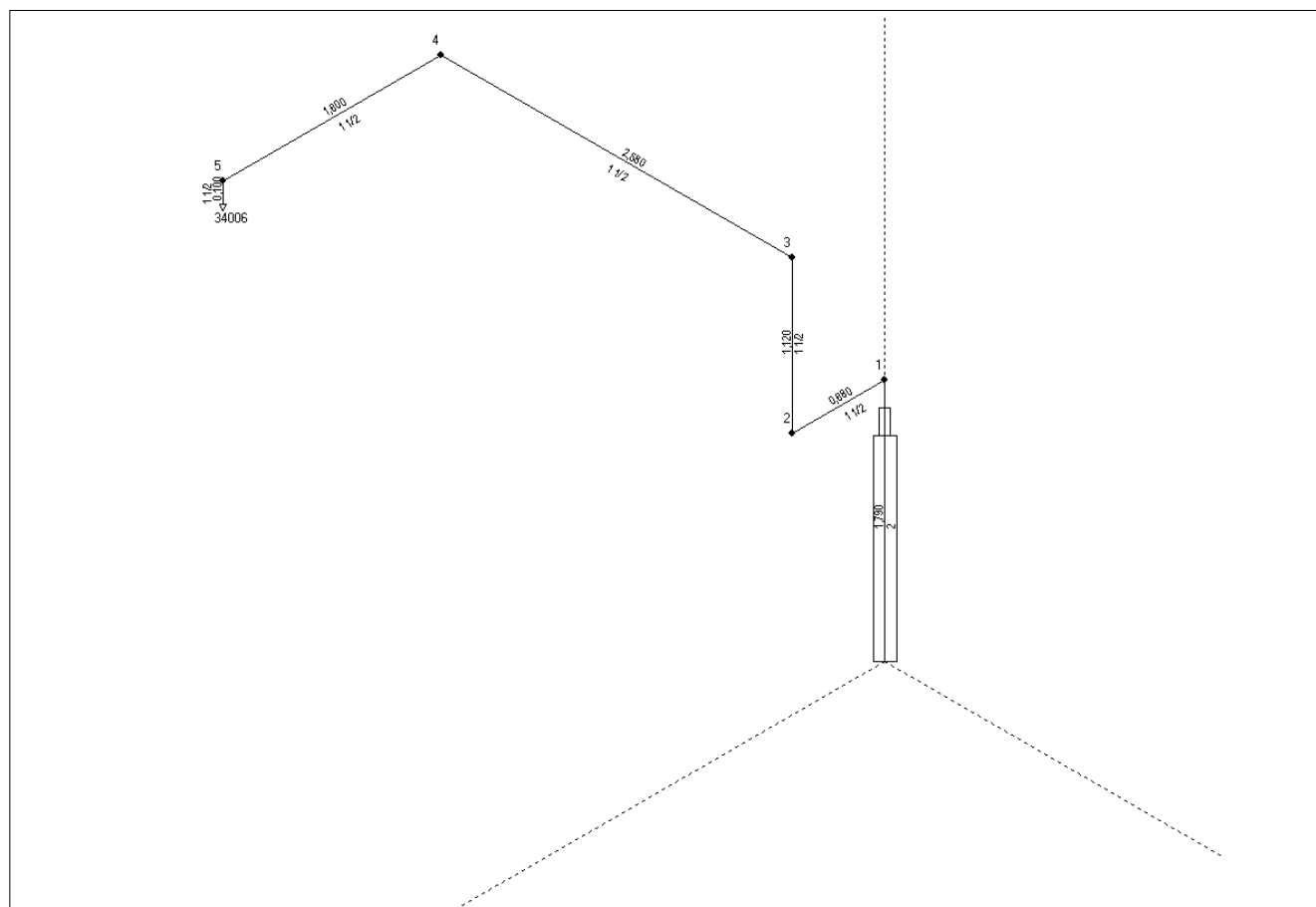


Project:
Project-No:
Building: Budynek Biurowy
Object: Serwerownia
Contractor: Sealab Sp. z o.o.
Owner:
Project engineer: Tomasz Sawicki
Date: 2010-01-05
Altitude above sealevel: 100 m
Regulation rule for calculation of FM200 quantities: NFPA 2001 (edition 2000)

Pipe catalogue: kidde_18.10.2004.rkl
Component catalogue: Kidde_18.10.2004.arm
Nozzle catalogue: kidde_18.10.2004.noz



Pipesystem data:

Section-No:	Starting-node	Endnode	Length [m]	Height [m]	Pipetype	Diameter [mm] **	Fitting *	Component code	Component coefficient	Nb of containers FM200 quantity
1	0	1	1,790	1,790	20	46,8	C	142	16,000	0,0
2	1	2	0,680	0,000	11	41,9	E	-	-	0,0
3	2	3	1,120	1,120	11	41,9	E	-	-	0,0
4	3	4	2,580	0,000	11	41,9	E	-	-	0,0
5	4	5	1,600	0,000	11	41,9	E	-	-	0,0
6	5	34006	0,100	-0,100	11	41,9	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
20	dip tube KD-200/KD-1230 (only for smoothg calculations)	
11	welded pipe, PT=90 bar, (EN 1020galvanized)	

Legend of components

Code	Type	Resistance coefficient
142	cylinder valves KD-200, 42 bar (preliminary coefficient)	16,000

Nozzle data:

No.	Calculation zone	Diameter [mm]
34006	Serwerownia GŁÓWNA	0,0

Legend of nozzles:

Type	Number of orifices	C1	C2	C3	C4	C5	C6
3 KD-200/25 and /42 ba	4	1,000	-1,255	3,294	15,475	-0,791	0,000

Calculation zone data:**Calculation of design quantity:**

Zone	Total volume [m3]	Volume of building parts [m3]	Calculated volume [m3]	Total surface [m2]	Max. Over-pressure [mbar]	Design temp. [°C]	Extinguish-conc. [% Vol]	Design factor	Design conc. [% Vol]	Design quantity [kg]
1 Serwerownia GŁÓ	77,6A	0,0	77,6	0,0	5,000	20,0	6,6	1,20	7,9	48,59

Regulation rule for calculation of FM200 quantities: NFPA 2001 (edition 2000)

Altitude above sealevel: 100,0 m

FM200 storage input data:

Container volume:	80,0 l
Filling ratio:	1,050 kg/l
Filling pressure:	43,0 bar abs
Storage temperature:	20,0 °C
Supplement factor:	1,02
Minimum storage quantity:	49,57 kg
Number of containers:	0

Discharge time (input value): 9,5 s

Further information:

Design with included gas discharge time

Calculation results:

FM200 storage data:

Design quantity:	48,6 kg
Supplement factor:	1,02
Minimum storage quantity:	49,6 kg
Container volume:	80,0 l
Filling ratio:	0,62 kg/l
Filling pressure:	43,0 bar abs
FM200 -mass per container:	49,6 kg
Number of containers:	1
Actual storage quantity:	49,6 kg
Storage temperature:	20,0 °C
Starting container pressure:	43,0 bar abs

Discharge time:

Discharge time air:	0,1 s
Total gas discharge time:	0,1 s
Two-phase discharge time:	9,4 s
Total discharge time:	9,5 s

System information:

Container working pressure:	26,3 bar abs
Container working temperature:	19,0 °C
Total network volume:	11,2 l
Medium pipe content:	14,5 kg FM200
Filling portion in pipe system:	0,30 kg FM200 /kg FM200 -storage

**Pipe system:**

Section- No:	Starting- node	Endnode	Pressure [bar abs]	Flowrate [kg/s]	Pipedimension Di [mm]	DN
1	0	1	25,58	4,89	46,8	--
2	1	2	25,47	4,89	41,9	--
3	2	3	25,22	4,89	41,9	--
4	3	4	25,09	4,89	41,9	--
5	4	5	24,97	4,89	41,9	--
6	5	34006	24,88	4,89	41,9	--

**Nozzle data:**

Calculation- zone no:	Nozzle no.	Nozzle type	Number of orifices	Pipeconnection Di [mm]	DN	Orifice [mm]	FM200 out- put [kg]
1	34006	3	4	41,9	--	14,5	48,6

Two-phase discharge time: 9,4 s

Released two-phase FM200 : 48,6 kg

Calculation- zone no:	Nozzle no.	Outlet velocity [m/s]	Transport time [s]	Jetdistance [m]
1	34006	5,8	2,96	2,61

**Concentrations:**

Calculation- zone no:	O2	Gascomposition after discharge [%]	
		FM200	N2
1	19,2	8,0	71,9

Pressure relief opening:

Calculation- zone no:	Recommended area against overpressure	
	Area [m ²]	Overpressure [mbar]
1	0,039	5,0

**Component list:**

Component	Number	Code	Coefficient
cylinder valves KD-2	1	142	16,000

Nozzle-type	Number	C1	C2	C3	C4	C5	C6
3	1	1,000	-1,250	3,290	15,500	-0,791	0,000

Pipe-type	Di [mm]	DN	Length [m]
20	46,80	2	1,800
11	41,90	1 1/2	6,100

Number of bends (+) and elbows (-)

Bend-type	Di [mm]	DN	Number
-90	41,90	1 1/2	5

Number of T-distributors (in- and outdiameter)

Number	Input	90-out	90-out	0-out
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