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VANDTÅGE I BYGNINGER

DBI - Sikkerhedens Hus

Maj 2013

TORBEN GULDBÆK JENSEN

Projektleder hos DTEK A/S

Uddannet blikkenslager

10 års erfaring som sprinklermontør i “marken”

2 år på kontor som projektleder med hovedvægten på sprinkler

DTEK- DANSK TEKNIK ENTERPRISE A/S

- Grundlagt i 2001 .
- DTEK A/S beskæftiger omkring 80 montører, med afdelinger i København og Støvring.
- DTEK A/S er akkrediteret og certificeret under DS/EN ISO 9001:2000.
- DTEK A/S vores kerneydelser er VVS og sprinkler
- DTEK I samarbejde med Novenco på flere projekter siden 2007 fra plejehjem til kontorhuse Projekter under opførelse:
- Ingeniørfirmaet Moe, nyt domicil, Gladsaxe – 25000m².
- Turbinehallerne, Middelfart 2500 m²

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SPRINKLER VS. VANDTÅGE SYSTEM

	Conventional Sprinkler System	Water Mist System
Pressure at Nozzle	0.5 bar	4 bar
Way of extingination	Cooling	Cooling and Oxygen suffocation
System configuration	Difficult	Simple
Price	Low	Low
Water consumption	5 l/min/m^2	1.6l /min/m^2
Pipe size	Large	Small
Recommended Pipe material	Steel	Stainless steel, Galvanized pipes
Working Pressure	< 12 bar	<16 bar
Fitting	Sprinklerfitting	Pressfitting
Max. Areal coverage pr. sprinkler	12m2	25, 26, 30 m2
Installation time	100 %	40 %

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DYSER TIL MONTAGE I LOFT

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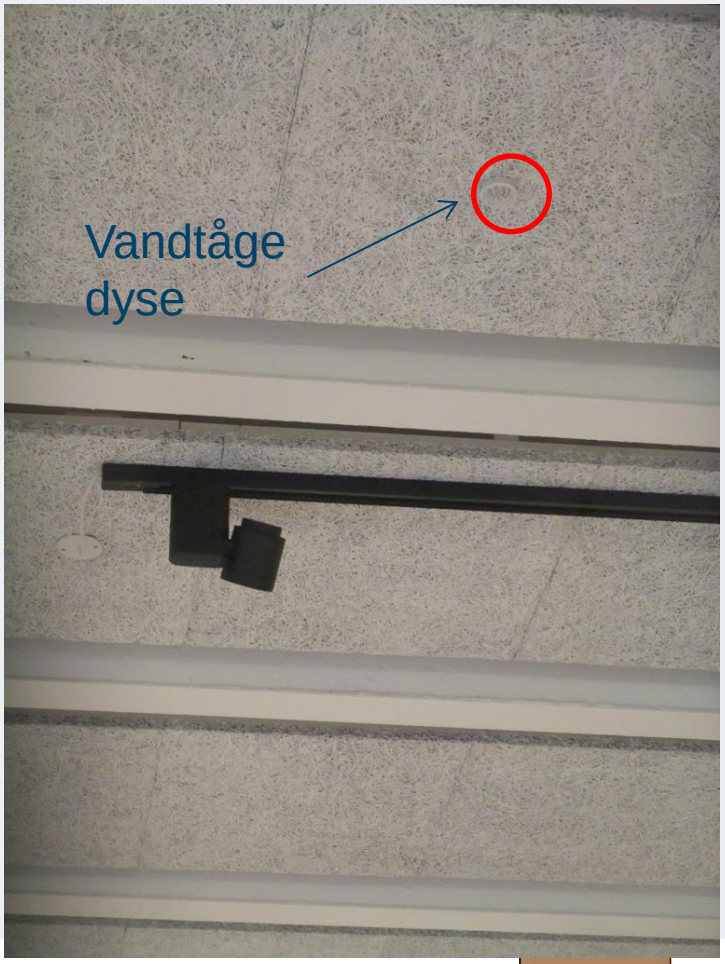
DYSER MONTERET I NEDHÆNGT LOFT



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FLEKSIBEL TILSLUTNING

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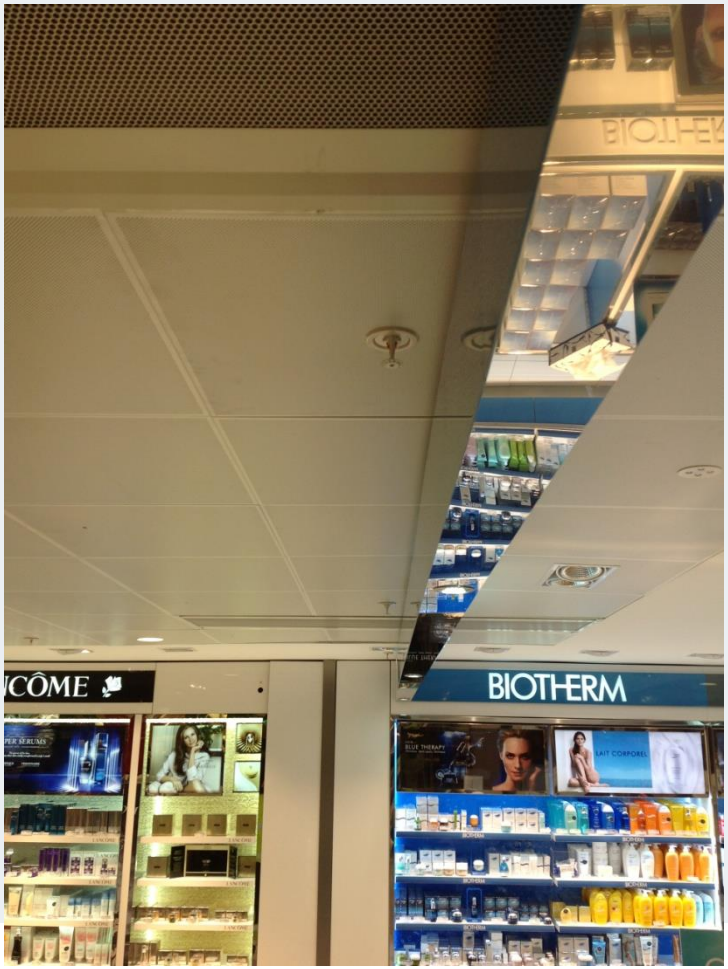
SPRINKLER MONTERET I NEDHÆNGT LOFT



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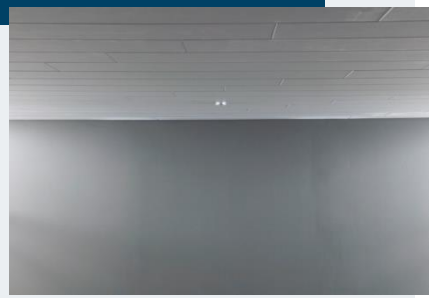
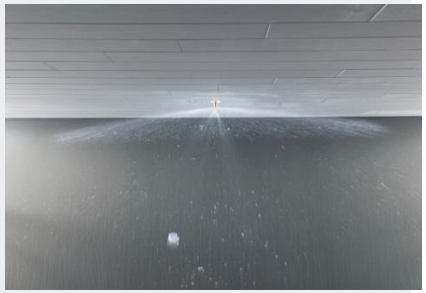
VANDTÅGE SYSTEM

- Simpel pålidelig system
- Tidsbesparende montering
- Større dækningsareal pr. enhed
- Mindre rør dimensioner
- Standard vvs komponenter
- Op til 50% mindre vandmængde-
  - F.ex.1600l/min traditionel vs. 700l/min Novenco vandtåge system
- Press fitting- lettere vedligeholdelse
- Arkitektonisk tiltalende – concealed sprinkler
- Ergonomisk fordelagtig - mindre nedslidning af medarbejderne grundet den lavere vægt.





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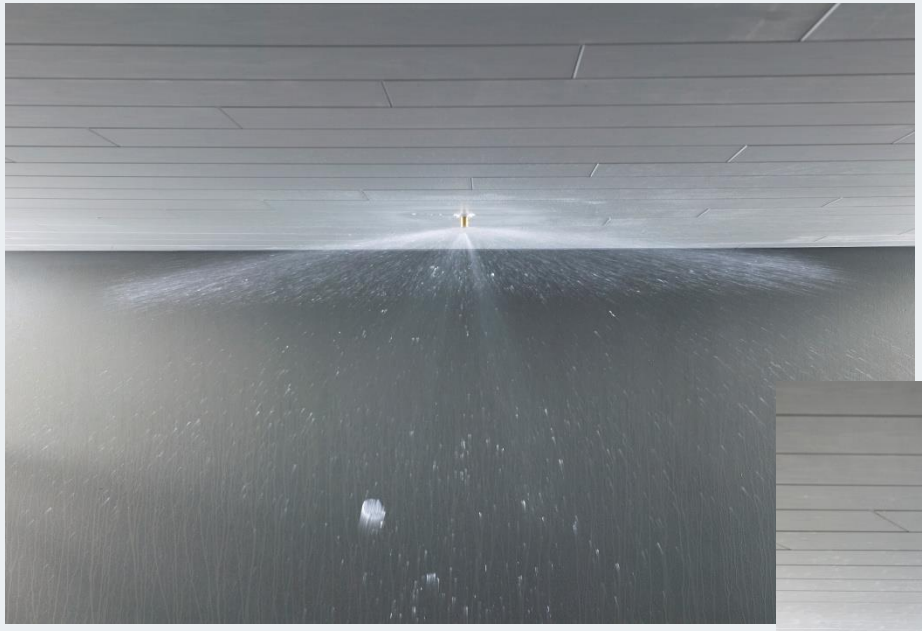
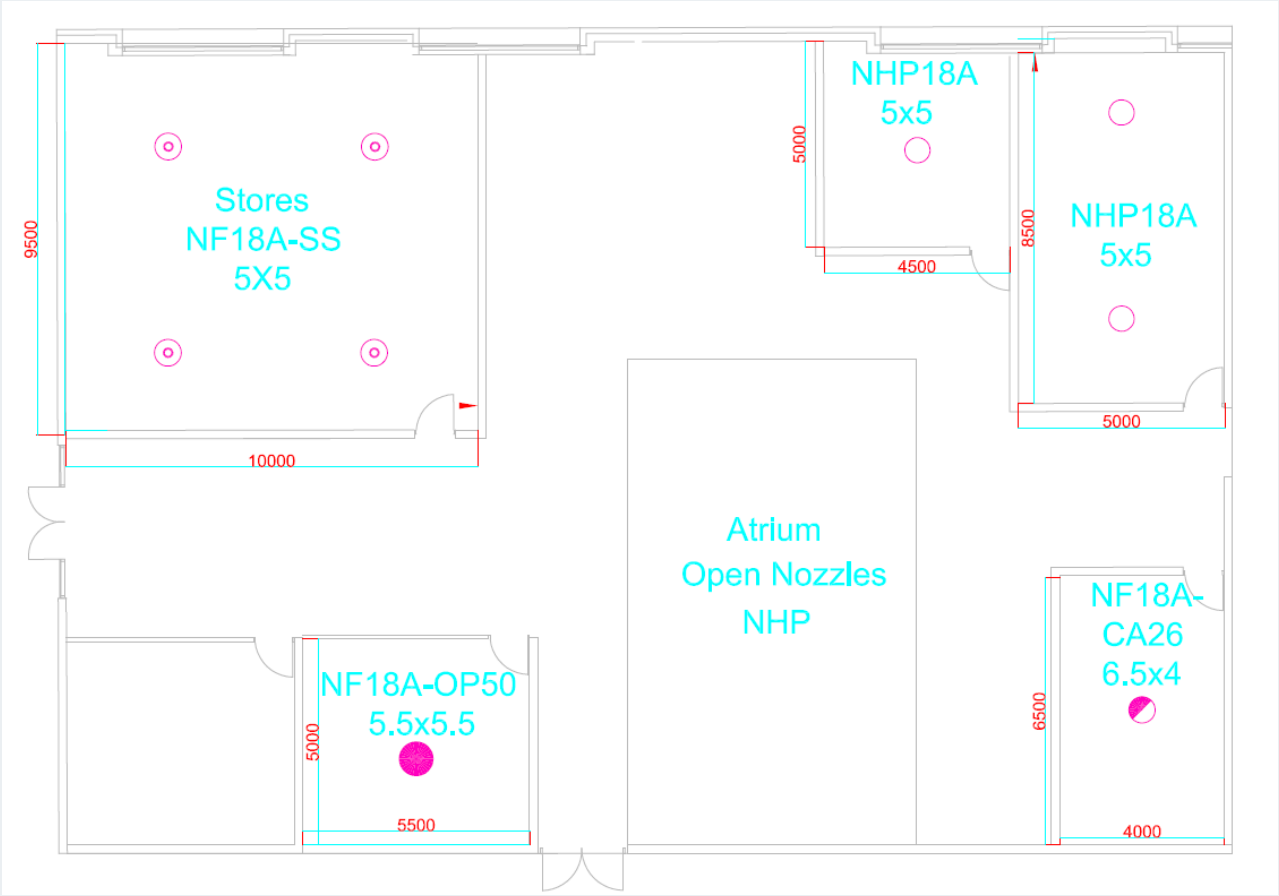
AKTIVERET DYSE



OVERSIGT VANDTÅGEDYSER



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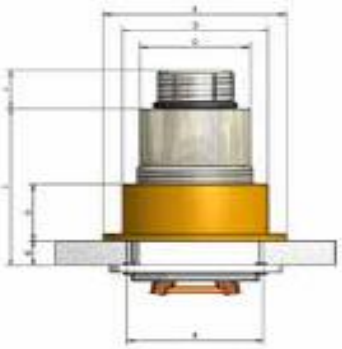
CLOSED NOZZLE NF18A-CA26

WATER MIST NOZZLE

Lloyds Approved



TECHNICAL DATA:

Nozzle Material:	Brass M558/NiSn
Installation:	Pendant installation
Flow Calculation:	$Q = k\sqrt{\text{Working pressure}}$
B: Ceiling hole diametre:	35mm-40mm
C: Nozzle diameter:	M32 x 1 - Ø32
D: Top ring shaft diametre:	40mm
E: Top ring plate diametre:	50mm
F: Cover below ceiling:	15mm
G: Ceiling thickness:	0-18mm
H: Height of top ring:	18mm
I: Nozzle stem length:	50mm
J: ½" Pipe thread nipple:	18mm

Type:		NF18A-CA26, 57/68°C	NF 18A-CA26, 141°C
Working Pressure	[bar]	3,4	3,4
K-factor	[L / min * $bar^{1/2}$]	31,3	31,3
Max. spacing between nozzles	m * m	4 x 6,5	4 x 6,5
Density of coverage	[L / min * m^2]	2,22	2,22

Owing to continued product development, Novenco reserves the right to introduce alterations without prior notice.

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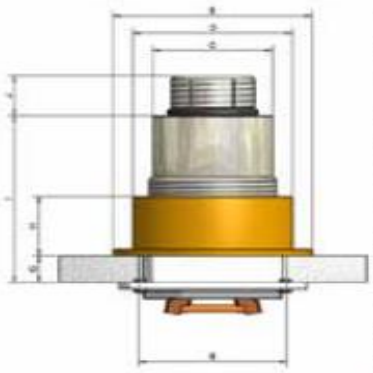
CLOSED NOZZLE, NHP-18 A

WATER MIST NOZZLE



TECHNICAL DATA:

Nozzle Material:	Brass MS58/NiSn
Installation:	Pendant installation
Flow Calculation:	$Q = k\sqrt{\text{Working pressure}}$
B: Ceiling hole diametre:	35mm-40mm
C: Nozzle diameter:	M32 x 1 - Ø32
D: Top ring shaft diametre:	40mm
E: Top ring plate diametre:	50mm
F: Cover below ceiling:	15mm
G: Ceiling thickness:	0-18mm
H: Height of top ring:	18mm
I: Nozzle stem length:	50mm
J: ½" Pipe thread nipple:	18mm

Type:		NHP 18A, 57/68°C	NHP 18A, 93°C	NHP 18A, 141°C
Working Pressure	[bar]	4	4	4
K-factor	[L / min * $bar^{1/2}$]	20	20	20
Max. spacing between nozzles	m * m	5 x 5	5 x 5	5 x 5
Density of coverage	[L / min * m^2]	1,6	1,6	1,6

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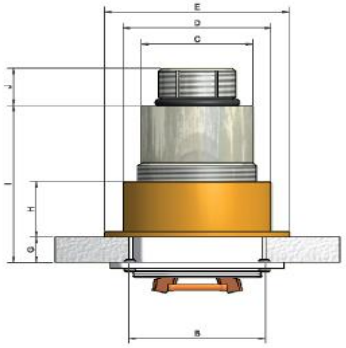
CLOSED NOZZLE NF18 A-OP50

WATER MIST NOZZLE

Lloyds Approved
OH1 & OH3



TECHNICAL DATA:

Nozzle Material:	Brass MS58/NiSn
Installation:	Pendant installation
Flow Calculation:	$Q = k\sqrt{\text{Working pressure}}$
B: Ceiling hole diametre:	35mm-40mm
C: Nozzle diameter:	M32 x 1 - Ø32
D: Top ring shaft diametre:	40mm
E: Top ring plate diametre:	50mm
F: Cover below ceiling:	15mm
G: Ceiling thickness:	0-18mm
H: Height of top ring:	18mm
I: Nozzle stem length:	50mm
J: ½" Pipe thread nipple:	18mm

Type:		NF18A op50, 57/68°C	NF18AOP50, 93°C	NF18Aop50, 141°C
Working Pressure	[bar]	3,4	3,4	3,4
K-factor	[L / min * $bar^{l/2}$]	31,4	31,4	31,4
Max. spacing between nozzles	m * m	5,5 x 5,5	5,5 x 5,5	5,5 x 5,5
Density of coverage	[L / min * m^2]	1,92	1,92	1,92

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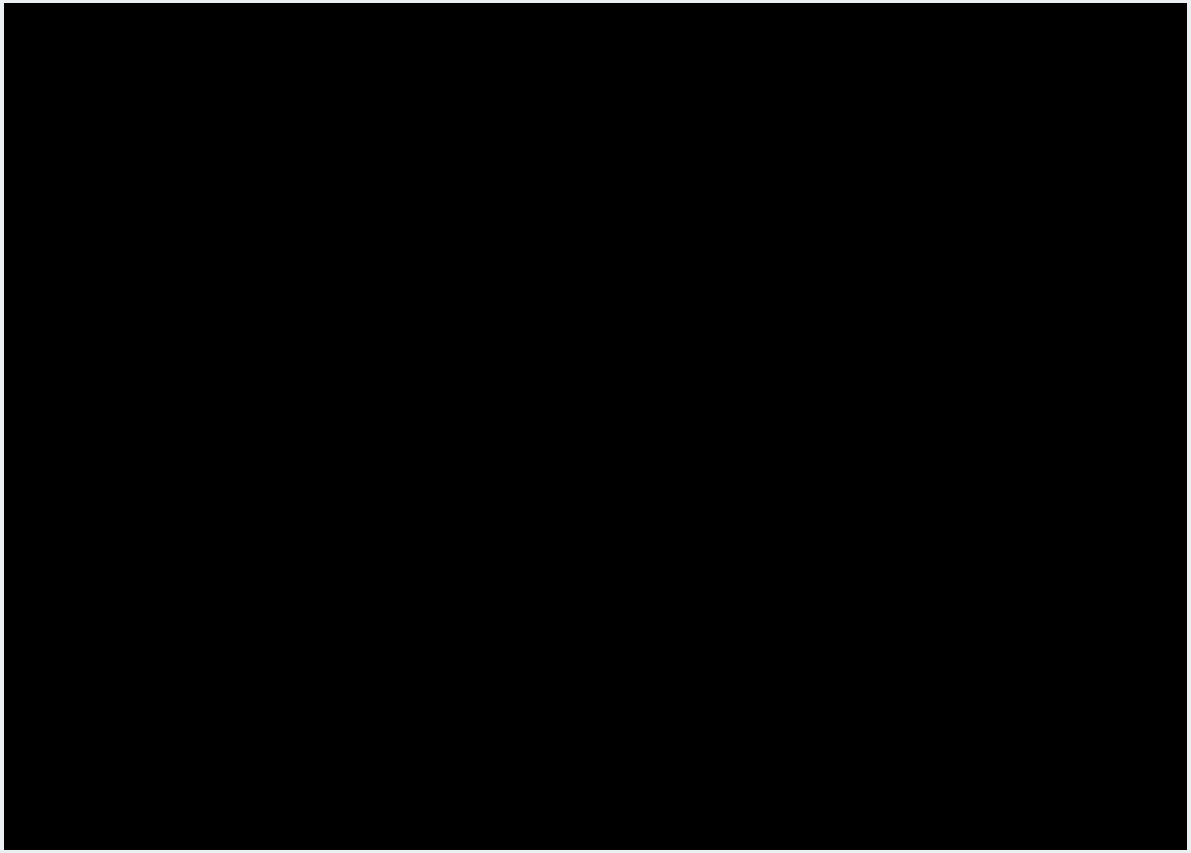
NEM OPMÅLING



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NEM TILDANNELSE AF RØR

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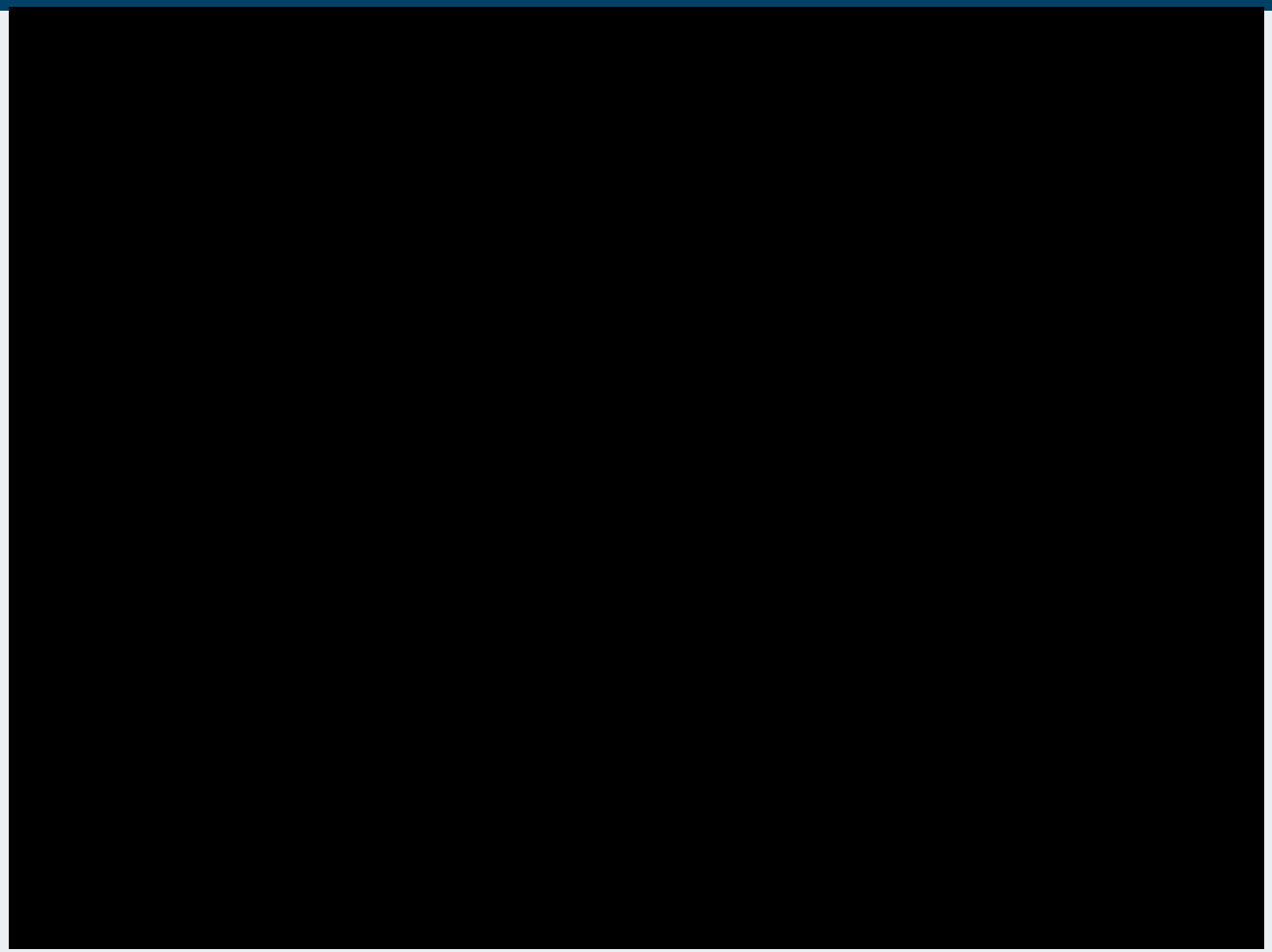
HURTIG MONTAGE



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OMBYGNING AF GAMMEL FABRIK TIL KONTOR 20000 M2 KLASSIFICERET SOM OH2

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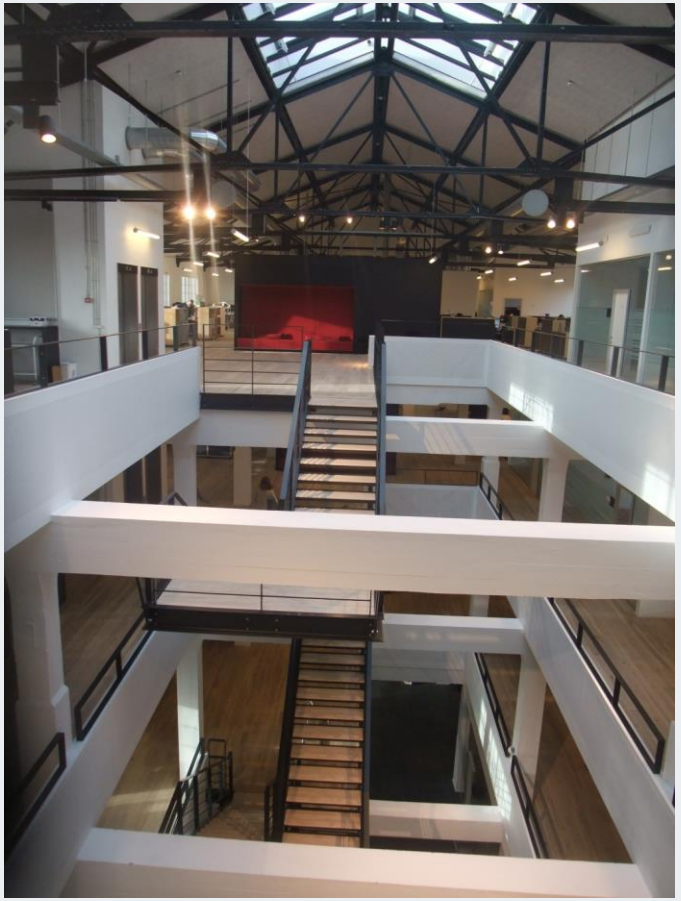
ATRIUM



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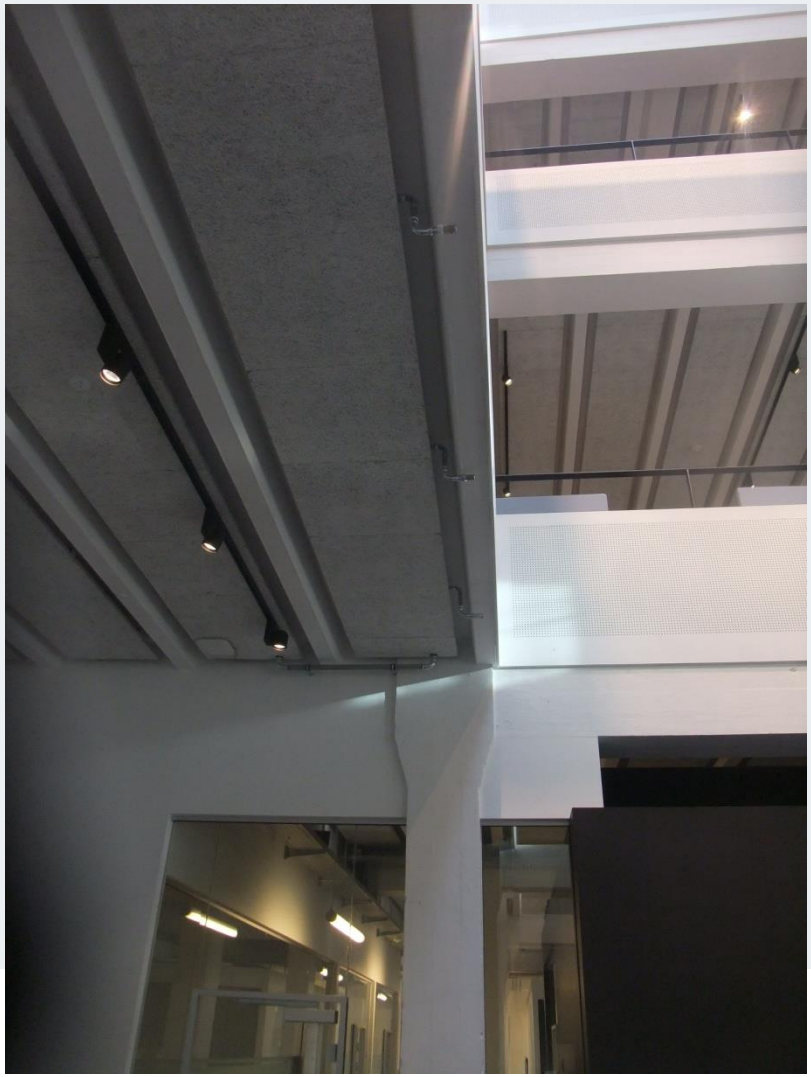
ATRIUM DYSE OH2



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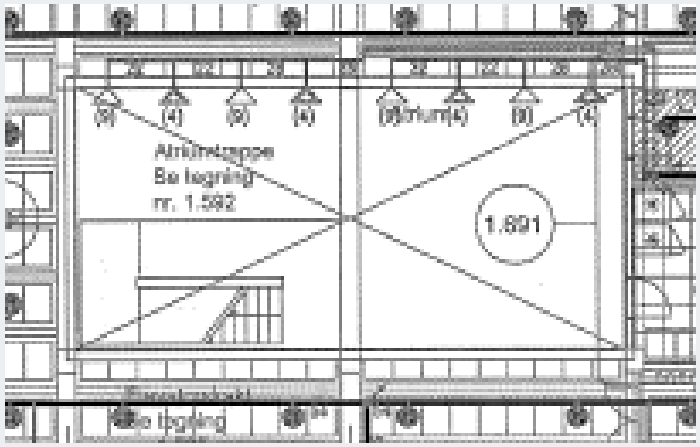
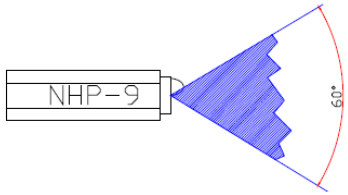
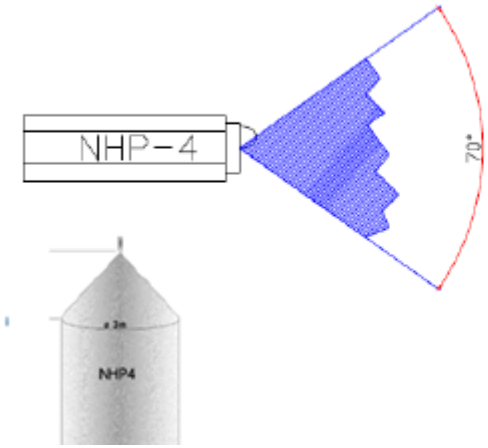
STUE PLAN MED ATRIUM





Working Pressure [Bar]	Spray Angle [deg]	Max. Length [m]
4	60	4.6
9	60	7.4



Working Pressure [Bar]	Spray Angle [deg]	Max. Length [m]
4	70	4.4
9	70	5.5

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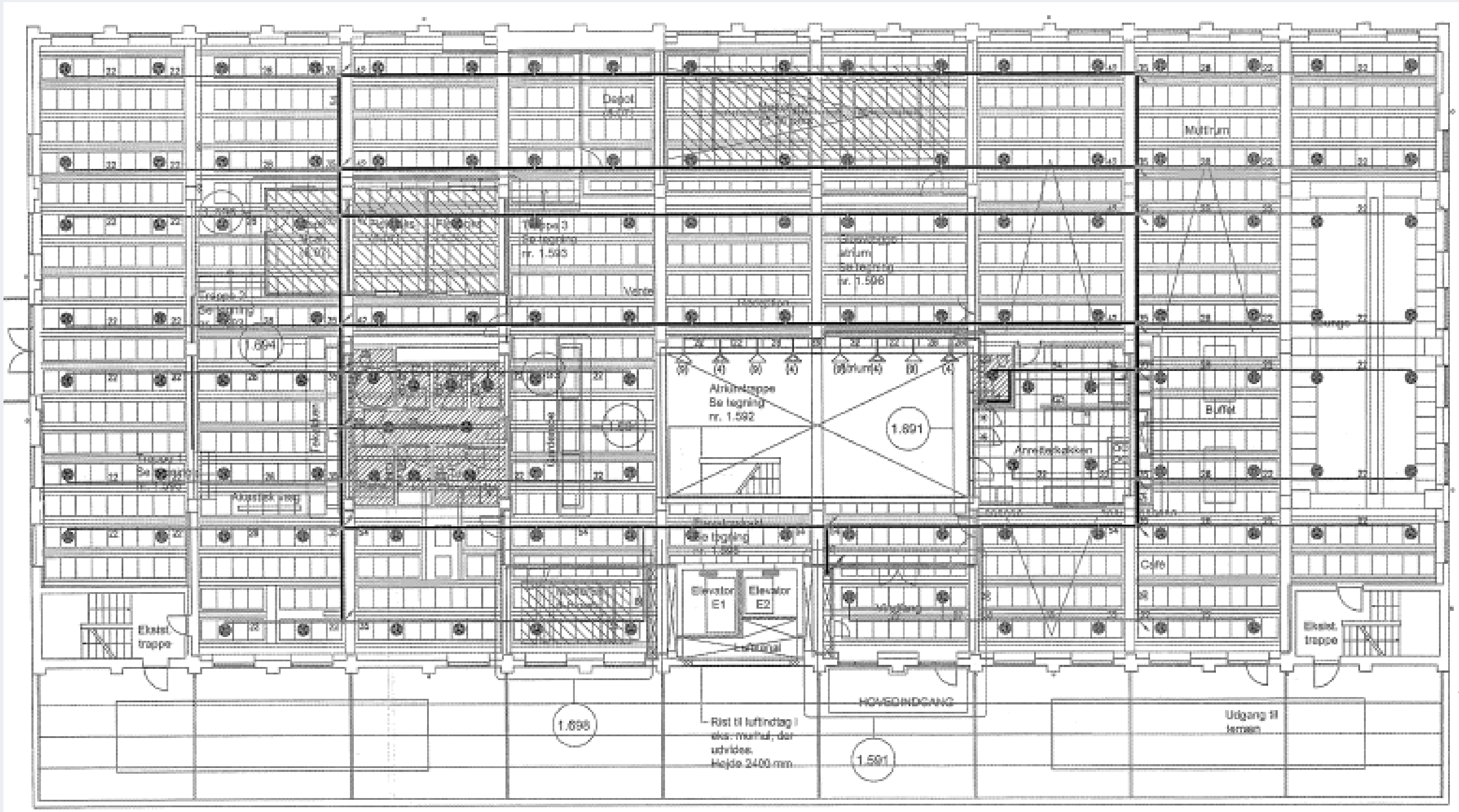
STUE PLAN MED VANDTÅGE
GRID SYSTEM MED Ø56 MM FZ RØR



PLAN AF STUEETAGE Stueplan Bygning B

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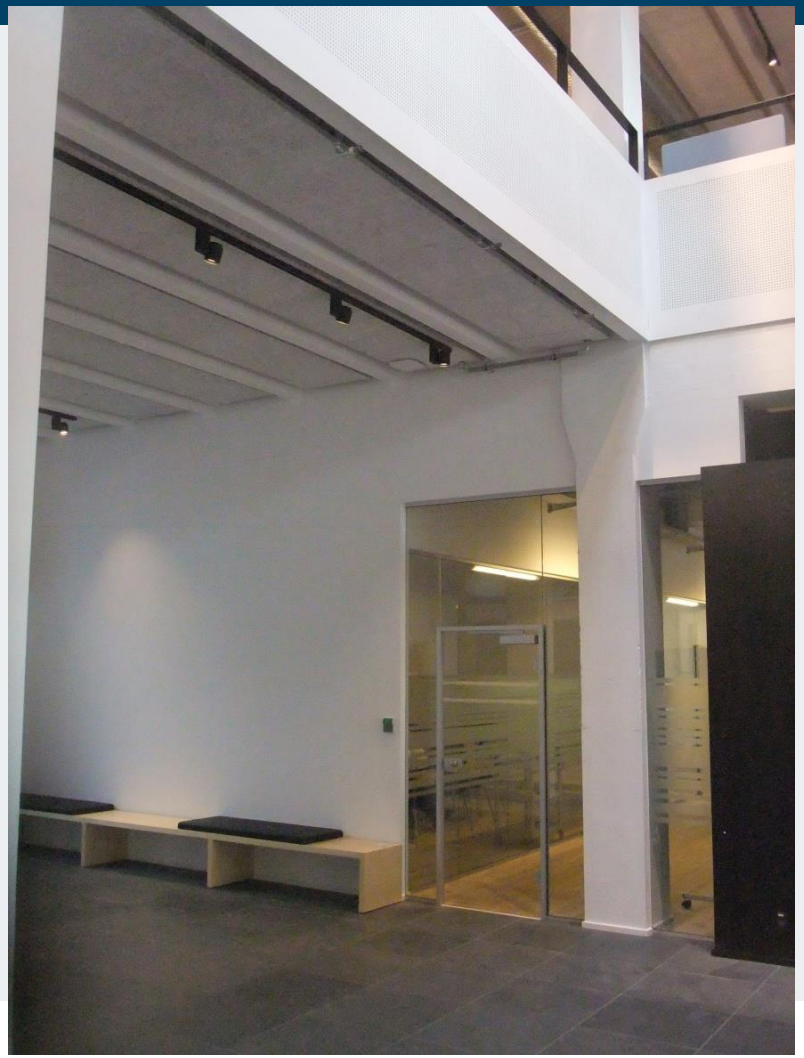
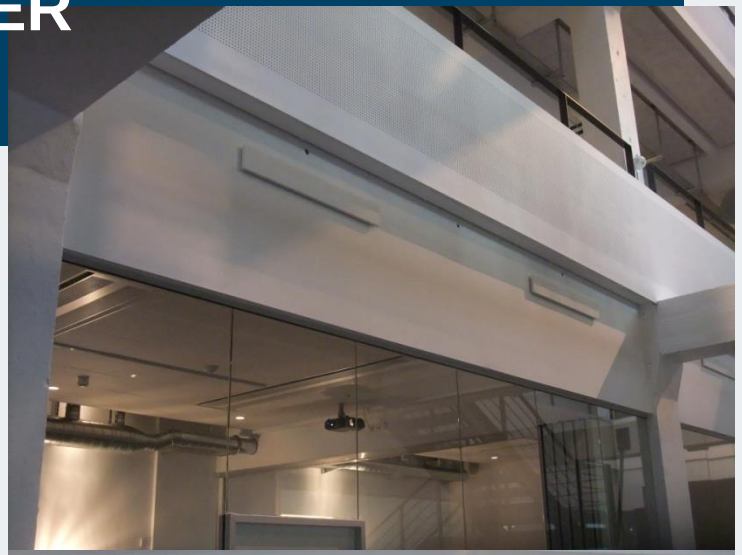
MED KUN 10 CM HULRUM OVER NEDHÆNGT LOFT





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PROJEKTER UNDER OPFØRELSE

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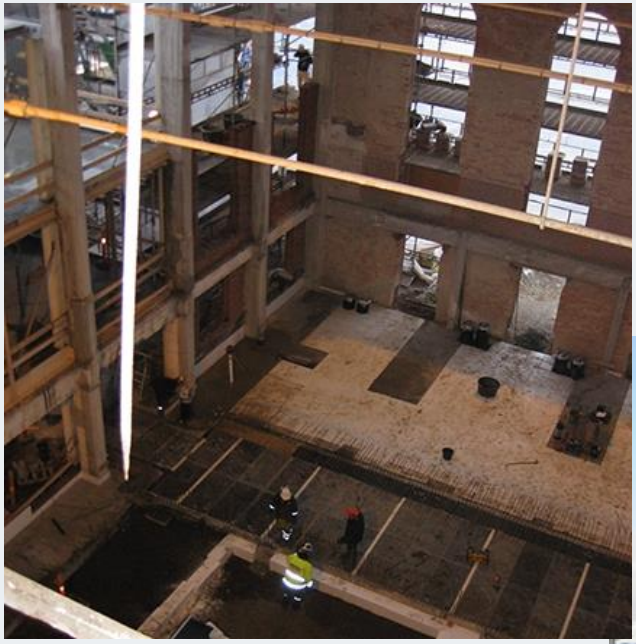
TURBINEHALLEN, MIDDELFART
OMBYGNING TIL KONTORER - 2500 M²



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MOE, GLADSAXE
NYT DOMICIL 25000 M²

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WATER TANK, SPRINKLER VS MIST SYSTEM

Table 9 — Minimum water volume for pre-calculated LH and OH systems

Group	Height *h* of the highest sprinkler above the lowest sprinkler [A1] (see NOTE) [A1] m	Minimum water volume m^3
LH - (Wet or pre-action)	$h \leq 15$ $15 < h \leq 30$ $30 < h \leq 45$	9 10 11
OH1 - Wet or pre-action	$h \leq 15$ $15 < h \leq 30$ $30 < h \leq 45$	55 70 80
OH1 - Dry or alternate OH2 - Wet or pre-action	$h \leq 15$ $15 < h \leq 30$ $30 < h \leq 45$	105 125 140
OH2 - Dry or alternate OH3 - Wet or pre-action	$h \leq 15$ $15 < h \leq 30$ $30 < h \leq 45$	135 160 185
OH3 - Dry or alternate OH4 - Wet or pre-action	$h \leq 15$ $15 < h \leq 30$ $30 < h \leq 45$	160 185 200
OH4 - Dry or alternate	Use HH protection	

[A1] NOTE [A1] Excluding sprinklers in the sprinkler valve room.

Water flow requried: 580 l/min
Duration: 60 min
Water tank V m3
Water tank V = 580 l/min x 60 min
Water tank V = 34,8 m3

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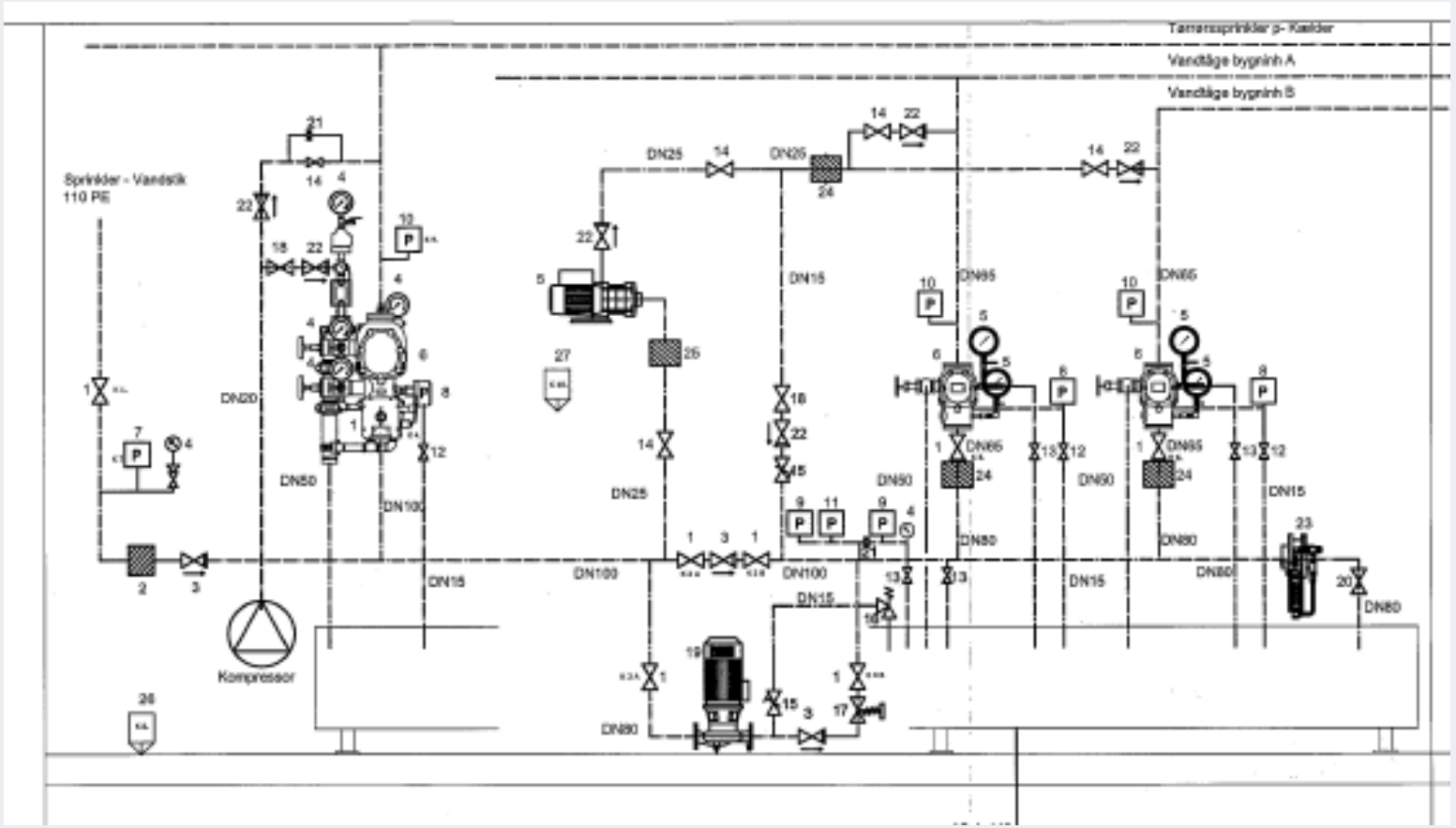
SPRINKLER CENTRAL



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SPRINKLER CENTRALER

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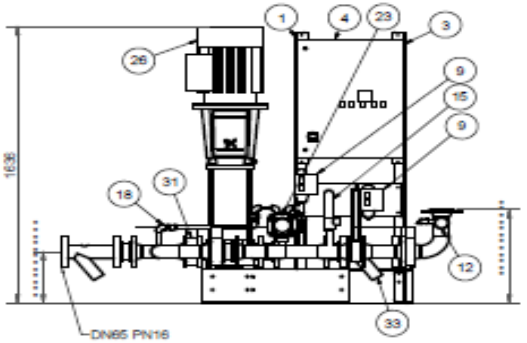
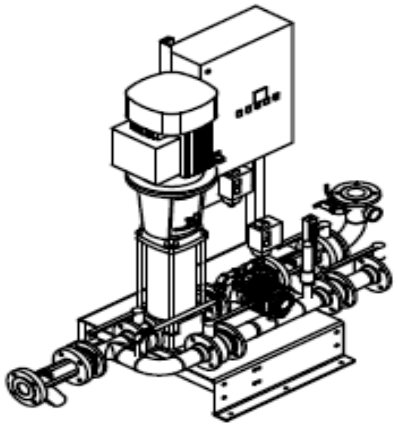
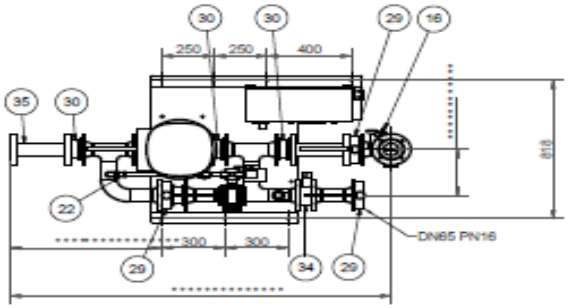
PUMPE UNIT







Weekly Testing of System Call Fire-alarm central and inform of the testing

1.Read the pressure on manometer (Pos.12)
2. Open the test valve (Pos.29)
3. The pilot pressure drops and pilot pump (Pos.23) will start.
4. After 10 seconds pilot pump (Pos.23) will stop and the main pump (Pos.26) will start
5. Check the alarm is indicated as on the pump control panel (Pos.3)
6. Close the test valve (Pos.29)
7. Observe Control Panel is operational
8. Stop Main Pump (Pos.3) by turning S01 to"0".
9. Read the pressure at the manometer (Pos.12). If the pressure is over the design pressure, open test valve (Pos.12) slowly until the set design pressure. 10. Re-establishing the pump control panel by the following procedure

- Turn main pump switch S01 to "AUTO"
- Check pilot pump switch S04 to "AUTO"

11. Control all valves positions correct with diagram

Maintenance	General	Weekly	Monthly	Yearly
1. Pump Unit should be kept in a frost-free and fire hazard free storage	X			
3. Visual Check		X		
5. Weekly Testing of System		X		
6. Check All The Valve Positions are in normal state		X		
5. Stop and Lamp Test			X	
6. Pump Capability Test			X	
7. Pilot Pump Test			X	
8. Clean Filter				X
9. Check Remote Operation of Pumps				X
10. Check of water supply(in conjunction with the fire projection authorities)				X
11. Check of alarm transfer(in conjunction with the fire projection authorities)				X

Pos. Description - State
1. Main Pumpstop
2.1Butterfly Valve with Limited switch - Open
2.2Butterfly Valve with Limited switch - Closed
3.1Butterfly Valve with Limited switch - Open
3.2Butterfly Valve with Limited switch - Closed
12Pilot Pump - Maintain system pressure by stop/run
16Manometer System pressure22Drain Valve - Closed

Activated :
One or more nozzles are activated, the system pressure is reduced.

Pressure switch Pos.9 activate the pilot pump.

If the Pilot pump cannot maintain system pressure within 10 second, main pump is activated, and fire alarm signal is given.

If system pressure continue to decrease below the setting value in pressure swith (Pos.9), the main pump unit will be activated by Pressure switch (Pos.9), and fire alarm signal is given.
(As a back-up to the pilot alarm described in the above square)

ITEM	PART NUMBER	QTY	DESCRIPTION
35	9240180	1	Strainer DN65 3mm
34	30032024	1	Flow meter DN80
33	9226240	1	Strainer DN65 0,5mm
31	9217810	1	Butterfly valve DN65 Wafer PN16
30	9194670	4	Disc Check Valve - DN65
29	9217920	3	Butterfly ventil DN65 LUG PN16
26	CR_32-2-2_Sps_11kW	1	
23	9230990	1	Pilot pump Sqflexso 50/60Hz
22	9180930	1	Non-return valve DN15
18	9182820	6	Elbow DN15 AISI 316
16	9179690	1	Butterfly valve DN15 F/F
15	9241810	1	Safetyvalve with -DN25
12	9187980	1	Manometer RP63-DT01
10	9182820	2	R-221 Tee DN15 AISI 316
9	9241620	2	Pressure Switch RT116
4	Switchboard_500x750	1	
3	30032169	1	Pillar for switchboard 2
1	30032168	1	Pillar for switchboard 1

NOVENCO
PUMPUNIT
WATERMIST
MCH
DRAWINGNO

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UDFØRTE PROJEKTER
CAMPUS VARDE

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MIKADO HOUSE, KØBENHAVN

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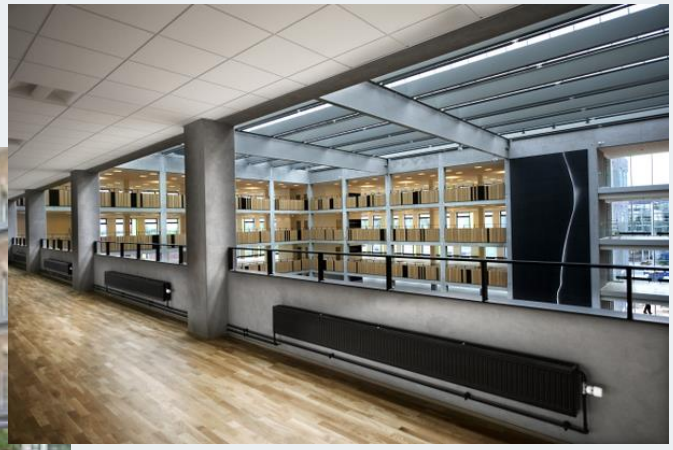
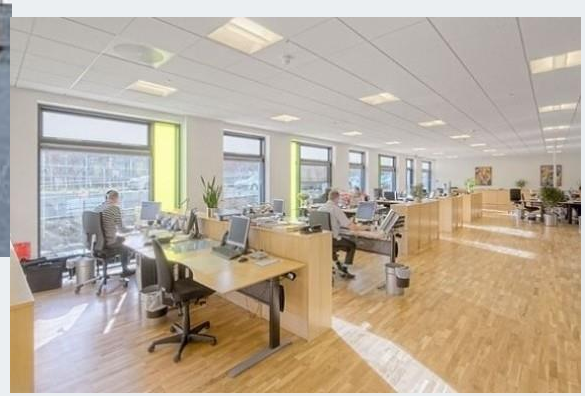
VAT 83, GLADSAXE





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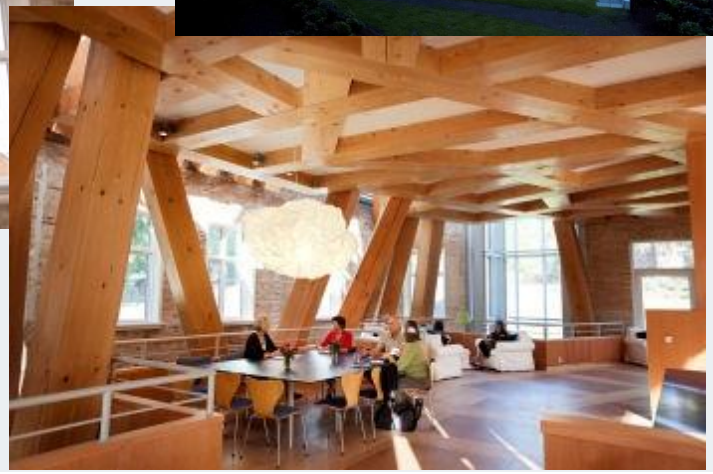
KRÆFTENS BEKÆMPELSE, ÅRHUS



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INSPEKTION / GODKENDELSE

DBI

Inspektionsrapport

Vandtågeanlæg

Bygning/område:	Campus
Anlægstype:	Automatisk vandtågeanlæg
Risikoklasse:	OH 2
Vandtæthed, mm/min.:	1,6 mm/min
Krav til vandforsyning:	404 l/min. 6,5 bar

Første inspektion

Campus
Frisvadvej 72
6800 Varde

Sag: IA06035

Inspektion udført: 2011-03-31
Rapport udstedt: 2011-05-10
Inspektør: Kurt Søballe Anderse

Inspektionsafdelingen

Aftapningsprøve fra 1. inspektion

	Venstre lukket				Højre lukket				Begge åbne			
Vandmængde l/min.	UP	P1	P2	P3	UP	P1	P2	P3	UP	P1	P2	P3
2011-03-31												
0	3,1	11,0			3,1	11,5			3,2	11,0		
250	2,5	10,8			2,9	10,8			3,2	10,9		
405	1,1	9,7			2,8	10,5			2,9	10,5		
500	0,7	8,0			2,7	907,0			2,8	9,8		

Inspektionsresultat

GODKENDT anmærkningsfrit.

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FORDELE MED XFLOW SYSTEM

- mindre vand – mindre energi - miljø venlig
- quick respons
- hurtig kontrol med branden
- mindre vandskade ved fejl aktivering
- diskret rør installation med tyndvæggede presrør
- små rør, større spacing - mere plads til de andre installationsfag
- mindre reservoir
- mindre pumper - både økonomisk og pladsmæssigt
- nem installation
- lav vedligeholdelses omkostninger

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END

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