fischer

TherMax.
Thermal separation
with secure hold.

fischer TherMax, the approved stand-off installation with thermal separation in external thermal insulation composite systems.

The fischer TherMax solves a problem that has been prevented by any efficient building insulation (ETICS) so far. Until now, the classic distance installation with spacer tubes or wooden blocks was the standard. But every attached threaded rod or clamp tears a gap in the thermal insulation. But not with the fischer TherMax stand-off installation system. fischer TherMax interrupts the thermal flow in the anchoring with the anti-cold cone made of glass-fiber-reinforced plastic. The cone is self-tapping and mills directly through the plaster into the insulation material. This enables economical and adjustable installation without special tools.

No chance for thermal bridges.

Building thermography shows where thermal bridges are threatening:

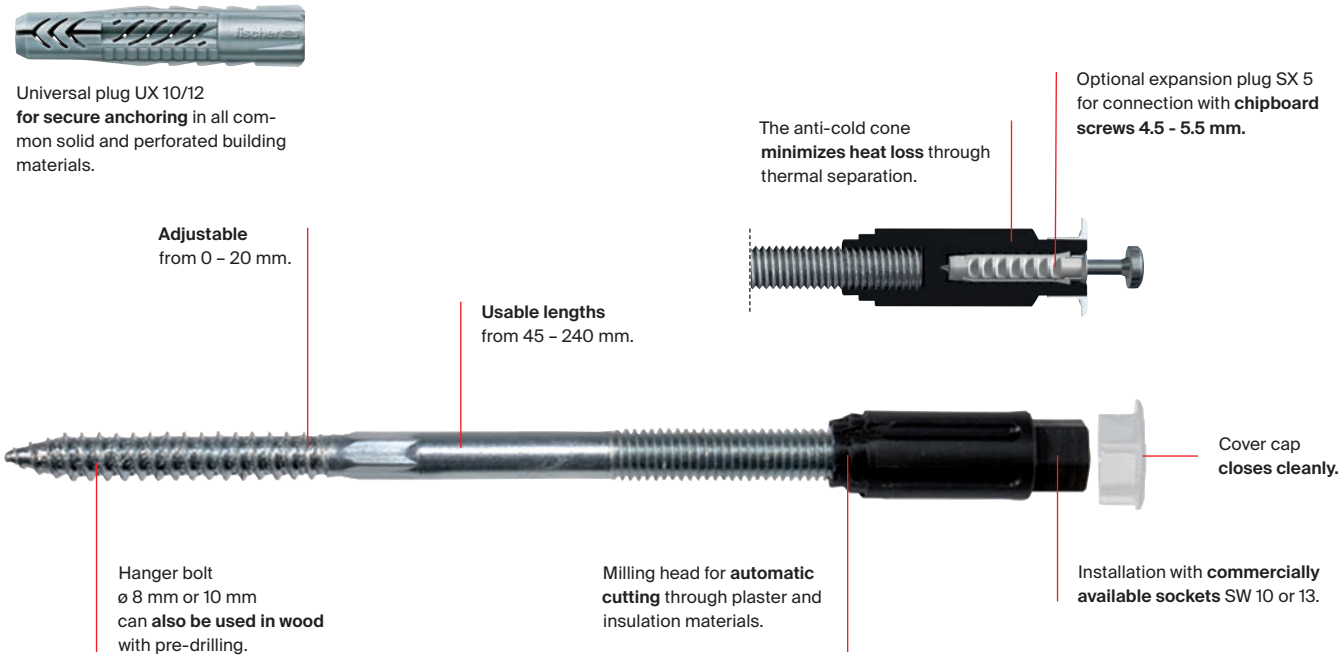
For example on windows, doors, joints and junctions. In other words, everywhere where the insulation is penetrated. This leads to higher transmission heat loss and thus to higher reheating thermal demand and higher heating costs. With fischer TherMax, the heat stays inside the building and damp spots that lead to mould are avoided.

Two systems, one goal.
Avoid thermal bridges.

TherMax 8/10

TherMax 12/16

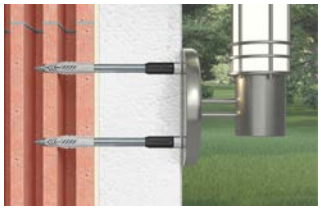
TherMax 8 and 10.
The simple form of thermal stand-off installation.



Your advantages at a glance

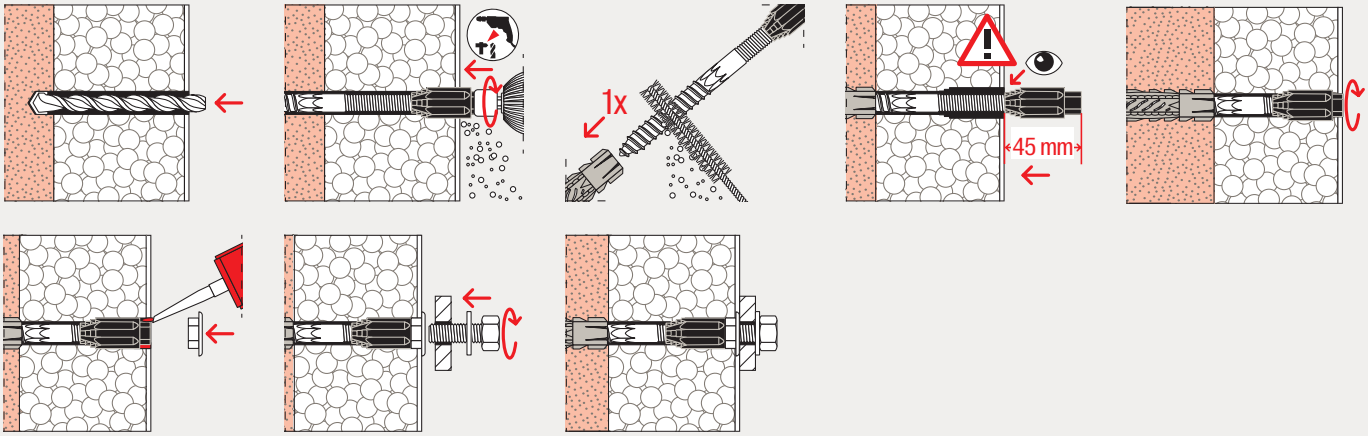
- The stand-off installation allows for the fixture to be adjusted to the exact position required, whereby pressure marks and damage to the ETICS are avoided.
- The plastic cone creates a thermal barrier between the fixture and the inner fixture, and offers an energy-optimised fixing.
- The glass-fibre-reinforced plastic cone cuts its own way through the ETICS with a positive fit, and allows for a simple and fast installation without the need for any special tools.
- Combining TherMax 8 and 10 with the universal plug UX provides a secure anchoring in the substrate.
- Without UX plug, direct mounting in wood substrate is possible after pre-drilling.

Functioning

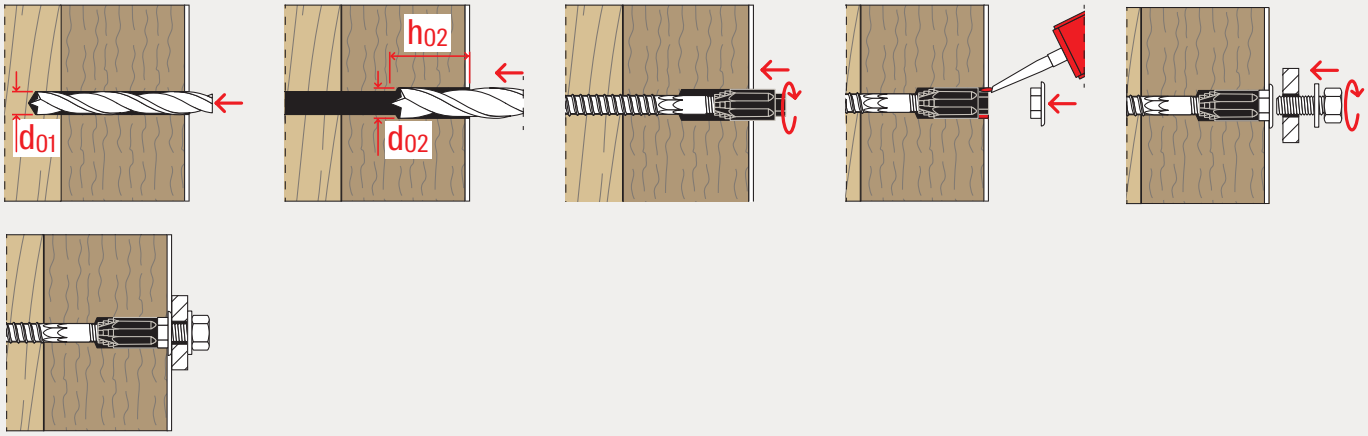


Installation

Installation in masonry



Installation in wood



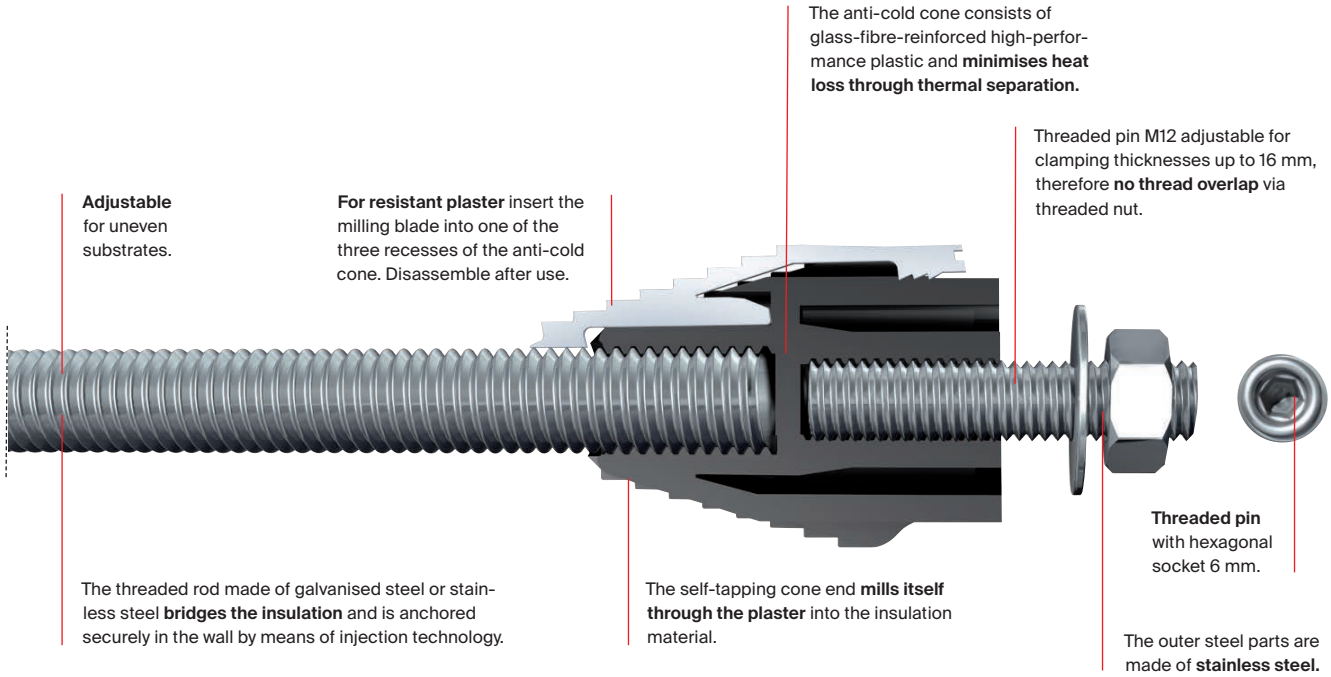
Functioning

- TherMax 8 and 10 are suitable for pre-positioned installation.
- The self-tapping, glass-fibre-reinforced cone cuts its own way through the plaster into the insulation during installation.
- The anti-cold cone uses a thermal barrier to minimise heat losses.
- Installation does not require any special tools.
- The assortment offers connection possibilities using M6/8/10 metric screws, 6.3 mm self-tapping screws, 6.0 mm chipboard screws, and 4.5 – 5.5 mm chipboard screws if using an SX 5 plug.
- For use in wood without a plug, the wood (see the footnote beneath the load table) and plaster must be pre-drilled.

TherMax 8:
d_{01} in wood = 5 mm
d_{02} in the insulation = 14 mm
h_{02} = 50 mm

TherMax 10:
d_{01} in wood = 7 mm
d_{02} in the insulation = 18 mm
h_{02} = 50 mm

TherMax 12 and 16.
The strong form of thermal stand-off installation.

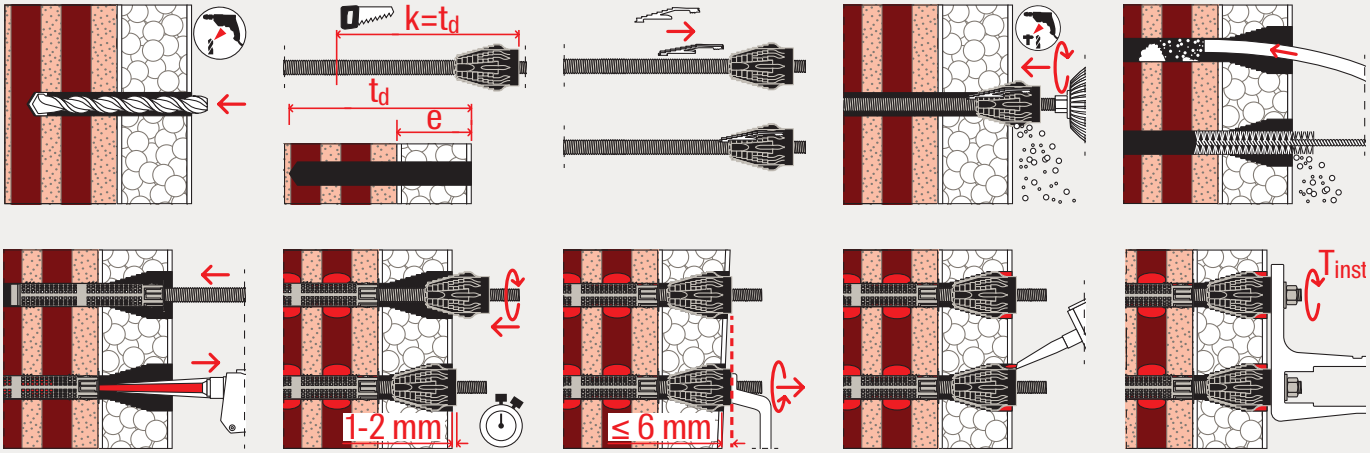


Your advantages at a glance

- When combined with the injection mortars FIS EM Plus, FIS V Plus, FIS SB and FIS Green, the stand-off installation is approved for high loads in a range of building materials. This allows for a secure fixing.
- Usable lengths of 62 to 290 mm can be covered with just one TherMax.
- The plastic cone creates a thermal barrier between the attachement part and the inner fixture and offers an energy-optimised fixing.
- The glass-fibre-reinforced plastic cone cuts its own way through the ETICS with a positive fit and allows for a simple, fast and adjustable installation without the need for any special tools.

Installation

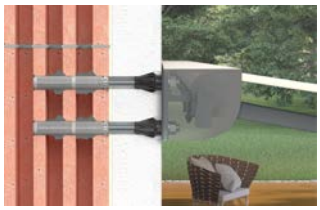
Installation



Functioning

- The systems TherMax 12 and 16 are suitable for pre-positioned installation.
- The self-tapping, glass-fibre-reinforced cone cuts its own way through the plaster into the insulation during installation.
- The anti-cold cone uses a thermal barrier to minimise heat losses.
- In the case of resistant plaster (e.g. thick cement plaster), it is recommended that the included TherMax cutting blade is used for grinding out the plaster.
- The sealing of the annular gap with the adhesive and sealant Multi MS seals the façade at plaster level.

Functioning



Approvals

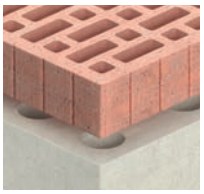
Recommendations and applications.

Recommendations

Suitable for building materials such as:


Concrete

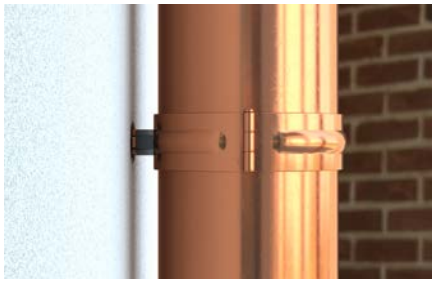

Solid brick


Perforated brick

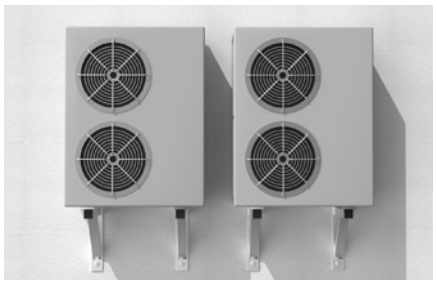

Aerated concrete


Wood
(Only TherMax 8/10)

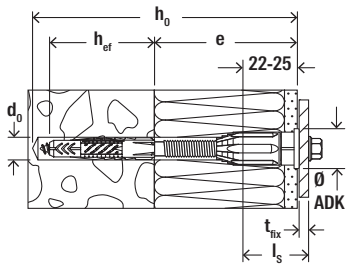
Applications TherMax 8/10



Applications TherMax 12/16



Assortment TherMax 8/10



Stand-off installation TherMax 8/10

TherMax 8 and 10

Item	Item No.	Drill hole diameter d_0 [mm]	Drill hole depth h_0 [mm]	Max. thickness of non-bearing layer e [mm]	Anchorage depth h_{ef} [mm]	Cover cap-ø ADK [mm]	Width across nut SW [mm]	Chipboard/metric/ sheet metal screw	Sales unit [pcs]
TherMax 8/60 M6	045685 [1)2)]	10	120	45 – 60	60	18	10	4,5 – 6,0/M6/6,3	20
TherMax 8/80 M6	045686 [1)2)]	10	140	60 – 80	60	18	10	4,5 – 6,0/M6/6,3	20
TherMax 8/100 M6	045687 [1)2)]	10	160	80 – 100	60	18	10	4,5 – 6,0/M6/6,3	20
TherMax 8/120 M6	045688 [1)2)]	10	180	100 – 120	60	18	10	4,5 – 6,0/M6/6,3	20
TherMax 8/140 M6	045689 [1)2)]	10	200	120 – 140	60	18	10	4,5 – 6,0/M6/6,3	20
TherMax 8/160 M6	045690 [1)2)]	10	220	140 – 160	60	18	10	4,5 – 6,0/M6/6,3	20
TherMax 8/180 M6	045691 [1)2)]	10	240	160 – 180	60	18	10	4,5 – 6,0/M6/6,3	20
TherMax 10/100 M6	045692 [1)2)]	12	160	80 – 100	70	22	13	4,5 – 6,0/M6/6,3	20
TherMax 10/120 M6	045693 [1)2)]	12	180	100 – 120	70	22	13	4,5 – 6,0/M6/6,3	20
TherMax 10/140 M6	045694 [1)2)]	12	200	120 – 140	70	22	13	4,5 – 6,0/M6/6,3	20
TherMax 10/160 M6	045695 [1)2)]	12	220	140 – 160	70	22	13	4,5 – 6,0/M6/6,3	20
TherMax 10/180 M6	045696 [1)2)]	12	240	160 – 180	70	22	13	4,5 – 6,0/M6/6,3	20
TherMax 10/200 M6	512605 [1)2)]	12	260	180 – 200	70	22	13	4,5 – 6,0/M6/6,3	20
TherMax 10/220 M6	514250 [1)2)]	12	280	200 – 220	70	22	13	4,5 – 6,0/M6/6,3	20
TherMax 10/240 M6	514251 [1)2)]	12	300	220 – 240	70	22	13	4,5 – 6,0/M6/6,3	20
TherMax 10/100 M8	045697 [2)]	12	160	80 – 100	70	22	13	M8	20
TherMax 10/120 M8	045698 [2)]	12	180	100 – 120	70	22	13	M8	20
TherMax 10/140 M8	045699 [2)]	12	200	120 – 140	70	22	13	M8	20
TherMax 10/160 M8	045700 [2)]	12	220	140 – 160	70	22	13	M8	20
TherMax 10/180 M8	514252 [2)]	12	240	160 – 180	70	22	13	M8	20
TherMax 10/200 M8	514253 [2)]	12	260	180 – 200	70	22	13	M8	20
TherMax 10/220 M8	514254 [2)]	12	280	200 – 220	70	22	13	M8	20
TherMax 10/240 M8	514255 [2)]	12	300	220 – 240	70	22	13	M8	20
TherMax 10/100 M10	045702 [2)]	12	160	80 – 100	70	22	13	M10	20
TherMax 10/120 M10	045703 [2)]	12	180	100 – 120	70	22	13	M10	20
TherMax 10/140 M10	045704 [2)]	12	200	120 – 140	70	22	13	M10	20
TherMax 10/160 M10	045705 [2)]	12	220	140 – 160	70	22	13	M10	20
TherMax 10/180 M10	514256 [2)]	12	240	160 – 180	70	22	13	M10	20
TherMax 10/200 M10	514257 [2)]	12	260	180 – 200	70	22	13	M10	20
TherMax 10/220 M10	514258 [2)]	12	280	200 – 220	70	22	13	M10	20
TherMax 10/240 M10	514259 [2)]	12	300	220 – 240	70	22	13	M10	20

[1)] Including SX 5

[2)] Min. screw length l_s = 22mm + thickness of mounting member t_{fix}; for use in wood without universal plug UX, consider drill hole diameter in footnote under load table.

Assortment TherMax 12/16

Stand-off installation TherMax 12/16

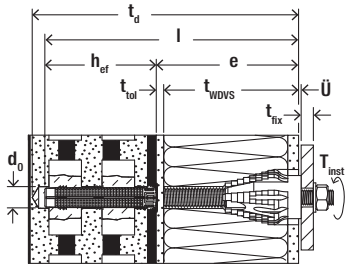
TherMax 12/110 M12

TherMax 16/170 M12

Item	Zinc-plated steel gvz Item No.	Stainless steel R Item No.	Approval DIBt	Contents	Sales unit [pcs]
TherMax 12/110 M12	**051291**	**–**	●	20 TherMax M12, 20 perforated sleeves 20 x 130, 5 bits, 5 cutting blades, 5 user manuals	20
TherMax 12/110 M12 R	**–**	**051537**	●	10 TherMax M12 R, 10 perforated sleeves 20 x 130, 3 bits, 3 cutting blades, 3 user manuals	10
TherMax 12/110 M12 (2)	**051290**	**–**	●	2 TherMax M12, 2 perforated sleeves 20 x 130, 1 bit, 1 cutting blade, 1 user manual	1
TherMax 16/170 M12	**051293**	**–**	●	20 TherMax M16, 20 perforated sleeves 20 x 200, 5 bits, 5 cutting blades, 5 applicator tip extension hoses, 5 user manuals	20
TherMax 16/170 M12 R	**–**	**051543**	●	10 TherMax M16 R, 10 perforated sleeves 20 x 200, 3 bits, 3 cutting blades, 3 applicator tip extension hoses, 3 user manuals	10
TherMax 16/170 M12 (2)	**051292**	**–**	●	2 TherMax M16, 2 perforated sleeves 20 x 200, 1 bit, 1 cutting blade, 1 applicator tip extension hose, 1 user manual	1

Installation data & Accessories TherMax 12/16.

Installation data



		Building material + insulation							Fixture			
Type	Length of TherMax incl. anti-cold cone l [mm]	Threaded rod in building material	Building material	Suitable injection anchor sleeve	Drill hole diameter d_0 [mm]	Min. anchorage depth h_{ef} [mm]	Drill hole depth t_d [mm]	Thickness of non-bearing layer e [mm]	Max. fixture thick-ness t_{fix} [mm]	Con-nection thread	Max. installa-tion torque T_{inst} [Nm]	Required resin quantity [Scale unit]
TherMax M12	240	M12	Concrete	–	14	70	h_{ef} + e	62 – 170	16[1)]	M12	20	5
	240	M12	Solid brick	–	14	80	h_{ef} + e	62 – 160	16[1)]	M12	20	6
	240	M12	Perforated brick	FIS H 20x130 K	20	130	h_{ef} + e + 10 mm	62 – 110	16[1)]	M12	20	26
	240	M12	Aerated concrete	–	14	100	h_{ef} + e	62 – 140	16[1)]	M12	20	8
TherMax M16	370	M16	Concrete	–	18	80	h_{ef} + e	62 – 290	16[1)]	M12	20	7
	370	M16	Solid brick	–	18	80	h_{ef} + e	62 – 290	16[1)]	M12	20	7
	370	M16	Perforated brick	FIS H 20x200 K	20	200	h_{ef} + e + 10 mm	62 – 170	16[1)]	M12	20	40
	370	M16	Aerated concrete	–	18	100	h_{ef} + e	62 – 270	16[1)]	M12	20	9

[1)] The setscrews may be replaced by a setscrew / fixing screw up to a length 200 mm.

Accessories for installation

Injection mortar


FIS EM Plus 390 S


FIS V Plus 360 S


FIS SB 390 S


FIS Green 300 T


Multi MS white

Item	Item No.	Approval DIBt	Approval ETA	Languages on the cartridge	Contents	Sales unit [pcs]
FIS EM Plus 390 S	**544154** [1)]	●	●	DE, EN, FR, NL, ES, PT	1 cartridge 390 ml, 2 x FIS MR Plus	6
FIS EM Plus 390 S	**544155** [1)]	●	●	EN, ZH, EL, KO, HU, PL	1 cartridge 390 ml, 2 x FIS MR Plus	6
FIS V Plus 360 S	**558752**	●	●	DE, FR, NL	1 cartridge 360 ml, 2 x FIS MR Plus	6
FIS V Plus 360 S	**558746**	●	●	EN, ES, PT	1 cartridge 360 ml, 2 x FIS MR Plus	6
FIS SB 390 S	**519451**	–	●	DE, FR, NL	1 cartridge 390 ml, 2 x FIS MR Plus	6
FIS SB 390 S	**518831**	–	●	EN, ES, PT	1 cartridge 390 ml, 2 x FIS MR Plus	6
FIS GREEN 300 T	**523245**	–	●	IT	1 cartridge 300 ml, 2 x FIS MR Plus with transparent Clip	12
FIS GREEN 300 T	**532972**	–	●	DA, SV, NO, FI	1 cartridge 300 ml, 2 x FIS MR Plus with transparent Clip	12
Multi MS white	**059389**	–	–	DE, EN	1 cartridge 290 ml	12

[1)] Dangerous goods - no express shipping possible.

Accessories TherMax 12/16.

Dispenser

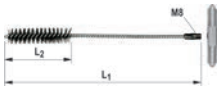
Dispenser

FIS DM S

Item	Item No.	Sales unit [pcs]
FIS DM S	**511118**	1

Accessories for drill hole cleaning

Brushes



BS

AB G

Item	Item No.	Length L_1 [mm]	Length L_2 [mm]	Brush diameter [mm]	For drill diameter [mm]	Sales unit [pcs]
BS ø 14	**078180**	250	80	16	14	1
BS ø 16/18	**078181**	250	80	20	16/18	1
BS ø 20/22	**052277**	180	80	25	20/22	1
Brush set ø14/20 mm	**048980**	–	–	–	8 - 16	1
Brush set ø20/30 mm	**048981**	–	–	–	16 - 30	1
Blow-out pump AB G	**089300**	–	–	–	–	1

Accessories

Accessories

TherMax cutting blade

TherMax thread reducing pin

Item	Item No.	Description	Contents	Sales unit [pcs]
TherMax cutting blade,	**547723**	for milling the thermal insulation with a resistant plaster	25 cutting blades	1
TherMax thread reducing pin M12/M10 R	**553834**	enables a connection thread M10	10 x thread reducing pins M12/M10 R (total length 59 mm; M12 29 mm, M10 30 mm), 10 x washers 10,5 x 25 x 3 R, 10 x hexagon nuts M10 R SW17, 1 x installation instruction	10

Loads TherMax 8/10

Stand-off installation TherMax 8 and 10					
Recommended loads[1] of a single anchor in concrete and masonry.					
Type				**TherMax 8**	**TherMax 10**
Supplied type of plug for the anchorage in the base material				UX 10 x 60	UX 12 x 70
Recommended tensile loads in the respective base material N_{rec}[2]					
Concrete[3] [4]	≥ C20/25		**[kN]**	1.00	1.00
Solid brick[3][4]	≥ Mz 12		**[kN]**	0.50	0.70
Perforated sand-lime brick[3][4]	≥ KSL 12		**[kN]**	0.60	0.80
Vertically perforated brick[4]	≥ Hlz 12		**[kN]**	0.20	0.30
Aerated concrete[3][4]	≥ AAC 4		**[kN]**	0.40	0.60
Recommended shear load V_{rec}, valid für all above mentioned base materials for the stated insulation thickness					
External Thermal Insulation Composite System[5]	≤ 240 mm		**[kN]**	0.15	0.20

[1] Required safety factors are considered.
[2] The drilling method is to be adapted to the building material used. As different joint qualities are possible, the given values only apply for installation in the brick.
[3] The given recommended tensile loads apply for fastenings with metric screws.
When using chipboard screws with diameter 6.0 mm they have to be reduced to 0.35 kN.
[4] The given recommended tensile loads apply for fastenings with metric screws.
When using a SX 5-plug chipboard screws with diameter 4.5 – 5.5 mm they have to be reduced to 0.1 kN.
[5] Values are valid for an ETICS made from PS- respectively PU-rigid foam panels. Thickness of rendering minimum 6 mm.

Stand-off installation TherMax 8 and 10				
Recommended shear loads[1] for a single anchor.				
Type			**UX 10 + TherMax 8**[3]	**UX 12 + TherMax 10**[3]
Recommended shear loads V_{rec}[1]				
External thermal insulation composite system[2]	≤ 240 mm	**[kN]**	0.15	0.20

[1] Required safety factors are considered.
[2] Values are valid for an ETICS made from PS- respectively PU-rigid foam panels. Thickness of rendering minimum 6 mm.
[3] In wood installation without plug.

Stand-off installation TherMax 8 and 10				
Recommended tensile loads[1] for a single anchor in wood.				
Type			**TherMax 8**	**TherMax 10**
Recommended tensile loads in the respective base material N_{rec}[2]				
Beech	≥ D35	**[kN]**	1.00[3]	1.00[5]
Spruce	≥ C24	**[kN]**	1.00[4]	1.00[5]

[1] Required safety factors are considered.
[2] Installation without UX-plug. Edge distances and spacings following Eurocode 5.
[3] Pre-drilled wood with diameter 6 mm.
[4] Pre-drilled wood with diameter 5 mm.
[5] Pre-drilled wood with diameter 7 mm.

Loads TherMax 12/16

Stand-off installation TherMax 12 and 16 with load-bearing anchor rod made of zinc-plated steel 8.8 and a displacement of 1 mm.

The below load table is valid for short-term loading (e.g. wind load). If the sealing of the annular gap between TherMax and plaster is assured by fischer sealant and adhesive Multi MS, KD or DKM, the TherMax version with an anchor rod on base substrate side made of zinc-plated steel may be used.

Highest permissible loads[1)5)7)] of a TherMax within an anchor group[2)] in concrete with the injection mortars FIS V Plus or FIS SB and in masonry with the injection mortar FIS V Plus.

Type	Minimum effective anchorage depth h_{ef} [4)8)] [mm]	Permissible tensile load N_{perm} [3)] [kN]	Permissible shear load at e = 62 mm V_{perm} [3)] [kN]	Permissible shear load at e = 100 mm V_{perm} [3)] [kN]	Permissible shear load at e = 120 mm V_{perm} [3)] [kN]	Permissible shear load at e = 140 mm V_{perm} [3)] [kN]	Permissible shear load at e = 160 mm V_{perm} [3)] [kN]	Permissible shear load at e = 180 mm V_{perm} [3)] [kN]	Permissible shear load at e = 200 mm V_{perm} [3)] [kN]	Permissible shear load at e = 250 mm V_{perm} [3)] [kN]	Permissible shear load at e = 300 mm V_{perm} [3)] [kN]	Minimum member thickness h_{min} [mm]	Minimum spacing $s_{min\,\parallel}$ / $s_{min\,\perp}$ [9)] [mm]	Minimum edge distance c_{min} [mm]
Concrete, cracked and non-cracked, strength class ≥ C20/25														
TherMax 12[8)]	70	3.40[6)]	1.22	0.75	0.63	0.54	0.40	0.29	0.22	0.10	0.05	100	55	55
TherMax 16[8)]	80	3.40[6)]	1.59	0.99	0.82	0.70	0.62	0.55	0.46	0.22	0.10	116	65	65
Solid brick, Mz, EN 771-1; f_b ≥ 12 N/mm²; ρ ≥ 1.8 kg/dm³; LxWxH ≥ 240x115x71 mm, NF														
TherMax 12[8)]	200	2.71	0.85	0.75	0.63	0.54	0.36	0.29	0.22	0.10	0.05	240	80/80	60
TherMax 16[8)]	200	2.71	1.29	0.99	0.82	0.70	0.62	0.55	0.46	0.22	0.10	240	80/80	60
Solid sand-lime brick, KS, EN 771; f_b ≥ 20 N/mm²; ρ ≥ 2.0 kg/dm³; LxWxH ≥ 250x240x240 mm, 8DF														
TherMax 12[8)]	50	2.86	1.22	0.75	0.63	0.54	0.40	0.29	0.22	0.10	0.05	240	80/80	60
TherMax 16[8)]	50	2.14	1.59	0.99	0.82	0.70	0.62	0.55	0.46	0.22	0.10	240	80/80	60
Vertically perforated brick type B, HLz, EN 771-1; f_b ≥ 12 N/mm²; ρ ≥ 1.0 kg/dm³; LxWxH = 370x240x237 mm resp. 500x175x237 mm														
TherMax 12[4)]	110	1.14	0.57	0.57	0.57	0.54	0.40	0.29	0.22	0.10	0.05	175	100/100	100
TherMax 16[4)]	110	1.14	0.57	0.57	0.57	0.57	0.57	0.55	0.46	0.22	0.10	175	100/100	100
Perforated sand-lime brick, KSL, EN 771-2; f_b ≥ 12 N/mm²; ρ ≥ 1.4 kg/dm³; LxWxH = 240x175x113 mm, 3DF														
TherMax 12[4)]	85	1.00	1.22	0.75	0.63	0.54	0.40	0.29	0.22	0.10	0.05	175	100/115	80
TherMax 16[4)]	85	1.00	1.14	0.99	0.82	0.70	0.62	0.55	0.46	0.22	0.10	175	100/115	80
Hollow block made of light weight concrete, Hbl, EN 771-3; f_b ≥ 2 N/mm²; ρ ≥ 1.0 kg/dm³; LxWxH = 362x240x240 mm														
TherMax 12[4)]	110	0.43	0.26	0.26	0.26	0.26	0.26	0.26	0.22	0.10	0.05	240	100/240	60
TherMax 16[4)]	180	0.71	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.22	0.10	240	100/240	60
Aerated concrete (cylindrical drill hole), EN 771-4; f_b ≥ 2 N/mm²; ρ ≥ 0.35 kg/dm³; LxWxH ≥ 599x240x249 mm														
TherMax 12[8)]	200	1.43	0.43	0.43	0.43	0.43	0.40	0.29	0.22	0.10	0.05	240	80/80	100
TherMax 16[8)]	200	1.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.22	0.10	240	80/80	100

For the design the complete approval Z-21.8-1837 issued on 21.01.2022 as well as the European Technical Assessments ETA-20/0603, ETA-20/0729 or ETA-12/0258 have to be considered.

1) The required partial safety factors for material resistance as well as a partial safety factor for load actions of γ_L = 1.4 are considered.

2) Set-up of one or more TherMax in a row in direction of shear, for which the clamping of the attachment prevents a torsion on attachment side due to a sufficient stiffness of the attachment or connecting construction. For a clamping on base substrate side only, see approval.

3) For combinations of tensile and shear loads as well as reduced spacing or edge distances (anchor groups) see approval. The values for tensile loads in masonry are valid only, if the joints of the masonry is completely filled with masonry mortar. If the joints are not filled with masonry mortar are not filled with masonry mortar and the edge distance towards the joints is less than c_{min}, the loads have to be reduced by the factor a_j = 0.75. The values for shear loads are valid only, if the joints are filled with masonry mortar. For not completely filled joints they have to be handled like a free edge and a minimum edge distance c_{min} of the anchors to the joints has to be observed. For compression loads and perforated bricks or hollow blocks see approval. Calculative assumed thickness of the attachment t_{fix} = 6 mm.

4) In vertically perforated bricks HLz, perforated sand-lime bricks KSL as well as hollow blocks made of light weight concrete Hbl the TherMax 12 (standard version) can bridge non-load bearing layers up to 110 mm and the TherMax 16 can bridge them up to 170 mm. Larger usable lengths up to 300 mm are possible, if other perforated sleeves and where required longer anchor rods are used and again the anchorage depth gets reduced - see approval.

5) The stated permissible loads are valid for anchorages in dry base substrates - use category d/d - and for temperatures up to +50 °C (resp. short-term up to +80 °C) in the area of the injection mortar and during drill hole cleaning in accordance with the approval. The load values apply to anchor rods on base substrate side made of zinc-plated steel grade 8.8 - for other steel grades or stainless steel see approval.

6) Complies with the permissible tensile load of the TherMax cone.

7) Intermediate values of the shear load may be linearly interpolated in dependence of "e", if nothing else is mentioned in the approval.

8) In solid bricks Mz and solid sand-lime bricks KS the TherMax 12 (standard version) can bridge non-load bearing layers up to 190 mm (140 mm in aerated concrete) and the TherMax 16 can bridge them up to 300 mm (270 mm in aerated concrete) - but in solid brick Mz and aerated concrete the above load values have to be reduced. In concrete the TherMax 12 (standard version) can bridge non-loadbearing layers up to 170 mm and the TherMax 16 can bridge them up to 290 mm. Larger usable lengths up to 300 mm are possible, if longer anchor rods are used and again in solid bricks Mz if the anchorage depth (compared to above values) gets reduced where required - see approval.

9) Minimum spacing with simultaneous reduction of the permissible load for each TherMax.

Loads TherMax 12/16

Stand-off installation TherMax 12 and 16 with load-bearing anchor rod made of stainless steel R-70 and a displacement of 3 mm

The below load table is valid for short-term loading (e.g. wind load). Measures for sealing see approval, section 3.2.4.
Highest permissible loads[1)5)7)] of a TherMax within an anchor group[2)] in concrete with the injection mortars FIS V Plus or FIS SB and in masonry with the injection mortar FIS V Plus.

Type	Minimum effective anchorage depth h_{ef} [4)8)] [mm]	Permissible tensile load N_{perm} [3)] [kN]	Permissible shear load at e = 62 mm V_{perm} [3)] [kN]	Permissible shear load at e = 100 mm V_{perm} [3)] [kN]	Permissible shear load at e = 120 mm V_{perm} [3)] [kN]	Permissible shear load at e = 140 mm V_{perm} [3)] [kN]	Permissible shear load at e = 160 mm V_{perm} [3)] [kN]	Permissible shear load at e = 180 mm V_{perm} [3)] [kN]	Permissible shear load at e = 200 mm V_{perm} [3)] [kN]	Permissible shear load at e = 250 mm V_{perm} [3)] [kN]	Permissible shear load at e = 300 mm V_{perm} [3)] [kN]	Minimum member thickness h_{min} [mm]	Minimum spacing $s_{min} \parallel / s_{min-\perp}$ [9)] [mm]	Minimum edge distance c_{min} [mm]
Concrete, cracked and non-cracked, strength class ≥ C20/25														
TherMax 12[8)]	70	3.40[6)]	1.22	0.75	0.63	0.54	0.47	0.42	0.38	0.30	0.15	100	55	55
TherMax 16[8)]	80	3.40[6)]	1.59	0.99	0.82	0.70	0.62	0.55	0.49	0.39	0.31	116	65	65
Solid brick, Mz, EN 771-1; $f_b \geq 12$ N/mm²; $\rho \geq 1.8$ kg/dm³; LxWxH ≥ 240x115x71 mm, NF														
TherMax 12[8)]	200	2.71	0.85	0.75	0.63	0.54	0.47	0.42	0.38	0.30	0.15	240	80/80	60
TherMax 16[8)]	200	2.71	1.29	0.99	0.82	0.70	0.62	0.55	0.49	0.39	0.31	240	80/80	60
Solid sand-lime brick, KS, EN 771; $f_b \geq 20$ N/mm²; $\rho \geq 2.0$ kg/dm³; LxWxH ≥ 250x240x240 mm, 8DF														
TherMax 12[8)]	50	2.86	1.22	0.75	0.63	0.54	0.47	0.42	0.38	0.30	0.15	240	80/80	60
TherMax 16[8)]	50	2.14	1.59	0.99	0.82	0.70	0.62	0.55	0.49	0.39	0.31	240	80/80	60
Vertically perforated brick type B, HLz, EN 771-1; $f_b \geq 12$ N/mm²; $\rho \geq 1.0$ kg/dm³; LxWxH = 370x240x237 mm resp. 500x175x237 mm														
TherMax 12[4)]	110	1.14	0.57	0.57	0.57	0.54	0.47	0.42	0.38	0.30	0.15	175	100/100	100
TherMax 16[4)]	110	1.14	0.57	0.57	0.57	0.57	0.57	0.55	0.49	0.39	0.31	175	100/100	100
Perforated sand-lime brick, KSL, EN 771-2; $f_b \geq 12$ N/mm²; $\rho \geq 1.4$ kg/dm³; LxWxH = 240x175x113 mm, 3DF														
TherMax 12[4)]	85	1.00	1.22	0.75	0.63	0.54	0.47	0.42	0.38	0.30	0.15	175	100/115	80
TherMax 16[4)]	85	1.00	1.14	0.99	0.82	0.70	0.62	0.55	0.49	0.39	0.31	175	100/115	80
Hollow block made of light weight concrete, Hbl, EN 771-3; $f_b \geq 2$ N/mm²; $\rho \geq 1.0$ kg/dm³; LxWxH = 362x240x240 mm														
TherMax 12[4)]	110	0.43	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.15	240	100/240	60
TherMax 16[4)]	180	0.71	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	240	100/240	60
Aerated concrete (cylindrical drill hole), EN 771-4; $f_b \geq 2$ N/mm²; $\rho \geq 0.35$ kg/dm³; LxWxH ≥ 599x240x249 mm														
TherMax 12[8)]	200	1.43	0.43	0.43	0.43	0.43	0.43	0.42	0.38	0.30	0.15	240	80/80	100
TherMax 16[8)]	200	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.39	0.31	240	80/80	100

For the design the complete approval Z-21.8-1837 issued on 21.01.2022 as well as the European Technical Assessments ETA-20/0603, ETA-20/0729 or ETA-12/0258 have to be considered.

1) The required partial safety factors for material resistance as well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered.

2) Set-up of one or more TherMax in a row in direction of shear, for which the clamping of the attachment prevents a torsion on attachment side due to a sufficient stiffness of the attachment or connecting construction. For a clamping on base substrate side only, see approval.

3) For combinations of tensile and shear loads as well as reduced spacing or edge distances (anchor groups) see approval. The values for tensile loads in masonry are valid only, if the joints of the masonry is completely filled with masonry mortar. If the joints are not filled with masonry mortar are not filled with masonry mortar and the edge distance towards the joints is less than c_{min}, the loads have to be reduced by the factor $a_j = 0.75$. The values for shear loads are valid only, if the joints are filled with masonry mortar. For not completely filled joints they have to be handled like a free edge and a minimum edge distance c_{min} of the anchors to the joints has to be observed. For compression loads and perforated bricks or hollow blocks see approval. Calculative assumed thickness of the attachment $t_{fix} = 6$ mm.

4) In vertically perforated bricks HLz, perforated sand-lime bricks KSL as well as hollow blocks made of light weight concrete Hbl the TherMax 12 (standard version) can bridge non-load bearing layers up to 110 mm and the TherMax 16 can bridge them up to 170 mm. Larger usable lengths up to 300 mm are possible, if other perforated sleeves and where required longer anchor rods are used and again the anchorage depth gets reduced - see approval.

5) The stated permissible loads are valid for anchorages in dry base substrates - use category d/d - and for temperatures up to +50 °C (resp. short-term up to +80 °C) in the area of the injection mortar and during drill hole cleaning in accordance with the approval. The load values apply to anchor rods on base substrate side made of stainless steel of the grade A4-70.

6) Complies with the permissible tensile load of the TherMax cone.

7) Intermediate values of the shear load may be linearly interpolated in dependence of "e", if nothing else is mentioned in the approval.

8) In solid bricks Mz and solid sand-lime bricks KS the TherMax 12 (standard version) can bridge non-load bearing layers up to 190 mm (140 mm in aerated concrete) and the TherMax 16 can bridge them up to 300 mm (270 mm in aerated concrete) - but in solid brick Mz and aerated concrete the above load values have to be reduced. In concrete the TherMax 12 (standard version) can bridge non-loadbearing layers up to 170 mm and the TherMax 16 can bridge them up to 290 mm. Larger usable lengths up to 300 mm are possible, if longer anchor rods are used and again in solid bricks Mz if the anchorage depth (compared to above values) gets reduced where required - see approval.

9) Minimum spacing with simultaneous reduction of the permissible load for each TherMax.

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