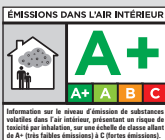


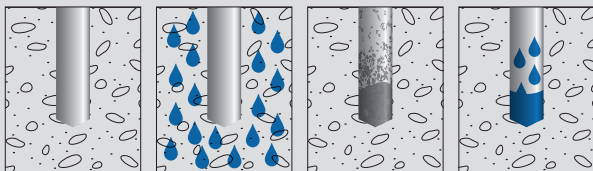
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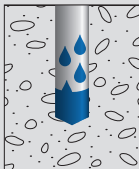
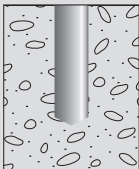
fischer FIS EM Plus



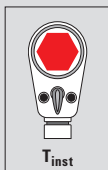
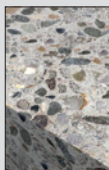
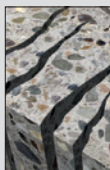
D	Gebrauchsanweisung	HR	Upute za instalaciju
GB	Operating instructions	SRB	Uputstvo za instalaciju
F	Mode d'emploi	TR	Kurulum talimatları
NL	Montagehandleiding	GR	Οδηγίες Εγκατάστασης
I	Istruzioni per l'installazione	BG	Инструкции за инсталиране
E	Instrucciones de uso	RUS	Инструкция по установке
P	Instruções de utilização	UA	Інструкція з використання
DK	Installationsvejledning	KZ	Қолдану нұсқаулығы
S	Installationsinstruktioner	RC	使用说明书
N	Installasjonsveiledning	J	取扱説明書
FIN	Asennusohjeet	ROK	사용 설명서
IS	Notkunarleiðbeiningar	RI	Panduan Penggunaan
EST	Kasutusjuhend	UAE	تعليمات الاستخدام
LV	Lietošanas instrukcija		
LT	Naudojimo instrukcija		
PL	Instrukcja instalacji		
CZ	Návod k instalaci		
SK	Návod na používanie		
H	Szerelési útmutató		
RO	Instrucțiuni de utilizare		
SL	Navodila za namestitve		



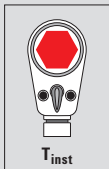
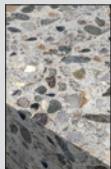
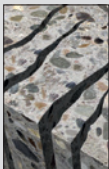
(D)	Trockener Beton	Nasser Beton	Verschmutztes Bohrloch	Wassergefülltes Bohrloch
(GB)	Dry concrete	Water saturated concrete	Contaminated drill hole	Water filled borehole
(F)	Béton sec	Béton humide	Perçage non dépolvé	Trou inondé
(NL)	Droog beton	Met water verzadigd beton	Vervuild boorgat	Met water gevuld boorgat
(I)	Calcestruzzo secco	Calcestruzzo saturo d'acqua	Foro sporco	Foro pieno d'acqua nel calcestruzzo
(E)	Hormigón seco	Hormigón saturado de agua	Agujero de taladrado sucio	Taladro lleno de agua en hormigón
(P)	Betão seco	Betão saturado de água	Furo com sujidade	Furo cheio de água
(DK)	Tør beton	Vandmættet beton	Tilsmudset borehul	Vandfyldt borehul
(S)	Torr betong	Vattenmättad betong	Smutsigt hål	Vattenfyllt hål
(N)	Tørr betong	Vannmettet betong	Tilskitnet borehull	Vannfylte borehull
(FIN)	Kuiva betony	Veden kylästämä betoni	Likaantunut poranreikä	Vedellä täyttynyt porareikä
(IS)	Purr steinsteypa	Blaut steinsteypa	Óhrein borhola	Vatnsfyllt borhola
(EST)	Kuivbetoon	Märgbetoon	Mustunud puuriauk	Veega täidetud puuriauk
(LV)	Sauss betons	Mitrš betons	Piesārņots urbums	Urbums ar ūdeni
(LT)	Sausas betonas	Drėgnas betonas	Užteršta išgręžta skylė	Vandens pripildyta išgręžta skylė
(PL)	Beton suchy wodą	Beton nasycony wodą	Zabrudzony wywiercony otwór	Wywiercony otwór wypełniony
(CZ)	Suchý beton	Mokrý beton otvory vyvrtané do	Znečištěný vývrt	Naplněné vodou
(SK)	Suchý betón	Vodou nasýtený betón	Znečistený vývrt	Vodou naplnený otvor vyvrtaný
(H)	Száraz beton	Nedves beton	Szennyezett furat	Vízzel töltött furat
(RO)	Beton uscat	Beton ud	Gaură forată contaminată	Gaură forată umplută cu apă
(SLO)	Suh beton	Moker beton	Umazana izvrtina	Z vodo napolnjena izvrtina



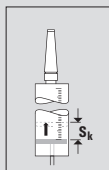
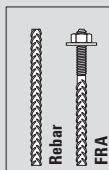
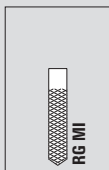
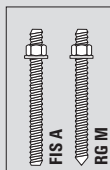
HR	Suhi beton	Mokri beton	Zaprljani provrt	Vodom napunjen provrt
SRB	Suv beton	Mokar beton	Zaprljan provrt	Provrt napunjen vodom
TR	Kuru beton	Yaş beton	Kirli delik	Su dolu delik
GR	Στεγνό μπετόν	Υγρό μπετόν	Βρώμικη τρύπα	Τρύπα γεμάτη νερό
BG	Сух бетон	Мокър бетон	Замърсен отвор	Пълен с вода отвор
RUS	Сухой бетон	Водонасыщенный бетон	Загрязненное отверстие	Отверстие в бетоне, заполненное водой
UA	Сухий бетон	Водонасичений бетон	Забруднений отвір	Заповнений водою отвір
KZ	Құрғақ бетон	Ылғалды бетон	Ластанған саңылау	Сумен толтырылған саңылау
RC	干燥混凝土	湿混凝土	受污的钻孔	注水的钻孔
J	いたベトン	湿ったベトン	汚れた掘削孔	水がたまった掘削孔
ROK	건조 콘크리트	습윤 콘크리트	이물질이 삽입된 드릴 구멍	물이 찬 드릴 구멍
RI	Beton kering	Beton basah	Lubang bor terkontaminasi	Lubang bor terisi air
UAE	خرسانة جافة	خرسانة رطبة	ثقب ملوث	ثقب ممتلئ بالماء



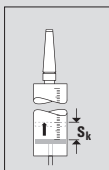
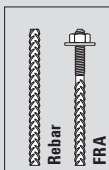
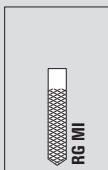
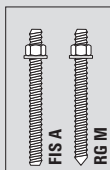
D	Gerissener Beton	Ungerissener Beton	Bewehrungsanschluss	Drehmoment	Verarbeitungszeit
GB	Cracked concrete	Non-cracked concrete	Reinforcement connection	Required torque	Open time
F	Béton fissuré	Béton non fissuré	Scellement d'armatures	Couple	Temps de manipulation
NL	Gescheurd beton	Ongescheurd beton	Wapeningsaansluiting	Draaimoment	Verwerkingstijd
I	Calcestruzzo fessurato	Calcestruzzo non fessurato	Ferri di ripresa	Coppia	Tempo di lavorazione
E	Hormigón agrietado	Hormigón sin grietas	Conexión de refuerzo	Par	Tiempo de tratamiento
P	Betão fissurado	Betão não fissurado	Conetor de reforço	Binário	Tempo de processamento
DK	Revnet beton	Ikkerevnet beton	Armerings-tilslutninger	Tilspændingsmoment	Forarbejdsningstid
S	Sprucken betong	Ej sprucken betong	Armeringsanslutning	Vridmoment	Bearbetningstid
N	Betong med riss	Betong uten riss	Armeringsforbindelse	Dreiemoment	Bearbeidelsestid
FIN	Haljennut betoni	Halkeamaton betoni	Vahvistusliitântä	Vääntömomentti	Käsittelyaika
IS	Sprungin steypa	Óbrotin steinsteypa	Tenging við styrkingu	Snúningsátak	Vinnslutími
EST	Pragunenud betoon	Pragudeta betoon	Sarrusühendus	Pöördemoment	Töötlemissaeg
LV	Betons ar plaisām	Betons bez plaisām	Stiegrojuma savienojums	Griezies moments	Apstrādājamības laiks
LT	Sutrūkinėjęs betonas	Vientisas betonas	Armatūros sujungimo elementas	Sukimo momentas	Darbo su medžiaga laikas
PL	Beton spękany	Beton niespękany	Złącze zbrojarskie	Moment dokręcenia	Czas żelowania
CZ	Beton s trhlinami	Beton bez trhlin	Připojka výztuže	Utahovací moment	Doba zpracování
SK	Betón s trhlinami	Betón bez trhlin	Styková výstuž	Utahovací moment	Doba spracovania
H	Repedéses beton	Repedésmentes beton	Betonvasalatsatlakozás	Forgatónyomaték	Feldolgozási idő
RO	Beton fisurat	Beton fără fisuri	Racord de armătură	Cuplu	Timp de punere în operă
SLD	Razpokan beton	Nerazpokan beton	Priključek za armaturo	Navor	Čas obdelave



HR	Ispucani beton	Neispucani beton	Priključak armature	Okretni moment	Vrijeme obrade
SRB	Ispucao beton	Neispucao beton	Priključak armature	Obrtni moment	Vreme obrade
TR	Çatlamış beton	Çatlamamış beton	Destek bağlantısı	Tork	Kullanma süresi
GR	Μπετόν με ρωγμές	Μπετόν χωρίς ρωγμές	Σύνδεση οπλισμού	Ροπή σύφιξης	Χρόνος επεξεργασίας
BG	Напукан бетон	Ненапукан бетон	Връзка за армировка	Въртящ момент	Време за обработка
RUS	Треснутый бетон	Целый бетон	Соединитель армирования	Крутящий момент	Время обработки
UA	Тріснутий бетон	Бетон у зоні стиснення	Арматурне пруття	Крутний момент	Час обробки
KZ	Жарықтары бар бетон	Бүтін бетон	Арматуралау қосылымы	Айналдыру моменті	Өңделу уақыты
RC	有裂缝的混凝土	无裂缝的混凝土	钢筋连接件	扭矩	加工时间
J	ひび割れがあるベトン	ひび割れのないベトン	強化コネクタ	トルク	加工時間
ROK	균열 콘크리트	비균열 콘크리트	보강재 연결	토크	작업 시간
RI	Beton retak	Beton tidak licin	Sambungan penguat	Torsi	Waktu pemrosesan
UAE	خرسانة متصدعة	خرسانة غير متصدعة	وصلة حديد مسلح	عزم الدوران	وقت التصنيع








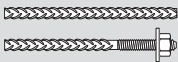


D	Aushärtezeit	Ankerstangen	Innengewindeanker	Bewehrungsstab / Bewehrungsanker	Skalenteile
GB	Hardening time	Anchor rods	Internal thread anchors	Reinforcement rod / Reinforcement anchor	Scale divisions
F	Temps de durcissement	Tiges filetées	Douilles taraudées	Barres d'armatures / Ancrage d'armature	Graduations
NL	Uithardtijd	Ankerstangen	Binnendraadanker	Wapeningsstaaf / Wapeningsanker	Schaalonderdelen
I	Tempo di indurimento	Barre di ancoraggio	Ancoraggio con filettatura interna	Ferro di ripresa / Ancoraggio di ripresa	Divisioni di scala
E	Tiempo de endurecimiento	Barras de anclaje	Anclaje de rosca interior	Barra de refuerzo / Anclaje de refuerzo	Unidades de escala
P	Tempo de endurecimento	Tirantes de ancoragem	Ancoragem de rosca interna	Barra de armação / Ancoragem de reforço	Intervalos de gradação
DK	Hærdetid	Gevindstænger	Anker med indvendigt gevind	Armeringsstav / Armeringsanker	Skalatrin
S	Hårdningstid	Förankringsstångar	Ankare med innergånga	Armeringsjärn / Armeringsankare	Skaldelar
N	Herdetid	Ankerstenger	Innvendig gjengeanker	Wapeningsstaaf / Wapeningsanker	Skaladeler
FIN	Kovettumisaika	Harustangot	Sisäkierreankkuri	Tartuntateräs / Tartuntaankkuri	Asteikkojaot
IS	Pornunartími	Festistangir	Festing með skrúfgangi að innanverðu	Styrktarteinn / Styrktarfesting	Mælikvarði
EST	Kõvastumisaeg	Ankurvardad	Sisekeermega ankur	Sarrusvarras / Sarrusankur	Skaala jaotused
LV	Sacietēšanas laiks	Enkura stienis	Iekšējās vītnes enkurs	Enkura stiegrojuma / Enkura stienis	Skalas iedaļas
LT	Kietėjimo laikas	Inkariniai strypai	Strypas su vidiniu sriegiu	Armatūrinis strypas / Armatūrinis inkaras	Skalės padalos
PL	Czas wiązania	Kotwy	Kotwy z gwintem wewnętrznym	Pręt zbrojarski / Kotwa zbrojarska	Podziałki skali
CZ	Doba vytvrzení	Kotevní tyče	Svorník s vnitřním závitem	Výztužná tyč / Kotva výztuže	Díly na stupnici
SK	Doba vytvrdnutia	Kotviace tyče	Kotva s vnútorným závitom	Výstužný prút / Vystužovacia kotva	Diely na stupnici
H	Kikeményedési idő	Horgonyrudak	Belsőmenetes horgony	Betonvas rúd / Horgonyzó vas	Skálarészértekek
RO	Timp de întărire	Bare de ancorare	Ancoră cu filet interior	Tijă de armătură / Ancoră de armătură	Diviziuni scală
SLD	Čas strjevanja	Sidra	Sidro z notranjim navojem	Armaturna palica / Sidro armature	Razdelki na skali



HR	Vrijeme stvrdnjavanja	Sidrene šipke	Sidro s unutrašnjim navojem	Armaturna šipka / Armaturno sidro	Dijelovi skale
SRB	Vreme otvrdnjavanja	Šipke za ankerovanje	Kotva s unutrašnjim navojem	Armaturna šipka / Armaturna kotva	Delovi skale
TR	Sertleşme süresi	Dübel çubukları	İçten dişli dübel	Takviye çubuğu / Takviye demiri	Kadran bölümleri
GR	Χρόνος σκλήρυνσης	Ντιζες αγκύρωσης	Αγκύρια εσωτερικού σπειρώματος	Ράβδος οπλισμού / Αγκύριο οπλισμού	Διαβαθμίσεις κλίμακας
BG	Време за втвърдяване	Анкерни пръти	Анкерен болт с вътрешна резба	Армировъчен прът / Армировъчен анкерен болт	Части на скалата
RUS	Время отверждения	Анкерные болты	Анкеры с внутренней резьбой	Арматурный стержень / Арматурный анкер	Деление шкалы
UA	Час затвердіння	Анкерні шпильки	Анкер із внутрішнім різьбленням	Арматурний стрижень / Арматурний анкер	Поділки шкали
KZ	Қатаю уақыты	Анкерлік болттары	Ішкі бұрандасы бар анкерлер	Арматуралық өзек / Арматуралық анкері	Шәкіл бөліктері
RC	硬化时间	系杆	内部螺纹系杆	钢筋 / 钢筋锚杆	刻度
J	凝固時間	アンカーロッド	めねじアンカー	鉄筋 / 強化アンカー	目盛り分割
ROK	경화 시간	앵커 로드	頂睡 蝶湖葡萄 操	보강 로드 / 보강 앵커	스케일의 눈금폭
RI	Waktu pengerasan	Batang jangkar	Jangkar berulir dalam	Batang penguat / Jangkar penguat	Bagian skala
UAE	وقت التصلب	قضبان تثبيت	لولبة تثبيت داخلية	قضيب حديد مسلح تثبيت حديد مسلح	أجزاء المقياس

°C	t_{work}	t_{cure}
	FIS EM Plus	FIS EM Plus
> -5 °C - -1 °C	180 min.	200 h
> ±0 °C - +4 °C	150 min.	90 h
> +5 °C - +9 °C	120 min.	40 h
> +10 °C - +19 °C	30 min.	18 h
> +20 °C - +29 °C	14 min.	10 h
> +30 °C - +40 °C	7 min.	5 h



 ETA-17/0979 EAD 330499-01-0601 Option 1 for cracked concrete		FIS A / RG M	10/11/15/ 16/17
 ETA-17/0979 EAD 330499-01-0601 Option 1 for cracked concrete		RG MI	12/15/ 16/18
 ETA-17/0979 EAD 330499-01-0601 Option 1 for cracked concrete		Rebar / FRA	13/14/ 15/16/17
 See ICC-ES Evaluation Report at www.icc-es.org ESR-1990		Rods /Rebar	19/20/ 21/22



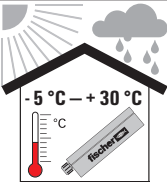

03/21



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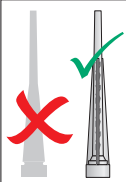




-5 °C – +30 °C

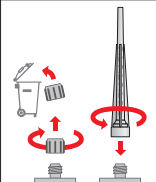
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X

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FIS MR Plus / FIS UMR

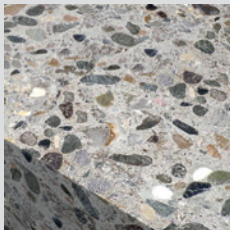
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	FIS AM	058000	
	FIS DCD S	543629	
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585 ml	FIS DM S-L	510992	
	FIS DP S-L	511125	
1500 ml	FIS DP S-XL	512401	






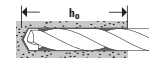
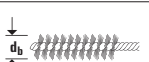
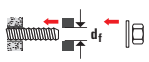
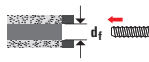
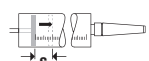
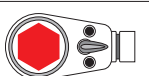
FIS A



RG M



FIS A, RG M

 θ	M6	M8	M10	M12	M14	M16	M20
		✓	✓	✓	✓	✓	✓
 d_o	8	10	12	14	16	18	24
 h_o	$h_{o,min}$ [mm]	50	60	60	70	75	80
	$h_{o,max}$ [mm]	120	160	200	240	280	320
 d_b	fischer BS	Ø 8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 14
	d_b [mm]	10	11	14	16	20	20
 d_f	7	9	12	14	16	18	22
 d_f	9	12	14	16	18	20	26
 s_k	$s_k(h_{o,min})$ [-]	2	3	4	3	5	5
	$s_k(h_{o,max})$ [-]	4	8	12	10	16	19
 $T_{inst,max}$	5	10	20	40	50	60	120





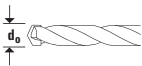
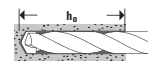
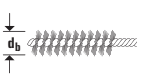
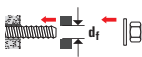
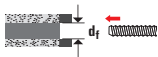
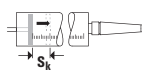
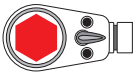
FIS A



RG M

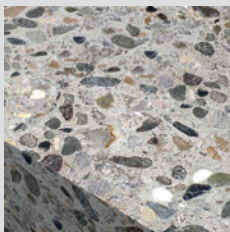


FIS A, RG M



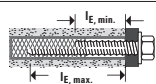
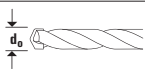
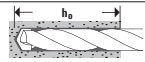
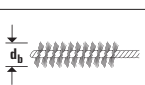
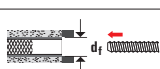
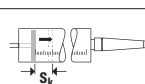
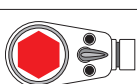
	M22	M24	M27	M30	M33	M36	M40
	✓	✓	✓	✓			
 d_0 [mm]	25	28	30	35	37	40	44
 $h_{0,min}$ [mm]	93	96	108	120	132	144	160
	$h_{0,max}$ [mm]	440	480	540	600	660	800
 fischer BS d_b [mm]	Ø 25	Ø 28	Ø 35	Ø 35	Ø 37	Ø 40	Ø 44
	d_b [mm]	27	30	40	40	40	42
 d_f [mm]	24	26	30	33	36	39	43
 d_f [mm]	28	30	33	40	43	46	50
 s_k [mm]	10	14	17	27	29	36	50
	s_k [mm]	46	69	85	132	144	179
 $T_{inst,max}$ [Nm]	135	150	200	300	400	500	600



RG MI



RG MI

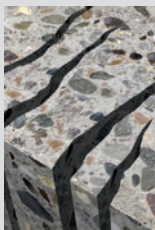
	M5	M6	M8	M10	M12	M16	M20
			✓	✓	✓	✓	✓
 <div style="display: flex; flex-direction: column; align-items: center;"> <div>$l_{E,min}$</div> <div>[mm]</div> <hr/> <div>$l_{E,max}$</div> <div>[mm]</div> </div>	8	8	8	10	12	16	20
 <div style="display: flex; flex-direction: column; align-items: center;"> <div>d_0</div> <div>[mm]</div> </div>	10	12	14	18	20	24	32
 <div style="display: flex; flex-direction: column; align-items: center;"> <div>h_0</div> <div>[mm]</div> </div>	75	75	90	90	125	160	200
 <div style="display: flex; flex-direction: column; align-items: center;"> <div>fischer BS</div> <hr/> <div>d_b</div> <div>[mm]</div> </div>	Ø 10	Ø 12	Ø 14	Ø 18	Ø 20	Ø 24	Ø 35
 <div style="display: flex; flex-direction: column; align-items: center;"> <div>d_f</div> <div>[mm]</div> </div>	6	7	9	12	14	18	22
 <div style="display: flex; flex-direction: column; align-items: center;"> <div>S_k</div> <div>[-]</div> </div>	3	3	4	6	11	17	39
 <div style="display: flex; flex-direction: column; align-items: center;"> <div>$T_{inst,max}$</div> <div>[Nm]</div> </div>	-	-	10	20	40	80	120







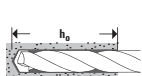


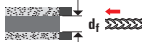

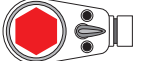
Rebar

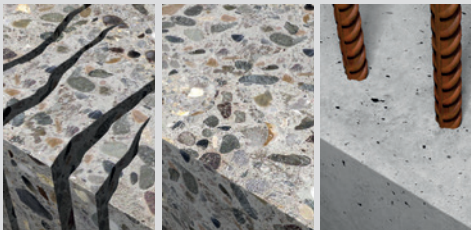


FRA




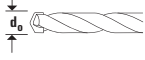
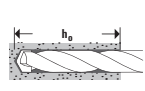
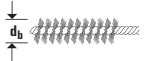
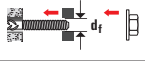
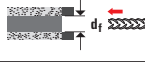
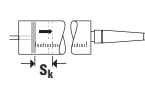
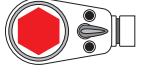


Rebar, FRA

	Rebar	Ø 8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 18	Ø 20	Ø 22	Ø 24
	FRA	-	-	M12	-	M16	-	M20	-	-
	Rebar	✓	✓	✓	✓	✓	✓	✓	✓	✓
	FRA			✓		✓		✓		
	d_0 [mm]	10/12	12/14	14/16	18	20	25	25	30	30
	Rebar $h_{0,min}$ [mm]	60	60	70	75	80	85	90	94	98
	Rebar $h_{0,max}$ [mm]	160	200	240	280	320	360	400	440	480
	FRA $h_{0,min}$ [mm]	-	-	170	-	180	-	190	-	-
	FRA $h_{0,max}$ [mm]	-	-	240	-	320	-	400	-	-
	fischer BS	Ø 12	Ø 14	Ø 16	Ø 18	Ø 20	Ø 25	Ø 25	Ø 30	Ø 30
	d_b [mm]	14	16	20	20	25	27	27	40	40
	FRA d_f [mm]	-	-	14	-	18	-	22	-	-
	FRA d_f [mm]	-	-	18	-	22	-	26	-	-
	Rebar $h_{0,min}$	3	3	4	5	6	12	10	18	15
	Rebar S_k [-]	7	10	14	18	24	50	45	80	69
	FRA $h_{0,min}$	-	-	10	-	14	-	22	-	-
	FRA S_k [-]	-	-	14	-	24	-	45	-	-
	FRA $T_{inst,max}$ [Nm]	-	-	40	-	60	-	120	-	-



Rebar, FRA

	Rebar	$\emptyset 25$	$\emptyset 26$	$\emptyset 28$	$\emptyset 30$	$\emptyset 32$	$\emptyset 34$	$\emptyset 36$	$\emptyset 40$
	FRA	M24	-	-	-	-	-	-	-
	Rebar	✓	✓	✓	✓	✓	✓	✓	✓
	FRA	✓							
	d_o [mm]	30	35	35	40	40	40	45	55
	Rebar $h_{o,min}$ [mm]	100	104	112	120	128	136	144	160
	Rebar $h_{o,max}$ [mm]	500	520	560	600	640	680	720	800
	FRA $h_{o,min}$ [mm]	196	-	-	-	-	-	-	-
	FRA $h_{o,max}$ [mm]	480	-	-	-	-	-	-	-
	fischer BS	$\emptyset 30$	$\emptyset 35$	$\emptyset 35$	$\emptyset 40$	$\emptyset 40$	$\emptyset 40$	$\emptyset 45$	$\emptyset 55$
	d_b [mm]	40	40	40	42	42	42	47	58
	FRA d_f [mm]	26	-	-	-	-	-	-	-
	FRA d_f [mm]	32	-	-	-	-	-	-	-
	Rebar $h_{o,min}$	13	26	24	36	35	28	47	101
	Rebar S_k [-]	$h_{o,max}$	65	127	116	175	173	135	233
	FRA $h_{o,min}$	26	-	-	-	-	-	-	-
	FRA S_k [-]	$h_{o,max}$	63	-	-	-	-	-	-
	FRA $T_{inst,max}$ [Nm]	150	-	-	-	-	-	-	-



FIS A



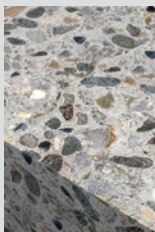
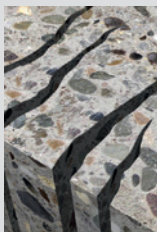
RG MI



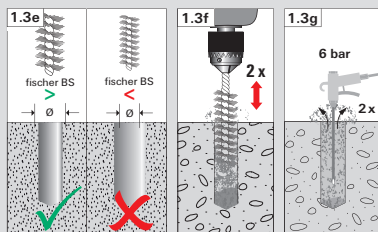
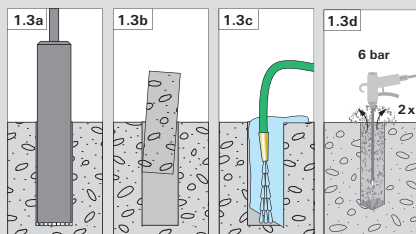
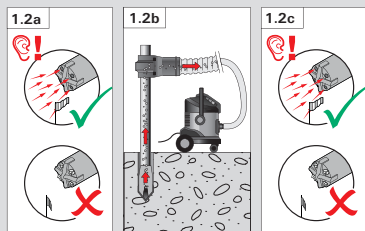
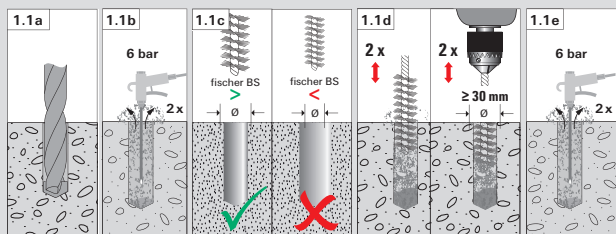
Rebar



FRA



FIS A, RG MI, Rebar, FRA





FIS A



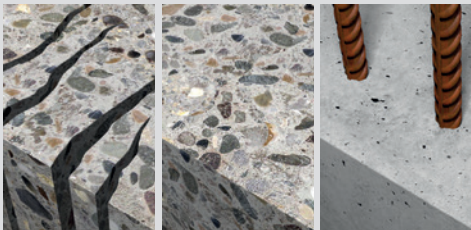
RG MI



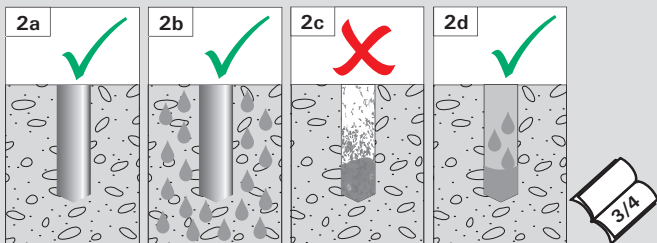
Rebar



FRA



FIS A, RG MI, Rebar, FRA





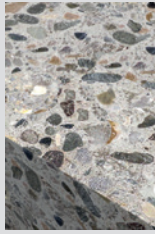
FIS A



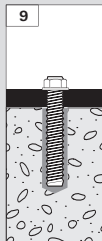
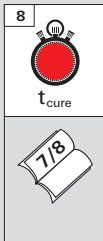
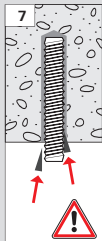
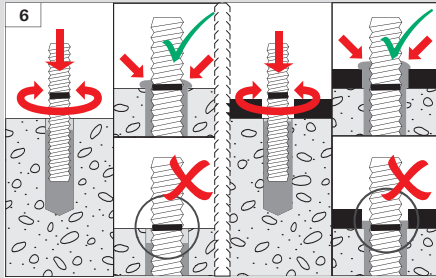
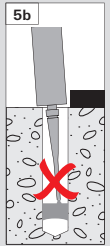
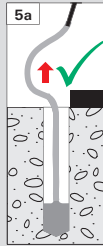
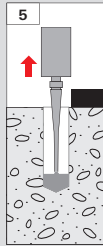
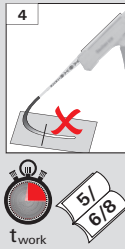
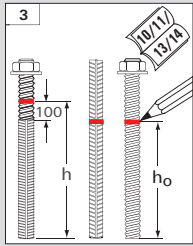
Rebar



FRA

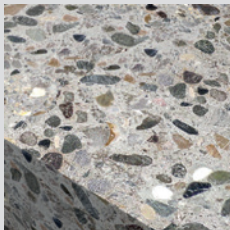


FIS A, Rebar, FRA

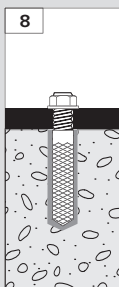
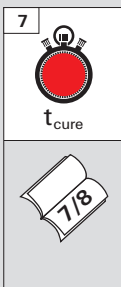
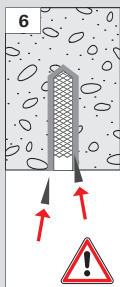
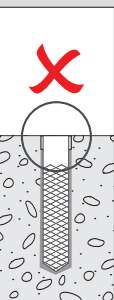
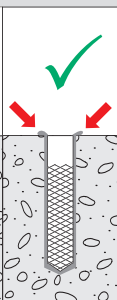
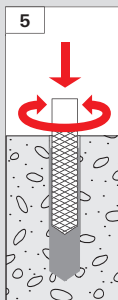
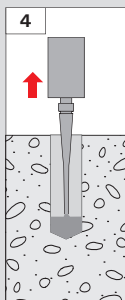
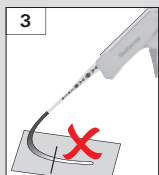




RG MI



RG MI



Installation instruction



see ICC-ES Evaluation Report
No.1990 at www.icc-es.org

fischer adhesive anchoring system FIS EM Plus

fischer FIS EM Plus is an epoxy adhesive anchoring system for fastenings in normal weight concrete.

Important: Before use, read and review the installation instructions and the SDS (safety data sheet).
Do not use expired adhesive.

A Preparing the cartridge

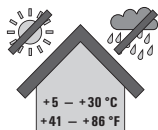
1. Remove the cap by turning and pulling it off.
2. Insert the static mixer and lock it in place (turn to the right). **The spiral element mixer in the static mixer must be clearly visible.** Never use without the static mixer !
3. Place the cartridge in the dispenser.
4. Press approx. 10 cm of material out **until the resin mortar comes out evenly grey in colour.** Mortar which is not grey colour will not cure and must be disposed off.
5. The temperature of the concrete must be at least 50 °F (10 °C) and at most 104 °F (40 °C) (see **Table VII**). The temperature of the cartridge must be at least \ominus 41 °F (5 °C).
6. After finishing work, leave the static mixer attached to the cartridge.

Important: If the processing time is exceeded, use a new static mixer and if necessary remove encrusted material in the cartridge mouth.

B Installation

Important: Installation instructions – follow the pictograms 1–7 for the sequence of operating and refer to **Tables I–VI** for setting details. The construction drawings must be adhered. For any applications not covered by this document, or by any problems with installation contact **fischer**.

1. Drill hole with a hammer drill set. Observe the correct hole diameter and depth according to **Tables I–VI**.
- 2.1/2.2a/2.2b/2.3. Standing water in bore holes must be completely removed by blowing out before cleaning the bore hole. The drill hole must be blown out twice with compressed air (oil-free 87 psi (6 bar)), brushed two times (minimal by hand). For drill hole diameter \geq 30 mm use a power drill.) Starting from the bottom of the hole and then again blown out twice with compressed air (oil-free 87 psi (6 bar)). The diameters of the brushes are given in **Table I**. Clean dirty brushes. Check brushes for wear (brush \varnothing drill hole \varnothing). If required use brush extension.
3. Fill approx. of the hole with mortar starting from the bottom of the hole. For drill hole depth $>$ 150 mm use an extension tube. For drill hole diameter 40 mm use an fischer injection adapter. Observe processing time.
4. Anchoring element must be straight and free of oil and other contaminants. Mark the anchor with correct embedment depth. Press the anchoring element down to the bottom of the hole, turning it slightly while so doing. After insert the anchoring element, excess mortar must emerge from the mouth of the hole.
5. For overhead installations and applications between horizontal and overhead use the appropriate injection adapter and at least three wedges to support the anchor during curing time (the cartridge temperature must be 77 °F (25 °C)). Also use an injection adapter for all applications with a drill hole depth $>$ 250 mm or a drill hole diameter \geq 40 mm. Use appropriate accessories to capture excess adhesive during installation of the anchor element in order to protect the unbonded portion of the anchor element from adhesive.
6. Do not disturb the anchoring element until cure time has elapsed. Do not apply load or installation torque moment to the anchor until the prescribed curing times are elapsed. The allowable working time and the minimum curing time are given in **Table VII**.
7. The installation torque moments are given in **Table II**.



**Store mortar in
a cool dry place.**

Table VII. Processing and curing times.

Temperature range		Working time / processing time [min]	Curing time [h]
[°C]	[°F]		
+10 - +14	+50 - +58	45	48
+15 - +19	+59 - +67	30	18
+20 - +29	+68 - +85	14	10
+30 - +40	+86 - +104	7	5

Table I. Drill hole diameter / Accessories for metric sizes.

Drill bit		Rods	Rebar	Brush	Injection adapter		
\varnothing [inch]	\varnothing [mm]	\varnothing [mm]	\varnothing [mm]	Type	Item No.	Size	Color
7/16	12	M10	8	BS 12	78179	12	nature
9/16	14	M12	10	BS 14	78180	14	blue
5/8	16	-	12	BS 16/18	78181	16	red
3/4	18	M16	-	BS 16/18	78181	18	yellow
13/16	20	-	16	BS 20	52277	20	green
1	24	M20	-	BS 24	78182	24	nature
1	25	-	20	BS 25	97806	25	black
1 1/8	28	M24	-	BS 28	78183	28	nature
1 1/4	30	-	25	BS 35	78184	30	grey
1 3/8	35	M30	28	BS 35	78184	35	brown
1 1/2	40	-	32	BS 40	505061	40	red

Table II. Metric threaded rods.

d	d_0	$h_{ef, min}$	$h_{ef, max}$	h_{min}	$s_{min} = c_{min}$	T_{inst}						
[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[Nm] [ft - lb]						
M10	12	7/16	60	2,36	200	7,87	$h_{ef} + 30$	$h_{ef} + 1,25$	45	1,77	20	15
M12	14	9/16	70	2,76	240	9,45	$h_{ef} + 30$	$h_{ef} + 1,25$	55	2,17	40	30
M16	18	3/4	80	3,15	320	12,60	$h_{ef} + 30$	$h_{ef} + 1,25$	65	2,55	60	44
M20	24	1	90	3,54	400	15,75	$h_{ef} + 2d_0$	$h_{ef} + 2d_0$	85	3,35	120	89
M24	28	1 1/8	96	3,78	480	18,90	$h_{ef} + 2d_0$	$h_{ef} + 2d_0$	105	4,13	150	111
M30	35	1 3/8	120	4,72	600	23,62	$h_{ef} + 2d_0$	$h_{ef} + 2d_0$	140	5,51	300	221

Table III. Metric rebars.

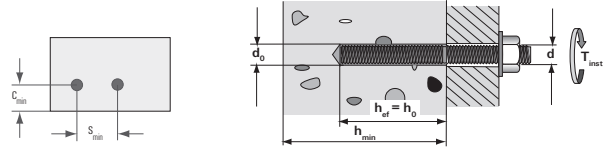
d	d_0	$h_{ef, min}$	$h_{ef, max}$	h_{min}	$s_{min} = c_{min}$	T_{inst}^*					
[mm]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]					
10	14	9/16	60	2,36	200	7,87	$h_{ef} + 30$	$h_{ef} + 1,25$	45	1,77	30
12	16	5/8	70	2,76	240	9,45	$h_{ef} + 30$	$h_{ef} + 1,25$	55	2,17	50
16	20	13/16	80	3,15	320	12,60	$h_{ef} + 30$	$h_{ef} + 1,25$	65	2,56	110
20	25	1	90	3,54	400	15,75	$h_{ef} + 30$	$h_{ef} + 1,25$	85	3,35	190
25	30	1 1/4	100	3,94	500	19,69	$h_{ef} + 2d_0$	$h_{ef} + 2d_0$	110	4,33	280
28	35	1 3/8	112	4,41	560	22,05	$h_{ef} + 2d_0$	$h_{ef} + 2d_0$	130	5,12	350
32	40	1 1/2	128	5,04	640	25,20	$h_{ef} + 2d_0$	$h_{ef} + 2d_0$	160	6,30	430

* Torque moment only required when using threaded reinforcing bars to resist seismic loading.

Table IV. Drill hole diameter / Accessories for fractional sizes.

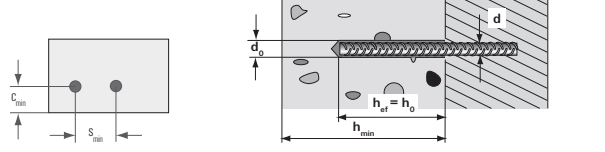
Drill bit		Rods	Rebar	Brush	Injection adapter		
\varnothing [inch]	\varnothing [mm]	\varnothing [inch]	\varnothing [inch]	Type	Item No.	Size	Color
7/16	12	3/8	-	BS 12	78179	-	-
1/2	14	-	#3	BS 14	78180	12	nature
9/16	15	1/2	-	BS 14	78180	14	blue
5/8	16	-	#4	BS 16/18	78181	16	red
3/4	18	5/8	-	BS 20	52277	18	yellow
3/4	20	-	#5	BS 20	52277	18	yellow
7/8	22	3/4	#6	BS 20	52277	20	green
1	25	7/8	-	BS 25	97806	25	black
1 1/8	28	1	#7	BS 28	78183	28	nature
1 1/4	32	1 1/8	#8	BS 35	78184	30	grey
1 3/8	35	1 1/4	#9	BS 35	78184	35	brown
1 1/2	40	-	#10	BS 40	505061	40	red

Table V. Fractional threaded rods.



d	d_0	$h_{ef, min}$	$h_{ef, max}$	h_{min}	$s_{min} = c_{min}$	T_{inst}						
[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[Nm] [ft·lb]						
3/8	12	7/16	60	2,38	191	7,50	$h_{ef} + 30$	$h_{ef} + 1,25$	42,5	1,67	20	15
1/2	15	9/16	70	2,75	254	10,00	$h_{ef} + 2d_0$	$h_{ef} + 2d_0$	57,5	2,26	41	30
5/8	18	3/4	79	3,13	318	12,50			65	2,56	68	50
3/4	22	7/8	89	3,50	381	15,00	$h_{ef} + 2d_0$	$h_{ef} + 2d_0$	80	3,15	122	90
7/8	25	1	89	3,50	445	17,50			95	3,74	136	100
1	28	1 1/8	102	4,00	508	20,00			110	4,33	183	135
1 1/8	32	1 1/4	114	4,50	572	22,50	$h_{ef} + 2d_0$	$h_{ef} + 2d_0$	135	5,31	244	180
1 1/4	35	1 3/8	127	5,00	635	25,00			160	6,30	325	240

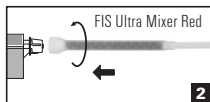
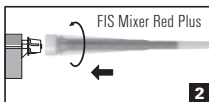
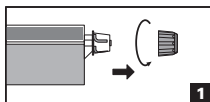
Table VI. Fractional reinforcing bars.



d	d_0	$h_{ef, min}$	$h_{ef, max}$	h_{min}	$s_{min} = c_{min}$	T_{inst}^*					
[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[Nm]					
#3	14	1/2	60	2,38	191	7,50	$h_{ef} + 30$	$h_{ef} + 1,25$	43	1,69	30
#4	16	5/8	70	2,75	254	10,00	$h_{ef} + 2d_0$	$h_{ef} + 2d_0$	58	2,28	60
#5	20	3/4	79	3,13	318	12,50			65	2,56	110
#6	22	7/8	89	3,50	381	15,00	$h_{ef} + 2d_0$	$h_{ef} + 2d_0$	80	3,15	175
#7	28	1 1/8	89	3,50	445	17,50			95	3,74	240
#8	32	1 1/4	102	4,00	508	20,00			110	4,33	320
#9	35	1 3/8	114	4,50	572	22,50	$h_{ef} + 2d_0$	$h_{ef} + 2d_0$	130	5,12	380
#10	40	1 1/2	127	5,00	635	25,00			160	6,30	450
#11	45	1 3/4	140	5,50	699	27,50	$h_{ef} + 2d_0$	$h_{ef} + 2d_0$	175	6,89	450

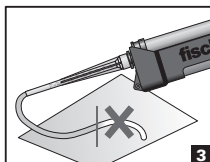
* Torque moment only required when using threaded reinforcing bars to resist seismic loading.



A FIS EM Plus 390 S / FIS EM Plus 585 S / FIS EM Plus 1500 S



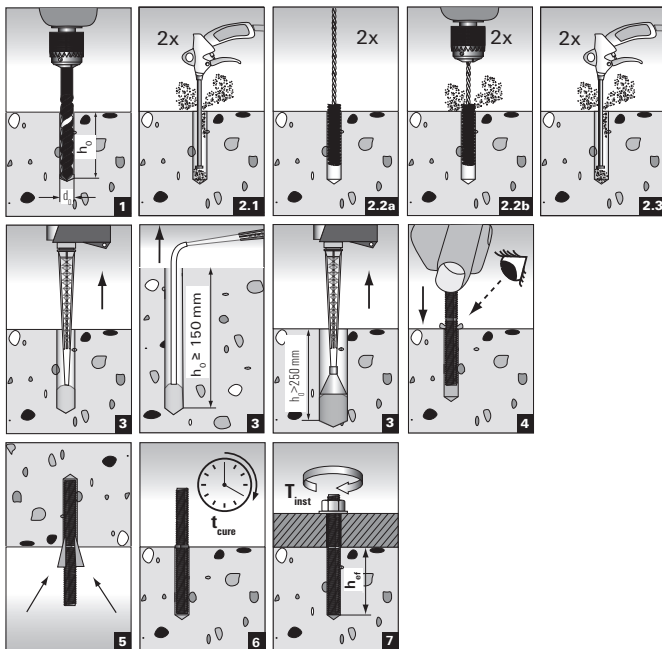
FIS EM Plus 390 S

FIS EM Plus 585 S,
FIS EM Plus 1500 S



Cartridge	Dispenser	Item No.	Static mixer
390 ml	FIS DM S	511118	FIS Mixer Red Plus 
	FIS DCD S	543629	
	FIS AP	058027	
585 ml	FIS DM S-L	510992	FIS Ultra Mixer Red 
	FIS DP S-L	511125	
1500 ml	FIS DP S-XL	512401	

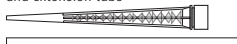
B



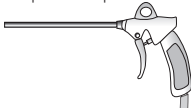
Brush with extension



Static mixer FIS MR Plus/FIS UMR
and extension tube



Compressed air pistol



Injection adapter



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