GIVI MISURE s.r.l.
Via Assunta 57 - 20054 NOVA MILANESE (MI) ITALY
TEL.+39 0362.36.61.26 FAX +39 0362.36.68.76
www.givimisure.it sales@givimisure.it

Code	Project	Release	Title
ST03	***A29***	***L***	***TECHNICAL DATASHEET***

OPTICAL SCALE NCS V (1 Vpp)

GENERAL FEATURES

- Optical scale with glass measuring support (grating pitch 20 µm). Particularly suitable for CNC machines.
- Resolutions up to 0.1 µm.
- Swinging connecting cable output.
- Connector incorporated into the transducer.
- Reference indexes at coded distance, or at constant step, with predefined and selectable positions.
- Small overall dimensions, to allow installation in narrow spaces.

MECHANICAL AND ELECTRICAL FEATURES

MECHANICAL
- Rugged and heavy PROFILE: anodized aluminium, dimensions 40x24mm.
- Elastic COUPLING to compensate misalignments and self-correction of mechanical hysteresis. Backlash error <0.2 µm.
- Double level LIP SEALS (internal and external) along the sliding side of the reader head.
- READER HEAD, consisting of tie rod and reading block, with fully protected place for electronic boards.
- READING BLOCK sliding through ball bearings.
- Die-cast TIE ROD.
- GLASS SCALE placed in the scale housing.
- Elastomeric GASKETS which allow to reproduce the full protection in mechanical joints (in case of disassembling).
- Power supply shielded CABLE without any connection outside the transducer.
- Possibility to use a fixing SUPPORT which guarantees the maintenance of accuracy when temperature changes and optimizes its performances in case of vibrations.
- Full possibility to disassemble and reassemble it.
- Possibility of direct service.

ELECTRICAL
- Reading device with an infra-red light emitter and receiving photodiodes.
- A and B output signals with phase displacement of 90° (electrical).
- Real signal I_O of reference index approximately equal to 0.5 V.
- Incremental reference indexes (selectable or coded).
- Available options such as open-collector NPN or PNP on dedicated wires (on request).
- CABLE:
  - 8 wires shielded cable ∅ = 6.1 mm, PUR external sheath
  - Conductor section: supply 0.35 mm^2, signals 0.14 mm^2

Do not exceed the minimum cable bending radius of 40 mm.

The cable is suitable to continuous movements.

SIGNALS	CONDUCTOR COLOUR
VS0 = 0V	Blue
VS = 5V	Red
A	Green
$\overline{A}$	Orange
B	White
$\overline{B}$	Light-blue
I_O	Brown
$\overline{I_O}$	Yellow
SCH	Shield

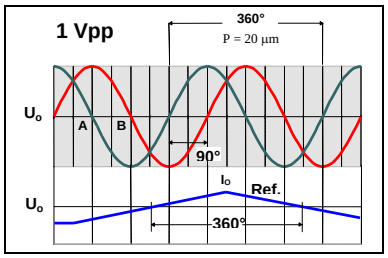
Code NCS	V20
Measuring support Grating pitch Thermal expansion coefficient	glass scale 20 µm P 8 x 10^{-6} ∘ C^{-1}
Reference index (I_0)	**P** = constant step (40 mm) **E** = selectable **C** = coded distance
Resolution	up to 0.1 µm*
Accuracy	± 3 µm**
Measuring length ML in mm	70, 120, 170, 220, 270, 320, 370,420, 470, 520, 570, 620, 720, 770, 820, 920, 1020, 1140, 1240, 1340, 1440, 1540, 1640, 1740, 1840, 2040, 2240, 2440, 2640, 2840, 3040, 3240_{MAX}
Max. traversing speed	120 m/min
Max. acceleration	30 m/s^2
Required moving force	≤ 4 N ≤ 2.5 N on request
Vibration resistance (EN 60068-2-6)	100 m/s^2 [55 ÷ 2000 Hz]
Shock resistance (EN 60068-2-27)	150 m/s^2 [11 ms]
Protection class (EN 60529)	IP 54 standard IP 64 pressurized
Operating temperature	0° ÷ 50° C
Storage temperature	-20° ÷ 70° C
Relative humidity	20% ÷ 80% (not condensed)
Sliding block	by ball bearings
Power supply	5 V ± 5%
Current consumption	120 mA_{MAX} (R = 120 Ω)
A and B output signals Period	1 Vpp 20 µm
Max. cable length	80 m***
Electrical connection	see rel. table
Connector	inside the transducer
Electrical protections	inversion of power supply polarity and short circuit on output ports
Weight	700 g + 1250 g/m

* Depending on CNC division factor.
** The declared accuracy rate of ± Xµm is referred to a measuring length of 1000 mm.
*** Ensuring a power supply of 5 V to the transducer, the max. cable length can be up to 150 m.

GIVI MISURE s.r.l.
Via Assunta 57 - 20054 NOVA MILANESE (MI) ITALY
TEL.+39 0362.36.61.26 FAX +39 0362.36.68.76
www.givimisure.it sales@givimisure.it

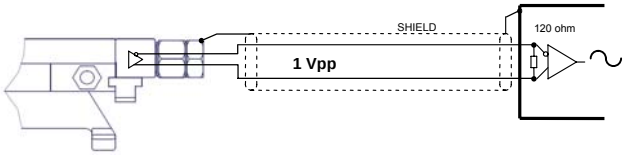
Code	Project	Release	Title
ST03	***A29***	***L***	***TECHNICAL DATASHEET***

OUTPUT SIGNALS



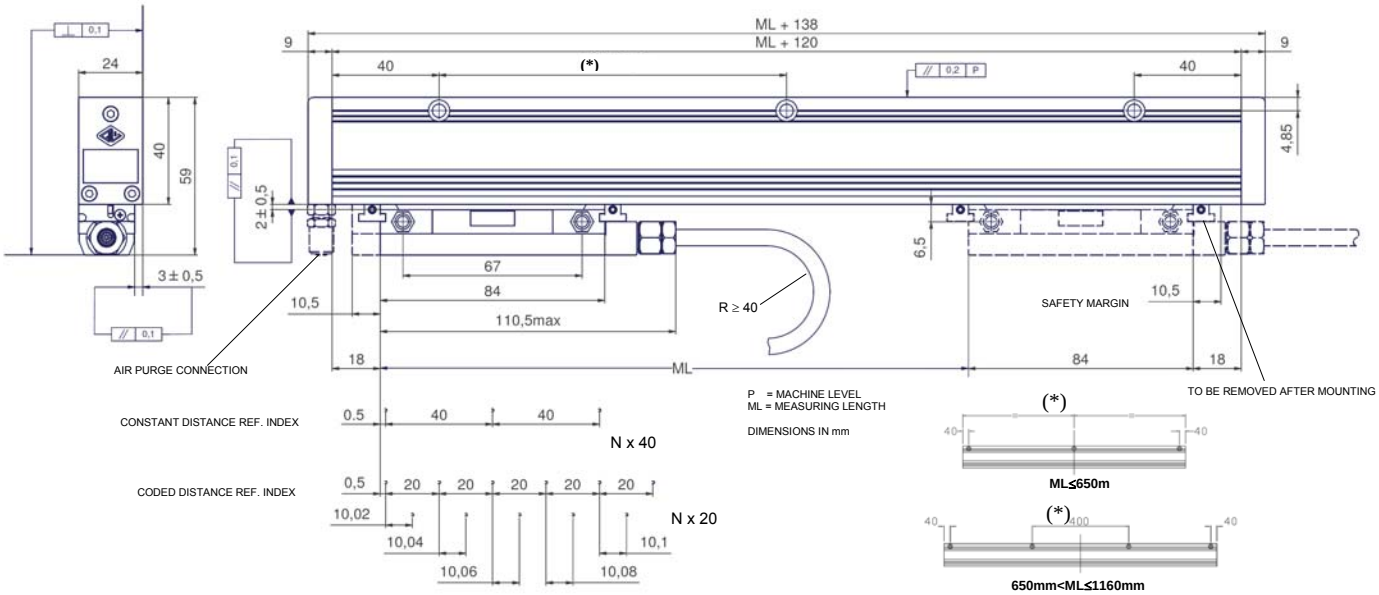
A and B amplitude	0.6 Vpp ÷ 1.2 Vpp typical 1 Vpp
I_O amplitude	0.25 V ÷ 0.8 V (useful zone)
A and B phase displacement	90° ± 10° electrical
Reference voltage U_o	2.5 V
Signal amplitude is referred to a differential measurement made with 120 Ω impedance, with power supply voltage to the transducer of 5 V ± 5%.	

CABLE



In case of cable extension, the electrical connection between the body of the connectors must be ensured.

DIMENSIONS



Make holes at 40 mm from the cut heads, when the first hole to constant step is at X>175 mm distance.

ORDERING CODE

MODEL	SCALE TYPE, GRATING PITCH, INDEX (OPTIONS)	MEAS. LENGTH, ADAPTOR	POWER SUPPLY, OUTPUT SIGNAL	CABLE LENGTH, CABLE TYPE	CONNECTOR WIRING	SPECIAL, PRESSURIZED
NCS	**V 20 C**	**03040**	**05VS**	**M03 / S**	**C15**	**PR**

V = 1Vpp
20 = 20µm (grating pitch)
C = indexes at coded distance
P = indexes at constant step
E = selectable indexes at constant step

Length in mm
03240 = ML_{MAX}
S3240 = ML_{MAX} with adaptor

05V = 5V
S = sinusoidal

Mnn = length in m
M03 = 3m
M04 = 4m (standard)
120 = 120m
S = cable for continuous mov.

Cnn = progressive

No code = standard
SPnn = special nn
PR = pressurized

Example ☞ **OPTICAL SCALE NCS V20C 03040 05VS M03/S C15 PR**