QT50R-EU-RHQ
Radar Sensor –   retroreflective sensor
With Switching Output
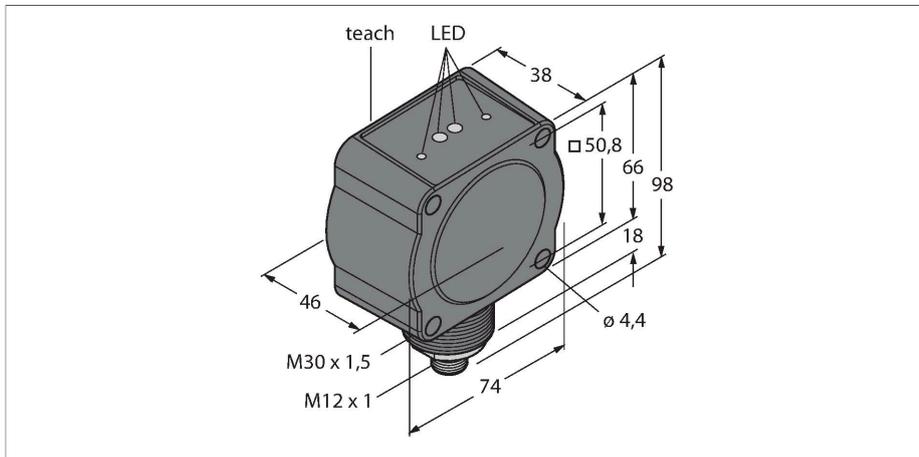

Technical data

Type	QT50R-EU-RHQ
ID	3054276
Radar data	
Function	Retroreflective Sensor
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	1000…12000 mm
Edge lengths of the nominal actuator	200 mm
Number of radio channels	1
Duty cycle	100 %
Antenna connection	Internal, planar
Antenna gain	15 dBi
Antenna pattern	45o (Azimuth / 38o (Elevation)
Side-lobe suppression	13 dB (azimuth)/13 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 or 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 connector, 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 12 m
- Configuration via DIP switch
- Teach-in function for reflector position
- Operating voltage 12…30 VDC
- PNP/NPN switching output

Wiring diagram
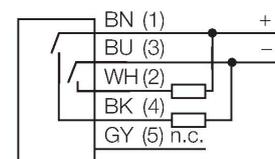
Functional principle

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

Technical data

Output function	NO/NC programmable, PNP/NPN
Readiness delay	≤ 2000 ms
Response time typical	< 30 ms
Setting option	DIP switch Vision Software and Firmware Remote Teach

Mechanical data

Design	Rectangular, QT50
Dimensions	46.1 x 74.1 x 99.7 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	100 years acc. to SN 29500 (Ed. 99) 40 °C
Approvals	CE, UKCA

received, then this has a runtime delay as with 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
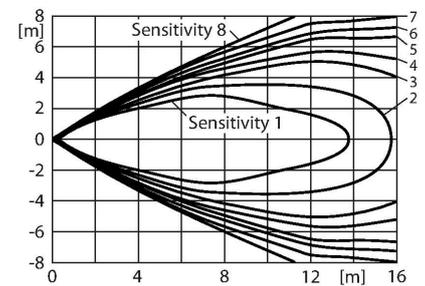
Accessories

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