

Technical data

Injection anchor sleeve with net FIS H N



FIS H N

Item	Item No.	Drill hole diameter	Min. drill hole depth	Min. anchorage depth anchor	Fill quantity per sleeve	Match	Sales unit
		d ₀ [mm]	h ₁ [mm]	h _v [mm]	[scale units]		[pcs]
FIS H 16 x 85 N	050470	16	95	85	15	Ø8/M8	20
FIS H 18 x 85 N	050472	18	95	85	17	Ø10/M10	20
FIS H 20 x 85 N	050474	20	95	90	18	Ø12/M12	20

Stand-off installation TherMax 8/10

The thermally separated stand-off installation in external thermal insulation composite systems (ETICS)



External lighting



Down pipes

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Applications

For the thermally separated fixing of:

- Signs
- Lighting
- Letter boxes
- Motion detectors
- Downpipes
- Lightning rods
- Blind guide rails

Advantages

- 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.

Building materials

- Concrete
- Vertically perforated brick
- Hollow blocks made from lightweight concrete
- Perforated sand-lime brick
- Solid sand-lime brick
- Building brick
- Aerated concrete
- Wood

Functioning

- The TherMax 8 and 10 systems 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 without any special tools.
- For use in wood without plug, the wood (footnote below load table) as well as the plaster has to be pre-drilled:

TherMax 8:

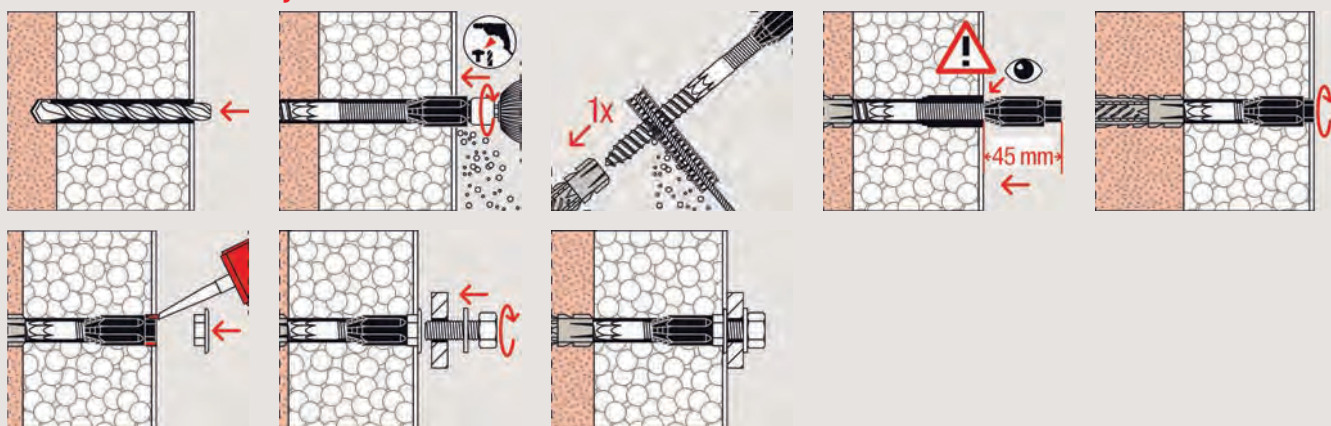
$d_{02} = 14 \text{ mm}$, $h_{02} = 50 \text{ mm}$;

TherMax 10:

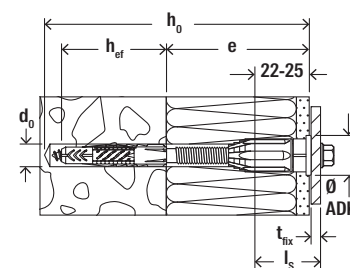
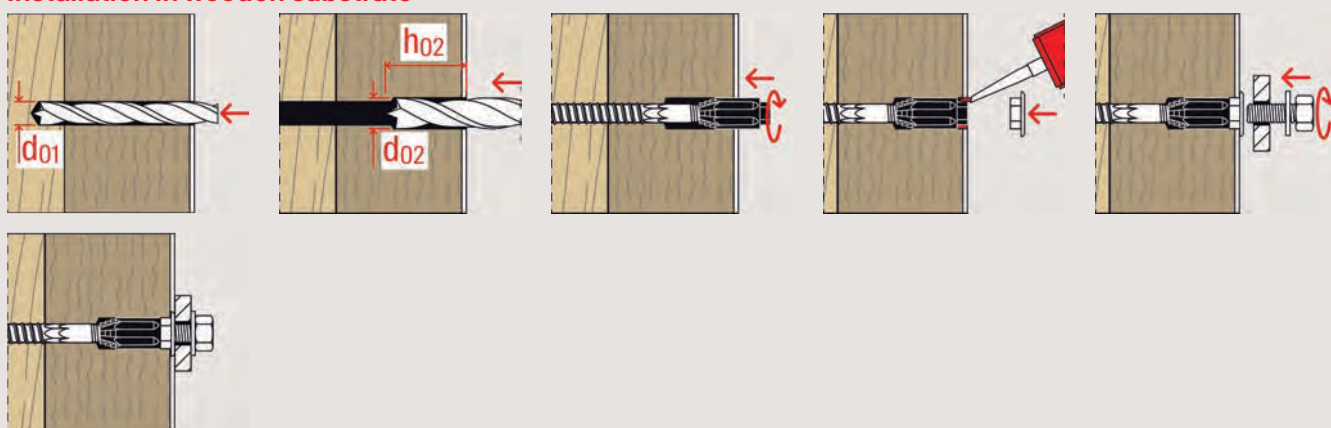
$d_{02} = 18 \text{ mm}$, $h_{02} = 50 \text{ mm}$

- The extensive range features fitting options with metric screws (M6/8/10), sheet screws (6.3 mm), chipboard screws (6.0 mm) or chipboard screws (4.5 - 5.5 mm) when using an SX 5 expansion plug.

Installation in masonry



Installation in wooden substrate



Technical data

Stand-off installation TherMax 8/10

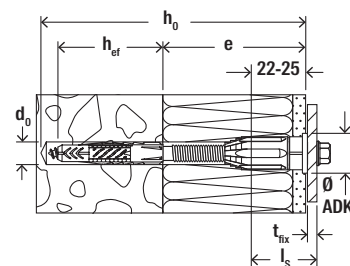


TherMax 8 and 10

		Drill hole diameter	Drill hole depth	Max. thickness of non-bearing layer	Anchorage depth	Cover cap-Ø	Width across nut	Chipboard / metric / sheet metal screw	Sales unit
	Item No.	d ₀ [mm]	h ₀ [mm]	e [mm]	h _{ef} [mm]	ADK [mm]	SW [mm]		[pcs]
Item									
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

1) including SX 5

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



Technical data

Stand-off installation TherMax 8/10



TherMax 8 and 10

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		Drill hole diameter	Drill hole depth	Max. thickness of non-bearing layer	Anchorage depth	Cover cap-Ø	Width across nut	Chipboard / metric / sheet metal screw	Sales unit
	Item No.	d ₀ [mm]	h ₀ [mm]	e [mm]	h _{ef} [mm]	ADK [mm]	SW [mm]		[pcs]
Item									
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.

Loads

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)}	$\geq C20/25$	[kN]	1.00	1.00
Solid brick ^{3) 4)}	$\geq Mz 12$	[kN]	0.50	0.70
Perforated sand-lime brick ^{3) 4)}	$\geq KSL 12$	[kN]	0.60	0.80
Vertically perforated brick ⁴⁾	$\geq Hlz 12$	[kN]	0.20	0.30
Aerated concrete ^{3) 4)}	$\geq AAC 4$	[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.

Loads

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.

Loads

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	$\geq D35$	[kN]	1.00 ³⁾	1.00 ⁵⁾
Spruce	$\geq C24$	[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.

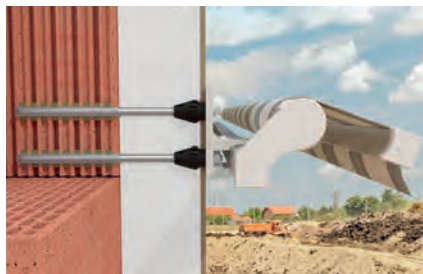
³⁾ Pre-drilled wood with diameter 6 mm.

⁴⁾ Pre-drilled wood with diameter 5 mm.

⁵⁾ Pre-drilled wood with diameter 7 mm.

Stand-off installation TherMax 12/16

The approved stand-off installation with thermal barrier in external thermal insulation composite systems



Awnings



Satellite dishes and air conditioning units

Applications

For the thermally separated fixing of:

- Awnings
- Canopies
- French balcony railings
- Air conditioning units
- Satellite dishes

Advantages

- 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 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 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, fast and adjustable installation without the need for any special tools.

Certificates



Building materials

Approved for:

- Concrete, cracked and non-cracked
- Vertically perforated brick
- Hollow blocks made from lightweight concrete
- Perforated sand-lime brick
- Solid sand-lime brick
- Solid brick
- Aerated concrete

Versions

- Zinc-plated steel
- Stainless steel

Functioning

- The TherMax 12 and 16 systems 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 TherMax cutting blade included is used for grinding out the plaster.
- The sealing of the annular gap with sealing adhesive Multi MS seals the facade at plaster level.

See also

FIS EM Plus mortar



FIS V Plus mortar

page



FIS SB mortar

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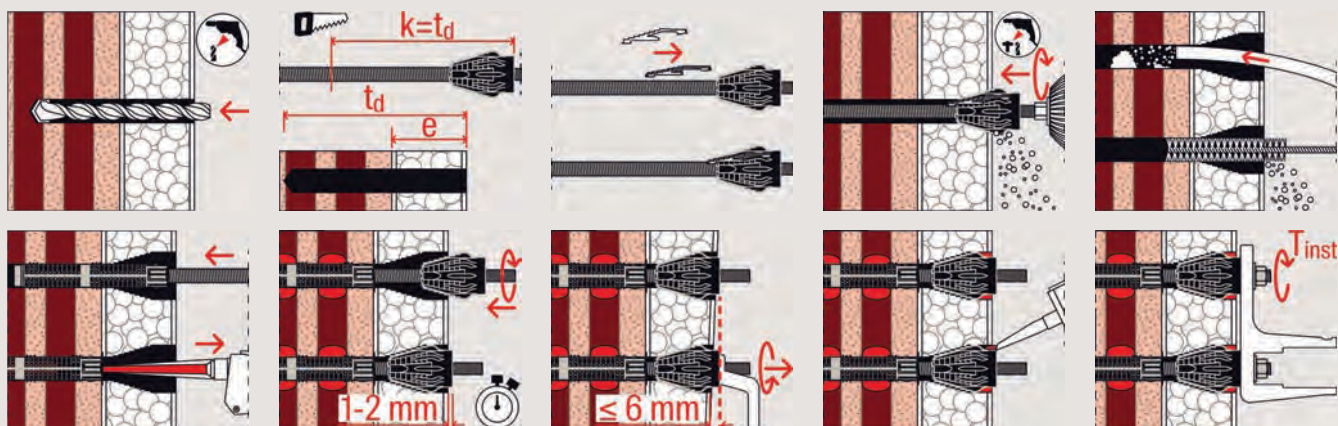


FIS Green mortar

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Installation TherMax 12/16



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Technical data

Stand-off installation TherMax 12/16

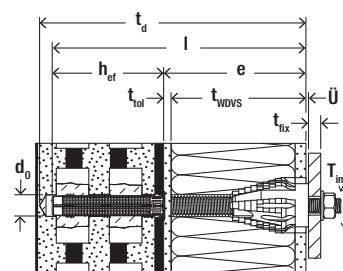


TherMax 12/110 M12

TherMax 16/170 M12

	Zinc-plated steel	Stainless steel	Approval	Contents	Sales unit
	Item No.	Item No.			[pcs]
Item	gvz	R	DIBt		
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



Type	Length of TherMax incl. anti-cold cone l [mm]	Building material + insulation		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]	Fixture	Con-nection thread	Max. installation torque T _{inst} [Nm]	Required resin quantity [Scale unit]
		Threaded rod in building material	Building material						Max. fixture thickness t _{fix} [mm]			
TherMax M 12	240	M 12	Concrete	-	14	70	h _{ef} + e	62 - 170	16 ¹⁾	M 12	20	5
	240	M 12	Solid brick	-	14	80	h _{ef} + e	62 - 160	16 ¹⁾	M 12	20	6
	240	M 12	Perforated brick	FIS H 20x130 K	20	130	h _{ef} + e + 10 mm	62 - 110	16 ¹⁾	M 12	20	26
	240	M 12	Aerated concrete	-	14	100	h _{ef} + e	62 - 140	16 ¹⁾	M 12	20	8
TherMax M 16	370	M 16	Concrete	-	18	80	h _{ef} + e	62 - 290	16 ¹⁾	M 12	20	7
	370	M 16	Solid brick	-	18	80	h _{ef} + e	62 - 290	16 ¹⁾	M 12	20	7
	370	M 16	Perforated brick	FIS H 20x200 K	20	200	h _{ef} + e + 10 mm	62 - 170	16 ¹⁾	M 12	20	40
	370	M 16	Aerated concrete	-	18	100	h _{ef} + e	62 - 270	16 ¹⁾	M 12	20	9

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

Accessories installation

Injection mortar



FIS EM Plus 390 S



FIS V Plus 360 S



FIS Green 300 T



FIS SB 390 S



Multi MS white

Item	Item No.	Approval		Languages on the cartridge	Contents	Sales unit [pcs]
		DIBt	ETA			
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 (EN,ES,PT)	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	522989	—	●	FR	1 cartridge 300 ml, 2 x FIS MR Plus with transparent Clip	4
FIS Green 300 T	523245	—	●	IT	1 cartridge 300 ml, 2 x FIS MR Plus with transparent Clip	12
FIS Green 300 T	538219	—	●	CS, SK	1 cartridge 300 ml, 2 x FIS MR Plus	12
FIS Green 300 T	532972	—	●	DA, SV, NO, FI	1 cartridge 300 ml, 2 x FIS MR Plus with transparent Clip	12
KD white 290ML	059389	—	—	DE, EN	1 cartridge 290 ml	12

¹⁾ Dangerous goods - no express shipping possible.

Accessories for drill hole cleaning

Brushes



BS

	Item No.	Length L ₁ [mm]	Length L ₂ [mm]	Brush diameter [mm]	For drill diameter [mm]	Sales unit [pcs]
Item						
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

Accessories for drill hole cleaning

Blow-out pump



AB G

	Item No.	Sales unit [pcs]
Item		
Blow-out pump AB G	089300	1

Accessories

Accessories



TherMax cutting blade



TherMax thread reducing pin

	Item No.	Description	Sales unit [pcs]
Item			
TherMax cutting blade, 25 pcs	547723	for milling the thermal insulation with a resistant plaster	1
TherMax thread reducing pin M12/M10 A4	553834	enables a connection thread M10	10

Loads

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 all-round sealing KD, the TherMax version with an anchor rod on base substrate side made of zinc-plated steel may be used.

Highest permissible loads¹⁾⁵⁾⁷⁾ of a TherMax within an anchor group²⁾ 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 anchor-age 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 $\geq C20/25$														
TherMax 12 ⁸⁾	70	3,40 ⁶⁾	1,22	0,75	0,63	0,54	0,4	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; $f_b \geq 12$ N/mm²; $\rho \geq 1,8$ kg/dm³; $LxWxH \geq 240x115x71$ 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; $f_b \geq 20$ N/mm²; $\rho \geq 2,0$ kg/dm³; $LxWxH \geq 250x240x240$ 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	0,7	0,62	0,55	0,46	0,22	0,10	240	80/80	60
Vertically perforated brick type B, HLZ, EN 771-1; $f_b \geq 12$ 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	0,40	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; $f_b \geq 12$ 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	0,40	0,29	0,22	0,10	0,05	175	100/115	80
TherMax 16 ⁴⁾	85	1,00	1,14	0,99	0,82	0,7	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; $f_b \geq 2$ 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	0,22	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; $f_b \geq 2$ N/mm²; $\rho \geq 0,35$ kg/dm³; $LxWxH \geq 599x240x249$ 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 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 edge distances or spacings (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 $a_s = 0,75$. 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 spacings for at the same time reduced permissible loads, where required.

Loads

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 loads⁷⁾⁹⁾ of a TherMax within an anchor group⁸⁾ 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 $\geq C20/25$														
TherMax 12 ⁸⁾	70	3,40 ⁶⁾	1,22	0,75	0,63	0,54	0,4	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; $f_b \geq 12$ N/mm²; $\rho \geq 1,8$ kg/dm³; $LxWxH \geq 240x115x71$ 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; $f_b \geq 20$ N/mm²; $\rho \geq 2,0$ kg/dm³; $LxWxH \geq 250x240x240$ 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	0,7	0,62	0,55	0,46	0,22	0,10	240	80/80	60
Vertically perforated brick type B, HLZ, EN 771-1; $f_b \geq 12$ N/mm²; $\rho \geq 1,0$ kg/dm³; $LxWxH = 370x240x237$ mm resp. $500x175x237$ mm														
TherMax 12 ⁸⁾	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 ⁸⁾	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; $f_b \geq 12$ N/mm²; $\rho \geq 1,4$ kg/dm³; $LxWxH = 240x175x113$ mm, 3DF														
TherMax 12 ⁸⁾	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 ⁸⁾	85	1,00	1,14	0,99	0,82	0,7	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; $f_b \geq 2$ N/mm²; $\rho \geq 1,0$ kg/dm³; $LxWxH = 362x240x240$ mm														
TherMax 12 ⁸⁾	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 ⁸⁾	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; $f_b \geq 2$ N/mm²; $\rho \geq 0,35$ kg/dm³; $LxWxH \geq 599x240x249$ 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 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 edge distances or spacings (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 $a_e = 0,75$. 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 spacings for at the same time reduced permissible loads, where required.