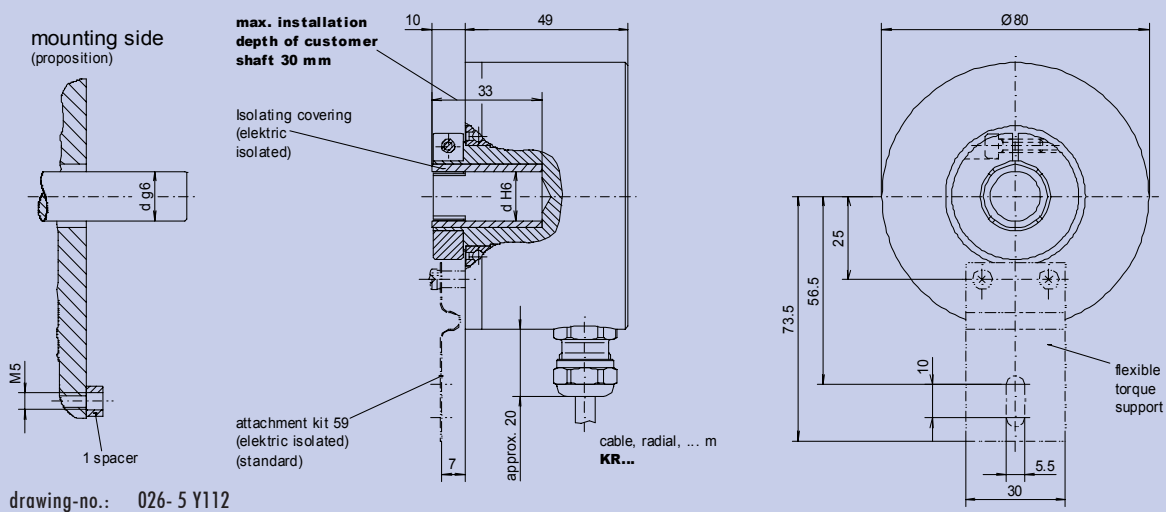


**Features**

- High-class incremental encoder with electric isolated hollow shaft and attachment kit
- **Number of pulses** up to **10000** pulses/rev.
- Mounting at torque support
- TTL- or HTL- output signals



**Mechanical data**

Design	A 4		<b>A 4</b>
Attachment kit	59	standard, (ref. datasheet »Attachment kit's ...«)	<b>59</b>
Housing	aluminium, black, powder coated		
Protection	IP 65	according to DIN EN 60 529	<b>IP65</b>
Construction principle	LED with glass slotdisc		
max. revolution (mechanical)	$n_{max} \leq 5000$ rpm	(observe limit frequency)	
Permissible motor-shaft play	axial $\leq 0.25$ mm radial $\leq 0.1$ mm		
Starting torque	at 20 °C $\leq 1$ Ncm		
Vibration	55... 2000 Hz $\leq 100$ m/s <sup>2</sup>	according to DIN IEC 60 068, part 2-6	
Shock	11 ms $\leq 300$ m/s <sup>2</sup>	according to DIN IEC 60 068, part 2-27	
Hollow shaft diameter	d 15 mm	(standard), 10 mm to 16 mm possible	<b>15</b>
Weight	approx. 600 g		

## Electrical data

Number of pulses	Z	2000 to 10000 pulses/revolution	XXXX
Electronic version (output signals)	TTL	Line driver-output stage, supply voltage: $U_B = 5 \text{ VDC} \pm 5\%$ (polarity protected) output amplitude: $U_{\text{LOW}} \leq 0.5 \text{ V}$ , $U_{\text{HIGH}} \geq 2.5 \text{ V}$	T
	HTL	Push pull-output stage (short-circuit proof), supply voltage: $U_B = 8\text{-}30 \text{ VDC}$ (polarity protected) output amplitude: $U_{\text{LOW}} \leq 1.5 \text{ V}$ , $U_{\text{HIGH}} \geq U_B - 3 \text{ V}$	H
Output signals	A, B, N + Inv.	2 square wave pulse trains, electr. phase shifted $90^\circ \pm 10^\circ$ + zero pulse, electr. length $90^\circ \pm 9^\circ$ + signal inverting*	NI
Pulse ratio		pulse : pause = 1 : 1, $\pm 10\%$ at 30 kHz	
Edge steepness		$\geq 15 \text{ V}/\mu\text{s}$	
Limit frequency	$f_G$	TTL 300 kHz HTL 160 kHz	
Output load current	$I_{\text{Load}}$	TTL $\leq 70 \text{ mA}$ HTL $\leq 70 \text{ mA}$	
Current consumption (no-load)	$I_{\text{max}}$	$\leq 100 \text{ mA}$	
Permissible cable length		$\leq 100 \text{ m}$ (Thalheim-cable)	
Type of connection		cable, radial, 1 m	KR1
Operating temperature range		$0^\circ \text{C}$ to $+70^\circ \text{C}$	S
Permissible relative humidity		$\leq 90\%$ (condensation not permitted)	

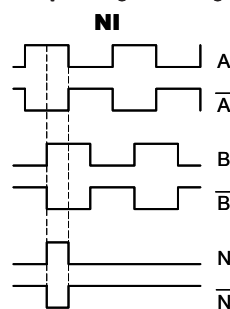
## Options

Electronic version	TTL-output signals, Line driver-output stage supply voltage: $U_B = 8\text{-}30 \text{ VDC}$ (polarity protected)	R
Operating temperature range	$0^\circ \text{C}$ to $+100^\circ \text{C}$ (IP 54: $n_{\text{max}} \leq 5000 \text{ min}^{-1}$ , IP65: $n_{\text{max}} \leq 3000 \text{ min}^{-1}$ )	E

## Connection table

wire color	signals
brown	A
green	A inv.
grey	B
pink	B inv.
red	N
black	N inv.
brown 0.5 mm <sup>2</sup>	+ $U_B$
white 0.5 mm <sup>2</sup>	0 V
blue	+ $U_{\text{sensor}}$
white	0 V <sub>sensor</sub>
transparent	shielding/housing

## Output signal diagram



Pulse trains:  
Clockwise rotation when  
looking at the end of the  
shaft (mounting side).

## Ordering example:

<b>ITD 41</b> Incremental encoder ITD 41	<b>A 4</b> Design A 4	<b>Y112</b> Mechanical variant Y112 = look at the drawing	<b>2500</b> Number of pulses 2500 pulses/revolution	<b>H</b> Electronic version $U_B = 8\text{-}30 \text{ VDC HTL}$	<b>NI</b> Output signals A-, B-, N-track + inv.	<b>KR1</b> Type of connection cable, radial, 1 m	<b>S</b> Operating temperature $0^\circ \text{C}$ to $+70^\circ \text{C}$	<b>15</b> Hollow shaft diameter 15 mm	<b>IP65</b> Protection IP65	<b>59</b> Attachment kit variant 59
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\* ref. output signal diagram