W-LX Concrete Screws

Ultimate performance zinc-plated concrete screws for anchoring in cracked and non-cracked concrete

Anchor types

W-LX-H 6x40 6x60 6x75 8x60 8x75 8x90 8x100 8x120 10x65 10x90 10x100 10x120 10x140 12x75 12x100 14x115 14x135

- **W-LX-H** zinc-plated concrete screw with hexagon head and a pre-pressed washer
- Ø10 suits installation with BIS RapidStrut

W-LX-N 6x35 6x55

- **W-LX-N** unibody zinc-plated concrete screw with an internal M8/M10 thread.

W-LX-M 6x35 6x55

- **W-LX-M** zinc-plated concrete screw with M8 external thread connection

W-LX-P 6x40 6x60

- **W-LX-P** zinc-plated concrete screw with a ø14.6 mm pan head and torx T30 drive

W-LX-PX 6x40 6x60

- **W-LX-PX** zinc-plated concrete screw with a large ø17.0 mm pan head andd torx T30 drive

Features and benefits

- ETA according to EAD 330232-00-0601 anchoring in cracked and non-cracked concrete
- Seismic performance categories C1 and C2 for design of anchorages under seismic action
- Simple and quick installation procedure
- Unique tip and thread geometry prevents concrete spalling
- Very high load capacity
- Compliance with VdS CE 4001:2014-04 (05) and VdS VdS CE 4001:2018-01 (06) for applications with sprinkler systems in concrete elements.
- Up to 2 anchoring depths provide maximum installation and design flexibility
- Removable with option to re-use
- Reduced edge and anchor spacing distances
- Fire resistance class R30-R120 for design of anchorages under exposure to fire

Suitable base materials

Concrete (non-cracked)

Concrete (cracked)

Approvals and certificates

- European Technical Assessment — ETA-21/0612
- Fire Test Report — ETA-21/0612

- Compliance with VdS requirements for applications with sprinkler systems in concrete elements — VdS CEA 4001:2014-04 (05), VdS CEA 4001:2018-01 (06)

1. Product details

Article	Description	Size	Length	Thread diameter	Max. Fixture Thickness*		Drive System
			L [mm]	d_s [mm]	$t_{fix,max}$ [mm]		
					h_{nom} = red	h_{nom} = std	
62430304	W-LX-H 6x40	6	40	7.5	-	-	SW10
62430306	W-LX-H 6x60	6	60	7.5	17	5	SW10
62430308	W-LX-H 6x75	6	75	7.5	32	20	SW10
62430406	W-LX-H 8x60	8	60	9.9	10	-	SW13
62430408	W-LX-H 8x75	8	75	9.9	25	5	SW13
62430409	W-LX-H 8x90	8	90	9.9	40	20	SW13
62430410	W-LX-H 8x100	8	100	9.9	50	30	SW13
62430412	W-LX-H 8x120	8	120	9.9	70	50	SW13
62430507	W-LX-H 10x65	10	65	12.4	10	-	SW15
62430509	W-LX-H 10x90	10	90	12.4	35	5	SW15
62430510	W-LX-H 10x100	10	100	12.4	45	15	SW15
62430512	W-LX-H 10x120	10	120	12.4	65	35	SW15
62430514	W-LX-H 10x140	10	140	12.4	85	55	SW15
62430608	W-LX-H 12x75	12	75	14.9	15	-	SW16
62430610	W-LX-H 12x100	12	100	14.9	40	-	SW16
62430711	W-LX-H 14x115	14	115	17.4	40	-	SW19
62430713	W-LX-H 14x135	14	135	17.4	60	15	SW19
62431304	W-LX-P 6x40	6	40	7.5	-	-	T30
62431306	W-LX-P 6x60	6	60	7.5	17	5	T30
62432304	W-LX-PX 6x40	6	40	7.5	-	-	T30
62432306	W-LX-PX 6x60	6	60	7.5	17	5	T30
62433304	W-LX-N 6x35	6	35	7.5	-	-	SW13
62433305	W-LX-N 6x55	6	55	7.5	□	□	SW13
62434304	W-LX-M 6x35	6	35	7.5	-	-	T30
62434305	W-LX-M 6x55	6	55	7.5	□	□	T30

*Articles without a valid fixture thickness cannot be designed and used according to ETA-21/0612
□ product not intended for application with fixture plate

2. Packaging details

Article	Description	Dimension	Pack 1					
			[pcs]	EAN13	length [mm]	width [mm]	height [mm]	weight [kg]
62430304	W-LX-H	6x40	100	8719942052115	186	140	72	1.37
62430306	W-LX-H	6x60	100	8719942052146	186	140	72	1.83
62430308	W-LX-H	6x75	100	8719942052177	186	140	72	2.19
62430406	W-LX-H	8x60	100	8719942052207	186	140	108	3.37
62430408	W-LX-H	8x75	100	8719942052238	186	140	108	3.95
62430409	W-LX-H	8x90	100	8719942052269	286	122	108	4.53
62430410	W-LX-H	8x100	100	8719942052290	286	122	108	4.92
62430412	W-LX-H	8x120	50	8719942052320	186	140	108	2.9
62430507	W-LX-H	10x65	50	8719942052351	286	122	108	2.78
62430509	W-LX-H	10x90	50	8719942052351	186	140	108	3.6
62430510	W-LX-H	10x100	50	8719942052412	186	140	108	3.83
62430512	W-LX-H	10x120	25	8719942052443	186	140	108	2.22
62430514	W-LX-H	10x140	25	8719942052474	286	122	108	2.53
62430608	W-LX-H	12x75	50	8719942052504	286	122	108	4.68
62430610	W-LX-H	12x100	50	8719942052535	379	140	108	5.77
62430711	W-LX-H	14x115	20	8719942052566	186	140	108	3.56
62430713	W-LX-H	14x135	20	8719942052597	186	140	108	4.02
62431304	W-LX-P	6x40	100	8719942052627	186	140	72	1.29
62431306	W-LX-P	6x60	100	8719942052658	186	140	72	
62432304	W-LX-PX	6x40	100	8719942052689	186	140	72	1.28
62432306	W-LX-PX	6x60	100	8719942052719	186	140	72	
62433304	W-LX-N	6x35	100	8719942052740	186	140	108	2.57
62433305	W-LX-N	6x55	100	8719942052771	186	140	108	3.11
62434304	W-LX-M	6x35	100	8719942052801	186	140	108	
62434305	W-LX-M	6x55	100	8719942052832	186	140	108	1.64

3. Mechanical properties

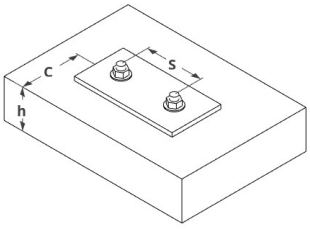
Property			ETA-21/0612
			W-LX-H, W-LX-P, W-LX-PX, W-LX-N, W-LX-M
Material			Carbon Steel - St. 1.5523 (19MnB4)
Coating			Zinc plated ≥ 5µm
Characteristic steel yield strength	f_{yk}	[N/mm^2]	1020-1250
Characteristic steel ultimate strength	f_{uk}	[N/mm^2]	800-1100

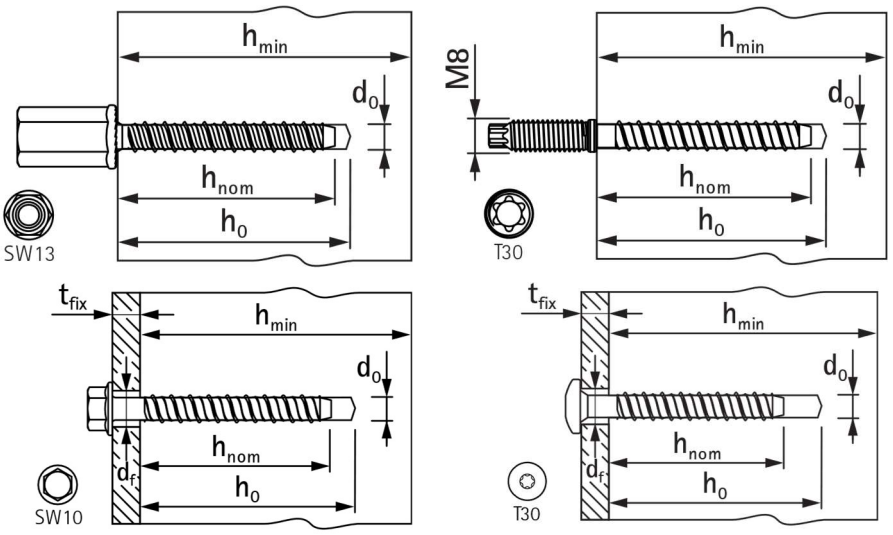
3. Installation data

3.1 Installation parameters for cracked and non-cracked concrete

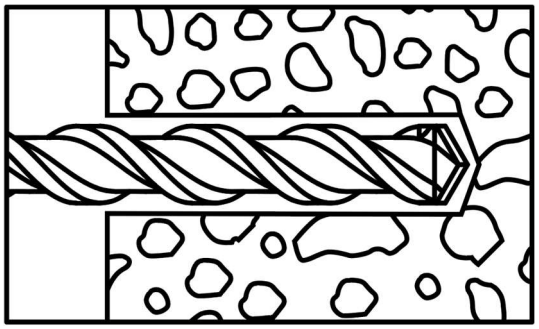
Anchor Type			W-LX-H / W-LX-P									
Anchor Size			6	6	8	8	10	10	12	12	14	14
Nominal embedment depth	h_{nom}	[mm]	43	55	50	70	55	85	60	100	75	120
Effective embedment depth	h_{ef}	[mm]										
Drill hole diameter	d_0	[mm]	6	6	8	8	10	10	12	12	14	14
Cutting diameter of drill bit	d_{cut}	[mm]	6.40	6.40	8.45	8.45	10.45	10.45	12.50	12.50	14.50	4.50
Depth of drill hole	$h_0 \geq$	[mm]	50	65	60	80	65	95	70	110	85	130
Diameter of clearing hole in the fixture	d_f	[mm]	9	9	12	12	14	14	16	16	18	18
Max fixture thickness	$t_{fix,max}$	[mm]	L - h_{nom}									
Minimum concrete member thickness	h_{min}	[mm]	100	100	100	110	100	130	110	155	110	190
Minimum edge distance	c_{min}	[mm]	45	45	50	50	60	60	80	80	100	100
Minimum anchor spacing	s_{min}	[mm]	45	45	50	50	60	60	80	80	100	100
Max. impact screw driver torque	$T_{imp,max}$	[Nm]	400	400	900	900	950	950	950	950	950	950

Anchor Type			W-LX-N / W-LX-M	
Anchor Size			6	6
Nominal embedment depth	h_{nom}	[mm]	39	55
Effective embedment depth	h_{ef}	[mm]	32	42
Drill hole diameter	d_0	[mm]	6	6
Cutting diameter of drill bit	d_{cut}	[mm]	6.40	6.40
Depth of drill hole	$h_0 \geq$	[mm]	50	65
Minimum concrete member thickness	h_{min}	[mm]	100	100
Minimum edge distance	c_{min}	[mm]	45	45
Minimum anchor spacing	s_{min}	[mm]	45	45
Max. impact screw driver torque	$T_{imp,max}$	[Nm]	400	400



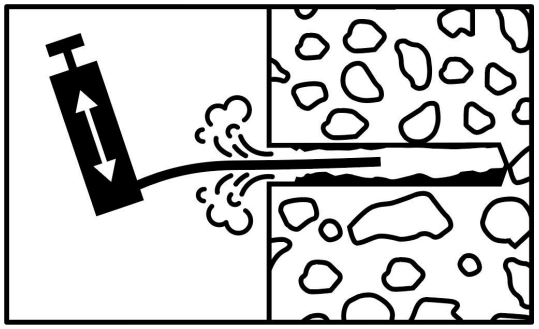


3.2 Installation procedure for concrete

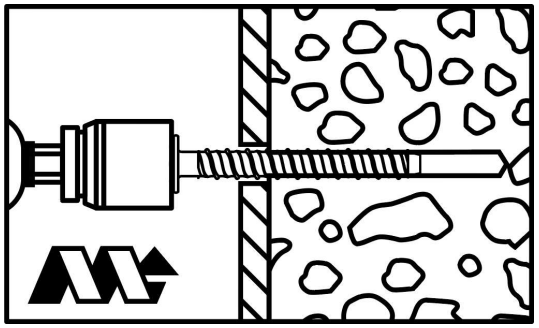


Drill the hole with rotary hammer drilling machine.

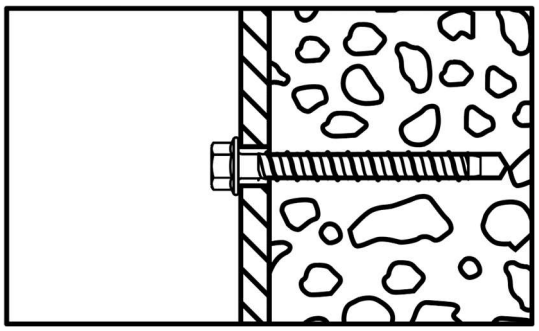
Drill to a required depth.



Clean the drill hole (blow out dust at least 4 times with a hand pump).



Tighten the anchor to substrate. Install with any torque impact screw driver up to the maximum torque moment ($T_{imp,max}$).



After installation a further turning of the screw must not be possible. The head of the screw must be in contact with the fixture / substrate and it must be not damaged.

4. Performance information

4.1 Loading information for cracked and non-cracked concrete for single anchors[1)]

Anchor Type			W-LX									
Anchor Size			6	6	8	8	10	10	12	12	14	14
Nominal embedment depth	h_{nom}	[mm]	43	55	50	70	55	85	60	100	75	120
Non-cracked concrete												
Characteristic tension load	N_{Rk}	[kN]	8.90	12.00	10.63	18.98	12.45	25.78	13.39	32.59	19.52	43.41
Characteristic shear load	V_{Rk}	[kN]	8.90	13.13	10.63	18.98	12.45	41.20	13.39	57.00	19.52	78.50
Design tension load	N_{Rd}	[kN]	5.93	8.00	7.09	12.65	8.30	17.19	8.93	21.73	13.01	28.94
Design shear load	V_{Rd}	[kN]	5.94	8.93	7.08	12.65	8.30	27.47	8.93	38.00	13.01	52.33
Recommended tension load	N_{Rec}	[kN]	4.24	5.71	5.06	9.04	5.93	12.28	6.38	15.52	9.30	20.67
Recommended shear load	V_{Rec}	[kN]	4.24	6.37	5.05	9.03	5.92	19.62	6.37	27.14	9.29	37.37
Cracked concrete												
Characteristic tension load	N_{Rk}	[kN]	6.23	7.00	7.00	13.00	8.00	18.05	7.00	22.8	13.00	30.39
Characteristic shear load	V_{Rk}	[kN]	6.23	9.37	7.44	13.29	8.71	36.09	9.37	45.63	13.66	60.77
Design tension load	N_{Rd}	[kN]	4.16	4.67	4.67	8.67	5.33	12.03	4.67	15.21	8.67	20.26
Design shear load	V_{Rd}	[kN]	4.16	6.25	4.96	8.86	5.81	24.06	6.25	30.42	9.11	60.52
Recommended tension load	N_{Rec}	[kN]	2.97	3.33	3.33	6.19	3.8	8.59	3.33	10.86	6.19	14.47
Recommended shear load	V_{Rec}	[kN]	2.97	4.46	3.54	6.32	4.15	17.18	4.46	21.72	6.5	43.22

1) Single anchors are anchors not affected by concrete edge and anchor spacing influence.
2) Recommended load includes partial safety factor and an overall partial safety factor for action of 1.4. The partial safety factor for action depends on the type of loading and shall be taken from national regulations. All anchor failure modes and the entire relevant product European Technical Assessment must be considered for anchor design.

4.2 Performance data for cracked and non-cracked concrete for single anchors[1)]

Anchor Type			W-LX									
Anchor Size			6	6	8	8	10	10	12	12	14	14
Nominal embedment depth	h_{nom}	[mm]	43	55	50	70	55	85	60	100	75	120
Tension load												
Steel failure												
Characteristic resistance	$N_{Rk,s}$	[kN]	35.40		60.40		82.40		113.00		157.00	
Partial safety factor	γ_{Ms}		1.4		1.4		1.4		1.4		1.5	
Pullout failure, non-cracked concrete												
Characteristic resistance	$N_{Rk,p}$	[kN]	-	12.00	-	-	-	-	-	-	-	-
Pullout failure, cracked concrete												
Characteristic resistance	$N_{Rk,p}$	[kN]	-	7.00	7.00	13.00	8.00	-	7.00	-	13.00	-
Pullout failure												
Installation safety factor	γ_{inst}	-	1.0		1.0		1.0		1.0		1.0	
Increasing factor for C30/37	Ψ_C	-	1.08		1.08		1.08		1.08		1.08	
Increasing factor for C40/50	Ψ_C	-	1.15		1.15		1.15		1.15		1.15	
Increasing factor for C50/50	Ψ_C	-	1.19		1.19		1.19		1.19		1.19	
Concrete cone failure												
Installation safety factor	γ_{inst}	-	1.0		1.0		1.0		1.0		1.0	
Factor for cracked concrete	$k_{cr,N}$	-	7.7		7.7		7.7		7.7		7.7	
Factor for non-cracked concrete	$k_{ucr,N}$	-	11		11		11		11		11	
Spacing	$S_{cr,N}$	[mm]	90	126	112	160	120	222	126	228	165	312
Edge distance	$C_{cr,N}$	[mm]	45	63	56	80	60	111	63	114	83	156
Concrete splitting failure												
Installation safety factor	γ_{inst}	-	1.0		1.0		1.0		1.0		1.0	
Spacing	$S_{cr,sp}$	[mm]	90	126	112	160	136	222	126	228	188	312
Edge distance	$C_{cr,sp}$	[mm]	45	63	56	80	68	111	63	114	94	156
Shear load												
Steel failure												
Characteristic resistance without lever arm	$V_{Rk,s}$	[kN]	17.70		30.20		41.20		57.00		78.50	
Ductility factor	k_7	-	0.80		0.80		0.80		0.80		0.80	
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	31.80		72.40		123.60		203.30		329.60	
Partial safety factor for steel	γ_{Ms}	-	1.5		1.5		1.5		1.5		1.5	
Concrete pry-out failure												
Factor	k	-	1.00		1.00		1.00		1.00		1.00	
Installation safety factor	γ_{inst}	-	1.00		1.00		1.00		1.00		1.00	
Concrete edge failure												
Effective length of anchor	ℓ_f	[mm]	43	35	50	70	55	85	60	100	75	120
Anchor diameter	d_{nom}	[mm]	6.00		8.00		10.00		12.00		14.00	
Installation safety factor	γ_{inst}	-	1.00		1.00		1.00		1.00		1.00	

4.3 Characteristic values for seismic performance category C1

Anchor Type			W-LX		
Anchor Size			8	10	14
Nominal embedment depth	h_{nom}	[mm]	70	85	120
Steel failure for tension and shear load					
Characteristic resistance for tension	$N_{Rk,s,eq}$	[kN]	60.4	82.4	157.0
Characteristic resistance for shear	$V_{Rk,s,eq}$	[kN]	15.1	27.4	52.3
Pullout failure					
Characteristic resistance	$N_{Rk,p,eq}$	[kN]	5.4	13.5	19.2
Concrete cone failure					
Effective embedment depth	h_{ef}	[mm]	53	65	92
Characteristic edge distance	$C_{cr,N}$	[mm]	79.5	97.5	138
Characteristic spacing	$S_{cr,N}$	[mm]	159	195	276
Installation safety factor	γ_{inst}	-	1.0	1.0	1.0
Concrete pry-our failure					
Factor	k_8	-	1.0	2.0	2.0
Concrete edge failure					
Outside diameter of the anchor	d_{nom}	[mm]	8	10	14
Effective length of anchor under shear loads	ℓ_f	[mm]	70	85	120

4.4 Characteristic values for seismic performance category C2

Anchor Type			W-LX		
Anchor Size			8	10	14
Nominal embedment depth	h_{nom}	[mm]	70	85	120
Steel failure for tension and shear load					
Characteristic resistance for tension	$N_{Rk,s,eq}$	[kN]	60.4	82.4	157.0
Characteristic resistance for shear	$V_{Rk,s,eq}$	[kN]	9.9	20.6	35.1
Pullout failure					
Characteristic resistance	$N_{Rk,p,eq}$	[kN]	1.57	4.91	14.87
Concrete cone failure					
Effective embedment depth	h_{ef}	[mm]	53	65	92
Characteristic edge distance	$C_{cr,N}$	[mm]	79.5	97.5	138
Characteristic spacing	$S_{cr,N}$	[mm]	159	195	276
Installation safety factor	γ_{inst}	-	1.0	1.0	1.0
Concrete pry-our failure					
Factor	k_8	-	1.0	2.0	2.0
Concrete edge failure					
Outside diameter of the anchor	d_{nom}	[mm]	8	10	14
Effective length of anchor under shear loads	ℓ_f	[mm]	70	85	120
Displacements					
Displacements under tension load					
Displacements DLS	$\delta_{N,eq}$	[mm]	0.10	0.20	0.63
Displacements ULS	$\delta_{N,eq}$	[mm]	0.50	0.73	3.94
Displacements under shear load					
Displacements DLS	$\delta_{N,eq}$	[mm]	2.00	3.44	4.22
Displacements ULS	$\delta_{N,eq}$	[mm]	3.04	5.04	7.15

4.5 Characteristic values of resistance to fire exposure[1)]

Anchor Type			W-LX									
Anchor Size			6	6	8	8	10	10	12	12	14	14
Nominal embedment depth	h_{nom}	[mm]	43	55	50	70	55	85	60	100	75	120
Steel failure for tension and shear load $F_{Rk,s,fi} = N_{Rk,s,fi} = V_{Rk,s,fi}$												
Characteristic resistance												
R30	$F_{Rk,s,fi}$	[kN]	0.28	0.28	0.75	0.75	1.57	1.57	2.26	2.26	3.08	3.08
R60	$F_{Rk,s,fi}$	[kN]	0.25	0.25	0.65	0.65	1.18	1.18	1.70	1.70	2.31	2.31
R90	$F_{Rk,s,fi}$	[kN]	0.20	0.20	0.50	0.50	1.02	1.02	1.47	1.47	2.00	2.00
R120	$F_{Rk,s,fi}$	[kN]	0.14	0.14	0.40	0.40	0.79	0.79	1.13	1.13	1.54	1.54
R30	$M^0_{Rk,s,fi}$	[kN]	0.25	0.25	0.90	0.90	2.36	2.36	4.07	4.07	6.47	6.47
R60	$M^0_{Rk,s,fi}$	[kN]	0.23	0.23	0.78	0.78	1.77	1.77	3.05	3.05	4.85	4.85
R90	$M^0_{Rk,s,fi}$	[kN]	0.18	0.18	0.60	0.60	1.53	1.53	2.65	2.65	4.20	4.20
R120	$M^0_{Rk,s,fi}$	[kN]	0.13	0.13	0.48	0.48	1.18	1.18	2.04	2.04	3.23	3.23
Pullout failure												
Characteristic resistance												
R30	$F_{Rk,p,fi}$	[kN]	1.38	1.75	1.88	3.25	2.00	4.75	1.75	6.50	3.25	8.50
R60	$F_{Rk,p,fi}$	[kN]	1.38	1.75	1.88	3.25	2.00	4.75	1.75	6.50	3.25	8.50
R90	$F_{Rk,p,fi}$	[kN]	1.38	1.75	1.88	3.25	2.00	4.75	1.75	6.50	3.25	8.50
R120	$F_{Rk,p,fi}$	[kN]	1.10	1.40	1.50	2.60	1.60	3.80	1.40	5.20	2.60	6.80
Concrete cone failure												
Characteristic resistance												
R30	$F_{Rk,c,fi}$	[kN]	0.89	2.06	1.50	3.68	1.82	6.13	2.06	9.06	4.04	14.61
R60	$F_{Rk,c,fi}$	[kN]	0.89	2.06	1.50	3.68	1.82	6.13	2.06	9.06	4.04	14.61
R90	$F_{Rk,c,fi}$	[kN]	0.89	2.06	1.50	3.68	1.82	6.13	2.06	9.06	4.04	14.61
R120	$F_{Rk,c,fi}$	[kN]	0.71	1.65	1.20	2.94	1.46	4.91	1.65	7.25	3.23	11.69
Edge distance												
R30 to R120	$C_{cr,fi}$	[mm]	$2 \times h_{ef}$									
In case of fire attack from more than one side, the minimum edge distance shall be ≥ 300mm.												
Anchor spacing												
R30 to R120	$S_{cr,fi}$	[mm]	$4 \times h_{ef}$									
Concrete pry-out failure												
R30 to R120	k	-	1.0	1.0	1.0	1.0	1.0	2.0	1.0	2.0	1.0	2.0