UNIVERSAL

R-FF1-N-ZP

FF1 POLYAMIDE FRAME FIXING WITH A COUNTERSUNK HEAD OR COLLAR

Polyamide frame fixing with a zinc-plated screw, designed for durable and secure attachment of structural elements. Intended for indoor use.

FEATURES AND BENEFITS

- Zinc electroplated surface for enhanced corrosion resistance.
- High quality workmanship.
- Internal plug geometry designed to fit the screw head.
- Plug design ensures multi-axis expansion.
- The countersunk plug for flush fixing of soft material (eg. timber).
- Collared plug for fixing of hard materials (eg. steel).

SUBSTRATES

- Cracked concrete
- Non-cracked concrete
- Solid brick
- Solid sand-lime brick
- Hollow brick
- Hollow sand-lime brick
- Hollow lightweight concrete block
- Aerated concrete block



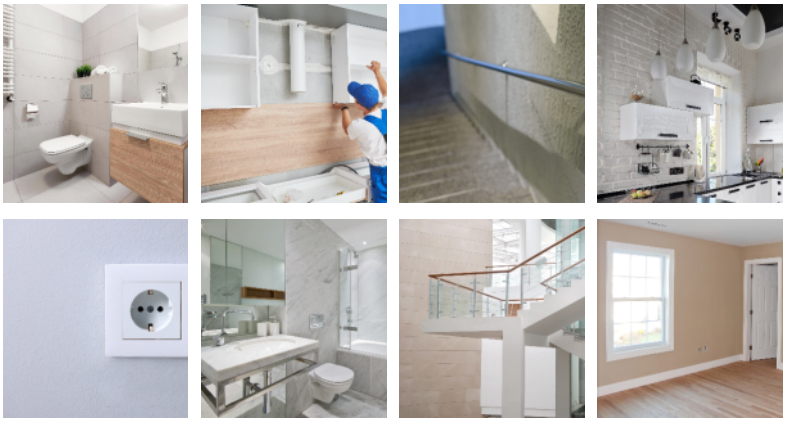
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APPLICATIONS

- Bathroom accessories
- Doors and windows
- Electrical Installations
- Handrails
- Kitchen cabinets
- Stairs
- Ventilated facades



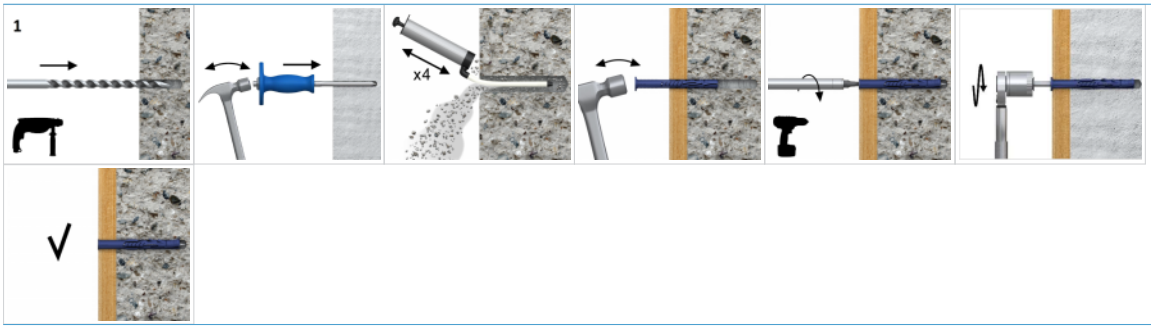


Bangkok, Thailand
Nora Townhome

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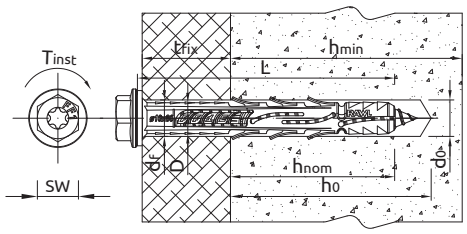
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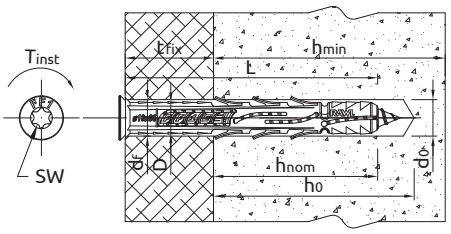
INSTALLATION GUIDE



1. Drill a hole of required diameter and depth (figure 1 - base material A,B,C,D) or use punch-tool in aerated concrete (figure 2 - base material D).
2. Clean the hole thoroughly with hand pump and hole brush.
3. With a hammer, lightly tap the plug through the fixture into hole until fixing depth is reached.
4. Tighten the FF1 screw.

INSTALLATION DATA





SKU	Frame fixing		Plug type	Fastened element	
	Plug diameter	Plug length	-	Max thickness	Max thickness
	D	L	-	$t_{fix\ hnom\ min}$	$t_{fix\ hnom\ max}$
	mm	mm	-	mm	mm
R-FF1-N-08L080	8	80	Countersunk	30	10
R-FF1-N-08L100	8	100	Countersunk	50	30
R-FF1-N-08L120	8	120	Countersunk	70	50
R-FF1-N-08L140	8	140	Countersunk	90	70
R-FF1-N-08L160	8	160	Countersunk	110	90
R-FF1-N-10K080	10	80	Collar	30	10
R-FF1-N-10K100	10	100	Collar	50	30
R-FF1-N-10K120	10	120	Collar	70	50
R-FF1-N-10K140	10	140	Collar	90	70
R-FF1-N-10K160	10	160	Collar	110	90
R-FF1-N-10K200	10	200	Collar	150	130
R-FF1-N-10K240	10	240	Collar	190	170
R-FF1-N-10K300	10	300	Collar	250	230
R-FF1-N-10L080	10	80	Countersunk	30	10
R-FF1-N-10L100	10	100	Countersunk	50	30
R-FF1-N-10L120	10	120	Countersunk	70	50
R-FF1-N-10L140	10	140	Countersunk	90	70
R-FF1-N-10L160	10	160	Countersunk	110	90
R-FF1-N-10L200	10	200	Countersunk	150	130
R-FF1-N-10L240	10	240	Countersunk	190	170
R-FF1-N-10L300	10	300	Countersunk	250	230
R-FF1-N-14K120	14	120	Collar	50	50
R-FF1-N-14K160	14	160	Collar	90	90
R-FF1-N-14K200	14	200	Collar	130	130
R-FF1-N-14K240	14	240	Collar	170	170

Installation data

R-FF1-N-ZP FF1 POLYAMIDE FRAME FIXING WITH A COUNTERSUNK HEAD OR COLLAR

Size			Ø8	Ø8	Ø10	Ø10	Ø14
Hole diameter in substrate	d_0	[mm]	8	8	10	10	14
Hole diameter in fixture	d_f	[mm]	8,0 ÷ 8,5	8,0 ÷ 8,5	10,0 ÷ 10,5	10,0 ÷ 10,5	14,0 ÷ 14,5
Max. installation torque - concrete and solid masonry	T_{inst}	[Nm]	9	-	16	16	30
Max. installation torque - aerated concrete	T_{inst}	[Nm]	-	3,6	-	4,3	6,6
Min. installation depth	h_{nom}	[mm]	50	70	50	70	70
Min. hole depth in substrate	h_0	[mm]	60	80	60	80	80
Drive type - countersunk head screw	Torx	[-]	30	30	40	40	50
Drive type – hex head screw	SW	[mm]	-	-	13	13	17

Installation data for concrete substrates

Size			Ø8	Ø10	Ø10	Ø14
Installation depth	h_{nom}	[mm]	50	50	70	70
Concrete ≥ C12/15						
Min. substrate thickness	h_{min}	[mm]	100	100	100	100
Min. edge distance	c_{min}	[mm]	84	112	112	168
Min. spacing	s_{min}	[mm]	84	126	133	168
Concrete ≥ C16/20						
Min. substrate thickness	h_{min}	[mm]	100	100	100	100
Min. edge distance	c_{min}	[mm]	60	80	80	120
Min. spacing	s_{min}	[mm]	60	95	95	120

Installation data			h_{min}	c_{min}	s_{min} [1)]	s_{min} [2)]
R-FF1-N Ø8						
Clay brick HD min. 20MPa	-	[mm]	125	60	120	240
Sand-lime brick HD min. 20MPa	-	[mm]	125	60	120	240
Perforated ceramic brick MAX min. 20MPa	-	[mm]	238	60	120	240
Perforated ceramic brick Porotherm P+W min. 15MPa	-	[mm]	238	80	160	320
Calcium silicate holow block KSL 6DF min. 20MPa	-	[mm]	115	60	120	240
Hollow lightweight aggregate concrete element HBL min. 2MPa	-	[mm]	249	70	140	280
Perforated ceramic brick HLZ 12 min. 12MPa	-	[mm]	113	60	120	240
Perforated ceramic brick HLZ 15 min. 15MPa	-	[mm]	240	80	160	320
Autoclaved aerated concrete AAC	-	[mm]	100	100	200	400
R-FF1-N Ø10						
Clay brick HD min. 20MPa	-	[mm]	125	100	100	150
Sand-lime brick HD min. 20MPa	-	[mm]	125	100	100	100
Perforated ceramic brick MAX min. 20MPa	-	[mm]	238	100	100	250
Perforated ceramic brick Porotherm P+W min. 15MPa	-	[mm]	238	100	100	100
Calcium silicate holow block KSL 6DF min. 20MPa	-	[mm]	115	100	100	100
Hollow lightweight aggregate concrete element HBL min. 2MPa	-	[mm]	249	100	100	150
Perforated ceramic brick HLZ 12 min. 12MPa	-	[mm]	113	100	100	150
Perforated ceramic brick HLZ 15 min. 15MPa	-	[mm]	115	100	200	400
Hollow ceramic brick Optibrick min min. 7,5MPa	-	[mm]	200	100	100	130
Autoclaved aerated concrete AAC2 min. 2MPa	-	[mm]	100	70	80	70
Autoclaved aerated concrete AAC4 min. 4MPa	-	[mm]	100	70	80	80
Autoclaved aerated concrete AAC5 min. 5MPa	-	[mm]	100	80	110	80
Autoclaved aerated concrete AAC6 min. 6MPa	-	[mm]	100	80	110	400
R-FF1-N Ø14						
Clay brick HD min. 20MPa	-	[mm]	125	120	240	480
Sand-lime brick HD min. 20MPa	-	[mm]	125	150	300	600
Perforated ceramic brick MAX min. 20MPa	-	[mm]	238	120	240	480
Perforated ceramic brick Porotherm P+W min. 15MPa	-	[mm]	238	120	240	480
Calcium silicate holow block KSL 6DF min. 20MPa	-	[mm]	115	70	140	280
Hollow lightweight aggregate concrete element HBL min. 2MPa	-	[mm]	249	70	140	280
Perforated ceramic brick HLZ 12 min. 12MPa	-	[mm]	113	120	240	480
Perforated ceramic brick HLZ 15 min. 15MPa	-	[mm]	240	120	240	480
Autoclaved aerated concrete AAC	-	[mm]	100	100	200	400

Spacing between single anchors a_{min} = 250mm

[1)] In direction perpendicular to free edge

[2)] In direction parallel to free edge

BASIC PERFORMANCE DATA

Performance data for single anchor without influence of edge distance and spacing

Concrete substrates

Size			Ø8	Ø10	Ø10	Ø14
CONCRETE						
Effective embedment depth	h_{ef}	[mm]	50	50	70	70
CHARACTERISTIC LOAD						
TENSION LOAD						

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Size			Ø8	Ø10	Ø10	Ø14
Concrete ≥ C12/15	N_{Rk}	[kN]	1,5	1,2	6,0	4,0
Concrete ≥ C16/20	N_{Rk}	[kN]	2,0	2,0	8,5	5,5
SHEAR LOAD						
Concrete	V_{Rd}	[kN]	3,6	5,4	5,4	20,4
DESIGN LOAD						
TENSION LOAD						
Concrete ≥ C12/15	N_{Rd}	[kN]	0,8	0,7	3,3	2,2
Concrete ≥ C16/20	N_{Rd}	[kN]	1,1	1,1	4,7	3,1
SHEAR LOAD						
Concrete	V_{Rd}	[kN]	2,2	3,4	3,4	12,7
RECOMMENDED LOAD						
TENSION LOAD						
Concrete ≥ C12/15	N_{rec}	[kN]	0,6	0,5	2,4	1,6
Concrete ≥ C16/20	N_{rec}	[kN]	0,8	0,8	3,4	2,2
SHEAR LOAD						
Concrete	V_{rec}	[kN]	1,6	2,4	2,4	9,1

Performance data for single anchor without influence of edge distance and spacing

Masonry substrates

Size			Ø8	Ø8	Ø10	Ø10	Ø14
MASONRY SUBSTRATES							
Effective embedment depth	h_{ef}	[mm]	50	70	50	70	70
CHARACTERISTIC RESISTANCE							
TENSION AND SHEAR LOAD							
Clay brick HD min. 20MPa [1]	F_{Rk}	[kN]	1,5	-	-	5,0	4,5
Sand-lime brick HD min. 20MPa [1]	F_{Rk}	[kN]	1,5	-	1,5	-	3,5
Perforated ceramic brick MAX min. 20MPa [2]	F_{Rk}	[kN]	0,8	-	-	1,5	1,2
Perforated ceramic brick Porotherm P+W min. 15MPa [2]	F_{Rk}	[kN]	0,4	-	-	1,5	1,2
Calcium silicate holow block KSL 6DF min. 20MPa [2]	F_{Rk}	[kN]	0,5	-	-	2,5	1,2
Hollow lightweight aggregate concrete element HBL min. 2MPa [2]	F_{Rk}	[kN]	0,9	-	-	0,8	1,2
Perforated ceramic brick HLZ 12 min. 12MPa [2]	F_{Rk}	[kN]	0,6	-	-	0,6	0,9
Perforated ceramic brick HLZ 15 min. 15MPa [2]	F_{Rk}	[kN]	1,2	-	-	0,6	1,5
Hollow ceramic brick Optibrick min min. 7,5MPa [2]	F_{Rk}	[kN]	-	-	-	0,5	-
Autoclaved aerated concrete AAC2 min. 2MPa [2]	F_{Rk}	[kN]	-	0,4	-	0,4	0,6
Autoclaved aerated concrete AAC6 min. 6MPa [2]	F_{Rk}	[kN]	-	0,9	-	1,2	1,5
Autoclaved aerated concrete AAC2 min. 2MPa [3]	F_{Rk}	[kN]	-	-	-	0,4	-
Autoclaved aerated concrete AAC4 min. 4MPa [3]	F_{Rk}	[kN]	-	-	-	1,2	-
Autoclaved aerated concrete AAC5 min. 5MPa [3]	F_{Rk}	[kN]	-	-	-	1,5	-
DESIGN RESISTANCE							
TENSION AND SHEAR LOAD							
Clay brick HD min. 20MPa [1]	F_{Rd}	[kN]	0,6	-	-	2,0	1,8
Sand-lime brick HD min. 20MPa [1]	F_{Rd}	[kN]	0,6	-	0,6	-	1,4
Perforated ceramic brick MAX min. 20MPa [2]	F_{Rd}	[kN]	0,3	-	-	0,6	0,5
Perforated ceramic brick Porotherm P+W min. 15MPa [2]	F_{Rd}	[kN]	0,2	-	-	0,6	0,5
Calcium silicate holow block KSL 6DF min. 20MPa [2]	F_{Rd}	[kN]	0,2	-	-	1,0	0,5
Hollow lightweight aggregate concrete element HBL min. 2MPa [2]	F_{Rd}	[kN]	0,4	-	-	0,3	0,5
Perforated ceramic brick HLZ 12 min. 12MPa [2]	F_{Rd}	[kN]	0,2	-	-	0,2	0,4
Perforated ceramic brick HLZ 15 min. 15MPa [2]	F_{Rd}	[kN]	0,5	-	-	0,2	0,6
Hollow ceramic brick Optibrick min min. 7,5MPa [2]	F_{Rd}	[kN]	-	-	-	0,2	-
Autoclaved aerated concrete AAC2 min. 2MPa [2]	F_{Rd}	[kN]	-	0,2	-	0,2	0,3
Autoclaved aerated concrete AAC6 min. 6MPa [2]	F_{Rd}	[kN]	-	0,5	-	0,6	0,8
Autoclaved aerated concrete AAC2 min. 2MPa [3]	F_{Rd}	[kN]	-	-	-	0,2	-
Autoclaved aerated concrete AAC4 min. 4MPa [3]	F_{Rd}	[kN]	-	-	-	0,6	-
Autoclaved aerated concrete AAC5 min. 5MPa [3]	F_{Rd}	[kN]	-	-	-	0,8	-
RECOMMENDED LOAD							
TENSION AND SHEAR LOAD							
Clay brick HD min. 20MPa [1]	F_{rec}	[kN]	0,4	-	-	1,4	1,3
Sand-lime brick HD min. 20MPa [1]	F_{rec}	[kN]	0,4	-	0,4	-	1,0
Perforated ceramic brick MAX min. 20MPa [2]	F_{rec}	[kN]	0,2	-	-	0,4	0,3
Perforated ceramic brick Porotherm P+W min. 15MPa [2]	F_{rec}	[kN]	0,1	-	-	0,4	0,3
Calcium silicate holow block KSL 6DF min. 20MPa [2]	F_{rec}	[kN]	0,1	-	-	0,7	0,3
Hollow lightweight aggregate concrete element HBL min. 2MPa [2]	F_{rec}	[kN]	0,3	-	-	0,2	0,3
Perforated ceramic brick HLZ 12 min. 12MPa [2]	F_{rec}	[kN]	0,2	-	-	0,2	0,3
Perforated ceramic brick HLZ 15 min. 15MPa [2]	F_{rec}	[kN]	0,3	-	-	0,2	0,4
Hollow ceramic brick Optibrick min min. 7,5MPa [2]	F_{rec}	[kN]	-	-	-	0,1	-
Autoclaved aerated concrete AAC2 min. 2MPa [2]	F_{rec}	[kN]	-	0,1	-	0,1	0,2
Autoclaved aerated concrete AAC6 min. 6MPa [2]	F_{rec}	[kN]	-	0,3	-	0,4	0,5
Autoclaved aerated concrete AAC2 min. 2MPa [3]	F_{rec}	[kN]	-	-	-	0,1	-

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Size			Ø8	Ø8	Ø10	Ø10	Ø14
Autoclaved aerated concrete AAC4 min. 4MPa [3]	F_{rec}	[kN]	-	-	-	0,4	-
Autoclaved aerated concrete AAC5 min. 5MPa [3]	F_{rec}	[kN]	-	-	-	0,5	-

[1] Hammer drilling

[2] Rotary drilling only

[3] Punch tool

DESIGN PERFORMANCE DATA

Static loads

Size			Ø8	Ø10	Ø10	Ø14
Effective embedment depth	h_{ef}	[mm]	50	50	70	70
TENSION LOAD						
STEEL FAILURE; f_{uk} ≥ 420 MPa f_{yk} ≥ 260 MPa						
Characteristic resistance	$N_{Rk,s}$	[kN]	7,3	10,7	10,7	40,7
Partial safety factor	γ_{MS}	[-]	1,94	1,94	1,94	1,94
PULL-OUT FAILURE						
NON-CRACKED AND CRACKED CONCRETE ≥ C12/15						
Characteristic resistance	$N_{Rk,p}$	[kN]	1,5	1,2	6,0	4,0
Partial safety factor	γ_{Mc}	[-]	1,8	1,8	1,8	1,8
NON-CRACKED AND CRACKED CONCRETE ≥ C16/20						
Characteristic resistance	$N_{Rk,p}$	[kN]	2,0	2,0	8,5	5,5
Partial safety factor	γ_{Mc}	[-]	1,8	1,8	1,8	1,8
SHEAR LOAD						
STEEL FAILURE; f_{uk} ≥ 420 MPa f_{yk} ≥ 260 MPa						
Characteristic resistance without lever arm	$V_{Rk,s}$	[kN]	3,6	5,4	5,4	14,3
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	5,1	9,2	9,2	39,8
Partial safety factor	γ_{MS}	[-]	1,61	1,61	1,61	1,61

Resistance to tension and shear loads under fire exposure

Size			Ø10	Ø10	Ø14
Effective embedment depth	h_{ef}	[mm]	50	70	70
TENSION AND SHEAR LOAD					
R (for EI) = 90 min					
Characteristic resistance - concrete C20/25 - C50/60	F°_{Rk}	[kN]	0,8	0,8	0,8

LOGISTICAL DATA

SKU	Base-sales unit	Unit pack	Bulk pack	Pallet	Single Package - Gross Weight	Bulk Package - Gross Weight	Palette - Gross Weight	Barcode
R-FF1-N-08L080	pcs.	50.0	800.0	19200.0	0.9	14.2	340.2	5906675163703
R-FF1-N-08L100	pcs.	50.0	800.0	19200.0	1.1	18.3	440.2	5906675163741
R-FF1-N-08L120	pcs.	50.0	800.0	19200.0	1.3	21.3	512.3	5906675292830
R-FF1-N-08L140	pcs.	50.0	600.0	14400.0	1.6	19.0	455.3	5906675428444
R-FF1-N-08L160	pcs.	50.0	600.0	14400.0	1.8	21.5	516.9	5906675428451
R-FF1-N-10K080	pcs.	50.0	400.0	9600.0	1.7	14.1	338.5	5906675266985
R-FF1-N-10K100	pcs.	25.0	400.0	9600.0	1.0	16.9	406.3	5906675266992
R-FF1-N-10K120	pcs.	25.0	300.0	7200.0	1.2	14.9	357.6	5906675267005
R-FF1-N-10K140	pcs.	25.0	300.0	7200.0	1.4	16.9	405.6	5906675267012
R-FF1-N-10K160	pcs.	25.0	300.0	7200.0	1.6	19.0	455.5	5906675267029
R-FF1-N-10K200	pcs.	25.0	25.0	6000.0	1.9	1.9	473.9	5906675018249
R-FF1-N-10K240	pcs.	25.0	25.0	3000.0	2.2	2.2	284.6	5906675019307
R-FF1-N-10K300	pcs.	10.0	10.0	3120.0	1.1	1.1	355.7	5906675019321
R-FF1-N-10L080	pcs.	50.0	400.0	9600.0	1.3	11.1	265.9	5906675266909
R-FF1-N-10L100	pcs.	25.0	400.0	9600.0	0.9	13.8	331.6	5906675266916
R-FF1-N-10L120	pcs.	25.0	300.0	7200.0	1.0	12.6	303.4	5906675266923
R-FF1-N-10L140	pcs.	25.0	300.0	7200.0	1.2	14.6	350.2	5906675266930
R-FF1-N-10L160	pcs.	25.0	300.0	7200.0	1.4	16.6	398.4	5906675266947
R-FF1-N-10L200	pcs.	25.0	25.0	6000.0	1.7	1.7	412.6	5906675033983
R-FF1-N-10L240	pcs.	25.0	25.0	3000.0	2.1	2.1	166.8	5906675034102
R-FF1-N-10L300	pcs.	10.0	10.0	3120.0	1.0	1.0	327.0	5906675034119
R-FF1-N-14K120	pcs.	20.0	20.0	5120.0	2.3	2.3	594.4	5906675395272
R-FF1-N-14K160	pcs.	20.0	20.0	3840.0	2.9	2.9	559.7	5906675395289
R-FF1-N-14K200	pcs.	20.0	20.0	3840.0	3.5	3.5	692.4	5906675395296
R-FF1-N-14K240	pcs.	20.0	20.0	3840.0	4.1	4.1	787.4	5906675395302

R-FF1-N-ZP

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RELATED PRODUCTS

SAFETY	Protective gloves for power tools **R-PGL** 			
DRILLING	Rotary Hammer Drill SDS plus; 850W; 26mm; 2.5J **R-PRH-26850** 	Cordless Hammer 18V SDS plus **R-PRH18** 	Drill bits Aggressor SDS plus **RT-SDSA** 	Wedge anchor setting tools - II generation **R-DCA-ST-II** 
CLEANING	Blow Pump **R-BLOWPUMP** 	Steel wire brushes for cleaning holes **R-BRUSH-TC** 	Rigid extension R-BRUSH-TC for cleaning with SDS+ drive **R-BRUSH-EXT-H-SDS** 	
ANCHORING	Cordless RawlDriver 18V **R-PDD18** 	Hammer **RT-HAM-0500** 		