Aluline · Superplan

Designed as 2-pipe and 4-pipe system

SUNLINE

Warm like the sun

Contents

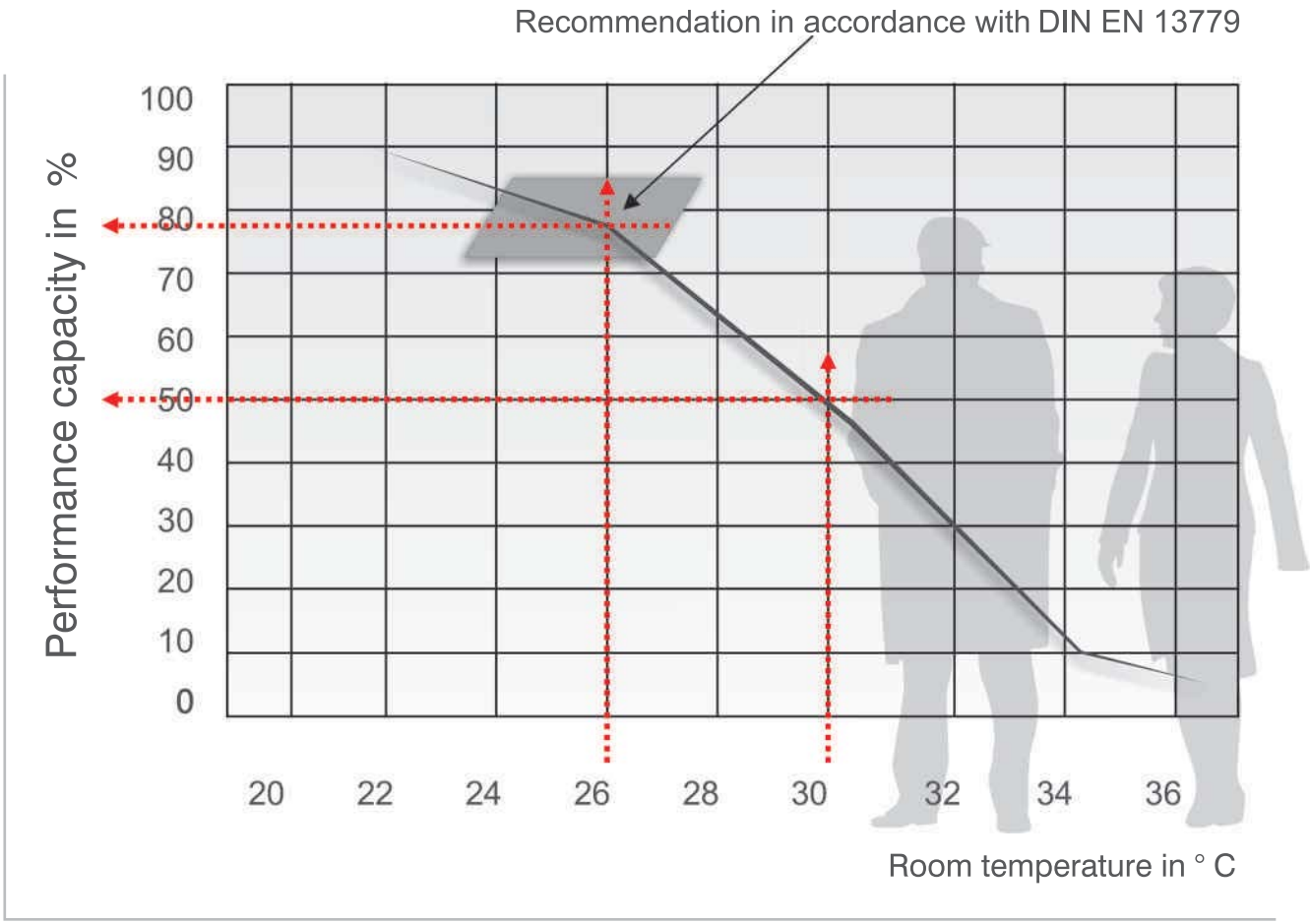
Thermal comfort is a prerequisite for health and high efficiency at the workplace.

Optimum productivity in the workplace should be the goal of every company.

According to general experience, a person's performance capacity decreases by 30 per cent when the room temperature rises from 26°C to 30°C.

Therefore, the cooling of buildings is gaining in importance.

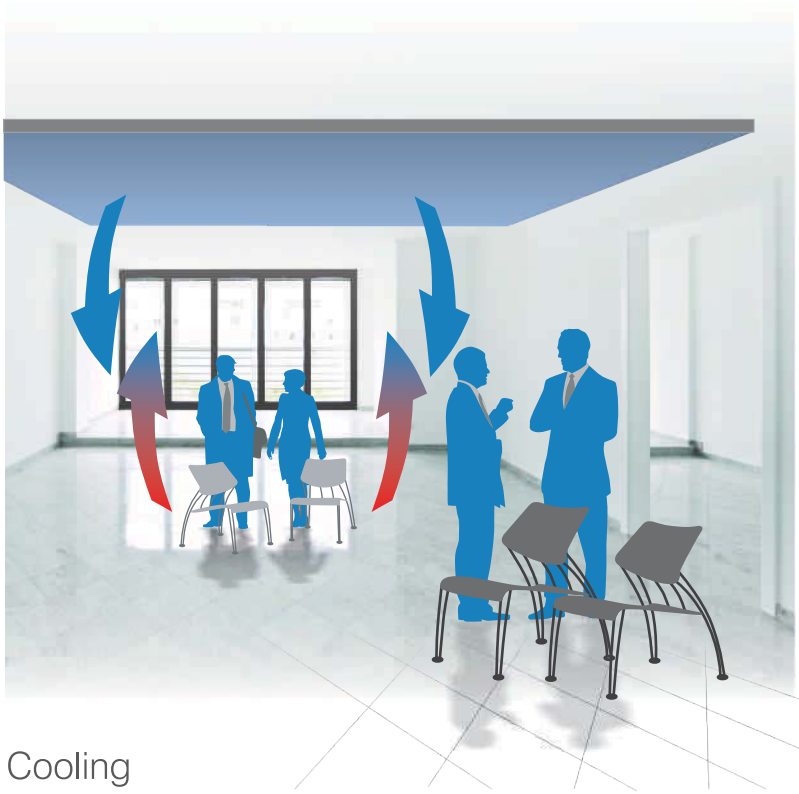
Performance capacity of a person



The ASR 6/1.3 Guideline for Workplaces specifies limit values for indoor temperatures. When taking these guidelines into consideration, it must be ensured that the room temperature does not exceed 26 °C at outdoor temperatures of 32 °C.
In the case of higher outdoor temperatures, a difference of at least 6K must be ensured.
The Aluline Superplan meets this requirement for comfortable air-conditioning at the workplace both in winter and in summer. This highly efficient aluminium radiant panel combines the advantages of energy-saving heating and cooling with the aesthetic demand for a simple and stylish design.
For reasons of comfort and energy, the use of panel heating and cooling in the form of suspended sails and ceilings has, compared to air-conditioning systems, increasingly established itself. It is an energy-efficient, quiet and extremely comfortable alternative to conventional systems which have previously been used in office buildings.

The use of large surfaces as a source of radiation ensures that the average heating and cooling water temperatures are close to the ambient temperature. They are therefore particularly suited for the integration of renewable energy sources.
A smooth surface, free from ledges and pipe wells, provides a multitude of architectural applications for office complexes, public and cultural institutions, industrial areas and much more.

The advantage of a thermally active ceiling is its impact on the room temperature. The radiant panels, which have water flowing through them, can rapidly react to changing temperature levels and discharge high cooling or heating loads economically. Thanks to the rapid heating or cooling of the total wall area, a high level of comfort is achieved.



Cooling

Heating

Up to 50% energy savings

System Advantages

...up to 50 % energy saving compared to other heating and cooling systems

…low ceiling load due to low operating weight

…ideal for renewable energy sources

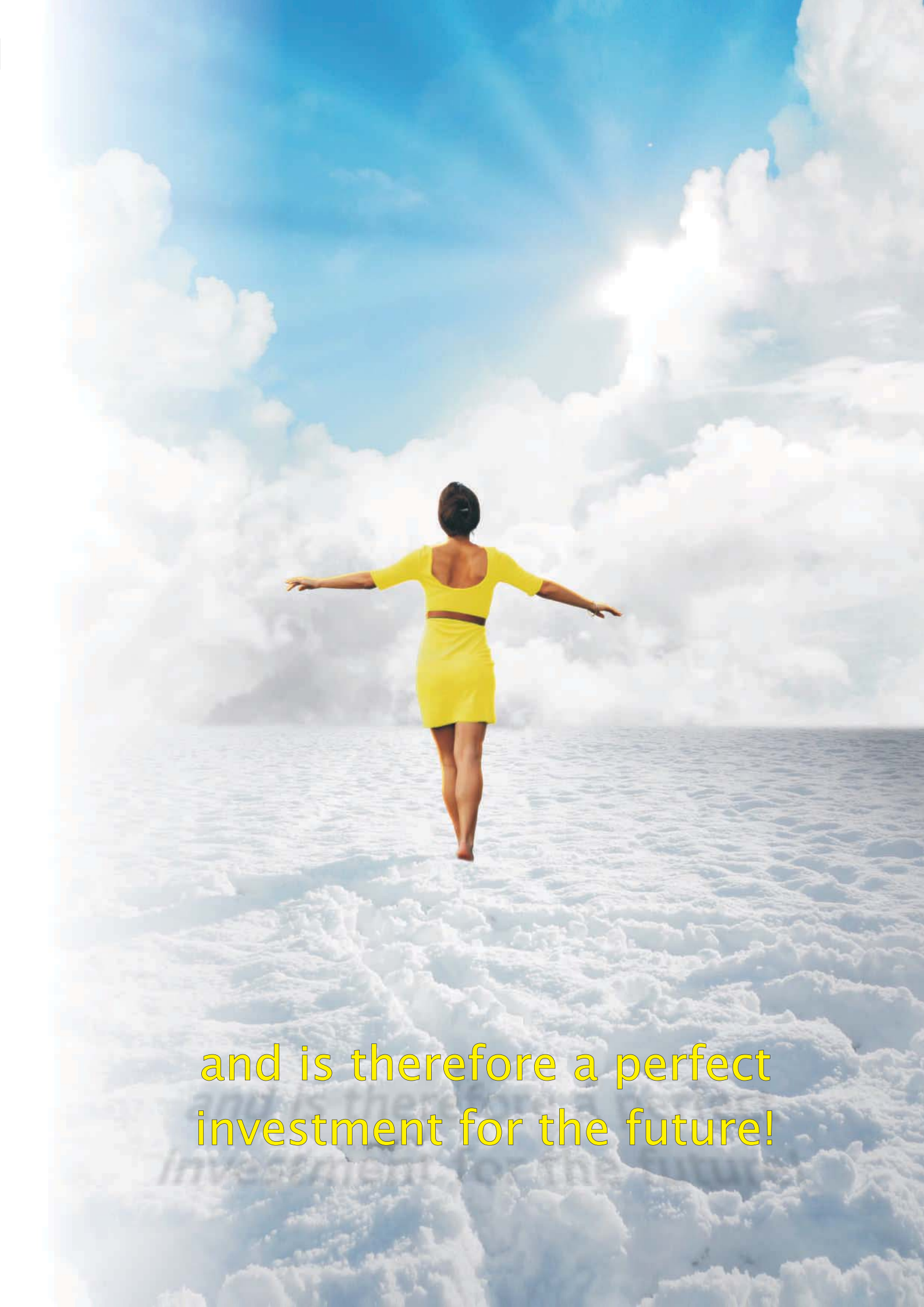
…high level of thermal comfort, even at low heated water temperatures

…efficient climate control according to user requirements

…quick reaction to changing thermal loads

…improvement of acoustics in rooms thanks to use of perforated panel surfaces

… easy integration into ceiling grid



and is therefore a perfect investment for the future!

Fields of Application

Sunline Aluline Superplan is the preferred choice for rooms which demand a high level of comfort. With its smooth surface, free from joints and ledges, this design is often installed in areas of hygiene and in many other premises for heating and air-conditioning.

For example:

- Administration buildings
- Bank buildings
- Schools, childcare centres
- Hospitals, doctor's rooms
- Car dealerships
- Hotel buildings
- Museums, exhibition spaces
- Industrial buildings and warehouses

Bank buildings

Industrial plants

Schools, childcare centres

Museum, exhibition hall

Car dealer

Hospital, doctor's rooms

Office buildings

Hotel buildings

Product Description

Just like the Aluline heating and cooling panels, the Aluline Superplan has a very low operating weight of 11.8 kg//m^2. In addition, thanks to the smooth visible surface which is free from joints and ledges, the highest demands in terms of styling options are accommodated.

The Aluline Superplan consists of the following components:
Heat conduction profiles, which are bonded to the radiant panel, are on the inside of the Aluline Superplan. The water-bearing copper pipes, with a diameter of 15 x 0.75 mm, are firmly pressed into the 1 mm thick heat-conducting profile. To avoid heat loss in the direction of the ceiling, the top of the panel is equipped with high-quality mineral wool insulation. The non-flammable insulation is 40 mm thick. The insulation is held in position with a lateral 60 mm high upstand. This upstand is available at an angle of 90° or 70 °. Movable profiles made from galvanised sheet steel allow for a variable suspension grid. The connection of the individual panels takes place on-site with patented sliding sleeves.

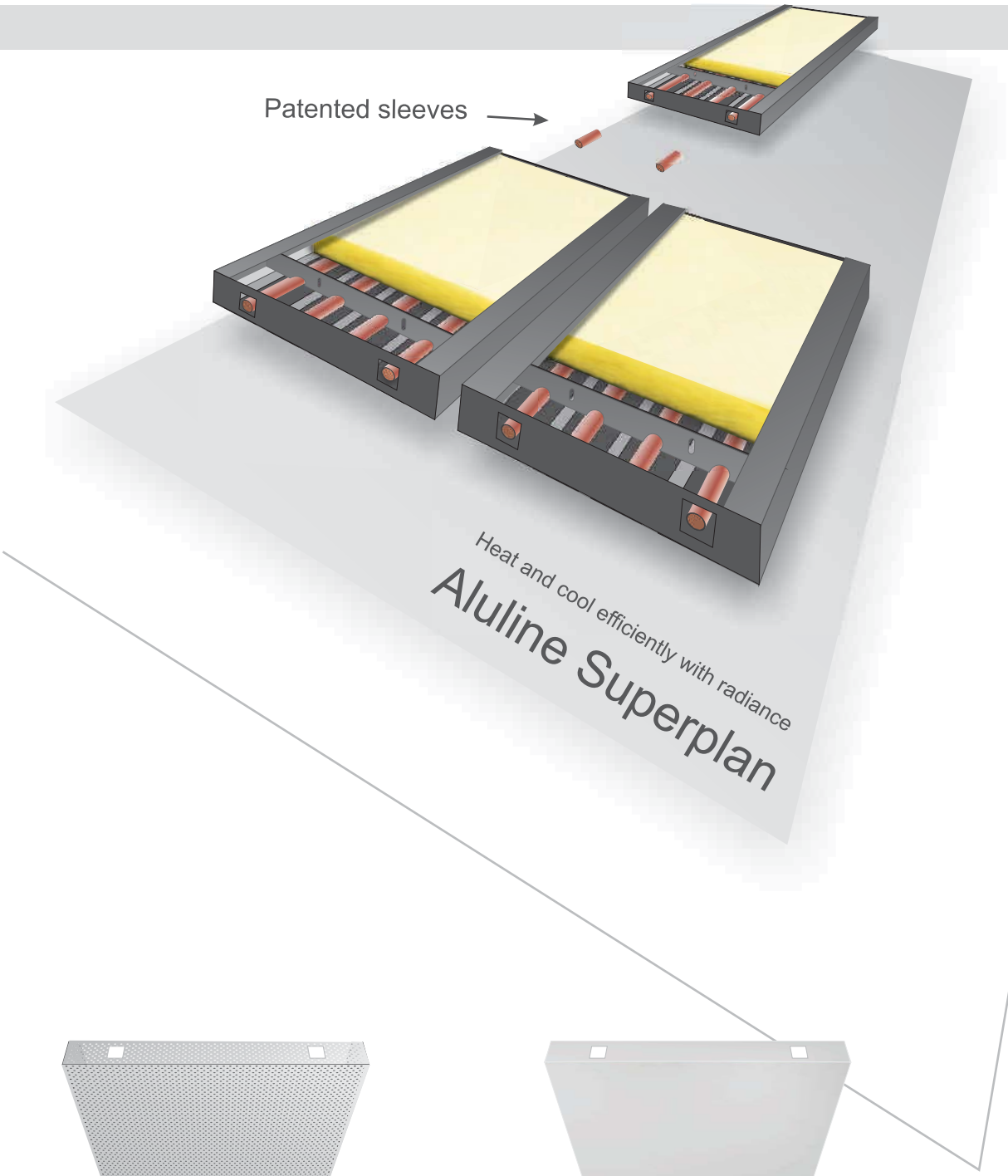
Individual components can be manufactured up to a maximum length of 3,000 mm. A perforated version of the Aluline Superplan is available to fulfil acoustic as well as visual requirements. Due to the holes, in combination with the heat insulation, excellent room acoustics can be achieved and the reverberation period is shortened considerably.

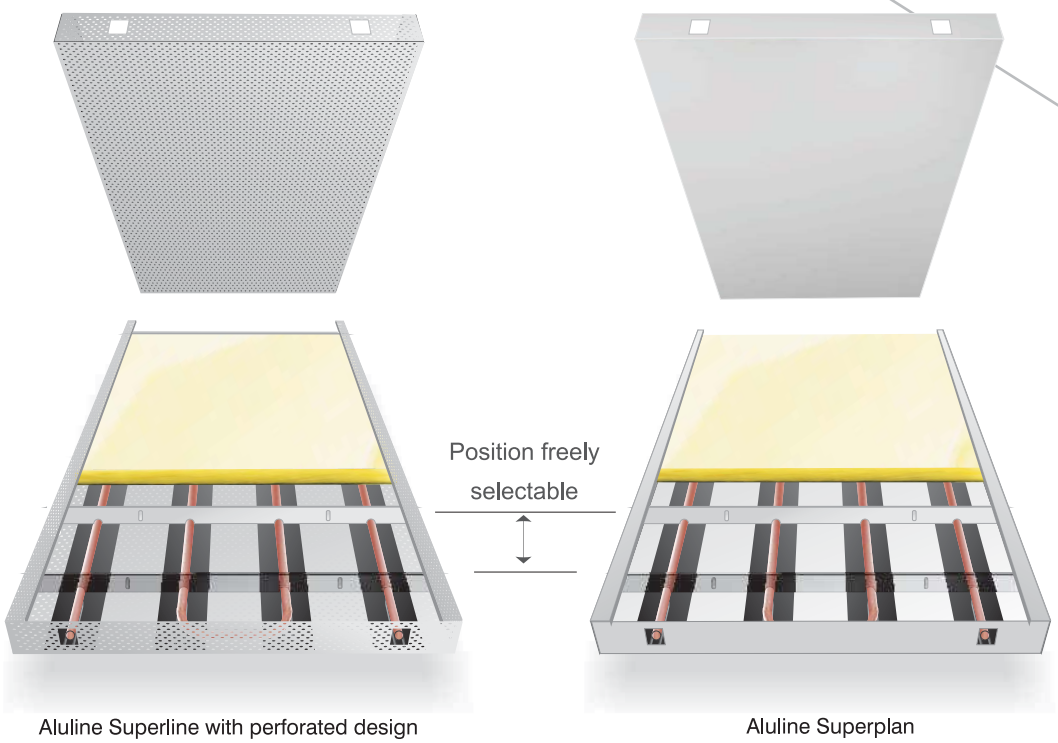
Aluline Superplan in perforated design

Aluline Superplan with cut out

In addition to the standard colour RAL 9016 - Traffic white - other RAL colours can be supplied.

Upper plate covers are also available as accessories. If required, cut outs for lighting or loudspeakers, in round, square or rectangular shape can be made in the radiant panels at the factory. Mitres for angled panels or adaptations for special designs can be manufactured easily.



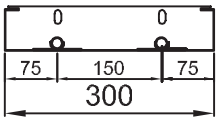


Aluline Superline with perforated design

Aluline Superplan

Type Range

TYPE 300



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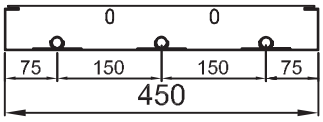
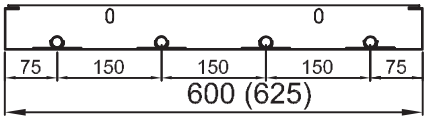


TYPE 600



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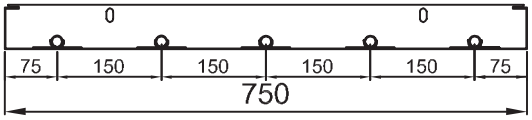

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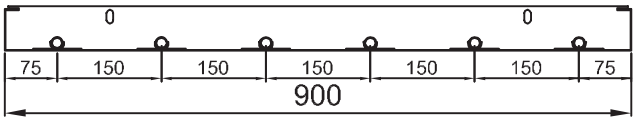

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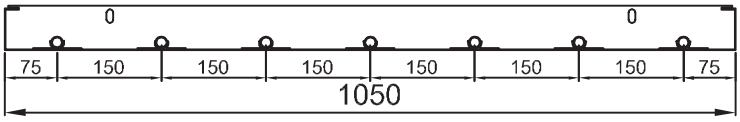

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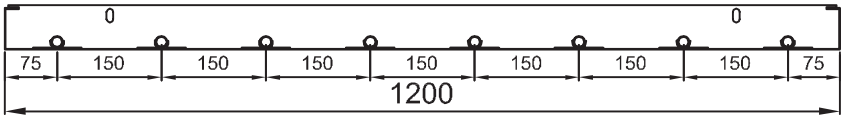
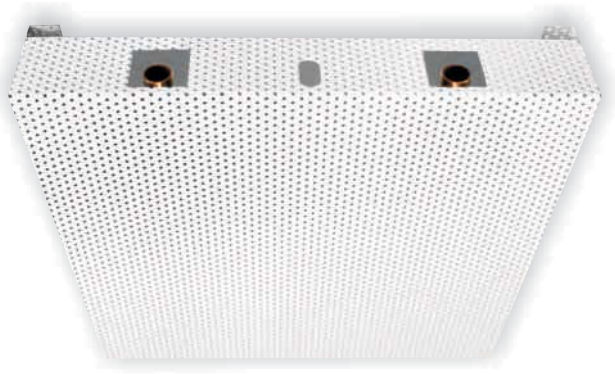


Design variants

90 ° upstand for tape and sail design

70 ° upstand for modular grid ceilings and ceiling panels



90° upstand

70° upstand

Type Sunline
Aluline Superplan

Width	Number of	Water content	Operating weight	Rated thermal output at Δt=55K	Rated cooling capacity at Δt=10K
mm	pipes	l/m	kg/m	W/m	W/m
300	2	0,27	3,86	195	35
450	3	0,40	5,58	280	56
600	4	0,53	7,26	361	73
750	5	0,66	8,98	430	95
900	6	0,80	10,69	503	115
1050	7	0,93	12,42	571	133
1200	8	1,06	14,11	638	154

Operating pressure of max. 6 bar

Operating temperature of max. 90 °

Thermal Output

Rated thermal output in W / m for different over temperatures on Δ T
Type Sunline Aluline Superplan (with insulation)

Over temperature tm-ti Δ tK	Width 300 mm	Width 450 mm	Width 600 mm	Width 750 mm	Width 900 mm	Width 1050 mm	Width 1200 mm
10	26	39	49	58	66	73	81
12	32	45	56	71	79	93	106
14	40	53	72	82	99	109	123
16	45	66	81	99	113	132	147
18	51	73	94	111	132	151	167
20	58	86	109	127	147	168	189
22	66	83	118	145	168	191	215
24	75	103	133	158	184	210	236
26	83	117	148	178	205	234	259
28	87	126	163	191	221	252	286
30	94	134	177	211	244	278	309
32	106	149	190	225	261	299	333
34	111	156	201	244	282	319	361
36	121	168	219	259	303	344	386
38	126	181	233	279	319	368	410
40	137	192	245	296	341	389	439
42	144	204	261	312	363	415	461
44	149	213	278	330	381	439	488
46	161	223	295	348	402	459	515
48	166	238	306	365	427	487	545
50	176	250	322	386	448	511	569
52	181	259	340	402	469	532	599
54	191	274	357	421	489	560	626
55	**195**	**280**	**361**	**430**	**503**	**571**	**638**
56	199	287	373	443	511	581	655
58	210	296	386	462	535	607	680
60	215	307	405	479	558	635	711
62	224	319	421	501	577	660	738
64	235	333	433	517	601	683	765
66	241	347	451	540	621	708	792
68	253	359	469	559	645	734	824
70	261	369	483	576	670	763	853

Rated cooling capacity in W / m for different over temperatures Δ T
Type Sunline Aluline Superplan (with insulation)

Over temperature ti-tm Δ tK	Width 300 mm	Width 450 mm	Width 600 mm	Width 750 mm	Width 900 mm	Width 1050 mm	Width 1200 mm
4	13	19	26	35	39	47	55
4,5	15	22	31	39	45	54	64
5	17	26	35	44	51	61	72
5,5	19	29	37	48	58	69	80
6	21	31	40	51	65	77	89
6,5	22	34	44	57	71	83	96
7	24	36	47	63	78	89	103
7,5	26	40	52	67	83	97	112
8	28	44	58	71	87	105	122
8,5	30	46	62	78	95	112	131
9	32	48	66	84	103	119	139
9,5	34	52	69	89	109	126	147
10	**35**	**56**	**73**	**95**	**115**	**133**	**154**
10,5	37	59	77	100	122	141	163
11	39	62	81	105	128	149	172
11,5	40	65	86	111	134	157	181
12	42	67	90	116	140	164	190

Over temperature

$$\Delta\vartheta_{Over} = \frac{(\vartheta_{heat\ flow} + \vartheta_{heat\ return})}{2} - \vartheta_i$$

Under temperature

$$\Delta\vartheta_{Under} = \vartheta_i - \frac{(\vartheta_{cooling\ flow} + \vartheta_{cooling\ return})}{2}$$

Further fields of application


OP 4

Superplan 4-pipe system

The Aluline Superplan 4-pipe system is a special solution. It ensures optimal performance adaptation to local user requirements. The separate heating and cooling cycle allows for a quick change of the individual systems.

As the number of pipes is invidually matched to the particular heating or cooling situation, we guarantee an optimal adaptation to thermal loads.

Particularly in open-plan offices, a rapid response to changing thermal loads is very important. With our Superplan 4-pipe system, the south side of an office can be cooled, while the north side is still being heated. Working conditions are optimally adapted to the specific requirements of the users. The workplace heating in office buildings has an impact on both the sick rate and the performance capability of the employees. The costs which are incurred due to an unhealthy working climate in office buildings can be just as high as the costs for the creation of optimal thermal and acoustic comfort.

Due to the optimisation of the mass flows, the cross sections of the supply lines are perfectly adjusted.
Due to the Superplan 4-pipe system's quick reaction to changes in performance, it is the preferred choice for spaces with frequent temperature fluctuations.

This product variant is only available in the following widths:
600 mm, 900 mm and 1200 mm.

... clear system separation of heating and cooling cycle

... no antifreeze admixture in the core cycle; therefore no loss of heat or performance

... fast reaction time to changing thermal loads

... optimisation of the mass flows

... optimum adaptation of the calculated pipe cross sections to the heating or cooling load

... cost savings due to low installation expense

... simple control components

Special Version 4-pipe system

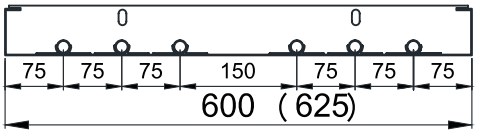
Type Sunline
Aluline Superplan - 4-pipe system

Width	Number of pipes		Water content	Operating weight	Rated thermal output at Δt=55K	Rated cooling capacity at Δt=8K
mm	Heating	Cooling	l/m	kg/m	W/m	W/m
600	2	4	0,80	8,04	281	55
	4	2	0,80	8,04	364	37
900	4	6	1,33	12,25	416	88
	6	4	1,33	12,25	504	66
1200	6	6	1,59	15,67	559	98
	4	8	1,59	15,67	488	117

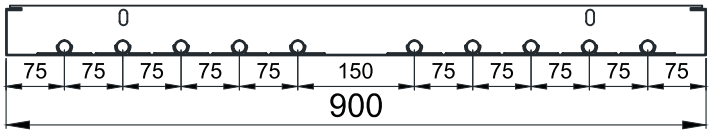
Operating pressure of max. 6 bar

Operating temperature of max. 90 °

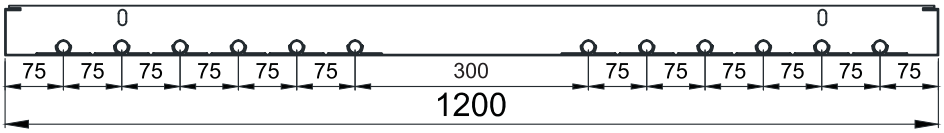
TYPE 600



TYPE 900



TYPE 1200

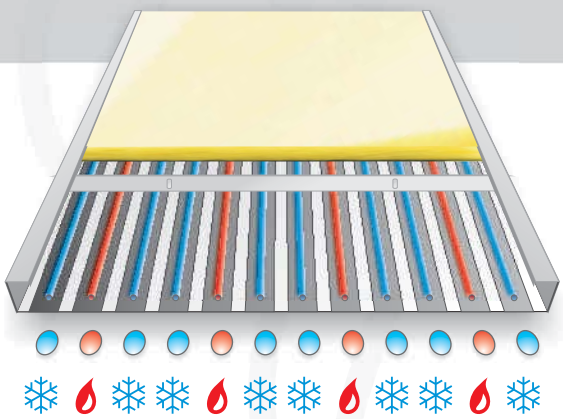


Design variants

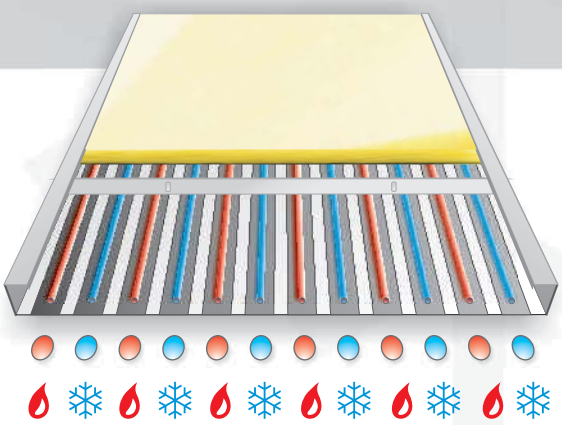
90 ° upstand for tape and sail design

70 ° upstand for modular grid ceilings and ceiling panels

Width 1200: 4 x heating / 8 x cooling
for higher cooling requirements



Width 1200: 6 x heating / 6 x cooling
for equal heating and cooling requirements



We will gladly provide you with a technical layout, customised to your property.

Mounting Options

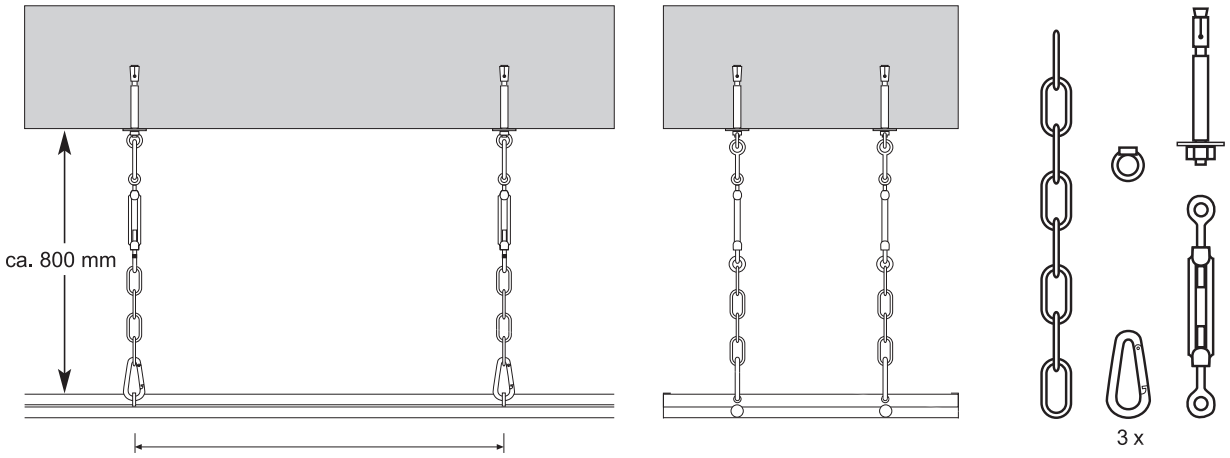
Suspension of panels to flexible suspension connectors

The most common attachment variants for concrete and steel ceilings as well as trapezoidal roof structures are listed below.

Attachment to concrete ceilings

with express anchor, M6 ring nut, M6 turnbuckle with eyelets, 500 mm link chain and 3 carabineer hooks.

The link chain is delivered in a bundle to be cut to length on-site.

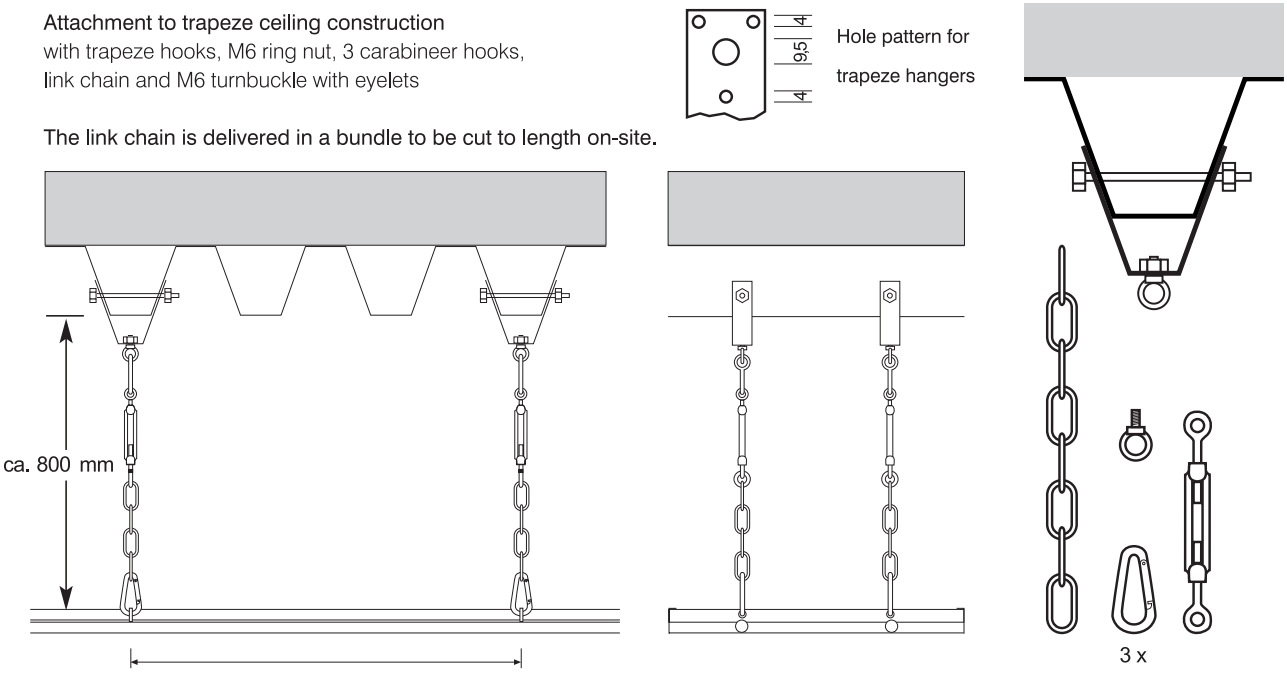


Attachment to trapeze ceiling construction

with trapeze hooks, M6 ring nut, 3 carabineer hooks, link chain and M6 turnbuckle with eyelets

The link chain is delivered in a bundle to be cut to length on-site.

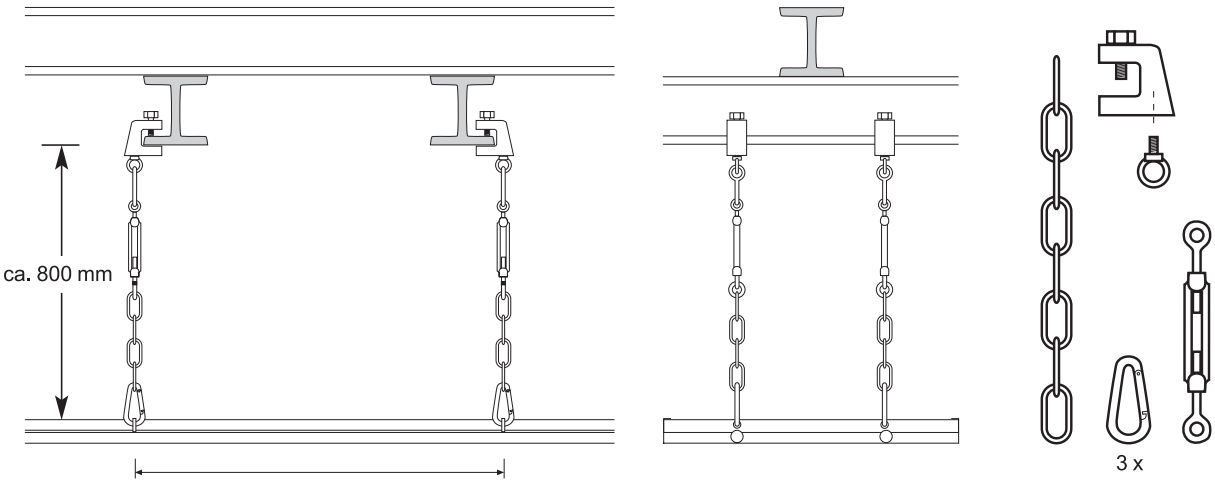
Hole pattern for trapeze hangers



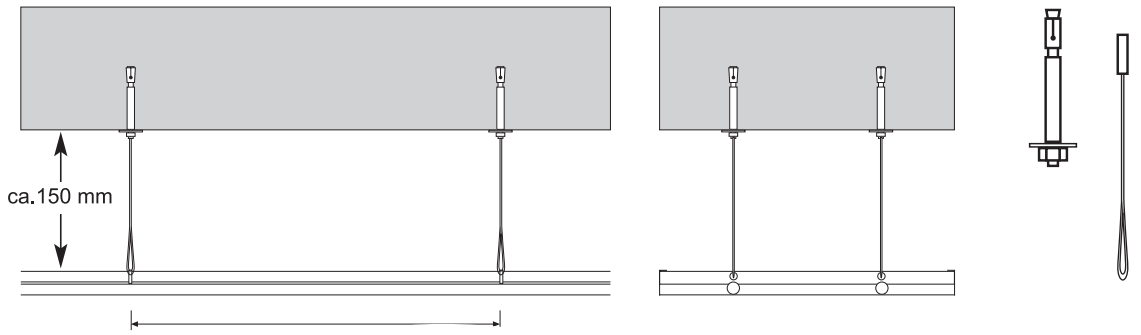
ther mounting options are available for various installation variants, e. g. attachment to a rail construction.

Attachment to steel T, U or angle profiles
with attachment clamps, M6 ring nut, M6 turnbuckle and eyelets, 50 mm link chain and 3 carabineer hooks

The link chain is delivered in a bundle to be cut to length on-site.

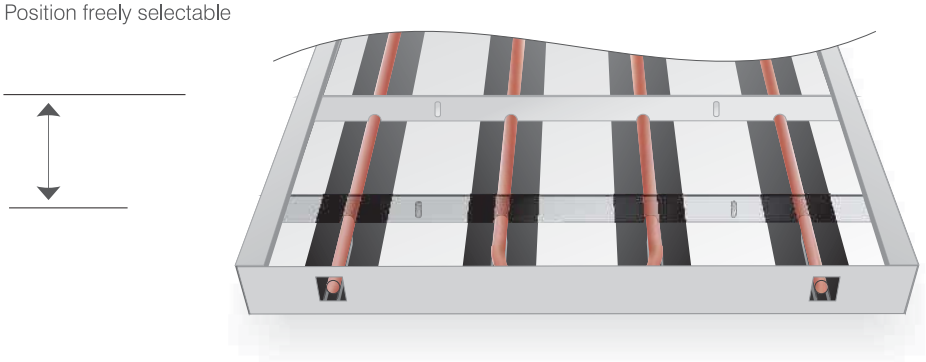


Attachment with wire cable / short suspension height
with express anchor and wire cable



Attachment with flexible suspension connectors

Position freely selectable



Aluline Superplan's Control

Cooling and heating panels offer a high level of comfort.

The most convenient way to control cooling and heating panels is using a combination of a pressure independent control valve and a thermostat.
Depending on requirements, room thermostats are implemented for cooling or heating, or even a combination of both. Programmable thermostats in combination with radiation sensors can also contribute significantly to energy savings and perfect comfort.

Sunline combination valve

Generally, the flow temperature, both for cooling and heating, should be controlled flexibly. The volume flow rate of the cooling or heating cycle remains constant. Dropping below the minimum volume flow rate would result in uncontrollable temperature fluctuations in the building.
The Sunline combination valve for cooling and heating applications is a pressure-independent control valve and combines several functions in one casing:
On the one hand it is an automatic flow control, and on the other hand, when combined with an actuator, it acts as a combination valve for temperature control and hydraulic compensation. The result of this flexibility in function is that far less valves are required for a cooling or heating system. This also means that costs for installation and hydraulic compensation are reduced significantly. The various volume flow rates of the individual cooling or heating ceilings can be set on the pre-set scale effortlessly and are easy to understand. The valve integrated in the membrane keeps the differential pressure above the control valve on a constant level. This ensures a perfect hydraulic compensation of the cooling and heating panels, even at partial loads at low requirements.

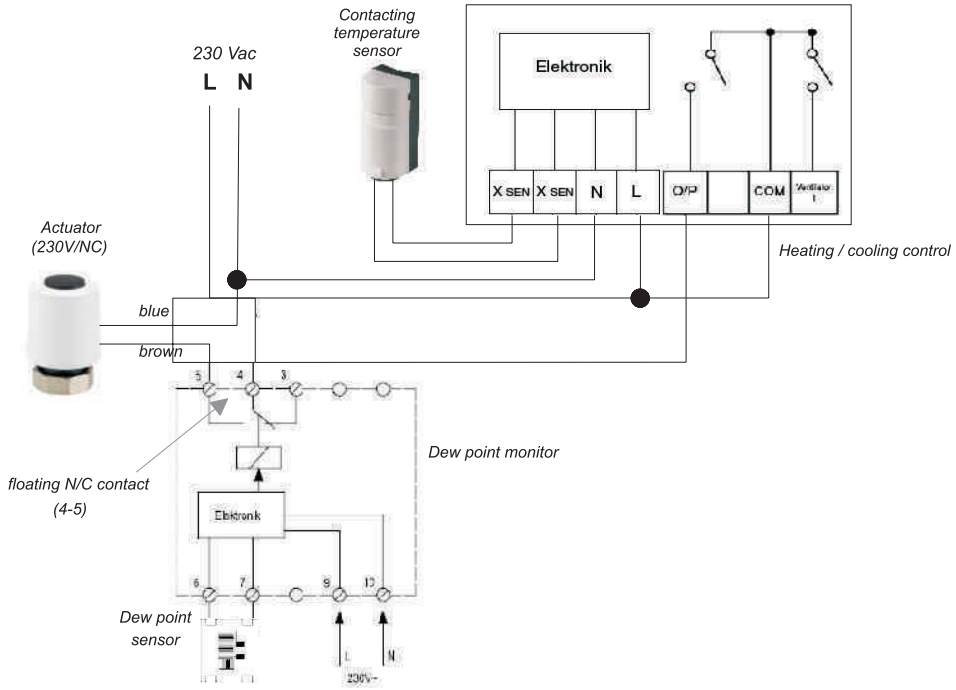
Radiation sensor

The operative temperature (target temperature) can be monitored with the standard air sensors. However, these are quite slow. In the case of radiant heating or cooling, we strongly recommend the use of a Sunline radiation sensor. These sensors record both the actual room temperature and the radiation proportion of the heating or cooling panels. These measured values correspond to the user's perceived temperature quite accurately.

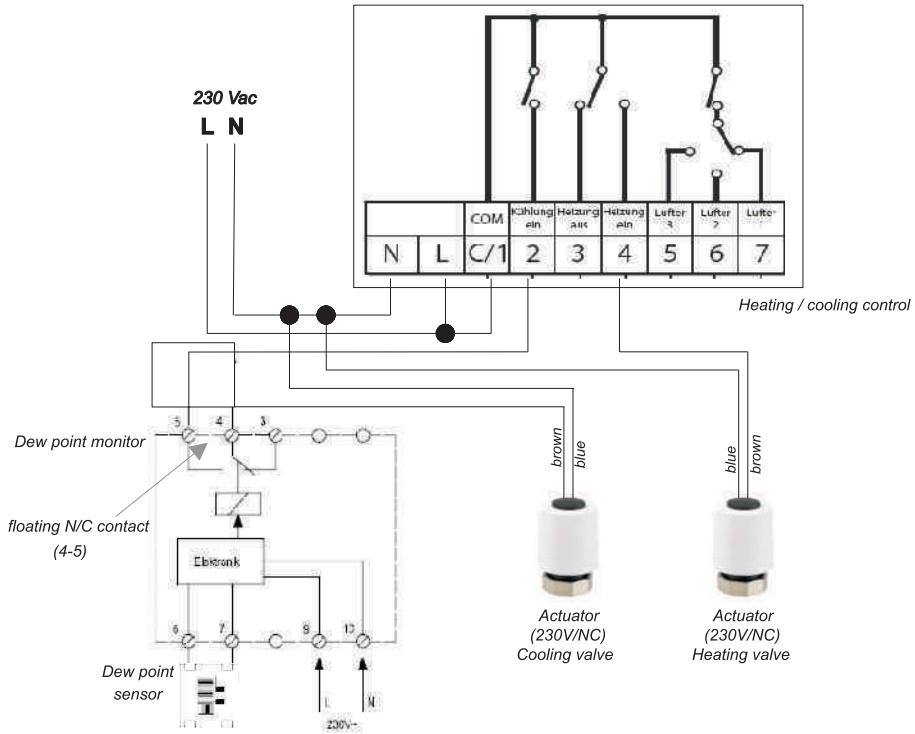
Dew point sensor or condensate monitor

When cooling panels are installed, technical measures for the prevention of condensation must be taken. A condensate monitor is a special sensor which prevents the temperature from falling below the dew point during cooling. A sensor on the cooling panels records any potential moisture. When condensation occurs on the panel, the condensation monitor shuts off the control valve. The cold water supply is interrupted.

Heating / cooling control with dew point monitor in 2-tube system (Wiring example)

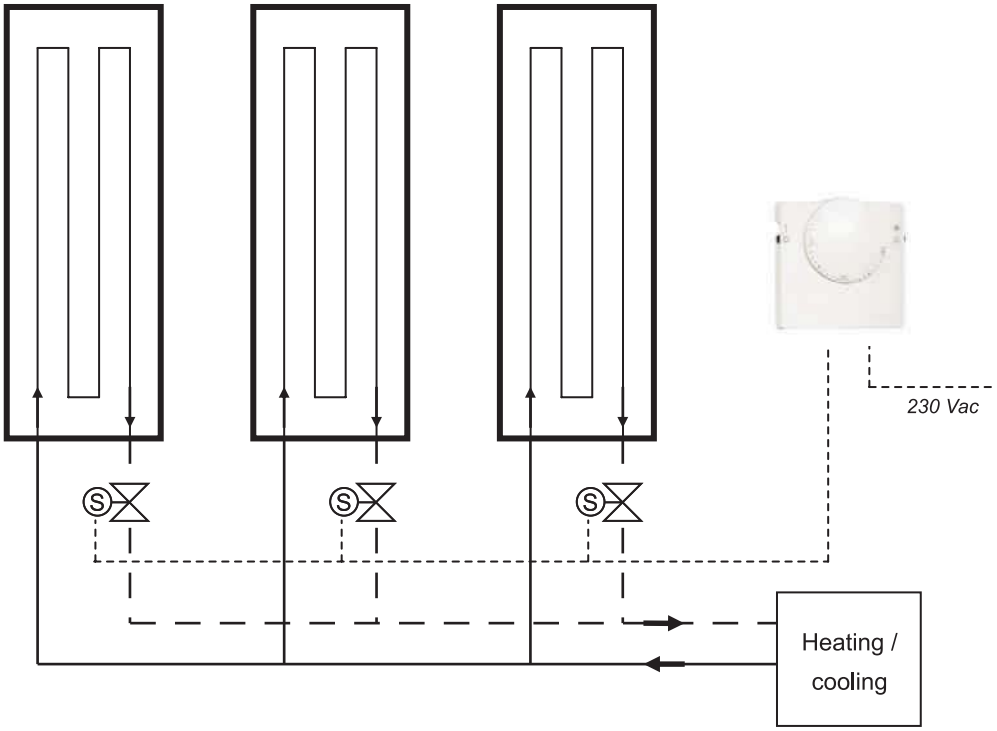


Programmable heating / cooling control with dew point monitor in 4-pipe system + 4 tube system (Wiring example)

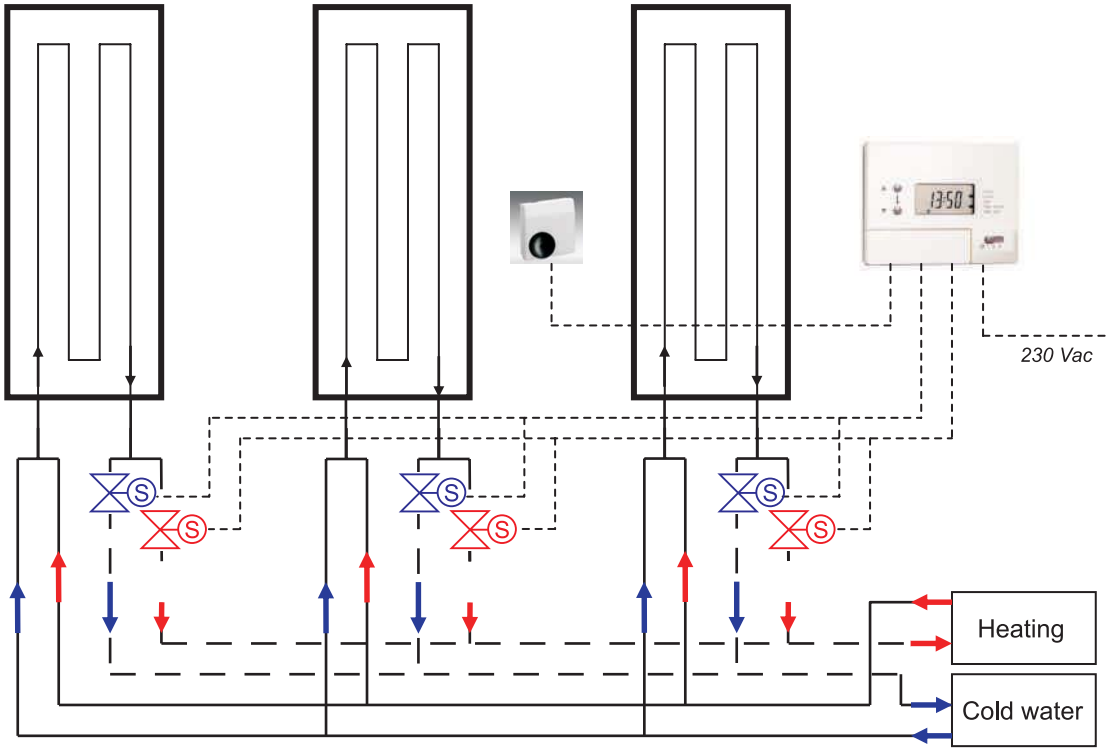


Control for 2- and 4-pipe system

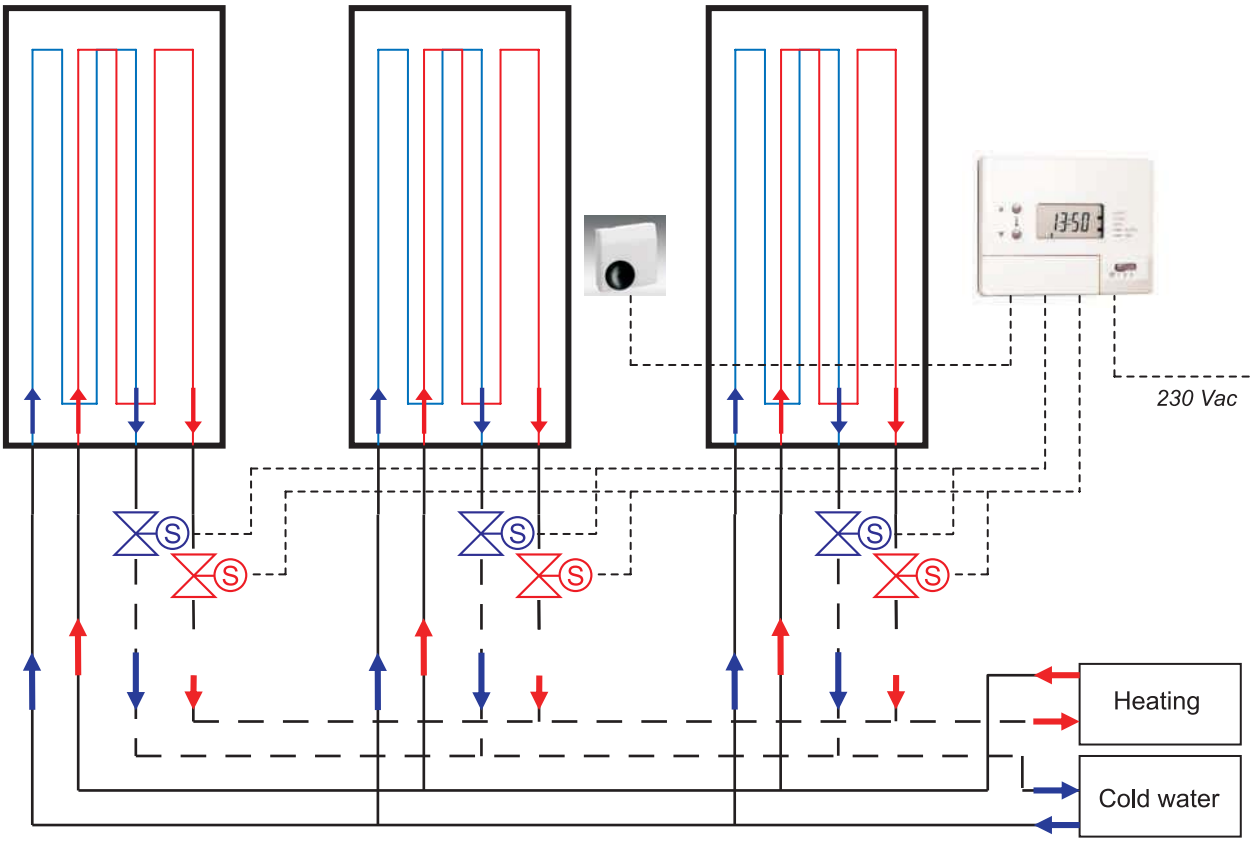
Control of a heating or cooling ceiling with heating / cooling thermostat and volume flow rate control and manual switch over for 2-pipe system (without dew point control)



Control of a heating or cooling ceiling with programmable heating / cooling thermostat and volume flow rate control for 4-pipe system (without dew point control)



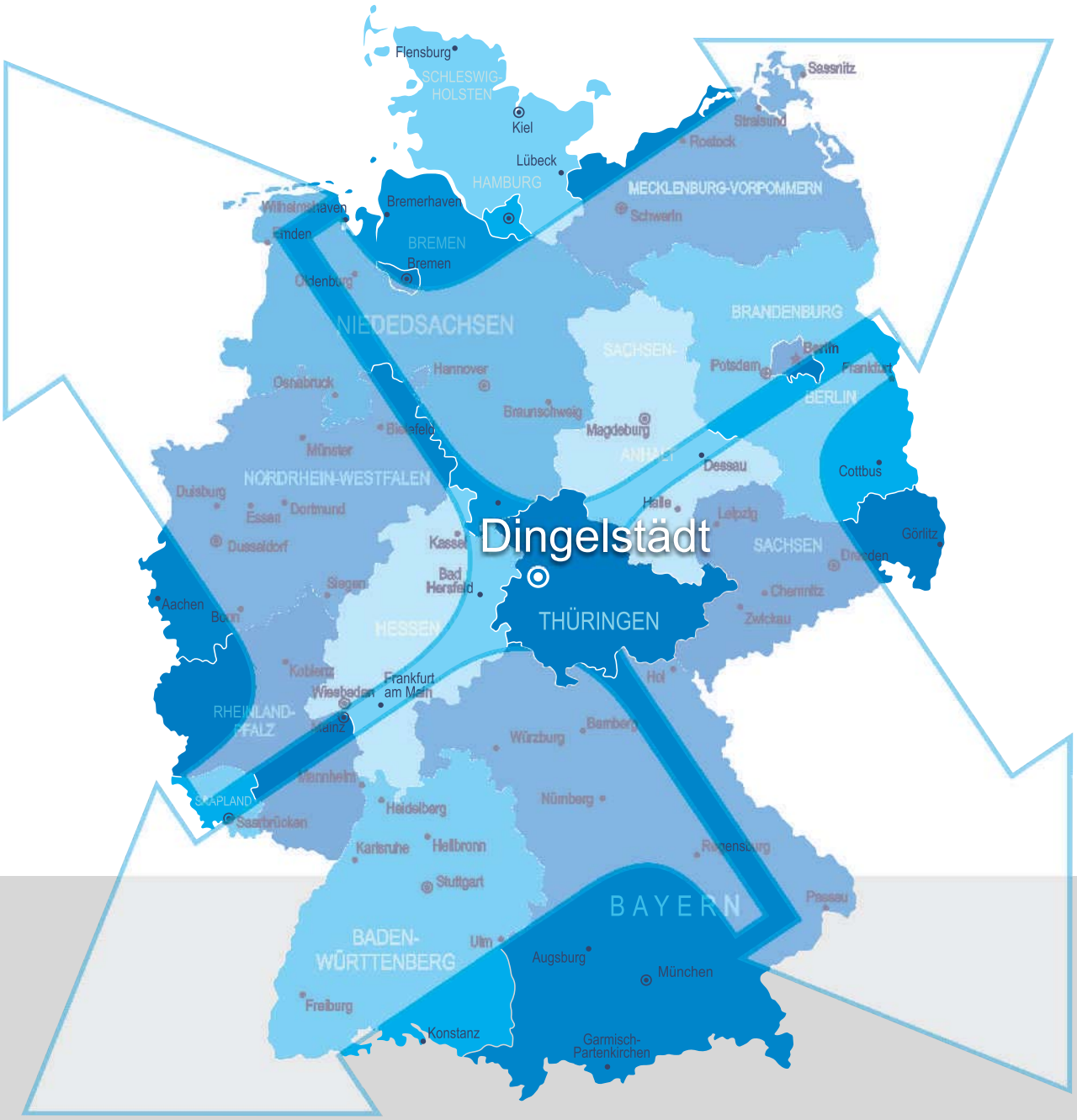
Control of a heating or cooling ceiling with programmable heating/ cooling thermostat and volume flow control for Superplan 4-tube system (without dew point control)



Benefits of a Sunline controller:

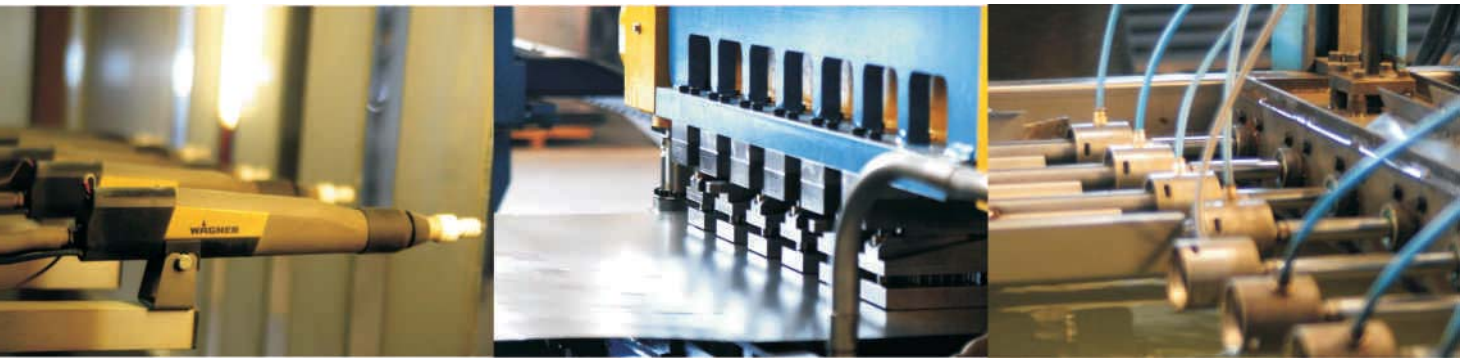
- Automatic hydraulic compensation of the entire system
- Perfect control for heating, cooling or heating/cooling combination.
- Cost savings thanks to two valves in one casing
- No manual adjusting or calibration of valves required
- Simple and user friendly setting of the volume flow rate
- Digital display of room temperature
- Display of perceived temperature when using radiation sensors

Our central location in the heart of Germany and Europe
ensures reliable and prompt delivery...




Ihr Spezialist für energiesparende Beheizung und Kühlung.
SUNLINE
Wärmen wie die Sonne
Deckenstrahlplatten - Heiz- / Kühlsegel - Heizen/Lüften

Perfect Climate by SUNLINE



Sunline offers everything from one source...

... Advice from our sales staff

... Planning by our factory technicians

... State of the art production line

... Installation by our technicians

... Acceptance of the entire system

Sunline products are ...

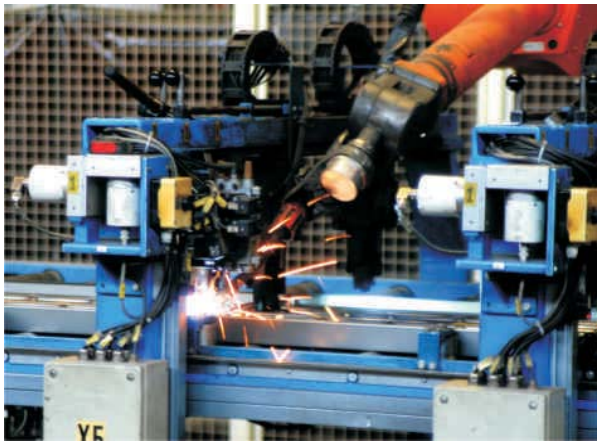
... energy efficient and maintenance free

... durable and hygienic

... comfortable and silent

... future-proof and draft-free

SUNLINE Deckenstrahlungsheizungen GmbH



Sunline assists you during the entire construction phase. We provide individual and competent advice; we find solutions and implement these in planning, production and installation, customised to your premises. The joint acceptance ensures transparent and flawless implementation of the entire project.

SUNLINE

Warm like the sun

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