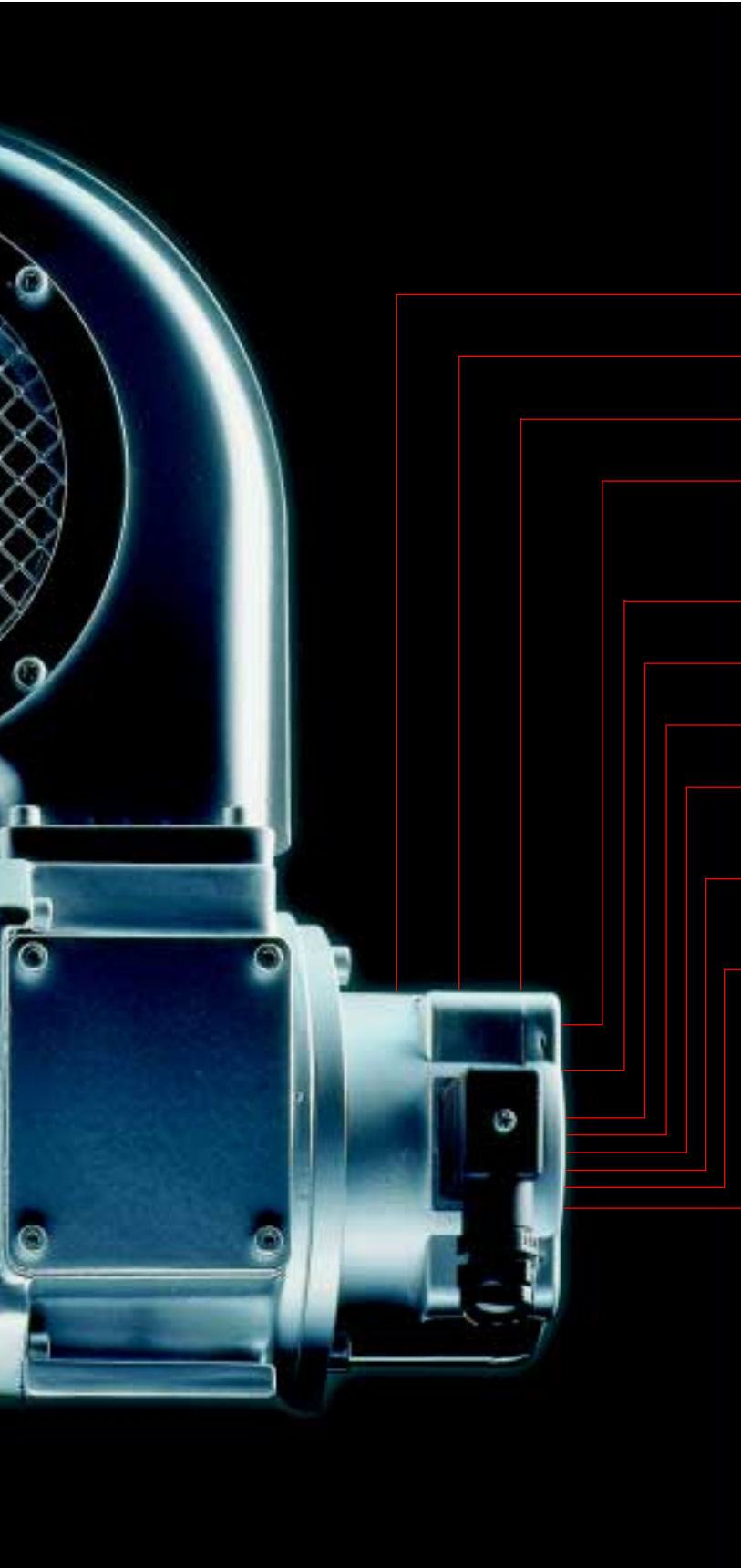


**Analog-Tachos** (DC Tachogenerators, Tachometers)

Information for the User

- Criteria for Selection ■ Combinations
- Optimum Signal Transmission
- Application Examples ■ Technical Data





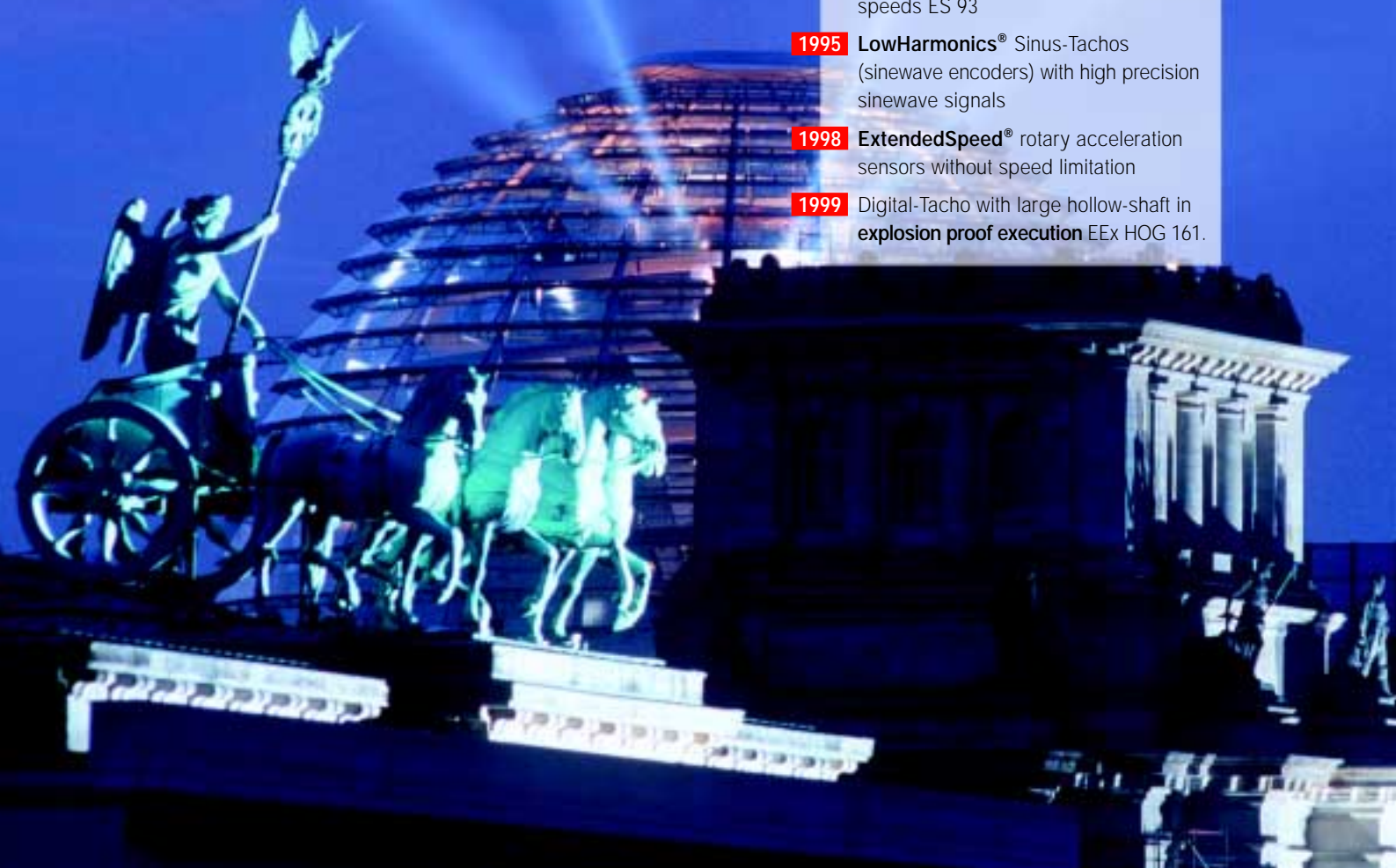
Analog-Tachos (DC tachogenerators, tachometers), usually called "tachos" for short (US: "tachs"), are devices for measuring **actual speed values**, which in drive engineering combine high control **dynamics** and **ruggedness**. HÜBNER LongLife® tachogenerators are characterized by the following features, some of which are offered by no other speed sensor:

- **Speed and direction of rotation** measured in **real-time**.
- **Speed range** exceeds 1:20,000 (>14 bit) distinctly.
- **Resistant** to mechanical and electrical influences.
- **Temperature range** -30 °C ... +130 °C as standard, lower temperature option. **Protection** against **maritime climates** and **tropicalization** as option.
- **Interference immunity** at signal transmission.
- **Two-core cable** for cost-effective signal transmission.
- **Auxiliary power** (power supply) unnecessary.
- **Bearingless** hollow-shaft types for direct mounting **without coupling** for high dynamics.
- **High signal quality** and **long lifetime** thanks to patented **HÜBNER LongLife® Technology**.
- **Cost-saving** package "Tachogenerator – cable – electronics".
- **Combinations with common shaft:**
  - tachogenerator + tachogenerator (twin tachogenerator)
  - tachogenerator + Digital-Tacho (incremental encoder),
  - tachogenerator + overspeed switch.
- All HÜBNER devices are covered by a **two-year guarantee** subject to the conditions of the Association of the German Electrical Engineering Industry (ZVEI).



HÜBNER, founded by Johannes Hübner in 1934 in Berlin as a factory for special electrical machines, has been setting standards for decades with innovative sensors for drive engineering applications:

- 1955** Rugged **Tachogenerator** with permanent magnets  
TDP 5,5 for rolling mill drives
- 1966** Tachogenerator TDP 0,2 with **EURO flange®** B10
- 1970** Europe's first **hollow-shaft tachogenerator** TDP 0,5
- 1971** **Centrifugal switch** FSL
- 1978** **HeavyDuty®** Digital-Tachos (incremental encoders) with EURO flange® B10 and high-volt signals (HTL)
- 1981** Tachogenerator **in explosion proof execution** EEx GP 0,2
- 1982** **Combination** of Analog- and Digital-Tacho TDP 0,2 + OG 9 with common shaft
- 1985** Hollow-shaft tachogenerator GTB 9 with protection class **IP 68**
- 1987** **LongLife®** Analog-Tachos with patented embedded silver track
- 1989** Digital-Tacho **in explosion proof execution** EEx OG 9,  
**Twin encoder** (Twin Digital-Tacho)  
POG 9 G
- 1993** Overspeed switch with **three** switching speeds ES 93
- 1995** **LowHarmonics®** Sinus-Tachos (sinewave encoders) with high precision sinewave signals
- 1998** **ExtendedSpeed®** rotary acceleration sensors without speed limitation
- 1999** Digital-Tacho with large hollow-shaft in **explosion proof execution** EEx HOG 161.



This document is based on many years of experience with applications in various fields of industry (➔ *Typical Applications* on pages 30 to 35) and demonstrates the expertise of HÜBNER as a competent partner for tachogenerators and combinations across a wide range of electrical and mechanical variants tailored to suit specific applications and requirements.

- The following pages ...
- ... describe the most important features of the **LongLife® tachogenerators** to enable you to make the best possible use of the capabilities of this speed sensor, which has been tried and tested in numerous drive engineering applications.
- **AC tachogenerators, trapezoidal tachogenerators and f/A converters** round off the tachogenerator range.
- **Twin tachogenerators and Combinations** with their special possibilities for drive engineering applications will be dealt with in a specific chapter.
- Typical **Applications** show HÜBNER tachogenerators and combinations in practical use.
- Followed by a catalogue section with the most important **Technical Data**.
- A detailed **Index** makes working with this documentation easier.

You can find additional information on our website at:

<http://www.huebner-berlin.de> ➔

or you may be advised individually by the **Hot Line +49 (0) 30 - 6 90 03 - 111** or - 112.

We would be grateful for any information that will help us to develop this documentation further. We reserve the right to modify technical data in the interest of technical advance. Contents and layout of this documentation: Copyright HÜBNER ELEKTROMASCHINEN AG.

**HÜBNER Technology Survey**

Detailed Content: ➔ see next page

- Electrical Characteristics
- LongLife® Technology
- Four-pole/Two-pole Tachogenerators
- Mechanical Characteristics
- Special Tachogenerators

|    |
|----|
| 7  |
| 8  |
| 13 |
| 14 |
| 16 |
| 21 |

**Twin Tachogenerators and Combinations for Special Drive Applications**

- Tachogenerator + Tachogenerator (Twin Tachogenerator)
- Tachogenerator/Twin Tachogenerator + Incremental encoder
- Tachogenerator/Twin Tachogenerator + Overspeed switch

|    |
|----|
| 25 |
|----|

**Optimum Signal Transmission**

|    |
|----|
| 29 |
|----|

**HÜBNER Tachogenerators and Combinations in Use**

Typical Applications

|    |
|----|
| 30 |
|----|

**HÜBNER Tachogenerators and Combinations and their Key Data**

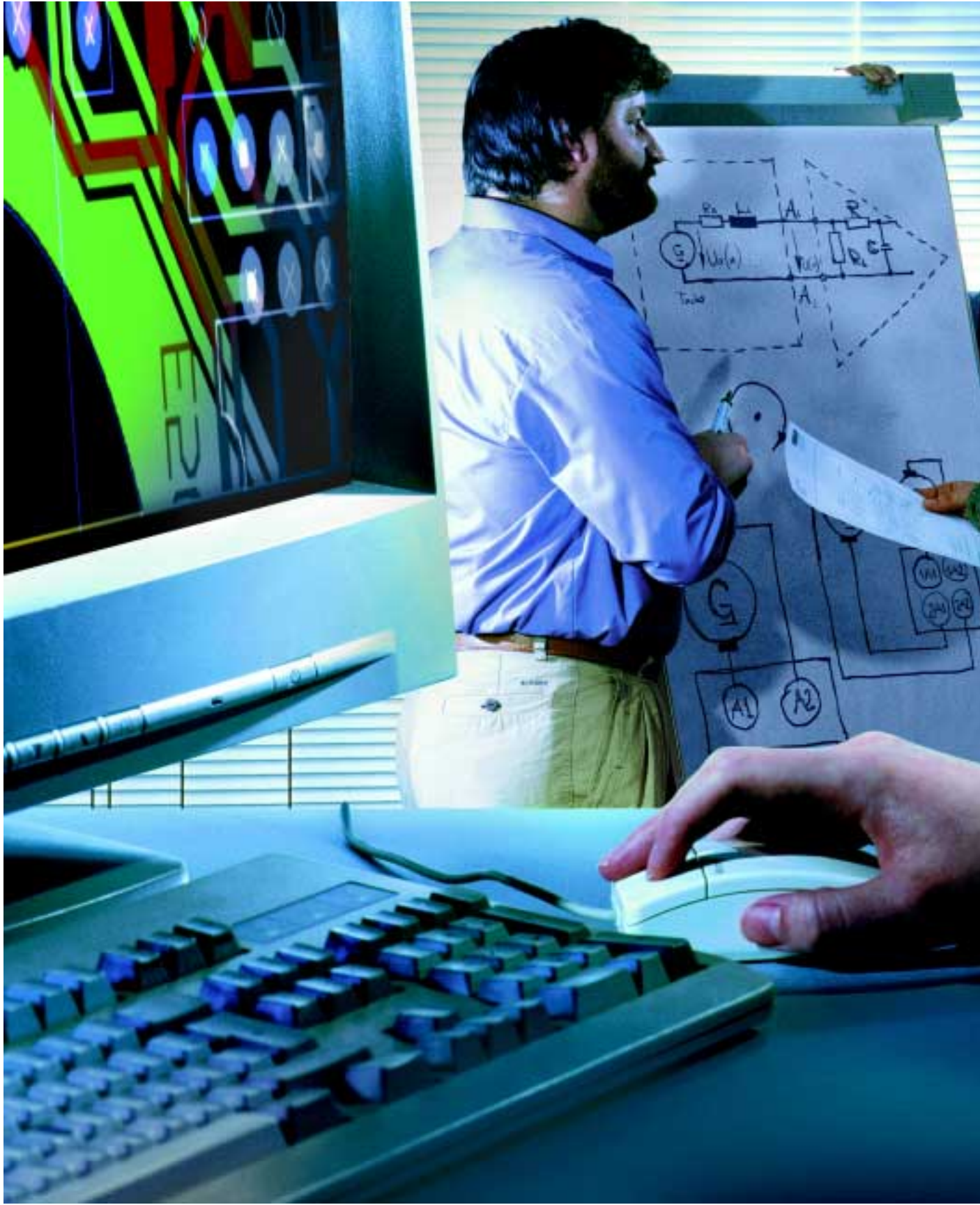
- Hollow-shaft Tachogenerators
- Tachogenerators with own bearings
- Explosion proof Tachogenerators
- Special Tachogenerators
- Twin Tachogenerators
- Combinations

|    |
|----|
| 36 |
| 37 |
| 39 |
| 41 |
| 42 |
| 43 |
| 44 |

**Index**

|    |
|----|
| 46 |
|----|







|  |    |
|--|----|
| ■ Tachogenerator voltage                                       | 8  |
| ■ Minimum load resistance                                      | 9  |
| ■ Calibration tolerance  | 10 |
| ■ Linearity tolerance  | 10 |
| ■ Reversing tolerance  | 10 |
| ■ Ripple   | 11 |
| ■ Temperature coefficient                                      | 11 |
| ■ Delay time (armature circuit time constant)                  | 11 |
| ■ LongLife® Technology   | 13 |
| ■ Hollow-shaft tachogenerators (Four-pole tachogenerators)     | 14 |
| ■ Tachogenerators with own bearings (Two-pole tachogenerators) | 15 |
| ■ Minimum – Maximum speed                                      | 16 |
| ■ Housings   | 16 |
| ■ Types  | 17 |
| ■ Ball bearings  | 17 |
| ■ No-load drive torque   | 17 |
| ■ Bearings at both ends  | 17 |
| ■ Coupling   | 18 |
| ■ Protection against shaft currents                            | 18 |
| ■ Temperature range  | 19 |
| ■ Vibration and shock resistance                               | 19 |
| ■ Protection class   | 20 |
| ■ Cable connection   | 20 |
| ■ EURO flange® B10   | 21 |
| ■ Explosion proof  | 21 |
| ■ ISO 9001   | 21 |
| ■ EU Declaration of Conformity · CE                            | 21 |
| ■ AC tachogenerators   | 21 |
| ■ Trapezoidal tachogenerators                                  | 22 |
| ■ f/a Converter HEAG 121 P                                     | 23 |