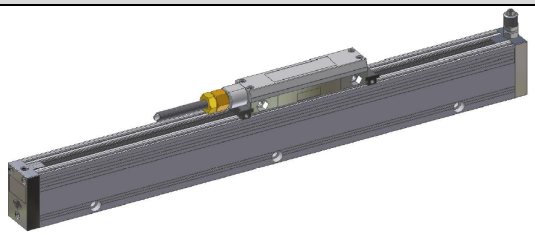
GIVI MISURE s.r.l.
Via Assunta 57 - 20054 NOVA MILANESE (MI) ITALY
TEL.+39 0362.36.61.26 (6 LINEE r.a.) - TELEFAX +39 0362.36.68.76
http://www.givimisure.it - E-mail: sales@givimisure.it

Codice	Progetto	Revisione	Titolo
ST03	***A29***	***B***	***TECHNICAL DATASHEET***

DESCRIPTION: OPTICAL SCALES NCS V (1Vpp)

GENERAL FEATURES

- Optical scale with glass reticle (grating pitch 20µm), particularly suitable for CNC machines.
- Reference indexes at coded distance, or at costant step, with predefined and selectable positions.
- Connector incorporated into the reader head.



MECHANICAL AND ELECTRICAL FEATURES

MECHANICAL

- Rugged and heavy PROFILE: anodized aluminium, dimensions 40x24mm.
- Elastic COUPLING to compensate misalignements and self-correction of mechanical histeresys.
- Double levels 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 made of special material, sliding through ball bearings.
- Die-cast TIE ROD.
- GLASS RETICLE placed in the aluminium profile.
- Elastomeric GASKETS which allow to reproduce the full protection in mechanical joints (in case of disassembling).
- Power supply CABLE, shielded or armoured/shielded, without any connection outside the transducer.
- Possibility to use a fixing support which guarantees the manteinance of the accuracy when temperature changes and optimizes its performances in case of vibrations.
- Full possibility to dismount and reassemble it.

ELECTRICAL

- Reading device with an infra-red brighting 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 0.5V.
- Incremental reference index every 50mm, selectable or coded.
- Available options as open-collector NPN or PNP on dedicated wires (on request):
  - External sensor for selecting Index (EZI).
- CABLE:
  - NCS standard
    8 wires shielded cable ∅ = 5.3mm, PVC external sheath
  - NCS with options
    10 wires shielded cable ∅ = 5.3mm, PVC external sheath
  - Conductors's section: (for all cables):
    supply 0.35mm^2, signals 0.14mm^2

Do not exceed the minimum cable's bending radius of 50mm.
Cable suitable to continuous movements can be requested, with minimum cable's bending radius of 33mm.

SIGNALS	CONDUCTOR COLOUR
VS0 = 0V	Blue
EZI	Grey
A negative	Orange
I_O	Brown
B negative	Light-blue
B	White
I_O negative	Yellow
A	Green
NC	Pink
VS = 5V	Red
SCH	Shield

Cod. NCS	V20
Scale	Glass
Grating pitch	20µm P
Thermal expansion coefficient	8 x 10^{-6} ∘ C^{-1}
Reference index (I_O)	**P** = constant step (50mm) ML=70mm: 1 in the middle; ML=120÷1020 mm: 1 at 35mm from left and right, the others every 50mm; ML≥1140mm: 1 at 45mm from left and right, the others every 50mm. **C** = coded distance **E** = selectable
Resolution	Up a 0.1µm*
Accuracy	± 3µm/m
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_{MAX}
Max. Traversing speed	120m/min
Max. Acceleration	30m/s^2
Required moving force	≤ 4N (0.4Kgf) ≤ 2.5N (0.25Kgf) on request
Vibration resistance (EN 60068-2-6)	100m/ s^2 [10÷2000Hz]
Shock resistance (EN 60068-2-27)	150m/s^2 [11ms]
Class of protection (EN 60529)	IP 54 Standard IP 64 Pressurized
Operating temperature	0° ÷ 50° C
Storage temperature	-20° ÷ 70° C
Relative humidity	20% ÷ 80%
Sliding Block	By ball bearing
Power supply	5V ± 5%
Current	120mA_{MAX} (con Zo=120Ω)
Output signals A and B **Period**	1Vpp 20µm
Maximum cable length	80m**
Electrical connection	See the rel. table
Connector	Inside the transducer
Options	External sensor (**EZI**)
Electrical Protections	Inversion of Power Supply Polarity Short Circuit on output port
Weight	700g + 1250g/m

* Depending on CNC division factor.
**If a power supply of 5V is guaranteed on the reader head, maximum lenght could reach 150m.

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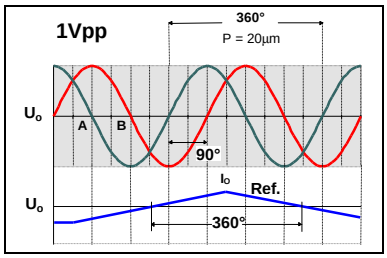
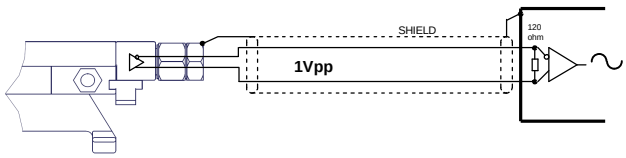
OUTPUT SIGNALS

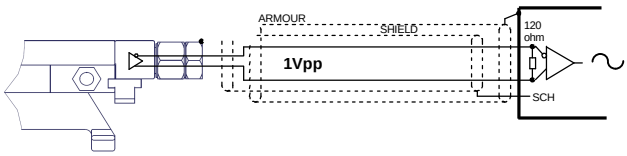


A and B Amplitude	0.6Vpp ÷ 1.2Vpp typ. 1Vpp
I_O Amplitude	0.25V ÷ 0.8V (usable part)
A and B Phase Displacement	90° ±10° el.
Reference voltage U_o	2.5V
Signals amplitude is referred to a differential measurement made with 120Ω impedence, with power supply voltage to the transducer of 5V ± 5%.	

STANDARD / SPECIAL CABLE (CONT. MOV.)

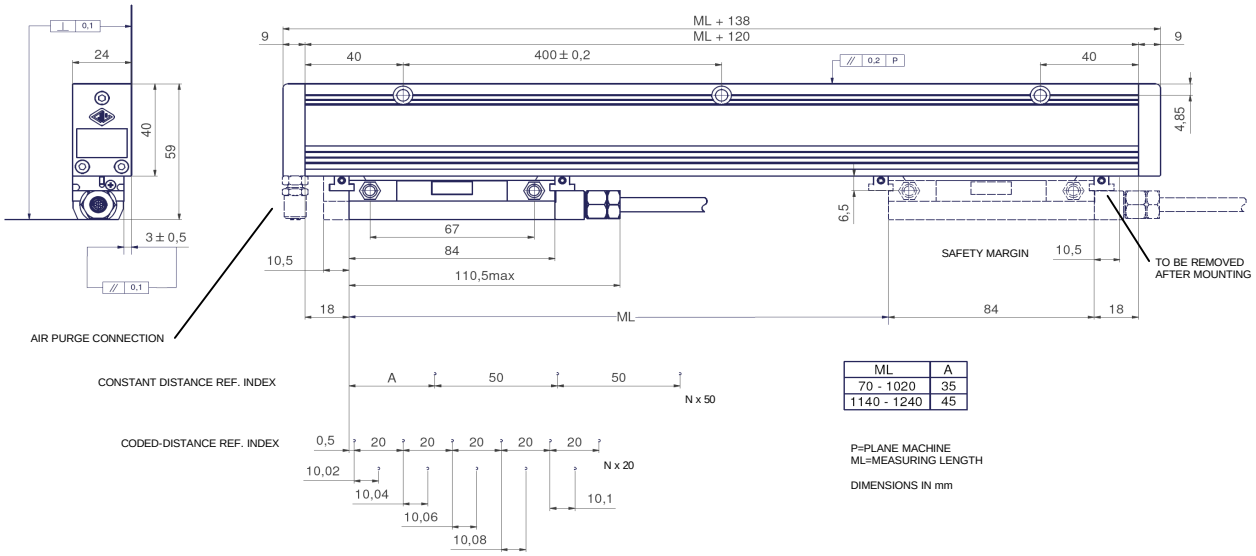


ARMOURED CABLE



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

DIMENSIONS



ML	A
70 - 1020	35
1140 - 1240	45

ORDERING CODE

MODEL	SCALE TYPE, GRATING PITCH, INDEX (OPTIONS)	STROKE/ ADAPTOR	POWER SUPPLY/ OUTPUT SIGNAL	LENGTH/ CABLE TYPE	CONNECTOR/ WIRING	SPECIAL/ PRESSURIZED
NCS	**V20C**	**03040**	**05VS**	**M03 / N**	**C15**	**SP10**

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

OPTIONS

G = P + EZI PNP
H = P + EZI NPN
R = C + EZI PNP
S = C + EZI NPN

Length in mm
03040 = ML_{MAX}
S3040 = ML_{MAX} with adaptor

05V = 5V
S = sinusoidal

Mnn = length in m
M03 = 3m
M04 = 4m (standard)
M50 = 50m
120 = 120m

N = Shielded cable not armoured
S = Special Cable for continuous mov.
A = Armoured cable (on request

Cnn = progressive

No cod. = standard
SPnn = special nn
PR = pressurized