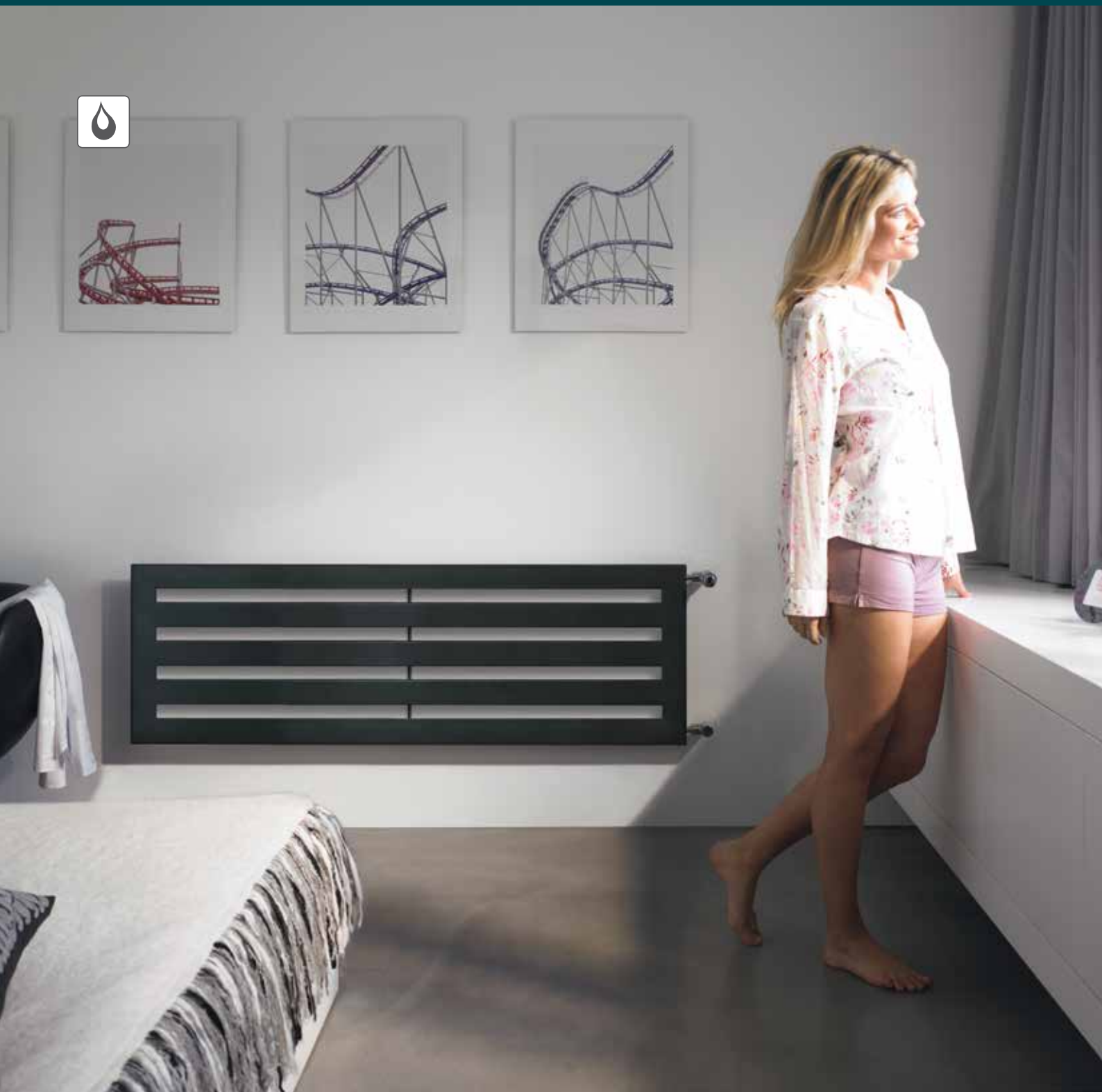




Zehnder Metropolitan

Prices and Technology 2023 - Sales International

always the best climate



ALWAYS THE BEST CLIMATE

“We strive to improve the quality of life by providing the finest indoor climate solutions.”



Excellent team

Every day we combine passion, expert knowledge and commitment to give you the best results.



Great solutions, products and services

Great products and unique service for an energy-efficient, healthy and comfortable indoor climate.

WE ARE THE SPECIALISTS FOR A HEALTHY, COMFORTABLE AND ENERGY-EFFICIENT

The broad and clearly structured portfolio from the Zehnder Group is split into five product lines. Consequently, we can provide our customers with the right product, perfect system and matching service for all types of projects – from new build to renovations, single or multi-occupancy homes, as well as commercial projects. This variety ensures that our wealth of experience is continuously expanding, providing tangible added value to our customers on a daily basis.



Comfortable indoor ventilation

Our comfortable indoor ventilation is energy-efficient and provides a healthy indoor climate. It promotes the wellbeing of the occupants and increases the value of the property.

OUR BRAND REPRESENTS INNOVATION, QUALITY AND DESIGN

zehnder

The Zehnder brand offers excellent indoor climate solutions within the product lines of decorative radiators, comfortable indoor ventilation, heating and cooling ceiling and clean air solutions.

INNOVATION OVER 5 GENERATIONS



First choice for customers

Always close to the needs of our customers, to grow with you and overcome all challenges together.

MANUFACTURER OF THE WORLD'S

1st

STEEL AND BATHROOM RADIATORS

REPRESENTED IN MORE THAN

70 COUNTRIES

AROUND

3,500

EMPLOYEES

17 OF OUR OWN PRODUCTION PLANTS IN EUROPE, NORTH AMERICA AND CHINA

INNOVATION SINCE **1895**

900 PATENTS AND DESIGN RIGHTS THROUGHOUT THE WORLD

AROUND **40,000**

TRAINED CUSTOMERS PER YEAR

INDOOR CLIMATE



Decorative radiators

Our individual decorative radiators make every room – whether at home or in commercial or public buildings – not only warmer, but also more attractive. They combine iconic design with outstanding comfort experience.



Heating and cooling ceiling

The ceiling is the perfect place to supply a room with convenient heating and cooling. Energy-efficient climate via radiant panels work perfectly with our suite of solutions from office to manufacturing spaces.

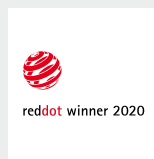
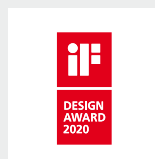


Clean air solutions

Air cleaning systems from Zehnder effectively reduce the amount of dust and other particles in the air. The result: clean working environments, significantly improved employee health and enhanced business performance.


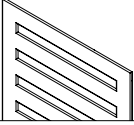
BEST QUALITY CERTIFICATES

Zehnder Group products are frequently awarded prizes for design and innovative technology.

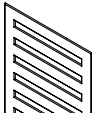



General Sales and Delivery Conditions:

Our General Sales and Delivery Conditions apply. You can find these under “Legal notice” on our homepage at www.international.zehnder-systems.com.

Heating panels	Zehnder Metropolitan			5
Accessories	Zehnder Mounting sets			
	Zehnder Rails and hooks			14
	Zehnder Valves			
General	Keyword list			
	Pressure loss graph, conversion table			22
	Zehnder comfortable indoor ventilation			

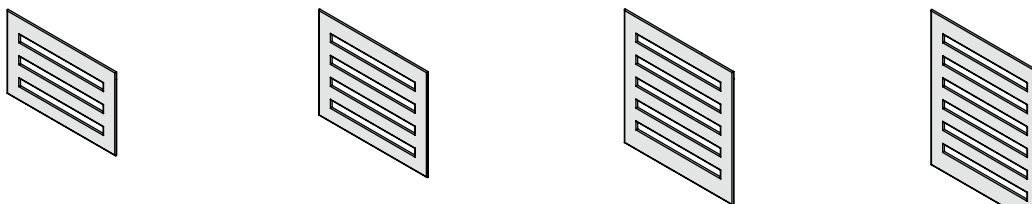


	Overview of models	Product description	List prices / technical specifications	Special versions	Connections	Fixing accessories	Installation points
Zehnder Metropolitan - Horizontal version							
 <ul style="list-style-type: none"> ■ Horizontal flat tubes ■ Innovative, flat design ■ Looks light because of triangular tubes 	6	7	8	10	11	12	13
Zehnder Metropolitan - Vertical version							
 <ul style="list-style-type: none"> ■ Vertical flat tubes ■ Central connection as standard ■ Pleasant radiant heat 	6	7	9	10	11	12	13

Zehnder Metropolitan

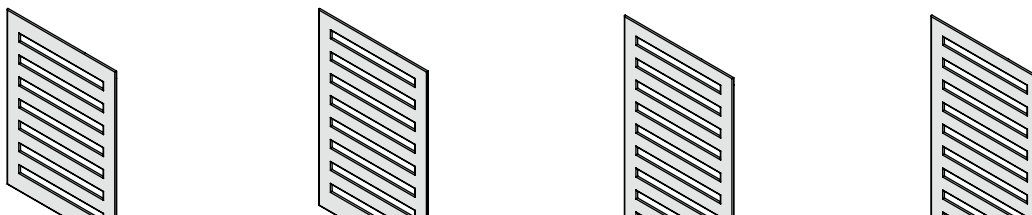


Zehnder Metropolitan Horizontal



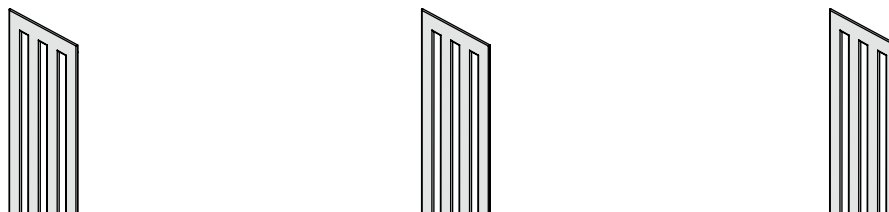
Length mm	Height mm			
	385	490	595	700
900	-	-	MEH-060-090	MEH-070-090
1400	MEH-040-140	MEH-050-140	MEH-060-140	MEH-070-140
1600	MEH-040-160	MEH-050-160	MEH-060-160	MEH-070-160
1800	MEH-040-180	MEH-050-180	MEH-060-180	MEH-070-180
2000	MEH-040-200	MEH-050-200	MEH-060-200	MEH-070-200

Zehnder Metropolitan Horizontal



Length mm	Height mm			
	805	1225	1540	1750
400	MEH-080-040	MEH-120-040	MEH-150-040	MEH-180-040
500	MEH-080-050	MEH-120-050	MEH-150-050	MEH-180-050
600	MEH-080-060	MEH-120-060	MEH-150-060	MEH-180-060

Zehnder Metropolitan Vertical



Length mm	Height mm		
	1500	1800	2000
280	MEV-150-030	MEV-180-030	MEV-200-030
385	MEV-150-040	MEV-180-040	MEV-200-040
490	MEV-150-050	MEV-180-050	MEV-200-050
595	MEV-150-060	MEV-180-060	MEV-200-060

Zehnder Metropolitan



Zehnder Metropolitan (vertical)



Zehnder Metropolitan (horizontal)

Product description

Decorative radiator for aesthetically timeless warmth.

The Zehnder Metropolitan product family includes both horizontal and vertical models. The decisive feature is the direction of the slotted openings resulting from the gaps between the flat steel tube elements, which are smoothly welded into a frame made from triangular profile tube. The resulting flat surface emits maximum radiant heat, making it not only extremely efficient, but also very comfortable.

The connections can be either at the bottom on the outside or at the bottom in the centre; in the low models with a longer length, it is also possible to have them on the same side at the left or right. The connection size of each is 1/2" both on the water side and for the directional air vent. Zehnder Metropolitan is of course available in white and all other colours of the Zehnder colour system.

Thanks to this flexibility, Zehnder Metropolitan can be individually adapted to its spatial surroundings, thereby satisfying any and all design requirements.

Technical specifications

- Maximum operating pressure 4,0 bar
- Maximum operating temperature 110 °C
- Powder coated to DIN 55900
- Thermal output tested to EN 442 with CE marking

Advantages

- Innovative radiator with flat design
- Large proportion of radiation
- Light, airy look
- Elegant valve integration as option
- Clean look due to innovative welding technology

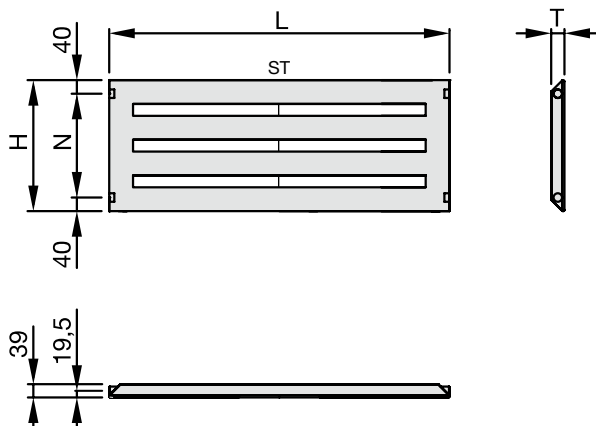
Standard scope of delivery for hot water operation

- Powder coating acc. to DIN 55900, RAL 9016
- Connections 4 x 1/2" for flow/return, Boss spacing 50 mm or outside left/right
- Connection for directional air vent 1/2" top centre
- Designer directional air vent in chrome 1/2"
- Mounting accessories in colour of radiator, with Technoline in RAL 7013 (brown-grey)
- Packaging

Zehnder Metropolitan



Horizontal models



- H = Height
- L = Length
- N = Boss spacing = L - 80
- ST = Stabilising brace
- T = Depth of radiator
- V = Water content
- M = Weight
- s_k = Proportion of radiation
- q_{ms} = Nominal flow rate
- n = Exponent
- Φ_s = Nominal heat output according to EN 442 (75/65/20 °C)
- Φ = Thermal output at system temperatures

Dimensions in mm

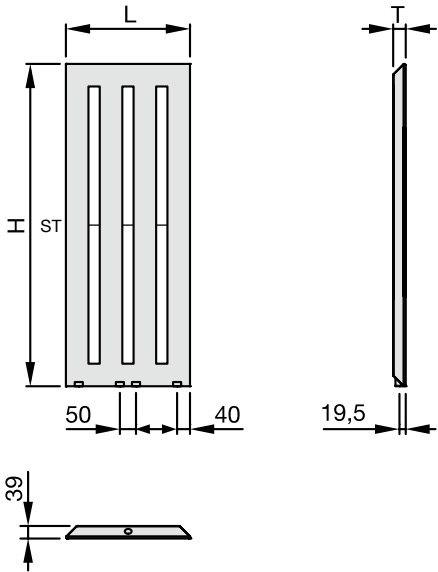
Prices and technical specifications per radiator

Model	Price ¹⁾ RAL 9016 €	H mm	L mm	T mm	V dm ³	M kg	s_k %	q_{ms} kg/h	Exp. n	$\Phi_s = \Delta T$ 50 K EN442 Watt	Φ 70/55/20 °C Watt	Φ 55/45/20 °C Watt
MEH-040-140	757,56	385	1400	39	5,3	10,3	35	40,8	1,31	474	379	240
MEH-040-160	785,75	385	1600	39	6,0	11,7	35	46,6	1,31	542	434	275
MEH-040-180	815,57	385	1800	39	6,6	13,1	35	52,5	1,31	610	488	309
MEH-040-200	850,43	385	2000	39	7,3	14,5	35	58,2	1,31	677	542	343
MEH-050-140	827,20	490	1400	39	6,0	12,8	35	50,3	1,31	585	469	298
MEH-050-160	857,03	490	1600	39	6,7	14,6	35	57,5	1,31	669	536	340
MEH-050-180	891,82	490	1800	39	7,5	16,3	35	64,7	1,31	753	603	383
MEH-050-200	928,31	490	2000	39	8,2	18,1	35	71,9	1,31	836	670	425
MEH-060-090	827,20	595	900	39	4,7	10,1	35	38,4	1,30	447	358	228
MEH-060-140	911,74	595	1400	39	6,7	15,3	35	59,8	1,30	695	557	354
MEH-060-160	946,56	595	1600	39	7,5	17,4	35	68,3	1,30	794	637	405
MEH-060-180	983,01	595	1800	39	8,3	19,5	35	76,9	1,30	894	717	456
MEH-060-200	1.024,46	595	2000	39	9,1	21,6	35	85,4	1,30	993	796	506
MEH-070-090	847,11	700	900	39	5,2	11,8	35	44,5	1,30	517	415	264
MEH-070-140	996,27	700	1400	39	7,4	17,9	35	69,1	1,30	804	645	411
MEH-070-160	1.031,09	700	1600	39	8,3	20,3	35	79,0	1,30	919	737	470
MEH-070-180	1.069,22	700	1800	39	9,1	22,7	35	88,9	1,30	1034	830	529
MEH-070-200	1.109,01	700	2000	39	10,0	25,1	35	98,7	1,30	1148	921	587
MEH-080-040	732,70	805	400	39	3,5	6,8	35	27,8	1,29	323	259	166
MEH-080-050	747,61	805	500	39	4,0	8,2	35	33,3	1,29	387	311	199
MEH-080-060	772,50	805	600	39	4,4	9,7	35	38,6	1,29	449	361	230
MEH-120-040	813,91	1225	400	39	4,9	10,3	35	40,3	1,28	469	378	242
MEH-120-050	832,17	1225	500	39	5,5	12,4	35	48,4	1,28	563	453	291
MEH-120-060	857,03	1225	600	39	6,1	14,5	35	56,1	1,28	653	526	338
MEH-150-040	961,47	1540	400	39	5,5	12,0	35	50,0	1,22	582	473	310
MEH-150-050	981,37	1540	500	39	6,2	14,4	35	62,8	1,23	730	593	387
MEH-150-060	1.012,86	1540	600	39	7,0	16,8	35	74,9	1,23	871	707	461
MEH-180-040	1.075,86	1750	400	39	6,7	14,4	35	57,0	1,29	663	533	340
MEH-180-050	1.097,42	1750	500	39	7,6	17,4	35	68,4	1,29	795	639	408
MEH-180-060	1.132,22	1750	600	39	8,5	20,4	35	79,3	1,29	922	741	473

¹⁾ Surcharge for special colour, category 1 = 20%; category 2 = 30%

Zehnder Metropolitan

Vertical models



- H = Height
- L = Length
- N = Boss spacing = L - 80
- T = Depth of radiator
- ST = Stabilising brace
- V = Water content
- M = Weight
- s_k = Proportion of radiation
- q_{rms} = Nominal flow rate
- n = Exponent
- Φ_s = Nominal heat output according to EN 442 (75/65/20 °C)
- Φ = Thermal output at system temperatures


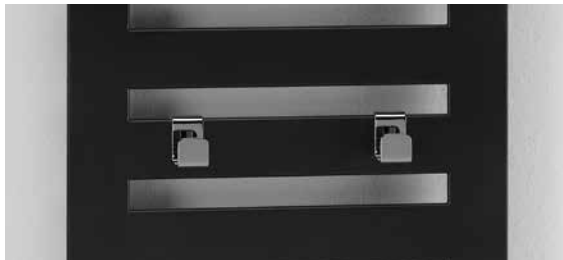

Dimensions in mm

Prices and technical specifications per radiator

Model	Price ¹⁾ RAL 9016 €	H mm	L mm	T mm	V dm ³	M kg	s_k %	q_{rms} kg/h	Exp. n	$\Phi_s = \Delta T 50 K$ EN442 Watt	Φ 70/55/20 °C Watt	Φ 55/45/20 °C Watt
MEV-150-030	605,07	1500	280	39	5,1	9,5	35	15,0	1,24	405	328	213
MEV-150-040	689,61	1500	385	39	5,9	12,3	35	29,9	1,25	533	431	279
MEV-150-050	784,09	1500	490	39	6,6	15,1	35	45,0	1,26	655	529	342
MEV-150-060	886,85	1500	595	39	7,4	17,9	35	59,9	1,27	773	623	401
MEV-180-030	656,45	1800	280	39	6,1	11,3	35	17,7	1,23	490	398	259
MEV-180-040	757,56	1800	385	39	7,0	14,6	35	35,4	1,24	643	521	339
MEV-180-050	868,63	1800	490	39	7,8	17,9	35	53,1	1,24	791	641	417
MEV-180-060	987,98	1800	595	39	8,7	21,3	35	70,9	1,25	934	755	490
MEV-200-030	716,11	2000	280	39	6,6	12,5	35	19,5	1,22	544	442	290
MEV-200-040	835,51	2000	385	39	7,6	16,1	35	39,1	1,23	714	579	378
MEV-200-050	963,13	2000	490	39	8,5	19,8	35	58,6	1,23	878	713	465
MEV-200-060	1.099,06	2000	595	39	9,5	23,5	35	78,2	1,24	1037	840	546

¹⁾ Surcharge for special colour, category 1 = 20%; category 2 = 30%

Zehnder Metropolitan

		Price €															
<p>Towel rail for horizontal models High quality towel rail in steel, chrome-plated, with 1-point attachment on both sides for asymmetrical mounting in lengths 295 and 395 mm, 2-point attachment for symmetrical mounting in lengths 495 and 795 mm, load capacity max. 5 kg (asymmetrical) or 10 kg (symmetrical)</p>  <table border="1"> <thead> <tr> <th>Article no.:</th> <th>Length towel rail</th> <th>Min. length radiator</th> </tr> </thead> <tbody> <tr> <td>468038</td> <td>295 mm</td> <td>400 mm</td> </tr> <tr> <td>468048</td> <td>395 mm</td> <td>500 mm</td> </tr> <tr> <td>468058</td> <td>495 mm</td> <td>600 mm</td> </tr> <tr> <td>468078</td> <td>795 mm</td> <td>900 mm</td> </tr> </tbody> </table> <p>Magnet accessories can continue to be used for all models, see p. 15</p>		Article no.:	Length towel rail	Min. length radiator	468038	295 mm	400 mm	468048	395 mm	500 mm	468058	495 mm	600 mm	468078	795 mm	900 mm	<p>156,06 156,06 156,06 186,16</p>
Article no.:	Length towel rail	Min. length radiator															
468038	295 mm	400 mm															
468048	395 mm	500 mm															
468058	495 mm	600 mm															
468078	795 mm	900 mm															
<p>Towel hook for horizontal models Set of 2 high-quality towel hooks in steel, chrome-plated, with soft insert for simple attachment; load capacity up to max. 5 kg</p>  <p>Article no.: 480438</p> <p>Magnet accessories can continue to be used for all models, see p. 15</p>		<p>57,04</p>															
<p>Integrated valve Elegantly hidden connection technology behind an extended cover. Possible for the horizontal models L ≤ 900 mm. Incl. pre-adjustable valve AV 9 and thermostat in chrome.</p>  <p>Please note: The height of the radiator is 175 mm larger compared to the standard dimensions.</p>		<p>352,38</p>															

Zehnder Metropolitan

Horizontal design

Connection type	Price €	Dimensional drawings: front view, side view and top view (bottom)
Connection 2-tube with external valve		
from bottom to bottom, opposite end or central 50 mm 	No additional charge	
same-side or opposite end 	No additional charge	
retrofit model connection on side as required 	186,33	
Connection with valve integrated on front (max. recommended flow rate 250 kg/h)		
50 mm connection 	352,38	

Only possible for length L ≤ 900 mm

Vertical design

Connection type	Price €	Dimensional drawings: front view, side view and top view (bottom)
Connection 2-tube with external valve		
from bottom to bottom, opposite end or central 50 mm 	No additional charge	

When an order is placed without indication of the connection type, connection S012 is delivered with connection option at bottom outside or bottom centre.

- H = Height
- L = Length
- N = Boss spacing
- * = Venting
- Δ = Draining
- = Internal installations

Dimensions in mm

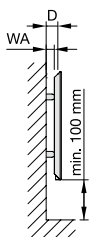
Zehnder Metropolitan



Recommended for installation situations with normal or increased requirements (VDI 6036 Classes 1 and 2).¹⁾

Illustration	Sketch Side view	Model				
		Application	Wall clearance WA mm	Brackets ²⁾ in set	Article no. ³⁾ set	€/Set White Colour

Fixing details for accessory set

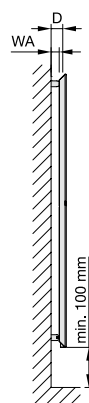


Distance D:
59-69 mm

Horizontal models

All models	40-50	4	962071	113,46	183,98
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Vertical models



Distance D:
59-69 mm

All models	40 - 50	4	962071	113,46	183,98
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¹⁾ Notes on load requirements, safety and installation conditions in the keyword list.

²⁾ Brackets only for repeat order, since fixing set is included in the scope of delivery of the radiator.

³⁾ The article no. of the set in colour is produced by replacing the end digit 1 by the end digit 9.

Zehnder Metropolitan

Horizontal, all lengths, dimensions for drill holes¹⁾

B	H = 385	H = 490 - 1750
4		

Horizontal with integrated valve, all heights, dimensions for drill holes¹⁾

B	L = 400 - 900
4	

Vertical, all heights, dimensions for drill holes¹⁾

B	L = 280 - 385	L = 490 - 595
4		

- = Position of drill holes
- L = Length
- H = Height
- B = Required number of brackets



Dimensions in mm

¹⁾ Notes on load requirements, safety and installation conditions in the keyword list





Zehnder Metropolitan: Set for wall mounting

Description	Version	Article number	Price €	Application
<p>Set for Metropolitan (included in the scope of delivery of the radiator)</p> <p>4x wall brackets 1x directional air vent in chrome 1x assembly sleeve 1x venting key 1x Allen key 1x Installation instructions</p>		<p>RAL 9016</p> <p>Special finish</p>	<p>962071</p> <p>962079</p> <p>113,49</p> <p>183,98</p>	<p>Zehnder Metropolitan</p>

Rails and hooks








Description	Version	Article number	Price €	Application
<p>Towel rail High-quality towel bar in steel, chrome-plated, asymmetrical mounting 5 kg (up to 395 mm), symmetrical mounting (from 495 mm); max. load 10 kg</p>	 <p>Chrome 295 mm 395 mm 495 mm 795 mm</p>	<p>468038 468048 468058 468078</p>	<p>156,06 156,06 156,06 186,16</p>	<p>Zehnder Metropolitan</p>
<p>Towel hook Set of 2 high-quality towel hooks in steel, chrome-plated, with soft insert for simple attachment; max. load 5 kg</p>	 <p>Chrome</p>	<p>480438</p>	<p>57,04</p>	<p>Zehnder Metropolitan</p>

Thermostats

Description	Version	Article number	Price €	Application	
<p>Zehnder thermostat "LH2"</p> <p>Thermostat with integrated fluid sensor, tested according to EN 215. Can be restricted and locked to individual reference value of 7 to 28 °C. Version with zero setting and threaded connection for thermostat M 30 x 1,5</p>		<p>White Chrome</p>	<p>819140 819148</p>	<p>35,02 60,35</p>	For all radiators with threaded connection M 30 x 1,5 mm
<p>Zehnder thermostat "DH"</p> <p>Thermostat with integrated expansion material sensor, reference value range 7 to 28 °C. Version with zero setting</p>		<p>White Chrome</p>	<p>819050 819058</p>	<p>35,02 53,36</p>	
<p>Zehnder thermostat "SH"</p> <p>Elegant thermostat with integrated fluid sensor, tested according to EN 215, reference value range 7 to 28 °C. Version with zero setting. Thermostat threaded connection M 30 x 1,5 with coupling nut in chrome.</p>		<p>White Chrome Stainless steel</p>	<p>819080 819088 819082</p>	<p>38,09 53,47 53,47</p>	
<p>Zehnder thermostat „Design Line“</p> <p>Thermostat with integrated fluid sensor. Can be restricted and locked to individual reference value of 6,5 - 28 °C, connection for thermostat M 30 x 1,5</p>		<p>White Chrome Stainless steel optic Special finish</p>	<p>841271 841278 853720 841279</p>	<p>64,11 64,11 131,65 73,79</p>	

All fittings etc. suitable for operating temperature max. 110 °C and operating pressure max. 10 bar, unless indicated otherwise.

Miscellaneous

Description	Version	Article number	Price €	Application
Adaptor nipple From ½" female thread to ¾" external thread for screwing with O-ring seal	No illustration	837110	9,01	For all radiators
Directional air vent, nickel-plated, self-sealing	 ¼" ⅜" ½" ⅝"	816010 816020 816030 816040	4,17 4,17 4,17 4,17	For all radiators
Directional air vent, chrome-plated, self-sealing Suitable for max. operating pressure of 18 bar	 ½"	816070	7,09	
Blanking plug, nickel-plated, self-sealing	 ½"	974020	2,39	For all radiators
Blanking plug, chrome-plated Suitable for operating pressure up to max. 18 bar	 ½"	974058	6,28	
Angle adapter for thermostat M 30 x 1,5	 White	819500	13,92	For all radiators with threaded connection M 30 x 1,5 mm
Lacquer aerosol Original paint, air-drying For improving the surface finish, 150 ml RAL 9001 (Cream White) RAL 9002 (Grey White) RAL 9010 (Pure White) RAL 9016 (Traffic White)		Colour: RAL 9001 RAL 9002 RAL 9010 RAL 9016	977020 977050 977080 977090	30,75 30,75 30,75 30,75
Lacquer pens Original paint, air-drying For repairing minor damage RAL 9010 (Pure White) RAL 9016 (Traffic White)		Colour: RAL 9010 RAL 9016 On request	675020 675130 675000	26,18 26,18 26,18

Zehnder Design Line Valve


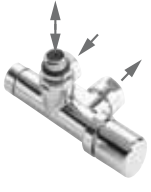
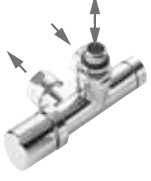





Description	Version	Article number	Price €	Application
Valve set type A Angled flow and lockshield, thermostatic insert M 30 x 1,5 mm with pre-setting 1-7, manual handwheel, including 2 pcs ¾" Eurocone nuts Ø 16,8 mm in finish of valve body, without adaptors for pipes	Chrome	838888	76,44	For all radiators with ½" female thread
Valve set type B Angled flow and lockshield, manual handwheel thermostatic insert M 30 x 1,5 mm with pre-setting 1-7, including 2 pcs ¾" Eurocone nuts Ø 16,8 mm in finish of valve body, without adaptors for pipes	White Chrome	838891 838898	119,66 119,66	
Valve set type C Straight flow and lockshield, manual handwheel thermostatic insert M 30 x 1,5 mm with pre-setting 1-7, including 2 pcs ¾" Eurocone nuts Ø 16,8 mm in finish of valve body, without adaptors for pipes	White Chrome	838941 838948	119,66 119,66	
Valve set type D Reverse flow and angled lockshield, manual handwheel thermostatic insert M 30 x 1,5 mm with pre-setting 1-7, including 2 pcs ¾" Eurocone nuts Ø 16,8 mm in finish of valve body, without adaptors for pipes	White Chrome	838951 838958	125,37 125,37	
Valve set type G Angled-angled flow head to the left, thermostatic insert M 30 x 1,5 mm with pre-setting 1-7, manual handwheel, lockshield angled, including 2 pcs ¾" Eurocone nuts Ø 16,8 mm in finish of valve body, without adaptors for pipes	White Chrome	838981 838988	133,41 133,41	
Valve set type I Angled-angled flow head to the right, manual handwheel, thermostatic insert M 30 x 1,5 mm with pre-setting 1-7, lockshield angled, including 2 pcs ¾" Eurocone nuts Ø 16,8 mm in finish of valve body, without adaptors for pipes	White Chrome	838991 838998	133,41 133,41	

→ Direction of flow

All valves etc. suitable for operating temperature max. 110 °C and operating pressure max. 10 bar, if not indicated differently.
For further information, please see information in the keyword list.

All valves respectively connection fittings are delivered with handwheels as protection caps (thermostatic heads to be ordered separately) and union nuts as transition to the tube (matching adaptors and connection sets are to be ordered separately!) --> see page 21

Zehnder Design Line

Description		Version	Article number	Price €	Application
Valve type J Single entry/monotube valve vertical, straight, with by-pass, thermostatic insert M 30 x 1,5 mm with pre-setting 1-7, turnable for manual handwheel to the left or right, including 2 pcs ¾" Eurocone nuts Ø 16,8 mm in finish of valve body and dip tube, without adaptors for pipes		White Chrome	839001 839008	132,50 132,50	For all radiators with ½" female thread
Valve type K Single entry/monotube valve vertical, angled, with by-pass, thermostatic insert M 30 x 1,5 mm with pre-setting 1-7, manual handwheel to the right, including 2 pcs ¾" Eurocone nuts Ø 16,8 mm in finish of valve body and dip tube, without adaptors for pipes		White Chrome	839011 839018	129,26 129,26	
Valve type M Single entry/monotube valve vertical, angled, with by-pass, thermostatic insert M 30 x 1,5 mm with pre-setting 1-7, manual handwheel to the left, including 2 pcs ¾" Eurocone nuts Ø 16,8 mm in finish of valve body and dip tube, without adaptors for pipes		White Chrome	839021 839028	129,26 129,26	
Valve type N Single entry/monotube valve horizontal, straight, with by-pass, thermostatic insert M 30 x 1,5 mm with pre-setting 1-7, manual handwheel to the top, including 2 pcs ¾" Eurocone nuts Ø 16,8 mm in finish of valve body and dip tube, without adaptors for pipes		White Chrome	839031 839038	173,82 173,82	
Valve type O 50 mm straight, thermostatic insert M 30 x 1,5 mm with pre-setting 1-7 and by-pass, turnable for manual handwheel to the left or right, including 2 pcs ¾" Eurocone nuts Ø 16,8 mm in finish of valve body, without adaptors for pipes		White Chrome	839041 839048	132,50 132,50	
Valve type P 50 mm angled, with by-pass, to the right thermostatic insert M 30 x 1,5 mm, with pre-setting 1-7 and by-pass, manual handwheel, including 2 pcs ¾" Eurocone nuts Ø 16,8 mm in finish of valve body, without adaptors for pipes		White Chrome	839051 839058	132,50 132,50	
Valve type Q 50 mm angled, with by-pass, to the left thermostatic insert M 30 x 1,5 mm with pre-setting 1-7 and by-pass, manual handwheel, including 2 pcs ¾" Eurocone nuts Ø 16,8 mm in finish of valve body, without adaptors for pipes		White Chrome	839101 839108	132,50 132,50	
Valve type U 50 mm swiveling design valve straight or angled, with by-pass, thermostatic insert M 30 x 1,5 mm with pre-setting 1-7, manual handwheel to the left or to the right, including 2 pcs ¾" Eurocone nuts Ø 16,8 mm in finish of valve body, without adaptors for pipes		White Chrome	839171 839178	242,19 242,19	

Zehnder Design Line Coloured Valves





Description	Version	Article nr.	Price €	Application
<p>Zehnder thermostat "Design Line" Thermostat with integrated fluid sensor. Can be restricted and locked to individual reference value of 6,5 - 28 °C, connection for thermostat M 30 x 1,5</p>	Special finish	841279	73,79	For all radiators with ½" female thread, in colour of radiator
<p>Valve set type B Angled flow and lockshield, thermostatic insert M 30 x 1,5 mm with pre-setting 1-7, including 2 pcs 3/4" Eurocone nuts Ø 16,8 mm in finish of valve body, without adaptors for pipes. Thermostat Design Line with integrated fluid sensor. Can be restricted and locked to individual reference value of 6,5 - 28 °C, connection for thermostat M 30 x 1,5.</p>	Special finish	838899	119,66	
	Valve set with manual handwheel		193,45	
<p>Valve type O 50 mm straight, thermostatic insert M 30 x 1,5 mm with pre-setting 1-7 and by-pass, turnable to the left or right, including 2 pcs 3/4" Eurocone nuts Ø 16,8 mm in finish of valve body, without adaptors for pipes. Thermostat Design Line with integrated fluid sensor. Can be restricted and locked to individual reference value of 6,5 - 28 °C, connection for thermostat M 30 x 1,5.</p>	Special finish	839049	132,50	
	Valve set with manual handwheel		206,29	
<p>Valve type P 50 mm angled, with by-pass, to the right thermostatic insert M 30 x 1,5 mm, with pre-setting 1-7 and by-pass, including 2 pcs 3/4" Eurocone nuts Ø 16,8 mm in finish of valve body, without adaptors for pipes. Thermostat Design Line with integrated fluid sensor. Can be restricted and locked to individual reference value of 6,5 - 28 °C, connection for thermostat M 30 x 1,5.</p>	Special finish	839059	132,50	
	Valve set with manual handwheel		206,29	
<p>Valve type Q 50 mm angled, with by-pass, to the left thermostatic insert M 30 x 1,5 mm with pre-setting 1-7 and by-pass, including 2 pcs 3/4" Eurocone nuts Ø 16,8 mm in finish of valve body, without adaptors for pipes. Thermostat Design Line with integrated fluid sensor. Can be restricted and locked to individual reference value of 6,5 - 28 °C, connection for thermostat M 30 x 1,5.</p>	Special finish	839109	132,50	
	Valve set with manual handwheel		206,29	

All valves etc. suitable for operating temperature max. 110 °C and operating pressure max. 10 bar, if not indicated differently.
For further information, please see information in the keyword list.

Zehnder Design Line Accessories

Description	Version	Article number	Price €	Application
Nut ½", 2 pcs Fe - ¾" Eurocone	White	842001	24,23	Adaptor for screw fittings with ½" external thread
	Chrome	842008	24,23	
Adaptors, 2 pcs Multilayer Ø 14 mm	Brass	842160	11,41	
Adaptors, 2 pcs Multilayer 16 x 2,0 mm	Brass	842060	11,41	Matching to Zehnder Design Line valves and union nuts (2 x ¾" Eurocone Ø 16,8 mm) which are in the scope of delivery
Adaptors, 2 pcs PEX 12 x 1,0 mm	Brass	842070	11,41	
Adaptors, 2 pcs Multilayer Ø 16 x 2,25 mm	Brass	842170	11,41	
Adaptors, 2 pcs Copper Ø 10 mm	Brass	842080	7,13	
Copper Ø 12 mm	Brass	842090	7,13	
Copper Ø 14 mm	Brass	842100	7,13	
Copper Ø 15 mm	Brass	842110	7,13	
Copper Ø 16 mm	Brass	842120	7,13	
Nuts Ø 18 mm - ¾" Eurocone + adaptors copper Ø 18 mm 2 pcs	Chrome / Brass	842140	35,63	
Nuts Ø 20,8 mm - ¾" Eurocone + adaptors multilayer Ø 20 x 2 mm 2 pcs	Chrome / Brass	842150	35,63	
Universal Adaptor set (without nuts ¾" Eurocone - Ø 16,8 mm) - 2 pcs Alu/Pex multilayer 16 x 2,0 mm - 2 pcs PEX 12 x 1 mm - 2 pcs CU 12 mm - 2 pcs CU 14 mm - 2 pcs CU 15 mm	Brass	842180	39,90	

Zehnder Design Line Accessories

Description		Version	Article number	Price €	Application
Sleeving kit L = 70 mm L = 160 mm		Chrome Chrome	853738 853668	24,23 31,33	For radiator installation
Collar Ø45 mm for Ø ½" for Ø 10 mm for Ø 12 mm for Ø 14 mm for Ø 15 mm for Ø 16 mm for Ø 18 mm		White Chrome White Chrome White Chrome White Chrome White Chrome White Chrome	816241 816248 816251 816258 816261 816268 816271 816278 816281 816288 816291 816298 816301 816308	2,85 7,13 2,85 7,13 2,85 7,13 2,85 7,13 2,85 7,13	For existing connections

Keyword list

Accessories

A wide range of accessories are available for various additional uses, such as hanging up towels. For more information, see the section on "Accessories".

Accessory set

To make accessories simple to choose, accessory sets are offered for each radiator. Detailed information is provided in the relevant section.

Baffle

To avoid reduced output, e.g. with a riding connection, internal installations, e.g. baffles, deflector plates, guide plates, are required. Detailed information is available on request.

Advantages

See "Product description".

Brackets

Appropriate brackets are offered as an accessory set for the respective radiators. Detailed information is given alongside the relevant products and in the "Accessories" section. Also see notes under "Fixings".

CE marking

The CE marking on Zehnder radiators shows that they are manufactured in accordance with the prevailing European standard EN 442 and that the product has been subjected to the prescribed conformity evaluation procedure.



The following parameters, which allow the CE mark to be shown, can be found in the respective product section:

- Model designation
- Max. operating pressure
- Nominal heat output

Product/product family	CE - Year
Zehnder Metropolitan	CE - 09

Clear Lacquer Version (Technoline)

See "Colours"

Connections

Each Zehnder radiator is supplied complete with connections. Unless stated otherwise, all connections are female threads. Unless a different dimension is specified, the supplied connections are 1/2". Orders without a connection type number will always be delivered with the respective standard connection. Plastic plugs inserted to protect the thread must be removed and replaced with an directional air vent / draining valve or blind plug.

Conversion

Factor for converting the nominal heat output to thermal outputs at other system temperatures, see "Thermal output".

Corrosion protection

See "Finish" and "Surface protection".

Colours

Zehnder radiators are available in almost every colour conceivable. From all possible colours, the Zehnder colour chart shows a selection of colours from various colour systems, such as RAL colours, sanitary colours or colours from the NCS-S system. The standard paint for the entire Zehnder radiator programme is the colour RAL 9016, Traffic White. 33 common colours make up Zehnder colour category 1, with an additional charge of 20%, 12 others colour make up category 2, with an additional charge of 30% on the standard finish. All other paintable colours are available for a surcharge on request. These

colour deviations are not a fault and are therefore not subject to claims under warranty as described in our "General Sales and Delivery Conditions".

Structural paints (structured paint surface) are possible on Zehnder radiators and also fall under category 2.

The Zehnder colour chart is printed on the inside of the rear catalogue cover.

For more information, see "Finish".

Description

The description for a product contains all the information needed to create a specification or tender. The text-block structure simplifies the composition of all necessary features according to on-site requirements.

Dimensions

The dimensions indicated in the documentation are correct at the time of printing. Subject to change without notice.

Electric radiators and EcoDesign guidelines

The electric guidelines define fixed units consisting of a corpus, a filling medium (heat transfer liquid), a heating insert and a matching control device. This unit is the base for a function test and it may not be modified.

The heat transfer liquid is frost proof up to -20 °C, if there are no further restrictions listed in the standard scope of delivery for the corresponding radiator.

Electric radiators are subject to the EcoDesign guidelines. Aim of this guideline is the reduction of environmental impacts of relevant energy consumption production taking the product lifecycle into consideration. The fulfillment of the guideline is rated according a specific points system. Different functions are e.g. stand-by mode ≤ 05 W weekly program or open-window detection contribute in fulfilling the minimum requirements. The electrical radiators in this price-list match the EcoDesign guidelines.

Please note:

- The electrical installations need to be accordance with local guidelines.
- For fixed installations (without plug) a switch needs to be installed. (All poles of the power supply with min 3m contact distance.)
- The filling capacity may not be altered.
- The electric heating element and connection cable may only be opened and replaced by the manufacturer.
- When installing an electrical radiator, a qualified electrician is the competent person to contact.
- Follow the user manual precisely.

Environment

The certification of our environmental management system to DIN EN ISO 14 001 by an independent institution obliges us to make continuous improvements to our environmental services through reducing or avoiding environmental burdens and waste, encouraging the utilisation and protection of resources as well as observing all environmental laws and regulations applicable to us.

Finish

Ready-painted radiators in this price list have a two-coat finish (to DIN 55900, Part 1 and 2, comprising primer and top coat).

The top coat is a powder coating. The high-quality Zehnder powder coating produces an especially smooth and extremely durable surface. Further information on the applications and limits of radiators is contained in information sheet number 7 of the BDH (Bundesindustrieverband Deutschland, Haus-, Energie- und Umwelttechnik e.V.).

Please **always** use the original RAL, NCS colour samples or original colour charts of the sanitary manufacturers for exact colour matching. For technical production reasons, minor colour deviations are possible in paints on steel surfaces, also when taking the prevailing lighting conditions into account. Deviations can also occur when

Keyword list

comparing painted steel surfaces (radiators) with ceramic products. The colours shown here (see inside of rear cover) are not binding for printing reasons. Radiators in metallic colours, e.g. RAL 9006, RAL 9007 and Anthracite are unique products and visual differences may appear in the colour, depending on the radiator.

Fins

To increase the convective thermal output, convection fins are used.

Fixings

To ensure that radiators are fitted safely, the weight of the radiator and other aspects must be considered when choosing the right quality and quantity of fixings. Additional loads and foreseeable misuse of a radiator must be considered or ruled out by planning and implementation in line with the known building use. The installation situation and accessibility are just as important criteria as wall material, bracket shape, location of the suspension points, locking device, add-on elements and the like.

Detailed information on the required number of fixing axes in accordance with VDI 6036 requirements class 2 is given for the respective products in the section on "Installation accessories". Recommendations for additional requirements classes on request. See also the key word VDI 6036.

Flow connection

This concerns the connection on the radiator through which the hot water flows into the radiator.

Galvanising

Product/product family	Maximum dimension galvanised
Zehnder Metropolitan	-

Only ½" connections or larger are possible. Curved or angled radiators cannot be galvanised. Galvanisation creates structures on the surface. These are caused by the technological process and therefore are not a fault. We cannot guarantee a clean, smooth surface. Galvanised radiators are generally delivered with a top coat. For explanation, see "Surface protection".

Grille

Grilles can be ordered for various radiators. Detailed information is given alongside the relevant products. See keyword "Reduced output".

Ground clearance

A reduction in the distance between the radiator and the floor can result in reduced output. For more information, see "Reduced output".

Guide plate

See "Baffle".

High pressure

Even with suitable radiators and accessory parts, pressure loads up to a maximum of 18 bar are only permitted if pressure surges can be excluded.

Hydraulic balancing

By hydraulic balancing the various system resistances are set so that the radiators are supplied with the necessary quantity of water at all operational points, in order to achieve the desired thermal output.

Hygiene version

Numerous Zehnder radiators are suitable for use in hygienically sensitive areas. Hygiene certificates can be requested for this.

Product/product family	Hygiene
Zehnder Metropolitan	X

¹⁾ only without fins

Immersion tube

Some types of connection require the installation of an immersion tube to achieve optimal heat distribution.

Inlet and outlet resistance

The resistance coefficient (zeta value) is used to calculate the pressure loss. For more information, see "Pressure loss".

Installation in series

The installation in series of radiators refers to the series connection of several radiators. Detailed information is given alongside the relevant products.

Joining

Zehnder radiators in lengths above the set maximum number of elements are supplied in sub-blocks and must be joined together on site.

Lance valve

The lances must be shortened or extended, depending on the radiator and connection types. Detailed information is available on request. See keyword "Single-tube systems".

Length restrictions

Avoiding damage during transport significantly increases the cost of packaging, which must be charged for accordingly.

Made to measure

Zehnder radiators can be customised (e.g. angled, curved, with welded brackets). Special shapes require templates to be made from solid materials (cardboard, packing paper) in order to guarantee quick and trouble-free processing. The support of the area manager can be used for a small charge.

Where necessary, the customer will receive a scale drawing of the version to be installed and final pricing for inspection and approval, after which the order will be manufactured. The order cannot be cancelled once placed.

Minimum water flow

If the flow of water through a radiator is heavily reduced, the heat output can fall far below the calculated or indicated value. For this reason, a minimum water flow should always be ensured. The following table shows the approximate minimum water flows $q_{m \min}$ in % of the nominal flow rate q_{ms} which does not cause the thermal output to deviate from the standard characteristic curve by more than 5%.

For some radiators, similar conditions can be reached through additional installations, even at lower water flows as shown in the following table. More information is available on request.

Product/product family	$q_{m \min}$ in % of q_{ms}
Zehnder Metropolitan vertical models	27%
Zehnder Metropolitan	20%

Operating pressure

The maximum permissible operating pressure of a radiator depends on its geometry, the material used and the finish. The permissible operating pressure varies according to the product, see table: Suitable fittings, plugs and directional air vents must be ensured in connection with high pressure applications in excess of 10 bar. See "High pressure".

Product/product family	Standard version [bar]	High pressure version [bar]
Zehnder Metropolitan	10	-

Operating temperature

The coating of Zehnder radiators can be used for central heating systems up to 110 °C. It is suitable for use in district heating, low temperature and condensing systems.

Packaging

The packaging of Zehnder radiators serves as protection against damage during transport and on building sites. It must be removed before starting the system for the first time in order to avoid any damage caused by condensation.

Pressure loss

The pressure loss is determined using a zeta value of 2,5 per radiator for connection sizes from $\frac{3}{8}$ " to $\frac{3}{4}$ " and a flow velocity of 1 m/sec. The inherent resistance of a radiator can be ignored. In special cases (e.g. where an integrated valve is fitted), information on pressure losses is provided.

Prices

Terms of delivery for quoted prices are: FCA Lahr. All prices are gross prices. Where prices are not stated or only shown with the proviso 'current list price', the valid list prices will be calculated on the day of delivery. Also see General Sales and Delivery Conditions.

Quality check

Zehnder Group Deutschland GmbH is certified to DIN ISO 9001 and is therefore subject to stringent quality controls carried out by independent institutions in the areas of design/development, production, assembly and customer service.

Reduced output

The thermal output can be affected depending on where the radiator is installed. The standard thermal output is measured in an unobstructed setting with a ground clearance of 110 mm and a wall clearance of 50 mm. Any reduction in these clearances, as well as installation in alcoves and the application of covers and grilles can, depending on the model, lead to a reduction in thermal output. In the case of grilles, this reduction can differ between 5 and 12%, depending on the radiator.

Reflective cover plates

The disadvantage of installing a radiator in front of external glazing is that heat is lost directly through the glass. The back of a radiator emits heat in the form of thermal radiation in the same way as the front. For wall mounted radiators, the thermal radiation is reflected or absorbed by the wall, whereas this long-wave radiation radiates almost unimpeded through the pane of glass when radiators are installed in front of windows, even at greater distances. In order to avoid this unnecessary loss of heat and energy, radiators are available with a reflective cover plate fitted to the side of the radiator facing the window.

The requirement for thermal radiation shields previously anchored in the Federal Heat Insulation Ordinance (WVO) is also fulfilled as a result of this.

The installation of thermal radiation shields in front of external glazing is also expedient in times of the Energy Saving Ordinance (EnEV) and is recommended especially with low overall heat transfer resistance on the part of the windows.

Returns

Radiators and accessories cannot be returned.

Return connection

This concerns the connection on the radiator through which the hot water leaves the radiator and passes along the return line to the heat generator.

Safety

See "Statutory Accident Insurer".

Scope of delivery

The scope of delivery for the standard version of a radiator can be found in the respective product description.

Seal

In the case of sealed connections and plugs, it may be necessary to tighten up the connection and blind plugs depending on the water quality, e.g. in a remote heating connection, after testing the pressure or heating the system for the first time. The sealing materials supplied or used by Zehnder are intended for use in closed heating systems.

Single-tube system

We recommend using single-tube valves with an adjustable bypass or a ballast system (riser), i.e. with an adjustable water volume over the radiator. Essentially, a reduced output of at least 25% must be considered when using single-tube lance valves. Function is often guaranteed only for certain models and up to specific lengths. Maximum lengths and an indication of how the radiators function with various makes of valve is available on request.

Special finish

See "Finish" and "Colours".

Special versions

Product/product family	angled	bevelled	curved	Galvanised
Zehnder Metropolitan	-	-	-	-

Standard thermal output

The standard thermal output of a radiator is determined in an independent, certified test laboratory according to standard EN 442 at the standard operating temperatures of 75/65/20 °C. The conversion of the thermal output to other system temperatures is done on the basis of the standard thermal output according to EN 12831.

For easy dimensioning, additional outputs for frequently used temperatures are shown alongside the standard thermal output:

- 70/55/20 °C
- 55/45/20 °C

¹⁾ Only horizontal, single-layer models

²⁾ Height max. 420 mm

³⁾ Only models with 4 mm gap

⁴⁾ Only vertical models

⁵⁾ Only single-layer models without fins

Standard colour/finish

The standard colour for Zehnder radiators is RAL 9016. Exceptions: Zehnder Fare Tech, Zehnder Alura Tech RAL 9010. For more information, see "Painting".

Keyword list

Storage

Zehnder radiators must be stored for the long-term or temporarily in dry and chemical-free rooms.

Structural finish

See "Finish".

Surface protection

We recommend that installation areas affected by damp or chemicals are only fitted with radiators that are galvanised and then given a powder coating. A polyzinc coating with subsequent powder-coating increases the corrosion protection of the radiator, depending on the surface geometry. Possible applications are available on request. (see also Galvanising)

System temperatures

These are the temperatures at which the hot water heating system is operated (flow, return and room temperature).

Technical specifications

The dimensions indicated in the documentation are correct at the time of printing. We reserve the right to make amendments that improve the product.

Technoline

See "Colours"

Test pressure

Each radiator is checked for leaks by subjecting it to 1,3 times its rated maximum operating pressure before delivery. For orders that do not indicate the required operating pressure, the radiator will be delivered with the operating pressure of the standard version.

Thermal output Φ

The thermal output of a radiator model is given by the standard characteristic curve:

$$\Phi = K_M \cdot \Delta T^n$$



EN 442 defines the test procedure and the measurement method in identically arranged test laboratories. A single, pan-European measuring method therefore replaces the previous measurements that varied from country to country.

The output given under the following conditions in accordance with EN 442 applies as the nominal heat output Φ_s :

Flow temperature	$t_1 = 75 \text{ °C}$
Return temperature	$t_2 = 65 \text{ °C}$
Mean water temperature	$t_m = 70 \text{ °C}$
Room temperature	$t_r = 20 \text{ °C}$
Excess temperature ($t_m - t_r$)	$\Delta T = 50 \text{ K}$

Thermal outputs Φ (different ΔT than 50 K)

For all excess temperatures other than $\Delta T_n = 50 \text{ K}$, the thermal output is calculated in accordance with the formulae

$$\Phi = \Phi_s \times f_1 \text{ or } \Phi = \Phi_s \times \left(\frac{\Delta T}{\Delta T_n} \right)^n$$

ΔT is to be calculated logarithmically as follows:

$$\Delta T = \frac{(t_1 - t_r) - (t_2 - t_r)}{\ln \left(\frac{t_1 - t_r}{t_2 - t_r} \right)} = \frac{t_1 - t_2}{\ln \left(\frac{t_1 - t_r}{t_2 - t_r} \right)}$$

The excess temperature ΔT_n under standard conditions (75/65/20 °C) is, as a logarithmic excess temperature

$$\Delta T_n = \frac{75 - 65}{\ln \left(\frac{75 - 20}{65 - 20} \right)} = 49,83 \text{ K}$$

The entire calculation process can be avoided by using the tables on page 28/29.

These can be used to directly read off the f_1 factor for known system temperatures (t_1, t_2, t_r) and radiator exponents. For other system temperatures, f_1 must be determined mathematically according to the specified formulae.

Examples for the dimensioning of radiators

1. Example of Zehnder Metropolitan:

Model MEV-180-060, length 595 mm

$\Phi_s = 934 \text{ W}$, exponent $n = 1,25$

$t_1 = 70 \text{ °C}$, $t_2 = 50 \text{ °C}$, $t_r = 22 \text{ °C}$

Determine the f_1 factor from the table on page 28/29.

$$\Phi = 934 \text{ W} \times 0,672 = \underline{646 \text{ W}}$$

Tolerances

Industry standard tolerances and tolerances based on production technology are subject to change for all indicated dimensions and fall within the tolerances defined in EN 442. The maximum tolerance must be considered during pre-assembly of the pipework or fixing materials. We reserve the right to make technical amendments during the validity of the documentation as part of product improvement.

VDI 6036

Application of the directive VDI 6036 assists all participants in the process to make a comprehensive and comparable assessment of the installation situation. As an accepted rule of technology, this directive and the resulting assessment can also be drawn on for regulation purposes in the event of damages. Directive VDI 6036 classifies applications for radiator fastenings into various requirements classes with different loads. Additional loads for various intensities of misuse can be added to the net weight and water content of the radiator as required. Zehnder issues standard assignment recommendations for requirements class 2, and for stable wall constructions (e.g. concrete) for selected fixing pieces - unless otherwise marked. Assignment recommendations for requirements class 3 and for special custom applications (requirements class 4) on request.

Example applications from VDI 6036:

Requirements class 2 (normal and increased requirements): owner-occupied homes, rented flats, kindergartens, hospitals, retirement and nursing homes, office buildings, doctors' surgeries/lawyers offices, retail outlets.

Requirements class 3 (high-level requirements): schools, sports facilities, youth centres, meeting places, railway stations, barracks

Requirements class 4 (very high-level requirements or special burdens): prisons, psychiatric institutions, special agreements

Wall clearance

This is the distance between the wall and the back of the radiator. For more information, see "Reduced output".

Warranty

The warranty period shall be sixty (60) months from date of delivery to Buyer. Excluded are electrical radiators, electrical and electronic components. The warranty period for these products is twenty-four (24) months.

Water quality

Operating conditions and water quality according to VDI 2035 must be maintained.

Claims under guarantee will be rejected if substances (e.g. chemicals, antifreeze, etc.) are added to the heating water which have an aggressive effect on the sealing material. In case of non compliance, no liability can be accepted in accordance with point 8 of our "General Sales and Delivery Conditions" for sealing material, nor for any resulting defects and consequences. Claims under guarantee in accordance with point 8 of our "General Sales and Delivery Conditions" will also be rendered invalid in case of:

- Operation with steam,
- Periodical or long-term draining of the system,
- Excessive sludge in the radiators and
- Occasional or constant seepage of oxygen into the system.

Wetrooms

See "Surface protection"

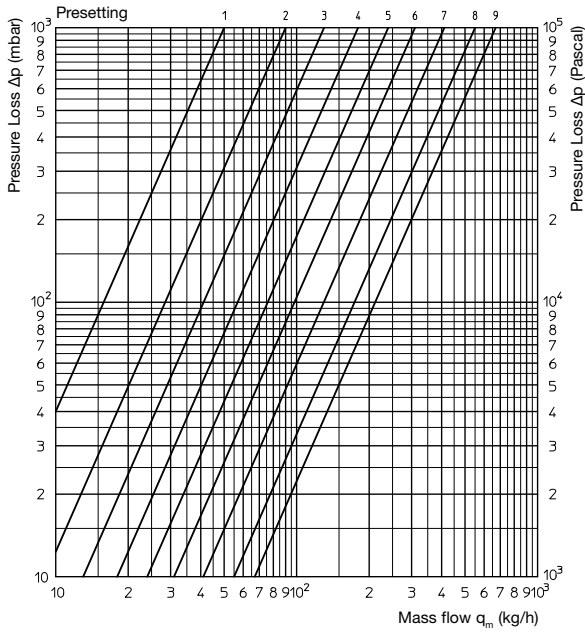
Legend

Icon	Unit	Description
H	mm	Height
L	mm	Length
T	mm	Depth
H Lam.	mm	Height of fins
N	mm	Boss spacing
A	m ²	Surface
V	dm ³	Water content
M	kg	Empty weight
N _s	-	Number of elements
t ₁	°C	Flow temperature
t ₂	°C	Return temperature
t _r	°C	Room air temperature
t _m	°C	Mean water temperature (t ₁ +t ₂)/2
ΔT	K	Excess temperature t _m - t _r
Φ	W=(J/s)	Thermal output
Φ _s	W	Nominal heat output
Φ _L	W	Nominal heat output of the module
C _p	J/(kg K)	Specific heat capacity
n	-	Radiator indicator, exponent
S _x	%	Proportion of radiation
C _k	-	Conversion factor to Φ _s
q _m	kg/h/(kg/s)	Water flow
q _{ms}	kg/h/(kg/s)	Nominal flow rate
v	m/s	Velocity
Δp	kPa	Pressure loss, pressure drop
ζ	-	Resistance coefficient
ln	-	Natural logarithm

Physical unit

°C	Degrees, Celsius
K	Kelvin, unit for temperature difference
m	Metres
mm	Millimetres
m/s	Metres/second, flow rate
Pa	Pascal, 1 Pa = 0,102 mmWS
mmWS	mm water column
W	Watt, unit of power 1 W = 0,6 kilocalories/hour old unit of power, 1 kcal/h = 1,163 W
c	Specific heat capacity of water = 1 kcal/kg K = 4,187 kJ/kg K
kJ	Kilojoule, 1 kJ = 0,239 kcal

Thermostatic valve (presetting Oventrop) AV9 for Metropolitan



Presetting	1	2	3	4	5	6	7	8	9
kv-value	0,05	0,09	0,14	0,20	0,26	0,32	0,43	0,57	0,67

Conversion table, f₁ factor

		75					70					65					60					55				
		75					70					65					60					55				
t ₁	t ₂	1,20	1,25	1,30	1,35	1,40	1,20	1,25	1,30	1,35	1,40	1,20	1,27	1,30	1,35	1,40	1,20	1,25	1,30	1,35	1,40	1,20	1,25	1,30	1,35	1,40
90	10	1,562	1,591	1,621	1,651	1,682	1,491	1,516	1,542	1,568	1,594	1,419	1,449	1,462	1,483	1,505	1,346	1,363	1,380	1,397	1,414	1,270	1,283	1,296	1,309	1,322
	15	1,432	1,454	1,476	1,498	1,521	1,363	1,380	1,398	1,416	1,435	1,291	1,311	1,319	1,333	1,347	1,218	1,228	1,238	1,248	1,259	1,142	1,149	1,155	1,162	1,168
	18	1,356	1,373	1,390	1,408	1,426	1,286	1,300	1,313	1,327	1,341	1,215	1,229	1,235	1,245	1,255	1,142	1,148	1,155	1,161	1,168	1,066	1,069	1,072	1,075	1,078
	20	1,305	1,319	1,334	1,349	1,364	1,236	1,247	1,258	1,269	1,280	1,165	1,175	1,180	1,187	1,195	1,092	1,096	1,100	1,104	1,108	1,016	1,017	1,017	1,018	1,019
	22	1,254	1,266	1,278	1,290	1,303	1,185	1,194	1,202	1,211	1,220	1,115	1,122	1,125	1,130	1,135	1,042	1,043	1,045	1,047	1,049	0,966	0,964	0,963	0,962	0,960
24	1,204	1,214	1,223	1,233	1,242	1,136	1,142	1,148	1,154	1,160	1,065	1,069	1,071	1,073	1,076	0,992	0,992	0,991	0,991	0,991	0,916	0,913	0,909	0,906	0,903	
85	10	1,501	1,526	1,552	1,579	1,606	1,432	1,454	1,476	1,498	1,521	1,363	1,387	1,398	1,416	1,435	1,291	1,305	1,319	1,333	1,347	1,218	1,228	1,238	1,248	1,259
	15	1,372	1,391	1,409	1,428	1,447	1,305	1,319	1,334	1,349	1,364	1,236	1,251	1,258	1,269	1,280	1,165	1,172	1,180	1,187	1,195	1,092	1,096	1,096	1,100	1,108
	18	1,296	1,311	1,325	1,339	1,354	1,229	1,240	1,251	1,261	1,272	1,160	1,171	1,175	1,182	1,190	1,090	1,094	1,098	1,102	1,105	1,017	1,017	1,017	1,018	1,019
	20	1,246	1,258	1,269	1,281	1,293	1,179	1,187	1,196	1,204	1,212	1,111	1,118	1,121	1,125	1,130	1,040	1,042	1,044	1,045	1,047	0,967	0,966	0,964	0,963	0,962
	22	1,196	1,205	1,214	1,223	1,233	1,130	1,135	1,141	1,147	1,153	1,061	1,065	1,067	1,069	1,072	0,991	0,991	0,990	0,990	0,989	0,918	0,915	0,911	0,908	0,905
24	1,147	1,153	1,160	1,166	1,173	1,080	1,084	1,087	1,091	1,094	1,012	1,013	1,013	1,014	1,014	0,942	0,940	0,937	0,935	0,933	0,869	0,864	0,859	0,854	0,849	
80	10	1,439	1,461	1,483	1,505	1,528	1,372	1,391	1,409	1,428	1,447	1,305	1,325	1,334	1,349	1,364	1,236	1,247	1,258	1,269	1,280	1,165	1,172	1,180	1,187	1,195
	15	1,312	1,326	1,342	1,357	1,372	1,246	1,258	1,269	1,281	1,293	1,179	1,191	1,196	1,204	1,212	1,111	1,116	1,121	1,125	1,130	1,040	1,042	1,044	1,045	1,047
	18	1,236	1,247	1,258	1,270	1,281	1,171	1,179	1,187	1,195	1,203	1,105	1,111	1,114	1,119	1,124	1,037	1,038	1,040	1,041	1,043	0,966	0,965	0,964	0,962	0,961
	20	1,187	1,195	1,204	1,212	1,221	1,122	1,127	1,133	1,138	1,144	1,056	1,059	1,061	1,063	1,066	0,988	0,987	0,987	0,986	0,986	0,918	0,914	0,911	0,908	0,904
	22	1,137	1,143	1,149	1,156	1,162	1,073	1,076	1,079	1,082	1,086	1,007	1,008	1,008	1,008	1,008	0,939	0,937	0,934	0,932	0,930	0,869	0,864	0,859	0,854	0,849
24	1,088	1,092	1,096	1,100	1,103	1,024	1,025	1,026	1,027	1,028	0,959	0,956	0,955	0,954	0,952	0,891	0,887	0,883	0,878	0,874	0,821	0,814	0,808	0,801	0,794	
75	10						1,312	1,326	1,342	1,357	1,372	1,246	1,262	1,269	1,281	1,293	1,179	1,187	1,196	1,204	1,212	1,111	1,116	1,121	1,125	1,130
	15						1,187	1,195	1,204	1,212	1,221	1,122	1,130	1,133	1,138	1,144	1,056	1,058	1,061	1,063	1,066	0,988	0,988	0,987	0,987	0,986
	18						1,113	1,118	1,122	1,127	1,133	1,049	1,051	1,053	1,055	1,057	0,983	0,982	0,981	0,981	0,980	0,915	0,912	0,908	0,905	0,902
	20						1,064	1,066	1,069	1,072	1,075	1,000	1,000	1,000	1,000	1,000	0,935	0,932	0,929	0,927	0,924	0,867	0,862	0,857	0,852	0,847
	22						1,015	1,016	1,016	1,017	1,018	0,952	0,949	0,948	0,946	0,944	0,887	0,882	0,878	0,874	0,869	0,820	0,813	0,806	0,799	0,793
24						0,967	0,966	0,964	0,963	0,962	0,904	0,899	0,897	0,893	0,889	0,839	0,833	0,827	0,821	0,815	0,772	0,764	0,756	0,748	0,740	
70	10											1,187	1,198	1,204	1,212	1,221	1,122	1,127	1,133	1,138	1,144	1,056	1,058	1,061	1,063	1,066
	15											1,064	1,068	1,069	1,072	1,075	1,000	1,000	1,000	1,000	1,000	0,935	0,932	0,929	0,927	0,924
	18											0,991	0,991	0,990	0,990	0,990	0,928	0,925	0,922	0,919	0,917	0,863	0,858	0,853	0,847	0,842
	20											0,943	0,940	0,939	0,936	0,934	0,880	0,876	0,871	0,867	0,862	0,816	0,809	0,802	0,795	0,789
	22											0,896	0,890	0,887	0,883	0,879	0,833	0,827	0,821	0,815	0,808	0,769	0,761	0,752	0,744	0,736
24											0,848	0,840	0,837	0,831	0,826	0,787	0,779	0,771	0,763	0,756	0,723	0,713	0,703	0,694	0,684	
65	10																1,064	1,066	1,069	1,072	1,075	1,000	1,000	1,000	1,000	1,000
	15																0,943	0,941	0,939	0,936	0,934	0,880	0,876	0,871	0,867	0,862
	18																0,872	0,867	0,862	0,857	0,852	0,810	0,803	0,796	0,789	0,782
	20																0,825	0,818	0,812	0,805	0,799	0,763	0,755	0,746	0,738	0,730
	22																0,779	0,770	0,762	0,755	0,747	0,717	0,707	0,698	0,688	0,679
24																0,733	0,723	0,714	0,705	0,696	0,672	0,661	0,650	0,639	0,629	
60	10																									
	15																					0,943	0,941	0,939	0,936	0,934
	18																					0,825	0,818	0,812	0,805	0,799
	20																					0,755	0,747	0,738	0,729	0,721
	22																					0,710	0,700	0,690	0,680	0,670
24																					0,664	0,653	0,642	0,631	0,621	
																					0,620	0,607	0,595	0,584	0,572	

Conversion factor f₁ for converting the standard thermal output to EN 442 at 75/65/20 °C for other system temperatures: $\Phi = \Phi_s \cdot f_1$

$$f_1 = \left[\frac{(t_1 - t_2)}{\ln \left(\frac{t_1 - t_r}{t_2 - t_r} \right) \cdot 49,83 \text{ K}} \right]^n$$

The radiator exponent depends on the model and type of radiator and can therefore be found in the table containing the technical specifications for the respective radiator. For exponents other than those given, the correction factor can be interpolated or precisely calculated according to the above formulae. An exponent of 1,3 can be used for the approximate calculation.

System temperatures not shown must be mathematically determined using the formulae given, or can be made available on request.

For more information about thermal outputs, see keyword list.

Legend

Icon	Unit	Description
t ₁	°C	Flow temperature
t ₂	°C	Return temperature
t _r	°C	Room air temperature
Φ	W = (J / s)	Thermal output
Φ _s	W	Nominal heat output
n	-	Radiator indicator, exponent
ln	-	Natural logarithm

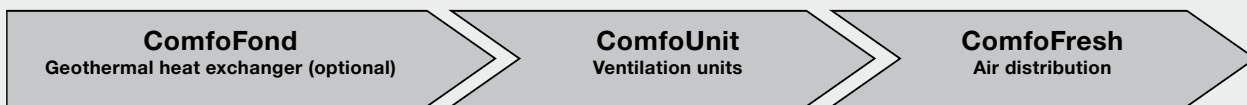
Physical unit

K	Kelvin, unit for temperature difference
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A large, empty grid of small squares occupies the central portion of the page, intended for taking notes. The grid is composed of approximately 30 columns and 40 rows of squares.

Zehnder comfortable indoor ventilation

Functional principle



1. Fresh air is fed into the system via an external wall vent. The fresh outdoor air can optionally flow through the Zehnder ComfoFond-L sub-soil heat exchanger, which uses geothermal energy to pre-temper the outdoor air.

2. The Zehnder ComfoAir ventilation unit recovers up to 95% of the energy from the extract air and returns it to the fresh air. This can be humidified, dehumidified and pre-tempered using optional components.

3. The Zehnder ComfoFresh air distribution system channels fresh air at the right temperature to individual rooms as needed and vents the extract air to the outside. The air volume can be individually adjusted for each room.

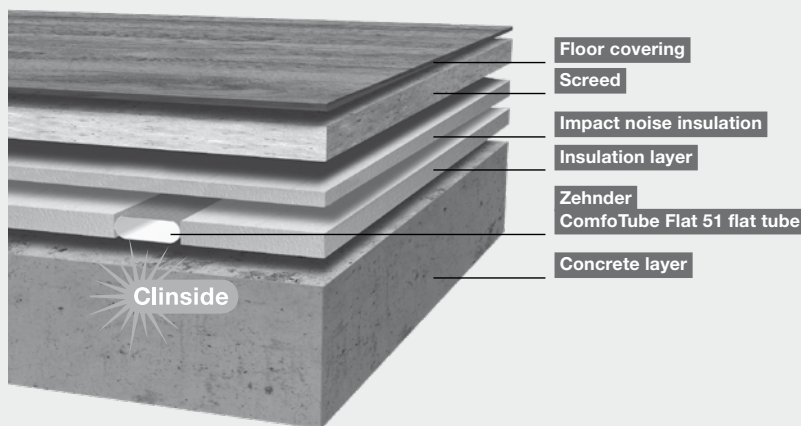


Zehnder comfortable indoor ventilation

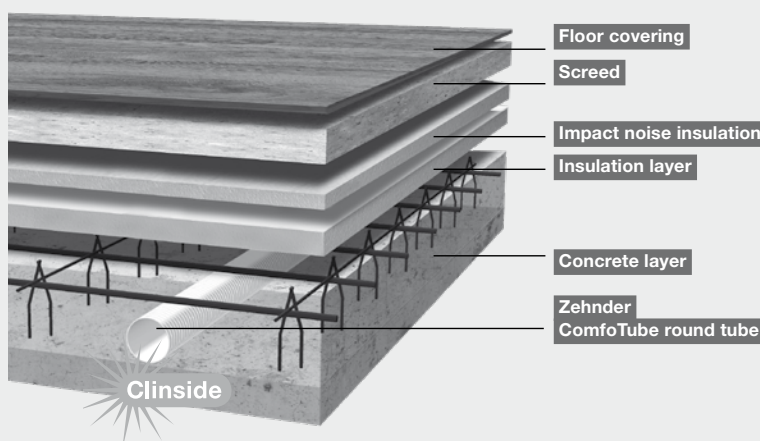
Air distribution system – effective and hygienic

There are two versions of air distribution systems available: Zehnder OnFloor and InFloor. In both cases, the volume of air is regulated as required. They are characterised by the ease with which they can be integrated into the building and their rapid installation. In the case of Zehnder OnFloor, fresh air flows through flat, oval ducts with an internal coating, which are installed in the insulation layer of the unfinished floor. Zehnder InFloor functions on the same principle, only the round tubes are laid in the unfinished floor. Both versions Zehnder InFloor and OnFloor can be combined and thus offer maximum versatility.

The air distribution system with flat tube for cover, wall and floor (Zehnder OnFloor)

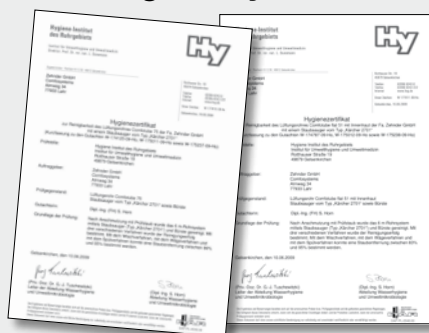


The air distribution system with round tube for cover, wall and floor (Zehnder InFloor)

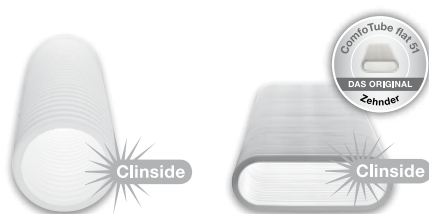


- Easy to install, flexible pipes
- High-quality food grade plastic (HDPE)
- Clinside smooth inner skin for clean tubes
- Centrally and peripherally adjustable airflow rates
- Low pressure loss
- Easy to clean

Tested cleaning ability



Certificates issued by a recognised hygiene institute.



Clean thanks to Clinside: The smooth inner skin prevents the build-up of dust. Cleaning is easy.

Zehnder comfortable indoor ventilation

Advantages

- Optimum oxygen and draught-free air supply promote your health
- Hypo-allergenic
- Filtering out pollutants
- Retention of the property's value by preventing mould from developing in the building's basic structure
- Energy saving through heat recovery
- Protects against outside noise



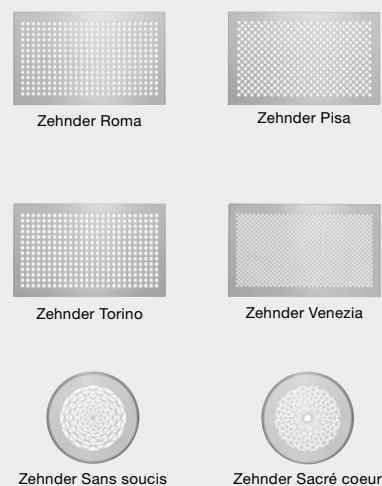
Zehnder ComfoAir ventilation units

- For use in demanding residential and commercial buildings
- Up to 95% heat recovery by cross-counterflow heat exchanger
- Fans with extremely efficient EC motors
- 100% automatic bypass
- Option: Electric pre-heater or enthalpy exchanger



Zehnder designer grilles

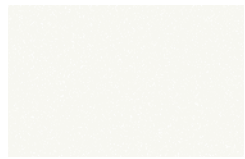
- Elegant and discreet
- For every interior
- Surface-mounted and flush-mounted version
- Available in white or stainless steel
- Suitable for displacement ventilation



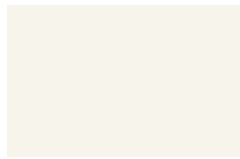
Warm colours

zehnder

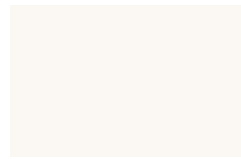
Colour category 1: CORE



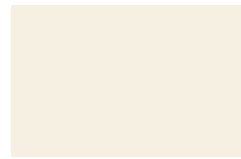
White Quartz¹⁾
0521



Pure White²⁾
RAL 9010 / 9010



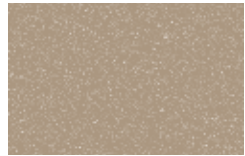
Edelweiss
0067



Cream
RAL 9001 / 9001



Telegrey 4
RAL 7047 / 7247



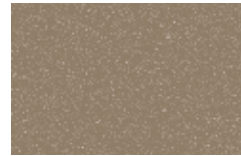
Beige Quartz
0523



Golden Sand
0258



Yellow Grey
RAL 7034 / 7234



Pearl Beige
RAL 1035 / 1235



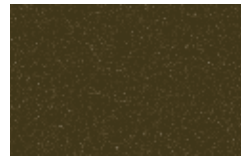
Beach Gold
0272



Concrete Grey
0265



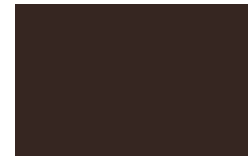
Beige Grey
0267



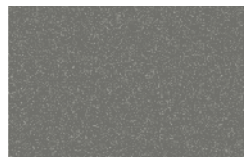
Bronze
0276



Brown Quartz
0529



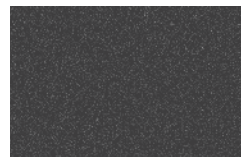
Dark Brown
0270



Grey Aluminium
9007



Anthracite
0346



Umbra Grey
RAL 7022 / 7222

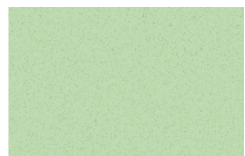


Volcanic
0336



Surcharge for colour category 1: 20 %

Colour category 2: TREND



Pastel Green
RAL 6019 / 6219



Reseda Green
RAL 6011 / 6211



Cement Grey
RAL 7033 / 7233



Olive Green
RAL 6003 / 6203



Terracotta Faded
0299



Terracotta
0292



Ruby Red
RAL 3003 / 3003



Surcharge for colour category 2: 30 %

¹⁾ Unlike to the colour standard (here RAL tone) the Zehnder no. also includes the features matt respectively glossy. Therefore the RAL standard and Zehnder no. differ in many colours. Please note that the prices always relate to the given finishes matt or glossy, deviating finishes will be calculated like colours outside of the colour cart. These colours are finished with a gloss finish; all other colours are matt-finished.

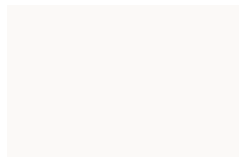
¹⁾ Not for Zehnder Nova, Nova Neo and Excelsior

²⁾ Standard colour for Fare Tech & Alura Tech, therefore Traffic White RAL 9016 with surcharge 20 % on category 1

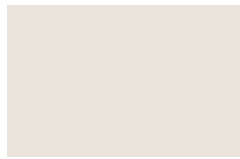
³⁾ Only for Zehnder Charleston and Zehnder Metropolitan

Cool colours

Colour category 1: CORE



White Matt
0556



Light Beige
0253



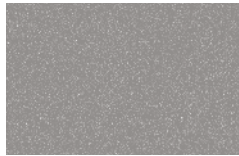
Light Grey
0262



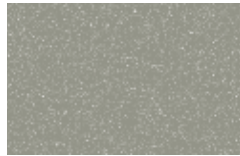
White Aluminium
9006



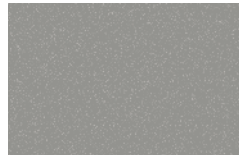
Light Jeans
0264



Titane
0335



Inox Look
0332



Telegrey 2
RAL 7046 / 7246



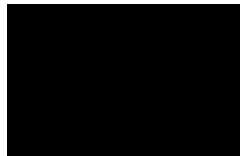
Blue Grey
RAL 7031 / 7231



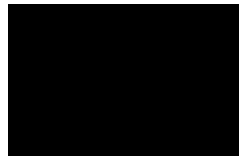
Anthracite Grey
RAL 7016 / 7016



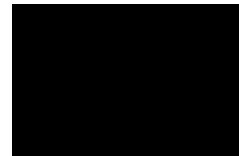
Black Quartz
0550



Black Matt
0557



Traffic Black
RAL 9017 / 9217



Jet Black
RAL 9005 / 9005

Surcharge for colour category 1: 20 %

Colour category 2: TREND



Pastel Blue
RAL 5024 / 5224



Pigeon Blue
RAL 5014 / 5214



Gentian Blue
RAL 5010 / 5210



Sapphire Blue
RAL 5003 / 5203



Blue Night
0289

Surcharge for colour category 2: 30 %

STANDARD



Traffic White
RAL 9016 / 9016

FINISHES



Technoline (Clear)³⁾
0325



Chrome (Surface)
0008



Stainless steel brushed
9517

Some colours/surfaces are only available for selected products. Please also see the notes on the respective product pages. For Special surfaces of the Studio Collection, please see the respective product chapters. Special colours on request. Due to different manufacturing techniques of the original colours, deviations can occur in colour and polish. RAL and NCS are designations from the manufacturer. The respective colour code (ED) is set at the 9th and 10th places in the article no.

Other special finishes in the RAL, RAL-D, NCS-S, Sanitary, DB colour systems are available as required, surcharges on request.

