

E57 Premium+ Series Sensors



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E57 Premium+ Series Sensors

Product Description

The Premium+ Series Inductive Proximity Sensors by Eaton's electrical sector have improved sensing performance, product durability and selection. This improved line of sensors carries the Premium+ Series name because we have upgraded the design to a rugged stainless steel body, shock-resistant front caps and impact-absorbing potting compound. Plus, the Premium+ Series line now includes a choice of AC, AC/DC and DC-only, 12, 18 and 30 mm sensors with unmatched noise immunity of greater than 20V/meter.

Features

- New expanded offering of two-wire, three-wire, AC, DC, and AC/DC multiple range sensor models
- Manufactured to take physical and environmental abuse
- Designed with stainless steel barrel and new potting compound for robust, high temperature, high pressure washdown, as well as intense shock and vibration applications
- Unmatched high noise immunity eliminates problems associated with electrical noise (all models >20V/meter)
- 360° output status indicator is visible from any angle and in any light condition
- Resetttable short circuit protection and reverse polarity in select models
- Right angle sensing models offer unique problem-solving capabilities
- Wide temperature range -13° to 158°F (-25° to 70°C) on cable, micro-style connections

Standards and Certifications

- cUL Listed
- CE (AC/DC and DC-only models)



! DANGER

THIS SENSOR IS NOT A SAFETY DEVICE AND IS NOT INTENDED TO BE USED AS A SAFETY DEVICE. This sensor is designed only to detect and read certain data in an electronic manner and perform no use apart from that, specifically no safety-related use. This sensor product does not include self-checking redundant circuitry, and the failure of this sensor product could cause either an energized or de-energized output condition, which could result in death, serious bodily injury, or property damage.

For the most current information on this product, visit our Web site: www.eaton.com

For Customer Service in the U.S. call 1-877-ETN CARE (386-2273), in Canada call 1-800-268-3578.
For Application Assistance in the U.S. and Canada call 1-800-426-9184.

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Product Selection

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Two-Wire Sensors

	Operating Voltage	Sensing Range (Sn)	Shielding	Connection Type ^①	NO Output Catalog Number	NC Output Catalog Number
Standard Range						
12 mm Diameter End Sensing						
	20–250 Vac	2 mm (standard range)	Shielded	2-meter cable	E57LAL12A2	E57LBL12A2
				3-pin micro AC connector	E57LAL12A2SA ☹	E57LBL12A2SA ☹
				3-pin micro AC pigtail connector	E57LAL12A2SP ☹	E57LBL12A2SP ☹
	20–132 Vac	4 mm (standard range)	Unshielded	2-meter cable	E57LAL12A2E	E57LBL12A2E
				3-pin micro AC connector	E57LAL12A2EA ☹	E57LBL12A2EA ☹
				3-pin micro AC pigtail connector	E57LAL12A2EP ☹	E57LBL12A2EP ☹
	20–132 Vac	6 mm (extended range)	Semi-shielded	2-meter cable	E57-12LE06-A	E57-12LE06-A1
				3-pin micro AC connector	E57-12LE06-AA ☹	E57-12LE06-A1A ☹
				3-pin micro AC pigtail connector	E57-12LE06-AP ☹	—
	40–250 Vac 50/60 Hz ^② 20–250 Vdc	10 mm (extended range)	Non-embeddable	2-meter cable	E57-12LE10-A	E57-12LE10-A1
				3-pin micro AC connector	E57-12LE10-AA ☹	E57-12LE10-A1A ☹
				3-pin micro AC pigtail connector	E57-12LE10-AP ☹	E57-12LE10-A1P ☹
	40–250 Vac 50/60 Hz ^② 20–250 Vdc	2 mm (standard range)	Shielded	2-meter cable	E57SAL12A2	E57SBL12A2
				3-pin micro AC connector	E57SAL12A2SA ☹	E57SBL12A2SA ☹
				3-pin mini-connector	E57MAL12A2B1 ☹	—
	40–250 Vac 50/60 Hz ^② 20–250 Vdc	4 mm (standard range)	Unshielded	2-meter cable	E57SAL12A2E	E57SBL12A2E
				3-pin micro AC connector	E57SAL12A2EA ☹	E57SBL12A2EA ☹
				Standard Range		
18 mm Diameter End Sensing						
	20–250 Vac	5 mm (standard range)	Shielded	2-meter cable	E57LAL18A2	E57LBL18A2
				3-pin micro AC connector	E57LAL18A2SA ☹	E57LBL18A2SA ☹
				3-pin micro AC pigtail connector	E57LAL18A2SP ☹	E57LBL18A2SP ☹
				3-pin mini-connector	E57MAL18A2B1 ☹	E57MBL18A2B1 ☹
	20–132 Vac	8 mm (standard range)	Unshielded	2-meter cable	E57LAL18A2E	E57LBL18A2E
				3-pin micro AC connector	E57LAL18A2EA ☹	E57LBL18A2EA ☹
				3-pin micro AC pigtail connector	E57LAL18A2EP ☹	E57LBL18A2EP ☹
				3-pin mini-connector	E57MAL18A2EB1 ☹	E57MBL18A2EB1 ☹
	20–132 Vac	12 mm (extended range)	Semi-shielded	2-meter cable	E57-18LE12-A	E57-18LE12-A1
				3-pin micro AC connector	E57-18LE12-AA ☹	E57-18LE12-A1A ☹
				3-pin micro AC pigtail connector	E57-18LE12-AP ☹	E57-18LE12-A1P ☹
				3-pin mini-connector	E57-18LE12-AB ☹	E57-18LE12-A1B ☹
40–250 Vac 50/60 Hz ^② 20–250 Vdc	20 mm (extended range)	Non-embeddable	2-meter cable	E57-18LE20-A	E57-18LE20-A1	
			3-pin micro AC connector	E57-18LE20-AA ☹	E57-18LE20-A1A ☹	
			3-pin micro AC pigtail connector	E57-18LE20-AP ☹	E57-18LE20-A1P ☹	
			3-pin mini-connector	E57-18LE20-AB ☹	E57-18LE20-A1B ☹	
				40–250 Vac 50/60 Hz ^② 20–250 Vdc	5 mm (standard range)	Shielded
3-pin micro AC connector	E57SAL18A2SA ☹	E57SBL18A2SA ☹				
3-pin mini-connector	E57MAL18A2B1 ☹	—				
	40–250 Vac 50/60 Hz ^② 20–250 Vdc	8 mm (standard range)	Unshielded	2-meter cable	E57SAL18A2E	E57SBL18A2E
				3-pin micro AC connector	E57SAL18A2EA ☹	E57SBL18A2EA ☹
				Notes		
<p>☹ See listing of compatible connector cables on Page V8-T3-23.</p> <p>① For cable lengths longer than 2 meters, add the number of the desired length in meters to the end of the listed catalog number (for catalog numbers ending with a number, add an S and then the length). Examples for a 5-meter cable: E57-18LE12-A becomes E57-18LE12-A5; E57LAL12A2 becomes E57LAL12A2S5.</p> <p>② Avoid wiring these AC/DC models in series as the sensors may not perform reliably. Contact Eaton's Applications Engineering at 1-800-426-9184 with questions.</p>						

Technical Data and Specifications

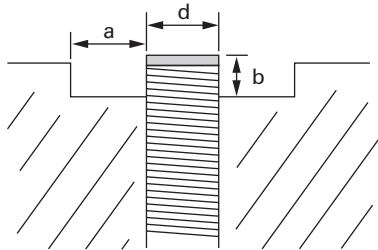
E57 Premium+ Sensors

Description	Two-Wire AC Sensors	Two-Wire AC/DC Sensors	Three-Wire DC Only Sensors
Operating voltage	20–250 Vac	40–240 Vac ^① 20–250 Vdc	6–48 Vdc
Maximum load current	250 mA	250 mA	500 mA at 6–30 Vdc
Switching frequency	20 Hz	60 Hz	12 mm: 800 Hz 18 mm: 500 Hz 30 mm: 300 Hz
Leakage current	1.7 mA maximum at 158°F (70°C)	≤2.0 mA	≤100 μA
Voltage drop	7V maximum	12V at <10 mA ≤4V at >25 mA	≤2.5V
Holding current	5 mA minimum	5 mA minimum	—
Burden current	—	—	≤10 mA
Protection	—	Resettable short circuit; overload protection	Auto reset
Switching hysteresis	2 to 20% of rated sensing range	<15% rated sensing distance	<15% rated sensing distance
Repeat accuracy	<3% sensing distance	Shielded models: <1% sensing distance; unshielded and extended range: <3%	Shielded models: <1% sensing distance; unshielded and extended range: <3%
Time delay before availability	—	<200 ms	<200 ms
Output indicator LED	360° viewable LED	360° viewable LED	360° viewable LED
Operating temperature	–13° to 158°F (–25° to 70°C) Mini Conn.: –13° to 122°F (–25° to 50°C)	–13° to 158°F (–25° to 70°C) Mini Conn.: –13° to 122°F (–25° to 50°C)	–13° to 158°F (–25° to 70°C) Mini Conn.: –13° to 122°F (–25° to 50°C)
Enclosure ratings	NEMA 4, 4X, 6, 6P, 12 and 13 (IP67) IP69K	NEMA 4, 4X, 6, 6P, 12 and 13 (IP67) IP69K	NEMA 4, 4X, 6, 6P, 12 and 13 (IP67) IP69K
Shock	30g, 11 ms per IEC 68-2-76	30g, 11 ms per IEC 68-2-76	30g, 11 ms per IEC 68-2-76
Vibration	10 to 55 Hz, 1 mm amplitude	10 to 55 Hz, 1 mm amplitude	10 to 55 Hz, 1 mm amplitude
Housing material	303 stainless steel ^② ; polycarbonate end bells; Ryton [®] front ends	303 stainless steel ^② ; polycarbonate end bells; Ryton [®] front ends	303 stainless steel ^② ; polycarbonate end bells; Ryton [®] front ends
Cable	AWM Style 20387 (PVC)	AWM Style 20387 (PVC)	AWM Style 20387 (PVC)

Recommended Mounting Clearances

For unshielded standard range sensors and extended range sensors, clearance must be provided around the sensor when mounting for reliable performance. (“Sn” is the sensing range of the sensor, “d” is the sensor diameter.)

E57 Premium+ Sensors, Mounting



Type	Shielding	a	b
Standard range	Shielded	0	0
	Unshielded	Cap height	2 x 5n
Extended range	Semi-shielded	d	Sn
	Non-embeddable	Cap height	2 x Sn

Notes

Ryton[®] is a registered trademark of Phillips Chemical (division of Phillips Petroleum).

^① 40–240 Vac at <–4°F (<–20°C).

^② Semi-shielded models are nickel-plated brass.

Wiring Diagrams

Pin numbers are for reference, rely on pin location when wiring.

E57 Premium+ Sensors

Operating Voltage	Output	Cable Models	Connector Models (Face View Male Shown)	
			Micro	Mini
Two-Wire Sensors				
20–250 Vac/dc and AC-only AC wiring example	NO and NC			
20–250 Vac/dc DC wiring example	NO and NC (NPN)			—
	NO and NC (PNP)			—
Three-Wire Sensors				
6–48 Vdc	NO (NPN)			
	NO (PNP)			
	NC (NPN)			
	NC (PNP)			

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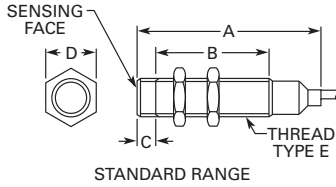
Dimensions

Approximate Dimensions in Inches (mm)

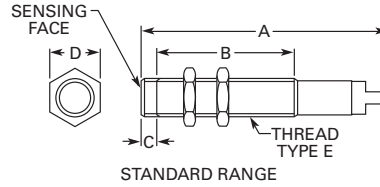
E57 Premium+ Series Sensors, End Sensing ^{①②}

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Cable Models



Connector Models



Size	Shielding	Overall Length A	Threaded Length B	Cap Height C	Nut Width D	Thread Size E
Two-Wire AC Sensors—Cable Models						
12 mm	Shielded	2.46 (62.4)	1.98 (50.3)	—	0.67 (16.8)	M12 x 1
	Semi-shielded	2.87 (72.8)	2.28 (57.9)	0.06 (1.62)	0.67 (16.8)	M12 x 1
	Unshielded	2.87 (72.7)	1.98 (50.3)	0.36 (9.14)	0.67 (16.8)	M12 x 1
18 mm	Shielded	2.54 (64.5)	2.00 (50.9)	—	0.94 (23.8)	M18 x 1
	Semi-shielded	2.60 (66.1)	1.90 (48.2)	0.10 (2.54)	0.94 (23.8)	M18 x 1
	Unshielded	2.60 (66.0)	1.47 (37.2)	0.56 (14.1)	0.94 (23.8)	M18 x 1
30 mm	Shielded	2.73 (69.3)	1.98 (50.3)	—	1.41 (35.9)	M30 x 1.5
	Semi-shielded	2.67 (67.8)	1.90 (48.2)	0.13 (3.30)	1.41 (35.9)	M30 x 1.5
	Unshielded	2.73 (69.3)	1.49 (37.8)	0.52 (13.26)	1.41 (35.9)	M30 x 1.5
Two-Wire AC Sensors—Micro-Connector Models						
12 mm	Shielded	2.69 (68.4)	1.98 (50.3)	—	0.67 (16.8)	M12 x 1
	Semi-shielded	3.04 (77.2)	2.28 (57.9)	0.06 (1.62)	0.67 (16.8)	M12 x 1
	Unshielded	3.06 (77.7)	1.98 (50.3)	0.36 (9.14)	0.36 (9.14)	M12 x 1
18 mm	Shielded	2.72 (69.06)	2.00 (50.9)	—	0.94 (23.8)	M18 x 1
	Semi-shielded	2.72 (69.1)	1.90 (48.2)	0.10 (2.54)	0.94 (23.8)	M18 x 1
	Unshielded	2.74 (69.4)	1.47 (37.2)	0.56 (14.1)	0.94 (23.8)	M18 x 1
30 mm	Shielded	2.91 (73.8)	1.98 (50.3)	—	1.41 (35.9)	M30 x 1.5
	Semi-shielded	2.78 (70.6)	1.90 (48.2)	0.13 (3.30)	1.41 (35.9)	M30 x 1.5
	Unshielded	2.91 (73.8)	1.49 (37.8)	0.52 (13.26)	1.41 (35.9)	M30 x 1.5
Two-Wire AC/DC Sensors—Cable Models						
12 mm	Shielded	2.45 (62.4)	1.98 (50.3)	—	0.67 (16.8)	M12 x 1
	Unshielded	2.45 (62.4)	1.80 (45.8)	0.20 (5)	0.67 (16.8)	M12 x 1
18 mm	Shielded	2.54 (64.5)	2.00 (50.9)	—	0.94 (23.8)	M18 x 1
	Unshielded	2.54 (64.5)	1.75 (44.4)	0.28 (7)	0.94 (23.8)	M18 x 1
30 mm	Shielded	2.72 (69.3)	1.98 (50.3)	—	1.41 (35.9)	M30 x 1.5
	Unshielded	2.72 (69.3)	1.49 (37.8)	0.52 (13.26)	1.41 (35.9)	M30 x 1.5
Two-Wire AC/DC Sensors—Micro-Connector Models						
12 mm	Shielded	2.69 (68.4)	1.98 (50.3)	—	0.67 (16.8)	M12 x 1
	Unshielded	2.69 (68.4)	1.80 (45.8)	0.20 (5)	0.67 (16.8)	M12 x 1
18 mm	Shielded	2.72 (69.06)	2.00 (50.9)	—	0.94 (23.8)	M18 x 1
	Unshielded	2.72 (69.06)	1.75 (44.4)	0.28 (7)	0.94 (23.8)	M18 x 1
30 mm	Shielded	2.91 (73.8)	1.98 (50.3)	—	1.41 (35.9)	M30 x 1.5
	Unshielded	2.91 (73.8)	1.49 (37.8)	0.52 (13.26)	1.41 (35.9)	M30 x 1.5

Notes

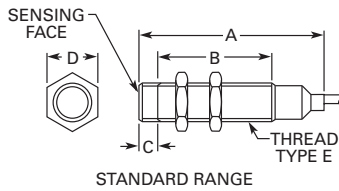
① These dimensions apply to the Premium+ Series models in this section. Not indicated Premium Series models.

② For short barrel model dimensions (E57SAL ...) refer to **Page V8-T3-29**.

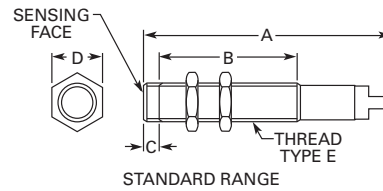
Approximate Dimensions in Inches (mm)

E57 Premium+ Series Sensors, End Sensing ①②

Cable Models, continued



Connector Models, continued



Size	Shielding	Overall Length A	Threaded Length B	Cap Height C	Nut Width D	Thread Size E
Two-Wire AC/DC Sensors—Mini-Connector Models						
18 mm	Shielded	3.39 (86.1)	2.00 (50.8)	0.02 (0.5)	0.94 (23.8)	M18 x 1
	Semi-shielded	3.39 (86.0)	1.90 (48.2)	0.10 (2.54)	0.94 (23.8)	M18 x 1
	Unshielded	3.39 (86.1)	1.46 (37.0)	0.57 (14.5)	0.94 (23.8)	M18 x 1
30 mm	Shielded	3.39 (86.1)	2.1 (53.3)	0.03 (0.8)	1.41 (35.9)	M30 x 1.5
	Semi-shielded	3.44 (87.4)	1.90 (48.2)	0.13 (3.30)	1.41 (35.9)	M30 x 1.5
	Unshielded	3.39 (86.1)	1.55 (39.4)	0.55 (14.0)	1.41 (35.9)	M30 x 1.5
Three-Wire DC Sensors—Mini-Connector Models						
18 mm	Shielded	3.39 (86.1)	2.00 (50.8)	0.02 (0.5)	0.94 (23.8)	M18 x 1
	Semi-shielded	3.39 (86.0)	1.90 (48.2)	0.10 (2.54)	0.94 (23.8)	M18 x 1
	Unshielded	3.39 (86.1)	1.46 (37.0)	0.57 (14.5)	0.94 (23.8)	M18 x 1
30 mm	Shielded	3.39 (86.1)	2.1 (53.3)	0.03 (0.8)	1.41 (35.9)	M30 x 1.5
	Semi-shielded	3.44 (87.4)	1.90 (48.2)	0.13 (3.30)	1.41 (35.9)	M30 x 1.5
	Unshielded	3.39 (86.1)	1.55 (39.4)	0.55 (14.0)	1.41 (35.9)	M30 x 1.5
Three-Wire DC Sensors—Cable Models						
12 mm	Shielded	2.46 (62.4)	1.98 (50.3)	—	0.67 (16.8)	M12 x 1
	Semi-shielded	2.87 (72.8)	2.28 (57.9)	0.06 (1.62)	0.67 (16.8)	M12 x 1
	Unshielded	2.87 (72.7)	1.98 (50.3)	0.36 (9.14)	0.67 (16.8)	M12 x 1
18 mm	Shielded	2.54 (64.5)	2.00 (50.9)	—	0.94 (23.8)	M18 x 1
	Semi-shielded	2.60 (66.1)	1.90 (48.2)	0.10 (2.54)	0.94 (23.8)	M18 x 1
	Unshielded	2.60 (66.0)	1.47 (37.2)	0.56 (14.1)	0.94 (23.8)	M18 x 1
30 mm	Shielded	2.73 (69.3)	1.98 (50.3)	—	1.41 (35.9)	M30 x 1.5
	Semi-shielded	2.67 (67.8)	1.90 (48.2)	0.13 (3.30)	1.41 (35.9)	M30 x 1.5
	Unshielded	2.73 (69.3)	1.49 (37.8)	0.52 (13.26)	1.41 (35.9)	M30 x 1.5
Three-Wire DC Sensors—Micro-Connector Models						
12 mm	Shielded	2.71 (68.7)	1.98 (50.3)	—	0.67 (16.8)	M12 x 1
	Semi-shielded	3.04 (77.2)	2.28 (57.9)	0.06 (1.62)	0.67 (16.8)	M12 x 1
	Unshielded	3.06 (77.7)	1.98 (50.3)	0.36 (9.14)	0.67 (16.8)	M12 x 1
18 mm	Shielded	2.73 (69.3)	2.00 (50.9)	—	0.94 (23.8)	M18 x 1
	Semi-shielded	2.72 (69.1)	1.90 (48.2)	0.10 (2.54)	0.94 (23.8)	M18 x 1
	Unshielded	2.74 (69.4)	1.47 (37.2)	0.56 (14.1)	0.94 (23.8)	M18 x 1
30 mm	Shielded	2.92 (74.1)	1.98 (50.3)	—	1.41 (35.9)	M30 x 1.5
	Semi-shielded	2.78 (70.6)	1.90 (48.2)	0.13 (3.30)	1.41 (35.9)	M30 x 1.5
	Unshielded	2.92 (74.1)	1.49 (37.8)	0.52 (13.26)	1.41 (35.9)	M30 x 1.5

Notes

- ① These dimensions apply to the Premium+ Series models in this section. Not indicated Premium Series models.
- ② For short barrel model dimensions (E57SAL ...) refer to **Page V8-T3-29**.

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Inductive Proximity Sensors

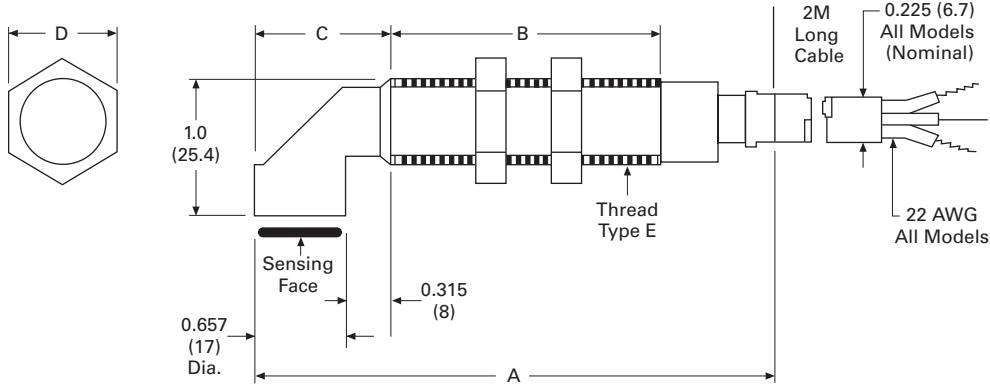
E57 Premium+ Series Sensors

Approximate Dimensions in Inches (mm)

E57 Premium+ Series Sensors, Right Angle Sensing

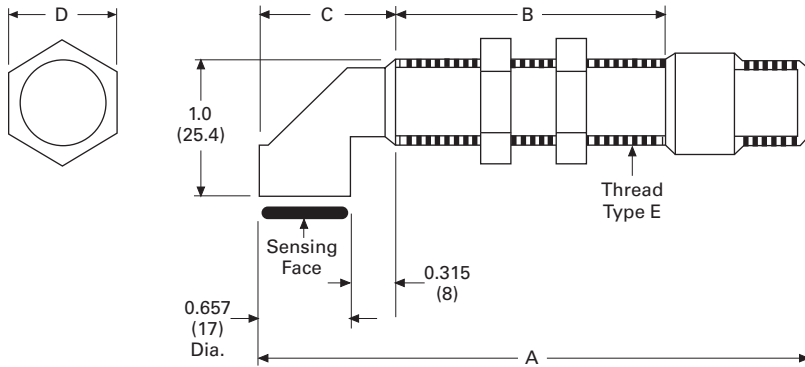
Cable Models

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Size	Overall Length A	Thread B	Cap C	Nut Width D	Thread Size E
Cable Models					
18 mm	3.465 (88)	1.97 (50)	0.98 (25)	0.94 (24)	M18 x 1

Connector Models



Size	Overall Length A	Thread B	Cap C	Nut Width D	Thread Size E
Mini-Connector Models					
18 mm	4.303 (109)	1.97 (50)	0.98 (25)	0.94 (24)	M18 x 1
Micro-Connector Models					
18 mm	3.65 (93)	1.97 (50)	0.98 (25)	0.94 (24)	M18 x 1