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Site survey report

(IAEN-29-005 Termoelectrica Unit #1-3_rep)

Customer site	Termoelectrica
Customer site location	Strada Mesterei, Manole 3, Chisinau, Moldova
Type of UNITROL	UNITROL 5000
Date of the survey	11.06.2019-13.06.2019
Prepared by	Oleksii Makarenko



[Handwritten Signature] S. Belice „ABS” SRL

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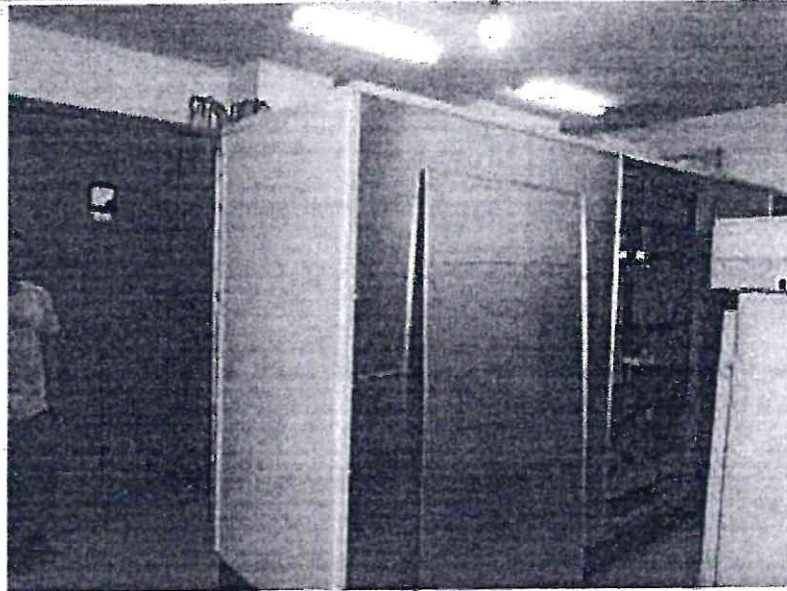
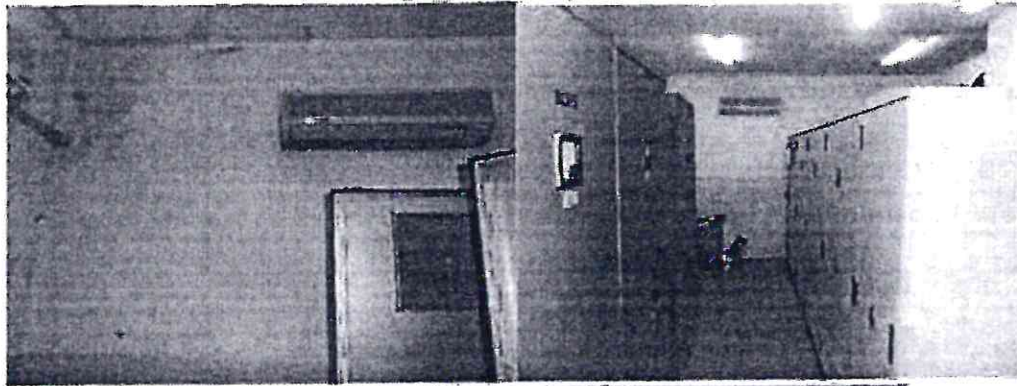
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1. General Aspects

1.1. Environmental conditions and system accessibility

Unit is mounted in the clean room with mean temperature 23 °C. Air conditioning is present. There is no chemical impact against the appliance. Access to rear and the front of the appliance is possible.

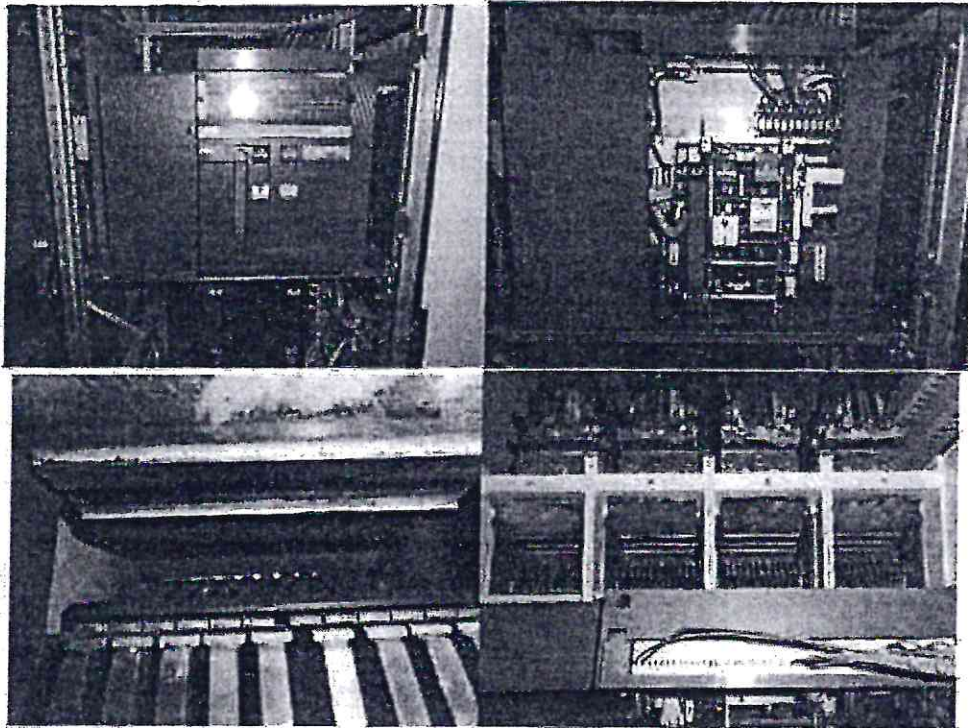


1.2. Availability of spare parts

- | | |
|------------------|-------------------|
| • Thyristors: | No; |
| • Fans: | Yes, # fans: 2; |
| • Field breaker: | actuator for PCB; |
| • CIN: | two pieces; |
| • PS: | MURR; |

1.3. Field breaker

The old field circuit breaker will be used. The FCB is in good condition, contacts are clean, spring mechanism is in order and is regularly replaced by the personnel.



1.4. Documentation

Availability of documents.

- | | |
|---|------|
| • Schematics | Yes; |
| • Layout drawings | No; |
| • Manuals | No; |
| • Single line diagram and test and commissioning report | Yes; |

Status of documentation:

After commissioning changes have been done, which were reflected in the documents-ATPS 05139 rep, UN5000 Termoelectrica schematics.

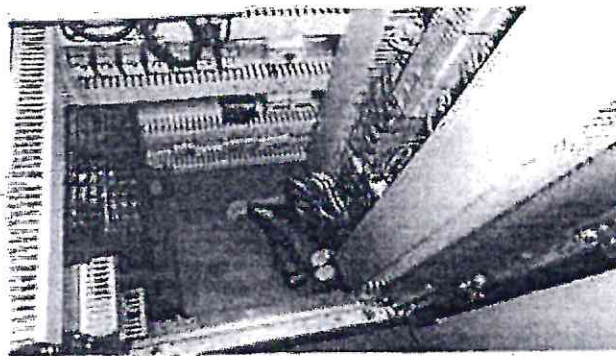
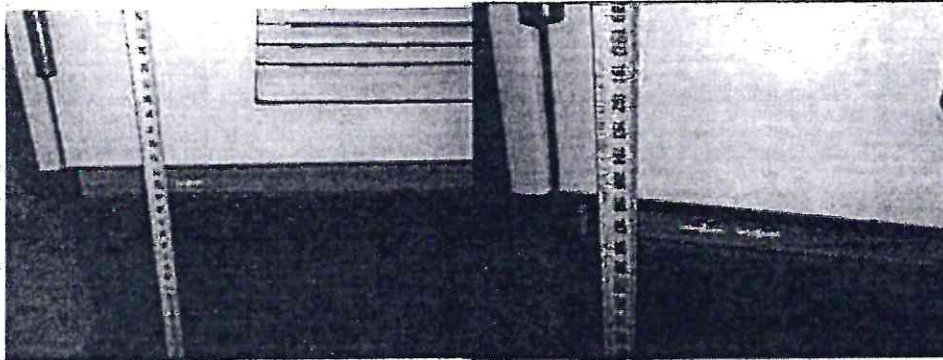
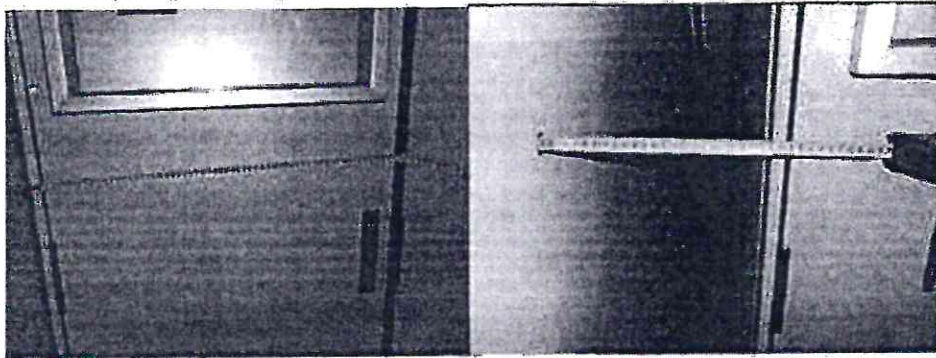
1.5. Functionalities

No additional functions are predicted.

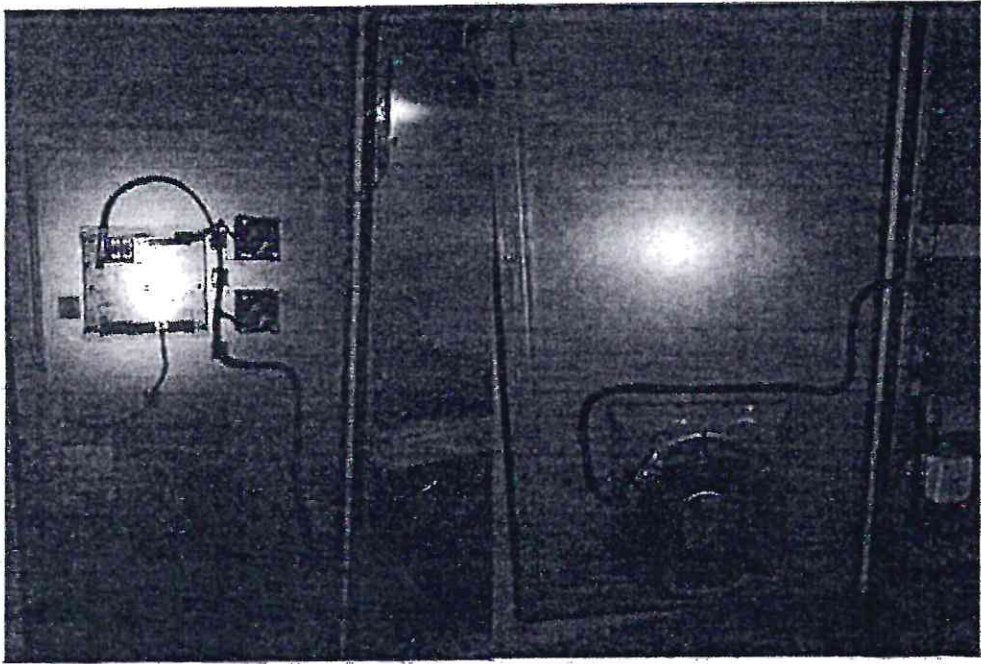
2. Control cabinet(+ER)

- Cleanness of the cabinet: good;
- External dimensions:
 - Width(mm): 620;
 - Depth(mm): 1040;
 - Height(mm): 2160;
- Internal dimensions:
 - Width(mm): 600;
 - Depth(mm): 860;
 - Height(mm): 1900;
- Cabinets' door opening(mm): 292x292 for fan, 150x195 for ECT;

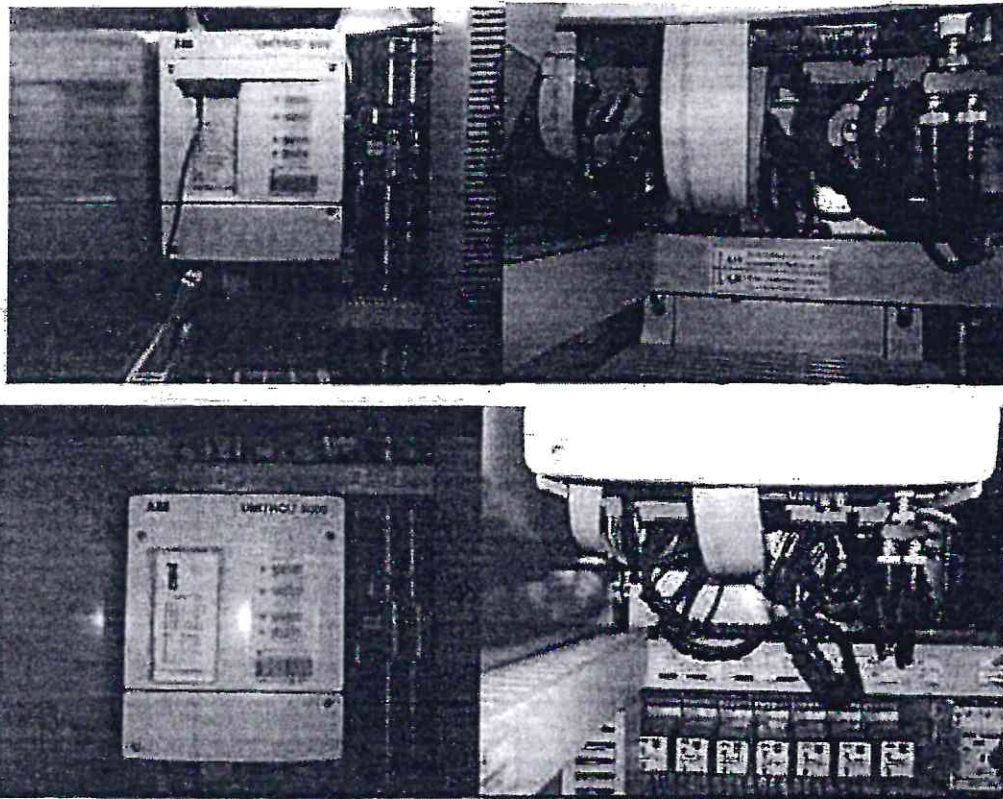
Position of the customer terminal is from right side.



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Picture of the UNITROL rack including the cables to the cabinet.



The instruments on the door are:

- Ammeter;
- Voltmeter;

Number of fans installed: 1 piece;

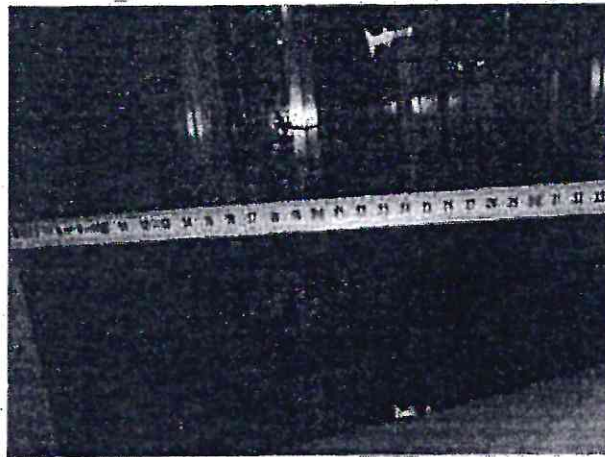
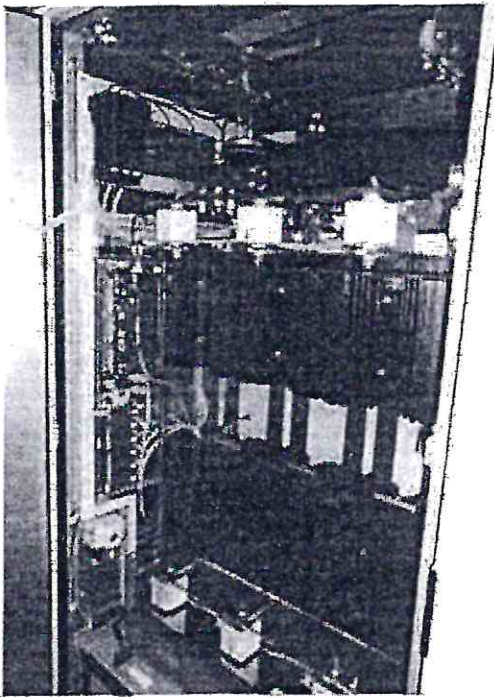
The general status of the door is good. The ECT is required.

3. Converter Cabinet (EG)

The unit has three identical cabinets. There is no heavy dust inside the condition is good.

- External dimensions:
 - Width(mm): 1000;
 - Depth(mm): 1040;
 - Height(mm): 2160;
- Cabinets' door opening (mm): 2x(292x292);

Plexiglas position is not preventing the new plates to be installed in the cabinets.

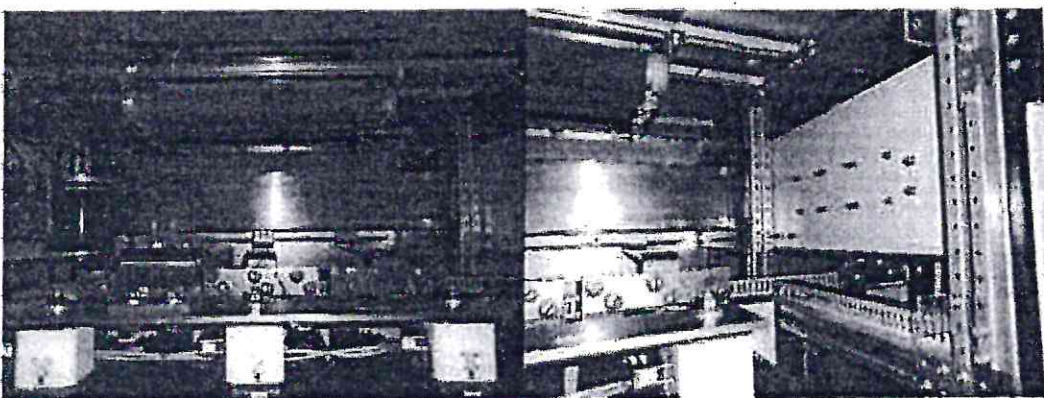
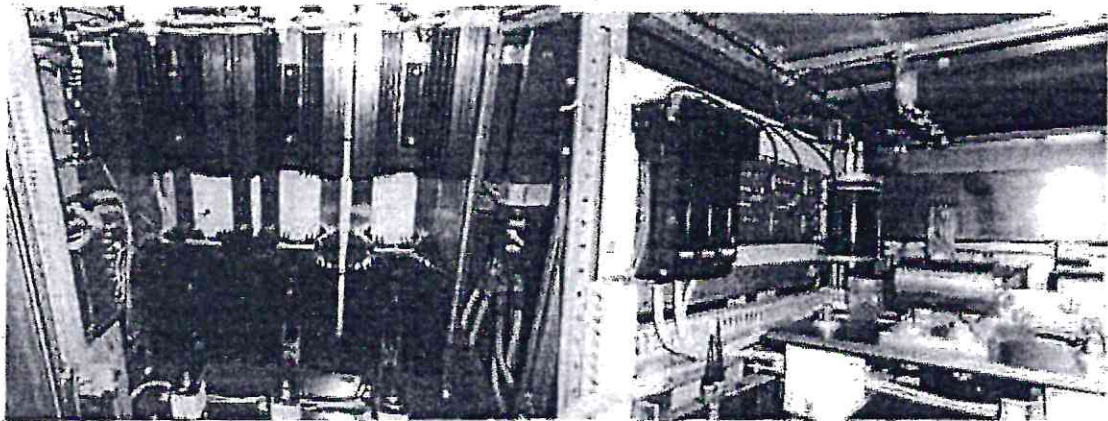


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The thyristors configuration is : 3 thyristor parallel n-1;

Converter type: UNL-13300/UNS-4680 VAR.88 w/o isolator;

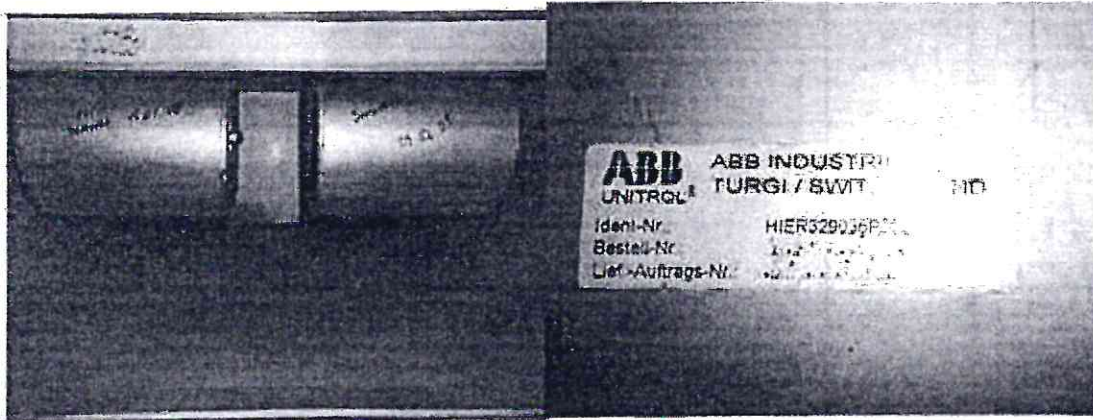
Test voltage of the thyristors is below 5 kV.





There are no instruments and fans mounted on the doors.

Number of the cooling fans is 2 pieces. The condition of the door is generally good.

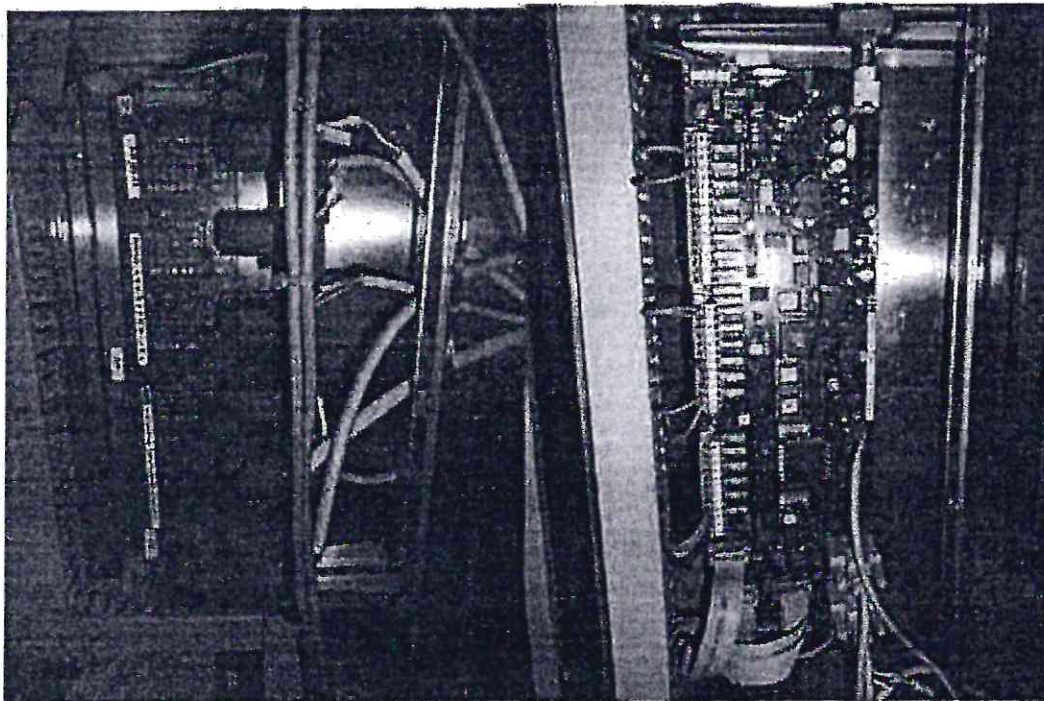


Fans ID: plate indications: HIER 329036P0003; Bestell: 424-231807; Lief-Auftrags-Nr. 501990/1.

Parallel logic of the fans is used.

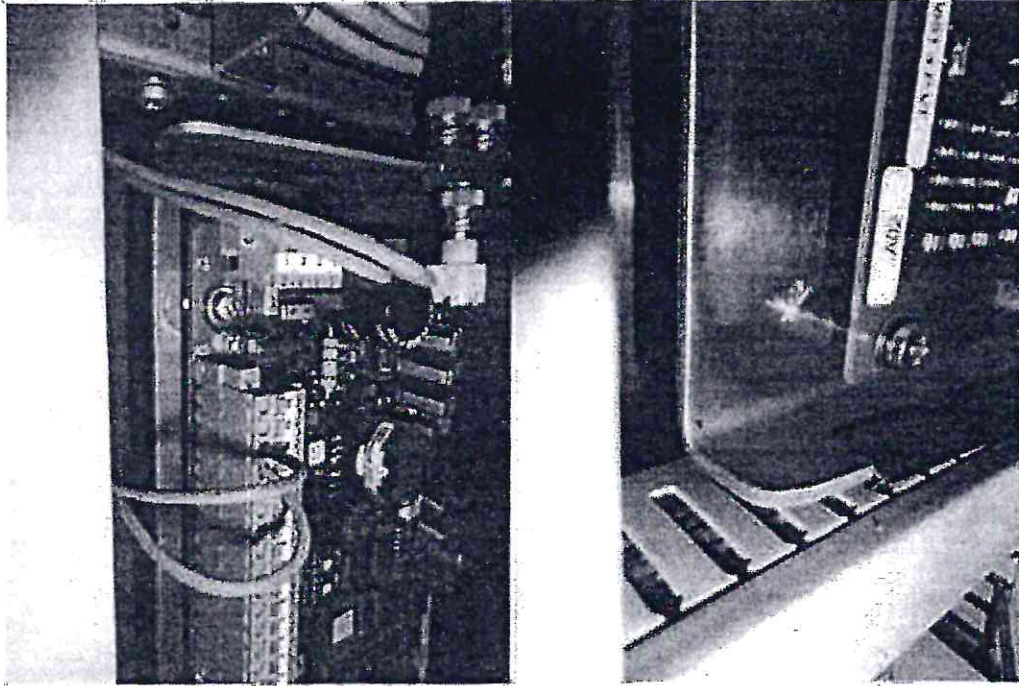
Tech. specs of the fans: 230V, 50-60 Hz, P=240 W.

Pictures of the electronic plate:

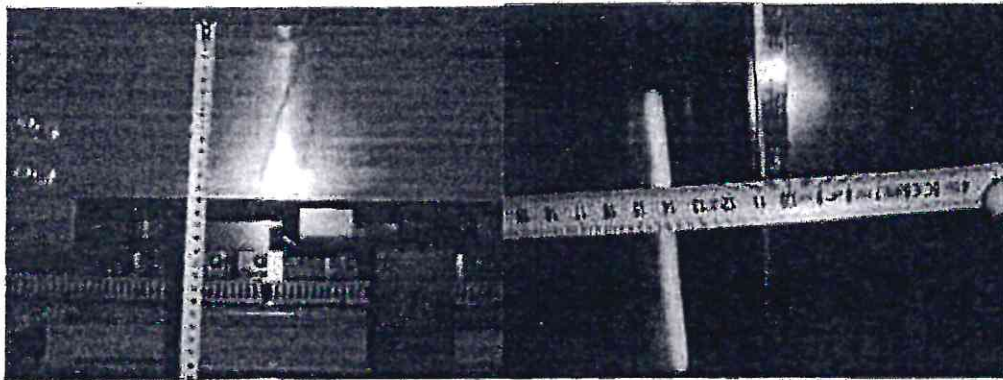




The boards are placed on the lateral side of the cabinet.



Pictures of the allocation of the bus bars:



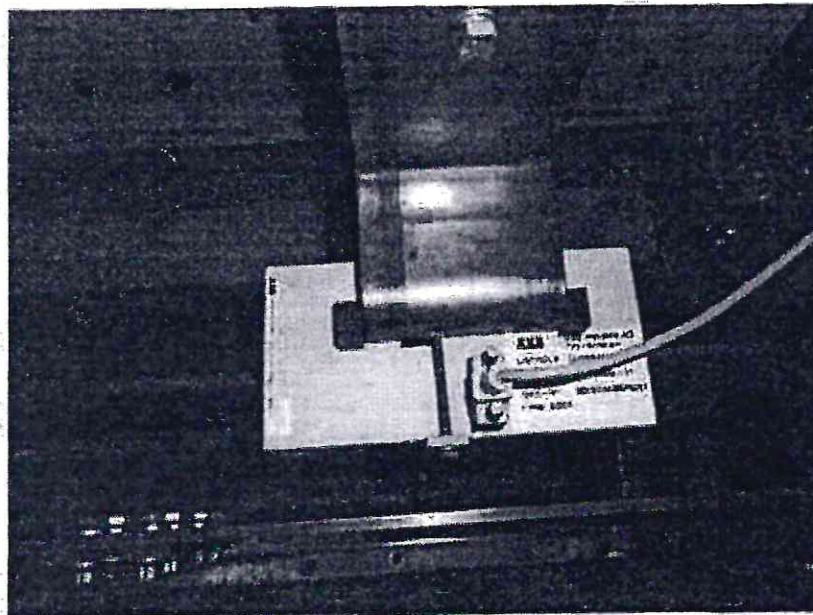
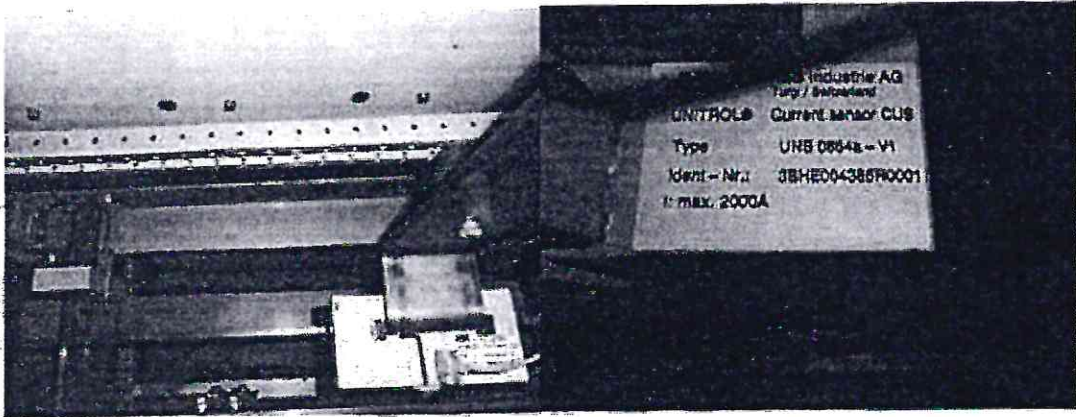
Free space between two bus bars: 100 mm

Free space between the first bus bar and the cabinet left wall: 100 mm

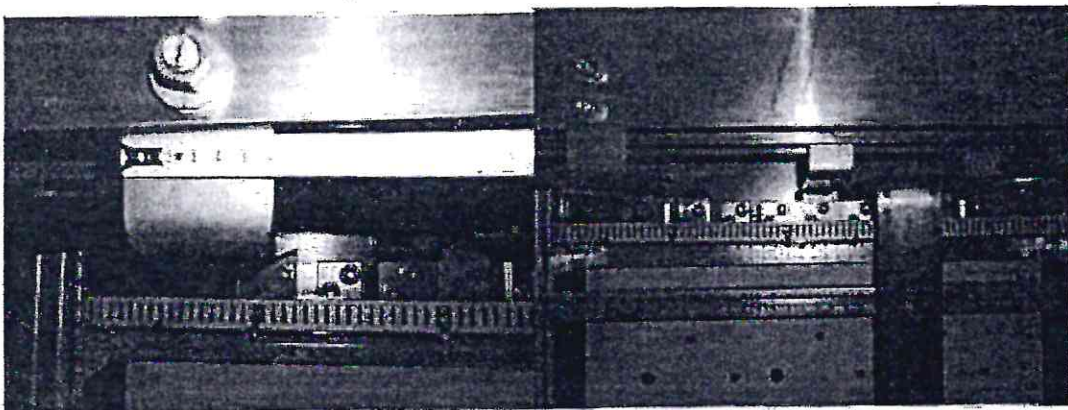
Free space between the last bus bar and the cabinet right wall: 100 mm



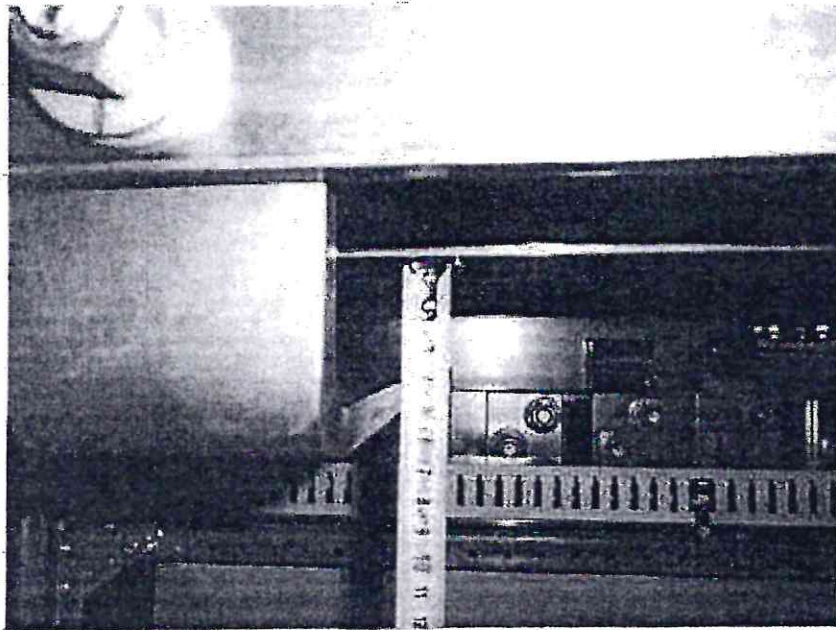
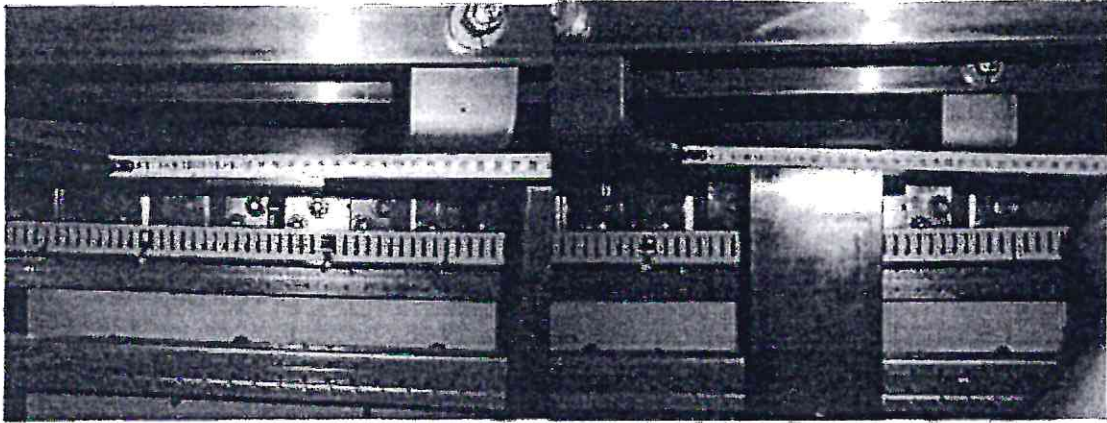
Picture of existing current sensors or other equipment installed on the bus bars



It was evaluated that there is a possibility of installing the new CTs at AC side.



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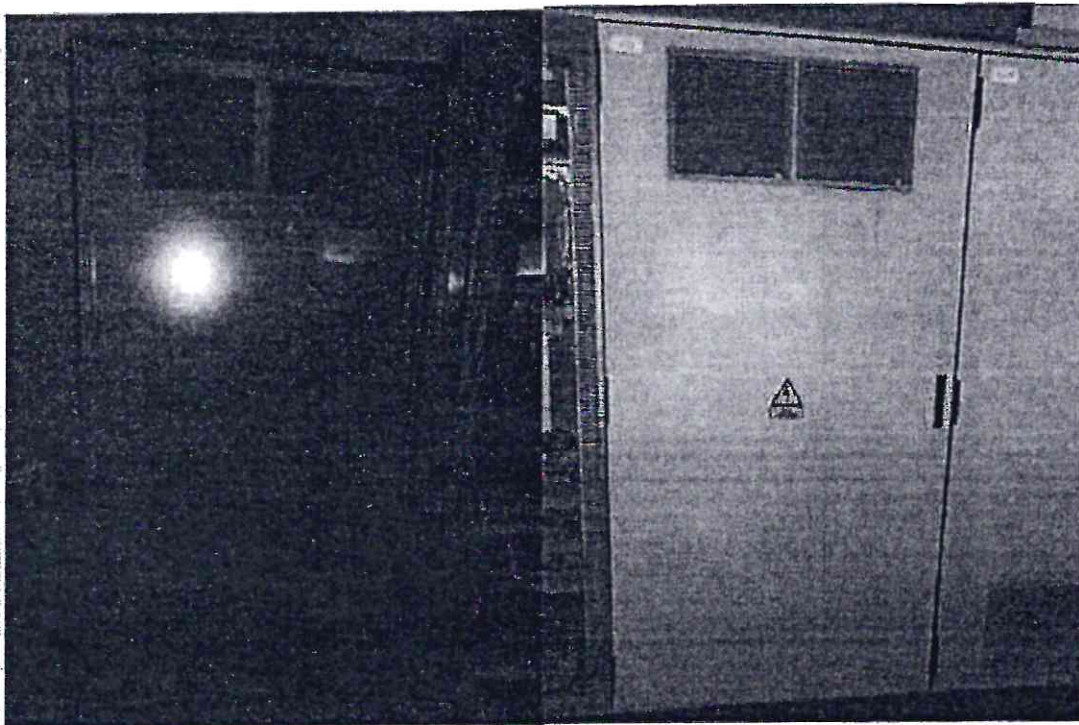


4. Field Circuit Breaker Cabinet(EE, EA)

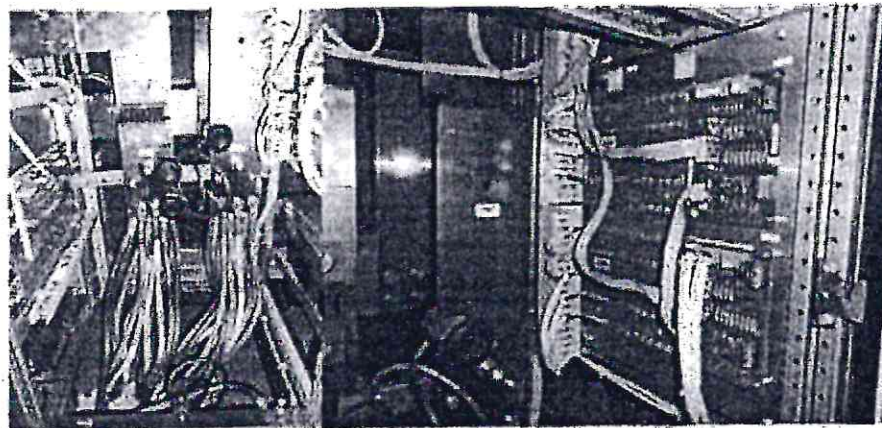
The overall condition of cubicle is good. The cubicle is clean without heavy dust.

- External dimensions:
 - Width(mm): 1000;
 - Depth(mm): 1040;
 - Height(mm): 2160;
- Cabinets' door opening (mm): 2x(292x292);

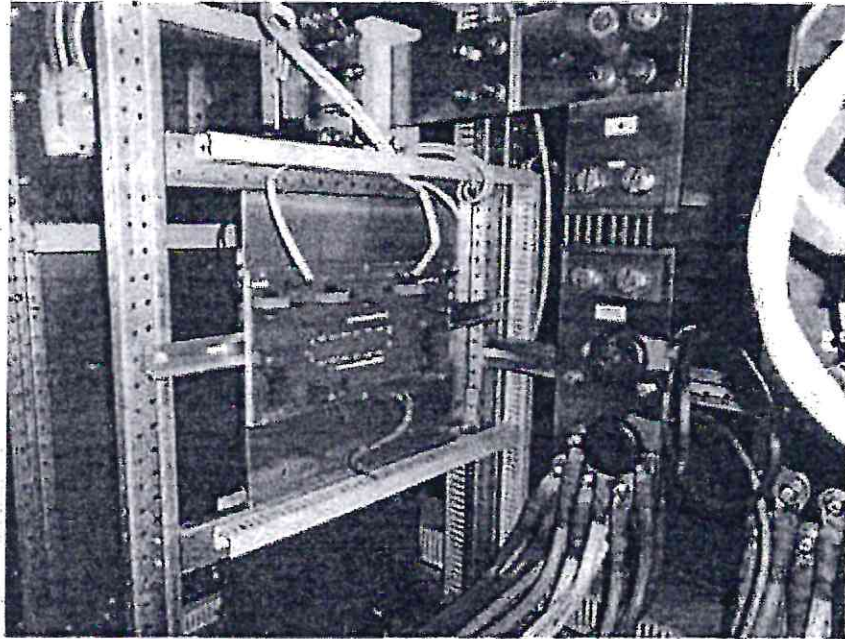
Cabinet door pictures.



Picture of the converter including the cables.



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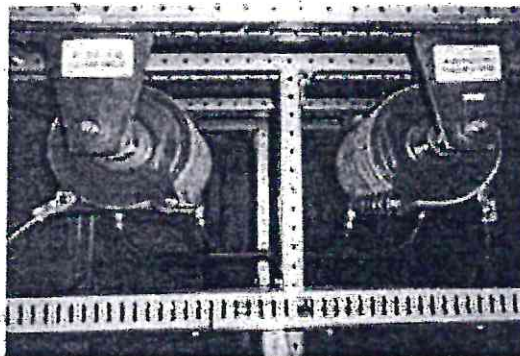
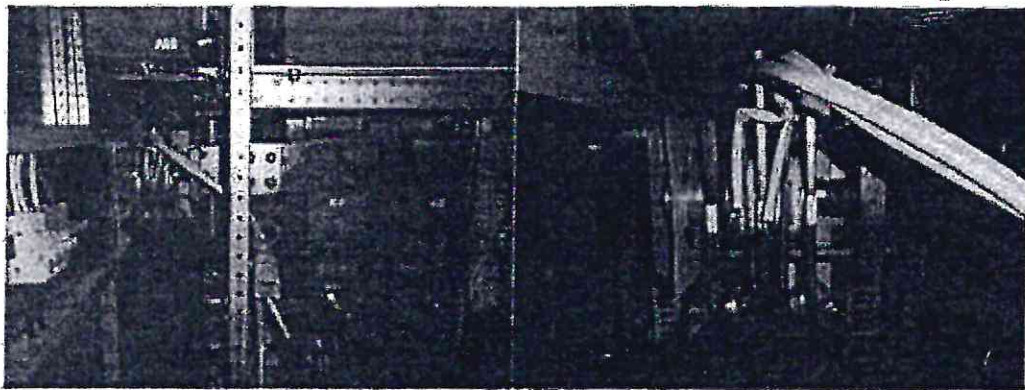


The door is without the instruments and fans. The general condition of the door is good.

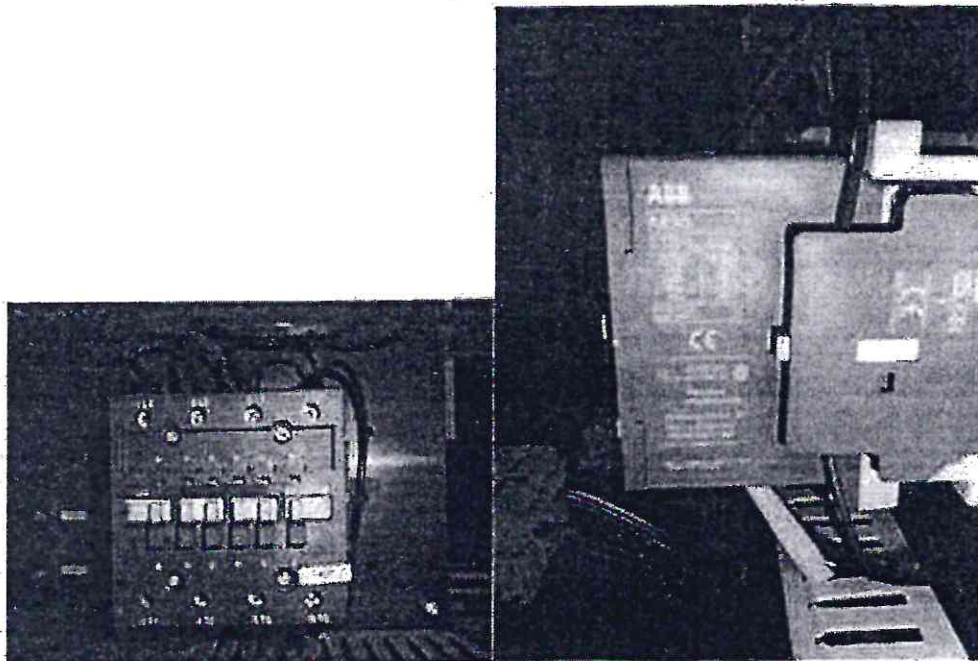
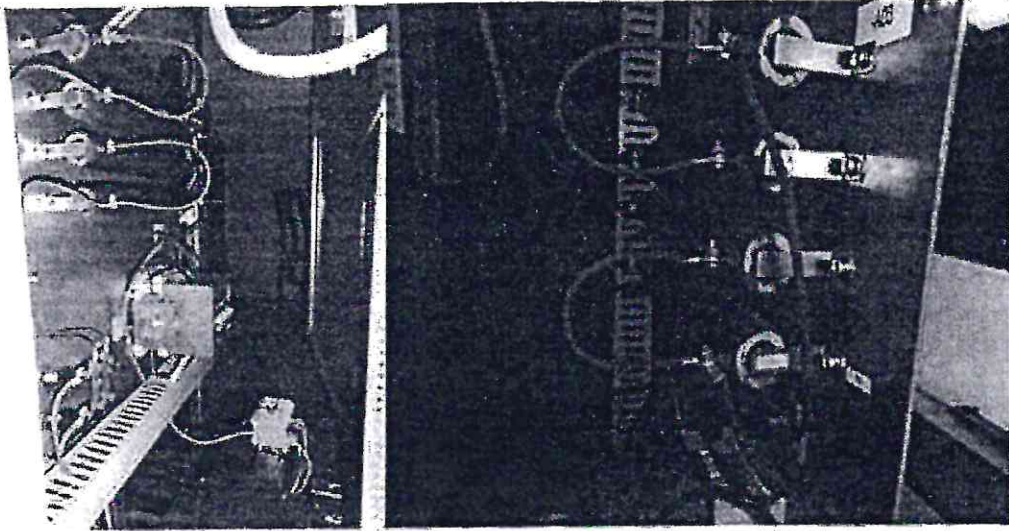
4.1. Earth Fault Detection (UNS 3020)

ID plate HIEE205010R0001; UNS3020A-Z V1.

Picture of the crowbar



Field flashing device



Types and level of supply voltages in the system:

- Battery: 236V;
- Aux.supply: 386 V;
- Voltage from exc.transformer: 585 V;
- Trafos: T15-585/230, t05--580/170-230 V



5. Other technical aspects

Generally no additional modifications were requested by the customer. The PSS parameters need not to be recalculated, but must be retaken from the existing controller.

6. Comments and conclusions

Snubber circuits capacitors and resistors were checked – no remarks ($C \approx 31 \mu F$, $R = 1145 \Omega$); Shaft filter capacitors were checked – no remarks $C \approx 2 \mu F$, FCB generally is in good condition. Main contacts are clean without traces of the arc. New terminals for the input of aux. 380 VAC and 230 VDC will be required.

Referring to the good conditions of the equipment, especially the main components (thyristors, capacitors, etc.) it's highly recommended for the particular systems to be upgraded in control part section to the 6th generation of the UNITROL systems in order to provide non-outage operation.