Interpolation electronics
▶ GEL 212 / 213
for sensors with sinusoidal output 1 V_{PP}

LENORD +BAUER

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Technical information   *Version 03.2014*

GEL 212

GEL 213

General information

▶ conversion of standardized sine signals into square signals up to an interpolation factor of 512
▶ GEL 212 closed housing with 12-pole connector, IP 65
▶ GEL 213 for top hat rail mounting with terminal strips, IP 20

Input signals

▶ 2 sine-wave signals shifted by 90° and their inverse signals
▶ signal level 250 mV_s peak value, per track = 1 V_{PP} as differential signal
▶ reference signal and inverse reference signal (option)

Output signals

▶ 2 square-wave signals shifted by 90° and their inverse signals
▶ reference pulse (option)
▶ output either with 5 V DC or 0 to 30 V DC signal level
▶ using quadruple edge evaluation a resolution of up to 2048 pulses per signal period is possible

Fields of applications

▶ interpolation of sinusoidal signals from the MiniCODER GEL 2442 K/KN/KM, GEL 243 L and rotary encoder GEL 295x K/KN
▶ interpolation of sine-shaped voltages with an amplitude of 1 V_{PP}

Technical data

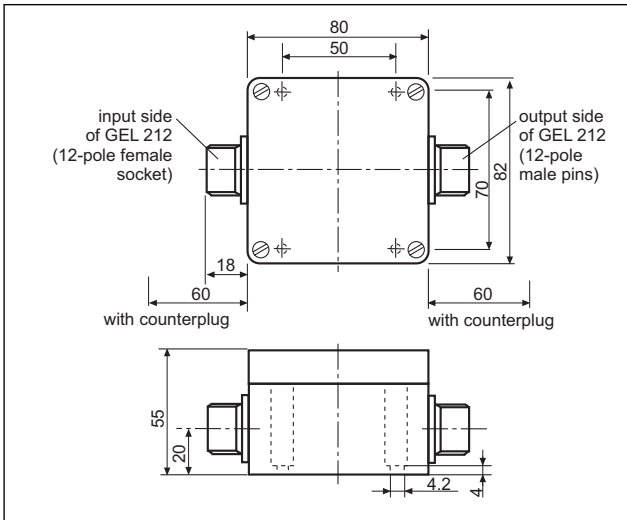|	T, TN	U, UN	V, VN	X, XN
Electrical data				
Supply voltage	5 V DC ± 5%	10 to 30 V DC		
Power consumption (without load)	≤ 1 W			
Output signals	2 square-wave signals shifted by 90° and their inversed signals optional: reference signal (N)			
Logic level	TTL, compatible with RS 422 and RS 485		push-pull signal	
Output level high	≥ V_S - 1.00 V at I = 10 mA; ≥ V_S - 1.20 V at I = 30 mA	≥ 4.00 V at I = 10 mA; ≥ 3.85 V at I = 30 mA	≥ V_S - 1.80 V at I = 10 mA; ≥ V_S - 2.20 V at I = 30 mA	
Output level low	≤ 0.75 V at I = 10 mA; ≤ 1.00 V at I = 30 mA		≤ 1.15 V at I = 10 mA; ≤ 1.55 V at I = 30 mA	
Input signals	2 sinusoidal signals shifted by 90° and their inversed signals with differential voltage 1 V_{PP} optional: reference signal (N)			
Input frequency	0 to 50 kHz			
Output frequency	max. 200 kHz Input frequency by multiplier (see type code)			
Short wave precision [1]	0,08° [2]			
Short wave precision	dependent on the precision of the measuring scale (target wheel)			
Connection data				
Connection	GEL 212: 12-pole circular connectors GEL 213: terminal strips			
Max. permissible cable length [3]	25 m for cable cross section 0.5 mm²			
Ambiant data				
Working and operating temperature	-40 °C to +85 °C			
Protection class (EN/IEC 60529)	GEL 212: IP 65 GEL 213: IP 20			
Vibration protection (EN/IEC 60068-2-6)	200 m/s² (20g)			
Electromagnetic compatibility (EMC)	EN/IEC 61000-6-1 bis 4			
Insulation strength (DIN EN 60439-1)	500 V AC			

[1] Reffering to a target wheel with 256 teeth and module 0.3
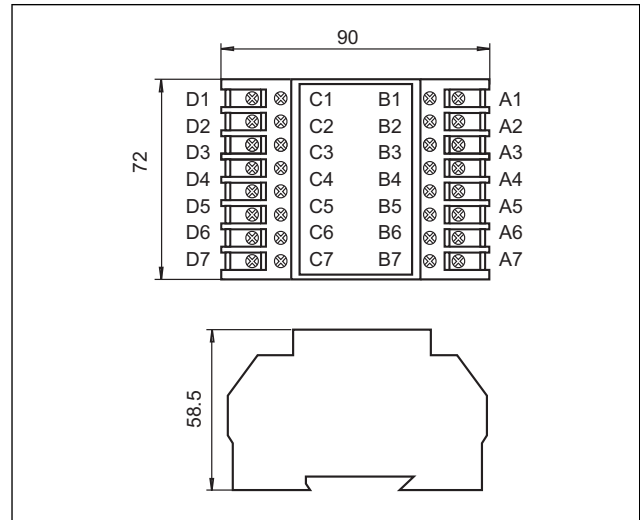[2] If sensor and interpolation electronics are matched to one another.
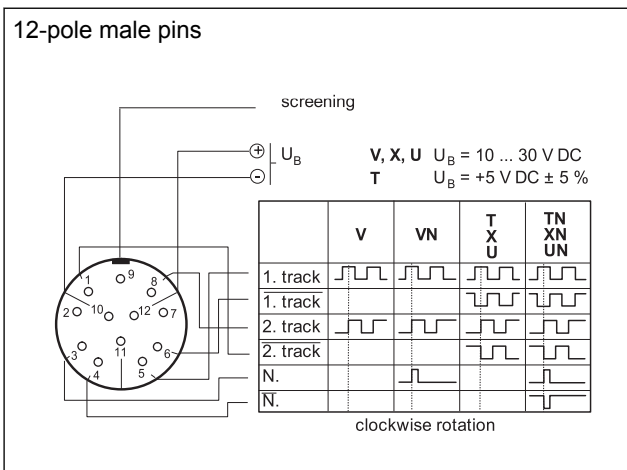[3] between sensor and the interpolation electronics

Dimensional drawing GEL 212

input side of GEL 212 (12-pole female socket)
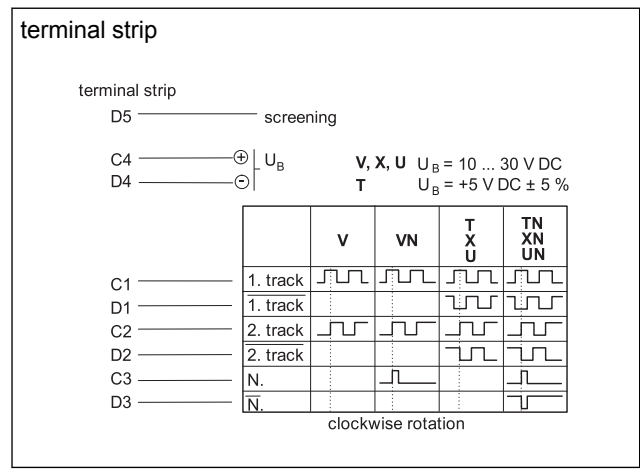
output side of GEL 212 (12-pole male pins)

80
50
70
82
18
60 with counterplug
60 with counterplug
55
20
4.2
4

Dimensional drawing GEL 213

D1	C1	B1	A1
D2	C2	B2	A2
D3	C3	B3	A3
D4	C4	B4	A4
D5	C5	B5	A5
D6	C6	B6	A6
D7	C7	B7	A7

90
72
58.5

Output side of GEL 212

12-pole male pins

screening

$\oplus\ U_B$
$\ominus$

V, X, U $U_B = 10 ... 30\ V\ DC$
T $U_B = +5\ V\ DC \pm 5\ \%$

	V	VN	T X U	TN XN UN
1. track				
$\overline{1.\ track}$				
2. track				
$\overline{2.\ track}$				
N.				
$\overline{N}$.				

clockwise rotation

Output side of GEL 213

terminal strip

terminal strip

D5 —— screening
C4 —— $\oplus\ U_B$
D4 —— $\ominus$

V, X, U $U_B = 10 ... 30\ V\ DC$
T $U_B = +5\ V\ DC \pm 5\ \%$

		V	VN	T X U	TN XN UN
C1	1. track				
D1	$\overline{1.\ track}$				
C2	2. track				
D2	$\overline{2.\ track}$				
C3	N.				
D3	$\overline{N}$.				

clockwise rotation

Connection assignment input side

GEL 212: 12-pole female socket

GEL 213 terminal strips

GEL 212   **GEL 213**

B5 —— screening
A4 —— $\oplus$ supply voltage for MiniCODER
B4 —— $\ominus$

white —— A1
brown —— B1
pink —— A2
black —— B2
grey —— A3
yellow —— B3

	2442		2442 K	2442 KM, KN	243		243 L
1.track	0.5 V_{PP}				1.track	1 V_{PP}	
$\overline{1.track}$	0.5 V_{PP}				BZ *	U_B / 2	
2.track	0.5 V_{PP}				2.track	1 V_{PP}	
$\overline{2.track}$	0.5 V_{PP}				BZ *	U_B / 2	
N.							
$\overline{N}$.							

clockwise rotation

Type code

	Design				
2	closed housing				
3	for top hat rail mounting				
		Signal pattern			
	T	2 square-wave signals shifted by 90° and their inversed signals (TTL)			
	V	2 square-wave signals shifted by 90° (HTL)			
	U	2 square-wave signals shifted by 90° and their inversed signals (TTL)			
	X	2 square-wave signals shifted by 90° and their inversed signals (HTL)			
			Reference signal		
		–	without		
		N	with reference signal		
				Multiplier	
			01	interpolation factor 1	
			02	interpolation factor 2	
			04	interpolation factor 4	
			08	interpolation factor 8	
			10	interpolation factor 10	
			16	interpolation factor 16	
			20	interpolation factor 20	
			25	interpolation factor 25	
			32	interpolation factor 32	
			40	interpolation factor 40	
			50	interpolation factor 50	
			64	interpolation factor 64	
			80	interpolation factor 80	
			AA	interpolation factor 100	
			BB	interpolation factor 125	
			CC	interpolation factor 128	
			DD	interpolation factor 200	
			EE	interpolation factor 250	
			FF	interpolation factor 256	
			GG	interpolation factor 400	
			HH	interpolation factor 500	
			KK	interpolation factor 512	
				Sense control	
				0	without
21	_	_	_	_ _	_

Note

When using the GEL 212 or GEL 213 interpolation electronics in combination with a GEL 243 or GEL 2442 sensor or with a GEL 295 encoder the components are factory-adapted to each other (the interpolation electronics has been labelled with the serial number of the sensor/encoder belonging to it).
Sensors from **other manufacturers** are to be adapted to the interpolation electronics in the factory.