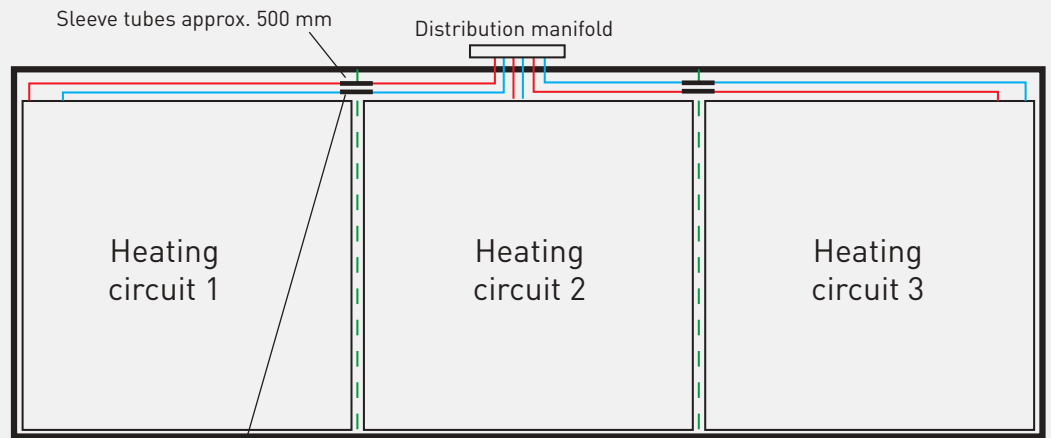


## Components



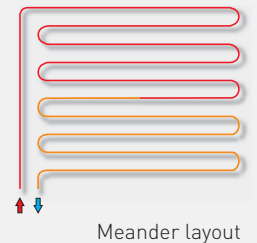
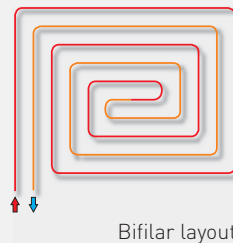
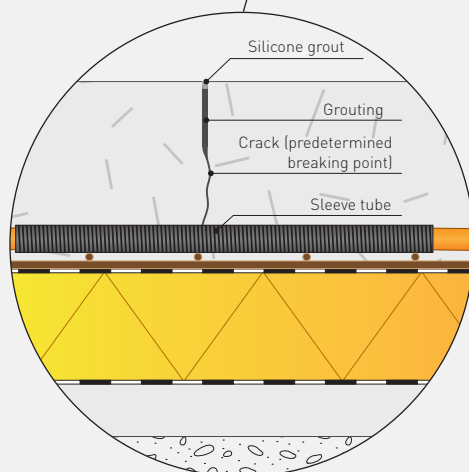
- 1 Variomodular pipe 20x2 Laser (each roll 150 m)
- 2 Bending models 20/200, 20/250 & 20/300
- 3 Sleeve tube (each roll 50 m)
- 4 Calibration and chamfering tool
- 5 Clamping screw fitting 3/4" EUROx20
- 6 Press-fit coupling 20 x 20 (press-connection as per data sheet Z62210)
- 7 REMS press-fitting jaws TH20 & Mini TH20
- 8 Battery powered binding tool & wire reel

## Example for a heated industrial floor - floor plan



Grouting\*, depth approx. 60 mm

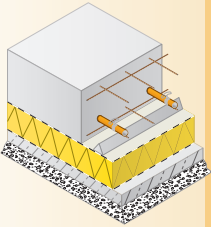
\*Notify construction company for design and layout of grouting



### Max. distribution manifold length: 150 m

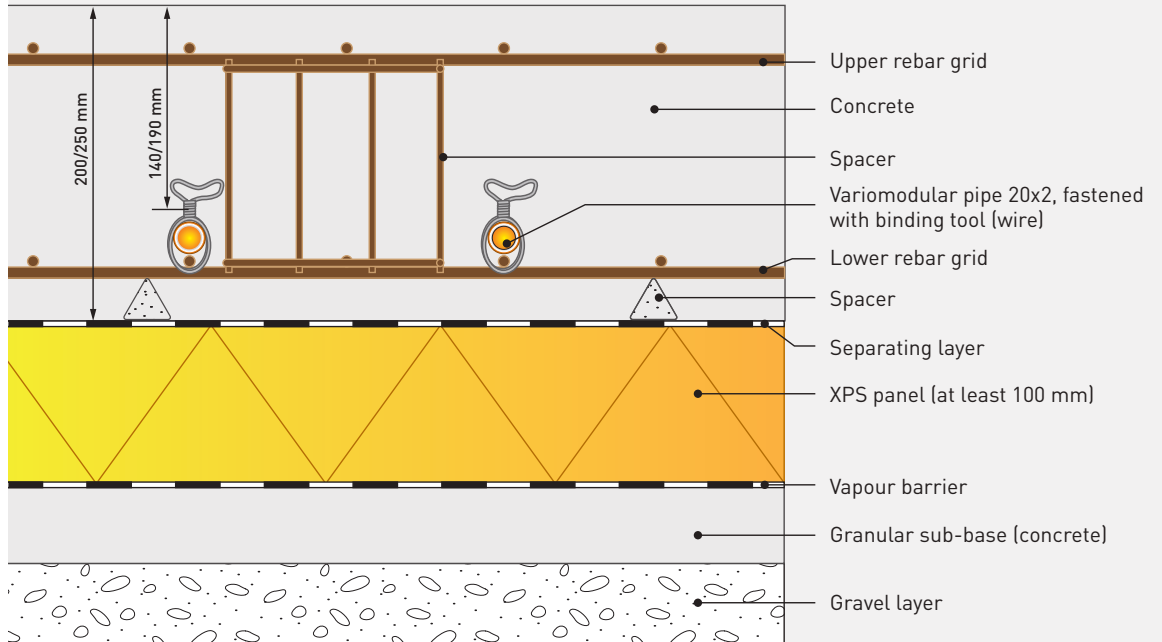
Pipe spacing	Pipe requirement
200 mm	5 m/m <sup>2</sup>
250 mm	4 m/m <sup>2</sup>
300 mm	3.3 m/m <sup>2</sup>

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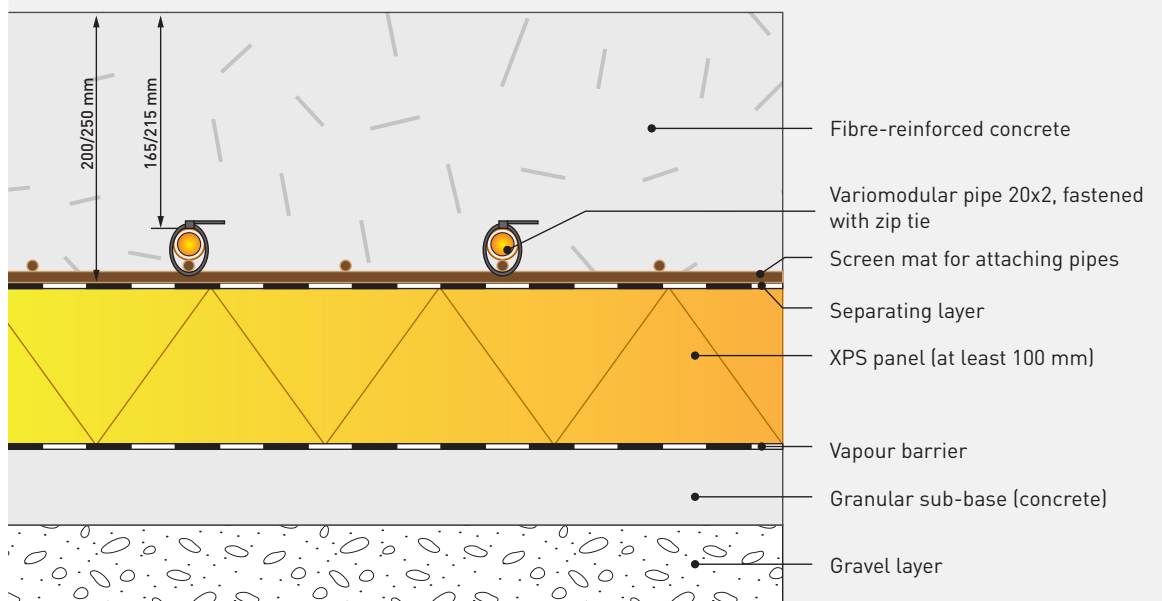


## Construction examples

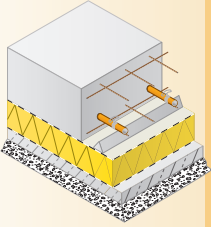
200/250 mm reinforced concrete slab - pipe covering 140/190 mm:



200/250 mm fibre-reinforced concrete slab - pipe covering 165/215 mm:



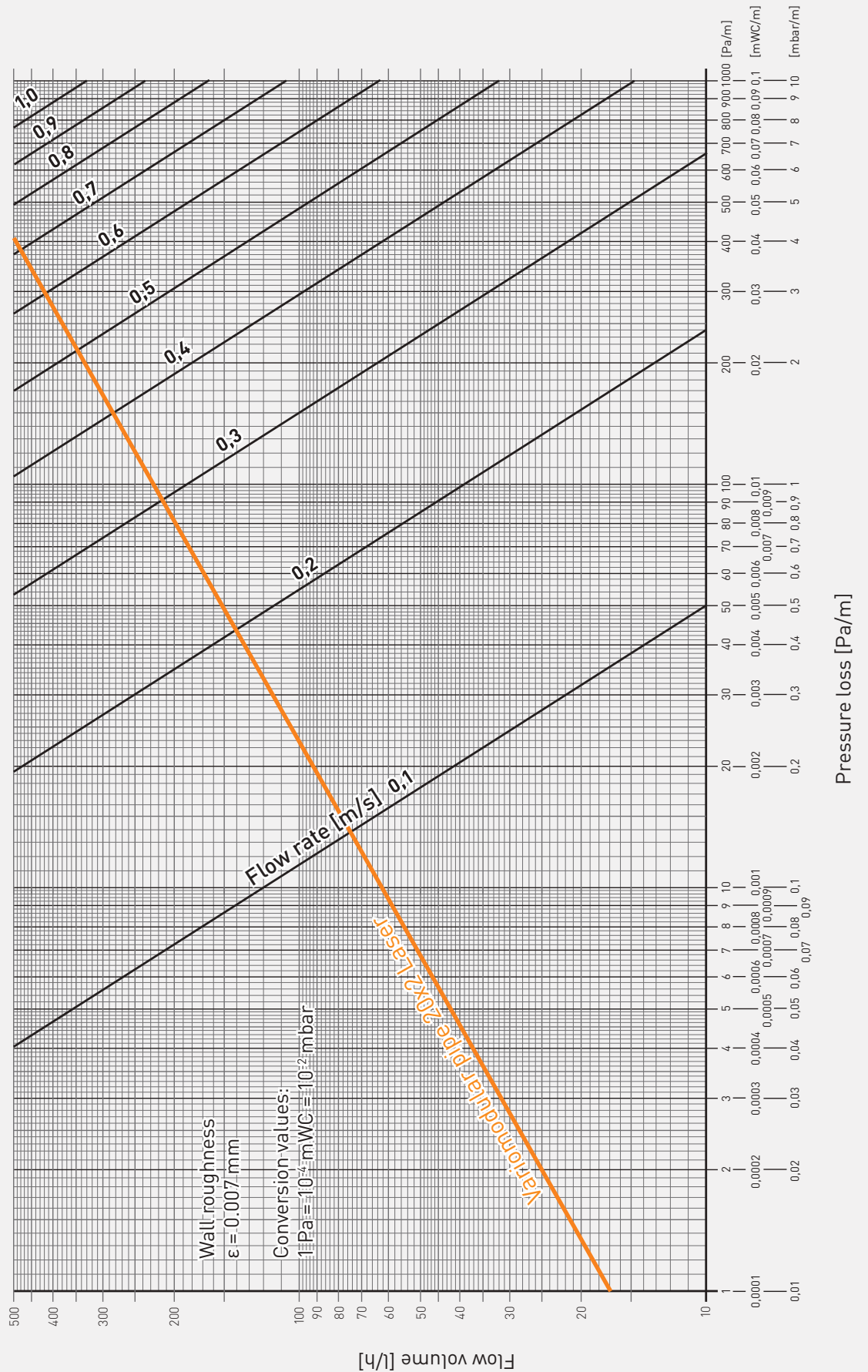
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# VARIOTHERM

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## Pressure loss Variomodular pipe 20x2 Laser

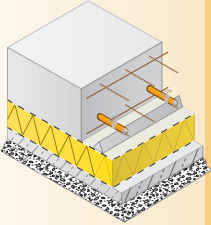


# Industrial floor heating system

General

4/4

## Heat output in W/m<sup>2</sup>



		200 mm concrete													
		Pipe covering 140 mm							Pipe covering 165 mm						
t <sub>r</sub> /t <sub>r</sub>	t <sub>mH</sub>	Pipe spacing	Room temperature T <sub>r</sub> [°C]					T <sub>0</sub> at T <sub>r</sub> = 20 °C	Room temperature T <sub>r</sub> [°C]					T <sub>0</sub> at T <sub>r</sub> = 20 °C	
			15	18	20	22	24		15	18	20	22	24		
30/20	25	200 mm	35	25	18	11	-	22	34	24	18	11	-	22	
		250 mm	31	22	15	10	-	21	30	21	15	9	-	21	
		300 mm	27	19	13	9	-	21	26	18	13	8	-	21	
30/25	27.5	200 mm	43	32	26	19	13	22	41	31	25	18	13	22	
		250 mm	38	29	23	17	11	22	37	28	22	17	11	22	
		300 mm	32	25	19	15	10	22	31	24	18	15	9	22	
35/25	30	200 mm	52	46	35	28	21	23	51	44	34	27	20	23	
		250 mm	46	40	31	25	19	23	44	39	30	24	18	23	
		300 mm	39	34	30	21	16	23	38	33	29	20	16	23	
35/28	31.5	200 mm	58	48	39	33	26	24	56	47	38	32	25	23	
		250 mm	50	43	35	30	23	23	49	41	34	29	22	23	
		300 mm	43	36	31	25	19	23	41	35	30	24	18	23	
35/30	32.5	200 mm	63	50	43	38	29	24	61	49	41	37	29	24	
		250 mm	54	45	38	34	27	24	53	43	37	33	26	23	
		300 mm	47	38	32	29	22	23	45	37	31	28	21	23	
37.5/32.5	35	200 mm	69	59	52	45	38	25	67	57	51	43	37	25	
		250 mm	61	52	46	40	34	24	59	51	44	39	33	24	
		300 mm	52	45	39	34	29	24	51	43	38	33	28	23	
40/30	35	200 mm	69	59	52	45	38	25	67	57	51	43	37	25	
		250 mm	61	52	46	40	34	24	59	51	44	39	33	24	
		300 mm	52	45	39	34	29	24	51	43	38	33	28	23	
40/35	37.5	200 mm	78	67	63	53	47	26	76	65	61	52	45	26	
		250 mm	69	58	54	48	41	25	66	56	53	46	40	25	
		300 mm	59	50	47	41	35	24	57	49	45	40	34	24	
45/35	40	200 mm	86	76	69	62	56	26	83	74	67	60	54	26	
		250 mm	76	67	61	55	49	26	74	65	59	53	48	25	
		300 mm	66	57	52	48	42	25	64	55	51	46	41	25	
45/40	42.5	200 mm	95	85	78	71	65	27	92	82	76	69	63	27	
		250 mm	84	75	69	63	57	26	81	73	67	61	55	26	
		300 mm	71	64	59	54	48	25	69	62	57	53	47	25	
50/40	45	200 mm	104	94	86	79	72	28	100	91	83	76	70	28	
		250 mm	91	83	76	70	65	27	88	80	74	68	63	27	
		300 mm	78	70	66	61	55	26	76	68	64	59	53	26	
50/45	47.5	200 mm	112	102	95	87	81	29	109	99	92	85	78	29	
		250 mm	99	90	84	78	71	28	96	88	81	76	69	28	
		300 mm	83	78	71	67	61	27	80	76	69	65	59	26	

		250 mm concrete													
		Pipe covering 190 mm							Pipe covering 215 mm						
t <sub>r</sub> /t <sub>r</sub>	t <sub>mH</sub>	Pipe spacing	Room temperature T <sub>r</sub> [°C]					T <sub>0</sub> at T <sub>r</sub> = 20 °C	Room temperature T <sub>r</sub> [°C]					T <sub>0</sub> at T <sub>r</sub> = 20 °C	
			15	18	20	22	24		15	18	20	22	24		
30/20	25	200 mm	33	23	17	11	-	22	32	22	16	10	-	22	
		250 mm	29	21	14	9	-	21	29	20	14	9	-	21	
		300 mm	25	18	13	8	-	21	24	17	12	8	-	21	
30/25	27.5	200 mm	40	30	24	18	13	22	39	29	23	17	12	22	
		250 mm	36	27	21	16	11	22	35	26	21	16	10	22	
		300 mm	30	23	18	14	9	22	29	22	17	14	9	22	
35/25	30	200 mm	49	43	33	26	20	23	48	41	32	25	19	23	
		250 mm	43	38	29	23	18	23	41	36	29	22	17	23	
		300 mm	37	32	29	20	15	23	35	31	28	19	15	23	
35/28	31.5	200 mm	54	46	37	31	24	23	53	44	35	30	23	23	
		250 mm	47	40	33	29	21	23	46	39	32	28	21	23	
		300 mm	40	34	29	23	18	23	39	33	29	22	17	23	
35/30	32.5	200 mm	59	47	40	36	28	24	57	46	39	35	27	24	
		250 mm	51	42	36	32	25	23	49	41	35	31	24	23	
		300 mm	44	36	30	27	21	23	42	35	29	26	20	23	
37.5/32.5	35	200 mm	65	55	49	42	36	25	63	54	48	41	35	24	
		250 mm	57	49	43	38	32	24	55	48	41	36	31	24	
		300 mm	49	42	37	32	27	23	48	41	35	31	26	23	
40/30	35	200 mm	65	55	49	42	36	25	63	54	48	41	35	24	
		250 mm	57	49	43	38	32	24	55	48	41	36	31	24	
		300 mm	49	42	37	32	27	23	48	41	35	31	26	23	
40/35	37.5	200 mm	73	63	59	50	44	25	71	61	57	48	42	25	
		250 mm	64	54	51	45	38	25	62	53	49	43	37	25	
		300 mm	55	47	44	38	33	24	54	46	42	37	32	24	
45/35	40	200 mm	80	71	65	58	53	26	78	69	63	56	51	26	
		250 mm	71	63	57	52	46	25	69	61	55	50	45	25	
		300 mm	62	54	49	45	39	25	60	52	48	43	38	24	
45/40	42.5	200 mm	89	79	73	67	61	27	86	77	71	65	59	27	
		250 mm	79	71	65	59	54	26	76	68	63	57	52	26	
		300 mm	67	60	55	51	46	25	65	58	54	49	44	25	
50/40	45	200 mm	97	88	80	74	68	27	94	86	78	72	66	27	
		250 mm	86	78	71	66	61	27	83	75	69	64	59	26	
		300 mm	73	66	62	57	52	26	71	64	60	55	50	26	
50/45	47.5	200 mm	105	96	89	82	76	28	102	93	86	80	73	28	
		250 mm	93	85	79	73	67	27	90	82	76	71	65	27	
		300 mm	78	73	67	63	57	26	75	71	65	61	55	26	

$$t_{mH} = \text{mean hot water temperature} = \frac{t_f + t_r}{2} \text{ [°C]}$$

t<sub>f</sub>/t<sub>r</sub> = flow/return temperature [°C]

T<sub>0</sub> = mean surface temperature [°C]

T<sub>r</sub> = room temperature [°C]

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