DIGITAL LENGTH GAUGES

Series ST 12 / ST 30

Key-Features:

- *Measurement range up to 30 mm*
- *Linearity 1 µm*
- *Inkremental output: TTL or 1 Vpp*
- *Protection class up to IP67*
- *Plunger actuation by measured object or pneumatic*
- *Working temperature: +10 °C to +40 °C*

Content:

22.08.18

WayCon Positionsmesstechnik

MECHANICAL DATA

		ST 1278	ST 1288	ST 3078	ST 3088	ST 1277	ST 1287	ST 3077	ST 3087
Measuring range	[mm]	12		30		12		30	
Plunger actuation		By measured object				Pneumatic			
Position of plunger at rest		Extended				Retracted			
Measuring standard		DIADUR grating on glass; grating period 20 µm							
System accuracy	[µm]	±1							
Position error per signal period	[µm]	≤ ±0.2							
Repeatability	[µm]	0.25		0.7		0.25		0.7	
Short-range accuracy typically	[µm]	0.3							
Reference mark	[mm]	approx. 5 below upper stop							
Working pressure	[bar]	-				0.7 to 2.5		0.8 to 2.5	
Radial force	[N]	≤ 0.8 (mechanically permissible)							
Fastening		Clamping shank Ø 8h6							
Operating orientation		Any							
Vibration 55 Hz to 2000 Hz	[m/s²]	≤ 100 (EN 60 068-2-6)							
Shock 11 ms	[m/s²]	≤ 1000 (EN 60 068-2-27)							
Working temperature	[°C]	+10 to +40; reference temperature +20							
Protection class EN 60 529		IP64 or IP67		IP64					
Mass without cable	[g]	40		50		40		50	

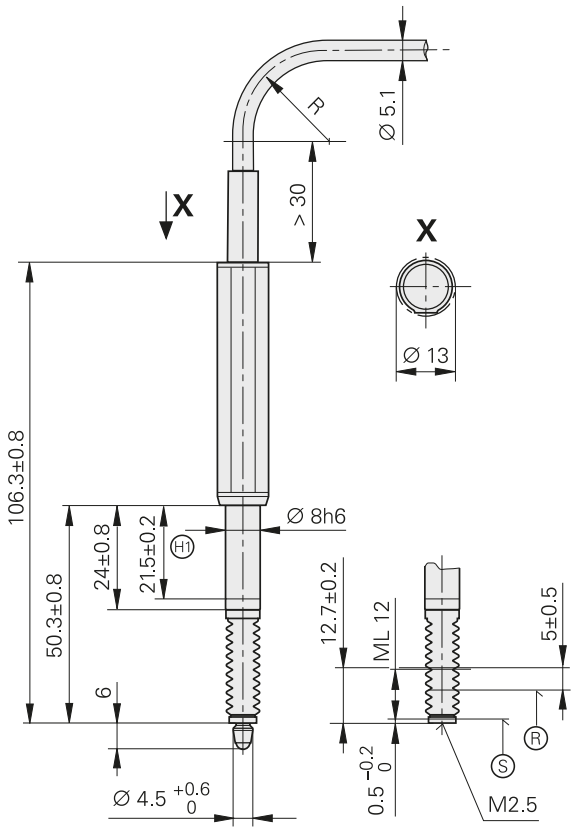
ELECTRICAL DATA

		ST 127x ST 307x		ST 128x ST 308x
Interface		TTL		1 Vpp
Integrated interpolation		10 fach		-
Signal period	[µm]	2		20
Edge separation a at scanning frequency/traverse speed[2] 100 kHz ≤ 72 m/min[1] 25 kHz ≤ 30 m/min	[µs]	≥ 0.48 ≥ 1.98	≥ 0.23 ≥ 0.98	-
Electrical connection		Cable 1.5 m with D-sub connector (male), 15-pin (integrated interface electronics)		Cable 1.5 m with D-sub connector (male), 15-pin
Cable outlet		axial or radial		
Voltage supply	[VDC]	5 ±0.5		
Current consumption	[mA]	< 195 (without load)		< 55

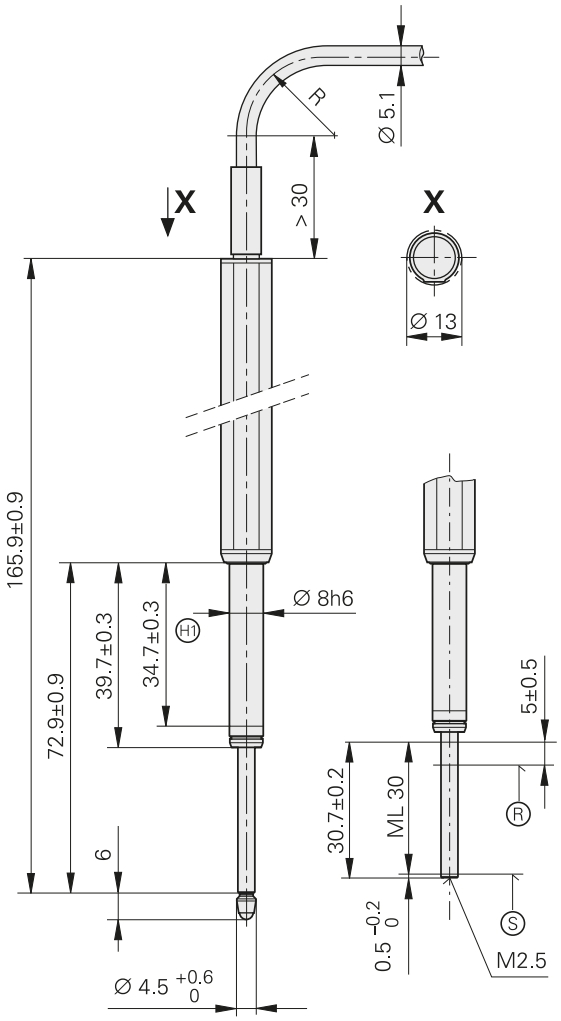
[1] Mechanically limited
[2] At a corresponding cutoff or scanning frequency

TECHNICAL DRAWING

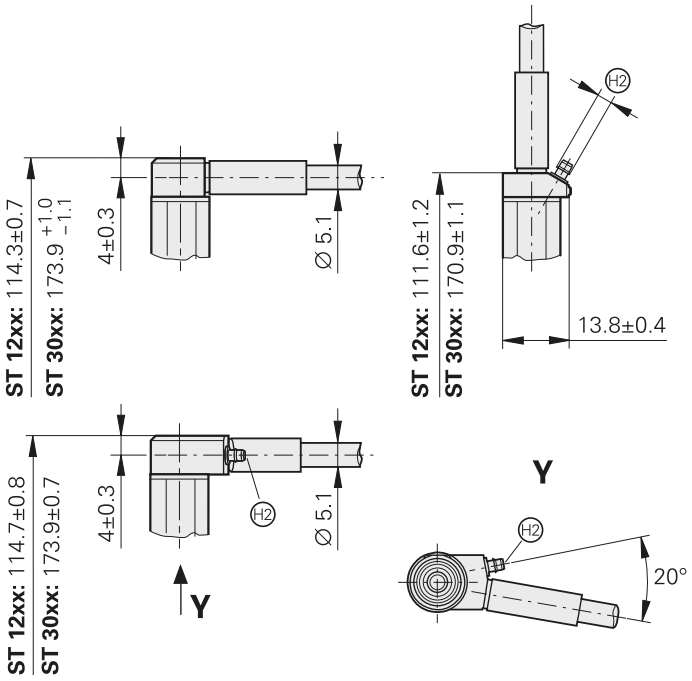
ST 12xx



ST 30xx



ST 12x7 / ST 30x7 (pneumatic versions)



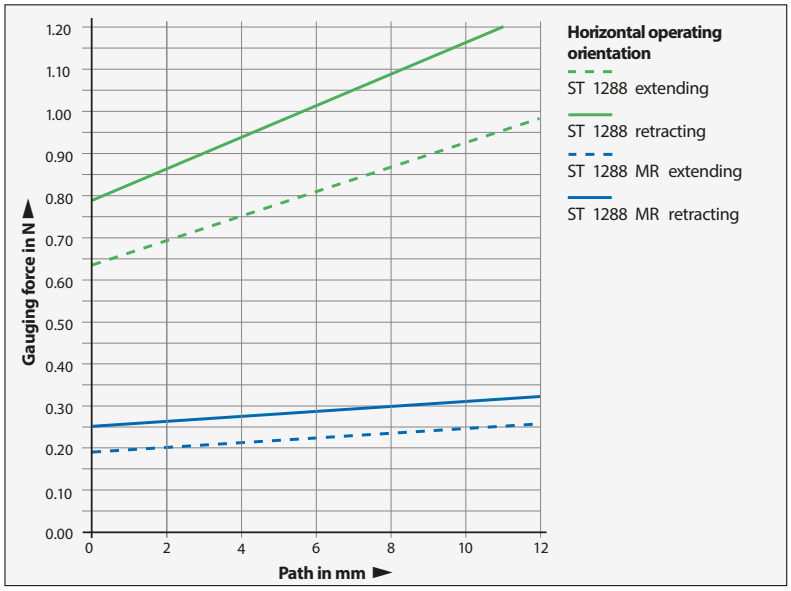
mm

Tolerancing ISO 8015
ISO 2768 - m H
< 6 mm: ±0.2 mm

Ⓡ = Reference mark position
Ⓢ = Beginning of measuring length
Ⓗ1 = Clamping area
Ⓗ2 = Air connection for 2 mm tube

GAUGING FORCE / PATH DIAGRAM

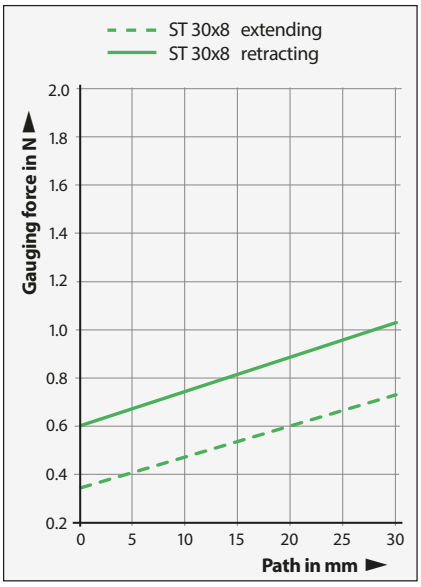
ST 1288



Version	Gauging force	Operating orientation
Default	0.65 N *	Any
MR (halve force)	0.4 N *	Any
MG (springless, constant force)	0.2 N **	Vertically downward

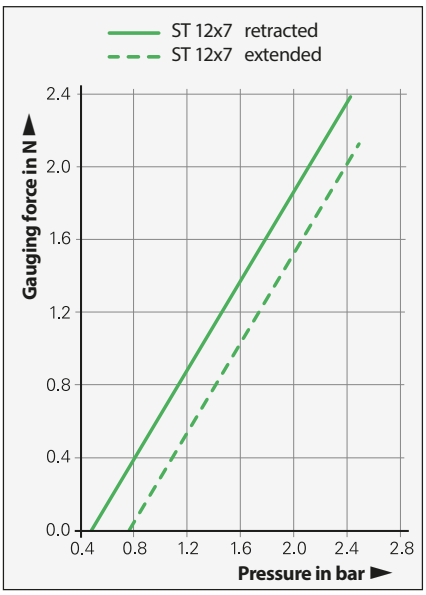
* With nearly completed plunger extension
** Over the entire measuring range

ST 30x8

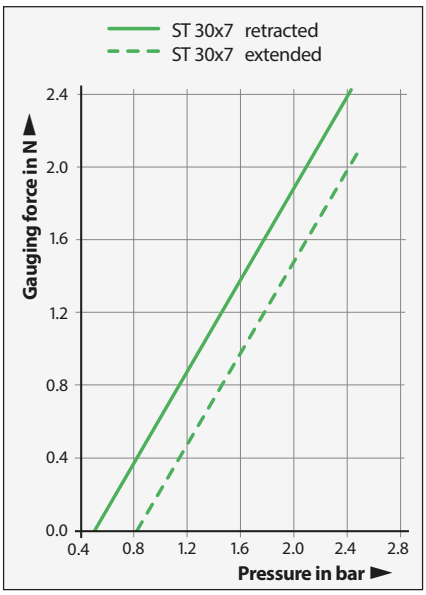


GAUGING FORCE / PRESSURE DIAGRAM

Length gauges with 12 mm range



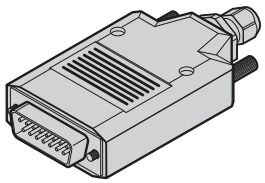
Length gauges with 30 mm range

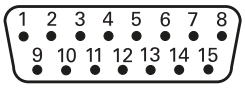


The diagrams apply for the horizontal operating orientation, except for special variants. The following compensation values are to be taken into account for other operating orientations:

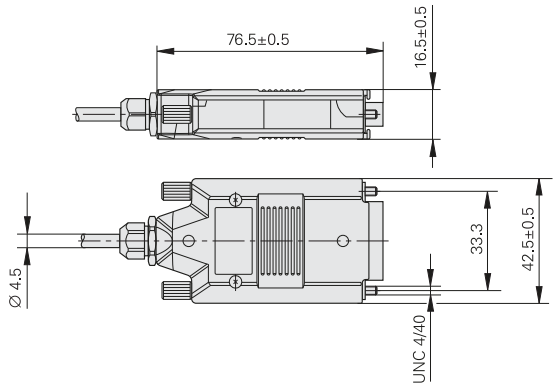
Model	Operating orientation vertical Upward	Operating orientation vertical Downward
ST 12x7	-0.07 N	+0.07 N
ST 12x8	-0.08 N	+0.08 N
ST 30xx	-0.11 N	+0.11 N

ELECTRICAL CONNECTION INCREMENTAL TTL





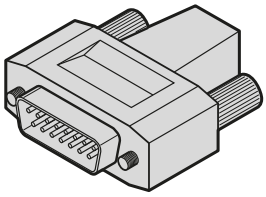
interface electronics integrated

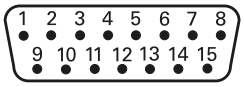


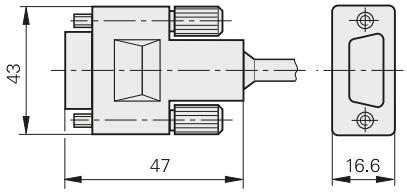
	Voltage supply				Incremental signals						Other signals		
Sub-D-Connector (male), 15-pin	4	12	2	10	1	9	3	11	14	7	13	5/6/8	15
Signal	U_P	Sensor U_P	0 V	Sensor 0 V	U_{a1}	/U_{a1}	U_{a2}	/U_{a2}	U_{a0}	/U_{a0}	/U_{aS}	n.c.	n.c.

Shield on housing; Up = Power supply
Sensor: The sensor line is connected in the encoder with the corresponding power line.
Vacant pins or wires must not be used.

ELECTRICAL CONNECTION INCREMENTAL 1 V_{PP}







	Voltage supply				Incremental signals						Other signals		
Sub-D-Connector (male), 15-pin	4	12	2	10	1	9	3	11	14	7	5/6/8/15	13	/
Signal	U_P	Sensor U_P	0 V	Sensor 0 V	A+	A-	B+	B-	R+	R-	n.c.	n.c.	n.c.

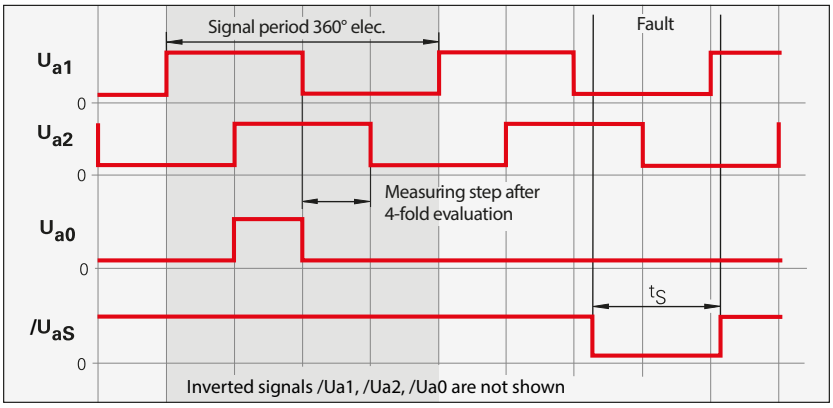
Shield on housing; U_P = Power supply
Sensor: The sensor line is connected in the encoder with the corresponding power line.
Vacant pins or wires must not be used.

INCREMENTAL SIGNAL TTL

Length gauges with TTL interface incorporate electronics that digitize sinusoidal scanning signals with or without interpolation.

The incremental signals are transmitted as the square-wave pulse trains U_{a1} and U_{a2}, phase-shifted by 90° elec. The reference mark signal consists of one or more reference pulses U_{a0}, which are gated with the incremental signals. In addition, the integrated electronics produce their inverted signals $/U_{a1}$, $/U_{a2}$ and $/U_{a0}$ for noise-proof transmission. The illustrated sequence of output signals - with U_{a2} lagging U_{a1} - applies to the direction of motion shown in the dimension drawing.

The fault detection signal $/U_{aS}$ indicates fault conditions such as an interruption in the supply lines, failure of the light source, etc.



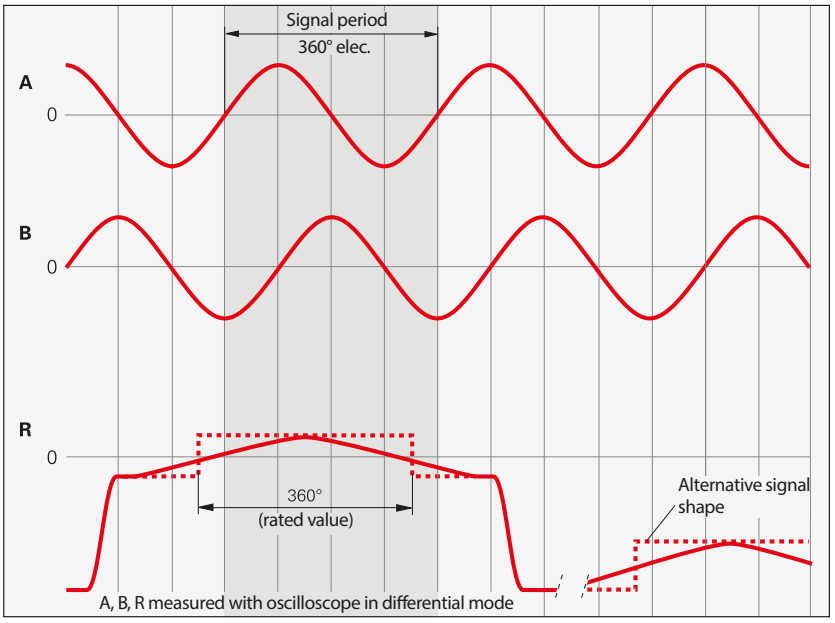
The distance between two successive edges of the incremental signals U_{a1} and U_{a2} through 1-fold, 2-fold or 4-fold evaluation is one measuring step.

INCREMENTAL SIGNAL 1 VPP

Length gauges with 1 Vpp interface provide voltage signals that can be highly interpolated.

The sinusoidal incremental signals A and B are phase-shifted by 90° elec. and have amplitudes of typically 1 Vpp. The illustrated sequence of output signals - with B lagging A - applies for the direction of motion shown in the dimension drawing.

The reference mark signal R has an unambiguous assignment to the incremental signals. The output signal might be somewhat lower next to the reference mark.



MODELS

ST 1277 / 383973-02	100 kHz, axial cable, pneumatic, TTL, IP64
ST 1277 / 511395-01	100 kHz, radial cable, pneumatic, TTL, IP64
ST 1278 / 383963-01	25 kHz, radial cable, spring, TTL, IP64
ST 1278 / 383965-01	25 kHz, axial cable, spring, TTL, IP64
ST 1288 / 383987-01	axial cable, spring, 1 Vpp

ST 3077 / 375137-02	100 kHz, axial cable, pneumatic, TTL
ST 3077 / 511398-01	100 kHz, radial cable, pneumatic, TTL
ST 3078 / 375133-02	100 kHz, axial cable, spring, TTL
ST 3078 / 375134-02	100 kHz, radial cable, spring, TTL
ST 3088 / 384007-01	axial cable, spring, 1 Vpp

further models on request

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