

# SENSOR | OQSX-G2

Product No.: OQSXG2-I-DD-02-5



## PRODUCT DESCRIPTION

Tan Delta's OQSx-G2 is the world's most advanced real-time oil condition sensor delivering a unique insight into the current status of your equipment. Easily fitted, the OQSx-G2 will continuously monitor, measure and report actual oil condition with absolute accuracy and reliability with simple plug & play data interface into your existing display and monitoring systems.

The OQSx-G2 works with any oil type, mineral/synthetic, and can be fitted to any engine, gearbox, hydraulic or electrical transformer system whilst in full operation. Our unique FSH™ oil condition monitoring technology ensures any wear and or contamination is instantly detected, measured and reported with an oil quality change sensitivity detection of 0.001% (10ppm) with an accuracy margin of +/-0.5%

Simple to install and use, the OQSx-G2 provides unique insight into the condition of your equipment, helping you prevent unnecessary breakdowns, eliminate unnecessary maintenance and reduce your operating costs.

## KEY FEATURES

- **FULL SPECTRUM HOLISTIC (FSH™)**

Detects all and any wear and contamination: water, acid, fuel, viscosity, different oil types, carbon, particles etc.

- **ABSOLUTE ACCURACY**

The FSH technology within our sensor enables it to have a oil quality change sensitivity detection of 0.001% (10ppm) with an accuracy margin of +/-0.5%.

- **REAL-TIME**

Continuously analyses oil condition on operating equipment and reports oil condition every two seconds.

- **ROBUST & RELIABLE**

Proven around the world for use in even the most extreme industrial and commercial applications.

- **EASY TO INSTALL**

Quick and easy to install on any equipment with plug & play integration with any existing data reporting and display systems.

## BENEFITS

Every equipment operator knows that machine monitoring enables effective management and thus increased reliability, efficiencies and profits. Oil condition monitoring with Tan Delta takes this to a new level through much greater insight into the real condition of your equipment, delivering significantly enhanced financial and operating benefits.

- **REDUCE MAINTENANCE COSTS**

Eliminate unnecessary maintenance and equipment downtime by precisely identifying oil end-of-life and reliably predicting optimal maintenance schedules.

- **REDUCE BREAKDOWNS & DAMAGE**

Improve efficiency and extend the life of your equipment by ensuring optimal oil condition and reliable early detection of potential issues before wear particles are present and damage has already occurred.

- **REDUCE OIL SAMPLING**

Significantly reduce time consuming oil sampling and costly laboratory analysis.

## TECHNICAL DATA

### PRODUCT INFORMATION

Name	Gen 2 - Oil Quality Sensor
Product Number	OQSxG2-1-DD-02-5

### PHYSICAL

Material	Stainless Steel AISI304
Dimensions	102mm x 36mm (L x W)
Weight	180g
Connection	32mm AF Hex Collar
Torque	25N.m

### AVAILABLE THREADS

Thread	Seal
1/2" BSPP	Dowty Type
1/2" NPT	n/a
7/8" UNF	'O' Ring
M18	Dowty Type

(Alternative threads available upon request)

### CONNECTIONS

Connector	6 pin Bulgin 4000 series
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### ELECTRICAL

Supply	+9-30V DC
Consumption	0.4w Average

### DATA OUTPUT/INPUT

Digital Output	RS485, CANbus
Protocols Supported	Modbus, CanOpen and J1939
Analog Output	4-20mA

### OIL QUALITY DETECTION PARAMETERS

Frequency	Every 2 seconds
Output	Tan Delta Number (TDN) Oil Temperature (C or F)
Sensitivity / Accuracy	0.001%, +/-0.5%
Elements	All wear and contamination

### OIL TYPE

Configuration	Any mineral, semi-synthetic or synthetic oil, including fuels (diesel & bio-diesel)
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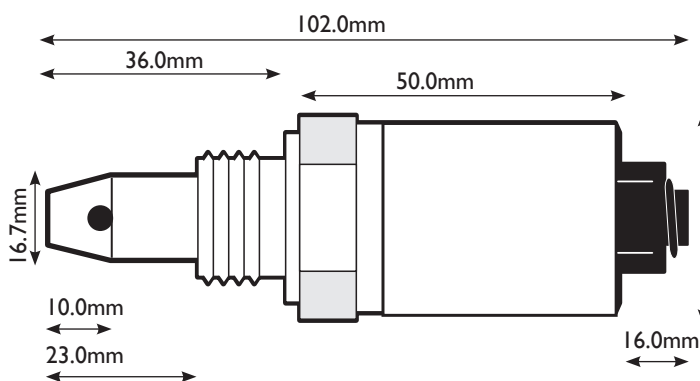
### ENVIRONMENTAL

Operating Temperature	-40°C (-40°F) to +120°C (+248°F)
Calibrated Temperature	-20°C (-4°F) to +120°C (+248°F)
Fluid Temperature	-40°C (-40°F) to +120°C (+248°F)
Fluid Pressure	up to 70 bar (1015 psi)
Storage Temperature	-55°C (-67°F) to +150°C (+302°F)

### STANDARDS & CERTIFICATION

Water & Dust	IP68 when connected
Shock & Vibration	BS EN 60068-2-30 (Test Db - Cyc.Hum.) BS EN 60068-2-6 (Test Fc - Sine Vib.) BS EN 60068-2-27 (Test Ea - Mech. Shock)
EMC	EN 61000-6-4:2007 (Generic Emissions Standard for Industrial Environments) EN 61000-6-2:2005 (Generic Immunity Standard for Industrial Environments)
Conformity	CE Marked RoHS Compliant

## DIMENSIONS & CONNECTION



①	+9-30V DC
②	Oil Temperature - 4-20mA
③	Oil Condition - 4-20mA
④	RS485A / CANL
⑤	Ground / 0V
⑥	RS485B / CANH

## WHY TAN DELTA

Tan Delta's advanced real-time oil condition monitoring is used by equipment owners around the world to improve reliability and reduce costs. Our core FSH technology delivers exceptional real-time oil analysis and condition insight. From wind turbines and ships to mining trucks and railways, Tan Delta real-time oil condition monitoring solutions are proven to deliver substantial operational and financial benefits. Our products are easy to install and use on any equipment and are fully supported by our dedicated support team.



Tan Delta provide OEM equipment manufacturers with fully customised integrated and cost optimised solutions. Please contact us directly to discuss your oil condition requirements.

# SENSOR | OQSEXG2 - ATEX

Product No.: OQSExG2-I-DD-02-5



## PRODUCT DESCRIPTION

The OQSExG2 is ATEX Zone 2 certified, providing operators with unmatched real-time oil condition monitoring and equipment status insight, designed for deployment on equipment operating in hazardous areas. Tan Delta's core technology enables real-time monitoring of synthetic or mineral oil, in any industrial application. Any change in quality or condition, caused by wear and/or contamination is instantly detected, accurately measured and reported. The OQSExG2 is designed for flexible integration with different head thread sizes to fit any inspection plug point, and multiple data outputs, CANBUS, MODBUS, 4-20mA for plug and play integration.

## KEY FEATURES

- **FULL SPECTRUM HOLISTIC (FSH™)**  
Detects all and any wear and contamination: water, acid, fuel, viscosity, different oil types, carbon, particles etc.
- **EXTREMELY SENSITIVE**  
Certified detection and measurement sensitivity of 0.001%. Even the smallest change is detected enabling early detection of issues before equipment damage.
- **REAL-TIME**  
Continuously analyses oil condition on operating equipment and reports oil condition every two seconds.
- **ROBUST & RELIABLE**  
Quality engineered from AISI304 stainless steel. IP67 rated, suitable for deployment on any equipment including ATEX Zone 2.
- **FULLY CERTIFIED**  
The OQSExG2 is fully certified, ATEX approval to BS EN 60079-0:2012 and BS EN 60079-11:2013 Ex ic IIA T3 Gc.

## BENEFITS

- Every equipment operator knows that machine monitoring enables effective management and thus increased reliability, efficiencies and profits. Oil condition monitoring with Tan Delta takes this to a new level through much greater insight into the real condition of your equipment, delivering significantly enhanced financial and operating benefits.
- **OPTIMISE SERVICE INTERVALS**  
Eliminate unnecessary maintenance and equipment downtime by precisely identifying oil end-of-life and reliably predicting optimal maintenance schedules.
  - **REDUCE CATASTROPHIC FAILURE**  
Ensuring optimal oil condition and reliable early detection of potential issues before wear particles are present and damage has already occurred by tracking real-time changes in oil quality.
  - **REDUCE RISK**  
Significantly reduce risks associated with inspections at heights, confined and remote assets or assets in explosive areas.

## TECHNICAL DATA

### PRODUCT INFORMATION

Name	ATEX Oil Quality Sensor
Product Number	OQSEx-G2-I-DD-02-5

### PHYSICAL

Material	Stainless Steel AISI304
Dimensions	118mm x 46mm (L x W)
Weight	160g
Connection	32mm AF Hex Collar
Torque	25N.m

### AVAILABLE THREADS

Thread	Seal
1/2" BSPP	Dowty Type
1/2" NPT	n/a
7/8" UNF	'O' Ring
M18	Dowty Type

(Alternative threads available upon request)

### CONNECTIONS

Glanded Sensor	With integral 2m Cable
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### ELECTRICAL

Supply	+9-30V DC
Consumption	0.4w Average

### DATA OUTPUT/INPUT

Digital Output	RS485, CANBus
Protocols Supported	Modbus, CANOpen and J1939

### OIL QUALITY DETECTION PARAMETERS

Frequency	Every 2 seconds
Output	Tan Delta Number (TDN) Oil Temperature (C or F)
Sensitivity / Accuracy	0.001%, +/-0.5%
Elements	All wear and contamination

### OIL TYPE

Configuration	Any mineral, semi-synthetic or synthetic oil, including fuels (diesel & bio-diesel)
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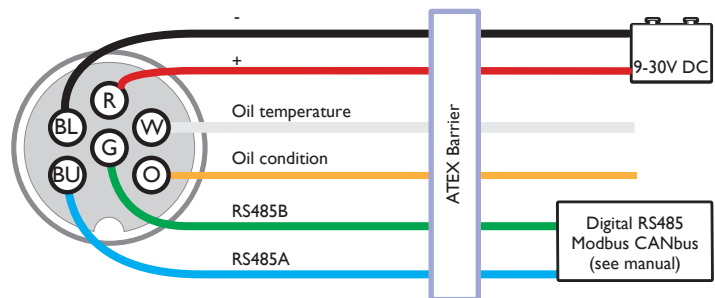
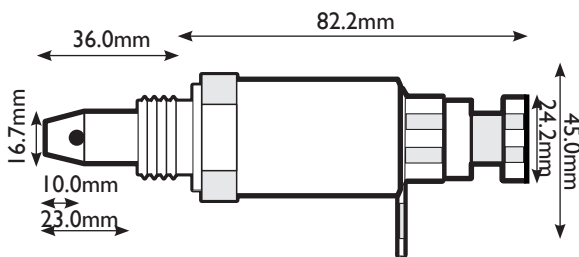
### ENVIRONMENTAL

Calibrated Temperature	-20°C (-4°F) to +120°C (+248°F)
Operating Temperature	-40°C (-40°F) to +120°C (+248°F)
Fluid Temperature	-40°C (-40°F) to +120°C (+248°F)
Fluid Pressure	up to 70 bar (1015 psi)
Storage Temperature	-55°C (-67°F) to +150°C (+302°F)

### STANDARDS & CERTIFICATION

Water & Dust	IP67 when connected
Shock & Vibration	BS EN 60068-2-30 (Test Db - Cyc.Hum.) BS EN 60068-2-6 (Test Fc - Sine Vib.) BS EN 60068-2-27 (Test Ea - Mech. Shock)
EMC	EN 61000-6-4:2007 (Generic Emissions Standard for Industrial Environments) EN 61000-6-2:2005 (Generic Immunity Standard for Industrial Environments)
ATEX	Zone II approval to BS EN 60079-0: 2012 and BS EN 60079-11:2013 Ex ic IIA T3 Gc
Conformity	CE Marked RoHS Compliant

## DIMENSIONS



## WHY TAN DELTA

Tan Delta's advanced real-time oil condition monitoring is used by equipment owners around the world to improve reliability and reduce costs. Our core FSH technology delivers exceptional real-time oil analysis and condition insight. From wind turbines and ships to mining trucks and railways, Tan Delta real-time oil condition monitoring solutions are proven to deliver substantial operational and financial benefits. Our products are easy to install and use on any equipment and are fully supported by our dedicated support team.



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# KIT | EXPRESS DISPLAY

Product No.: OQ-EXP-I-G2



## PRODUCT DESCRIPTION

A complete real time oil condition monitoring kit that is ideal for a single stand alone installation on any equipment.

The Express Display kit comprises of 1 x OQSx-G2 oil condition sensor, 1 x Config cable and application, 1 x 3 meter display to sensor connector cable, 1 x 3 meter Express power cable and 1 x OQDe Express display unit.

Please see individual product data sheets for detailed specifications.

## KEY FEATURES

### • CONFIGURABLE OIL QUALITY ALERTS

Configurable traffic light alert system provides simple visual oil quality reference.

### • DATA LOGGER

Continuously logs up to 800,000 records of oil quality data which can be downloaded for analysis.

### • ESSENTIAL INFORMATION

Displays oil quality, temperature and rate of change in real time.

### • FULL SPECTRUM HOLISTIC (FSH™)

Detects all and any wear and contamination: water, acid, fuel, viscosity, different oil types, carbon, particles etc.

### • BLUETOOTH CONNECTIVITY

Stored data can be easily downloaded and sent wherever needed.

### • INDEPENDENTLY TESTED

Has undertaken rigorous independent testing to verify the outstanding performance in a wide variety of applications.

## BENEFITS

Every equipment operator knows that machine monitoring enables effective management and thus increased reliability, efficiencies and profits. Oil condition monitoring with Tan Delta takes this to a new level through much greater insight into the real condition of your equipment, delivering significantly enhanced financial and operating benefits.

### • REAL-TIME DATA

Insight into potential failure modes through real-time trending and analysis of data.

### • REDUCE UNPLANNED DOWNTIME

Reliable early detection of potential issues before wear particles are present and damage has already occurred, allows you to pinpoint optimal maintenance prior to breakdowns.

### • FLEXIBLE & EASY TO USE

Deploy on any equipment operating in any environment - stand alone display/data logging or integration with existing monitoring systems.

## TECHNICAL DATA

### PRODUCT INFORMATION

Name	OQD Express (OQDe) Kit
Product Number	OQ-EXP-I

### PHYSICAL - SENSOR

Material	Stainless Steel AISI304
Dimensions	102mm x 36mm (L x W)
Weight	180g
Connection	32mm AF Hex Collar
Torque	25N·m
Connector	6 pin Bulgin 4000 series
Threads	Several available on request, including: 1/2" BSPP, 1/2" NPT, 7/8" UNF, M18

### PHYSICAL - DISPLAY

Material	Heat resistant polycarbonate
Dimensions	151mm x 66mm x 42mm (L x W x H)
Weight	300g

### DATA LOGGING

Storage Capacity	<800,000 records
Logging Interval	1 minute to 45 days, 5 minutes fixed
Battery Backup	~10 years
Data Download	Digital or Bluetooth
Real Time Clock	Yes

### ELECTRICAL

Supply	+9-30V DC
Consumption	0.4w Average

### DATA OUTPUT/INPUT

Digital Output	1xRS485: 9600 baud half duplex to sensor 1xRS485: 512000 baud half duplex from display
Analog Output	4-20mA

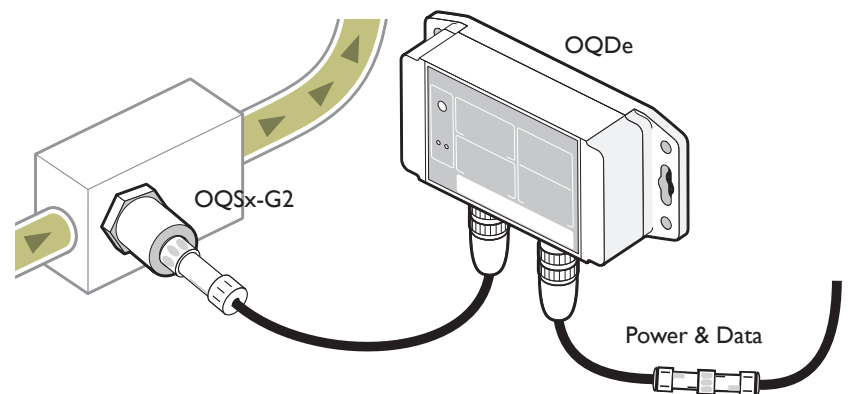
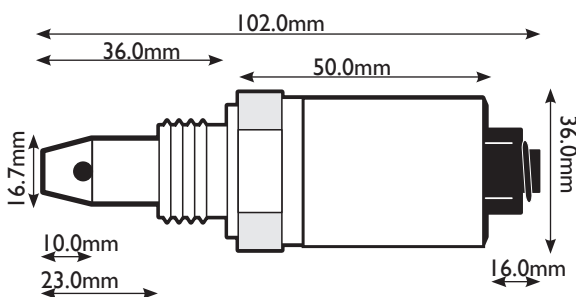
### ENVIRONMENTAL

Sensor Temperature	-40°C (-40°F) to +120°C (+248°F)
Fluid Temperature	-40°C (-40°F) to +120°C (+248°F)
Fluid Pressure	up to 70 bar (1015 psi)
Storage Temperature	-55°C (-67°F) to +150°C (+302°F)

### STANDARDS & CERTIFICATION

Water & Dust	IP67 when connected BS EN 60529:1992+A2:2013
Shock & Vibration	BS EN 60068-2-30 (Test Db - Cyc.Hum.) BS EN 60068-2-6 (Test Fc - Sine Vib.) BS EN 60068-2-27 (Test Ea - Mech. Shock)
EMC	EN 61000-6-4:2007 (Generic Emissions Standard for Industrial Environments) EN 61000-6-2:2007 (Generic Immunity Standard for Industrial Environments) EN 300 328 v1.8.1. (Transferable Electromagnetic Compatibility for Wideband Data Transmission Equipment operating in the 2.4GHz ISM Band and using Wideband Modulation Techniques.)
Conformity	CE Marked RoHS Compliant

## DIMENSIONS, INSTALL & CONNECT



## WHY TAN DELTA

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# ACCESSORY | GATEWAY (OQTG)

Product No.: OQA-TDG-I



## PRODUCT DESCRIPTION

The Oil Quality Gateway (OQTg) is a sophisticated industrial data communications modem solution that enables data from your OQSx-G2 sensors to be any online M2M / IOT monitoring system such as Tan Delta Online.

OQTg enables data transmission using a variety of methods depending upon location and network availability. These include cellular, WiFi and Ethernet.

## KEY FEATURES

### • SYSTEM INTEGRATION

The OQTg can support 10 sensors simultaneously, and the cables can be varying lengths to ensure easy installation, integration and operation.

### • CONNECTIVITY TO TD-ONLINE

A data hub and dashboard view of monitored assets and alerts you to developing issues prior to any equipment damage or lost production. The interface is similar across desktop/tablet/smart phone views for ease of use

### • SIMPLE TO DEPLOY

Allowing quick and simple installation on any piece of equipment whether brand new or being installed as part of a retrofit.

### • INDUSTRIAL QUALITY

IP67 rated, suitable for installation in any harsh commercial or industrial environment.

### • INDEPENDENTLY TESTED

The OQTg has undergone rigorous independent testing to verify it's outstanding performance in a wide variety of applications.



## BENEFITS

Every equipment operator knows that machine monitoring enables effective management and thus increased reliability, efficiencies and profits. Oil condition monitoring with Tan Delta takes this to a new level through much greater insight into the real condition of your equipment. Delivering significantly enhanced financial and operating benefits.

### • MONITOR ALL SITE ASSETS

Connect up to 10 OQSx-G2 sensors using the Gateway and modular cabling system, enabling you to view the health status and location of your entire fleet of assets at click of a button.

### • REDUCE BREAKDOWNS & DAMAGE

Improve efficiency and extend the life of your equipment by ensuring optimal oil condition and reliable early detection of potential issues before wear particles are present and damage has already occurred.

### • EXTEND OIL DRAIN INTERVALS

Safely extend oil-life and drain intervals by monitoring real-time degradation, and conduct maintenance when there is actual need rather than on an 'hours run' basis.

## TECHNICAL DATA

### PRODUCT INFORMATION

Name	Oil Quality Gateway (OQTg)
Product Number	OQA-TDG-I

### PHYSICAL

Enclosure	Glass reinforced plastic
Dimensions	149mm x 135mm x 58mm (L x H x W)
Weight	400g

### CONNECTIONS

Antenna Connector	FAKRA antenna
System Connector	TE 776163-1 (35 pins) microSD card slot
Other	MicroSD card slot Micro SIM slot USB host 2.0 Wifi 2.4GHz Ethernet 10/100 BaseT

### GSM / GPRS

GSM	GSM850 + EGSM900 + GSM1800 + GSM1900 Class 4 (2W) GSM850/EGSM900 Class 1 (1W) GSM1800/GSM1900
GPRS	GPRS Class B, Class 10 (4+2) Audio and CSD Data calls SMS (MT/MO) Optional HSPA+ (3G) and LTE (4G) support

### GNSS POSITIONING

Receiver	GPS L1 frequency, C/A code *56 channels* continuous tracker receiver GALILEO L1 openservice and GLONASS ready *
SBAS	WAAS, EGNOS, MSAS, GAGAN

Accuracy	2.5 meters CEP
Signal Acquisition	Cold Start: 29 sec* Warm Start: 28 sec* Hot start < 1 sec Reacquisition < 1 sec Active Antenna

### POWER

Supply	+3.0V @ 30mA
Nominal Range	7V to 48V
Batteries	Standard backup battery for RTC. Duration 10 years. Optional rechargeable Battery Li-Ion 3.7V at least 2600mAh. Inserted via rear battery cover.

### SYSTEM SPECS & CPU

ARM cortex A8	800MHz clock speed
LINUX OS	Kernel 4.4
RAM	512MByte DDR3
NAND Flash	1 GByte
Additional Storage	32GB+ with MicroSD card

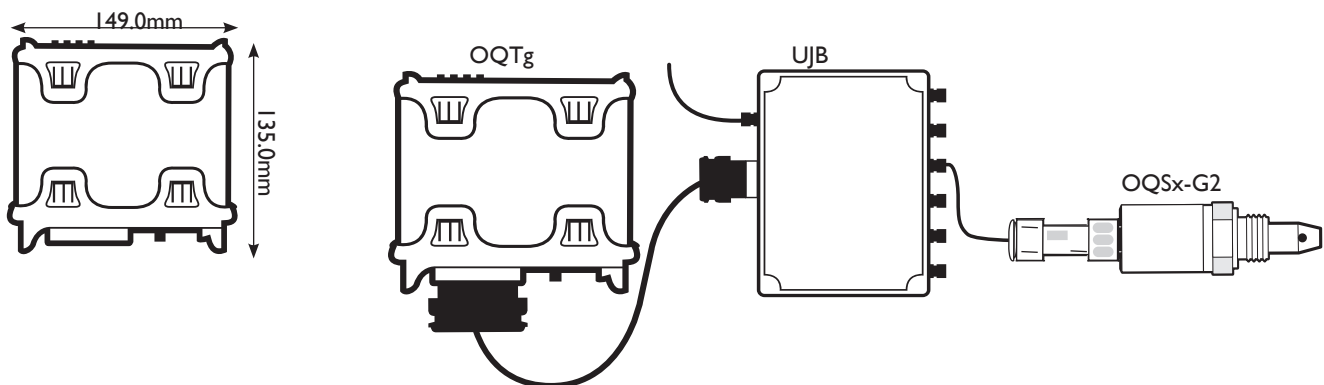
### ENVIRONMENTAL

Storage Temperature	-40°C to +85°C (-40°F to + 185°F)
Operating GSM Off	-40°C to +85°C (-40°F to + 185°F)
Operating GSM On	-30°C to + 80°C (-22°F to + 176°F)
Li-On Battery	-20°C to + 60°C (-4°F to +140°F) (re-charge 0°C to + 45°C, 113°F)

### STANDARDS & CERTIFICATION

Conformity	CE Marked E - Automotive Zulassung entsprechend Kfz-EMV-Richtlinie R & TTE RoHS Compliant
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## DIMENSIONS, INSTALL & CONNECT



\*The OQTg can be connected as part of a wider modular cabling system. Details provided separately.

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