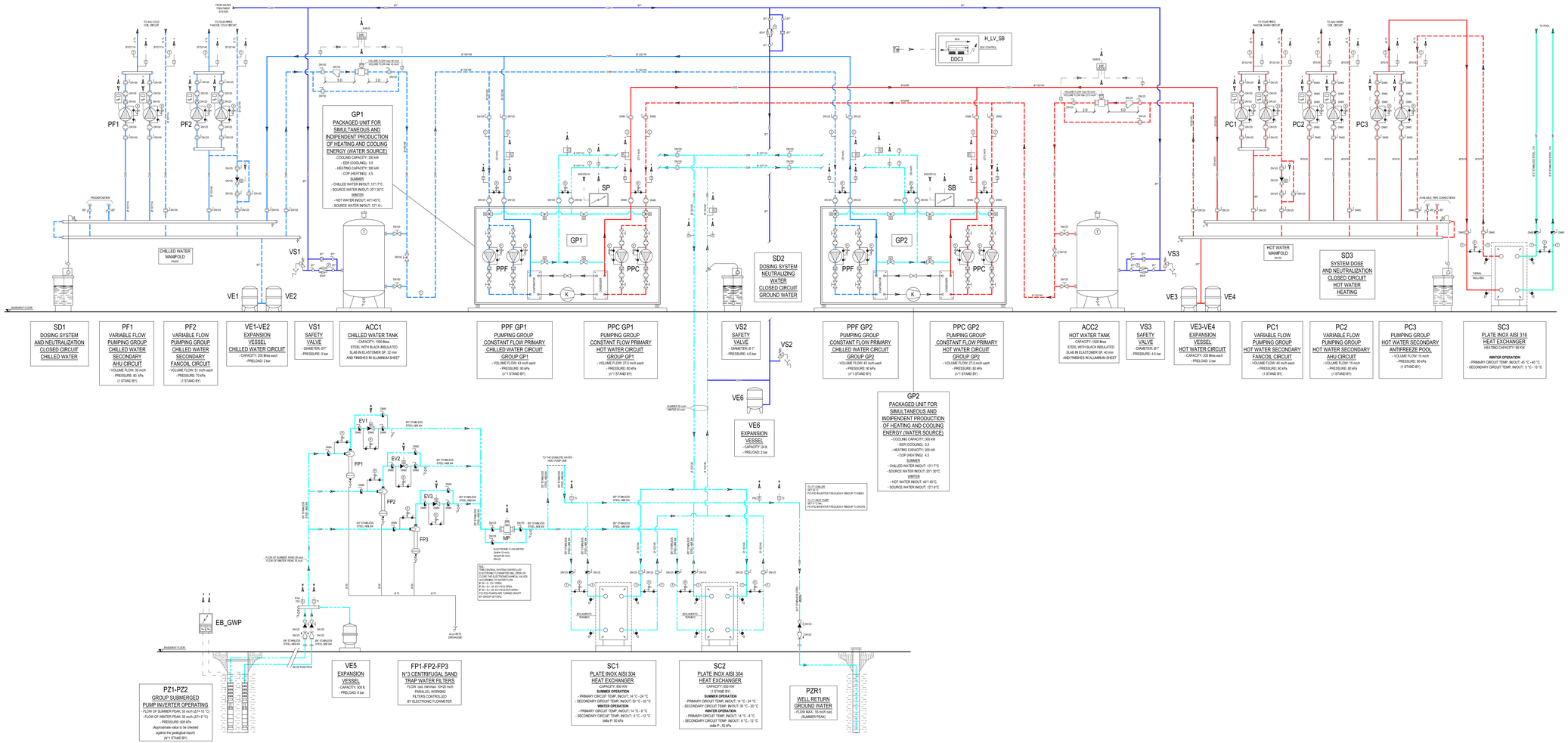

LEGEND

BALL VALVE	LIQUID LEVEL CONTROLLER
BUTTERFLY VALVE	FLOW SWITCH
STAINLESS STEEL BUTTERFLY VALVE	FLOW METER
BALANCING VALVE	BACKFLOW PREVENTER
GLOBE VALVE	SWING CHECK VALVE
STAINLESS STEEL GLOBE VALVE	PRESSURE REDUCING VALVE
GATE VALVE WITH RUBBER-ENCAPSULATED WEDGE	FINE CLEANING WATER FILTER
BALL CHECK VALVE	FUNNEL DRAIN
MOTORIZED 2 WAY CONTROL VALVE	ELECTRIC MOTOR DRIVEN PUMP
STAINLESS STEEL MOTORIZED 2 WAY CONTROL VALVE	INSTRUMENT CONNECTION
MOTORIZED 3 WAY CONTROL VALVE	INVERTER
SAFETY RELIEF VALVE	HWS HOT WATER SUPPLY
LIFT CHECK VALVE	HWR HOT WATER RETURN
EXPANSION JOINT	CWS CHILLED WATER SUPPLY
Y STRAINER	CWR CHILLED WATER RETURN
VOLUMETRIC WATER-METER	CDW COLD DOMESTIC WATER
ELETRICAL ENERGY METER	HDW HOT DOMESTIC WATER
THERMOMETER	RDW RECIRCULATING HOT DOMESTIC WATER
SENSOR (I) 4-20 = PRESSURE (T) 4-20 = TEMPERATURE (H) 4-20 = HUMIDITY (F) 4-20 = SPEED	GW GROUND WATER
PRESSURE GAUGE	ELECTRIC CONTROL SIGNAL
DIFFERENTIAL PRESSURE CONTROL DEVICE	(*) WIRE-LINE TO/FROM BUILDING MANAGEMENT SYSTEM
PRESSURE CONTROL DEVICE	

INVESTITOR: JOINT PROJECT ON ENVIRONMENT AND ENERGY BETWEEN ITALY AND MONTENEGRO

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Podgorica, Crna Gora

ISSUE:
MAIN PROJECT — THERMOTECHNICAL DRAWINGS

TITLE
COOLING, HEATING SCHEMATIC

REV.	DATE	FILE	SUBJECT	DRAW.	APPR.
5					
4					
3					

ISSUE NR.
Te_001

DATE: 30/11/2010
SCALE: -
FILE: 926_Te_001.dwg
J.R.: 926
DRAW.: G. A.
APPROVED: RI. M.

LEGEND

- MANIFOLD
- STEEL RADIATOR
- WALL CONCEALED FANCOIL UNIT
- FLOOR CONCEALED FANCOIL UNIT (ALL FANCOIL UNITS ARE MODEL GR1 UNLESS STATED OTHERWISE)
- GRILLE WITHOUT FANCOIL UNIT
- BOOSTER COIL
- FANCOIL UNIT CASSETTE

- MX — MECHANICAL SHAFT
- HWS — HOT WATER SUPPLY
- HWR — HOT WATER RETURN
- CWS — CHILLED WATER SUPPLY
- CWR — CHILLED WATER RETURN
- GW — GROUND WATER
- REFRIGERANT
- ELECTRIC CONTROL SIGNAL

PIPE INSULATIONS

CIRCUIT	LOCATION	MATERIAL	INSULATION	INSULATION THICKNESS (mm)	EXTERNAL COVER WHEN EXPOSED
CHILLED WATER	Pumping stations rooms level -1 and roof levels	Black steel	Flexible elastomeric foam	30	Aluminium sheet
CHILLED WATER	Exposed level -1	Black steel	Flexible elastomeric foam	30	Aluminium sheet
CHILLED WATER	Inside shafts	Black steel	Flexible elastomeric foam	20	-
CHILLED WATER	Inside false ceiling and raised floor	Black steel	Flexible elastomeric foam	13	-
HOT WATER	Pumping stations rooms -1 and roof levels	Black steel	Flexible elastomeric foam	30 till 1"1/2 50 from 2"	Aluminium sheet
HOT WATER	Exposed level -1	Black steel	Flexible elastomeric foam	30 till 1"1/2 50 from 2"	Aluminium sheet
HOT WATER	Inside shafts	Black steel	Flexible elastomeric foam	30	-
HOT WATER	Inside false ceiling and raised floor	Black steel	Flexible elastomeric foam	13	-
HOT WATER	In-floor	Black steel	Flexible elastomeric foam	9	-
GROUND WATER	From well	Stainless steel AISI 304	Flexible elastomeric foam	20	Aluminium sheet
GROUND WATER	To injection well	Stainless steel AISI 304	Flexible elastomeric foam	-	-

CEILING MOUNTED CASSETTE TYPE 4 - PIPE FANCOIL UNITS TECHNICAL DATA

MOD.	AIR FLOW RATE (medium speed) (m3/h)	3 ROW COOLING COIL					1 ROW HEATING COIL			
		WATER FLOW RATE	WATER PRESSURE DROP	REGULATING VALVE	TOTAL COOLING CAPACITY		WATER FLOW RATE	WATER PRESSURE DROP	REGULATING VALVE	HEATING CAPACITY
		(l/h)	(kPa)	Ø / kvs	TOT (W)	SENS (W)	(l/h)	(kPa)	Ø / kvs	(W)
UC2	410	290	6 - 10	1/2" / 1.6	1600	1100	200	8-10	1/2" / 1	1100

N.B.:
- HEATING CAPACITY REFERS TO MEDIUM SPEED, ROOM AIR TEMPERATURE 20 °C AND WATER INLET 45 °C AND WATER OUTLET 40 °C
- TOTAL COOLING CAPACITY REFERS TO MEDIUM SPEED, ROOM AIR TEMPERATURE 26° C D.B. - 50 % U.R., WATER INLET 7 °C AND WATER OUTLET 12 °C
- BALL VALVES, REGULATOR AND CONTROL VALVES ARE INCLUDED.

INVESTITOR: JOINT PROJECT ON ENVIRONMENT AND ENERGY BETWEEN ITALY AND MONTENEGRO

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ENERGETSKI EFIKASNA ZGRADA
Urbanistička parcela 9
DUP "Univerzitetski centar" - izmjene i dopune
Podgorica, Crna Gora

ISSUE
MAIN PROJECT — THERMOTECHNICAL DRAWINGS

TITLE
MECHANICAL HEATING/COOLING LAYOUT LEVEL –1

REV.	DATE	FILE	SUBJECT	DRAW	APPR.
a					
b					
c					
d					

ISSUE NR. Te_002

DATE:	SCALE:	FILE:
30/11/2010	1:100	926_Te_002.dwg
J.N. 926	DRAW: G. A.	APPROVED: R. M.

RE1469 • Rev.2 • November '10

MONOBLOCK CONDITIONING UNITS

TYPE	AIR CONDITIONER PEDESTALS	CONDENSER WITH MODULATING FAN SPEED CONTROL	ELECTRIC HEATING
CDZ 1	YES	YES	YES
CDZ 2	YES	YES	NO

2 MONOBLOCK UNITS FOR INDOOR INSTALLATION AND UNDERFLOOR CONDITIONING WITH FREE COOLING SYSTEM, BUILT-IN CONDENSER WITH CENTRIFUGAL FANS COOLING CAPACITY TOTSENS = 18,5 kw ROOM TEMPERATURE: 27°C+ 50% RUH; OUTDOOR TEMPERATURE: 35 °C+ 45% RUH; AIR FLOW 2200 m3/h (N, 1 STAND BY)

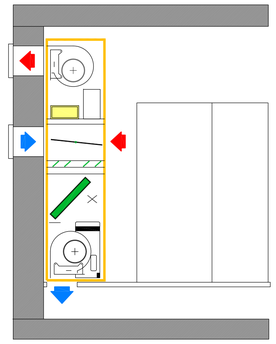
SPLIT R410A AIR CONDITIONER WITH INVERTER TECHNOLOGY AND HEAT PUMP MODE: 1 WALL MOUNTED TYPE INDOOR UNIT 1 OUTDOOR UNIT WIRED REMOTE CONTROL PANEL HEATING CAPACITY: 2,5 kW COOLING ROOM TEMPERATURE:24°C - 50% R.H. OUTDOOR TEMPERATURE:35 °C - 45% R.H. HEATING CAPACITY: 2,5 kW EACH ROOM TEMPERATURE:20°C OUTDOOR TEMPERATURE:-5°C

SPLIT R410A AIR CONDITIONER WITH INVERTER TECHNOLOGY AND HEAT PUMP MODE: 1 WALL MOUNTED TYPE INDOOR UNIT 1 OUTDOOR UNIT WIRED REMOTE CONTROL PANEL HEATING CAPACITY: 2,5 kW COOLING ROOM TEMPERATURE:24°C - 50% R.H. OUTDOOR TEMPERATURE:35 °C - 45% R.H. HEATING CAPACITY: 1,5 kW EACH ROOM TEMPERATURE:20°C OUTDOOR TEMPERATURE:-5°C

SPLIT R410A AIR CONDITIONER WITH INVERTER TECHNOLOGY AND HEAT PUMP MODE: 1 WALL MOUNTED TYPE INDOOR UNIT 1 OUTDOOR UNIT WIRED REMOTE CONTROL PANEL HEATING CAPACITY: 2,5 kW COOLING ROOM TEMPERATURE:24°C - 50% R.H. OUTDOOR TEMPERATURE:35 °C - 45% R.H. HEATING CAPACITY: 2,5 kW EACH ROOM TEMPERATURE:20°C OUTDOOR TEMPERATURE:-5°C

FLOOR CONCEALED FANCOIL UNIT "4 - PIPE KAMPMANN" INSTALLATION DETAIL

MONOBLOCK UNITS FOR INTERNAL INSTALLATION MIXING DETAIL



LEGEND

- MANIFOLD
- STEEL RADIATOR
- WALL CONCEALED FANCOIL UNIT
- FLOOR CONCEALED FANCOIL UNIT (ALL FANCOIL UNITS ARE MODEL GR1 UNLESS STATED OTHERWISE)
- GRILLE WITHOUT FANCOIL UNIT
- BOOSTER COIL
- FANCOIL UNIT CASSETTE
- MX MECHANICAL SHAFT
- HWS HOT WATER SUPPLY
- HWR HOT WATER RETURN
- CWS CHILLED WATER SUPPLY
- CWR CHILLED WATER RETURN
- GW GROUND WATER
- REFRIGERANT
- ELECTRIC CONTROL SIGNAL

PIPE INSULATIONS

CIRCUIT	LOCATION	MATERIAL	INSULATION	INSULATION THICKNESS (mm)	EXTERNAL COVER WHEN EXPOSED
CHILLED WATER	Pumping stations rooms level -1 and roof levels	Black steel	Flexible elastomeric foam	30	Aluminium sheet
CHILLED WATER	Exposed level -1	Black steel	Flexible elastomeric foam	30	Aluminium sheet
CHILLED WATER	Inside shafts	Black steel	Flexible elastomeric foam	20	-
CHILLED WATER	Inside false ceiling and raised floor	Black steel	Flexible elastomeric foam	13	-
HOT WATER	Pumping stations rooms -1 and roof levels	Black steel	Flexible elastomeric foam	30 till 1"1/2 50 from 2"	Aluminium sheet
HOT WATER	Exposed level -1	Black steel	Flexible elastomeric foam	30 till 1"1/2 50 from 2"	Aluminium sheet
HOT WATER	Inside shafts	Black steel	Flexible elastomeric foam	30	-
HOT WATER	Inside false ceiling and raised floor	Black steel	Flexible elastomeric foam	13	-
HOT WATER	In-floor	Black steel	Flexible elastomeric foam	9	-
GROUND WATER	From well	Stainless steel AISI 304	Flexible elastomeric foam	20	Aluminium sheet
GROUND WATER	To injection well	Stainless steel AISI 304	Flexible elastomeric foam	-	-

FLOOR CONCEALED 4-PIPE FANCOIL UNITS TECHNICAL DATA MODEL "KAMPMANN KATHERM HK 340 - 4 PIPE - h=200mm" OR EQUIVALENT

MOD.	AIR FLOW RATE (medium speed) (m3/h)	3 ROW COOLING COIL					1 ROW HEATING COIL			
		WATER FLOW RATE (l/h)	COIL CONNECTIONS Ø (mm)	WATER PRESSURE DROP (kPa)	COOLING CAPACITY TOTAL (W)	COOLING CAPACITY SENSIBLE (W)	WATER FLOW RATE (l/h)	COIL CONNECTIONS Ø (mm)	WATER PRESSURE DROP (kPa)	HEATING CAPACITY (W)
GR1 L=1250 mm	310	300	1/2"	10	1700	1200	200	1/2"	10	1100
GR2 L=2000 mm	620	600	3/4"	10	3400	2350	400	3/4"	10	2200

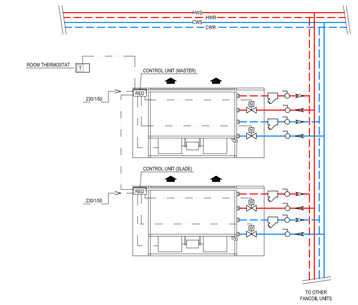
N.B.:
- HEATING CAPACITY REFERS TO MEDIUM (3RD) SPEED, ROOM AIR TEMPERATURE 20 °C, WATER INLET 45 °C AND WATER OUTLET 40 °C (1 ROW COIL)
- TOTAL COOLING CAPACITY REFERS TO MEDIUM (3RD) SPEED, ROOM AIR TEMPERATUR 26° C D.B. - 50 % U.R., WATER INLET 7 °C AND WATER OUTLET 12 °C (3 ROW COIL)
- SOUND PRESSURE: max 40 dB (A)
- BALL VALVES, REGULATOR AND CONTROL VALVES ARE INCLUDED.

WALL CONCEALED 4 - PIPE FANCOIL UNITS TECHNICAL DATA

MOD.	AIR FLOW RATE (medium speed) (m3/h)	3 ROW COOLING COIL						1 ROW HEATING COIL				
		WATER FLOW RATE (l/h)	WATER PRESSURE DROP (kPa)	REGULATING VALVE Ø	REGULATING VALVE kvs	TOTAL COOLING CAPACITY TOT (W)	TOTAL COOLING CAPACITY SENS (W)	WATER FLOW RATE (l/h)	WATER PRESSURE DROP (kPa)	REGULATING VALVE Ø	REGULATING VALVE kvs	HEATING CAPACITY (W)
FC-4	460	430	6 - 10	1/2"	1,6	2400	1600	230	13	1/2"	1	1600

N.B.:
- HEATING CAPACITY REFERS TO MEDIUM SPEED, ROOM AIR TEMPERATURE 20°C AND WATER INLET 45°C AND WATER OUTLET 40°C
- TOTAL COOLING CAPACITY REFERS TO MEDIUM SPEED, ROOM AIR TEMPERATUR 26°C D.B. - 50 % U.R., WATER INLET 7°C AND WATER OUTLET 12°C
- THE AVAILABLE STATIC PRESSURE FOR ALL THE FAN-COILS IS AT LEAST 50 Pa
- GALVANIZED STEEL DUCT, BALL VALVES, REGULATOR AND CONTROL VALVES ARE INCLUDED.

SINGLE ROOM CONTROL SYSTEM DESIGN DIAGRAM



NOTE
- NO MORE THAN TWO SLAVE CONTROL UNITS CAN BE LINKED TO A MASTER CONTROL UNIT

INVESTITOR: JOINT PROJECT ON ENVIRONMENT AND ENERGY BETWEEN ITALY AND MONTENEGRO

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Podgorica, Crna Gora

ISSUE

MAIN PROJECT THERMOTECHNICAL DRAWINGS

TITLE

MECHANICAL HEATING/COOLING
LAYOUT LEVEL 0

REV.	DATE	FILE	SUBJECT	DRAW	APPR.
a					
b					
c					
d					

ISSUE NR. Te_003

DATE:	SCALE:	FILE:
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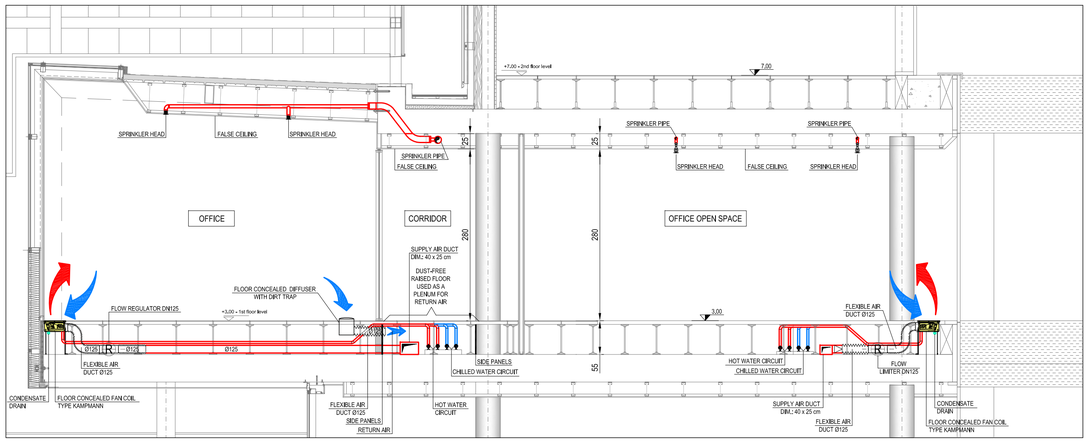
J.N. 926	DRAW: G. A.	APPROVED: R. M.

RE1403 - Rev.2 - Novembre '10

SECTION A-A' - scale 1:50



FLOOR CONCEALED FANCOIL UNIT "4 - PIPE KAMPMANN" INSTALLATION DETAIL

LEGEND

MANIFOLD	Mx MECHANICAL SHAFT
STEEL RADIATOR	HWS HOT WATER SUPPLY
WALL CONCEALED FANCOIL UNIT	HWR HOT WATER RETURN
FLOOR CONCEALED FANCOIL UNIT (ALL FANCOIL UNITS ARE MODEL GR1 UNLESS STATED OTHERWISE)	CWS CHILLED WATER SUPPLY
GRILLE WITHOUT FANCOIL UNIT	CWR CHILLED WATER RETURN
BOOSTER COIL	GW GROUND WATER
FANCOIL UNIT CASSETTE	REFRIGERANT
	ELECTRIC CONTROL SIGNAL

PIPE INSULATIONS

CIRCUIT	LOCATION	MATERIAL	INSULATION	INSULATION THICKNESS (mm)	EXTERNAL COVER WHEN EXPOSED
CHILLED WATER	Pumping stations rooms level -1 and roof levels	Black steel	Flexible elastomeric foam	30	Aluminium sheet
CHILLED WATER	Exposed level -1	Black steel	Flexible elastomeric foam	30	Aluminium sheet
CHILLED WATER	Inside shafts	Black steel	Flexible elastomeric foam	20	-
CHILLED WATER	Inside false ceiling and raised floor	Black steel	Flexible elastomeric foam	13	-
HOT WATER	Pumping stations rooms -1 and roof levels	Black steel	Flexible elastomeric foam	30 till 1"1/2 50 from 2"	Aluminium sheet
HOT WATER	Exposed level -1	Black steel	Flexible elastomeric foam	30 till 1"1/2 50 from 2"	Aluminium sheet
HOT WATER	Inside shafts	Black steel	Flexible elastomeric foam	30	-
HOT WATER	Inside false ceiling and raised floor	Black steel	Flexible elastomeric foam	13	-
HOT WATER	In-floor	Black steel	Flexible elastomeric foam	9	-
GROUND WATER	From well	Stainless steel AISI 304	Flexible elastomeric foam	20	Aluminium sheet
GROUND WATER	To injection well	Stainless steel AISI 304	Flexible elastomeric foam	-	-

FLOOR CONCEALED 4-PIPE FANCOIL UNITS TECHNICAL DATA MODEL "KAMPMANN KATHERM HK 340 - 4 PIPE - h=200mm" OR EQUIVALENT

MOD.	AIR FLOW RATE (medium speed) (mc/h)	3 ROW COOLING COIL					1 ROW HEATING COIL			
		WATER FLOW RATE (l/h)	COIL CONNECTIONS Ø (mm)	WATER PRESSURE DROP (kPa)	COOLING CAPACITY TOTAL (W)	COOLING CAPACITY SENSIBLE (W)	WATER FLOW RATE (l/h)	COIL CONNECTIONS Ø (mm)	WATER PRESSURE DROP (kPa)	HEATING CAPACITY (W)
GR1 L=1250 mm	310	300	1/2"	10	1700	1200	200	1/2"	10	1100
GR2 L=2000 mm	620	600	3/4"	10	3400	2350	400	3/4"	10	2200

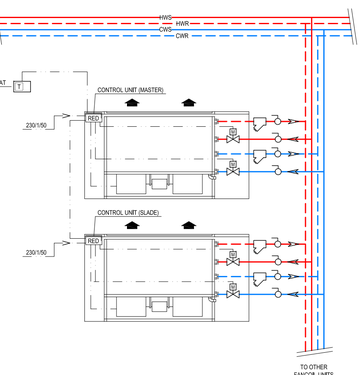
N.B.:
- HEATING CAPACITY REFERS TO MEDIUM (3RD) SPEED, ROOM AIR TEMPERATURE 20 °C, WATER INLET 45 °C AND WATER OUTLET 40 °C (1 ROW COIL)
- TOTAL COOLING CAPACITY REFERS TO MEDIUM (3RD) SPEED, ROOM AIR TEMPERATUR 26° C D.B. - 50 % U.R., WATER INLET 7 °C AND WATER OUTLET 12 °C (3 ROW COIL)
- SOUND PRESSURE: max 40 dB (A)
- BALL VALVES, REGULATOR AND CONTROL VALVES ARE INCLUDED.

WALL CONCEALED 4 - PIPE FANCOIL UNITS TECHNICAL DATA

MOD.	AIR FLOW RATE (medium speed) (mc/h)	3 ROW COOLING COIL					1 ROW HEATING COIL				
		WATER FLOW RATE (l/h)	WATER PRESSURE DROP (kPa)	REGULATING VALVE Ø	REGULATING VALVE kvs	TOTAL COOLING CAPACITY TOT (W)	TOTAL COOLING CAPACITY SENS (W)	WATER FLOW RATE (l/h)	WATER PRESSURE DROP (kPa)	REGULATING VALVE Ø	REGULATING VALVE kvs	HEATING CAPACITY (W)
FC-4	460	430	6 - 10	1/2"	1,6	2400	1800	230	13	1/2"	1	1600

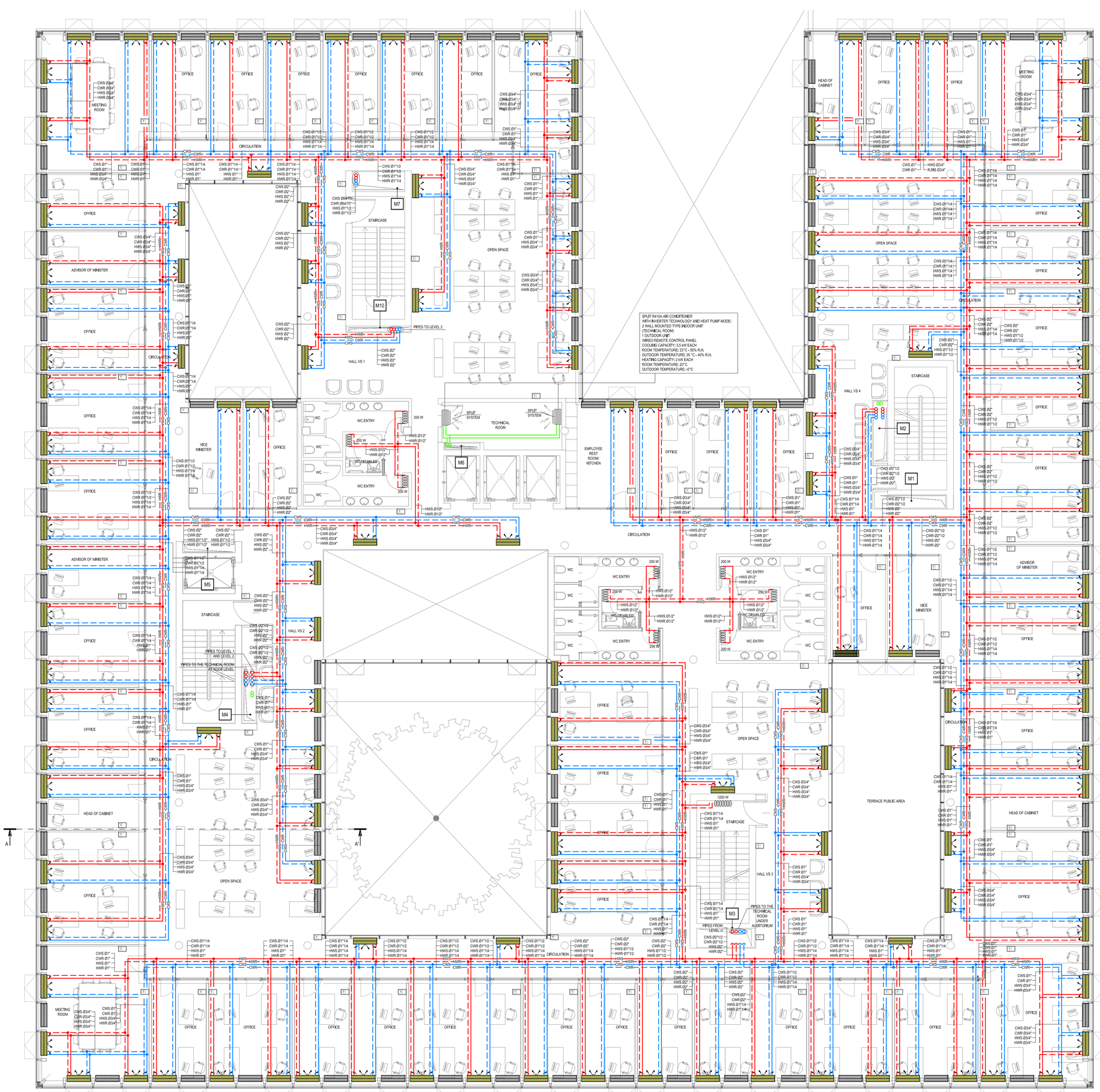
N.B.:
- HEATING CAPACITY REFERS TO MEDIUM SPEED, ROOM AIR TEMPERATURE 20°C AND WATER INLET 45°C AND WATER OUTLET 40°C
- TOTAL COOLING CAPACITY REFERS TO MEDIUM SPEED, ROOM AIR TEMPERATUR 26°C D.B. - 50 % U.R., WATER INLET 7°C AND WATER OUTLET 12°C
- THE AVAILABLE STATIC PRESSURE FOR ALL THE FAN-COILS IS AT LEAST 50 Pa
- GALVANIZED STEEL DUCT, BALL VALVES, REGULATOR AND CONTROL VALVES ARE INCLUDED.

SINGLE ROOM CONTROL SYSTEM DESIGN DIAGRAM



NOTE

- NO MORE THAN TWO SLAVE CONTROL UNITS CAN BE LINKED TO A MASTER CONTROL UNIT



INVESTITOR:	JOINT PROJECT ON ENVIRONMENT AND ENERGY BETWEEN ITALY AND MONTENEGRO MINISTRY OF THE ENVIRONMENT, LAND AND SEA OF THE REPUBLIC OF ITALY Bul. Džordža Vašingtona bb 81000 Podgorica, Crna Gora MINISTARSTVO TURIZMA MINISTARSTVO UREĐENJA PROSTORA I ZAŠTITE ŽIVOTNE SREDINE Rimski Trg 46, PC "Vektra" 81000 Podgorica, Crna Gora
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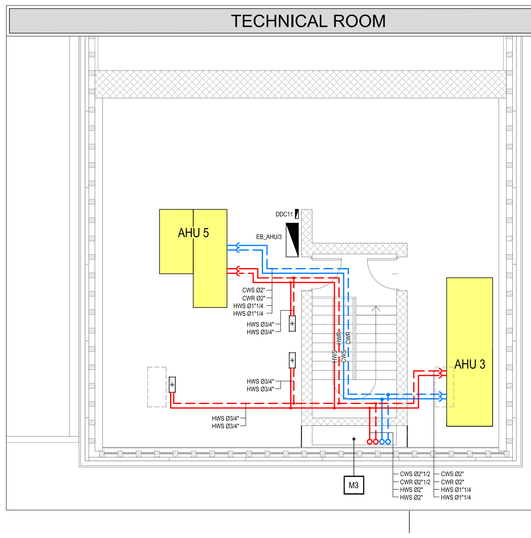
Projektant faze - ELEKTROINSTALACIJE / slaba struja:	simes inženjering Bul. Džordža Vašingtona 1 81 000 Podgorica, Crna Gora tel. +382(0) 20 228 005 fax. +382(0) 20 228 006 mail: info@simesing.me PROJECT MANAGMENT - REAL ESTATE - CONSULTING
Projektant faze - MAŠINSKE INSTALACIJE:	NOVA ENERGIJA D.O.O. ZA PROJEKTOVANJE, INŽENJERING, PROMET I USLUGE EVANA VLUOSEVIĆA 26, 81000 PODGORICA, CRNA GORA tel/fax, +382 20 245-142 e-mail: novaenerg@t-com.me
Projektant faze - ZAŠTITA OD POŽARA:	PREVENT d.o.o. Podgorica ul. 4. Jul 73-1 tel. 020/602-390 mob. 069/053-008 fax. 020/602-391 INSTITUTE za protivpožarna zaštita, Zaštita na radu i Zaštita životne sredine
Objekat i mjesto:	Poslovni objekat - objekat Vlade Crne Gore ENERGETSKI EFIKASNA ZGRADA Urbanistička parcela 9 DUP "Univerzitetski centar" - izmjene i dopune Podgorica, Crna Gora
ISSUE	MAIN PROJECT — THERMOTECHNICAL DRAWINGS
TITLE	MECHANICAL HEATING/COOLING LAYOUT LEVEL 1

REV.	DATE	FILE	SUBJECT	DRAW	APPR.
a					
b					
c					
d					

ISSUE NR. Te_004

DATE: 30/11/2010	SCALE: 1:100	FILE: 926_Te_004.dwg
J.N. 926	DRAW: G. A.	APPROVED: R. M.

TECHNICAL ROOM



FLOOR CONCEALED FANCOIL UNIT "4 - PIPE KAMPMANN" INSTALLATION DETAIL

LEGEND

MANIFOLD	Mx MECHANICAL SHAFT
STEEL RADIATOR	HWS HOT WATER SUPPLY
WALL CONCEALED FANCOIL UNIT	HWR HOT WATER RETURN
FLOOR CONCEALED FANCOIL UNIT (ALL FANCOIL UNITS ARE MODEL GR1 UNLESS STATED OTHERWISE)	CWS CHILLED WATER SUPPLY
GRILLE WITHOUT FANCOIL UNIT	CWR CHILLED WATER RETURN
BOOSTER COIL	GW GROUND WATER
FANCOIL UNIT CASSETTE	REFRIGERANT
	ELECTRIC CONTROL SIGNAL

PIPE INSULATIONS

CIRCUIT	LOCATION	MATERIAL	INSULATION	INSULATION THICKNESS (mm)	EXTERNAL COVER WHEN EXPOSED
CHILLED WATER	Pumping stations rooms level -1 and roof levels	Black steel	Flexible elastomeric foam	30	Aluminium sheet
CHILLED WATER	Exposed level -1	Black steel	Flexible elastomeric foam	30	Aluminium sheet
CHILLED WATER	Inside shafts	Black steel	Flexible elastomeric foam	20	-
CHILLED WATER	Inside false ceiling and raised floor	Black steel	Flexible elastomeric foam	13	-
HOT WATER	Pumping stations rooms -1 and roof levels	Black steel	Flexible elastomeric foam	30 till 1"1/2 50 from 2"	Aluminium sheet
HOT WATER	Exposed level -1	Black steel	Flexible elastomeric foam	30 till 1"1/2 50 from 2"	Aluminium sheet
HOT WATER	Inside shafts	Black steel	Flexible elastomeric foam	30	-
HOT WATER	Inside false ceiling and raised floor	Black steel	Flexible elastomeric foam	13	-
HOT WATER	In-floor	Black steel	Flexible elastomeric foam	9	-
GROUND WATER	From well	Stainless steel AISI 304	Flexible elastomeric foam	20	Aluminium sheet
GROUND WATER	To injection well	Stainless steel AISI 304	Flexible elastomeric foam	-	-

FLOOR CONCEALED 4-PIPE FANCOIL UNITS TECHNICAL DATA MODEL "KAMPMANN KATHERM HK 340 - 4 PIPE - h=200mm" OR EQUIVALENT

MOD.	AIR FLOW RATE (medium speed) (m3/h)	3 ROW COOLING COIL					1 ROW HEATING COIL			
		WATER FLOW RATE (l/h)	COIL CONNECTIONS Ø (mm)	WATER PRESSURE DROP (kPa)	COOLING CAPACITY TOTAL (W)	COOLING CAPACITY SENSIBLE (W)	WATER FLOW RATE (l/h)	COIL CONNECTIONS Ø (mm)	WATER PRESSURE DROP (kPa)	HEATING CAPACITY (W)
GR1 L=1250 mm	310	300	1/2"	10	1700	1200	200	1/2"	10	1100
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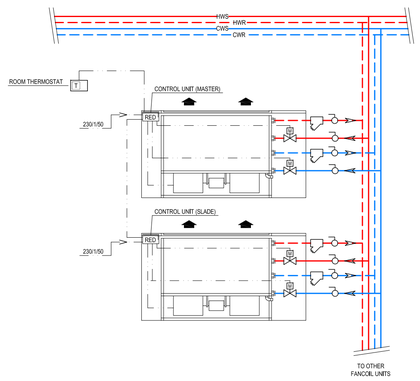
N.B.:
- HEATING CAPACITY REFERS TO MEDIUM (3RD) SPEED, ROOM AIR TEMPERATURE 20 °C, WATER INLET 45 °C AND WATER OUTLET 40 °C (1 ROW COIL)
- TOTAL COOLING CAPACITY REFERS TO MEDIUM (3RD) SPEED, ROOM AIR TEMPERATUR 26° C D.B. - 50 % U.R., WATER INLET 7 °C AND WATER OUTLET 12 °C (3 ROW COIL)
- SOUND PRESSURE: max 40 dB (A)
- BALL VALVES, REGULATOR AND CONTROL VALVES ARE INCLUDED.

WALL CONCEALED 4 - PIPE FANCOIL UNITS TECHNICAL DATA

MOD.	AIR FLOW RATE (medium speed) (m3/h)	3 ROW COOLING COIL						1 ROW HEATING COIL				
		WATER FLOW RATE (l/h)	WATER PRESSURE DROP (kPa)	REGULATING VALVE Ø	REGULATING VALVE kvs	TOTAL COOLING CAPACITY TOT (W)	TOTAL COOLING CAPACITY SENS (W)	WATER FLOW RATE (l/h)	WATER PRESSURE DROP (kPa)	REGULATING VALVE Ø	REGULATING VALVE kvs	HEATING CAPACITY (W)
FC-4	460	430	6 - 10	1/2"	1.6	2400	1800	230	13	1/2"	1	1600

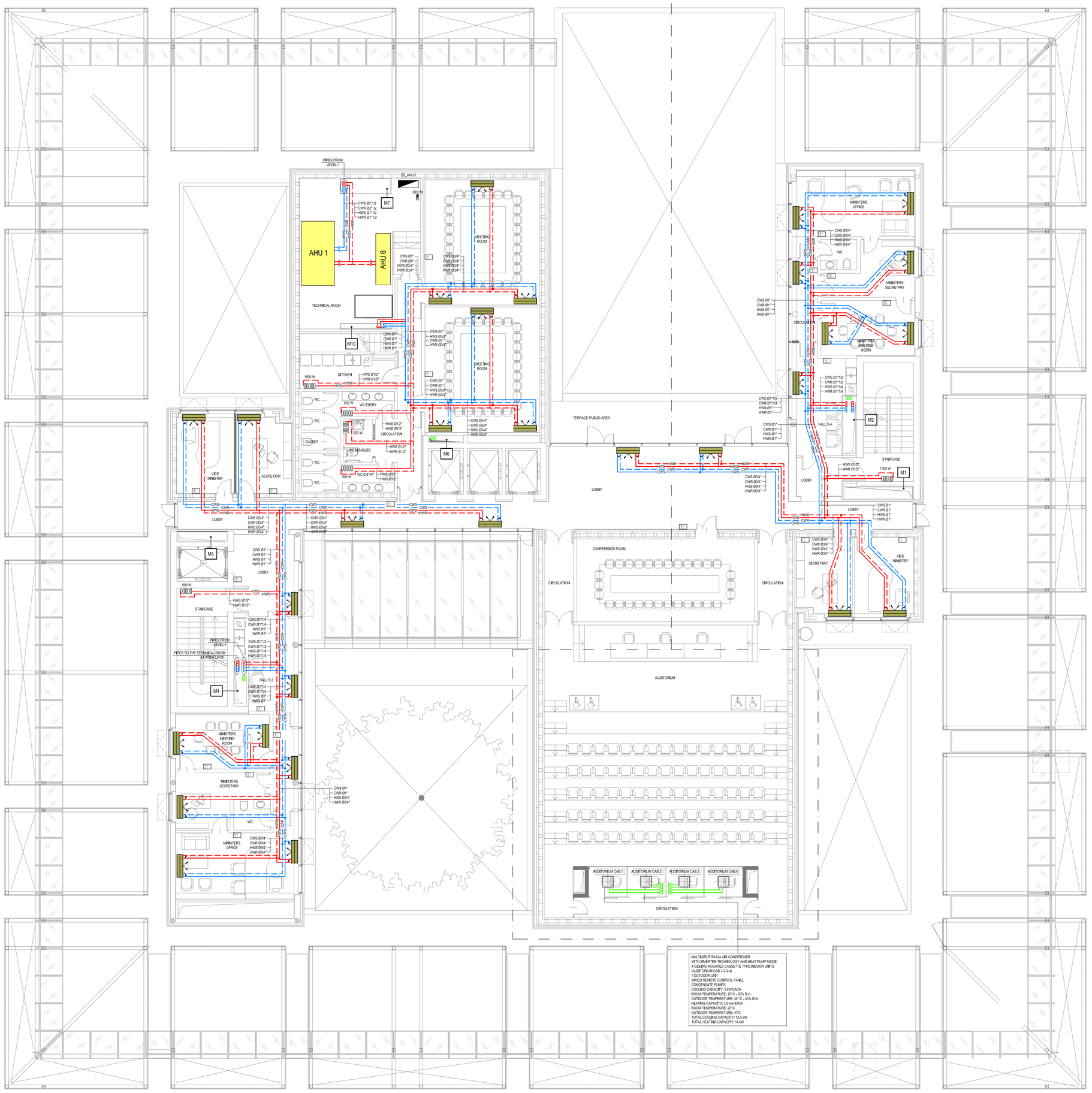
N.B.:
- HEATING CAPACITY REFERS TO MEDIUM SPEED, ROOM AIR TEMPERATURE 20°C AND WATER INLET 45°C AND WATER OUTLET 40°C
- TOTAL COOLING CAPACITY REFERS TO MEDIUM SPEED, ROOM AIR TEMPERATUR 26°C D.B. - 50 % U.R., WATER INLET 7°C AND WATER OUTLET 12°C
- THE AVAILABLE STATIC PRESSURE FOR ALL THE FAN-COILS IS AT LEAST 50 Pa
- GALVANIZED STEEL DUCT, BALL VALVES, REGULATOR AND CONTROL VALVES ARE INCLUDED.

SINGLE ROOM CONTROL SYSTEM DESIGN DIAGRAM



NOTE

- NO MORE THAN TWO SLAVE CONTROL UNITS CAN BE LINKED TO A MASTER CONTROL UNIT



INVESTITOR: JOINT PROJECT ON ENVIRONMENT AND ENERGY BETWEEN ITALY AND MONTENEGRO

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Bulevar Džordža Vašingtona bb
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fax. +382(0) 20 228 086
mail: Info@simesing.me
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Projektant faze - MAŠINSKE INSTALACIJE:
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D.O.O. ZA PROJEKTOVANJE, INŽENJERING, PROMET I USLUGE
IVANA VUJOŠEVIĆA 28, 81000 PODGORICA, CRNA GORA
TEL/FAX: +382 20 245-742 e-mail: novaenerg@t-com.me

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tel. 020/602-390
mob. 069/053-008
fax. 020/602-391
INVESTI,T za protivpožarna zaštita, Zaštita na radu i Zaštita životne sredine

Objekat i mjesto:

Poslovni objekat - objekat Vlade Crne Gore ENERGETSKI EFIKASNA ZGRADA

Urbanistička parcela 9
DUP "Univerzitetski centar" - izmjene i dopune
Podgorica, Crna Gora

ISSUE

MAIN PROJECT — **THERMOTECHNICAL DRAWINGS**

TITLE

MECHANICAL HEATING/COOLING LAYOUT LEVEL 2

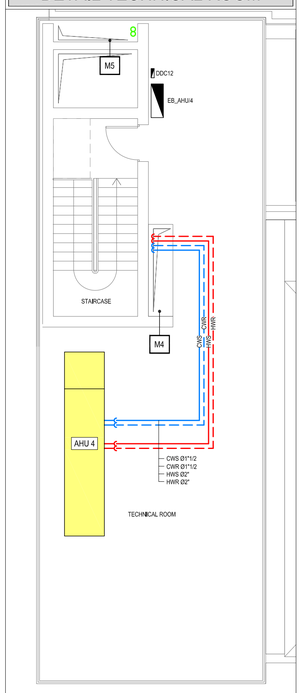
REV.	DATE	FILE	SUBJECT	DRAW	APPR.
a					
b					
c					
d					

ISSUE NR. Te_005

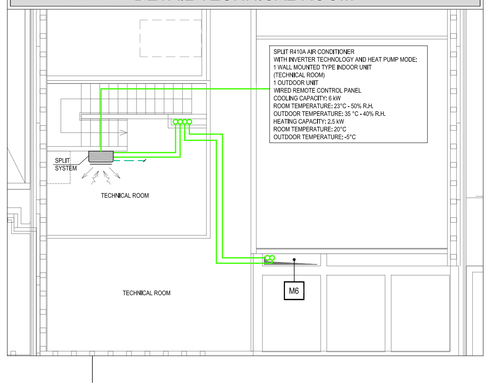
DATE:	SCALE:	FILE:
30/11/2010	1:100	926_Te_005.dwg
J.N. 926	DRAW: G. A.	APPROVED: R. M.

RE1469 - Rev.3 - Novembre '10

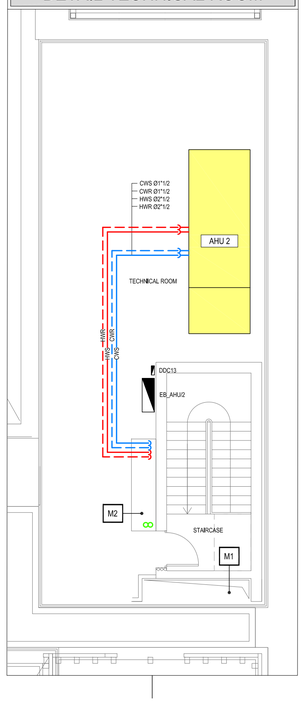
DETAIL TECHNICAL ROOM



DETAIL TECHNICAL ROOM



DETAIL TECHNICAL ROOM



LEGEND

MANIFOLD	Mx — MECHANICAL SHAFT
STEEL RADIATOR	HWS — HOT WATER SUPPLY
WALL CONCEALED FANCOIL UNIT	HWR — HOT WATER RETURN
FLOOR CONCEALED FANCOIL UNIT (ALL FANCOIL UNITS ARE MODEL GR1 UNLESS STATED OTHERWISE)	CWS — CHILLED WATER SUPPLY
GRILLE WITHOUT FANCOIL UNIT	CWR — CHILLED WATER RETURN
BOOSTER COIL	GW — GROUND WATER
FANCOIL UNIT CASSETTE	REFRIGERANT
	ELECTRIC CONTROL SIGNAL

PIPE INSULATIONS

CIRCUIT	LOCATION	MATERIAL	INSULATION	INSULATION THICKNESS (mm)	EXTERNAL COVER WHEN EXPOSED
CHILLED WATER	Pumping stations rooms level -1 and roof levels	Black steel	Flexible elastomeric foam	30	Aluminium sheet
CHILLED WATER	Exposed level -1	Black steel	Flexible elastomeric foam	30	Aluminium sheet
CHILLED WATER	Inside shafts	Black steel	Flexible elastomeric foam	20	-
CHILLED WATER	Inside false ceiling and raised floor	Black steel	Flexible elastomeric foam	13	-
HOT WATER	Pumping stations rooms -1 and roof levels	Black steel	Flexible elastomeric foam	30 till 1"1/2 50 from 2"	Aluminium sheet
HOT WATER	Exposed level -1	Black steel	Flexible elastomeric foam	30 till 1"1/2 50 from 2"	Aluminium sheet
HOT WATER	Inside shafts	Black steel	Flexible elastomeric foam	30	-
HOT WATER	Inside false ceiling and raised floor	Black steel	Flexible elastomeric foam	13	-
HOT WATER	In-floor	Black steel	Flexible elastomeric foam	9	-
GROUND WATER	From well	Stainless steel AISI 304	Flexible elastomeric foam	20	Aluminium sheet
GROUND WATER	To injection well	Stainless steel AISI 304	Flexible elastomeric foam	-	-

FLOOR CONCEALED 4-PIPE FANCOIL UNITS TECHNICAL DATA MODEL "KAMPMANN KATHERM HK 340 - 4 PIPE - h=200mm" OR EQUIVALENT

MOD.	AIR FLOW RATE (medium speed) (mc/h)	3 ROW COOLING COIL					1 ROW HEATING COIL			
		WATER FLOW RATE (l/h)	COIL CONNECTIONS Ø (mm)	WATER PRESSURE DROP (kPa)	COOLING CAPACITY TOTAL (W)	COOLING CAPACITY SENSIBLE (W)	WATER FLOW RATE (l/h)	COIL CONNECTIONS Ø (mm)	WATER PRESSURE DROP (kPa)	HEATING CAPACITY (W)
GR1 L=1250 mm	310	300	1/2"	10	1700	1200	200	1/2"	10	1100
GR2 L=2000 mm	620	600	3/4"	10	3400	2350	400	3/4"	10	2200

N.B.:
- HEATING CAPACITY REFERS TO MEDIUM (3RD) SPEED, ROOM AIR TEMPERATURE 20 °C, WATER INLET 45 °C AND WATER OUTLET 40 °C (1 ROW COIL)
- TOTAL COOLING CAPACITY REFERS TO MEDIUM (3RD) SPEED, ROOM AIR TEMPERATUR 26° C D.B. - 50 % U.R., WATER INLET 7 °C AND WATER OUTLET 12 °C (3 ROW COIL)
- SOUND PRESSURE: max 40 dB (A)
- BALL VALVES, REGULATOR AND CONTROL VALVES ARE INCLUDED.

WALL CONCEALED 4 - PIPE FANCOIL UNITS TECHNICAL DATA

MOD.	AIR FLOW RATE (medium speed) (mc/h)	3 ROW COOLING COIL						1 ROW HEATING COIL				
		WATER FLOW RATE (l/h)	WATER PRESSURE DROP (kPa)	REGULATING VALVE Ø	REGULATING VALVE kvs	TOTAL COOLING CAPACITY TOT (W)	TOTAL COOLING CAPACITY SENS (W)	WATER FLOW RATE (l/h)	WATER PRESSURE DROP (kPa)	REGULATING VALVE Ø	REGULATING VALVE kvs	HEATING CAPACITY (W)
FC-4	460	430	6 - 10	1/2"	1.6	2400	1800	230	13	1/2"	1	1600

N.B.:
- HEATING CAPACITY REFERS TO MEDIUM SPEED, ROOM AIR TEMPERATURE 20°C AND WATER INLET 45°C AND WATER OUTLET 40°C
- TOTAL COOLING CAPACITY REFERS TO MEDIUM SPEED, ROOM AIR TEMPERATUR 26°C D.B. - 50 % U.R., WATER INLET 7°C AND WATER OUTLET 12°C
- THE AVAILABLE STATIC PRESSURE FOR ALL THE FAN-COILS IS AT LEAST 50 Pa
- GALVANIZED STEEL DUCT, BALL VALVES, REGULATOR AND CONTROL VALVES ARE INCLUDED.

FLOOR CONCEALED FANCOIL UNIT "4 - PIPE KAMPMANN" INSTALLATION DETAIL

INVESTITOR:

JOINT PROJECT ON ENVIRONMENT AND ENERGY BETWEEN ITALY AND MONTENEGRO

MINISTRY OF THE ENVIRONMENT, LAND AND SEA OF THE REPUBLIC OF ITALY
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Objekat i mjesto:

Poslovni objekat - objekat Vlade Crne Gore
ENERGETSKI EFIKASNA ZGRADA
Urbanistička parcela 9
DUP "Univerzitetski centar" - izmjene i dopune
Podgorica, Crna Gora

ISSUE

MAIN PROJECT — **THERMOTECHNICAL DRAWINGS**

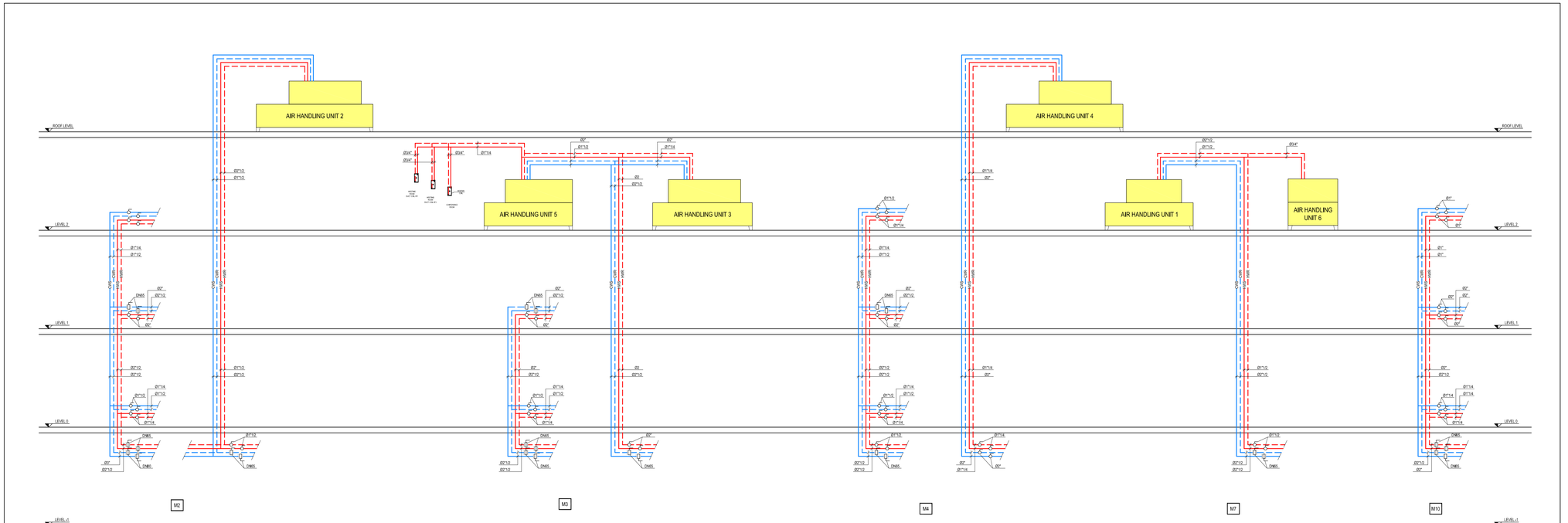
TITLE

MECHANICAL HEATING/COOLING
LAYOUT ROOF LEVEL

REV.	DATE	FILE	SUBJECT	DRAW	APPR.
a					
b					
c					
d					

ISSUE NR. Te_006

DATE:	SCALE:	FILE:
30/11/2010	1:100	926_Te_006.dwg
J.N. 926	DRAW: G. A.	APPROVED: R. M.



LEGEND

- MANIFOLD
- STEEL RADIATOR
- WALL CONCEALED FANCOIL UNIT
- FLOOR CONCEALED FANCOIL UNIT (ALL FANCOIL UNITS ARE MODEL GR1 UNLESS STATED OTHERWISE)
- GRILLE WITHOUT FANCOIL UNIT
- BOOSTER COIL
- FANCOIL UNIT CASSETTE
- MX — MECHANICAL SHAFT
- HWS — HOT WATER SUPPLY
- HWR — HOT WATER RETURN
- CWS — CHILLED WATER SUPPLY
- CWR — CHILLED WATER RETURN
- GW — GROUND WATER
- REFRIGERANT
- ELECTRIC CONTROL SIGNAL

PIPE INSULATIONS

CIRCUIT	LOCATION	MATERIAL	INSULATION	INSULATION THICKNESS (mm)	EXTERNAL COVER WHEN EXPOSED
CHILLED WATER	Pumping stations rooms level -1 and roof levels	Black steel	Flexible elastomeric foam	30	Aluminium sheet
CHILLED WATER	Exposed level -1	Black steel	Flexible elastomeric foam	30	Aluminium sheet
CHILLED WATER	Inside shafts	Black steel	Flexible elastomeric foam	20	-
CHILLED WATER	Inside false ceiling and raised floor	Black steel	Flexible elastomeric foam	13	-
HOT WATER	Pumping stations rooms -1 and roof levels	Black steel	Flexible elastomeric foam	30 till 1"1/2 50 from 2"	Aluminium sheet
HOT WATER	Exposed level -1	Black steel	Flexible elastomeric foam	30 till 1"1/2 50 from 2"	Aluminium sheet
HOT WATER	Inside shafts	Black steel	Flexible elastomeric foam	30	-
HOT WATER	Inside false ceiling and raised floor	Black steel	Flexible elastomeric foam	13	-
HOT WATER	In-floor	Black steel	Flexible elastomeric foam	9	-
GROUND WATER	From well	Stainless steel AISI 304	Flexible elastomeric foam	20	Aluminium sheet
GROUND WATER	To injection well	Stainless steel AISI 304	Flexible elastomeric foam	-	-

INVESTITOR: JOINT PROJECT ON ENVIRONMENT AND ENERGY BETWEEN ITALY AND MONTENEGRO

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Objekat i mjesto:
Poslovni objekat - objekat Vlade Crne Gore
ENERGETSKI EFIKASNA ZGRADA
Urbanistička parcela 9
DUP "Univerzitetski centar" - izmjene i dopune
Podgorica, Crna Gora

ISSUE
MAIN PROJECT THERMOTECHNICAL DRAWINGS

TITLE
MECHANICAL HEATING/COOLING
ALTIMETRIC

REV.	DATE	FILE	SUBJECT	DRAW	APPR.
a					
b					
c					
d					

ISSUE NR. Te_007

DATE:	SCALE:	FILE:
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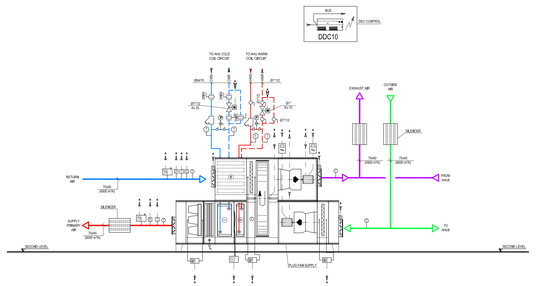

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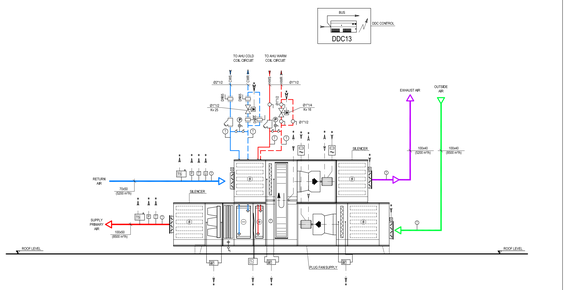

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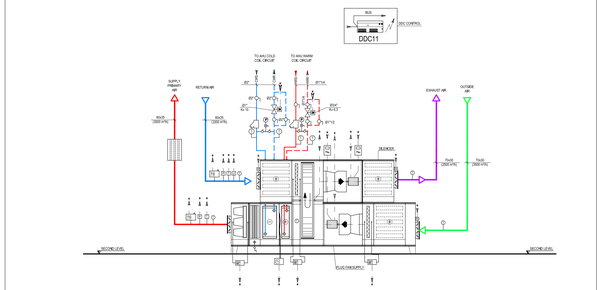

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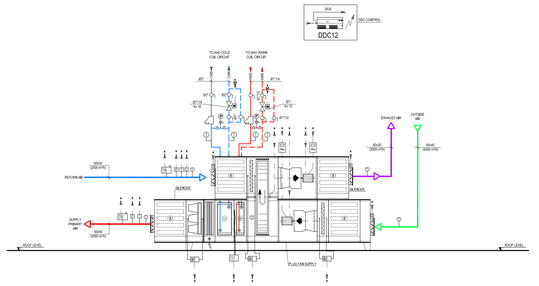

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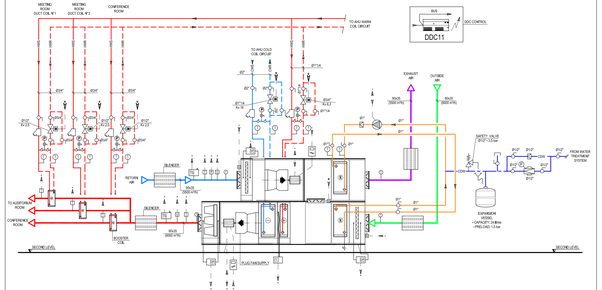

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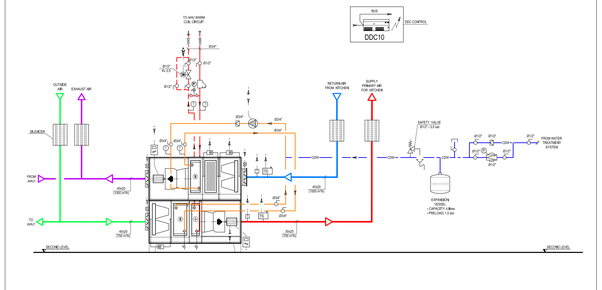

AHU1 TECHNICAL DETAILS
- BAR AND OFFICES -

PANELING
- SANDWICH PANEL, THICKNESS 40mm - PERALUMAN/PERALUMAN
- GLASS WOOL INSULATION - DENSITY 40 KG/M3

PRE-FILTER SECTION OUTSIDE AND EXHAUST AIR)
- FLAT SECTION FILTER CELLS
- FILTER EFFICIENCY (EN 779): G4

SUPPLY FAN SECTION
DIRECT-DRIVE CENTRIFUGAL PLUG FAN WITH BUILT-IN INVERTER)
- AIR VOLUME: 2700 m³/h
- AVAILABLE STATIC PRESSURE (SILENCERS EXCLUDED): 220 Pa

ROTARY HYGROSCOPIC WHEEL HEAT EXCHANGER
- EFFICIENCY: 72 % WINBOR
- FRESH AIR FLOW: 6500 m³/h
- EXHAUST AIR FLOW: 6500 m³/h

COOLING COIL
- ENTERING/AIR TEMP: 31°C R.U. 40%
- LEAVING/AIR TEMP: 15°C R.U. 85%
- ENTERING/WATER TEMP: 6 °C
- LEAVING/WATER TEMP: 14 °C
- COOLING CAPACITY: 51 kW
- WATER FLOW RATE: 8,8 m³/h
- DROPLET SEPARATOR

HEATING COIL
- ENTERING/AIR TEMP: 5°C
- LEAVING/AIR TEMP: 20°C
- ENTERING/WATER TEMP: 45°C
- LEAVING/WATER TEMP: 39 °C
- HEATING CAPACITY: 31 kW
- WATER FLOW RATE: 2,7 m³/h

POST-FILTER SECTION (SUPPLY AIR)
- BAG FILTERS
- FILTER EFFICIENCY (EN 779): F9

RETURN FAN SECTION
DIRECT-DRIVE CENTRIFUGAL PLUG FAN WITH BUILT-IN INVERTER)
- AIR VOLUME: 2700 m³/h
- AVAILABLE STATIC PRESSURE (SILENCERS EXCLUDED): 200 Pa

DUCT ATTENUATORS
SPECIFIC MINIMAL NOISE REDUCTION FOR THESE OCTAVE BANDS
Hz| 63 125 250 500 1k 2k 4k 8k
dB| 3 8 13 15 18 18 14 12 Ln1000 min

AHU2 TECHNICAL DETAILS
- OFFICES -

PANELING
- SANDWICH PANEL, THICKNESS 40mm - PERALUMAN/PERALUMAN
- GLASS WOOL INSULATION - DENSITY 40 KG/M3

PRE-FILTER SECTION OUTSIDE AND EXHAUST AIR)
- FLAT SECTION FILTER CELLS
- FILTER EFFICIENCY (EN 779): G4

SUPPLY FAN SECTION
DIRECT-DRIVE CENTRIFUGAL PLUG FAN WITH BUILT-IN INVERTER)
- AIR VOLUME: 2700 m³/h
- AVAILABLE STATIC PRESSURE (SILENCERS EXCLUDED): 220 Pa

ROTARY HYGROSCOPIC WHEEL HEAT EXCHANGER
- EFFICIENCY: 72 % WINBOR
- FRESH AIR FLOW: 6500 m³/h
- EXHAUST AIR FLOW: 6500 m³/h

COOLING COIL
- ENTERING/AIR TEMP: 31°C R.U. 40%
- LEAVING/AIR TEMP: 15°C R.U. 85%
- ENTERING/WATER TEMP: 6 °C
- LEAVING/WATER TEMP: 14 °C
- COOLING CAPACITY: 51 kW
- WATER FLOW RATE: 8,8 m³/h
- DROPLET SEPARATOR

HEATING COIL
- ENTERING/AIR TEMP: 5°C
- LEAVING/AIR TEMP: 20°C
- ENTERING/WATER TEMP: 45°C
- LEAVING/WATER TEMP: 39 °C
- HEATING CAPACITY: 31 kW
- WATER FLOW RATE: 2,7 m³/h

POST-FILTER SECTION (SUPPLY AIR)
- BAG FILTERS
- FILTER EFFICIENCY (EN 779): F9

RETURN FAN SECTION
DIRECT-DRIVE CENTRIFUGAL PLUG FAN WITH BUILT-IN INVERTER)
- AIR VOLUME: 2700 m³/h
- AVAILABLE STATIC PRESSURE (SILENCERS EXCLUDED): 200 Pa

DUCT ATTENUATORS
SPECIFIC MINIMAL NOISE REDUCTION FOR THESE OCTAVE BANDS
Hz| 63 125 250 500 1k 2k 4k 8k
dB| 3 8 13 15 18 18 14 12 Ln1000 min

AHU3 TECHNICAL DETAILS
- OFFICES -

PANELING
- SANDWICH PANEL, THICKNESS 40mm - PERALUMAN/PERALUMAN
- GLASS WOOL INSULATION - DENSITY 40 KG/M3

PRE-FILTER SECTION OUTSIDE AND EXHAUST AIR)
- FLAT SECTION FILTER CELLS
- FILTER EFFICIENCY (EN 779): G4

SUPPLY FAN SECTION
DIRECT-DRIVE CENTRIFUGAL PLUG FAN WITH BUILT-IN INVERTER)
- AIR VOLUME: 4500 m³/h
- AVAILABLE STATIC PRESSURE (SILENCERS EXCLUDED): 200 Pa

ROTARY HYGROSCOPIC WHEEL HEAT EXCHANGER
- EFFICIENCY: 72 % WINBOR
- FRESH AIR FLOW: 6500 m³/h
- EXHAUST AIR FLOW: 6500 m³/h

COOLING COIL
- ENTERING/AIR TEMP: 31°C R.U. 40%
- LEAVING/AIR TEMP: 15°C R.U. 85%
- ENTERING/WATER TEMP: 6 °C
- LEAVING/WATER TEMP: 14 °C
- COOLING CAPACITY: 51 kW
- WATER FLOW RATE: 8,8 m³/h
- DROPLET SEPARATOR

HEATING COIL
- ENTERING/AIR TEMP: 5°C
- LEAVING/AIR TEMP: 20°C
- ENTERING/WATER TEMP: 45°C
- LEAVING/WATER TEMP: 39 °C
- HEATING CAPACITY: 31 kW
- WATER FLOW RATE: 1,8 m³/h

POST-FILTER SECTION (SUPPLY AIR)
- BAG FILTERS
- FILTER EFFICIENCY (EN 779): F9

RETURN FAN SECTION
DIRECT-DRIVE CENTRIFUGAL PLUG FAN WITH BUILT-IN INVERTER)
- AIR VOLUME: 2700 m³/h
- AVAILABLE STATIC PRESSURE (SILENCERS EXCLUDED): 180 Pa

DUCT ATTENUATORS
SPECIFIC MINIMAL NOISE REDUCTION FOR THESE OCTAVE BANDS
Hz| 63 125 250 500 1k 2k 4k 8k
dB| 3 8 13 15 18 18 14 12 Ln1000 min

AHU4 TECHNICAL DETAILS
- OFFICES -

PANELING
- SANDWICH PANEL, THICKNESS 40mm - PERALUMAN/PERALUMAN
- GLASS WOOL INSULATION - DENSITY 40 KG/M3

PRE-FILTER SECTION OUTSIDE AND EXHAUST AIR)
- FLAT SECTION FILTER CELLS
- FILTER EFFICIENCY (EN 779): G4

SUPPLY FAN SECTION
DIRECT-DRIVE CENTRIFUGAL PLUG FAN WITH BUILT-IN INVERTER)
- AIR VOLUME: 4500 m³/h
- AVAILABLE STATIC PRESSURE (SILENCERS EXCLUDED): 220 Pa

ROTARY HYGROSCOPIC WHEEL HEAT EXCHANGER
- EFFICIENCY: 72 % WINBOR
- FRESH AIR FLOW: 6500 m³/h
- EXHAUST AIR FLOW: 6500 m³/h

COOLING COIL
- ENTERING/AIR TEMP: 31°C R.U. 40%
- LEAVING/AIR TEMP: 15°C R.U. 85%
- ENTERING/WATER TEMP: 6 °C
- LEAVING/WATER TEMP: 14 °C
- COOLING CAPACITY: 51 kW
- WATER FLOW RATE: 8,8 m³/h
- DROPLET SEPARATOR

HEATING COIL
- ENTERING/AIR TEMP: 5°C
- LEAVING/AIR TEMP: 20°C
- ENTERING/WATER TEMP: 45°C
- LEAVING/WATER TEMP: 39 °C
- HEATING CAPACITY: 31 kW
- WATER FLOW RATE: 1,8 m³/h

POST-FILTER SECTION (SUPPLY AIR)
- BAG FILTERS
- FILTER EFFICIENCY (EN 779): F9

RETURN FAN SECTION
DIRECT-DRIVE CENTRIFUGAL PLUG FAN WITH BUILT-IN INVERTER)
- AIR VOLUME: 2700 m³/h
- AVAILABLE STATIC PRESSURE (SILENCERS EXCLUDED): 200 Pa

DUCT ATTENUATORS
SPECIFIC MINIMAL NOISE REDUCTION FOR THESE OCTAVE BANDS
Hz| 63 125 250 500 1k 2k 4k 8k
dB| 3 8 13 15 18 18 14 12 Ln1000 min

AHU5 TECHNICAL DETAILS
- MEETING ROOM -

PANELING
- SANDWICH PANEL, THICKNESS 40mm - PERALUMAN/PERALUMAN
- GLASS WOOL INSULATION - DENSITY 80 KG/M3

PRE-FILTER SECTION OUTSIDE AND EXHAUST AIR)
- FLAT SECTION FILTER CELLS
- FILTER EFFICIENCY (EN 779): G4

RUNAROUND COIL HEAT EXCHANGER
- EFFICIENCY: 50% MINIMUM
- WATER FLOW RATE: 1 l m³/h
- PRESSURE: 50 kPa
- 27 ROWS

MIXING CHAMBER
SUMMER CONDITIONS
- OUTSIDE AIR: 2700 m³/h, TEMP. 34°C, R.U. 47%
- RETURN AIR: 2700 m³/h, TEMP. 26°C, R.U. 50%
- SUPPLY AIR: 4500 m³/h, TEMP. 31°C R.U. 45%
WINTER CONDITIONS
- OUTSIDE AIR: 2700 m³/h, TEMP. -4°C R.U. 70%
- RETURN AIR: 2700 m³/h, TEMP. 22°C R.U. 40%
- SUPPLY AIR: 4500 m³/h, TEMP. 5°C R.U. 60%

POST-FILTER SECTION (SUPPLY AIR)
- BAG FILTERS
- FILTER EFFICIENCY (EN 779): F9

HEATING COIL
- AIR VOLUME: 4500 m³/h
- ENTERING/AIR TEMP: 15°C
- LEAVING/AIR TEMP: 15°C
- ENTERING/WATER TEMP: 45°C
- LEAVING/WATER TEMP: 39 °C
- HEATING CAPACITY: 31 kW
- WATER FLOW RATE: 1,8 m³/h

COOLING COIL
- AIR VOLUME: 4500 m³/h
- ENTERING/AIR TEMP: 31°C R.U. 45%
- LEAVING/AIR TEMP: 15°C R.U. 80%
- ENTERING/WATER TEMP: 6 °C
- LEAVING/WATER TEMP: 14 °C
- COOLING CAPACITY: 46 kW
- WATER FLOW RATE: 8,8 m³/h
- DROPLET SEPARATOR

SUPPLY FAN SECTION
DIRECT-DRIVE CENTRIFUGAL PLUG FAN WITH BUILT-IN INVERTER)
- AIR VOLUME: 4500 m³/h
- AVAILABLE STATIC PRESSURE (SILENCERS EXCLUDED): 230 Pa

RETURN FAN SECTION
DIRECT-DRIVE CENTRIFUGAL PLUG FAN WITH BUILT-IN INVERTER)
- AIR VOLUME: 3700 m³/h
- AVAILABLE STATIC PRESSURE (SILENCERS EXCLUDED): 200 Pa

BOOSTER COIL (MEETING ROOM - TWO DUCT COILS)
- AIR VOLUME: 2700 m³/h each
- ENTERING/AIR TEMP: 15°C
- LEAVING/AIR TEMP: 20°C
- ENTERING/WATER TEMP: 45°C
- LEAVING/WATER TEMP: 35 °C
- HEATING CAPACITY: 5 kW
- WATER FLOW RATE: 0,45 m³/h

BOOSTER COIL (CONFERENCE ROOM - ONE DUCT COIL)
- AIR VOLUME: 1350 m³/h
- ENTERING/AIR TEMP: 15°C
- LEAVING/AIR TEMP: 20°C
- ENTERING/WATER TEMP: 45°C
- LEAVING/WATER TEMP: 35 °C
- HEATING CAPACITY: 5 kW
- WATER FLOW RATE: 0,45 m³/h

AHU6 TECHNICAL DETAILS
- KITCHEN -

PANELING
- SANDWICH PANEL, THICKNESS 40 mm
- INTERNAL SURFACE: PERALUMAN
- EXTERNAL SURFACE: PRE-PAINTED STEEL SHEET
- GLASS WOOL INSULATION - DENSITY 80 KG/M3

PRE-FILTER SECTION (FRESH AND EXHAUST AIR)
- FLAT SECTION FILTER CELLS
- FILTER EFFICIENCY (EN 779): G4

FILTER SECTION (EXHAUST AIR)
- ACTIVATED CARBON FILTER CELLS

SUPPLY FAN SECTION
DIRECT-DRIVE CENTRIFUGAL PLUG FAN WITH BUILT-IN INVERTER)
- AIR VOLUME: 700 m³/h
- AVAILABLE STATIC PRESSURE (SILENCERS EXCLUDED): 150 Pa

RUNAROUND COIL HEAT EXCHANGER
- EFFICIENCY: 50% MINIMUM
- WATER FLOW RATE: 1,4 m³/h
- PRESSURE: 50 kPa
- 27 ROWS

HEATING COIL
- AIR VOLUME: 700 m³/h
- ENTERING/AIR TEMP: 5°C
- LEAVING/AIR TEMP: 18°C
- ENTERING/WATER TEMP: 45°C
- LEAVING/WATER TEMP: 39 °C
- HEATING CAPACITY: 5,8 kW
- WATER FLOW RATE: 0,55 m³/h

POST-FILTERING SUPPLY AIR SECTION
- BAG FILTER
- FILTER EFFICIENCY (EN 779): F9

RETURN FAN SECTION
DIRECT-DRIVE CENTRIFUGAL PLUG FAN WITH BUILT-IN INVERTER)
- AIR VOLUME: 1500 m³/h
- AVAILABLE STATIC PRESSURE (SILENCERS EXCLUDED): 300 Pa

LEGEND

- BALL VALVE
- BUTTERFLY VALVE
- MOTORIZED 2 WAY CONTROL VALVE
- SAFETY RELIEF VALVE
- LIFT CHECK VALVE
- Y STRAINER
- THERMOMETER
- SENSOR (T: TEMPERATURE; H+I: HUMIDITY; S+V: SPEED)
- PRESSURE GAUGE
- DIFFERENTIAL PRESSURE CONTROL DEVICE
- PRESSURE CONTROL DEVICE
- ANTIFREEZE THERMOSTAT
- SAFETY THERMOSTAT
- HEATING COIL
- COOLING COIL
- DUCT FIRE DAMPER
- FLOW SWITCH
- PRESSURE REDUCING VALVE
- FUNNEL DRAIN
- ELECTRIC MOTOR DRIVEN PUMP
- INSTRUMENT CONNECTION
- INVERTER
- PRE-FILTER SECTION (PLAN FILTER)
- POST-FILTER SECTION (BAG FILTER)
- SUPPLY PRIMARY AIR
- RETURN AIR
- OUTSIDE AIR
- EXHAUST AIR
- HOT WATER SUPPLY
- HWR — HOT WATER RETURN
- CWS — CHILLED WATER SUPPLY
- CWR — CHILLED WATER RETURN
- CDS — COLD DOMESTIC WATER
- ELECTRIC CONTROL SIGNAL
- WIRE LINE TO/FROM BUILDING MANAGEMENT SYSTEM

HVAC SOUND ATTENUATOR ACOUSTIC PERFORMANCE
TYPE WOODS QB 64 - LENGTH 1000 mm

F (Hz)	63	125	250	500	1000	2000	4000	8000
dB	7	14	23	29	32	25	19	15

N.B.

ALL THE AIR HANDLING UNITS INCLUDE BALL VALVES, Y STRAINERS, THERMOMETERS, EXPANSION VESSELS, AUTOMATIC FILLING UNITS, SAFETY RELIEF VALVES AND DUCT BOOSTER COILS.

INVESTITOR: JOINT PROJECT ON ENVIRONMENT AND ENERGY BETWEEN ITALY AND MONTENEGRO
MINISTRY OF THE ENVIRONMENT, LAND AND SEA OF THE REPUBLIC OF ITALY
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PREVENTA is a joint-venture centre, Centre za rano i hitno reagovanje

Objekat i lokacija:
Poslovni objekat - objekat Vlade Crne Gore
ENERGETSKI EFIKASNA ZGRADA
Urbanistička parcela 9
DUP "Univerzitetski centar" - izmjene i dopune
Podgorica, Crna Gora

SEKT.: MAIN PROJECT — THERMOTECHNICAL DRAWINGS

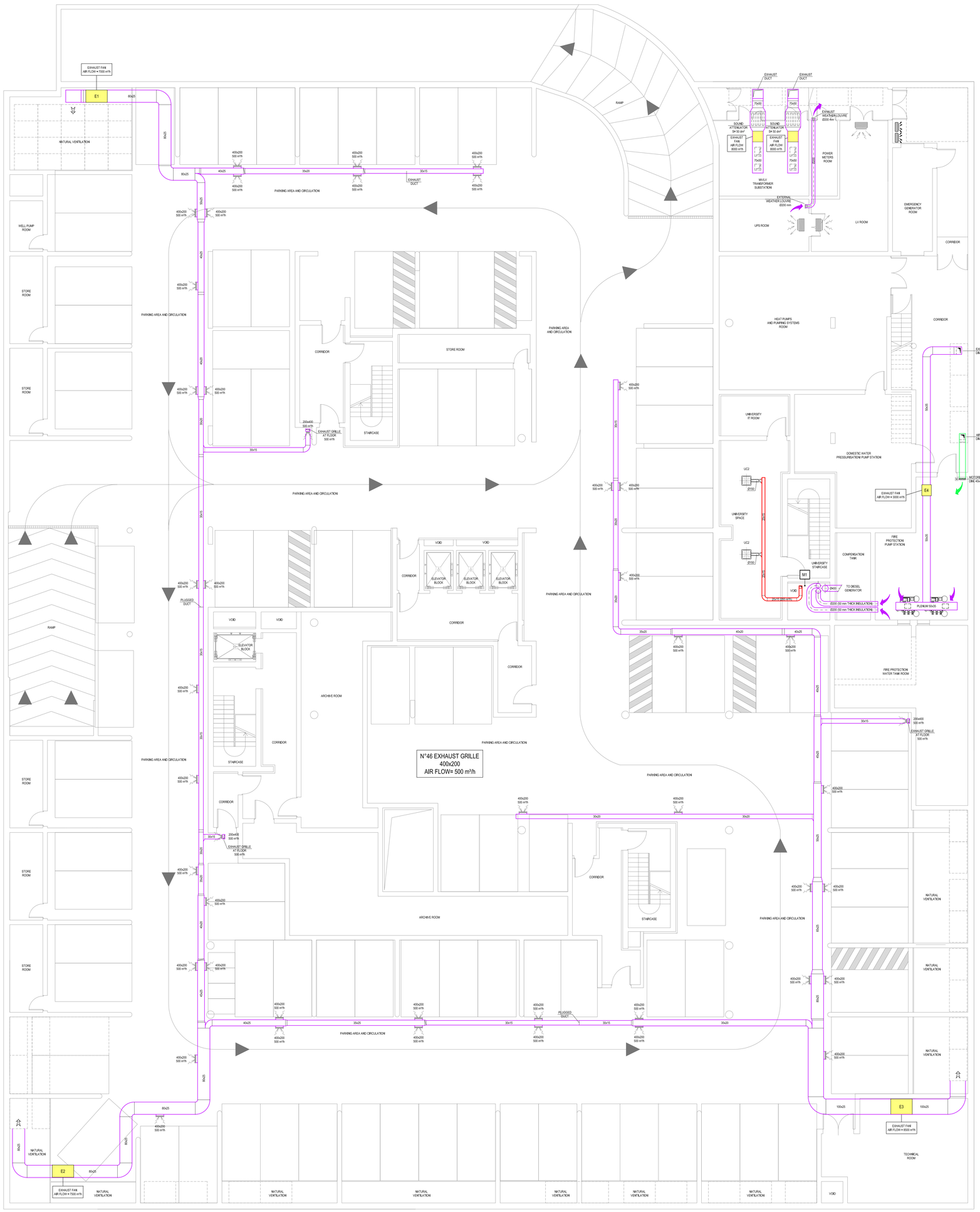
TITLE: AIRSIDE SCHEMATIC

REV.	DATE	FILE	SUBJECT	DRAW.	APPR.
4					
3					
2					
1					

ISSUE NR.

Te_101

DATE:	SCALE:	FILE:
30/11/2010	-	926_Te_101.dwg
J.R.	DRAW: G. A.	APPROVED: RI. M.



LEGEND

- CEILING TWISTED SUPPLY DIFFUSER
- CEILING TWISTED SUPPLY DIFFUSER
- SIDEWALL RETURN AIR GRILLE
- CEILING RETURN AIR GRILLE
- JET NOZZLES
- LINEAR CEILING DIFFUSERS
- WALL CONCEALED FANCOIL UNIT
- FLOOR CONCEALED FANCOIL UNIT (ALL FANCOIL UNITS ARE MODEL GR1 UNLESS STATED OTHERWISE)
- GRILLE WITHOUT FANCOIL UNIT
- FLOOR CONCEALED SUPPLY DIFFUSER
- FLOOR CONCEALED RETURN DIFFUSER
- AIR DISC VALVE
- LARGE GAP UNDER THE DOOR
- DOOR GRILLE
- MANUAL DAMPER
- DUCT FIRE DAMPER
- AIRFLOW REGULATOR
- MECHANICAL SHAFT
- STEEL RADIATOR
- BOOSTER COIL
- SUPPLY AIR DUCT
- RETURN AIR DUCT
- EXHAUST AIR DUCT
- AIR INTAKE DUCT
- SOUNDPROOF FLEXIBLE AIR DUCT

DUCT INSULATIONS

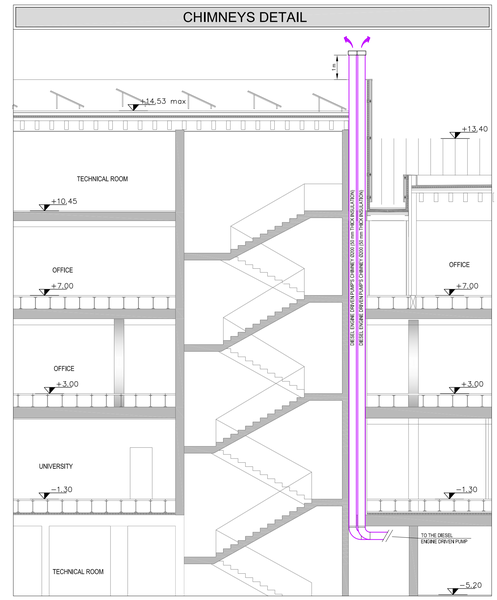
CIRCUIT	LOCATION	MATERIAL	INSULATION	INSULATION THICKNESS	EXTERNAL COVER WHEN EXPOSED
SUPPLY, RETURN AND AIR INTAKE	Technical rooms	Zinc coated steel sheet	Glass wool board	30	Aluminium sheet
EXHAUST AIR	Technical rooms	Zinc coated steel sheet	-	-	-
SUPPLY	Inside shafts	Class 0-1 pre-insulated aluminium ducts	Expanded polyurethane	20	Embossed aluminium 80 µ
RETURN	Inside shafts	Class 0-1 pre-insulated aluminium ducts	Expanded polyurethane	20	Embossed aluminium 80 µ
SUPPLY (RECTANGULAR)	Inside false ceiling and raised floor	Class 0-1 pre-insulated aluminium ducts	Expanded polyurethane	20	Embossed aluminium 80 µ
SUPPLY (CIRCULAR)	Inside false ceiling and raised floor	Zinc coated steel sheet	Flexible elastomeric foam	20	Aluminium sheet
RETURN	Inside false ceiling and raised floor	Class 0-1 pre-insulated aluminium ducts	Expanded polyurethane	20	Embossed aluminium 80 µ

CEILING MOUNTED CASSETTE TYPE 4 - PIPE FANCOIL UNITS TECHNICAL DATA

MOD.	AIR FLOW RATE (medium speed) (m³/h)	3 ROW COOLING COIL						1 ROW HEATING COIL				
		WATER FLOW RATE	WATER PRESSURE DROP	REGULATING VALVE		TOTAL COOLING CAPACITY		WATER FLOW RATE	WATER PRESSURE DROP	REGULATING VALVE		HEATING CAPACITY
		(l/h)	(kPa)	Ø	kvs	TOT (W)	SENS (W)	(l/h)	(kPa)	Ø	kvs	(W)
UC2	410	290	6 - 10	1/2"	1.6	1600	1100	200	8-10	1/2"	1	1100

N.B.:
- HEATING CAPACITY REFERS TO MEDIUM SPEED, ROOM AIR TEMPERATURE 20 °C AND WATER INLET 45 °C AND WATER OUTLET 40 °C
- TOTAL COOLING CAPACITY REFERS TO MEDIUM SPEED, ROOM AIR TEMPERATUR 26° C D.B. - 50 % U.R., WATER INLET 7 °C AND WATER OUTLET 12 °C
- BALL VALVES, REGULATOR AND CONTROL VALVES ARE INCLUDED.

CHIMNEYS DETAIL



INVESTITOR: JOINT PROJECT ON ENVIRONMENT AND ENERGY BETWEEN ITALY AND MONTENEGRO

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INSTITUT ZA protivpožarnu zaštitu, Zaštita na radu i Zaštita životne sredine

Objekat i mjesto:

Poslovni objekat - objekat Vlade Crne Gore
ENERGETSKI EFIKASNA ZGRADA
Urbanistička parcela 9
DUP "Univerzitetski centar" - izmjene i dopune
Podgorica, Crna Gora

ISSUE

MAIN PROJECT THERMOTECHNICAL DRAWINGS

TITLE

MECHANICAL DUCTWORK
LAYOUT LEVEL -1

REV.	DATE	FILE	SUBJECT	DRAW	APPR.
a	07/03/2011	926_Te_102a.dwg	REVIEW ACCORDING TO REVISION COMMISSION NOTES	G.A.	R.M.
b					
c					
d					

ISSUE NR. Te_102

DATE:	SCALE:	FILE:
30/11/2010	1:100	926_Te_102a.dwg
J.N.	DRAW:	APPROVED:
926	G. A.	R. M.

LEGEND

- CEILING TWISTED SUPPLY DIFFUSER
- CEILING TWISTED SUPPLY DIFFUSER
- SIDEWALL RETURN AIR GRILLE
- CEILING RETURN AIR GRILLE
- JET NOZZLES
- LINEAR CEILING DIFFUSERS
- WALL CONCEALED FANCOIL UNIT
- FLOOR CONCEALED FANCOIL UNIT (ALL FANCOIL UNITS ARE MODEL GR1 UNLESS STATED OTHERWISE)
- GRILLE WITHOUT FANCOIL UNIT
- FLOOR CONCEALED SUPPLY DIFFUSER
- FLOOR CONCEALED RETURN DIFFUSER
- AIR DISC VALVE
- LARGE GAP UNDER THE DOOR
- DOOR GRILLE
- MANUAL DAMPER
- DUCT FIRE DAMPER
- AIRFLOW REGULATOR
- MECHANICAL SHAFT
- STEEL RADIATOR
- BOOSTER COIL
- SUPPLY AIR DUCT
- RETURN AIR DUCT
- EXHAUST AIR DUCT
- AIR INTAKE DUCT
- SOUNDPROOF FLEXIBLE AIR DUCT

DUCT INSULATIONS

CIRCUIT	LOCATION	MATERIAL	INSULATION	INSULATION THICKNESS	EXTERNAL COVER WHEN EXPOSED
SUPPLY, RETURN AND AIR INTAKE	Technical rooms	Zinc coated steel sheet	Glass wool board	30	Aluminium sheet
EXHAUST AIR	Technical rooms	Zinc coated steel sheet	-	-	-
SUPPLY	Inside shafts	Class 0-1 pre-insulated aluminium ducts	Expanded polyurethane	20	Embossed aluminium 80 µ
RETURN	Inside shafts	Class 0-1 pre-insulated aluminium ducts	Expanded polyurethane	20	Embossed aluminium 80 µ
SUPPLY (RECTANGULAR)	Inside false ceiling and raised floor	Class 0-1 pre-insulated aluminium ducts	Expanded polyurethane	20	Embossed aluminium 80 µ
SUPPLY (CIRCULAR)	Inside false ceiling and raised floor	Zinc coated steel sheet	Flexible elastomeric foam	20	Aluminium sheet
RETURN	Inside false ceiling and raised floor	Class 0-1 pre-insulated aluminium ducts	Expanded polyurethane	20	Embossed aluminium 80 µ

FLOOR CONCEALED 4-PIPE FANCOIL UNITS TECHNICAL DATA
MODEL "KAMPMANN KATHERM HK 340 - 4 PIPE - h=200mm" OR EQUIVALENT

MOD.	AIR FLOW RATE (medium speed) (mc/h)	3 ROW COOLING COIL					1 ROW HEATING COIL			
		WATER FLOW RATE (l/h)	COIL CONNECTIONS Ø (mm)	WATER PRESSURE DROP (kPa)	COOLING CAPACITY TOTAL (W)	COOLING CAPACITY SENSIBLE (W)	WATER FLOW RATE (l/h)	COIL CONNECTIONS Ø (mm)	WATER PRESSURE DROP (kPa)	HEATING CAPACITY (W)
GR1 L=1250 mm	310	300	1/2"	10	1700	1200	200	1/2"	10	1100
GR2 L=2000 mm	620	600	3/4"	10	3400	2350	400	3/4"	10	2200

N.B.:
- HEATING CAPACITY REFERS TO MEDIUM (3RD) SPEED, ROOM AIR TEMPERATURE 20 °C, WATER INLET 45 °C AND WATER OUTLET 40 °C (1 ROW COIL)
- TOTAL COOLING CAPACITY REFERS TO MEDIUM (3RD) SPEED, ROOM AIR TEMPERATUR 26° C D.B. - 50 % U.R., WATER INLET 7 °C AND WATER OUTLET 12 °C (3 ROW COIL)
- SOUND PRESSURE: max 40 dB (A)
- BALL VALVES, REGULATOR AND CONTROL VALVES ARE INCLUDED.

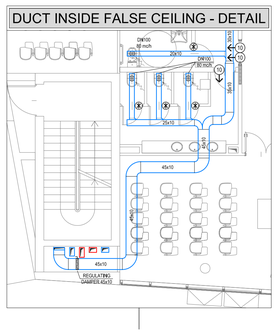
WALL CONCEALED 4-PIPE FANCOIL UNITS TECHNICAL DATA

MOD.	AIR FLOW RATE (medium speed) (mc/h)	3 ROW COOLING COIL						1 ROW HEATING COIL				
		WATER FLOW RATE (l/h)	WATER PRESSURE DROP (kPa)	REGULATING VALVE Ø	REGULATING VALVE kvs	TOTAL COOLING CAPACITY TOT (W)	TOTAL COOLING CAPACITY SENS (W)	WATER FLOW RATE (l/h)	WATER PRESSURE DROP (kPa)	REGULATING VALVE Ø	REGULATING VALVE kvs	HEATING CAPACITY (W)
FC-4	460	430	6 - 10	1/2"	1.6	2400	1800	230	13	1/2"	1	1600

N.B.:
- HEATING CAPACITY REFERS TO MEDIUM SPEED, ROOM AIR TEMPERATURE 20°C AND WATER INLET 45°C AND WATER OUTLET 40°C
- TOTAL COOLING CAPACITY REFERS TO MEDIUM SPEED, ROOM AIR TEMPERATUR 26° C D.B. - 50 % U.R., WATER INLET 7°C AND WATER OUTLET 12°C
- THE AVAILABLE STATIC PRESSURE FOR ALL THE FAN-COILS IS AT LEAST 50 Pa
- GALVANIZED STEEL DUCT, BALL VALVES, REGULATOR AND CONTROL VALVES ARE INCLUDED.

FLOOR CONCEALED FANCOIL UNIT "4 - PIPE KAMPMANN" INSTALLATION DETAIL

DUCT INSIDE FALSE CEILING - DETAIL



INVESTITOR: JOINT PROJECT ON ENVIRONMENT AND ENERGY BETWEEN ITALY AND MONTENEGRO
MINISTRY OF THE ENVIRONMENT, LAND AND SEA OF THE REPUBLIC OF ITALY
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INSTITUT za protivpožarna zaštita, Zaštita na radu i Zaštita životne sredine

Objekat i mjesto:
Poslovni objekat - objekat Vlade Crne Gore
ENERGETSKI EFIKASNA ZGRADA
Urbanistička parcela 9
DUP "Univerzitetski centar" - izmjene i dopune
Podgorica, Crna Gora

ISSUE
MAIN PROJECT THERMOTECHNICAL DRAWINGS

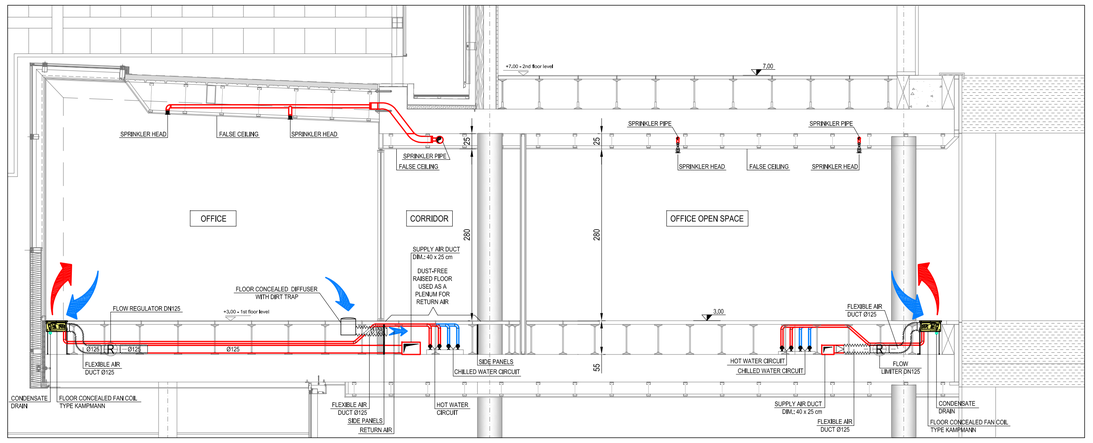
TITLE
MECHANICAL DUCTWORK LAYOUT LEVEL 0

REV.	DATE	FILE	SUBJECT	DRAW	APPR.
a					
b					
c					
d					

ISSUE NR. Te_103

DATE:	SCALE:	FILE:
30/11/2010	1:100	926_Te_103.dwg
J.N. 926	DRAW: G. A.	APPROVED: R. M.

SECTION A-A' - scale 1:50



LEGEND

- CEILING TWISTED SUPPLY DIFFUSER
- CEILING TWISTED SUPPLY DIFFUSER
- SIDEWALL RETURN AIR GRILLE
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- EXHAUST AIR DUCT
- AIR INTAKE DUCT
- SOUNDPROOF FLEXIBLE AIR DUCT

DUCT INSULATIONS

CIRCUIT	LOCATION	MATERIAL	INSULATION	INSULATION THICKNESS	EXTERNAL COVER WHEN EXPOSED
SUPPLY, RETURN AND AIR INTAKE	Technical rooms	Zinc coated steel sheet	Glass wool board	30	Aluminium sheet
EXHAUST AIR	Technical rooms	Zinc coated steel sheet	-	-	-
SUPPLY	Inside shafts	Class 0-1 pre-insulated aluminium ducts	Expanded polyurethane	20	Embossed aluminium 80 μ
RETURN	Inside shafts	Class 0-1 pre-insulated aluminium ducts	Expanded polyurethane	20	Embossed aluminium 80 μ
SUPPLY (RECTANGULAR)	Inside false ceiling and raised floor	Class 0-1 pre-insulated aluminium ducts	Expanded polyurethane	20	Embossed aluminium 80 μ
SUPPLY (CIRCULAR)	Inside false ceiling and raised floor	Zinc coated steel sheet	Flexible elastomeric foam	20	Aluminium sheet
RETURN	Inside false ceiling and raised floor	Class 0-1 pre-insulated aluminium ducts	Expanded polyurethane	20	Embossed aluminium 80 μ

FLOOR CONCEALED 4-PIPE FANCOIL UNITS TECHNICAL DATA MODEL "KAMPMANN KATHERM HK 340 - 4 PIPE - h=200mm" OR EQUIVALENT

MOD.	AIR FLOW RATE (medium speed) (mc/h)	3 ROW COOLING COIL					1 ROW HEATING COIL			
		WATER FLOW RATE (l/h)	COIL CONNECTIONS Ø (mm)	WATER PRESSURE DROP (kPa)	COOLING CAPACITY TOTAL (W)	COOLING CAPACITY SENSIBLE (W)	WATER FLOW RATE (l/h)	COIL CONNECTIONS Ø (mm)	WATER PRESSURE DROP (kPa)	HEATING CAPACITY (W)
GR1 L=1250 mm	310	300	1/2"	10	1700	1200	200	1/2"	10	1100
GR2 L=2000 mm	620	600	3/4"	10	3400	2350	400	3/4"	10	2200

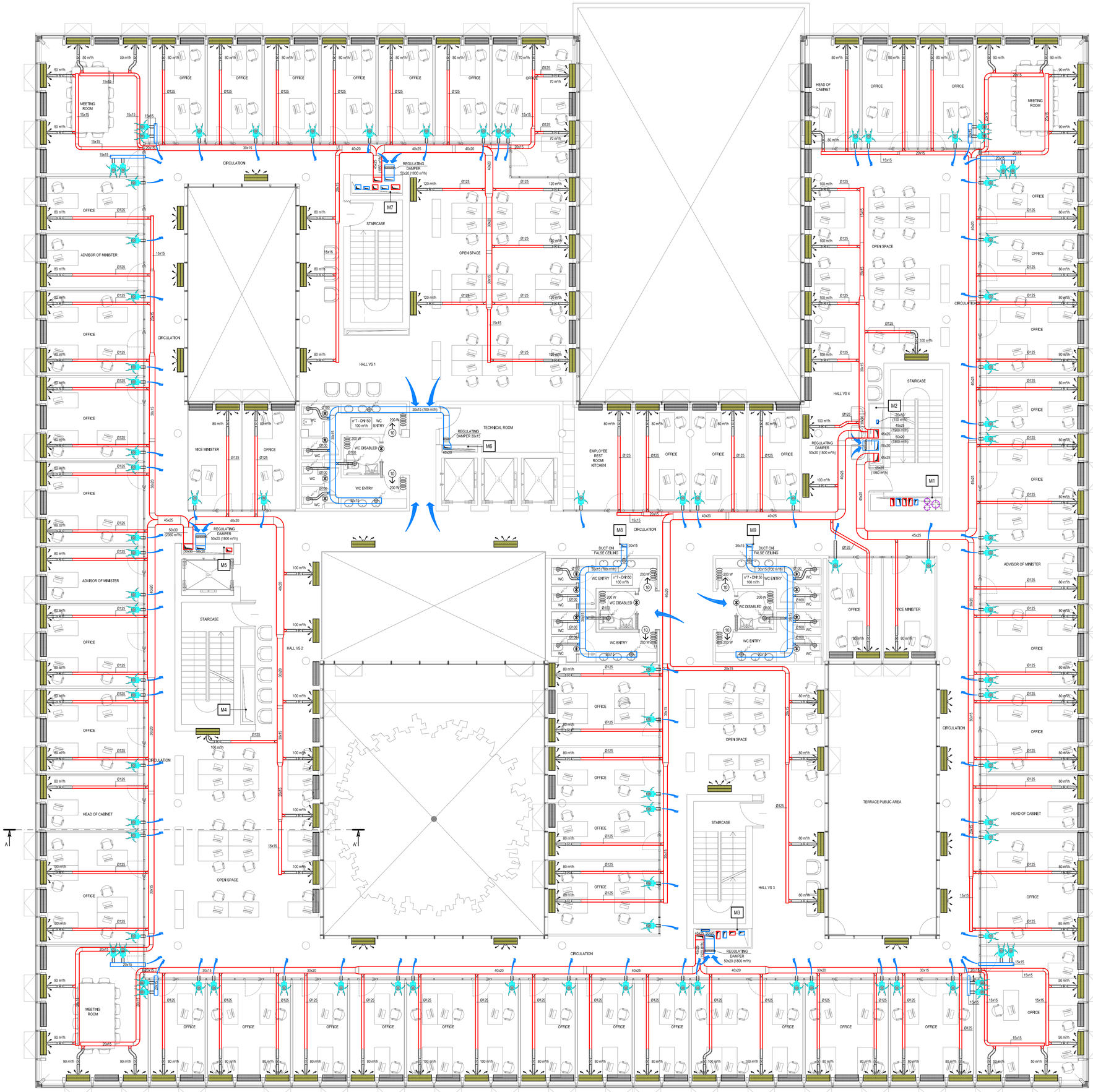
N.B.:
- HEATING CAPACITY REFERS TO MEDIUM (3RD) SPEED, ROOM AIR TEMPERATURE 20 °C, WATER INLET 45 °C AND WATER OUTLET 40 °C (1 ROW COIL)
- TOTAL COOLING CAPACITY REFERS TO MEDIUM (3RD) SPEED, ROOM AIR TEMPERATUR 26° C D.B. - 50 % U.R., WATER INLET 7 °C AND WATER OUTLET 12 °C (3 ROW COIL)
- SOUND PRESSURE: max 40 dB (A)
- BALL VALVES, REGULATOR AND CONTROL VALVES ARE INCLUDED.

WALL CONCEALED 4-PIPE FANCOIL UNITS TECHNICAL DATA

MOD.	AIR FLOW RATE (medium speed) (mc/h)	3 ROW COOLING COIL						1 ROW HEATING COIL				
		WATER FLOW RATE (l/h)	WATER PRESSURE DROP (kPa)	REGULATING VALVE Ø	REGULATING VALVE kvs	TOTAL COOLING CAPACITY TOT (W)	TOTAL COOLING CAPACITY SENS (W)	WATER FLOW RATE (l/h)	WATER PRESSURE DROP (kPa)	REGULATING VALVE Ø	REGULATING VALVE kvs	HEATING CAPACITY (W)
FC-4	460	430	6 - 10	1/2"	1,6	2400	1800	230	13	1/2"	1	1600

N.B.:
- HEATING CAPACITY REFERS TO MEDIUM SPEED, ROOM AIR TEMPERATURE 20°C AND WATER INLET 45°C AND WATER OUTLET 40°C
- TOTAL COOLING CAPACITY REFERS TO MEDIUM SPEED, ROOM AIR TEMPERATUR 26°C D.B, - 50 % U.R., WATER INLET 7°C AND WATER OUTLET 12°C
- THE AVAILABLE STATIC PRESSURE FOR ALL THE FAN-COILS IS AT LEAST 50 Pa
- GALVANIZED STEEL DUCT, BALL VALVES, REGULATOR AND CONTROL VALVES ARE INCLUDED.

FLOOR CONCEALED FANCOIL UNIT "4 - PIPE KAMPMANN" INSTALLATION DETAIL



INVESTITOR: JOINT PROJECT ON ENVIRONMENT AND ENERGY BETWEEN ITALY AND MONTENEGRO

MINISTRY OF THE ENVIRONMENT, LAND AND SEA OF THE REPUBLIC OF ITALY
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ENERGETSKI EFIKASNA ZGRADA
Urbanistička parcela 9
DUP "Univerzitetski centar" - izmjene i dopune
Podgorica, Crna Gora

ISSUE
MAIN PROJECT THERMOTECHNICAL DRAWINGS

TITLE
MECHANICAL DUCTWORK
LAYOUT LEVEL 1

REV.	DATE	FILE	SUBJECT	DRAW	APPR.
a					
b					
c					
d					

ISSUE NR.

Te_104

DATE:	SCALE:	FILE:
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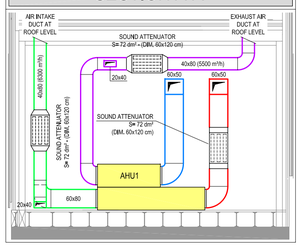
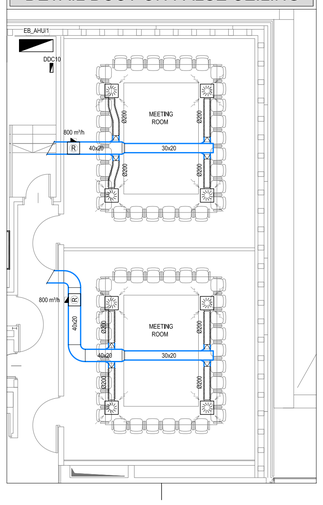
J.N. 926	DRAW: G. A.	APPROVED: R. M.

RE1409 - Rev.2 - Novembre '10

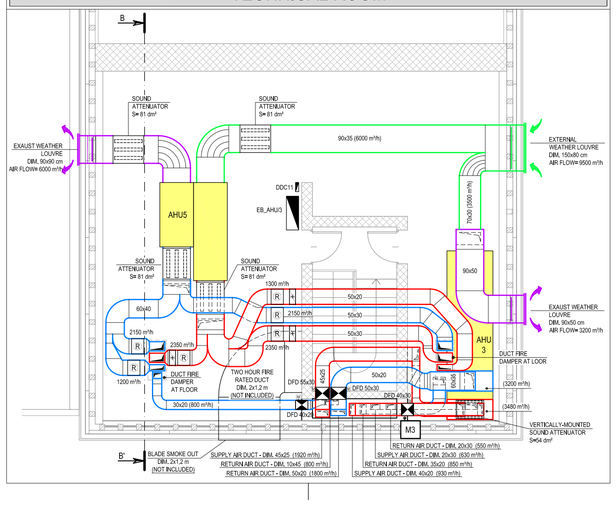
SECTION A-A'



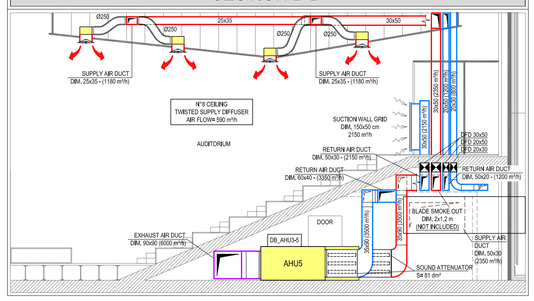
DETAIL DUCT ON FALSE CEILING



TECHNICAL ROOM



SECTION B-B'



LEGEND

- CEILING TWISTED SUPPLY DIFFUSER
- CEILING TWISTED SUPPLY DIFFUSER
- SIDEWALL RETURN AIR GRILLE
- CEILING RETURN AIR GRILLE
- JET NOZZLES
- LINEAR CEILING DIFFUSERS
- WALL CONCEALED FANCOIL UNIT
- FLOOR CONCEALED FANCOIL UNIT (ALL FANCOIL UNITS ARE MODEL GR1 UNLESS STATED OTHERWISE)
- GRILLE WITHOUT FANCOIL UNIT
- FLOOR CONCEALED SUPPLY DIFFUSER
- FLOOR CONCEALED RETURN DIFFUSER
- AIR DISC VALVE
- LARGE GAP UNDER THE DOOR
- DOOR GRILLE
- MANUAL DAMPER
- DUCT FIRE DAMPER
- AIRFLOW REGULATOR
- MECHANICAL SHAFT
- STEEL RADIATOR
- BOOSTER COIL
- SUPPLY AIR DUCT
- RETURN AIR DUCT
- EXHAUST AIR DUCT
- AIR INTAKE DUCT
- SOUNDPROOF FLEXIBLE AIR DUCT

DUCT INSULATIONS

CIRCUIT	LOCATION	MATERIAL	INSULATION	INSULATION THICKNESS	EXTERNAL COVER WHEN EXPOSED
SUPPLY, RETURN AND AIR INTAKE	Technical rooms	Zinc coated steel sheet	Glass wool board	30	Aluminium sheet
EXHAUST AIR	Technical rooms	Zinc coated steel sheet	-	-	-
SUPPLY	Inside shafts	Class 0-1 pre-insulated aluminium ducts	Expanded polyurethane	20	Embossed aluminium 80 µ
RETURN	Inside shafts	Class 0-1 pre-insulated aluminium ducts	Expanded polyurethane	20	Embossed aluminium 80 µ
SUPPLY (RECTANGULAR)	Inside false ceiling and raised floor	Class 0-1 pre-insulated aluminium ducts	Expanded polyurethane	20	Embossed aluminium 80 µ
SUPPLY (CIRCULAR)	Inside false ceiling and raised floor	Zinc coated steel sheet	Flexible elastomeric foam	20	Aluminium sheet
RETURN	Inside false ceiling and raised floor	Class 0-1 pre-insulated aluminium ducts	Expanded polyurethane	20	Embossed aluminium 80 µ

FLOOR CONCEALED 4-PIPE FANCOIL UNITS TECHNICAL DATA
MODEL "KAMPMANN KATHERM HK 340 - 4 PIPE - h=200mm" OR EQUIVALENT

MOD.	AIR FLOW RATE (medium speed) (mc/h)	3 ROW COOLING COIL					1 ROW HEATING COIL			
		WATER FLOW RATE (l/h)	COIL CONNECTIONS Ø (mm)	WATER PRESSURE DROP (kPa)	COOLING CAPACITY TOTAL (W)	COOLING CAPACITY SENSIBLE (W)	WATER FLOW RATE (l/h)	COIL CONNECTIONS Ø (mm)	WATER PRESSURE DROP (kPa)	HEATING CAPACITY (W)
GR1 L=1250 mm	310	300	1/2"	10	1700	1200	200	1/2"	10	1100
GR2 L=2000 mm	620	600	3/4"	10	3400	2350	400	3/4"	10	2200

N.B.:
- HEATING CAPACITY REFERS TO MEDIUM (3RD) SPEED, ROOM AIR TEMPERATURE 20 °C, WATER INLET 45 °C AND WATER OUTLET 40 °C (1 ROW COIL)
- TOTAL COOLING CAPACITY REFERS TO MEDIUM (3RD) SPEED, ROOM AIR TEMPERATUR 26° C D.B. - 50 % U.R., WATER INLET 7 °C AND WATER OUTLET 12 °C (3 ROW COIL)
- SOUND PRESSURE: max 40 dB (A)
- BALL VALVES, REGULATOR AND CONTROL VALVES ARE INCLUDED.

WALL CONCEALED 4-PIPE FANCOIL UNITS TECHNICAL DATA

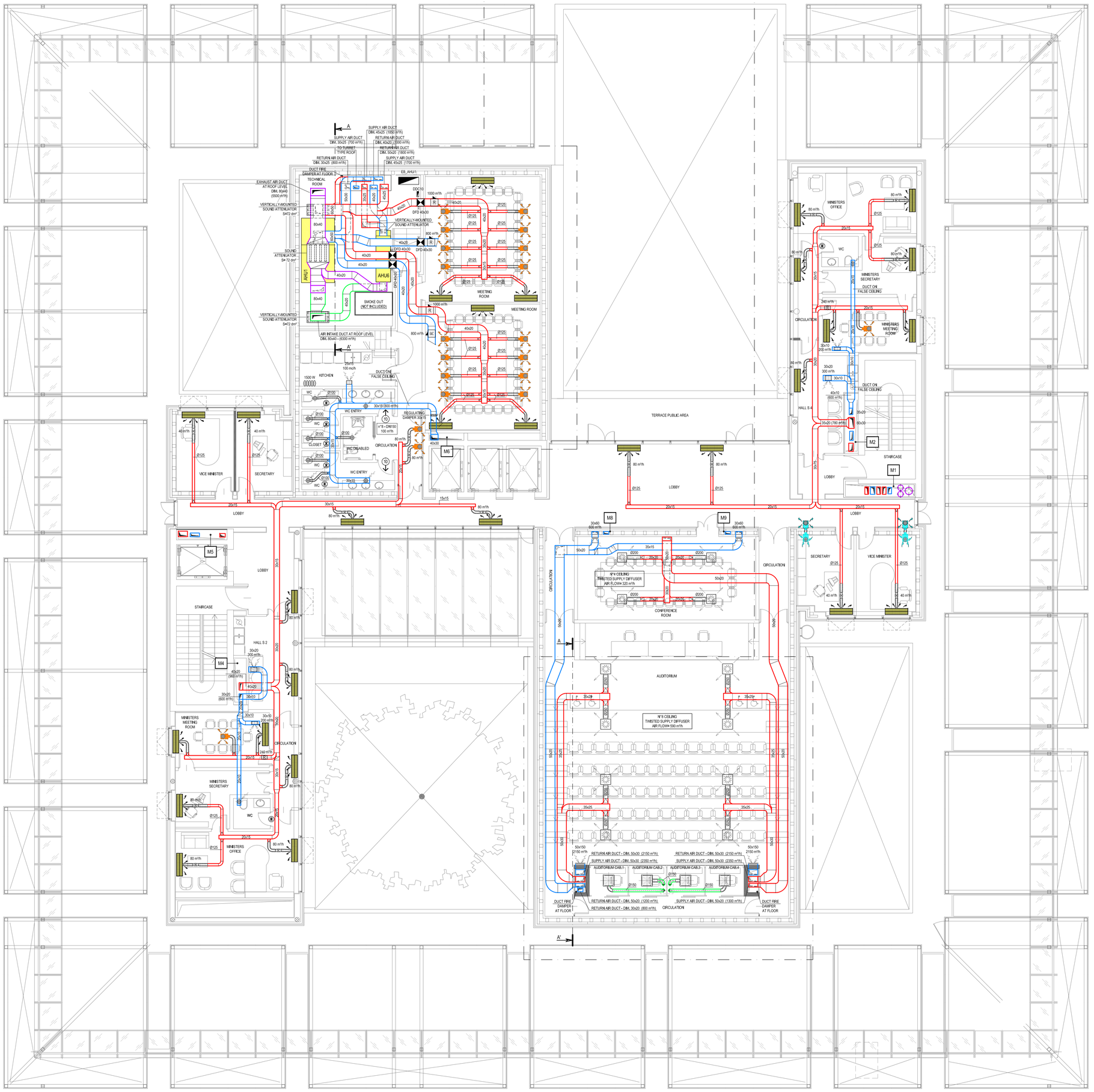
MOD.	AIR FLOW RATE (medium speed) (mc/h)	3 ROW COOLING COIL						1 ROW HEATING COIL				
		WATER FLOW RATE (l/h)	WATER PRESSURE DROP (kPa)	REGULATING VALVE Ø	REGULATING VALVE kvs	TOTAL COOLING CAPACITY TOT (W)	TOTAL COOLING CAPACITY SENS (W)	WATER FLOW RATE (l/h)	WATER PRESSURE DROP (kPa)	REGULATING VALVE Ø	REGULATING VALVE kvs	HEATING CAPACITY (W)
FC-4	460	430	6 - 10	1/2"	1,6	2400	1800	230	13	1/2"	1	1600

N.B.:
- HEATING CAPACITY REFERS TO MEDIUM SPEED, ROOM AIR TEMPERATURE 20°C AND WATER INLET 45°C AND WATER OUTLET 40°C
- TOTAL COOLING CAPACITY REFERS TO MEDIUM SPEED, ROOM AIR TEMPERATUR 26° C D.B. - 50 % U.R., WATER INLET 7°C AND WATER OUTLET 12°C
- THE AVAILABLE STATIC PRESSURE FOR ALL THE FAN-COILS IS AT LEAST 50 Pa
- GALVANIZED STEEL DUCT, BALL VALVES, REGULATOR AND CONTROL VALVES ARE INCLUDED.

HVAC SOUND ATTENUATOR ACOUSTIC PERFORMANCE
TYPE WOODS QB 64 - LENGTH 1000 mm

F (Hz)	63	125	250	500	1000	2000	4000	8000
dB	7	14	23	29	32	25	19	15

FLOOR CONCEALED FANCOIL UNIT "4 - PIPE KAMPMANN" INSTALLATION DETAIL



INVESTITOR: JOINT PROJECT ON ENVIRONMENT AND ENERGY BETWEEN ITALY AND MONTENEGRO

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Objekat i mjesto:
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ENERGETSKI EFIKASNA ZGRADA
Urbanistička parcela 9
DUP "Univerzitetski centar" - izmjene i dopune
Podgorica, Crna Gora

ISSUE
MAIN PROJECT — THERMOTECHNICAL DRAWINGS

TITLE
MECHANICAL DUCTWORK
LAYOUT LEVEL 2

REV.	DATE	FILE	SUBJECT	DRAW	APPR.
a					
b					
c					
d					

ISSUE NR. Te_105

DATE:	SCALE:	FILE:
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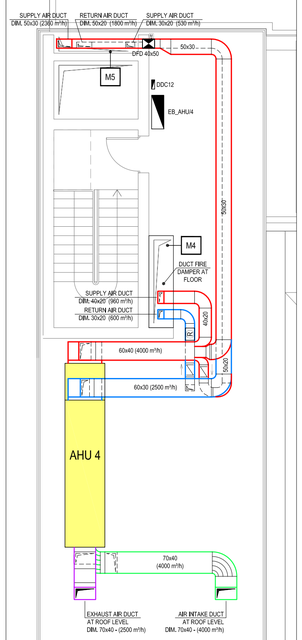
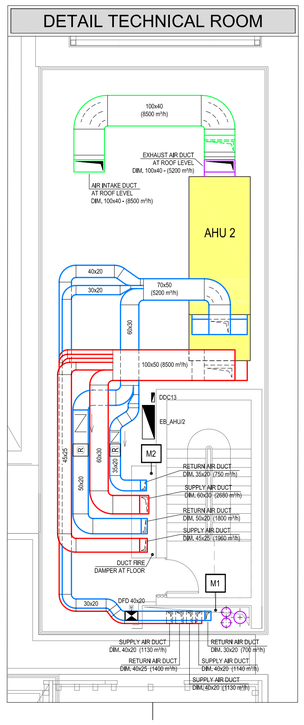
J.N. 926	DRAW: G. A.	APPROVED: R. M.

DETAIL TECHNICAL ROOM



DETAIL TECHNICAL ROOM



LEGEND

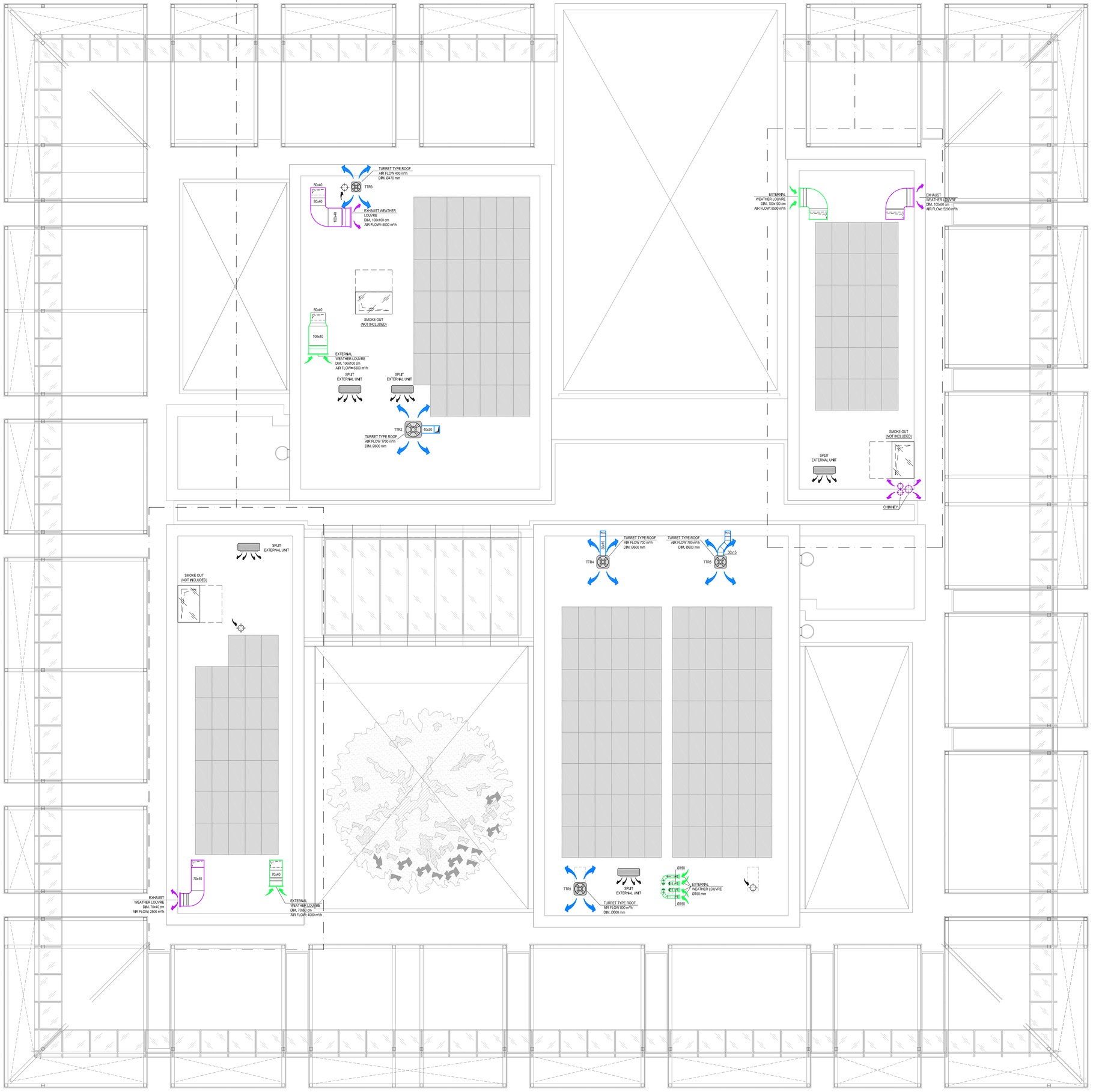
- CEILING TWISTED SUPPLY DIFFUSER
- CEILING TWISTED SUPPLY DIFFUSER
- SIDEWALL RETURN AIR GRILLE
- CEILING RETURN AIR GRILLE
- JET NOZZLES
- LINEAR CEILING DIFFUSERS
- WALL CONCEALED FANCOIL UNIT
- FLOOR CONCEALED FANCOIL UNIT (ALL FANCOIL UNITS ARE MODEL GR1 UNLESS STATED OTHERWISE)
- GRILLE WITHOUT FANCOIL UNIT
- FLOOR CONCEALED SUPPLY DIFFUSER
- FLOOR CONCEALED RETURN DIFFUSER
- AIR DISC VALVE
- LARGE GAP UNDER THE DOOR
- DOOR GRILLE
- MANUAL DAMPER
- DUCT FIRE DAMPER
- AIRFLOW REGULATOR
- MECHANICAL SHAFT
- STEEL RADIATOR
- BOOSTER COIL
- SUPPLY AIR DUCT
- RETURN AIR DUCT
- EXHAUST AIR DUCT
- AIR INTAKE DUCT
- SOUNDPROOF FLEXIBLE AIR DUCT

DUCT INSULATIONS

CIRCUIT	LOCATION	MATERIAL	INSULATION	INSULATION THICKNESS	EXTERNAL COVER WHEN EXPOSED
SUPPLY, RETURN AND AIR INTAKE	Technical rooms	Zinc coated steel sheet	Glass wool board	30	Aluminium sheet
EXHAUST AIR	Technical rooms	Zinc coated steel sheet	-	-	-
SUPPLY	Inside shafts	Class 0-1 pre-insulated aluminium ducts	Expanded polyurethane	20	Embossed aluminium 80 µ
RETURN	Inside shafts	Class 0-1 pre-insulated aluminium ducts	Expanded polyurethane	20	Embossed aluminium 80 µ
SUPPLY (RECTANGULAR)	Inside false ceiling and raised floor	Class 0-1 pre-insulated aluminium ducts	Expanded polyurethane	20	Embossed aluminium 80 µ
SUPPLY (CIRCULAR)	Inside false ceiling and raised floor	Zinc coated steel sheet	Flexible elastomeric foam	20	Aluminium sheet
RETURN	Inside false ceiling and raised floor	Class 0-1 pre-insulated aluminium ducts	Expanded polyurethane	20	Embossed aluminium 80 µ

HVAC SOUND ATTENUATOR ACOUSTIC PERFORMANCE
TYPE WOODS QB 64 - LENGTH 1000 mm

F (Hz)	63	125	250	500	1000	2000	4000	8000
dB	7	14	23	29	32	25	19	15



INVESTITOR: JOINT PROJECT ON ENVIRONMENT AND ENERGY BETWEEN ITALY AND MONTENEGRO

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Objekat i mjesto:

Poslovni objekat - objekat Vlade Crne Gore
ENERGETSKI EFIKASNA ZGRADA
Urbanistička parcela 9
DUP "Univerzitetski centar" - izmjene i dopune
Podgorica, Crna Gora

ISSUE

MAIN PROJECT — **THERMOTECHNICAL DRAWINGS**

TITLE

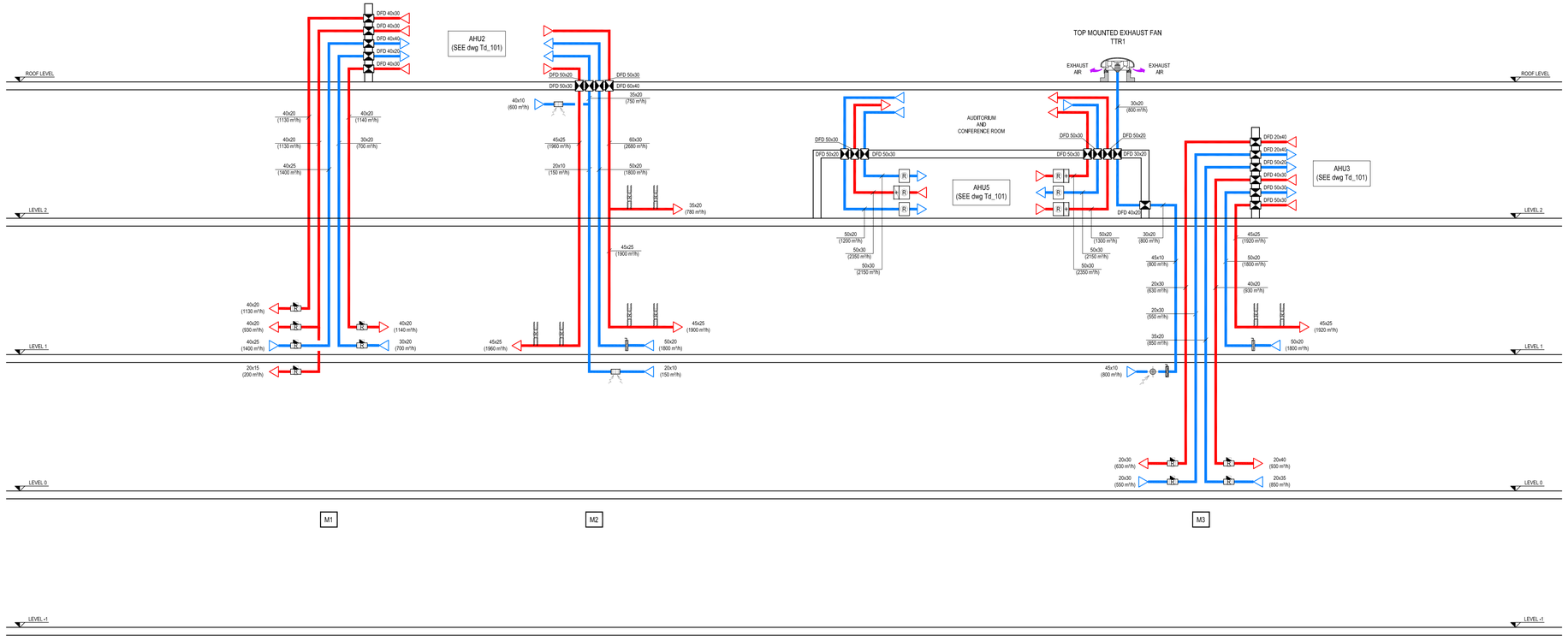
MECHANICAL DUCTWORK
LAYOUT ROOF LEVEL

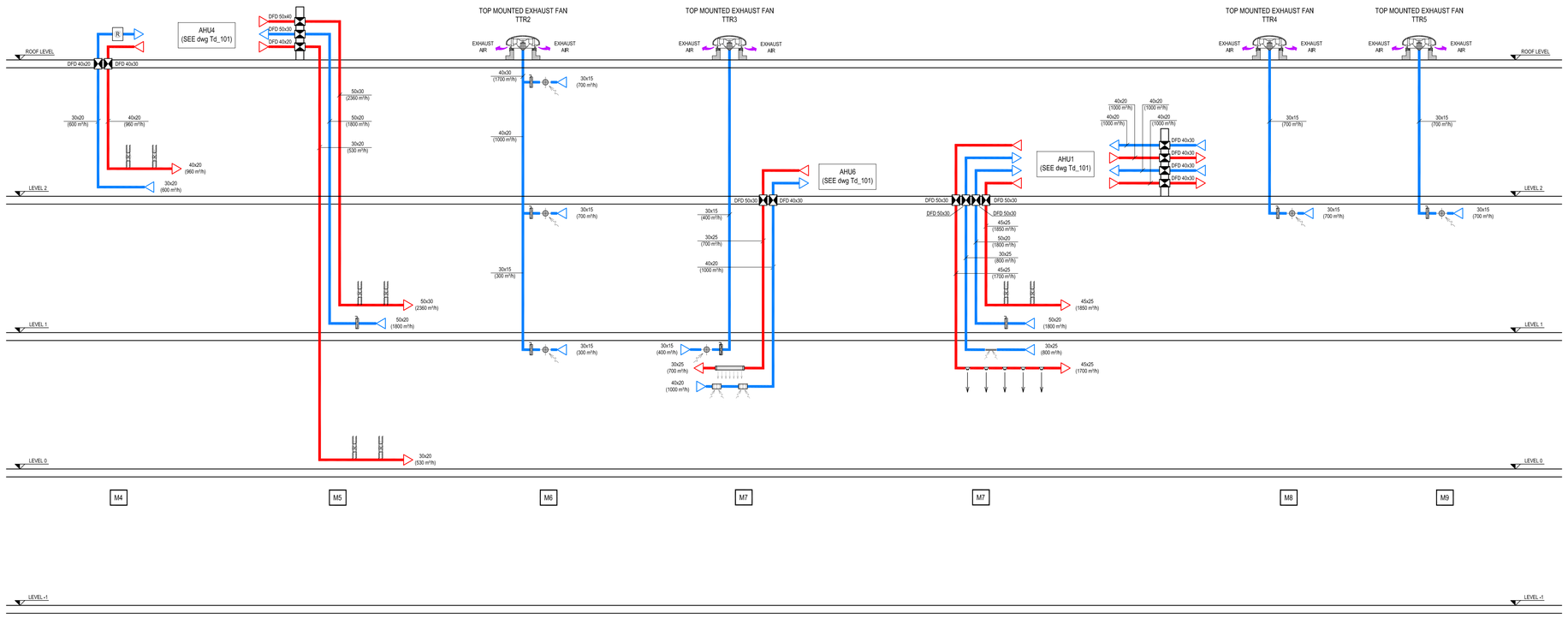
REV.	DATE	FILE	SUBJECT	DRAW	APPR.
a					
b					
c					
d					

ISSUE NR. Te_106

DATE:	SCALE:	FILE:
30/11/2010	1:100	926_Te_106.dwg
J.N. 926	DRAW: G. A.	APPROVED: R. M.

RE1469 - Rev.2 - Novembre '10





LEGEND

- CEILING TWISTED SUPPLY DIFFUSER
- CEILING TWISTED SUPPLY DIFFUSER
- SIDEWALL RETURN AIR GRILLE
- CEILING RETURN AIR GRILLE
- JET NOZZLES
- LINEAR CEILING DIFFUSERS
- WALL CONCEALED FANCOIL UNIT
- FLOOR CONCEALED FANCOIL UNIT (ALL FANCOIL UNITS ARE MODEL GR1 UNLESS STATED OTHERWISE)
- GRILLE WITHOUT FANCOIL UNIT
- FLOOR CONCEALED SUPPLY DIFFUSER
- FLOOR CONCEALED RETURN DIFFUSER
- AIR DISC VALVE
- LARGE GAP UNDER THE DOOR
- DOOR GRILLE
- MANUAL DAMPER
- DUCT FIRE DAMPER
- AIRFLOW REGULATOR
- MECHANICAL SHAFT
- STEEL RADIATOR
- BOOSTER COIL
- SUPPLY AIR DUCT
- RETURN AIR DUCT
- EXHAUST AIR DUCT
- AIR INTAKE DUCT
- SOUNDPROOF FLEXIBLE AIR DUCT

DUCT INSULATIONS

CIRCUIT	LOCATION	MATERIAL	INSULATION	INSULATION THICKNESS	EXTERNAL COVER WHEN EXPOSED
SUPPLY, RETURN AND AIR INTAKE	Technical rooms	Zinc coated steel sheet	Glass wool board	30	Aluminium sheet
EXHAUST AIR	Technical rooms	Zinc coated steel sheet	-	-	-
SUPPLY	Inside shafts	Class 0-1 pre-insulated aluminium ducts	Expanded polyurethane	20	Embossed aluminium 80 µ
RETURN	Inside shafts	Class 0-1 pre-insulated aluminium ducts	Expanded polyurethane	20	Embossed aluminium 80 µ
SUPPLY (RECTANGULAR)	Inside false ceiling and raised floor	Class 0-1 pre-insulated aluminium ducts	Expanded polyurethane	20	Embossed aluminium 80 µ
SUPPLY (CIRCULAR)	Inside false ceiling and raised floor	Zinc coated steel sheet	Flexible elastomeric foam	20	Aluminium sheet
RETURN	Inside false ceiling and raised floor	Class 0-1 pre-insulated aluminium ducts	Expanded polyurethane	20	Embossed aluminium 80 µ

INVESTITOR: JOINT PROJECT ON ENVIRONMENT AND ENERGY BETWEEN ITALY AND MONTENEGRO

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Poslovni objekat - objekat Vlade Crne Gore
ENERGETSKI EFIKASNA ZGRADA
Urbanistička parcela 9
DUP "Univerzitetski centar" - izmjene i dopune
Podgorica, Crna Gora

ISSUE

MAIN PROJECT — THERMOTECHNICAL DRAWINGS

TITLE

MECHANICAL DUCTWORK
ALTIMETRIC

REV.	DATE	FILE	SUBJECT	DRAW	APPR.
a					
b					
c					
d					

ISSUE NR.

Te_107

DATE: 30/11/2010	SCALE: -	FILE: 926_Te_107.dwg
J.N. 926	DRAW: G. A.	APPROVED: R. M.

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INVESTITOR:

JOINT PROJECT ON ENVIRONMENT AND ENERGY BETWEEN ITALY AND MONTENEGRO

MINISTRY OF THE ENVIRONMENT,
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ENERGETSKI EFIKASNA ZGRADA
Urbanistička parcela 9
DUP "Univerzitetski centar" - izmjene i dopune
Podgorica, Crna Gora

ISSUE

MAIN PROJECT **THERMOTECHNICAL DRAWINGS**

TITLE

ELECTRICAL SWITCHBOARDS WIRING DIAGRAM

REV.	DATE	FILE	SUBJECT	DRAW	APPR.
a					
b					
c					
d					

ISSUE NR. **Te_201**

DATE:	SCALE:	FILE:
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J.N. 926	DRAW: G. A.	APPROVED: R. M.

	DISCONNECTOR SWITCH	SR O/C D FB LO	SIGNAL AUXILIARY CONTACTS SR: RELAY RELEASED D: DISCONNECTED O/C: OPEN/CLOSED FB: FUSE BLOWOUT LO: LIMITER SWITCH ON		
	AUTOMATIC SWITCH		LED SIGNAL LAMPS RD (RED) = CLOSED SWITCH OR VOLTAGE PRESENT GN (GREEN) = OPEN SWITCH YE (YELLOW) = RELAY RELEASED WH (WHITE) = SECTIONED SWITCH, REMOTE CONTROL SWITCH OPEN OR REMOTE CONTROL SWITCH CLOSED		
	MAGNETIC RELEASE		LIGHT SIGNAL OF LED CROSS STATUS		
	THERMAL RELEASE		CURRENT REDUCTION GEAR		
	ADJUSTABLE THERMAL RELEASE	nP	AMMETRIC SWITCH (VOLTMETRIC) WITH "n" POSITIONS		
Id	RESIDUAL CURRENT RELEASE	V A kW kVAR	DIGITAL INDICATOR INSTRUMENTS		
Id	RESIDUAL CURRENT RELEASE WITH CT SEPARATED TOROIDAL	M_0_A	SWITCH WITH 3 POSITIONS (MANUAL_OR_AUTOMATIC)		
	INSULATOR MANOEUVRE SWITCH	B	OPEN SWITCH SPOOL WITH CURRENT LAUNCH		
	INSULATOR	M----	GEARED MOTOR FOR SPRING LOAD		
	PLUG-IN AND DRAW-OUT VERSION		KEY LOCK		
	FUSE BOX INSULATOR WITH FUSES		CABLE TERMINAL		
d b	CONTACTOR		PANEL EARTH BUSBAR		
	STEP BY STEP RELEASE	I/O	DEVICE (INPUT/OUTPUT) BUILDING AUTOMATION SYSTEM		
	COMMUTATOR WITH 2 POSITIONS		OVER VOLTAGE DUMPER/LIMITER		
	CONTROL SPOOL	E7	EMERGENCY RELEASE PUSHBUTTON		
	DELAY RELEASE CONTROL SPOOL		MULTI INSTRUMENT MEASUREMENT		
RA	AUXILIARY RELAY (n. 3 NA CONTACTS, n. 3 NC CONTACTS)		LED INDICATORS FOR STATE DEVICES		
	AUXILIARY CONTACT NORMALLY OPEN	SMDU	SWITCHGEAR MICROPROCESSOR DIALOG UNIT		
	AUXILIARY CONTACT NORMALLY CLOSED				
	AUXILIARY EXCHANGE CONTACT				

Annotations

Manens-Tifs INGEGNERIA

Title
DESCRIPTION OF SYMBOL

Reference n.
-

Drawing n.
Te_201

Rev.
0

Sheet n.
Pag.01 seg. 02

ⓐ MOULDED CASE CIRCUIT BREAKER, DISCONNECTOR SWITCH

ⓑ COMMUTATOR WITH 3 POSITIONS

ⓒ MODULAR DISCONNECTOR SWITCH

ⓓ MODULAR THERMOMAGNETIC CIRCUIT BREAKER WITH RESIDUAL CURRENT RELEASE

ⓓj MOULDED CASE THERMOMAGNETIC CIRCUIT BREAKER WITH RESIDUAL CURRENT RELEASE

ⓔ POWER CONTACTOR

ⓕ MODULAR DISCONNECTED SWITCH WITH FUSES

ⓖ AUTOMATIC MODULAR MAGNETIC THERMAL CIRCUIT BREAKER

ⓗ RESIDUAL CURRENT RELEASE

ⓘ OVER VOLTAGE DUMPER/LIMITER

ⓛ AUTOMATIC MODULAR MAGNETIC THERMAL CIRCUIT BREAKER WITH ADJUSTABLE THERMAL RELAY

ⓜ MOULDED CASE ONLY MAGNETIC CIRCUIT BREAKER

Annotations

Manens-Tifs INGEGNERIA

Title
DEVICE LEGEND

Reference n.
-

Drawing n.
Te_201

Rev.
0

Sheet n.
Pag.02 seg. 03

TABLE DESCRIPTION OF PANEL

1	USER INITIALS	
2	MAXIMUM ABSORBED POWER	kVA
3	MAXIMUM ABSORBED CURRENT	A
4	N.poles–I nom.–ADJUSTMENT SWITCH	A
5	I nominal CONTACTOR	A
6	HEAT RELAY ADJUSTMENT	A
7	I nominal FUSE	A
8	LINE FORMATION	mm²
9	CABLE TYPE	
10	LINE LENGTH	m
11	DESTINATION	
12	NOTE	

PANEL'S MAIN CHARACTERISTICS

NAME ON PANEL

HEAT PUMPS MAIN LOW VOLTAGE SWITCHBOARD

INITIALS

H_LV_SB

NOMINAL VOLTAGE

Up= 230/400V

FREQUENCY

f=50Hz

SIMULTANEOUS MAXIMUM POWER AND CURRENT

TOTAL P~92.4kVA I~133.4A (Kc=0.8)

NOMINAL INTERRUPTION POWER ON MAXIMUM LIMIT DERIVED SWITCHES (IEC 23_3 E IEC 17_5)

Icn=>10kA

PANEL STRUCTURE

METAL DISTRIBUTION BOARD

MINIMUM PROTECTION LEVEL

IP55 (IP20 TO OPEN PANEL)

Annotations

Manens-Tifs INGEGNERIA

Title

MAIN CHARACTERISTICS
H_LV_SB

Reference n.

-

Drawing n.

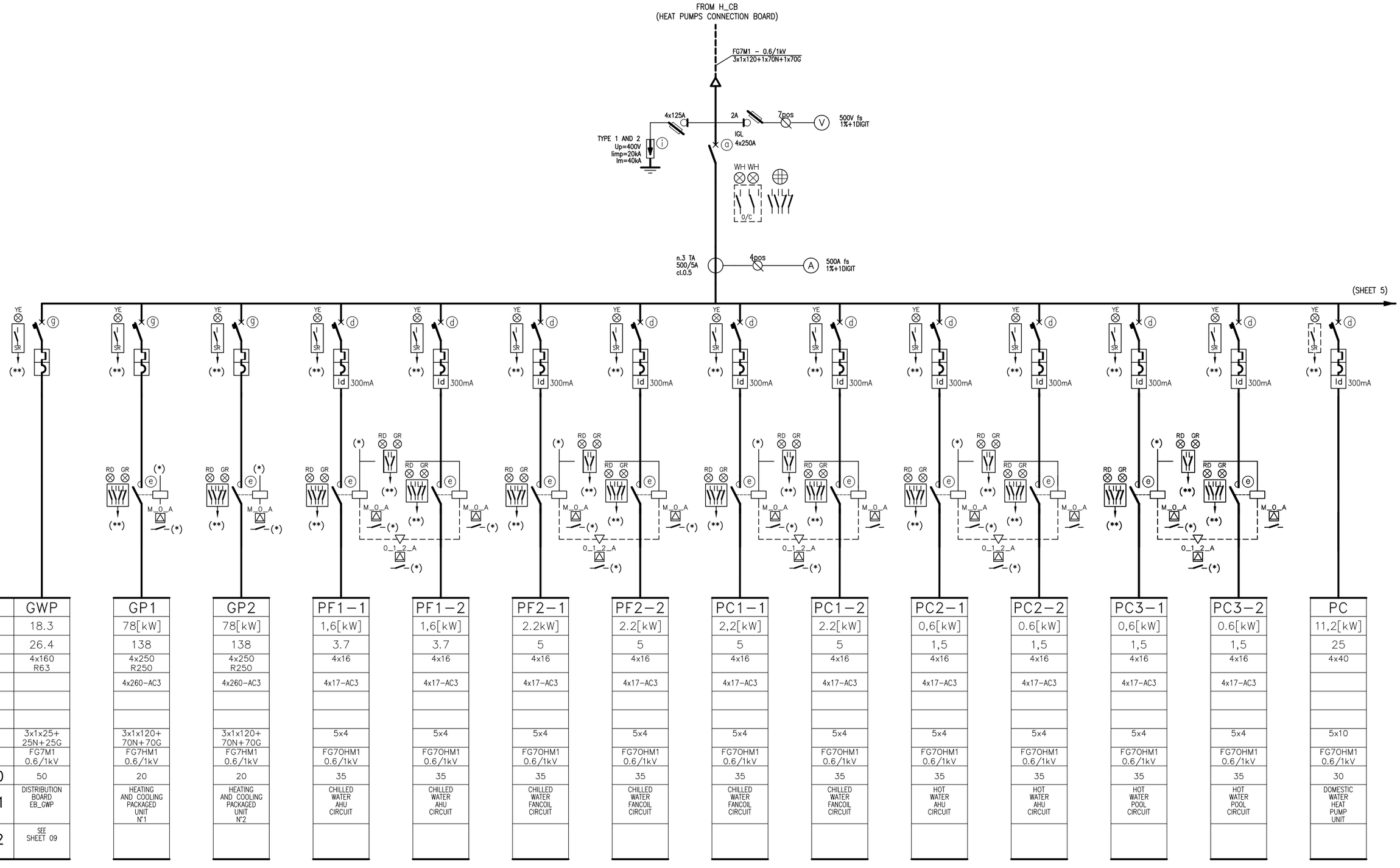
Te_201

Rev.

0

Sheet n.

Pag.03 seg. 04



1	GWP	GP1	GP2	PF1–1	PF1–2	PF2–1	PF2–2	PC1–1	PC1–2	PC2–1	PC2–2	PC3–1	PC3–2	PC
2	18.3	78[kW]	78[kW]	1,6[kW]	1,6[kW]	2.2kW]	2.2[kW]	2,2[kW]	2.2[kW]	0,6[kW]	0.6[kW]	0,6[kW]	0.6[kW]	11,2[kW]
3	26.4	138	138	3.7	3.7	5	5	5	5	1,5	1,5	1,5	1,5	25
4	4x160 R63	4x250 R250	4x250 R250	4x16	4x16	4x16	4x16	4x16	4x16	4x16	4x16	4x16	4x16	4x40
5		4x260–AC3	4x260–AC3	4x17–AC3	4x17–AC3	4x17–AC3	4x17–AC3	4x17–AC3	4x17–AC3	4x17–AC3	4x17–AC3	4x17–AC3	4x17–AC3	
6														
7														
8	3x1x25+ 25N+25G	3x1x120+ 70N+70G	3x1x120+ 70N+70G	5x4	5x4	5x4	5x4	5x4	5x4	5x4	5x4	5x4	5x4	5x10
9	FG7M1 0.6/1kV	FG7HM1 0.6/1kV	FG7HM1 0.6/1kV	FG7OHM1 0.6/1kV	FG7OHM1 0.6/1kV	FG7OHM1 0.6/1kV	FG7OHM1 0.6/1kV	FG7OHM1 0.6/1kV	FG7OHM1 0.6/1kV	FG7OHM1 0.6/1kV	FG7OHM1 0.6/1kV	FG7OHM1 0.6/1kV	FG7OHM1 0.6/1kV	FG7OHM1 0.6/1kV
10	50	20	20	35	35	35	35	35	35	35	35	35	35	30
11	DISTRIBUTION BOARD EB_GWP	HEATING AND COOLING PACKAGED UNIT N°1	HEATING AND COOLING PACKAGED UNIT N°2	CHILLED WATER AHU CIRCUIT	CHILLED WATER AHU CIRCUIT	CHILLED WATER FANCOIL CIRCUIT	CHILLED WATER FANCOIL CIRCUIT	CHILLED WATER FANCOIL CIRCUIT	CHILLED WATER FANCOIL CIRCUIT	HOT WATER AHU CIRCUIT	HOT WATER AHU CIRCUIT	HOT WATER POOL CIRCUIT	HOT WATER POOL CIRCUIT	DOMESTIC WATER HEAT PUMP UNIT
12	SEE SHEET 09													

Annotations

(*) FROM BUILDING MANEGEMENT SYSTEM

(**) TO BUILDING MANEGEMENT SYSTEM

Manens-Tifs INGEGNERIA

Title

H_LV_SB
WIRING DIAGRAM

Reference n.

-

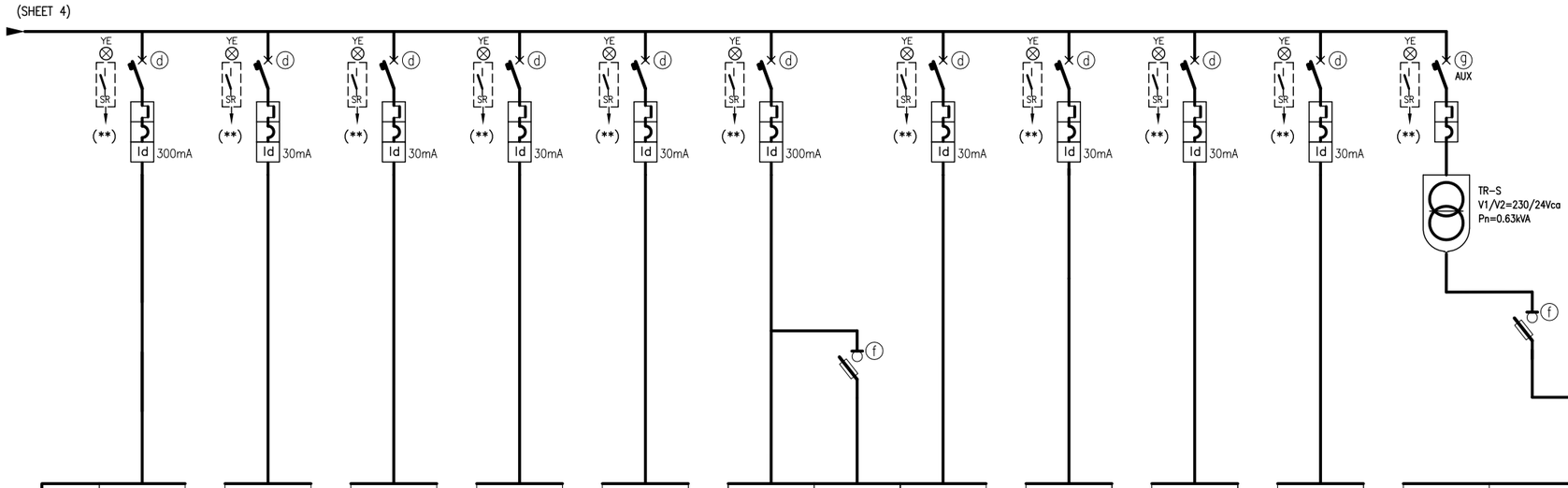
Drawing n.

Te_201

Rev. **0**

Sheet n. Pag.04 seg. 05

(SHEET 4)



1	PC1	SD1	SD2	SD3	REG	LS1	LS1–S	LS2	PLS1	PLS2	PLS3	TR–S	AUX1	AUX2	AUX3	AUX4
2		0.1[kW]	0.1[kW]	0.1[kW]	0.5	0.1			0.5	1.0					0.5	
3		0.5	0.5	0.5	2.2	0.5			2.2	1.5					2.2	
4	4x32	2x16	2x16	2x16	2x10	2x10	2x20	2x10	2x16	4x16	2x16	2x25	1x40+N	1x20+N	1x40+N	1x20+N
5																
6																
7							2A–gG						25A–gG	6A–gG	25A–gG	6A–gG
8		3x4	3x4	3x4	3x2,5	3x1x2.5	2x1x2.5		3x1x4	5x1x4				2x1x1.5	2x1x6	
9		FG7OM1 0.6/1kV	FG7OM1 0.6/1kV	FG7OM1 0.6/1kV	FG7OM1 0.6/1kV	HO7Z1–K 0.45/0.75kV	HO7Z1–K 0.45/0.75kV		HO7Z1–K 0.45/0.75kV	HO7Z1–K 0.45/0.75kV				HO7Z1–K 0,45/0.75kV	HO7Z1–K 0.45/0.75kV	
10		20	20	20	20	35	35		25	15				5	10	
11	RESERVE	NEUTRALIZATION CHILLES CLOSED CIRCUIT	NEUTRALIZATION CLOSED CIRCUIT	NEUTRALIZATION HOT CLOSED CIRCUIT	REGOLATION AND ALARM PANEL	LIGHTING SYSTEM	EMERGENCY LIGHTING	RISERVA	SERVICE SOCKET OUTLET	TREE FASES SOKET OUTLET	RESERVE		AUXILIARY SWITCHBOARD	AUX DISTRIBUTION BOARD	BMS BUILDING MANAGEMENT SYSTEM	RESERVE
12												230Vca		24Vca		

Annotations

(*) FROM BUILDING MANEGEMENT SYSTEM

(**) TO BUILDING MANEGEMENT SYSTEM

Manens-Tifs INGEGNERIA

Title

H_LV_SB

WIRING DIAGRAM

Reference n.

-

Drawing n.

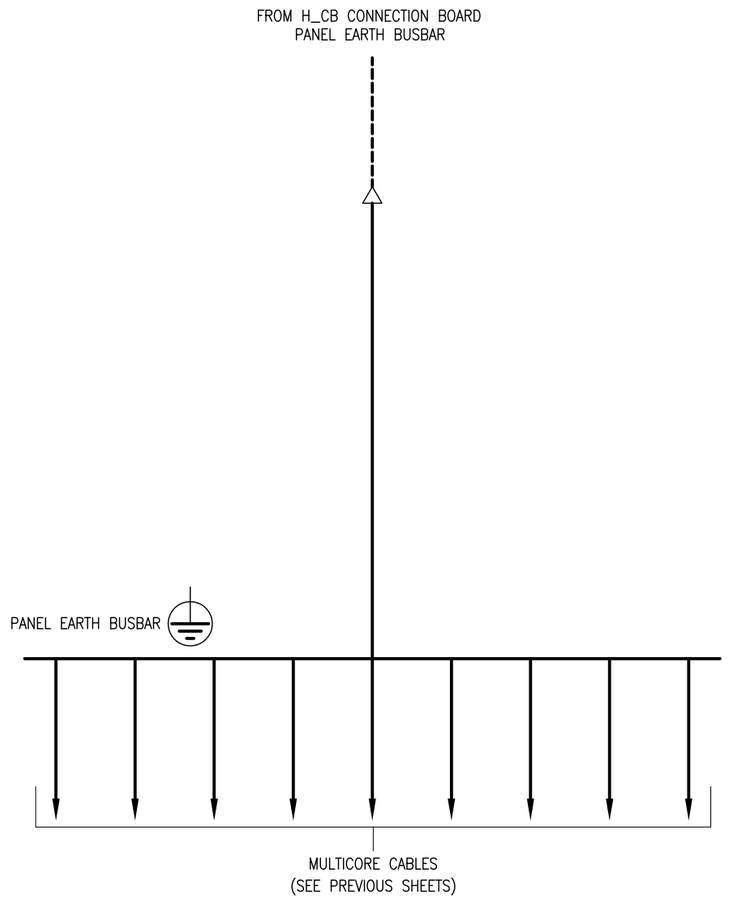
Te_201

Rev.

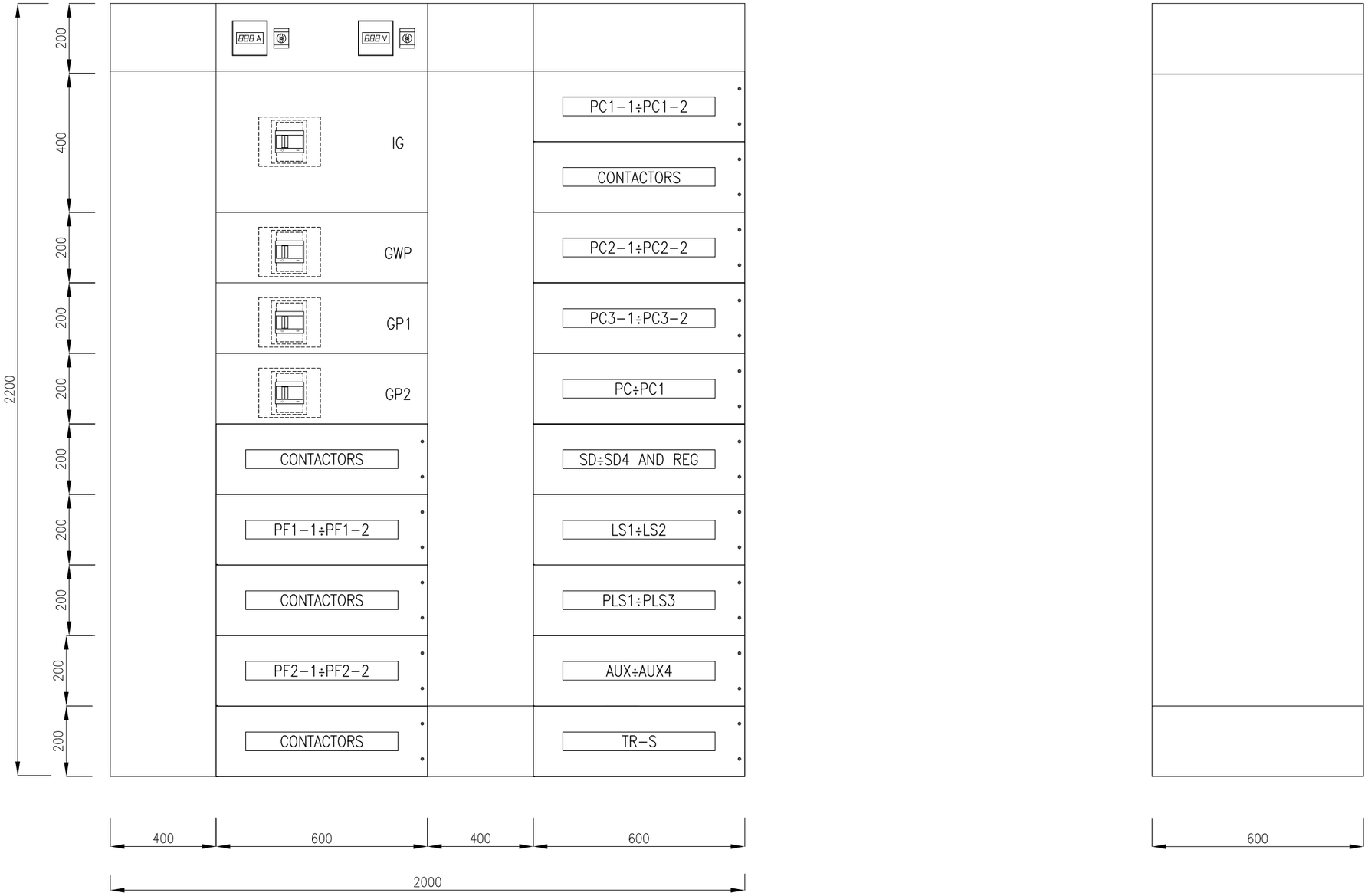
0

Sheet n.

Pag.05 seg. 06



Annotations	Manens-Tifs INGEGNERIA	Title H_LV_SB EARTH CONNECTION LAYOUT	Reference n. -	Drawing n. **Te_201**	
				Rev. **0**	Sheet n. Pag.06 seg. 07



Annotations	Manens-Tifs INGEGNERIA	Title: H_LV_SB FRONTAL LAYOUT	Reference n.: -	Drawing n.: Te_201
				Rev.: 0
				Sheet n.: Pag.07 seg. 08

TABLE DESCRIPTION OF PANEL

1	USER INITIALS	
2	MAXIMUM ABSORBED POWER	kVA
3	MAXIMUM ABSORBED CURRENT	A
4	N.poles–I nom.–ADJUSTMENT SWITCH	A
5	I nominal CONTACTOR	A
6	HEAT RELAY ADJUSTMENT	A
7	I nominal FUSE	A
8	LINE FORMATION	mm²
9	CABLE TYPE	
10	LINE LENGTH	m
11	DESTINATION	
12	NOTE	

PANEL'S MAIN CHARACTERISTICS

NAME ON PANEL

GROUND WATER PUMPS DISTRIBUTION BOARD

INITIALS

EB_GWP

NOMINAL VOLTAGE

Up=230/400V

FREQUENCY

f=50Hz

SIMULTANEOUS MAXIMUM POWER AND CURRENT

TOTAL P~18.3kVA I~26.5A (Kc=0.8)

NOMINAL INTERRUPTION POWER ON MAXIMUM LIMIT DERIVED SWITCHES (IEC 23_3 E IEC 17_5)

Icn=>10kA

PANEL STRUCTURE

METAL DISTRIBUTION BOARD

MINIMUM PROTECTION LEVEL

IP55 (IP20 TO OPEN PANEL)

Annotations

Manens-Tifs INGEGNERIA

Title

MAIN CHARACTERISTICS
EB_GWP

Reference n.

-

Drawing n.

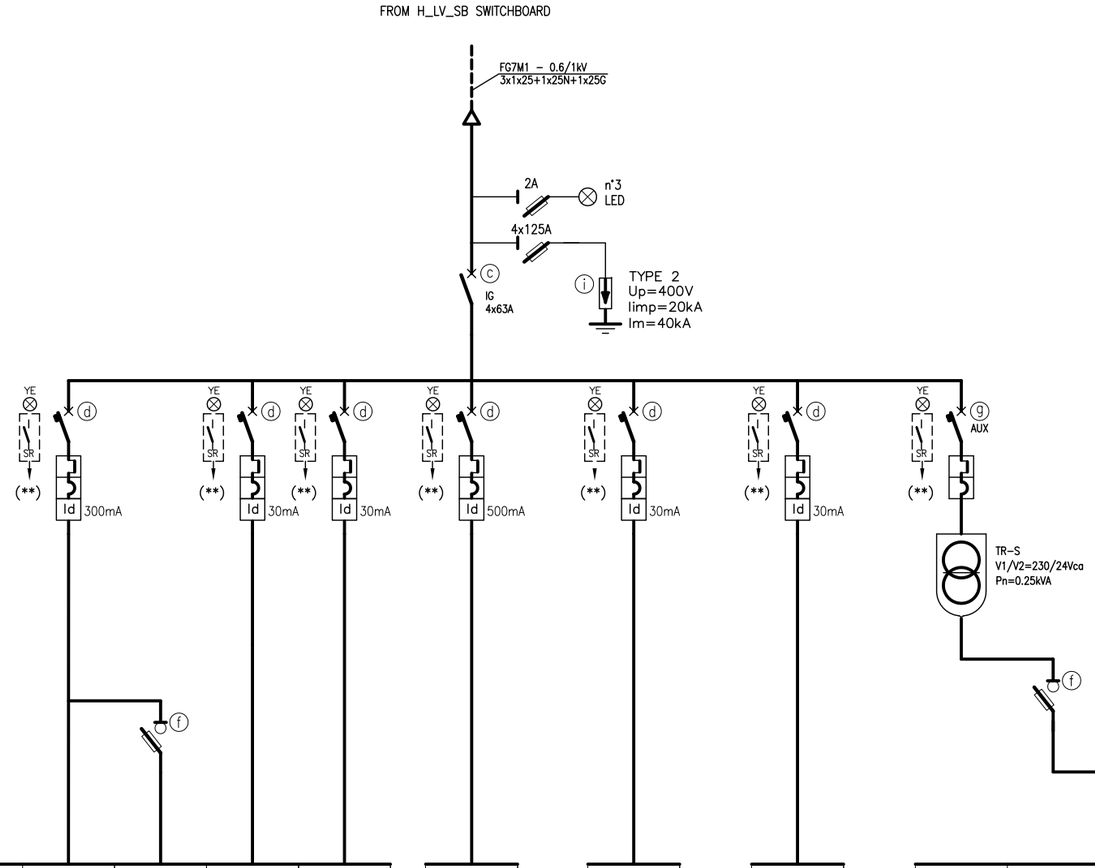
Te_201

Rev.

0

Sheet n.

Pag.08 seg. 09



1	LS1	LS1–S	PLS1	PLS2	PLS3	PLS4	REG	TR–S	AUX1	PLS5	PLS6	PLS7
2	0.2		0.3	1.0	18.5kW		0.5	0.25			0.1	
3	0.9		1.3	1.5	37		2.2	1.1			4.2	
4	1x10+N	1x20+N	1x16+N	4x16	3x50	4x16	2x10	1x6+N	1x20+N	1x20+N	1x20+N	1x20+N
5					3x50–AC3							
6					36÷45							
7		2A–gG							10A–gG	6A–gG	6A–gG	6A–gG
8	3x2.5	2x2.5	3x4	5x4	4x16		3x2,5	3x1x2.5	2x1x2.5	2x1x2.5	3x1x2.5	
9	FG7OM1 0.6/1kV	FG7OM1 0.6/1kV	FG7OM1 0.6/1kV	FG7OM1 0.6/1kV	FG7OM1 0.6/1kV		FG7OM1 0.6/1kV	H07Z1–K 0.45/0.75kV	H07Z1–K 0.45/0.75kV	H07Z1–K 0.45/0.75kV	H07Z1–K 0.45/0.75kV	
10	10	10	10	10	10		10	5	5	5	5	
11	LIGHTING SYSTEM	EMERGENCY LIGHTING	SERVICE SOCKET OUTLET	INDUSTRIAL LOAD POWER	SUBMERGED WATER PUMPING GROUP	RESERVE	REGOLATION AND ALARM PANEL		AUXILIARY SWITCHBOARD	AUXILIARY SWITCHBOARD	BUILDING MANAGEMENT SYSTEM	RESERVE
12												

Annotations

(*) FROM BUILDING MANEGEMENT SYSTEM

(**) TO BUILDING MANEGEMENT SYSTEM

Manens-Tifs INGEGNERIA

Title

EB_GWP

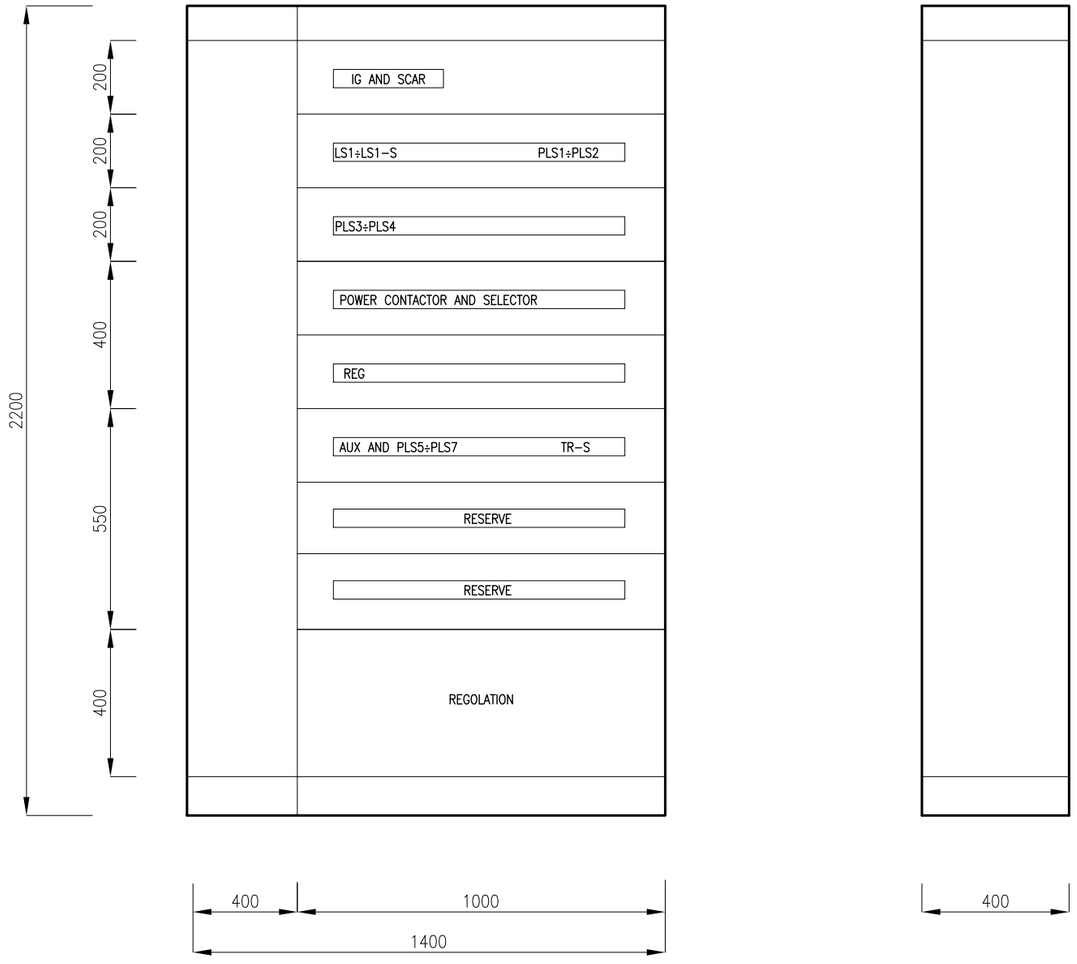
WIRING DIAGRAM

Reference n. -

Drawing n. **Te_201**

Rev. **0**

Sheet n. Pag.09 seg. 10



Annotations	Manens-Tifs INGEGNERIA	Title EB_GWP FRONTAL LAYOUT	Reference n. -	Drawing n. **Te_201** Rev. **0** / Sheet n. Pag.10 seg. 11

TABLE DESCRIPTION OF PANEL

1	USER INITIALS	
2	MAXIMUM ABSORBED POWER	kVA
3	MAXIMUM ABSORBED CURRENT	A
4	N.poles–I nom.–ADJUSTMENT SWITCH	A
5	I nominal CONTACTOR	A
6	HEAT RELAY ADJUSTMENT	A
7	I nominal FUSE	A
8	LINE FORMATION	mm²
9	CABLE TYPE	
10	LINE LENGTH	m
11	DESTINATION	
12	NOTE	

PANEL'S MAIN CHARACTERISTICS

NAME ON PANEL

FIRE PROTECTION PUMP STATION DISTRIBUTION BOARD

INITIALS

EB_FP

NOMINAL VOLTAGE

Up= 230/400V

FREQUENCY

f=50Hz

SIMULTANEOUS MAXIMUM POWER AND CURRENT

TOTAL P~4.5kVA I~6.5A (Kc=0.8)

NOMINAL INTERRUPTION POWER ON MAXIMUM LIMIT DERIVED SWITCHES (IEC 23_3 E IEC 17_5)

Icn=>10kA

PANEL STRUCTURE

METAL DISTRIBUTION BOARD

MINIMUM PROTECTION LEVEL

IP55 (IP20 TO OPEN PANEL)

Annotations

Manens-Tifs INGEGNERIA

Title

MAIN CHARACTERISTICS
EB_FP

Reference n.

-

Drawing n.

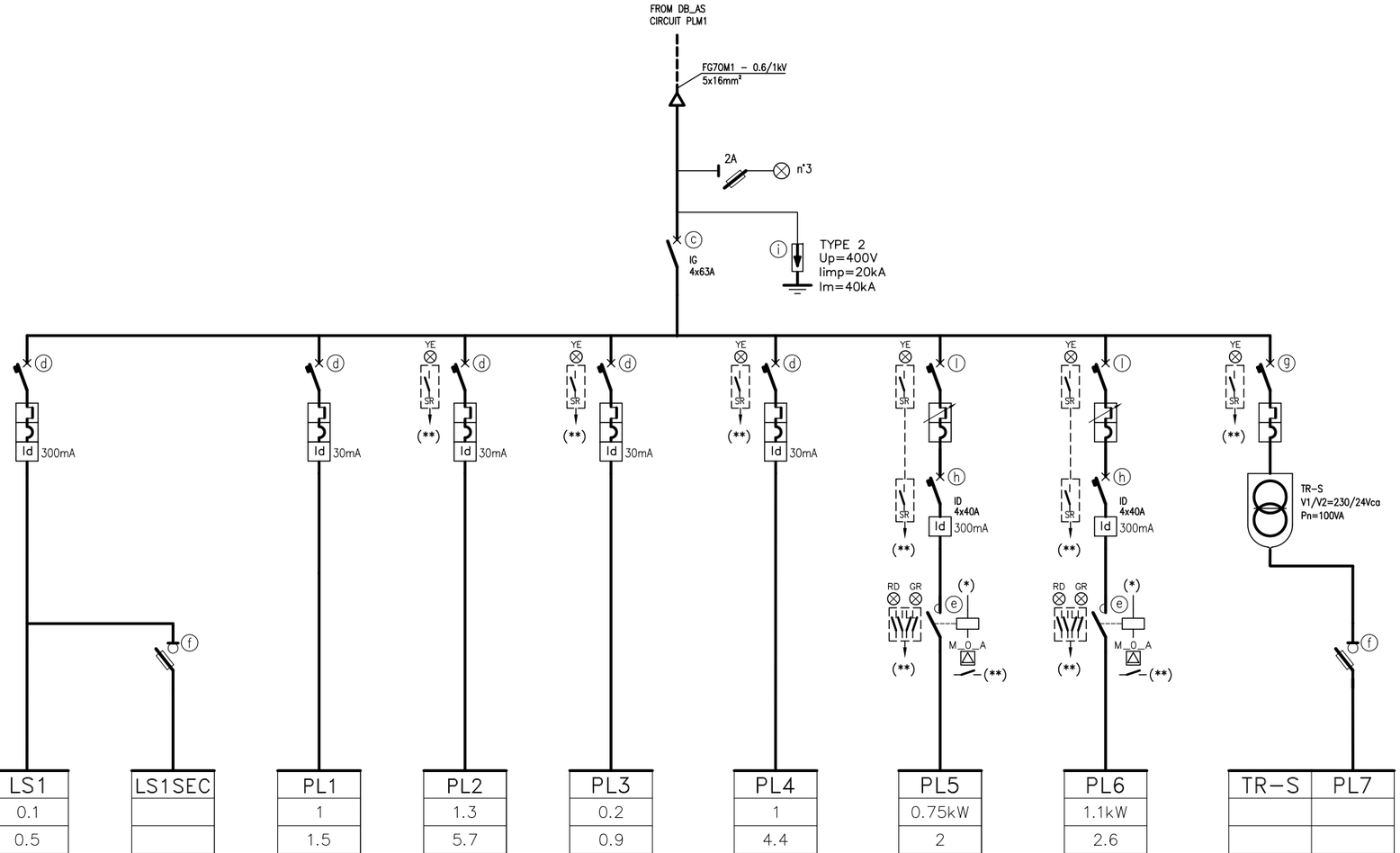
Te_201

Rev.

0

Sheet n.

Pag.11 seg. 12



1	LS1	LS1SEC	PL1	PL2	PL3	PL4	PL5	PL6	TR-S	PL7
2	0.1		1	1.3	0.2	1	0.75kW	1.1kW		
3	0.5		1.5	5.7	0.9	4.4	2	2.6		
4	2x10	2x20	4x16	2x16	2x16	2x16	3x25	3x25	1x6+n	2x20
5							3x9-AC3	3x9-AC3		
6							1.6÷2.5	2.5÷4		
7		2A-gG								4A
8	3x2.5	2x2.5	5x4	3x2.5	3x2.5	3x2.5	4x2.5	4x2.5		2x1x1.5
9	FG70M1 0.6/1kV	FG70M1 0.6/1kV	FG70M1 0.6/1kV	FG70M1 0.6/1kV	FG70M1 0.6/1kV	FG70M1 0.6/1kV	FG70M1 0.6/1kV	FG70M1 0.6/1kV		FM9
10	10	10	10	10	10	10	10	10		
11	LIGHTING	EMERGENCY LIGHTING	POWER SOCKETS LINE	HEATING CABLE	ALARM PANEL	ELECTRIC HEATER	JOCKEY PUMP FIRE HIDRANT	JOCKEY PUMP SPRINKLER	TRANSFORMER 230/24Vca	AUSILIARI QUADRO ELETTRICO
12						INVERTER A BORDO UTA			230Vca	24Vca

Annotations

(*) FROM BUILDING MANEGEMENT SYSTEM

(**) TO BUILDING MANEGEMENT SYSTEM

Manens-Tifs INGEGNERIA

Title

EB_FP

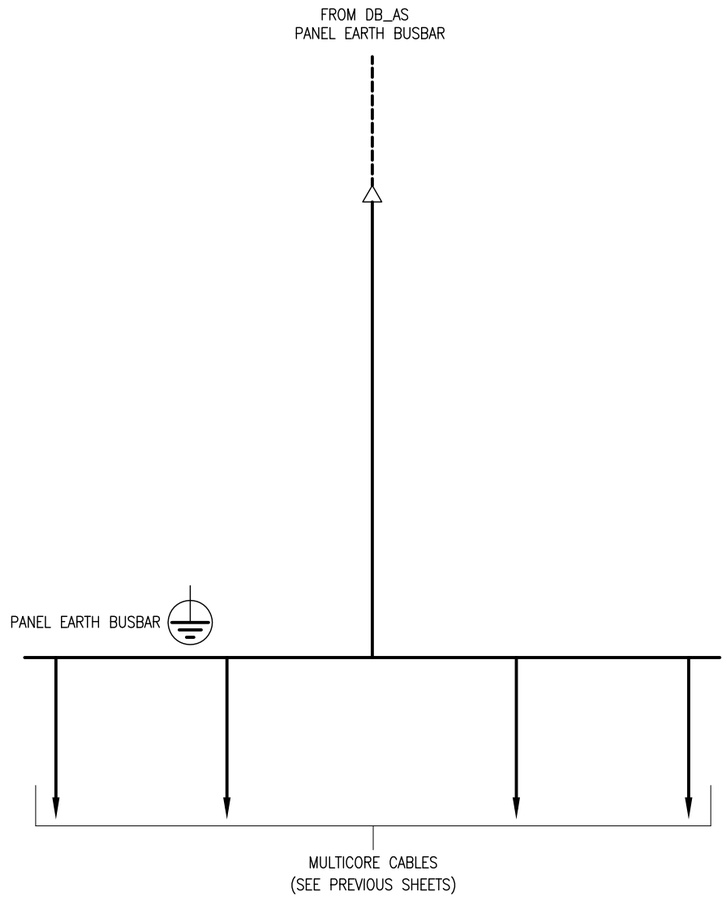
WIRING DIAGRAM

Reference n. -

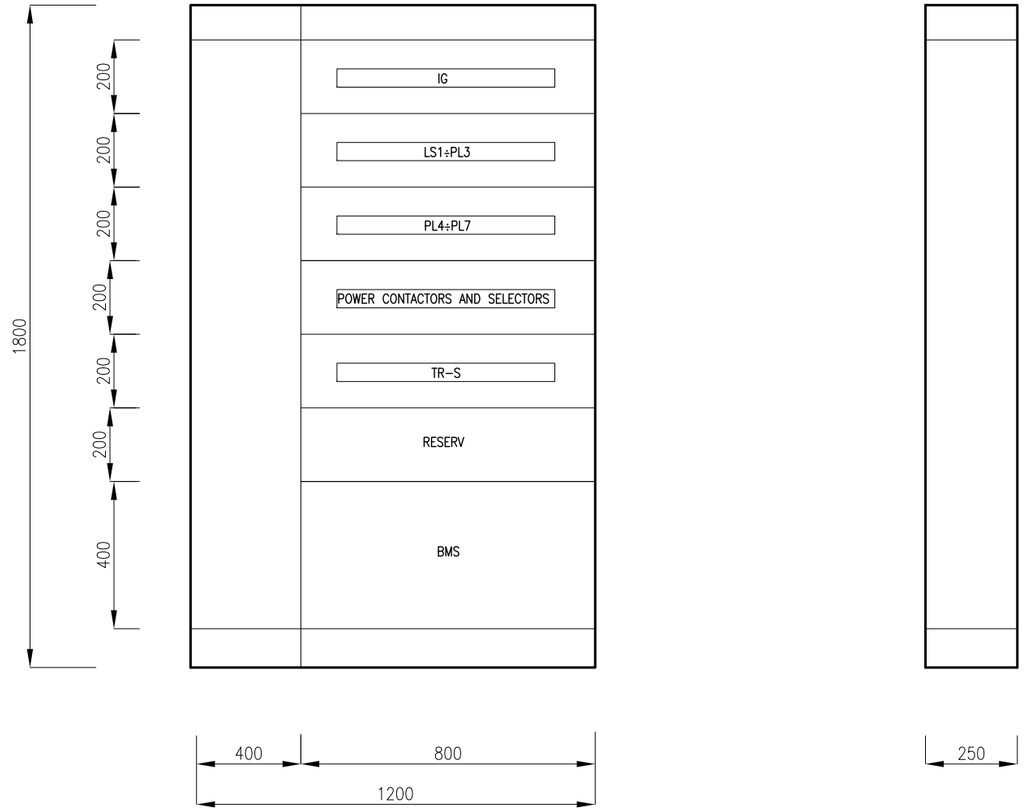
Drawing n. **Te_201**

Rev. **0**

Sheet n. Pag.12 seg. 13



Annotations	Manens-Tifs INGEGNERIA	Title EB_FP EARTH CONNECTION LAYOUT	Reference n. -	Drawing n. **Te_201** Rev. **0** · Sheet n. Pag.13 seg. 14



Annotations	Manens-Tifs INGEGNERIA	Title EB_FP FRONTAL LAYOUT	Reference n. -	Drawing n. Te_201 Rev. 0 / Sheet n. Pag.14 seg. 15

TABLE DESCRIPTION OF PANEL

1	USER INITIALS	
2	MAXIMUM ABSORBED POWER	kVA
3	MAXIMUM ABSORBED CURRENT	A
4	N.poles–I nom.–ADJUSTMENT SWITCH	A
5	I nominal CONTACTOR	A
6	HEAT RELAY ADJUSTMENT	A
7	I nominal FUSE	A
8	LINE FORMATION	mm²
9	CABLE TYPE	
10	LINE LENGTH	m
11	DESTINATION	
12	NOTE	

PANEL'S MAIN CHARACTERISTICS

NAME ON PANEL

DOMESTIC WATER PUMP STATION DISTRIBUTION BOARD

INITIALS

EB_DW

NOMINAL VOLTAGE

Up= 230/400V

FREQUENCY

f=50Hz

SIMULTANEOUS MAXIMUM POWER AND CURRENT

TOTAL P~15.0kVA I~21.7A (Kc=0.9)

NOMINAL INTERRUPTION POWER ON MAXIMUM LIMIT DERIVED SWITCHES (IEC 23_3 E IEC 17_5)

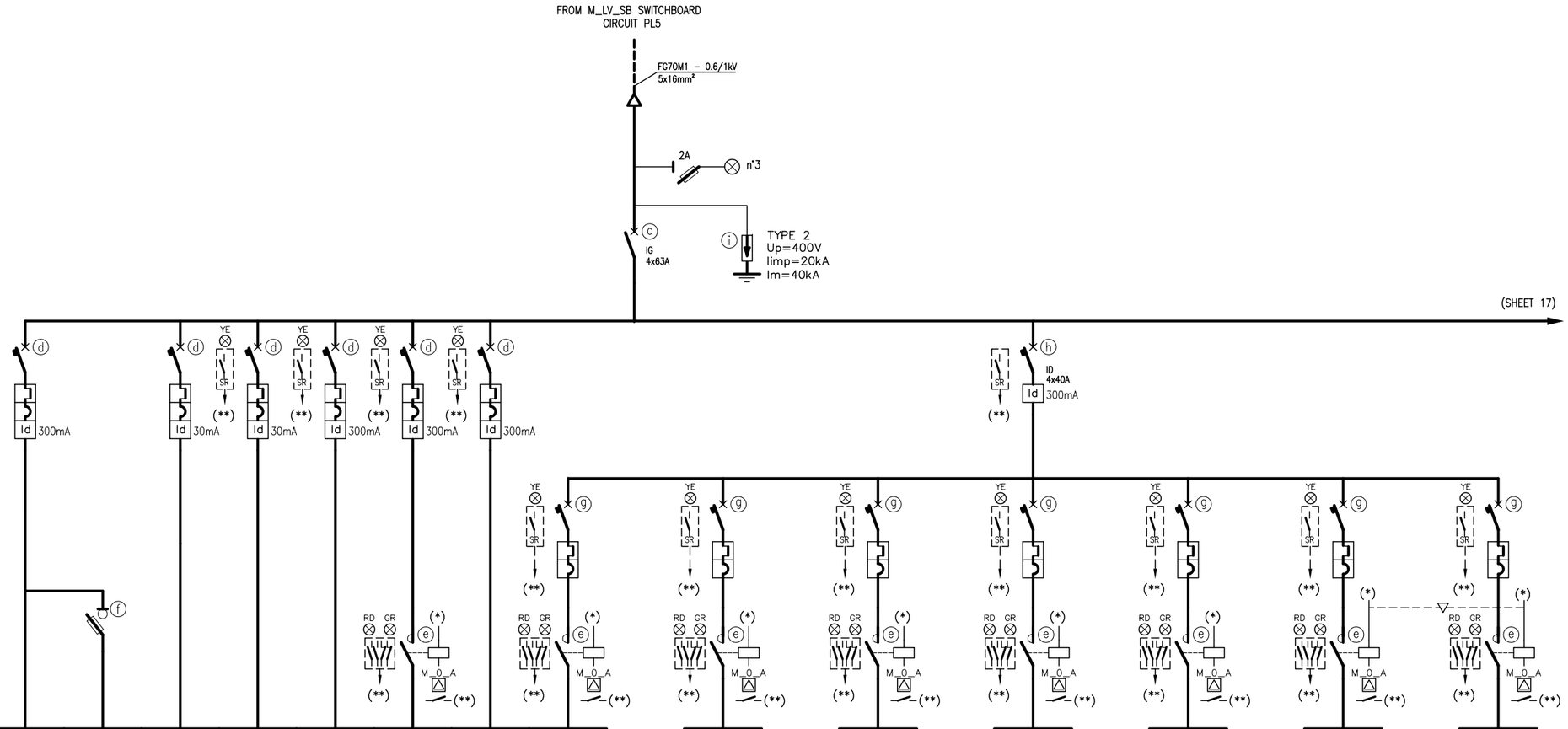
Icn=>10kA

PANEL STRUCTURE

METAL DISTRIBUTION BOARD

MINIMUM PROTECTION LEVEL

IP55 (IP20 TO OPEN PANEL)



1	LS1	LS1SEC	PL1	PL2	PL3	PL4	PL5	PL6	PL7	PL8	PL9	PL10	PL11	PL12
2	0.2		1	1.3	0.3	4kW	0.1kW	0.2kW	0.2kW	0.3kW	0.1kW	0.1kW	0.3kW	0.3kW
3	0.9		1.5	5.7	1.3	8.5	0.5	1.2	1.2	3	0.6	0.6	3	3
4	2x10	2x20	4x16	2x16	2x16	3x25	2x10	2x10 CURVA D	2x10 CURVA D	2x10 CURVA D	2x10	2x10	2x10 CURVA D	2x10 CURVA D
5						3x12-AC3		3x9-AC3	3x9-AC3	3x9-AC3	3x9-AC3	3x9-AC3	3x9-AC3	3x9-AC3
6						8÷12								
7		2A-gG												
8	3x2.5	2x2.5	5x4	3x2.5	3x2.5	4x2.5	3x2.5	3x2.5	3x2.5	3x2.5	3x2.5	3x2.5	3x2.5	3x2.5
9	FG70M1 0.6/1kV	FG70M1 0.6/1kV	FG70M1 0.6/1kV	FG70M1 0.6/1kV	FG70M1 0.6/1kV	FG70M1 0.6/1kV	FG70M1 0.6/1kV	FG70M1 0.6/1kV	FG70M1 0.6/1kV	FG70M1 0.6/1kV	FG70M1 0.6/1kV	FG70M1 0.6/1kV	FG70M1 0.6/1kV	FG70M1 0.6/1kV
10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
11	LIGHTING	EMERGENCY LIGHTING	POWER SOCKETS LINE	HEATING CABLE	REGULATION/ ALARM PANEL	DOMESTIC WATER PUMPING GROUP	HOT DOMESTIC WATER TREATMENT	WATER SOFTENER SYSTEM 1	WATER SOFTENER SYSTEM 2	HOT DOMESTIC WATER STORAGE TANK PUMP	FLOCCULANT POOL WATER TREATMENT	ELECTRONIC POOL CONTROL SYSTEM	HOT RECIRCULATION PUMP N.1	HOT RECIRCULATION PUMP N.2
12						(***)								

Annotations

(*) FROM BUILDING MANEGEMENT SYSTEM

(**) TO BUILDING MANEGEMENT SYSTEM

(***) INVERTER INSTALLED ON DISTRIBUTION BOARD

Manens-Tifs INGEGNERIA

Title

EB_DW
WIRING DIAGRAM

Reference n.

-

Drawing n.

Te_201

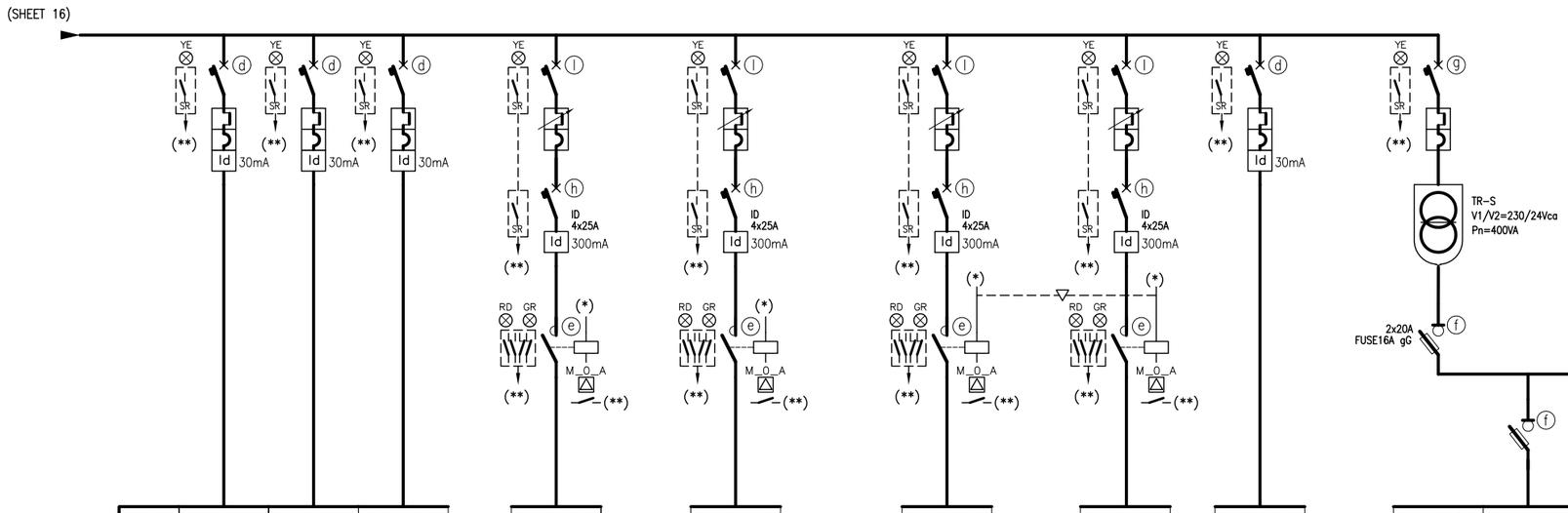
Rev.

0

Sheet n.

Pag.16 seg. 17

(SHEET 16)



1	PL13	PL14	PL15	PL16	PL17	PL18	PL19	PL20	TR-S	PL21	PL22	PL23
2	0.1	0.1	0.1	3.7kW	3.7kW	2.2kW	2.2kW					
3	0.5	0.5	0.5	8.2	8.2	5	5					
4	2x10	2x10	2x10	3x25	3x25	3x25	3x25	2x16	2x10	2x20	2x20	2x20
5				3x9-AC3	3x9-AC3	3x9-AC3	3x9-AC3					
6				6.3÷9	6.3÷9	4÷6.3	4÷6.3					
7										6A	10A	6A
8	3x2.5	3x2.5	3x2.5	4x2.5	4x2.5	4x2.5	4x2.5			2x1x1.5	3x1x2.5	
9	FG70M1 0.6/1kV	FG70M1 0.6/1kV	FG70M1 0.6/1kV	FG70M1 0.6/1kV	FG70M1 0.6/1kV	FG70M1 0.6/1kV	FG70M1 0.6/1kV			FM9	FM9	
10	10	10	10	10	10	10	10					
11	ANTI-ALGAE POOL WATER TREATMENT	BIOCIDE DISINFECTANT POOL WATER TREATMENT	NEUTRALIZATION COLD SANITARY	POOL PUMPING GROUP N.1	POOL PUMPING GROUP N.2	COMPENSATION TANK POUMPING GROUP N.1	COMPENSATION TANK POUMPING GROUP N.2	RISERVA	TRASFORMATORE DI SICUREZZA 230/24Vca	AUSILIARI QUADRO ELETTRICO	SISTEMA DI REGOLAZIONE	RISERVA
12									230Vca	24Vca	UNITA' DDC A BORDO QUADRO	

Annotations

(*) FROM BUILDING MANEGEMENT SYSTEM

(**) TO BUILDING MANEGEMENT SYSTEM

Manens-Tifs INGEGNERIA

Title

EB_DW

WIRING DIAGRAM

Reference n.

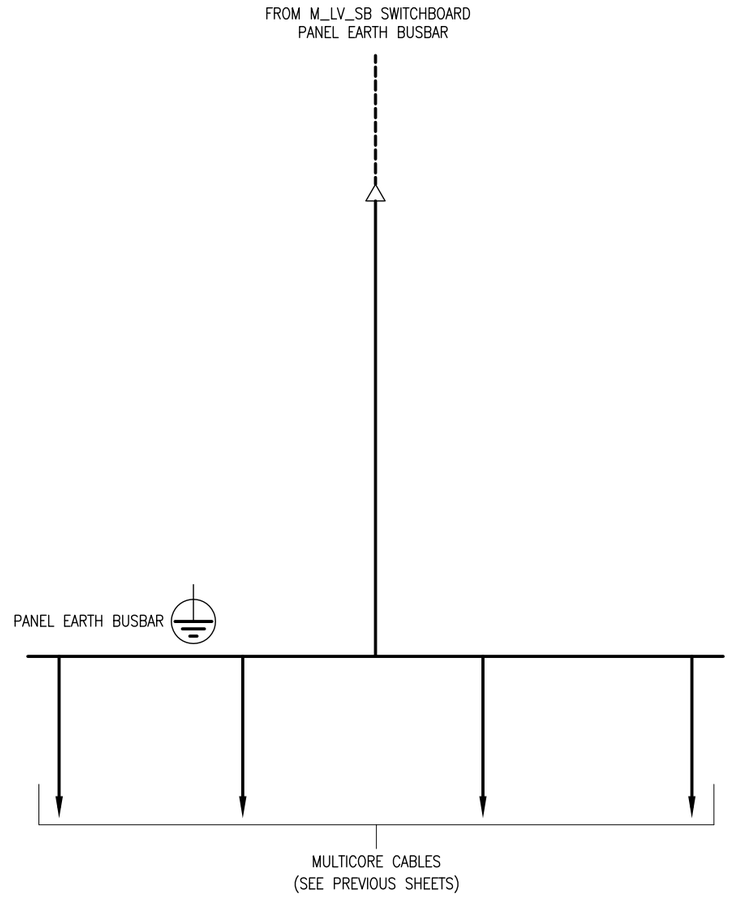
-

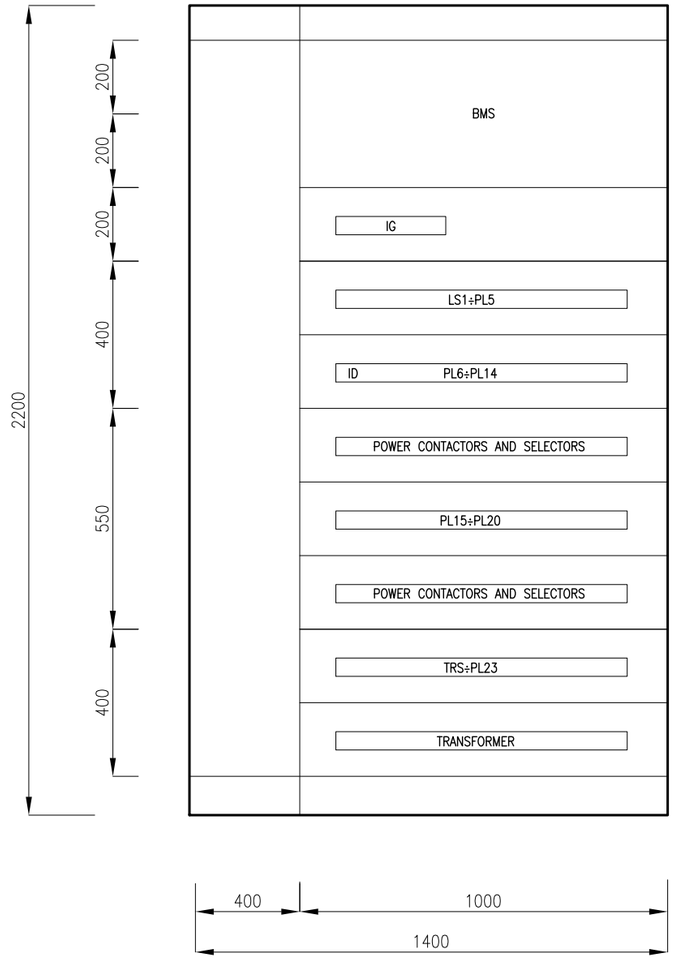
Drawing n.

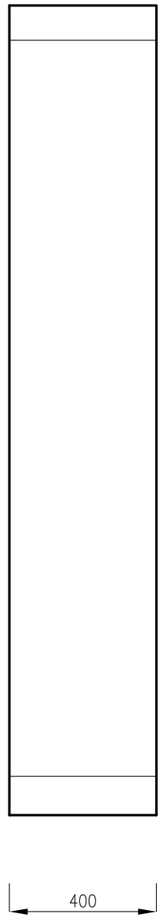
Te_201

Rev. **0**

Sheet n. Pag.17 seg. 18







Annotations	Manens-Tifs INGEGNERIA	Title EB_DW EARTH CONNECTION LAYOUT AND FRONTAL LAYOUT	Reference n. -	Drawing n. **Te_201** Rev. **0** / Sheet n. Pag.18 seg.19

TABLE DESCRIPTION OF PANEL

1	USER INITIALS	
2	MAXIMUM ABSORBED POWER	kVA
3	MAXIMUM ABSORBED CURRENT	A
4	N.poles–I nom.–ADJUSTMENT SWITCH	A
5	I nominal CONTACTOR	A
6	HEAT RELAY ADJUSTMENT	A
7	I nominal FUSE	A
8	LINE FORMATION	mm²
9	CABLE TYPE	
10	LINE LENGTH	m
11	DESTINATION	
12	NOTE	

PANEL'S MAIN CHARACTERISTICS

NAME ON PANEL

AIR HANDLING UNIT 1–6 DISTRIBUTION BOARD

INITIALS

EB_AUH/1–6

NOMINAL VOLTAGE

Up= 230/400V

FREQUENCY

f=50Hz

SIMULTANEOUS MAXIMUM POWER AND CURRENT

TOTAL P~7.5kVA I~10.9A (Kc=0.9)

NOMINAL INTERRUPTION POWER ON MAXIMUM LIMIT DERIVED SWITCHES (IEC 23_3 E IEC 17_5)

Icn=>10kA

PANEL STRUCTURE

METAL DISTRIBUTION BOARD

MINIMUM PROTECTION LEVEL

IP55 (IP20 TO OPEN PANEL)

Annotations

Manens-Tifs INGEGNERIA

Title

MAIN CHARACTERISTICS
EB_AUH/1-6

Reference n.

-

Drawing n.

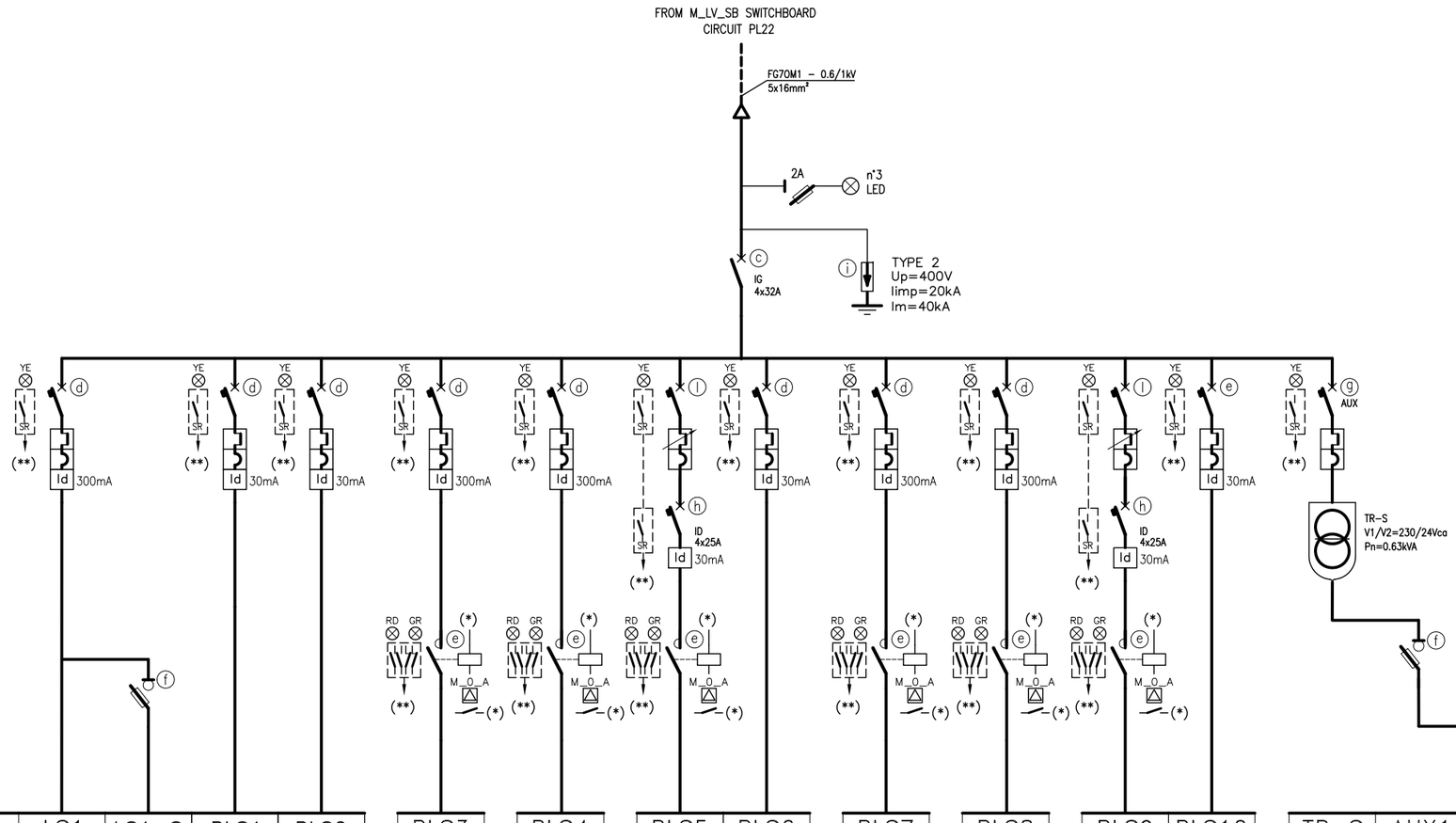
Te_201

Rev.

0

Sheet n.

Pag.19 seg.20



1	LS1	LS1–S	PLS1	PLS2	PLS3	PLS4	PLS5	PLS6	PLS7	PLS8	PLS9	PLS10	TR–S	AUX1	PLS11	PLS12	PLS13
2	0.1		0.3	1.0	3kW	1.5kW	0.09kW		0.75kW	0.75kW	0.12kW		0.63			0.3	
3	0.5		1.3	1.5	6.6	3.5	0.33		2	2	0.42		2.8			12.5	
4	1x10+N	1x20+N	1x16+N	4x16	4x16	4x16	3x25	1x16+N	4x16	4x16	3x25	1x16+N	1x25+N	1x40+N	1x20+N	1x20+N	1x20+N
5					4x17–AC3	4x17–AC3	3x12–AC3		4x17–AC3	4x17–AC3	3x12–AC3						
6							0.25÷0.4				0.4÷0.63						
7		2A–gG												25A–gG	6A–gG	16A–gG	6A–gG
8	3x2.5	2x2.5	3x4	5x4	5x4	5x4	4x2.5		5x4	5x4	4x2.5				2x1x2.5	3x1x4	
9	FG70M1 0.6/1kV	FG70M1 0.6/1kV	FG70M1 0.6/1kV	FG70M1 0.6/1kV	FG70HM1 0.6/1kV	FG70HM1 0.6/1kV	FG70M1 0.6/1kV		FG70HM1 0.6/1kV	FG70HM1 0.6/1kV	FG70M1 0.6/1kV				H07Z1–K 0.45/0.75kV	H07Z1–K 0.45/0.75kV	
10	10	10	10	10	10	30	10		15	30	15				5	5	
11	LIGHTING SYSTEM	EMERGENCY LIGHTING	SERVICE SOCKET OUTLET	INDUSTRIAL LOAD POWER	SUPPLY FAN SECTION AHU1	RETURN FAN SECTION AHU1	ROTARY HIGROSCOPIC HEAT AHU1	RESERVE	SUPPLY FAN SECTION AHU6	RETURN FAN SECTION AHU6	FUN AROUND COIL HEAT EXCHANGE	RESERVE		AUXILIARY SWITCHBOARD	AUXILIARY SWITCHBOARD	BUILDING MANAGEMENT SYSTEM	RESERVE
12					WITH INVERTER	WITH INVERTER			WITH INVERTER	WITH INVERTER							

Annotations

(*) FROM BUILDING MANEGEMENT SYSTEM

(**) TO BUILDING MANEGEMENT SYSTEM

Manens-Tifs INGEGNERIA

Title

EB_AUH/1-6
WIRING DIAGRAM

Reference n.

-

Drawing n.

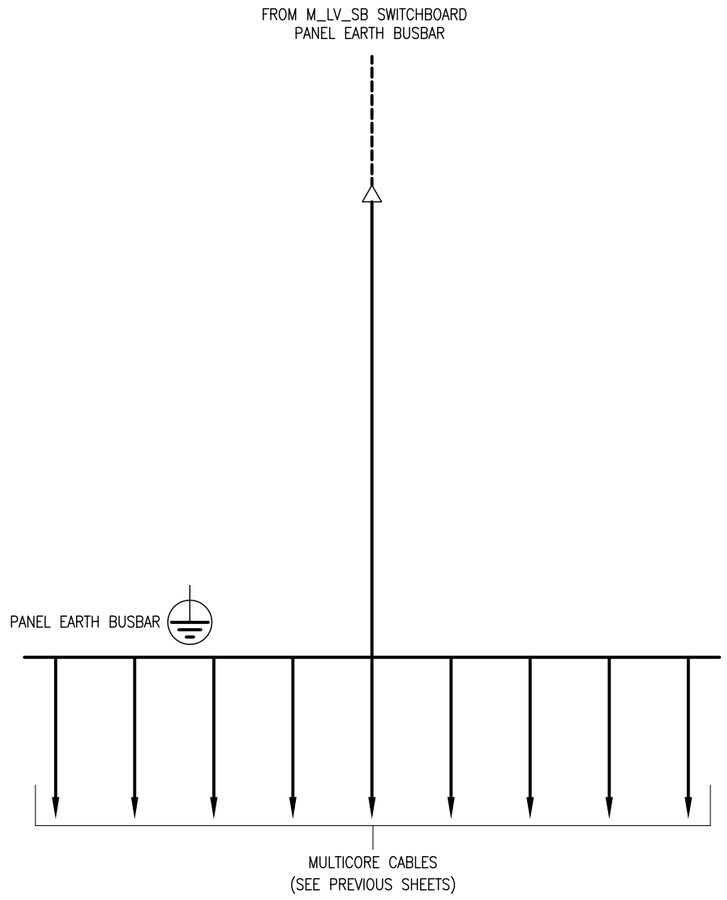
Te_201

Rev.

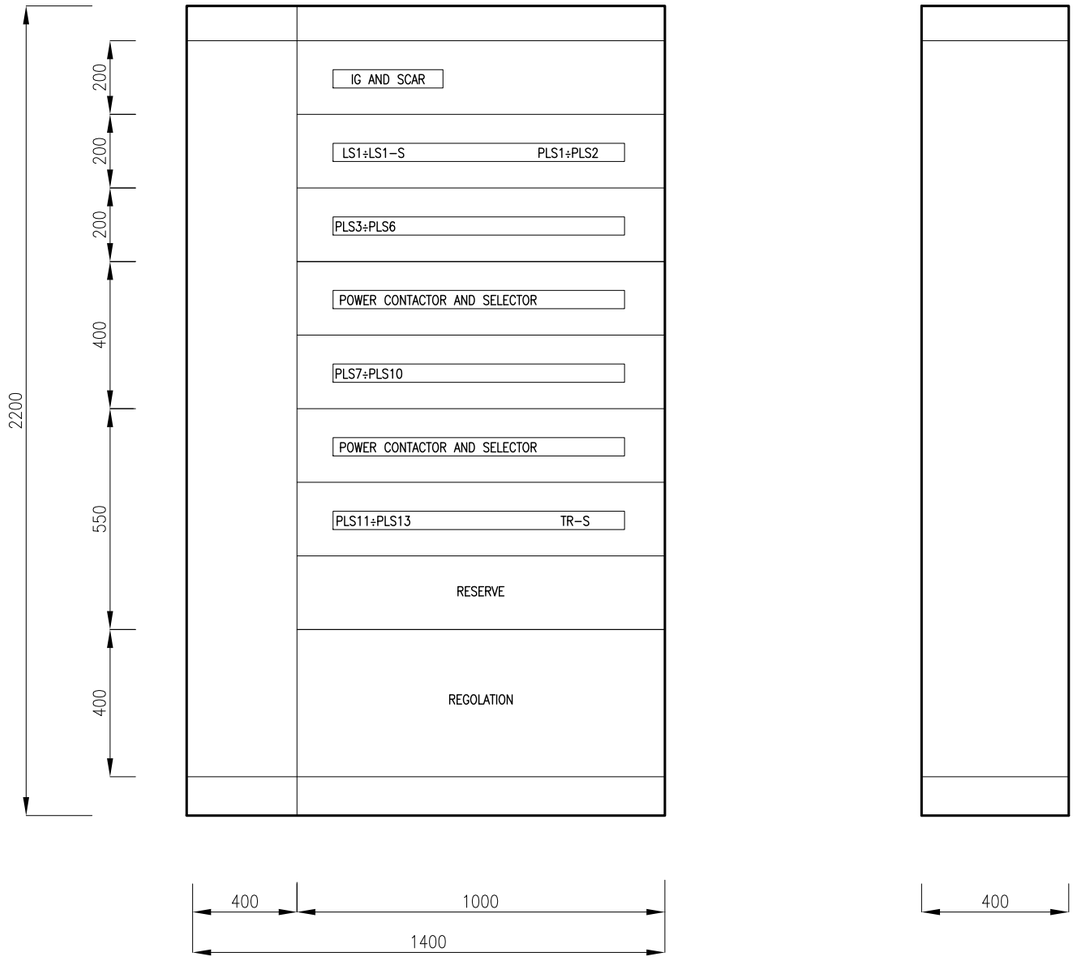
0

Sheet n.

Pag.20 seg. 21



Annotations	Manens-Tifs INGEGNERIA	Title EB_AUH/1-6 EARTH CONNECTION LAYOUT	Reference n. -	Drawing n. **Te_201**	
				Rev. **0**	Sheet n. Pag.21 seg. 22



Annotations	Manens-Tifs INGEGNERIA	Title EB_AUH/1-6 FRONTAL LAYOUT	Reference n. -	Drawing n. Te_201 Rev. 0 · Sheet n. Pag.22 seg. 23

TABLE DESCRIPTION OF PANEL

1	USER INITIALS	
2	MAXIMUM ABSORBED POWER	kVA
3	MAXIMUM ABSORBED CURRENT	A
4	N.poles–I nom.–ADJUSTMENT SWITCH	A
5	I nominal CONTACTOR	A
6	HEAT RELAY ADJUSTMENT	A
7	I nominal FUSE	A
8	LINE FORMATION	mm²
9	CABLE TYPE	
10	LINE LENGTH	m
11	DESTINATION	
12	NOTE	

PANEL'S MAIN CHARACTERISTICS

NAME ON PANEL

AIR HANDLING UNIT 2 DISTRIBUTION BOARD

INITIALS

EB_AUH/2

NOMINAL VOLTAGE

Up= 230/400V

FREQUENCY

f=50Hz

SIMULTANEOUS MAXIMUM POWER AND CURRENT

TOTAL P~6.6kVA I~9.6A (Kc=0.9)

NOMINAL INTERRUPTION POWER ON MAXIMUM LIMIT DERIVED SWITCHES (IEC 23_3 E IEC 17_5)

Icn=>10kA

PANEL STRUCTURE

METAL DISTRIBUTION BOARD

MINIMUM PROTECTION LEVEL

IP55 (IP20 TO OPEN PANEL)

Annotations

Manens-Tifs INGEGNERIA

Title

MAIN CHARACTERISTICS
EB_AUH/2

Reference n.

-

Drawing n.

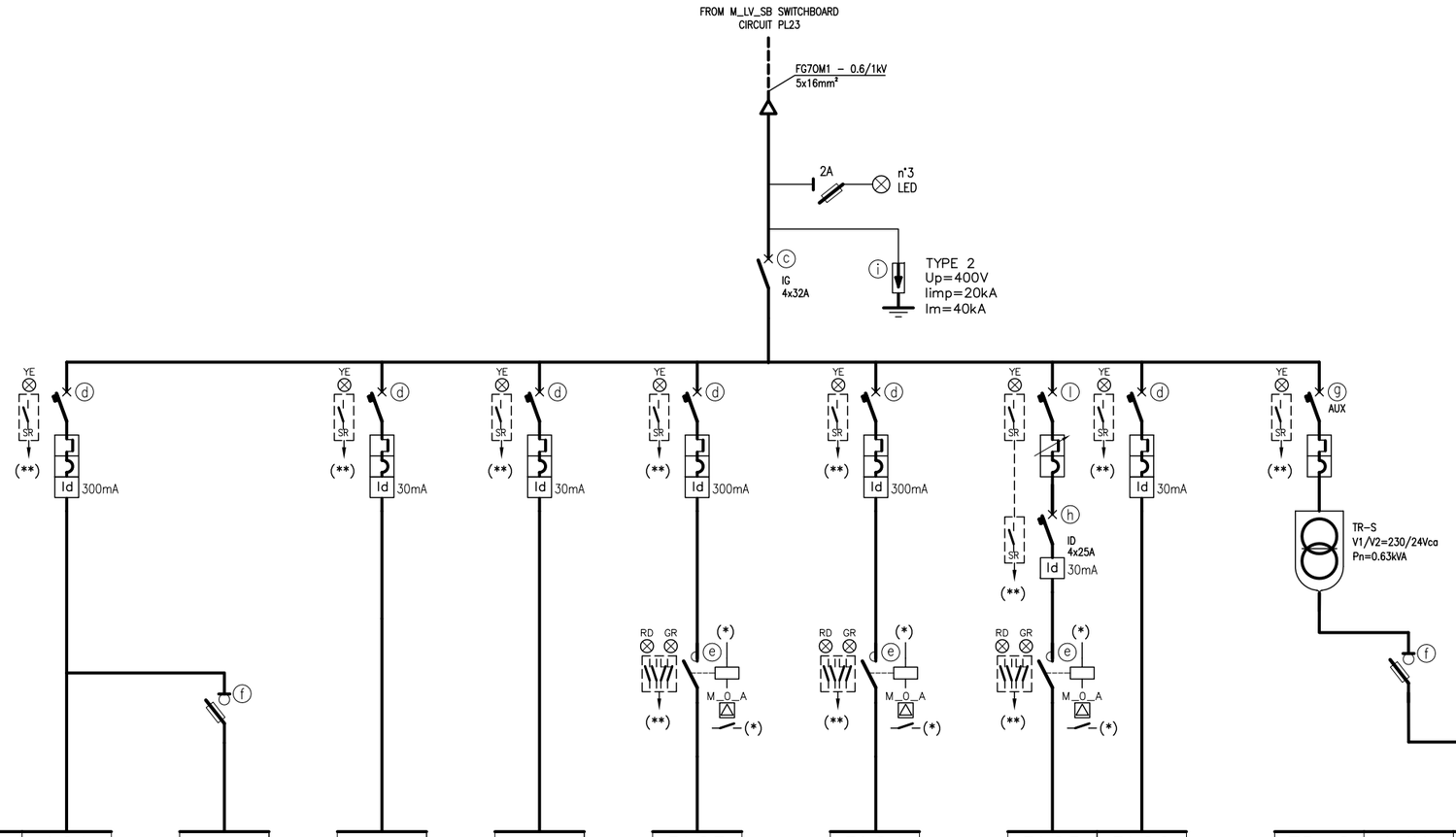
Te_201

Rev.

0

Sheet n.

Pag.23 seg. 24



1	LS1	LS1–S
2	0.1	
3	0.5	
4	1x10+N	1x20+N
5		
6		
7		2A–gG
8	3x2.5	2x2.5
9	FG70M1 0.6/1kV	FG70M1 0.6/1kV
10	10	10
11	LIGHTING SYSTEM	EMERGENCY LIGHTING
12		

PLS1	PLS2	PLS3	PLS4	PLS5	PLS6
0.3	1.0	3.7kW	1.5kW	0.1kW	
1.3	1.5	8.2	3.5	0,42	
1x16+N	4x16	4x16	4x16	3x25	1x16+N
		4x17–AC3	4x17–AC3	3x12–AC3	
				0.4÷0.63	
3x4	5x4	5x6	4x4	4x2.5	
FG70M1 0.6/1kV	FG70M1 0.6/1kV	FG70HM1 0.6/1kV	FG70HM1 0.6/1kV	FG70M1 0.6/1kV	
10	10	25	30	30	
SERVICE SOCKET OUTLET	INDUSTRIAL LOAD POWER	SUPPLY FAN SECTION AHU2	RETURN FAN SECTION AHU2	ROTARY HIGROSCOPIC HEAT AHU2	RESERVE
		WITH INVERTER	WITH INVERTER		

TR–S	AUX1	PLS7	PLS8	PLS9
0.63			0.3	
2.8			12.5	
1x25+N	1x40+N	1x20+N	1x20+N	1x20+N
	25A–gG	6A–gG	16A–gG	6A–gG
		2x1x2.5	3x1x4	
		HO7Z1–K 0.45/0.75kV	HO7Z1–K 0.45/0.75kV	
		5	5	
	AUXILIARY SWITCHBOARD	AUXILIARY SWITCHBOARD	BUILDING MANAGEMENT SYSTEM	RESERVE

Annotations

(*) FROM BUILDING MANEGEMENT SYSTEM

(**) TO BUILDING MANEGEMENT SYSTEM

Manens-Tifs INGEGNERIA

Title

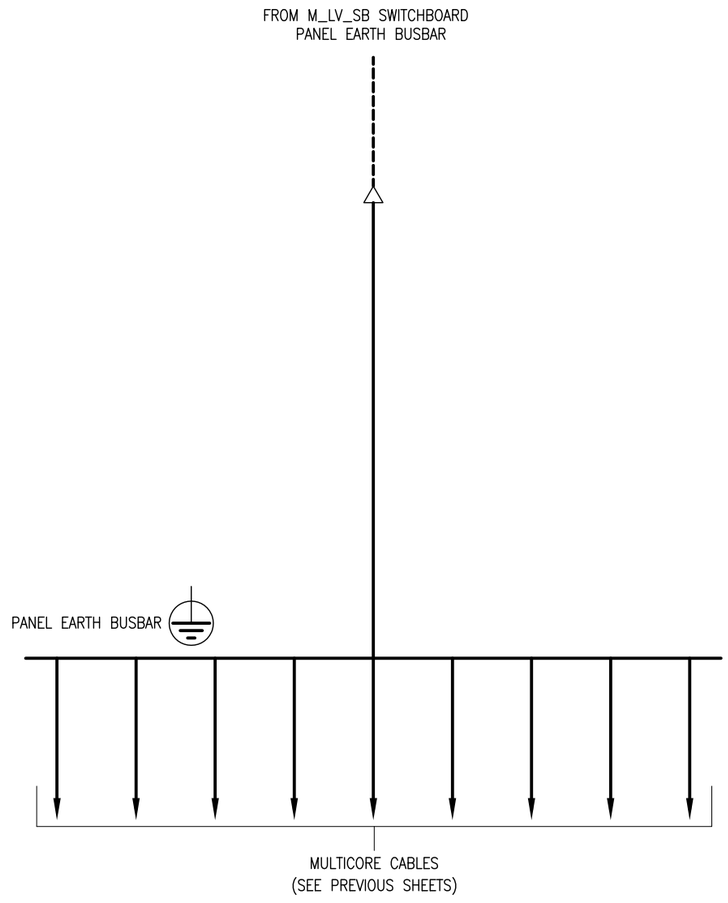
EB_AUH/2
WIRING DIAGRAM

Reference n. -

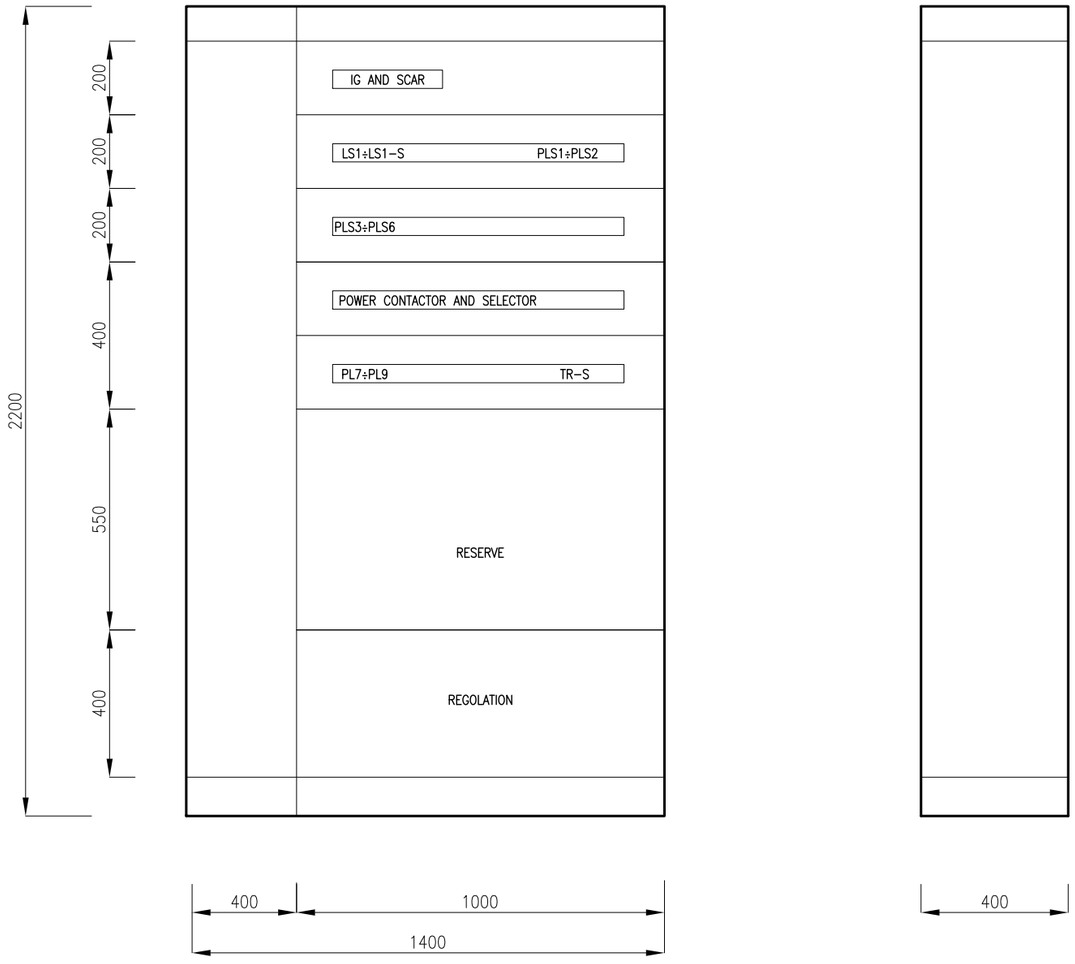
Drawing n. **Te_201**

Rev. **0**

Sheet n. Pag.24 seg. 25



Annotations	Manens-Tifs INGEGNERIA	Title EB_AUH/2 EARTH CONNECTION LAYOUT	Reference n. -	Drawing n. **Te_201** Rev. **0** · Sheet n. Pag.25 seg. 26



Annotations	Manens-Tifs INGEGNERIA	Title EB_AUH/2 FRONTAL LAYOUT	Reference n. -	Drawing n. **Te_201** Rev. **0** · Sheet n. Pag.26 seg. 27

TABLE DESCRIPTION OF PANEL

1	USER INITIALS	
2	MAXIMUM ABSORBED POWER	kVA
3	MAXIMUM ABSORBED CURRENT	A
4	N.poles–I nom.–ADJUSTMENT SWITCH	A
5	I nominal CONTACTOR	A
6	HEAT RELAY ADJUSTMENT	A
7	I nominal FUSE	A
8	LINE FORMATION	mm²
9	CABLE TYPE	
10	LINE LENGTH	m
11	DESTINATION	
12	NOTE	

PANEL'S MAIN CHARACTERISTICS

NAME ON PANEL

AIR HANDLING UNIT 3–5 DISTRIBUTION BOARD

INITIALS

EB_AUH/3–5

NOMINAL VOLTAGE

Up= 230/400V

FREQUENCY

f=50Hz

SIMULTANEOUS MAXIMUM POWER AND CURRENT

TOTAL P~7.8kVA I~11.2A (Kc=0.9)

NOMINAL INTERRUPTION POWER ON MAXIMUM LIMIT DERIVED SWITCHES (IEC 23_3 E IEC 17_5)

Icn=>10kA

PANEL STRUCTURE

METAL DISTRIBUTION BOARD

MINIMUM PROTECTION LEVEL

IP55 (IP20 TO OPEN PANEL)

Annotations

Manens-Tifs INGEGNERIA

Title

MAIN CHARACTERISTICS
EB_AUH/3-5

Reference n.

-

Drawing n.

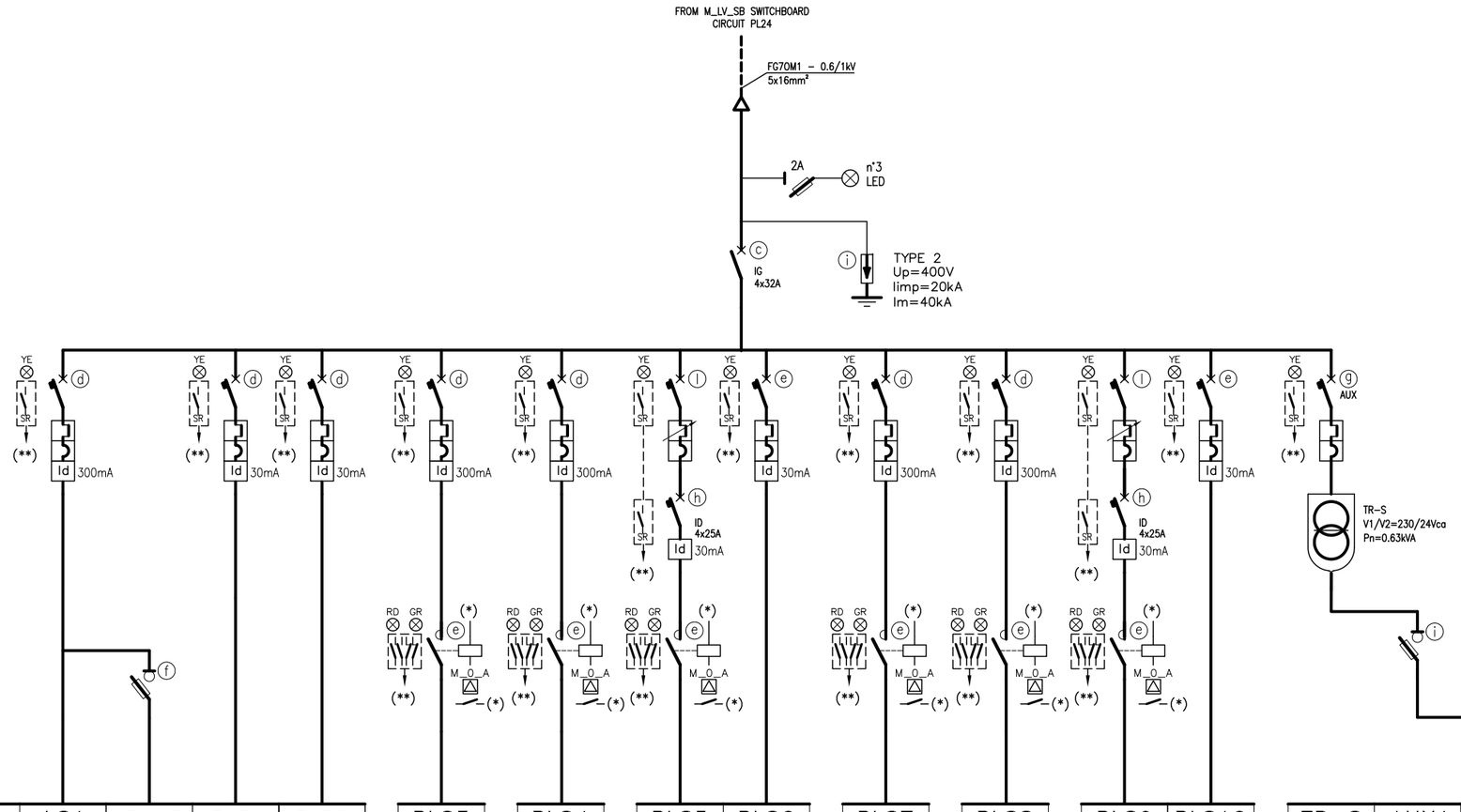
Te_201

Rev.

0

Sheet n.

Pag.27 seg. 28



1	LS1	LS1–S	PLS1	PLS2	PLS3	PLS4	PLS5	PLS6	PLS7	PLS8	PLS9	PLS10
2	0.1		0.3	1.0	1.5kW	0.75kW	0.06kW		2.5kW	1.5kW	0.25kW	
3	0.5		1.3	1.5	3.5	2	0.22		5.7	3.5	0.88	
4	1x10+N	1x20+N	1x16+N	4x16	4x16	4x16	3x25	1x16+N	4x16	4x16	3x25	1x16+N
5					4x17–AC3	4x17–AC3	3x12–AC3		4x17–AC3	4x17–AC3	3x12–AC3	
6							0.16÷0.25				0.63÷1	
7		2A–gG										
8	3x2.5	2x2.5	3x4	5x4	5x4	5x4	4x2.5		5x4	5x4	4x2.5	
9	FG70M1 0.6/1kV	FG70M1 0.6/1kV	FG70M1 0.6/1kV	FG70M1 0.6/1kV	FG7OHM1 0.6/1kV	FG7OHM1 0.6/1kV	FG70M1 0.6/1kV		FG7OHM1 0.6/1kV	FG7OHM1 0.6/1kV	FG70M1 0.6/1kV	
10	10	10	10	10	25	30	30		25	30	30	
11	LIGHTING SYSTEM	EMERGENCY LIGHTING	SERVICE SOCKET OUTLET	INDUSTRIAL LOAD POWER	SUPPLY FAN SECTION AHU3	RETURN FAN SECTION AHU3	ROTARY HIGROSCOPIC HEAT AHU3	RESERVE	SUPPLY FAN SECTION AHU5	RETURN FAN SECTION AHU5	ROTARY HIGROSCOPIC HEAT AHU5	RESERVE
12					WITH INVERTER	WITH INVERTER			WITH INVERTER	WITH INVERTER		

TR–S	AUX1	PLS11	PLS12	PLS13
0.63			0.3	
2.8			12.5	
1x25+N	1x40+N	1x20+N	1x20+N	1x20+N
	25A–gG	6A–gG	16A–gG	6A–gG
		2x1x2.5	3x1x4	
		H07Z1–K 0.45/0.75kV	H07Z1–K 0.45/0.75kV	
		5	5	
	AUXILIARY SWITCHBOARD	AUXILIARY SWITCHBOARD	BUILDING MANAGEMENT SYSTEM	RESERVE

Annotations

(*) FROM BUILDING MANEGEMENT SYSTEM

(**) TO BUILDING MANEGEMENT SYSTEM

Manens-Tifs INGEGNERIA

Title

EB_AUH/3-5

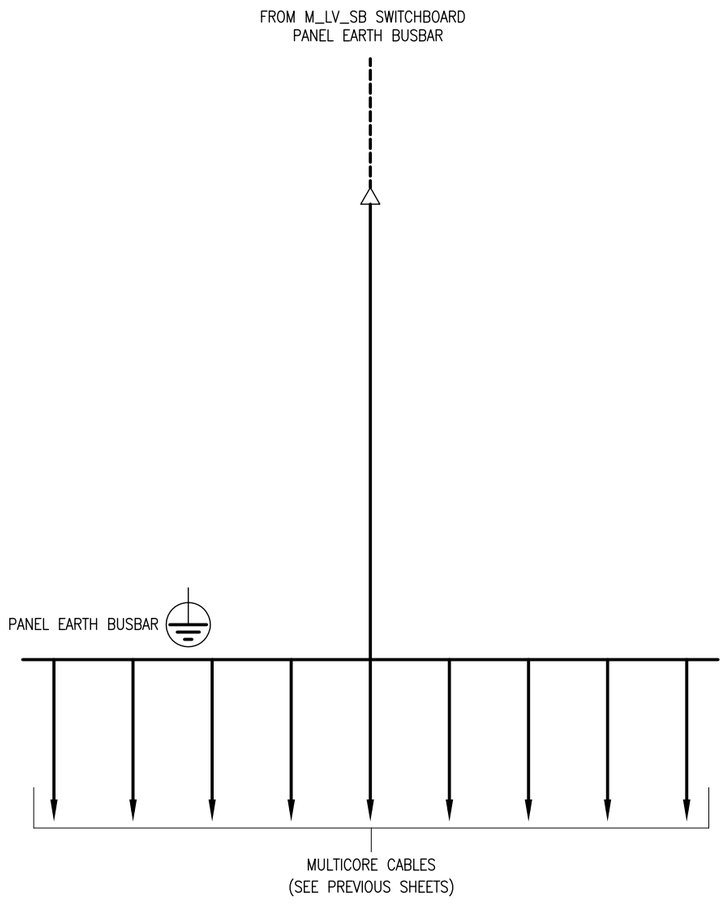
WIRING DIAGRAM

Reference n. -

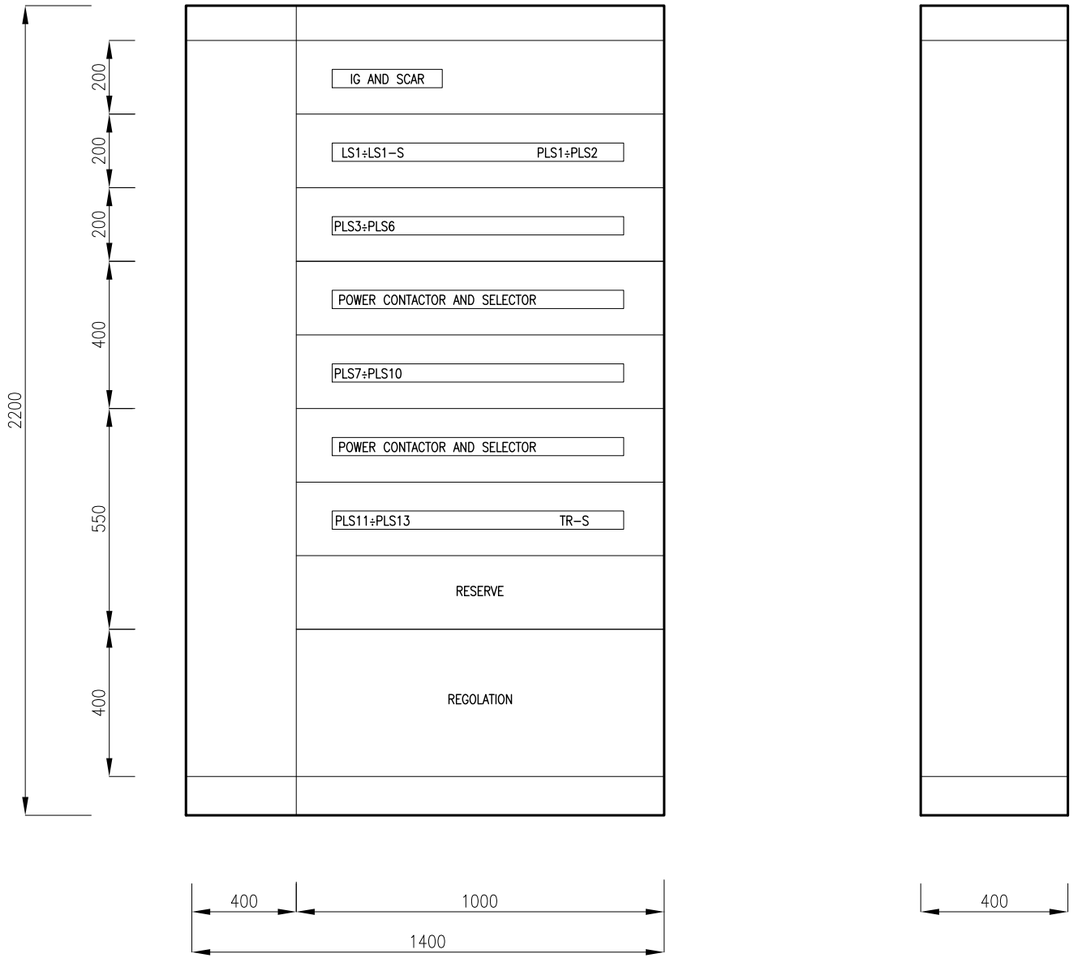
Drawing n. **Te_201**

Rev. **0**

Sheet n. Pag.28 seg. 29



Annotations	Manens-Tifs INGEGNERIA	Title EB_AUH/3-5 EARTH CONNECTION LAYOUT	Reference n. -	Drawing n. **Te_201**	
				Rev. **0**	Sheet n. Pag.29 seg. 30



Annotations		Title EB_AUH/3-5 FRONTAL LAYOUT	Reference n. -	Drawing n. **Te_201**
	Manens-Tifs INGEGNERIA			Rev. **0** / Sheet n. Pag.30 seg. 31

TABLE DESCRIPTION OF PANEL

1	USER INITIALS	
2	MAXIMUM ABSORBED POWER	kVA
3	MAXIMUM ABSORBED CURRENT	A
4	N.poles–I nom.–ADJUSTMENT SWITCH	A
5	I nominal CONTACTOR	A
6	HEAT RELAY ADJUSTMENT	A
7	I nominal FUSE	A
8	LINE FORMATION	mm²
9	CABLE TYPE	
10	LINE LENGTH	m
11	DESTINATION	
12	NOTE	

PANEL'S MAIN CHARACTERISTICS

NAME ON PANEL

AIR HANDLING UNIT 4 DISTRIBUTION BOARD

INITIALS

EB_AUH/4

NOMINAL VOLTAGE

Up= 230/400V

FREQUENCY

f=50Hz

SIMULTANEOUS MAXIMUM POWER AND CURRENT

TOTAL P~4.6kVA I~6.7A (Kc=0.9)

NOMINAL INTERRUPTION POWER ON MAXIMUM LIMIT DERIVED SWITCHES (IEC 23_3 E IEC 17_5)

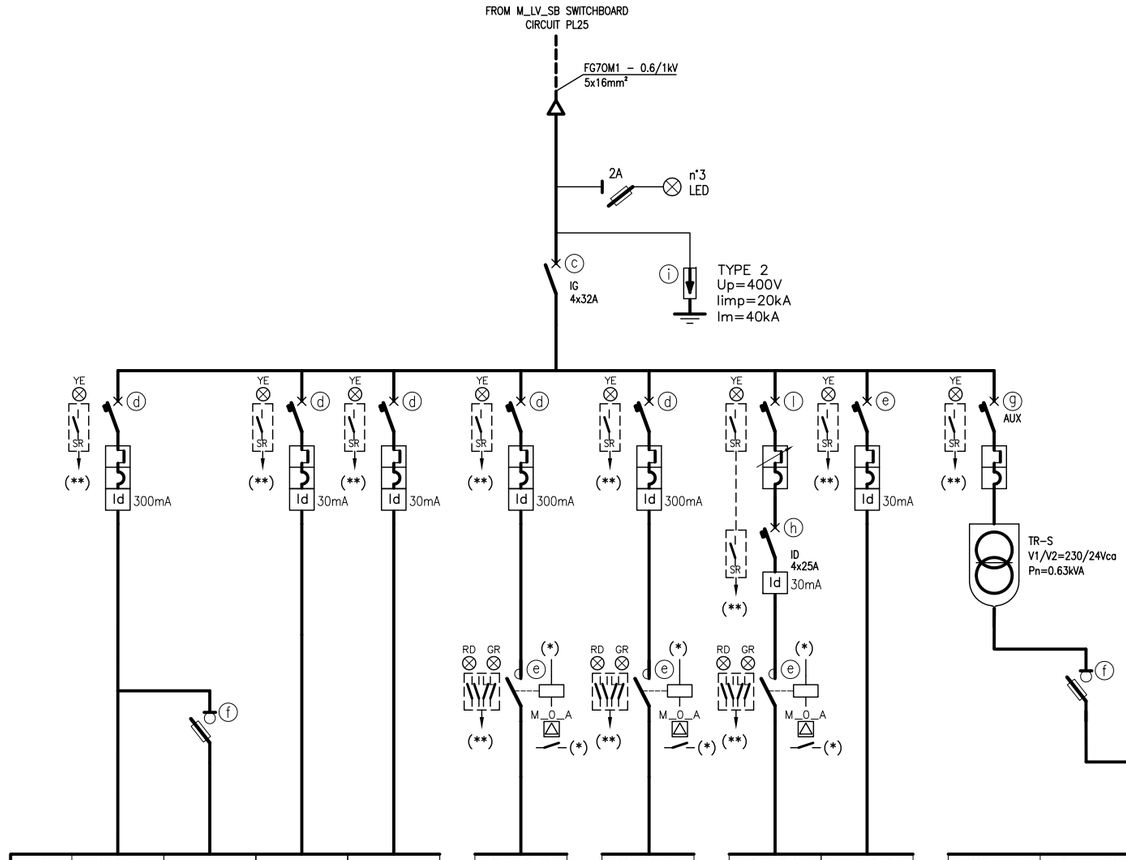
Icn=>10kA

PANEL STRUCTURE

METAL DISTRIBUTION BOARD

MINIMUM PROTECTION LEVEL

IP55 (IP20 TO OPEN PANEL)



1	LS1	LS1–S	PLS1	PLS2	PLS3	PLS4	PLS5	PLS6	TR–S	AUX1	PLS11	PLS12	PLS13
2	0.1		0.3	1.0	2.2kW	0.75kW	0.06kW		0.63			0.3	
3	0.5		1.3	1.5	5	2	0.22		2.8			12.5	
4	1x10+N	1x20+N	1x16+N	4x16	4x16	4x16	3x25	1x16+N	1x25+N	1x40+N	1x20+N	1x20+N	1x20+N
5					4x17–AC3	4x17–AC3	3x12–AC3						
6							0.16÷0.25						
7		2A–gG								25A–gG	6A–gG	16A–gG	6A–gG
8	3x2.5	2x2.5	3x4	5x4	5x4	5x4	4x2.5				2x1x2.5	3x1x4	
9	FG70M1 0.6/1kV	FG70M1 0.6/1kV	FG70M1 0.6/1kV	FG70M1 0.6/1kV	FG70HM1 0.6/1kV	FG70HM1 0.6/1kV	FG70M1 0.6/1kV				H07Z1–K 0.45/0.75kV	H07Z1–K 0.45/0.75kV	
10	10	10	10	10	25	30	30				5	5	
11	LIGHTING SYSTEM	EMERGENCY LIGHTING	SERVICE SOCKET OUTLET	INDUSTRIAL LOAD POWER	SUPPLY FAN SECTION AHU4	RETURN FAN SECTION AHU4	ROTARY HIGROSCOPIC HEAT AHU3	RESERVE		AUXILIARY SWITCHBOARD	AUXILIARY SWITCHBOARD	BUILDING MANAGEMENT SYSTEM	RESERVE
12					WITH INVERTER	WITH INVERTER							

Annotations

(*) FROM BUILDING MANEGEMENT SYSTEM

(**) TO BUILDING MANEGEMENT SYSTEM

Manens-Tifs INGEGNERIA

Title

EB_AUH/4

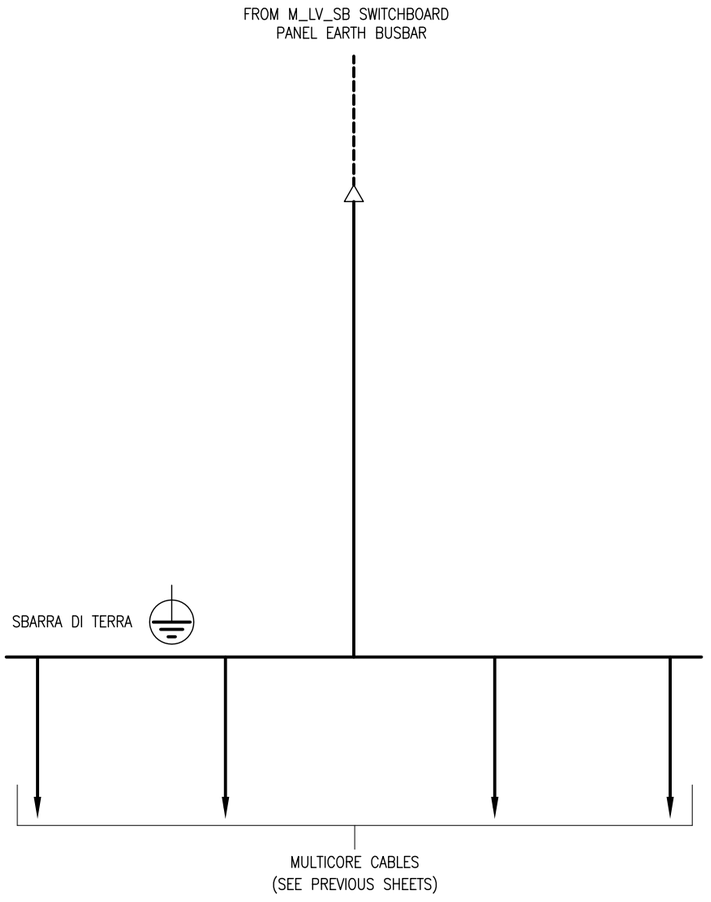
WIRING DIAGRAM

Reference n. -

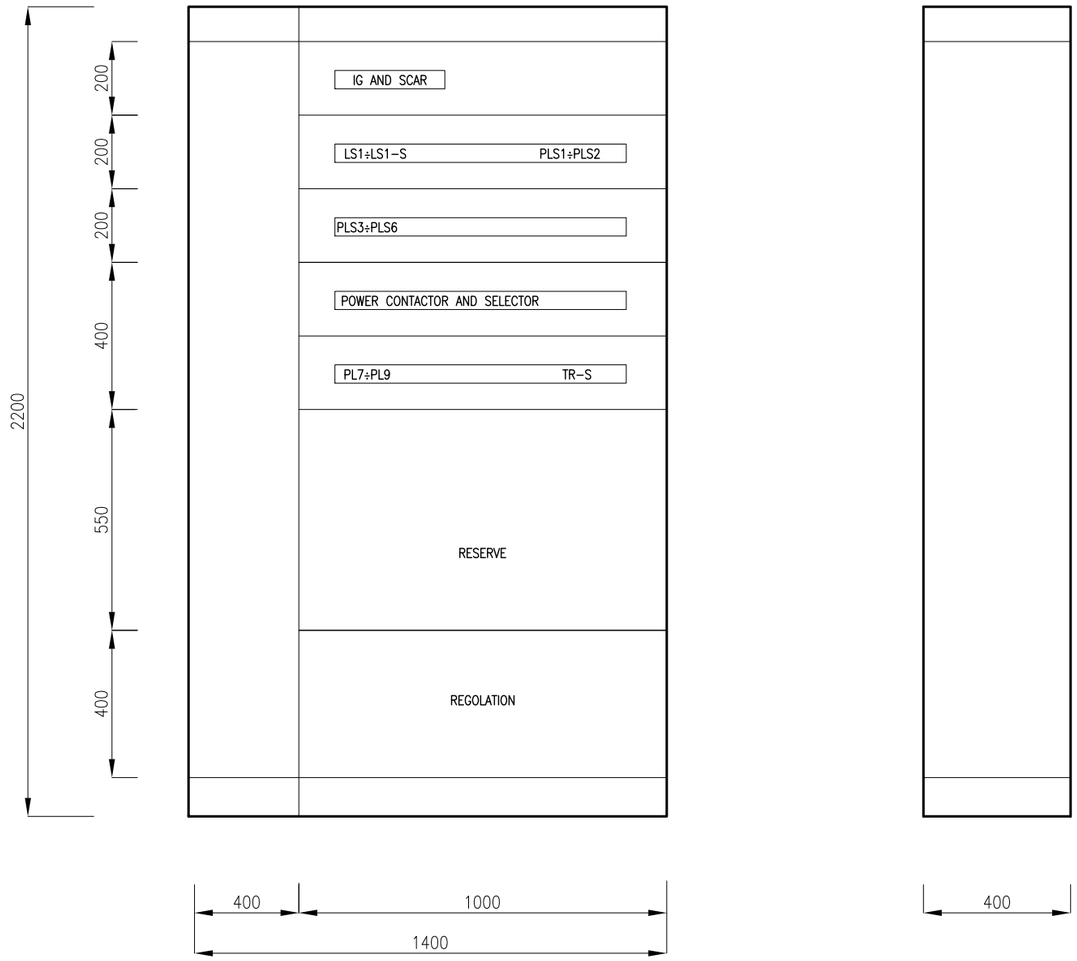
Drawing n. **Te_201**

Rev. **0**

Sheet n. Pag.32 seg. 33



Annotations		Title	Reference n.	Drawing n.
	Manens-Tifs INGEGNERIA	EB_AUH/4 EARTH CONNECTION LAYOUT	-	Te_201
			Rev. 0	Sheet n. Pag.33 seg. 34



Annotations	Manens-Tifs INGEGNERIA	Title EB_AUH/4 FRONTAL LAYOUT	Reference n. -	Drawing n. **Te_201**	
				Rev. **0**	Sheet n. Pag.34