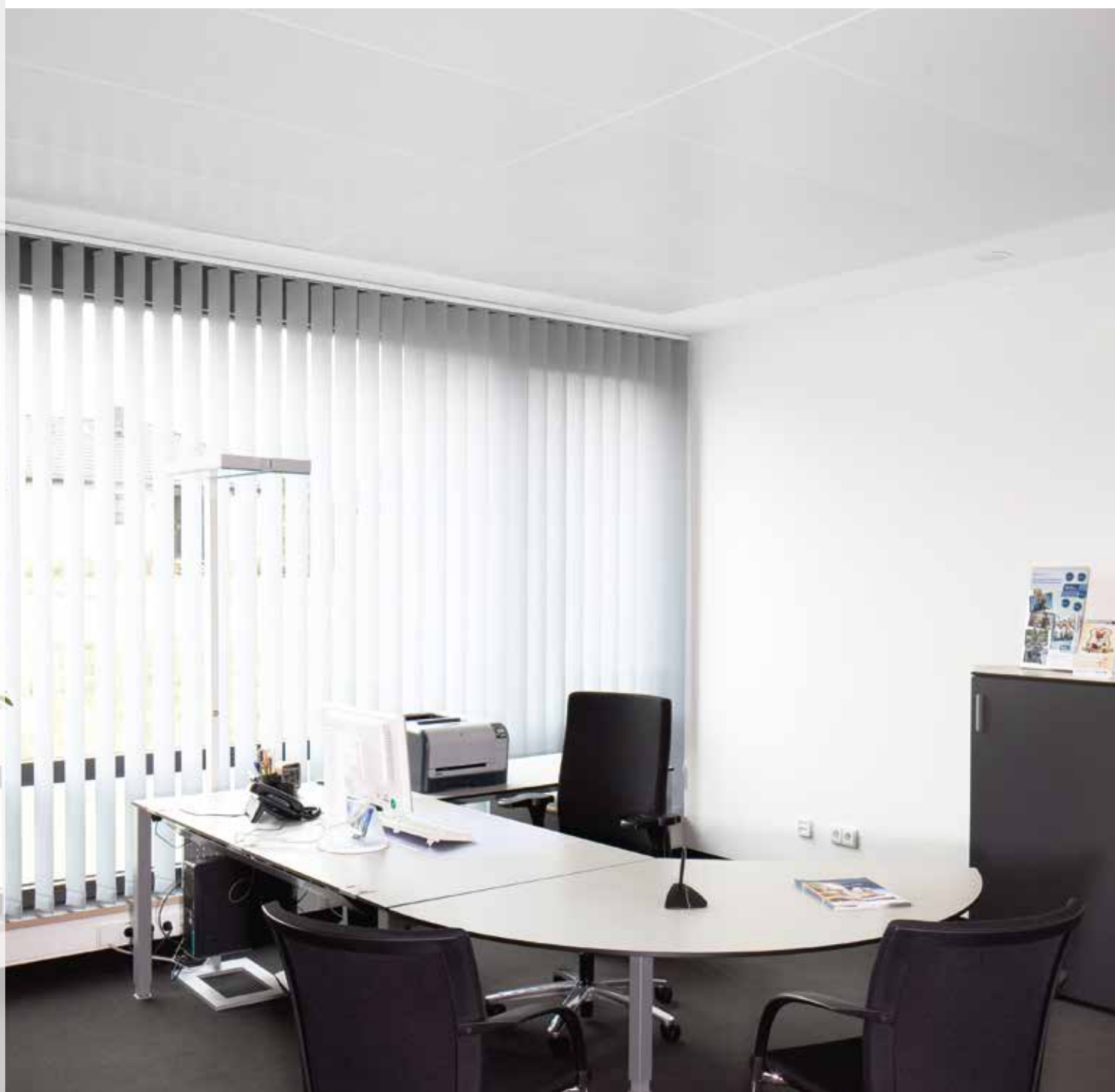


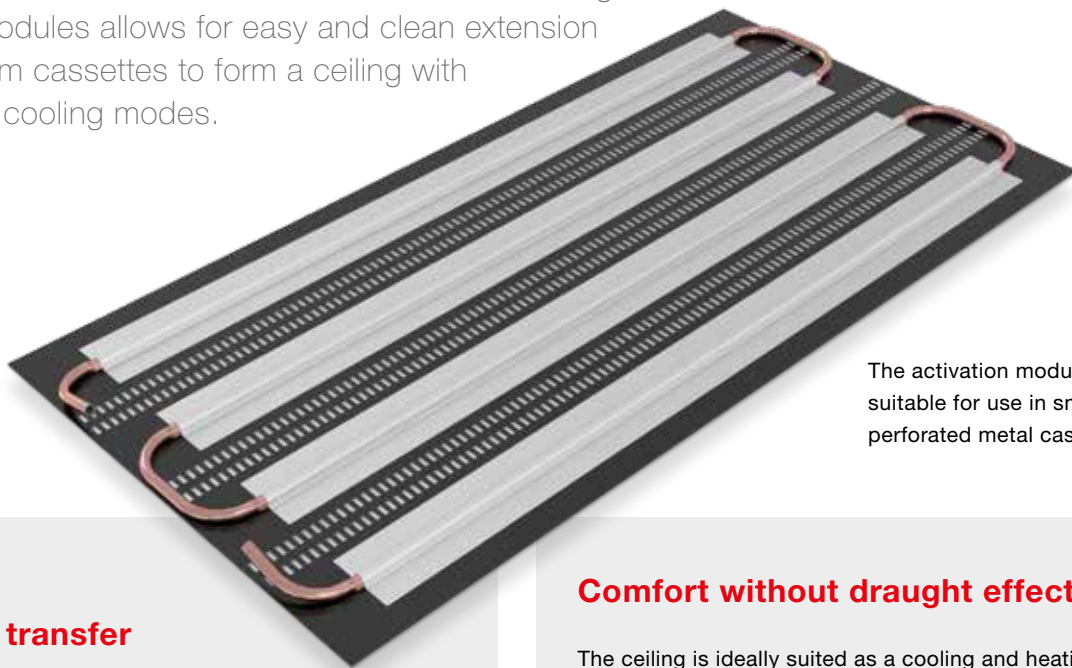
# Zehnder Fleximo

Technical data for activation modules in heating and cooling ceilings



# Flexible activation with Zehnder Fleximo

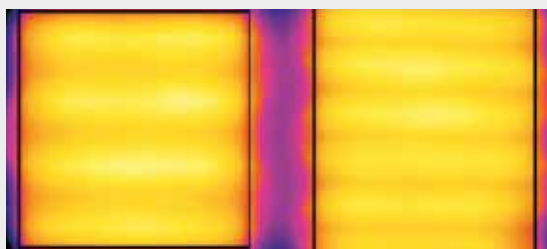
Metal ceilings that can do more: Comfort and added value with the Zehnder Fleximo activation modules. The extensive range of activation modules allows for easy and clean extension of any system cassettes to form a ceiling with heating and cooling modes.



The activation modules are suitable for use in smooth or perforated metal cassettes.

## Optimal thermal transfer

The D-profile tube used enables a higher and more uniform thermal transfer than conventional round tubes. In conjunction with the aluminium support plate, the temperature is optimally distributed across the entire surface, guaranteeing stability as well as a powerful heating and cooling performance.



## Comfort without draught effects

The ceiling is ideally suited as a cooling and heating surface, as the radiation surface is not obstructed by furniture. Metal ceilings can influence the indoor climate, providing comfortable temperatures in addition to architectural and design functions.

Heating and cooling ceilings work with the exchange of thermal radiation between warmer and colder surfaces. The principle works in both directions and is therefore suitable for heating and cooling. Particular attention is given to silent cooling, which is evenly distributed across the surface – without any draughts or noise.



## Quick and easy mounting

Zehnder Fleximo activation modules consist of a copper-aluminium thermal conduction system. A special aspect is the continuous support plate made of aluminium, which ensures both high thermal output of the activation modules as well as good stability. The support plate has an adhesive layer across the entire surface, which allows for a reliable, maximum strength connection between the activation modules and system cassettes.

# Technical data for heating and cooling

The following tables show the heating and cooling performance of Zehnder Fleximo in closed ceilings according to DIN EN 14037 and DIN EN 14240. The maximum recommended number of activation modules per heating circuit (N) with a pressure drop  $\Delta p \leq 25$  kPa is provided in the tables based on a temperature spread of 3K.

## Cooling

| Type                                                        | Width<br>mm | Length<br>mm | Area<br>m <sup>2</sup> | Weight<br>kg | Water content<br>kg | Cooling capacity, mass flow, max. number of activation modules |      |     |     |      |     |     |      |     |     |      |     |
|-------------------------------------------------------------|-------------|--------------|------------------------|--------------|---------------------|----------------------------------------------------------------|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|
|                                                             |             |              |                        |              |                     | 7K                                                             |      |     | 8K  |      |     | 9K  |      |     | 10K |      |     |
|                                                             |             |              |                        |              |                     | W                                                              | kg/h | [-] | W   | kg/h | [-] | W   | kg/h | [-] | W   | kg/h | [-] |
| <b>Activation module width 350 mm with 2 parallel pipes</b> |             |              |                        |              |                     |                                                                |      |     |     |      |     |     |      |     |     |      |     |
| Type 1                                                      | 350         | 550          | 0.193                  | 0.58         | 0.14                | 14                                                             | 3.9  | 32  | 16  | 4.5  | 30  | 18  | 5.1  | 27  | 20  | 5.8  | 26  |
| Type 2                                                      | 350         | 750          | 0.263                  | 0.80         | 0.18                | 19                                                             | 5.3  | 25  | 22  | 6.2  | 23  | 25  | 7.0  | 21  | 27  | 7.9  | 20  |
| Type 3                                                      | 350         | 950          | 0.333                  | 1.01         | 0.22                | 24                                                             | 6.8  | 20  | 27  | 7.8  | 18  | 31  | 8.9  | 17  | 35  | 10.0 | 16  |
| Type 4                                                      | 350         | 1,100        | 0.385                  | 1.18         | 0.25                | 27                                                             | 7.8  | 18  | 32  | 9.0  | 16  | 36  | 10.3 | 15  | 40  | 11.5 | 14  |
| Type 5                                                      | 350         | 1,325        | 0.464                  | 1.42         | 0.29                | 33                                                             | 9.4  | 15  | 38  | 10.9 | 13  | 43  | 12.4 | 12  | 48  | 13.9 | 12  |
| Type 6                                                      | 350         | 1,500*       | 0.525                  | 1.56         | 0.33                | 37                                                             | 10.7 | 13  | 43  | 12.3 | 12  | 49  | 14.0 | 11  | 55  | 15.7 | 10  |
| Type 7                                                      | 350         | 1,700*       | 0.595                  | 1.77         | 0.37                | 42                                                             | 12.1 | 12  | 49  | 14.0 | 11  | 55  | 15.9 | 10  | 62  | 17.8 | 9   |
| <b>Activation module width 550 mm with 4 parallel pipes</b> |             |              |                        |              |                     |                                                                |      |     |     |      |     |     |      |     |     |      |     |
| Type 8                                                      | 550         | 550          | 0.303                  | 1.03         | 0.25                | 23                                                             | 6.5  | 19  | 26  | 7.5  | 18  | 30  | 8.5  | 16  | 33  | 9.6  | 15  |
| Type 9                                                      | 550         | 750          | 0.413                  | 1.42         | 0.34                | 31                                                             | 8.9  | 15  | 36  | 10.2 | 13  | 41  | 11.6 | 12  | 46  | 13.0 | 11  |
| Type 10                                                     | 550         | 950          | 0.523                  | 1.80         | 0.42                | 39                                                             | 11.2 | 12  | 45  | 13.0 | 11  | 51  | 14.7 | 10  | 58  | 16.5 | 9   |
| Type 11                                                     | 550         | 1,100        | 0.605                  | 2.09         | 0.48                | 45                                                             | 13.0 | 10  | 52  | 15.0 | 9   | 60  | 17.1 | 8   | 67  | 19.1 | 8   |
| Type 12                                                     | 550         | 1,325        | 0.729                  | 2.53         | 0.57                | 55                                                             | 15.6 | 9   | 63  | 18.1 | 8   | 72  | 20.6 | 7   | 80  | 23.0 | 7   |
| Type 13                                                     | 550         | 1,500*       | 0.825                  | 2.74         | 0.64                | 62                                                             | 17.7 | 7   | 71  | 20.5 | 7   | 81  | 23.3 | 6   | 91  | 26.1 | 6   |
| Type 14                                                     | 550         | 1,700*       | 0.935                  | 3.11         | 0.72                | 70                                                             | 20.1 | 7   | 81  | 23.2 | 6   | 92  | 26.4 | 5   | 103 | 29.6 | 5   |
| <b>Activation module width 900 mm with 6 parallel pipes</b> |             |              |                        |              |                     |                                                                |      |     |     |      |     |     |      |     |     |      |     |
| Type 15                                                     | 900         | 550          | 0.495                  | 1.63         | 0.39                | 36                                                             | 10.4 | 13  | 42  | 12.1 | 11  | 48  | 13.7 | 11  | 54  | 15.4 | 10  |
| Type 16                                                     | 900         | 750          | 0.675                  | 2.24         | 0.51                | 50                                                             | 14.2 | 9   | 57  | 16.5 | 9   | 65  | 18.7 | 8   | 73  | 21.0 | 7   |
| Type 17                                                     | 900         | 950          | 0.855                  | 2.84         | 0.63                | 63                                                             | 18.0 | 7   | 73  | 20.8 | 7   | 83  | 23.7 | 6   | 93  | 26.6 | 6   |
| Type 18                                                     | 900         | 1,100        | 0.990                  | 3.29         | 0.72                | 73                                                             | 20.9 | 6   | 84  | 24.1 | 6   | 96  | 27.4 | 5   | 107 | 30.8 | 5   |
| Type 19                                                     | 900         | 1,325        | 1.193                  | 3.97         | 0.86                | 88                                                             | 25.1 | 5   | 101 | 29.1 | 5   | 115 | 33.0 | 4   | 129 | 37.1 | 4   |
| Type 20                                                     | 900         | 1,500*       | 1.350                  | 4.30         | 0.96                | 99                                                             | 28.5 | 5   | 115 | 32.9 | 4   | 131 | 37.4 | 4   | 146 | 42.0 | 4   |
| Type 21                                                     | 900         | 1,700*       | 1.530                  | 4.87         | 1.09                | 113                                                            | 32.3 | 4   | 130 | 37.3 | 4   | 148 | 42.4 | 3   | 166 | 47.5 | 3   |

## Heating

| Type                                                        | Width<br>mm | Length<br>mm | Area<br>m <sup>2</sup> | Weight<br>kg | Water content<br>kg | Thermal output, mass flow, max. number of activation modules |      |     |     |      |     |     |      |     |     |      |     |
|-------------------------------------------------------------|-------------|--------------|------------------------|--------------|---------------------|--------------------------------------------------------------|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|
|                                                             |             |              |                        |              |                     | 14K                                                          |      |     | 15K |      |     | 16K |      |     | 17K |      |     |
|                                                             |             |              |                        |              |                     | W                                                            | kg/h | [-] | W   | kg/h | [-] | W   | kg/h | [-] | W   | kg/h | [-] |
| <b>Activation module width 350 mm with 2 parallel pipes</b> |             |              |                        |              |                     |                                                              |      |     |     |      |     |     |      |     |     |      |     |
| Type 1                                                      | 350         | 550          | 0.193                  | 0.58         | 0.14                | 15                                                           | 4.3  | 30  | 16  | 4.7  | 29  | 18  | 5.0  | 28  | 19  | 5.4  | 27  |
| Type 2                                                      | 350         | 750          | 0.263                  | 0.80         | 0.18                | 21                                                           | 5.9  | 23  | 22  | 6.4  | 22  | 24  | 6.8  | 21  | 26  | 7.3  | 20  |
| Type 3                                                      | 350         | 950          | 0.333                  | 1.01         | 0.22                | 26                                                           | 7.5  | 19  | 28  | 8.1  | 18  | 30  | 8.7  | 17  | 32  | 9.3  | 16  |
| Type 4                                                      | 350         | 1,100        | 0.385                  | 1.18         | 0.25                | 30                                                           | 8.7  | 16  | 33  | 9.3  | 16  | 35  | 10.0 | 15  | 37  | 10.7 | 14  |
| Type 5                                                      | 350         | 1,325        | 0.464                  | 1.42         | 0.29                | 36                                                           | 10.4 | 14  | 39  | 11.3 | 13  | 42  | 12.1 | 13  | 45  | 12.9 | 12  |
| Type 6                                                      | 350         | 1,500*       | 0.525                  | 1.56         | 0.33                | 41                                                           | 11.8 | 12  | 45  | 12.8 | 12  | 48  | 13.7 | 11  | 51  | 14.6 | 11  |
| Type 7                                                      | 350         | 1,700*       | 0.595                  | 1.77         | 0.37                | 47                                                           | 13.4 | 11  | 50  | 14.4 | 10  | 54  | 15.5 | 10  | 58  | 16.6 | 9   |
| <b>Activation module width 550 mm with 4 parallel pipes</b> |             |              |                        |              |                     |                                                              |      |     |     |      |     |     |      |     |     |      |     |
| Type 8                                                      | 550         | 550          | 0.303                  | 1.03         | 0.25                | 25                                                           | 7.2  | 18  | 27  | 7.8  | 17  | 29  | 8.3  | 17  | 31  | 8.9  | 16  |
| Type 9                                                      | 550         | 750          | 0.413                  | 1.42         | 0.34                | 34                                                           | 9.8  | 14  | 37  | 10.6 | 13  | 40  | 11.4 | 12  | 42  | 12.1 | 12  |
| Type 10                                                     | 550         | 950          | 0.523                  | 1.80         | 0.42                | 43                                                           | 12.4 | 11  | 47  | 13.4 | 10  | 50  | 14.4 | 10  | 54  | 15.4 | 9   |
| Type 11                                                     | 550         | 1,100        | 0.605                  | 2.09         | 0.48                | 50                                                           | 14.4 | 9   | 54  | 15.5 | 9   | 58  | 16.7 | 9   | 62  | 17.8 | 8   |
| Type 12                                                     | 550         | 1,325        | 0.729                  | 2.53         | 0.57                | 60                                                           | 17.3 | 8   | 65  | 18.7 | 8   | 70  | 20.1 | 7   | 75  | 21.5 | 7   |
| Type 13                                                     | 550         | 1,500*       | 0.825                  | 2.74         | 0.64                | 68                                                           | 19.6 | 7   | 74  | 21.2 | 7   | 79  | 22.7 | 6   | 85  | 24.3 | 6   |
| Type 14                                                     | 550         | 1,700*       | 0.935                  | 3.11         | 0.72                | 78                                                           | 22.2 | 6   | 84  | 24.0 | 6   | 90  | 25.7 | 6   | 96  | 27.5 | 5   |
| <b>Activation module width 900 mm with 6 parallel pipes</b> |             |              |                        |              |                     |                                                              |      |     |     |      |     |     |      |     |     |      |     |
| Type 15                                                     | 900         | 550          | 0.495                  | 1.63         | 0.39                | 40                                                           | 11.6 | 12  | 44  | 12.5 | 11  | 47  | 13.4 | 11  | 50  | 14.3 | 10  |
| Type 16                                                     | 900         | 750          | 0.675                  | 2.24         | 0.51                | 55                                                           | 15.8 | 9   | 59  | 17.0 | 8   | 64  | 18.3 | 8   | 68  | 19.5 | 8   |
| Type 17                                                     | 900         | 950          | 0.855                  | 2.84         | 0.63                | 70                                                           | 20.0 | 7   | 75  | 21.5 | 7   | 81  | 23.1 | 6   | 86  | 24.7 | 6   |
| Type 18                                                     | 900         | 1,100        | 0.990                  | 3.29         | 0.72                | 81                                                           | 23.1 | 6   | 87  | 24.9 | 6   | 93  | 26.8 | 5   | 100 | 28.6 | 5   |
| Type 19                                                     | 900         | 1,325        | 1.193                  | 3.97         | 0.86                | 97                                                           | 27.8 | 5   | 105 | 30.0 | 5   | 113 | 32.3 | 4   | 120 | 34.5 | 4   |
| Type 20                                                     | 900         | 1,500*       | 1.350                  | 4.30         | 0.96                | 110                                                          | 31.5 | 4   | 119 | 34.0 | 4   | 127 | 36.5 | 4   | 136 | 39.0 | 4   |
| Type 21                                                     | 900         | 1,700*       | 1.530                  | 4.87         | 1.09                | 125                                                          | 35.7 | 4   | 135 | 38.6 | 4   | 144 | 41.4 | 3   | 154 | 44.3 | 3   |

\*Split base plate

# Pressure loss calculation

## Determining the pressure loss:



Type 10

1. Read the total mass flow as a multiple of the specified mass flow per activation module from the table that contains the technical data.
2. Read the pressure loss for the parallel activation modules from the respective diagram.

### Example:

10 activation modules of type 10, cooling at  $\Delta T$  8 K:

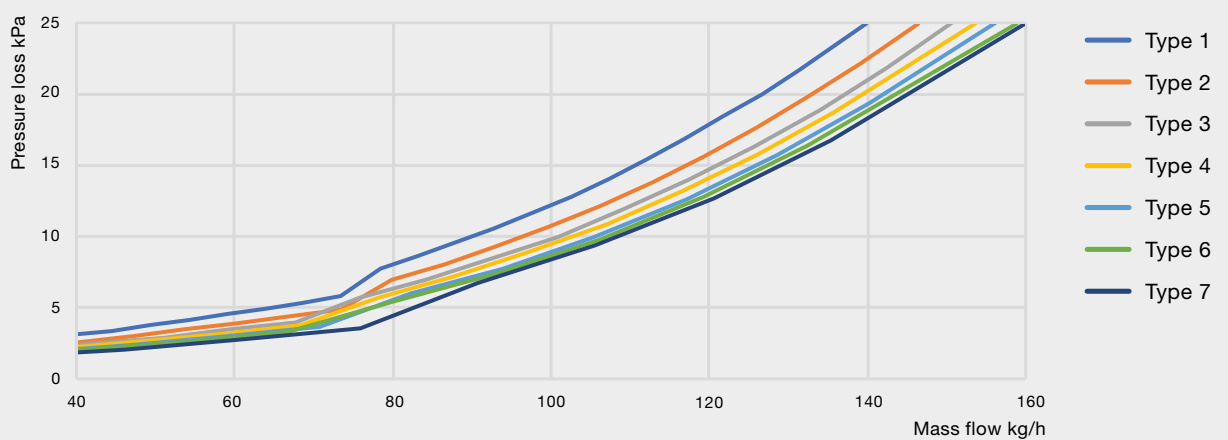
Cooling capacity  $Q$ :  $10 \times 45.2 \text{ W} = 452 \text{ W}$

Mass flow  $\dot{m}$ :  $10 \times 13 \text{ kg/h} = 130 \text{ kg/h}$

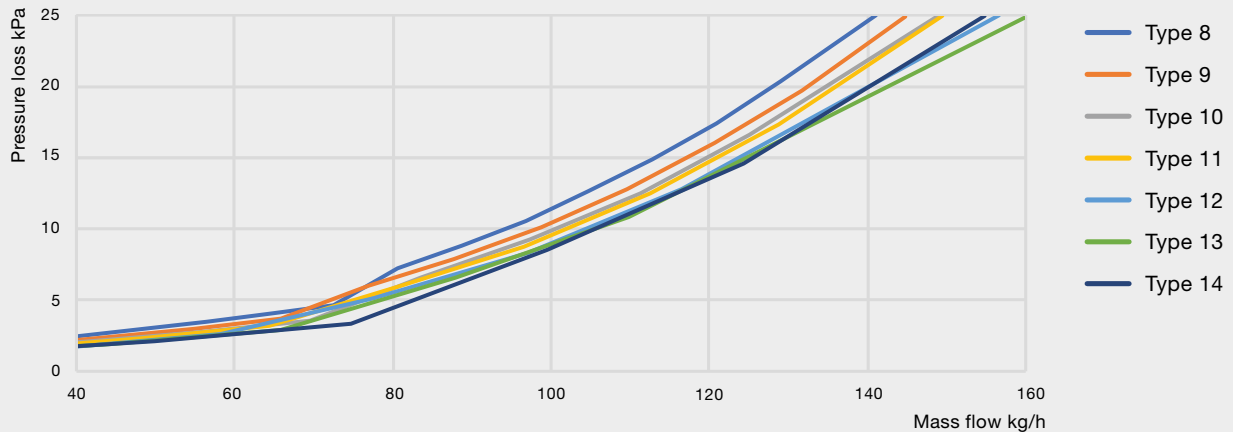
Pressure loss  $\Delta p$  at  $130 \text{ kg/h} = 18 \text{ kPa}$

Detailed calculations as well as calculation of circuits from different activation module variants upon request.

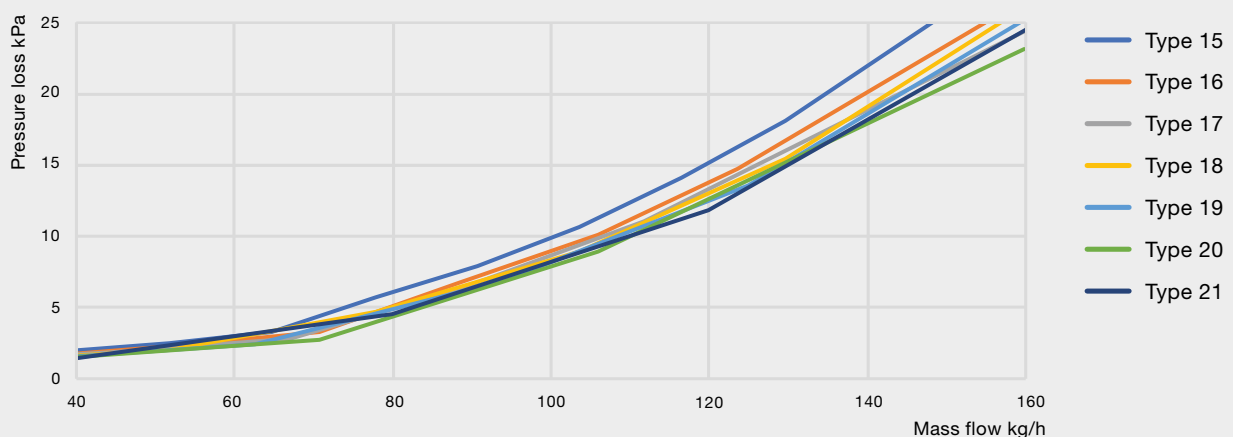
Activation module width 350 mm



Activation module width 550 mm



Activation module width 900 mm

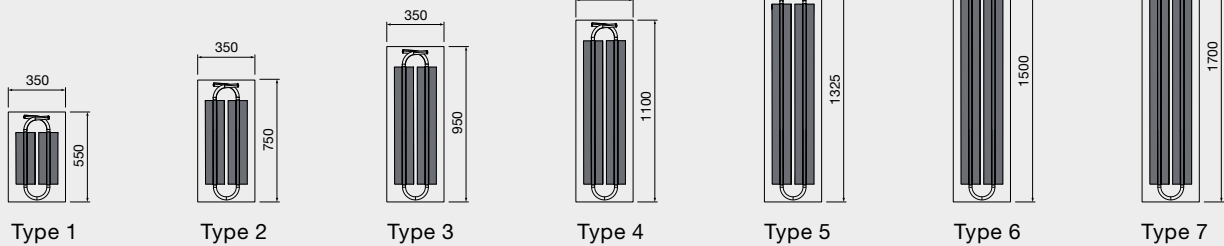


# Suitable formats – individually or in combination

Zehnder Fleximo activation modules are available in three widths and seven lengths. Combining two or more activation modules in one cassette allows metal cassettes of any size or shape to be activated – even with cut-outs or additional components. Flexible hoses are used for connecting the activation modules to each other, as well as for the connection to the pipework.

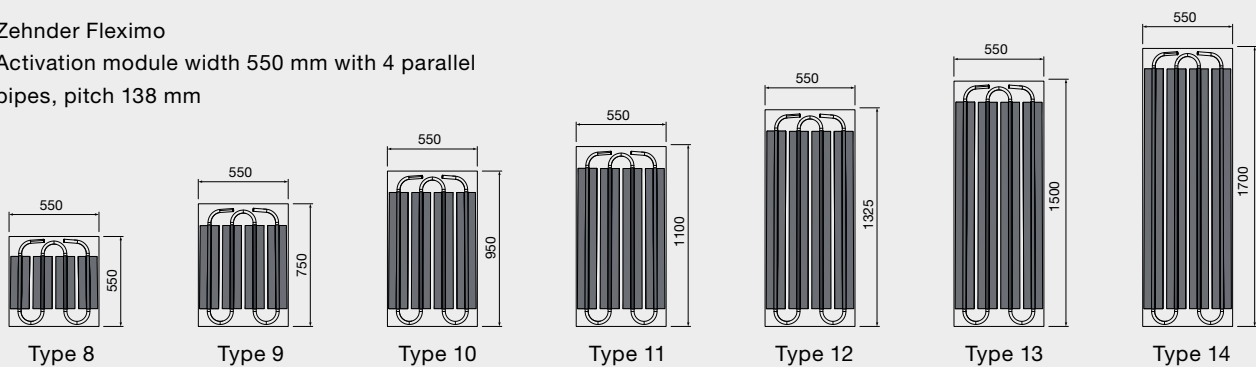
## Zehnder Fleximo

Activation module width 350 mm with 2 parallel pipes, pitch 175 mm



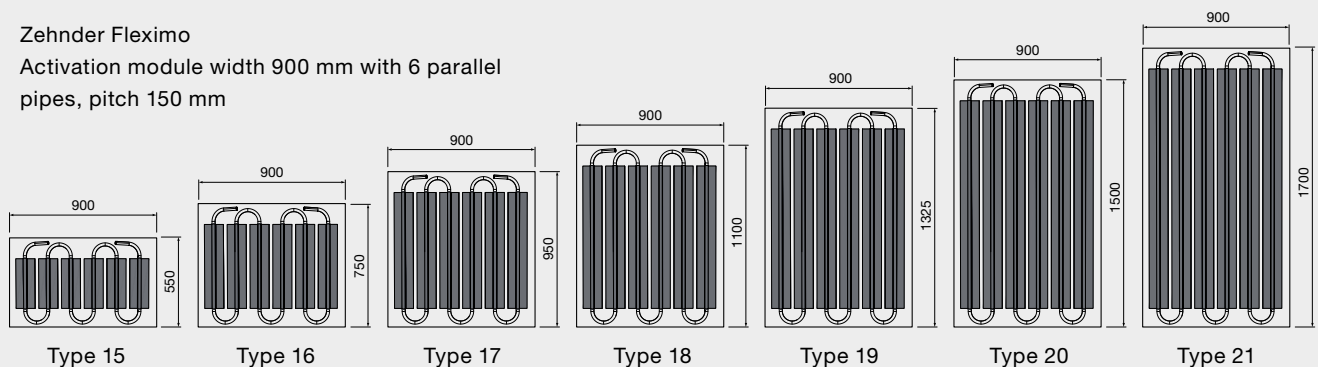
## Zehnder Fleximo

Activation module width 550 mm with 4 parallel pipes, pitch 138 mm



## Zehnder Fleximo

Activation module width 900 mm with 6 parallel pipes, pitch 150 mm



# Zehnder Fleximo – a versatile solution

The Zehnder Fleximo activation modules are mounted in dry-wall constructions and installed on site in existing metal ceilings according to the plug and play principle. The system cassettes and the ceiling substructure must be designed to handle the additional weight of the Zehnder Fleximo activation modules. A heating or cooling load calculation is necessary for determining the layout of the required activation modules.

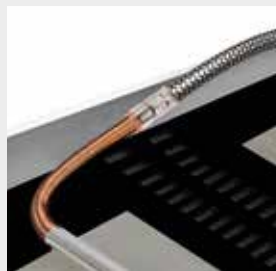
## MOUNTING TECHNOLOGY

Zehnder Fleximo is equipped with high performance self-adhesive tape. The activation module is mounted at the desired location in the clean system cassette and the activated cassette is processed as usual.

Zehnder Fleximo can be used to activate closed ceiling systems or individually suspended ceiling sails. Detailed room load calculations are required for correct dimensioning and layout.



## CONNECTOR TECHNOLOGY



Flexible hoses are used for connecting the activation modules and for the connection to a spiral circuit. Pressure losses for the pipework design and hydraulic balancing are provided in the technical data depending on the activation module size and temperature level.

Z-SI-V0820-RHC-TEC-Fleximo, en, subject to modification