

**Odberateľ:** AIR LIQUIDE.  
**Customer :** 57, Ave Carnot - B.P. 313  
94503 Champigny Cedex  
FRANCE

**Dodávateľ :** AREVA ENERGIECHNIK, GmbH.  
**Contractor:** Königsbrücker Straße 124  
010 99 Dresden  
GERMANY

**Spracovateľ:** VUJE, a.s., divízia 1200  
**Designed** Okružná 5  
918 64 Trnava  
SLOVAKIA

**Názov stavby:**

**Name of building**

**USS Košice, Kyslíkový aparát č.9**  
**USS Košice, Air separation unit No.9**

**PROJEKT PRE REALIZÁCIU ELEKTROČASTI**  
**DETAIL DESIGN FOR ELECTRICAL PART**

**ČASŤ B.**  
**6,3KV ROZVODŇA T80**

**Part B**  
**6,3KV SWITCHGEAR T80**

**Revízia: 0**  
**Revision:**

Výtlačok č./Copy:

Zákazkové číslo/Project No. Air Liquide :50-3023-01

Zákazkové číslo/Project No. VUJE : 9738

Archívne číslo/Document No.VUJE: V02-1240/2005/9738/B.00

Dátum vydania/Date:08/2005

**2**  
**DOCUMENTATION**  
**RELEASED FOR**  
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Názov zákazky: <b>USS Košice, ASU no.9</b> <b>ZOZNAM DOKUMENTÁCIE</b> <b>CONTENT OF DOCUMENTATION</b>  <b>ČASŤ B. 6,3KV ROZVODŇA T80</b> <b>PART B. 6,3KV SWITCHGEAR T80</b>				Číslo prílohy Annex  <b>01</b>		
Vypracoval Designed Ing. Vladimír Kuchta <i>/Kuchta</i>		Zodpovedný projektant Approved Ing. Vladimír Kuchta <i>/Kuchta</i>		Dátum Date 08/2005		
				Celkový počet listov Number of sheet 1		
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Poradové číslo No. of file	Názov dokumentácie Description	Archívne číslo Archive number VÚJE	Archívne číslo Archive number AIR LIQUIDE	Prevedenie T-text V-draw	Počet A4 Format A4	Počet výtlačkov No. of copy
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03	Zoznam strojov a zariadení Content of equipment	V02-1240/2005/9738/B/03		T	3	6
04	Špecifikácia materiálu Material specification	V02-1240/2005/9738/B/04		T	2	6
05	6,3kV rozvodňa T80 Přehľadová schéma výstroja 6,3kV switchgear T80 Single-line diagram	V02-1240/2005/9738/B/05	A3.761.	V	6	6
06	6,3kV rozvodňa T80 Pôdorys +6,600m, uzemnenie 6,3kV switchgear T80 Plane +6,600m, earthing	V02-1240/2005/9738/B/06	A3.761.	V	2	6
07	6,3kV rozvodňa T80 Pôdorys ±0,00m 6,3kV switchgear T80 Plane ±0,00m	V02-1240/2005/9738/B/07	A3.761.	V	2	6
08	6,3kV rozvodňa T80 Rez 1-1 6,3kV switchgear T80 Section 1-1 Reserve	V02-1240/2005/9738/B/08	A3.761.	V	2	6
09	Zoznam káblov Cables list	V02-1240/2005/9738/B/09		T	1	6

Archívne číslo spracovateľa: V02-1240/2005/9738/B/01 sk en	Archívne číslo Air Liquide:	Revízia 0	List č.: 1
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AIR LIQUIDE

INGENIERIE

VÚJE

Customer: **AIR LIQUIDE.**  
57, Ave Carnot - B.P. 313  
94503 Champigny Cedex  
FRANCE

Contractor: **AREVA ENERGIE TECHNIK, Gmbh.**  
Königsbrücker Straße 124  
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Designer: **VÚJE, a.s., divízia 1200**  
Okružná 5  
918 64 Trnava  
SLOVAKIA

Name of building

ASU No.9 -USS Košice/SK

## Realization project Electricparts

Documentation:

**PART B 6,3KV SWITCHGEAR T80**

Index:

**A5**

Annex No.

**02**

Designed:

Ing.Vladimír Kuchta

Approved:

Ing.Vladimír Kuchta

Date:

08/2005

Sheets

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# TECHNICAL REPORT

**2**

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V02-1240/2005/9738/B/02 en

Order number Air Liquide:

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0

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## 1. Subject and scope of project

### 1.1 Subject of project

Building in of two-system switchgear 6,3kV marked as T80 is the main subject of project. This switchgear will serve for conneting of drives and self-consumption of new air separation unit in USS Košice.

### 1.2 Scope of project

The scope of project is :

- shoulder and assembly of cabinets 6,3 kV two-system switchgear T80
- underground line for connection 220VDC - connecting of control circuit T80
- underground line 220 VAC for connection of control circuit T80
- grounding of switchgear T80 and cables' bearing system

Extra work compared with offer :

- shoulder of condensers 6.3 kV for compensation of reactive power
- underground line 6,3kV including endings for connection of condensers
- cables' bearing systems for tie-in cabling between T80 a control system

### 1.3 Project doesn't deal with

- cable 6kV inputs to switchgear T80, are in part „K“
- cable 6kV outputs from switchgear T80, are in part „K“
- project of protection setting
- parametrization of protections
- plan, delivery, accompaying documentation of cabinets 6.3 kV of two-system switchgear T80, AREVA is solving by its own.

## 2. List of used Abbreviatons

C,C1	Condensor 6kV
STN	Slovak technical standard
T1	Transformer 110/6,3kV
T2	Transformer 110/6,3kV
T80	Buiding – switchgear 6kV
RIS	Controlling information system

## 3. Regulations and Standards

The project documentation is processed according to regulations and STN standards in force at the time of this realization project elaboration.

There are particularly the following standards:

STN 33 3210	Distribution equipment
STN 33 2000-4-41	Electric system of buildings.

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STN 33 0300	Section 4: Safety assurance.
STN 33 2000-5-54	Chapter 41: Protection against electric shock injury.
	Electric equipment surroundings. Identification of outside factors.
	Electric system of buildings .
	Section 5: Selection and erection of electric equipment.
STN 33 2000-3	Chapter 54: Grounding systems and protective conductors.
	Electric system of buildings.
	Section 3: Assignment of basic features.
STN 38 1981	Safety and working tools for electric stations.

## 4. Basic operating data

### 4.1 Description of electric equipment according to health hazard margin

The electric devices are designed according to reg. No. 718/2002 Coll. MPSVaR SR, part III, technical electric equipment group A, section c) transmission and distribution network of electric system.

In terms of this reg. §11 this equipment is a subject of a first official testing.

### 4.2 Distribution system

- a) 3~ 50Hz 6 300V/IT – power circuit of switchgear T80
- b) 2 = 220V/IT (voltage by means of control circuit of switchgear T80)
- c) 1NPE~ 230V 50Hz/TN-S (circuit of fans of cooling cabinets T80)
- d) 2=24V/II (circuit of flash protection T80)

### 4.3 Protection against electric shock injury

4.3.1 Protection during regular operation (active parts): its is specified by the constructional execution and set-up of active parts of electrical equipment.

According to STN 33 2000-4-41 standard, following protective measures solve the protection:

- a) isolation of active parts art. 412.1, by guards and covers art. 412.2.
- b) isolation of active parts art. 412.1, by guards and covers art. 412.2.
- c) isolation of active parts art. 412.1, by guards and covers art. 412.2.
- d) extra low volatage PELV čl.411.1

- isolation of active parts art. 412.1 - cables 6kV, switchgear 6kV, condensors

4.3.2 Protection in case of failure (inactive parts):

- a) Automatic disconnection of power supply in network IT according to art. 413.1, 413.1.2, 413.1.5 and national annex NC.3.3
- b) Automatic disconnection of power supply in network IT according to art. 413.1.3.
- c) Automatic disconnection of power supply in network IT according to art. 413.1, 413.1.2, 413.1
- d) extra low voltage PELV čl.411.1

### 4.4 Signification grade of electrical energy supply

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The grade of signification of electrical energy supply is No. 1.

#### 4.5 Methods of electric energy supply

Switchgear T80 is connected to electric distribution by two single inputs from transformers 110/6,3 kV marked T1 and T2.

Condensor vn of compensation is connected from the distributor T80, cabinet No.5

#### 4.6 Short circuit data

We used background from project part F

$$I_{ks} = 32,4 \text{ kA}$$

$$I_{ke} = 34,1 \text{ kA}$$

$$I_{km} = 109,9 \text{ kA}$$

initial impulse short circuit

equivalent heating short circuit

dynamic short circuit (dynamic)

#### 4.7 Grounding

Grounding of cabinets 6kV, supporting cable construction and grounding of cable terminal will be connected to grounding system, which will be conducted away by use of downleads to the external

grounding system. Because of continuous run of this switchgear, and network of this switchgear is periodically checked, touch voltage and step voltage mustn't be higher than 125V, or  $125/\sqrt{t}$  V (t = switch time).

#### *Specification of cross section of grounding system*

$$S = I_{ke} \cdot \omega \cdot \sqrt{t_k} / k$$

$$S = 32\,400 \cdot 0,7 \cdot \sqrt{0,2} / 58,5$$

$$S = 175 \text{ mm}^2$$

$I_{ke}$  equivalent heating short circuit 32,4kA

$\omega$  coefficient of expectancy 0,7

$t_k$  short circuit duration (protection time+cut off time) 0,2

k coefficient for Fe a ending temperature 200°C is 58,5

It is necessary to used protective conductor Fe Zn 2 x 30 x 4 mm in switchgear T80, coat green/yellow.

#### 4.8 Specification of types of surroundings

Switchgear T80, area of condensers is in individual heated room of building according to standard STN 33 0300 year 1989 there are rooms :

čl.3.1.1. – basic - switchgear 6kV, compensation room

čl.3.1.2. - normal - cable rooms

#### 4.9 Protection against overloading and short circuit

Inputs of switchgear are protected by over current protections 7SJ61 firm Siemens, which are situated in switchgear T80 in control part of input cabinet. Outputs are protected by over current protections type P100 by firm Areva.

#### 4.10 Metrological analyses

During testing and putting into operation it is necessary to use the measuring devices of category 2,5 % at least.

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#### 4.11 Safety and protection of health at work

##### *Requirements on qualification of personnel operating electric equipment*

Personnel operating electric devices must be acquainted with regulations relating to their work, eventually to be trained for the respective type of work.

About safety regulations during operation and work with electric equipment deal the following standards: STN 34 3100, STN 34 3101 and the set of standards STN 33 2000 (mod IEC 60364). The designed electric equipment can operate personnel who have, at least, specialized qualification and who were instructed in accordance with §20 of reg. No.718/2002 Coll. Personnel acquaintance, training, first aid, warning and examination of their knowledge must be verified by a memorandum that must sign the worker in charge and also the instructed personnel.

Personnel that will operate electric equipment must be informed about operation and function of equipment.

Operating personnel can only touch those parts that are designated for servicing. There must always be a free approach to the servicing parts. In case of the electric equipment damage or failure that could jeopardize safety or health of personnel, the person who such status identifies must make measures and provide prevention or reduction of risk of injury, fire or other risks.

##### *Requirements on qualification of personnel working with electric equipment*

Personnel working with electric devices must be acquainted with respective regulations. Working with electric equipments can only personnel with specialized skills in terms of §21 reg. No.718/2002 Coll. and with experience in terms of reg. No.718/2002 Coll., appendix No.11, art. d). The personnel must have finished specialized education and after their training they must take an exam in frame of the defined regulations. The company must provide examination of personnel at least once in tree years.

During inspection and work with EHV equipment as well as ELV equipment, equipment must be switched off, grounded and locked against a re-activation.

##### *General requirements on safety and protection of health at work*

The general operating regulations in force must be extended with local operating instructions of equipment, to which they are supposed to serve. During operating and work with electric equipment must be provided following measurements:

- safety schemes,
- safety and auxiliary tools,
- technically-organizing measures: works on directive B, securing workplace,
- protection against accidents.

Electrical equipment must be kept in a state that complies with manufacturer of equipment regulations and with electro-technical standards.

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Operation and maintenance of equipment must be aimed towards error-free operation and protection of health at work, and consists of following actions:

- regular examination and inspection of physical state of equipment,
- regular inspection of functionality of equipment,
- regular maintenance.

Content of documentation accompanying technical equipment must be in terms of reg. No.: 718/2000 Coll., appendix No.:3

## 5. Technical description

### 5.1 General description

Switchgear T80 is situated in individual room No. 101 on the floor +6,600 m in new constructed building T80. There is a cable space below the switchgear. Condensers will be situated in individual room No. 01 on the floor +\_0,000 m in new constructed building T80.

### 5.2 6,3kV switchgear T80

Switchgear 6,3kV is tow system, bul up from type cabinets type AHA by firm AREVA T&D. Single line diagram of switchgear is on drawing No.5. Arrangement of cabinets is as follows:

- L01A, B - terminal from transformer T1- with cut-out switch 4000A, 50kA
- L02A, B - reeler to transformer - with cut-out switch 1250A, 50kA
- L03A, B - reeler to motor 6,7 MW, marked.BAC - with cut-out switch 1250A, 50kA
- L04A, B - reeler to motor 8,6 MW, marked.MAC - with cut-out switch 1250A, 50kA
- L05A, B - reeler to compensation 1600 kVAr - with cut-out switch 1250A, 50kA
- L06A, B - reeler to reactor L1 for connection of switchgear T81 - with cut-out switch 3150A, 50kA
- L07A, B - measuring cabinet 1.section - voltage changers
- L08A, B - reeler to switchgear T40 - with cut-out switch 4000A, 50kA
- L09A, B - cross joint 1.section - with cut-out switch 4000A, 50kA
- L10A, B - longitudinal joint with cut-out switch 4000A, 50kA
- L11A, B - longitudinal joint with isolator
- L12A, B - terminal from transformer T1- with cut-out switch 4000A, 50kA
- L13A, B - reeler to reactor L1 for connecting of switchgear T81 - with cut-out switch 3150A, 50kA
- L14A, B - cross joint 2.section - with cut-out switch 4000A, 50kA
- L15A, B - measuring cabinet 2.section - voltage changers

*Switchgear is two system* - Two cabinets stading nexto to each other by backside are used for one input or outlet. One is equipped by isolator and cut-out switch, other is equipped by isolator. The function of isolator is made by engaged or protuberant cart with cut-out switch. All inputs and outlets cabinet are equipped with grounding knives on the output.

Work of the cabinet is modular and they are devided in three parts :

- feeder part vn - individual space with copper branch bars 4000A, 50kA
- cart with cut-out switch - vacuum cut-out switch type ECA
- part nn - individual space with operating and safety components nn
- cable part - individual space with flat for connecting of cable terminals.

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Progress of assembly – 30 cabinets of switchgear will be shouldered in room No. 101 on site. (base frame section 50/40 is a part of building). The cabinets anchor into the frame by use of screw M10x50. Power branch bars will be connected by typed components after the assembling of cabinets.(AREVA is a supplier of these components). It is advisable to connect the cabinets on the ground system by strip FeZn2x30x4.(see point 4.7 technical report). It is necessary to connect control circuit of each cabinet by conductor - continuous potention on terminal- XO connecting conductors are in supply by firm. AREVA according to following table:

Tab1) 1.systém – 1.sekcia

Potenciál	L01.S1A		L02.S1A		L03.S1A		L04.S1A		L05.S1A	
AC230V.L1	-X0:1	-X0:2	-X0:1	-X0:2	-X0:1	-X0:2	-X0:1	-X0:2	-X0:1	-X0:2
N	-X0:3	-X0:4	-X0:3	-X0:4	-X0:3	-X0:4	-X0:3	-X0:4	-X0:3	-X0:4
DC220V.L+	-X0:11	-X0:12	-X0:11	-X0:12	-X0:11	-X0:12	-X0:11	-X0:12	-X0:11	-X0:12
DC220V.L-	-X0:13	-X0:14	-X0:13	-X0:14	-X0:13	-X0:14	-X0:13	-X0:14	-X0:13	-X0:14
03L+	-X0:15	-X0:16	-X0:15	-X0:16	-X0:15	-X0:16	-X0:15	-X0:16	-X0:15	-X0:16
03L-	-X0:17	-X0:18	-X0:17	-X0:18	-X0:17	-X0:18	-X0:17	-X0:18	-X0:17	-X0:18
214L+	-X0:021	-X0:022	-X0:021	-X0:022	-X0:021	-X0:022	-X0:021	-X0:022	-X0:021	-X0:022
214L-	-X0:023	-X0:024	-X0:023	-X0:024	-X0:023	-X0:024	-X0:023	-X0:024	-X0:023	-X0:024
BB ES RELAISE	-X0:025	-X0:028	-X0:025	-X0:028	-X0:025	-X0:028	-X0:025	-X0:028	-X0:025	-X0:028
DRAWG.UNIT	-X0:029	-X0:030	-X0:029	-X0:030	-X0:029	-X0:030	-X0:029	-X0:030	-X0:029	-X0:030
TXD+	-X0:051	-X0:052	-X0:051	-X0:052	-X0:051	-X0:052	-X0:051	-X0:052	-X0:051	-X0:052
TXD-	-X0:053	-X0:054	-X0:053	-X0:054	-X0:053	-X0:054	-X0:053	-X0:054	-X0:053	-X0:054
04L+	-X0:061	-X0:062	-X0:061	-X0:062	-X0:061	-X0:062	-X0:061	-X0:062	-X0:061	-X0:062
04L-	-X0:063	-X0:064	-X0:063	-X0:064	-X0:063	-X0:064	-X0:063	-X0:064	-X0:063	-X0:064
AUTF SS1	-X0:065	-X0:066	-X0:065	-X0:066	-X0:065	-X0:066	-X0:065	-X0:066	-X0:065	-X0:066
AUTF SS2	-X0:067	-X0:068	-X0:067	-X0:068	-X0:067	-X0:068	-X0:067	-X0:068	-X0:067	-X0:068
ACR+	-X0:091	-X0:092	-X0:091	-X0:092	-X0:091	-X0:092	-X0:091	-X0:092	-X0:091	-X0:092
ACR-	-X0:093	-X0:094	-X0:093	-X0:094	-X0:093	-X0:094	-X0:093	-X0:094	-X0:093	-X0:094
TRANSFER TRIP	-X0:095	-X0:096	-X0:095	-X0:096	-X0:095	-X0:096	-X0:095	-X0:096	-X0:095	-X0:096
I>	-X0:097	-X0:098	-X0:097	-X0:098	-X0:097	-X0:098	-X0:097	-X0:098	-X0:097	-X0:098
SPARE	-X0:099	-X0:100	-X0:099	-X0:100	-X0:099	-X0:100	-X0:099	-X0:100	-X0:099	-X0:100
SS1 L1			-X0:601	-X0:602	-X0:601	-X0:602	-X0:601	-X0:602	-X0:601	-X0:602
SS1 L2			-X0:603	-X0:604	-X0:603	-X0:604	-X0:603	-X0:604	-X0:603	-X0:604
SS1 L3			-X0:605	-X0:606	-X0:605	-X0:606	-X0:605	-X0:606	-X0:605	-X0:606
N			-X0:607	-X0:608	-X0:607	-X0:608	-X0:607	-X0:608	-X0:607	-X0:608
SS2 L1			-X0:609	-X0:610	-X0:609	-X0:610	-X0:609	-X0:610	-X0:609	-X0:610
SS2 L2			-X0:611	-X0:612	-X0:611	-X0:612	-X0:611	-X0:612	-X0:611	-X0:612
SS2 L3			-X0:613	-X0:614	-X0:613	-X0:614	-X0:613	-X0:614	-X0:613	-X0:614
N			-X0:615	-X0:616	-X0:615	-X0:616	-X0:615	-X0:616	-X0:615	-X0:616

Tab1) 1.systém – 1.sekcia pokračovanie

Potenciál	L06.S1A		L07.S1A		L08.S1A		L09.S1A		L10.S1A	
AC230V.L1	-X0:1	-X0:2	-X0:1	-X0:2	-X0:1	-X0:2	-X0:1	-X0:2	-X0:1	-X0:2
N	-X0:3	-X0:4	-X0:3	-X0:4	-X0:3	-X0:4	-X0:3	-X0:4	-X0:3	-X0:4
DC220V.L+	-X0:11	-X0:12	-X0:11	-X0:12	-X0:11	-X0:12	-X0:11	-X0:12	-X0:11	-X0:12
DC220V.L-	-X0:13	-X0:14	-X0:13	-X0:14	-X0:13	-X0:14	-X0:13	-X0:14	-X0:13	-X0:14
03L+	-X0:15	-X0:16	-X0:15	-X0:16	-X0:15	-X0:16	-X0:15	-X0:16	-X0:15	-X0:16
03L-	-X0:17	-X0:18	-X0:17	-X0:18	-X0:17	-X0:18	-X0:17	-X0:18	-X0:17	-X0:18
214L+	-X0:021	-X0:022	-X0:021	-X0:022	-X0:021	-X0:022	-X0:021	-X0:022	-X0:021	-X0:022

Order number VUJE:  
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0

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214L-	-X0:023	-X0:024	-X0:023	-X0:024	-X0:023	-X0:024	-X0:023	-X0:024	-X0:023	-X0:024
BB ES RELAISE	-X0:025	-X0:028	-X0:025	-X0:028	-X0:025	-X0:028	-X0:025	-X0:028	-X0:025	-X0:028
DRAWG.UNIT	-X0:029	-X0:030	-X0:029	-X0:030	-X0:029	-X0:030	-X0:029	-X0:030	-X0:029	-X0:030
TXD+	-X0:051	-X0:052	-X0:051	-X0:052	-X0:051	-X0:052	-X0:051	-X0:052	-X0:051	-X0:052
TXD-	-X0:053	-X0:054	-X0:053	-X0:054	-X0:053	-X0:054	-X0:053	-X0:054	-X0:053	-X0:054
04L+	-X0:061	-X0:062	-X0:061	-X0:062	-X0:061	-X0:062	-X0:061	-X0:062	-X0:061	-X0:062
04L-	-X0:063	-X0:064	-X0:063	-X0:064	-X0:063	-X0:064	-X0:063	-X0:064	-X0:063	-X0:064
AUTF SS1	-X0:065	-X0:066	-X0:065	-X0:066	-X0:065	-X0:066	-X0:065	-X0:066	-X0:065	-X0:066
AUTF SS2	-X0:067	-X0:068	-X0:067	-X0:068	-X0:067	-X0:068	-X0:067	-X0:068	-X0:067	-X0:068
ACR+	-X0:091	-X0:092	-X0:091	-X0:092	-X0:091	-X0:092	-X0:091	-X0:092	-X0:091	-X0:092
ACR-	-X0:093	-X0:094	-X0:093	-X0:094	-X0:093	-X0:094	-X0:093	-X0:094	-X0:093	-X0:094
TRANSFER TRIP	-X0:095	-X0:096	-X0:095	-X0:096	-X0:095	-X0:096	-X0:095	-X0:096	-X0:095	-X0:096
I>	-X0:097	-X0:098	-X0:097	-X0:098	-X0:097	-X0:098	-X0:097	-X0:098	-X0:097	-X0:098
SPARE	-X0:099	-X0:100	-X0:099	-X0:100	-X0:099	-X0:100	-X0:099	-X0:100	-X0:099	-X0:100
SS1 L1	-X0:601	-X0:602	-X0:601	-X0:602			-X0:601	-X0:602	-X0:601	-X0:602
SS1 L2	-X0:603	-X0:604	-X0:603	-X0:604			-X0:603	-X0:604	-X0:603	-X0:604
SS1 L3	-X0:605	-X0:606	-X0:605	-X0:606			-X0:605	-X0:606	-X0:605	-X0:606
N	-X0:607	-X0:608	-X0:607	-X0:608			-X0:607	-X0:608	-X0:607	-X0:608
SS2 L1	-X0:609	-X0:610	-X0:609	-X0:610			-X0:609	-X0:610	-X0:609	-X0:610
SS2 L2	-X0:611	-X0:612	-X0:611	-X0:612			-X0:611	-X0:612	-X0:611	-X0:612
SS2 L3	-X0:613	-X0:614	-X0:613	-X0:614			-X0:613	-X0:614	-X0:613	-X0:614
N	-X0:615	-X0:616	-X0:615	-X0:616			-X0:615	-X0:616	-X0:615	-X0:616

Tab2) 1.system – 2.sekcia

Potenciál	L11.S1A		L12.S1A		L13.S1A		L14.S1A		L15.S1A	
AC230V.L1	-X0:1	-X0:2	-X0:1	-X0:2	-X0:1	-X0:2	-X0:1	-X0:2	-X0:1	-X0:2
N	-X0:3	-X0:4	-X0:3	-X0:4	-X0:3	-X0:4	-X0:3	-X0:4	-X0:3	-X0:4
DC220V.L+	-X0:11	-X0:12	-X0:11	-X0:12	-X0:11	-X0:12	-X0:11	-X0:12	-X0:11	-X0:12
DC220V.L-	-X0:13	-X0:14	-X0:13	-X0:14	-X0:13	-X0:14	-X0:13	-X0:14	-X0:13	-X0:14
03L+	-X0:15	-X0:16	-X0:15	-X0:16	-X0:15	-X0:16	-X0:15	-X0:16	-X0:15	-X0:16
03L-	-X0:17	-X0:18	-X0:17	-X0:18	-X0:17	-X0:18	-X0:17	-X0:18	-X0:17	-X0:18
214L+	-X0:021	-X0:022	-X0:021	-X0:022	-X0:021	-X0:022	-X0:021	-X0:022	-X0:021	-X0:022
214L-	-X0:023	-X0:024	-X0:023	-X0:024	-X0:023	-X0:024	-X0:023	-X0:024	-X0:023	-X0:024
BB ES RELAISE	-X0:025	-X0:028	-X0:025	-X0:028	-X0:025	-X0:028	-X0:025	-X0:028	-X0:025	-X0:028
DRAWG.UNIT	-X0:029	-X0:030	-X0:029	-X0:030	-X0:029	-X0:030	-X0:029	-X0:030	-X0:029	-X0:030
TXD+	-X0:051	-X0:052	-X0:051	-X0:052	-X0:051	-X0:052	-X0:051	-X0:052	-X0:051	-X0:052
TXD-	-X0:053	-X0:054	-X0:053	-X0:054	-X0:053	-X0:054	-X0:053	-X0:054	-X0:053	-X0:054
04L+	-X0:061	-X0:062	-X0:061	-X0:062	-X0:061	-X0:062	-X0:061	-X0:062	-X0:061	-X0:062
04L-	-X0:063	-X0:064	-X0:063	-X0:064	-X0:063	-X0:064	-X0:063	-X0:064	-X0:063	-X0:064
AUTF SS1	-X0:065	-X0:066	-X0:065	-X0:066	-X0:065	-X0:066	-X0:065	-X0:066	-X0:065	-X0:066
AUTF SS2	-X0:067	-X0:068	-X0:067	-X0:068	-X0:067	-X0:068	-X0:067	-X0:068	-X0:067	-X0:068
ACR+	-X0:091	-X0:092	-X0:091	-X0:092	-X0:091	-X0:092	-X0:091	-X0:092	-X0:091	-X0:092
ACR-	-X0:093	-X0:094	-X0:093	-X0:094	-X0:093	-X0:094	-X0:093	-X0:094	-X0:093	-X0:094
TRANSFER TRIP	-X0:095	-X0:096	-X0:095	-X0:096	-X0:095	-X0:096	-X0:095	-X0:096	-X0:095	-X0:096
I>	-X0:097	-X0:098	-X0:097	-X0:098	-X0:097	-X0:098	-X0:097	-X0:098	-X0:097	-X0:098
SPARE	-X0:099	-X0:100	-X0:099	-X0:100	-X0:099	-X0:100	-X0:099	-X0:100	-X0:099	-X0:100
SS1 L1	-X0:601	-X0:602			-X0:601	-X0:602	-X0:601	-X0:602	-X0:601	-X0:602
SS1 L2	-X0:603	-X0:604			-X0:603	-X0:604	-X0:603	-X0:604	-X0:603	-X0:604
SS1 L3	-X0:605	-X0:606			-X0:605	-X0:606	-X0:605	-X0:606	-X0:605	-X0:606
N	-X0:607	-X0:608			-X0:607	-X0:608	-X0:607	-X0:608	-X0:607	-X0:608
SS2 L1	-X0:609	-X0:610			-X0:609	-X0:610	-X0:609	-X0:610	-X0:609	-X0:610
SS2 L2	-X0:611	-X0:612			-X0:611	-X0:612	-X0:611	-X0:612	-X0:611	-X0:612
SS2 L3	-X0:613	-X0:614			-X0:613	-X0:614	-X0:613	-X0:614	-X0:613	-X0:614
N	-X0:615	-X0:616			-X0:615	-X0:616	-X0:615	-X0:616	-X0:615	-X0:616



Tab3) Medzi 1.a 2.sekciou 1.systému musí byť káblový prepój nasledovne

Potenciál	1.sekcia		2.sekcia	
	L10.S1A		L11.S1A	
AC230V.L1	-X0:1	-X0:2	-X0:1	-X0:2
N	-X0:3	-X0:4	-X0:3	-X0:4
DC220V.L+	-X0:11	-X0:12	-X0:11	-X0:12
DC220V.L-	-X0:13	-X0:14	-X0:13	-X0:14
TXD+	-X0:051	-X0:052	-X0:051	-X0:052
TXD-	-X0:053	-X0:054	-X0:053	-X0:054

Tab4) 2.systém – 1.sekcia

Potenciál	L01.S1B		L02.S1B		L03.S1B		L04.S1B		L05.S1B	
224L+	-X0:022	-X0:021	-X0:022	-X0:021	-X0:022	-X0:021	-X0:022	-X0:021	-X0:022	-X0:021
224L-	-X0:024	-X0:023	-X0:024	-X0:023	-X0:024	-X0:023	-X0:024	-X0:023	-X0:024	-X0:023
BB ES RELAISE	-X0:028	-X0:025	-X0:028	-X0:025	-X0:028	-X0:025	-X0:028	-X0:025	-X0:028	-X0:025
DRAWG UNIT	-X0:030	-X0:029	-X0:030	-X0:029	-X0:030	-X0:029	-X0:030	-X0:029	-X0:030	-X0:029

Tab4) 2.systém – 1.sekcia, pokračovanie

Potenciál	L06.S1B		L07.S1B		L08.S1B		L09.S1B		L10.S1B	
224L+	-X0:022	-X0:021	-X0:022	-X0:021	-X0:022	-X0:021	-X0:022	-X0:021	-X0:022	-X0:021
224L-	-X0:024	-X0:023	-X0:024	-X0:023	-X0:024	-X0:023	-X0:024	-X0:023	-X0:024	-X0:023
BB ES RELAISE	-X0:028	-X0:025	-X0:028	-X0:025	-X0:028	-X0:025	-X0:028	-X0:025	-X0:028	-X0:025
DRAWG UNIT	-X0:030	-X0:029	-X0:030	-X0:029	-X0:030	-X0:029	-X0:030	-X0:029	-X0:030	-X0:029

Tab5) 2.systém – 2.sekcia

Potenciál	L11.S1B		L12.S1B		L13.S1B		L14.S1B		L15.S1B	
224L+	-X0:022	-X0:021	-X0:022	-X0:021	-X0:022	-X0:021	-X0:022	-X0:021	-X0:022	-X0:021
224L-	-X0:024	-X0:023	-X0:024	-X0:023	-X0:024	-X0:023	-X0:024	-X0:023	-X0:024	-X0:023
BB ES RELAISE	-X0:028	-X0:025	-X0:028	-X0:025	-X0:028	-X0:025	-X0:028	-X0:025	-X0:028	-X0:025
DRAWG UNIT	-X0:030	-X0:029	-X0:030	-X0:029	-X0:030	-X0:029	-X0:030	-X0:029	-X0:030	-X0:029

Auxiliary voltage 220 VDC and 230 VAC is connected from reserve outlet of distributor self-consumption to cabinet L01.S1A as follows

Kábel	Dimenzia/istenie	Odkiaľ	Svorky	Kam	Svorky
AC230V.L1	CYKY3Cx2,5 / 10A	R400VAC	L1	L01.S1A	-X0:1
N			N		-X0:3
PE			PE		PE
DC220V.L+	CYKY4Dx6 / 25A	R220VDC	L+	L01.S1A	-X0:11
DC220V.L-			L-		-X0:13

Distribution VAC serves as :

- connecting of cooling fans, control of fans in cabinets – L01, L12
- connecting of flow scanning relay F320 – for blocking of fans

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Distribution 220 VDC serves as:

- connecting of control panel
- connecting of cut-out switch drive
- connection of protections
- connection of signal components
- connection of converter 220/24 VDC

Description of cabinets, control panels, instrument filling is in accompanying documentation firm Areva

### 5.2.1 Safety and working equipment

Equipment of switchgear is going out form STN38 1981 and fire regulations of building.  
Tools can be stocked in control cabinet or directly in switchgear on accesible place, so that they can not be disvalued.

Switchgear with 30 cabinets and permanent operation must include :

- live line detector 7,2kV..... 2 pcs
- live line detector up to 500V..... 1 pc
- lock for guarantee of cut-off condition of isolator (construction of cabinet)..4 pc
- discharge device..... 1 pc
- safety gums gloves for electrotechnics for 500V, ..... 1 pair
- dialectical safety helmet for electrotechnics..... 2 pcs
- safety spectacles..... 2 pcs
- safety boots according to STN EN ISO 20345..... 1 pair
- isolator gum carpet 2x1m for electrotechnics STN83 2635..... 1 pc
- safety hook..... 1 pc
- resurgent device for artificial breathing..... 1 pc
- folding sedan..... 1 pc
- fire kit..... 1 pc
- first aid cabinet..... 1 pc
- self-resource luminaire ..... 1 pc
- hook isolator stick..... 1 pc
- safety sign 132 „High volatage - danger of life“..... 2 pcs
- safety sign 138 „Caution - Alive“..... 2 pcs
- safety sign 141 „Caution - Back current“..... 1 pc
- safety sign 77 „Work only here“..... 2 pcs
- safety sign 105 „Exit“ .....2 pcs
- safety sign 15 „Caution- equipment is in service“..... 4 pcs
- safety sign 144 „Caution - earthed“..... 4 pcs
- local operating and safety instructions..... 1 pc
- safety instructions STN34 3100, 34 3104..... 1 pc
- plagát Prvá pomoc pri úrazoch elektrinou STN34 3104..... 1 pc
- single line diagram of switchgear wall..... 1 pc
- telephone number of fire preventioon, police and salvage service..... 1 pc
- fire extinguisher snow (according fire project of building)..... 1 pc

### 5.3 Compensation of vn

Compensation of reactive power is on outlet No.5. Internal condenser unit „C“ 1600 kVAr is connected from switchgear T80. 6,3kV is shouldered in individual room No.01 on the floor  $\pm 0,000\text{m}$  in building T80. Condenser unit will be connected by use of individual vn cable. Compensation of reactive power motor is on outlet No.4. Internal condenser unit „C1“ 800 kVAr is connected from switchgear T80. 6,3kV is shouldered in individual room No.01 on the floor  $\pm 0,000\text{m}$  in building T80. Condenser unit will be connected by use of individual vn cable.

#### 5.3.1 Proposal of connecting cable

a) proposal of cable according to transferred power :

$$I_p = Q / \sqrt{3} * U * \sin\phi = 1600 \cdot 10^3 / \sqrt{3} * 6300 * \sin 90^\circ = 147 \text{ A}$$

For transmission of this power is cable with Cu core  $50\text{mm}^2$  enough.

b) proposal of cable according to short circuit :

$I_{ke} = 35 \text{ kA}$  heating short circuit

$t_k = 0,2 \text{ s}$  off period of short circuit (protective time + cut out switch time)

$K = 135$  coefficient for Cu conductor, with respect of temperature before the short circuit and max temperature of conductor core in short circuit

$$S_{min} = I_{ke} * \sqrt{t_k} / K = 35000 * \sqrt{0,2} / 135$$

$$S_{min} = 115 \text{ mm}^2$$

It is necessary to use a cable with Cu core  $120\text{mm}^2$  for connection.

c) conclusion

We suggest to use cable 6-CYKCY 3x1x120mm<sup>2</sup> for connection of condenser unit

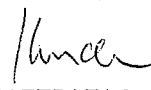
Cable will be on both sides –the cable will be secured by internal cable terminals Raychem type POLT-12D/1XI-H1-L12A, length 450 mm with mechanic cable eye in cabinet vn and in cabinte of condensers.

Cable will be led in cable trough below the switchgear T80 (supply part K) and in cable trough 150/50 length 25 and 30m. Total length of routing will be 30 and 35 m.

#### 5.4. Troughs for optical connection between switchgear T80 and substation of Control system

Substation of control system supply by firm SAT will be shouldered in the aera of switchgear T80. It is necessary to led cable trough 400/50 length 30m between the switchgear and data processing station .

In Trnava 08/2005

Ing. Vladimír Kuchta   
Osvedčenie 0046INA1999EZPAE1.0  
Autorizácia 3398\*Z\*5-3

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AIR LIQUIDE  
INGENIERIE

vúje

<b>vúje</b> VUJE, a.s. divízia 1200 Okružná 5 918 64 Trnava		Stupeň RD	Skartačný znak A5	Výtlačok č.:  <b>2</b>  Poradové číslo Annex No.  <b>03</b>	
Názov zákazky: USS Košice, Kyslíkový aparát č.9					
<b>ZOZNAM STROJOV A ZARIADENÍ</b> <b>SHEET OF MACHINES AND EQUIPMENTS</b>					
ČASŤ B PART B		6,3KV ROZVODŇA T80 6,3KV SWITCHGEAR T80			
Vypracoval / Designed Ing. Vladimír Kuchta		Zodpovedný projektant / Approved Ing. Vladimír Kuchta		Dátum / Date 08/2005	
				Počet listov / Sheet 3	
Číslo Number	Označenie Identification	Názov položky Description		Jednotka Measure	Množstvo Pieces
1	Rozvodňa T80			ks piece	1
	Typ Type	AHA12			
	Výrobca Producer	AREVA Energietechnik GmbH			
	Normy Standard	IEC 60298 VDE0670, part 6 IEC 60694 VDE 0670, part 1000 IEC 60056 VDE 0670, part101-107 IEC 60129 VDE 0670, part 2 IEC 61234-5 VDE 0682, part 415			
	Rozvodňa systém Switchgear system	2 systémová / double busbar			
	Počet skriň – systém A Number of cubicles – system A	15			
	Počet skriň – systém B Number of cubicles – system B	15			
	Menovité napätie Rated voltage	12 kV			
	Menovité rázové výdržné napätie Rated lightning impulse withstand voltage	75 kV			
	Nominálna frekvencia Rated frequency	50 Hz			
	Menovitý prúd – prípojnice Rated normal current – bus-bar	4000 A			
	Menovitý prúd vypínača Rated normal current –	4000 A – prívod / feeder L01,08,09,10,14 3150 A – vývod / outlet L06,13 1250 A - vývod / outlet L02,03,04,05			
	Rozsah teploty Class	-5°C...+40°C			
	Menovitý skratový prúd 1s Rated short-circuit current	50 kA			
Archívne číslo spracovateľa: V02-1240/2005/9738/B/03 sk en		Archívne číslo Air Liquide:		Revízia 0	List č.: 1



AIR LIQUIDE

INGENIERIE

vúje

	Menovitý skratový vypínací prúd Rated short-circuit breaking current		50 kA		
	Krytie Degree of protection on the front and on the sides		IP2XD		
	Vyhotovenie Condition		Vnútorne Indoor		
	Nadmorská výška Installation heights		>1000 m		
	Menovité napätie Rated voltage		12 kV		
	Menovité rázové výdržné napätie Rated lightning impulse withstand voltage		75 kV		
	Rozmery skrine Dimensions cubicle	Šírka Width	900 mm		
		Hĺbka Depth	2x1450 mm		
		Výška Height	(2330 + 770) mm		
	Hmotnosť skrine Mass of cubicle		1195 kg		
	C	Kondenzátor Capacitor		ks piece	1
	Typ Type		1600 kVar		
	Výrobca Producer		MR Maschinenfabrik Reinhausen GmbH		
	Norma Standard		IEC871-1		
	Menovité napätie Rated voltage		6,61 kV		
	Kapacita Capacitance		128,3 µF		
	Frekvencia Frequency		50 Hz		
	Inštalácia Installation		Vnútorná / indoor		
	Krytie Protection class		IP 55		
	Maximálna teplota Maximum temperature		+45°C		
	Rozmery Dimensions	Šírka Width	525 mm		
		Dĺžka Length	1100 mm		
		Výška Height	1100 mm		
	Hmotnosť Weight		~ 65 kg		
	Dielektrikum bez PCB Dielectric fluid non PCB		Jarylec C101		

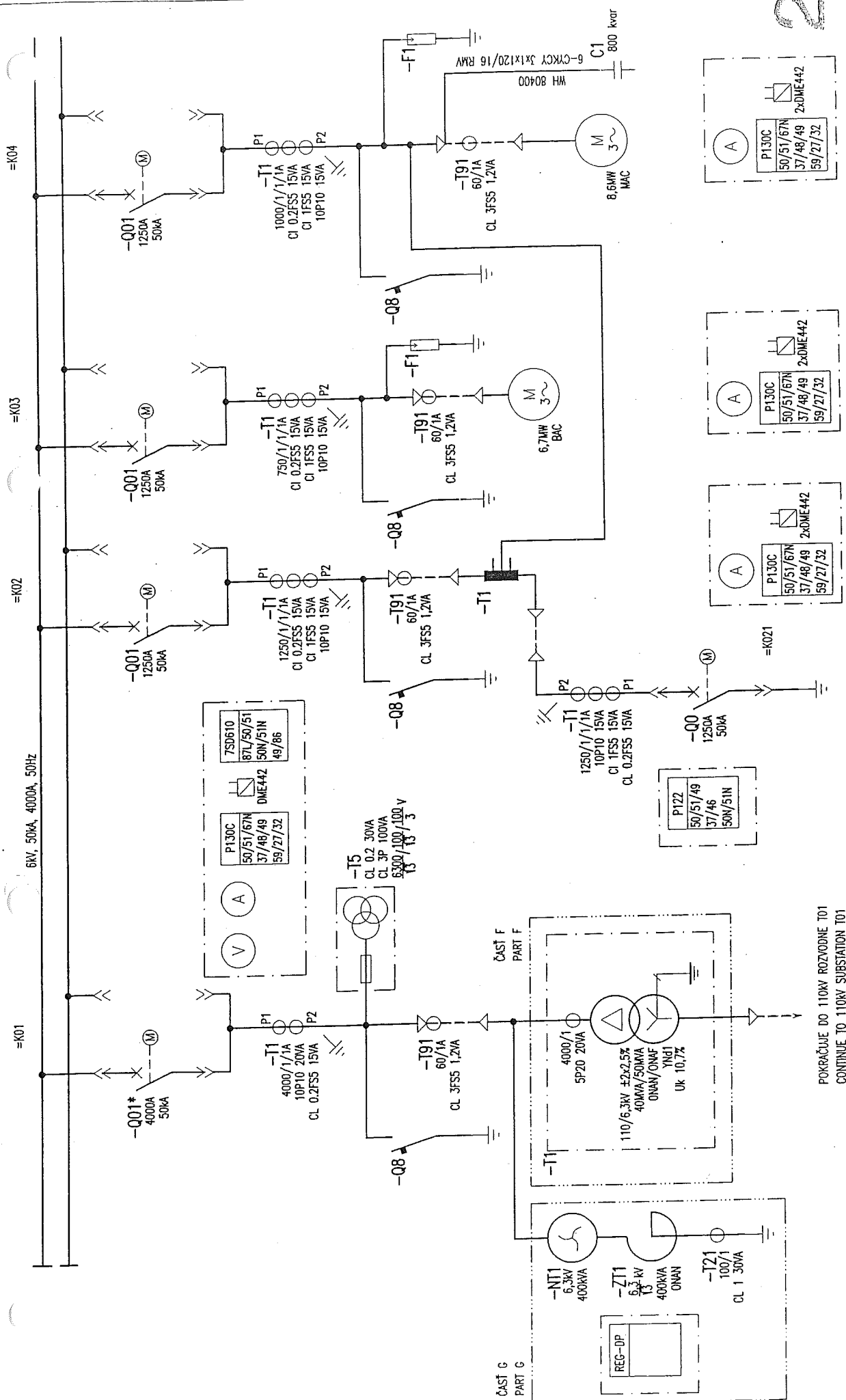




	C1	Kondenzátor Capacitor	ks piece	1
	Typ Type	800 kVAr		
	Výrobca Producer	MR Maschinenfabrik Reinhausen GmbH		
	Norma Standard	IEC871-1		
	Menovité napätie Rated voltage	6,61 kV		
	Kapacita Capacitance	64,1 $\mu$ F		
	Frekvencia Frequency	50 Hz		
	Inštalácia Installation	Vnúťorná / indoor		
	Krytie Protection class	IP 55		
	Maximálna teplota Maximum temperature	+45°C		
	Rozmery Dimensions	Šírka Width	525 mm	
		Dĺžka Length	1100 mm	
		Výška Height	900 mm	
	Hmotnosť Weight	~ 55 kg		
	Dielektrikum bez PCB Dielectric fluid non PCB	Jarylec C101		

<b>vúje</b> VUJE, a.s. divízia 1200 Okružná 5 918 64 Trnava		Stupeň RD DD	Skartačný znak A5	Výtlačok č.:  <b>2</b>  Poradové číslo Annex No.  <b>04</b>	
Názov zákazky: <b>USS Košice, Kyslíkový aparát č.9</b>					
<b>SPECIFIKÁCIA MATERIÁLU</b> <b>SPECIFICATION OF MATERIALS</b>					
<b>ČASŤ B.</b> <b>PART B.</b>		<b>6,3KV ROZVODŇA T80</b> <b>6,3KV SWITCHGEAR T80</b>			
Vypracoval / Designed Ing. Vladimír Kuchta		Zodpovedný projektant / Approved Ing. Vladimír Kuchta		Dátum / Date 08/2005	
				Počet listov / Sheet 2	
Číslo Number	Názov položky Description	Typ Type	Výrobca Producer	Jednotka Measure	Počet Pieces
<b>1</b>	<b>T80</b>				
<b>1.1.</b>	<b>Uzemnenenie – earthing</b>				
1.2.1	Uzemňovací pásik na povrchu Earthing conductor on surface	FeZn30x4	ZIN	kg	200
1.2.2	Svorka k uzemňovaciemu vedeniu križová Clamp for earthing system	SK	ZIN	ks	60
1.2.3	Penetračný náter Penetration coating	U2073/0984	Chemolak	kg	1
1.2.4	Riedidlo k penetračnému náteru Diluent for penetration coating	U6051	Chemolak	kg	1
1.2.5	Syntetická farba základná šedá Synthetic basic colour gray	S2000/0110	Chemolak	kg	1
1.2.6	Syntetická farba zelená Synthetic colour green	S2013/5300	Chemolak	kg	2
1.2.7	Syntetické riedidlo Synthetic diluent	S6006	Chemolak	kg	1
<b>1.2.</b>	<b>Kabeláž – cables</b>				
1.2.1.	PVC kábel do 1kV / TP-KB-03 PVC cable to 1kV / TP-KB-03	CYKY3Cx2,5	Kablo Pirelli	m	115
1.2.2.	PVC kábel do 1kV / TP-KB-03 PVC cable to 1kV / TP-KB-03	CYKY4Dx6	Kablo Pirelli	m	100
1.2.3.	PVC kábel do 1kV / TP-KB-03 PVC cable to 1kV / TP-KB-03	J-2Y(ST)Y 2x2x0,6		m	133
1.2.4.	Káblový žlab šírka 120, výška 30, dĺžka 3m Cable tray width 120mm, lenght 3m	KBP120H30/3	BAKS	ks pieces	25
Archívne číslo spracovateľa: V02-1240/2005/9738/B/04 sk en		Archívne číslo Air Liquide:		Revízia 0	List č.: 1

<b>2.</b>	<b>Kondenzátory - capacitor</b>				
2.1	PVC kábel do 6kV / TP 06/54-E-40/67 PVC cable to 6kV / TP 06/54-E-40/67	6-CYKCY 1x120/16 RMV	Kablo	m	195
2.2.	Vnúťorná káblová koncovka 6kV Indoor cable terminator 6kV	POLT-12D/1XI- H1-L12A	Raychem	sada set	2
2.3	Lisovacie káblové oko Cu Compression	300 028 273	Pfisterer	ks pieces	12
2.4	Káblový žlab šírka 200, výška 50, dĺžka 3m Cable tray width 200mm, lenght 3m	KBP200H50/3	BAKS	ks pieces	15
<b>3.</b>	<b>Žlaby pre optiku medzi T80 a RIS Tray for optic cable between T80 and CIS (controling and information syst.)</b>				
3.1.	Káblový žlab šírka 400, výška 50, dĺžka 3m Cable tray width 400mm, lenght 3m	KBP200H50/3	BAKS	ks pieces	9



POKRAČUJE DO 110KV ROZVODNE T01  
CONTINUE TO 110KV SUBSTATION T01

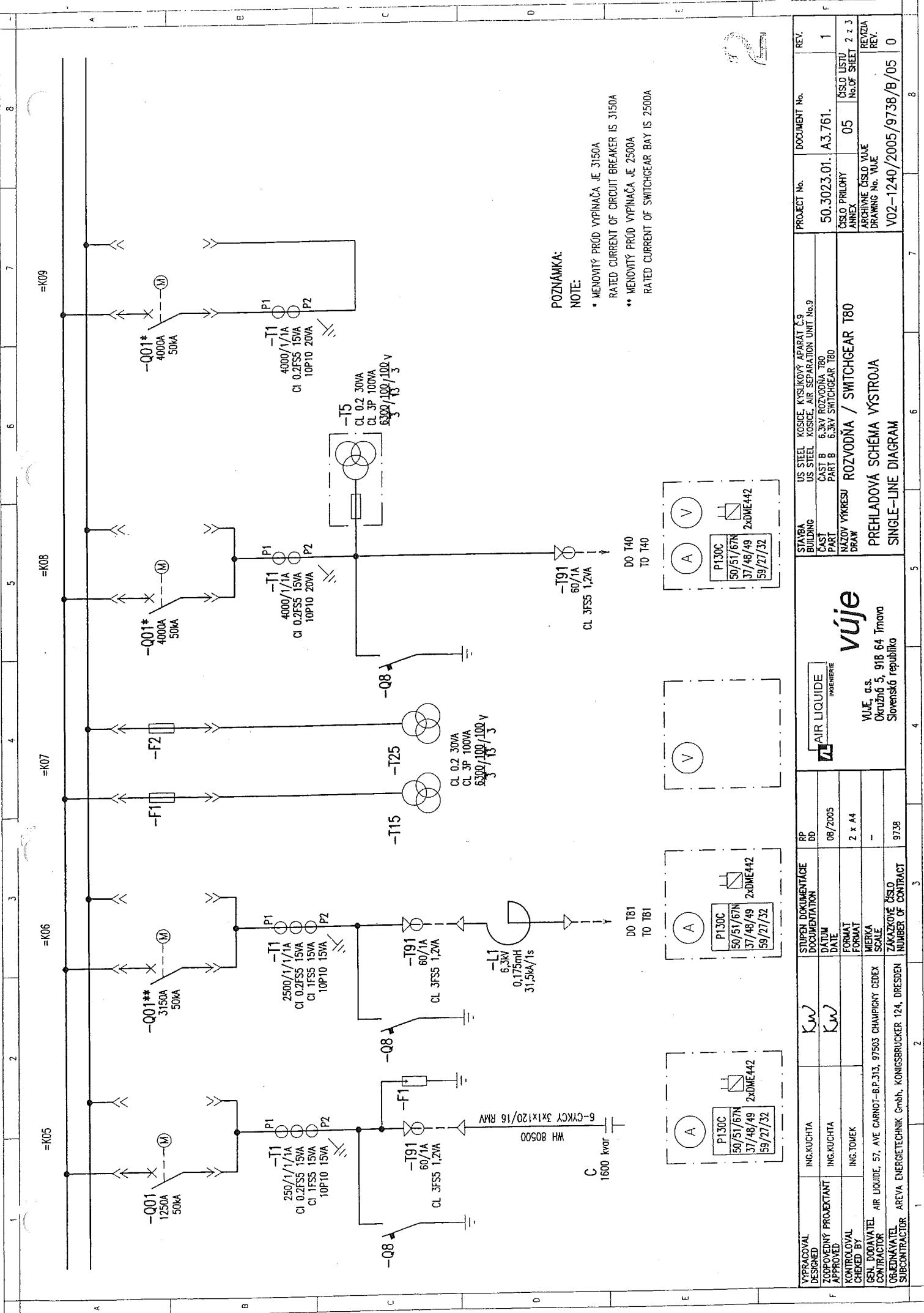
VPRAVDOVAL DESIGNED	ING. KUČTA	STUPEN DOKUMENTACE DOCUMENTATION	RP DD
ZODPOVEDNÝ PROJEKTANT APPROVED	ING. KUČTA	DATE	08/2005
KONTROLOVAL CHECKED BY	ING. TOMEK	FORMAT	2 x A4
GEN. DODAVATEL CONTRACTOR	AREVA ENERGietechnik GmbH, KÖNIGSBRUCKER 124, DRESDEN	MIERA SCALE	-
OBJEDNÁVATEL SUBCONTRACTOR	AREVA ENERGietechnik GmbH, KÖNIGSBRUCKER 124, DRESDEN	ZAKÁZKOVÉ ČÍSLO NUMBER OF CONTRACT	9738

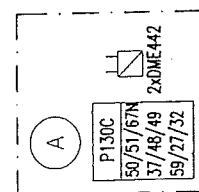
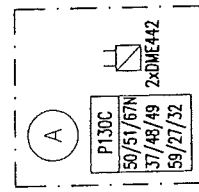
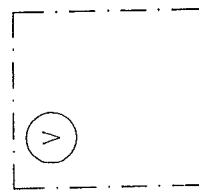
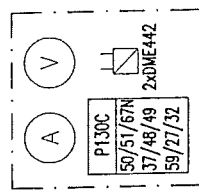
STAVBA BUILDING	US STEEL KOSICE, KYSUCKÝ APARÁT Č.9 US STEEL KOSICE, AIR SEPARATION UNIT No.9
ČÁST PART	ČÁST B PART B
NAZOV VÝKRESU DRAW	ROZVODNÁ / SWITCHGEAR T80
PREHLADOVÁ SCHÉMA VÝSTROJA SINGLE-LINE DIAGRAM	

PROJECT No.	DOCUMENT No.	REV.
50.3023.01. A3.761.	50.3023.01. A3.761.	1
ČÍSLO PRÍLOHY ANNEX	ČÍSLO LISTU No. OF SHEET	REV. 1 z 3
05	05	REV. 0
ARCHIVNÉ ČÍSLO VÝJE DRAWING No. VUE		
V02-1240/2005/9738/B/05		



POZNÁMKA:  
NOTE:  
\* MENOVITÝ PRÚD VYPÍNAČA JE 3150A  
RATED CURRENT OF CIRCUIT BREAKER IS 3150A  
\*\* MENOVITÝ PRÚD VYPÍNAČA JE 2500A  
RATED CURRENT OF SWITCHGEAR BAY IS 2500A



VYPRACOVANÝ DESIGNED	ING. KUČTA	Kw	STUPŇ DOKUMENTÁCIE DOCUMENTATION	RP DD	08/2005	2 x A4	-	9738	ZAKÁZKOVÉ ČÍSLO NUMBER OF CONTRACT	2	3	4	5	6	7	8	REV.
ZODPOVEDNÝ PROJEKTANT APPROVED	ING. KUČTA	Kw	DATE	08/2005													1
KONTROLOVAL CHECKED BY	ING. TOMEK		FORMAT	2 x A4													2 z 3
SEN. DODAVATEL CONTRACTOR	AREVA ENERGIE	7503 CHAMPIGNY CEDEX	SCALA														REV.
ORIEADNÁVATEL SUBCONTRACTOR	AREVA ENERGIE	124, DRESDEN	SCALE														0

STAVBA  
BUILDING

US STEEL KOSICE  
US STEEL KOSICE

KLST  
PART

CAST B  
PART B

5,3kV ROZVODNÁ T80  
5,3kV SWITCHGEAR T80

ROZVODNÁ / SWITCHGEAR T80

PREHLADOVÁ SCHÉMA VÝSTROJA  
SINGLE-LINE DIAGRAM

VÚJE, a.s.  
Okružná 5, 918 64 Tmava  
Slovenská republika

PROJECT No.

50.3023.01. A3.761.

ČÍSLO PRÍLOHY  
ANNEX

05

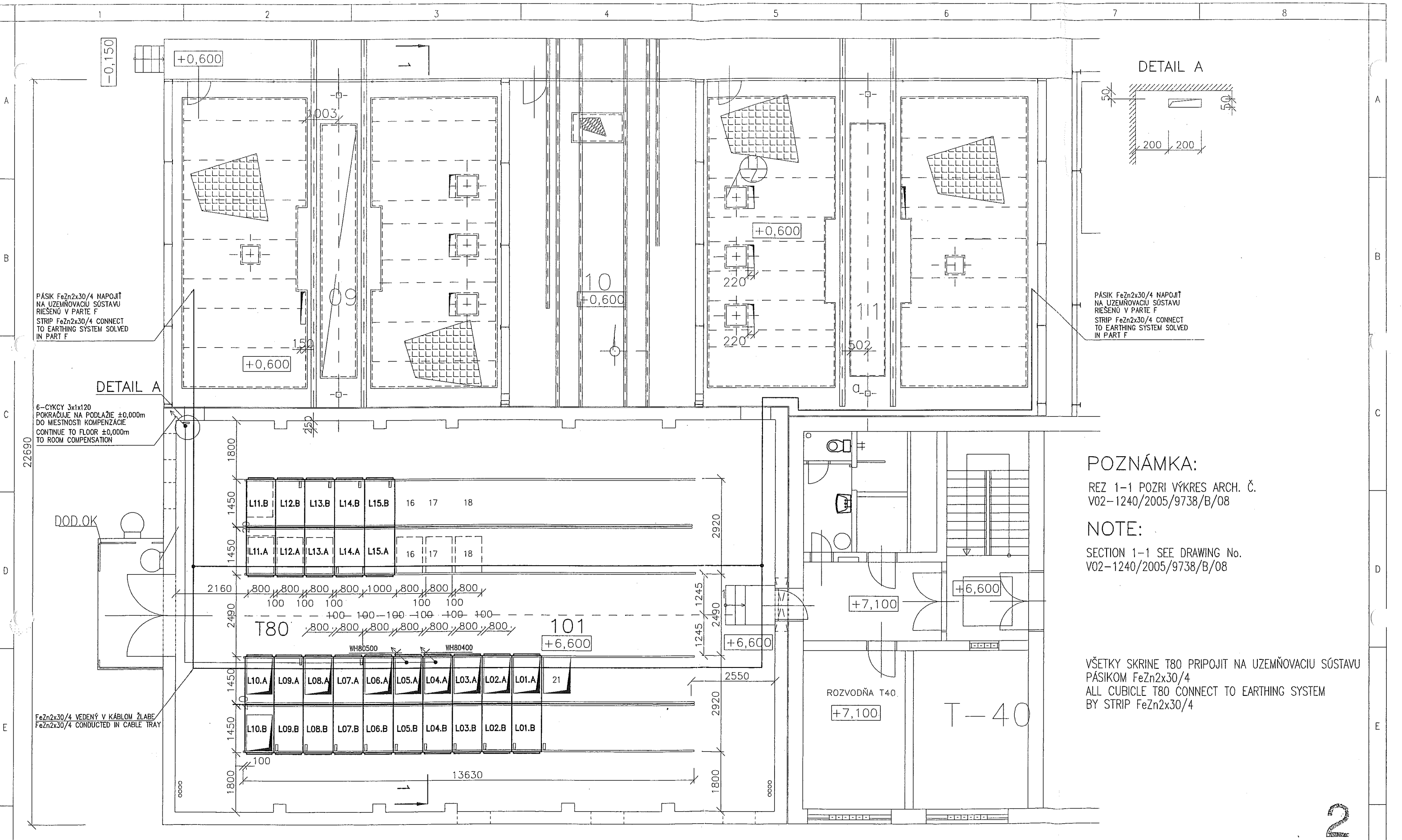
ČÍSLO LISTU  
No. OF SHEET

2 z 3

REV.

V02-1240/2005/9738/B/05





POZNÁMKA:

REZ 1-1 POZRI VÝKRES ARCH. Č.  
V02-1240/2005/9738/B/08

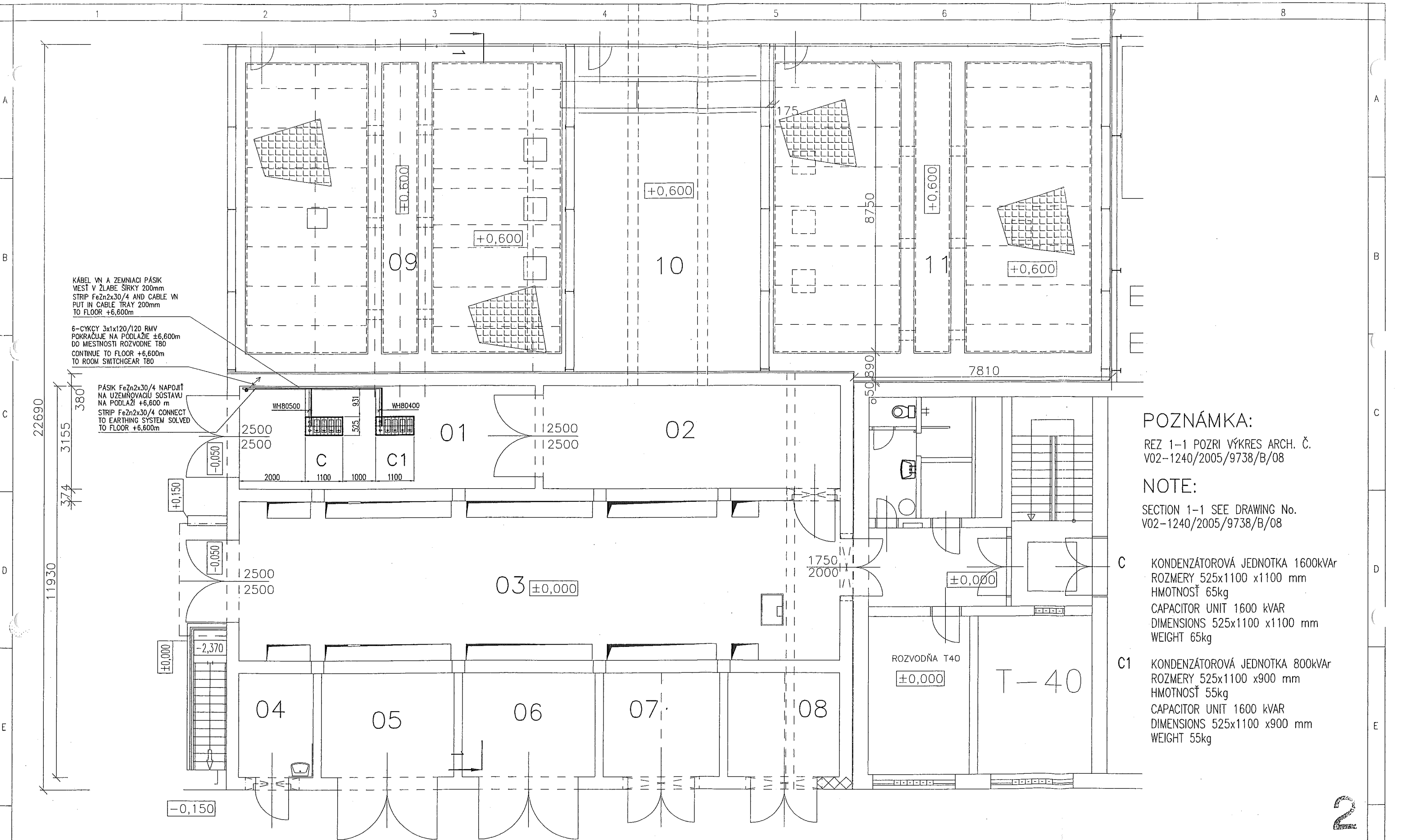
NOTE:

SECTION 1-1 SEE DRAWING No.  
V02-1240/2005/9738/B/08

VŠETKY SKRINE T80 PRIPOJIT NA UZEMŇOVACIU SÚSTAVU  
PÁSIKOM FeZn2x30/4  
ALL CUBICLE T80 CONNECT TO EARTHING SYSTEM  
BY STRIP FeZn2x30/4

2

VYPRACOVAL DESIGNED	ING.KUCHTA	Kw	STUPEN DOKUMENTÁCIE DOCUMENTATION	RP DD	<div><div>AIR LIQUIDE</div><div>INGENIERIE</div><div>vúje</div><div>VÚJE, a.s. Okružná 5, 918 64 Trnava Slovenská republika</div></div>	STAVBA BUILDING	US STEEL KOSICE, KYSLÍKOVÝ APARÁT Č.9 US STEEL KOSICE, AIR SEPARATION UNIT No.9	PROJECT No.	DOCUMENT No.	REV.
ZODPOVEDNÝ PROJEKTANT PROVED	ING.KUCHTA	Kw	DÁTUM DATE	07/2005		ČASŤ PART	ČASŤ B 6,3kV ROZVODŇA T80 PART B 6,3kV SWITCHGEAR T80	50.3023.01.	A3.761.	1
KONTROLOVAL CHECKED	ING.TOMEK		FORMAT FORMAT	2 x A4		NÁZOV VÝKRESU DESCRIPTION	ROZVODŇA T80 / SWITCHGEAR T80	ČÍSLO PRÍLOHY ANNEX	06	ČÍSLO LISTU No.OF SHEET 1 z 1
GEN. DODAVATEL CONTRACTOR	AIR LIQUIDE, 57, AVE CARNOT-B.P.313, 97503 CHAMPIGNY CEDEX		MIERKA SCALE	1:100		PÔDORYS +6,600m / PLANE +6,600m		ARCHIVNE ČÍSLO VÚJE DRAWING No.		REVÍZIA REV.
OBJEDNÁVATEL SUBCONTRACTOR	AREVA ENERGIECHNIK GmbH, KONIGSBRUCKER 124, DRESDEN		ZÁKAZKOVÉ ČÍSLO NUMBER OF CONTRACT	9738		UZEMNENIE / EARTHING		V02-1240/2005/9738/B/06		0

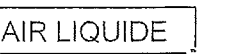


POZNÁMKA:  
REZ 1-1 POZRI VÝKRES ARCH. Č.  
V02-1240/2005/9738/B/08

NOTE:  
SECTION 1-1 SEE DRAWING No.  
V02-1240/2005/9738/B/08

C KONDENZÁTOROVÁ JEDNOTKA 1600kVAr  
ROZMERY 525x1100 x1100 mm  
HMOTNOSŤ 65kg  
CAPACITOR UNIT 1600 kVAR  
DIMENSIONS 525x1100 x1100 mm  
WEIGHT 65kg

C1 KONDENZÁTOROVÁ JEDNOTKA 800kVAr  
ROZMERY 525x1100 x900 mm  
HMOTNOSŤ 55kg  
CAPACITOR UNIT 1600 kVAR  
DIMENSIONS 525x1100 x900 mm  
WEIGHT 55kg

VYPRACOVAL DESIGNED	ING.KUCHTA	Kw	STUPEN DOKUMENTÁCIE DOCUMENTATION	RP DD	<div>vúje</div> <div>VÚJE, a.s. Okružná 5, 918 64 Trnava Slovenská republika</div>	STAVBA BUILDING	US STEEL KOSICE, KYSLÍKOVÝ APARÁT Č.9 US STEEL KOSICE, AIR SEPARATION UNIT No.9	PROJECT No.	DOCUMENT No.	REV.					
ZODPOVEDNÝ PROJEKTANT APPROVED	ING.KUCHTA	Kw	DÁTUM DATE	07/2005		ČASŤ PART	ČASŤ B 6,3kV ROZVODŇA T80 PART B 6,3kV SWITCHGEAR T80	50.3023.01.	A3.761.	1					
KONTROLOVAL CHECKED	ING.TOMEK		FORMAT FORMAT	2 x A4		NÁZOV VÝKRESU DESCRIPTION	ROZVODŇA T80 / SWITCHGEAR T80	ČÍSLO PRÍLOHY ANNEX	07	ČÍSLO LISTU No.OF SHEET 1 z 1					
GEN. DODAVATEL CONTRACTOR	AIR LIQUIDE, 57, AVE CARNOT-B.P.313, 97503 CHAMPIGNY CEDEX			MIERKA SCALE		1:100	PÔDORYS ±0,000m / PLANE ±0,000m	ARCHIVNE ČÍSLO VÚJE DRAWING No.		REVÍZIA REV.					
OBJEDNÁVATEL SUBCONTRACTOR	AREVA ENERGIETECHNIK GmbH, KONIGSBRUCKER 124, DRESDEN			ZÁKAZKOVÉ ČÍSLO NUMBER OF CONTRACT		9738	UZEMNENIE / EARTHING	V02-1240/2005/9738/B/07		0					
1		2		3		4		5		6		7		8	





<b>vúje</b> <b>VUJE, a.s. divízia 1200</b> Okružná 5 918 64 Trnava	Stupeň	Skartačný znak	Výtlačok č.:
	RD	A5	<div style="font-size: 48px; text-align: center;">2</div>
	Názov zákazky: <b>USS Košice, Kyslíkový aparát č.9</b>		
<b>ZOZNAM KÁBLOV PRE T80</b> <b>CABLE LIST FOR T80</b>			Poradové číslo
<b>ČASŤ B. 6,3KV ROZVODNA – T80</b> <b>PART B. 6,3KV SWITCHGEAR – T80</b>			<b>09</b>
Vypracoval / Designed Ing.Vladimír Kuchta <i>hnce</i>		Zodpovedný projektant / Approved Ing.Vladimír Kuchta <i>hnce</i>	Dátum / Date 08/2005
			Počet listov / Sheet 1

Číslo kábla Number cable	Odkiaľ From	Svorka Terminal	Funkcia Function	Kam To	Svorka Terminal	Typ kábla Type cable	Dĺžka m Distance
1.T01 pole č.21							
WH 80400	T80-L04	-L1	L1	C1	-L1	6-CYKCY 3x1x120/16 RMV	3x35
		-L2	L2		-L2		
		-L3	L3		-L3		
WH 80500	T80-L05	-L1	L1	C	-L1	6-CYKCY 3x1x120/16 RMV	3x30
		-L2	L2		-L2		
		-L3	L3		-L3		
WL 8001	T80.1A	-X0:1	L1	400 VAC		CYKY 3Cx2,5	115
		-X0:3	N				
		-XPE	PE		PE		
WL 8002	T80.1A	-X0:11	L+	220 VDC		CYKY 4Dx6	100
		-X0:13	L-				
SÉRIOVÁ DATOVÁ LINKA V T01							
	ASP21			Centrálna vstupná jednotka		J-2Y(ST)Y2x2x0,6	133
SUMARIZÁCIA KÁBLOV PRE T01							
6-CYKCY 1x120/16 RMV	M	195					
CYKY 4Dx6	M	100					
CYKY 3Cx2,5	M	115					
J-2Y(ST)Y2x2x0,6	M	133					