



## WANPAN® PLANNING

The planning must cover the following requirements:

- Ensure to obtain the best heat installation from a technical point of view.
- Collect all necessary information to calculate the price.
- Collect all necessary information for the installation.

### Calculation for WANPAN

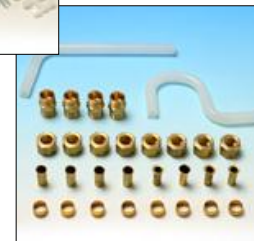
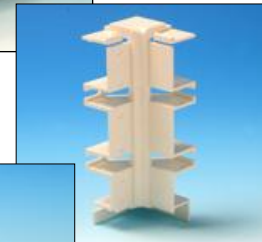
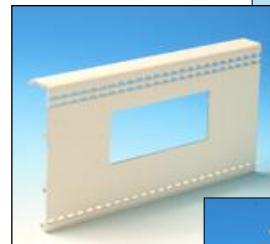
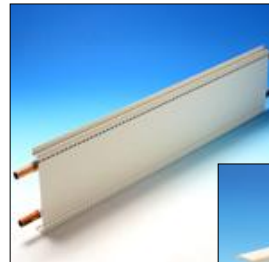
A drawing or a sketch of the room showing measurements, doors and if there are built-in cupboards etc. is used for the calculation.

If you wish to use the WANPAN elements' option for integrating fittings such as a socket, phone/data plug or an aerial connection, the location of these should be considered.

The calculation is made in the following order:

1. Calculate the loss of heat in each room using current law.
2. Under consideration of the heating source, you determine both the supply and the return temperature of the system.  
Due to the normal temperatures for boilers and heat pumps, which are approx. 65-70°C and 45-50°C respectively, we have to limit the performance per metre WANPAN to approx. 170 watts per metre for boilers and approx. 70 watts per metre for heat pumps.
3. Calculate the performance per metre and determine both the supply and the return temperature using the table 1 on page 3.
4. Calculate the total length of WANPAN elements.
5. Measure the walls precisely. State on the drawing where WANPAN should be placed, when you respect possible electrical installations and utilization of the encirclement effect. Table 2, page 4, shows how the elements can be combined to specific measures.
6. Determine the lengths of the blind panels to be used. Deduct the total length of the panels from the total length of the room.
7. Calculate the necessary water volume per room.
8. Determine the loss of pressure in the panel using the Nomogram on page 3.
9. Determine what kind of control is to be used.
10. Determine the necessary components for installation from the product catalogue.

Page 1	Planning instructions
Page 2	Calculation example.
Pages 3-4	Tables



**The easy way to plan for Wanpan, see page 4 at the bottom.**



Tel +45 6322 0044  
Fax +45 6322 0045

www.elpan.dk · www.wanpan.dk · E-mail: elpan@wanpan.dk

### Example of calculation

In the room below, WANPAN is to be installed.

- The loss of heat is calculated as 900 watts.
- It is a heating installation with a set temperature: The supply temperature is 70° C and return temperature 40° C
- Calculated the performance:** using Table 1, page3 = 75W/m
- Calculated the necessary length of WANPAN panels:**  
Heating loss: [W]/performance[W/m] =  
900/75 = 12m = 12000mm
- Using Table 2 for wall lengths, the following can be determined:  
Væg A = 3900 mm :2x WP16 = 3200 mm WP  
Væg B = 2950 mm : WP26 = 2600 mm WP  
Væg C = 4800 mm : WP20 + WP22 = 4200 mm WP  
Væg D = 2950 mm : WP24 = 2400 mm WP  
**Total = 14600 mm      I alt = 12400 mm WP**

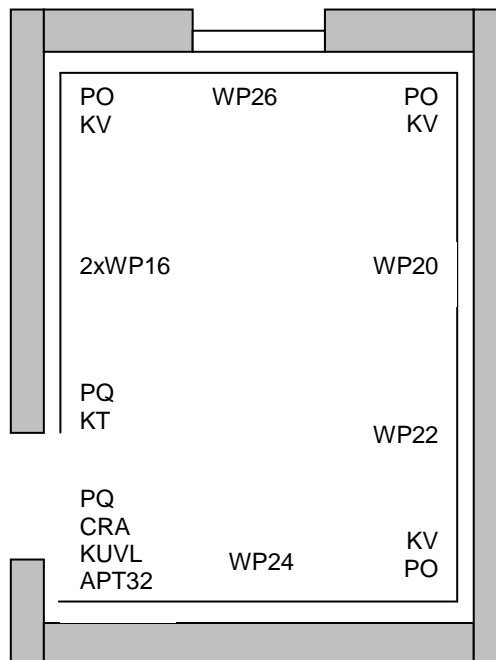
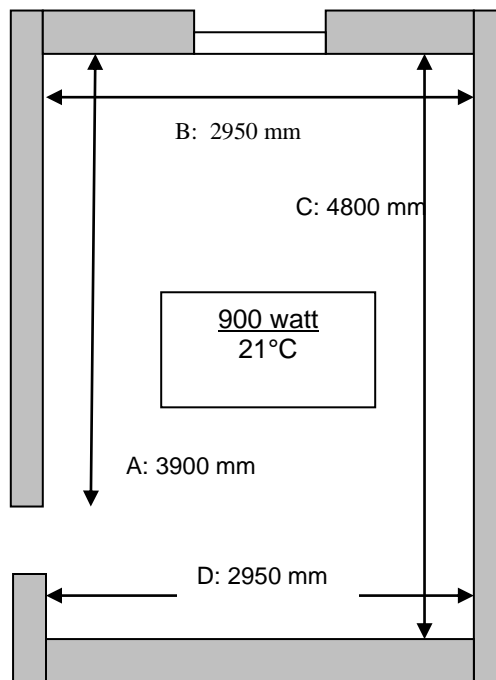
WP 12400>12000 necessary WP okay (stage 4)  
As it shows the possible assembly length in this case, it is very close to what is needed. With other heating sources, and possibly diverging supply and return temperatures, you can find a possibility to reduce the length of WANPAN panels. With such a reduction you should make sure to keep the encirclement effect, (plane apportionment of WANPAN panels).

- Calculation of blind panel:**  
Total walllength in the room-----14600 mm  
Length of Wanpan elements-----12400 mm  
Necessary length of blind panels----- 2200 mm
- Necessary volume of water for the room:**  
(l/h=Q(kcal) / T(supply) – T(return))  
(l/h = Q(kcal) / T(supply) - T(return)) l/h =  
(900\*0.86) / (70-40) ≈ 26 l/h
- The pressure loss:** Pressure loss for the calculated flow can be read from the nomogram, page 3 = 1,3mmVs/m. → the total pressure loss for the room is = 12.4 x 1.3 ≈16 mmVs
- Control:** For control, a thermostat valve type CRA is to be used. (For all type indications look in the product catalogue)
- Connection:** The connection is carried out with a connector type KT. In the corners 3 coupling corners type KV are used. As closing for the thermostat valve type CRA a U-coupling w. valve type KUVL and the APT32 are used. Insulating foil type HT should be placed on all cold walls, the foil helps project the heat into the room.

To finish the assembly the following parts are used:

2 pcs. Plug type PQ,	12 pcs. type PB = 2 pcs. per. WP
3 pcs. Inside corner type PO	15 pcs. type KB = 2 pcs. for WP unter 2m. 3 pcs. at above 3m.
	12 pcs. type PC = 2 pcs. per. WP
14600 mm HT Insulating foil	6 pcs. type KD = 2 pcs. per. corner + needed at the connection.

Size of room:  
Length 4.8m. Width 2.95m. Height 2.6m.

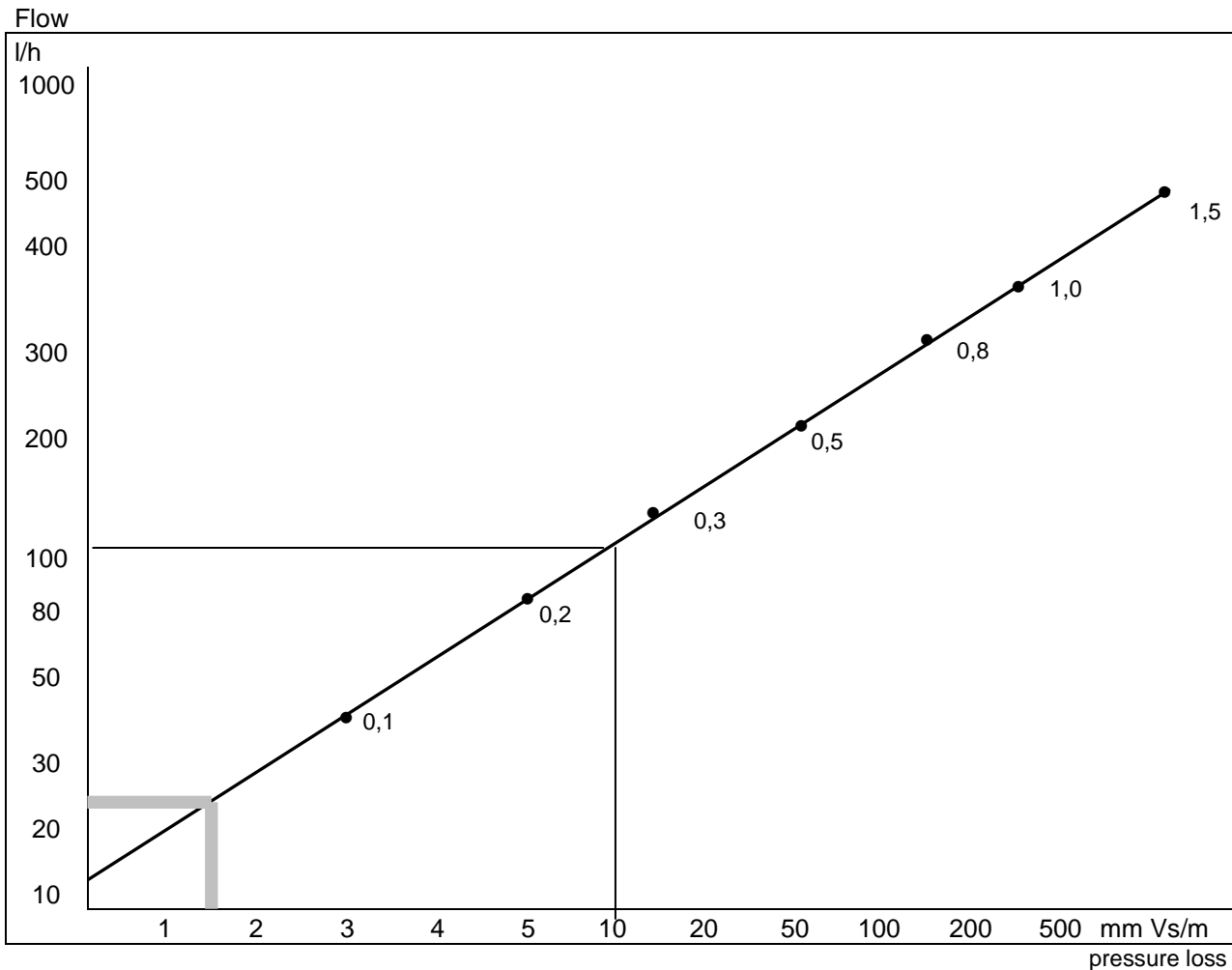




**Table 1 WANPAN®-output [w/m]**

Supply temp. °C	Return temp. °C										
	35	40	45	50	55	60	65	70	75	80	85
90	72	89	105	122	139	155	172	189	206	223	240
85	69	85	102	118	134	150	167	184	200	217	
80	66	82	98	114	129	146	162	178	195		
75	63	78	94	109	125	141	156	172			
70	60	75	90	105	120	135	151				
65	56	71	86	100	115	130					
60	53	67	81	96	110						
55	50	63	77	91							
50	46	59	73								
45	43	55									
40	39										

**Nomogram of pressure loss:**



**Table 2: Wall lengths/module requirements:**

Wall lengths mm	Module WP	Wall lengths mm	Module WP
540 - 640	2	6920 - 7120	20 + 20 + 22
640 - 740	3	7120 - 7320	20 + 22 + 22
740 - 940	4	7320 - 7520	22 + 22 + 22
940 - 1140	6	7520 - 7720	22 + 22 + 24
1140 - 1340	8	7720 - 7920	22 + 24 + 24
1340 - 1540	10	7920 - 8120	24 + 24 + 24
1540 - 1740	12	8120 - 8320	24 + 24 + 26
1740 - 1940	14	8320 - 8520	24 + 26 + 26
1940 - 2140	16	8520 - 8720	26 + 26 + 26
2140 - 2340	18	8720 - 8920	26 + 26 + 28
2340 - 2540	20	8920 - 9120	26 + 28 + 28
2540 - 2740	22	9120 - 9320	28 + 28 + 28
2740 - 2940	24	9320 - 9520	28 + 28 + 30
2940 - 3140	26	9520 - 9720	28 + 30 + 30
3140 - 3340	28	9720 - 9920	30 + 30 + 30
3340 - 3540	30	9920 - 10120	30 + 30 + 32
3540 - 3740	32	10120 - 10320	30 + 32 + 32
3740 - 3940	16 + 16	10320 - 10520	32 + 32 + 32
3940 - 4140	16 + 18	10510 - 10710	24 + 24 + 24 + 24
4130 - 4330	18 + 18	10710 - 10910	24 + 24 + 24 + 26
4330 - 4530	18 + 20	10910 - 11110	24 + 24 + 26 + 26
4530 - 4730	20 + 20	11110 - 11310	24 + 26 + 26 + 26
4730 - 4930	20 + 22	11310 - 11510	26 + 26 + 26 + 26
4930 - 5130	22 + 22	11510 - 11710	26 + 26 + 26 + 28
5130 - 5330	22 + 24	11710 - 11910	26 + 26 + 28 + 28
5330 - 5530	24 + 24	11910 - 12110	26 + 28 + 28 + 28
5530 - 5730	24 + 26	12110 - 12310	28 + 28 + 28 + 28
5730 - 5930	26 + 26	12310 - 12510	28 + 28 + 28 + 30
5930 - 6130	26 + 28	12510 - 12710	28 + 28 + 30 + 30
6130 - 6330	28 + 28	12710 - 12910	28 + 30 + 30 + 30
6330 - 6530	28 + 30	12910 - 13110	30 + 30 + 30 + 30
6530 - 6730	30 + 30		
6730 - 6930	30 + 32		

Survey of heat performance per metre WANPAN, at different  $\Delta t$ -values on the basis of a standard test no. 1073 from the technological institute.

The stated results are taken at 21°C room temperature

At $\Delta t$	Heat Watt/mtr.	Supply-temp.	Return temp.
60	189	86	76
58	181	84	74
56	174	82	72
54	166	80	70
52	159	78	68
50	151	76	66
48	144	74	64
46	136	72	62
44	128	70	60
42	121	68	58
40	113	66	56
38	106	64	54
36	100	62	52
34	93	60	50
32	87	58	48
30	79	56	46
28	74	54	44
26	66	52	42
24	60	50	40
22	55	48	38
20	47	46	36
18	42	44	34
16	36	42	32
14	30	40	30
12	25	38	28
10	21	36	26
8	15	34	24
6	11	32	22

Calculation of  $\Delta t$ :

$$\Delta t = (t(\text{supply}) + t(\text{return})/2) - t(\text{room})$$

**The easy way to plan for Wanpan is:**

Measure the length of the wall, subtract 20 cm from each end, and find the panel which fits within that length. Example: 278cm. -20 -20 = 238cm.  $\approx 1 \times \text{WP22}$ .

For longer walls, over 360 cm, where more than one Wanpan module must be used, subtract another 20 cm from the middle for the KL straight coupling.

Example: 478cm -20 -20 -20 = 418cm  $\approx 2 \times \text{WP20}$ .

Subtract 32cm for a thermostat.