

Load Cells

Ring torsion load cells
SIWAREX WL280 RN-S SA

Load cell

Overview



The ring torsion load cell is particularly suitable for use in hopper, belt, platform and roller conveyor scales.

Design

The measurement element is a ring torsion spring made of stainless steel. Two strain gauge spirals (DMS) are applied to the upper and lower faces of the ring respectively. The spring element is deformed by the load acting centrally in the measurement direction. This compresses the strain gauge of the upper face of the ring and extends the strain gauge on the lower face of the ring. This causes a change in the electrical resistance of the force-locked strain gauge, which is detected by means of a bridge circuit.

All load cells with a rated load of up to 13 t (12.79 tn. l.) are equipped with integrated overload protection.

Technical specifications

SIWAREX WL280 RN-S SA load cells

Possible applications	Hopper, belt, platform and roller conveyor scales		
Type of construction	Ring torsion load cell		
Rated load/maximum load E_{max}	<ul style="list-style-type: none"> • 60 kg (132.28 lb) • 130 kg (286.60 lb) • 280 kg (617.29 lb) 	<ul style="list-style-type: none"> • 0.5 t (0.49 tn. l.) • 1 t (0.98 tn. l.) • 2 t (1.97 tn. l.) • 3.5 t (3.45 tn. l.) • 5 t (4.92 tn. l.) • 10 t (9.84 tn. l.) 	<ul style="list-style-type: none"> • 13 t (12.80 tn. l.) • 28 t (27.56 tn. l.) • 60 t (59.05 tn. l.)
Accuracy class according to OIML R-60	C3		
Max. scale interval n_{LC}	3 000		
Min. scale interval V_{min}	$E_{max}/16\ 000$	$E_{max}/17\ 500$	
Minimum application range $R_{min(LC)}$	19 %	17 %	
Combined error F_{comb}	$\leq \pm 0.023\% C_n$		
Repeatability F_v	$\leq \pm 0.01\% C_n$		
Return of zero signal	$\leq \pm 0.0167\% C_n^{1)}$		
Creep error F_{cr}	$\leq \pm 0.0245\% C_n^{1)}$		
• 30 min	$\leq \pm 0.0053\% C_n^{1)}$		
• 20 ... 30 min			
Temperature coefficient	$\leq \pm 0.004\% C_n/5K$		
• Zero signal T_{Ko}	$\leq \pm 0.004\% C_n/5K$		
• Characteristic value T_{Kc}			
Min. dead load E_{min}	$\geq \pm 0\% E_{max}$		
Max. working load L_u	200 % E_{max}	150 % E_{max}	
Breaking load L_d	500 % E_{max}	300 % E_{max}	300 % E_{max}
Safe side load L_{Iq}	75 % E_{max}	100 % E_{max}	75 % E_{max}
Deflection h_n at E_{max}	0.07 mm	0.1 ± 0.02 mm	0.11 ... 0.2 mm
Overload protection	Integrated	Integrated	Integrated at 13 t
Supply voltage U_{sr} (reference value)	15 V	10 V	15 V
Supply voltage (range)	5 ... 30 V+		
Rated characteristic value C_n	1 mV/V	2 mV/V	2 mV/V
Tolerance D_c of characteristic value	Up to 500 kg (1 102.31 lb): 0.01 mV/V From 500 kg (1 102.31 lb): 0.1 mV/V		
Tolerance D_o of zero signal	$\leq \pm 1.0\% C_n$		
Input resistance R_e	60 kg (132.28 lb): 1 260 Ω ± 100 Ω 130 kg (286.60 lb): 1 260 Ω ± 100 Ω 280 kg (617.29 lb): 1260 Ω ± 250 Ω	1 100 Ω ± 100 Ω	13 t: 1 200 Ω ± 100 Ω 28 t: 1 075 Ω ± 100 Ω 60 t: 1 350 Ω ± 200 Ω
Output resistance R_a	1 020 Ω ± 0.5 Ω	1 025 Ω ± 25 Ω	13 t: 1 000 Ω ± 0.5 Ω 28 t: 930 Ω ± 0.5 Ω 60 t: 1 175 Ω ± 0.5 Ω
Insulation resistance R_{is}	$\geq 5\ 000\ M\Omega$		
Rated temperature range B_{tn}	-10 ... +40 °C (14 ... 104 °F)		
Operating temperature range B_{tu}	-35 ... +70 °C (-31 ... 158 °F)		
Storage temperature range B_{ts}	-50 ... +90 °C (-58 ... 194 °F)		
Sensor material (DIN)	Stainless steel EN 1.4542		
Degree of protection according to EN 60529; IEC 60529	IP66/68		
Recommended tightening torque of the fixing screws	8 Nm	14 Nm (0.5 ... 5 t) 10 Nm (10 t)	-
Current calibration ²⁾	Standard		
Ex protection to ATEX (optional)	II 1 G Ex ia IIC T4 Ga II 1 D Ex ia IIIC T73 °C Da II 3 G Ex ic IIC T4 Gc II 3 G Ex nA IIC T4 Gc II 3 G Ex tc IIIC T63 °C Dc		
Cable connection			
Function	Color		
• EXC +	Pink		
• EXC -	Gray		
• SIG +	Brown		
• SIG -	White		
• Shield (not connected to the load cell body)	Transparent		

¹⁾ For rated temperature -10 ... +40 °C (14 ... 104 °F)

²⁾ Current calibration: rated characteristic value and output resistance are adjusted so that the output current is calibrated within 0.05 % of a reference value. This makes it easier to connect several load cells in parallel.

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Selection and ordering data

Article No.

SIWAREX WL280 RN-S SA load cell

↗ **7MH5113-**

Stainless steel EN 1.4542, low mounting height, IP66/68

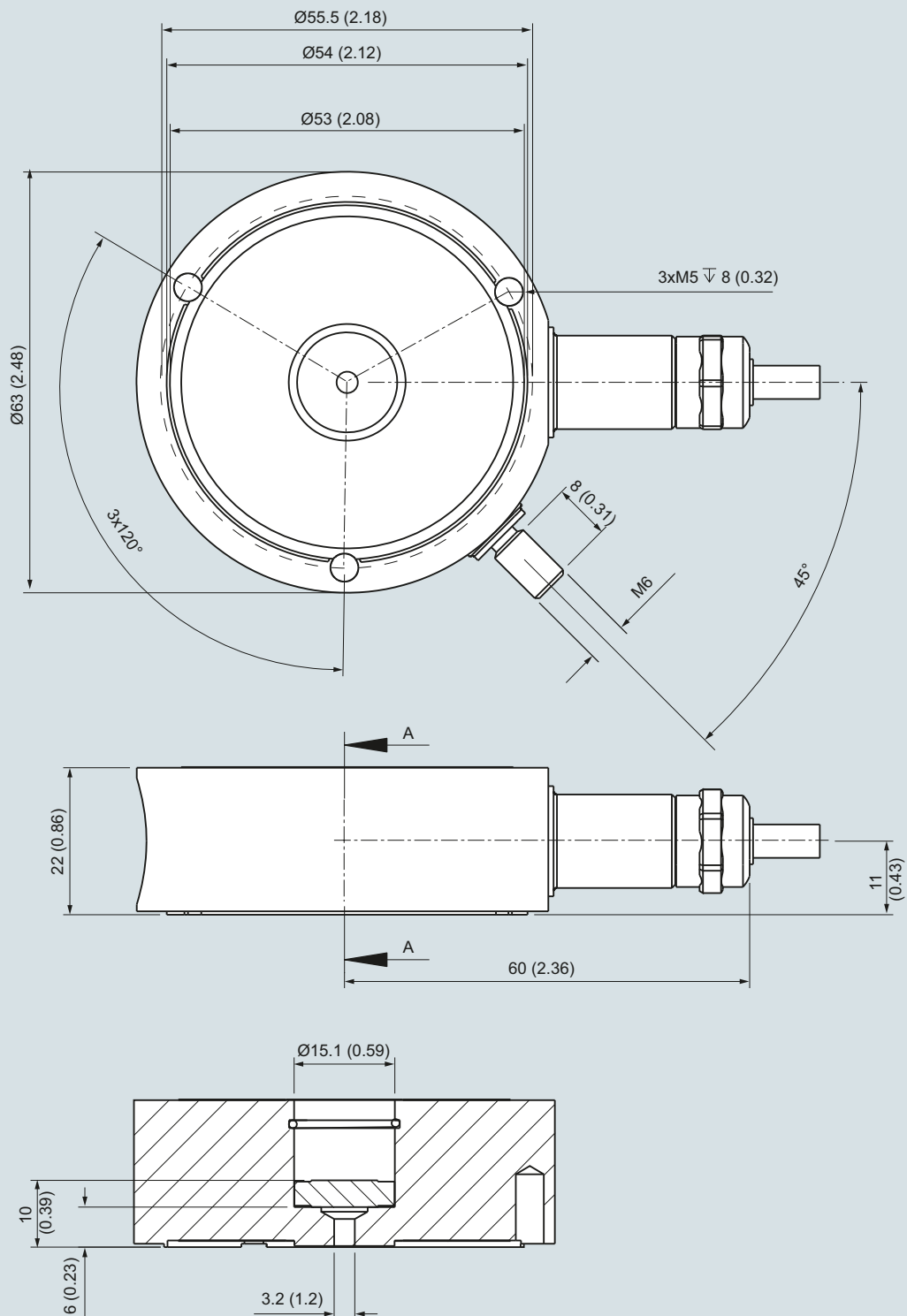
Accuracy class C3 according to OIML R-60

↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Rated load	Cable length	
• 60 kg (132.28 lb)	3 m (9.84 ft)	2 Q
• 130 kg (286.60 lb)	3 m (9.84 ft)	3 D
• 280 kg (617.29 lb)	3 m (9.84 ft)	3 J
• 500 kg (1 102.31 lb)	3 m (9.84 ft)	3 P
• 1 t (0.98 tn. l.)	3 m (9.84 ft)	4 A
• 2 t (1.97 tn. l.)	6 m (19.68 ft)	4 G
• 3.5 t (3.44 tn. l.)	6 m (19.68 ft)	4 L
• 5 t (4.92 tn. l.)	6 m (19.68 ft)	4 P
• 10 t (9.84 tn. l.)	15 m (49.21 ft)	5 A
• 13 t (12.79 tn. l.)	15 m (49.21 ft)	5 D
• 28 t (27.56 tn. l.)	15 m (49.21 ft)	5 J
• 60 t (59.05 tn. l.)	15 m (49.21 ft)	5 Q
Explosion protection		
• Without		0
• Explosion protection for zones 1, 2, 20, 21, 22		1

3

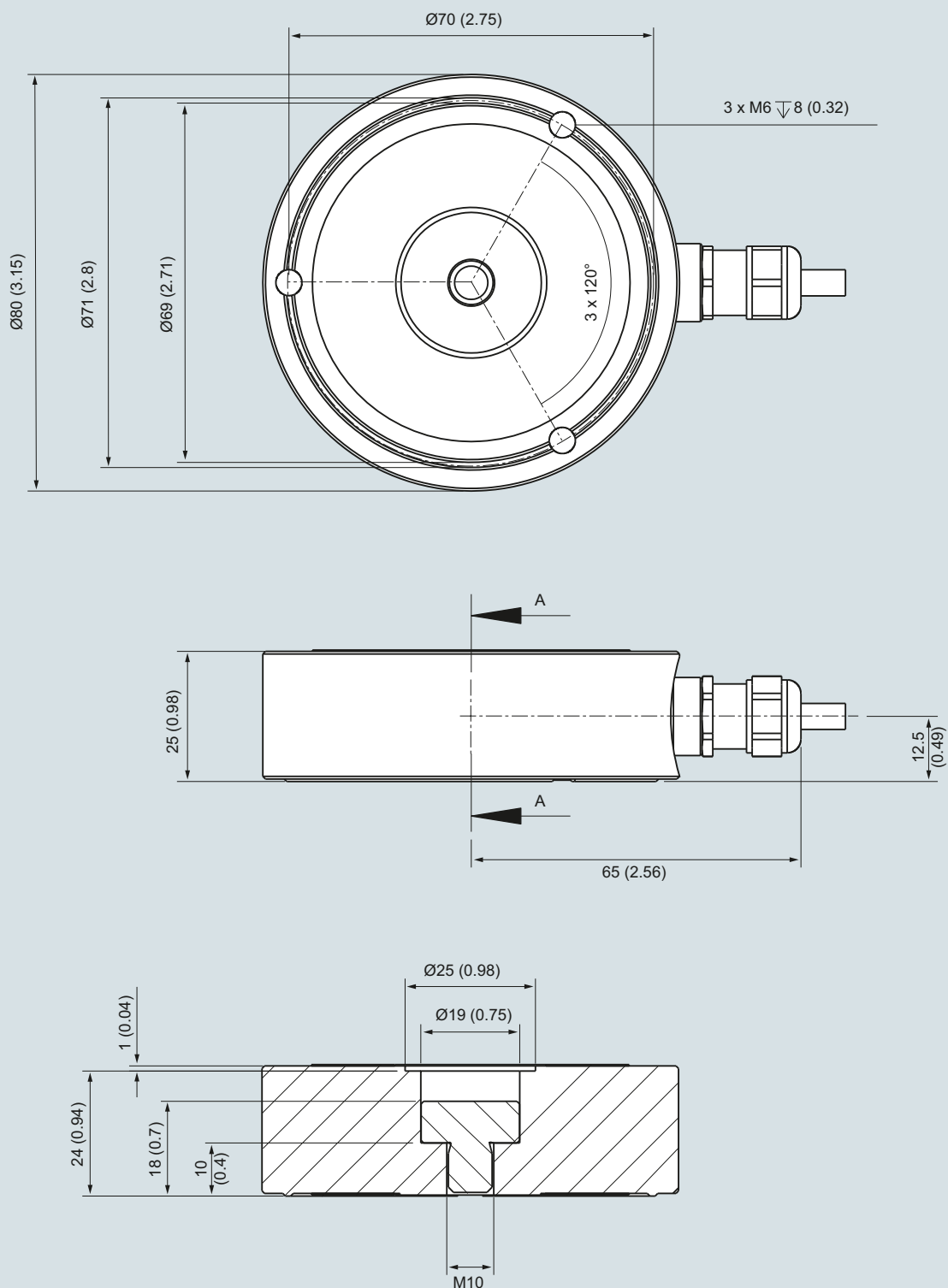
Dimensional drawings



SIWAREX WL280 RN-S SA load cell 60 ... 280 kg (132.28 ... 617.29 lb), dimensions in mm (inch)

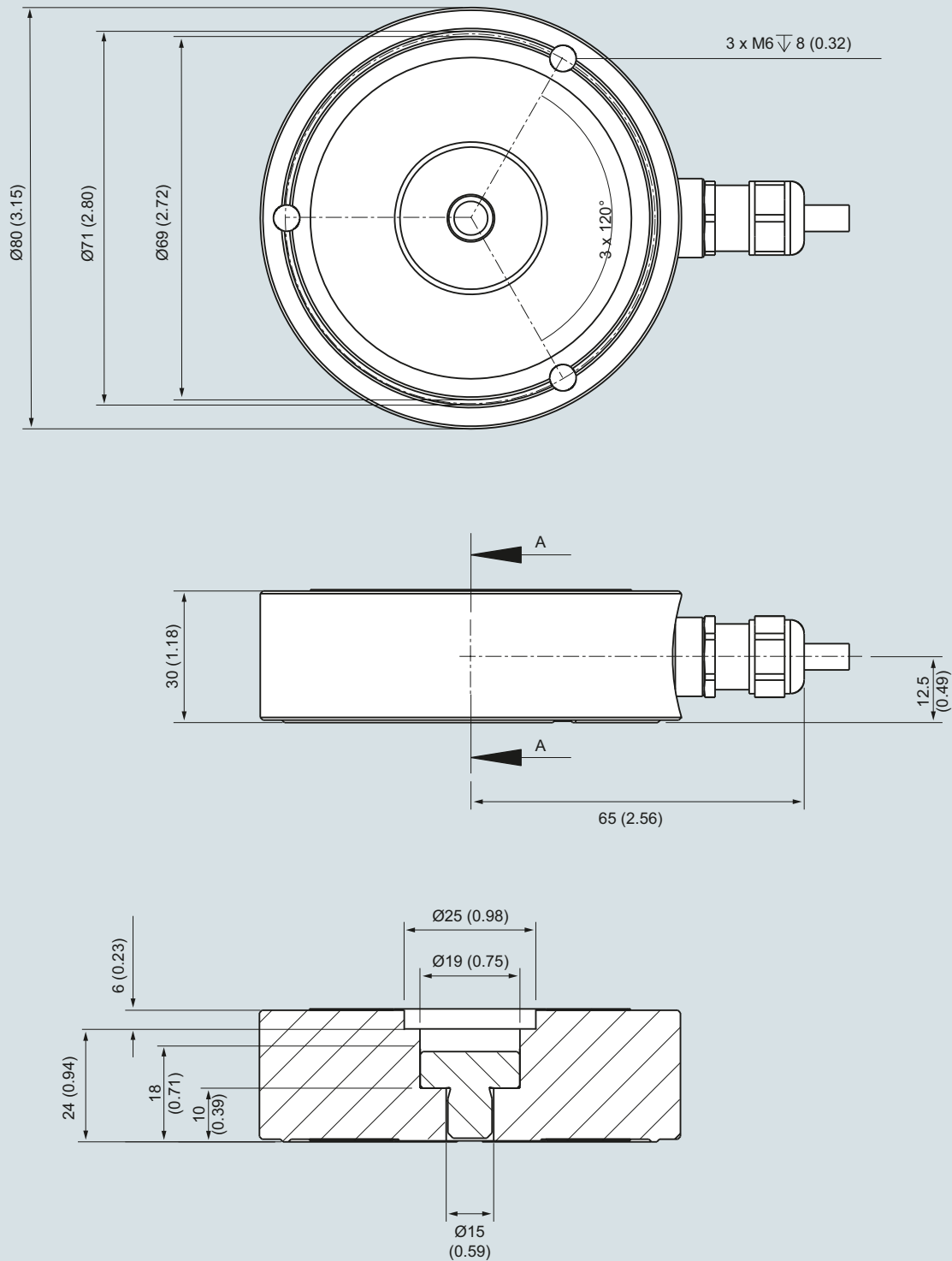
Load Cells

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Load cell**Dimensional drawings** (continued)

SIWAREX WL280 RN-S SA load cell, 0.5 and 1 t (0.49 and 0.98 tn. l.), dimensions in mm (inch)

Dimensional drawings (continued)

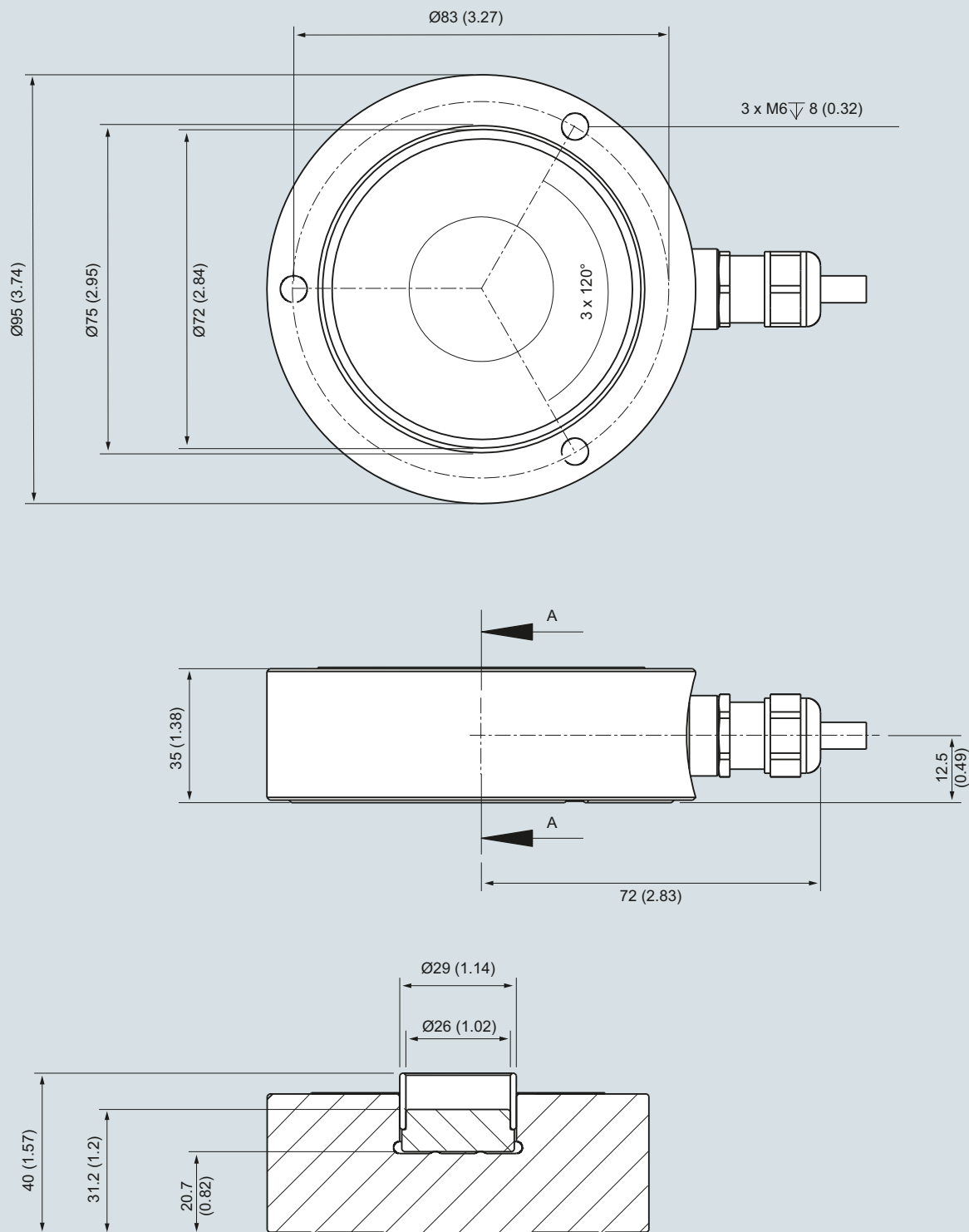


SIWAREX WL280 RN-S SA load cell, 2 ... 5 t (1.97 ... 4.92 tn. l.), dimensions in mm (inch)

Load Cells

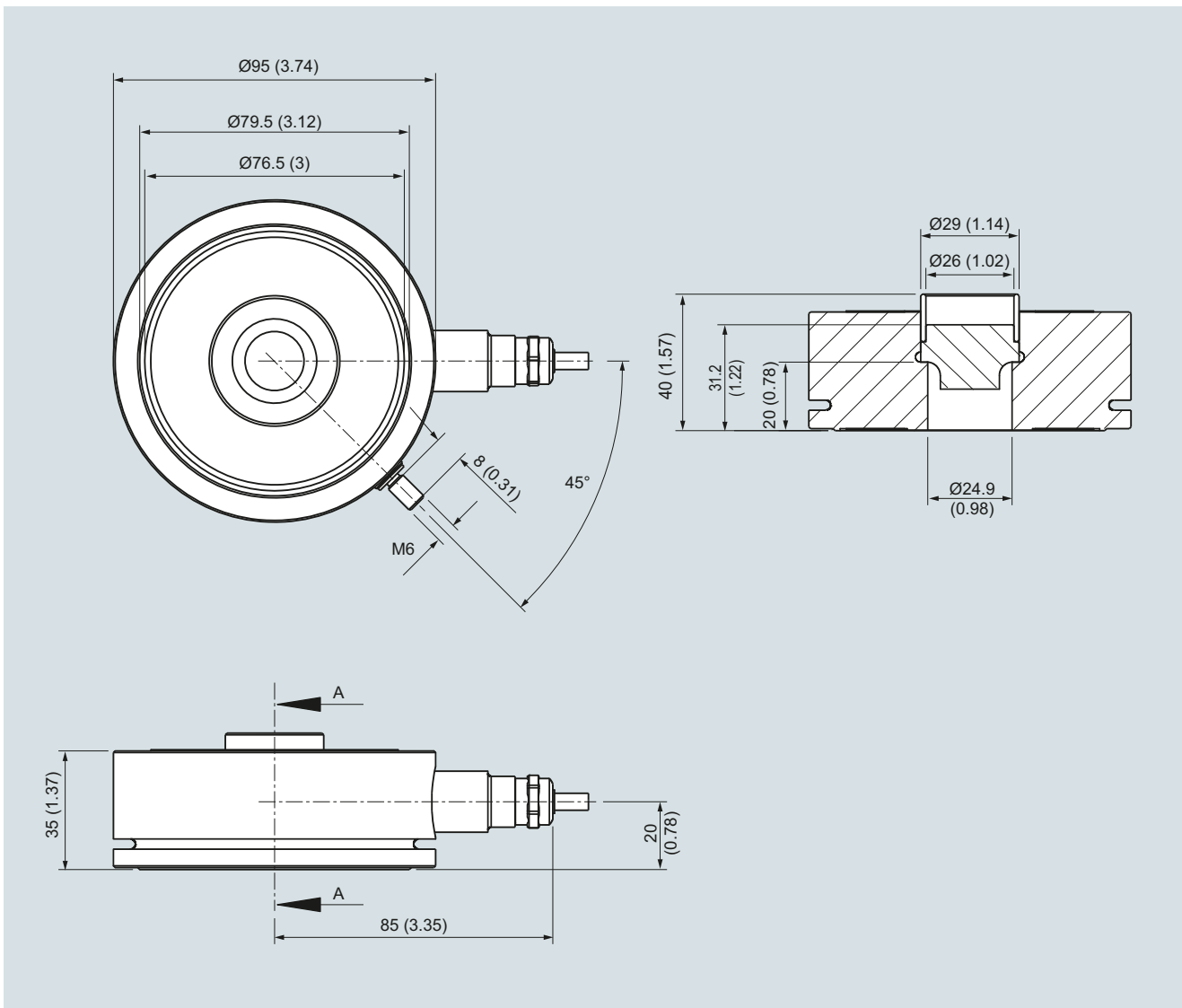
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Load cell**Dimensional drawings** (continued)

SIWAREX WL280 RN-S SA load cell 10 t (9.84 tn. l.), dimensions in mm (inch)

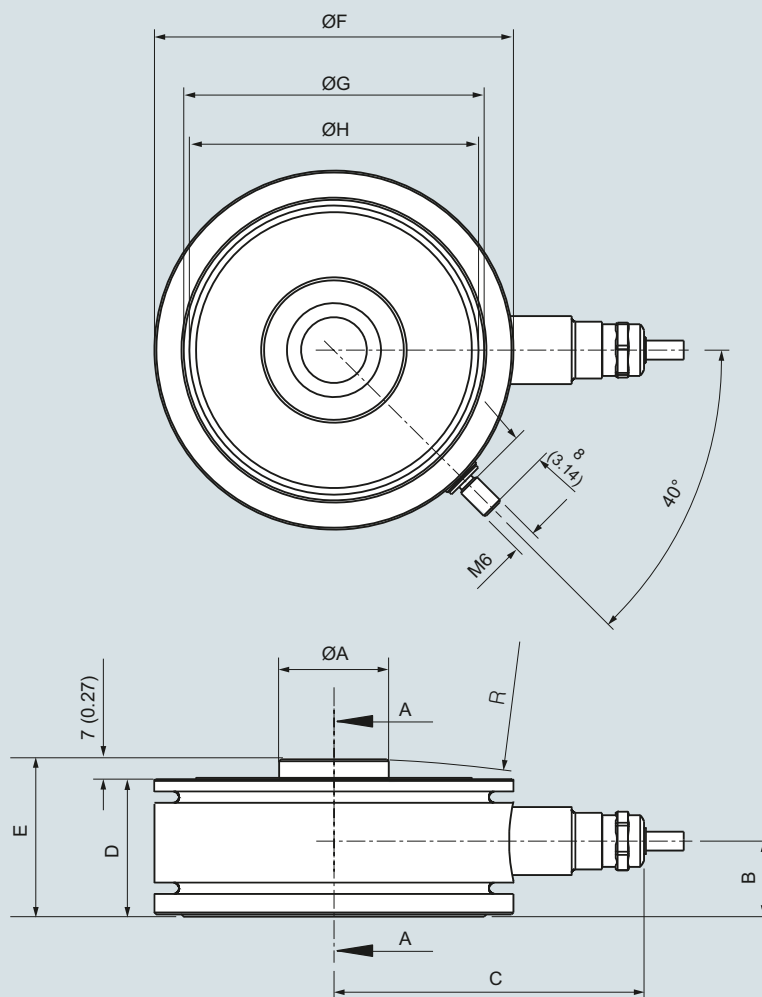
Dimensional drawings (continued)



SIWAREX WL280 RN-S SA load cell 13 t (12.79 tn. l.), dimensions in mm (inch)

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Load cell**Dimensional drawings** (continued)

Rated load [t]	øA	B	C	D	E	øF	øG	øH	R
28	35.9 (1.41)	25 (0.98)	94 (3.7)	46 (1.8)	53 (2.08)	120 (4.72)	102 (4)	98 (3.85)	R400
60	47.9 (1.88)	34 (1.33)	105 (4.13)	62 (2.44)	69 (2.71)	140 (5.5)	124 (4.88)	120 (4.72)	R600

SIWAREX WL280 RN-S SA load cell, 28 and 60 t (27.56 and 59.05 tn. l.), dimensions in mm (inch)