

# Position Sensors

## Ultrasonic Sensors



Ultrasonic sensors measure time delay between emitted and echo pulses. Available in analog or digital versions for distance or presence/absence sensing. Programmable versions available. May be used in a variety of rugged presence and absence sensing applications.



Series	940-F/947	941-D	942
<b>Range type</b>	from 0,6 m to 3 m [2 ft to 10 ft]	from 0,4 m to 3,5 m [1.3 ft to 11.5 ft]	from 1,5 m to 3,5 m [4.9 ft to 11.5 ft]
<b>Output type</b>	analog or switching	analog or switching	analog and switching
<b>Supply voltage</b>	19 Vdc to 30 Vdc	15 Vdc to 30 Vdc	19 Vdc to 30 Vdc
<b>Housing style</b>	plastic M18 and M30	plastic square housing	plastic M30
<b>Termination type</b>	cable or connector	connector	connector
<b>Beam angle</b>	8°	10°	8°, 10°
<b>Response time</b>	50 ms, 90 ms	150 ms	100 ms
<b>Switching frequency</b>	100 ms, 1 Hz, 8 Hz, 25 Hz	10 Hz	5 Hz to 30 Hz; 5 Hz to 8 Hz
<b>Repeatability</b>	0.3 % or ±1 mm; 0.2 % or ±2 mm	±1 mm	0.4 % or 2 mm; 0.2 % or ±1 mm
<b>Software programmable</b>	no	no	yes
<b>Teach in</b>	no	yes	yes
<b>Remote teach in</b>	no	no	no
<b>Synchronization output</b>	yes	yes	yes
<b>Approvals</b>	–	CE, UL, CSA	–
<b>Measurements</b>	M30 x 1,5 (140,0 mm [5.51 in L])	32,5 mm H x 36 mm W x 101 mm L [1.28 in H x 1.42 in W x 3.978 in L]	M30 x 1,5 (140,0 mm [5.51 in L])
<b>Features</b>	IP67; chemical-resistant epoxy head; synchronizing/hold input; adjustment by potentiometer; micro-processor controlled; temperature compensation	IP67; limit switch style sensor; teach in; M12 connector, 5 pin; visual indication; four output options; synchronizing/hold input; temperature compensation	IP65 (connector), IP67 (front face); four models; stainless steel M30 heads; synchronizing/hold input; beam power adjustable by switch



943	944	946	948
from 0,2 m to 3,5 m [0.7 ft to 11.5 ft]	from 0,4 m to 3,5 m [1.2 ft to 11.5 ft]	from 0,3 m to 6 m [0.93 ft to 19.69 ft]	0,3 m [0.93 ft]
analog or switching	analog and switching	analog and switching	switching
15 Vdc to 30 Vdc	19 Vdc to 30 Vdc	10 V to 30 V	18 Vdc to 30 Vdc
metal M12, plastic M18 and M30	plastic M18 and M30	stainless steel M30	2 pieces square plastic
cable or connector	connector	M12 connector	cable
8°	8°	5°	8°
400 ms	–	21 ms, 65 ms, 145 ms, 195 ms, 285 ms, 850 ms	–
100 ms, 250 ms, 1.2 Hz, 4.7 Hz	0.8 Hz, 1 Hz, 8 Hz	1 Hz, 5 Hz, 15 Hz	150 Hz
0.2 % or ±2 mm	0.4 % or ±2 mm	< 0.1 %	–
no	no	no	no
yes	yes	yes	no
yes	no	no	no
no	no	no	no
–	–	–	–
M18 or M30 (depending upon scanning ranges)	M30 x 1,5 (125,0 mm [4.92 in])	various sizes	2,0 mm H x 20,0 mm W x 30,0 mm L [0.08 in H x 0.79 in W x 1.18 in L]
remote teach-in/auto-tuning; Windows and hysteresis mode; two switching outputs; temperature compensation; connector or cable version	eight models; auto-tuning by one switch; slope direction selection; NO/NC selection; two switching outputs; analog output; temperature compensation	IP65; auto-tuning by four position plug; switching output models; two switching outputs; temperature compensation	IP67; four output configurations; switching frequency of 150 Hz; compact size