

Dear Mr. Martens,

attached find please a translated technical report related to the damaged ventilator

Best regards,  
Vasil Rosolanka  
HS HSV s.r.o.

## TECHNICAL REPORT

The subject matter of the design documentation is correction of connection and control of ventilators, room thermostats, valve servo-units and the design of the new switchboard RMS 002A.

### 1. STANDARDS USED

STN 332000-1	Electrical installations in buildings
Part 1:	Scope of validity, purpose and basic principles
STN 332000-4-41	Electrical installations in buildings
Part 4:	Securing of safety
Chapter 41:	Prevention of injuries caused by current
STN 332000-4-43	Electrical equipment
Part 4:	Safety
Chapter 43:	Protection against over-currents
STN 332000-4-473	Electrical equipment
Part 4:	Safety
Chapter 47:	Application of protective measures for securing of safety
Section 473:	Measures of protection against over-currents
STN 332000-5-523	Electrical equipment
Part 5:	Selection and construction of electrical equipment
Chapter 52:	Selection of systems and construction of wiring
Section 523:	Permissible currents
STN 330300	Types of environment for electrical equipment
STN 331310	Safety rules for electrical equipment to be used by persons without electrical qualification
Regulation No. 718/2002 (Coll.) – Regulation of the Ministry of Labor, Social Affairs and Family of the Slovak Republic	

### 2. VOLTAGE SYSTEMS

3/N/PE AC 400/230V 50 Hz TN – S  
1/N/PE AC 230 V 50 Hz TN – S

### 3. PREVENTION OF INJURIES CAUSED BY ELECTRIC CURRENT IN CASE OF BREAKDOWN /STN 332000-4-41/ by automatic disconnecting from power

### 4. PREVENTION OF INJURIES CAUSED BY ELECTRIC CURRENT DURING THE ORDINARY OPERATION /STN 332000-4-41/ by insulating of the live parts with a cover

### 5. INSTALLED CAPACITY

$P_i = 45 \text{ kW}$   
 $P_s = 45 \text{ kW}$

### 6. SHORT CIRCUIT RATIOS IN THE LOCATION OF THE SWITCHBOARD RMS 002A

$I_k = 10 \text{ kA}$   
 $I_{KM} = 18,4 \text{ kW}$

## 7. ENVIRONMENT /STN 330300/

Basic – 311 in accordance with the original documentation prepared by the designer office Hutný projekt Košice.

## 8. SWITCHBOARD RMS 002A

A new Switchboard will be added to the existing one - RMS 002, with interconnection of both of these by a short copper cable CYKY-J 5x35.

The Switchboard will contain completely new equipment for the ventilators M01/1, M01/2, M02/1, M02/2, M03/1, M03/2. The protection of the engines of the ventilators was supported by a supplemented control thermistor relay. The ventilators will be started by a Y-D system in order to reduce the dynamic load of the blades at the start up and at the reducing of the engagement current of the engine.

## 9. SWITCHBOARD RMS 002 /adjustments/

The Switchboard will be supplemented with thermistor protection for the ventilators M07/1, M07/2, M08/1, M08/2. The connection of the control circuit of the above mentioned ventilators and all valve servo-units will be repaired.

## 10. CONTROL SYSTEM OF THE VENTILATORS

The ventilators in the room No. 1 (main compressors) will be started up by the Y-D system. The control can be carried out either in the automatic regime /switch by a room thermostat/ or manually (only for the service purposes).

- Automatic regime of the ventilators M01/1, M01/2:  
Switch on at approx. 30°C, switch off at approx. 26 °C.
- Automatic regime of the ventilators M02/1, M02/2:  
Switch on at approx. 35°C, switch off at approx. 31 °C.
- Automatic regime of the ventilators M03/1, M03/2:  
Switch on at approx. 40°C, switch off at approx. 36 °C.

The ventilators in the room No. 2 /GAN compressors/ will be started up directly. The control is possible either in the automatic regime /switch by a room thermostat/ or manually (only for the service purposes).

- Automatic regime of the ventilators M07/1, M07/2:  
Switch on at approx. 32°C, switch off at approx. 25 °C.
- Automatic regime of the ventilators M08/1, M08/2:  
Switch on at approx. 40°C, switch off at approx. 33 °C.

**The thermostats can be set up within 0-40 °C, with switching difference 3-10 °C.**

## 11. CONTROL OF THE VALVE SERVO-UNITS

The servo-units in the room No. 1 /main compressors/ will be controlled by the thermostat ST 04. At the decrease of the temperature in the room to 10 °C the valves will close /the ventilators will be switched off by the thermostats ST 01, ST 02, ST 03/. They will open at the increase of the temperature to 15 °C. In the temperature range between ST 04 and ST 01, the natural airing of the room will be ensured.

The manual control of the valve servo-units shall be used only for service purposes.

The servo-units in the room No. 2 /GAN compressors/ will be controlled by the thermostat ST 09. At the decrease of the temperature in the room to 10 °C the valves will close /the ventilators will be switched off by the thermostats ST 07, ST 08/. They will open at the increase of the temperature to 15 °C. In the temperature range between ST 09 and ST 07, the natural airing of the room will be ensured.

The manual control of the valve servo-units shall be used only for service purposes.

**The thermostats can be set up within 0-40 °C, with switching difference 3-10 °C.**

## 12. ROOM THERMOSTATS

The control of the ventilators and the valves depending on the temperature has been modified on the basis of the original technical order of the air-conditioning designer. In order to keep it, the repair works shall involve removal of the existing electronic thermostats REGMET ES11, which have a constant switching difference 1 °C, and replacing of those by the room thermostats Danfoss KP75 with the adjustable switching difference 3-10 °C.

Ing. Pavel Slančo

## ŠPECIFIKÁCIA MATERIÁLU/SPECIFICATION STUFF

### 1. Rozvádzač RMS 002A/distribution box RMS 002A

P.č.	Názov/name	Typ/type	Mn.
1.	skriňa plechová /tinplate box	SAREL SA18605, 1400x600x300mm	1
2.	istič/breaker	Moeller PL7-20D/3	6
3.	prepojovací hrebeň/junction rack, 80A		1m
4.	stykač/contactor	DILM 12-10, 230V	6
		DILM 17-10, 230V	12
	pomocný kontakt/auxiliary contact	DILA-XHI22	16
5.	termistorové relé/thermistor relay	ELKO TER-7, 230V	6
6.	časové relé Y-D/time relay Y-D	Telemecanique RE7TL11BU, 230V	6
7.	svorka/clamp	Legrand 39060	40
		Legrand 39061	40
8.	mostík/jumper, PE+N	Legrand 048 82	1
9.	lišta/strip	TS35/500mm	6
10.	perforovaný žľab/fenestrated canal	Kopos 60x80	4m
		Kopos 100x80	3m
11.	upchávková vývodka/cranchise bushing	P13	4
		P21	7
		P36	1
		P11	6

### 2. Rozvádzač RMS 002/distribution box RMS 002

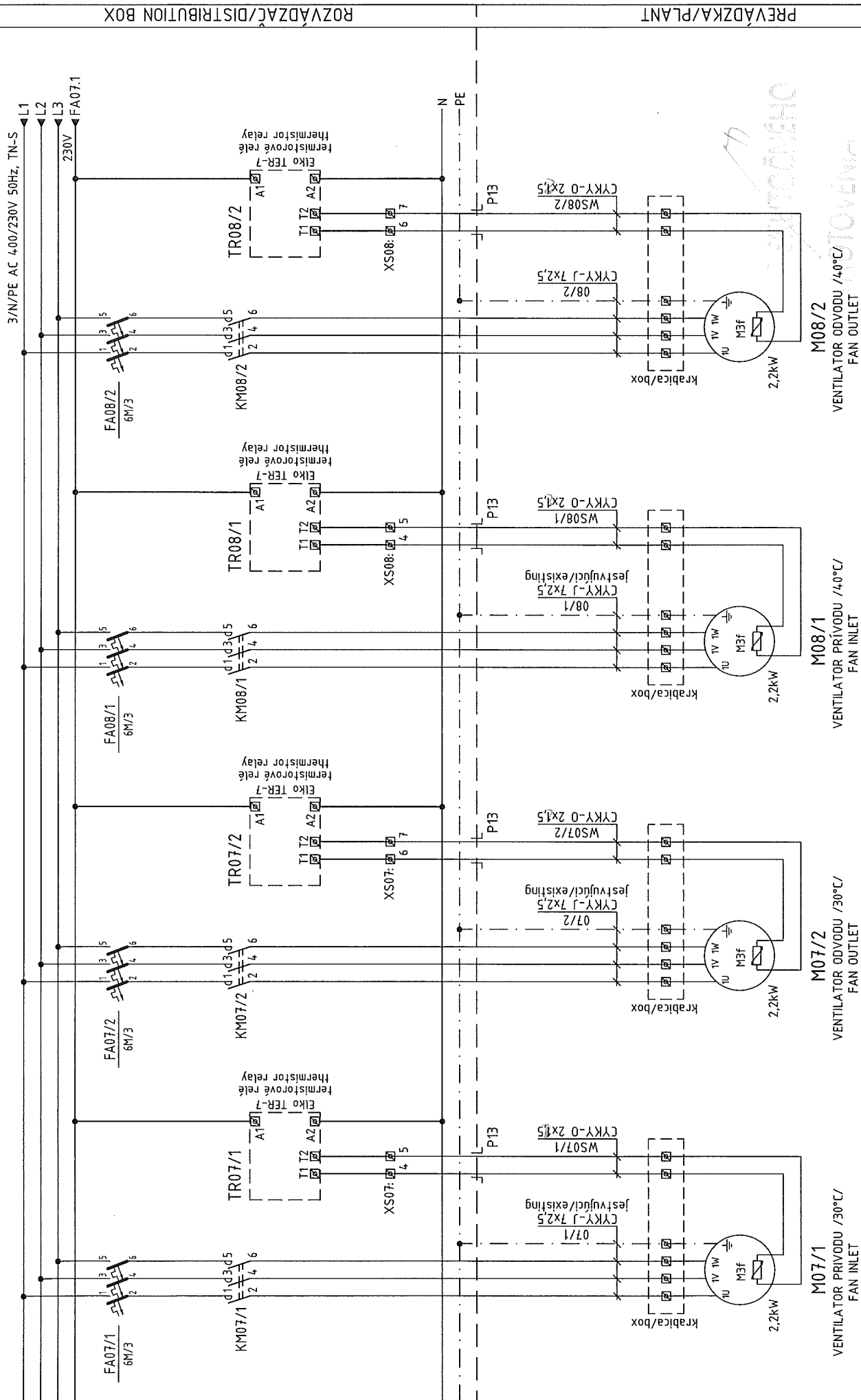
P.č.	Názov/name	Typ/type	Mn.
1.	termistorové relé/thermistor relay	ELKO TER-7, 230V	4
2.	upchávková vývodka/cranchise bushing	P21	1
		P36	1
		P11	4

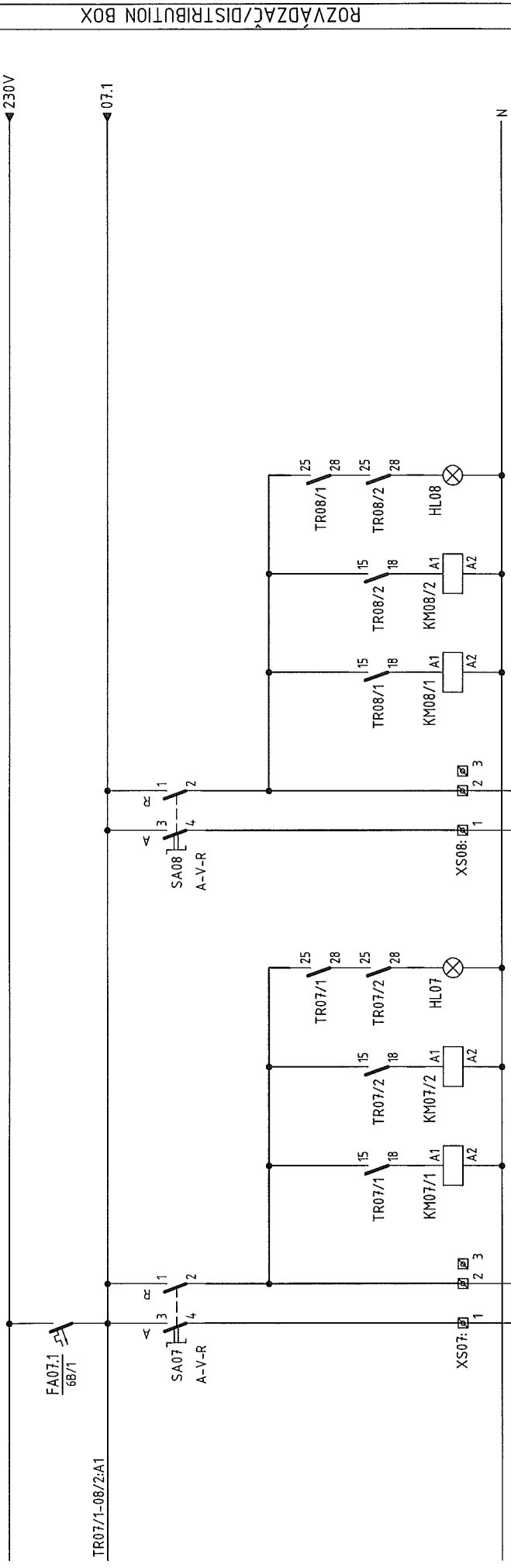
### 3. Elektroinštalačný materiál/electrical installation stuff

P.č.	Názov/name	Typ/type	Mn.
1.	priestorový termostat/space thermostat	Danfoss KP75, 0-40°C	7
	+držák na stenu/wall holder		
	Dodávateľ/contractor: Maret Nové Mesto nad Váhom		

# ZOZNAM NOVÝCH KÁBLOV/LIST OF NEW CABLES

Číslo kábla/ Cable number		CYKY-O 2x1,5	CYKY-J 5x35	JYTY-O 14x1		Z/FROM	DO/TO	Pozn./Note
WS01/1		20m				RMS002A	M01/1	
WS01/2		50m				RMS002A	M01/2	
WS02/1		40m				RMS002A	M02/1	
WS02/2		25m				RMS002A	M02/2	
WS03/1		30m				RMS002A	M03/1	
WS03/2		35m				RMS002A	M03/2	
WS07/1		50m				RMS002	M07/1	
WS07/2		60m				RMS002	M07/2	
WS08/1		60m				RMS002	M08/1	
WS08/2		60m				RMS002	M08/2	
WL01A			2m			RMS002	RMS002A	
WS01A				2m		RMS002	RMS002A	

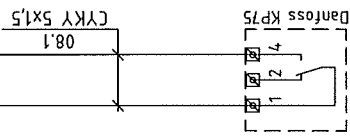




PREVÁDZKA/PLANT

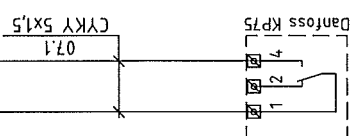
CHOD/MOTION

CHOD/MOTION



ST08  
THERMOSTAT 40°C  
THERMOSTAT 40°C

≥ 40°C VENTILÁTORY ZAPNUTÉ  
≤ 33°C VENTILÁTORY VYPNUTÉ  
≥ 40°C FUNDS TURN ON  
≤ 33°C FUNDS TURN OFF



ST07  
THERMOSTAT 30°C  
THERMOSTAT 30°C

≥ 32°C VENTILÁTORY ZAPNUTÉ  
≤ 25°C VENTILÁTORY VYPNUTÉ  
≥ 32°C FUNDS TURN ON  
≤ 25°C FUNDS TURN OFF

PROJEKT AUTOMATIZACE  
VYHOTOVENÍ

Miestnosť: č.2-GAN kompresory/Room No.2-GAN compressors

Názov: RMS002-zapojovacia schéma-ovládací obvod

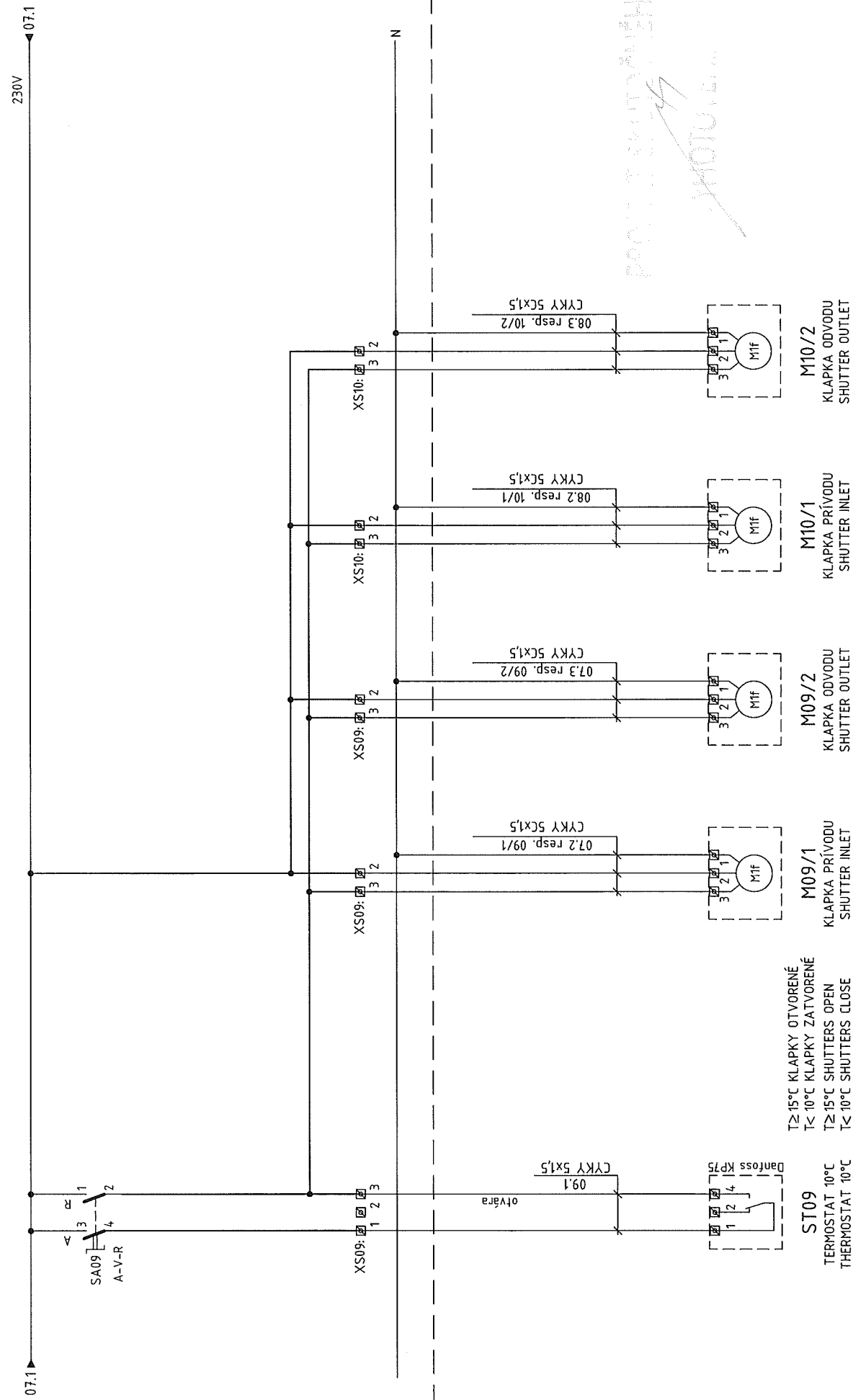
Title: RMS002-connection diagram-operating circuit

list/sheet

02

ROZVÄDZAČ/DISTRIBUTION BOX

PREVÄDZKA/PLANT

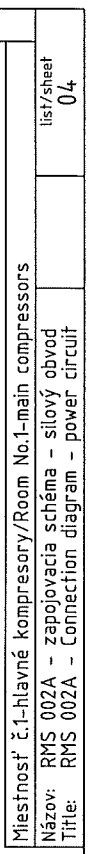


Miestnosť č.2-GAN kompresory/Room No.2-GAN compressors

Názov: RMS002-zapojovacia schéma-ovládanie klapiek

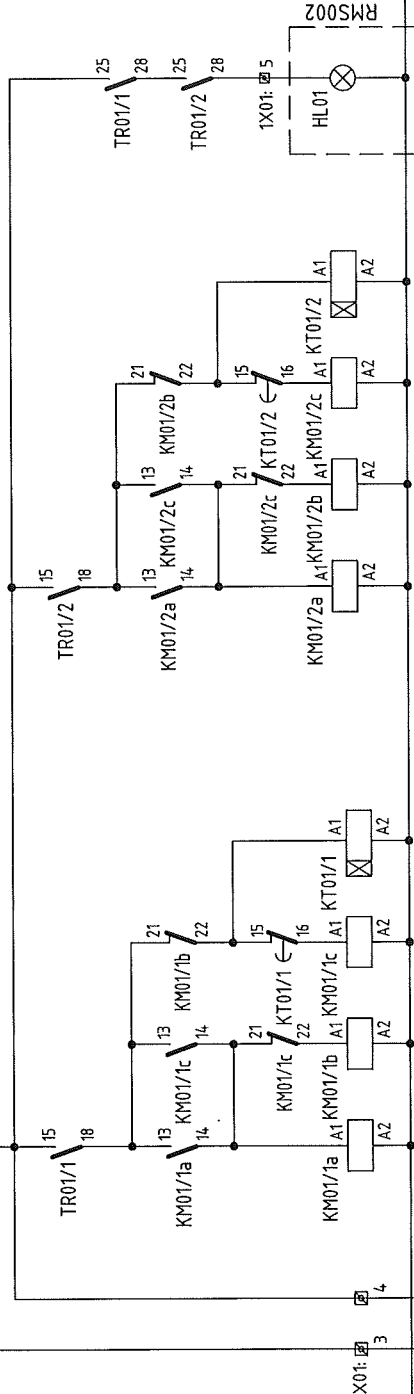
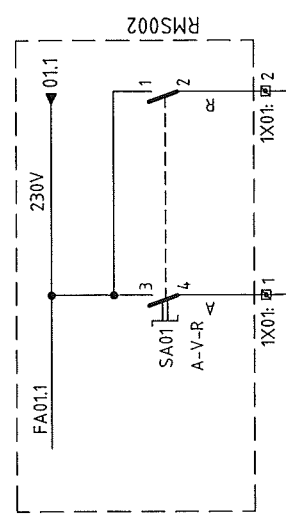
Title: RMS002-connection diagram-operating air shutters





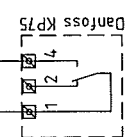






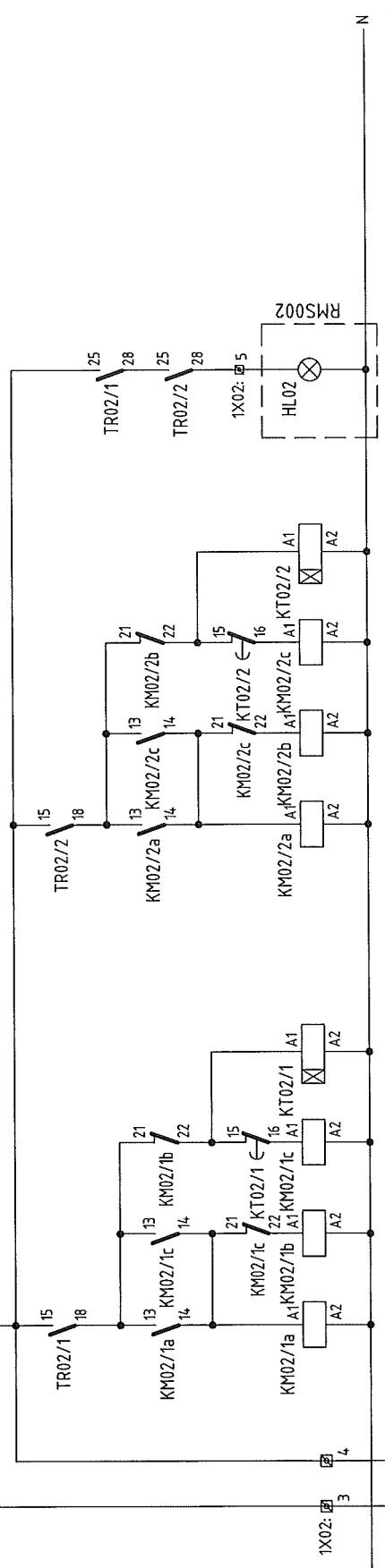
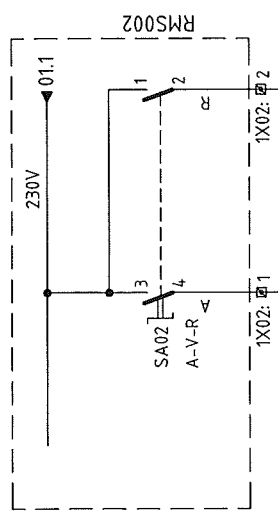
KM01/1a+KM01/1c - Y /WYE/  
 KM01/1a+KM01/1b - D /DELTA/  
 KM01/2a+KM01/2c - Y /WYE/  
 KM01/2a+KM01/2b - D /DELTA/

CHOD/MOTION



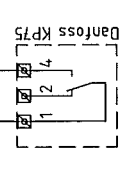
ST01  
 TERMOSTAT 30°C  
 THERMOSTAT 30°C

T ≥ 30°C VENTILÁTORY ZAPNUTÉ  
 T < 26°C VENTILÁTORY VYPNUTÉ  
 T ≥ 30°C FUNTS TURN ON  
 T < 26°C FUNTS TURN OFF



KM02/1a+KM02/1c - Y /WYE/  
 KM02/1a+KM02/1b - D /DELTA/  
 KM02/2a+KM02/2c - Y /WYE/  
 KM02/2a+KM02/2b - D /DELTA/

T<sub>2</sub> ≥ 35°C VENTILÁTORY ZAPNUTÉ  
 T<sub>2</sub> < 31°C VENTILÁTORY VYPNUTÉ  
 T<sub>2</sub> ≥ 35°C FUNDS TURN ON  
 T<sub>2</sub> < 31°C FUNDS TURN OFF

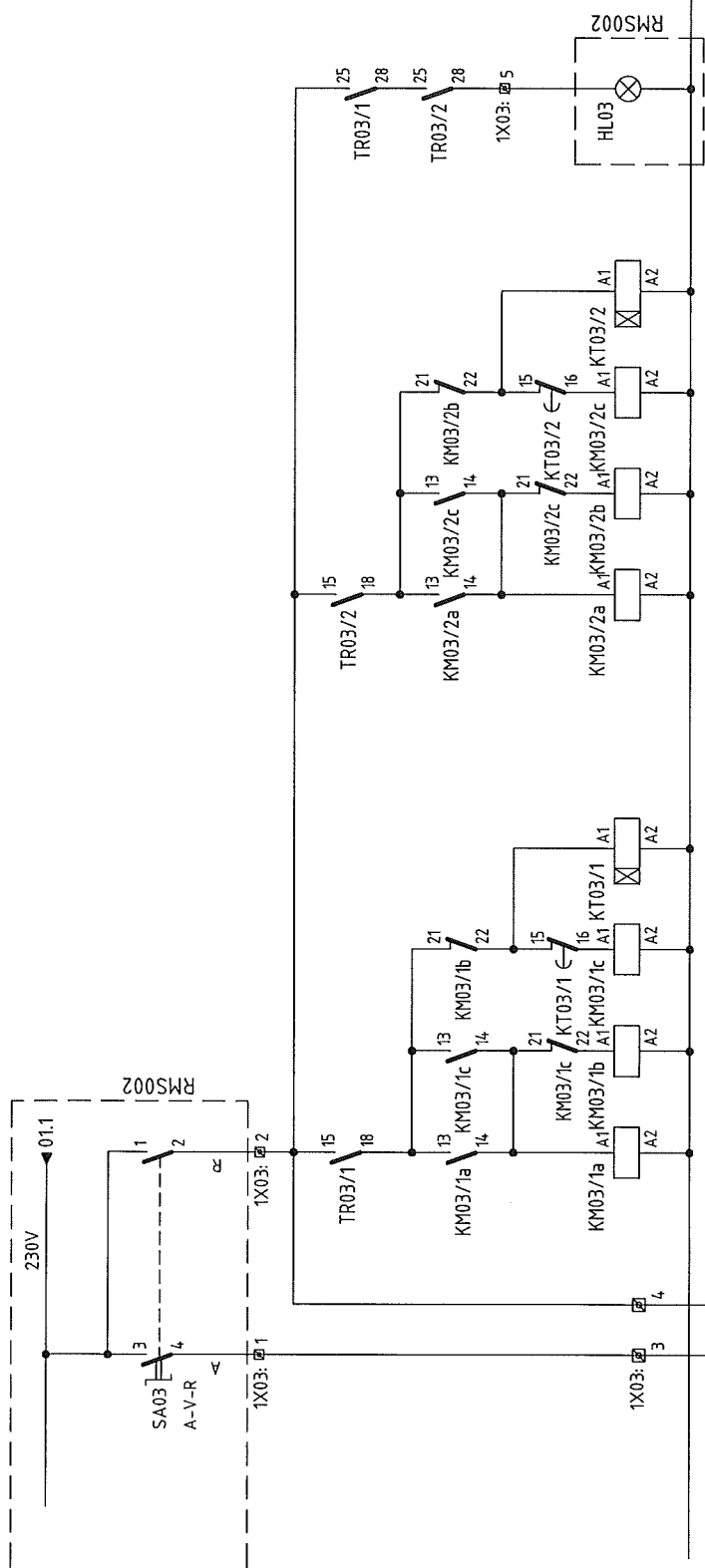


ST02  
 TERMOSTAT 35°C  
 THERMOSTAT 35°C

CHOD/MOTION

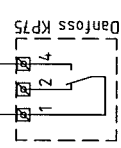
PREVÁDZKA/PLANT

ROZVÁDZAČ/DISTRIBUTION BOX

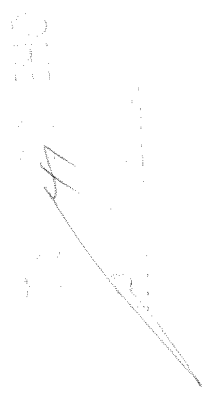


KM03/1a+KM03/1c - Y /WYE/  
 KM03/1a+KM03/1b - D /DELTA/  
 KM03/2a+KM03/2c - Y /WYE/  
 KM03/2a+KM03/2b - D /DELTA/

T ≥ 40°C VENTILÁTORY ZAPNUTÉ  
 T < 36°C VENTILÁTORY VYPNUTÉ  
 T ≥ 40°C FUNDS TURN ON  
 T < 36°C FUNDS TURN OFF



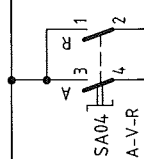
CHOD/MOTION



230V

ROZVÁDZAČ/DISTRIBUTION BOX

PREVÁDZKA/PLANT



XS04: 1 2 3

XS05: 3 2

XS05: 3 2

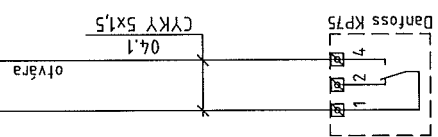
XS05: 3 2

XS05: 3 2

XS04: 3 2

XS04: 3 2

N



04/1  
CYKY 5Cx1,5

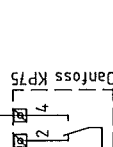
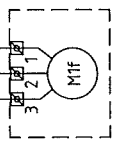
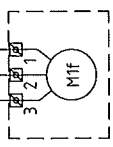
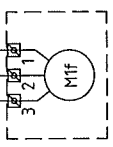
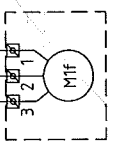
04/2  
CYKY 5Cx1,5

05/1  
CYKY 5Cx1,5

05/2  
CYKY 5Cx1,5

06/1  
CYKY 5Cx1,5

06/2  
CYKY 5Cx1,5



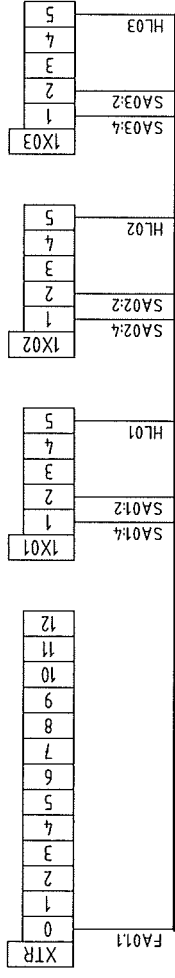
T ≥ 15°C Klapky otvorené  
T < 10°C Klapky zatvorené  
T ≥ 15°C Shutters open  
T < 10°C Shutters close

Miestnosť č.1-hlavné kompresory/Room No.1-main compressors

Názov: RMS002-zapojovacia schéma - ovládanie klapiek  
Title: RMS002-connection diagram - operating shutters

ROZVÄDZAČ/DISTRIBUTION BOX RMS002

ROZVÄDZAČ/DISTRIBUTION BOX RMS002A

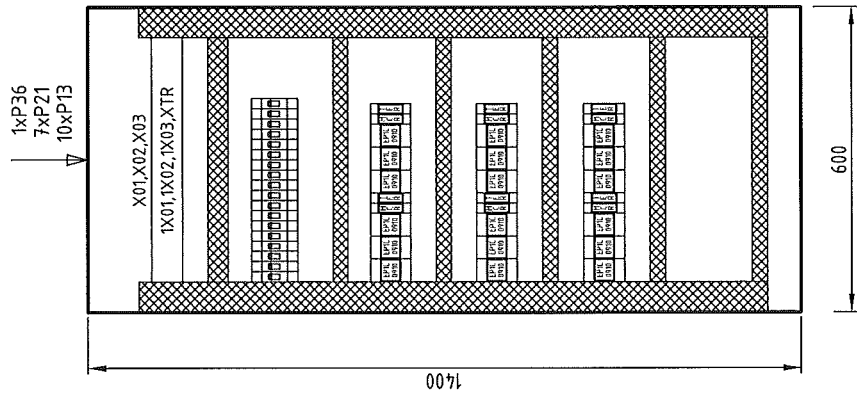


RMS002  
JYTY-O 14x1  
WS01A

P21





KRYTIE ROZVÁDZAČA: IP43/IP20  
 NAPĚTOVÉ SÚSTAVY: 3/N/PE AC 400/230V 50Hz TN-S

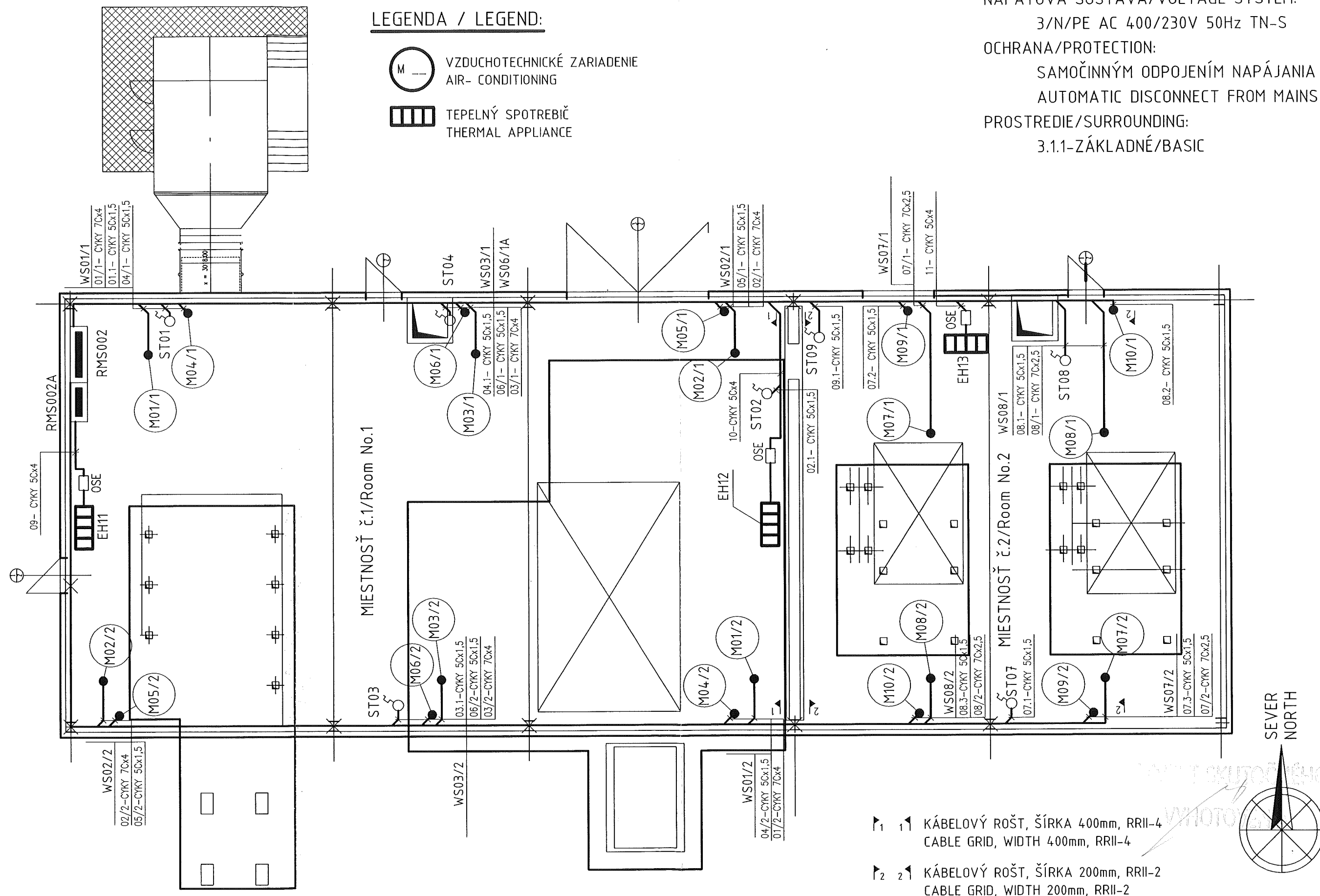


Skriňa Sarel 18605 /1400x600x300mm/

# LEGENDA / LEGEND:

-  VZDUCHOTECHNICKÉ ZARIADENIE  
AIR- CONDITIONING
-  TEPELNÝ SPOTREBIČ  
THERMAL APPLIANCE

NAPĚŤOVÁ SÚSTAVA/VOLTAGE SYSTEM:  
3/N/PE AC 400/230V 50Hz TN-S  
OCHRANA/PROTECTION:  
SAMOČINNÝM ODPOJENÍM NAPÁJANIA  
AUTOMATIC DISCONNECT FROM MAINS  
PROSTREDIE/SURROUNDING:  
3.1.1-ZÁKLADNÉ/BASIC



- 1 KÁBELOVÝ ROŠT, ŠÍRKA 400mm, RRII-4  
CABLE GRID, WIDTH 400mm, RRII-4
- 2 KÁBELOVÝ ROŠT, ŠÍRKA 200mm, RRII-2  
CABLE GRID, WIDTH 200mm, RRII-2

Miestnosť č.1+2/Room No.1+2

Názov: Rozvod káblov  
Title: Cables distribution

MIERKA/SCALE:  
1:100

Číslo výkresu:  
13