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**EASYLAB - Commissioning protocol**

Date of creation	7/25/2024
Created via EasyConnect	Version 11.0.0.0
Created by user-ID	2281
<b>General device information</b>	
Device functionality	Room exhaust controller within exhaust air controlled system
Device name	Wywiew / Pom. Z 2 18 / DE17540230160
Device-ID	0
Device status	Original equipment
Serial Number	120227
Total operating time	2 days
<b>Basic device</b>	
Hardware-name	TCU3
Hardware-version	3.0
Software-name	EASYLAB TCU3
Software-version	9.0
<b>Device expansions</b>	
Expansion slot 1	not used
Connector socket X2	not used
Connector socket X3	not used
Terminal 3	not used
Expansion module EM-AUTOZERO	not present
Expansion module EM-TRF-USV	not present

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## Configuration settings

### Basic technical data

C-value	6.4 based on l/s
Technical Vmin	50 m³/h
Technical Vnominal	353 m³/h
Volume flow registration	
Transmitter typ	internal volume flow transmitter on AI1
Characteristic for AI1	0.50 ... 4.50 V equals 0 ... 300 Pa
Signal smoothing	50

### Volume flow control

Volume flow split-up if several room controllers	automatic
Fraction in Standard mode at manual split-up	50 %
Fraction in Low mode at manual split-up	50 %
Fraction in High mode at manual split-up	50 %
Control settings	
Control tolerance - relative	4.0 %
Control tolerance - absolute	14 m³/h
Preset the limit to reach the maximum actuating value	automatic
Open damper - minimum actuating variable	0.10
Open damper - maximum actuating variable	5.00
Close damper - minimum actuating variable	0.15
Close damper - maximum actuating variable	2.00

## Configuration settings

### Alarm settings

Category 1 (UPS Battery operation)	activated
Category 2 (control functions)	
Monitoring - Volume flow (labour mode)	activated
Volume flow monitoring (Low mode)	not configured
Alarm delay time	12 s
Category 3 (Hardware failure)	activated

### UPS function

normal controller action

### Analogue outputs

Function AO1	Current volume flow
Characteristic	2.00 ... 10.00 V equals 0 ... 353 m³/h
Function AO2	Total exhaust air
Characteristic	2.00 ... 10.00 V equals 0 ... 0 m³/h
Function AO3	Damper position
Characteristic	2.00 ... 10.00 V equals 0 ... 100 %
Function AO4	Actuator
Characteristic	2.00 ... 9.00 V equals 0 ... 100 %

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#### Configuration settings - Equipment components

Integration of switchable constant volume flows

not configured

Integration of switchable variable volume flows

not configured

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#### Configuration settings - Equipment components

Room mode dependent relay switching

not configured

Room-Management-Function (RMF)

not configured

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## EASYLAB - Commissioning protocol

Date of creation	7/25/2024
Created via EasyConnect	Version 11.0.0.0
Created by user-ID	2281

### General device information

Device functionality	Fume cupboard controller
Device name	Dygestorium / Pom. Z 2 18 / DE17540230150

Device-ID	0
Device status	Original equipment
Serial Number	119497
Total operating time	2 days
Period since last service	2 days

### Basic device

Hardware-name	TCU3
Hardware-version	3.0
Software-name	EASYLAB TCU3
Software-version	9.0

### Device expansions

Expansion slot 1	not used
Connector socket X2	
Hardware-name	BE-SEG-02
Hardware-version	2.0
Software-name	EASYLAB BE-SEG-02
Software-version	1.1
Connector socket X3	not used
Terminal 3	not used
Expansion module EM-AUTOZERO	not present
Expansion module EM-TRF-USV	not present

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## Configuration settings

### Basic technical data

C-value	15.0 based on l/s
Technical Vmin	108 m³/h
Technical Vnominal	774 m³/h
Volume flow registration	
Transmitter typ	internal volume flow transmitter on AI1
Characteristic for AI1	0.47 ... 4.47 V equals 0 ... 300 Pa
Signal smoothing	50

### Volume flow control

Control concept	FH-VS
Volume flow set values	
Standard mode Vmin	202 m³/h
Standard mode Vmax	652 m³/h
High mode	652 m³/h
Low mode	202 m³/h
Consider diversity control	activated

### Face velocity

Setpoint	0.50 m/s
Tolerance range (+/-)	0.10 m/s
Characteristic for AI5	2.00 ... 10.00 V equals 0.00 ... 1.00 m/s
Signal smoothing	50
Time target - Setpoint adaption open sash	3 s
Time target - Setpoint adaption close sash	10 s

### Control settings

Control tolerance - relative	4.0 %
Control tolerance - absolute	14 m³/h
Preset the limit to reach the maximum actuating value	automatic
Open damper - minimum actuating variable	0.10
Open damper - maximum actuating variable	5.00
Close damper - minimum actuating variable	0.15
Close damper - maximum actuating variable	2.00

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## Configuration settings

### Alarm settings

Optical alarm (BE)	continuous
Acoustic alarm (BE)	limited to 15 s
Acoustic alarm (BE) - Sash monitoring	off
Optical alarm (BE) - Sash monitoring	not configured
Category 1 (Smoke extraction / UPS Battery operation)	activated
Category 2 (control functions)	
Monitoring - Volume flow (labour mode)	activated
Volume flow monitoring (Low mode)	not configured
Alarm delay time	15 s
Monitoring - Face velocity (labour mode)	not configured
Category 3 (Hardware failure)	activated

### Service interval

Specified service period	365 days
Signaling at end of service interval	not configured

### UPS function

normal controller action

### Control panel

Key - High mode	unlimited
Key - Low mode	activated
Key - Shut off mode	activated
Key - Fume cupboard light	activated
Switch off when activating Low mode, Shut off mode	not configured
Key - Hand mode	not configured
ECO-Display (BE-SEG-02)	not configured
Display options	
Display language	English
Display volume flow setpoint and current value	activated
Volume flow unit	m <sup>3</sup> /h
Display current face velocity value	not configured
Display actual volume flow (BE-SEG-02)	not configured
Display actual face velocity (BE-SEG-02)	not configured

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## Configuration settings

### Operation mode presets

Room operation mode presets

Modification of room operation mode

High mode is changed to Standard mode

Low mode is changed to Standard mode

Shut off mode is changed to Standard mode

Low mode is changed to Shut off mode

Standard mode is changed to Shut off mode

will be overtaken

not configured

not configured

not configured

not configured

not configured

### Analogue outputs

Function AO1

Characteristic

Function AO2

Characteristic

Function AO3

Characteristic

Function AO4

Characteristic

Current volume flow

2.00 ... 10.00 V equals 0 ... 774 m<sup>3</sup>/h

Total exhaust air

2.00 ... 10.00 V equals 0 ... 0 m<sup>3</sup>/h

Damper position

2.00 ... 10.00 V equals 0 ... 100 %

Actuator

2.00 ... 9.00 V equals 0 ... 100 %

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**Configuration settings - Equipment components**

Integration of switchable constant volume flows	not configured
Integration of switchable variable volume flows	not configured

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## Configuration settings - Equipment components

Alarm Sash monitoring EN 14175

Release - caused by

Direction of switch contact

Switching input DI1

Make contact = Activates function

Fume scrubber

not configured

Supportive flow technology

not configured

Automatic sash device (Third-party supplier)

not configured

Motion detector

not configured

Smoke extraction / Temperature alarm

not configured

Operation mode dependent relay switching

Switching caused by

Switching output DO4 and DO5

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## Function test

Test the volume flow measure point and zero point adjustment	not done
Test the volume flow alarm	OK
Test the volume flow setpoints	
Shut off mode	
Damper position	0 %
Volume flow setpoint	0 m³/h
Current volume flow	0 m³/h
Low mode	
Damper position	23 %
Volume flow setpoint	202 m³/h
Current volume flow	202 m³/h
High mode	
Damper position	57 %
Volume flow setpoint	652 m³/h
Current volume flow	616 m³/h
Standard mode Vmin	
Damper position	24 %
Volume flow setpoint	202 m³/h
Current volume flow	202 m³/h
Standard mode Vmax	
Damper position	57 %
Volume flow setpoint	652 m³/h
Current volume flow	630 m³/h
Test setpoint of face velocity	
Current face velocity	0.34 m/s
Test the 500mm-alarm	not done
Test the 'Smoke extraction - alarm only'	not done
Test the alarm 'Supportive flow technology'	not done
Reset service interval	not done
Comment	

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## EASYLAB - Commissioning protocol

Date of creation	7/25/2024
Created via EasyConnect	Version 11.0.0.0
Created by user-ID	2281

### General device information

Device functionality	Room supply controller within exhaust air controlled system
Device name	Nawiew / Pom. Z 2 18 / DE17540230170
Device-ID	0
Device status	Original equipment
Serial Number	118550
Total operating time	2 days

### Basic device

Hardware-name	TCU3
Hardware-version	3.0
Software-name	EASYLAB TCU3
Software-version	9.0

### Device expansions

Expansion slot 1	
Hardware-name	EM-BAC-MOD-01
Hardware-version	1.0
Software-name	EASYLAB Modbus RTU
Software-version	4.1
Connector socket X2	not used
Connector socket X3	not used
Terminal 3	not used
Expansion module EM-AUTOZERO	not present
Expansion module EM-TRF-USV	not present

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## Configuration settings

### Basic technical data

C-value	16.6 based on l/s
Technical Vmin	130 m³/h
Technical Vnominal	929 m³/h
Volume flow registration	
Transmitter typ	internal volume flow transmitter on AI1
Characteristic for AI1	0.50 ... 4.50 V equals 0 ... 300 Pa
Signal smoothing	50

### Volume flow control

Volume flow split-up if several room controllers	automatic
Fraction in Standard mode at manual split-up	50 %
Fraction in Low mode at manual split-up	50 %
Fraction in High mode at manual split-up	50 %
Control settings	
Control tolerance - relative	4.0 %
Control tolerance - absolute	14 m³/h
Preset the limit to reach the maximum actuating value	automatic
Open damper - minimum actuating variable	0.10
Open damper - maximum actuating variable	5.00
Close damper - minimum actuating variable	0.15
Close damper - maximum actuating variable	2.00

## Configuration settings

### Alarm settings

Category 1 (UPS Battery operation)	activated
Category 2 (control functions)	
Monitoring - Volume flow (labour mode)	activated
Volume flow monitoring (Low mode)	not configured
Alarm delay time	12 s
Category 3 (Hardware failure)	activated

### UPS function

normal controller action

### Analogue outputs

Function AO1	Current volume flow
Characteristic	2.00 ... 10.00 V equals 0 ... 929 m³/h
Function AO2	Total exhaust air
Characteristic	2.00 ... 10.00 V equals 0 ... 0 m³/h
Function AO3	Damper position
Characteristic	2.00 ... 10.00 V equals 0 ... 100 %
Function AO4	Actuator
Characteristic	2.00 ... 9.00 V equals 0 ... 100 %

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#### Configuration settings - Equipment components

Integration of switchable constant volume flows

not configured

Integration of switchable variable volume flows

not configured

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### Configuration settings - Equipment components

Room mode dependent relay switching	not configured
Diffusor volume flow optimisation	not configured
Room-Management-Function (RMF)	activated

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## Configuration settings - RMF

### Volume flow settings for the room

Minimum total exhaust air at High mode	180 m³/h
Minimum total exhaust air at Standard mode	180 m³/h
Minimum total exhaust air at Low mode	180 m³/h
Total amount unmeasured Constant exhaust air	0 m³/h
Total amount unmeasured Constant supply air	0 m³/h
Split-up for Exhaust air volume flows	automatic
Split-up the supply air volume flows	automatic
Supply-Exhaust air balance	0 m³/h

### Alarm settings for the room

Optical alarm (RBE)	continuous
Acoustic alarm (RBE)	limited to 15 s
Alarms based on category 1 (Smoke extraction, UPS battery operation)	activated
Alarms based on category 2 (control functions)	
Monitoring - Labour mode	activated
Monitoring - Low mode	not configured
Alarms based on category 3 (hardware-failure)	activated
Monitoring - Diversity limit exceeded	activated
Monitoring - Minimum Total exhaust air too low	
Tolerance	10.0 %
Delay time	15 s

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## Configuration settings - RMF

### Support Room control panel

Key - High mode	not configured
Key - Low mode	not configured
Key - Shut off mode	not configured
Key switch function (DO2)	not configured
Key - Hand mode	not configured
Display options	
Display language	Alternative language
Display current room volume flow values	activated
Volume flow unit	m <sup>3</sup> /h

### Sun blinder control

not configured

### Room operation mode preset via switching inputs (DI)

Preset via DI 1	not configured
Preset via DI 2	
Direction of switch contact	Make contact = Activates function
Function	Shut off mode
Preset via DI 3	
Direction of switch contact	Make contact = Activates function
Function	Low mode
Preset via DI 4	
Direction of switch contact	Make contact = Activates function
Function	High mode
Preset via DI 5	not configured
Preset via DI 6	not configured
Behaviour at invalid room operation mode preset	Force Standard mode

### Shut off for all room exhaust controller within Low Mode

not configured

### Diversity Monitoring / Diversity control

not configured

### External volume flow shift

not configured

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## Configuration settings - RMF

Pressure control	not configured
Room exhaust air optimisation	
Sum of technical Vmin of all Room exhaust air controller	50 m³/h
Tolerance	10 %
Delay time	2 s

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## Configuration settings - RMF

Room reactivation

not configured

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## EASYLAB - Commissioning protocol

Date of creation	7/25/2024
Created via EasyConnect	Version 11.0.0.0
Created by user-ID	2281

### General device information

Device functionality	Fume cupboard controller
Device name	dygestorium / Pom.Z 1 01 / DE17540230120

Device-ID	0
Device status	Original equipment
Serial Number	119501
Total operating time	2 days
Period since last service	2 days

### Basic device

Hardware-name	TCU3
Hardware-version	3.0
Software-name	EASYLAB TCU3
Software-version	9.0

### Device expansions

Expansion slot 1	not used
Connector socket X2	
Hardware-name	BE-SEG-02
Hardware-version	2.0
Software-name	EASYLAB BE-SEG-02
Software-version	1.1
Connector socket X3	not used
Terminal 3	not used
Expansion module EM-AUTOZERO	not present
Expansion module EM-TRF-USV	not present

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## Configuration settings

### Basic technical data

C-value	15.2 based on l/s
Technical Vmin	108 m³/h
Technical Vnominal	774 m³/h
Volume flow registration	
Transmitter typ	internal volume flow transmitter on AI1
Characteristic for AI1	0.47 ... 4.47 V equals 0 ... 300 Pa
Signal smoothing	50

### Volume flow control

Control concept	FH-VS
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#### Volume flow set values

Standard mode Vmin	202 m³/h
Standard mode Vmax	652 m³/h
High mode	652 m³/h
Low mode	202 m³/h
Consider diversity control	activated

### Face velocity

Setpoint	0.50 m/s
Tolerance range (+/-)	0.10 m/s
Characteristic for AI5	2.00 ... 10.00 V equals 0.00 ... 1.00 m/s
Signal smoothing	50
Time target - Setpoint adaption open sash	3 s
Time target - Setpoint adaption close sash	10 s

### Control settings

Control tolerance - relative	4.0 %
Control tolerance - absolute	14 m³/h
Preset the limit to reach the maximum actuating value	automatic
Open damper - minimum actuating variable	0.10
Open damper - maximum actuating variable	5.00
Close damper - minimum actuating variable	0.15
Close damper - maximum actuating variable	2.00

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#### Configuration settings - Equipment components

Integration of switchable constant volume flows

not configured

Integration of switchable variable volume flows

not configured

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### Configuration settings - Equipment components

Alarm Sash monitoring EN 14175

Release - caused by

Direction of switch contact

Switching input DI1

Make contact = Activates function

Fume scrubber

not configured

Supportive flow technology

not configured

Automatic sash device (Third-party supplier)

not configured

Motion detector

not configured

Smoke extraction / Temperature alarm

not configured

Operation mode dependent relay switching

Switching caused by

Switching output DO4 and DO5

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## Function test

Test the volume flow measure point and zero point adjustment	not done
Test the volume flow alarm	OK
Test the volume flow setpoints	
Shut off mode	
Damper position	0 %
Volume flow setpoint	0 m³/h
Current volume flow	0 m³/h
Low mode	
Damper position	26 %
Volume flow setpoint	202 m³/h
Current volume flow	220 m³/h
High mode	
Damper position	54 %
Volume flow setpoint	652 m³/h
Current volume flow	634 m³/h
Standard mode Vmin	
Damper position	22 %
Volume flow setpoint	202 m³/h
Current volume flow	198 m³/h
Standard mode Vmax	
Damper position	53 %
Volume flow setpoint	652 m³/h
Current volume flow	630 m³/h
Test setpoint of face velocity	
Current face velocity	0.35 m/s
Test the 500mm-alarm	not done
Test the 'Smoke extraction - alarm only'	not done
Test the alarm 'Supportive flow technology'	not done
Reset service interval	not done
Comment	

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## EASYLAB - Commissioning protocol

Date of creation	7/25/2024
Created via EasyConnect	Version 11.0.0.0
Created by user-ID	2281

### General device information

Device functionality	Room exhaust controller within exhaust air controlled system
Device name	Wywiew / Pom. Z 1 01 / DE17540230130
Device-ID	0
Device status	Original equipment
Serial Number	120237
Total operating time	2 days

### Basic device

Hardware-name	TCU3
Hardware-version	3.0
Software-name	EASYLAB TCU3
Software-version	9.0

### Device expansions

Expansion slot 1	not used
Connector socket X2	not used
Connector socket X3	not used
Terminal 3	not used
Expansion module EM-AUTOZERO	not present
Expansion module EM-TRF-USV	not present

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## Configuration settings

### Basic technical data

C-value	6.3 based on l/s
Technical Vmin	50 m³/h
Technical Vnominal	353 m³/h
Volume flow registration	
Transmitter typ	internal volume flow transmitter on AI1
Characteristic for AI1	0.66 ... 4.66 V equals 0 ... 300 Pa
Signal smoothing	50

### Volume flow control

Volume flow split-up if several room controllers	automatic
Fraction in Standard mode at manual split-up	50 %
Fraction in Low mode at manual split-up	50 %
Fraction in High mode at manual split-up	50 %

### Control settings

Control tolerance - relative	4.0 %
Control tolerance - absolute	14 m³/h
Preset the limit to reach the maximum actuating value	automatic
Open damper - minimum actuating variable	0.10
Open damper - maximum actuating variable	5.00
Close damper - minimum actuating variable	0.15
Close damper - maximum actuating variable	2.00

## Configuration settings

### Alarm settings

Category 1 (UPS Battery operation)	activated
Category 2 (control functions)	
Monitoring - Volume flow (labour mode)	activated
Volume flow monitoring (Low mode)	not configured
Alarm delay time	12 s
Category 3 (Hardware failure)	activated

### UPS function

normal controller action

### Analogue outputs

Function AO1	Current volume flow
Characteristic	2.00 ... 10.00 V equals 0 ... 353 m³/h
Function AO2	Total exhaust air
Characteristic	2.00 ... 10.00 V equals 0 ... 0 m³/h
Function AO3	Damper position
Characteristic	2.00 ... 10.00 V equals 0 ... 100 %
Function AO4	Actuator
Characteristic	2.00 ... 9.00 V equals 0 ... 100 %

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#### Configuration settings - Equipment components

Integration of switchable constant volume flows

not configured

Integration of switchable variable volume flows

not configured

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**Configuration settings - Equipment components**

Room mode dependent relay switching

not configured

Room-Management-Function (RMF)

not configured

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**EASYLAB - Commissioning protocol**

Date of creation	7/25/2024
Created via EasyConnect	Version 11.0.0.0
Created by user-ID	2281
<b>General device information</b>	
Device functionality	Room supply controller within exhaust air controlled system
Device name	Nawiew / Pom. Z 1 01 / DE17540230140
Device-ID	0
Device status	Original equipment
Serial Number	120234
Total operating time	2 days
<b>Basic device</b>	
Hardware-name	TCU3
Hardware-version	3.0
Software-name	EASYLAB TCU3
Software-version	9.0
<b>Device expansions</b>	
Expansion slot 1	
Hardware-name	EM-BAC-MOD-01
Hardware-version	1.0
Software-name	EASYLAB BACnet MS/TP
Software-version	4.1
Connector socket X2	not used
Connector socket X3	not used
Terminal 3	not used
Expansion module EM-AUTOZERO	not present
Expansion module EM-TRF-USV	not present

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## Configuration settings

### Basic technical data

C-value	15.8 based on l/s
Technical Vmin	130 m³/h
Technical Vnominal	929 m³/h
Volume flow registration	
Transmitter typ	internal volume flow transmitter on AI1
Characteristic for AI1	0.51 ... 4.51 V equals 0 ... 300 Pa
Signal smoothing	50

### Volume flow control

Volume flow split-up if several room controllers	automatic
Fraction in Standard mode at manual split-up	50 %
Fraction in Low mode at manual split-up	50 %
Fraction in High mode at manual split-up	50 %
Control settings	
Control tolerance - relative	4.0 %
Control tolerance - absolute	14 m³/h
Preset the limit to reach the maximum actuating value	automatic
Open damper - minimum actuating variable	0.10
Open damper - maximum actuating variable	5.00
Close damper - minimum actuating variable	0.15
Close damper - maximum actuating variable	2.00

## Configuration settings

### Alarm settings

Category 1 (UPS Battery operation)	activated
Category 2 (control functions)	
Monitoring - Volume flow (labour mode)	activated
Volume flow monitoring (Low mode)	not configured
Alarm delay time	12 s
Category 3 (Hardware failure)	activated

### UPS function

normal controller action

### Analogue outputs

Function AO1	Current volume flow
Characteristic	2.00 ... 10.00 V equals 0 ... 929 m³/h
Function AO2	Total exhaust air
Characteristic	2.00 ... 10.00 V equals 0 ... 0 m³/h
Function AO3	Damper position
Characteristic	2.00 ... 10.00 V equals 0 ... 100 %
Function AO4	Actuator
Characteristic	2.00 ... 9.00 V equals 0 ... 100 %

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#### Configuration settings - Equipment components

Integration of switchable constant volume flows

not configured

Integration of switchable variable volume flows

not configured

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#### Configuration settings - Equipment components

Room mode dependent relay switching

not configured

Diffusor volume flow optimisation

not configured

Room-Management-Function (RMF)

activated

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## Configuration settings - RMF

### Volume flow settings for the room

Minimum total exhaust air at High mode	320 m³/h
Minimum total exhaust air at Standard mode	320 m³/h
Minimum total exhaust air at Low mode	320 m³/h
Total amount unmeasured Constant exhaust air	0 m³/h
Total amount unmeasured Constant supply air	0 m³/h
Split-up for Exhaust air volume flows	automatic
Split-up the supply air volume flows	automatic
Supply-Exhaust air balance	0 m³/h

### Alarm settings for the room

Optical alarm (RBE)	continuous
Acoustic alarm (RBE)	limited to 15 s
Alarms based on category 1 (Smoke extraction, UPS battery operation)	activated
Alarms based on category 2 (control functions)	
Monitoring - Labour mode	activated
Monitoring - Low mode	not configured
Alarms based on category 3 (hardware-failure)	activated
Monitoring - Diversity limit exceeded	activated
Monitoring - Minimum Total exhaust air too low	
Tolerance	10.0 %
Delay time	15 s

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## Configuration settings - RMF

### Support Room control panel

Key - High mode	not configured
Key - Low mode	not configured
Key - Shut off mode	not configured
Key switch function (DO2)	not configured
Key - Hand mode	not configured

### Display options

Display language	Alternative language
Display current room volume flow values	activated
Volume flow unit	m <sup>3</sup> /h

### Sun blinder control

not configured

### Room operation mode preset via switching inputs (DI)

Preset via DI 1	not configured
Preset via DI 2	
Direction of switch contact	Make contact = Activates function
Function	Shut off mode
Preset via DI 3	
Direction of switch contact	Make contact = Activates function
Function	Low mode
Preset via DI 4	
Direction of switch contact	Make contact = Activates function
Function	High mode
Preset via DI 5	not configured
Preset via DI 6	not configured
Behaviour at invalid room operation mode preset	Force Standard mode

### Shut off for all room exhaust controller within Low Mode

not configured

### Diversity Monitoring / Diversity control

not configured

### External volume flow shift

not configured

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## Configuration settings - RMF

Pressure control

not configured

Room exhaust air optimisation

Sum of technical Vmin of all Room exhaust air controller

50 m<sup>3</sup>/h

Tolerance

10 %

Delay time

2 s

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**Configuration settings - RMF**

Room reactivation

not configured

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Date of creation	7/25/2024
Created via EasyConnect	Version 11.0.0.0
Created by user-ID	2281
<b>General device information</b>	
Device functionality	Room exhaust controller within exhaust air controlled system
Device name	Wywiew / Pom. Z 0 01 / DE17540230110
Device-ID	0
Device status	Original equipment
Serial Number	120248
Total operating time	3 days
<b>Basic device</b>	
Hardware-name	TCU3
Hardware-version	3.0
Software-name	EASYLAB TCU3
Software-version	9.0
<b>Device expansions</b>	
Expansion slot 1	not used
Connector socket X2	not used
Connector socket X3	not used
Terminal 3	not used
Expansion module EM-AUTOZERO	not present
Expansion module EM-TRF-USV	not present

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## Configuration settings

### Basic technical data

C-value	9.6 based on l/s
Technical Vmin	83 m³/h
Technical Vnominal	580 m³/h
Volume flow registration	
Transmitter typ	internal volume flow transmitter on AI1
Characteristic for AI1	0.50 ... 4.50 V equals 0 ... 300 Pa
Signal smoothing	50

### Volume flow control

Volume flow split-up if several room controllers	automatic
Fraction in Standard mode at manual split-up	50 %
Fraction in Low mode at manual split-up	50 %
Fraction in High mode at manual split-up	50 %
Control settings	
Control tolerance - relative	4.0 %
Control tolerance - absolute	14 m³/h
Preset the limit to reach the maximum actuating value	automatic
Open damper - minimum actuating variable	0.10
Open damper - maximum actuating variable	5.00
Close damper - minimum actuating variable	0.15
Close damper - maximum actuating variable	2.00

## Configuration settings

### Alarm settings

Category 1 (UPS Battery operation)	activated
Category 2 (control functions)	
Monitoring - Volume flow (labour mode)	activated
Volume flow monitoring (Low mode)	not configured
Alarm delay time	12 s
Category 3 (Hardware failure)	activated

### UPS function

normal controller action

### Analogue outputs

Function AO1	Current volume flow
Characteristic	2.00 ... 10.00 V equals 0 ... 580 m³/h
Function AO2	Total exhaust air
Characteristic	2.00 ... 10.00 V equals 0 ... 0 m³/h
Function AO3	Damper position
Characteristic	2.00 ... 10.00 V equals 0 ... 100 %
Function AO4	Actuator
Characteristic	2.00 ... 9.00 V equals 0 ... 100 %

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### Configuration settings - Equipment components

Integration of switchable constant volume flows

not configured

Integration of switchable variable volume flows

not configured

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#### Configuration settings - Equipment components

Room mode dependent relay switching

not configured

Room-Management-Function (RMF)

not configured

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## EASYLAB - Commissioning protocol

Date of creation	7/25/2024
Created via EasyConnect	Version 11.0.0.0
Created by user-ID	2281

### General device information

Device functionality	Fume cupboard controller
Device name	Dygestorium / Pom. Z 0 01 / DE17540230050

Device-ID	0
Device status	Original equipment
Serial Number	119499
Total operating time	3 days
Period since last service	3 days

### Basic device

Hardware-name	TCU3
Hardware-version	3.0
Software-name	EASYLAB TCU3
Software-version	9.0

### Device expansions

Expansion slot 1	not used
Connector socket X2	not used
Connector socket X3	
Hardware-name	BE-SEG-02
Hardware-version	2.0
Software-name	EASYLAB BE-SEG-02
Software-version	1.1
Terminal 3	not used
Expansion module EM-AUTOZERO	not present
Expansion module EM-TRF-USV	not present

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## Configuration settings

### Basic technical data

C-value	15.1 based on l/s
Technical Vmin	108 m³/h
Technical Vnominal	774 m³/h
Volume flow registration	
Transmitter typ	internal volume flow transmitter on AI1
Characteristic for AI1	0.60 ... 4.60 V equals 0 ... 300 Pa
Signal smoothing	50

### Volume flow control

Control concept	FH-VS
-----------------	-------

#### Volume flow set values

Standard mode Vmin	202 m³/h
Standard mode Vmax	652 m³/h
High mode	652 m³/h
Low mode	202 m³/h
Consider diversity control	activated

#### Face velocity

Setpoint	0.50 m/s
Tolerance range (+/-)	0.10 m/s
Characteristic for AI5	2.00 ... 10.00 V equals 0.00 ... 1.00 m/s
Signal smoothing	50
Time target - Setpoint adaption open sash	3 s
Time target - Setpoint adaption close sash	10 s

#### Control settings

Control tolerance - relative	4.0 %
Control tolerance - absolute	14 m³/h
Preset the limit to reach the maximum actuating value	automatic
Open damper - minimum actuating variable	0.10
Open damper - maximum actuating variable	5.00
Close damper - minimum actuating variable	0.15
Close damper - maximum actuating variable	2.00

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## Configuration settings

### Alarm settings

Optical alarm (BE)	continuous
Acoustic alarm (BE)	limited to 15 s
Acoustic alarm (BE) - Sash monitoring	off
Optical alarm (BE) - Sash monitoring	not configured
Category 1 (Smoke extraction / UPS Battery operation)	activated
Category 2 (control functions)	
Monitoring - Volume flow (labour mode)	activated
Volume flow monitoring (Low mode)	not configured
Alarm delay time	15 s
Monitoring - Face velocity (labour mode)	not configured
Category 3 (Hardware failure)	activated

### Service interval

Specified service period	365 days
Signaling at end of service interval	not configured

### UPS function

normal controller action

### Control panel

Key - High mode	unlimited
Key - Low mode	activated
Key - Shut off mode	activated
Key - Fume cupboard light	activated
Switch off when activating Low mode, Shut off mode	not configured
Key - Hand mode	not configured
ECO-Display (BE-SEG-02)	not configured
Display options	
Display language	English
Display volume flow setpoint and current value	activated
Volume flow unit	m <sup>3</sup> /h
Display current face velocity value	not configured
Display actual volume flow (BE-SEG-02)	not configured
Display actual face velocity (BE-SEG-02)	not configured

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## Configuration settings

### Operation mode presets

Room operation mode presets

Modification of room operation mode

High mode is changed to Standard mode

Low mode is changed to Standard mode

Shut off mode is changed to Standard mode

Low mode is changed to Shut off mode

Standard mode is changed to Shut off mode

will be overtaken

not configured

not configured

not configured

not configured

not configured

### Analogue outputs

Function AO1

Characteristic

Function AO2

Characteristic

Function AO3

Characteristic

Function AO4

Characteristic

Current volume flow

2.00 ... 10.00 V equals 0 ... 774 m<sup>3</sup>/h

Total exhaust air

2.00 ... 10.00 V equals 0 ... 0 m<sup>3</sup>/h

Damper position

2.00 ... 10.00 V equals 0 ... 100 %

Actuator

2.00 ... 9.00 V equals 0 ... 100 %

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#### Configuration settings - Equipment components

Integration of switchable constant volume flows

not configured

Integration of switchable variable volume flows

not configured

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### Configuration settings - Equipment components

Alarm Sash monitoring EN 14175

Release - caused by

Direction of switch contact

Fume scrubber

Supportive flow technology

Automatic sash device (Third-party supplier)

Motion detector

Smoke extraction / Temperature alarm

Operation mode dependent relay switching

Switching caused by

Switching input DI1

Make contact = Activates function

not configured

not configured

not configured

not configured

not configured

Switching output DO4 and DO5

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## Function test

Test the volume flow measure point and zero point adjustment	done
Test the volume flow alarm	OK
Test the volume flow setpoints	
Shut off mode	
Damper position	0 %
Volume flow setpoint	0 m³/h
Current volume flow	0 m³/h
Low mode	
Damper position	30 %
Volume flow setpoint	202 m³/h
Current volume flow	198 m³/h
High mode	
Damper position	65 %
Volume flow setpoint	652 m³/h
Current volume flow	623 m³/h
Standard mode Vmin	
Damper position	27 %
Volume flow setpoint	202 m³/h
Current volume flow	220 m³/h
Standard mode Vmax	
Damper position	65 %
Volume flow setpoint	652 m³/h
Current volume flow	612 m³/h
Test setpoint of face velocity	
Current face velocity	0.38 m/s
Test the 500mm-alarm	not done
Test the 'Smoke extraction - alarm only'	not done
Test the alarm 'Supportive flow technology'	not done
Reset service interval	not done
Comment	

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## EASYLAB - Commissioning protocol

Date of creation	7/25/2024
Created via EasyConnect	Version 11.0.0.0
Created by user-ID	2281

### **General device information**

Device functionality	Room supply controller within exhaust air controlled system
Device name	Nawiew / Pom. Z 0 01 / DE15785720040
Device-ID	0
Device status	Original equipment
Serial Number	107817
Total operating time	3 days

### Basic device

Hardware-name	TCU3
Hardware-version	3.0
Software-name	EASYLAB TCU3
Software-version	9.0

### Device expansions

Expansion slot 1	EM-BAC-MOD-01
Hardware-name	1.0
Hardware-version	EASYLAB BACnet MS/TP
Software-name	4.1
Software-version	not used
Connector socket X2	not used
Connector socket X3	not used
Terminal 3	not used
Expansion module EM-AUTOZERO	not present
Expansion module EM-TRF-USV	not present

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## Configuration settings

### Basic technical data

C-value	40.8 based on l/s
Technical Vmin	317 m³/h
Technical Vnominal	2293 m³/h
Volume flow registration	
Transmitter typ	internal volume flow transmitter on AI1
Characteristic for AI1	0.50 ... 4.50 V equals 0 ... 300 Pa
Signal smoothing	50

### Volume flow control

Volume flow split-up if several room controllers	automatic
Fraction in Standard mode at manual split-up	50 %
Fraction in Low mode at manual split-up	50 %
Fraction in High mode at manual split-up	50 %
Control settings	
Control tolerance - relative	4.0 %
Control tolerance - absolute	14 m³/h
Preset the limit to reach the maximum actuating value	automatic
Open damper - minimum actuating variable	0.10
Open damper - maximum actuating variable	5.00
Close damper - minimum actuating variable	0.15
Close damper - maximum actuating variable	2.00

## Configuration settings

### Alarm settings

Category 1 (UPS Battery operation)	activated
Category 2 (control functions)	
Monitoring - Volume flow (labour mode)	activated
Volume flow monitoring (Low mode)	not configured
Alarm delay time	12 s
Category 3 (Hardware failure)	activated

### UPS function

normal controller action

### Analogue outputs

Function AO1	Current volume flow
Characteristic	2.00 ... 10.00 V equals 0 ... 2293 m³/h
Function AO2	Total exhaust air
Characteristic	2.00 ... 10.00 V equals 0 ... 0 m³/h
Function AO3	Damper position
Characteristic	2.00 ... 10.00 V equals 0 ... 100 %
Function AO4	Actuator
Characteristic	2.00 ... 9.00 V equals 0 ... 100 %

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### Configuration settings - Equipment components

Integration of switchable constant volume flows

not configured

Integration of switchable variable volume flows

not configured

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#### Configuration settings - Equipment components

Room mode dependent relay switching	not configured
Diffusor volume flow optimisation	not configured
Room-Management-Function (RMF)	activated

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## Configuration settings - RMF

### Volume flow settings for the room

Minimum total exhaust air at High mode	349 m³/h
Minimum total exhaust air at Standard mode	349 m³/h
Minimum total exhaust air at Low mode	349 m³/h
Total amount unmeasured Constant exhaust air	101 m³/h
Total amount unmeasured Constant supply air	0 m³/h
Split-up for Exhaust air volume flows	automatic
Split-up the supply air volume flows	automatic
Supply-Exhaust air balance	0 m³/h

### Alarm settings for the room

Optical alarm (RBE)	continuous
Acoustic alarm (RBE)	limited to 15 s
Alarms based on category 1 (Smoke extraction, UPS battery operation)	activated
Alarms based on category 2 (control functions)	
Monitoring - Labour mode	activated
Monitoring - Low mode	not configured
Alarms based on category 3 (hardware-failure)	activated
Monitoring - Diversity limit exceeded	activated
Monitoring - Minimum Total exhaust air too low	
Tolerance	10.0 %
Delay time	15 s

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## Configuration settings - RMF

### Support Room control panel

Key - High mode	not configured
Key - Low mode	not configured
Key - Shut off mode	not configured
Key switch function (DO2)	not configured
Key - Hand mode	not configured
Display options	
Display language	Alternative language
Display current room volume flow values	activated
Volume flow unit	m <sup>3</sup> /h

### Sun blinder control

not configured

### Room operation mode preset via switching inputs (DI)

Preset via DI 1	not configured
Preset via DI 2	
Direction of switch contact	Make contact = Activates function
Function	Shut off mode
Preset via DI 3	
Direction of switch contact	Make contact = Activates function
Function	Low mode
Preset via DI 4	
Direction of switch contact	Make contact = Activates function
Function	High mode
Preset via DI 5	not configured
Preset via DI 6	not configured
Behaviour at invalid room operation mode preset	Force Standard mode

### Shut off for all room exhaust controller within Low Mode

not configured

### Diversity Monitoring / Diversity control

not configured

### External volume flow shift

not configured

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## Configuration settings - RMF

Pressure control

not configured

Room exhaust air optimisation

Sum of technical  $V_{min}$  of all Room exhaust air controller

90 m<sup>3</sup>/h

Tolerance

10 %

Delay time

2 s

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Configuration settings - RMF  
Room reactivation

not configured

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## EASYLAB - Commissioning protocol

Date of creation	7/25/2024
Created via EasyConnect	Version 11.0.0.0
Created by user-ID	2281

### General device information

Device functionality	Fume cupboard controller
Device name	Dygestorium 2 / pom. Z 0 12c / DE17540230080
Device-ID	0
Device status	Original equipment
Serial Number	119502
Total operating time	3 days
Period since last service	3 days

### Basic device

Hardware-name	TCU3
Hardware-version	3.0
Software-name	EASYLAB TCU3
Software-version	9.0

### Device expansions

Expansion slot 1	not used
Connector socket X2	
Hardware-name	BE-SEG-02
Hardware-version	2.0
Software-name	EASYLAB BE-SEG-02
Software-version	1.1
Connector socket X3	not used
Terminal 3	not used
Expansion module EM-AUTOZERO	not present
Expansion module EM-TRF-USV	not present

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## Configuration settings

### Basic technical data

C-value	15.3 based on l/s
Technical Vmin	108 m³/h
Technical Vnominal	774 m³/h
Volume flow registration	
Transmitter typ	internal volume flow transmitter on AI1
Characteristic for AI1	0.47 ... 4.47 V equals 0 ... 300 Pa
Signal smoothing	50

### Volume flow control

Control concept	FH-VS
Volume flow set values	
Standard mode Vmin	202 m³/h
Standard mode Vmax	630 m³/h
High mode	630 m³/h
Low mode	202 m³/h
Consider diversity control	activated

### Face velocity

Setpoint	0.50 m/s
Tolerance range (+/-)	0.10 m/s
Characteristic for AI5	2.00 ... 10.00 V equals 0.00 ... 1.00 m/s
Signal smoothing	50
Time target - Setpoint adaption open sash	3 s
Time target - Setpoint adaption close sash	10 s

### Control settings

Control tolerance - relative	4.0 %
Control tolerance - absolute	14 m³/h
Preset the limit to reach the maximum actuating value	automatic
Open damper - minimum actuating variable	0.10
Open damper - maximum actuating variable	5.00
Close damper - minimum actuating variable	0.15
Close damper - maximum actuating variable	2.00

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## Configuration settings

### Alarm settings

Optical alarm (BE)	continuous
Acoustic alarm (BE)	limited to 15 s
Acoustic alarm (BE) - Sash monitoring	off
Optical alarm (BE) - Sash monitoring	not configured
Category 1 (Smoke extraction / UPS Battery operation)	activated
Category 2 (control functions)	
Monitoring - Volume flow (labour mode)	activated
Volume flow monitoring (Low mode)	not configured
Alarm delay time	12 s
Monitoring - Face velocity (labour mode)	not configured
Category 3 (Hardware failure)	activated

### Service interval

Specified service period	365 days
Signaling at end of service interval	not configured



### UPS function

normal controller action

### Control panel

Key - High mode	unlimited
Key - Low mode	activated
Key - Shut off mode	activated
Key - Fume cupboard light	activated
Switch off when activating Low mode, Shut off mode	not configured
Key - Hand mode	not configured
ECO-Display (BE-SEG-02)	not configured
Display options	
Display language	English
Display volume flow setpoint and current value	activated
Volume flow unit	m <sup>3</sup> /h
Display current face velocity value	not configured
Display actual volume flow (BE-SEG-02)	not configured
Display actual face velocity (BE-SEG-02)	not configured



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## Configuration settings

### Operation mode presets

#### Room operation mode presets

#### Modification of room operation mode

High mode is changed to Standard mode

Low mode is changed to Standard mode

Shut off mode is changed to Standard mode

Low mode is changed to Shut off mode

Standard mode is changed to Shut off mode

will be overtaken

not configured

not configured

not configured

not configured

not configured

### Analogue outputs

#### Function AO1

#### Characteristic

#### Function AO2

#### Characteristic

#### Function AO3

#### Characteristic

#### Function AO4

#### Characteristic

Current volume flow

2.00 ... 10.00 V equals 0 ... 774 m<sup>3</sup>/h

Total exhaust air

2.00 ... 10.00 V equals 0 ... 0 m<sup>3</sup>/h

Damper position

2.00 ... 10.00 V equals 0 ... 100 %

Actuator

2.00 ... 9.00 V equals 0 ... 100 %

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#### Configuration settings - Equipment components

Integration of switchable constant volume flows

not configured

Integration of switchable variable volume flows

not configured

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### Configuration settings - Equipment components

Alarm Sash monitoring EN 14175

Release - caused by

Direction of switch contact

Switching input DI1

Make contact = Activates function

Fume scrubber

not configured

Supportive flow technology

not configured

Automatic sash device (Third-party supplier)

not configured

Motion detector

not configured

Smoke extraction / Temperature alarm

not configured

Operation mode dependent relay switching

Switching caused by

Switching output DO4 and DO5

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## Function test

Test the volume flow measure point and zero point adjustment not done

Test the volume flow alarm OK

Test the volume flow setpoints

Shut off mode

Damper position	0 %
Volume flow setpoint	0 m³/h
Current volume flow	0 m³/h

Low mode

Damper position	24 %
Volume flow setpoint	202 m³/h
Current volume flow	216 m³/h

High mode

Damper position	51 %
Volume flow setpoint	630 m³/h
Current volume flow	616 m³/h

Standard mode Vmin

Damper position	22 %
Volume flow setpoint	202 m³/h
Current volume flow	209 m³/h

Standard mode Vmax

Damper position	50 %
Volume flow setpoint	630 m³/h
Current volume flow	616 m³/h

Test setpoint of face velocity

Current face velocity	0.37 m/s
-----------------------	----------

Test the 500mm-alarm not done

Test the 'Smoke extraction - alarm only' not done

Test the alarm 'Supportive flow technology' not done

Reset service interval not done

Comment

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**EASYPOLAB - Commissioning protocol**

Date of creation	7/25/2024
Created via EasyConnect	Version 11.0.0.0
Created by user-ID	2281

**General device information**

Device functionality	Fume cupboard controller
Device name	Dygestorium 1 / pom. Z 0 12c / DE15785720010
Device-ID	0
Device status	Original equipment
Serial Number	107571
Total operating time	3 days
Period since last service	3 days

**Basic device**

Hardware-name	TCU3
Hardware-version	3.0
Software-name	EASYPOLAB TCU3
Software-version	9.0

**Device expansions**

Expansion slot 1	not used
Connector socket X2	
Hardware-name	BE-SEG-02
Hardware-version	2.0
Software-name	EASYPOLAB BE-SEG-02
Software-version	1.1
Connector socket X3	not used
Terminal 3	not used
Expansion module EM-AUTOZERO	existing
Expansion module EM-TRF-USV	not present

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## Configuration settings

### Basic technical data

C-value	27.5 based on l/s
Technical Vmin	194 m³/h
Technical Vnominal	1411 m³/h
Volume flow registration	
Transmitter typ	internal volume flow transmitter on AI1
Characteristic for AI1	0.52 ... 4.52 V equals 0 ... 300 Pa
Signal smoothing	50

### Volume flow control

Control concept	FH-VS
-----------------	-------

#### Volume flow set values

Standard mode Vmin	202 m³/h
Standard mode Vmax	652 m³/h
High mode	652 m³/h
Low mode	202 m³/h
Consider diversity control	activated

#### Face velocity

Setpoint	0.50 m/s
Tolerance range (+/-)	0.10 m/s
Characteristic for AI5	2.00 ... 10.00 V equals 0.00 ... 1.00 m/s
Signal smoothing	50
Time target - Setpoint adaption open sash	3 s
Time target - Setpoint adaption close sash	10 s

#### Control settings

Control tolerance - relative	4.0 %
Control tolerance - absolute	14 m³/h
Preset the limit to reach the maximum actuating value	automatic
Open damper - minimum actuating variable	0.10
Open damper - maximum actuating variable	5.00
Close damper - minimum actuating variable	0.15
Close damper - maximum actuating variable	2.00

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## Configuration settings

### Alarm settings

Optical alarm (BE)	continuous
Acoustic alarm (BE)	limited to 15 s
Acoustic alarm (BE) - Sash monitoring	off
Optical alarm (BE) - Sash monitoring	not configured
Category 1 (Smoke extraction / UPS Battery operation)	activated
Category 2 (control functions)	
Monitoring - Volume flow (labour mode)	activated
Volume flow monitoring (Low mode)	not configured
Alarm delay time	12 s
Monitoring - Face velocity (labour mode)	not configured
Category 3 (Hardware failure)	activated

### Service interval

Specified service period	365 days
Signaling at end of service interval	not configured

### UPS function

normal controller action

### Control panel

Key - High mode	unlimited
Key - Low mode	activated
Key - Shut off mode	activated
Key - Fume cupboard light	activated
Switch off when activating Low mode, Shut off mode	not configured
Key - Hand mode	not configured
ECO-Display (BE-SEG-02)	not configured
Display options	
Display language	English
Display volume flow setpoint and current value	activated
Volume flow unit	m <sup>3</sup> /h
Display current face velocity value	not configured
Display actual volume flow (BE-SEG-02)	not configured
Display actual face velocity (BE-SEG-02)	not configured

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## Configuration settings

### Operation mode presets

Room operation mode presets

Modification of room operation mode

High mode is changed to Standard mode

Low mode is changed to Standard mode

Shut off mode is changed to Standard mode

Low mode is changed to Shut off mode

Standard mode is changed to Shut off mode

will be overtaken

not configured

not configured

not configured

not configured

not configured

### Analogue outputs

Function AO1

Characteristic

Function AO2

Characteristic

Function AO3

Characteristic

Function AO4

Characteristic

Current volume flow

2.00 ... 10.00 V equals 0 ... 1411 m<sup>3</sup>/h

Total exhaust air

2.00 ... 10.00 V equals 0 ... 0 m<sup>3</sup>/h

Damper position

2.00 ... 10.00 V equals 0 ... 100 %

Actuator

2.00 ... 9.00 V equals 0 ... 100 %

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#### Configuration settings - Equipment components

Integration of switchable constant volume flows

not configured

Integration of switchable variable volume flows

not configured

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## Configuration settings - Equipment components

Alarm Sash monitoring EN 14175

Release - caused by

Direction of switch contact

Switching input DI1

Make contact = Activates function

Fume scrubber

not configured

Supportive flow technology

not configured

Automatic sash device (Third-party supplier)

not configured

Motion detector

not configured

Smoke extraction / Temperature alarm

not configured

Operation mode dependent relay switching

Switching caused by

Switching output DO4 and DO5

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## Function test

Test the volume flow measure point and zero point adjustment	not done
Test the volume flow alarm	OK
Test the volume flow setpoints	
Shut off mode	
Damper position	0 %
Volume flow setpoint	0 m <sup>3</sup> /h
Current volume flow	0 m <sup>3</sup> /h
Low mode	
Damper position	37 %
Volume flow setpoint	202 m <sup>3</sup> /h
Current volume flow	220 m <sup>3</sup> /h
High mode	
Damper position	69 %
Volume flow setpoint	652 m <sup>3</sup> /h
Current volume flow	626 m <sup>3</sup> /h
Standard mode Vmin	
Damper position	33 %
Volume flow setpoint	202 m <sup>3</sup> /h
Current volume flow	202 m <sup>3</sup> /h
Standard mode Vmax	
Damper position	69 %
Volume flow setpoint	652 m <sup>3</sup> /h
Current volume flow	619 m <sup>3</sup> /h
Test setpoint of face velocity	
Current face velocity	0.20 m/s
Test the 500mm-alarm	not done
Test the 'Smoke extraction - alarm only'	not done
Test the alarm 'Supportive flow technology'	not done
Reset service interval	not done
Comment	

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EASYLAB - Commissioning protocol

Date of creation	7/25/2024
Created via EasyConnect	Version 11.0.0.0
Created by user-ID	2281
<b>General device information</b>	
Device functionality	Room exhaust controller within exhaust air controlled system
Device name	Wywiew / Pom. Z 0 12c / DE17540230070
Device-ID	0
Device status	Original equipment
Serial Number	120249
Total operating time	3 days
<b>Basic device</b>	
Hardware-name	TCU3
Hardware-version	3.0
Software-name	EASYLAB TCU3
Software-version	9.0
<b>Device expansions</b>	
Expansion slot 1	not used
Connector socket X2	not used
Connector socket X3	not used
Terminal 3	not used
Expansion module EM-AUTOZERO	not present
Expansion module EM-TRF-USV	not present

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## Configuration settings

### Basic technical data

C-value	9.4 based on l/s
Technical Vmin	83 m³/h
Technical Vnominal	580 m³/h
Volume flow registration	
Transmitter typ	internal volume flow transmitter on AI1
Characteristic for AI1	0.51 ... 4.51 V equals 0 ... 300 Pa
Signal smoothing	50

### Volume flow control

Volume flow split-up if several room controllers	automatic
Fraction in Standard mode at manual split-up	50 %
Fraction in Low mode at manual split-up	50 %
Fraction in High mode at manual split-up	50 %
Control settings	
Control tolerance - relative	4.0 %
Control tolerance - absolute	14 m³/h
Preset the limit to reach the maximum actuating value	automatic
Open damper - minimum actuating variable	0.10
Open damper - maximum actuating variable	5.00
Close damper - minimum actuating variable	0.15
Close damper - maximum actuating variable	2.00

## Configuration settings

### Alarm settings

Category 1 (UPS Battery operation)	activated
Category 2 (control functions)	
Monitoring - Volume flow (labour mode)	activated
Volume flow monitoring (Low mode)	not configured
Alarm delay time	12 s
Category 3 (Hardware failure)	activated

### UPS function

normal controller action

### Analogue outputs

Function AO1	Current volume flow
Characteristic	2.00 ... 10.00 V equals 0 ... 580 m³/h
Function AO2	Total exhaust air
Characteristic	2.00 ... 10.00 V equals 0 ... 0 m³/h
Function AO3	Damper position
Characteristic	2.00 ... 10.00 V equals 0 ... 100 %
Function AO4	Actuator
Characteristic	2.00 ... 9.00 V equals 0 ... 100 %

DOKUMENTACJA  
POWYKONAWCZA

#### Configuration settings - Equipment components

Integration of switchable constant volume flows

not configured

Integration of switchable variable volume flows

not configured

DOKUMENTACJA  
POWYKONAWCZA

### Configuration settings - Equipment components

Room mode dependent relay switching

not configured

Room-Management-Function (RMF)

not configured

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## EASYLAB - Commissioning protocol

Date of creation	7/25/2024
Created via EasyConnect	Version 11.0.0.0
Created by user-ID	2281

### General device information

Device functionality	Room supply controller within exhaust air controlled system
Device name	Nawiew / Pom. Z 0 12c / DE15785720050
Device-ID	0
Device status	Original equipment
Serial Number	107616
Total operating time	3 days

### Basic device

Hardware-name	TCU3
Hardware-version	3.0
Software-name	EASYLAB TCU3
Software-version	9.0

### Device expansions

Expansion slot 1	
Hardware-name	EM-BAC-MOD-01
Hardware-version	1.0
Software-name	EASYLAB BACnet MS/TP
Software-version	4.1
Connector socket X2	not used
Connector socket X3	not used
Terminal 3	not used
Expansion module EM-AUTOZERO	existing
Expansion module EM-TRF-USV	not present

DOKUMENTACJA  
POWYKONAWCZA

## Configuration settings

### Basic technical data

C-value	41.9 based on l/s
Technical Vmin	317 m³/h
Technical Vnominal	2293 m³/h
Volume flow registration	
Transmitter typ	internal volume flow transmitter on AI1
Characteristic for AI1	0.52 ... 4.52 V equals 0 ... 300 Pa
Signal smoothing	50

### Volume flow control

Volume flow split-up if several room controllers	automatic
Fraction in Standard mode at manual split-up	50 %
Fraction in Low mode at manual split-up	50 %
Fraction in High mode at manual split-up	50 %
Control settings	
Control tolerance - relative	4.0 %
Control tolerance - absolute	14 m³/h
Preset the limit to reach the maximum actuating value	automatic
Open damper - minimum actuating variable	0.10
Open damper - maximum actuating variable	5.00
Close damper - minimum actuating variable	0.15
Close damper - maximum actuating variable	2.00

## Configuration settings

### Alarm settings

Category 1 (UPS Battery operation)	activated
Category 2 (control functions)	
Monitoring - Volume flow (labour mode)	activated
Volume flow monitoring (Low mode)	not configured
Alarm delay time	12 s
Category 3 (Hardware failure)	activated

### UPS function

normal controller action

### Analogue outputs

Function AO1	Current volume flow
Characteristic	2.00 ... 10.00 V equals 0 ... 2293 m³/h
Function AO2	Total exhaust air
Characteristic	2.00 ... 10.00 V equals 0 ... 0 m³/h
Function AO3	Damper position
Characteristic	2.00 ... 10.00 V equals 0 ... 100 %
Function AO4	Actuator
Characteristic	2.00 ... 9.00 V equals 0 ... 100 %

DOCUMENTACJA  
POWYKONANCA

#### Configuration settings - Equipment components

Integration of switchable constant volume flows

not configured

Integration of switchable variable volume flows

not configured

DOKUMENTACJA  
POWYKONAWCZA

#### Configuration settings - Equipment components

Room mode dependent relay switching	not configured
Diffusor volume flow optimisation	not configured
Room-Management-Function (RMF)	activated

DOKUMENTACJA  
POWYKONAWCZA

### Configuration settings - RMF

#### Volume flow settings for the room

Minimum total exhaust air at High mode	540 m³/h
Minimum total exhaust air at Standard mode	540 m³/h
Minimum total exhaust air at Low mode	540 m³/h
Total amount unmeasured Constant exhaust air	202 m³/h
Total amount unmeasured Constant supply air	0 m³/h
Split-up for Exhaust air volume flows	automatic
Split-up the supply air volume flows	automatic
Supply-Exhaust air balance	0 m³/h

#### Alarm settings for the room

Alarms based on category 1 (Smoke extraction, UPS battery operation)	activated
Alarms based on category 2 (control functions)	
Monitoring - Labour mode	activated
Monitoring - Low mode	not configured
Alarms based on category 3 (hardware-failure)	activated
Monitoring - Diversity limit exceeded	activated
Monitoring - Minimum Total exhaust air too low	
Tolerance	10.0 %
Delay time	15 s

DOKUMENTACJA  
POWYKONAWCZA

**Configuration settings - RMF**

Support Room control panel	not configured
Sun blinder control	not configured
Room operation mode preset via switching inputs (DI)	not configured
Shut off for all room exhaust controller within Low Mode	not configured
Diversity Monitoring / Diversity control	not configured
External volume flow shift	not configured

DOCUMENT  
POWYKŁADOWY

## Configuration settings - RMF

Pressure control

not configured

Room exhaust air optimisation

Sum of technical Vmin of all Room exhaust air controller

90 m<sup>3</sup>/h

Tolerance

10 %

Delay time

0 s

DOKUMENTACJA  
POWYKONAWCZA

**Configuration settings - RMF**

Room reactivation

not configured

DOKUMENTACJA  
POWYKONAWCZA



**EASYLAB - Commissioning protocol**

Date of creation	7/25/2024
Created via EasyConnect	Version 11.0.0.0
Created by user-ID	2281
<b>General device information</b>	
Device functionality	Fume cupboard controller
Device name	Dygestorium / Pom. Z -1 09 / DE17540230010
Device-ID	0
Device status	Original equipment
Serial Number	119500
Total operating time	0 days
Period since last service	0 days
<b>Basic device</b>	
Hardware-name	TCU3
Hardware-version	3.0
Software-name	EASYLAB TCU3
Software-version	9.0
<b>Device expansions</b>	
Expansion slot 1	not used
Connector socket X2	not used
Connector socket X3	
Hardware-name	BE-SEG-02
Hardware-version	2.0
Software-name	EASYLAB BE-SEG-02
Software-version	1.1
Terminal 3	not used
Expansion module EM-AUTOZERO	not present
Expansion module EM-TRF-USV	not present

DOKUMENTACJA  
POWYKONAWCZA

## Configuration settings

### Basic technical data

C-value	25.4 based on l/s
Technical Vmin	194 m³/h
Technical Vnominal	1411 m³/h
Volume flow registration	
Transmitter typ	internal volume flow transmitter on AI1
Characteristic for AI1	0.50 ... 4.50 V equals 0 ... 300 Pa
Signal smoothing	50

### Volume flow control

Control concept	FH-VS
Volume flow set values	
Standard mode Vmin	202 m³/h
Standard mode Vmax	601 m³/h
High mode	601 m³/h
Low mode	202 m³/h
Consider diversity control	activated

### Face velocity

Setpoint	0.50 m/s
Tolerance range (+/-)	0.10 m/s
Characteristic for AI5	2.00 ... 10.00 V equals 0.00 ... 1.00 m/s
Signal smoothing	50
Time target - Setpoint adaption open sash	3 s
Time target - Setpoint adaption close sash	10 s

### Control settings

Control tolerance - relative	4.0 %
Control tolerance - absolute	14 m³/h
Preset the limit to reach the maximum actuating value	automatic
Open damper - minimum actuating variable	0.10
Open damper - maximum actuating variable	5.00
Close damper - minimum actuating variable	0.15
Close damper - maximum actuating variable	2.00

DOKUMENTACJA  
POWYKONAWCZA

## Configuration settings

### Alarm settings

Optical alarm (BE)	continuous
Acoustic alarm (BE)	limited to 15 s
Acoustic alarm (BE) - Sash monitoring	off
Optical alarm (BE) - Sash monitoring	not configured
Category 1 (Smoke extraction / UPS Battery operation)	activated
Category 2 (control functions)	
Monitoring - Volume flow (labour mode)	activated
Volume flow monitoring (Low mode)	not configured
Alarm delay time	12 s
Monitoring - Face velocity (labour mode)	not configured
Category 3 (Hardware failure)	activated

### Service interval

Specified service period	365 days
Signaling at end of service interval	not configured

### UPS function

normal controller action

### Control panel

Key - High mode	unlimited
Key - Low mode	activated
Key - Shut off mode	activated
Key - Fume cupboard light	activated
Switch off when activating Low mode, Shut off mode	not configured
Key - Hand mode	not configured
ECO-Display (BE-SEG-02)	not configured
Display options	
Display language	English
Display volume flow setpoint and current value	activated
Volume flow unit	m <sup>3</sup> /h
Display current face velocity value	not configured
Display actual volume flow (BE-SEG-02)	not configured
Display actual face velocity (BE-SEG-02)	not configured

DOKUMENTACJA  
POWYKONAWCZA

## Configuration settings

### Operation mode presets

#### Room operation mode presets

#### Modification of room operation mode

High mode is changed to Standard mode

Low mode is changed to Standard mode

Shut off mode is changed to Standard mode

Low mode is changed to Shut off mode

Standard mode is changed to Shut off mode

will be overtaken

not configured

not configured

not configured

not configured

not configured

### Analogue outputs

#### Function AO1

#### Characteristic

#### Function AO2

#### Characteristic

#### Function AO3

#### Characteristic

#### Function AO4

#### Characteristic

Current volume flow

2.00 ... 10.00 V equals 0 ... 1411 m<sup>3</sup>/h

Total exhaust air

2.00 ... 10.00 V equals 0 ... 0 m<sup>3</sup>/h

Damper position

2.00 ... 10.00 V equals 0 ... 100 %

Actuator

2.00 ... 9.00 V equals 0 ... 100 %

DOKUMENTACJA  
POWŁOKOWANCA

#### Configuration settings - Equipment components

Integration of switchable constant volume flows

not configured

Integration of switchable variable volume flows

not configured

DOKUMENTACJA  
POWYKONAWCZA

### Configuration settings - Equipment components

Alarm Sash monitoring EN 14175

Release - caused by

Direction of switch contact

Switching input DI1

Make contact = Activates function

Fume scrubber

not configured

Supportive flow technology

not configured

Automatic sash device (Third-party supplier)

not configured

Motion detector

not configured

Smoke extraction / Temperature alarm

not configured

Operation mode dependent relay switching

Switching caused by

Switching output DO4 and DO5

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POWYKONAWCZA

### Function test

Test the volume flow measure point and zero point adjustment	done
Test the volume flow alarm	not done
Test the volume flow setpoints	
Shut off mode	not done
Low mode	not done
High mode	not done
Standard mode Vmin	not done
Standard mode Vmax	not done
Test setpoint of face velocity	not done
Test the 500mm-alarm	not done
Test the 'Smoke extraction - alarm only'	not done
Test the alarm 'Supportive flow technology'	not done
Reset service interval	not done
Comment	

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POWYKONAWCZA

## EASYLAB - Commissioning protocol

Date of creation	7/25/2024
Created via EasyConnect	Version 11.0.0.0
Created by user-ID	2281

### General device information

Device functionality	Room exhaust controller within exhaust air controlled system
Device name	Wywiew / pom. Z -1 09 / DE15785720030
Device-ID	0
Device status	Original equipment
Serial Number	107818
Total operating time	0 days

### Basic device

Hardware-name	TCU3
Hardware-version	3.0
Software-name	EASYLAB TCU3
Software-version	9.0

### Device expansions

Expansion slot 1	not used
Connector socket X2	not used
Connector socket X3	not used
Terminal 3	not used
Expansion module EM-AUTOZERO	existing
Expansion module EM-TRF-USV	not present

DOKUMENTACJA  
POWYKONAWCZA



## Configuration settings

### Basic technical data

C-value	42.5 based on l/s
Technical Vmin	317 m³/h
Technical Vnominal	2293 m³/h
Volume flow registration	
Transmitter typ	internal volume flow transmitter on AI1
Characteristic for AI1	0.52 ... 4.52 V equals 0 ... 300 Pa
Signal smoothing	50

### Volume flow control

Volume flow split-up if several room controllers	automatic
Fraction in Standard mode at manual split-up	50 %
Fraction in Low mode at manual split-up	50 %
Fraction in High mode at manual split-up	50 %

### Control settings

Control tolerance - relative	4.0 %
Control tolerance - absolute	14 m³/h
Preset the limit to reach the maximum actuating value	automatic
Open damper - minimum actuating variable	0.10
Open damper - maximum actuating variable	5.00
Close damper - minimum actuating variable	0.15
Close damper - maximum actuating variable	2.00

## Configuration settings

### Alarm settings

Category 1 (UPS Battery operation)	activated
Category 2 (control functions)	
Monitoring - Volume flow (labour mode)	activated
Volume flow monitoring (Low mode)	not configured
Alarm delay time	12 s
Category 3 (Hardware failure)	activated

### UPS function

normal controller action

### Analogue outputs

Function AO1	Current volume flow
Characteristic	2.00 ... 10.00 V equals 0 ... 2293 m³/h
Function AO2	Total exhaust air
Characteristic	2.00 ... 10.00 V equals 0 ... 0 m³/h
Function AO3	Damper position
Characteristic	2.00 ... 10.00 V equals 0 ... 100 %
Function AO4	Actuator
Characteristic	2.00 ... 9.00 V equals 0 ... 100 %

DOKUMENTACJA  
POWYKONAWCZA

#### Configuration settings - Equipment components

Integration of switchable constant volume flows

not configured

Integration of switchable variable volume flows

not configured

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POWYKONAWCZA

#### Configuration settings - Equipment components

Room mode dependent relay switching

not configured

Room-Management-Function (RMF)

not configured

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POWYKONAWCZA

## EASYLAB - Commissioning protocol

Date of creation	7/25/2024
Created via EasyConnect	Version 11.0.0.0
Created by user-ID	2281

### General device information

Device functionality	Room supply controller within exhaust air controlled system
Device name	Nawiew / Pom. Z -1 09 / DE17540230030
Device-ID	0
Device status	Original equipment
Serial Number	120236
Total operating time	0 days

### Basic device

Hardware-name	TCU3
Hardware-version	3.0
Software-name	EASYLAB TCU3
Software-version	9.0

### Device expansions

Expansion slot 1	
Hardware-name	EM-BAC-MOD-01
Hardware-version	1.0
Software-name	EASYLAB BACnet MS/TP
Software-version	4.1
Connector socket X2	not used
Connector socket X3	not used
Terminal 3	not used
Expansion module EM-AUTOZERO	not present
Expansion module EM-TRF-USV	not present

DOKUMENTACJA  
POWYKONAWCZA

## Configuration settings

### Basic technical data

C-value	41.4 based on l/s
Technical Vmin	317 m³/h
Technical Vnominal	2293 m³/h
Volume flow registration	
Transmitter typ	internal volume flow transmitter on AI1
Characteristic for AI1	0.50 ... 4.50 V equals 0 ... 300 Pa
Signal smoothing	50

### Volume flow control

Volume flow split-up if several room controllers	automatic
Fraction in Standard mode at manual split-up	50 %
Fraction in Low mode at manual split-up	50 %
Fraction in High mode at manual split-up	50 %

### Control settings

Control tolerance - relative	4.0 %
Control tolerance - absolute	14 m³/h
Preset the limit to reach the maximum actuating value	automatic
Open damper - minimum actuating variable	0.10
Open damper - maximum actuating variable	5.00
Close damper - minimum actuating variable	0.15
Close damper - maximum actuating variable	2.00

## Configuration settings

### Alarm settings

Category 1 (UPS Battery operation)	activated
Category 2 (control functions)	
Monitoring - Volume flow (labour mode)	activated
Volume flow monitoring (Low mode)	not configured
Alarm delay time	12 s
Category 3 (Hardware failure)	activated

### UPS function

normal controller action

### Analogue outputs

Function AO1	Current volume flow
Characteristic	2.00 ... 10.00 V equals 0 ... 2293 m³/h
Function AO2	Total exhaust air
Characteristic	2.00 ... 10.00 V equals 0 ... 0 m³/h
Function AO3	Damper position
Characteristic	2.00 ... 10.00 V equals 0 ... 100 %
Function AO4	Actuator
Characteristic	2.00 ... 9.00 V equals 0 ... 100 %

DOKUMENTACJA  
POWYKONAWCZA

#### Configuration settings - Equipment components

Integration of switchable constant volume flows

not configured

Integration of switchable variable volume flows

not configured

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POWYKONAWCZA

### Configuration settings - Equipment components

Room mode dependent relay switching

not configured

Diffusor volume flow optimisation

not configured

Room-Management-Function (RMF)

activated

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POWYKONAWCZA

### Configuration settings - RMF

#### Volume flow settings for the room

Minimum total exhaust air at High mode	1001 m <sup>3</sup> /h
Minimum total exhaust air at Standard mode	1001 m <sup>3</sup> /h
Minimum total exhaust air at Low mode	1001 m <sup>3</sup> /h
Total amount unmeasured Constant exhaust air	101 m <sup>3</sup> /h
Total amount unmeasured Constant supply air	0 m <sup>3</sup> /h
Split-up for Exhaust air volume flows	automatic
Split-up the supply air volume flows	automatic
Supply-Exhaust air balance	0 m <sup>3</sup> /h

#### Alarm settings for the room

Optical alarm (RBE)	continuous
Acoustic alarm (RBE)	limited to 15 s
Alarms based on category 1 (Smoke extraction, UPS battery operation)	activated
Alarms based on category 2 (control functions)	
Monitoring - Labour mode	activated
Monitoring - Low mode	not configured
Alarms based on category 3 (hardware-failure)	activated
Monitoring - Diversity limit exceeded	activated
Monitoring - Minimum Total exhaust air too low	
Tolerance	10.0 %
Delay time	15 s

DOKUMENTACJA  
POWYKONAWCZA



## Configuration settings - RMF

### Support Room control panel

Key - High mode	not configured
Key - Low mode	not configured
Key - Shut off mode	not configured
Key switch function (DO2)	not configured
Key - Hand mode	not configured

### Display options

Display language	Alternative language
Display current room volume flow values	activated
Volume flow unit	m <sup>3</sup> /h

### Sun blinder control

not configured

### Room operation mode preset via switching inputs (DI)

Preset via DI 1	not configured
Preset via DI 2	
Direction of switch contact	Make contact = Activates function
Function	Shut off mode
Preset via DI 3	
Direction of switch contact	Make contact = Activates function
Function	Low mode
Preset via DI 4	
Direction of switch contact	Make contact = Activates function
Function	High mode
Preset via DI 5	not configured
Preset via DI 6	not configured
Behaviour at invalid room operation mode preset	Force Standard mode

### Shut off for all room exhaust controller within Low Mode

not configured

### Diversity Monitoring / Diversity control

not configured

### External volume flow shift

not configured

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POWYKONAWCZA

## Configuration settings - RMF

Pressure control

not configured

Room exhaust air optimisation

not configured

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POWYKONAWCZA

**Configuration settings - RMF**

Room reactivation

not configured

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POWYKONAWCZA

## PROTOKÓŁ POMIAROWY UKŁADU WENTYLACJI MECHANICZNEJ

### Informacje ogólne:

Generalny Wykonawca:

**BAUDZIEDZIC Sp. z o.o.**

ul. Lotniskowa 8, 36-060 Głogów Małopolski

Stanisław Kielbicki – Kierownik Budowy

Inwestor:

**Akademia Górniczo-Hutnicza Im. Stanisława Staszica w Krakowie.**

al. Mickiewicza 30, 30-059 Kraków

Paweł Brzeźny – Inspektor nadzoru

Wykonawca:

**NOVA SERVICE Sp. z o.o.**

ul. Powstańców 20/LU9, 31-422 Kraków

Tomasz Kamiński – Kierownik Robót

Obiekt:

Rozbudowa budynku S-1 o zachodnie i wschodnie skrzydło w ramach inwestycji pn. „Rozbudowa i nadbudowa budynku S-1 wraz z infrastrukturą wewnętrzną obejmującą instalacje: elektryczną, sanitarną ( wentylacja mechaniczna, klimatyzacja, instalacje grzewcze, instalacje wodne, instalacje kanalizacji opadowej, sanitarnej i technicznej ), gazów technicznych i zewnętrzna obejmującą: kanalizację kablowej elektrycznej SN i NN, kanalizację kablowej technicznej, wodociągowej, kanalizacji opadowej z retencją, sanitarnej i ogólnospławnej, gazowej i pomp ciepła oraz przebudowę sieci ciepłowniczej i przyłącza gazu kolidujących z inwestycją” – skrzydło zachodnie usytuowany w Krakowie przy ul. Władysława Reymonta działka Nr 19/47”

Dane techniczne instalacji:

Rodzaj przewodów: stalowe ocynkowane o przekroju kołowym i prostokątnym w klasie szczelności A

Lokalizacja:

Cały obiekt.

Przedmiot opracowania i metodyka pomiarów:

Przedmiotem opracowania jest zestawienie wyników pomiarowych wydajności wentylacji mechanicznej. Dokumentację opracowano zgodnie z normą PN-EN 12599.

Pomiary i regulację przeprowadzono przy użyciu anemometru LCA301.  
Certyfikaty na w/w urządzenia pomiarowe załączono do dokumentacji.  
Zgodnie z normą PN-EN 12599, wydajność systemu wentylacyjnego:  
 $\pm 15\%$  wartości projektowych w pojedynczym pomieszczeniu.  
 $\pm 10\%$  wartości projektowych.

Uwagi:

Instalacja wentylacji mechanicznej jest sprawna i nadaje się do eksploatacji

Załącznik:

1. Tabela pomiarów wydatków powietrza w punktach nawiewnych i wywiewnych
2. Certyfikat kalibracji anemometru i balometru

### Podpisy komisji:

KIEROWNIK BUDOWY

INSPEKTOR NAZDORU

WYKONAWCA



KIEROWNIK BUDOWY

Stanisław Kielbicki  
upr. bud. B-236/90

INSPEKTOR NAZDORU

mgr inż. Paweł Brzeźny  
upr. bud. nr MAP/0092/PW08/06

mgr inż. Tomasz Kamiński  
Uprawnienia budowlane do kierowania robotami  
budowlanymi w specjalności instalacyjnej w zakresie sieci  
instalacji i urządzeń cieplnych, wentylacyjnych, gazowych,  
wodociągowych i kanalizacyjnych bez ograniczeń  
nr uprawnień MAP/0350/WBS/21

Data podpisania protokołu: 25.06.2024

**DOKUMENTACJA  
POWYKONAWCZA**





# CERTIFICATE OF CALIBRATION AND TESTING

TSI Instruments Ltd, Stirling Road, Cressex Business Park  
High Wycombe Bucks HP12 3ST England  
Tel: (Int +44) (UK 0) 1494 459200 Fax: (Int +44) (UK 0) 1494 459700 <http://www.tsiinc.co.uk>

ENVIRONMENT CONDITIONS			MODEL	5725
TEMPERATURE	20.6	°C	SERIAL NUMBER	T57252219004
RELATIVE HUMIDITY	42.31	%RH		
BAROMETRIC PRESSURE	1003.4	hPa		
<input checked="" type="checkbox"/> AS LEFT			<input checked="" type="checkbox"/> IN TOLERANCE	
<input type="checkbox"/> AS FOUND			<input type="checkbox"/> OUT OF TOLERANCE	

## - CALIBRATION VERIFICATION RESULTS -

VELOCITY				SYSTEM RV02-01				Unit: m/s
#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE	
1	0.51	0.50	0.48~0.53	5	5.06	5.10	4.99~5.14	
2	0.76	0.76	0.73~0.79	6	7.62	7.70	7.52~7.72	
3	1.01	1.01	0.98~1.04	7	15.24	15.26	15.07~15.41	
4	2.54	2.56	2.49~2.59	8	30.46	30.46	30.13~30.78	

TEMPERATURE				SYSTEM RV02-01				Unit: °C
#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE	
1	20.6	20.7	19.5~21.7					

TSI does hereby certify that the above described instrument conforms to the original manufacturer's specification (not applicable to As Found data) and has been calibrated using standards whose accuracies are traceable to members of the European co-operation for Accreditation (EA) (for example: UKAS, SWEDAC, DAkkS) or has been verified with respect to instrumentation whose accuracy is traceable to some member of EA, or is derived from accepted values of physical constants. TSI's calibration system is registered to ISO-9001:2015.

Measurement Variable	System ID	Last Cal.	Cal. Due	Measurement Variable	System ID	Last Cal.	Cal. Due
Pressure	E006005	08-02-22	08-02-23	DC Voltage	E006009	08-02-22	08-02-23
Pressure	E006024	08-02-22	08-02-23	Temperature	E006102	01-02-22	01-02-23
Velocity	E006251	15-02-22	15-02-23				

P. McBAIN

CALIBRATED

04 JUL 2022

DATE

Dcc. ID: CERT\_DEFAULT

Dystrybutor w Polsce  
+48 12 3767051  
[www.iBros.pl](http://www.iBros.pl)

DOKUMENTACJA  
POWYKONAWCZA





## CERTIFICATE OF CALIBRATION

TSI Instruments Ltd., Stirling Road, Cressex Business Park,  
High Wycombe, Bucks HP12 3RT England  
Tel: (Int +44)(UK 0) 1494 459200 Fax: (Int +44)(UK 0) 1494 459700  
<http://www.tsiinc.co.uk>

ENVIRONMENT CONDITION		
TEMPERATURE	20.1	° C
RELATIVE HUMIDITY	49.0	% RH
BAROMETRIC PRESSURE	1005	hPa

MODEL	PROHOOD™ PH731
SERIAL NO.	PH7311412032

CALIBRATION STANDARDS USED
Capture Hood Calibration System UK I

<input checked="" type="checkbox"/> AS LEFT	<input checked="" type="checkbox"/> IN TOLERANCE
<input type="checkbox"/> AS FOUND	<input type="checkbox"/> OUT OF TOLERANCE

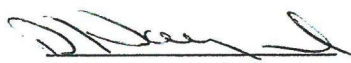
CALIBRATION DATA						
Tolerance: $\pm$ ( 3% of reading + 3.3 l/s )						
TESTING POINTS	SUPPLY DATA MEASURED IN l/s			RETURN DATA MEASURED IN l/s		
	CALIBRATION STANDARD	INSTRUMENT OUTPUT	ALLOWABLE RANGE	CALIBRATION STANDARD	INSTRUMENT OUTPUT	ALLOWABLE RANGE
1	896	920	866 ~ 926	898	886	868 ~ 928
2	707	718	683 ~ 731	707	701	683 ~ 731
3	567	572	547 ~ 587	566	561	546 ~ 586
4	422	425	407 ~ 437	423	423	408 ~ 438
5	283	285	272 ~ 294	284	286	273 ~ 295
6	142	142	135 ~ 149	142	142	135 ~ 149
7	47	48	43 ~ 51	47	48	43 ~ 51

\* Indicates out of tolerance condition

TSI does hereby certify that the above described instrument conforms to the original manufacturer's specification (not applicable to As Found data) and has been calibrated using standards whose accuracies are traceable to members of the European co-operation for Accreditation (EA) for example: UKAS, SWEDAC, DAkkS) or has been verified with respect to instrumentation whose accuracy is traceable to some member of EA, or is derived from accepted values of physical constants. TSI's calibration system meets ISO-9001:2008 and meets the requirements of ISO 10012:2003.

Measurement Variable	System ID Number	Date Last Calibrated	Calibration Due Date
DC Voltage	E006072	05-01-18	05-01-19
Thermometer	E006103	05-02-18	05-02-19
Pressure	E006155	05-01-18	05-01-19
Pressure	E006095	05-01-18	05-01-19
Flow	E004015	08-14-15	08-14-18
Flow	E004017	08-12-15	08-12-19
Flow	E006061	05-01-18	05-01-19

Calibration procedure used: 9011156

  
Calibrated By

Jun. 28, 2018

Calibration Date

1083503A

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POWYKONAWCZA



## CERTIFICATE OF CALIBRATION

TSI Instruments Ltd., Stirling Road, Cressex Business Park,  
High Wycombe, Bucks HP12 3RT England  
Tel: (Int +44)(UK 0) 1494 459200 Fax: (Int +44)(UK 0) 1494 459700  
[http:// www.tsiinc.co.uk](http://www.tsiinc.co.uk)

ENVIRONMENT CONDITION		
TEMPERATURE	20.1	° C
RELATIVE HUMIDITY	49.0	% RH
BAROMETRIC PRESSURE	1005	hPa

MODEL	PROHOOD™ PH731
SERIAL NO.	PH7311412032

CALIBRATION STANDARDS USED
Capture Hood Calibration System UK1

<input checked="" type="checkbox"/> AS LEFT	<input checked="" type="checkbox"/> IN TOLERANCE
<input type="checkbox"/> AS FOUND	<input type="checkbox"/> OUT OF TOLERANCE

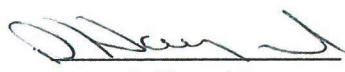
CALIBRATION DATA						
Tolerance: $\pm$ ( 3% of reading + 11.9 m <sup>3</sup> /h )						
TESTING POINTS	SUPPLY DATA MEASURED IN m <sup>3</sup> /h			RETURN DATA MEASURED IN m <sup>3</sup> /h		
	CALIBRATION STANDARD	INSTRUMENT OUTPUT	ALLOWABLE RANGE	CALIBRATION STANDARD	INSTRUMENT OUTPUT	ALLOWABLE RANGE
1	3226	3311	3118 ~ 3334	3232	3191	3124 ~ 3340
2	2547	2586	2459 ~ 2635	2545	2523	2457 ~ 2633
3	2042	2061	1969 ~ 2115	2037	2018	1964 ~ 2110
4	1519	1531	1462 ~ 1576	1524	1522	1467 ~ 1581
5	1019	1025	977 ~ 1061	1021	1031	979 ~ 1063
6	511	510	484 ~ 538	511	510	484 ~ 538
7	168	172	152 ~ 184	170	173	154 ~ 186

\* Indicates out of tolerance condition

TSI does hereby certify that the above described instrument conforms to the original manufacturer's specification (not applicable to As Found data) and has been calibrated using standards whose accuracies are traceable to members of the European co-operation for Accreditation (EA) for example: UKAS, SWEDAC, DAkkS) or has been verified with respect to instrumentation whose accuracy is traceable to some member of EA, or is derived from accepted values of physical constants. TSI's calibration system meets ISO-9001:2008 and meets the requirements of ISO 10012:2003.

Measurement Variable	System ID Number	Date Last Calibrated	Calibration Due Date
DC Voltage	E006072	05-01-18	05-01-19
Thermometer	E006103	05-02-18	05-02-19
Pressure	E006155	05-01-18	05-01-19
Pressure	E006095	05-01-18	05-01-19
Flow	E004015	08-14-15	08-14-18
Flow	E004017	08-12-15	08-12-19
Flow	E006061	05-01-18	05-01-19

Calibration procedure used: 9011156

  
Calibrated By

Jun. 28, 2018

Calibration Date

1083503A

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POWYKONAWCZA





# CERTIFICATE OF CALIBRATION

TSI Instruments Ltd, Stirling Road, Cressex Business Park

High Wycombe, Bucks HP12 3ST, United Kingdom

TEL: (INT +44) (UK 0) 1494 459200 FAX: (INT +44) (UK 0) 1494 459700 <http://www.tsiinc.co.uk>

ENVIRONMENT CONDITION		
TEMPERATURE	20.2	° C
RELATIVE HUMIDITY	51.0	% RH
BAROMETRIC PRESSURE	1009	hPa

MODEL	Micromanometer PH731
SERIAL NO.	PH7311412032

CALIBRATION STANDARDS USED
Manometer Calibration Bench PRESSURE02-02

<input checked="" type="checkbox"/> AS LEFT	<input checked="" type="checkbox"/> IN TOLERANCE
<input type="checkbox"/> AS FOUND	<input type="checkbox"/> OUT OF TOLERANCE

CALIBRATION DATA						
TESTING POINTS	BAROMETRIC PRESSURE MEASURED IN hPa			DIFFERENTIAL PRESSURE MEASURED IN Pa		
	CALIBRATION STANDARD	INSTRUMENT OUTPUT	ALLOWABLE RANGE	CALIBRATION STANDARD	INSTRUMENT OUTPUT	ALLOWABLE RANGE
1	691	690	677 ~ 705	24.11	24.36	23.60 ~ 24.62
2	1010	1010	990 ~ 1030	123	123	121 ~ 125
3	1164	1164	1141 ~ 1187	722	725	708 ~ 736
4	-	-	-	2914	2914	2856 ~ 2972
5	-	-	-	3637	3637	3564 ~ 3710

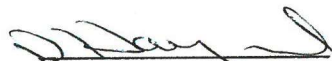
TESTING POINTS	TEMPERATURE MEASURED IN °C		
	CALIBRATION STANDARD	INSTRUMENT OUTPUT	ALLOWABLE RANGE
1	-15.0	-15.0	-14.7 ~ -15.3
2	25.0	24.9	24.7 ~ 25.3
3	70.0	69.9	69.7 ~ 70.3

\* Indicates out of tolerance condition

TSI does hereby certify that the above described instrument conforms to the original manufacturer's specification (not applicable to As Found data) and has been calibrated using standards whose accuracies are traceable to members of the European co-operation for Accreditation (EA) (for example: UKAS, SWEDAC, DAkkS) or has been verified with respect to instrumentation whose accuracy is traceable to some member of EA, or is derived from accepted values of physical constants. TSI's calibration system meets ISO-9001:2015.

Measurement Variable	System ID Number	Date Last Calibrated	Calibration Due Date
DC Voltage	E006185	05-01-18	05-01-19
DC Voltage	E006188	03-26-18	03-26-19
Pressure	E006187	05-02-18	05-02-19
Pressure	E006193	05-01-18	05-01-19

Calibration procedure used: 9011158A

  
Calibrated By

Jun. 28, 2018

Calibration Date

1083501A

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Tabela 1. - Wyniki pomiarów wydatków powietrza w punktach pomiarowych

nr	Kondygnacja	Punkt pomiarowy	NAWIEW			WYWIEW			UWAGI
			Wydajność projektowa [m <sup>3</sup> /h]	Wydajność zmierzona [m <sup>3</sup> /h]	Odchyłka [%]	Wydajność projektowa [m <sup>3</sup> /h]	Wydajność zmierzona [m <sup>3</sup> /h]	Odchyłka [%]	
1.	-1	N1	130	110	-15	-	-	-	system SZ-N-CNW-02
2.	-1	N2	280	244	-13	-	-	-	system SZ-N-CNW-02
3.	-1	N3	280	313	12	-	-	-	system SZ-N-CNW-02
4.	-1	N4	280	320	14	-	-	-	system SZ-N-CNW-02
5.	-1	N5	280	245	-13	-	-	-	system SZ-N-CNW-02
6.	-1	N6	180	205	14	-	-	-	system SZ-N-CNW-02
7.	-1	N7	350	300	-14	-	-	-	system SZ-N-CNW-02
8.	-1	N8	40	45	13	-	-	-	system SZ-N-CNW-02
9.	-1	N9	340	290	-15	-	-	-	system SZ-N-CNW-02
10.	-1	N10	112	98	-13	-	-	-	system SZ-N-CNW-02
11.	-1	N11	113	102	-10	-	-	-	system SZ-N-CNW-02
12.	-1	N12	113	101	-11	-	-	-	system SZ-N-CNW-02
13.	-1	N13	112	99	-12	-	-	-	system SZ-N-CNW-02
14.	-1	N14	113	98	-13	-	-	-	system SZ-N-CNW-02
15.	-1	N15	112	125	12	-	-	-	system SZ-N-CNW-02
16.	-1	N16	113	129	14	-	-	-	system SZ-N-CNW-02
17.	-1	N17	112	130	16	-	-	-	system SZ-N-CNW-02
18.	-1	W1	-	-	-	130	113,00	-13	system SZ-W-CNW-02
19.	-1	W2	-	-	-	450	395	-12	system SZ-W-CNW-02
20.	-1	W3	-	-	-	450	393	-13	system SZ-W-CNW-02
21.	-1	W4	-	-	-	360	408	13	system SZ-W-CNW-02
22.	-1	W5	-	-	-	450	505	12	system SZ-W-CNW-02
23.	-1	W6	-	-	-	130	114	-12	system SZ-W-CNW-02
24.	-1	W7	-	-	-	340	312	-8	system SZ-W-CNW-02
25.	-1	WRF36	-	-	-	300	348	16	SYSTEM RF-36
26.	-1	WRF1.1	-	-	-	90	103	14	SYSTEM RF-01
27.	-1	WRF1.2	-	-	-	60	68	13	SYSTEM RF-01
28.	-1	WRF1.3	-	-	-	120	106	-12	SYSTEM RF-01
29.	-1	WRF1.4	-	-	-	40	45	13	SYSTEM RE-01

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**POWYKONAWCZA**

[illegible]



64.	0	W0.11	-	-	-	-	150	167	11	system SZ-W-CNW-02
65.	0	W0.12	-	-	-	-	150	168	12	system SZ-W-CNW-02
66.	0	WRF11	-	-	-	-	-	-	-	POMIARY I REGULACJA WYKONANE PRZES TROX ZGODNE Z PROTOKOŁEM - SZAFKA NA ODCZYNNIKI
67.	0	WRF21	-	-	-	-	-	-	-	POMIARY I REGULACJA WYKONANE PRZES TROX ZGODNE Z PROTOKOŁEM - DYGESTORIUM
68.	0	WRF22.01	-	-	-	-	-	-	-	POMIARY I REGULACJA WYKONANE PRZES TROX ZGODNE Z PROTOKOŁEM - DYGESTORIUM
69.	0	WRF41	-	-	-	-	-	-	-	POMIARY I REGULACJA WYKONANE PRZES TROX ZGODNE Z PROTOKOŁEM - SZAFKA NA BUTLE
70.	0	WRF23	-	-	-	-	-	-	-	POMIARY I REGULACJA WYKONANE PRZES TROX ZGODNE Z PROTOKOŁEM - SZAFKA NA BUTLE
71.	0	WRF13	-	-	-	-	-	-	-	POMIARY I REGULACJA WYKONANE PRZES TROX ZGODNE Z PROTOKOŁEM - DYGESTORIUM
72.	0	WRF14	-	-	-	-	-	-	-	POMIARY I REGULACJA WYKONANE PRZES TROX ZGODNE Z PROTOKOŁEM - DYGESTORIUM
73.	0	WRF1.01	-	-	-	-	70	75	7	system RF-01
74.	0	DF1.01	-	-	-	-	50	45	-10	system SZ-W-WC
75.	0	DF1.02	-	-	-	-	50	55	10	system SZ-W-WC
76.	0	DF1.03	-	-	-	-	30	34	13	system SZ-W-WC
77.	0	DF1.04	-	-	-	-	50	55	10	system SZ-W-WC
78.	0	WRF42.1	-	-	-	-	220	238	8	system RF-42
79.	0	WRF42.2	-	-	-	-	335	314	-6	system RF-42
80.	0	WRF42.3	-	-	-	-	335	318	-5	system RF-42
81.	0	WRF42.4	-	-	-	-	220	230	5	system RF-42
82.	0	WRF42.5	-	-	-	-	220	240	9	system RF-42
83.	1	NN1.1	427	379	-11	-	-	-	-	system SZ-N-CNW-01
84.	1	NN1.2	428	396	-7	-	-	-	-	system SZ-N-CNW-01
85.	1	NN1.3	427	398	-7	-	-	-	-	system SZ-N-CNW-01
86.	1	NN1.4	428	403	-6	-	-	-	-	system SZ-N-CNW-01
87.	1	NN1.5	100	108	8	-	-	-	-	system SZ-N-CNW-01
88.	1	NN1.6	90	82	-9	-	-	-	-	system SZ-N-CNW-01
89.	1	NN1.7	90	84	-7	-	-	-	-	system SZ-N-CNW-01
90.	1	NN1.8	300	271	-10	-	-	-	-	system SZ-N-CNW-01
91.	1	NN1.9	300	273	-9	-	-	-	-	system SZ-N-CNW-01

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92.	1	NN1.10	300	328	9	-	-	-	system SZ-N-CNW-01
93.	1	NN1.11	300	330	10	-	-	-	system SZ-N-CNW-01
94.	1	NN1.12	120	109	-9	-	-	-	system SZ-N-CNW-01
95.	1	NN1.13	100	111	11	-	-	-	system SZ-N-CNW-01
96.	1	NN1.14	120	130	8	-	-	-	system SZ-N-CNW-01
97.	1	N1.1	150	162	8	-	-	-	system SZ-N-CNW-02
98.	1	N1.2	150	165	10	-	-	-	system SZ-N-CNW-02
99.	1	N1.3	300	267	-11	-	-	-	system SZ-N-CNW-02
100.	1	N1.4	300	320	7	-	-	-	system SZ-N-CNW-02
101.	1	WW1.1	-	-	-	428	400	-7	system SZ-W-CNW-01
102.	1	WW1.2	-	-	-	427	395	-7	system SZ-W-CNW-01
103.	1	WW1.3	-	-	-	427	375	-12	system SZ-W-CNW-01
104.	1	WW1.4	-	-	-	428	465	9	system SZ-W-CNW-01
105.	1	WW1.5	-	-	-	110	121	10	system SZ-W-CNW-01
106.	1	WW1.6	-	-	-	110	118	7	system SZ-W-CNW-01
107.	1	WW1.7	-	-	-	450	480	7	system SZ-W-CNW-01
108.	1	WW1.8	-	-	-	450	485	8	system SZ-W-CNW-01
109.	1	WW1.9	-	-	-	300	274	-9	system SZ-W-CNW-01
110.	1	WW1.10	-	-	-	120	132	10	system SZ-W-CNW-01
111.	1	WW1.11	-	-	-	120	110	-8	system SZ-W-CNW-01
112.	1	WW1.12	-	-	-	90	84	-7	system SZ-W-CNW-01
113.	1	W1.1	-	-	-	150	165	10	system SZ-W-CNW-02
114.	1	W1.2	-	-	-	150	160	7	system SZ-W-CNW-02
115.	1	W1.3	-	-	-	120	112	-7	system SZ-W-CNW-02
116.	1	W1.4	-	-	-	120	110	-8	system SZ-W-CNW-02
117.	1	WRF1.11	-	-	-	70	64	-9	system RF-01
118.	1	WRF15	-	-	-	-	-	-	POMIARY I REGULACJA WYKONANE PRZES TROX ZGODNE Z PROTOKOŁEM - DYGESTORIUM
119.	1	WRF23.1	-	-	-	-	-	-	POMIARY I REGULACJA WYKONANE PRZES TROX ZGODNE Z PROTOKOŁEM - SZAFKA NA BUTLE
120.	1	DF1.11	-	-	-	50	55	10	system SZ-W-WC
121.	1	DF1.12	-	-	-	50	54	8	system SZ-W-WC
122.	1	DF1.13	-	-	-	30	28	-7	system SZ-W-WC
123.	1	DF1.14	-	-	-	30	27	-10	system SZ-W-WC
124.	1	DF1.15	-	-	-	50	46	-8	system SZ-W-WC



125.	1	DF1.16	-	-	-	-	50	55	10	system SZ-W-WC
126.	2	NN2.1	180	170	-6	-	-	-	-	system SZ-N-CNW-01
127.	2	NN2.2	180	192	7	-	-	-	-	system SZ-N-CNW-01
128.	2	NN2.3	140	150	7	-	-	-	-	system SZ-N-CNW-01
129.	2	NN2.4	300	321	7	-	-	-	-	system SZ-N-CNW-01
130.	2	NN2.5	300	323	8	-	-	-	-	system SZ-N-CNW-01
131.	2	NN2.6	60	65	8	-	-	-	-	system SZ-N-CNW-01
132.	2	NN2.7	90	85	-6	-	-	-	-	system SZ-N-CNW-01
133.	2	NN2.8	90	84	-7	-	-	-	-	system SZ-N-CNW-01
134.	2	NN2.9	90	85	-6	-	-	-	-	system SZ-N-CNW-01
135.	2	NN2.10	90	95	6	-	-	-	-	system SZ-N-CNW-01
136.	2	NN2.11	90	96	7	-	-	-	-	system SZ-N-CNW-01
137.	2	NN2.12	110	120	9	-	-	-	-	system SZ-N-CNW-01
138.	2	NN2.13	140	150	7	-	-	-	-	system SZ-N-CNW-01
139.	2	NN2.14	90	96	7	-	-	-	-	system SZ-N-CNW-01
140.	2	NN2.15	100	92	-8	-	-	-	-	system SZ-N-CNW-01
141.	2	NN2.16	20	22	10	-	-	-	-	system SZ-N-CNW-01
142.	2	NN2.17	180	190	6	-	-	-	-	system SZ-N-CNW-01
143.	2	NN2.18	90	85	-6	-	-	-	-	system SZ-N-CNW-01
144.	2	NN2.19	180	190	6	-	-	-	-	system SZ-N-CNW-01
145.	2	NN2.20	180	195	8	-	-	-	-	system SZ-N-CNW-01
146.	2	N2.1	300	275	-8	-	-	-	-	system SZ-N-CNW-02
147.	2	N2.2	300	280	-7	-	-	-	-	system SZ-N-CNW-02
148.	2	WW2.1	-	-	-	180	190	6	6	system SZ-W-CNW-01
149.	2	WW2.2	-	-	-	180	168	-7	-7	system SZ-W-CNW-01
150.	2	WW2.3	-	-	-	100	106	6	6	system SZ-W-CNW-01
151.	2	WW2.4	-	-	-	180	168	-7	-7	system SZ-W-CNW-01
152.	2	WW2.5	-	-	-	180	167	-7	-7	system SZ-W-CNW-01
153.	2	WW2.6	-	-	-	20	21	5	5	system SZ-W-CNW-01
154.	2	WW2.7	-	-	-	90	98	9	9	system SZ-W-CNW-01
155.	2	WW2.8	-	-	-	210	192	-9	-9	system SZ-W-CNW-01
156.	2	WW2.9	-	-	-	90	85	-6	-6	system SZ-W-CNW-01
157.	2	WW2.10	-	-	-	90	96	7	7	system SZ-W-CNW-01
158.	2	WW2.11	-	-	-	90	97	8	8	system SZ-W-CNW-01
159.	2	WW2.12	-	-	-	60	64	7	7	system SZ-W-CNW-01

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160.	2	WW2.13	-	-	-	-	-	360	380	6	system SZ-W-CNW-01
161.	2	WW2.14	-	-	-	-	-	110	116	5	system SZ-W-CNW-01
162.	2	WW2.15	-	-	-	-	-	90	85	-6	system SZ-W-CNW-01
163.	2	WW2.16	-	-	-	-	-	300	275	-8	system SZ-W-CNW-01
164.	2	WW2.17	-	-	-	-	-	300	325	8	system SZ-W-CNW-01
165.	2	W2.1	-	-	-	-	-	180	169	-6	system SZ-W-CNW-02
166.	2	WRF1.21	-	-	-	-	-	70	75	7	system RF-01
167.	2	WRF16	-	-	-	-	-	-	-	-	POMIARY I REGULACJA WYKONANE PRZES TROX ZGODNE Z PROTOKOŁEM - DYGESTORIUM
168.	2	DF1.21	-	-	-	-	-	50	53	6	system SZ-W-WC
169.	2	DF1.22	-	-	-	-	-	50	47	-6	system SZ-W-WC
170.	2	DF1.23	-	-	-	-	-	50	54	8	system SZ-W-WC
171.	2	DF1.24	-	-	-	-	-	50	47	-6	system SZ-W-WC
172.	2	DF1.25	-	-	-	-	-	50	47	-6	system SZ-W-WC
173.	3	NN3.1	90	94	4	-	-	-	-	-	system SZ-N-CNW-01
174.	3	NN3.2	60	57	-5	-	-	-	-	-	system SZ-N-CNW-01
175.	3	NN3.3	90	86	-4	-	-	-	-	-	system SZ-N-CNW-01
176.	3	NN3.4	90	84	-7	-	-	-	-	-	system SZ-N-CNW-01
177.	3	NN3.5	90	97	8	-	-	-	-	-	system SZ-N-CNW-01
178.	3	NN3.6	90	96	7	-	-	-	-	-	system SZ-N-CNW-01
179.	3	NN3.7	90	86	-4	-	-	-	-	-	system SZ-N-CNW-01
180.	3	NN3.8	120	112	-7	-	-	-	-	-	system SZ-N-CNW-01
181.	3	NN3.9	60	63	5	-	-	-	-	-	system SZ-N-CNW-01
182.	3	NN3.10	360	375	4	-	-	-	-	-	system SZ-N-CNW-01
183.	3	NN3.11	140	148	6	-	-	-	-	-	system SZ-N-CNW-01
184.	3	NN3.12	60	56	-7	-	-	-	-	-	system SZ-N-CNW-01
185.	3	NN3.13	60	57	-5	-	-	-	-	-	system SZ-N-CNW-01
186.	3	NN3.14	120	128	7	-	-	-	-	-	system SZ-N-CNW-01
187.	3	NN3.15	110	115	5	-	-	-	-	-	system SZ-N-CNW-01
188.	3	NN3.16	140	146	4	-	-	-	-	-	system SZ-N-CNW-01
189.	3	WW3.1	-	-	-	-	-	90	95	6	system SZ-W-CNW-01
190.	3	WW3.2	-	-	-	-	-	60	56	-7	system SZ-W-CNW-01
191.	3	WW3.3	-	-	-	-	-	90	86	-4	system SZ-W-CNW-01
192.	3	WW3.4	-	-	-	-	-	90	85	-6	system SZ-W-CNW-01
193.	3	WW3.5	-	-	-	-	-	90	85	-6	system SZ-W-CNW-01

DOKUMENTACJA  
POWYKONAWCZA



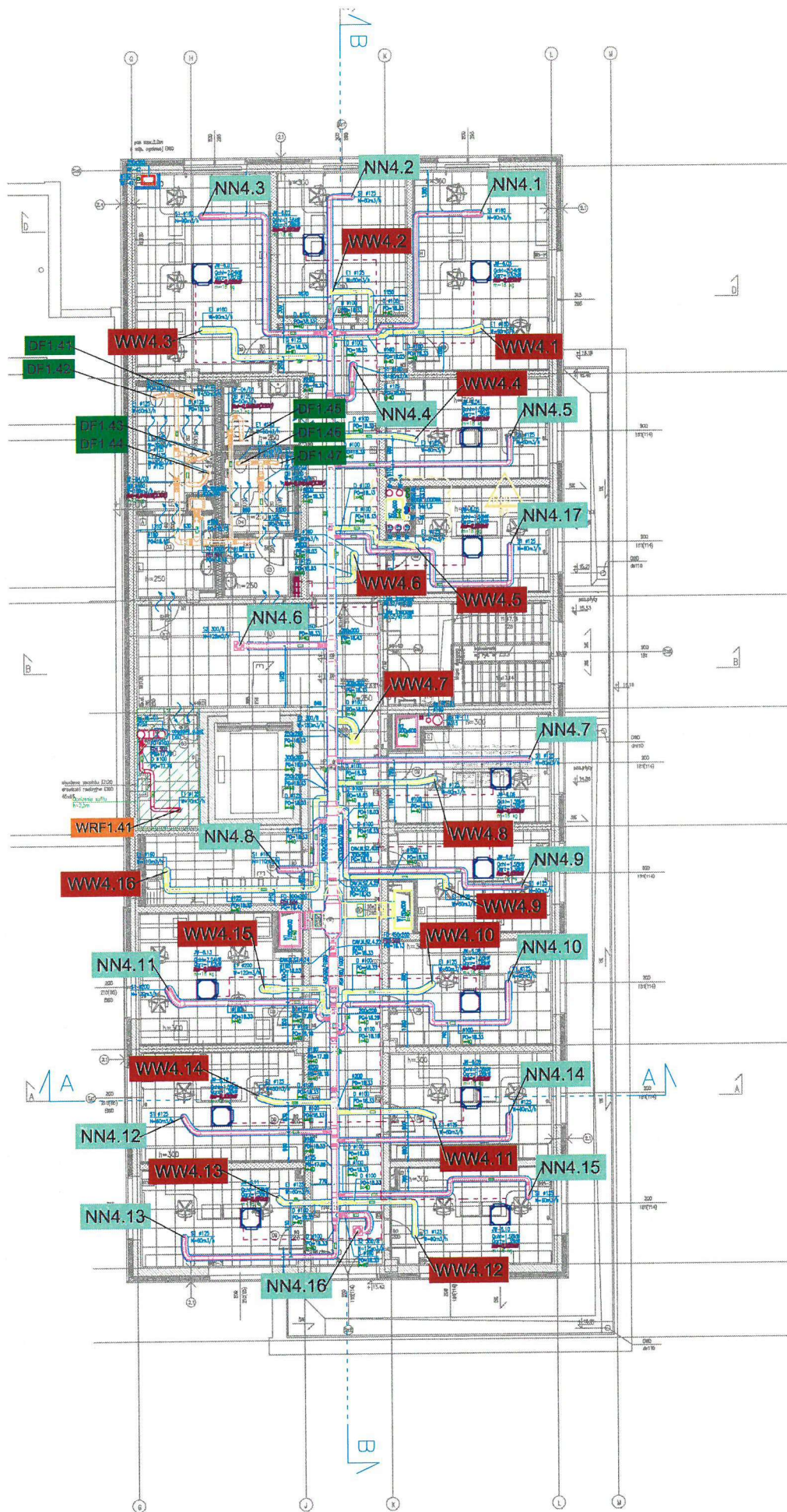
194.	3	WW3.6	-	-	-	-	90	96	7	system SZ-W-CNW-01
195.	3	WW3.7	-	-	-	-	210	220	5	system SZ-W-CNW-01
196.	3	WW3.8	-	-	-	-	90	86	-4	system SZ-W-CNW-01
197.	3	WW3.9	-	-	-	-	120	126	5	system SZ-W-CNW-01
198.	3	WW3.10	-	-	-	-	60	56	-7	system SZ-W-CNW-01
199.	3	WW3.11	-	-	-	-	360	342	-5	system SZ-W-CNW-01
200.	3	WW3.12	-	-	-	-	60	57	-5	system SZ-W-CNW-01
201.	3	WW3.13	-	-	-	-	60	56	-7	system SZ-W-CNW-01
202.	3	WW3.14	-	-	-	-	120	114	-5	system SZ-W-CNW-01
203.	3	WW3.15	-	-	-	-	110	115	5	system SZ-W-CNW-01
204.	2	WRF1.31	-	-	-	-	70	75	7	system RF-01
205.	3	DF1.31	-	-	-	-	50	53	6	system SZ-W-WC
206.	3	DF1.32	-	-	-	-	50	47	-6	system SZ-W-WC
207.	3	DF1.33	-	-	-	-	30	28	-7	system SZ-W-WC
208.	3	DF1.34	-	-	-	-	30	28	-7	system SZ-W-WC
209.	3	DF1.35	-	-	-	-	50	48	-4	system SZ-W-WC
210.	3	DF1.36	-	-	-	-	50	53	6	system SZ-W-WC
211.	3	DF1.37	-	-	-	-	50	47	-6	system SZ-W-WC
212.	4	NN4.1	90	92	2	-	-	-	-	system SZ-N-CNW-01
213.	4	NN4.2	60	59	-2	-	-	-	-	system SZ-N-CNW-02
214.	4	NN4.3	90	87	-3	-	-	-	-	system SZ-N-CNW-03
215.	4	NN4.4	60	57	-5	-	-	-	-	system SZ-N-CNW-04
216.	4	NN4.5	60	63	5	-	-	-	-	system SZ-N-CNW-05
217.	4	NN4.6	125	128	2	-	-	-	-	system SZ-N-CNW-06
218.	4	NN4.7	60	58	-3	-	-	-	-	system SZ-N-CNW-07
219.	4	NN4.8	110	114	4	-	-	-	-	system SZ-N-CNW-08
220.	4	NN4.9	60	58	-3	-	-	-	-	system SZ-N-CNW-09
221.	4	NN4.10	60	57	-5	-	-	-	-	system SZ-N-CNW-10
222.	4	NN4.11	120	124	3	-	-	-	-	system SZ-N-CNW-11
223.	4	NN4.12	60	63	5	-	-	-	-	system SZ-N-CNW-12
224.	4	NN4.13	60	63	5	-	-	-	-	system SZ-N-CNW-13
225.	4	NN4.14	60	57	-5	-	-	-	-	system SZ-N-CNW-14
226.	4	NN4.15	60	58	-3	-	-	-	-	system SZ-N-CNW-15
227.	4	NN4.16	125	120	-4	-	-	-	-	system SZ-N-CNW-16
228.	4	NN4.17	60	58	-3	-	-	-	-	system SZ-N-CNW-17

POWYKONAWCZA

229.	4	WW4.1	-	-	-	-	-	90	86	-4	system SZ-W-CNW-01
230.	4	WW4.2	-	-	-	-	-	60	57	-5	system SZ-W-CNW-02
231.	4	WW4.3	-	-	-	-	-	90	85	-6	system SZ-W-CNW-03
232.	4	WW4.4	-	-	-	-	-	60	58	-3	system SZ-W-CNW-04
233.	4	WW4.5	-	-	-	-	-	60	59	-2	system SZ-W-CNW-05
234.	4	WW4.6	-	-	-	-	-	90	90	0	system SZ-W-CNW-06
235.	4	WW4.7	-	-	-	-	-	180	173	-4	system SZ-W-CNW-07
236.	4	WW4.8	-	-	-	-	-	60	59	-2	system SZ-W-CNW-08
237.	4	WW4.9	-	-	-	-	-	60	58	-3	system SZ-W-CNW-09
238.	4	WW4.10	-	-	-	-	-	60	59	-2	system SZ-W-CNW-10
239.	4	WW4.11	-	-	-	-	-	60	57	-5	system SZ-W-CNW-11
240.	4	WW4.12	-	-	-	-	-	60	62	3	system SZ-W-CNW-12
241.	4	WW4.13	-	-	-	-	-	60	63	5	system SZ-W-CNW-13
242.	4	WW4.14	-	-	-	-	-	60	63	5	system SZ-W-CNW-14
243.	4	WW4.15	-	-	-	-	-	120	124	3	system SZ-W-CNW-15
244.	4	WW4.16	-	-	-	-	-	110	105	-5	system SZ-W-CNW-16
245.	4	WRF1.41	-	-	-	-	-	70	68	-3	system RF-01
246.	4	DF1.41	-	-	-	-	-	50	52	4	system SZ-W-WC
247.	4	DF1.42	-	-	-	-	-	50	48	-4	system SZ-W-WC
248.	4	DF1.43	-	-	-	-	-	50	47	-6	system SZ-W-WC
249.	4	DF1.44	-	-	-	-	-	50	49	-2	system SZ-W-WC
250.	4	DF1.45	-	-	-	-	-	50	51	2	system SZ-W-WC
251.	4	DF1.46	-	-	-	-	-	50	42	-16	system SZ-W-WC
252.	4	DF1.47	-	-	-	-	-	50	51	2	system SZ-W-WC

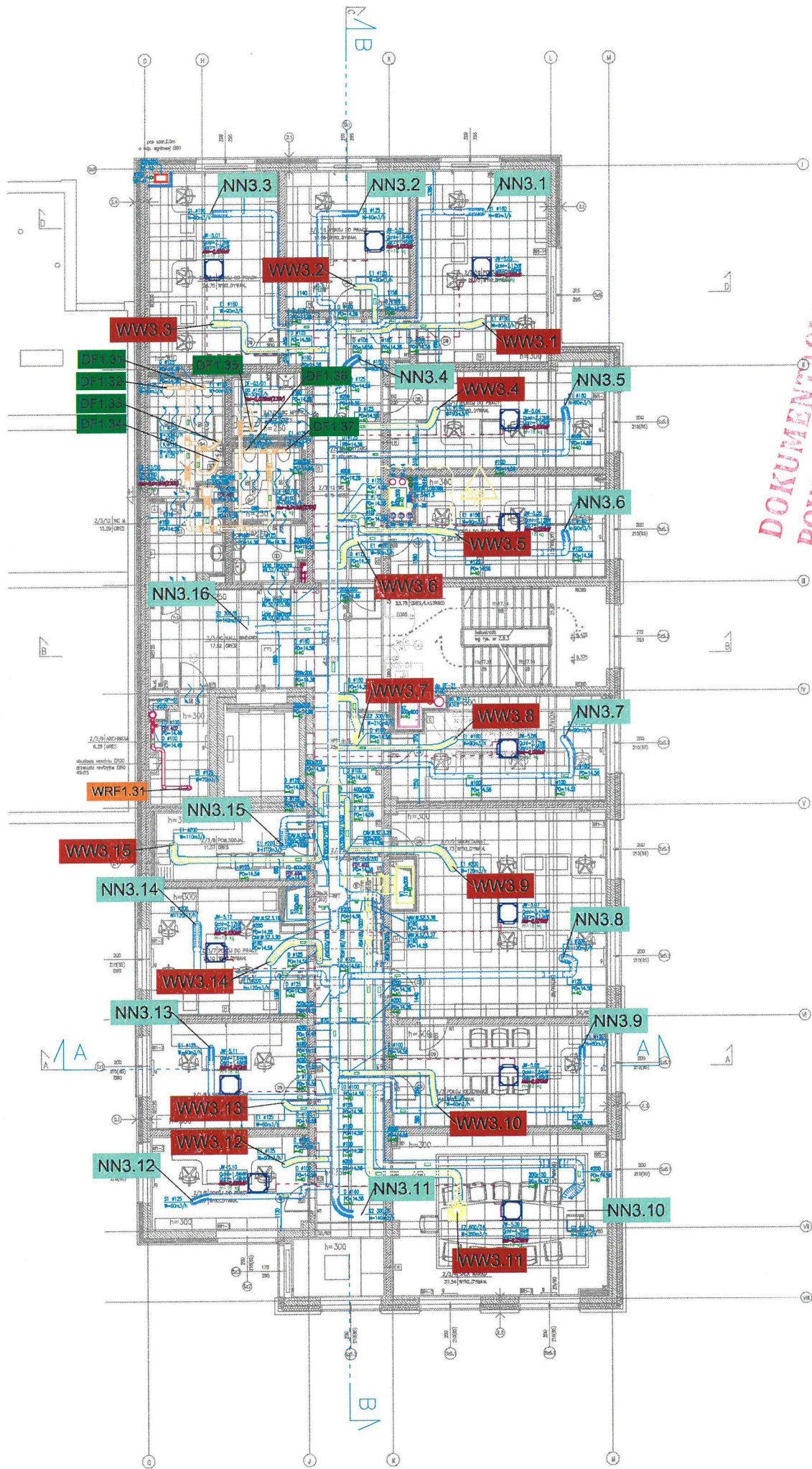
**DOKUMENTACJA  
POWYKONAWCZA**





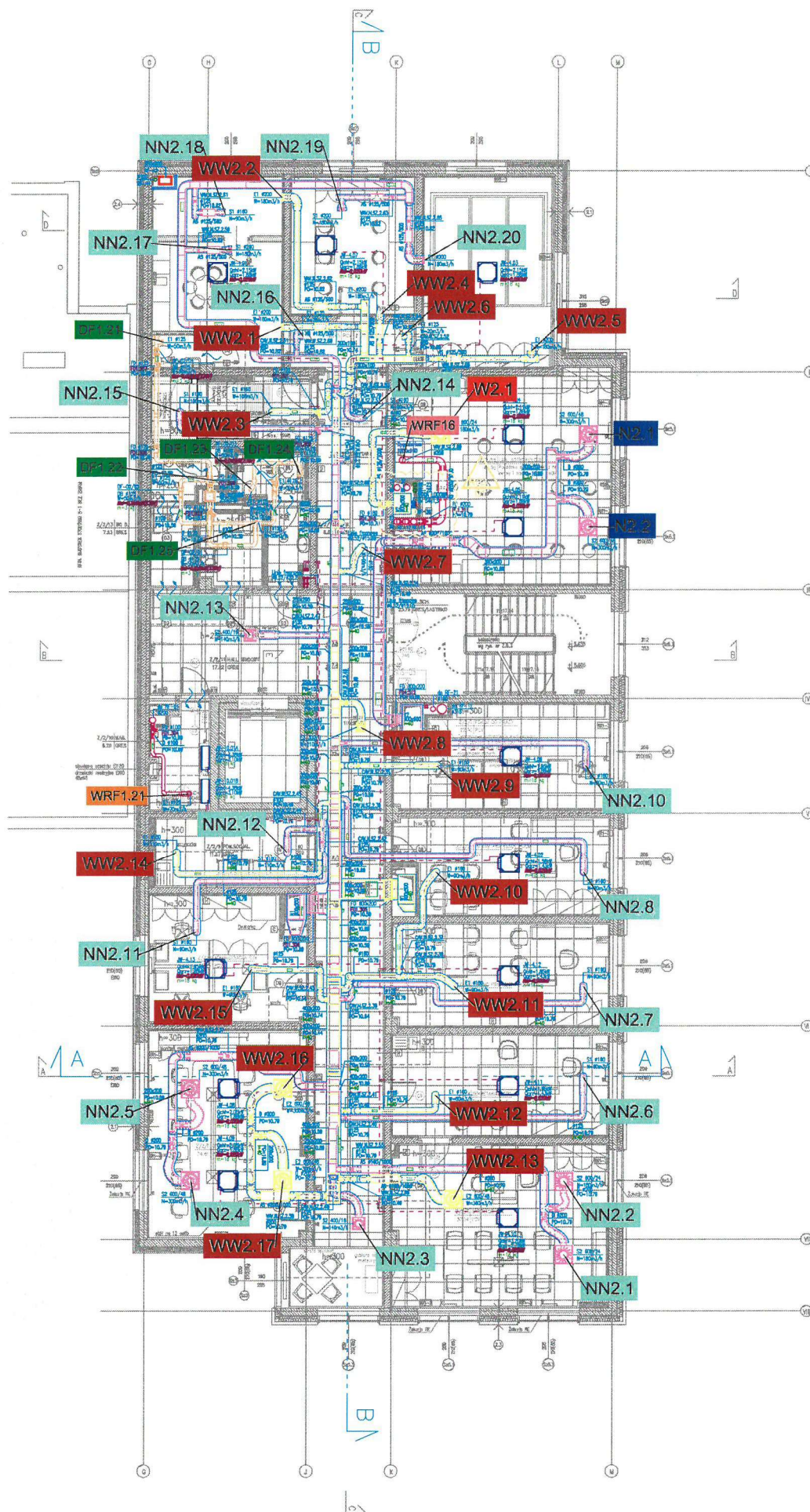
DOKUMENTACJA  
POWYKONAWCZA





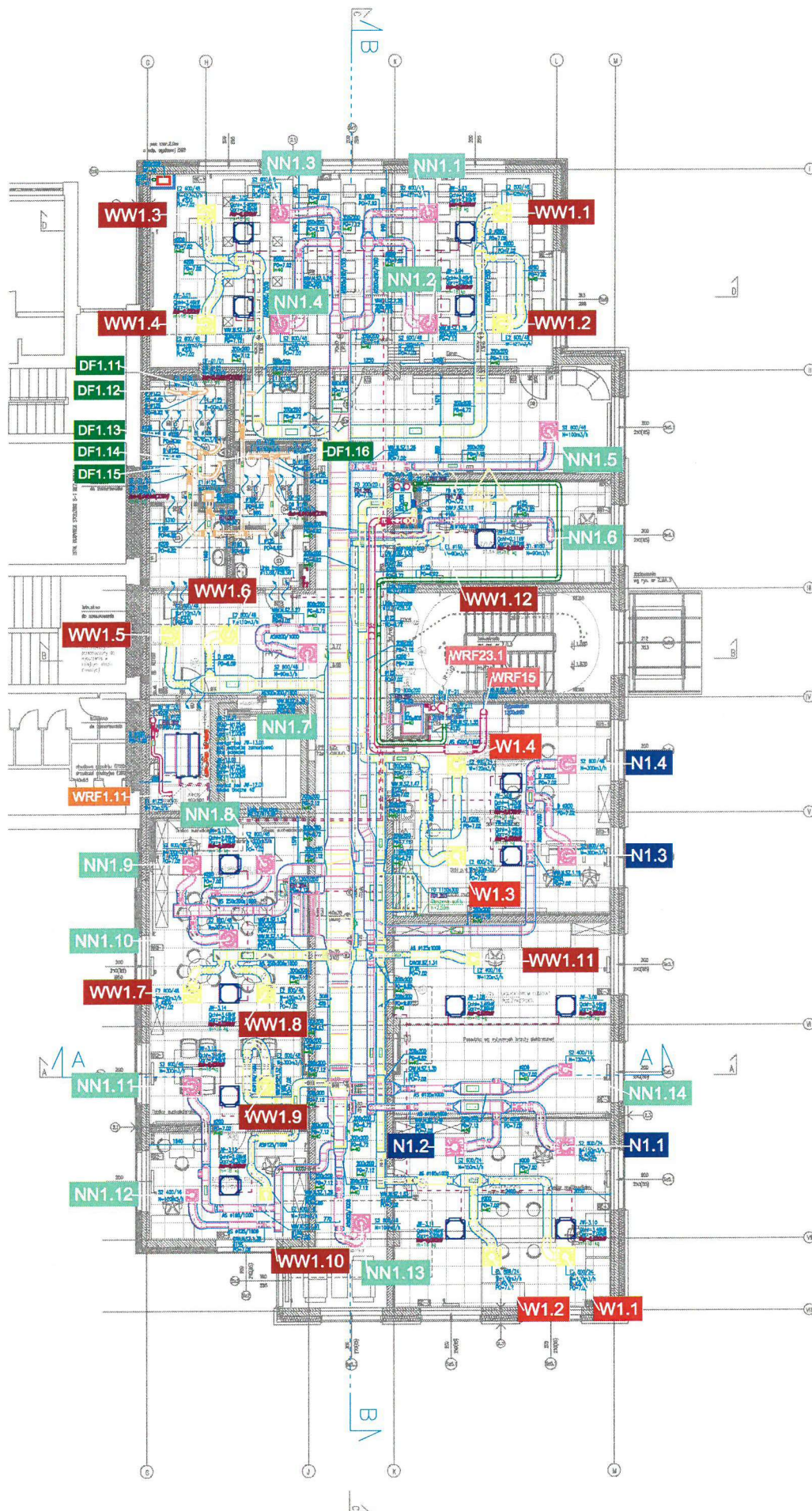
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POWYKONAWCA





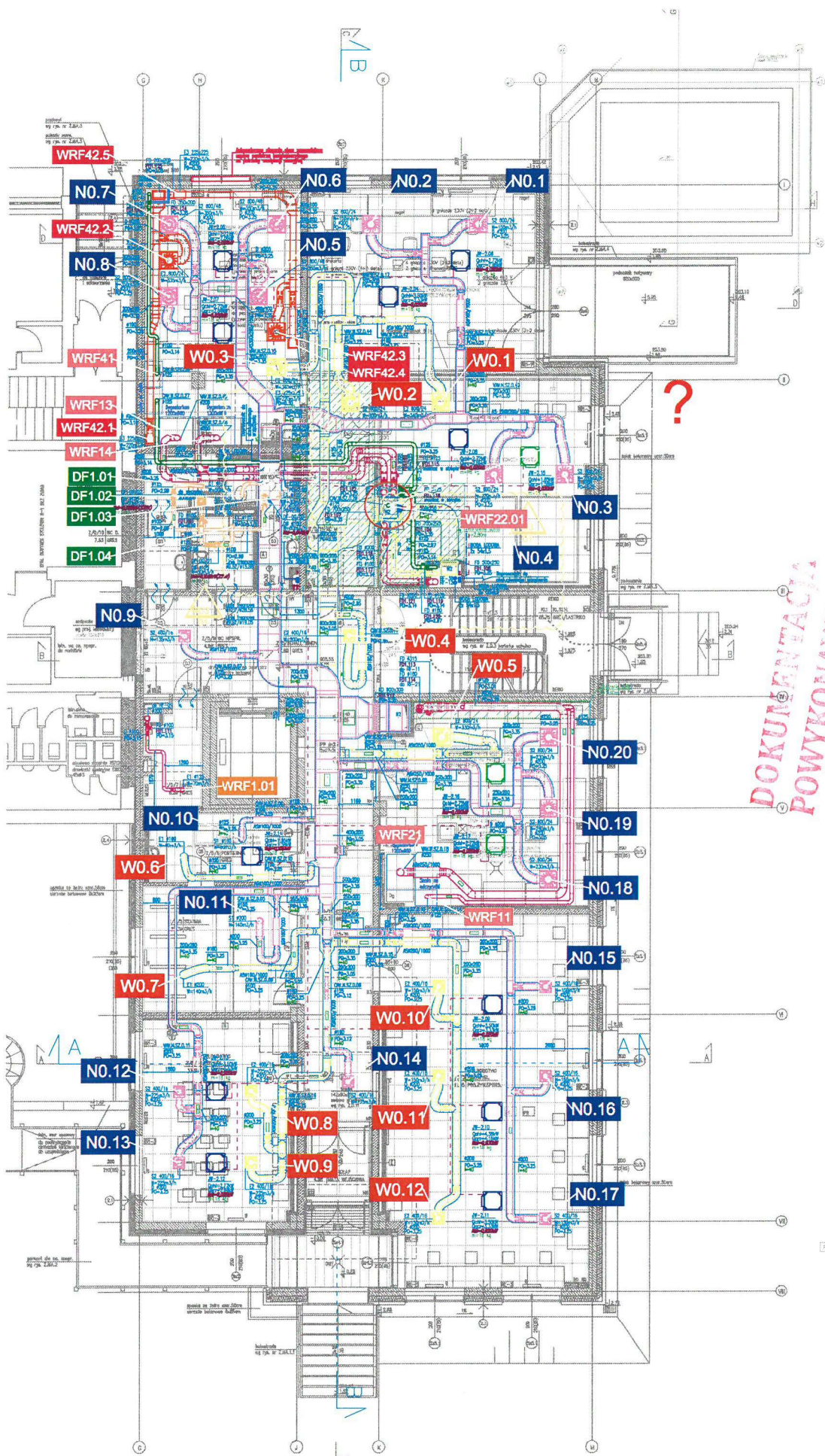
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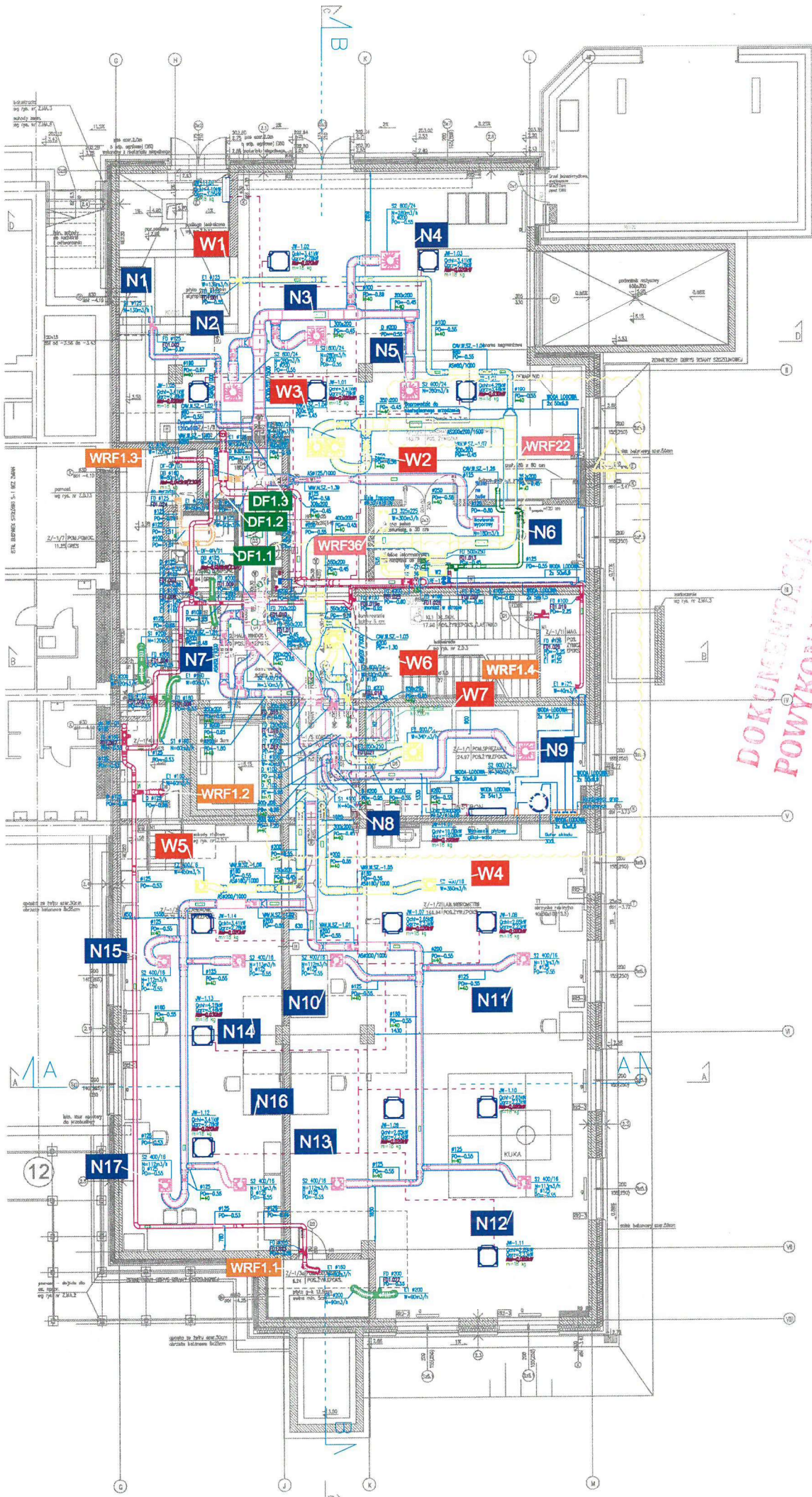
DOKUMENTACJA  
POWYKONANCA





DOKUMENTACJA  
POWYKONANCA







# PROTOKÓŁ Z URUCHOMIENIA INSTALACJI KLIMATYZACJI FREONOWEJ

Zamawiający:

**BAUDZIEDZIC Sp. z o.o.**  
ul. Lotniskowa 8, 36-060 Głogów Małopolski  
**Stanisław Kielbicki – Kierownik Budowy**

Wykonawca:

**Nova Service Sp. z o.o.**  
ul. Powstańców 20/LU9, 31-422 Kraków  
**Tomasz Kamiński – Kierownik Robót**  
**Marcin Golara - Inżynier Budowy**

**DOKUMENTACJA  
POWYKONAWCZA**

**Piotr Mięso** – uruchamiający  
Nr certyfikatu F-gaz: FGAZ-O/12/00072/17  
**Mateusz Jamka** – uruchamiający  
Nr certyfikatu F-gaz: FGAZ-O/09/00045/22

Obiekt: „Rozbudowa budynku S-1 o zachodnie i wschodnie skrzydło w ramach inwestycji pn. „Rozbudowa i nadbudowa budynku S-1 wraz z infrastrukturą wewnętrzną obejmującą instalacje: elektryczną, sanitarną ( wentylacja mechaniczna, klimatyzacja, instalacje grzewcze, instalacje wodne, instalacje kanalizacji opadowej, sanitarnej i technicznej ), gazów technicznych i zewnętrzną obejmującą: kanalizacji kablowej elektrycznej SN i NN, kanalizacji kablowej technicznej, wodociągowej, kanalizacji opadowej z retencją, sanitarnej i ogólnospławnej, gazowej i pomp ciepła oraz przebudowę sieci ciepłowniczej i przyłącza gazu kolidujących z inwestycją” – skrzydło zachodnie usytuowany w Krakowie przy ul. Władysława Reymonta działka Nr 19/47”

## układ VRF MITSUBISHI ELECTRIC Pietro -1

Model jednostki zewnętrznej/wewnętrznej	PUHY-P450YNW-A
Fabryczna ilość czynnika chłodniczego R410A	9,8 kg
Dobita ilość czynnika chłodniczego R410A	12,9 kg
Sumaryczna ilość czynnika chłodniczego R410A	22,7 kg
Sumaryczna ilość czynnika chłodniczego w układzie wyrażona ekwiwalentem CO <sub>2</sub>	47,3976 ton CO <sub>2</sub> -eq
System został uruchomiony	pozytywnie / negatywnie*

## - układ VRF MITSUBISHI ELECTRIC Pietro 0

Model jednostki zewnętrznej/wewnętrznej	PUHY-P350YNW-A
Fabryczna ilość czynnika chłodniczego R410A	9,8 kg
Dobita ilość czynnika chłodniczego R410A	12,3 kg
Sumaryczna ilość czynnika chłodniczego R410A	22,1 kg
Sumaryczna ilość czynnika chłodniczego w układzie wyrażona ekwiwalentem CO <sub>2</sub>	46,1448 ton CO <sub>2</sub> -eq
System został uruchomiony	pozytywnie / negatywnie*

## układ VRF MITSUBISHI ELECTRIC Pietro 1

Model jednostki zewnętrznej/wewnętrznej	PUHY-P500YNW-A
Fabryczna ilość czynnika chłodniczego R410A	10,8 kg
Dobita ilość czynnika chłodniczego R410A	9,8 kg
Sumaryczna ilość czynnika chłodniczego R410A	20,6 kg

Sumaryczna ilość czynnika chłodniczego w układzie wyrażona ekwiwalentem CO <sub>2</sub>	43,0128 ton CO <sub>2</sub> -eq
System został uruchomiony	pozytywnie / negatywnie*

#### układ VRF MITSUBISHI ELECTRIC Piętro 2

Model jednostki zewnętrznej/wewnętrznej	PUHY-P250YNW-A
Fabryczna ilość czynnika chłodniczego R410A	6,5 kg
Dobita ilość czynnika chłodniczego R410A	7,0 kg
Sumaryczna ilość czynnika chłodniczego R410A	13,5 kg
Sumaryczna ilość czynnika chłodniczego w układzie wyrażona ekwiwalentem CO <sub>2</sub>	28,188 ton CO <sub>2</sub> -eq
System został uruchomiony	pozytywnie / negatywnie*

#### układ VRF MITSUBISHI ELECTRIC Piętro 3

Model jednostki zewnętrznej/wewnętrznej	PUHY-P250YNW-A
Fabryczna ilość czynnika chłodniczego R410A	6,5 kg
Dobita ilość czynnika chłodniczego R410A	6,7 kg
Sumaryczna ilość czynnika chłodniczego R410A	13,2 kg
Sumaryczna ilość czynnika chłodniczego w układzie wyrażona ekwiwalentem CO <sub>2</sub>	27,5616 ton CO <sub>2</sub> -eq
System został uruchomiony	pozytywnie / negatywnie*

#### układ VRF MITSUBISHI ELECTRIC Piętro 4

Model jednostki zewnętrznej/wewnętrznej	PUHY-P200YNW-A
Fabryczna ilość czynnika chłodniczego R410A	6,5 kg
Dobita ilość czynnika chłodniczego R410A	6,5 kg
Sumaryczna ilość czynnika chłodniczego R410A	13,0 kg
Sumaryczna ilość czynnika chłodniczego w układzie wyrażona ekwiwalentem CO <sub>2</sub>	27,144 ton CO <sub>2</sub> -eq
System został uruchomiony	pozytywnie / negatywnie*

#### układ agregatu skraplającego do centrali wentylacyjnej Lennox nr1

Model jednostki zewnętrznej/wewnętrznej	LV-MSO200-I4M
Fabryczna ilość czynnika chłodniczego R410A	6,5 kg
Dobita ilość czynnika chłodniczego R410A	0,0 kg
Sumaryczna ilość czynnika chłodniczego R410A	6,5 kg
Sumaryczna ilość czynnika chłodniczego w układzie wyrażona ekwiwalentem CO <sub>2</sub>	13,572 ton CO <sub>2</sub> -eq
System został uruchomiony	pozytywnie / negatywnie*

**DOKUMENTACJA  
POWYKONAWCZA**



**układ agregatu skraplającego do centrali wentylacyjnej Lennox nr2**

Model jednostki zewnętrznej/wewnętrznej	LV-MSO260-I4M
Fabryczna ilość czynnika chłodniczego R410A	6,5 kg
Dobita ilość czynnika chłodniczego R410A	0,0 kg
Sumaryczna ilość czynnika chłodniczego R410A	6,5 kg
Sumaryczna ilość czynnika chłodniczego w układzie wyrażona ekwiwalentem CO <sub>2</sub>	13,572 ton CO <sub>2</sub> -eq
System został uruchomiony	pozytywnie / negatywnie*

Uwaga: niniejszym informuje się Użytkownika/Operatora urządzeń i systemów o obowiązkach wynikających z ustawy z dnia 15 maja 2015 r. o substancjach zubożających warstwę ozonową oraz o niektórych fluorowanych gazach cieplarnianych (Dz. U. z 2015 r. poz. 881). Powyższe wspomniane obowiązki obejmują m.in.:

- okresowe kontrole szczelności,
- założenie i prowadzenie stosownej dokumentacji,
- rejestrację w Centralnym Rejestrze Operatorów Urządzeń i Systemów Ochrony Przeciwpożarowej.

Podpisy Przedstawicieli Stron:

**PRZEDSTAWICIEL  
ZAMAWIAJACEGO****KIEROWNIK BUDOWY**Stanisław Kielbicki  
upr. bud. B-236/90

.....  
(Stanisław Kielbicki – Kierownik Budowy)

**PRZEDSTAWICIEL  
WYKONAWCY**

.....  
(Marcin Golar – Inż. Budowy)

Data podpisania: 24.06.2024r

  
WYKONAWCA  
mgr inż. Tomasz Kamiński  
nr upr. MAP/0350/WBS/21  
NOVA SERVICE Sp. z o.o.**DOKUMENTACJA  
POWYKONAWCZA**