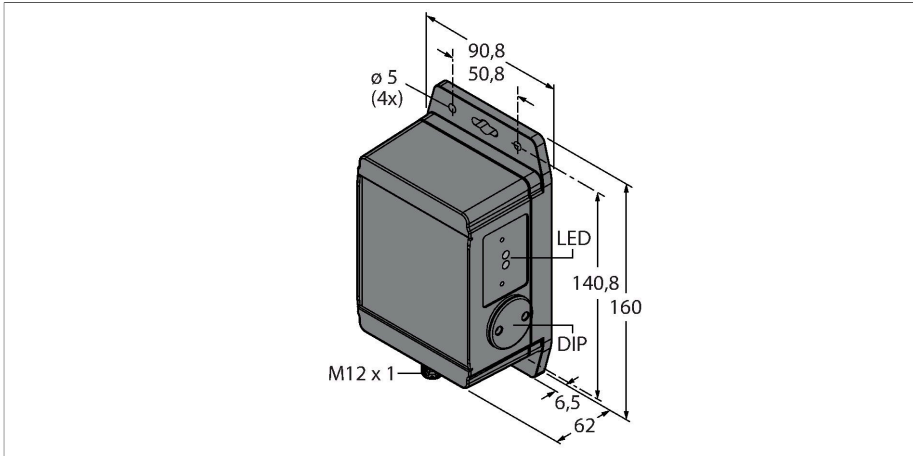


Q120RA-EU-AF2Q

Radar Sensor

With Switching Outputs



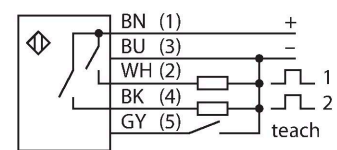
Technical data

Type	Q120RA-EU-AF2Q
ID	3025378
Radar data	
Function	Proximity switch
Operating mode	Time-of-Flight
Frequency band	K band, ISM region
Frequency range	24.05 - 24.25 GHz
Modulation	FMCW (Frequency Modulated Continuous Wave)
Range	2000...40000 mm
Edge lengths of the nominal actuator	500 mm
Number of radio channels	1
Duty cycle	100 %
Antenna connection	Internal, planar
Antenna gain	17.5 dBi
Antenna pattern	12o (Azimuth) / 25o (Elevation)
Side-lobe suppression	15 dB (azimuth)/15 dB (elevation)
Output power ERP	5 dBm / 3.3 mW ERP
Output power EIRP	20 dBm / 100 mW EIRP
Field strength max.	88-20log(m) dBuA/m bzw. 24-20log(m) dBmW/m2
Electrical data	
Operating voltage U_b	12...30 VDC
No-load current	≤ 100 mA
Short-circuit protection	yes/Cyclic
Reverse polarity protection	yes

Features

- M12 × 1 male, 5-pin
- Protection class IP67
- FMCW radar (frequency-modulated continuous wave radar), detects stationary and moving objects
- Approved for Europe (incl. UK), Australia, New Zealand, Japan and China
- Max. range 40 m
- Configuration via DIP switch
- Operating voltage 12...30 VDC
- 2 PNP/NPN switching outputs

Wiring diagram



Functional principle

An FMCW radar is a Frequency Modulated Continuous Wave radar. FMCW is the English abbreviation for Frequency Modulated Continuous Wave. Unmodulated continuous wave radars have the disadvantage that they cannot measure distances due to the lack of a time reference. Such a time reference for measuring the distance of stationary objects can be generated by means of frequency modulation. Using this method, a signal is emitted which continually changes frequency. A periodic frequency that increases and decreases linearly is used to limit the frequency range and to simplify the signal evaluation. The factor for the rate of change df/dt remains constant. If an echo signal is received, then this has a runtime delay as with

Technical data

Output function	NO/NC programmable, PNP/NPN
Readiness delay	≤ 2000 ms
Response time typical	< 15 ms
Mechanical data	
Design	Rectangular, Q120
Dimensions	62 x 90.8 x 159.5 mm
Housing material	Plastic, ABS/Polycarbonate, Black
Electrical connection	Connector, M12 × 1, PVC
Number of cores	5
Ambient temperature	-40...+65 °C
Protection class	IP67
Power-on indication	LED, Green
Switching state	LED, Yellow
Excess gain indication	LED, red
Tests/approvals	
MTTF	98 years acc. to SN 29500 (Ed. 99) 40 °C
Approvals	CE

the pulse radar, and thus a different frequency that is proportional to the distance. As a result, unlike with unmodulated Continuous Wave (CW) radars, both stationary and moving objects can be detected.

Conformity

CE

ISM defined in ITU-R 5.138, 5.150 and 5.280

ETSI/EN 300 440

FCC part 15

RSS-210

ANATEL Category II

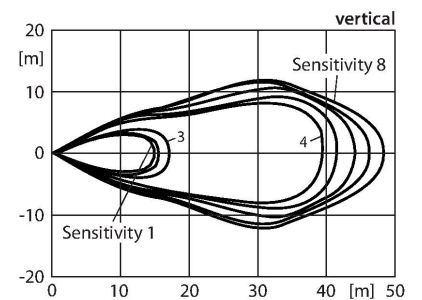
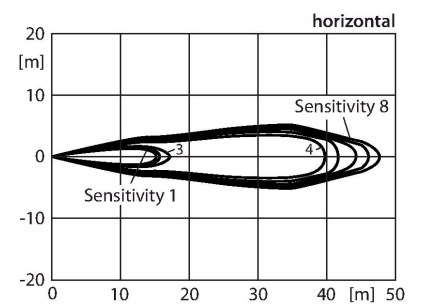
CMIIT Category G

ARIB STD T-73

KC mark — MSIP/RRA

NCC

Excess Gain Curve

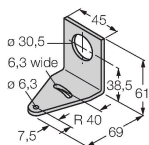


Accessories

SMB30A

3032723

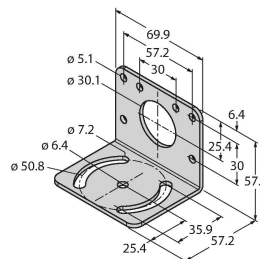
Mounting bracket, rectangular, stainless steel, for sensors with 30mm thread



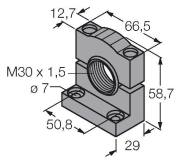
SMB30MM

3027162

Mounting bracket, rectangular, stainless steel, for sensors with 30 mm thread, wide holes for accurate alignment



SMB30SC **3052521**
 Mounting bracket, PBT black, for sensors with 30 mm thread, rotatable



Accessories

Dimension drawing	Type	ID	
	WKC4.5T-2/TEL	6625028	Connection cable, M12 female connector, angled, 5-pin, cable length: 2 m, jacket material: PVC, black; cULus approval
	RKC4.5T-2/TEL	6625016	Connection cable, M12 female connector, straight, 5-pin, cable length: 2 m, jacket material: PVC, black; cULus approval

Accessories

Dimension drawing	Type	ID	
	SMBWSQ120	3026881	Protective cap prevents water film or ice formation on the face, needed for rain or snow
	BRTR-CC20E	3011118	Radar reflector, large tetrahedron, protected by plastic, 7-fold function reserve at a distance of 6 m, optional