Speed pick-up with square wave output

NAD1..., NAD2...

Speed pick-up

- **Cost-effective speed pick-up with square wave output signal**
- **Can be mounted in place of a flexible shaft**
- **Small design**
- **Maintenance-free**
- **Integrated signal amplifier**
- **Powerful, interference-immune output signal**
- **15 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 ... +100 °C**
- **Complies with CE requirements**
- **For harsh conditions up to IP67**
- **Matching evaluators can be supplied**

NAD1...

NAD2...

Speed pick-up type series NAD1..., NAD2...

Functional principle of the speed pick-up

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

The speed is converted into a square wave signal using a signal amplifier. The square wave signal can be evaluated or converted by several devices. Connection to PLC digital counter assemblies is also possible.

Design and mounting

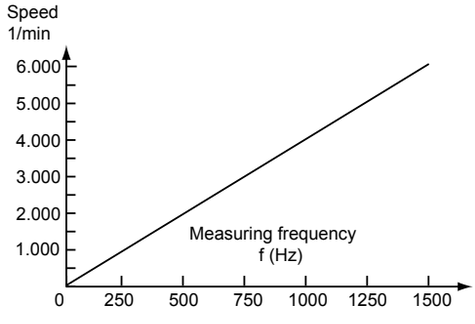
The speed pickups feature a particularly small and robust design. They have an enclosed metal housing and the degree of protection is IP67. The electrical connections are made via an Euro M12x1 plug connection, also with IP67 degree of protection.

Depending on design the electrical connection to the drive shaft is intended via tongue or slotted connection. The pick-up NAD1... is mounted through directly screwing and securing with a locknut. The pick-up NAD2... is mounted using a bracket for spigots with Ø 30 mm.

In many cases the dimensions allow mounting of this pick-up instead of a flexible shaft. This has the advantage that the high susceptibility to failure of a flexible shaft can be avoided.

Speed and frequency characteristics

The drive shaft powers a perforated disc with 15 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 15 holes generate a frequency of 250 Hz.



Speed pick-up 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 Ω 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.

Technical Data

	Type series NAD1... and NAD2...	
General	Supply voltage	US=10 ... 32 V/DC, Unom=24 V/DC ±5% harmonic content
	Current consumption	Approx. 15 mA @ 24V/DC + switching current
	Reverse voltage protection	Integrated
	Overvoltage protection	Integrated
Input	Speed range	0 ... 6,000 rpm = 0 ... 1,500 Hz
	Mechanical connection	NAD1-1125-E: shaft with slot (see drawing) NAD2-1225-E: shaft with tongue (DIN 75532/E4 and DIN 5377 connection 5)
Output	Output circuit	Push-pull output stage
	Output signal	NORIS standard signal, square wave, galvanically connected with supply voltage
	Output level	High: approx. US-2.0 V @ 1 mA, US-2.5 V @ 5 mA, US-3.5 V @ 10 mA Low: approx. US+1.2 V @ 1 mA, US+1.8 V @ 5 mA, US+2.6 V @ 10 mA
	Output ratio	1,000 rpm = 250 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
Environmental influences	Operating temperature	-25 ... +100°C
	Climatic test	DIN IEC60068-T2-1/-2/-30
	Vibration resistance	DIN IEC60068-T2-6: 4g @ 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: IP67
	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_g=2 Ω); ±1 kV/DM (R_g=42 Ω); ±1 kV/CM (R_g=12 Ω)
	Conducted HF interference	IEC61000-4-6: 3 V_{eff} f=150 kHz ... 80 MHz, 80% AM @ 1 kHz
	Conducted LF interference	IEC60553: 3 V_{eff} 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 ... +105 °C)
	Mounting (standard version)	NAD1-1125-E: via screw-in thread M22x1.5 and lock nut NAD2-1225-E: via bracket Ø 30 mm
	Electrical connection	Euro M12x1
	Recommended cable length	1,000 m / 1 kHz @ 0.5 mm² shielded
	Installation position	Any
	Weight	Approx. 80 g
	Applied standards	CE requirements fulfilled

Type code / standard versions

Device series

NA	Mechanical driven speed pick-up

Principle

D	Digital hall principle

Design

1	Screw-in spigot with lock nut, housing Ø 28 and length 28 mm
2	Spigot Ø 30 mm, housing like spigot Ø 30 mm

Mechanical connection

-	1125	Connecting shaft with groove (see drawing), Connection thread M22 x 1.5
-	1225	Connecting shaft with tongue (DIN 75532/E4 and DIN 5377 connection 5), Connection thread M22 x 1.5

Electrical connection

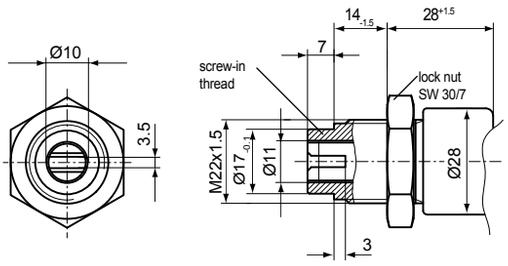
-	E	EURO M12 x 1, male connector 5-pin, contacts gold-plated

NAD 1 -1125 -E (NAD1-1125-E)

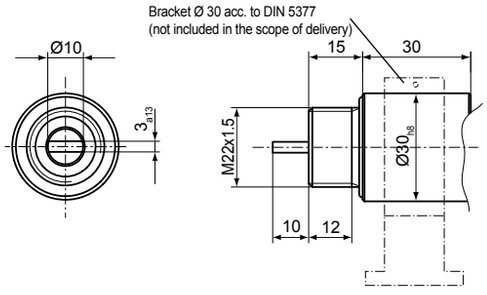
(Only standard versions, other customised versions on request)

Dimensions, Connection, Diagrams

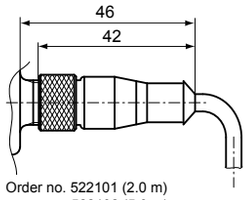
NAD1-1125-E



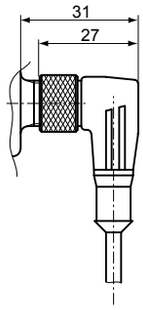
NAD2-1225-E



Connection cable (not included in the scope of delivery)

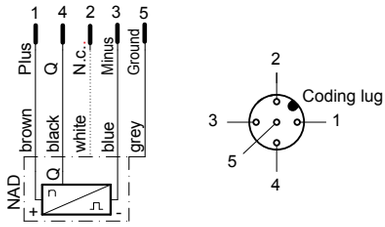


Order no. 522101 (2.0 m)
522102 (5.0 m)
522108 (7.5 m)
522109 (10.0 m)

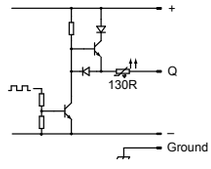


Order no. 522105 (2.0 m)
522106 (5.0 m)
522110 (7.5 m)
522111 (10.0 m)

Connection diagram



Schematic diagram (push-pull amplifier)



NPN- or PNP-inputs can be connected

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V01.00 - 07/2019
Errors and omissions expected