

Underfloor heating

Project number **New Project**
Project name **Electric Heat Warehouse**

project address

building owner

planner

site inspector

Project comment:

Underfloor heating
New Project Electric Heat Warehouse

Room overview										
0 Ground floor										
No. _R	Room description	θ _i °C	θ _{int,c} °C	A _r m ²	Contour m	Q _N Watt	Q _{P-A} Watt	Q _H Watt	x %	QnUfhCalculation Watt
001	ENTRANCE HALL	18		69.7	50.8	2627	254	2373		2373
002	LOWER GALLERY	18		31.1	19.2	888	111	777		777
003	LOWER GALLERY 2	18		30.2	19.2	1157	131	1026		1026
004	MAIN LOUNGE	21		77.4	37.0	3528	377	3151		3151
005	DINING ROOM	21		51.4	19.2	2004	225	1779		1779
006	KITCHEN	18		69.1	36.8	3457	250	3206		3206
007	LOUNGE 1/2	21		56.2	32.3	1775	325	1450		1450
008	BED ROOM 1 / DRESSING ROOM	18		47.1	40.2	1668	182	1486		1486
009	BEDROOM 2	18		18.7	20.6	483	72	411		411
010	GAMES ROOM 1	21		57.4	35.4	2374	278	2097		2097
011	GAMES ROOM 2	21		12.1	16.3	513	64	449		449
012	UTILITY/BOOT ROOM	18		16.5	19.3	529	69	460		460
013	CLOAK ROOM	18		2.6	7.1	117	13	104		104
014	EN SUITE 1	22		13.1	18.3	852	74	778		778
015	ENSUITE 2	22		3.3	7.4	253	17	236		236
016	GYM	21		28.3	21.5	764	146	618		618
017	CLOAK ROOM/WC	18		5.9	10.7	283	35	249		249
018	PLANT ROOM	20		14.2	15.5		0	0		0
				604.3	426.8			20650		20650
1 1. Upper floor										
No. _R	Room description	θ _i °C	θ _{int,c} °C	A _r m ²	Contour m	Q _N Watt	Q _{P-A} Watt	Q _H Watt	x %	QnUfhCalculation Watt
001	LANDING	18		26.0	46.2	881	0	881		881
002	SITTING ROOM	21		20.4	18.4	827	21	806		806
003	THOMASBED ROOM / DRESSING AREA	18		21.7	24.2	542	0	542		542
004	BED ROOM 4 / DRESSING AREA	18		21.1	22.3	616	16	600		600
005	GUEST ROOM 1	18		14.4	16.4	417	0	417		417
006	GUEST ROOM 2	18		13.7	15.7	486	0	486		486
007	EN SUITE 3	22		4.2	8.3	356	1	354		354
008	EN SUITE 4	22		4.7	8.8	363	2	361		361
009	SHOWER ROOM	22		3.3	7.8	339	2	337		337
				129.5	168.1			4784		4784

Underfloor heating
New Project Electric Heat Warehouse

Room overview landscape														
Building														
0 Ground floor														
No. _R	Room description	Θ _i °C	θ _{int,c} °C	A _r m ²	Θ _{Adjoining} °C	Θ _{Angre. c} °C	Covering	Insulation	Contour m	Q _N Watt	Q _{P-A} Watt	Q _H Watt	x %	QnUfhCalculation Watt
001	ENTRANCE HALL	18		69.7	5	26	Wood	TE + WD 50 mm	50.8	2627	254	2373		2373
002	LOWER GALLERY	18		31.1	5	26	Wood	TE + WD 50 mm	19.2	888	111	777		777
003	LOWER GALLERY 2	18		30.2	5	26	Wood	TE + WD 50 mm	19.2	1157	131	1026		1026
004	MAIN LOUNGE	21		77.4	5	26	Wood	TE + WD 50 mm	37.0	3528	377	3151		3151
005	DINING ROOM	21		51.4	5	26	Tile	TE + WD 50 mm	19.2	2004	225	1779		1779
006	KITCHEN	18		69.1	5	26	Tile	TE + WD 50 mm	36.8	3457	250	3206		3206
007	LOUNGE 1/2	21		56.2	5	26	Wood	TE + WD 50 mm	32.3	1775	325	1450		1450
008	BED ROOM 1 / DRESSING ROOM	18		47.1	5	26	Carpet	TE + WD 50 mm	40.2	1668	182	1486		1486
009	BEDROOM 2	18		18.7	5	26	Carpet	TE + WD 50 mm	20.6	483	72	411		411
010	GAMES ROOM 1	21		57.4	5	26	Wood	TE + WD 50 mm	35.4	2374	278	2097		2097
011	GAMES ROOM 2	21		12.1	5	26	Wood	TE + WD 50 mm	16.3	513	64	449		449
012	UTILITY/BOOT ROOM	18		16.5	5	26	Wood	TE + WD 50 mm	19.3	529	69	460		460
013	CLOAK ROOM	18		2.6	5	26	Wood	TE + WD 50 mm	7.1	117	13	104		104
014	EN SUITE 1	22		13.1	5	26	Tile	TE + WD 50 mm	18.3	852	74	778		778
015	ENSUITE 2	22		3.3	5	26	Tile	TE + WD 50 mm	7.4	253	17	236		236
016	GYM	21		28.3	5	26	Wood	TE + WD 50 mm	21.5	764	146	618		618
017	CLOAK ROOM/WC	18		5.9	5	26	Tile	TE + WD 50 mm	10.7	283	35	249		249
018	PLANT ROOM	20		14.2	5	26	Carpet	TE + WD 50 mm	15.5		0	0		0
				604.3					426.8			20650		20650
1 1. Upper floor														
No. _R	Room description	Θ _i °C	θ _{int,c} °C	A _r m ²	Θ _{Adjoining} °C	Θ _{Angre. c} °C	Covering	Insulation	Contour m	Q _N Watt	Q _{P-A} Watt	Q _H Watt	x %	QnUfhCalculation Watt
001	LANDING	18		26.0	20	26	Carpet	TE + WD 30 mm	46.2	881	0	881		881

Underfloor heating
New Project Electric Heat Warehouse

Room overview landscape														
Building														
No. _R	Room description	θ_i °C	$\theta_{int,c}$ °C	A_r m ²	ϑ Adjoining °C	ϑ Angre. c °C	Covering	Insulation	Contour m	Q_N Watt	Q_{P-A} Watt	Q_H Watt	x %	QnUfhCalculation Watt
002	SITTING ROOM	21		20.4	20	26	Carpet	TE + WD 30 mm	18.4	827	21	806		806
003	THOMASBED ROOM / DRESSING AREA	18		21.7	20	26	Carpet	TE + WD 30 mm	24.2	542	0	542		542
004	BED ROOM 4 / DRESSING AREA	18		21.1	20	26	Carpet	TE + WD 30 mm	22.3	616	16	600		600
005	GUEST ROOM 1	18		14.4	20	26	Carpet	TE + WD 30 mm	16.4	417	0	417		417
006	GUEST ROOM 2	18		13.7	20	26	Carpet	TE + WD 30 mm	15.7	486	0	486		486
007	EN SUITE 3	22		4.2	20	26	Carpet	TE + WD 30 mm	8.3	356	1	354		354
008	EN SUITE 4	22		4.7	20	26	Carpet	TE + WD 30 mm	8.8	363	2	361		361
009	SHOWER ROOM	22		3.3	20	26	Carpet	TE + WD 30 mm	7.8	339	2	337		337
				129.5					168.1			4784		4784

Underfloor heating

New Project Electric Heat Warehouse

Room data

Building	001	Building
Storey	0	Ground floor
Room	001	ENTRANCE HALL

Room data

Width	b_R	18.53 m	Room ground area	A_r	69.7 m ²
Length	l_R	3.76 m	Standard inner temperature	Θ_i	18 °C

Output (power) data

Standard heat load	Q_N	2627 Watt	QnUfhCalculation		2373 Watt
Specific heating load per m ²	q_{HL}	37.7 W/m ²	Open output	Q_{out}	-1632 Watt
Standard transmission heat downward	Q_{P-A}	254 Watt	Achieved output		169 %
Design thermal output	Q_H	2373 Watt	Heat output by underfloor heating	$\Phi_{FBH,R}$	4005 Watt
Margin	x	%			
Flow temperature		45 °C			

Catalogue data

Manufacturer	<neutral>
System element	Trägerelement
Pipe description	Metallverbundrohr 16 x 2,0

Top floor covering

Tag	Wood
Thermal resistance of cover	0.150 (m ² *K)/W

Load screed layers

Screed layers-designation	Zementestrich ZE 20 75 mm
Screed layers-thermal conductivity	1.200 W/(m*K)
Screed layers-thickness	75 mm

Thermal insulation

Insulation layer structure	TE + WD 50 mm
Thermal resistance	1.250 (m ² *K)/W
Insulation layer structure application case	Directly on the ground
Neighbouring temperature	5 °C

Ceiling (lower)

Thermal resistance	0.094 (m ² *K)/W
--------------------	-----------------------------

UFH - Heating

No.	D	$A_{F,b}$ m ²	A_F m ²	L_{ANB} m	L_{HC} m	Q_s Watt	V_H l	m_H kg/h	\dot{V}_H l/h	Δp_{HC} mbar	σ K	$\Theta_{s,m}$	Distributor	Profile
5	OA 20 cm	12.1	12.1	17.9	96.2	710	10.9	130.9	131.9	151.3	10.0	23.8 °C	M3	Nassverlegesystem Boden
6	OA 20 cm	19.1	19.1	5.0	98.0	1121	11.1	133.3	134.4	159.1	10.0	23.8 °C	M3	Nassverlegesystem Boden
7	OA 20 cm	18.2	18.2	2.9	78.1	1068	8.8	106.2	107.0	84.8	10.0	23.8 °C	M3	Nassverlegesystem Boden
8	OA 20 cm	20.4	18.8	0.6	79.2	1107	9.0	107.7	108.6	88.1	10.0	23.8 °C	M3	Nassverlegesystem Boden

UFH - Cooling

No.	D	$A_{F,b}$ m ²	A_F m ²	L_{ANB} m	L_{HC} m	Q_C Watt	V_H l	m_H kg/h	\dot{V}_H l/h	Δp_{HC} mbar	σ_C K	$\Theta_{C,m}$	Distributor	Profile
5	OA 20 cm	12.1	12.1	17.9	96.2		10.9	130.9		151.3			M3	Nassverlegesystem Boden
6	OA 20 cm	19.1	19.1	5.0	98.0		11.1	133.3		159.1			M3	Nassverlegesystem Boden
7	OA 20 cm	18.2	18.2	2.9	78.1		8.8	106.2		84.8			M3	Nassverlegesystem Boden
8	OA 20 cm	20.4	18.8	0.6	79.2		9.0	107.7		88.1			M3	Nassverlegesystem Boden

Underfloor heating
New Project Electric Heat Warehouse

Room data

Building	001	Building
Storey	0	Ground floor
Room	002	LOWER GALLERY

Room data							
Width	b_R	11.16 m	Room ground area	A_r	31.1 m ²		
Length	l_R	2.79 m	Standard inner temperature	Θ_i	18 °C		
Output (power) data							
Standard heat load	Q_N	888 Watt	QnUfhCalculation		777 Watt		
Specific heating load per m ²	q_{HL}	28.56 W/m ²	Open output	Q_{out}	-1049 Watt		
Standard transmission heat downward	Q_{P-A}	111 Watt	Achieved output		235 %		
Design thermal output	Q_H	777 Watt	Heat output by underfloor heating	$\Phi_{FBH,R}$	1826 Watt		
Margin	x	%					
Flow temperature		45 °C					
Catalogue data							
Manufacturer		<neutral>					
System element		Trägerelement					
Pipe description		Metallverbundrohr 16 x 2,0					
Top floor covering							
Tag		Wood					
Thermal resistance of cover		0.150 (m ² *K)/W					
Load screed layers							
Screed layers-designation		Zementestrich ZE 20 75 mm					
Screed layers-thermal conductivity		1.200 W/(m*K)					
Screed layers-thickness		75 mm					
Thermal insulation							
Insulation layer structure		TE + WD 50 mm					
Thermal resistance		1.250 (m ² *K)/W					
Insulation layer structure application case		Directly on the ground					
Neighbouring temperature		5 °C					
Ceiling (lower)							
Thermal resistance		0.094 (m ² *K)/W					

UFH - Heating

No.	D	$A_{F,b}$ m ²	A_F m ²	L_{ANB} m	L_{HC} m	Q_s Watt	V_H l	m_H kg/h	\dot{V}_H l/h	Δp_{HC} mbar	σ K	$\Theta_{s,m}$	Distributor	Profile
3	OA 20 cm	16.8	16.8	3.3	84.1	986	9.5	114.4	115.3	104.1	10.0	23.8 °C	M1	Nassverlegesystem Boden
4	OA 20 cm	14.3	14.3	4.2	77.8	840	8.8	105.8	106.6	83.9	10.0	23.8 °C	M1	Nassverlegesystem Boden

UFH - Cooling

No.	D	$A_{F,b}$ m ²	A_F m ²	L_{ANB} m	L_{HC} m	Q_C Watt	V_H l	m_H kg/h	\dot{V}_H l/h	Δp_{HC} mbar	σ_C K	Θ_C, m	Distributor	Profile
3	OA 20 cm	16.8	16.8	3.3	84.1		9.5	114.4		104.1			M1	Nassverlegesystem Boden
4	OA 20 cm	14.3	14.3	4.2	77.8		8.8	105.8		83.9			M1	Nassverlegesystem Boden

Underfloor heating
New Project Electric Heat Warehouse

Room data

Building	001	Building
Storey	0	Ground floor
Room	003	LOWER GALLERY 2

Room data						
Width	b_R	16.10 m	Room ground area	A_r	30.2 m ²	
Length	l_R	1.88 m	Standard inner temperature	Θ_i	18 °C	
Output (power) data						
Standard heat load	Q_N	1157 Watt	QnUfhCalculation		1026 Watt	
Specific heating load per m ²	q_{HL}	38.32 W/m ²	Open output	Q_{out}	-599 Watt	
Standard transmission heat downward	Q_{P-A}	131 Watt	Achieved output		158 %	
Design thermal output	Q_H	1026 Watt	Heat output by underfloor heating	$\Phi_{FBH,R}$	1625 Watt	
Margin	x	%				
Flow temperature		45 °C				
Catalogue data						
Manufacturer	<neutral>					
System element	Trägerelement					
Pipe description	Metallverbundrohr 16 x 2,0					
Top floor covering						
Tag	Wood					
Thermal resistance of cover	0.150 (m ² *K)/W					
Load screed layers						
Screed layers-designation	Zementestrich ZE 20 75 mm					
Screed layers-thermal conductivity	1.200 W/(m*K)					
Screed layers-thickness	75 mm					
Thermal insulation						
Insulation layer structure	TE + WD 50 mm					
Thermal resistance	1.250 (m ² *K)/W					
Insulation layer structure application case	Directly on the ground					
Neighbouring temperature	5 °C					
Ceiling (lower)						
Thermal resistance	0.094 (m ² *K)/W					

UFH - Heating

No.	D	$A_{F,b}$ m ²	A_F m ²	L_{ANB} m	L_{HC} m	Q_s Watt	V_H l	m_H kg/h	\dot{V}_H l/h	Δp_{HC} mbar	σ K	$\Theta_{s,m}$	Distributor	Profile
1	OA 20 cm	12.4	11.3	5.7	68.0	665	7.7	92.5	93.3	57.9	10.0	23.8 °C	M2	Nassverlegesystem Boden
2	OA 20 cm	17.8	16.4	4.1	53.0	961	6.0	72.1	72.6	28.9	10.0	23.8 °C	M2	Nassverlegesystem Boden

UFH - Cooling

No.	D	$A_{F,b}$ m ²	A_F m ²	L_{ANB} m	L_{HC} m	Q_C Watt	V_H l	m_H kg/h	\dot{V}_H l/h	Δp_{HC} mbar	σ_C K	$\Theta_{C,m}$	Distributor	Profile
1	OA 20 cm	12.4	11.3	5.7	68.0		7.7	92.5		57.9			M2	Nassverlegesystem Boden
2	OA 20 cm	17.8	16.4	4.1	53.0		6.0	72.1		28.9			M2	Nassverlegesystem Boden

Underfloor heating
New Project Electric Heat Warehouse

Room data

Building	001	Building
Storey	0	Ground floor
Room	004	MAIN LOUNGE

Room data

Width	b_R	12.57 m	Room ground area	A_r	77.4 m ²
Length	l_R	6.16 m	Standard inner temperature	Θ_i	21 °C

Output (power) data

Standard heat load	Q_N	3528 Watt	QnUfhCalculation		3151 Watt
Specific heating load per m ²	q_{HL}	45.59 W/m ²	Open output	Q_{out}	-751 Watt
Standard transmission heat downward	Q_{P-A}	377 Watt	Achieved output		124 %
Design thermal output	Q_H	3151 Watt	Heat output by underfloor heating	$\Phi_{FBH,R}$	3902 Watt
Margin	x	%			
Flow temperature		45 °C			

Catalogue data

Manufacturer	<neutral>
System element	Trägerelement
Pipe description	Metallverbundrohr 16 x 2,0

Top floor covering

Tag	Wood
Thermal resistance of cover	0.150 (m ² *K)/W

Load screed layers

Screed layers-designation	Zementestrich ZE 20 75 mm
Screed layers-thermal conductivity	1.200 W/(m*K)
Screed layers-thickness	75 mm

Thermal insulation

Insulation layer structure	TE + WD 50 mm
Thermal resistance	1.250 (m ² *K)/W
Insulation layer structure application case	Directly on the ground
Neighbouring temperature	5 °C

Ceiling (lower)

Thermal resistance	0.094 (m ² *K)/W
--------------------	-----------------------------

UFH - Heating

No.	D	$A_{F,b}$ m ²	A_F m ²	L_{ANB} m	L_{HC} m	Q_s Watt	V_H l	m_H kg/h	\dot{V}_H l/h	Δp_{HC} mbar	σ K	$\Theta_{s,m}$	Distributor	Profile
4	OA 20 cm	14.6	14.6	10.0	93.2	738	10.5	114.0	114.9	114.7	10.0	26 °C	M4	Nassverlegesystem Boden
5	OA 20 cm	14.5	14.5	8.9	88.2	733	10.0	107.8	108.6	98.2	10.0	26 °C	M4	Nassverlegesystem Boden
6	OA 20 cm	14.5	14.5	7.7	83.2	730	9.4	101.7	102.5	83.6	10.0	26 °C	M4	Nassverlegesystem Boden
7	OA 20 cm	14.4	14.4	6.5	78.3	728	8.9	95.8	96.5	70.8	10.0	26 °C	M4	Nassverlegesystem Boden
8	OA 20 cm	19.3	19.3	5.3	95.5	973	10.8	116.7	117.6	122.4	10.0	26 °C	M4	Nassverlegesystem Boden

UFH - Cooling

No.	D	$A_{F,b}$ m ²	A_F m ²	L_{ANB} m	L_{HC} m	Q_C Watt	V_H l	m_H kg/h	\dot{V}_H l/h	Δp_{HC} mbar	σ_C K	$\Theta_{C,m}$	Distributor	Profile
4	OA 20 cm	14.6	14.6	10.0	93.2		10.5	114.0		114.7			M4	Nassverlegesystem Boden
5	OA 20 cm	14.5	14.5	8.9	88.2		10.0	107.8		98.2			M4	Nassverlegesystem Boden
6	OA 20 cm	14.5	14.5	7.7	83.2		9.4	101.7		83.6			M4	Nassverlegesystem Boden
7	OA 20 cm	14.4	14.4	6.5	78.3		8.9	95.8		70.8			M4	Nassverlegesystem Boden
8	OA 20 cm	19.3	19.3	5.3	95.5		10.8	116.7		122.4			M4	Nassverlegesystem Boden

Underfloor heating

New Project Electric Heat Warehouse

Room data

Building	001	Building
Storey	0	Ground floor
Room	005	DINING ROOM

Room data

Width	b_R	9.24 m	Room ground area	A_r	51.4 m ²
Length	l_R	5.56 m	Standard inner temperature	Θ_i	21 °C

Output (power) data

Standard heat load	Q_N	2004 Watt	Q_{nUfh} Calculation		1779 Watt
Specific heating load per m ²	q_{HL}	39 W/m ²	Open output	Q_{out}	-2359 Watt
Standard transmission heat downward	Q_{P-A}	225 Watt	Achieved output		233 %
Design thermal output	Q_H	1779 Watt	Heat output by underfloor heating	$\Phi_{FBH,R}$	4137 Watt
Margin	x	%			
Flow temperature		45 °C			

Catalogue data

Manufacturer	<neutral>
System element	Trägerelement
Pipe description	Metallverbundrohr 16 x 2,0

Top floor covering

Tag	Tile
Thermal resistance of cover	0.000 (m ² *K)/W

Load screed layers

Screed layers-designation	Zementestrich ZE 20 75 mm
Screed layers-thermal conductivity	1.200 W/(m*K)
Screed layers-thickness	75 mm

Thermal insulation

Insulation layer structure	TE + WD 50 mm
Thermal resistance	1.250 (m ² *K)/W
Insulation layer structure application case	Directly on the ground
Neighbouring temperature	5 °C

Ceiling (lower)

Thermal resistance	0.094 (m ² *K)/W
--------------------	-----------------------------

UFH - Heating

No.	D	$A_{F,b}$ m ²	A_F m ²	L_{ANB} m	L_{HC} m	Q_s Watt	V_H l	m_H kg/h	\dot{V}_H l/h	Δp_{HC} mbar	σ K	$\Theta_{s,m}$	Distributor	Profile
9	OA 20 cm	18.7	18.7	0.5	81.0	1505	9.2	138.3	139.4	140.4	10.0	28.6 °C	M4	Nassverlegesystem Boden
10	OA 20 cm	17.0	17.0	0.2	75.2	1365	8.5	128.4	129.4	114.2	10.0	28.6 °C	M4	Nassverlegesystem Boden
11	OA 20 cm	15.7	15.7	3.6	86.0	1267	9.7	146.7	147.9	165.3	10.0	28.6 °C	M4	Nassverlegesystem Boden

UFH - Cooling

No.	D	$A_{F,b}$ m ²	A_F m ²	L_{ANB} m	L_{HC} m	Q_C Watt	V_H l	m_H kg/h	\dot{V}_H l/h	Δp_{HC} mbar	σ_C K	$\Theta_{C,m}$	Distributor	Profile
9	OA 20 cm	18.7	18.7	0.5	81.0		9.2	138.3		140.4			M4	Nassverlegesystem Boden
10	OA 20 cm	17.0	17.0	0.2	75.2		8.5	128.4		114.2			M4	Nassverlegesystem Boden
11	OA 20 cm	15.7	15.7	3.6	86.0		9.7	146.7		165.3			M4	Nassverlegesystem Boden

Underfloor heating

New Project Electric Heat Warehouse

Room data

Building	001	Building
Storey	0	Ground floor
Room	006	KITCHEN

Room data

Width	b_R	12.23 m	Room ground area	A_r	69.1 m ²
Length	l_R	5.65 m	Standard inner temperature	Θ_i	18 °C

Output (power) data

Standard heat load	Q_N	3457 Watt	Q_{nUfh} Calculation		3206 Watt
Specific heating load per m ²	q_{HL}	50.05 W/m ²	Open output	Q_{out}	-1881 Watt
Standard transmission heat downward	Q_{P-A}	250 Watt	Achieved output		159 %
Design thermal output	Q_H	3206 Watt	Heat output by underfloor heating	$\Phi_{FBH,R}$	5087 Watt
Margin	x	%			
Flow temperature		45 °C			

Catalogue data

Manufacturer	<neutral>
System element	Trägerelement
Pipe description	Metallverbundrohr 16 x 2,0

Top floor covering

Tag	Tile
Thermal resistance of cover	0.000 (m ² *K)/W

Load screed layers

Screed layers-designation	Zementestrich ZE 20 75 mm
Screed layers-thermal conductivity	1.200 W/(m*K)
Screed layers-thickness	75 mm

Thermal insulation

Insulation layer structure	TE + WD 50 mm
Thermal resistance	1.250 (m ² *K)/W
Insulation layer structure application case	Directly on the ground
Neighbouring temperature	5 °C

Ceiling (lower)

Thermal resistance	0.094 (m ² *K)/W
--------------------	-----------------------------

UFH - Heating

No.	D	$A_{F,b}$ m ²	A_F m ²	L_{ANB} m	L_{HC} m	Q_s Watt	V_H l	m_H kg/h	\dot{V}_H l/h	Δp_{HC} mbar	σ K	$\Theta_{s,m}$	Distributor	Profile
3	OA 20 cm	23.1	19.6	1.8	94.0	1835	10.6	180.9	182.3	261.8	10.0	26.8 °C	M4	Nassverlegesystem Boden
2	OA 20 cm	24.9	17.3	3.9	90.2	1623	10.2	173.6	175.0	233.6	10.0	26.8 °C	M4	Nassverlegesystem Boden
1	OA 20 cm	21.0	17.4	5.6	98.1	1629	11.1	188.8	190.3	294.7	10.0	26.8 °C	M4	Nassverlegesystem Boden

UFH - Cooling

No.	D	$A_{F,b}$ m ²	A_F m ²	L_{ANB} m	L_{HC} m	Q_C Watt	V_H l	m_H kg/h	\dot{V}_H l/h	Δp_{HC} mbar	σ_C K	$\Theta_{C,m}$	Distributor	Profile
3	OA 20 cm	23.1	19.6	1.8	94.0		10.6	180.9		261.8			M4	Nassverlegesystem Boden
2	OA 20 cm	24.9	17.3	3.9	90.2		10.2	173.6		233.6			M4	Nassverlegesystem Boden
1	OA 20 cm	21.0	17.4	5.6	98.1		11.1	188.8		294.7			M4	Nassverlegesystem Boden

Underfloor heating

New Project Electric Heat Warehouse

Room data

Building	001	Building
Storey	0	Ground floor
Room	007	LOUNGE 1/2

Room data

Width	b_R	11.05 m	Room ground area	A_r	56.2 m ²
Length	l_R	5.09 m	Standard inner temperature	Θ_i	21 °C

Output (power) data

Standard heat load	Q_N	1775 Watt	QnUfhCalculation		1450 Watt
Specific heating load per m ²	q_{HL}	31.57 W/m ²	Open output	Q_{out}	-1225 Watt
Standard transmission heat downward	Q_{P-A}	325 Watt	Achieved output		185 %
Design thermal output	Q_H	1450 Watt	Heat output by underfloor heating	$\Phi_{FBH,R}$	2675 Watt
Margin	x	%			
Flow temperature		45 °C			

Catalogue data

Manufacturer	<neutral>
System element	Trägerelement
Pipe description	Metallverbundrohr 16 x 2,0

Top floor covering

Tag	Wood
Thermal resistance of cover	0.150 (m ² *K)/W

Load screed layers

Screed layers-designation	Zementestrich ZE 20 75 mm
Screed layers-thermal conductivity	1.200 W/(m*K)
Screed layers-thickness	75 mm

Thermal insulation

Insulation layer structure	TE + WD 50 mm
Thermal resistance	1.250 (m ² *K)/W
Insulation layer structure application case	Directly on the ground
Neighbouring temperature	5 °C

Ceiling (lower)

Thermal resistance	0.094 (m ² *K)/W
--------------------	-----------------------------

UFH - Heating

No.	D	$A_{F,b}$ m ²	A_F m ²	L_{ANB} m	L_{HC} m	Q_s Watt	V_H l	m_H kg/h	\dot{V}_H l/h	Δp_{HC} mbar	σ K	$\Theta_{s,m}$	Distributor	Profile
4	OA 20 cm	17.8	17.8	12.8	96.1	899	10.9	117.5	118.4	124.8	10.0	26 °C	M3	Nassverlegesystem Boden
3	OA 20 cm	15.0	12.6	18.3	95.1	637	10.8	116.2	117.1	121.0	10.0	26 °C	M3	Nassverlegesystem Boden
2	OA 20 cm	13.5	12.7	19.1	100.1	641	11.3	122.4	123.4	139.8	10.0	26 °C	M3	Nassverlegesystem Boden
1	OA 20 cm	9.9	9.9	19.9	89.2	498	10.1	109.1	110.0	101.6	10.0	26 °C	M3	Nassverlegesystem Boden

UFH - Cooling

No.	D	$A_{F,b}$ m ²	A_F m ²	L_{ANB} m	L_{HC} m	Q_C Watt	V_H l	m_H kg/h	\dot{V}_H l/h	Δp_{HC} mbar	σ_C K	$\Theta_{C,m}$	Distributor	Profile
4	OA 20 cm	17.8	17.8	12.8	96.1		10.9	117.5		124.8			M3	Nassverlegesystem Boden
3	OA 20 cm	15.0	12.6	18.3	95.1		10.8	116.2		121.0			M3	Nassverlegesystem Boden
2	OA 20 cm	13.5	12.7	19.1	100.1		11.3	122.4		139.8			M3	Nassverlegesystem Boden
1	OA 20 cm	9.9	9.9	19.9	89.2		10.1	109.1		101.6			M3	Nassverlegesystem Boden

Underfloor heating
New Project Electric Heat Warehouse

Room data

Building	001	Building
Storey	0	Ground floor
Room	008	BED ROOM 1 / DRESSING ROOM

Room data							
Width	b_R	9.38 m	Room ground area	A_r	47.1 m ²		
Length	l_R	5.02 m	Standard inner temperature	Θ_i	18 °C		
Output (power) data							
Standard heat load	Q_N	1668 Watt	QnUfhCalculation		1486 Watt		
Specific heating load per m ²	q_{HL}	35.45 W/m ²	Open output	Q_{out}	-1103 Watt		
Standard transmission heat downward	Q_{P-A}	182 Watt	Achieved output		174 %		
Design thermal output	Q_H	1486 Watt	Heat output by underfloor heating	$\Phi_{FBH,R}$	2589 Watt		
Margin	x	%					
Flow temperature		45 °C					
Catalogue data							
Manufacturer		<neutral>					
System element		Trägerelement					
Pipe description		Metallverbundrohr 16 x 2,0					
Top floor covering							
Tag		Carpet					
Thermal resistance of cover		0.100 (m ² *K)/W					
Load screed layers							
Screed layers-designation		Zementestrich ZE 20 75 mm					
Screed layers-thermal conductivity		1.200 W/(m*K)					
Screed layers-thickness		75 mm					
Thermal insulation							
Insulation layer structure		TE + WD 50 mm					
Thermal resistance		1.250 (m ² *K)/W					
Insulation layer structure application case		Directly on the ground					
Neighbouring temperature		5 °C					
Ceiling (lower)							
Thermal resistance		0.094 (m ² *K)/W					

UFH - Heating

No.	D	$A_{F,b}$ m ²	A_F m ²	L_{ANB} m	L_{HC} m	Q_s Watt	V_H l	m_H kg/h	\dot{V}_H l/h	Δp_{HC} mbar	σ K	$\Theta_{s,m}$	Distributor	Profile
3	OA 20 cm	12.3	8.0	26.6	93.2	535	10.5	139.3	140.4	163.4	10.0	24.5 °C	M2	Nassverlegesystem Boden
4	OA 20 cm	12.6	12.6	21.3	81.4	849	9.2	121.7	122.6	112.4	10.0	24.5 °C	M2	Nassverlegesystem Boden
5	OA 20 cm	10.1	8.7	23.1	89.2	586	10.1	133.3	134.3	144.7	10.0	24.5 °C	M2	Nassverlegesystem Boden
6	OA 20 cm	12.0	9.2	24.9	96.0	620	10.9	143.5	144.6	177.6	10.0	24.5 °C	M2	Nassverlegesystem Boden

UFH - Cooling

No.	D	$A_{F,b}$ m ²	A_F m ²	L_{ANB} m	L_{HC} m	Q_C Watt	V_H l	m_H kg/h	\dot{V}_H l/h	Δp_{HC} mbar	σ_C K	$\Theta_{C,m}$	Distributor	Profile
3	OA 20 cm	12.3	8.0	26.6	93.2		10.5	139.3		163.4			M2	Nassverlegesystem Boden
4	OA 20 cm	12.6	12.6	21.3	81.4		9.2	121.7		112.4			M2	Nassverlegesystem Boden
5	OA 20 cm	10.1	8.7	23.1	89.2		10.1	133.3		144.7			M2	Nassverlegesystem Boden
6	OA 20 cm	12.0	9.2	24.9	96.0		10.9	143.5		177.6			M2	Nassverlegesystem Boden

Underfloor heating
New Project Electric Heat Warehouse

Room data

Building	001	Building
Storey	0	Ground floor
Room	009	BEDROOM 2

Room data							
Width	b_R	7.09 m	Room ground area	A_r	18.7 m ²		
Length	l_R	2.63 m	Standard inner temperature	Θ_i	18 °C		
Output (power) data							
Standard heat load	Q_N	483 Watt	QnUfhCalculation		411 Watt		
Specific heating load per m ²	q_{HL}	15.41 W/m ²	Open output	Q_{out}	-730 Watt		
Standard transmission heat downward	Q_{P-A}	72 Watt	Achieved output		278 %		
Design thermal output	Q_H	411 Watt	Heat output by underfloor heating	$\Phi_{FBH,R}$	1140 Watt		
Margin	x	%					
Flow temperature		45 °C					
Catalogue data							
Manufacturer		<neutral>					
System element		Trägerelement					
Pipe description		Metallverbundrohr 16 x 2,0					
Top floor covering							
Tag		Carpet					
Thermal resistance of cover		0.100 (m ² *K)/W					
Load screed layers							
Screed layers-designation		Zementestrich ZE 20 75 mm					
Screed layers-thermal conductivity		1.200 W/(m*K)					
Screed layers-thickness		75 mm					
Thermal insulation							
Insulation layer structure		TE + WD 50 mm					
Thermal resistance		1.250 (m ² *K)/W					
Insulation layer structure application case		Directly on the ground					
Neighbouring temperature		5 °C					
Ceiling (lower)							
Thermal resistance		0.094 (m ² *K)/W					

UFH - Heating

No.	D	$A_{F,b}$ m ²	A_F m ²	L_{ANB} m	L_{HC} m	Q_s Watt	V_H l	m_H kg/h	\dot{V}_H l/h	Δp_{HC} mbar	σ K	$\Theta_{s,m}$	Distributor	Profile
1	OA 20 cm	18.7	17.0	8.0	100.2	1140	11.3	149.7	150.9	199.6	10.0	24.5 °C	M1	Nassverlegesystem Boden

UFH - Cooling

No.	D	$A_{F,b}$ m ²	A_F m ²	L_{ANB} m	L_{HC} m	Q_C Watt	V_H l	m_H kg/h	\dot{V}_H l/h	Δp_{HC} mbar	σ_C K	$\Theta_{C,m}$	Distributor	Profile
1	OA 20 cm	18.7	17.0	8.0	100.2		11.3	149.7		199.6			M1	Nassverlegesystem Boden

Underfloor heating
New Project Electric Heat Warehouse

Room data

Building	001	Building
Storey	0	Ground floor
Room	010	GAMES ROOM 1

Room data						
Width	b_R	10.04 m	Room ground area	A_r	57.4 m ²	
Length	l_R	5.72 m	Standard inner temperature	Θ_i	21 °C	
Output (power) data						
Standard heat load	Q_N	2374 Watt	QnUfhCalculation		2097 Watt	
Specific heating load per m ²	q_{HL}	41.34 W/m ²	Open output	Q_{out}	-700 Watt	
Standard transmission heat downward	Q_{P-A}	278 Watt	Achieved output		133 %	
Design thermal output	Q_H	2097 Watt	Heat output by underfloor heating	$\Phi_{FBH,R}$	2797 Watt	
Margin	x	%				
Flow temperature		45 °C				
Catalogue data						
Manufacturer		<neutral>				
System element		Trägerelement				
Pipe description		Metallverbundrohr 16 x 2,0				
Top floor covering						
Tag		Wood				
Thermal resistance of cover		0.150 (m ² *K)/W				
Load screed layers						
Screed layers-designation		Zementestrich ZE 20 75 mm				
Screed layers-thermal conductivity		1.200 W/(m*K)				
Screed layers-thickness		75 mm				
Thermal insulation						
Insulation layer structure		TE + WD 50 mm				
Thermal resistance		1.250 (m ² *K)/W				
Insulation layer structure application case		Directly on the ground				
Neighbouring temperature		5 °C				
Ceiling (lower)						
Thermal resistance		0.094 (m ² *K)/W				

UFH - Heating

No.	D	$A_{F,b}$ m ²	A_F m ²	L_{ANB} m	L_{HC} m	Q_s Watt	V_H l	m_H kg/h	\dot{V}_H l/h	Δp_{HC} mbar	σ K	$\Theta_{s,m}$	Distributor	Profile
7	OA 20 cm	21.5	19.8	0.4	83.0	999	9.4	101.5	102.3	83.2	10.0	26 °C	M1	Nassverlegesystem Boden
6	OA 20 cm	20.5	20.1	0.3	93.1	1016	10.5	113.8	114.7	114.1	10.0	26 °C	M1	Nassverlegesystem Boden
5	OA 20 cm	15.5	15.5	2.6	82.2	782	9.3	100.5	101.3	81.0	10.0	26 °C	M1	Nassverlegesystem Boden

UFH - Cooling

No.	D	$A_{F,b}$ m ²	A_F m ²	L_{ANB} m	L_{HC} m	Q_C Watt	V_H l	m_H kg/h	\dot{V}_H l/h	Δp_{HC} mbar	σ_C K	$\Theta_{C,m}$	Distributor	Profile
7	OA 20 cm	21.5	19.8	0.4	83.0		9.4	101.5		83.2			M1	Nassverlegesystem Boden
6	OA 20 cm	20.5	20.1	0.3	93.1		10.5	113.8		114.1			M1	Nassverlegesystem Boden
5	OA 20 cm	15.5	15.5	2.6	82.2		9.3	100.5		81.0			M1	Nassverlegesystem Boden

Underfloor heating
New Project Electric Heat Warehouse

Room data

Building	001	Building
Storey	0	Ground floor
Room	011	GAMES ROOM 2

Room data						
Width	b_R	4.80 m	Room ground area	A_r	12.1 m ²	
Length	l_R	2.51 m	Standard inner temperature	Θ_i	21 °C	
Output (power) data						
Standard heat load	Q_N	513 Watt	QnUfhCalculation		449 Watt	
Specific heating load per m ²	q_{HL}	42.5 W/m ²	Open output	Q_{out}	-160 Watt	
Standard transmission heat downward	Q_{P-A}	64 Watt	Achieved output		136 %	
Design thermal output	Q_H	449 Watt	Heat output by underfloor heating	$\Phi_{FBH,R}$	609 Watt	
Margin	x	%				
Flow temperature		45 °C				
Catalogue data						
Manufacturer		<neutral>				
System element		Trägerelement				
Pipe description		Metallverbundrohr 16 x 2,0				
Top floor covering						
Tag		Wood				
Thermal resistance of cover		0.150 (m ² *K)/W				
Load screed layers						
Screed layers-designation		Zementestrich ZE 20 75 mm				
Screed layers-thermal conductivity		1.200 W/(m*K)				
Screed layers-thickness		75 mm				
Thermal insulation						
Insulation layer structure		TE + WD 50 mm				
Thermal resistance		1.250 (m ² *K)/W				
Insulation layer structure application case		Directly on the ground				
Neighbouring temperature		5 °C				
Ceiling (lower)						
Thermal resistance		0.094 (m ² *K)/W				

UFH - Heating

No.	D	$A_{F,b}$ m ²	A_F m ²	L_{ANB} m	L_{HC} m	Q_s Watt	V_H l	m_H kg/h	\dot{V}_H l/h	Δp_{HC} mbar	σ K	$\Theta_{s,m}$	Distributor	Profile
10	OA 20 cm	12.1	12.1	2.7	49.4	609	5.6	60.4	60.9	19.8	10.0	26 °C	M2	Nassverlegesystem Boden

UFH - Cooling

No.	D	$A_{F,b}$ m ²	A_F m ²	L_{ANB} m	L_{HC} m	Q_C Watt	V_H l	m_H kg/h	\dot{V}_H l/h	Δp_{HC} mbar	σ_C K	$\Theta_{C,m}$	Distributor	Profile
10	OA 20 cm	12.1	12.1	2.7	49.4		5.6	60.4		19.8			M2	Nassverlegesystem Boden

Underfloor heating
New Project Electric Heat Warehouse

Room data

Building	001	Building
Storey	0	Ground floor
Room	012	UTILITY/BOOT ROOM

Room data						
Width	b_R	4.80 m	Room ground area	A_r	16.5 m ²	
Length	l_R	3.44 m	Standard inner temperature	Θ_i	18 °C	
Output (power) data						
Standard heat load	Q_N	529 Watt	QnUfhCalculation		460 Watt	
Specific heating load per m ²	q_{HL}	32.03 W/m ²	Open output	Q_{out}	-211 Watt	
Standard transmission heat downward	Q_{P-A}	69 Watt	Achieved output		146 %	
Design thermal output	Q_H	460 Watt	Heat output by underfloor heating	$\Phi_{FBH,R}$	671 Watt	
Margin	x	%				
Flow temperature		45 °C				
Catalogue data						
Manufacturer		<neutral>				
System element		Trägerelement				
Pipe description		Metallverbundrohr 16 x 2,0				
Top floor covering						
Tag		Wood				
Thermal resistance of cover		0.150 (m ² *K)/W				
Load screed layers						
Screed layers-designation		Zementestrich ZE 20 75 mm				
Screed layers-thermal conductivity		1.200 W/(m*K)				
Screed layers-thickness		75 mm				
Thermal insulation						
Insulation layer structure		TE + WD 50 mm				
Thermal resistance		1.250 (m ² *K)/W				
Insulation layer structure application case		Directly on the ground				
Neighbouring temperature		5 °C				
Ceiling (lower)						
Thermal resistance		0.094 (m ² *K)/W				

UFH - Heating

No.	D	$A_{F,b}$ m ²	A_F m ²	L_{ANB} m	L_{HC} m	Q_s Watt	V_H l	m_H kg/h	\dot{V}_H l/h	Δp_{HC} mbar	σ K	$\Theta_{s,m}$	Distributor	Profile
11	OA 20 cm	16.5	11.4	2.5	62.1	671	7.0	84.5	85.1	45.0	10.0	23.8 °C	M2	Nassverlegesystem Boden

UFH - Cooling

No.	D	$A_{F,b}$ m ²	A_F m ²	L_{ANB} m	L_{HC} m	Q_C Watt	V_H l	m_H kg/h	\dot{V}_H l/h	Δp_{HC} mbar	σ_C K	$\Theta_{C,m}$	Distributor	Profile
11	OA 20 cm	16.5	11.4	2.5	62.1		7.0	84.5		45.0			M2	Nassverlegesystem Boden

Underfloor heating
New Project Electric Heat Warehouse

Room data

Building	001	Building
Storey	0	Ground floor
Room	013	CLOAK ROOM

Room data							
Width	b_R	1.71 m	Room ground area	A_r	2.6 m ²		
Length	l_R	1.53 m	Standard inner temperature	Θ_i	18 °C		
Output (power) data							
Standard heat load	Q_N	117 Watt	QnUfhCalculation			104 Watt	
Specific heating load per m ²	q_{HL}	44.61 W/m ²	Open output	Q_{out}		-50 Watt	
Standard transmission heat downward	Q_{P-A}	13 Watt	Achieved output			148 %	
Design thermal output	Q_H	104 Watt	Heat output by underfloor heating	$\Phi_{FBH,R}$	154 Watt		
Margin	x	%					
Flow temperature		45 °C					
Catalogue data							
Manufacturer		<neutral>					
System element		Trägerelement					
Pipe description		Metallverbundrohr 16 x 2,0					
Top floor covering							
Tag		Wood					
Thermal resistance of cover		0.150 (m ² *K)/W					
Load screed layers							
Screed layers-designation		Zementestrich ZE 20 75 mm					
Screed layers-thermal conductivity		1.200 W/(m*K)					
Screed layers-thickness		75 mm					
Thermal insulation							
Insulation layer structure		TE + WD 50 mm					
Thermal resistance		1.250 (m ² *K)/W					
Insulation layer structure application case		Directly on the ground					
Neighbouring temperature		5 °C					
Ceiling (lower)							
Thermal resistance		0.094 (m ² *K)/W					

UFH - Heating

No.	D	$A_{F,b}$ m ²	A_F m ²	L_{ANB} m	L_{HC} m	Q_s Watt	V_H l	m_H kg/h	\dot{V}_H l/h	Δp_{HC} mbar	σ K	$\Theta_{s,m}$	Distributor	Profile
9	OA 15 cm	2.6	2.4	7.6	31.2	154	3.5	34.2	34.4	4.6	10.0	24 °C	M3	Nassverlegesystem Boden

UFH - Cooling

No.	D	$A_{F,b}$ m ²	A_F m ²	L_{ANB} m	L_{HC} m	Q_C Watt	V_H l	m_H kg/h	\dot{V}_H l/h	Δp_{HC} mbar	σ_C K	$\Theta_{C,m}$	Distributor	Profile
9	OA 15 cm	2.6	2.4	7.6	31.2		3.5	34.2		4.6			M3	Nassverlegesystem Boden

Underfloor heating
New Project Electric Heat Warehouse

Room data

Building	001	Building
Storey	0	Ground floor
Room	014	EN SUITE 1

Room data						
Width	b_R	4.75 m	Room ground area	A_r	13.1 m ²	
Length	l_R	2.75 m	Standard inner temperature	Θ_i	22 °C	
Output (power) data						
Standard heat load	Q_N	852 Watt	QnUfhCalculation		778 Watt	
Specific heating load per m ²	q_{HL}	65.27 W/m ²	Open output	Q_{out}	102 Watt	
Standard transmission heat downward	Q_{P-A}	74 Watt	Achieved output		87 %	
Design thermal output	Q_H	778 Watt	Heat output by underfloor heating	$\Phi_{FBH,R}$	676 Watt	
Margin	x	%				
Flow temperature		45 °C				
Catalogue data						
Manufacturer		<neutral>				
System element		Trägerelement				
Pipe description		Metallverbundrohr 16 x 2,0				
Top floor covering						
Tag		Tile				
Thermal resistance of cover		0.000 (m ² *K)/W				
Load screed layers						
Screed layers-designation		Zementestrich ZE 20 75 mm				
Screed layers-thermal conductivity		1.200 W/(m*K)				
Screed layers-thickness		75 mm				
Thermal insulation						
Insulation layer structure		TE + WD 50 mm				
Thermal resistance		1.250 (m ² *K)/W				
Insulation layer structure application case		Directly on the ground				
Neighbouring temperature		5 °C				
Ceiling (lower)						
Thermal resistance		0.094 (m ² *K)/W				

UFH - Heating

No.	D	$A_{F,b}$ m ²	A_F m ²	L_{ANB} m	L_{HC} m	Q_s Watt	V_H l	m_H kg/h	\dot{V}_H l/h	Δp_{HC} mbar	σ K	$\Theta_{s,m}$	Distributor	Profile
7	OA 15 cm	13.1	7.9	17.4	87.2	676	9.9	119.1	120.1	116.0	10.0	29.9 °C	M2	Nassverlegesystem Boden

UFH - Cooling

No.	D	$A_{F,b}$ m ²	A_F m ²	L_{ANB} m	L_{HC} m	Q_C Watt	V_H l	m_H kg/h	\dot{V}_H l/h	Δp_{HC} mbar	σ_C K	$\Theta_{C,m}$	Distributor	Profile
7	OA 15 cm	13.1	7.9	17.4	87.2		9.9	119.1		116.0			M2	Nassverlegesystem Boden

Underfloor heating
New Project Electric Heat Warehouse

Room data

Building	001	Building
Storey	0	Ground floor
Room	015	ENSUITE 2

Room data							
Width	b_R	2.25 m	Room ground area	A_r	3.3 m ²		
Length	l_R	1.48 m	Standard inner temperature	Θ_i	22 °C		
Output (power) data							
Standard heat load	Q_N	253 Watt	QnUfhCalculation		236 Watt		
Specific heating load per m ²	q_{HL}	76.13 W/m ²	Open output	Q_{out}	-5 Watt		
Standard transmission heat downward	Q_{P-A}	17 Watt	Achieved output		102 %		
Design thermal output	Q_H	236 Watt	Heat output by underfloor heating	$\Phi_{FBH,R}$	240 Watt		
Margin	x	%					
Flow temperature		45 °C					
Catalogue data							
Manufacturer		<neutral>					
System element		Trägerelement					
Pipe description		Metallverbundrohr 16 x 2,0					
Top floor covering							
Tag		Tile					
Thermal resistance of cover		0.000 (m ² *K)/W					
Load screed layers							
Screed layers-designation		Zementestrich ZE 20 75 mm					
Screed layers-thermal conductivity		1.200 W/(m*K)					
Screed layers-thickness		75 mm					
Thermal insulation							
Insulation layer structure		TE + WD 50 mm					
Thermal resistance		1.250 (m ² *K)/W					
Insulation layer structure application case		Directly on the ground					
Neighbouring temperature		5 °C					
Ceiling (lower)							
Thermal resistance		0.094 (m ² *K)/W					

UFH - Heating

No.	D	$A_{F,b}$ m ²	A_F m ²	L_{ANB} m	L_{HC} m	Q_s Watt	V_H l	m_H kg/h	\dot{V}_H l/h	Δp_{HC} mbar	σ K	$\Theta_{s,m}$	Distributor	Profile
2	OA 15 cm	3.3	2.8	10.3	39.2	240	4.4	53.5	53.9	12.6	10.0	29.9 °C	M1	Nassverlegesystem Boden

UFH - Cooling

No.	D	$A_{F,b}$ m ²	A_F m ²	L_{ANB} m	L_{HC} m	Q_C Watt	V_H l	m_H kg/h	\dot{V}_H l/h	Δp_{HC} mbar	σ_C K	$\Theta_{C,m}$	Distributor	Profile
2	OA 15 cm	3.3	2.8	10.3	39.2		4.4	53.5		12.6			M1	Nassverlegesystem Boden

Underfloor heating

New Project Electric Heat Warehouse

Room data

Building	001	Building
Storey	0	Ground floor
Room	016	GYM

Room data

Width	b_R	6.12 m	Room ground area	A_r	28.3 m ²
Length	l_R	4.64 m	Standard inner temperature	Θ_i	21 °C

Output (power) data

Standard heat load	Q_N	764 Watt	Q_{nUfh} Calculation		618 Watt
Specific heating load per m ²	q_{HL}	26.95 W/m ²	Open output	Q_{out}	-812 Watt
Standard transmission heat downward	Q_{P-A}	146 Watt	Achieved output		231 %
Design thermal output	Q_H	618 Watt	Heat output by underfloor heating	$\Phi_{FBH,R}$	1429 Watt
Margin	x	%			
Flow temperature		45 °C			

Catalogue data

Manufacturer	<neutral>
System element	Trägerelement
Pipe description	Metallverbundrohr 16 x 2,0

Top floor covering

Tag	Wood
Thermal resistance of cover	0.150 (m ² *K)/W

Load screed layers

Screed layers-designation	Zementestrich ZE 20 75 mm
Screed layers-thermal conductivity	1.200 W/(m*K)
Screed layers-thickness	75 mm

Thermal insulation

Insulation layer structure	TE + WD 50 mm
Thermal resistance	1.250 (m ² *K)/W
Insulation layer structure application case	Directly on the ground
Neighbouring temperature	5 °C

Ceiling (lower)

Thermal resistance	0.094 (m ² *K)/W
--------------------	-----------------------------

UFH - Heating

No.	D	$A_{F,b}$ m ²	A_F m ²	L_{ANB} m	L_{HC} m	Q_s Watt	V_H l	m_H kg/h	\dot{V}_H l/h	Δp_{HC} mbar	σ K	$\Theta_{s,m}$	Distributor	Profile
9	OA 20 cm	11.6	11.6	16.5	91.1	587	10.3	111.4	112.3	107.7	10.0	26 °C	M2	Nassverlegesystem Boden
8	OA 20 cm	16.7	16.7	12.4	99.0	842	11.2	121.0	121.9	135.3	10.0	26 °C	M2	Nassverlegesystem Boden

UFH - Cooling

No.	D	$A_{F,b}$ m ²	A_F m ²	L_{ANB} m	L_{HC} m	Q_C Watt	V_H l	m_H kg/h	\dot{V}_H l/h	Δp_{HC} mbar	σ_C K	$\Theta_{C,m}$	Distributor	Profile
9	OA 20 cm	11.6	11.6	16.5	91.1		10.3	111.4		107.7			M2	Nassverlegesystem Boden
8	OA 20 cm	16.7	16.7	12.4	99.0		11.2	121.0		135.3			M2	Nassverlegesystem Boden

Underfloor heating
New Project Electric Heat Warehouse

Room data

Building	001	Building
Storey	0	Ground floor
Room	017	CLOAK ROOM/WC

Room data							
Width	b_R	3.40 m	Room ground area	A_r	5.9 m ²		
Length	l_R	1.75 m	Standard inner temperature	Θ_i	18 °C		
Output (power) data							
Standard heat load	Q_N	283 Watt	QnUfhCalculation		249 Watt		
Specific heating load per m ²	q_{HL}	47.76 W/m ²	Open output	Q_{out}	-289 Watt		
Standard transmission heat downward	Q_{P-A}	35 Watt	Achieved output		216 %		
Design thermal output	Q_H	249 Watt	Heat output by underfloor heating	$\Phi_{FBH,R}$	537 Watt		
Margin	x	%					
Flow temperature		45 °C					
Catalogue data							
Manufacturer		<neutral>					
System element		Trägerelement					
Pipe description		Metallverbundrohr 16 x 2,0					
Top floor covering							
Tag		Tile					
Thermal resistance of cover		0.000 (m ² *K)/W					
Load screed layers							
Screed layers-designation		Zementestrich ZE 20 75 mm					
Screed layers-thermal conductivity		1.200 W/(m*K)					
Screed layers-thickness		75 mm					
Thermal insulation							
Insulation layer structure		TE + WD 50 mm					
Thermal resistance		1.250 (m ² *K)/W					
Insulation layer structure application case		Directly on the ground					
Neighbouring temperature		5 °C					
Ceiling (lower)							
Thermal resistance		0.094 (m ² *K)/W					

UFH - Heating

No.	D	$A_{F,b}$ m ²	A_F m ²	L_{ANB} m	L_{HC} m	Q_s Watt	V_H l	m_H kg/h	\dot{V}_H l/h	Δp_{HC} mbar	σ K	$\Theta_{s,m}$	Distributor	Profile
8	OA 20 cm	5.9	5.7	15.7	60.1	537	6.8	115.7	116.6	75.9	10.0	26.8 °C	M1	Nassverlegesystem Boden

UFH - Cooling

No.	D	$A_{F,b}$ m ²	A_F m ²	L_{ANB} m	L_{HC} m	Q_C Watt	V_H l	m_H kg/h	\dot{V}_H l/h	Δp_{HC} mbar	σ_C K	$\Theta_{C,m}$	Distributor	Profile
8	OA 20 cm	5.9	5.7	15.7	60.1		6.8	115.7		75.9			M1	Nassverlegesystem Boden

Underfloor heating

New Project Electric Heat Warehouse

List of rooms and zones with heating circuits

Building 001 Building

Rooms: 0 Ground floor

No.	Q _{s,req.} Watt	Q _s Watt	T	A _{F,b} m ²	A _F m ²	A _R m ²	L _{ANB} m	L _{HK} m	θ _v °C	σ K	θ _s °C	θ _{s,PA} °C	V _H l	m _H kg/h	Ḃ _H L/h	Ḃ _H l/min	ΔP _{HC,T} mbar
001 ENTRANCE HALL																	
5	421	710	OA 20 cm	12.1	12.1		17.9	96.2	45.0	10.0	23.8		10.88	130.9	131.9	2.20	153.5
6	664	1121	OA 20 cm	19.1	19.1		5.0	98.0	45.0	10.0	23.8		11.09	133.3	134.4	2.24	161.5
7	633	1068	OA 20 cm	18.2	18.2		2.9	78.1	45.0	10.0	23.8		8.83	106.2	107.0	1.78	86.3
8	656	1107	OA 20 cm	20.4	18.8		0.6	79.2	45.0	10.0	23.8		8.95	107.7	108.6	1.81	89.7
002 LOWER GALLERY																	
3	419	986	OA 20 cm	16.8	16.8		3.3	84.1	45.0	10.0	23.8		9.51	114.4	115.3	1.92	105.9
4	357	840	OA 20 cm	14.3	14.3		4.2	77.8	45.0	10.0	23.8		8.80	105.8	106.6	1.78	85.4
003 LOWER GALLERY 2																	
1	420	665	OA 20 cm	12.4	11.3		5.7	68.0	45.0	10.0	23.8		7.69	92.5	93.3	1.55	59.0
2	607	961	OA 20 cm	17.8	16.4		4.1	53.0	45.0	10.0	23.8		5.99	72.1	72.6	1.21	29.6
004 MAIN LOUNGE																	
4	596	738	OA 20 cm	14.6	14.6		10.0	93.2	45.0	10.0	26.0		10.54	114.0	114.9	1.91	116.4
5	592	733	OA 20 cm	14.5	14.5		8.9	88.2	45.0	10.0	26.0		9.97	107.8	108.6	1.81	99.7
6	589	730	OA 20 cm	14.5	14.5		7.7	83.2	45.0	10.0	26.0		9.41	101.7	102.5	1.71	84.9
7	588	728	OA 20 cm	14.4	14.4		6.5	78.3	45.0	10.0	26.0		8.86	95.8	96.5	1.61	72.0
8	786	973	OA 20 cm	19.3	19.3		5.3	95.5	45.0	10.0	26.0		10.80	116.7	117.6	1.96	124.2
005 DINING ROOM																	
9	647	1505	OA 20 cm	18.7	18.7		0.5	81.0	45.0	10.0	28.6		9.17	138.3	139.4	2.32	143.0
10	587	1365	OA 20 cm	17.0	17.0		0.2	75.2	45.0	10.0	28.6		8.51	128.4	129.4	2.16	116.3
11	545	1267	OA 20 cm	15.7	15.7		3.6	86.0	45.0	10.0	28.6		9.72	146.7	147.9	2.46	168.2
006 KITCHEN																	
3	1156	1835	OA 20 cm	23.1	19.6		1.8	94.0	45.0	10.0	26.8		10.63	180.9	182.3	3.04	266.2
2	1023	1623	OA 20 cm	24.9	17.3		3.9	90.2	45.0	10.0	26.8		10.20	173.6	175.0	2.92	237.6
1	1027	1629	OA 20 cm	21.0	17.4		5.6	98.1	45.0	10.0	26.8		11.10	188.8	190.3	3.17	299.5
007 LOUNGE 1/2																	
4	487	899	OA 20 cm	17.8	17.8		12.8	96.1	45.0	10.0	26.0		10.87	117.5	118.4	1.97	126.6
3	345	637	OA 20 cm	15.0	12.6		18.3	95.1	45.0	10.0	26.0		10.75	116.2	117.1	1.95	122.8
2	348	641	OA 20 cm	13.5	12.7		19.1	100.1	45.0	10.0	26.0		11.33	122.4	123.4	2.06	141.8
1	270	498	OA 20 cm	9.9	9.9		19.9	89.2	45.0	10.0	26.0		10.09	109.1	110.0	1.83	103.2
008 BED ROOM 1 / DRESSING ROOM																	
3	307	535	OA 20 cm	12.3	8.0		26.6	93.2	45.0	10.0	24.5		10.54	139.3	140.4	2.34	166.0
4	487	849	OA 20 cm	12.6	12.6		21.3	81.4	45.0	10.0	24.5		9.21	121.7	122.6	2.04	114.3
5	336	586	OA 20 cm	10.1	8.7		23.1	89.2	45.0	10.0	24.5		10.09	133.3	134.3	2.24	147.0
6	356	620	OA 20 cm	12.0	9.2		24.9	96.0	45.0	10.0	24.5		10.86	143.5	144.6	2.41	180.3
009 BEDROOM 2																	
1	411	1140	OA 20 cm	18.7	17.0		8.0	100.2	45.0	10.0	24.5		11.33	149.7	150.9	2.51	202.6
010 GAMES ROOM 1																	
7	749	999	OA 20 cm	21.5	19.8		0.4	83.0	45.0	10.0	26.0		9.39	101.5	102.3	1.70	84.6
6	762	1016	OA 20 cm	20.5	20.1		0.3	93.1	45.0	10.0	26.0		10.53	113.8	114.7	1.91	115.8
5	586	782	OA 20 cm	15.5	15.5		2.6	82.2	45.0	10.0	26.0		9.30	100.5	101.3	1.69	82.3
011 GAMES ROOM 2																	
10	449	609	OA 20 cm	12.1	12.1		2.7	49.4	45.0	10.0	26.0		5.59	60.4	60.9	1.02	20.3
012 UTILITY/BOOT ROOM																	
11	460	671	OA 20 cm	16.5	11.4		2.5	62.1	45.0	10.0	23.8		7.02	84.5	85.1	1.42	45.9
013 CLOAK ROOM																	
9	104	154	OA 15 cm	2.6	2.4		7.6	31.2	45.0	10.0	24.0		3.53	34.2	34.4	0.57	4.7

Underfloor heating
New Project Electric Heat Warehouse

List of rooms and zones with heating circuits

No.	Q _{s,req.} Watt	Q _s Watt	T	A _{F,b} m ²	A _F m ²	A _R m ²	L _{ANB} m	L _{HK} m	Θ _v °C	σ K	Θ _S °C	Θ _{S,PA} °C	V _H l	m _H kg/h	V̇ _H L/h	V̇ _H l/min	Δp _{HC,T} mbar
014 EN SUITE 1																	
7	778	676	OA 15 cm	13.1	7.9		17.4	87.2	45.0	10.0	29.9		9.86	119.1	120.1	2.00	117.9
015 ENSUITE 2																	
2	236	240	OA 15 cm	3.3	2.8		10.3	39.2	45.0	10.0	29.9		4.43	53.5	53.9	0.90	13.0
016 GYM																	
9	254	587	OA 20 cm	11.6	11.6		16.5	91.1	45.0	10.0	26.0		10.31	111.4	112.3	1.87	109.3
8	364	842	OA 20 cm	16.7	16.7		12.4	99.0	45.0	10.0	26.0		11.19	121.0	121.9	2.03	137.2
017 CLOAK ROOM/WC																	
8	249	537	OA 20 cm	5.9	5.7		15.7	60.1	45.0	10.0	26.8		6.80	115.7	116.6	1.94	77.6
018 PLANT ROOM																	
Rooms: 1 1. Upper floor																	
No.	Q _{s,req.} Watt	Q _s Watt	T	A _{F,b} m ²	A _F m ²	A _R m ²	L _{ANB} m	L _{HK} m	Θ _v °C	σ K	Θ _S °C	Θ _{S,PA} °C	V _H l	m _H kg/h	V̇ _H L/h	V̇ _H l/min	Δp _{HC,T} mbar
001 LANDING																	
002 SITTING ROOM																	
003 THOMASBED ROOM / DRESSING AREA																	
004 BED ROOM 4 / DRESSING AREA																	
005 GUEST ROOM 1																	
006 GUEST ROOM 2																	
007 EN SUITE 3																	
008 EN SUITE 4																	
009 SHOWER ROOM																	

Underfloor heating

New Project Electric Heat Warehouse

Overview heating circuits landscape - summarized per storey

Building 001 Building

Rooms: 0 Ground floor

No.-R	Room description	No.	Q _{s,req.} Watt	Q _s Watt	T	A _{F,b} m ²	A _{HeatOA} m ²	A _{HeatPA} m ²	A _{Pipe ges.} m ²	A _{Pipe OA} m ²	A _{Pipe PA} m ²	L _{ANB} m	L _{HK} m	ϕ _v °C	σ K	ϑ _{s,m}	V _H l	m _H kg/h	V _H l/h	V _H l/min	Δp _{HC,T} mbar	Distributor
001	ENTRANCE HALL	5	421	710	OA 20 cm	12.1	12.1		12.09			17.9	96.2	45.0	10.0	23.8 °C	10.88	130.9	131.9	2.20	153.5	M3
001	ENTRANCE HALL	6	664	1121	OA 20 cm	19.1	19.1		17.60			5.0	98.0	45.0	10.0	23.8 °C	11.09	133.3	134.4	2.24	161.5	M3
001	ENTRANCE HALL	7	633	1068	OA 20 cm	18.2	18.2		14.44			2.9	78.1	45.0	10.0	23.8 °C	8.83	106.2	107.0	1.78	86.3	M3
001	ENTRANCE HALL	8	656	1107	OA 20 cm	20.4	18.8		15.58			0.6	79.2	45.0	10.0	23.8 °C	8.95	107.7	108.6	1.81	89.7	M3
002	LOWER GALLERY	3	419	986	OA 20 cm	16.8	16.8		15.49			3.3	84.1	45.0	10.0	23.8 °C	9.51	114.4	115.3	1.92	105.9	M1
002	LOWER GALLERY	4	357	840	OA 20 cm	14.3	14.3		13.87			4.2	77.8	45.0	10.0	23.8 °C	8.80	105.8	106.6	1.78	85.4	M1
003	LOWER GALLERY 2	1	420	665	OA 20 cm	12.4	11.3		11.32			5.7	68.0	45.0	10.0	23.8 °C	7.69	92.5	93.3	1.55	59.0	M2
003	LOWER GALLERY 2	2	607	961	OA 20 cm	17.8	16.4		8.95			4.1	53.0	45.0	10.0	23.8 °C	5.99	72.1	72.6	1.21	29.6	M2
004	MAIN LOUNGE	4	596	738	OA 20 cm	14.6	14.6		14.63			10.0	93.2	45.0	10.0	26 °C	10.54	114.0	114.9	1.91	116.4	M4
004	MAIN LOUNGE	5	592	733	OA 20 cm	14.5	14.5		14.08			8.9	88.2	45.0	10.0	26 °C	9.97	107.8	108.6	1.81	99.7	M4
004	MAIN LOUNGE	6	589	730	OA 20 cm	14.5	14.5		13.56			7.7	83.2	45.0	10.0	26 °C	9.41	101.7	102.5	1.71	84.9	M4
004	MAIN LOUNGE	7	588	728	OA 20 cm	14.4	14.4		13.08			6.5	78.3	45.0	10.0	26 °C	8.86	95.8	96.5	1.61	72.0	M4
004	MAIN LOUNGE	8	786	973	OA 20 cm	19.3	19.3		16.98			5.3	95.5	45.0	10.0	26 °C	10.80	116.7	117.6	1.96	124.2	M4
005	DINING ROOM	9	647	1505	OA 20 cm	18.7	18.7		16.02			0.5	81.0	45.0	10.0	28.6 °C	9.17	138.3	139.4	2.32	143.0	M4
005	DINING ROOM	10	587	1365	OA 20 cm	17.0	17.0		14.97			0.2	75.2	45.0	10.0	28.6 °C	8.51	128.4	129.4	2.16	116.3	M4
005	DINING ROOM	11	545	1267	OA 20 cm	15.7	15.7		15.74			3.6	86.0	45.0	10.0	28.6 °C	9.72	146.7	147.9	2.46	168.2	M4
006	KITCHEN	1	1027	1629	OA 20 cm	21.0	17.4		17.37			5.6	98.1	45.0	10.0	26.8 °C	11.10	188.8	190.3	3.17	299.5	M4
006	KITCHEN	2	1023	1623	OA 20 cm	24.9	17.3		16.50			3.9	90.2	45.0	10.0	26.8 °C	10.20	173.6	175.0	2.92	237.6	M4
006	KITCHEN	3	1156	1835	OA 20 cm	23.1	19.6		18.10			1.8	94.0	45.0	10.0	26.8 °C	10.63	180.9	182.3	3.04	266.2	M4
007	LOUNGE 1/2	1	270	498	OA 20 cm	9.9	9.9		9.87			19.9	89.2	45.0	10.0	26 °C	10.09	109.1	110.0	1.83	103.2	M3
007	LOUNGE 1/2	2	348	641	OA 20 cm	13.5	12.7		12.37			19.1	100.1	45.0	10.0	26 °C	11.33	122.4	123.4	2.06	141.8	M3
007	LOUNGE 1/2	3	345	637	OA 20 cm	15.0	12.6		11.68			18.3	95.1	45.0	10.0	26 °C	10.75	116.2	117.1	1.95	122.8	M3
007	LOUNGE 1/2	4	487	899	OA 20 cm	17.8	17.8		14.12			12.8	96.1	45.0	10.0	26 °C	10.87	117.5	118.4	1.97	126.6	M3
008	BED ROOM 1 / DRESSING ROOM	3	307	535	OA 20 cm	12.3	8.0		7.98			26.6	93.2	45.0	10.0	24.5 °C	10.54	139.3	140.4	2.34	166.0	M2
008	BED ROOM 1 / DRESSING ROOM	4	487	849	OA 20 cm	12.6	12.6		7.77			21.3	81.4	45.0	10.0	24.5 °C	9.21	121.7	122.6	2.04	114.3	M2
008	BED ROOM 1 / DRESSING ROOM	5	336	586	OA 20 cm	10.1	8.7		8.59			23.1	89.2	45.0	10.0	24.5 °C	10.09	133.3	134.3	2.24	147.0	M2
008	BED ROOM 1 / DRESSING ROOM	6	356	620	OA 20 cm	12.0	9.2		9.24			24.9	96.0	45.0	10.0	24.5 °C	10.86	143.5	144.6	2.41	180.3	M2
009	BEDROOM 2	1	411	1140	OA 20 cm	18.7	17.0		16.84			8.0	100.2	45.0	10.0	24.5 °C	11.33	149.7	150.9	2.51	202.6	M1
010	GAMES ROOM 1	5	586	782	OA 20 cm	15.5	15.5		15.42			2.6	82.2	45.0	10.0	26 °C	9.30	100.5	101.3	1.69	82.3	M1
010	GAMES ROOM 1	6	762	1016	OA 20 cm	20.5	20.1		18.51			0.3	93.1	45.0	10.0	26 °C	10.53	113.8	114.7	1.91	115.8	M1
010	GAMES ROOM 1	7	749	999	OA 20 cm	21.5	19.8		16.44			0.4	83.0	45.0	10.0	26 °C	9.39	101.5	102.3	1.70	84.6	M1
011	GAMES ROOM 2	10	449	609	OA 20 cm	12.1	12.1		8.79			2.7	49.4	45.0	10.0	26 °C	5.59	60.4	60.9	1.02	20.3	M2
012	UTILITY/BOOT ROOM	11	460	671	OA 20 cm	16.5	11.4		11.42			2.5	62.1	45.0	10.0	23.8 °C	7.02	84.5	85.1	1.42	45.9	M2

Underfloor heating
New Project Electric Heat Warehouse

Overview heating circuits landscape - summarized per storey																						
013	CLOAK ROOM	9	104	154	OA 15 cm	2.6	2.4		2.42			7.6	31.2	45.0	10.0	24 °C	3.53	34.2	34.4	0.57	4.7	M3
014	EN SUITE 1	7	778	676	OA 15 cm	13.1	7.9		7.87			17.4	87.2	45.0	10.0	29.9 °C	9.86	119.1	120.1	2.00	117.9	M2
015	ENSUITE 2	2	236	240	OA 15 cm	3.3	2.8		2.80			10.3	39.2	45.0	10.0	29.9 °C	4.43	53.5	53.9	0.90	13.0	M1
016	GYM	8	364	842	OA 20 cm	16.7	16.7		14.85			12.4	99.0	45.0	10.0	26 °C	11.19	121.0	121.9	2.03	137.2	M2
016	GYM	9	254	587	OA 20 cm	11.6	11.6		11.65			16.5	91.1	45.0	10.0	26 °C	10.31	111.4	112.3	1.87	109.3	M2
017	CLOAK ROOM/WC	8	249	537	OA 20 cm	5.9	5.7		5.73			15.7	60.1	45.0	10.0	26.8 °C	6.80	115.7	116.6	1.94	77.6	M1
													3215.4				363.67		4559.3	75.96		

Underfloor heating
New Project Electric Heat Warehouse

Room overview - result
Building

1 1. Upper floor

θ_i °C	$\theta_{int,c}$ °C	A_r m ²	Contour m	$\Phi_{HL,Net}$ Watt	Φ_{RH} Watt	Φ_{HL} Watt	Q_{P-A} Watt	$\Phi_{FBH,%,R}$ %	Q_H Watt	$\Phi_{FBH,R}$ Watt	Output %	Q_{out} Watt	Q_C Watt
001 LANDING													
18		26.0	46.2	881	0	881	0.00	100	881	0	0	-881	
002 SITTING ROOM													
21		20.4	18.4	827	0	827	21.28	100	806	0	0	-806	
003 THOMASBED ROOM / DRESSING AREA													
18		21.7	24.2	542	0	542	0.00	100	542	0	0	-542	
004 BED ROOM 4 / DRESSING AREA													
18		21.1	22.3	616	0	616	15.67	100	600	0	0	-600	
005 GUEST ROOM 1													
18		14.4	16.4	417	0	417	0.00	100	417	0	0	-417	
006 GUEST ROOM 2													
18		13.7	15.7	486	0	486	0.00	100	486	0	0	-486	
007 EN SUITE 3													
22		4.2	8.3	356	0	356	1.43	100	354	0	0	-354	
008 EN SUITE 4													
22		4.7	8.8	363	0	363	1.67	100	361	0	0	-361	
009 SHOWER ROOM													
22		3.3	7.8	339	0	339	1.79	100	337	0	0	-337	
		129.5		4827	0	4827			4784				

0 Ground floor

θ_i °C	$\theta_{int,c}$ °C	A_r m ²	Contour m	$\Phi_{HL,Net}$ Watt	Φ_{RH} Watt	Φ_{HL} Watt	Q_{P-A} Watt	$\Phi_{FBH,%,R}$ %	Q_H Watt	$\Phi_{FBH,R}$ Watt	Output %	Q_{out} Watt	Q_C Watt
001 ENTRANCE HALL													
18		69.7	50.8	2627	0	2627	253.97	100	2373	4005	169	1632	
002 LOWER GALLERY													
18		31.1	19.2	888	0	888	110.90	100	777	1826	235	1049	
003 LOWER GALLERY 2													
18		30.2	19.2	1157	0	1157	130.81	100	1026	1625	158	599	
004 MAIN LOUNGE													
21		77.4	37.0	3528	0	3528	376.94	100	3151	3902	124	751	
005 DINING ROOM													
21		51.4	19.2	2004	0	2004	225.40	100	1779	4137	233	2359	
006 KITCHEN													
18		69.1	36.8	3457	0	3457	250.31	100	3206	5087	159	1881	
007 LOUNGE 1/2													
21		56.2	32.3	1775	0	1775	325.16	100	1450	2675	185	1225	
008 BED ROOM 1 / DRESSING ROOM													
18		47.1	40.2	1668	0	1668	182.32	100	1486	2589	174	1103	
009 BEDROOM 2													
18		18.7	20.6	288	0	288	72.32	100	411	1140	278	730	

Underfloor heating
New Project Electric Heat Warehouse

Room overview - result

Building

θ_i °C	$\theta_{int,c}$ °C	A_r m ²	Contour m	$\Phi_{HL,Net}$ Watt	Φ_{RH} Watt	Φ_{HL} Watt	Q_{P-A} Watt	$\Phi_{FBH,%,R}$ %	Q_H Watt	$\Phi_{FBH,R}$ Watt	Output %	Q_{out} Watt	Q_C Watt
010 GAMES ROOM 1													
21		57.4	35.4	2374	0	2374	277.57	100	2097	2797	133	700	
011 GAMES ROOM 2													
21		12.1	16.3	513	0	513	64.25	100	449	609	136	160	
012 UTILITY/BOOT ROOM													
18		16.5	19.3	529	0	529	69.08	100	460	671	146	211	
013 CLOAK ROOM													
18		2.6	7.1	117	0	117	12.76	100	104	154	148	50	
014 EN SUITE 1													
22		13.1	18.3	852	0	852	74.14	100	778	676	87	-102	
015 ENSUITE 2													
22		3.3	7.4	253	0	253	16.94	100	236	240	102	5	
016 GYM													
21		28.3	21.5	764	0	764	146.37	100	618	1429	231	812	
017 CLOAK ROOM/WC													
18		5.9	10.7	283	0	283	34.77	100	249	537	216	289	
		590.1		23077	0	23077			20650				

Underfloor heating
New Project Electric Heat Warehouse

Manifold data (project-wide)

Description	M2	HC connected	11
Manufacturer	<neutral>	Δp_{system}	mbar
Manifold type	Fußbodenheizkreisverteiler Typ A HK-11	Δp_{Distr}	180.3 mbar
Flow valve	Fußbodenheizkreisventil - Vorlauf	\dot{m}_{Distr}	1198.8 kg/h
Return valve	Fußbodenheizkreisventil - Rücklauf	Θ_v	45.0 °C
Cabinet	Verteilerschrank - Unterputz Typ A		
City			
001	Building		
0	Ground floor		

No.-AE	Global no	Connection	\dot{V}_{HC} l/min	\dot{m}_{HC} kg/h	Δp_{HC} mbar	Δp_{EBT} mbar	Δp_{VE} mbar	$\Delta p_{HC,T}$ mbar	$\Sigma \Delta p$ mbar	$\Delta p_{V_{open}}$ mbar	$k_{V_{VE}}$	$k_{V_{EBT}}$	EN_{VE}
1	001.0.003.1	Heating circuit	1.6	92.5	57.9		122.4	59.0	180.3	1.1	0.27		0.3
2	001.0.003.2	Heating circuit	1.2	72.1	28.9		151.3	29.6	180.3	0.7	0.19		0.2
3	001.0.008.3	Heating circuit	2.3	139.3	163.4		16.9	166.0	180.3	2.6	1.08		1.15
4	001.0.008.4	Heating circuit	2.0	121.7	112.4		67.9	114.3	180.3	2.0	0.47		0.5
5	001.0.008.5	Heating circuit	2.2	133.3	144.7		35.6	147.0	180.3	2.4	0.71		0.75
6	001.0.008.6	Heating circuit	2.4	143.5	177.6		2.7	180.3	180.3	2.7	2.76		3.5
7	001.0.014.7	Heating circuit	2.0	119.1	116.0		64.3	117.9	180.3	1.9	0.47		0.5
8	001.0.016.8	Heating circuit	2.0	121.0	135.3		45.0	137.2	180.3	1.9	0.57		0.65
9	001.0.016.9	Heating circuit	1.9	111.4	107.7		72.6	109.3	180.3	1.7	0.42		0.5
10	001.0.011.10	Heating circuit	1.0	60.4	19.8		160.5	20.3	180.3	0.5	0.15		0.2
11	001.0.012.11	Heating circuit	1.4	84.5	45.0		135.3	45.9	180.3	0.9	0.23		0.25

Underfloor heating
New Project Electric Heat Warehouse

Manifold data (project-wide)

Description	M1		
Manufacturer	<neutral>	HC connected	8
Manifold type	Fußbodenheizkreisverteiler Typ A HK-8	Δp_{system}	mbar
Flow valve	Fußbodenheizkreisventil - Vorlauf	Δp_{Distr}	202.6 mbar
Return valve	Fußbodenheizkreisventil - Rücklauf	\dot{m}_{Distr}	854.8 kg/h
Cabinet	Verteilerschrank - Unterputz Typ A	Θ_v	45.0 °C
City			
001	Building		
0	Ground floor		

No.-AE	Global no	Connection	\dot{V}_{HC} l/min	\dot{m}_{HC} kg/h	Δp_{HC} mbar	Δp_{EBT} mbar	Δp_{VE} mbar	$\Delta p_{\text{HC,T}}$ mbar	$\Sigma \Delta p$ mbar	$\Delta p_{\text{V}_{\text{open}}}$ mbar	$k_{\text{V}_{\text{VE}}}$	$k_{\text{V}_{\text{EBT}}}$	EN_{VE}
1	001.0.009.1	Heating circuit	2.5	149.7	199.6		3.0	202.6	202.6	3.0	2.76		3.5
2	001.0.015.2	Heating circuit	0.9	53.5	12.6		190.0	13.0	202.6	0.4	0.12		0.2
3	001.0.002.3	Heating circuit	1.9	114.4	104.1		98.5	105.9	202.6	1.7	0.37		0.4
4	001.0.002.4	Heating circuit	1.8	105.8	83.9		118.7	85.4	202.6	1.5	0.31		0.4
5	001.0.010.5	Heating circuit	1.7	100.5	81.0		121.6	82.3	202.6	1.3	0.29		0.3
6	001.0.010.6	Heating circuit	1.9	113.8	114.1		88.5	115.8	202.6	1.7	0.39		0.4
7	001.0.010.7	Heating circuit	1.7	101.5	83.2		119.4	84.6	202.6	1.4	0.30		0.3
8	001.0.017.8	Heating circuit	1.9	115.7	75.9		126.7	77.6	202.6	1.8	0.33		0.4

Underfloor heating
New Project Electric Heat Warehouse

Manifold data (project-wide)

Description	M4		
Manufacturer	<neutral>	HC connected	11
Manifold type	Fußbodenheizkreisverteiler Typ A HK-11	ΔP_{system}	mbar
Flow valve	Fußbodenheizkreisventil - Vorlauf	ΔP_{Distr}	299.5 mbar
Return valve	Fußbodenheizkreisventil - Rücklauf	\dot{m}_{Distr}	1492.6 kg/h
Cabinet	Verteilerschrank - Unterputz Typ A	Θ_v	45.0 °C
City			
001	Building		
0	Ground floor		

No.-AE	Global no	Connection	\dot{V}_{HC} l/min	\dot{m}_{HC} kg/h	ΔP_{HC} mbar	ΔP_{EBT} mbar	ΔP_{VE} mbar	$\Delta P_{\text{HC,T}}$ mbar	$\Sigma \Delta p$ mbar	$\Delta p_{\text{V}_{\text{open}}}$ mbar	$k_{\text{V}_{\text{VE}}}$	$k_{\text{V}_{\text{EBT}}}$	EN_{VE}
1	001.0.006.1	Heating circuit	3.2	188.8	294.7		4.7	299.5	299.5	4.7	2.76		3.5
2	001.0.006.2	Heating circuit	2.9	173.6	233.6		65.9	237.6	299.5	4.0	0.68		0.75
3	001.0.006.3	Heating circuit	3.0	180.9	261.8		37.7	266.2	299.5	4.4	0.94		1
4	001.0.004.4	Heating circuit	1.9	114.0	114.7		184.8	116.4	299.5	1.7	0.27		0.3
5	001.0.004.5	Heating circuit	1.8	107.8	98.2		201.3	99.7	299.5	1.5	0.24		0.25
6	001.0.004.6	Heating circuit	1.7	101.7	83.6		215.9	84.9	299.5	1.4	0.22		0.25
7	001.0.004.7	Heating circuit	1.6	95.8	70.8		228.6	72.0	299.5	1.2	0.20		0.25
8	001.0.004.8	Heating circuit	2.0	116.7	122.4		177.0	124.2	299.5	1.8	0.28		0.3
9	001.0.005.9	Heating circuit	2.3	138.3	140.4		159.0	143.0	299.5	2.5	0.35		0.4
10	001.0.005.10	Heating circuit	2.2	128.4	114.2		185.3	116.3	299.5	2.2	0.30		0.4
11	001.0.005.11	Heating circuit	2.5	146.7	165.3		134.2	168.2	299.5	2.9	0.40		0.5