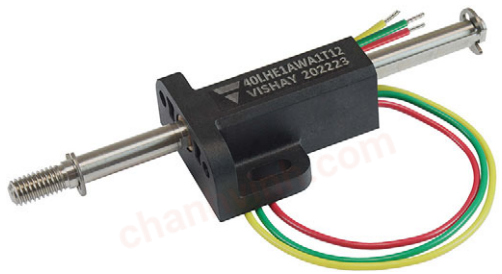
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Linear Position Sensor in Hall Effect Technology (0 mm to 40 mm Max.)



FEATURES

- Accurate linearity down to: ± 1 %
- Absolute position
- Electrical strokes from 0 mm to 40 mm
- Long life: greater than 10M cycles
- Non contacting technology: Hall effect
- Model dedicated to all applications in harsh environments
- Versatile “2 faces” mounting
- Spring return (optional)
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT

LINKS TO ADDITIONAL RESOURCES

3D Models

QUICK REFERENCE DATA	
Sensor type	LINEAR, non contacting Hall effect
Output type	Wires
Market appliance	Industrial
Dimensions	35 mm x 14.5 mm x 28 mm

ELECTRICAL SPECIFICATIONS	
PARAMETER	**STANDARD**
Electrical stroke	Up to 40 mm
Independent linearity	Analog output: ± 1 % (at $V_{max.}$ = 0.5 m/s) / ± 2 % (at $V_{max.}$ = 1 m/s) PWM output: ± 1 % (at $V_{max.}$ = 0.4 m/s) / ± 2 % (at $V_{max.}$ = 0.8 m/s)
Resolution (40 mm stroke)	12 µm
Supply voltage	5 V_{DC} ± 10 %
Supply current	< 16 mA typical
Output signal	Analog ratiometric (10 % to 90 % of V_{supply}) or PWM (1 kHz - 10 % to 90 % of duty cycle) Other on request
Over voltage protection (input)	+20 V_{DC}
Reverse voltage protection (input)	-10 V_{DC}
Over voltage protection (output)	+10 V_{DC} (+14 V_{DC} peak - 200 s at 25 °C)
Recommended load resistance	Min. 1 kΩ for analog output and PWM output
Hysteresis	Static: 0.1 % of V_{supply}
Start up cycle	< 15 ms

MECHANICAL SPECIFICATIONS	
PARAMETER	
Mechanical travel	42 mm max.
Bearing type	Sleeve bearing
Mounting type	“2 faces” mounting (drilled flange - 2 x 2 holes for 2 M3 screws) + M5 at the end of shaft (threaded option only)
Weight	26 g ± 1 g (“no spring” configuration)
Actuation force	0.2 N max. (spring option: from 1.3 N to 7 N along stroke - typical)

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ORDERING INFORMATION/DESCRIPTION

40 LHE	1	A	W	A	1T54	xxxx	e1
MODEL	FEATURES	LINEARITY	OUTPUT TYPE	OUTPUT SIGNAL	SHAFT TYPE	SPECIAL REQUEST	LEAD FINISH
	1: spring return **2**: without spring	**X**: ± 2 % **A**: ± 1 %	**W**: wires **Z**: custom	**A**: analog increasing (1) **B**: analog decreasing (1) **C**: PWM increasing (1) **D**: PWM decreasing (1)	**1**: Ø 5 mm **9**: special **P**: plain **T**: threaded M5 x 9.8 mm **Z**: Other type Shaft length from mounting face 54 mm (fully extended) / 87 mm (spring option)		

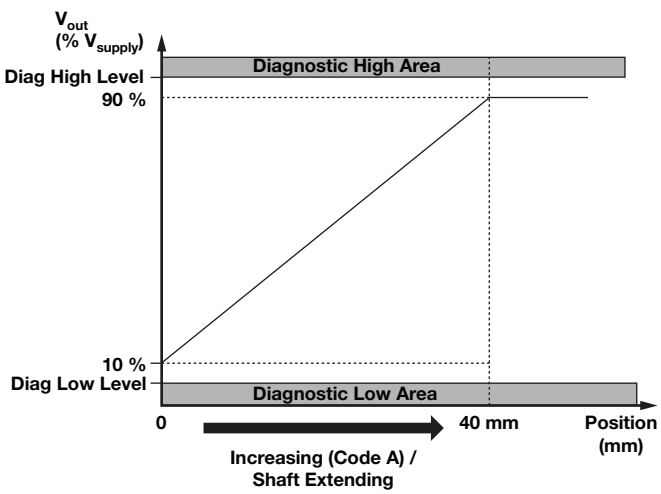
Note

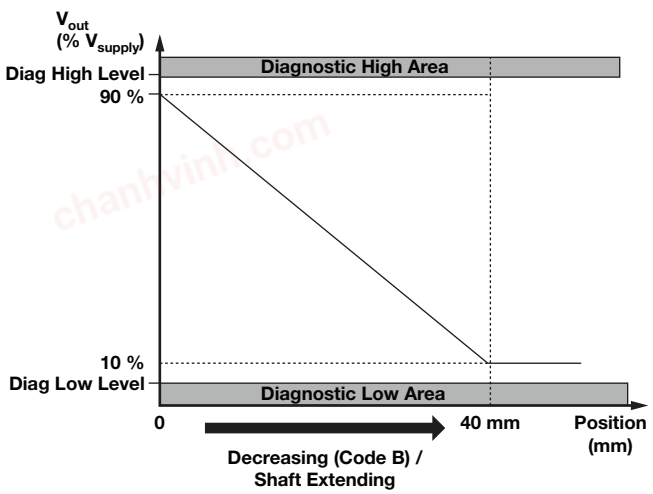
(1) Shaft extending

SAP PART NUMBERING GUIDELINES

40LHE	2	X	Z	C	1T54	xxxx
MODEL	FEATURES	LINEARITY	OUTPUT TYPE	OUTPUT SIGNAL	SHAFT TYPE	SPECIAL REQUEST
	Without spring return system	**± 2 %**	**"Custom"**	PWM increasing	M5 - 54 mm length	

V_{OUT} ANALOG (other on request)

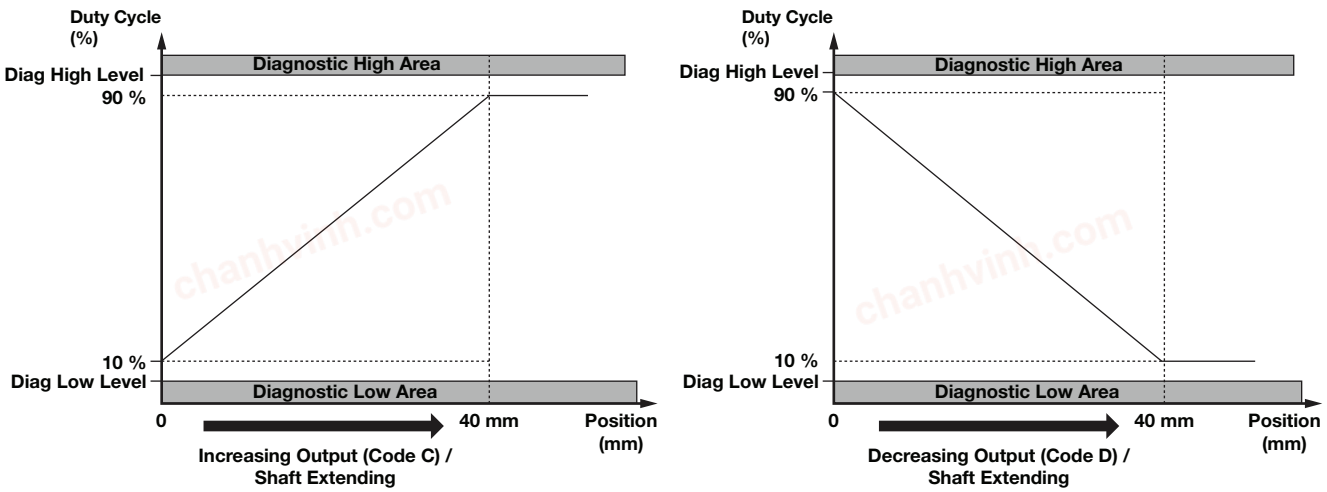


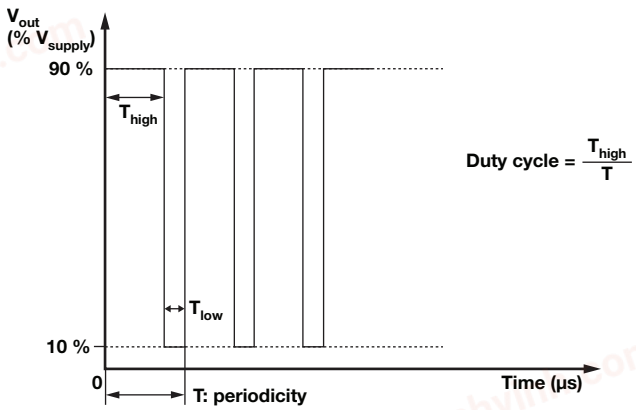


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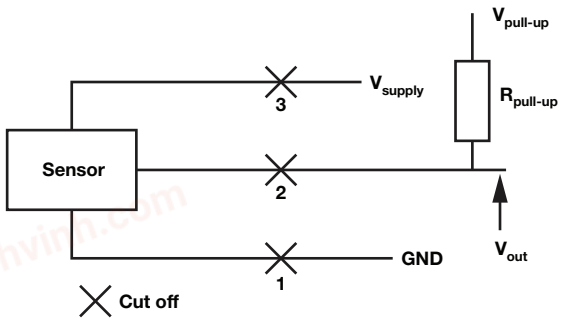
PWM OUTPUT (duty cycle / V_{OUT} - active high)





DIAGNOSTIC MODES

FAILURE	V_{out} ANALOG $R_{pull-up}$	V_{out} ANALOG $R_{pull-down}$	V_{out} PWM $R_{pull-up}$ = 1 kΩ $V_{pull-up} = V_{supply}$ = 5 V
1: Broken GND	Diagnostic high area	Diagnostic low area	> 97 % V_{supply} without modulation
2: Broken V_{out}	Diagnostic high area	Diagnostic low area	> 97 % V_{supply} without modulation
3: Broken V_{supply}	Diagnostic high area	Diagnostic low area	> 97 % V_{supply} without modulation
Over voltage V_{supply} > 7 V	Diagnostic high area	Diagnostic low area	> 97 % V_{supply} without modulation
Under voltage V_{supply} < 2.7 V	Diagnostic high area	Diagnostic low area	> 97 % V_{supply} without modulation



$V_{pull-up}$ can be independent to V_{supply}

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ENVIRONMENTAL SPECIFICATIONS	
Life	> 10M of cycles
Sealing	Electronics: IP67 / shaft bearing: IP47 Others on request
Vibrations	20 *g* from 10 Hz to 2000 Hz
Shocks	3 shocks/axis; 50 *g* half a sine 11 ms
Operating temperature range	-40 °C; +85 °C
Relative humidity range	40 % to 60 %
Electrostatic discharges	Contact discharges: ± 4 kV Air discharges: ± 8 kV EN 61000-4-2
Immunity to power frequency magnetic field	200 A/m 50 Hz / 60 Hz EN 61000-4-8
Immunity to radiated electromagnetic disturbances	200 V/m 150 kHz/1 GHz IEC 62132-2 part 2 (level A)
Radiated electromagnetic emissions	At 3 meters 30 MHz to 230 MHz < 50 dBµV/m 230 MHz to 1 GHz < 57 dBµV/m At 10 meters 30 MHz to 230 MHz < 40 dBµV/m 230 MHz to 1 GHz < 47 dBµV/m EN 61000-6-4
Immunity to radiated RF field	10 V/m 80 MHz to 1 GHz EN6100-4-3
Immunity to radiated electromagnetic disturbances	200 V/m 150 kHz to 1 GHz IEC 62132-2 part 2 (level A)
Dielectric strength	500 V_{AC} RMS, 50 Hz, 1 min IEC 60393-1
Insulation resistance	> 50 MΩ IEC 60393-1

MATERIALS	
Housing	Thermoplastic housing
Shaft	Stainless steel
Output wires	19 stranded silver-plated copper core + PVC insulating sleeve 3 lead wires (AWG 22) Length: 300 mm
Spring (option)	Stainless steel

Note

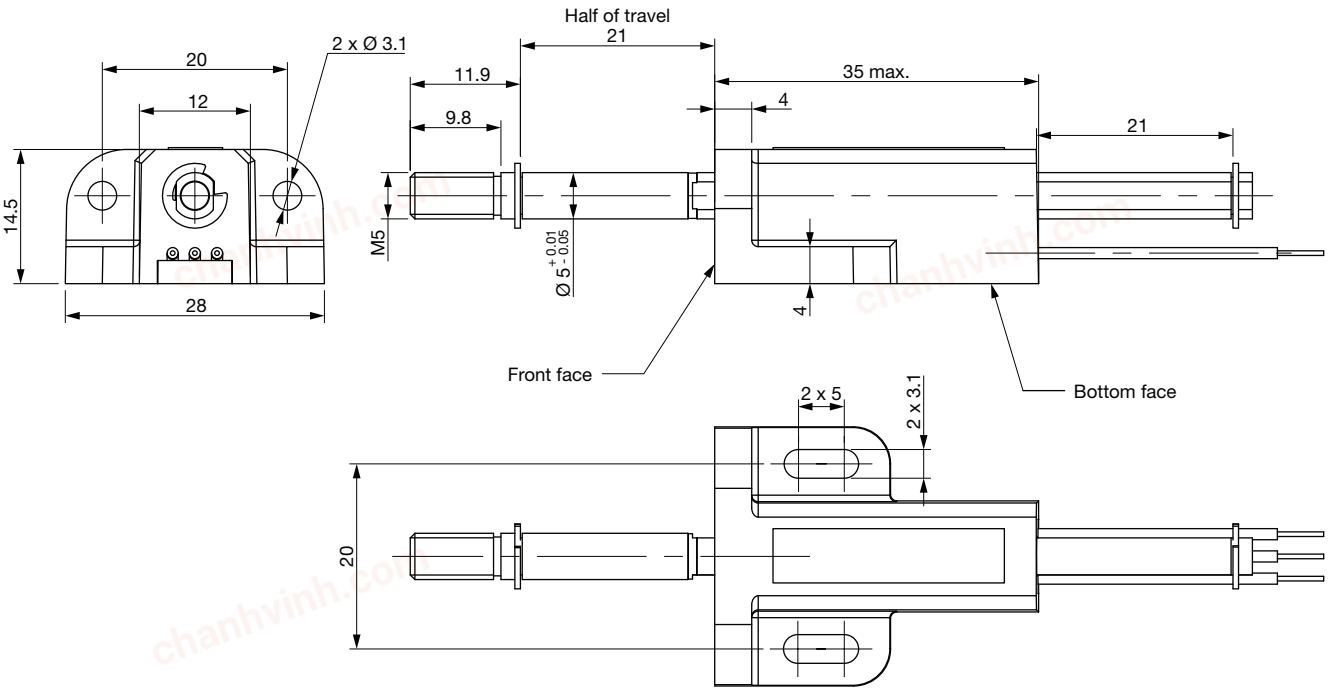
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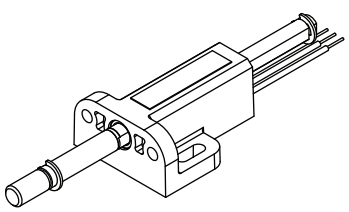
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DIMENSIONS in millimeters

WITHOUT SPRING RETURN



Gen. tol.:
± 0.5 mm



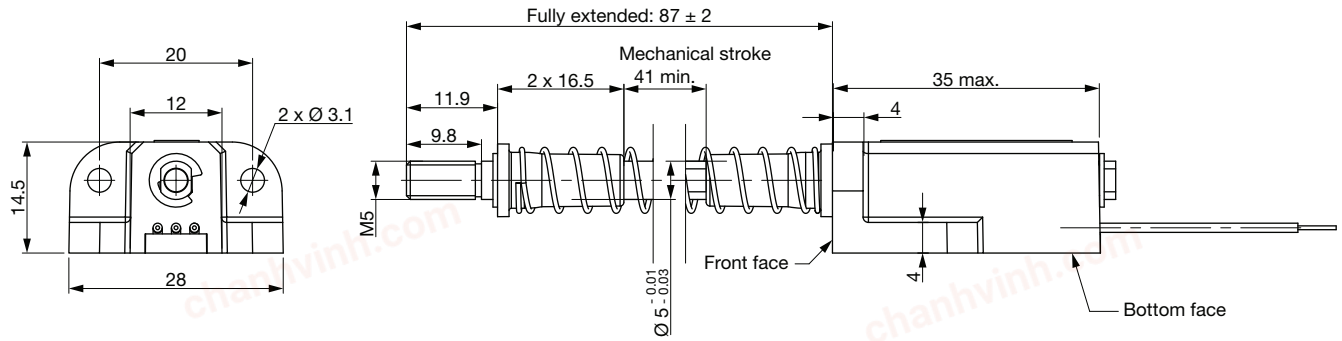
WIRE	
YELLOW	GND (-)
RED	SIGNAL
GREEN	V_{cc} (+)

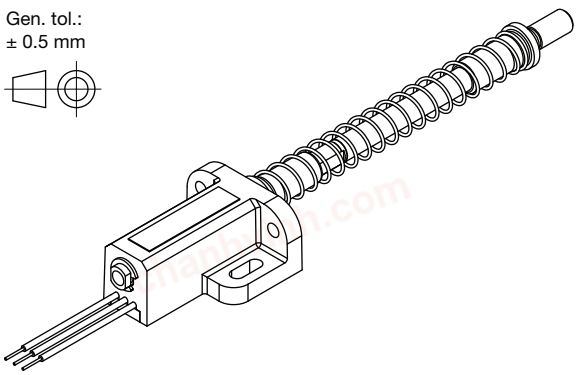
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WITH SPRING RETURN





WIRE	
YELLOW	GND (-)
RED	SIGNAL
GREEN	V_{cc} (+)

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