VIESMANN

VITOCROSSAL 300

Gas fired condensing boiler
27 to 66 kW

Datasheet

Part numbers and prices: see pricelist

File in:
Vitotec folder, register 6

VITOCROSSAL 300 Type CU3

Gas fired condensing boiler for natural gas E and LL
With modulating MatriX-compact gas burner (9 to 66 kW),
for **open** and **balanced** flue operation

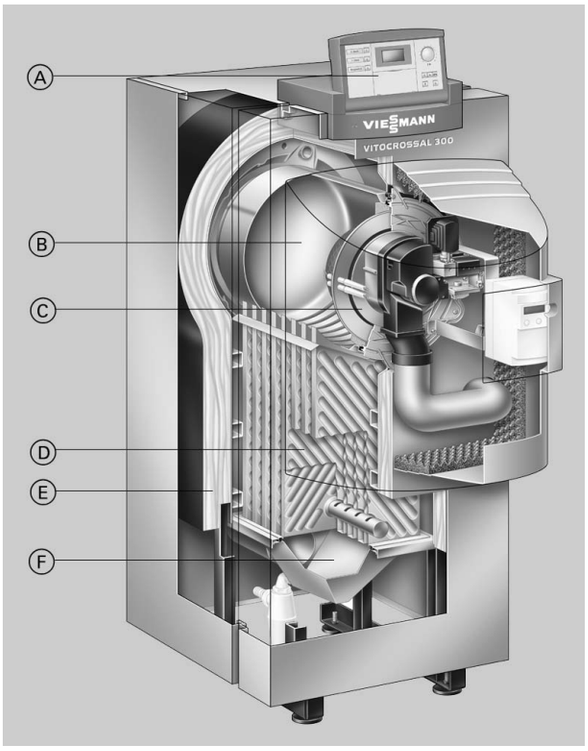
Product information

The Vitocrossal 300 is a leading product amongst freestanding gas fired condensing boilers.
It is designed to utilise the condensing energy in its hot gases with exceptional intensity. Its balanced flue operation is particularly noteworthy.
This enables the Vitocrossal 300 to be installed inside the thermally insulated building envelope. This is especially advantageous for the EnEV [Germany] calculation.

The Inox-Crossal heating surface in the Vitocrossal 300 was combined with another milestone of Viessmann heating technology: the MatriX-compact burner. This reduces heating costs and ensures minimised emissions without compromise. These are so low that the Vitocrossal 300 performs significantly better than the limits set for the "Blue Angel" certificate of environmental excellence.

Benefits at a glance

- Compact boiler body with large water content and Inox-Crossal heating surfaces made from stainless steel for the efficient utilisation of condensing technology.
- Standard efficiency: up to 98% (H_s)/109% (H_i).
- Balanced flue operation.
- Vertical Inox-Crossal heating surfaces
  – for high operational reliability and a long service life,
  – any condensate can drain off freely,
  – this prevents concentrations through re-evaporation of condensate,
  – improved self-cleaning effect through smooth stainless steel surfaces.
- With modulating MatriX-compact gas burner for particularly quiet and environmentally responsible operation.
- Optional use of the coaxial flue gas system 80/125 or 100/150 from the Vitodens boiler.
- Excellent controllability and reliable heat transfer through wide water galleries and high water content.
- Also suitable for use in multi-boiler systems.



Ⓐ Vitotronic 300 – weather-compensated, digital boiler and heating circuit control unit

Ⓑ Water cooled stainless steel combustion chamber

Ⓒ Modulating MatriX-compact gas burner – for extremely clean combustion

Ⓓ Inox-Crossal heating surface made from stainless steel

Ⓔ Highly effective thermal insulation

Ⓕ Stainless steel flue gas collector with condensate drain

5822 292-3 GB

Specification - boiler

Specification

Gas fired boiler, type B and C, category I_{2ELL}

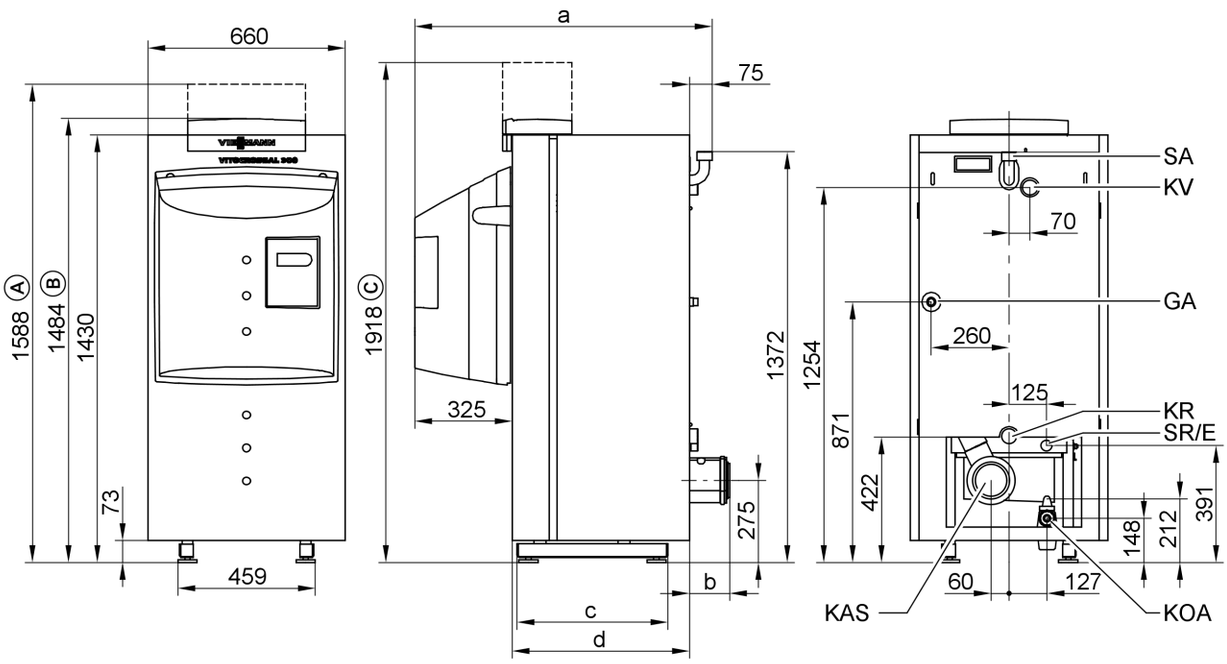
Rated output range					
T_V/T_R = 50/30 °C	**kW**	**9 to 27**	**12 to 35**	**16 to 49**	**22 to 66**
T_V/T_R = 80/60 °C	**kW**	**8 to 24**	**11 to 32**	**15 to 44**	**20 to 60**
Rated thermal load	kW	8 to 25	11 to 33	15 to 46	21 to 63
K value of thermal insulation	$W/m^2 \cdot K$	0.5	0.5	0.5	0.5
Heating surface	m^2	1.44	1.77	2.63	3.31
Product ID		CE-0085 BN 0570			
Gas supply pressure	mbar	20	20	20	20
Max. permissible gas supply pressure*1	mbar	50	50	50	50
Weight Boiler with thermal insulation and MatriX-compact gas burner	kg	122	125	155	160
Content boiler water	litres	51	49	86	82
Permissible operating pressure	bar	3	3	3	3
Permiss. operating temperature (max. flow temperature)	°C	95	95	95	95
Boiler connections					
Boiler flow and return	G	1½"	1½"	1½"	1½"
Drain	R	1"	1"	1"	1"
Boiler body dimensions					
Length	mm	512	512	668	668
Width	mm	570	570	570	570
Height	mm	1372	1372	1372	1372
Total dimensions					
Total length a	mm	836	836	992	992
Total width	mm	660	660	660	660
Total height (operation) with the Vitotronic 200/ 300 (type KW1, KW2 and KW3)	mm	1484	1484	1484	1484
Total height (operation) with the Vitotronic 100 (type GC1)	mm	1623	1623	1623	1623
– Height Ⓐ (control unit in operating position)	mm	1588	1588	1588	1588
– Height Ⓒ (control unit in maintenance position)	mm	1918	1918	1918	1918
Internal pipe diameter to the					
– expansion vessel	DN	20	20	20	20
– Safety valve	DN	15	15	20	20
Gas connection	R	½"	½"	¾"	¾"
Condensate connection (siphon)	Ext. Ø mm	19	19	19	19
Max. condensate volume*2	kg/h	3.1	4.0	5.6	7.6
Connection values relative to the max. load with					
– natural gas E	m^3/h	2.7	3.6	5.0	6.7
– natural gas LL	m^3/h	3.2	4.1	5.8	7.8
Flue gas parameters*3					
Temperature (at return temp. 30 °C)					
– at rated output	°C	55	55	55	55
– at partial load	°C	43	43	43	43
Temperature (at return temp. 60 °C)	°C	75	75	75	75
Mass flow rate (for natural gas)					
– at rated output	kg/h	41	54	75	102
– at partial load	kg/h	14	18	25	34
Available delivery pressure	Pa	100	100	100	100
to the flue outlet	mbar	1	1	1	1
Standard efficiency at T_V/T_R = 40/30 °C	%	up to 98 (H_s)/109 (H_i)			
Flue gas connection	∅ mm	80	80	100	100
Ventilation air inlet	∅ mm	125	125	150	150

*1 *If the gas supply pressure is higher than the maximum permitted value, install a separate gas pressure governor upstream of the system.*

*2 *According to ATV-DVWK-A 251 Code of Practice (condensate from condensing boilers).*

*3 *Calculation values for sizing the flue gas system to EN 13384.*
Flue gas temperatures measured as gross values at 20 °C combustion air temperature.
The flue gas temperature at a return temperature of 30 °C is significant for the sizing of the flue gas system.

Specification - boiler (cont.)



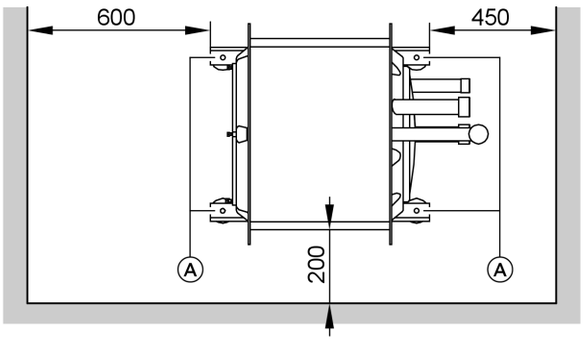
Ⓐ Height with control unit in operating position
Ⓑ Height with the Vitotronic 200/300 (type KW1, KW2 and KW3)
Height with the Vitotronic 100 (type GC1): 1623 mm
Ⓒ Height with the control unit in the maintenance position
E Drain
GA Gas connection
KAS Boiler flue connection
KOA Condensate drain
KR Boiler return
KV Boiler flow
SA Safety connection (safety valve and air vent valve)
SR Safety return (diaphragm expansion vessel)

Dimensions

Rated output	kW	27 and 35	49 and 66
a	mm	836	992
b	mm	120	135
c	mm	348	504
d	mm	436	592

Positioning

Minimum clearances



(Boiler body without thermal insulation)

Ⓐ Base rails

For **open** flue operation, the installation room must provide a ventilation aperture with a clear cross-section of at least 150 cm^2 or 2 × 75 cm^2.
Observe the stated dimensions to ensure easy installation and maintenance.

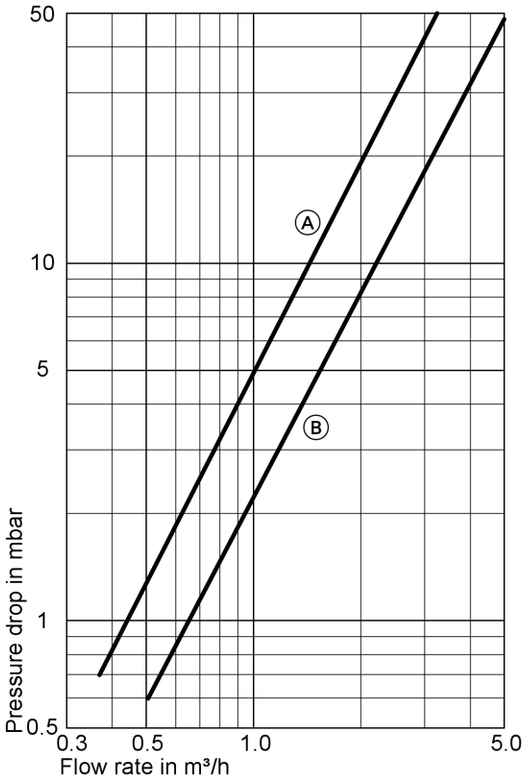
Specification - boiler (cont.)

Positioning
- Avoid air contamination by halogenated hydrocarbons (e.g. as in sprays, paints, solvents and cleaning agents)
- Avoid very dusty conditions
- Avoid high levels of humidity
- Protect against frost and ensure good ventilation

Otherwise, the system may suffer faults and damage.
In rooms where air contamination from **halogenated hydrocarbons** is to be expected, operate the boiler only in balanced flue mode.

Pressure drop on the heating water side

The Vitocrossal 300 is only suitable for fully pumped hot water heating systems.

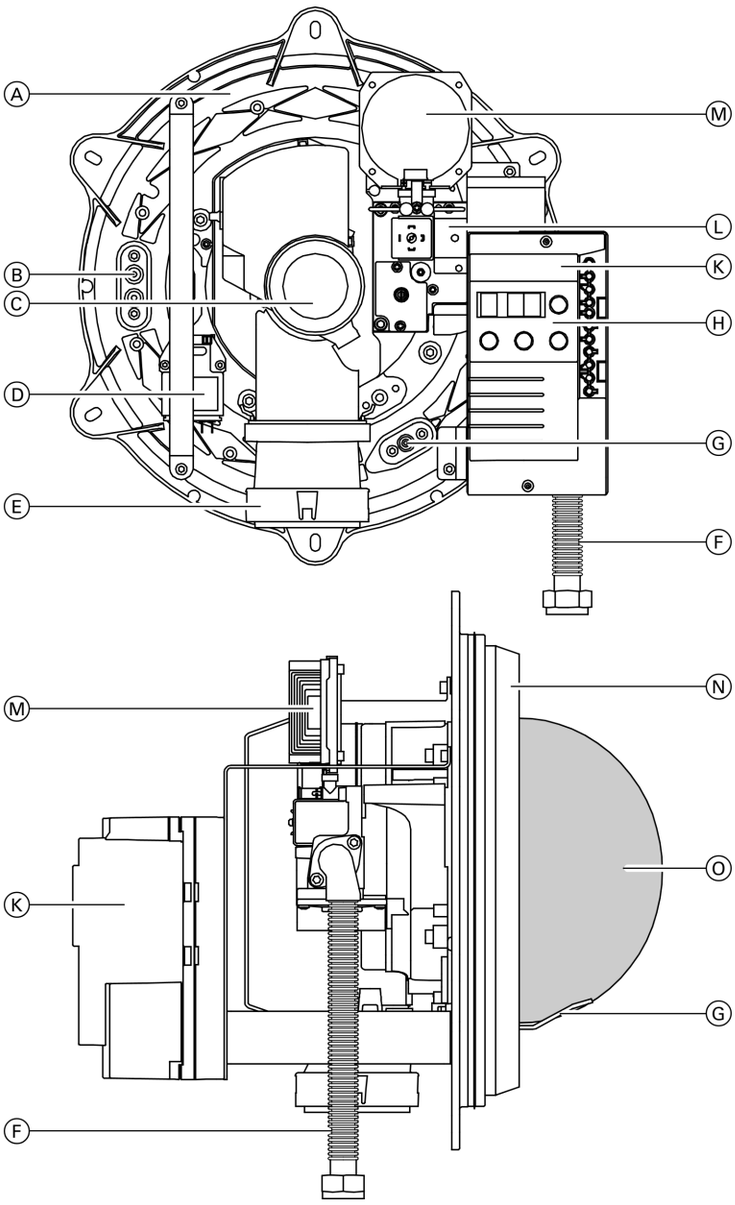


Ⓐ Rated output 27 and 35 kW
Ⓑ Rated output 49 and 66 kW

Specification - MatriX-compact gas burner

Rated boiler output range (at T_V/T_R 50/30 °C)	**kW**	**9 to 27**	**12 to 35**	**16 to 49**	**22 to 66**
Burner type		VGMI-1	VGMI-2	VGMI-3	VGMI-4
Voltage	V	230	230	230	230
Frequency	Hz	50	50	50	50
Motor speed	rpm	2272-4320	2336-4512	2560-5056	2944-6208
Version		modulating	modulating	modulating	modulating
Modulation range	%	33-100	33-100	33-100	33-100
Gas connection	R	½"	½"	¾"	¾"

Specification - MatriX-compact gas burner (cont.)



Ⓐ Boiler door
Ⓑ Ignition electrodes
Ⓒ Fan
Ⓓ Ignition unit
Ⓔ Inlet flange
Ⓕ Flexible gas pipe
Ⓖ Ionisation electrode
Ⓗ Display and programming unit
Ⓚ Burner control unit
Ⓛ Gas train
Ⓜ Air pressure switch
Ⓝ Insulation ring
Ⓞ Burner gauze assembly

Delivered condition

Boiler body

1 Carton with boiler door and fitted MatriX-compact burner
1 Carton with thermal insulation
1 Carton containing the boiler control unit and 1 bag with technical documentation
1 Burner cable

Delivered condition (cont.)

Control unit versions

For single boiler systems:
Vitotronic 200 (type KW1 or KW2)
for modulating boiler water temperature, with or without mixer control
Vitotronic 300 (type KW3)
for modulating boiler water temperature, with mixer control for up to two heating circuits with mixer

For multi-boiler systems (up to 4 boilers):
(only for 49 and 66 kW):
- without Vitocontrol control panel
  Vitotronic 100 (type GC1) **and LON module in conjunction with a Vitotronic 300-K**
  (type MW1)
  for modulating boiler water temperature
  and
  Vitotronic 100 (type GC1) **and LON module** for modulating boiler water temperature
  for each additional boiler in a multi-boiler system
- with Vitocontrol control panel
  Vitotronic 100 (type GC1) **and LON module** for modulating boiler water temperature
  for each boiler in a multi-boiler system
  and
  Vitocontrol control panel with Vitotronic 300-K (type MW1S)
  for multi-boiler system, weather-compensated operation and mixer control for up to 2 heating circuits with mixer and additional Vitotronic 200-H, type HK1S or HK3S for 1 or up to 3 heating circuits with mixer
  or
  Control panel with external control unit
  (on site)

Design information

Selection of rated output

Select a boiler according to the required heat demand including DHW heating.
The rated output for low temperature boilers and condensing boilers may be higher than the calculated heat demand of the building in question.

System design

The boiler water temperature is limited to 95 °C.
To minimise distribution losses, we recommend that you size the heat distribution system and the DHW heating system for a max. flow temperature of 70 ºC. Subject to local regulations, the installation of a condensing boiler may need to be notified or authorised.

If possible, avoid installing mixing devices in heating circuits, because the utilisation of condensing technology demands low return temperatures. Use only three-way mixers if mixers are required, e.g. for multi-circuit or underfloor heating systems.

Safety equipment

The boiler must be equipped with a type-tested safety valve (subject to design) in accordance with EN 12828 for DHW heating systems with a safety temperature of up to 110 °C.
This valve must be identified in accordance with TRD 721, i.e. with

- "H" up to 3.0 bar permissible operating pressure and max. 2700 kW rated output,
- "D/G/H" for all other operating conditions.

Flue gas system

Subject to the heating water return temperature, the flue gases are cooled inside the boiler into the condensing range. They then exit the system with a relative humidity of 100 %. The flue gas temperature lies approx. 5 to 20 K higher than the heating return temperature. Therefore, it may be, subject to system conditions, between 30 and 115 °C.
The low flue gas temperature and the resulting low draught plus the additional condensation of the flue gases inside the flue system make it necessary for the flue gas system manufacturer to calculate the system, which must also be made from suitable materials.

Also, special requirements apply to the design and installation of the flue gas system of condensing combustion systems.
Condensing boilers must be connected to tested and approved flue pipes.
Flue pipes must comply with Building Regulations.
Use the flue system identified in the pricelist (register 6).

Design information (cont.)

Heating circuits

For heating systems with plastic pipes, we recommend the use of impermeable pipes to prevent the infusion of oxygen through the pipe walls. Provide system separation in heating systems with plastic pipes to DIN 4726 that are permeable to oxygen. We deliver a separate heat exchanger for this.

Underfloor heating systems and heating circuits with very large water content should be connected to the boiler via a three-way mixer; see technical guide on "Control of underfloor heating systems".
Install a temperature limiter into the flow of the underfloor heating circuit to limit the maximum temperature. Observe the requirements of DIN 18560-2 [or local regulations].

Plastic pipework for radiators

We also recommend the installation of a temperature limiter to limit the maximum temperature of plastic pipes in heating circuits with radiators.

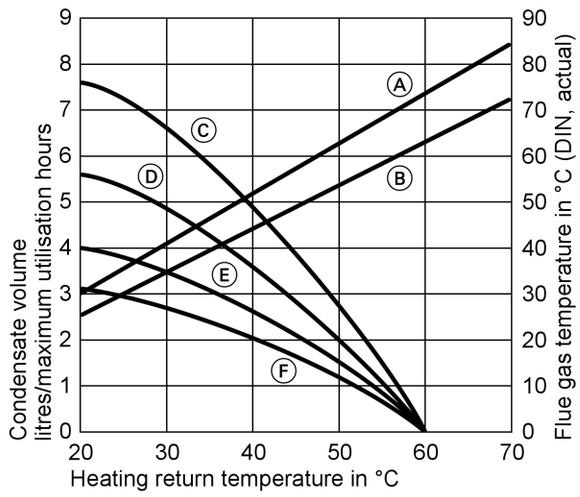
Low water indicator

According to EN 12828, a special low water level protection is not required for boilers up to 300 kW (except in attic heating centres), as long as heating can be reliably prevented when the water level is too low.
These boilers are equipped with type-tested control thermostats and high limit safety cut-outs.

Tests have verified that the burner will be automatically switched OFF in the event of water shortage due to a leak in the heating system and simultaneous burner operation, before the boiler or flue systems reach unacceptably high temperatures.

Condensate and neutralisation

The amount of condensate created during the boiler operation can be identified in the diagram. This refers to condensate volumes from actual operating values obtained in practical use. Not included here is the condensate volume that may occur in the flue gas system.
The neutralisation of condensate is not required up to a rated output of 200 kW, subject to the requirements specified by the Code of Practice ATV -DVWK-A 251 having been met. Your local water board will advise you accordingly.
Route the condensate from the flue gas system together with the boiler condensate directly or (if installed) via the neutralising system (available as boiler accessory) into the public sewer.



Ⓐ Flue gas temperature (full load)
Ⓑ Flue gas temperature (partial load)
Ⓒ Condensate volume 66 kW
Ⓓ Condensate volume 49 kW
Ⓔ Condensate volume 35 kW
Ⓕ Condensate volume 27 kW

Neutralising system (accessories)

During condensation an acidic condensate with a pH value of between 3 and 4 is produced. This condensate can be neutralised after leaving the boiler by a neutralising system. Granular magnesium hydrolith is used as neutralising agent. This raises the pH value of the acidic condensate to between 6.5 and 9.
The neutralising medium will be gradually consumed by the condensate.

Since the consumption of neutralising granulate depends on the operating mode of the system, determine the required top-up amount during the first year of operation by regular checks. Establish the consumption through inspections over a longer period of time. The top-up volumes and dates can then be determined.
The consistency of the drained (neutralised) condensate meets the requirements specified in the ATV-DVWK-A 251 Code of Practice "Condensate from condensing boilers".

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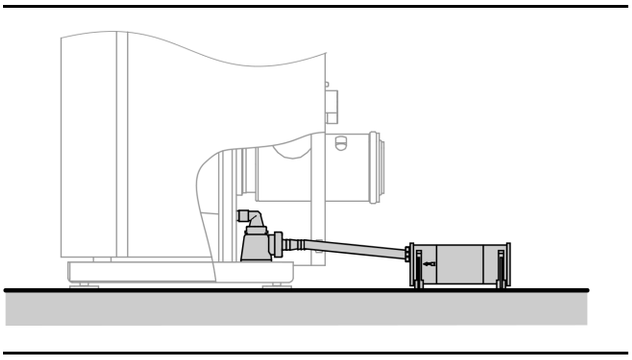
Design information (cont.)

The condensate drain to the sewer inlet must be able to be inspected. It must be installed with a continuous gradient and must contain a stench trap. Also provide a suitable facility for extracting samples.
Install a condensate lifting pump (see the Vitoset pricelist) if the boiler has been installed below the waste water antiflooding level.



For further information on design

see the technical guide of this boiler.

Tested quality

VDE certificate of conformity with production monitoring (applied for).
CE designation according to current EC Directives.

Printed on environmentally friendly, chlorine-free bleached paper

Subject to technical modifications.

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