HÜBNER clearly identifies all its devices mechanically and electrically by the **serial number**. Please always give the serial number along with the type designation.

The following pages provide an **overview of the key data** on HÜBNER Digital- and Sinus-Tachos.

We would be pleased to supply you with comprehensive **leaflets** on individual devices.

If you cannot find the optimum solution for your application, please ask. The majority of the devices are of a modular construction, thus in most cases **adaptation to specific customer requirements** is possible.

HÜBNER Digital-Tachos have a progressive **type designation**:

- **OG**: **O**ptical encoder with solid shaft
- **POG**: Variant, very rugged (developed initially for **P**aper machines)
- **HOG**: Optical encoder with **H**ollow-shaft
- **KOG**: Variant with internal **C**oupling
- **EG**: Built-in **E**ncoder (reduced protection class)
- **AG**: V**A**riant to the EG, exterior mounted encoder (normal protection class)
- **HG**: Hollow-shaft encoder **without** own bearings
- **... S**: Sinus-Tacho
- **... A**: Sinus-Tacho with additional sinewave **A**bsolute track
- **Number**: Series number (equivalent to the approximate diameter of the housing in cm or mm)

The **electrical features** are characterized as follows:

- **E ...** **Single channel** Digital-Tacho with one output signal (channel K1), only for HTL
- **D ...** **Dual channel** Digital-Tacho with two output signals displaced by 90° (channels K1, K2)
- **DN ...** **Dual channel** Digital-Tacho with two output signals displaced by 90° (channels K1, K2) and an additional synchronized **marker pulse** (channel K0)
- **DN ... I** **Dual channel** Digital-Tacho with two output signals displaced by 90° (channels K1, K2), synchronized **marker pulse** (channel K0) and additional **inverted** signals (channels $\overline{K1}$, $\overline{K2}$, $\overline{K0}$), standard on TTL and sinewave
- **G ...** **Twin** encoder with two **separate** systems
- **...** **Number** corresponding to the number of **slots** (pulses per revolution)

HÜBNER Digital-Tachos with squarewave signals have **HTL outputs** with **power transistors** as **standard** (➲ Figure 7 on page 10). Other versions are identified as follows:

- **I** **Inverted** outputs, serial with TTL and Sinus
- **C** HTL outputs with line driver **IC**
- **TTL** **TTL** outputs with line driver IC meeting RS-422 interface standard
- **R** Internal voltage **R**egulator for supply voltage V_B = +9 V ... 26 V, TTL or sinewave outputs.

The following **options** are available on some Digital-Tachos:

- **Rear shaft** for the installation of further equipment
- **Redundant** scanning
- **Stainless steel** housing

- **Example:**

  POG 9 DN 1024 I ➔ Optical encoder with solid shaft, rugged, diameter of housing approx. 90 mm, double channel with marker pulse, 1,024 pulses per turn, HTL outputs with power transistors, inverted signals.

HÜBNER HeavyDuty® Digital-Tachos and their Key Data

Series 3 → 8

OG 3

Pulses per turn:	360 → 600
max. switching frequency:	100 kHz
Logic level:	TTL, HTL (C)
Temperature range:	–20 °C → +85 °C
Weight:	approx. 50 g
Shock proof:	300 m/s² (11 ms)
Protection:	IP 54

Servo flange
4 mm solid shaft
Cable connection

OG 6

Pulses per turn:	50 → 1,024
max. switching frequency:	120 kHz
Logic level:	TTL, TTL (R), HTL (C)
Temperature range:	–20 °C → +70 °C
Weight:	approx. 200 g
Shock proof:	1,000 m/s² (6 ms)
Protection:	IP 55

Servo flange
Internal terminal strip

OG 60 · HOG 60

Pulses per turn:	200 → 10,000
max. switching frequency:	250 kHz
Logic level:	TTL, TTL (R), HTL (C))
Temperature range:	–20 °C → +85 °C
Weight:	approx. 320 g
Shock proof:	3,000 m/s² (1 ms)
Protection:	IP 65

Servo flange (OG 60)
Hollow-shaft with clamping ring
up to ∅ 12 mm (HOG 60)
Mating connector
High resolution

OG 71/OG 710 · HOG 71/HOG 710

Pulses per turn:	60 → 5,000
max. switching frequency:	120 kHz · 250 kHz
Logic level:	TTL, TTL (R), HTL (C)
Temperature range:	–20 °C → +70 °C
Weight:	approx. 360 g (OG 71)
	approx. 240 g (HOG 71)
Shock proof:	1,000 m/s² (6 ms)
Protection:	IP 56

Servo flange (OG 71/OG 710)
Hollow-shaft ∅ 14 mm (HOG 71/HOG 710)
Option: stub shaft
Internal terminal strip

Series 3 → 8

OG 71 US · HOG 71 US

Pulses per turn:	60 → 5,000	US-version of OG 71 / HOG 71
max. switching frequency:	120 kHz	1/2“ hollow-shaft (OG 71 US)
Logic level:	TTL, TTL (R), HTL (C)	3/8“ servo flange (HOG 71 US)
Temperature range:	–20 °C → +70 °C	Internal terminal strip
Weight:	approx. 240 g (OG 71 US)	NPT 1/2“ fitting
	approx. 380 g (HOG 71 US)	
Shock proof:	1,000 m/s² (6 ms)	
Protection:	IP 56	

HOG 75

Pulses per turn:	250 → 2,500	Thru-hole hollow-shaft ∅ 16 ... 1“ ... 26 mm
max. switching frequency:	120 kHz	Internal terminal strip
Logic level:	TTL, TTL (R), HTL (C)	
Temperature range:	–20 °C → +70 °C	
Weight:	approx. 500 g	
Shock proof:	1,000 m/s² (6 ms)	
Protection:	IP 56	

OG 8 · HOG 8

Pulses per turn:	1 → 2,500	EURO-Flange® B10, shaft ∅ 11mm (OG 8)
max. switching frequency:	120 kHz	Hollow-shaft with clamping hub
Logic level:	TTL, TTL (R), HTL (C)	up to ∅ 16 mm (HOG 8)
Temperature range:	–20 °C → +70 °C	Internal terminal strip
Weight:	approx. 700 g (OG 8)	
	approx. 550 g (HOG 8)	
Shock proof:	1,000 m/s² (6 ms)	
Protection:	IP 54	

HÜBNER HeavyDuty® Digital-Tachos and their Key Data

Series 9

OG 9

Pulses per turn:	1 → 1,250
max. switching frequency:	120 kHz
Logic level:	HTL, TTL, TTL (R)
Temperature range:	–20 °C → +100 °C
Weight:	approx. 900 g
Shock proof:	1,000 m/s² (6 ms)
Protection:	IP 55

EURO-Flange® B10, shaft ∅ 11 mm
Terminal box
High HTL output current
Bearing at each end

OG 90

Pulses per turn:	1,000 → 10,000
max. switching frequency:	250 kHz
Logic level:	HTL (C), TTL, TTL (R)
Temperature range:	–20 °C → +85 °C
Weight:	approx. 1.5 kg
Shock proof:	1,000 m/s² (6 ms)
Protection:	IP 55

EURO-Flange® B10, shaft ∅ 11 mm
Terminal box
High HTL output current
High resolution

HOG 9 · HOG 9G

Pulses per turn:	1 → 1,250
max. switching frequency:	120 kHz
Logic level:	HTL, TTL, TTL (R)
Temperature range:	–20 °C → +100 °C
Weight:	approx. 700 g (HOG 9)
	approx. 1.1 kg (HOG 9G)
Shock proof:	1,000 m/s² (6 ms)
Protection:	IP 56

Hollow-shaft with clamping device
up to ∅ 16 mm
Option cone 1:10
Mating connector
High HTL output current
Bearing at each end
Protection against eddy currents
Twin encoder HOG 9G

FOG 9

Pulses per turn:	1 → 1,250
max. switching frequency:	120 kHz
Logic level:	HTL, TTL, TTL (R)
Temperature range:	–20 °C → +100 °C
Weight:	approx. 860 g
Shock proof:	1,000 m/s² (6 ms)
Protection:	IP 56

EURO-Flange® B10, shaft ∅ 11 mm
Mating connector
High HTL output current
Bearing at each end

Series 9

POG 9 · POG 9G

Pulses per turn:	1 → 1,250	EURO-Flange® B10, shaft ∅ 11 mm
max. switching frequency:	120 kHz	Terminal box
Logic level:	HTL, TTL, TTL (R)	High HTL output current
Temperature range:	–20 °C → +100 °C	Bearing at each end
Weight:	approx. 1.3 kg (POG 9)	
	approx. 1.7 kg (POG 9G)	**Twin encoder POG 9G**
Shock proof:	1,000 m/s² (6 ms)	
Protection:	IP 56	

POG 90

Pulses per turn:	2,000 → 10,000	EURO-Flange® B10, shaft ∅ 11 mm
max. switching frequency:	250 kHz	Terminal box
Logic level:	HTL, TTL, TTL (R)	High HTL output current
Temperature range:	–20 °C → +85 °C	High resolution
Weight:	approx. 1.5 kg	Bearing at each end
Shock proof:	3,000 m/s² (1 ms)	
Protection:	IP 56	

HÜBNER HeavyDuty® Digital-Tachos and their Key Data

Series 10

HOG 10 · HOG 10G

Pulses per turn:	1 → 1,024	Hollow-shaft with clamping device
max. switching frequency:	120 kHz	up to ∅ 16 mm
Logic level:	HTL, TTL, TTL (R)	Option cone 1:10
Temperature range:	–20 °C → +100 °C	Internal terminal strip or terminal box
Weight:	approx. 1.6 kg (HOG 10)	High HTL output current
	approx. 2.2 kg (HOG 10G)	Bearing at each end
Shock proof:	2,000 m/s² (6 ms)	Protection against eddy currents
Protection:	IP 66	**Twin encoder HOG 10G**

HOG 100

Pulses per turn:	2,000 → 5,000	Hollow-shaft with clamping device
max. switching frequency:	250 kHz	up to ∅ 16 mm
Logic level:	HTL, TTL, TTL (R)	Option cone 1:10
Temperature range:	–20 °C → +100 °C	Internal terminal strip or terminal box
Weight:	approx. 1.5 kg	High HTL output current
Shock proof:	1,000 m/s² (6 ms)	Protection against eddy currents
Protection:	IP 66	

POG 10 · POG 10G

Pulses per turn:	1 → 1,024	EURO-Flange® B10, shaft ∅ 11 mm
max. switching frequency:	120 kHz	Terminal box
Logic level:	HTL, TTL, TTL (R)	High HTL output current
Temperature range:	–20 °C → +100 °C	Bearing at each end
Weight:	approx. 1.8 kg (POG 10)	
	approx. 2.2 kg (POG 10G)	**Twin encoder POG 10G**
Shock proof:	2,000 m/s² (6 ms)	
Protection:	IP 66	

Series 12 → 22

HOG 12

Pulses per turn:	1,024
max. switching frequency:	120 kHz
Logic level:	TTL, TTL (R), HTL(C)
Temperature range:	–20 °C → +85 °C
Weight:	approx. 1 kg
Shock proof:	1,000 m/s² (6 ms)
Protection:	IP 54

Hollow-shaft with clamping ring
up to ∅ 45 mm
Cable connection

EG 14 · AG 14

Pulses per turn:	1,024 → 2,500
max. switching frequency:	120 kHz
Logic level:	TTL, TTL (R), HTL (C),
Temperature range:	–20 °C → +70 °C
Weight:	approx. 1.2 kg
Shock proof:	1,000 m/s² (6 ms)
Protection:	IP 20 · IP 54

Hollow-shaft up to ∅ 70 mm
Mating connector (EG 14)
Terminal box / Mating connector (AG 14)
Especially for lift drives

HOG 16

Pulses per turn:	600 → 2,500
max. switching frequency:	120 kHz
Logic level:	HTL, TTL, TTL (R)
Temperature range:	–20 °C → +100 °C
Weight:	approx. 4 kg
Shock proof:	1,000 m/s² (6 ms)
Protection:	IP 66

Hollow-shaft with clamping ring
up to ∅ 38 mm
Terminal box
High HTL output current

Option: **Earthing slip ring**
Option: **Redundant scanning**

HOG 161

Pulses per turn:	600 → 2,500
max. switching frequency:	120 kHz
Logic level:	TTL, TTL (R), HTL (C)
Temperature range:	–20 °C → +85 °C
Weight:	approx. 3 kg
Shock proof:	1,000 m/s² (6 ms)
Protection:	IP 54

Hollow-shaft with clamping ring
up to ∅ 70 mm
Terminal box

Option: **Redundant scanning**

Series 12 → 22

HG 16 · HG 18 · HG 22

Pulses per turn:	250 → 4,000
max. switching frequency:	120 kHz
Logic level:	TTL, TTL (R), HTL (C)
Temperature range:	–20 °C → +70 °C
Weight:	approx. 2.4 kg (HG 16)
	approx. 4.2 kg (HG 18)
	approx. 5.8 kg (HG 22)
Shock proof:	1,000 m/s² (11 ms)
Protection:	IP 56 · IP 54 · IP 44

Hollow-shaft with clamping device:
∅ 20 ... 45 mm (HG 16)
∅ 65 ... 85 mm (HG 18)
∅ 90, 100, 110 mm (HG 22)
Terminal box

Without own bearings

HOG 22

Pulses per turn:	1,024 → 4,000
max. switching frequency:	120 kHz
Logic level:	TTL, TTL (R), HTL (C)
Temperature range:	–20 °C → +85 °C
Weight:	approx. 8.6 kg
Shock proof:	1,000 m/s² (6 ms)
Protection:	IP 54

Hollow-shaft with clamping ring
up to ∅ 110 mm
Mating connector

Option: **Redundant scanning**

OGS 60 · HOGS 60

Sinewaves per turn:	1,024 → 2,048
Bandwidth:	250 kHz
Outputs:	1 V_{PP}
Temperature range:	–20 °C → +85 °C
Weight:	approx. 350 g
Shock proof:	3,000 m/s² (1 ms)
Protection:	IP 65

Servo flange (OGS 60)

Hollow-shaft up to ∅ 12 mm (HOGS 60)

Low harmonic sinewave signals

Plug or cable connector

EGS 60 ··· A

Sinewaves per turn:	1,024
Bandwidth:	200 kHz
Outputs:	1 V_{PP}
Temperature range:	–20 °C → +85 °C
Weight:	approx. 400 g
Shock proof:	1,000 m/s² (6 ms)
Protection:	IP 40

Thru-hole hollow-shaft up to ∅ 14 mm

Low harmonic sinewave signals

Flat cable connector

Absolute track: 1 or 3 sinewaves per turn

OGS 71 · HOGS 71

Sinewaves per turn:	1,024 → 2,048
Bandwidth:	200 kHz
Outputs:	1 V_{PP}
Temperature range:	–20 °C → +85 °C
Weight:	approx. 350 g
Shock proof:	1,000 m/s² (6 ms)
Protection:	IP 56

Servo flange (OGS 70)

Hollow-shaft up to ∅ 14 mm (HOGS 70)

Low harmonic sinewave signals

Internal terminal strip

HOGS 75

Sinewaves per turn:	1,024 → 2,048
Bandwidth:	200 kHz
Outputs:	1 V_{PP}
Temperature range:	–20 °C → +70 °C
Weight:	approx. 500 g
Shock proof:	1,000 m/s² (6 ms)
Protection:	IP 56

Thru-hole hollow-shaft ∅ 16 ... 1“ ... 26 mm

Low harmonic sinewave signals

Internal terminal strip

EGS 14 · AGS 14

Sinewaves per turn:	1,024
Bandwidth:	200 kHz
Outputs:	1 V_{PP}
Temperature range:	–20 °C → +85 °C
Weight:	approx. 1.35 kg
Shock proof:	1,000 m/s² (6 ms)
Protection:	IP 54

Thru-hole hollow-shaft up to ∅ 70 mm

Low harmonic sinewave signals

Mating connector

HOGS 15

Sinewaves per turn:	2,048
Bandwidth:	200 kHz
Outputs:	1 V_{PP}
Temperature range:	–20 °C → +85 °C
Weight:	approx. 1.4 kg
Shock proof:	1,000 m/s² (6 ms)
Protection:	IP 54

Thru-hole hollow-shaft up to ∅ 60 mm

Low harmonic sinewave signals

Cable connection

Option: **Sinewave absolute track**

HOGS 80 · HOGS 120 · HOGS 140

Sinewaves per turn:	1,024, 2,048
Bandwidth:	200 kHz
Outputs:	1 V_{PP} (Sinus)
Temperature range:	–20 °C → +85 °C
Weight:	approx. 400 g (HOGS 80)
Shock proof:	1,000 m/s² (1 ms)
Protection:	IP 56

Thru-hole hollow-shaft:

up to ∅ 25 mm (HOGS 80)

up to ∅ 42 mm (HOGS 120)

up to ∅ 70 mm (HOGS 140)

Low harmonic sinewave signals

Cable connection

Option: **Sinewave absolute track**

Explosion proof

EEx OG 9

Pulses per turn:	1 → 5,000
max. switching frequency:	120 (250) kHz
Logic level:	HTL, TTL, TTL (R)
Temperature range:	–20 °C → +75 °C
Weight:	approx. 3.5 kg
Shock proof:	1,000 m/s² (6 ms)
Protection:	IP 56

EURO-Flange® B10, shaft ∅ 11 mm
Terminal box
High HTL output current

Sinewave signals option

Explosion proof according to “EEx de IIC T6”

EEx HOG 161

Pulses per turn:	1,024 → 2,500
max. switching frequency:	120 (250) kHz
Logic level:	HTL (C), TTL, TTL (R)
Temperature range:	–20 °C → +75 °C
Weight:	approx. 6.2 kg → 8.8 kg
Shock proof:	1,000 m/s² (6 ms)
Protection:	IP 56

Thru-hole hollow-shaft ∅ 38 ... 70 mm
Terminal box

Sinewave signals option

Explosion proof according to “EEx de IIC T6”

Absolute Multiturn

AMG 10

Absolute multiturn signals:
13 Bit per turn
12 Bit = 4,096 turns
SSI- or EnDat-Interface

Sinewaves per turn:	512
Output:	1 V_{PP}

Temperature range:	–20 °C → +100 °C
Weight:	approx. 2 kg
Shock proof:	1,000 m/s² (6 ms)
Protection:	IP 66

EURO-Flange® B10, shaft ∅ 11 mm
Terminal box

HÜBNER Combinations and their Key Data

OG 60 + GT 5

Digital-Tacho OG 60
with LongLife-DC-Tachogenerator GT 5

Shock proof: 1,000 m/s² (6 ms)
Weight: approx. 450 g
Protection: IP 54

Servo flange
Small size
Common shaft

GT 5: 7 → 10 mV/rpm

FOG 9 + GT 7

Digital-Tacho FOG 9
with LongLife-DC-Tachogenerator GT 7

Shock proof: 1,000 m/s² (6 ms)
Weight: approx. 1.1 kg
Protection: IP 55

EURO-Flange® B10, shaft ∅ 11 mm
Common shaft

GT 7: 10 → 60 mV/rpm

POG 9 + FSL · POG 9 + ESL

Digital-Tacho POG 9
with mechanical
overspeed switch FS(L) 90
or with electronic
overspeed switch ES(L) 90 or ES(L) 93

Shock proof: 1,000 m/s² (6 ms)
Weight: approx. 2.6 kg
Protection: IP 55

EURO-Flange® B10, shaft ∅ 11 mm
Common shaft

FS(L) 90: 700 → 4,900 rpm
ES(L) 90: 650 → 6,000 rpm
ES(L) 93: 3 × 200 → 5,000 rpm

POG 90 + OG 9 · POG 90 + FSL/ESL

Digital-Tacho POG 90
with Digital-Tacho OG 9
or with mechanical
overspeed switch FS(L) 90
or with electronic
overspeed switch ES(L) 90 or ES(L) 93

Shock proof: 1,000 m/s² (6 ms)
Weight: approx. 2.8 kg
Protection: IP 56

EURO-Flange® B10, shaft ∅ 11 mm
Common shaft

OG 9: 1 ... 1,250 Pulses per turn
FS(L) 90: 700 → 4,900 rpm
ES(L) 90: 650 → 6,000 rpm
ES(L) 93: 3 × 200 → 5,000 rpm

HOG 10 + FSL · HOG 10 + ESL

Digital-Tacho HOG 10
with mechanical
overspeed switch FS(L) 90
or with electronic
overspeed switch ES(L) 90 or ES(L) 93

Shock proof: 1,000 m/s² (6 ms)
Weight: approx. 2.5 kg
Protection: IP 55

Hollow-shaft with clamping device
up to ∅ 16 mm
Option: cone 1:10
Common shaft

FS(L) 90: 700 → 4,900 rpm
ES(L) 90: 650 → 6,000 rpm
ES(L) 93: 3 × 200 → 5,000 rpm

POG 10 + FSL · POG 10 + ESL

Digital-Tacho POG 10
with mechanical
overspeed switch FS(L) 90
or with electronic
overspeed switch ES(L) 90 or ES(L) 93

Shock proof: 1,000 m/s² (6 ms)
Weight: approx. 2.7 kg
Protection: IP 66

EURO-Flange® B10, shaft ∅ 11 mm
Common shaft

FS(L) 90: 700 → 4,900 rpm
ES(L) 90: 650 → 6,000 rpm
ES(L) 93: 3 × 200 → 5,000 rpm

TDP 0,2 + OG 9

LongLife-DC-Tachogenerator TDP 0,2
with Digital-Tacho OG 9

Shock proof: 1,000 m/s² (6 ms)
Weight: approx. 3 kg
Protection: IP 55

EURO-Flange® B10, shaft ∅ 11 mm
Common shaft

TDP 0,2: 10 → 150 mV/rpm

TDP 0,2 + OG 60

LongLife-DC-Tachogenerator TDP 0,2
with Digital-Tacho OG 60

Shock proof: 1,000 m/s² (6 ms)
Weight: approx. 3 kg
Protection: IP 55

EURO-Flange® B10, shaft ∅ 11 mm
Internal coupling

TDP 0,2: 10 → 150 mV/rpm

HOG 22 + HTA 11 + ES 100

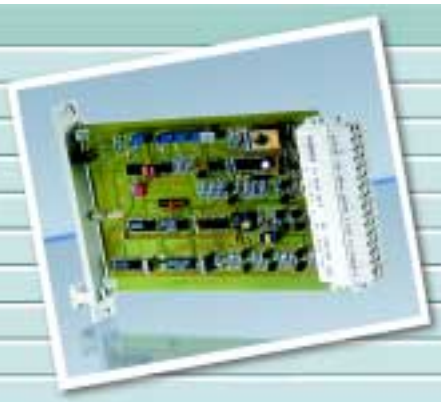
Digital-Tacho HOG 22
with LongLife-DC-Tachogenerator HTA 11
and overspeed switch ES 100

Shock proof: 1,000 m/s² (6 ms)
Weight: approx. 15 kg
Protection: IP 54

Hollow-shaft with clamping ring up to ∅ 110 mm
for rolling mills
for low speeds
Internal coupling

HTA 11: 20 → 100 mV/rpm
ES 100: 110 → 500 rpm

HEAG 121 P



Bipolar f/A-Converter
for frequency analogue conversion

Inputs:	HTL, TTL
Outputs:	–10 V ... +10 V
and	–20 mA ... +20 mA

PC board 100 × 160 mm
Opto coupler inputs
Linearity ≤ 0,02 %
Quartz controlled

HEAG 151 – 154

Digital-Converter for signal level shifting,
isolating, regeneration of signals

TTL → TTL (HEAG 151)
HTL → TTL (HEAG 152)
TTL → HTL (HEAG 153)
HTL → HTL (HEAG 154)

Outputs: TTL, HTL (C)
Standard rail installation
Opto coupler inputs

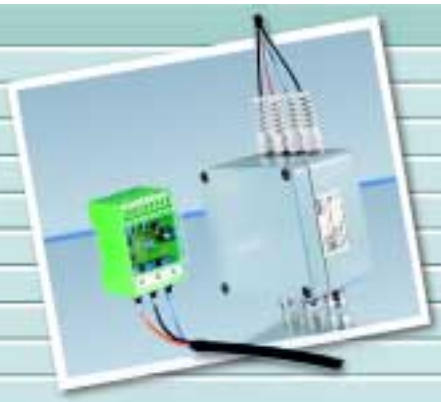
HEAG 156 – 157

Sinus-Digital-Converter
for interpolation of sine waves

Inputs:	1 V_{PP} (HEAG 156)
	5 V_{PP} (HEAG 157)
Outputs:	TTL
Output frequency:	max. 200 kHz

Standard rail installation
5 or 10 times interpolation

HEAG 171 – 174



Fibre optic transmitter
for Digital-Tachos

4 × TTL → fibre link	(HEAG 171)
4 × HTL → fibre link	(HEAG 172)
3 × fibre link → TTL	(HEAG 173)
3 × fibre link → HTL	(HEAG 174)

Sealed housing (HEAG 171, 172)
Standard rail installation (HEAG 173, 174)
HCS® fibre link
Simple fibre optic connector