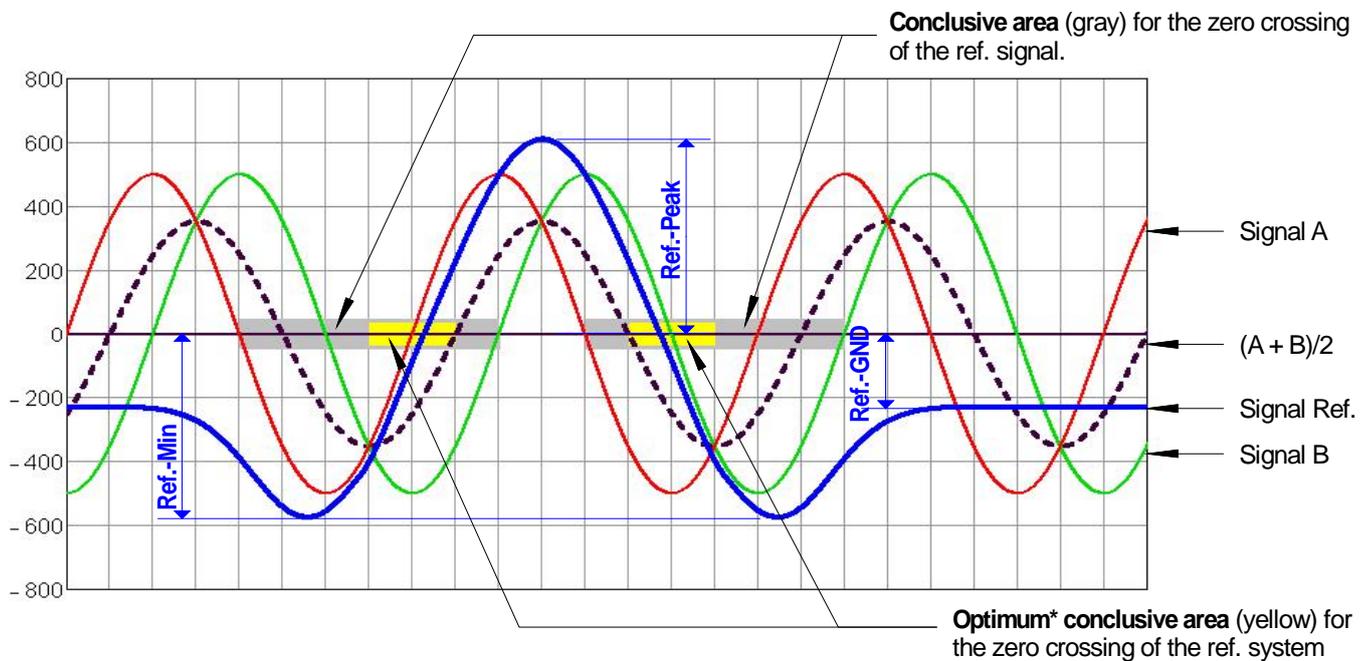


# Output signals 1Vpp encoder Ref.-Signal

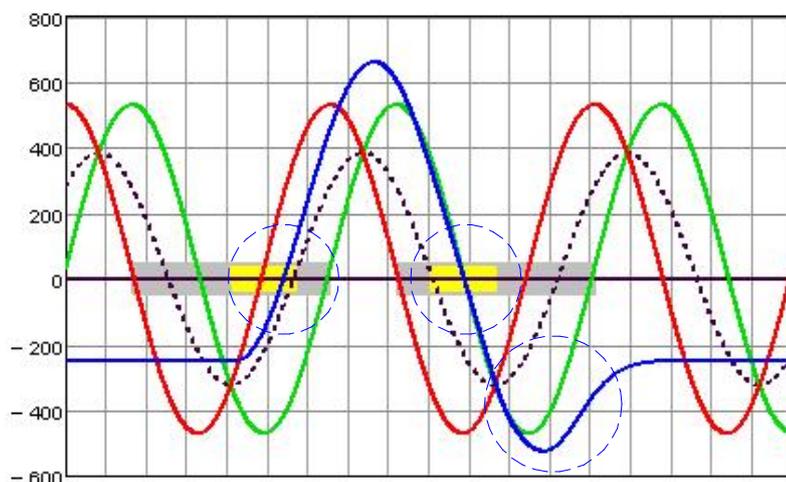


<b>Ref.-Peak</b> = Peak Ref.-Signal	200 ... 700mV	optimal*: 500 ... 600mV
<b>Ref.-GND</b> = Ground Ref.-Signal	-200 ... -700mV	optimal*: -200 ... -400mV
<b>Ref.-Min</b> = Minimum Ref.-Signal	-200 ... -700mV	optimal*: -200 ... -600mV

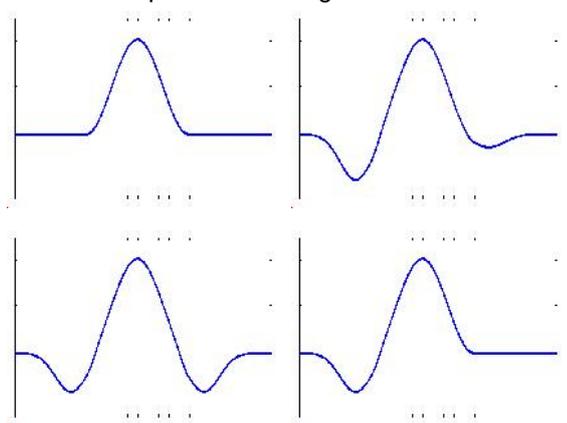
\* "Optimum" values: Values which are classed as optimum are values for signal parameters which allow for reservations compared to the maximum allowed valued. The optimum signal parameters should be set when installing the encoder. This guarantees that in case of any possible drifts of the values through temperature, resolution, weathering etc., the allowed tolerance areas are still observed.

The zero crossing of the ref. system can also lay asymmetrically to signals A & B. Furthermore, local deviations from the ideal signal shape (signal shoulder) are possible.

**Important:** the ref. signal may only have 2 zero crossings and these should be within the optimum conclusive area (yellow).



Possible shapes of the ref. signal:



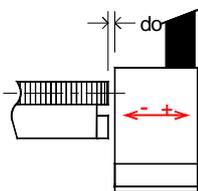
# Output signals 1Vpp encoder

## Ref.-Signal: Troubleshooting

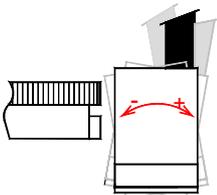
If the ref. signal does not correspond to the required parameters, the following must be clarified:

- Electrical connection: is the output cable connected in accordance with the cable assignment / connection plug arrangement?
- Is the shielding of the connector cable connected?
- Do the encoder and the gearwheel fit together? (gearwheel module, ref. mark type: tooth, hook, gap et al.)
- Is the gearing and / or the ref. mark damaged?

### assembly fault

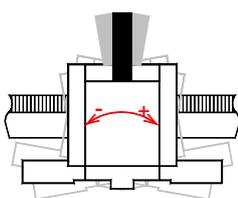


If the encoder is not fitted with the correct distance  $d_0$  to the gearwheel, this will have direct consequences on the ref. signal parameters. The difference (amplitude of the ref. signal)  $\text{Ampl-Ref} = \text{Peak} - \text{GND}$  becomes larger with decreasing distance  $d_0$ . If  $d_0$  is increased, the  $\text{Ampl-Ref}$  becomes smaller. Comparable behavior can be observed with the amplitudes of the lead signals A & B. Ensure the encoder is fitted with the correct distance to the gearwheel! When fitting the encoder, tighten the fixing screws alternately while closely controlling the distance  $d_0$  to the gearwheel!

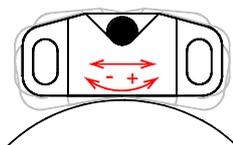


During assembly the distance gauge is placed between the gearing of the gearwheel and the front side of the encoder. Because of this, an encoder which is tilted will only show changes of the amplitude of the ref. signal. The amplitudes of the lead signals A & B could show virtually optimum values.

(-): Reduction of the amplitude of the ref. signals (+): Increase of the amplitude of the ref. signals, check the screwing surface of the encoder and clean if necessary. A similar effect can occur if the gearwheel is tilted in the axis - adjust the gearwheel in the axis.



If the encoder is rotated in the tangent plane relative to the gearwheel, this will affect the phase position of the ref. signal to the lead signals A & B, i.e. the zero crossing of the ref signal is possibly not in the optimum conclusive area. Check the screwing surface of the encoder and clean if necessary. A similar effect can occur if the gearwheel is tilted in the axis - adjust the gearwheel in the axis.



If the encoder is displaced from the gearwheel in the tangent plane and / or rotated in the tangent plane relative to the gearwheel (not parallel), this will affect the phase position of the ref. signal to the lead signals A & B (conclusive area). Furthermore, this can lead to changes to the offset of the ref. signal. Check the screwing surface of the encoder and clean if necessary. Check the width and radial alignment of the guide slot for the encoder.

Provided that the described errors can be ascribed to incorrect assembly of the encoder, the parameters for the encoder signal can be corrected using the I2C interface programming. This is also possible in the case of incorrect positioning of the gearwheel on the axis. Take note, however, that any possible eccentricity errors will be disguised.