental conditions:

NEMA 1 / NEMA 12

Temperature: -10° C / +40° C  
Relative Humidity: < 60%  
Altitude: 0 -1000 masl\*

NEMA 3R

Temperature: -10° C / +40° C  
Relative Humidity: < 90%  
Altitude: 0 -1000 masl\*

\* For higher installation must apply the appropriate correction factors.

**DRIWISA™ “PP” compact substations** have the appropriate protection NEMA or IP degree, to ensure the specified temperature and humidity conditions, so as to keep the inside air free of smoke, gases, corrosive or explosive vapors and electrically conductive particulates (dust).

IEC 60529	Degrees of protection provided by enclosures (IP Code)
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NEMA  
250

Enclosures for electrical equipment (1000 volts  
maximum)

## 4. Ratings

**DRIWISA™ “PP” compact substations** meet the following electrical values (according to the requirements of section 2).

MAXIMUM VOLTAGE kV	RATED CURRENT A	PEAK CURRENT kA	SHORT-TIME CURRENT kA(rms) @ 3seg	IMPULSE VOLTAGE (BIL) 1.2 x 50 μs kV	WITHSTAND VOLTAGE 60 Hz 1 min DRY kV
<b>7.2</b>	<b>400</b>	<b>65</b>	<b>25</b>	<b>60</b>	<b>20</b>
	<b>630</b>	<b>65</b>	<b>25</b>	<b>60</b>	<b>20</b>
	<b>1250</b>	<b>99</b>	<b>38.1</b>	<b>60</b>	<b>20</b>
<b>17.5</b>	<b>400</b>	<b>65</b>	<b>25</b>	<b>95</b>	<b>38</b>
	<b>630</b>	<b>65</b>	<b>25</b>	<b>95</b>	<b>38</b>
	<b>1250</b>	<b>99</b>	<b>38.1</b>	<b>95</b>	<b>38</b>
<b>25.8</b>	<b>400</b>	<b>65</b>	<b>25</b>	<b>125</b>	<b>60</b>
	<b>630</b>	<b>65</b>	<b>25</b>	<b>125</b>	<b>60</b>
	<b>1250</b>	<b>99</b>	<b>38.1</b>	<b>125</b>	<b>60</b>
<b>38</b>	<b>400</b>	<b>65</b>	<b>25</b>	<b>150</b>	<b>80</b>
	<b>630</b>	<b>65</b>	<b>25</b>	<b>150</b>	<b>80</b>
	<b>1250</b>	<b>99</b>	<b>38.1</b>	<b>150</b>	<b>80</b>

Table 1

## 5. Constructions

### 5.1 Modular System

Screwed modules permit, increase or reduce the original electrical arrangement using the following modules:

- a. Meter Module:  
This section allows measuring and control equipment from the utility to be installed (Current and Potential transformers).
- b. Non load switch Module:  
The **DRIWISA™** non-load switch type “DTP” is installed upside-down on the upper part of the load break switch module, sharing the same connections and space in order to reduce external dimensions of the substation. The function of the non-load switch is the isolation of

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the the load break switch from the other sections, once the load break switch type LDTP has been disconnected, thus permitting safe maintenance.

Due to the position of the non-load switch, this section can also be used as incoming line section, because of sufficient available space to connect the incoming cables.

c. **Load Break Switch Module:**

Designed to install the LDTP type Load Break Switch in a lateral position, with quick make and quick break mechanisms to be directly operated from the front of the substation. No additional transmission rods or other operating mechanisms are necessary.

Current limiting fuses are extracted laterally due to their installation. For this matter, the fixation clips show a 60° angle towards the front of the substation. It is always recommended to use safety accessories when removing fuses (pliers) to avoid burns because of the high temperature fuses show after operation (between 200 and 500° C). Always follow the protection and safety recommendations described in the respective operating manuals.

This section will usually be provided with a lightning arrester, unless told otherwise by the customer.

d. **Transformer connecting Module:**

Because of the design of the substation, the transformer connecting section is included in the module of the Load Break Switch, thus avoiding an additional module. Therefore, if the customer only requires an outgoing module, the conduting bus bars will not be installed.

e. **Incoming module:**

This module is included in the non-load switch module. If a Non-Load Switch is required, cables can be directly connected to the bus bars.

f. **Transition Module:**

This module is included withing the load break switch module.

## **5.2 Surge Arresters**

Metal oxide with polymeric housing, distribution class, heavy duty, neutral earthing.

## **5.3 Incomming line and transformer connecting bar.**

Are electrolytic copper (99.9%) with rolled edges, natural finish, ¼ x 1 ¼", able to conduct up to 630 A. rate currents and able to withstand short-time currents, and meets with the temperature rise limits according to the indicated standars in section 2.

## **5.4 Insulators**

Made of non-hygroscopic material, inflammable with adequate mechanical strength to withstand the stresses generated by normal operation and the effects of short circuit currents. Their mechanical strength not allows distortion that can cause insulation failures in the **DRIWISA™ "PP" compact substations**.

## **5.5 Structure**

Are made out of cold rolled steel 12 gauge (2.78 mm), firmly connected to covers by ¼" rivet nuts.

## **5.6 Doors and covers**

Are made out of cold rolled steel 14 gauge (2 mm), with fixing holes for easy mounting to the frames. The frontal doors have a window shatterproof material and rustproof locks.

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### **5.7 Finish**

All structural parts, covers and doors are painted with electrostatic paint (epoxy powder) in grey color (ANSI 61), both on the inside and the outside, thus providing ideal protection against corrosion.

### **5.8 Fasteners**

- Cadmium plated fasteners grade 2 at NEMA 1 and NEMA12 substations.
- Stainless steel grade 5 fasteners grade 5 at NEMA 3R substations.

## **6. Technical Data**

### **6.1 Drawings**

Printed drawings on letter size or multiple letter are available as required. If it is requested, an electronic drawings (2D and 3D) copy can be provided.

### **6.2 Instructions**

Each **DRIWISA™ “PP” compact substations** are supplied with printed mounting, operation and maintenance instructions manual, and a electronic manual are available in our we site.

## **7. Certifications**

### **7.1 Prototype test reports**

Prototipe test reports were conducted at national laboratories certified (LAPEM) to ensure compliance with the values and capacities specified in Section 4.

Next tests were made to the **DRIWISA™ “PP” compact substations**:

- Short time current test (3 sec.)
- Temperature rise test
- Peak current
- Impulse voltage
- Withstand voltage 1 min. 60 Hz.

### **7.2 Routine Tests**

Routine tests are carried out on each **DRIWISA™ “PP” compact substations** after fabrication, and test reports are available.

The routine tests are performed as follows:

- Visual Inspeccion and dimensional analysis.
- Contact resistance
- Power Frequency withstand test.
- Insulation test (megger)
- 10 no-load mechanical operations.
- Blockings system mechanicla operation

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## **8. Marking**

Each **DRIWISA™ compact substations** includes a nameplate or identification label, made of steel or adhesive plastic material containing the following information:

- Name of the manufacturer and date of manufacture
- Serial Number
- Type and Model
- Rated Voltage kV
- Rated lightning impulse withstand voltage (BIL) in kV
- Rated Current A
- Short Circuit Current kA
- Country of origin

## **9. Accessories and spare parts**

### **9.1 Accessories**

**DRIWISA™ compact substations** offer optional accessories to be installed before or after the shipping, such as:

- a) Auxiliary tripping coil.
- b) Auxiliary contacts for position indication of main blades.
- c) Auxiliary contacts to indicate the fuse state.
- d) Auxiliary contacts to indicate the position of the grounding switches.
- e) Disc operators mechanism.
- f) Complete conversion kit (to change the single fuse holder to double fuse holder).
- g) Fuse size conversion kit.
- h) Motor drive local or remote operation.
- i) Substation covers.
- j) Additional modules.
- k) Plier for high voltage fuses.
- l) Voltage indicators.

### **9.2 Spare Parts**

**DRIWISA™ compact substations** offer the following spare parts for repair or maintenance:

- a) Clip Assemblies for current limiting fuses single or dual version.
- b) Complete pole (insulator and conductive parts).
- c) Live parts (conductive parts).
- d) Insulators.
- e) Lateral covers.
- f) Locking door.
- g) Additional modules.
- h) Operating levers.