PTI SUBSTATIONS

Substations : Indoor and outdoor type
PRODUCTS PRESENTATION
PTI SUBSTATIONS

Indoor PTS 32 and outdoor PTS 32
Indoor and outdoor models
from 5 to 50 kVA

PT BTM
Outdoor model
from 5 to 100 kVA

PTC
Outdoor or indoor models
from 25 to 500 kVA

PTM and PTMI
Indoor model
From 25 to 160 kVA
PTI SUBSTATIONS
From 5 to 500 kVA

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PTI SUBSTATIONS

These compact substations are modular units that ensure that the transformer substation operates smoothly: they can be either step up or a step down models, for indoor or outdoor use.

They offer all the advantages of an integrated and modular design:
* Easy to set up, the station is ready to be connected.
* Station can be made up according to specific requirements

They also offer all the advantages of products made with quality materials:
* Indoor models in steel or aluminium sheets.
* Outdoor models in painted aluminium sheet providing:
  - Greater better resistance against corrosion
  - Easier handling and installation due to its lightness.

Different models available:
The choice of model should be made according to requirements, use, voltage characteristics, power rating, as well as the functioning of the equipment installed on the MV side:

<table>
<thead>
<tr>
<th>Model</th>
<th>Installation</th>
<th>Max voltage* (kV)</th>
<th>Power rating ** in kVA for network</th>
<th>MV device Associated with an HRC protection</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Single-phase</td>
<td>Three-phase</td>
</tr>
<tr>
<td>Indoor PTS 32</td>
<td>Indoor</td>
<td>3.2</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Outdoor PTS 32</td>
<td>Outdoor</td>
<td>3.2</td>
<td>50</td>
<td>32</td>
</tr>
<tr>
<td>PTS BTM</td>
<td>Outdoor</td>
<td>0.95</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>Indoor PTC</td>
<td>Indoor</td>
<td>5.5</td>
<td>250</td>
<td>500</td>
</tr>
<tr>
<td>Outdoor PTC</td>
<td>Outdoor</td>
<td>5.5</td>
<td>100</td>
<td>160</td>
</tr>
<tr>
<td>PTM</td>
<td>Indoor</td>
<td>5.5</td>
<td>160</td>
<td>160</td>
</tr>
<tr>
<td>PTMI</td>
<td>Indoor</td>
<td>5.5</td>
<td>160</td>
<td>160</td>
</tr>
</tbody>
</table>

* Maximum use voltage ** at max. voltage.

Standards: The PTI substations answer the following recommendation standards:
Substation:
* NFC 64 400 - CEI 6227 I-200 : HV equipment in metallic wrap.
* NFC 20 010 - CEI 60529 : Protection degrees insured by the wraps.
Transformer:
* NFC 52-100 - CEI 60076 : Power transformer.
* NFC 52-410 : HV / LV transformer for public lighting.

Composition:
Depending on the models, the substation can comprise:
* Low Voltage compartment containing protection module and, if required ,optional metering (not equipped).
  This metering has an input through the bottom left and output through bottom right.If required, connection circuit breakers can be provided on the outside of substation.
* Transformer compartment LV/MV or MV/LV. Coupling of the transformer according to following table.
* HV isolating switch compartment, with or without earthing isolating switch, with HRC fuse protections.
* HV cable connection compartment.

Setting up:
The step-up substation is fixed on a concrete base supplied by the company with space reserved for input output cables.
It is fully equipped and ready to be connected when it is delivered. The pre-wired transformer is delivered separately.
In the case of a dry transformer equipped with rollers, it must be placed in its permanent position and appropriately installed on the concrete base.
Possible couplings and on load transformation ratios (in volts):

<table>
<thead>
<tr>
<th>Type</th>
<th>Maximum LV BTM</th>
<th>Medium voltage MV</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Single</td>
<td>Three</td>
</tr>
<tr>
<td>Step up</td>
<td>230 / 950 V</td>
<td>400 / 950 V</td>
</tr>
<tr>
<td>Step down</td>
<td>950 / 230 V</td>
<td>950 / 400 V</td>
</tr>
</tbody>
</table>

**Equipements with shared characteristics:**
Composition of the substations and locking system are explained in descriptions of the different models available.

Common elements to the different models are the following:

**Transformer design:** generally dry type with impregnated windings; but for the PTS 32 /out it is an IP68 sealed type. This transformer is specifically designed to cope with routine, daily electromechanical stresses and strains. The step-up transformer, being specifically designed, allows reduction of initial switching on of the current.

**Thermal protection** (optional): This protection is made up of a set of three thermal sensors incorporated into the transformer’s windings. It works on the LV circuit breaker through the use of a release mechanism.

**Protection and MV division unit**: protected by the HRC fuse, as an isolating switch device that can be feeders and/or earthed and short circuited, depending on the model requested. The isolating switch device can be an isolating switch, a load break switch or a contactor feeder depending on substation model. It is described in presentation of models table on page 4. In the case of a sole step-down substation connected to a step-up substation, for selectivity reasons, only the step-up substation is equipped with HRC fuses.

**Complementary equipment and protections**, optional, depending on the model of the retained station description.

**Locking mechanism:**
These units will be supplied with a locking mechanism using a safety lock which prevents:

- Access to a MV compartment provided LV protection and MV isolating switch are not locked in the “open” position and, if necessary, the closed earthing switch for the step-up substation.
- Operation of the on-load MV switch.

Choose your model:

If you still hesitate, trust the AUGIER specialists for expert advice: contact us!
General characteristics:
Painted in aluminium plate sheet RAL 1015, IP 21, this station can be easily installed because the steel works are equipped with a handle to lift and position it over the transformer, which is an impregnated dry type. On the MV side, it is equipped with a 3-position CIMALT rotating switch, which allows line sectionalising, its earthing, as well as feeder insulating measurement. It can be used in 950 V as well as in 3200 V for the three-phase and single-phase networks. The maximum power rating is 50 kVA in 3200 V.

Protections:
On the MV side by HRC fuses and a thermal magnetic circuit breaker (temperature probe in the secondary winding) LV side of the set-down substations.

Easy to operate:
- Switch / isolating switch with three positions allowing normal operation, earthing, short-circuiting and the insulating measurement of the network.
- The adjustment of the voltage by moving straps, off load, +/-5%.
- Earth terminal linked to transformer’s magnetic circuits.

Options:
- Live voltage signal lights (MV side).
- MV fuse melting signalling contact output on terminal.
- Thermal probe output on the terminals for the step-up transformer.
- Homopolar protection by differential core and relay.
- P1 card and C cardew, insulation controller mounted on the door (950 V).
- Lighting arrester on the MV side but also on the LV side, if appropriate.
- “In service” position for the CIMALT switch output on the terminals.
- Resistant to heat.
- LV compartment to equip depending on the needs.
- Substation with bottom and anti-insects wire mesh on airways (IP31).
- 950 V load break switch at the place of the CIMALT.

Standards characteristics:

<table>
<thead>
<tr>
<th>Power rating (kVA)</th>
<th>5 to 50 kVA (see selection table)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step up transformer:</strong></td>
<td></td>
</tr>
<tr>
<td>Primary voltage</td>
<td>230 V or 400 V</td>
</tr>
<tr>
<td>No load secondary voltage</td>
<td>970 V or 3360 V</td>
</tr>
<tr>
<td><strong>Step down transformer:</strong></td>
<td></td>
</tr>
<tr>
<td>Primary voltage</td>
<td>950 V or 3200 V</td>
</tr>
<tr>
<td>No load secondary voltage</td>
<td>235 V or 410 V</td>
</tr>
<tr>
<td>Insulation class primary / secondary</td>
<td>1100V or 3600 V</td>
</tr>
<tr>
<td>Coupling</td>
<td>Single phase, Three phase or Three-single phase</td>
</tr>
<tr>
<td>Transformer</td>
<td>TTAI impregnated dry type</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dimensions:</th>
<th>Small model S</th>
<th>Big model XL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length (mm) + LV compartment</td>
<td>1000 + 300</td>
<td>1200 + 300</td>
</tr>
<tr>
<td>Depth (mm)</td>
<td>600</td>
<td>800</td>
</tr>
<tr>
<td>Height (mm)</td>
<td>1200</td>
<td>1500</td>
</tr>
</tbody>
</table>

Dielectric tests: Power frequency withstand voltage : 3 kV or 10 kV 50 Hz - 1 mn depending on the voltage level.
### SELECTION TABLE - POWER RATING LIMITS OF USE

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Power rating (kVA)</th>
<th>5</th>
<th>7.5</th>
<th>10</th>
<th>16</th>
<th>25</th>
<th>32</th>
<th>50</th>
</tr>
</thead>
<tbody>
<tr>
<td>950 V Single phase</td>
<td></td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S*</td>
<td>XL*</td>
<td>XL*</td>
</tr>
<tr>
<td>950 V Three phase</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>XL</td>
<td>XL</td>
<td>XL*</td>
</tr>
<tr>
<td>3200 V Single phase</td>
<td></td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>XL</td>
<td>XL</td>
</tr>
<tr>
<td>3200 V Three phase</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>XL</td>
<td>XL</td>
<td>XL</td>
</tr>
</tbody>
</table>

- Power rating compatible to the voltage level
- S: small model
- XL: big model
- * With 950 V load break switch

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### PTS 32 - OPENED DOOR

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### STEP UP / STEP DOWN STATIONS - LOCKING

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### DIAGRAM FOR LOCKING SYSTEM

Open the upstream LV circuit breaker and open it through A, key A becomes free. With key A unlock the step-up station’s switch/isolating switch, prisoner key A. Position the step-up station’s switch/isolating switch in the earthing position and lock it with the help of key B, key B becomes free. With key B the possibility of access: to the transformer compartment, opened door, key B is imprisoned, or to the MV network.

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Plan 55 01359

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Plan 4504135

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1. GENERAL CIRCUIT BREAKER (not supplied)
2. STEP UP TRANSFORMER
3. MV FUSES
4. SWITCH / ISOLATING SWITCH (CIMALT)
5. STEP DOWN TRANSFORMER
MINI SUBSTATION PTS 32 ext
Outdoor type

General characteristics:
Painted in aluminium plate sheet RAL 1015, IP 44, this station can be easily installed because the steel works are equipped with a handle to be lifted and be placed over the transformer that is made of epoxy resin and is watertight IP 68. On the MV side, it is equipped with a 3 position CIMALT rotating switch, which allows line sectionalising its earthing as well as feeder insulating measurement.
It can be used in 950 V (LV) and 3200 V (MV) for single-phase or three-phase networks. Its maximum power rating is:
- 50 kVA single-phase.
- 32 kVA three-phase.

Protections:
On the MV side of the transformer by HRC fuses, by a thermal magnetic circuit breaker (temperature probe in the secondary winding incorporated in the transformer) LV side of the set-down substations.

Easy to operate and intervene:
- 3 position switch / isolating switch, allowing normal operations, earthing, short-circuiting and the insulating measurement of the network.
- The adjusting of the voltage by moving straps, off-load +5% (950 V).
- 3 point locking.
- Earthing terminal linked to the transformer’s magnetic circuits.

Options:
- Homopolar protection by differential core and relay.
- P1 card and C cardew, insulation controller mounted on the door (950 V).
- Lighting arrester on the MV side and also on the LV side if appropriate.
- « In service » position for the CIMALT switch output on the terminals.
- Resistant to heat and thermostat.
- LV compartment to equip depending on the needs.
- Substation with bottom and anti-insects wire mesh on airways (IP31).
- 950 V load break switch at the place of the CIMALT.

Standard characteristics:

<table>
<thead>
<tr>
<th>Power rating (kVA)</th>
<th>5 to 50 kVA (see selection table)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step up transformer:</td>
<td></td>
</tr>
<tr>
<td>Primary voltage</td>
<td>230 V or 400 V</td>
</tr>
<tr>
<td>No load secondary voltage</td>
<td>970 V or 3360 V</td>
</tr>
<tr>
<td>Step down transformer:</td>
<td></td>
</tr>
<tr>
<td>Primary voltage</td>
<td>950 V or 3200 V</td>
</tr>
<tr>
<td>No load secondary voltage</td>
<td>235 V or 410 V</td>
</tr>
<tr>
<td>Primary / secondary insulating class</td>
<td>1100V or 3600 V</td>
</tr>
<tr>
<td>Coupling</td>
<td>Single phase, three phase</td>
</tr>
<tr>
<td>Transformer</td>
<td>IP 68 TSA or TED type</td>
</tr>
<tr>
<td>Dimensions:</td>
<td></td>
</tr>
<tr>
<td>Length (mm) + LV compartment</td>
<td>Small model S 1000 + 300</td>
</tr>
<tr>
<td></td>
<td>Big model XL 1200 + 300</td>
</tr>
<tr>
<td>Width (mm)</td>
<td>600</td>
</tr>
<tr>
<td></td>
<td>800</td>
</tr>
<tr>
<td>Height (mm)</td>
<td>1200</td>
</tr>
<tr>
<td></td>
<td>1500</td>
</tr>
</tbody>
</table>

Dielectric tests: Power frequency withstand voltage: 3 kV or 10 kV 50 Hz - 1 mn depending on voltage level.
### SELECTION TABLE - POWER RATING LIMITS OF USE

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Power rating limits (kVA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>950 V single-phase</td>
<td>5, 7.5, 10, 16, 25, 32, 50</td>
</tr>
<tr>
<td>950 V three-phase</td>
<td>XL, XL, XL, XL, XL, XL, -</td>
</tr>
<tr>
<td>3200 V single-phase</td>
<td>XL, XL, XL, XL, XL, XL, -</td>
</tr>
<tr>
<td>3200 V three-phase</td>
<td>XL, XL, XL, XL, XL, XL, -</td>
</tr>
</tbody>
</table>

#### Notes:
- Power rating compatible to the voltage level.
- S: Small model
- XL: Big model
- * With 950 V load break switch

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**PTS 32 ext «XL»**
With LV compartment

**PTS 32 - OPENED DOOR**
Cables connection plate
Isolating switch and earthing terminal (CIMALT)

Cross pieces that may be deposited for the extraction of the transformer

230 V or 400 V connection terminal
Step up transformer

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### STEP UP / STEP DOWN STATIONS : LOCKING

**DIAGRAM FOR INTERLOCKING SYSTEM**

**Step-up station:** Open the upstream LV circuit breaker with key A, key A becomes free. With key A open the step-up stations door lock, when door opened, key A is imprisoned. Position the step-up stations switch/ isolating switch on the earthing position and lock it with the help of key B, key B becomes free.

**Step-down station:**
Using key B you can access MV network and step-down station, retrieve key C, the outside bolt prevents the closing of the door. Using key C, it is possible to unlock the switch/ isolating switch in order to put it on earthing or insulation measurement position.

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1 - GENERAL CIRCUIT BREAKER (not supplied)
2 - STEP UP TRANSFORMER
3 - MV FUSES
4 - SWITCH / ISOLATING SWITCH
5 - SHUNT
6 - STEP DOWN TRANSFORMER
7 - LV CIRCUIT BREAKER OF STEP DOWN SUBSTATION (optional)
MINI SUBSTATION PT BTM
Outdoor type

General characteristics:
Painted in aluminium steel plate sheet RAL 1015, IP 44, for outdoor use, this station is characterised by its robustness and easiness.
On the 950 V side, it is equipped with a load break switch, earthing and short-circuiting isolating switch. Its LV compartment is conceived to receive LV equipments. It can be equipped with a 100 kVA maximum power rating watertight transformer. The watertight transformer is delivered separately.

Protections:
With a magneto-thermic circuit breaker (thermal probe in the secondary winding) at the output of the step up transformer and with HRC fuses on the 950 V side.

Advantages:
- LV compartment integrated with an independent access.
- 950 V earthing switch and insulating measurement.
- The adjusting of the voltage by moving straps, off load +/-5%.
- Locking and closing of the station by 3 points locking.
- 950 V connection on terminals for copper cable of 35 mm² maximum.
- Disposable lifting lugs to be easily installed.

Options:
- An other 950 V load break switch to create two three-phase outputs or four single-phase outputs.
- 950 V live voltage signal lights installed in LV compartment.
- 950 V fuse melting signalling contact output on terminal.
- Homopolar protection by differential core and relay.
- Thermal protection by probes in the transformer.
- Lighting arrester on the 950 V side and also on the LV side if appropriate.
- Resistant to heat and thermostat.
- LV dimmer compartment from 5 to 63 kVA.

Standard characteristics:

<table>
<thead>
<tr>
<th>Power rating (kVA)</th>
<th>5 to 100 kVA (see selection table)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step up transformer</strong> :</td>
<td>230 V or 400 V 970 V</td>
</tr>
<tr>
<td>Primary voltage</td>
<td></td>
</tr>
<tr>
<td>No load secondary voltage</td>
<td></td>
</tr>
<tr>
<td><strong>Step down transformer</strong> :</td>
<td>950 V 235 V or 410 V</td>
</tr>
<tr>
<td>Primary voltage</td>
<td></td>
</tr>
<tr>
<td>No load secondary voltage</td>
<td></td>
</tr>
<tr>
<td>Primary / secondary insulating class</td>
<td>1100 V</td>
</tr>
<tr>
<td>Coupling</td>
<td>Single phase, three phase or three single phase</td>
</tr>
<tr>
<td>Transformer</td>
<td>IP 68 watertight</td>
</tr>
<tr>
<td>Length (mm) + dimmer compartment</td>
<td>2000 + 500</td>
</tr>
<tr>
<td>Width (mm)</td>
<td>1100</td>
</tr>
<tr>
<td>Height (mm)</td>
<td>1700</td>
</tr>
</tbody>
</table>

Dieletrical tests: Power frequency withstand voltage: 3 kV 50 Hz - 1 mn.
**SELECTION TABLE - POWER RATING LIMITS OF USE**

<table>
<thead>
<tr>
<th>Voltage</th>
<th>5</th>
<th>7.5</th>
<th>10</th>
<th>16</th>
<th>25</th>
<th>32</th>
<th>50</th>
<th>63</th>
<th>80</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>950 V single phase</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>950 V three phase</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Power rating compatible with the voltage level.

**DIAGRAM FOR LOCKING SYSTEM**

**STATION POWERING OFF**

- Access to LV compartment by the door and with the help of the D key.
- Open the LV circuit breaker, lock it opened with the A key, A key free.
- Position the switch / isolating switch on earthing position and lock it with the B key.
- Introduce A and B keys in the central lock «A,B,C». Lock A and B keys, the C key goes free and keys A and B are imprisoned.
- With C and E keys; possible access to the 950 V compartment by the door => access to the transformer, to the fuses and 950 V connection terminals.

0 - COUTING TABLE (not supplied)
1 - LV GENERAL CIRCUIT BREAKER
2 - LV CONTACTOR
3 - STEP UP TRANSFORMER
4 - 950 V FUSE
5 - SWITCH / ISOLATING SWITCH
NETWORK - POWER OFF - EARTHING
General characteristics:
Painted in steel plate sheet RAL 7035, IP 21, a typical of this station is its great capacity to receive impregnated dry type transformers. On the MV side, it is equipped with a rotated isolating switch, which allows sectionalising of the line. It can be used in 3200 V and in 5500 V (MV) for the single phase or three phase networks.
Power rating:
- 160 kVA in 5500 V : small model
- 500kVA in 5500 V : larger model

Access is through the right side door for MV connection and LV compartment if this is required. Access at front for fuse compartment, transformer compartment and control of the isolating switch.

Protections:
Through HRC fuses installed in an independant and lockable compartment. Optional: LV compartment if this is required when ordering equipment. A circuit breaker can be supplied if required with or without a visible powercut, with or without current emission release, and control contactor.

Easy to operate:
The rotated isolating switch, 200 A, installed on the front, does not allow a load installation cut. A locking device can also be supplied ensuring totally safe operations.

Options:
- Earthing isolating switch.
- MV live voltage signal lights.
- MV differential protection that acts on the LV circuit breaker.
- Thermal protection through probe incorporated in the center part of the windings Which works on the LV circuit breaker.
- Fuse melting signalling and tripping system.
- Adjusting taps +/- 2,5 +/- 5 %.
- Rotating isolating switch position, output on the terminals.
- Supplementary connections in case of single / three-phase transformer (up to 4 feeders).

Standard characteristics:

<table>
<thead>
<tr>
<th>Power rating (kVA)</th>
<th>25 to 500 kVA (see selection table)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step up transformer</strong> :</td>
<td></td>
</tr>
<tr>
<td>Primary voltage</td>
<td>400 V</td>
</tr>
<tr>
<td>No load secondary voltage</td>
<td>3360 V or 5750 V</td>
</tr>
<tr>
<td><strong>Step down transformer</strong> :</td>
<td></td>
</tr>
<tr>
<td>Primary voltage</td>
<td>3200 V or 5500 V</td>
</tr>
<tr>
<td>No load secondary voltage</td>
<td>410 V</td>
</tr>
<tr>
<td>Primary / secondary insulating class</td>
<td>7200 V</td>
</tr>
<tr>
<td>Coupling</td>
<td>Three phase or Three single</td>
</tr>
<tr>
<td>Transformer</td>
<td>TTAI Impregnated dry type</td>
</tr>
<tr>
<td>Dimensions without LV compartment</td>
<td></td>
</tr>
<tr>
<td>Small model S</td>
<td>Big model XL</td>
</tr>
<tr>
<td>Length (mm)</td>
<td>1300</td>
</tr>
<tr>
<td>Width (mm)</td>
<td>1070</td>
</tr>
<tr>
<td>Height (mm)</td>
<td>1900</td>
</tr>
</tbody>
</table>
### SELECTION TABLE - POWER RATING LIMITS OF USE

<table>
<thead>
<tr>
<th>Coupling</th>
<th>Power rating (kVA)</th>
<th>25</th>
<th>32</th>
<th>50</th>
<th>63</th>
<th>80</th>
<th>100</th>
<th>160</th>
<th>250</th>
<th>315</th>
<th>400</th>
<th>500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Three phase</td>
<td></td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>XL</td>
<td>XL</td>
<td>XL</td>
<td>XL</td>
<td>XL</td>
</tr>
<tr>
<td>Three single phase</td>
<td></td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>XL</td>
<td>XL</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**S** : small model  
**XL** : big model

---

**LV side view**

Cable glands for LV earthing cables (on request)

**Front view**

**Left view**

Cable glands for MV cables (on request)

**Rear view**

---

**Detailed size for the PTC in - S model**

- Protection degree : IP21
- Color : RAL 7035
- Handling : 4 lifting bolts

Plan 5500390 d

---

**PTC int - LOCKING**

1– GENERAL CIRCUIT BREAKER (optional)  
2– CONTACTOR (optional)  
3– TRANSFORMER  
4– FUSES  
5– ROTATING ISOLATING SWITCH  
6– EARTHING SWITCH (optional)  
7– MV TERMINATION BARS

- ![IMPRISONED KEY](image)
- ![FREE KEY](image)
- ![PADLOCKING POSSIBILITY](image)

Plan 4501007
MINI COMPACT SUBSTATION PTC ext
Outdoor type

General characteristics:
Consisting of a double enclosure made from aluminium plates sheets IP 45, RAL 7035, this station is equipped with an impregnated dry type transformer. On MV side, it is equipped with a rotating isolating switch, which allows sectionalising of the line. It can be used in 3200 V and in 5500 V (MV) for the three phase or single-phase networks. Power ratings 160 kVA, in 5500 V. Access through right side for MV connection and left side door for LV compartment. Through front door for fuse compartment, transformer compartment and operation of the isolating switch.

Protections:
Through the HRC fuses installed in an independent and lockable compartment. The low voltage compartment is equipped with a protection system for the substation auxiliary, a current socket. On request: a circuit breaker with or without visible cutting, with or without switching off the present current and control switch.

Easy to operate:
The 200A rotated isolating switch installed in the front allows the no load installation cut. A locking device ensures totally safe operations.

Options:
- Earthing switch.
- MV live voltage signal lights.
- MV differential protection acting on the LV circuit breaker.
- Thermal protection through sensors on central part of windings which react on LV circuit breaker.
- Fuse melting signalling and tripping system.
- Adjustment taps +/- 2.5 +/- 5 %.
- Position of the rotating isolating switch, output on the terminals.
- Supplementary connections for three-single-phase transformers (up to 4 connections).
- Plug-in terminal for two-pole concentric type cable, three-pole belt or three-pole twisted type cable.

Standard characteristics:

<table>
<thead>
<tr>
<th>Power rating (kVA)</th>
<th>25 to 160 kVA (see selection table)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step up transformer:</strong></td>
<td>400 V</td>
</tr>
<tr>
<td>Primary voltage</td>
<td></td>
</tr>
<tr>
<td>No load secondary voltage</td>
<td>3360 V or 5750 V</td>
</tr>
<tr>
<td><strong>Step down transformer:</strong></td>
<td>3200 V or 5500 V</td>
</tr>
<tr>
<td>Primary voltage</td>
<td></td>
</tr>
<tr>
<td>No load secondary voltage</td>
<td>410 V</td>
</tr>
<tr>
<td>Primary / secondary insulating class</td>
<td>1100 V or 7200 V</td>
</tr>
<tr>
<td>Coupling</td>
<td>Three phase or Three single phase</td>
</tr>
<tr>
<td>Transformer</td>
<td>TTAI Impregnated dry type</td>
</tr>
<tr>
<td><strong>Dimensions:</strong></td>
<td></td>
</tr>
<tr>
<td>Length (mm)</td>
<td>2000</td>
</tr>
<tr>
<td>Width (mm)</td>
<td>1260</td>
</tr>
<tr>
<td>Height (mm)</td>
<td>1940</td>
</tr>
</tbody>
</table>
### SELECTION TABLE - POWER RATING LIMITS OF USE

<table>
<thead>
<tr>
<th>Coupling</th>
<th>Power rating kVA</th>
<th>25</th>
<th>32</th>
<th>50</th>
<th>63</th>
<th>80</th>
<th>100</th>
<th>160</th>
</tr>
</thead>
<tbody>
<tr>
<td>Three phase</td>
<td></td>
<td>☑️</td>
<td>☑️</td>
<td>☑️</td>
<td>☑️</td>
<td>☑️</td>
<td>☑️</td>
<td>☑️</td>
</tr>
<tr>
<td>Three single phase</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Available models

- Top view
- Front view
- LV side view
- Rear view
- MV side view
- MV compartment
- Fuse compartment
- Transformer compartment
- Switch compartment

**Note:**

- Material:
  - Aluminium 5754 : H111 - thickness : 2.5 mm
  - Protection degree : IP45
  - Color : RAL 7035
  - Handling : 4 lifting bolts
  - Roof is sloped

---

**PTC ext - LOCKING SYSTEM**

1. SITE FOR TARIFF CHANGE COUNTER
2. GENERAL CIRCUIT BREAKER (optional)
3. CONTACTOR (optional)
4. TRANSFORMER
5. FUSES
6. ROTATED ISOLATING WITCH
7. EARTHING SWITCH (optional)
8. MV PLUGIN TYPE TERMINALS (optional)

---

Plan 55 00391 D

Plan 4504007
MODULAR SUBSTATION PTM
Indoor type

General characteristics:
Painted in steel plate sheet RAL 7035 and 7016, IP 21, for indoor use, an important characteristic of this station is its capacity for modification. It is composed of a transformer cell connected to a MV switchboard. It can be used on all LVM ranges and all MV in single phase, three-phase and three/ single phase. The modular substation, though smaller, is entirely accessible through the front, and offers all the functions of MV EP12 - 13 modulars, MV switchboard, as well as maximum user safety. Power rating 160 kVA in 5.5 kV.

Transformer cell:
- **Made up of Low voltage compartment** containing, if required, sectionalising, cut out, protection devices and fuses, switches or circuit breakers, and, if appropriate the control device.
- **A transformer compartment** composed of impregnated dry type transformer. The transformer is delivered separately. Transformer cell can be positioned either at right or left of switchboard, to be specified on order.

**MV switchboard**:
Comprising one or several feeder cubicle equipped with a detachable carriage, which allows the sectionalising and MV protection, protected by HRC fuses, as well as earthing and short circuiting of output cable by earthing switch. Opening of circuit is ensured by the isolating switches or contactor.

Options:
- MV live voltage signal lights.
- Thermal protection through sensors connected to the central part of the windings which react on LV circuit breaker.
- Fuse melting signalling and tripping device.
- Adjustment taps + - 2.5 +- 5 %.
- Diurnal insulation surveillance device DFTEP.

**Standard characteristics**:

<table>
<thead>
<tr>
<th>Power rating (kVA)</th>
<th>25 to 160 kVA (see selection table)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step up transformer</strong> :</td>
<td></td>
</tr>
<tr>
<td>Primary voltage</td>
<td>400 V</td>
</tr>
<tr>
<td>No load secondary voltage</td>
<td>970 V or 3360 V or 5750 V</td>
</tr>
<tr>
<td><strong>Step down transformer</strong> :</td>
<td></td>
</tr>
<tr>
<td>Primary voltage</td>
<td>950V or 3200 V or 5500 V</td>
</tr>
<tr>
<td>No load secondary voltage</td>
<td>410 V</td>
</tr>
<tr>
<td>Primary / secondary insulating class</td>
<td>1100 V or 7200 V</td>
</tr>
<tr>
<td>Coupling</td>
<td>Three phase or three single phase</td>
</tr>
<tr>
<td>Transformer</td>
<td>TTAI Impregnated dry type</td>
</tr>
<tr>
<td>Dimensions with one switchboard</td>
<td></td>
</tr>
<tr>
<td>Length (mm)</td>
<td>1125</td>
</tr>
<tr>
<td>Width (mm)</td>
<td>950</td>
</tr>
<tr>
<td>Height (mm)</td>
<td>1600</td>
</tr>
</tbody>
</table>
SELECTION TABLE - POWER RATING LIMITS OF USE

<table>
<thead>
<tr>
<th>Coupling</th>
<th>25</th>
<th>32</th>
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<tr>
<td>Power rating kVA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Three phase</td>
<td>S</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>XL</td>
<td>XL</td>
</tr>
<tr>
<td>Three single phase</td>
<td>S</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>XL</td>
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<td>XL</td>
</tr>
</tbody>
</table>

S : small model  
L : intermediary model  
XL : big model

PTM - L - CLOSED DOOR

Conforms to NFC 13200 et NFC 64400 standards; allocated current : 200 A; Acceptable short-circuit current : 2.5 kA eff. 1 s.

PTM - LOCKING

With a 2 contactor feeders switchboard

When opening LV circuit breaker, key A becomes free. Open the contactor feeder D1, close the earthing isolating switch, close it, key D1 becomes free. Open the contactor feeder D2, close the earthing isolating switch, lock it and key D2 becomes free. Lock keys A1, D1, D2 in the central lock, key x1 becomes free. Using key x1 the transformer compartment can be accessed.
MODULAR SUBSTATION PTM I
Indoor type

General characteristics:
Painted in steel plate sheet RAL 7035 and 7016, IP 21, for indoor use. It is made up of a transformer cell connected to one or various MV load break switch cells. Can be used on all MLV and MV ranges in single phase, three phase and three/single phase. The modular substation, though smaller, is accessible through the front, and offers maximum user safety. Power rating 160 kVA in 5,5 kV.

Transformer cell:
- **Made up of Low voltage compartment containing, if required,** sectionalising, cut out, protection devices and fuses, switch or circuit breakers and, if appropriate, control device.
- **A transformer compartment** composed of impregnated dry type transformer. The transformer is delivered separately. The transformer cell can be positioned at right or left of switchboard: to be specified on order.

MV load break switch cell:
The load break switch cell, 375 mm long, allows the on load cut-off of the feeder as well as protection through HRC fuses. The cell is equipped with an earthing isolating switch and live voltage signal lights. A locking system ensures totally safe operations.

Options :
- Thermal protection through sensors incorporated in central part of windings which react on the LV circuit breaker.
- Fuse melting signalling and tripping device with information retrieved on terminal.
- Adjustment taps +/- 2.5 +/- 5 %.
- Position contact of the load break switch.

Standard characteristics :

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<tr>
<td>Transformer</td>
<td>TTAI Impregnated dry type</td>
</tr>
<tr>
<td>Dimensions with one switchboard</td>
<td>Small model : S intermediary : L big : XL</td>
</tr>
<tr>
<td>Length (mm)</td>
<td>750 1125 1125</td>
</tr>
<tr>
<td>Width (mm)</td>
<td>950 950 1200</td>
</tr>
<tr>
<td>Height (mm)</td>
<td>1600 1600 1600</td>
</tr>
</tbody>
</table>
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<td>XL</td>
<td>XL</td>
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<td>L</td>
<td>L</td>
<td>L</td>
<td>XL</td>
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<td>XL</td>
</tr>
</tbody>
</table>

S : small model  
L : intermediary model  
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PTM I - CLOSED DOOR

Transformer cell

Cell width : 950 mm

Load break switch cell

Plan 4002473

Conforms to NFC 13200 and NFC 64400 standards; Allocated current : 200 A; Acceptable short circuit current : 2,5 kA eff. 1 s.

PTM I - LOCKING SYSTEM

1- LV LOAD BREAK SWITCH (optional)  
2 - IMPREGNATED DRY TYPE TRANSFORMER  
3 - MV LOAD BREAK SWITCH  
4- FUSES  
5- EARTHING ISOLATING SWITCH  
6- MV TERMINAL BARS

Plan 4503189
NOTE:
Place of the cables lifting according to the plan, in the case of gutter use.
Possibility to install «press «toupes» for cable passage, on request.

INDOOR COMPACT SUBSTATION PTC int (small model)
WALKWAY BASE

WITHOUT LV COMPARTMENT

Cables input
HV 3200 or 5500 V
140 x 300
Earthing terminal place
4 threaded, sealed pins M14
height without base: 40 mm
LV cable input
250 x 300

WITH LV COMPARTMENT

Cables input
HV 3200 or 5500 V
140 x 300
Earthing terminal place
6 threaded, sealed pins M14
height without base: 40 mm
LV cable input
250 x 300
LV cable output
250 x 300

OUTDOOR COMPACT SUBSTATION PTC ext
LAYOUT PLAN

REAR VIEW

HV cable input
3200 or 5500 V
W/NEED

LV cable input
250 x 300
LV cable output
250 x 300

Connection to earthing terminal block at 200 mm
4 threaded, sealed pins M14
height without base: 40 mm
5 threaded, sealed pins M14
height without base: 40 mm

Plan 40 01864 C
Plan 40 02482
NOTE: For outdoor substations we advice:

A walkway with a minimum width of 700 mm, will be made with a light slope forward.

Conform to the NF C 13 200 standard, the equipotential belting will be placed about 0.5 meters near the substation. It can be made up of a copper conductor with 25 mm² cross-section, buried 20 to 30 cm deep.

Connection of the earthing: done by a copper cable of 25 mm² cross-section, connected to the equipotential belting and the concrete base framework. The watertightness between the substation and the base will be made by a neopren washer to be anticipated by the company, around the substation.
INDOOR SUBSTATION PTS 32 int S Model

Rear view

4 threaded, sealed pins M14
height without base : 40 mm

Cables output
100 x 200

Plan 40 02516a

INDOOR SUBSTATION PTS 32 int XL Model

Plan 40 02415a
Our team puts its know-how and expertise at your disposal and is ready to answer all your queries and adapt our products to your specific needs and requirements.

PTS 32 int
PTS 32 ext
PTS 32 ext

PTC LV compartment
PTC outdoor model installed on a walkway base.

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BP 131 - 06513 CARROS Cedex
FRANCE

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Fax : +33 (0) 4 93 29 01 40
home@augier.com
www.augier.com

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