MICROFLEX® HP

Pre-insulated piping system

Technical Data Sheet

watts.eu

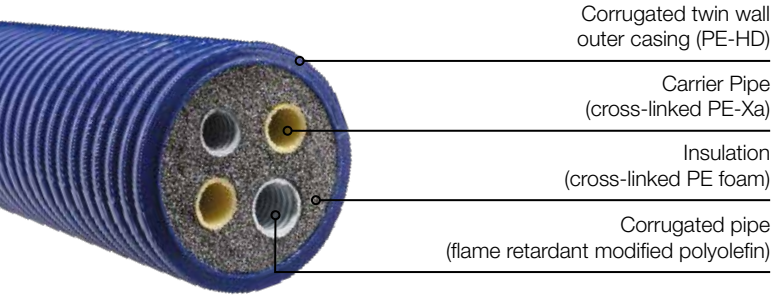
Description

Microflex's pre-insulated piping system is composed of a thermal insulation around a carrier pipe and covered by a "closed chamber" protective UV-resistant outer casing.

Microflex HP pipe is used for the connection of external heat pumps, e.g. Air-Water Monobloc heat pumps. The intelligent design of Microflex HP combines the supply and return pipes for heating/cooling with two corrugated pipes for mains and control cables in the same outer casing. The empty corrugated pipes allow safe routing of the cables.

It provides significant advantages such as low-weight, hyper flexibility, robustness, and easy and rapid laying even over obstacles and around corners.

System accessories can be mounted without any special tools.



The Microflex HP piping system consists of four (4) integrated components and it is manufactured according to the EN 15632: 1-3 norm.

Insulating material

The insulating material used consists of cross-linked polyethylene foam. In addition to the excellent insulating properties, the closed-cell structure of the material ensures that there is only minimal water absorption. The material is CFC free.

Corrugated PE-HD double-walled casing

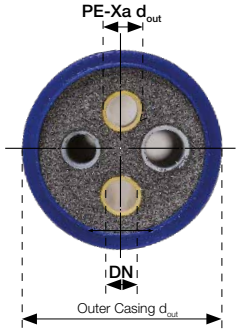
The UV-resistant outer casing in dark blue color is made from PE-HD according to the "closed chamber" principle, protects the inner pipe as well as the insulating material from external impacts. The ribs of the corrugated outer cover are completely closed; water ingress due to superficial damage to the outer cover is therefore impossible.

Dimensions of coils

The standard length of a coil is 100m. Tailored lengths can be cut. The coils are designed to fit standard HGV trailers and containers. For transport and storage specifications see installation manual.

Pre-Insulated pipes

Microflex HP



Art. No.	PE-Xa d_out x s (mm)	DN	Electric corrugated conduit outer/inner diameter (mm)	Outer casing d_out (mm)	Weight (kg/m)	Inner bending radius (1) (m)	Average Thickness of Insulation (mm)
Microflex HP: PN6/SDR11 + electric conduit							
MQ12525C3225E	2 x 25 x 2.3	20-20	25/18.8 32/25	125	1,63	0,3	15
MQ12532C3225E	2 x 32 x 2.9	25-25	25/18.8 32/25	125	1,79	0,3	12
MQ16032C3225E	2 x 32 x 2.9	25-25	25/18.8 32/25	160	2,27	0,5	27
MQ16040C32E	2 x 40 x 3.7	32-32	2 x 32/25	160	2,60	0,6	15
MQ20050C40E	2 x 50 x 4.6	40-40	2 x 40/32	200	4,00	0,8	22

(1) Valores prácticos que no deformen ni dañen las tuberías

Details of material properties PE-Xa pipes, life expectancy, chemical resistance etc. can be found in technical datasheet Microflex system.

Accessories

Microflex dust caps

Art. No.	Ø Outer Casing	Ø Pipe
MSQ125253225	125	MQ12525C3225E
MSQ125323225	125	MQ12532C3225E
MSQ160323225	160	MQ16032C3225E
MSQ1604032	160	MQ16040C32E
MSQ200504040	200	MQ20050C40E

Microflex EPDM rubber end caps

Art. No.	Ø Outer Casing	Ø Pipe
MGQ1251832	125	MQ12525C3225E MQ12532C3225E
MGQ1601832	160	MQ16032C3225E MQ16040C32E
MGQ2002550	200	MQ20050C40E

Fix points

Art. No.	PE-Xa d_{out} x s (mm)	Thread (inch)
MFP34	25 x 2,3	¾" M
MFP44	32 x 2,9	1" M
MFP54	40 x 3,7	1 ¼" M
MFP64	50 x 4,6	1 ½" M

PE-X coupling heating 6/16 bar

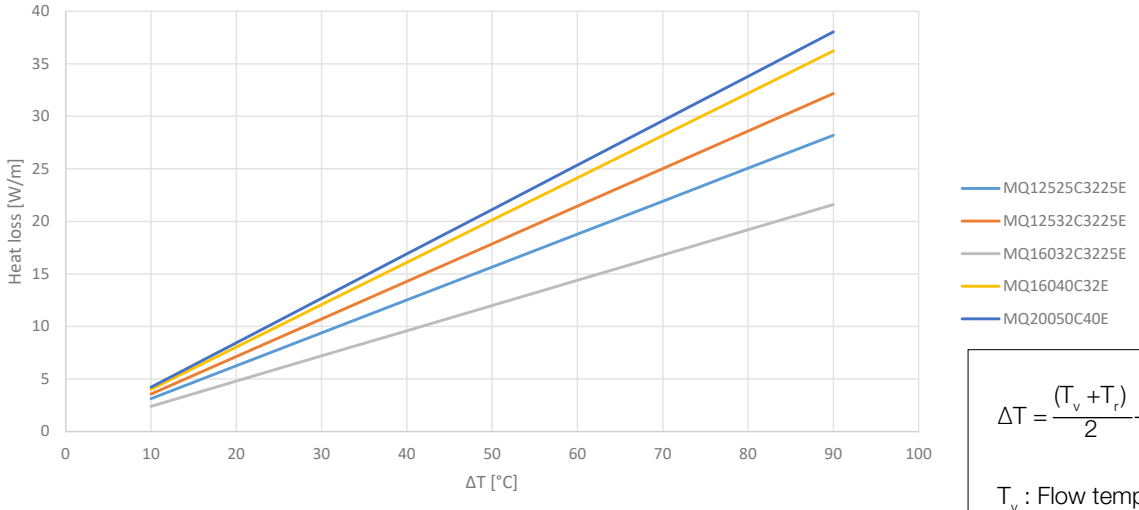
Art. No.	PE-Xa d_{out} x s (mm)	Thread (inch)
MJ3413425/23	25 x 2,3	¾" M
MJ3414432/29	32 x 2,9	1" M
MJ3415440/37	40 x 3,7	1 ¼" M
MJ3416450/46	50 x 4,6	1 ½" M

Determine the necessary power of the heat source

The necessary power of the heat source is calculated as a function of the required capacity and the heat loss of the network.
To calculate the heat loss one has to take into account the following factors:

- λ insulation: 0.0335 W/m.K at 10°C
  0.0372 W/m.K at 40°C
- λ ground: 1 W/mK
- λ PEX-a pipe: 0,35 W/mK
- Depth of cover over top of pipe: 80cm

Heat loss graphs



$$\Delta T = \frac{(T_v + T_r)}{2} - T_o$$

T_v : Flow temperature
T_r : Return temperature
T_o : Ground temperature

Using the above graphs the heat loss per meter can be calculated for a temperature difference (ΔT) between the pipe media and the ground temperature.

U-values

NB: The temperature value displayed above the different columns gives the temperature differential between the ground temperature and the pipe temperature (average temperature between the flow and the return).

Type	U_{TPS} [W/(m K)]	Pipe heat loss [W/m] ΔT [°C]								
		10	20	30	40	50	60	70	80	90
MQ12525C3225E	0,313	3,13	6,26	9,40	12,53	15,66	18,79	21,93	25,06	28,19
MQ12532C3225E	0,357	3,57	7,15	10,72	14,30	17,87	21,44	25,02	28,59	32,17
MQ16032C3225E	0,240	2,40	4,80	7,20	9,60	12,00	14,40	16,80	19,20	21,60
MQ16040C32E	0,403	4,03	8,05	12,08	16,10	20,13	24,15	28,18	32,20	36,23
MQ20050C40E	0,423	4,23	8,45	12,68	16,90	21,13	25,36	29,58	33,81	38,03

Pressure loss tables heating pipes

Pipe roughness: 0.007 mm, Water density: 0.9719 g/cm^3, Water temperature: 80°C.

Heating Capacity [kW] at a given ΔT [K]							Flow [l/s]	25 x 2,3		32 x 2,9		40 x 3,7		50 x 4,6	
5	10	15	20	25	30	40		m/s	Pa/m	m/s	Pa/m	m/s	Pa/m	m/s	Pa/m
1,3	2,5	3,8	5	6,3	7,5	10	0,08	0,21	33	0,15	13	0,11	6	-	-
2,5	5	7,5	10	12,5	15	20	0,12	0,37	84,8	0,22	25,6	0,14	9	0,08	2,3
3,8	7,5	11,3	15	18,8	22,5	30	0,18	0,55	174,9	0,33	52,4	0,22	18,4	0,11	4,6
5	10	15	20	25	30	40	0,24	0,73	239,5	0,45	87,5	0,29	30,6	0,19	11,2
6,3	12,5	18,8	25	31,3	37,5	50	0,3	0,92	439,9	0,56	130,7	0,36	45,5	0,23	15,5
7,5	15	22,5	30	37,5	45	60	0,36	1,1	613,2	0,67	181,5	0,43	63,1	0,27	20,4
8,8	17,5	26,3	35	43,8	52,5	70	0,42	1,28	813,1	0,78	240	0,5	83,2	0,31	25,9
10	20	30	40	50	60	80	0,48	1,47	1039,3	0,89	305,8	0,58	105,9	0,34	31,9
11,3	22,5	33,8	45	56,3	67,5	90	0,55	1,68	1336	1,02	392	0,66	135,4	0,42	45,8
12,5	25	37,5	50	62,5	75	100	0,6	1,84	1569,5	1,11	459,6	0,72	158,6	0,46	53,5
13,8	27,5	41,3	55	68,8	82,5	110	0,65	1,99	1820,8	1,21	532,2	0,78	183,4	0,5	61,8
15	30	45	60	75	90	120	0,7	-	-	1,3	609,8	0,84	209,8	0,54	70,7
16,3	32,5	48,8	65	81,3	97,5	130	0,75	-	-	1,39	692,3	0,9	237,9	0,57	80,1
17,5	35	52,5	70	87,5	105	140	0,85	-	-	1,58	872,2	1,02	299	0,65	100,4
18,8	37,5	56,3	75	93,8	112,5	150	0,9	-	-	1,67	969,4	1,08	332	0,69	111,4
20	40	60	80	100	120	160	0,95	-	-	1,76	1071,5	1,14	366,6	0,73	122,9
21,3	42,5	63,8	85	106,3	127,5	170	1	-	-	1,85	1178,5	1,2	402,8	0,76	134,9
22,5	45	67,5	90	112,5	135	180	1,05	-	-	1,95	1290,3	1,26	440,6	0,8	147,4
23,8	47,5	71,3	95	118,8	142,5	190	1,1	-	-	2,04	1406,9	1,32	480	0,84	160,5
25	50	75	100	125	150	200	1,2	-	-	-	-	1,44	563,5	0,92	188,1
27,5	55	82,5	110	137,5	165	220	1,3	-	-	-	-	1,56	653,3	0,99	217,8
30	60	90	120	150	180	240	1,4	-	-	-	-	1,68	749,4	1,07	249,5
32,5	65	97,5	130	162,5	195	260	1,55	-	-	-	-	1,86	905,2	1,19	300,8
35	70	105	140	175	210	280	1,65	-	-	-	-	1,98	1016,9	1,26	337,4
								-	-	-	-	-	-	1,38	396,2
								-	-	-	-	-	-	1,45	437,8
								-	-	-	-	-	-	1,53	481,3
								-	-	-	-	-	-	1,61	526,9
								-	-	-	-	-	-	1,68	574,3
								-	-	-	-	-	-	1,84	675,1

Conversion: 1 watt = 0,860 kCal

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