

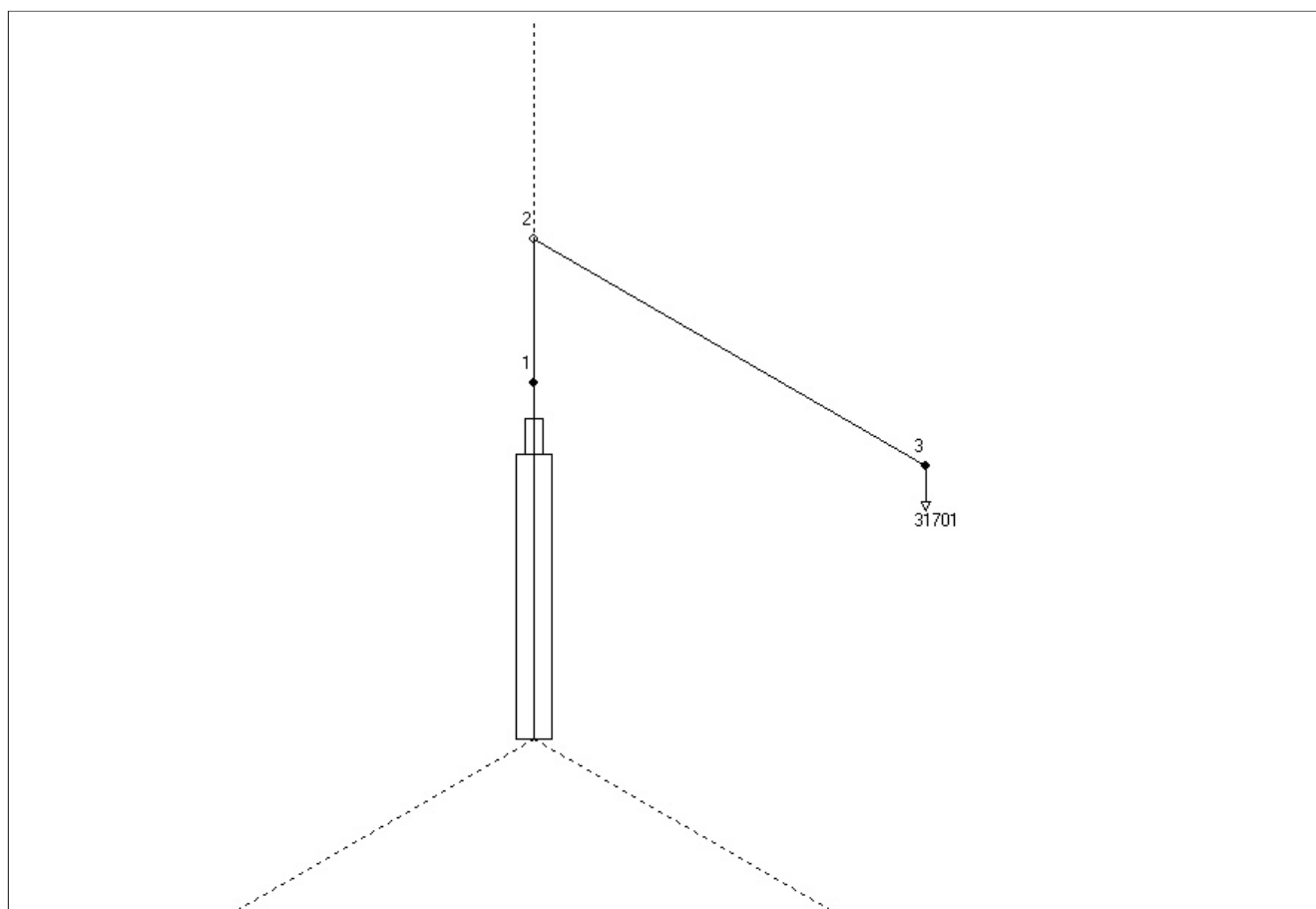
Rev.	Důvod vydání dokumentu, druh změny	Vypracoval	Datum

Investor :		Kraj :	Vysočina	
<b>Město Žďár nad Sázavou,</b> Žižkova 227/1, Žďár nad Sázavou 59101 IČO: 00295841, DIČ: CZCZ00295841		Okres :	Žďár nad Sázavou	
		KÚ :	795232	
<b>Projektant :</b>  <b>PINET projekt s.r.o.</b> Máchova 2328, 256 01 Benešov IČO: 24274950, DIČ: CZ24274950 T: 317 702 560, E: info@pinetprojekt.cz		Zodp. projektant :	Ing. Miloš Průha	
		Vypracoval :	Ing. Miloš Průha	
		Kontroloval :	Marcel Pilát	
<b>Projekt :</b> Výstavby nové serverovny v objektu Městský úřad Žďár nad Sázavou		Datum :	07/2024	Číslo výtisku :
		Číslo projektu :	24Z054	
		Stupeň dokum. :	DSP+DPS	
Část stavby :	Plynové stabilní hasicí zařízení	Formát :	ISO A4	Číslo přílohy : <b>02</b>
<b>Příloha :</b> HYDRAULICKÝ VÝPOČET		Měřítko :	-	
		Část :	D2.1	



Project: MU Zdar n.S.  
Project-No: server  
Building:  
Object:  
Contractor:  
Owner:  
Project engineer:  
Date: 25.07.2024  
Altitude above sealevel: 200 m  
Regulation rule for calculation of FK-5-1-12 quantities: ISO 14520-1, Edition 2000

Pipe catalogue: Wattcom-potrubí-Novec-2021.01.21.rkl  
Component catalogue: Rotarex - Novec-2021.01.21.arm  
Nozzle catalogue: Rotarex - Novec-2021.01.21.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	1,500	1,500	22	33,0	C	482	6,820	1,0
2	1	2	0,600	0,600	11	20,9		-	-	0,0
3	2	3	1,900	0,000	11	20,9	E	-	-	0,0
4	3	31701	0,100	-0,100	11	20,9	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
22	Sestava hadice	hose
11	Potrubí	galvanized

**Legend of components**

Code	Type	Resistance coefficient
482	Sestava vypouštění B0482	6,820

**Nozzle data:**

No.	Calculation zone	Diameter [mm]
31701	Místnost	3,2

**Legend of nozzles:**

Type	Number of orifices	C1	C2	C3	C4	C5	C6
3 180° 1/2 - 1-1/4	17	0,82800	0,05416	0,00000	0,10826	0,00000	0,00000

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

Zone	Total volume [m3]	Volume of building parts [m3]	Calculated volume [m3]	Max. Overpressure [mbar]	Design temp. [°C]	Extinguish-conc. [% Vol]	Design factor	Design conc. [% Vol]	Design quantity [kg]
1 Místnost	44,0	0,0	44,0	3,000	20,0	4,3	1,30	5,6	36,61

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

Altitude above sealevel: 200,0 m

**FK-5-1-12 storage input data:**

Container volume:	50,0 l
Filling ratio:	-0,740 kg/l (fixed value)
Filling pressure:	25,0 bar abs
Storage temperature:	20,0 °C
Supplement factor:	1,00
Minimum storage quantity:	36,61 kg
Number of containers:	1

**Discharge time (input value):** 10,0 s**Further information:**

Design with included gas discharge time

Design with predetermined orifice diameters



## Calculation results:

### FK-5-1-12 storage data:

Design quantity:	36,6 kg
Supplement factor:	1,00
Minimum storage quantity:	36,6 kg
Container volume:	50,0 l
Filling ratio:	0,74 kg/l
Filling pressure:	25,0 bar abs
FK-5-1-12 -mass per container:	37,0 kg
Number of containers:	1
Actual storage quantity:	37,0 kg
Storage temperature:	20,0 °C
Starting container pressure:	25,0 bar abs

### Discharge time:

Discharge time air:	0,1 s
Total gas discharge time:	0,1 s
Two-phase discharge time:	9,8 s
Total discharge time:	9,8 s

### System information:

Container working pressure:	16,7 bar abs
Container working temperature:	20,0 °C
Total network volume:	2,1 l
Medium pipe content:	3,2 kg FK-5-1-12
Filling portion in pipe system:	0,09 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	16,03	3,55	33,0 *	--
2	1	2	15,31	3,56	20,9	3/4
3	2	3	13,42	3,56	20,9	3/4
4	3	31701	12,07	3,56	20,9	3/4

\* Attention! This pipe dimension is not in the pipe catalogue!

**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	31701	3	17	20,9	3/4	3,2	36,7

Two-phase discharge time: 9,8 s

Calculation- zone no:	Nozzle no.	Outlet velocity [m/s]	Transport time [s]	Jetdistance [m]	Evaporation distance [m]
1	31701	22,2	0,88	1,53	1,10

**Concentrations:**

Calculation- zone no:	O2	Gascomposition after discharge [%]	
		FK-5-1-12	N2
1	19,7	5,6	73,7

**Pressure relief opening:**

Calculation- zone no:	Recommended area against overpressure		Max. flow [kg/s]
	Area [m <sup>2</sup> ]	Overpressure [mbar]	
1	0,021	3,0	3,6



**Component list:**

Component	Number	Code	Coefficient
Sestava vypouštění B	1	482	6,800

Nozzle-type	Number	C1	C2	C3	C4	C5	C6
3	1	0,82800	0,05410	0,00000	0,10820	0,00000	0,00000

Pipe-type	Di [mm]	DN	Length [m]
22	33,00	--	1,500
11	20,90	3/4	2,600

**Number of bends (+) and elbows (-)**

Bend-type	Di [mm]	DN	Number
-90	20,90	3/4	2

**Number of T-distributors (in- and outdiameter)**

Number	Input	90-out	90-out	0-out
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