OUTPUT SIGNALS

SINUSOIDAL VOLTAGE SIGNALS 1Vpp
(drawing shows "positive counting direction")
Two sinusoidal voltage signals A1 and A2 and one reference mark signal
(all with inverted signals).

Power supply: +5 V ±10 %, max. 130 mA (unloaded)
Track signals (differential voltage A1 to $\overline{A1}$ resp. A2 to $\overline{A2}$):
Signal amplitude 0.6 Vpp to 1.2 Vpp; typ. 1 Vpp
(with terminating impendance Zo = 120 Ω between A1 to $\overline{A1}$ resp. A2 to $\overline{A2}$)

Reference mark
(differential voltage RI to $\overline{RI}$):
Useable component 0.8 up to 1.2 V; typical 1 V
(with terminating impedance Zo = 120 Ω between RI to $\overline{RI}$)

Advantage:
- High traversing speed with long cable lengths possible

SQUARE-WAVE SIGNALS
(drawing shows "positive counting direction")
With an interpolation electronics (for times -5, -10, -50 or -100) the photoelement output
signals are converted into two square-wave signals that have a phase shift of 90°. The output
signals are „differential" via line driver (RS 422). One measuring step reflects the measuring
distance between two edges of the square-wave signals.

The controls/DRO´s must be able to detect each edge of the square-wave signals. The minimum edge separation a_{min} is listed in the technical data and refers to a measurement at
the output of the interpolator (inside the scanning head). Propagation-time differences in
the line driver, the cable and the line receiver reduce the edge separation.

Propagation-time differences:
Line driver: max. 10 ns
Cable: 0.2 ns per meter
Line receiver: max. 10 ns refered to the recommended line receiver circuit

To prevent counting errors, the controls/DRO´s must be able to process the resulting edge
separation.

Example:
a_{min} = 200 ns, 10 m cable
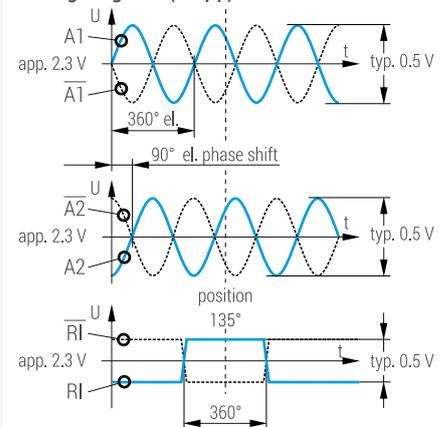200 ns - 10 ns - 10 x 0.2 ns - 10 ns = 178 ns

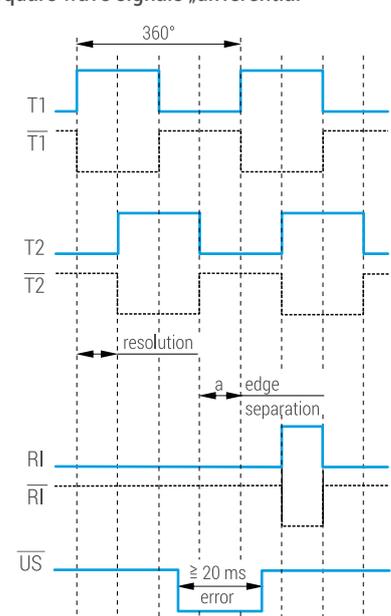**Power supply:** +5 V ±10%, max. 140 mA (unloaded)

Advantage:
- Noise immune signals
- No further subdividing electronics necessary

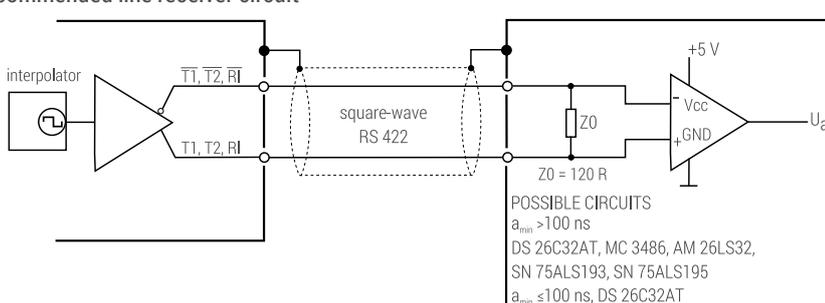### Voltage signals (1 Vpp)

Square wave signals „differential"

Recommended line receiver circuit

POSSIBLE CIRCUITS
a_{min} >100 ns
DS 26C32AT, MC 3486, AM 26LS32,
SN 75ALS193, SN 75ALS195
a_{min} ≤100 ns, DS 26C32AT

Counting direction

positive counting direction