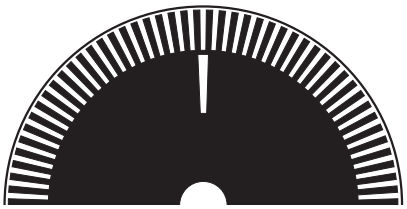
Incremental output sequence



The resolution of the encoder is determined by the number of dark/bright segments coated onto a disk. Baumer electric offers encoders with various pulse sequences.

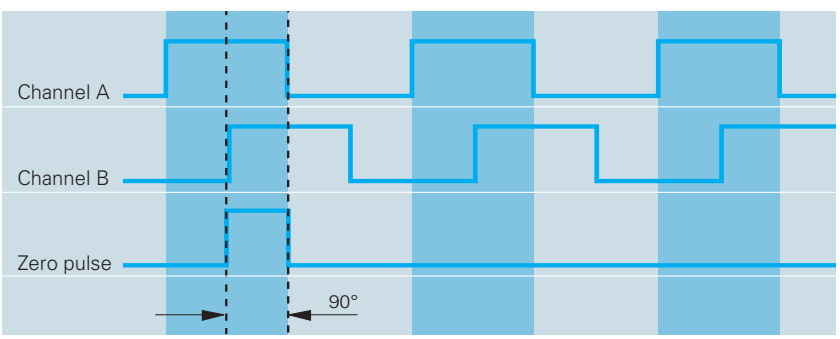
The width of the dark/bright segments is determined by the selected number of pulses.

Two pulse sequences, 90° out of phase, are generated by two separate measuring systems. With this method the direction of rotation can be determined.

Looking at the shaft end of the encoder and watching the shaft moving in the counter clockwise direction means that channel B lags channel A for a 1/4 period (by 90°).

reference 6

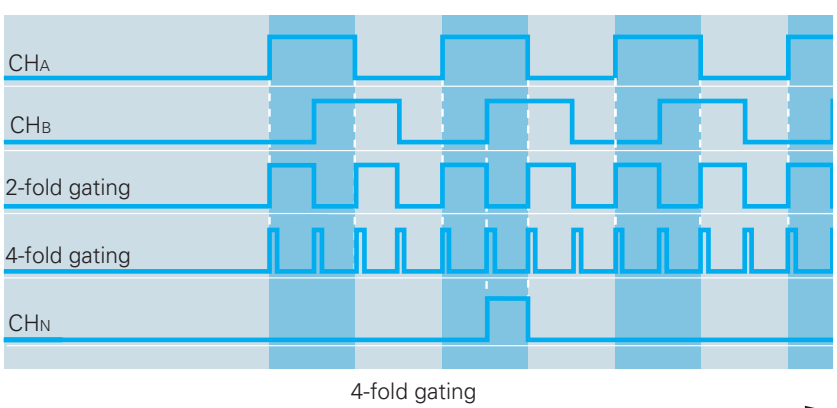
3 channel square wave



The zero pulse with the designation 6 exists as long as the level of channel A and B is HIGH.

This method is standard at Baumer electric.

Signal edge counting

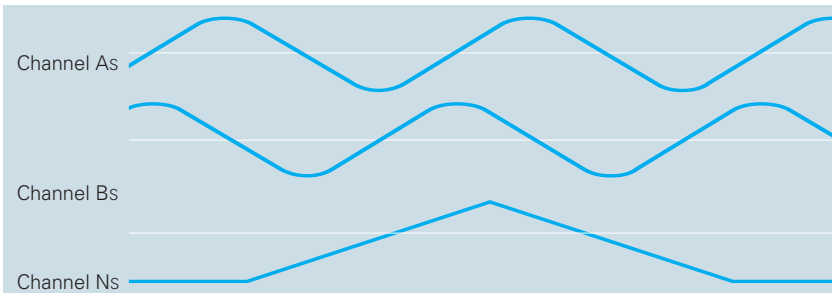


The output signal of the encoder is a square wave. One period is equally subdivided by the four edges of the two channel (CH_A and CH_B) signals.

This results in the ability to multiply the raw pulse count by a factor of four (quadrature).

reference 8

3 channel sine signal

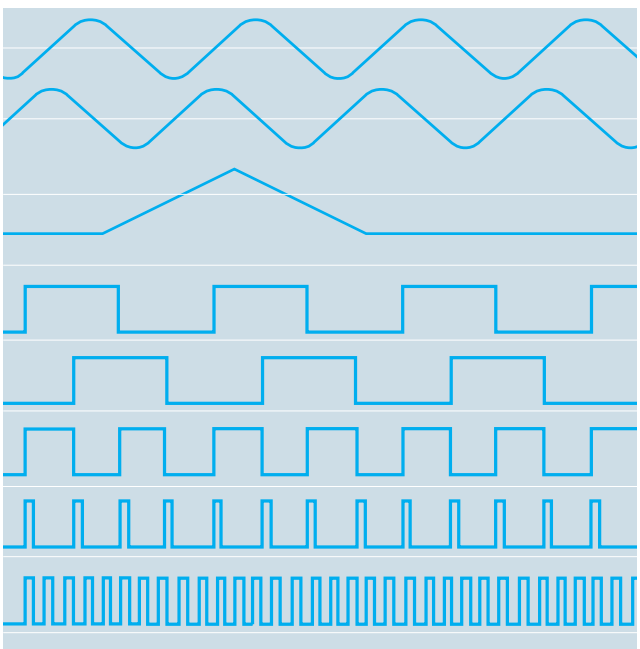


Sine signals (As, Bs, Ns)

Two sinusoidal signals[1)] are generated which possess a phase quadrature in relation to one another. One analog zero reference point is generated per revolution, so that its peak value is between the maximum of the sinusoidal signals. Looking at the shaft end of the encoder and the rotation of the shaft CCW, the As channel lags behind the Bs channel by 1/4 (90°) of a period.

[1)] After subtraction in the sequence electronics

Signal edge counting by interpolation box

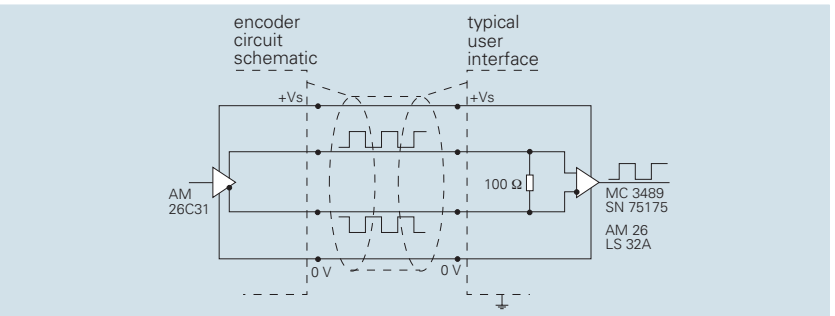


For the purpose of matching to a given interface or on account of a requirement for higher resolution, there are separate interpolation boxes available for each application. Thus, four counting steps are obtained from the period T; these can then be passed to a counter.

If the basic resolution of T/4 is inadequate for the application, the analog signal must be interpolated. Here, the basic period is subdivided into smaller units by applying trigonometric laws. Thus, with 10 fold interpolation, a 5'000 pulse sinusoidal encoder can supply 200'000 steps per revolution.

Complementary line-driver

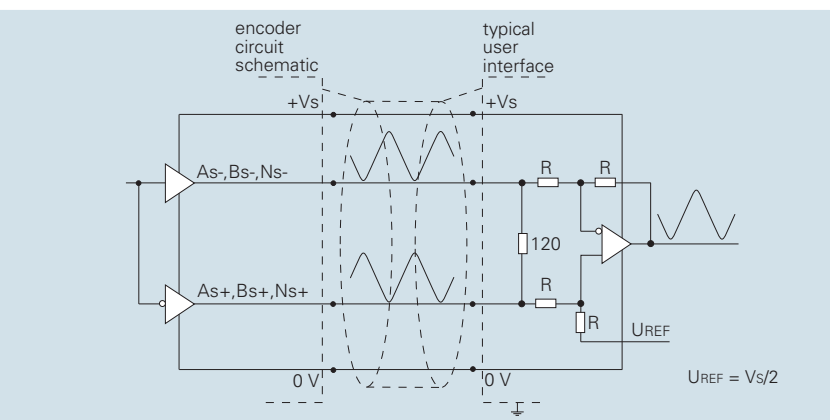
05A



voltage supply	5 VDC ±10%
level of signal	U_{High} ≥ 2,4 V at -I_{High} = 20 mA U_{Low} ≥ 0,4 V at I_{Low} = 20 mA
supply current	see product page
special features	EIA-standard RS-422
preferred application	when EMI is present and with long cable lengths

Sine

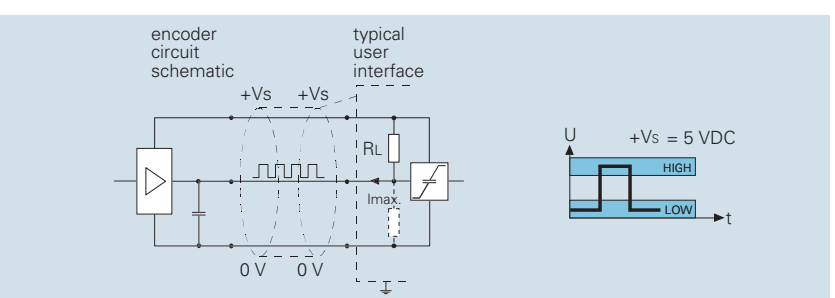
05S



voltage supply	5 VDC ±5%
supply current	see product page
level of output signal	approx. 1 Vpp
preferred application	for external interpolation

Push-pull short-circuit protection (TTL-compatible)

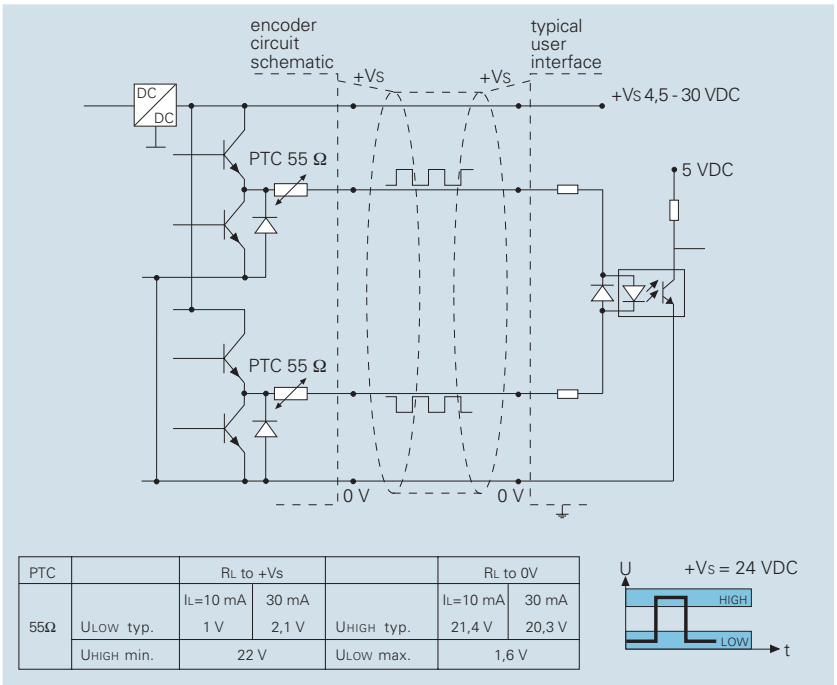
05T



voltage supply	5 VDC ±10%
level of signal	U_{High} ≥ 3,8 V at -I_{High} = 1 mA U_{Low} ≥ 0,4 V at I_{Low} = 5 mA
supply current	see product page
preferred application	with short cable lengths

Push-pull complementary short-circuit protection

25W

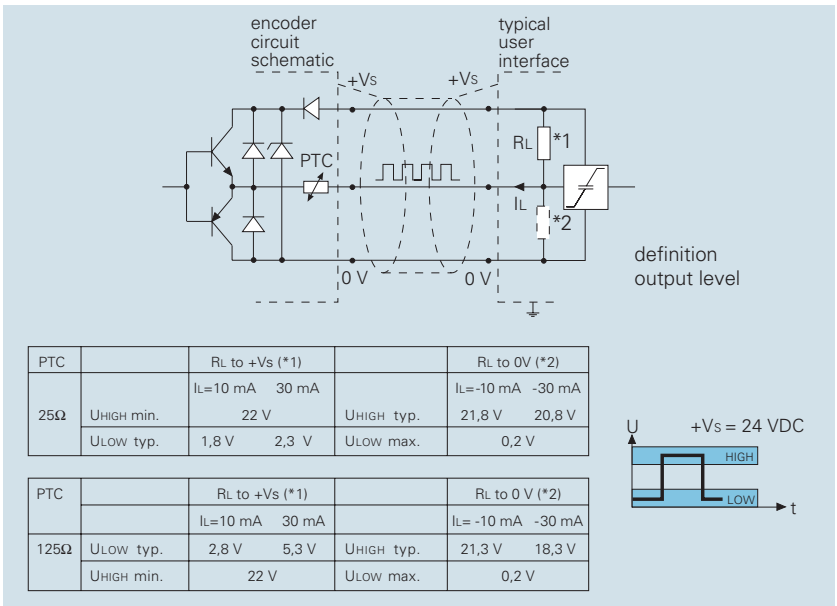


PTC		RL to +Vs			RL to 0V	
		IL=10 mA	30 mA		IL=10 mA	30 mA
55Ω	ULOW typ.	1 V	2,1 V	UHIGH typ.	21,4 V	20,3 V
	UHIGH min.	22 V		ULOW max.	1,6 V	

voltage supply	4,5 - 30 VDC
supply current	see product page
output current	max. 40 mA
preferred application	when EMI is present and with long cable lenghts

Push-pull short-circuit protection

24K



PTC		RL to +Vs (*1)			RL to 0V (*2)	
		IL=10 mA	30 mA		IL=-10 mA	-30 mA
25Ω	UHIGH min.	22 V		UHIGH typ.	21,8 V	20,8 V
	ULOW typ.	1,8 V	2,3 V	ULOW max.	0,2 V	

PTC		RL to +Vs (*1)			RL to 0 V (*2)	
		IL=10 mA	30 mA		IL= -10 mA	-30 mA
125Ω	ULOW typ.	2,8 V	5,3 V	UHIGH typ.	21,3 V	18,3 V
	UHIGH min.	22 V		ULOW max.	0,2 V	

voltage supply	10 - 30 VDC reverse polarity protected
supply current	see product page
output current	max. 30 mA
PTC-resistance	25 Ω (BDK, BHK 125 Ω)