HÜBNER
ELEKTROMASCHINEN AG
BERLIN

ENCODERS

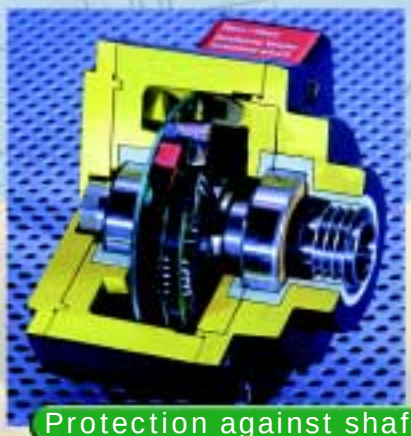
HÜBNER HeavyDuty® Technology

Mechanics & Electronics:
tough in operation –
precise in application.

HEAVY DUTY®

Mechanics

…adapted to the application



1 Rugged construction

- Solid housing made from aluminium or stainless steel (option).
- Specially protected unit for operation in hostile environments: marine air, tropics, dust.
- Protection up to IP 66.
- Versions with a flange and shaft, or with a thru-hole hollow-shaft up to 110 mm bore diameter.
- Incremental encoder disk made of metal, wherever possible.
- High vibration and shock resistance according to IEC 62-2-6 and IEC 62-2-27.
- Temperature range to match the class of application.
- Cable connection:
  - terminal box,
  - internal terminal clamps,
  - metal connector or
  - permanently attached cable.

Vibration test

Dust protection test

2 Bearings at both ends

- High radial and axial load-bearing capability of the shaft is ensured by mounting the incremental disk and the electronics between the bearings, as far as mechanically feasible.
  This provides additional advantages:
  - additional functions can be incorporated, such as combinations,
  - a second (free) shaft end can be used as an option for attaching further units.
- The ball bearings are generously dimensioned, and have been adapted in many cases from the proven LongLife® DC-tachogenerators.

3 Protection against shaft currents

- Inductive shaft currents are prevented in some hollow-shaft encoders by building in insulated ball bearings.
- Capacitive shaft currents can be diverted to ground by an additional slip-ring earthing contact (option).
- HÜBNER spring disk couplings with insulated hub protect solid shaft devices from shaft currents.

Electronics

… that copes with difficult transmission conditions

EMC test installation

4 Electromagnetic Compatibility (EMC)

- Tested for burst immunity with voltage pulses up to 4 kV, following IEC 801-4.

Logic level

5

- HTL (high threshold logic) circuitry for signal transmission over long cables
  - with short-circuit proof power transistors for peak currents up to 300 mA,
  - with line driver ICs for Digital-Tachos in compact design.
- TTL (transistor-transistor logic) technology for signal transmission in accordance with RS-422
  - Operating voltage + 5 V ± 5 %,
  - Operating voltage +9 ... 26 V with internal voltage regulator for 5 V.

Sensing

6

- Opto-ASIC for incremental disks up to 2,500 lines.
- Special electronics for incremental disks up to 10,000 lines.
- Redundant scanning with two completely isolated sensing systems (option).

Explosion protection

7

- HÜBNER devices with explosion protection with the label "EEx de IIC T6" are approved for operation with standard industrial cables in areas with an explosion hazard. Devices fitted with a EURO-flange® B10 or a thru-hole hollow-shaft up to 70 mm diameter can also be delivered with LowHarmonics® sinewave signals.

Solutions

… for special drive tasks

8

LowHarmonics® Technology

Sinewave encoders in HeavyDuty® technology:

- very pure sinewave signals,
- additional absolute signals (option).
- speciality: large hollow-shaft

9

Combinations

Devices with bearings at both ends form the basis of combinations that are distinguished by using a common shaft.

- Digital-Tacho+Digital-Tacho (twin encoder)
  Two separate sensing systems, with (if required) different line counts.
- Digital-Tacho+Analog-Tacho
  The advantages of digital and analog techniques are combined: digital position signals and analog real-time speed signals.
- Digital-Tacho+Overspeed switch
  Mechanical overspeed switches monitor a single speed, electronic overspeed switches monitor one to three speeds.

10

EURO-flange® B10

HÜBNER devices with a EURO-flange® B10 have established themselves as an industry standard in machinery and plant design:

- Digital-Tachos (incremental encoders),
- Analog-Tachos (DC-tachogenerators),
- Overspeed switches (mechanical/ electronic),
- Combinations of all these devices.

2-year guarantee

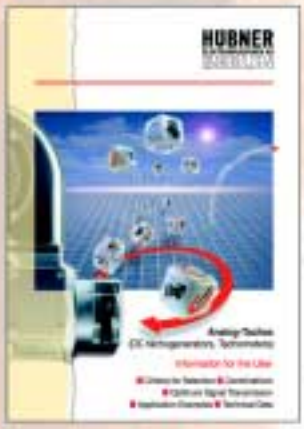
as covered by the ZVEI conditions.

Flexibility

... for tailor-made solutions

Comprehensive documentation

- 20 years competence in HeavyDuty®
  - Digital-Tachos (Incremental Encoders)
  - Sinus-Tachos (Sinewave Encoders)



- 12 arguments for LongLife® technology
  - Analog-Tachos (DC-tachogenerators)

- EURO-flange® B10
  - Product range
- Detailed data sheets and typical applications can also be found on the Internet: www.huebner-berlin.de

HeavyDuty® Technology

in robust design
has its partners in the entire
HÜBNER program:

- LowHarmonics® Sinus-Tachos (sinewave encoders)
  Sinewave signals with an especially low harmonic content set standards for precision.
- LongLife® Analog-Tachos (DC-tachogenerators)
  with the patented silver track embedded in the commutator.
- Safety® overspeed switches
  mechanical (centrifugal), or electronic with internal or external power supply.
- Absolute-Tachos (absolute encoders)
  with digital signals for position and sinewave signals for speed.
- ExtendedSpeed® acceleration sensors
  (rotary/linear) in patented technology, with no speed limitation.
- Explosion protected devices
  Digital, sinewave and analog tachos in explosion-proof versions, labelled "EEx de IIC T6".
- Combinations
  Digital tachos, DC-tachogenerators, overspeed switches and/or acceleration sensors in a single device with a common shaft.

The decisive "plus"

In consultation with you, the customer, we adapt "your" product mechanically and electrically to match your particular application and the specific inverter technology.

So that, together, we can achieve the best results for your customers.
And, of course, we are also available to give you professional advice over the hotline:
+49 (0) 30-6 90 03-111 or -112.

HeavyDuty® Technology

1955

HÜBNER develops and manufactures the first DC-tacho TDP 5,5 for rolling mills.
The rugged construction proved itself so well that this tacho (in a form that has undergone further development) is still being produced today, and provided the foundation for the HeavyDuty® technology.

1966

DC-tacho TDP 0,2 with EURO-flange® B10, in LongLife® technology since 1987, is as up-to-date as ever for machinery and plant.

1978

Digital-Tacho (optical encoder) OG 9 with EURO-flange® B10 in HeavyDuty® technology:

- rugged design with solid aluminium housing,
- bearings at both ends of the shaft, with the electronics between the bearings,
- short-circuit proof power transistors for peak currents up to 300 mA, for driving long cables with High Threshold Logic (HTL) signals,
- high level of Electromagnetic Compatibility (EMC).

1982

Combination Analog-/Digital-Tacho TDP 0,2 + OG 9 with EURO-flange® B10 on a common shaft.

1983

Digital-Tacho POG 9 with EURO-flange® B10, originally developed for paper machinery (hence P), has found widespread application: here on the drives of an HVAC control system.

1985

Combination: Digital-Tacho + Centrifugal switch POG 9 + FSL.

1989

Twin encoder (double Digital-Tacho) POG 9 G.

Digital-Tacho in explosion-proof version, EEx OG 9.

1992

Hollow-shaft Digital-Tacho HOG 10 with labyrinth seal for protection against heavy contamination, with insulated bearings to prevent inductive shaft currents.

1999

Digital-Tacho with large-bore thru-hole hollow-shaft in explosion-proof version, EEx HOG 161.

2000

Digital-Tachos HG 16 ... HG 22 without bearings, with thru-hole hollow-shaft up to ∅ 110 mm.

HÜBNER ELEKTROMASCHINEN AG BERLIN

HÜBNER ELEKTROMASCHINEN AG

Postbox 61 02 71, D-10924 Berlin
Planufer 92 b, D-10967 Berlin

Phone + 49 (0) 30-6 90 03-0
Fax + 49 (0) 30-6 90 03-104

http://www.huebner-berlin.de
eMail: marketing@huebner-berlin.de

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