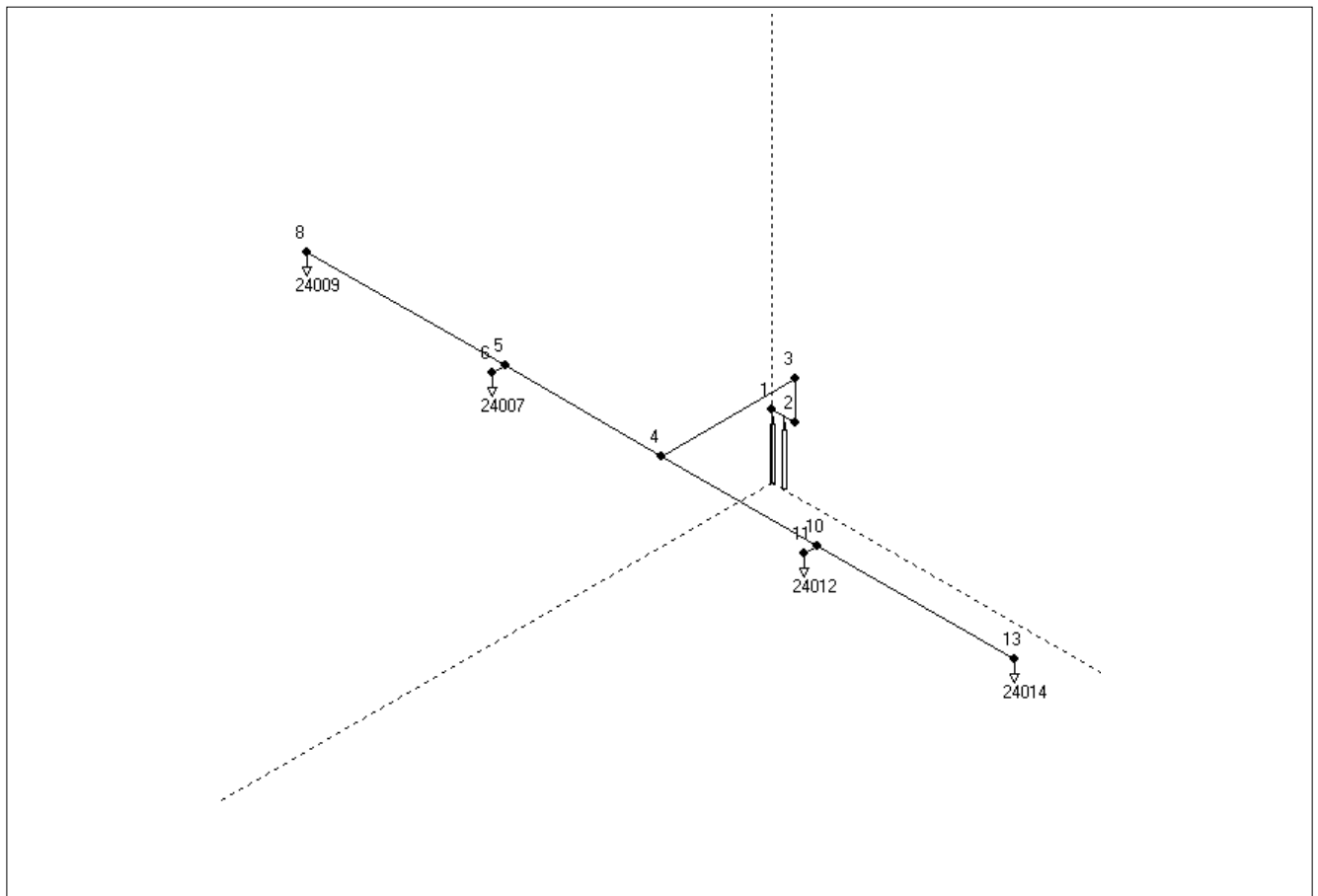


Project: Archive-Big Room
Project-No:
Building:
Object:
Contractor:
Owner:
Project engineer:
Date: 7.3.2019
Altitude above sealevel: 400 m
Regulation rule for calculation of FK-5-1-12 quantities: ISO 14520-1, Edition 2000

Pipe catalogue: 1230_SEE_20150727.rkl
Component catalogue: 1230_20150727.arm
Nozzle catalogue: 1230_25052007.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	0,100	0,100	31	27,0	C	101	7,340	2	
2	1	2	0,900	0,000	31	50,3	E	-	-		
3	2	3	0,600	0,600	13	53,0	E	-	-		
4	3	4	2,100	0,000	13	53,0	E	-	-		
5	4	5	2,450	0,000	13	53,0	T-90°	-	-		
6	5	6	0,200	0,000	13	27,2	T-90°	-	-		
7	6	24007	0,200	-0,200	13	27,2	E	-	-	43.6	
8	5	8	3,100	0,000	13	27,2	T-0°	-	-		
9	8	24009	0,200	-0,200	13	27,2	E	-	-	43.6	
10	4	10	2,450	0,000	13	53,0	T-90°	-	-		
11	10	11	0,200	0,000	13	27,2	T-90°	-	-		
12	11	24012	0,200	-0,200	13	27,2	E	-	-	43.6	
13	10	13	3,100	0,000	13	27,2	T-0°	-	-		
14	13	24014	0,200	-0,200	13	27,2	E	-	-	43.6	

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

Legend of pipetypes

Type	Pipeclass	Pipe roughness
31	Manifolds/diptubes/valve section	galvanized
13	EN 10255-M	black pipe

Legend of components

Code	Type	Resistance coefficient
101	VSB33+diptube (Di 27 mm)+FRF33+CARF33+manifold	7,340



Calculation zone data:

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 Archive-Big Room	223,8	0,0	223,8	3,000	20,0	4,1	1,30	5,3	174,42

Regulation rule for calculation of FK-5-1-12 quantities: ISO 14520-1, Edition 2000
Altitude above sealevel: 400,0 m

Further information:

Design with included gas discharge time

Calculation results:

FK-5-1-12 storage data:

Design quantity:	174,4 kg
Supplement factor:	1,00
Minimum storage quantity:	174,4 kg
Container volume:	120,0 l
Filling ratio:	0,76 kg/l
Filling pressure:	42,0 bar abs
FK-5-1-12 -mass per container:	91,2 kg
Number of containers:	2
Actual storage quantity:	182,4 kg
Storage temperature:	20,0 °C
Starting container pressure:	42,0 bar abs

Discharge time:

Discharge time air:	0,2 s
Total gas discharge time:	0,6 s
Two-phase discharge time:	9,4 s
Total discharge time:	10,0 s

System information:

Container working pressure:	26,3 bar abs
Container working temperature:	20,0 °C
Total network volume:	23,0 l
Medium pipe content:	25,5 kg FK-5-1-12
Filling portion in pipe system:	0,14 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	18,44	8,76	27,0	tube
2	1	2	17,65	17,51	50,3	50_63
3	2	3	17,02	17,51	53,0	2"
4	3	4	16,34	17,51	53,0	2"
5	4	5	15,81	8,76	53,0	2"
6	5	6	15,66	4,38	27,2	1"
7	6	24007	15,00	4,38	27,2	1"
8	5	8	15,31	4,38	27,2	1"
9	8	24009	14,64	4,38	27,2	1"
10	4	10	15,81	8,76	53,0	2"
11	10	11	15,66	4,38	27,2	1"
12	11	24012	15,00	4,38	27,2	1"
13	10	13	15,31	4,38	27,2	1"
14	13	24014	14,64	4,38	27,2	1"



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	24007	2	4	27,2	1"	7,3	43,6
1	24009	2	4	27,2	1"	7,4	43,6
1	24012	2	4	27,2	1"	7,3	43,6
1	24014	2	4	27,2	1"	7,4	43,6

MAXIMUM TRANSPORT TIME DIFF. BETWEEN NOZZLES: 24012./ 24009. IS 0.38 S



Concentrations:

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

Pressure relief opening:

Calculation- zone no:	Recommended area against overpressure		Max. flow [kg/s]
	Area [ml]	Overpressure [mbar]	
1	0,097	3,0	



Component list:

Component	Number	Code	Coefficient
VSB33+diptube (Di 27	1	101	7,300

Nozzle-type	Number
BFFP	4

Pipe-type	Di [mm]	DN	Length [m]
31	27,00	tube	0,100
31	50,30	50_63	0,900
13	53,00	2"	7,700
13	27,20	1"	7,400

Number of bends (+) and elbows (-)

Bend-type	Di [mm]	DN	Number
-90	50,30	50_63	1
-90	53,00	2"	2
-90	27,20	1"	4

Number of T-distributors (in- and outdiameter)

Number	Input	90-out	90-out	0-out
1	53,0	53,0	53,0	0,0
2	53,0	27,2	0,0	27,2