

# Speed pickup with two square wave outputs and rotational direction relay

- Speed pickup with square wave output signal and rotational direction relay
- Can be mounted in place of a tachogenerator
- Robust design
- Maintenance-free
- Integrated signal amplifier
- Powerful, interference-immune output signal
- 60 pulses per revolution
- Push-pull output stage as output
- Can be loaded with 50 mA SINK and 20 mA LOAD
- High EMC protection for harsh electrical environments
- Large operating temperature range -25 °C ... +85 °C
- Complies with CE requirements
- For harsh conditions up to IP66
- Matching evaluators can be supplied



## Speed pickup type series NADS3...

### Functional principle of the speed pickup

Speed pickups are maintenance-free devices for converting rotary motion into square wave signals. The drive shaft of the speed pickup is connected directly to the speed source (e.g. motor, generator) by means of a coupling.

The speed is converted into a square wave signal using a signal amplifier. Two square wave signals with a phase offset of 90° are available. These enable the direction of rotation to be detected. The square wave signal can be evaluated or converted by several devices. Connection to PLC digital counter assemblies is also possible. An integrated rotational direction relay outputs the direction of rotation directly as a binary value.

### Design and mounting

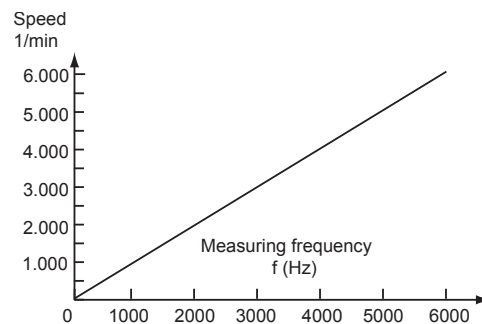
The speed pickups feature a particularly robust design. They have an enclosed metal housing and an impact-resistant plastic terminal box with a screwed cable gland. The degree of protection is IP66.

The electrical connections are made via screw terminals in the plastic terminal box, also with IP66 degree of protection. The device is connected to the drive shaft via a coupling (not included in the scope of delivery). Flexible couplings are recommended to compensate for shaft misalignment. The pickup is mounted using a bracket or installation flange for standard spigots with Ø 40 mm.

The NADS3... speed pickup can be used instead of tachogenerators if a speed-proportional square wave signal is required.

### Speed and frequency characteristics

The drive shaft powers a perforated disc with 60 holes. Magnetic sensing of the holes produces a square wave signal, whereby the frequency is proportional to the speed of the drive shaft. At 1,000 rpm, the 60 holes generate a frequency of 1,000 Hz.



### Speed pickup output

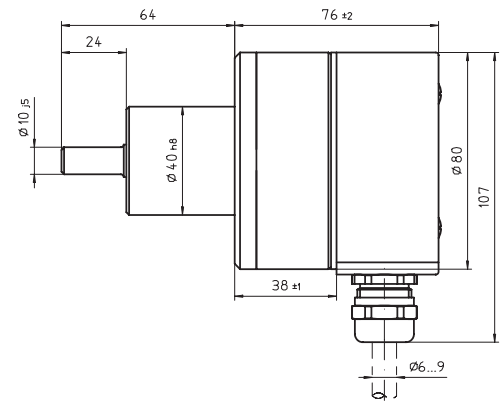
The output signal is a noise-immune square wave signal, whereby the frequency is proportional to the speed. The voltage range is between the supply voltage and is load-dependent. The pulse duty factor is approx. 50%. The output circuit is a push-pull output stage. Short-circuit protection is provided by a 130 PTC resistor. Spurious pulses are intercepted by an internal varistor operating relative to the negative pole. The push-pull output stage can be used as an NPN output (SINK) and as a PNP output (LOAD). The output voltage is galvanically connected to the supply voltage. The rotational direction relay contact is a floating NO contact.

## Technical Data

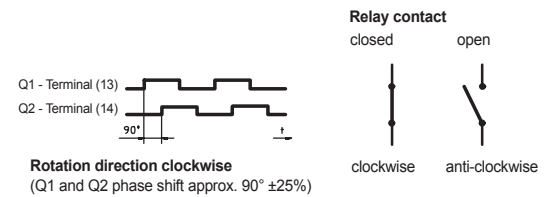
Type series NADS3...		
General	Supply voltage	US=18 ... 30 V/DC, Unom=24 V/DC ±5% harmonic content US=10 ... 30 V/DC if speed relay function is not used
	Current consumption	Approx. 20 mA @ 24 V/DC + switching current
	Reverse voltage protection	Integrated
	Oversvoltage protection	Integrated
Input	Speed range	0 ... 6,000 rpm = 0 ... 6,000 Hz
	Mechanical connection	Shaft for coupling (see drawing), coupling not included in scope of delivery
Output	Output circuit	Push-pull output stage
	Output signal	NORIS standard signal, square wave, galvanically connected to supply voltage
	Output level	High: approx. US-0.8 V @ 1 mA, US-1.5 V @ 5 mA, US-2.3 V @ 10 mA Low: approx. US+0.2 V @ 1 mA, US+0.8 V @ 5 mA, US+1.6 V @ 10 mA
	Output ratio	1,000 rpm = 1,000 Hz
	Output resistance	Series resistance: 130 Ω
	Switching current	NPN (SINK) 50 mA, PNP (LOAD) 20 mA, permanent short-circuit proof
	Rise time	≥ 10 V/μs
	Switching contact	Max. 60 W, max. 230 V/AC, max. 2 A/DC
Environmental influences	Operating temperature	-25 ... +85°C
	Climatic test	DIN IEC60068-T2-1/-2/-30
	Vibration resistance	DIN IEC60068-T2-6: 4 g @ 25 ... 100 Hz, amplitude 1.6 mm @ 2 ... 25 Hz
	Shock resistance	DIN IEC60068-T2-27: 300 m/s² @ 18 ms
	Degree of protection	EN 60529: IP66
	ESD	IEC61000-4-2: ±6 kV/CD; ±8 kV/AD
	HF-interference immunity	IEC61000-4-3: 10 V/m f=80 MHz ... 2000 MHz, 80% AM @ 1 kHz
	Burst	IEC61000-4-4: ±2 kV/PL; ±1 kV/DL
	Surge	IEC61000-4-5: ±0.5 kV/DM (R <sub>0</sub> =2 Ω); ±1 kV/DM (R <sub>0</sub> =42 Ω); ±1 kV/CM (R <sub>0</sub> =12 Ω)
	Conducted HF interference	IEC61000-4-6: 3 V <sub>eff</sub> f=150 kHz ... 80 MHz, 80% AM @ 1 kHz
Conducted LF interference	IEC60553: 3 V <sub>eff</sub> 0,05 ... 10 kHz	
Interference emission	CISPR 16-1, 16-2: EMC2	
Dielectric strength	500 V/AC, 50 Hz @ 1 min	
Other	Storage temperature	Recommended -25 ... +70 °C (possible -40 ... +85 °C)
	Mounting (standard version)	Via bracket or installation flange Ø 40 mm
	Electrical connection	Screw terminals 1.5 mm² (recommended cable cross-section 0.5 ... 1 mm²)
	Recommended cable length	1.000 m / 1 kHz @ 0.5 mm² shielded
	Installation position	Any
	Weight	Ca. 800 g
	Applied standards	CE requirements fulfilled

## Dimensions, Connection, Diagrams

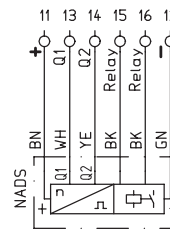
### NADS3-13-K



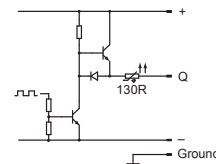
### Direction of rotation detection



### Connection diagram



### Schematic diagram (push-pull amplifier)



NPN- or PNP-inputs can be connected

## Type code / standard versions

### Device series

NA	Mechanical driven speed pickup
<b>Principle</b>	
DS	Digital hall principle. two-channel version, with rotational directional relay output
<b>Design</b>	
3	Spigot Ø 40 mm, housing Ø 80 and length 76 mm
<b>Mechanical connection</b>	
- 13	Connecting shaft Ø 10 mm for coupling (see drawing)
<b>Electrical connection</b>	
- K	Terminal box with screw terminals

NADS 3 -13-K (NADS3-13-K)

(Only standard versions, other customised versions on request)



NORIS Automation GmbH  
Muggenhofer Straße 95  
90429 Nuremberg  
GERMANY

Phone.: +49 911 3201-0  
Fax: +49 911 3201-150  
info@noris-group.com  
www.noris-group.com