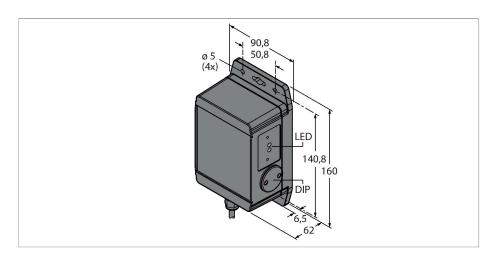


# Q120RA-EU-AF Radar Sensor With Switching Output



### Technical data

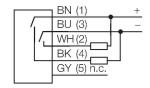
Туре	Q120RA-EU-AF		
ID	3054279		
Radar data			
Function	Proximity switch		
Operating mode	Time-of-Flight		
Frequency band	K band, ISM region		
Frequency range	24.05 - 24.25 GHz		
Modulation	FMCW (Frequency Modulated Continuous Wave)		
Range	200012000 mm		
Edge lengths of the nominal actuator	500 mm		
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 <sub>B</sub>	1230 VDC		
No-load current	≤ 100 mA		
Short-circuit protection	yes/Cyclic		
Reverse polarity protection	yes		



#### **Features**

- Cable, 2m
- ■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
- PNP/NPN switching output

### 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

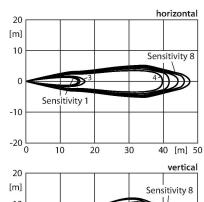
Output function	NO/NC programmable, PNP/NPN		
Readiness delay	≤ 2000 ms		
Response time typical	< 15 ms		
Mechanical data			
Design	Rectangular, Q120		
Dimensions	62 x 90.8 x 159.5 mm		
Housing material	Plastic, ABS/Polycarbonate, Black		
Electrical connection	Cable, 2 m, PVC		
Number of cores	5		
Ambient 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		

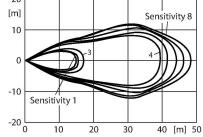
the pulse radar, and thus a different frequency that is proportional to the distance. As a result, unlike with unmodulated Continuous Wave (CW) radars, both stationary and moving objects can be detected.

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**





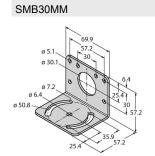
### Accessories

SMB30A 3032723

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

thread





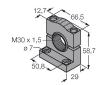
Mounting bracket, rectangular, stainless steel, for sensors with 30 mm thread, wide holes for accurate alignment

3027162



SMB30SC 3052521

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



### Accessories

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