

Universal Type 5850 (Shaft) / 5870 (Hollow shaft), analogue, parallel



- Highest shock resistance on the market ($\approx 2500 \text{ m/s}^2$, 6 ms acc. to DIN IEC 68-2-27)
- Parallel interface
- Divisions: up to 16384 (14 bits), singleturn
- Housing \varnothing 58 mm
- **Shaft version:** IP 65
Hollow shaft version: IP 66
- Various options (e.g. LATCH, SET...)
- Gray, Binary or BCD code
- Short-circuit proof outputs
- Patented new type of construction integrates all components; use of an opto-asic and 6-layer multilayer technology now on just a single PCB with resolution of up to 14 bits.
- **Shaft version:** Current interface 4 ... 20 mA

Mechanical characteristics:

Speed:	Shaft version: max. 12000 min ⁻¹ Hollow shaft version ¹⁾ : max. 6000 min ⁻¹
Rotor moment of inertia:	Shaft version: approx. $1.8 \times 10^{-6} \text{ kgm}^2$ Hollow shaft version: approx. $6 \times 10^{-6} \text{ kgm}^2$
Starting torque:	Shaft version: < 0.01 Nm Hollow shaft version: < 0.05 Nm
Radial load capacity of shaft:	80 N
Axial load capacity of shaft:	40 N
Weight:	approx. 0.4 kg
Protection acc. to EN 60 529:	Shaft version: IP 65 Hollow shaft version: IP 66
Working temperature:	-20° C ... +85 °C ²⁾³⁾
Shaft:	stainless steel
Shock resistance acc. to DIN-IEC 68-2-27	2500 m/s ² , 6 ms
Vibration resistance acc. to DIN-IEC 68-2-6:	100 m/s ² , 10...2000 Hz

¹⁾ For continuous operation 1500 min⁻¹

²⁾ 80 °C, shaft version and cable connection

³⁾ 70 °C, hollow shaft version and cable connection

Electrical characteristics SSI or parallel interface:

Interface type:	Parallel	Parallel
Supply voltage (U _B):	5 V DC ($\pm 5 \%$)	10 ... 30 V DC
Output driver:	Push-pull	Push-pull
Current consumption typ.:	109 mA	109 mA
(no load) max.:	169 mA	169 mA
Permissible load/channel:	max. +/- 10 mA	max. +/- 10 mA
Signal level high:	min. 3.4 V	min. U _B - 2.8 V
Signal level low (I _{Load} = 10 mA):	max. 1.5 V	max. 1.8 V
(I _{Load} = 1 mA):	max. 0.3 V	-
Rise time t _r (without cable):	max. 0.2 μ s	max. 1 μ s
Fall time t _f (without cable):	max. 0.2 μ s	max. 1 μ s
Short circuit proof outputs: ¹⁾	yes	yes
Reverse connection protection at U _B :	no	yes
UL certified	File 224618	
Conforms to CE requirements acc. to EN 61000-6-2, EN 61000-6-4 and EN 61000-6-3		
RoHS compliant acc. to EU guideline 2002/95/EG		

¹⁾ If supply voltage is correctly applied

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Terminal assignment (Parallel interface, up to 13 bits and max. 2 options, 17 pin plug):

Sig.:	0V	+UB	1	2	3	4	5	6	7	8	9	10	11	12	13	ST/ VR	VR/ LH		⏏	
Col.:	WH	BN	GN	YE	GY	PK	BU	RD	BK	VT	GY PK	RD BU	WH GN	BN GN	WH YE	YE BN	WH GY			
Pin:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17		PH	

Terminal assignment (Parallel interface, 14 bits and max. 2 options, cable version):

Sig.:	0V	+UB	1	2	3	4	5	6	7	8	9	10	11	12	13	ST/ VR	VR/ LH	14	⏏	
Col.:	WH	BN	GN	YE	GY	PK	BU	RD	BK	VT	GY PK	RD BU	WH GN	BN GN	WH YE	YE BN	WH GY	GY BN		

Terminal assignment (Parallel interface, 14 bits, 1 option, 17 pin plug):

Sig.:	0V	+UB	1	2	3	4	5	6	7	8	9	10	11	12	13	ST/ VR/ LH	14	⏏	
Pin:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	PH	

Sig.: 1 = MSB; 2 = MSB-1; 3 = MSB-2 etc.

ST: SET input. The current position value is stored as new zero position.

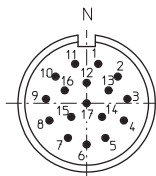
VR: Up/down input. As long as this input is active, decreasing code values are transmitted when shaft turning clockwise.

LH: LATCH input. High active. The current position is „frozen“. It is statically available at the parallel output.

PH: Plug housing
Isolate unused outputs before initial start-up.

Top view of mating side, male contact base:

17 pin plug



Control inputs:

Up/down input to switch the counting direction

By default, if glancing at the shaft side, absolute encoders deliver increasing code values when shaft rotates clockwise (cw). When the shaft rotates counter-clockwise (ccw), the output delivers accordingly decreasing code values. The same applies to models with current interfaces. When the shaft rotates clockwise, the output delivers increasing current values, and decreasing values when it rotates counter-clockwise.

As long as the Up/down input receives the corresponding signal (high), this feature is reversed. Clockwise rotation will deliver decreasing code/current values while counter-clockwise rotation will deliver increasing code/current values.

The response time is : for 5 V DC supply voltage, 0.4 ms
for 10-30 V DC supply voltage, 2 ms.

Switching level of the control inputs:

Supply voltage:	5 V DC	10 ... 30 V DC
low	£ 1.7 V	£ 4.5 V
high	³ 3.4 V	³ 8.7 V

SET input

This input is used to reset (to zero) the encoder. A control pulse (high) sent to this input allows storing the current position value as new zero position in the encoder.

For models equipped with a current interface, the analogue output (4 ... 20 mA) will be set accordingly to the value 4 mA.

Note : before activating the SET input after supplying the encoder with the supply voltage, a counting direction (cw or ccw) must be defined univocally on the Up/down input!

The response time is : for 5 V DC supply voltage, 0.4 ms
for 10 ... 30 V DC supply voltage, 2 ms.

LATCH input

This input is used to „freeze“ the current position value. The position value will be statically available on the parallel output as long as this input will remain active (high).

The response time is : for 5 V DC supply voltage, 140 µs,
for 10 ... 30 V DC supply voltage, 200 µs.

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Electrical characteristics current interface 4 ... 20 mA (Shaft version)

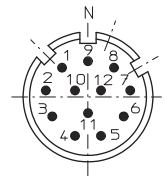
Sensor part			Max. Failure (25 °C):		0.2 °	
Interface type:	4 ... 20 mA	4 ... 20 mA	Resolution:	13 Bit		
Supply voltage (U _B):	10 ... 30 V DC	5 V DC	Building up time:	max. 2 ms		
Current consumption typ.:	70 mA	70 mA	Temperature coefficient:	0.1°/10 K		
(no load) max.:	84 mA	84 mA	Current if detector error:	£ 3.5 mA		
Sensor and current loop are galvanically isolated						
Current loop			UL certified	File 224618		
Supply voltage (U _s):	10 ... 30 V DC		Conforms to CE requirements acc. to EN 61000-6-2, EN 61000-6-4 and EN 61000-6-3			
Analogue signal:	4 ... 20 mA		RoHS compliant acc. to EU guideline 2002/95/EG			
max. input resistance of the input circuit: 200 W (U _s = 10 V), 1 kW (U _s = 30 V)						
Measuring range: 0 ... 360 °						

Terminal assignment (Current interface 4 ... 20 mA, 12pin plug):

Sig.	0V	+UB	—	—	I+	I-	ST	VR							
Col.:	WH	BN	GN	YE	GY	PK	BU	RD	BK	VT	GY	RD	PK	BU	
Pin:	1	2	3	4	5	6	7	8	9	10	11	12	PH		

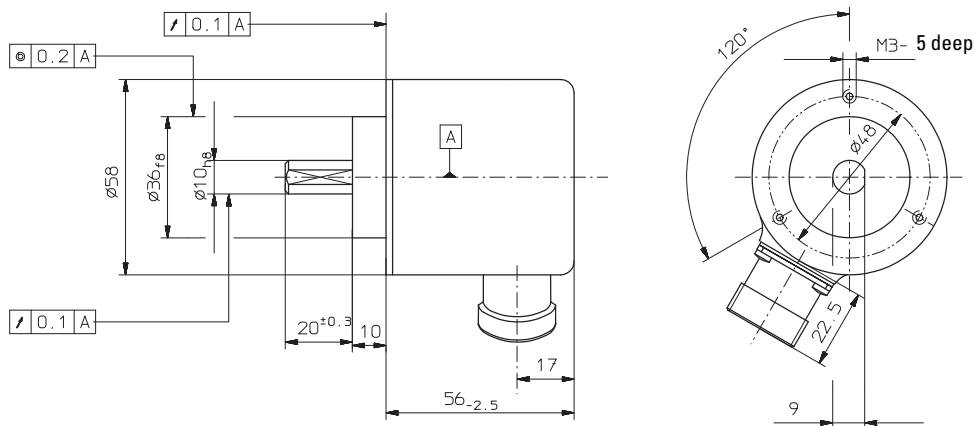
- +I: Input of the current loop
- I: Output of the current loop
- ST: SET input. The output current is set to 4 mA.
- VR: Up/down input. As long as this input is active, decreasing current values are transmitted when shaft turning clockwise.
- PH: Plug housing
Isolate unused outputs before initial start-up.

Top view of mating side, male contact base: 12 pin plug

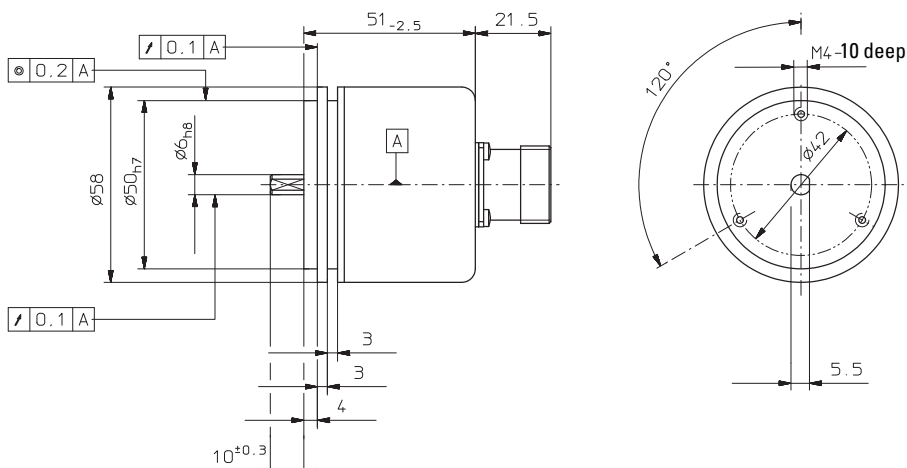


Dimensions shaft version

Clamping flange with shaft \varnothing 10



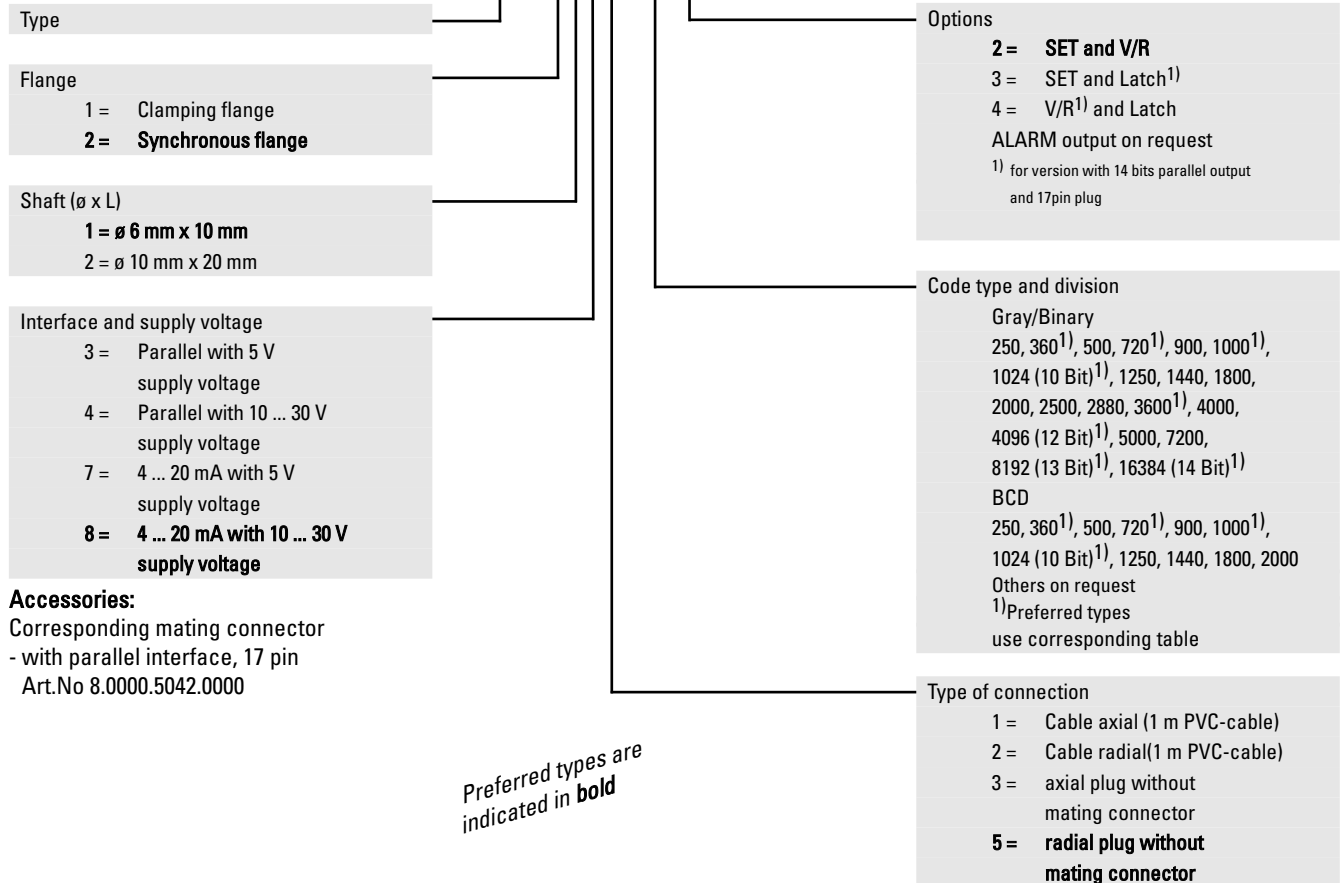
Synchro flange with shaft \varnothing 6 mm



Universal Type 5850 (Shaft) / 5870 (Hollow shaft), analogue, parallel

Order code shaft version:

8.5850.XXXX.XXXX



Code type and division for encoder with parallel output (Interface and supply voltage, version 3 or 4)

Division	Order code	Order code	Order code
	Gray/Gray-Excess	Binary	BCD
250	E02	B02	D02
360	E03	B03	D03
500	E05	B05	D05
720	E07	B07	D07
900	E09	B09	D09
1000	E01	B01	D01
1024 (10 Bit)	G10	B10	D10
1250	E12	BA2	DA2
1440	E14	BA1	DA1
1800	E18	B18	D18
2000	E20	B20	D20
2500	E25	B25	
2880	E28	B28	
3600	E36	B36	
4000	E40	B40	
4096 (12 Bit)	G12	B12	
5000	E50	B50	
7200	E72	B72	
8192 (13 Bit)	G13	B13	
16384 (14 Bit)	G14	B14	

Preferred divisions are indicated in bold

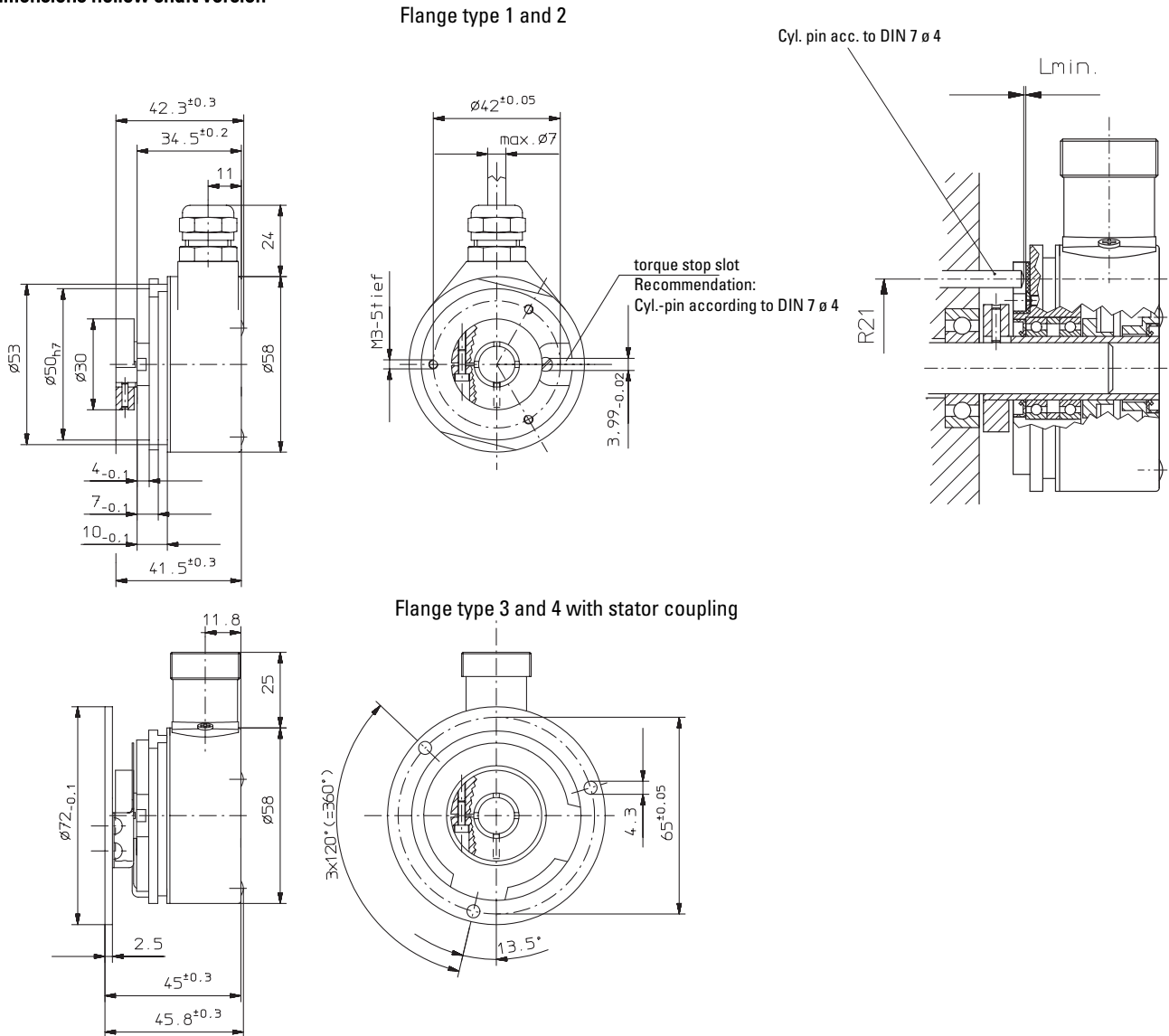
Code type and division for encoder with analogue output

Interface and supply voltage, version 7 or 8
 (4 ... 20 mA)

8192 (13 Bit)	G13
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Universal Type 5850 (Shaft) / 5870 (Hollow shaft), analogue, parallel

Dimensions hollow shaft version



Note: minimum insertion depth $1.5 \times D_{\text{hollow shaft}}$

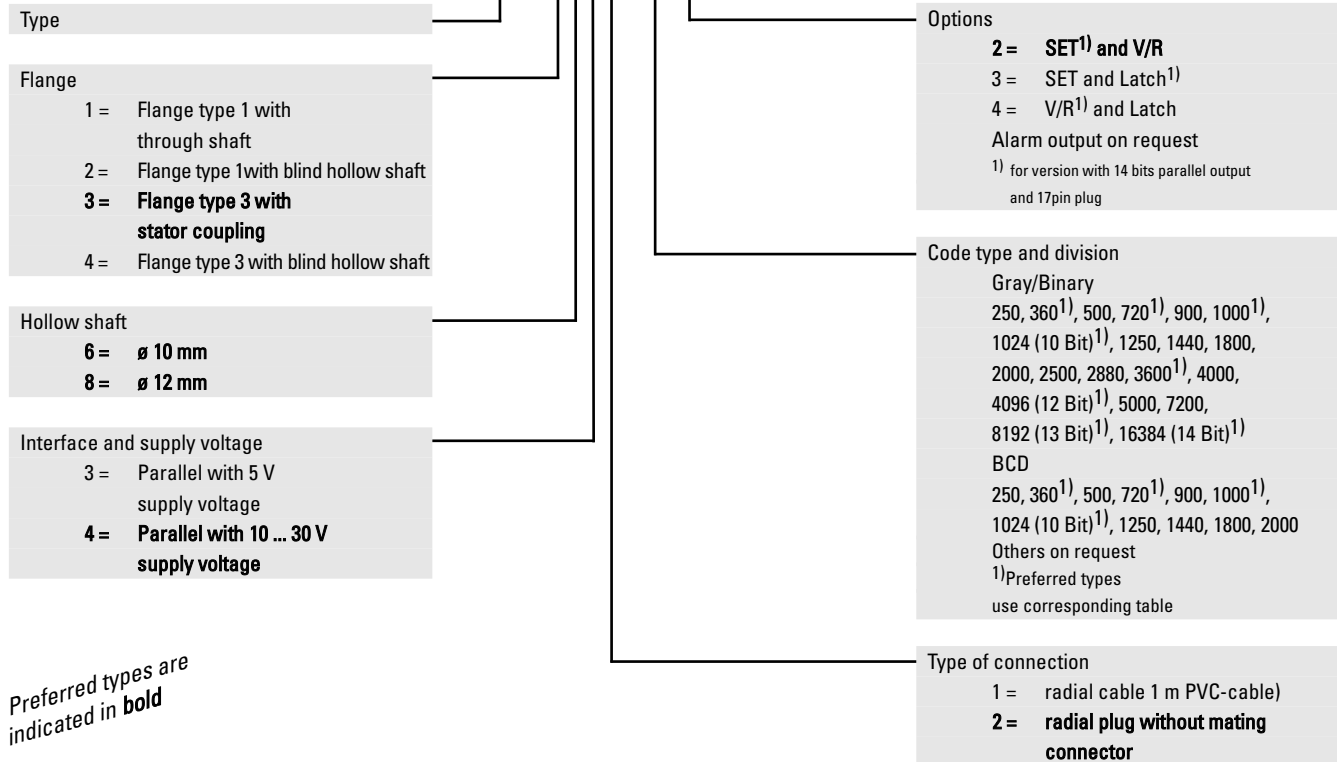
Mounting advice:

- 1) The flanges and shafts of the encoder and drive should not both be rigidly coupled together at the same time.
- 2) When mounting a hollow shaft encoder, we recommend using a torque stop pin or a stator coupling.
- 3) When mounting the encoder ensure that the dimension L_{min} is larger than the maximum axial play of the drive. Otherwise there is a danger that the device could mechanically seize up.

Universal Type 5850 (Shaft) / 5870 (Hollow shaft), analogue, parallel

Order code hollow shaft version:

8.5870.XXXX.XXXX



Preferred types are indicated in bold

Code type and division with parallel output

Interface and supply voltage, version 3 or 4 (Parallel):

Division	Order code Gray/Gray-Excess	Order code Binary	Order code BCD
250	E02	B02	D02
360¹	E03	B03	D03
500	E05	B05	D05
720¹	E07	B07	D07
900	E09	B09	D09
1000¹	E01	B01	D01
1024 (10 Bits)	G10	B10	D10
1250	E12	BA2	DA2
1440	E14	BA1	DA1
1800	E18	B18	D18
2000	E20	B20	D20
2500	E25	B25	
2880	E28	B28	
3600 ¹	E36	B36	
4000	E40	B40	
4096 (12 Bits)	G12	B12	
5000	E50	B50	
7200	E72	B72	
8192 (13 Bits)	G13	B13	
16384 (14 Bit)	G14	B14	

Preferred divisions are indicated in bold

Accessories:

Corresponding mating connector
- with parallel interface, 17 pin
Art.No 8.0000.5042.0000

Mounting set:

Ord.-No. 8.0010.4600.0000
Stator coupling two wings
for high dynamic application
Order-No.: 8.0010.4D00.0000
Tether arm short
Order-No.: 8.0010.4R00.0000