DINAK

GE

GE

0036 CPD 90220 016

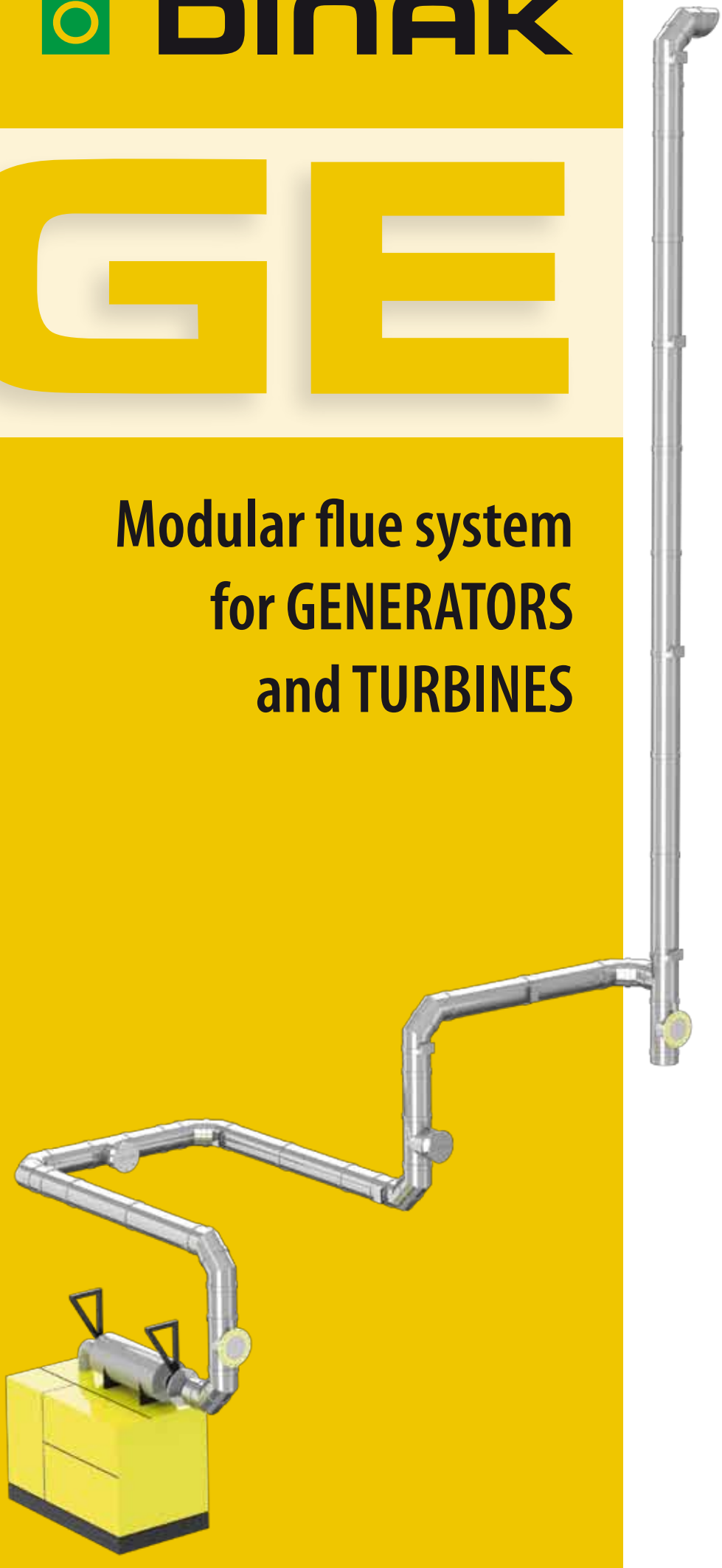
0036

DINAK GE37
EN 1856-1 T600 H1 D V2 L50040 O40
EN 1856-1 T600 H1 D Vm L20040 O40

DINAK GE50
EN 1856-1 T600 H1 D V2 L50040 O40
EN 1856-1 T600 H1 D Vm L20040 O40

DINAK GE100
EN 1856-1 T600 H1 D V2 L50040 O30
EN 1856-1 T600 H1 D Vm L20040 O30

Modular flue system for GENERATORS and TURBINES



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DINAK has a complete line of products specially designed for evacuating combustion products from power generators and co-generators.

POWER GENERATORS, DINAK EI

Power generators generate electricity through the movement of an alternator, which is in turn driven by a combustion engine fuelled by petrol or fuel oil.

The evacuation of combustion products generated by a generator set is characterised by the following factors:

- *High gas temperatures, from 400 to 600 ºC.*
- *High back pressure available at the primary silencer outlet, up to 5,000 Pa of back pressure.*
- *High gases evacuation speed, from 25 up to 35 m/s.*
- *Problem with noise emission due to the acoustic energy generated by the group, and the friction of the high-speed gasses on the inside of the chimney.*
- *Possibility of heat dilations and vibrations from the generator being transmitted to the chimney.*
- *Need to keep separate fire sections in the building, when the chimney passes through separating elements for fire sectors, rated EI tt*
- *Risk of explosions during motor start-up and stopping operations.*

The case for the evacuation of combustion products from fuel oil pumps are similar to those for generator sets, although they have a smaller scale for power and diameters.

The DINAK GE chimney is designed to work in conditions with high pressure (H1) and high gas temperatures (T600, D), which makes it ideal for evacuating combustion products from such equipment.

When the chimney runs through fire separation zones, the use of the DINAK EI range is necessary, which has equivalent features to DINAK GE (T600, H1, D9) but also has the EI 60 or EI 120 fire resistance rating, for internal and external fire in both cases (i↔o), in both vertical and horizontal configuration.

For further information about the DINAK EI range, consult the specific technical and commercial documentation.

EQUIPMENT FOR CO-GENERATION AND MICRO CO-GENERATION: DINAK hp

Co-generation equipment is based on the simultaneous production of useful heat and electricity, and is basically made up of a generator set and a heat exchanger.

Unlike the equipment described previously, the temperature of combustion products in this case is low, usually below 200ºC, which means there is a risk of condensation forming inside the chimney.

In order to evacuate combustion products from co-generation and micro co-generation equipment, DINAK has its hp line of chimneys, designed and manufactured to work under conditions with high pressure (H1) and low gas temperatures (T200, W).

For further information about the DINAK hp range, consult the specific technical and commercial documentation.

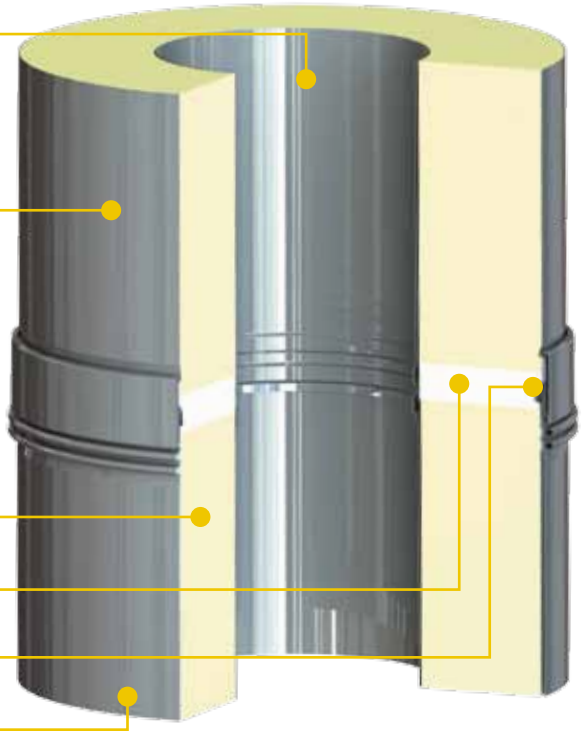
Insulated double-walled modular metallic chimney, designed specifically to work in conditions of high temperature (up to 600ºC) and high pressure (up to 5,000 Pa).

The DINAK GE chimney is available in three versions: GE37, GE50 and GE100. The main difference between them is the insulation thickness and the available diameters, which are shown in the following table:

	DN	80	100	125	150	175	200	250	300	350	400	450	500	550	600	650	700	750	800
GE37	Dext	155	175	200	225	250	275	325	375	425	475	525	575	625	675	-	-	-	-
	kg/m	4,8	5,4	6,3	7,1	7,9	8,7	10,4	12,1	14,8	16,6	18,4	20,1	21,9	23,7	-	-	-	-
GE50	Dext	180	200	225	250	275	300	350	400	450	500	550	600	650	700	750	800	850	900
	kg/m	6,4	7,2	8,1	9,1	10,0	10,9	12,8	15,7	17,7	19,7	21,7	23,7	25,7	29,4	34,8	37,2	39,6	42,0
GE100	Dext	280	300	325	350	375	400	450	500	550	600	650	700	750	800	850	900	950	1000
	kg/m	16,2	17,2	18,6	20,0	22,3	23,7	26,6	29,5	32,3	35,2	38,1	42,7	45,7	48,7	55,1	58,3	61,6	64,8

MATERIALS

- **Inner wall**
  - Stainless steel AISI 304 (1.4301)
    Fuel natural gas, LGPs and diesel oil
  - Stainless steel AISI 316L (1.4404)
    Fuel natural gas, LPGs, diesel oil and biodiesel
- **Outer wall**
  - Stainless steel AISI 430 (1.4016) **NEW**
    Indoor installation in clean environment.
  - Stainless steel AISI 304 (1.4301)
    Indoor installation in uncontaminated environment
    Outdoor installation in area away from the coast.
  - Stainless steel AISI 316L (1.4404)
    Outdoor installation in coastal or industrial area.
    Indoor and aggressive environment installation.
- **Insulation**
  100 kg/m^3 density Rockwool
- **Joint insulation**
  Biosoluble ceramic fibre with density 220 kg/m3 and 96 kg/m^3
- **Sealing ring**
  Stainless steel AISI 304 (1.4301)
- **External finish**
  Mirror finish (BA). Optional power couted according RAL range

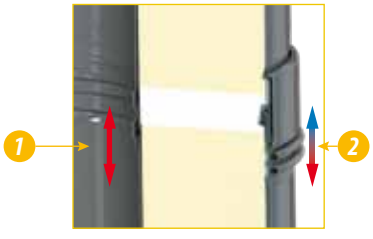


FEATURES

Individual expansion absorption at joints

The inner and outer walls work together on the male end of straight sections, while on the female end the inner wall expansions freely with the effects of temperature.

Fig. 1



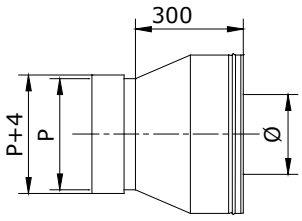
The outer wall on the straight elements (202) includes a bellow on the male end, which ensures correct absorption of the expansions in the outer wall.

Fig. 2

Gas tightness

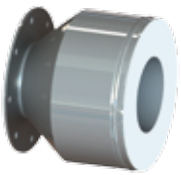
The outer wall has a perimeter sealing ring for the application of a strip of DINAK high temperature neutral silicon during assembly, which also ensures joint sealing.

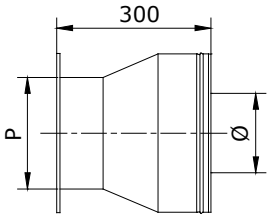
100 Adaptor



	Ø	80	100	125	150	175	200	250	300	350	400	450	500	550	600
GE37	P (mm)	85	105	130	155	180	205	255	305	355	405	455	505	555	605
GE50	P (mm)	85	105	130	155	180	205	255	305	355	405	455	505	555	605
GE100	P (mm)	85	105	130	155	180	205	255	305	355	405	455	505	555	605

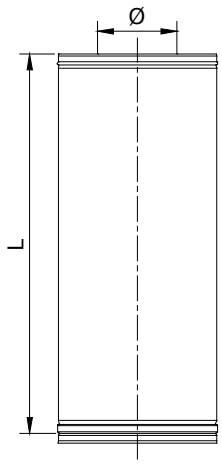
1B0 Flange adaptor





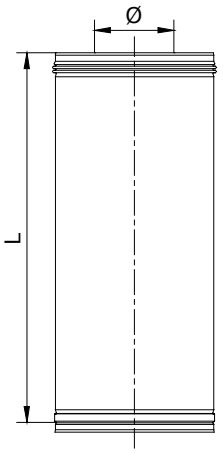
	Ø	80	100	125	150	175	200	250	300	350	400	450	500	550	600
GE37	P (mm)	85	105	130	155	180	205	255	305	355	405	455	505	555	605
GE50	P (mm)	85	105	130	155	180	205	255	305	355	405	455	505	555	605
GE100	P (mm)	85	105	130	155	180	205	255	305	355	405	455	505	555	605

020 Straight length 960 mm



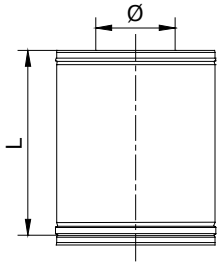
	Ø	80	100	125	150	175	200	250	300	350	400	450	500	550	600
GE37	L (mm)	960	960	960	960	960	960	960	960	960	960	960	960	960	960
GE50	L (mm)	960	960	960	960	960	960	960	960	960	960	960	960	960	960
GE100	L (mm)	960	960	960	960	960	960	960	960	960	960	960	960	940	940

202 Straight length with expansion system 935 mm



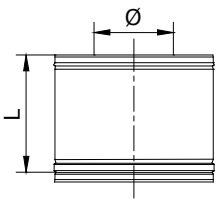
	Ø	80	100	125	150	175	200	250	300	350	400	450	500	550	600
GE37	L (mm)	935	935	935	935	935	935	935	935	935	935	935	935	935	935
GE50	L (mm)	935	935	935	935	935	935	935	935	935	935	935	935	935	935
GE100	L (mm)	-	-	-	-	-	-	-	-	-	-	-	-	-	-

024 Straight length 460 mm



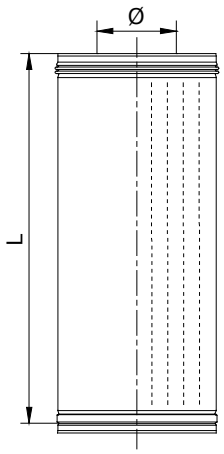
	Ø	80	100	125	150	175	200	250	300	350	400	450	500	550	600
GE37	L (mm)	460	460	460	460	460	460	460	460	460	460	460	460	460	460
GE50	L (mm)	460	460	460	460	460	460	460	460	460	460	460	460	460	460
GE100	L (mm)	460	460	460	460	460	460	460	460	460	460	460	460	440	440

025 Straight length 290 mm



	Ø	80	100	125	150	175	200	250	300	350	400	450	500	550	600
GE37	L (mm)	290	290	290	290	290	290	290	290	290	290	290	290	290	290
GE50	L (mm)	290	290	290	290	290	290	290	290	290	290	290	290	290	290
GE100	L (mm)	290	290	290	290	290	290	290	290	290	290	290	290	270	270

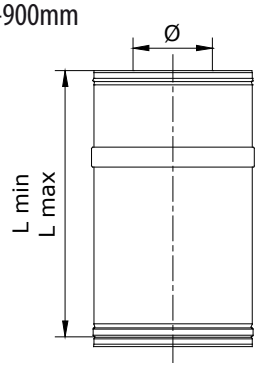
021 Silencer



See acoustic data p.13

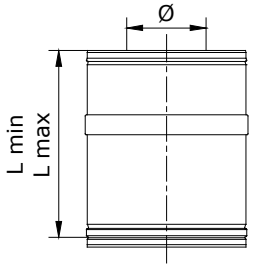
	Ø	80	100	125	150	175	200	250	300	350	400	450	500	550	600
GE37	L (mm)	-	-	960	960	960	960	960	960	960	960	960	960	960	960
GE50	L (mm)	-	-	960	960	960	960	960	960	960	960	960	960	960	960
GE100	L (mm)	-	-	960	960	960	960	960	960	960	960	960	960	940	940

022 Adjustable length L=550-900mm



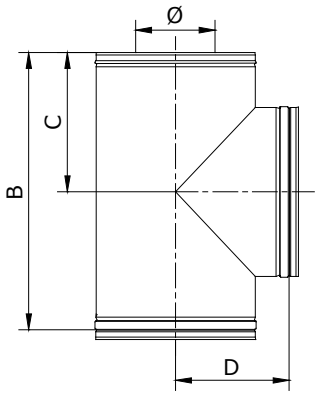
	Ømm	80	100	125	150	175	200	250	300	350	400	450	500	550	600
GE37	L. min.	550	550	550	550	550	550	550	550	550	550	550	550	550	550
	L.max.	900	900	900	900	900	900	900	900	900	900	900	900	900	900
GE50	L. min.	550	550	550	550	550	550	550	550	550	550	550	550	550	625
	L. max.	900	900	900	900	900	900	900	900	900	900	900	900	900	975
GE100	L. min.	550	550	550	550	550	550	550	550	550	550	625	625	605	605
	L. max.	900	900	900	900	900	900	900	900	900	900	975	975	955	955

023 Adjustable length L=375-550mm



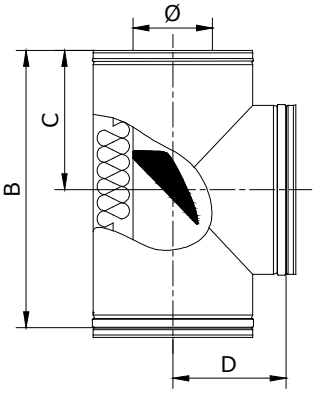
	Ømm	80	100	125	150	175	200	250	300	350	400	450	500	550	600
GE37	L. min.	370	370	370	370	370	370	370	370	370	370	370	370	370	370
	L. max.	550	550	550	550	550	550	550	550	550	550	550	550	550	550
GE50	L. min.	370	370	370	370	370	370	370	370	370	370	370	370	370	445
	L. max.	550	550	550	550	550	550	550	550	550	550	550	550	550	625
GE100	L. min.	370	370	370	370	370	370	370	370	370	370	445	445	425	425
	L. max.	550	550	550	550	550	550	550	550	550	550	625	625	605	605

031 90º Tee with no deflector



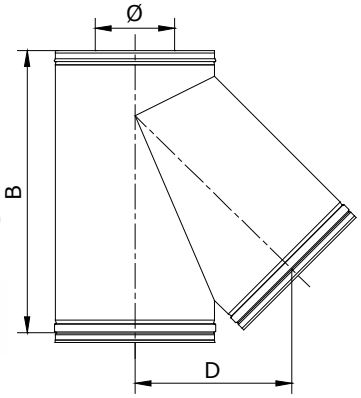
	Ø	80	100	125	150	175	200	250	300	350	400	450	500	550	600
GE37	B (mm)	290	290	290	460	460	460	460	630	630	630	630	960	960	960
	C (mm)	145	145	145	230	230	230	230	315	315	315	315	480	480	480
	D (mm)	130	140	155	165	180	190	215	240	265	290	315	340	365	390
GE50	B (mm)	290	290	460	460	460	460	460	630	630	630	710	710	960	960
	C (mm)	145	145	230	230	230	230	230	315	315	315	355	355	480	480
	D (mm)	145	155	165	180	190	205	230	255	280	305	330	355	380	405
GE100	B (mm)	460	460	460	460	630	630	630	630	710	710	960	960	940	940
	C (mm)	230	230	230	230	315	315	315	315	355	355	480	480	480	480
	D (mm)	195	205	215	230	240	255	280	305	330	355	380	405	430	455

318 90º Tee with deflector



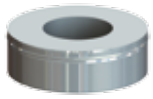
	Ø	80	100	125	150	175	200	250	300	350	400	450	500	550	600
GE37	B (mm)	290	290	290	460	460	460	460	630	630	630	630	960	960	960
	C (mm)	145	145	145	230	230	230	230	315	315	315	315	480	480	480
	D (mm)	130	140	155	165	180	190	215	240	265	290	315	340	365	390
GE50	B (mm)	290	290	460	460	460	460	460	630	630	630	710	710	960	960
	C (mm)	145	145	230	230	230	230	230	315	315	315	355	355	480	480
	D (mm)	145	155	165	180	190	205	230	255	280	305	330	355	380	405
GE100	B (mm)	460	460	460	460	630	630	630	630	710	710	960	960	940	940
	C (mm)	230	230	230	230	315	315	315	315	355	355	480	480	480	480
	D (mm)	195	205	215	230	240	255	280	305	330	355	380	405	430	455

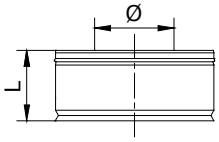
303 135º Tee



	Ø	80	100	125	150	175	200	250	300	350	400	450	500	550	600
GE37	B (mm)	460	460	460	630	630	630	630	710	960	960	960	960	1050	1150
	D (mm)	205	220	240	265	285	305	350	390	435	475	520	560	605	645
GE50	B (mm)	460	460	630	630	630	630	710	960	960	960	960	1050	1150	-
	D (mm)	225	240	265	285	305	325	370	410	455	500	540	585	625	-
GE100	B (mm)	630	630	630	710	710	960	960	960	960	1050	1150	-	-	-
	D (mm)	310	325	350	370	390	410	455	500	540	585	625	-	-	-

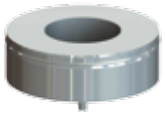
060 Soot collector

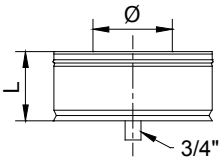




	Ø	80	100	125	150	175	200	250	300	350	400	450	500	550	600
GE37	L (mm)	125	125	125	125	125	125	125	125	125	125	125	125	125	125
GE50	L (mm)	125	125	125	125	125	125	125	125	125	125	125	125	125	125
GE100	L (mm)	125	125	125	125	125	125	125	125	125	125	125	125	125	125

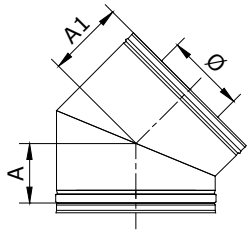
061 Soot collector with drain





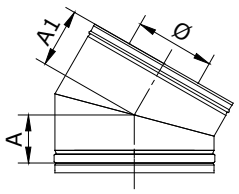
	Ø	80	100	125	150	175	200	250	300	350	400	450	500	550	600
GE37	L (mm)	125	125	125	125	125	125	125	125	125	125	125	125	125	125
GE50	L (mm)	125	125	125	125	125	125	125	125	125	125	125	125	125	125
GE100	L (mm)	125	125	125	125	125	125	125	125	125	125	125	125	125	125

045 45º Elbow



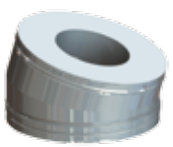
		Ø	80	100	125	150	175	200	250	300	350	400	450	500	550	600
GE37	A (mm)		80	85	90	95	100	105	100	110	120	130	140	150	160	170
	A1 (mm)		100	105	110	115	120	125	120	130	140	150	160	170	180	190
GE50	A (mm)		85	90	95	100	105	110	105	115	125	135	145	155	165	175
	A1 (mm)		105	110	115	120	125	130	125	135	145	155	165	175	185	195
GE100	A (mm)		105	110	100	105	110	115	125	135	145	155	165	175	205	215
	A1 (mm)		125	130	120	125	130	135	145	155	165	175	185	195	245	255

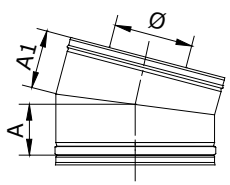
042 30º Elbow



		Ø	80	100	125	150	175	200	250	300	350	400	450	500	550	600
GE37	A (mm)		70	70	75	80	80	85	75	80	90	95	100	110	115	120
	A1 (mm)		90	90	95	100	100	105	95	100	110	115	120	130	135	140
GE50	A (mm)		70	75	80	80	85	90	80	85	90	100	105	110	120	125
	A1 (mm)		90	95	100	100	105	110	100	105	110	120	125	130	140	145
GE100	A (mm)		85	90	75	80	80	85	90	100	105	110	120	125	150	155
	A1 (mm)		105	110	95	100	100	105	110	120	125	130	140	145	190	195

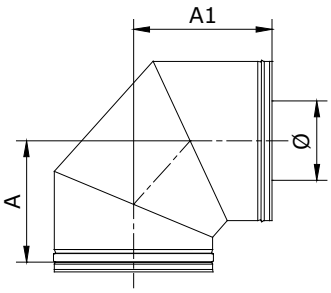
044 15º Elbow





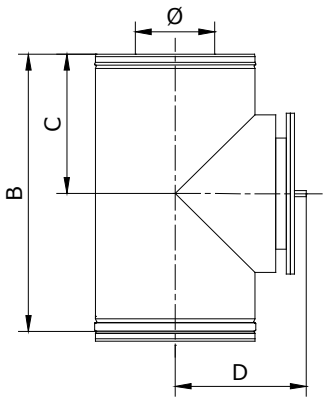
		Ø	80	100	125	150	175	200	250	300	350	400	450	500	550	600
GE37	A (mm)		60	60	60	65	65	65	55	55	60	65	65	70	75	75
	A1 (mm)		80	80	80	85	85	85	75	75	80	85	85	90	95	95
GE50	A (mm)		60	60	65	65	65	70	55	60	60	65	65	70	75	80
	A1 (mm)		80	80	85	85	85	90	75	80	80	85	85	90	95	100
GE100	A (mm)		65	70	50	55	55	60	60	65	65	70	75	80	95	100
	A1 (mm)		85	90	70	75	75	80	80	85	85	90	95	100	135	140

433 90º Elbow



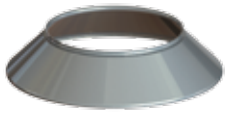
		Ø	80	100	125	150	175	200	250	300	350	400	450	500	550	600
GE37	A (mm)		155	165	180	190	200	215	225	250	275	300	325	350	375	400
	A1 (mm)		175	185	200	210	220	235	245	270	295	320	345	370	395	420
GE50	A (mm)		165	175	190	200	215	225	250	275	300	325	350	375	400	-
	A1 (mm)		185	195	210	220	235	245	270	295	320	345	370	395	420	-
GE100	A (mm)		215	225	240	250	265	275	300	325	350	375	400	-	-	-
	A1 (mm)		235	245	260	270	285	295	320	345	370	395	420	-	-	-

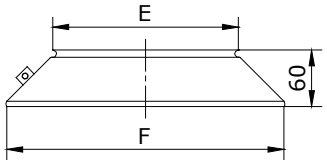
529 Inspection Tee



	Ø	80	100	125	150	175	200	250	300	350	400	450	500	550	600
GE37	B (mm)	290	290	290	460	460	460	460	630	630	630	630	960	960	960
	C (mm)	145	145	145	230	230	230	230	315	315	315	315	480	480	480
	D (mm)	190	200	215	230	240	250	275	300	325	350	375	400	425	450
GE50	B (mm)	290	290	460	460	460	460	460	630	630	630	710	710	960	960
	C (mm)	145	145	230	230	230	230	230	315	315	315	355	355	480	480
	D (mm)	205	215	225	240	250	265	290	315	340	365	390	415	440	465
GE100	B (mm)	460	460	460	460	630	630	630	630	710	710	960	960	940	940
	C (mm)	230	230	230	230	315	315	315	315	355	355	480	480	470	470
	D (mm)	255	265	275	290	300	315	335	365	385	410	435	460	490	510

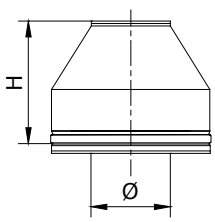
013 Storm Collar





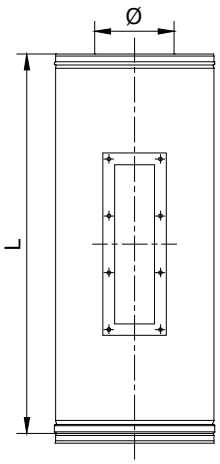
	Ø	80	100	125	150	175	200	250	300	350	400	450	500	550	600
GE37	E (mm)	155	175	200	225	250	275	325	375	425	475	525	575	625	675
	F (mm)	265	285	310	335	360	385	435	485	535	585	635	685	735	785
GE50	E (mm)	180	200	225	250	275	300	350	400	450	500	550	600	650	700
	F (mm)	290	310	335	360	385	410	460	510	560	610	660	710	760	810
GE100	E (mm)	280	300	325	350	375	400	450	500	550	600	650	700	750	800
	F (mm)	390	410	435	460	485	510	560	610	660	710	760	810	860	910

011 Open Terminal



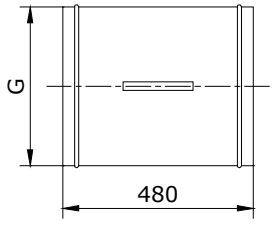
	Ø	80	100	125	150	175	200	250	300	350	400	450	500	550	600
GE37	H (mm)	210	210	220	220	220	220	220	220	220	220	220	220	220	220
GE50	H (mm)	210	210	220	220	220	220	220	220	220	220	220	220	220	220
GE100	H (mm)	210	210	220	220	220	220	220	220	220	220	220	220	200	200

526 Inspection element



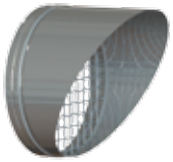
	Ø	80	100	125	150	175	200	250	300	350	400	450	500	550	600
GE37	L (mm)	960	960	960	960	960	960	960	960	960	960	960	960	960	960
GE50	L (mm)	960	960	960	960	960	960	960	960	960	960	960	960	960	960
GE100	L (mm)	960	960	960	960	960	960	960	960	960	960	960	960	940	940

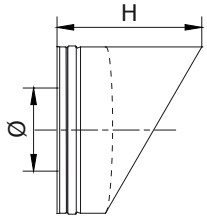
014 Wall sleeve



	Ø	80	100	125	150	175	200	250	300	350	400	450	500	550	600
GE37	G (mm)	185	200	225	250	275	310	350	400	450	500	550	600	650	700
GE50	G (mm)	210	225	250	275	310	325	350	425	475	525	575	625	675	750
GE100	G (mm)	310	325	350	375	400	425	475	525	575	625	675	750	800	850

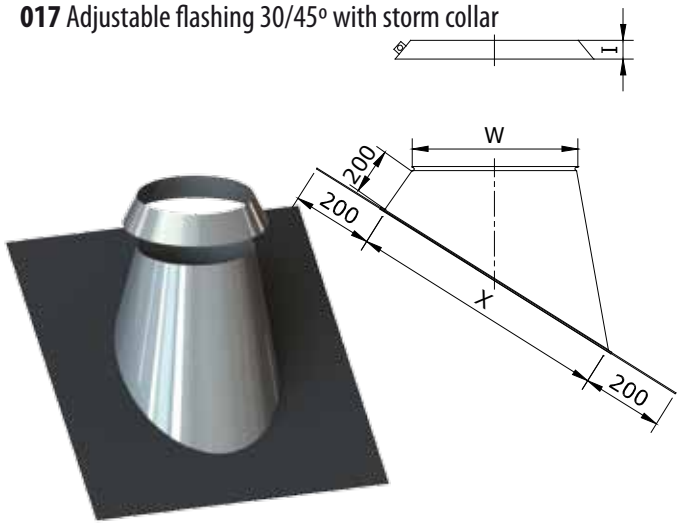
015 Horizontal Terminal





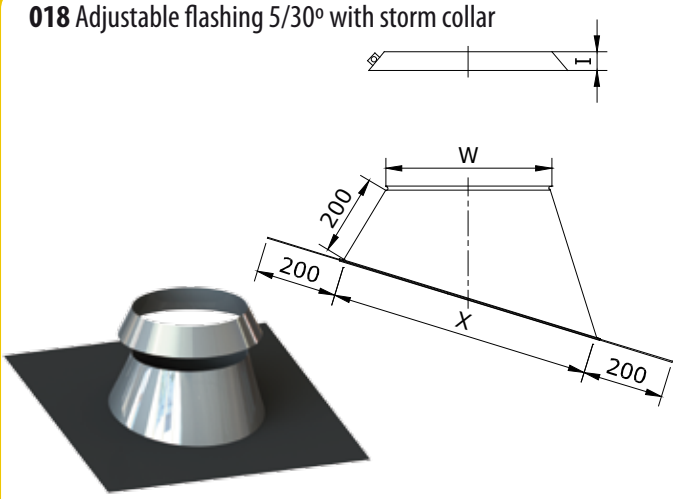
	Ø	80	100	125	150	175	200	250	300	350	400	450	500	550	600
GE37	H (mm)	170	180	195	210	225	240	270	295	325	355	380	480	515	550
GE50	H (mm)	185	195	210	225	240	250	280	310	340	370	465	500	535	570
GE100	H (mm)	240	250	270	280	300	310	340	370	465	500	535	570	625	660

017 Adjustable flashing 30/45º with storm collar



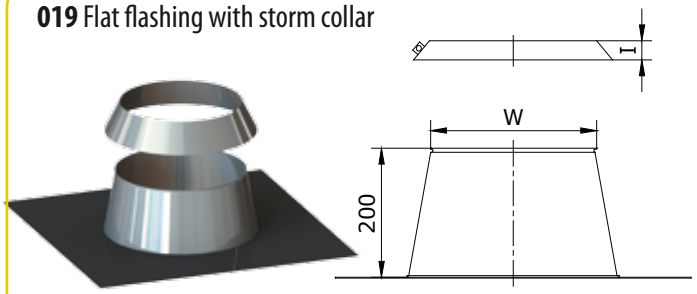
	Ø	80	100	125	150	175	200	250	300	350	400	450	500	550	600
GE37	I (mm)	90	100	100	105	110	110	120	135	150	160	170	180	190	200
	W (mm)	190	210	230	260	280	305	355	405	465	515	565	615	665	715
	X (mm)	385	410	455	480	510	545	615	685	765	840	905	975	1045	1115
GE50	I (mm)	100	100	100	110	110	110	140	165	170	180	190	200	220	-
	W (mm)	210	230	260	280	305	330	390	440	490	540	590	640	690	-
	X (mm)	410	455	480	510	545	580	660	730	800	870	940	1010	1080	-
GE100	I (mm)	110	110	120	140	135	165	170	180	190	200	220	240	-	-
	W (mm)	315	330	355	390	405	440	490	540	590	640	690	740	-	-
	X (mm)	555	580	615	660	680	730	800	870	940	1010	1080	1150	-	-

018 Adjustable flashing 5/30º with storm collar



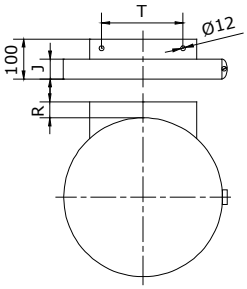
	Ø	80	100	125	150	175	200	250	300	350	400	450	500	550	600
GE37	I (mm)	90	100	100	105	110	110	120	135	150	160	170	180	190	200
	W (mm)	190	210	230	260	280	305	355	405	465	515	565	615	665	715
	X (mm)	350	370	395	430	450	480	580	635	660	715	770	825	885	940
GE50	I (mm)	100	100	100	110	110	110	140	165	170	180	190	200	220	-
	W (mm)	210	230	260	280	305	330	390	440	490	540	590	640	690	-
	X (mm)	370	395	430	450	480	505	575	630	685	745	800	855	910	-
GE100	I (mm)	110	110	120	140	135	165	170	180	190	200	220	240	-	-
	W (mm)	315	330	355	390	405	440	490	540	590	640	690	740	-	-
	X (mm)	490	505	545	575	600	630	685	740	800	855	910	965	-	-

019 Flat flashing with storm collar



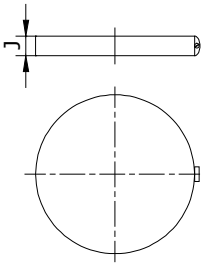
	Ø	80	100	125	150	175	200	250	300	350	400	450	500	550	600
GE37	I (mm)	90	100	100	105	110	110	120	135	150	160	170	180	190	200
	W (mm)	190	210	230	260	280	305	355	405	465	515	565	615	665	715
	X (mm)	215	280	300	330	350	400	450	500	525	575	625	675	725	775
GE50	I (mm)	100	100	100	110	110	110	140	165	170	180	190	200	220	-
	W (mm)	210	230	260	280	305	330	390	440	490	540	590	640	690	-
	X (mm)	305	325	355	375	400	425	475	525	575	625	675	725	775	-
GE100	I (mm)	110	110	120	140	135	165	170	180	190	200	220	240	-	-
	W (mm)	315	330	355	390	405	440	490	540	590	640	690	740	-	-
	X (mm)	385	400	425	450	475	500	550	600	650	700	750	800	-	-

080 / 086 Wall support / Flat wall support



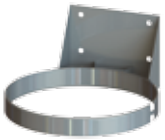
	Ø	80	100	125	150	175	200	250	300	350	400	450	500	550	600
GE37	J (mm)	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60
	R (mm)	30	30	30	35	45	40	25	35	40	40	20	25	30	35
	T (mm)	60	60	120	120	120	190	190	190	190	190	270	270	270	270
GE50	J (mm)	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60
	R (mm)	32	30	35	45	40	20	30	35	45	25	30	35	40	40
	T (m)	120	120	120	120	190	190	190	190	190	270	270	270	270	270
GE100	J (mm)	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60	70/60	70/60
	R (mm)	15	20	25	30	35	35	45	25	30	35	40	45	35	35
	T (mm)	190	190	190	190	190	190	190	270	270	270	270	270	355	375

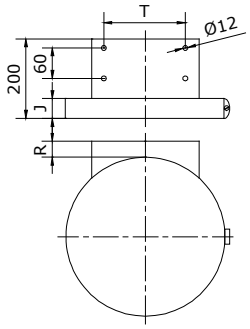
070 Locking band



	Ø	80	100	125	150	175	200	250	300	350	400	450	500	550	600
GE37	J (mm)	50	50	50	50	50	50	50	50	50	50	50	50	50	50
GE50	J (mm)	50	50	50	50	50	50	50	50	50	50	50	50	50	50
GE100	J (mm)	50	50	50	50	50	50	50	50	50	50	50	50	70	70

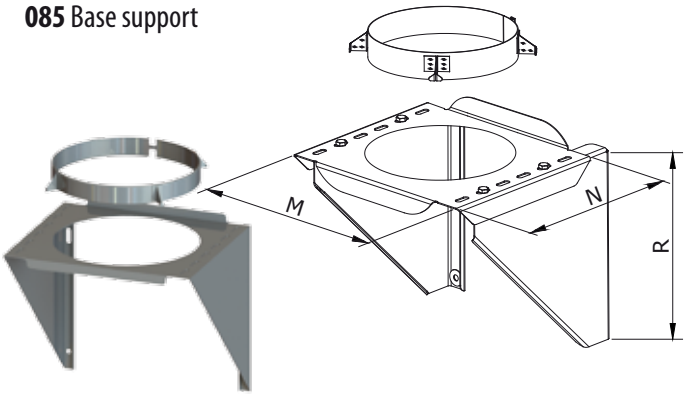
090 Wall support with 2 extra fixing points





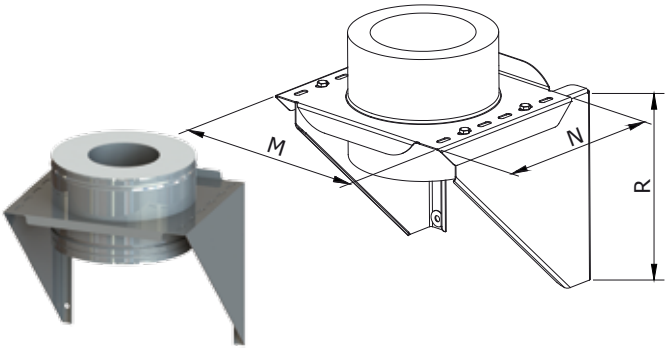
	Ø	80	100	125	150	175	200	250	300	350	400	450	500	550	600
GE37	J (mm)	50	50	50	50	50	50	50	50	50	50	50	50	50	50
	R (mm)	30	30	30	35	45	40	25	35	40	40	20	25	30	35
	T (mm)	60	60	120	120	120	190	190	190	190	190	270	270	270	270
GE50	J (mm)	50	50	50	50	50	50	50	50	50	50	50	50	50	50
	R (mm)	32	30	35	45	40	20	30	35	45	25	30	35	40	40
	T (m)	120	120	120	120	190	190	190	190	190	270	270	270	270	270
GE100	J (mm)	50	50	50	50	50	50	50	50	50	50	50	50	70	70
	R (mm)	15	20	25	30	35	35	45	25	30	35	40	45	35	35
	T (mm)	190	190	190	190	190	190	190	270	270	270	270	270	355	375

085 Base support



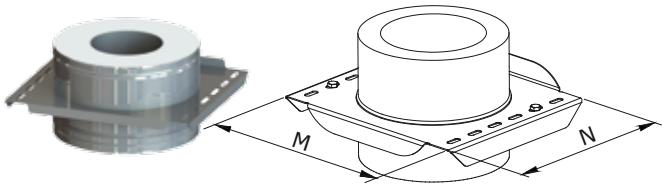
	Ø	80	100	125	150	175	200	250	300	350	400	450	500	550	600
GE37	M (mm)	270	285	310	335	360	385	435	480	535	585	635	685	735	785
	N (mm)	240	265	280	290	325	360	390	440	490	550	575	635	690	750
	R (mm)	245	265	290	315	360	365	400	450	485	560	590	650	710	770
GE50	M (mm)	270	310	335	360	380	390	455	510	560	605	655	705	740	-
	N (mm)	240	280	290	325	360	360	415	465	515	565	615	665	710	-
	R (mm)	255	290	315	360	365	375	425	475	535	585	635	690	725	-
GE100	M (mm)	370	390	430	455	480	505	555	605	655	705	740	-	-	-
	N (mm)	340	360	390	415	440	465	515	565	615	665	710	-	-	-
	R (mm)	350	375	400	425	450	475	535	585	635	685	725	-	-	-

853 Adjustable base support + brackets



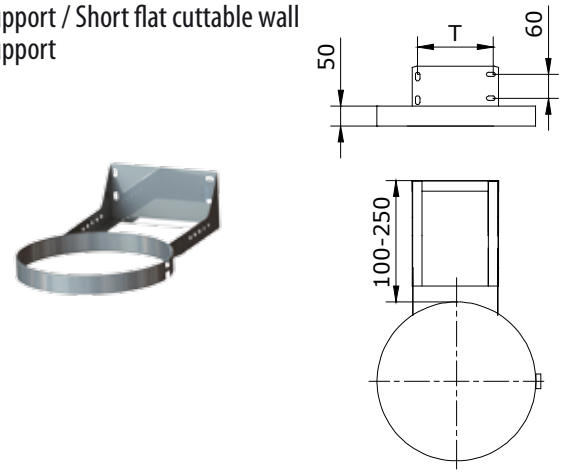
	Ø	80	100	125	150	175	200	250	300	350	400	450	500	550	600
GE37	M (mm)	270	285	310	335	360	385	435	480	535	585	635	685	735	785
	N (mm)	240	265	280	290	325	360	390	440	490	550	575	635	690	750
	R (mm)	245	265	290	315	360	365	400	450	485	560	590	650	710	770
GE50	M (mm)	270	310	335	360	380	390	455	510	560	605	655	705	740	-
	N (mm)	240	280	290	325	360	360	415	465	515	565	615	665	710	-
	R (mm)	255	290	315	360	365	375	425	475	535	585	635	690	725	-
GE100	M (mm)	370	390	430	455	480	505	555	605	655	705	740	-	-	-
	N (mm)	340	360	390	415	440	465	515	565	615	665	710	-	-	-
	R (mm)	350	375	400	425	450	475	535	585	635	685	725	-	-	-

854 Console plate



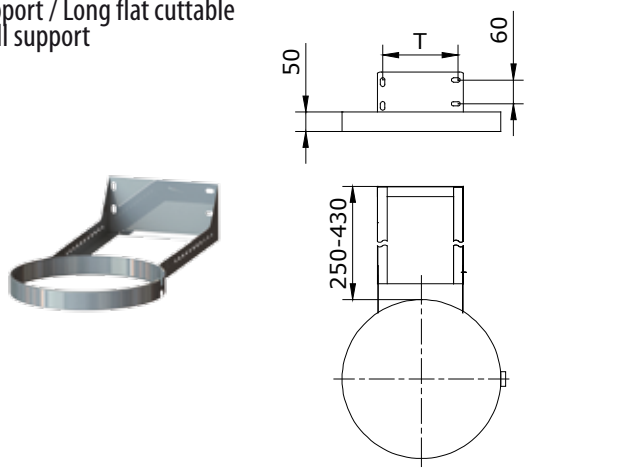
	Ø	80	100	125	150	175	200	250	300	350	400	450	500	550	600
GE37	M (mm)	270	285	310	335	360	385	435	480	535	585	635	685	735	785
	N (mm)	240	265	280	290	325	360	390	440	490	550	575	635	690	750
GE50	M (mm)	270	310	335	360	380	390	455	510	560	605	655	705	740	-
	N (mm)	240	280	290	325	360	360	415	465	515	565	615	665	710	-
GE100	M (mm)	370	390	430	455	480	505	555	605	655	705	740	-	-	-
	N (mm)	340	360	390	415	440	465	515	565	615	665	710	-	-	-

835 / 836 Short cuttable wall support / Short flat cuttable wall support



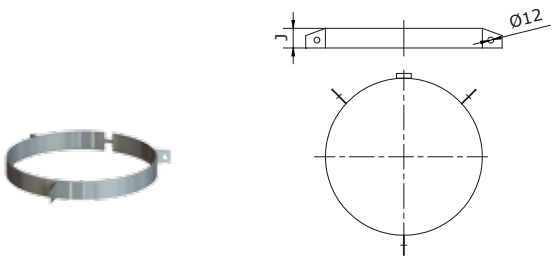
	Ø	80	100	125	150	175	200	250	300	350	400	450	500	550	600
GE37	T (mm)	55	120	120	120	120	190	190	190	190	190	270	270	270	270
GE50	T (mm)	120	120	120	120	190	190	190	190	190	270	270	270	270	-
GE100	T (mm)	190	190	190	190	190	190	190	270	270	270	270	-	-	-

845 / 846 Long cuttable wall support / Long flat cuttable wall support



	Ø	80	100	125	150	175	200	250	300	350	400	450	500	550	600
GE37	T (mm)	55	120	120	120	120	190	190	190	190	190	270	270	270	270
GE50	T (mm)	120	120	120	120	190	190	190	190	190	270	270	270	270	-
GE100	T (mm)	190	190	190	190	190	190	190	270	270	270	270	-	-	-

110 Guy wire bracket



	Ø	80	100	125	150	175	200	250	300	350	400	450	500	550	600
GE37	J (mm)	50	50	50	50	50	50	50	50	50	50	50	50	50	50
GE50	J (mm)	50	50	50	50	50	50	50	50	50	50	50	50	50	50
GE100	J (mm)	50	50	50	50	50	50	50	50	50	50	50	50	70	70

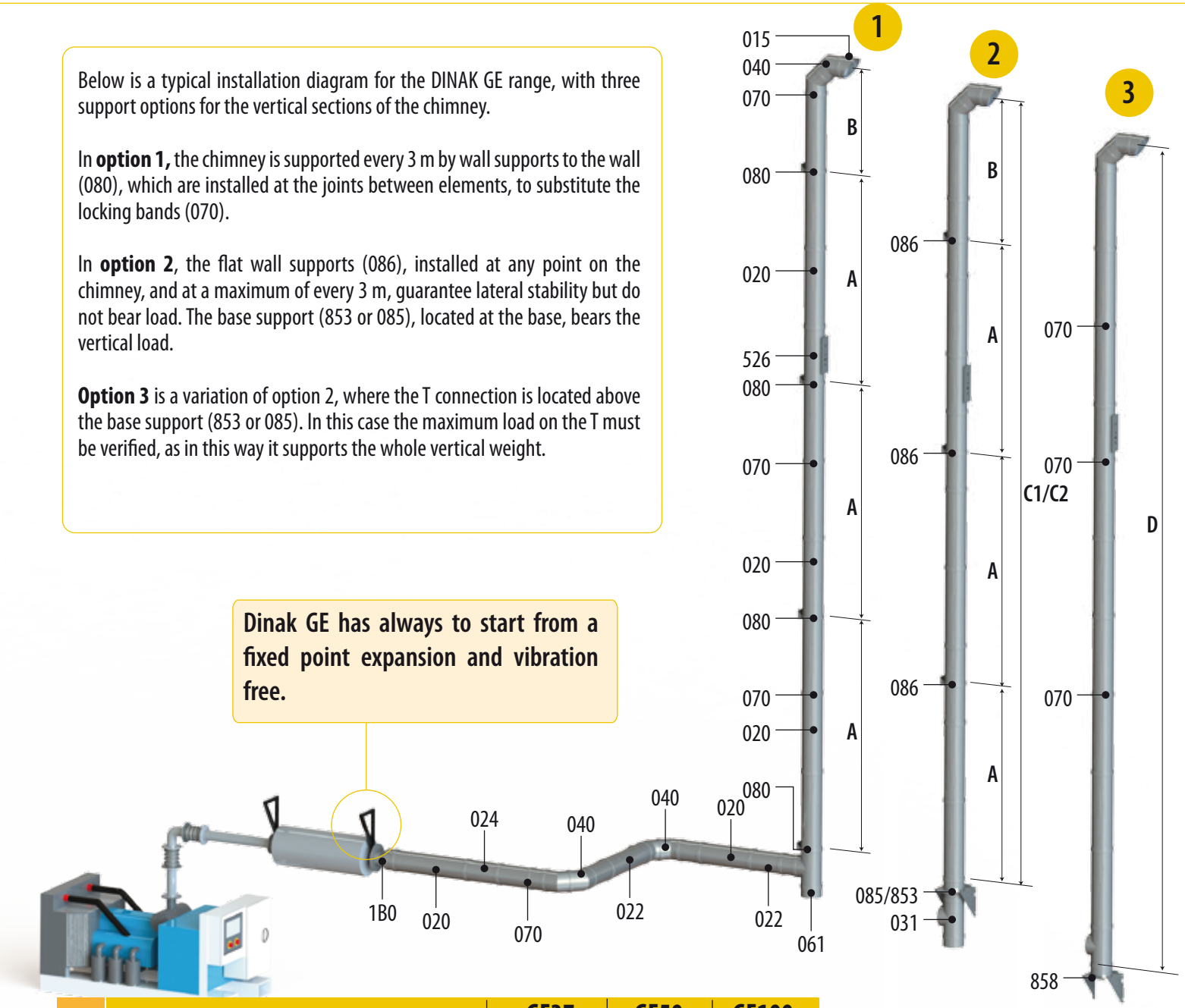
TYPICAL INTALLATION DIAGRAMS

Below is a typical installation diagram for the DINAK GE range, with three support options for the vertical sections of the chimney.

In **option 1,** the chimney is supported every 3 m by wall supports to the wall (080), which are installed at the joints between elements, to substitute the locking bands (070).

In **option 2**, the flat wall supports (086), installed at any point on the chimney, and at a maximum of every 3 m, guarantee lateral stability but do not bear load. The base support (853 or 085), located at the base, bears the vertical load.

Option 3 is a variation of option 2, where the T connection is located above the base support (853 or 085). In this case the maximum load on the T must be verified, as in this way it supports the whole vertical weight.



Dinak GE has always to start from a fixed point expansion and vibration free.

DN	A (m) 080 086	A (m) 835 836	A (m) 845 846	B (m) 080 086	B (m) 835 836	B (m) 845 846	GE37 C1/C2 (m)	GE37 D (m)	GE50 C1/C2 (m)	GE50 D (m)	GE100 C1/C2 (m)	GE100 D (m)
80	3	3	2	2 / 1	1	1	66/35	17	49/26	12	19/10	5
100	3	3	2	2 / 1	1	1	58/31	15	44/23	11	18/9	4
125	3	3	2	2 / 1	1	1	50/27	13	39/21	10	17/9	4
150	3	3	2	2 / 1	1	1	44/24	11	35/18	9	15/8	4
175	3	3	2	2 / 1	1	1	40/21	10	31/17	8	17/12	4
200	3	3	2	2 / 1	1	1	36/19	9	29/15	7	16/11	4
250	3	3	2	2 / 1	1	1	30/16	7	24/13	6	14/10	3
300	3	3	2	2 / 1	1	1	26/14	6	24/17	6	13/9	3
350	3	3	2	2 / 1	1	1	26/18	7	22/15	5	12/8	3
400	3	3	2	2 / 1	1	1	23/16	6	19/13	5	11/7	3
450	3	3	2	2 / 1	1	1	21/14	5	18/12	4	10/7	2
500	3	3	2	2 / 1	1	1	19/13	5	16/11	4	-	4
550	3	3	2	2 / 1	1	1	17/12	4	15/10	4	-	3
600	3	3	2	2 / 1	1	1	16/11	4	-	6	-	3

A: Maximum distance (m) between supports :
-Wall supports (080) or flat wall supports (086)
-Short cuttable wall supports (835) or flats one (836)
-Long cuttable wall supports (845) or flats one (845)

B: Maximum clear height (m) from the last wall support
The maximum clear height will be:
1 m, if the straight modules have expansion (202)
2 m, if at least the last three straight modules do not have expansion (020)

C1: Maximum height (m) over the base support without extending

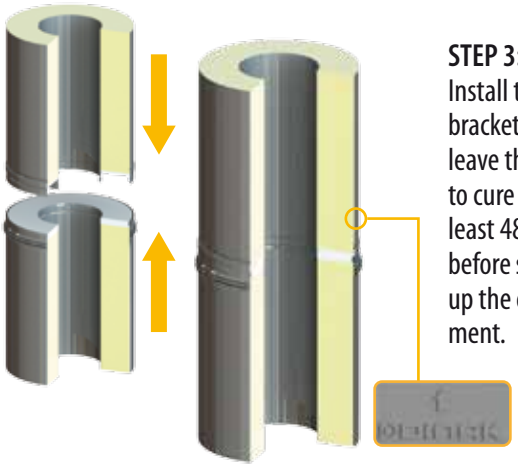
C2: Maximum height over the extended base support

D: Maximum height (m) over the T connection, when it bears load.

FITTING BETWEEN ELEMENTS

STEP 1:
Apply a strip of DINAK heat resistant neutral silicon in the sealing ring located on the female end of the piece.

STEP 2:
Insert the male end into the female end of the next piece, respecting the direction of gases indicated by an arrow on the base of the element.

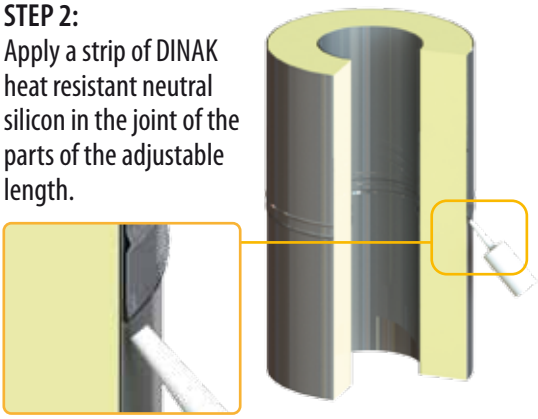


STEP 3:
Install the joint bracket, and leave the silicon to cure for at least 48 hours before starting up the equipment.

ADJUSTABLE LENGTHS

STEP 1:
Remove the locking band from the adjustable length and adjust the element to the desired length.

STEP 2:
Apply a strip of DINAK heat resistant neutral silicon in the joint of the parts of the adjustable length.



STEP 3:
Install the locking band and leave the silicon to cure for at least 48 hours before starting up the equipment.

SILICONE CARTRIDGE

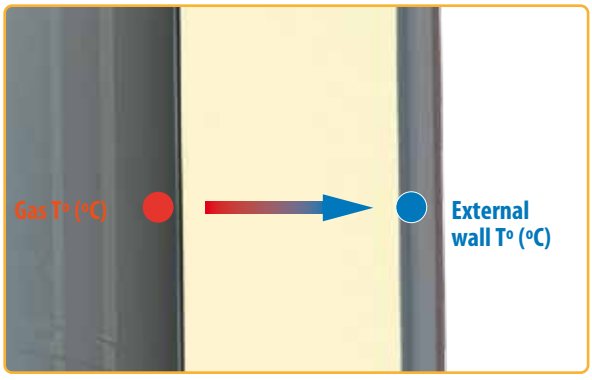
Estimation of the quantity of connections that can be sealed with each Dinak silicone cartridge (310 ml)

DN	80	100	125	150	175	200	250	300	350	400	450	500	550	600	650	700	750	800
GE37	6	6	6	5	5	5	4	4	3	3	3	3	3	2	-	-	-	-
GE50	6	6	5	5	5	4	4	3	3	3	3	3	3	2	2	2	2	2
GE100	5	4	4	4	4	3	3	3	3	3	3	2	2	2	2	2	2	2

OUTER WALL TEMPERATURE

One of the main criteria for selection of the GE range is the temperature for the outer wall of the chimney.
The following table shows the values calculated in the same depending on the features of the facility.

Gas temperature (°C)	GE 37		GE 50		GE 100	
	Inside installation	Outside installation	Inside installation	Outside installation	Inside installation	Outside installation
200	54	24	49	22	39	19
300	70	32	63	28	48	21
400	87	42	77	35	57	25
450	96	48	85	39	62	27
500	106	55	92	45	67	29
550	115	63	101	51	72	32
600	126	72	109	57	78	35



Calculation assumptions:
Inside installation: ambiant temperature 25 °C, vertical installation, interior diameter 450 mm.
Outside installation: ambiant temperature 15 °C, vertical installation, interior diameter 450 mm, wind speed 2 m/s.

To obtain a calculation adapted to a specific installation, contact DINAK.

The **Protection panels** have been designed to protect the DINAK GE chimney from possible damage that might be caused to it by anomalous installation operation. The following cases are identified:

EXPLOSIONS INSIDE THE CHIMNEY

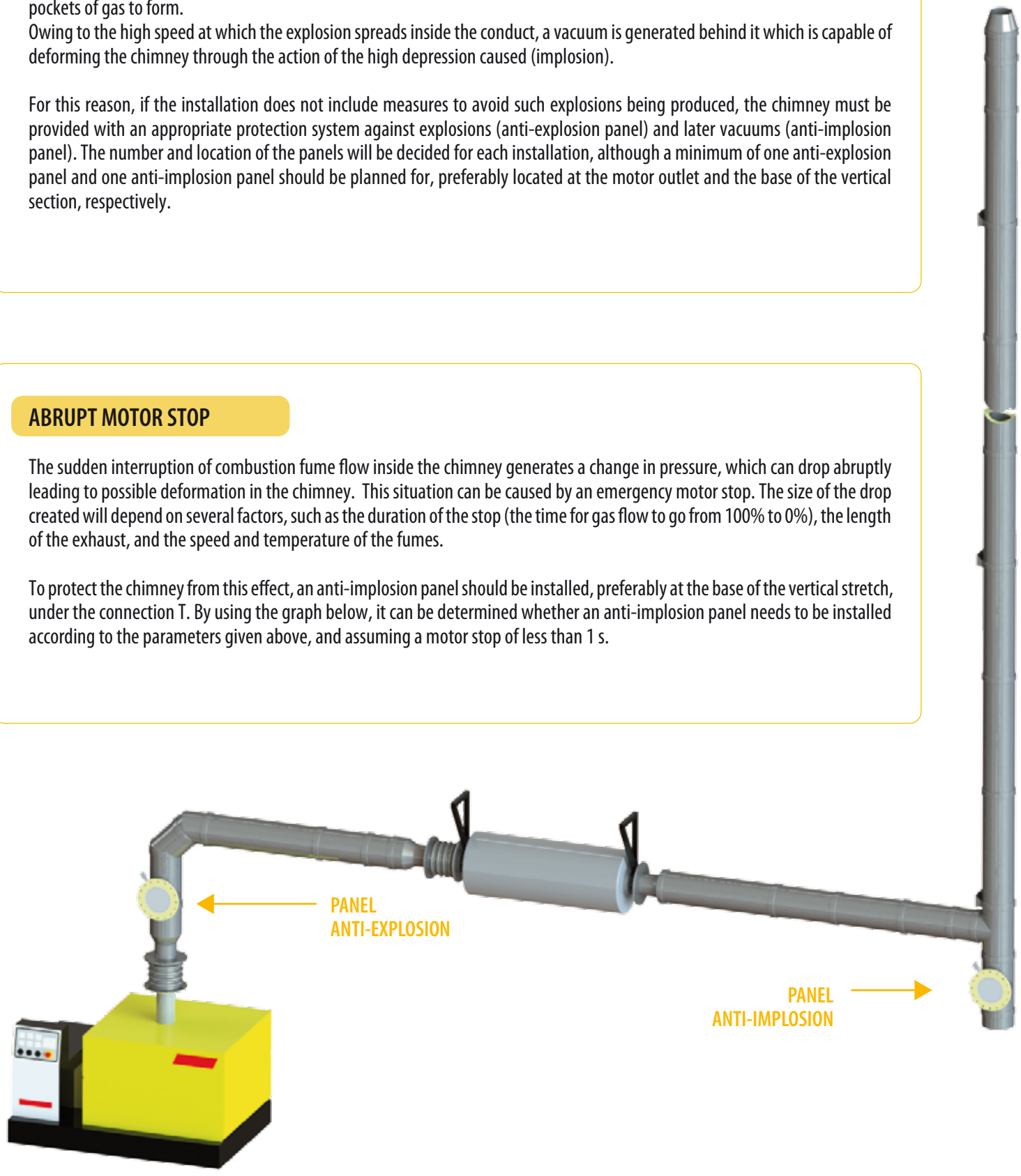
During motor start-up and stop operations leaks of unburned fuel can occur into the chimney, which carry a risk of explosion, particularly when gas is used as fuel. This effect can be aggravated if there are downward runs in the chimney, as these can cause pockets of gas to form.
Owing to the high speed at which the explosion spreads inside the conduct, a vacuum is generated behind it which is capable of deforming the chimney through the action of the high depression caused (implosion).

For this reason, if the installation does not include measures to avoid such explosions being produced, the chimney must be provided with an appropriate protection system against explosions (anti-explosion panel) and later vacuums (anti-implosion panel). The number and location of the panels will be decided for each installation, although a minimum of one anti-explosion panel and one anti-implosion panel should be planned for, preferably located at the motor outlet and the base of the vertical section, respectively.

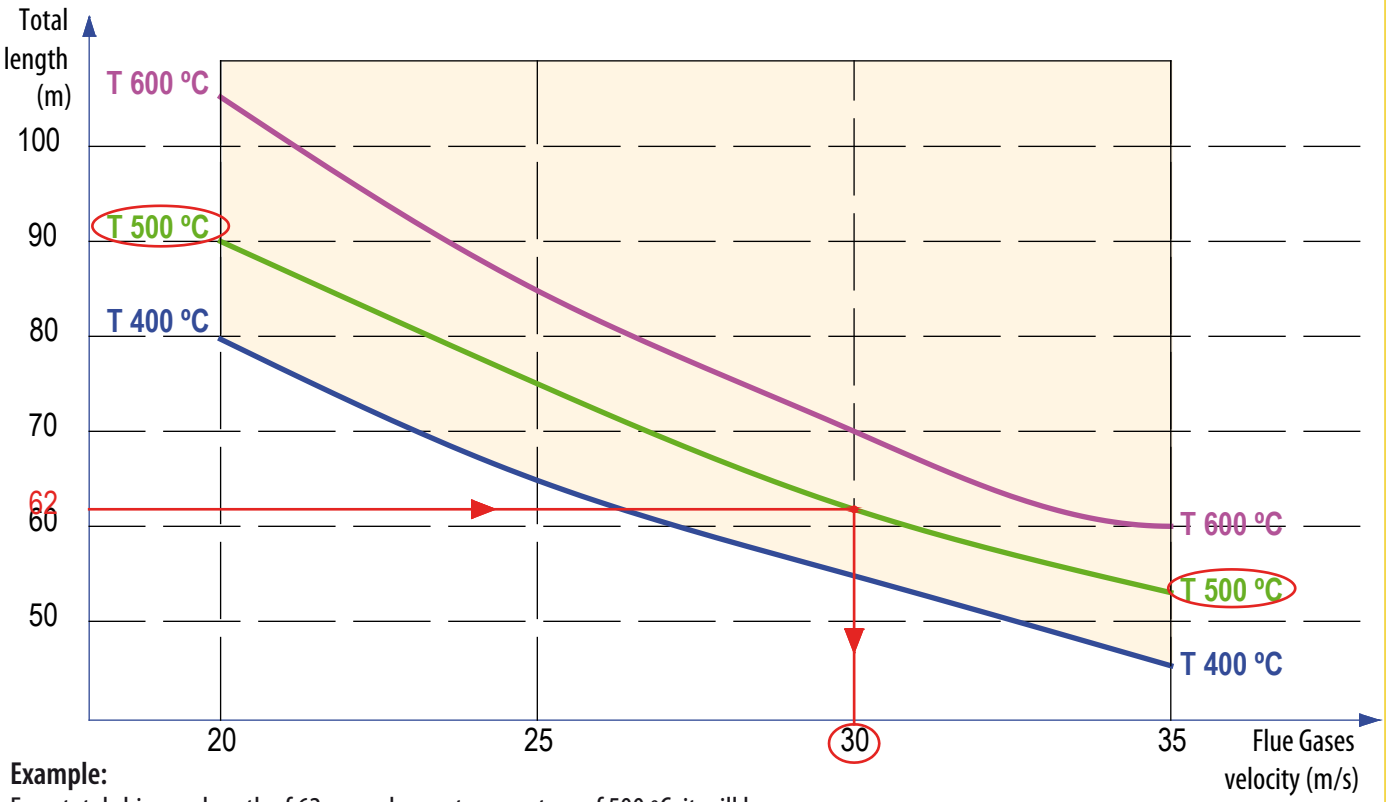
ABRUPT MOTOR STOP

The sudden interruption of combustion fume flow inside the chimney generates a change in pressure, which can drop abruptly leading to possible deformation in the chimney. This situation can be caused by an emergency motor stop. The size of the drop created will depend on several factors, such as the duration of the stop (the time for gas flow to go from 100% to 0%), the length of the exhaust, and the speed and temperature of the fumes.

To protect the chimney from this effect, an anti-implosion panel should be installed, preferably at the base of the vertical stretch, under the connection T. By using the graph below, it can be determined whether an anti-implosion panel needs to be installed according to the parameters given above, and assuming a motor stop of less than 1 s.



SELECTION CRITERIA FOR PROTECTION PANELS IN CASE OF ABRUPT MOTOR STOP



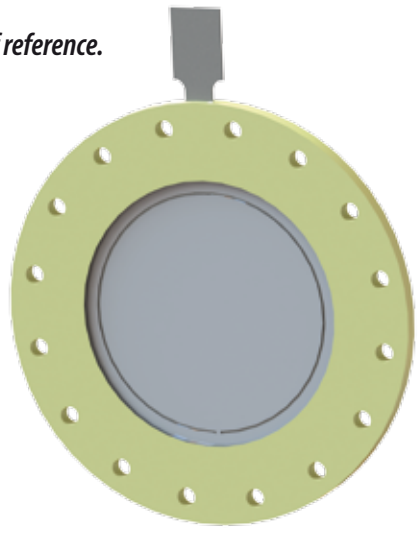
Example:
For a total chimney length of 62 m, and a gas temperature of 500 ºC, it will be necessary to install protection panels for speeds over 30 m/s.

Please note:
The graph above has been prepared from the resistance values of the chimney vacuum Dinak GE, which have been obtained by testing in the ETS Industrial Engineering at the University of Vigo (Report 9 / 2009), so it does not apply to any other make or model of generator.

CARACTERISTICS OF THE PANELS

Maximum operation temperature: 600 ºC
Materials: Stainless steel AISI 304 (1.4301)
Teflon (sealing joints)
Ceramic fibre (insulation)

The DInak protection panels have the CE Mark according to the Harmonised European Normof reference.



OPERATION

When an explosion exceeds the chimney's admissible back pressure limit, the anti-explosion panel breaks, releasing the explosion gases through the opening created, and so protecting the chimney from excessive back pressure.

The anti-implosion panels work in a similar way. If the admissible depression limit is exceeded, the panel breaks and allows outside air to enter. This balances the pressure inside the chimney and protects it from possible deformations caused by the vacuum created.

If they are broken, the panels must be replaced.

Importaant note:
The Dinak protection panels are supplied according to Dinak GE characteristics. The panels are only suitable for the DINAK GE chimney.

In the evacuation of combustion products coming from generator sets, there are two main sources of noise that should be taken into consideration when carrying out acoustic studies of the installation; they are are the following:

- *The generator set, the noise from which is partly transmitted along the exhaust chimney.*

- *The "regeneration" effect, caused by the speed and the turbulence of the gases as they move at high speed along the inside of the chimney.*

As starting point for the acoustic analysis of an installation, we need to know the level of acoustic power (Lw) of the power-generator, in octave band for the frequency area of 125 up to 4000 kHz.

Most of the power-generators have a primary silencer in the exhaust that reduces part of the noise generated by the combustion motor. This is the waste value of the noise behind this silencer that has to be used for the acoustic study in the modular chimney because this is the connection point where the chimney starts.

SILENCER LENGTHS (021)

Drawing and dimensions p.4

The function of the main silencer, located at the outlet from the set, is to reduce noise coming from the set, which is transmitted along the exhaust.

To complement this, but never to substitute it, the Dinak GE range has silencer lengths that are externally identical to the standard straight length, which means they can be built in as yet another element in the chimney set-up.

The tables below show the noise reduction levels for the Dinak GE silencer lengths (021), in the octave bands frequency spectrum. The values have been calculated using empirical formulas and should therefore be considered only as a guide.

Acoustic table (dB/m) 021 GE37

DN	Dext	Frequences (Hz)					
		125	250	500	1.000	2.000	4.000
125	200	4	13	22	27	27	30
150	225	3	11	19	22	23	25
175	250	3	9	16	19	20	21
200	275	2	8	14	17	17	19
250	325	2	6	11	13	14	15
300	375	1	5	9	11	11	12
350	425	1	5	8	10	10	11
400	475	1	4	7	8	9	9
450	525	1	4	6	7	8	8
500	575	1	3	6	7	7	7
550	625	1	3	5	6	6	7
600	675	1	3	5	6	6	6

Acoustic table (dB/m) 021 GE50

DN	Dext	Frequences (Hz)					
		125	250	500	1.000	2.000	4.000
125	225	4	17	29	29	29	31
150	250	3	14	24	24	24	26
175	275	3	12	21	21	20	22
200	300	3	11	18	18	18	20
250	350	2	9	14	14	14	16
300	400	2	7	12	12	12	13
350	450	1	6	10	10	10	11
400	500	1	5	9	9	9	10
450	550	1	5	8	8	8	9
500	600	1	4	7	7	7	8
550	650	1	4	7	7	6	7
600	700	1	4	6	6	6	7
650	750	1	3	6	6	5	6
700	800	1	3	5	5	5	6
750	850	1	3	5	5	5	5
800	900	1	3	5	5	4	5

Acoustic table (dB/m) 021 GE100

DN	Dext	Frequences (Hz)					
		125	250	500	1.000	2.000	4.000
125	325	16	33	33	33	31	31
150	350	14	28	28	28	26	26
175	375	12	24	24	24	22	22
200	400	10	21	21	21	20	20
250	450	8	17	17	17	16	16
300	500	7	14	14	14	13	13
350	550	6	12	12	12	11	11
400	600	5	10	10	10	10	10
450	650	5	9	9	9	9	9
500	700	4	8	8	8	8	8
550	750	4	8	8	8	7	7
600	800	3	7	7	7	7	7
650	850	3	6	6	6	6	6
700	900	3	6	6	6	6	6
750	950	3	6	6	6	5	5
800	1000	3	5	5	5	5	5

REGENERATED NOISE

Regenerated noise, caused by the speed and turbulence of the gases as they move at high speed along the inside of the chimney, can be estimated by calculation. Below are the values for acoustic power (dB) derived from regenerated noise, according to the diameter of the chimney (mm) and the speed of the gases (m/s).

Ruido regenerado (dB)				
DN	Velocidad (m/s)			
	20	**25**	**30**	**35**
80	49	54	58	61
100	51	56	60	63
125	53	58	62	65
150	55	59	63	67
175	56	61	65	68
200	57	62	66	69
250	59	64	68	71
300	61	65	69	73
350	62	67	71	74
400	63	68	72	75
450	64	69	73	76
500	65	70	74	77
550	66	71	75	78
600	67	71	75	79

Source: R. H. Warring. Handbook of noise and vibration control.

The table below shows the spectral correction that makes it possible to obtain, from the above data, the values for noise generated by octave band.

125 Hz	250 Hz	500 Hz	1.000 Hz	2.000 Hz	4.000 Hz
-6	-7	-8	-9	-10	-15

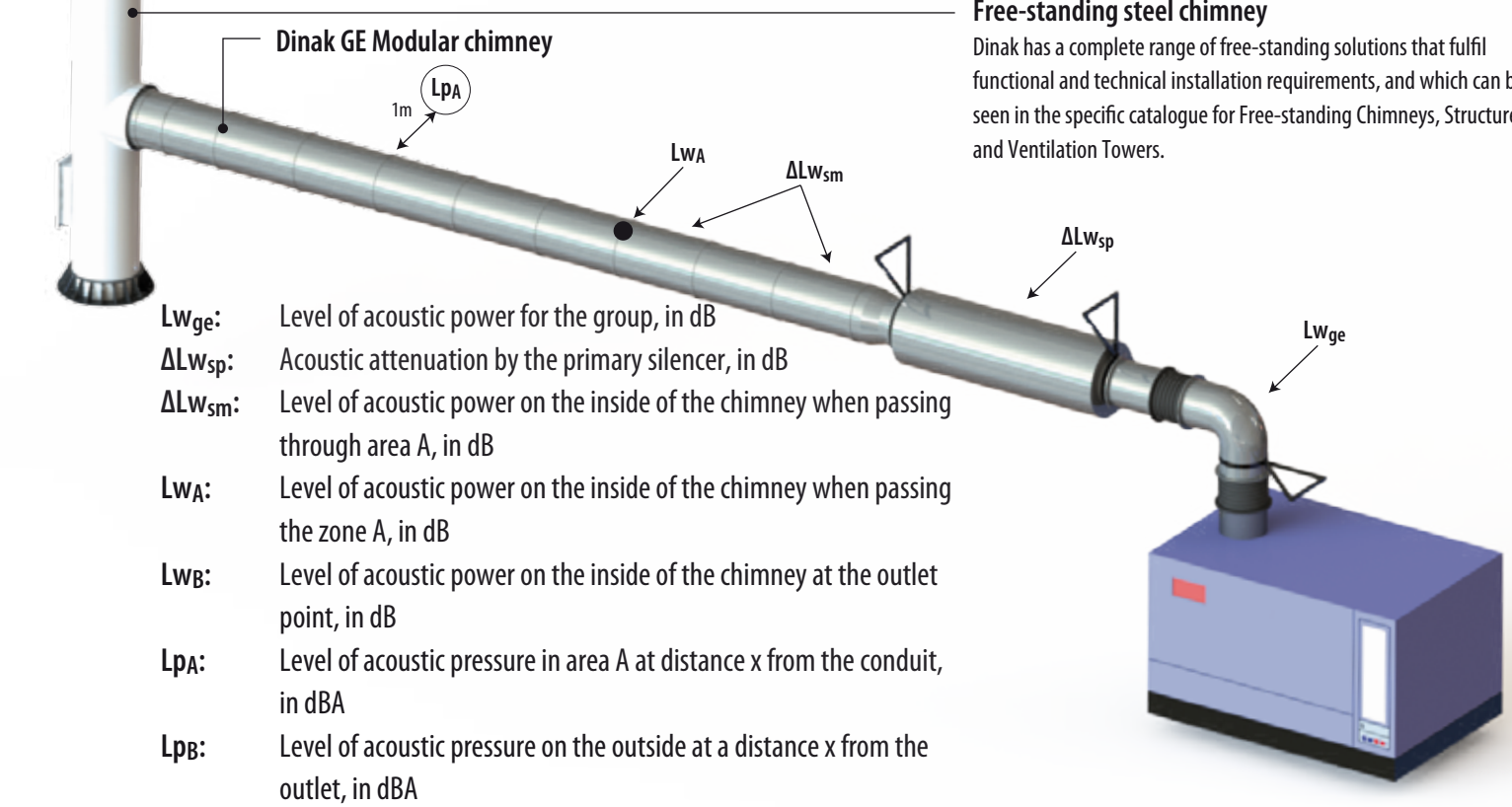
RADIATED NOISE REDUCTION

Inside the modular chimney, sound waves affect the inner wall, and some of them are reflected, others are absorbed and finally others are transmitted to the outside. In metallic chimneys the absorption effect can be disregarded and the residual noise from the group can be considered to be fully transmitted along the inside until the outlet end. However, we cannot disregard the effect of noise transmission from the inside of the chimney towards the environment of the premises through which it runs, which is called radiated noise.

Estimation of the sound pressure level caused by radiated noise must be made by taking into account the thickness of the insulation used in the chimney, the layout and type of location, and, finally, the distance between the outer wall of the chimney and the receiver. The interior noise to be considered in calculations should include that generated by the motor itself and transmitted along the inside of the chimney and also the regeneration noise described above.

The insulation between walls in the Dinak GE range enables attenuation of noise radiated from inside the conduit towards the premises through which it runs. Below is the noise reduction (dB) provided by the insulation in each range, which has been obtained through testing:

	125 Hz	250 Hz	500 Hz	1.000 Hz	2.000 Hz	4.000 Hz
GE37	6	7	6	11	18	19
GE50	12	9	15	17	26	43
GE100	10	17	19	28	37	48



Lwge: Level of acoustic power for the group, in dB

ΔLwsp: Acoustic attenuation by the primary silencer, in dB

ΔLwsm: Level of acoustic power on the inside of the chimney when passing through area A, in dB

LwA: Level of acoustic power on the inside of the chimney when passing the zone A, in dB

LwB: Level of acoustic power on the inside of the chimney at the outlet point, in dB

LpA: Level of acoustic pressure in area A at distance x from the conduit, in dBA

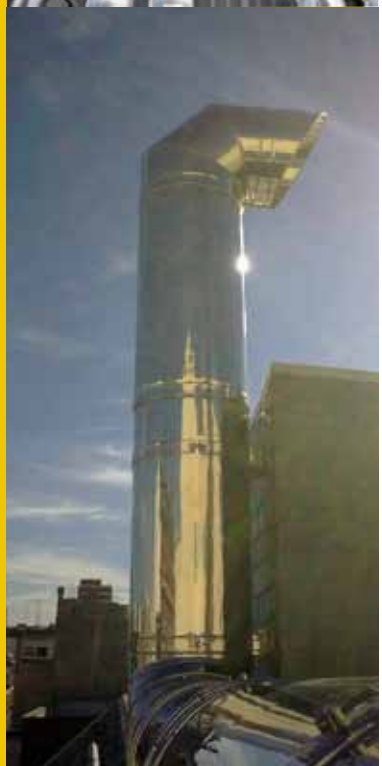
LpB: Level of acoustic pressure on the outside at a distance x from the outlet, in dBA

Free-standing steel chimney

Dinak has a complete range of free-standing solutions that fulfil functional and technical installation requirements, and which can be seen in the specific catalogue for Free-standing Chimneys, Structures and Ventilation Towers.

SOME REFERENCES OF SITES WITH THE DINAK GE RANGE

Canary Wharf – London – UK
Microsoft. Berkshire – UK
NatWest Bank – Birmingham - UK
Spanish Bank – Madrid - Spain
Microsoft Berkshire – UK
Xerox Dundalk-Northen Ireland
IRITEL Central - Milan - Italy
IRITEL Central - Turin – Italy
Commercial Center Las Glorias - Barcelone - Spain
Congress Center of Clermont-Ferrand - France
Congress Center of Dijon - France
Tarbes Hospital - France
Regional Center EDF from Lyon - France
Universitary Clinic of Navarra – Pamplone- Spain
Alzira Hospital – Valencia - Spain
Basurto Hostipal - Vizcaya - Spain
Galdácano Hospital – Vizcaya - Spain
Santa Marine Hospital – Vizcaya - Spain
San Juan Hospital - Vizcaya - Spain
Gregorio Marañón Hospital – Madrid - Spain
France Telecom – Marseille - France
Carlos Haya Hospital – Malaga - Spain
La Timone Hospital – Marseille - France
Universitary Clinic Hospital from Malaga - Spain
Maternal Hospital of Malaga - Spain
St Jose Hospital – Paris - France
Hospital from Marmande - France
Inditex (Zara Factory) - La Coruña - Spain
Lloyd Adriatique – Trieste –Italy
Co-generation plant Drema - Italy
Guggenheim Museum – Bilbao - Spain
Moncloa Palace – Madrid - Spain
Euskalduna Palace – Bilbao- Spain
Opel factory – Vilanova da Rainha - Portugal
Xerox- Dundalk – Northen Ireland
Hotel de Police – Montpellier - France
Ste Camille Hospital – Bry sur Marne - France
Kyriad Hotel – Paris - France
Auchan Montgéron (Supermarket) – Paris - France
Ste Marguerite Hospital – Marseille - France
Aix Hospital – Aix en provence - France
La Roseraie Clinic– Paray le Monial – France
EDF regional Center - Lyon - Frane
Auchan Montgéron - Francia
Franklin Clinic – France
Hadassa Hospital- Israel
Ichilov Hospital- Israel
ME Hotel – London
Olimpic Village- London
Data centre Greenwich – Val de Reuil- France
Centre Hôpitalier de Vileneuve St George – France
Hotel Ambassador- Ghana
Galeria Tecza- Kalisz- Poland
Deutsche Bundesbank-Frankfurt- Germany
Centre chirurgical marie Iannelongue- France
International Airport of Doha-Qatar
Val d' Or Clinic- Belgium
Sint Lucas Hospital- Belgium
La Tourelle Hospital- Belgium
Midi Station - Belgium
Politiecentrum Lier - Belgium
Square de Meeuws - Belgium



CAT/GE-UK-106

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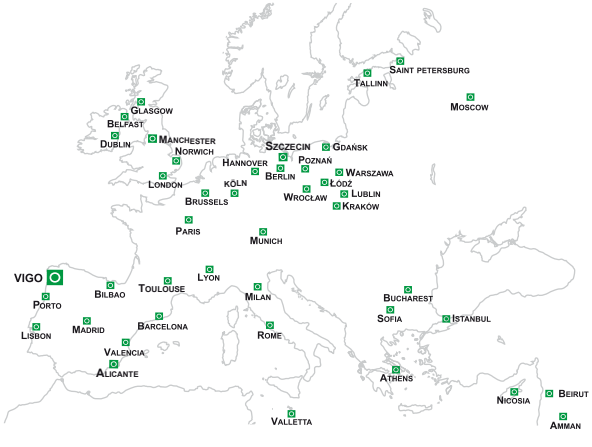

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