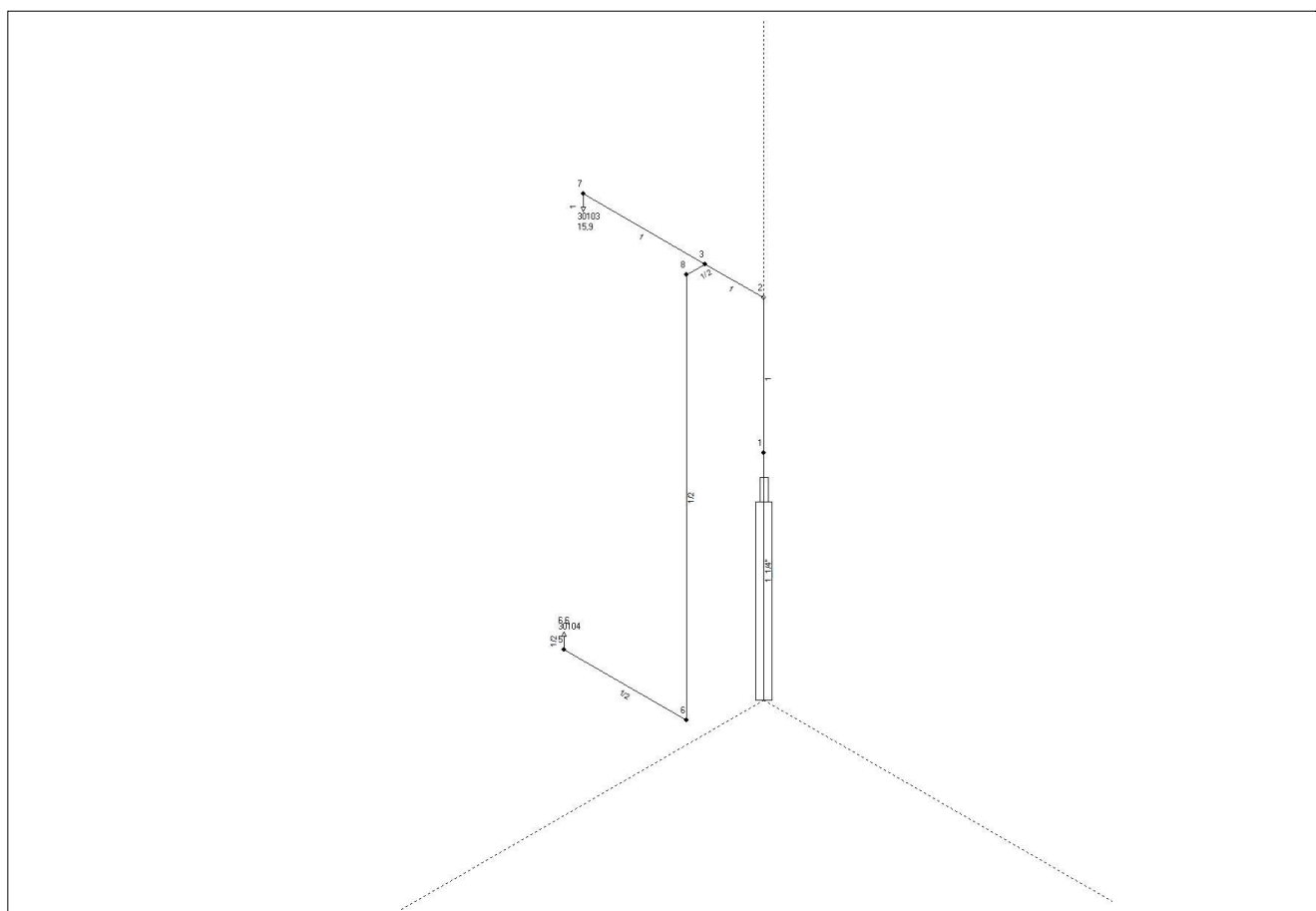




Project: PR-3002
Project-No: 3002
Building: Samodzielny Publiczny Zakład opieki Zdrowotnej MSWiA w Poznaniu
Object: Serwerownia główna w nowym budynku p. 0
Contractor:
Owner:
Project engineer: MK
Date: 2023-09-07
Altitude above sealevel: 100 m
Regulation rule for calculation of FK-5-1-12 quantities: ISO 14520-1, Edition 2000

Pipe catalogue: Rury Logistal.rkl
Component catalogue: Savi Technologie.arm
Nozzle catalogue: Savi Technologie.noz





Pipesystem data:

Section-No:	Starting-node	Endnode	Length [m]	Height [m]	Pipetype	Diameter [mm] **	Fitting *	Component code	Component coefficient	Nb of containers FK-5-1-12 quantity
1	0	1	2,280	2,280	10	37,5	C	250	4,000	1,0
2	1	2	1,430	1,430	31	26,5		-	-	0,0
3	2	3	0,250	0,000	31	26,5	B	-	-	0,0
4	3	7	1,300	0,000	31	26,5	T-0°	-	-	0,0
5	7	30103	0,050	-0,050	31	26,5	E	-	-	0,0
6	3	8	0,200	0,000	31	16,1	T-90°	-	-	0,0
7	8	6	4,110	-4,110	31	16,1	E	-	-	0,0
8	6	5	1,300	0,000	31	16,1	E	-	-	0,0
9	5	30104	0,050	0,050	31	16,1	E	-	-	0,0

* C=Component, B=Bend, T=T-Piece, E=Elbow

** If a pipe diameter is equal zero see the extra table of the calculated diameters

Legend of pipetypes

Type	Pipeclass	Pipe roughness
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10	Rury Savi	smooth
31	Logistal 2020	galvanized

Legend of components

Code	Type	Resistance coefficient
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250	Zawor HFC Savi	4,000
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Nozzle data:

No.	Calculation zone	Diameter [mm]
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30103	Główna	15,9
30104	Podłoga	6,6

Legend of nozzles:

Type	Number of orifices	C1	C2	C3	C4	C5	C6
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3 Dysza FK-5-1-12 1/2"	1	0,04976	0,25599	0,00000	0,00000	0,00000	0,00000
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Calculation zone data:

Calculation of design quantity:

Zone	Total volume [m3]	Volume of building parts [m3]	Calculated volume [m3]	Max. Over-pressure [mbar]	Design temp. [°C]	Extinguish-conc. [% Vol]	Design factor	Design conc. [% Vol]	Design quantity [kg]
1 Główna	71,3	0,0	71,3	2,000	20,0	4,3	1,30	5,6	58,82
2 Podłoga	9,3	0,0	9,3	2,000	20,0	4,3	1,30	5,6	7,72

Regulation rule for calculation of FK-5-1-12 quantities: ISO 14520-1, Edition 2000

Altitude above sealevel: 100,0 m

FK-5-1-12 storage input data:

Container volume:	75,0 l
Filling ratio:	1,100 kg/l
Filling pressure:	42,0 bar abs
Storage temperature:	20,0 °C
Supplement factor:	1,00
Minimum storage quantity:	66,54 kg
Number of containers:	1

Discharge time (input value): 8,5 s

Further information:

Design with included gas discharge time

Design with predetermined orifice diameters



Calculation results:

FK-5-1-12 storage data:

Design quantity:	66,5 kg
Supplement factor:	1,00
Minimum storage quantity:	66,5 kg
Container volume:	75,0 l
Filling ratio:	0,89 kg/l
Filling pressure:	42,0 bar abs
FK-5-1-12 -mass per container:	66,5 kg
Number of containers:	1
Actual storage quantity:	66,5 kg
Storage temperature:	20,0 °C
Starting container pressure:	42,0 bar abs

Discharge time:

Discharge time air:	0,1 s
Total gas discharge time:	0,7 s
Two-phase discharge time:	7,8 s
Total discharge time:	8,5 s

System information:

Container working pressure:	24,0 bar abs
Container working temperature:	20,0 °C
Total network volume:	5,2 l
Medium pipe content:	6,9 kg FK-5-1-12
Filling portion in pipe system:	0,10 kg FK-5-1-12 /kg FK-5-1-12 -storage

**Pipe system:**

Section-No:	Starting-node	Endnode	Pressure [bar abs]	Flowrate [kg/s]	Pipedimension Di [mm]	DN
1	0	1	22,80	8,06	37,5	1_1/4"
2	1	2	21,49	8,09	26,5	1
3	2	3	20,02	8,09	26,5	1
4	3	7	18,99	7,17	26,5	1
5	7	30103	17,17	7,17	26,5	1
6	3	8	18,28	0,93	16,1	1/2
7	8	6	17,75	0,93	16,1	1/2
8	6	5	17,21	0,93	16,1	1/2
9	5	30104	16,76	0,93	16,1	1/2



Nozzle data:

Calculation- zone no:	Nozzle no.	Nozzle type	Number of orifices	Pipeconnection Di [mm]	DN	Orifice [mm]	FK-5-1-12 out- put [kg]
1	30103	3	1	26,5	1	15,9	59,2
2	30104	3	1	16,1	1/2	6,6	7,6

Two-phase discharge time: 7,8 s

MAXIMUM TRANSPORT TIME DIFF. BETWEEN NOZZLES: 30104./ 30103. IS 0.57 S

Calculation- zone no:	Nozzle no.	Outlet velocity [m/s]	Transport time [s]	Jetdistance [m]	Evaporation distance [m]
1	30103	27,6	0,78	8,90	4,90
2	30104	48,6	1,35	5,56	1,70



Concentrations:

Calculation- zone no:	O2	Gascomposition after discharge [%]	
		FK-5-1-12	N2
1	19,7	5,5	73,8
2	19,8	5,4	73,8

Pressure relief opening:

Calculation- zone no:	Recommended area against overpressure		Max. flow [kg/s]
	Area [m ²]	Overpressure [mbar]	
1	0,050	2,0	7,2
2	0,006	2,0	0,9



Component list:

Component	Number	Code	Coefficient
Zawor HFC Savi	1	250	4,000

Nozzle-type	Number	C1	C2	C3	C4	C5	C6
3	2	0,04970	0,25590	0,00000	0,00000	0,00000	0,00000

Pipe-type	Di [mm]	DN	Length [m]
10	37,50	1_1/4"	2,300
31	26,50	1	3,100
31	16,10	1/2	5,700

Number of bends (+) and elbows (-)

Bend-type	Di [mm]	DN	Number
90	26,50	1	1
-90	26,50	1	1
-90	16,10	1/2	3

Number of T-distributors (in- and outdiameter)

Number	Input	90-out	90-out	0-out
1	26,5	16,1	0,0	26,5