NORIMETER 2 - Stepping-motor analog indicator, square variant, protection IP52 / IP66

NORIS AUTOMATION

NIQ(D)2...

Analog indicators

- **Light and uniformly distributed LED illumination due to innovative lighting design**
- **LED illumination generates less internal heating**
- **Pointer and dial are illuminated separately**
- **Illumination can be linearly dimmed internally or externally**
- **IP52 or IP66 protection class at front**
- **High accuracy class rating of 0.5**
- **Vibration resistant up to 4g; shock resistant up to 25g**
- **Robust steel-plate enclosure with reduced mounting depth**
- **WATCH-DOG monitors the micro-processor controller**
- **Direct connection for all usual input signals**
- **Options available with integrated signal LED**
- **Operation possible in any installed position**
- **Optional non-linear scale portions or centre-zero scale**
- **Complies with CE requirements**
- **Check function auxiliary power failed: pointer moves back against mechanical stop**
- **Check function sensor failure: pointer moves to position outside scale range**
- **No transverse acceleration on curves, no overshooting as in the case of moving-coil indicators**
- **High torque of stepping motor prevents friction errors**

Stepping-motor analog indicator NIQ(D)2

Germanischer Lloyd

Range of application

The NORIMETER 2 is a reliable analog indicator that uses stepping motor technology and has a long service life as opposed to purely mechanical indicators. The only moving component is the high resolution stepping motor, which is fitted with robust shaft bearings. The steel-plate enclosure, with its IP52 or IP66 protection class front, holds the electronics firmly in place. This ensures that it always remains unaffected by vibrations during continuous operation as well as making it extremely suitable for handling increased mechanical stress and this capability enables it to be mounted directly on a motor.

Different designs have been developed for this unit (square or round) as well as many different application versions. Function upgrades, such as the input signal transducer, which have been integrated in the unit result in cost and space savings.

The combination of high-grade electronic components with an excellent software system provides a maximum degree of accuracy.

Function description

Every indicator is calibrated individually. The calibration points are stored in an EEPROM. Unintentional changes during operation are prevented by write-protect hardware.

After applying the operating voltage, the pointer is first run back against the gear stop and then initialised for scale zero. This initialising function provides recalibration of the instrument every time the voltage has been interrupted and, as a result, ensures an accurate measuring process. After amplification and A/D-conversion or frequency measurement, the input signal is available in digital form. The signal is then standardised for the scale range to drive the stepping motor. Sliding indication is provided by a routine whereby the stepping motor is slightly braked on approaching the end position in order to prevent overshooting. The measuring process is controlled and evaluated by a microprocessor so that an optimum combination is obtained of sliding measured-value matching and a high degree of accuracy, but without any pointer flutter. In appearance, the presentation is comparable to that of a well-damped moving-coil indicator; but then the device is constructed to withstand much more rigorous conditions.

The improved and innovative illumination design used in our range of NORIMETER 2 units consists of differently coloured LEDs that are used to illuminate the light-pointer and the surface fibre-optic beneath the dial. Uniformly distributed illumination over the complete dial is guaranteed by the use of a special surface fibre-optic and its diffuser dial. This ensures optimum illumination regardless of size, even with white dials. Shadowing of parts of the dial that is frequently seen in units with transparent dials illuminated from underneath does not occur.

Input signal

NORIMETER accepts all usual measuring signals without it being necessary for users to purchase an additional signal transducer.

Non-linear measuring range, centre-zero point

The NORIMETER 2 features calibration points that can be located on the scale to suit users‘ requirements. Each of these points has a certain value of the input signal assigned to it. The software is responsible for the measuring. This ensures that ranges that are proportional to one another can be displayed on a single dial or the zero-point can also be set in the center of the dial.

Technical Data

Series NIQ(D)2...	
Pointer deflection/resolution	240°, 720 steps
Resolution of measurement	12 bit
Resistance (R_i, R_i)	R_i>20kΩ at V-imput R_i<150Ω at mA-input R_i<1kΩ at frequency input
Protection class	DIN EN60529 terminals: IP30 (all), front: IP52 (NIQ2...), IP66 (NIQD2...)
Accuracy class	IEC51-1 0.5%
Vibration resistance	IEC60068-T2-6 4g increased strain, characteristic 2 (10...100 Hz)
Shock resistance (impact)	DIN IEC60068-T2-27 25g with 11 ms dwell time
Operating voltage	U_O=18 ... 36 V/DC, U_R=24 V/DC
Ripple	< 20% U_o
Reverse voltage protection	Integrated
Overvoltage	80 V/DC (2 ms)
Power consumption at 24V/DC incl. illumination	Approx. 60 mA in continuous operation, < 160 mA (5 ms) on switching on
Internal Illumination, dimmer	LED illumination, internal basic brightness adjustment via integr. potentiometer external brightness adjustment via operating voltage
ESD	IEC61000-4-2 +/-6kV/CD, +/-8kV/AD
Electromagnetic field	IEC61000-4-3 10 V/m f=80 MHz ... 2 GHz, 80% AM @ 1 kHz
Burst	IEC61000-4-4 +/- 2 kV/PL, +/- 1 kV/DL
Surge	IEC61000-4-5 sym. +/- 1 kV (R_i=2 Ω) asym. +/- 2 kV (R_i=12 Ω)
HF-susceptibility	IEC61000-4-6 10 V_{pp} 80% AM @ 1 kHz f=10 kHz ... 100 MHz
NF-susceptibility	IEC60553 3 V_{pp} 0.05 ... 10 kHz
Interference field intensity	CISPR 16-1, 16-2, EMC1 conducted emission 10 kHz ... 30 MHz interference field emission of housing 30 MHz ... 1 GHz
Initialising time	Approx. 6 s from application of operating voltage
Case material	Zinc-plated steel, rustproof
Weight	72x72: 260 g, 96x96: 370 g, 144x144: 710 g
Installed position	Any
Mounting	2 mounting elements according to DIN 43835 form B
Connection	connecting plug 9-pin with screwable locking
Operating temperature	-20 °C ... +70 °C
Shelf temperature	-40 °C ... +85 °C
Humidity	RH 96% maximum
Standard supply	CE requirements, DIN EN 61010-1, DIN EN 50155, Rail standard DIN EN 50121-3-2:2000, DIN EN 55011:1998, GL(2003), approved by GL, MED

Type key / variants

Standard variants Scale labelling to DIN 43802, coarse-fine division, bezel black, anti-reflection glass	
Non-illuminated white scale:	bar pointer black non-illuminated, scale lettering black
Illuminated white scale:	white illuminated trough-lighted scale, Bar pointer black non-illuminated, scale lettering black
Non-illuminated black scale:	bar pointer white non-illuminated, scale lettering white
Illuminated black scale:	white scale lettering trough-lighted, luminous pointer white - when lighted red, scale lettering white

Device codes

NI NORIMETER indicator instruments

Type

Q square

Type extension

without designation	Standard version protection class IP52
D	Special version protection class IP66

Type series

2	Type series NORIMETER 2

Size

-072	72 x 72 mm
-096	96 x 96 mm
-144	144 x 144 mm

Variant

without designation	Standard variant in NORIS design without special characteristics

Input range

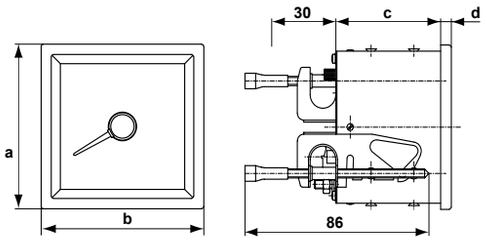
-...	Voltage, current, frequency, Pt100, Pt1000 (see area Types)

Scale number

-...	Descripes the scale. Issued on receipt of order.

NI Q D 2 -072 -G1-123 (NIQD2-072-G1-123)

Dimensions



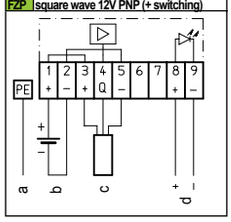
e = console cutout to DIN 43700

Type	a	b	c	d	e
NIQ2-072	72	72	49	5	$68^{+0,7}$x$68^{+0,7}$
NIQD2-072	72	72	48	6	$68^{+0,7}$x$68^{+0,7}$
NIQ2-096	96	96	43	6	$92^{+0,8}$x$92^{+0,8}$
NIQD2-096	96	96	42	7	$92^{+0,8}$x$92^{+0,8}$
NIQ2-144	144	144	48	7	138^{+1}x138^{+1}
NIQD2-144	144	144	47	8	138^{+1}x138^{+1}

Types and Connection diagram

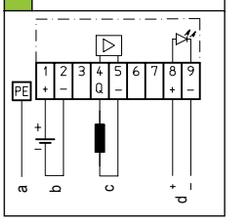
Types frequency

F	square wave 24V NPN (- switching)
FP	square wave 24V PNP (+ switching)
FZ	square wave 12V NPN (- switching)
FZP	square wave 12V PNP (+ switching)



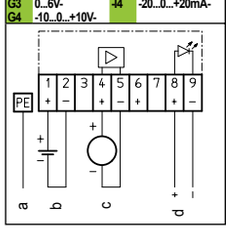
Types frequency

-FG	tachogenerator >6Vpp
-FS	coil >1Vpp
-FJ	coil >100mVpp



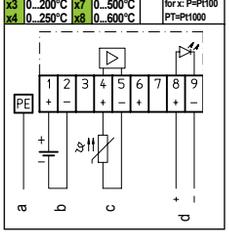
Types current/voltage

G1	0...10V-	-I1	0...20mA-
G2	2...10V-	-I2	4...20mA-
G3	0...6V-	-I4	-20...0...+20mA-
G4	-10...0...+10V-		



Types Pt100/Pt1000

x1	0...120°C	x5	0...300°C	x11	-30...120°C
x2	0...150°C	x6	0...400°C	x12	0...100°C
x3	0...200°C	x7	0...500°C		for x: P=Pt100
x4	0...250°C	x8	0...600°C		PT=Pt1000



Special variant

Individual variations	
Illuminated scale:	trough-lighted scale black or white, when lighted red, green, yellow
Non-illumin. scale	scale in black or white
Labeling	in white, black, red, yellow, green
Scale division	pilot scale division, coarse-fine division
Marking	divisions or range in color, scale arc in color
Luminous pointer	non-illumin. white, when lighted red, green or yellow
Bar pointer	non-illuminated white or black

NORIS Automation GmbH
Muggenhofer Strasse 95

D - 90429 Nürnberg
Germany
Tel.: +49 (9 11)32 01-0
Fax: +49 (9 11)32 01-150
info@noris-automation.com
www.noris-automation.com

Version A: 05/2007
Änderungen vorbehalten