

DynamiQ MG2400 series

Gas chromatograph for
on-line mudlogging analysis



DynamiQ MG2400 series

Gas chromatographs

The DynamiQ-X MG2400 series provides fast and accurate on-line monitoring of mudlogging gases, enabling the quantification of hydrocarbons from C1 to C5 and comprehensive analysis up to C8.

The analyzer is extremely compact while its capabilities are massive. The applied micro GC chips enable analysis times of seconds.

Available with housing options for hazardous and non-hazardous areas, it is designed for deployment anywhere in the world.



DynamiQ-X universal



DynamiQ-S

Areas of application

Effective mudlogging relies on rapid and reliable gas composition data. DynamiQ gas analyzers are purpose-built for drilling applications, providing continuous C1-C8 hydrocarbon analysis of gases extracted from drilling mud. Near real-time analytical results help geologists and drilling engineers better understand subsurface conditions and make informed operational decisions.

Key applications include:

- Reservoir characterization and formation evaluation
- Hydrocarbon identification and gas ratio calculations
- Geosteering support
- Early detection of formation changes
- Continuous gas logging and wellsite reporting

Optimized for mudlogging samples

The DynamiQ MG2400 series provides optimized configurations for accurate and rapid mudlogging gas analysis, whether water vapor is removed from the sample gas or remains present during measurement.

Helium and Hydrogen

All DynamiQ MG2400 series configurations can be equipped with an optional unit for precise and reliable helium and hydrogen quantification, complementing standard mudlogging gas analysis.

DynamiQ-X for harsh environments

Ready for demanding conditions, DynamiQ-X analyzers feature a marine-grade aluminum IP65 enclosure for reliable operation in hazardous areas and harsh environments, such as offshore installations. With a compact volume of only 10 liters and a weight of less than 15 kg, the analyzers are easy to transport and deploy wherever local power and gas supplies are available.

DynamiQ-S is compact and efficient for mobile labs

The DynamiQ-S combines compact dimensions with high analytical performance, making it ideal for mobile laboratory installations. With a volume of only 4 liters and a weight of less than 8 kg, DynamiQ-S analyzers are easy to transport and deployable wherever local power and gas supplies are available.

DynamiQ micro GC gas analyzers

Very short analysis times

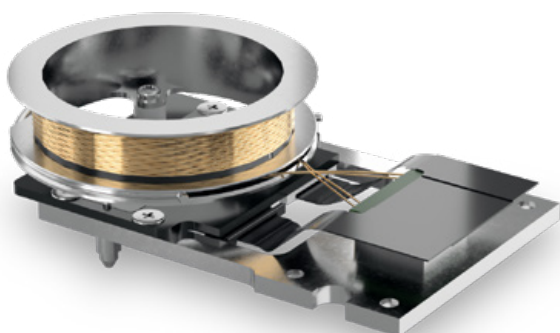
The DynamiQ micro GC gas analyzers accommodate multiple gas chromatograph (GC) units working in parallel, each performing a different GC analysis under individually optimized conditions. Each GC unit contains a state-of-the-art microchip-based injector and a thermal conductivity detector (TCD) combined with a proven microbore GC column and is set with optimal chromatography conditions. This enables a compact instrument as well as short analysis times of 21 seconds for C1 – C5 analysis and 61 seconds for C1 – C8 analysis.

Rapid deployment

With pre-loaded methods at the factory, the DynamiQ MG2400 series are ready for calibration and deployment in the field for mudlogging analysis. This minimizes setup time and allows operators to start measurements quickly and efficiently.

Continuous monitoring

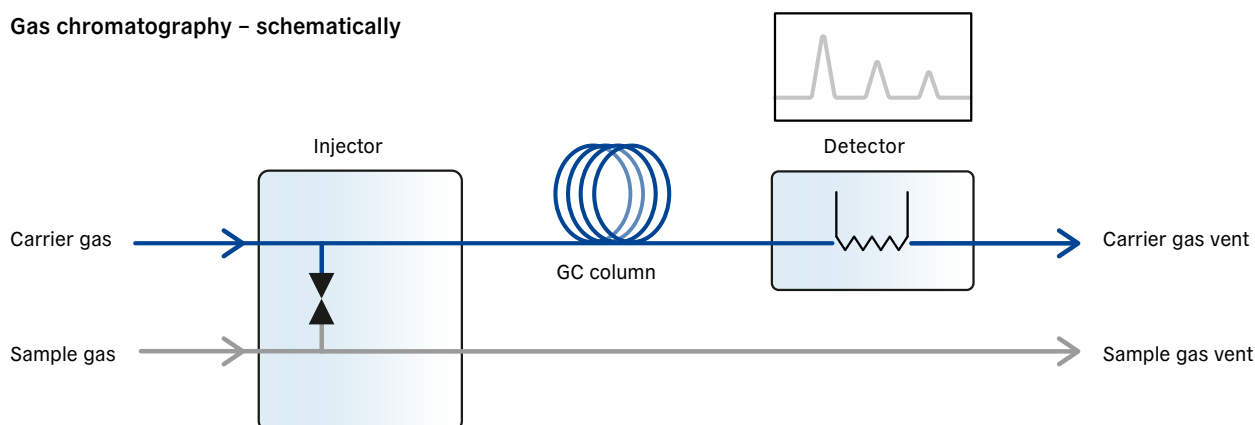
The instrument is designed for continuous monitoring and works therefore stand-alone using the integrated processor on a future-proof operating system based on Linux RT, without the need for a separate controller giving commands. In addition, dedicated DynamiQ PC software can be used to analyze the collected data in further detail and to change operation settings. The PC can be connected to the analyzer at any location via a network connection.



DynamiQ's micro Gas Chromatography

The gas analysis is realized by means of gas chromatography, a proven analysis method for determining the chemical composition of a gas mixture. A small volume of the sample gas is injected into the carrier gas and this mixture flows through a 'GC column', where the gas components are separated and individually detected, resulting in a so-called chromatogram. From this chromatogram, the components concentrations are calculated.

Gas chromatography – schematically



Tubeless analyzer

A one-piece manifold replaces tubing found in traditional GCs. This adds to the robustness and performance of the analyzer, as fewer connections reduce possible sources of leakage. In fact, the GC column is the only 'tube' inside the instrument.

Fast exchange of cartridges

The cartridge is an exchangeable part, containing the GC units, which can be replaced by the end user. The replacement is simple and can be done within 10 minutes. In about 2 hours after cartridge replacement, the DynamiQ analyzers are fully operable again.

Stream selector

The analyzer has a built-in stream selector to connect up to 4 streams and/or calibration gas bottles. This integrated stream selector switches between the different gas inlets, so only one stream is introduced into the analyzer at a time. The stream selector has a double block and bleed design so there are virtually no history or cross contamination effects between the different gas streams.

After the stream selector, the selected sample gas together with the carrier gas is led in parallel through all GC units. In addition, an external (VICI) 16 port multi stream selector can be connected and controlled from the software.

Injector

Time-controlled injection is used, with an integrated array of pneumatically controlled micro membrane valves. This makes injection extremely accurate and reproducible, and provides short analysis times.

Detector

The in-house fabricated detector chip is a thermal conductivity detector (TCD), a robust device featuring simplicity, a large dynamic range, a general response to both organic and inorganic species and a non-destructive character. The temperature-controlled micro TCD – with 2x24 bit digital detector electronics – automatically adapts for different gases and is protected against overheating. Qmicro's microchip TCD technology results in low detection limits below 1 ppm.



DynamiQ-X easy-connect



Exchangeable GC cartridge

Back-flush-to-vent

The DynamiQ MG2400 series are equipped with back-flush-to-vent technology. This increases the analytical column lifetime because polluting or reactive components are prevented from entering the column. Analysis of C1 – C5 can be done in 21 seconds and C1 – C8 analysis in 61 seconds.

Fastloop

To be able to follow changes in the gas composition in near real-time, the DynamiQ analyzers feature a fastloop. For sample flow refreshment, the fastloop increases the incoming sample flow by connecting a parallel gas channel which reduces overall resistance of sample flow.

Low carrier gas consumption

The gas port connections are 1/16" VICI Valco fittings. Typical carrier gas consumption is less than 15ml/minute during an analysis. Helium is the standard carrier gas for mudlogging applications. For configurations equipped with optional helium and hydrogen quantification, the dual-carrier-gas design allows nitrogen to be connected as a second carrier gas.

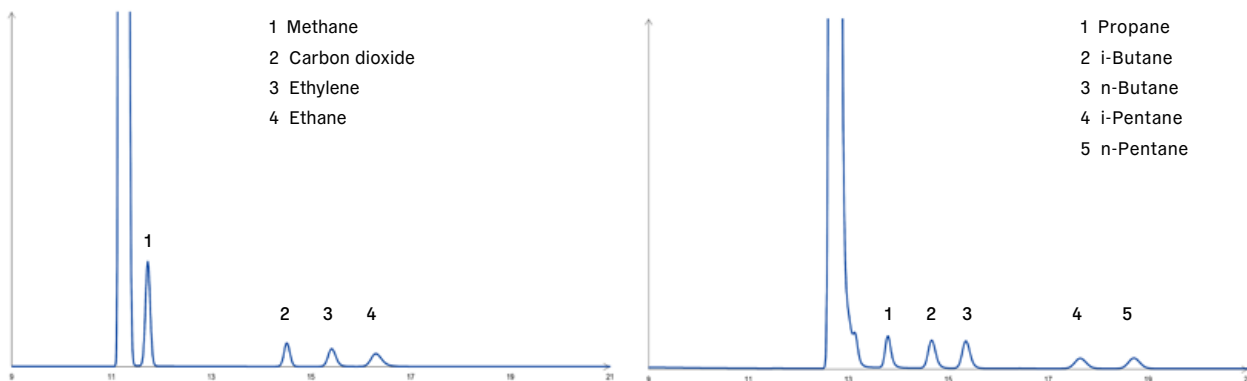
DynamiQ-X easy-connect and universal options

ATEX/IECEx-certified DynamiQ-X easy-connect analyzers feature an Ex connector, allowing the cable to be easily disconnected and removed for greater flexibility during installation and transport. DynamiQ-X universal analyzers feature a permanently attached Ex cable, ATEX/IECEx/cQPSus Class 1 Div 1 certification, and a Type 4X enclosure rating. Both models feature a rugged, marine-grade aluminum IP65 enclosure for reliable operation in hazardous areas and harsh environments.

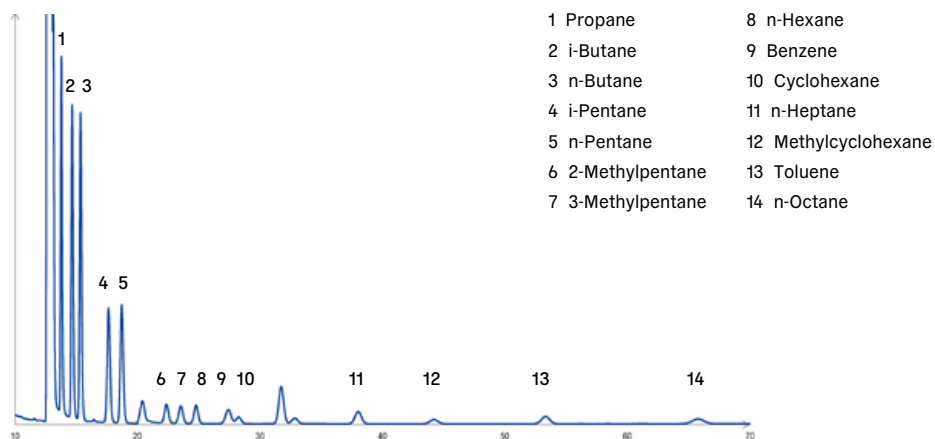
Optimized for dry gas streams

With water vapor removed before analysis, the compact 2-unit GC delivers C1-C5 results in only 21 seconds and C1-C8 analysis in 70 seconds. An optional third GC unit provides even faster analysis and comprehensive component coverage.

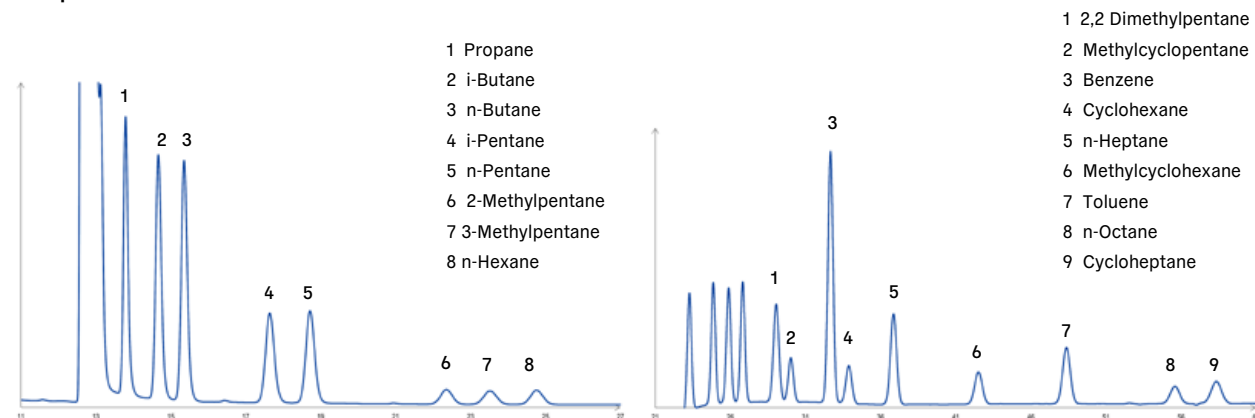
C1-C5 in 21 seconds



C1-C8 in 70 seconds



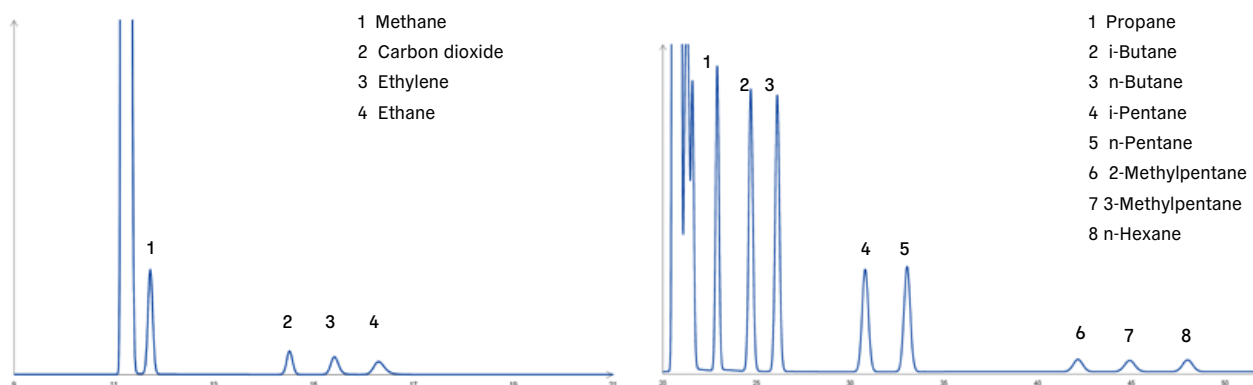
Comprehensive C1-C8 in 61 seconds



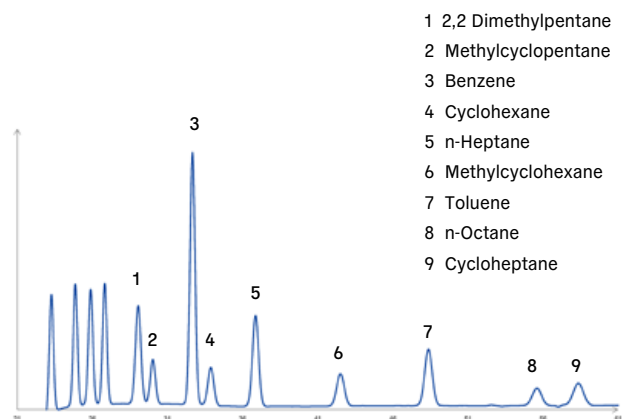
Designed for samples containing water vapor

No sample drying available? No problem. The analyzer handles gas streams containing non-condensing water vapor while delivering C1–C5 analysis in just 35 seconds and comprehensive C1–C8 analysis in only 61 seconds.

C1-C5 in 35 seconds

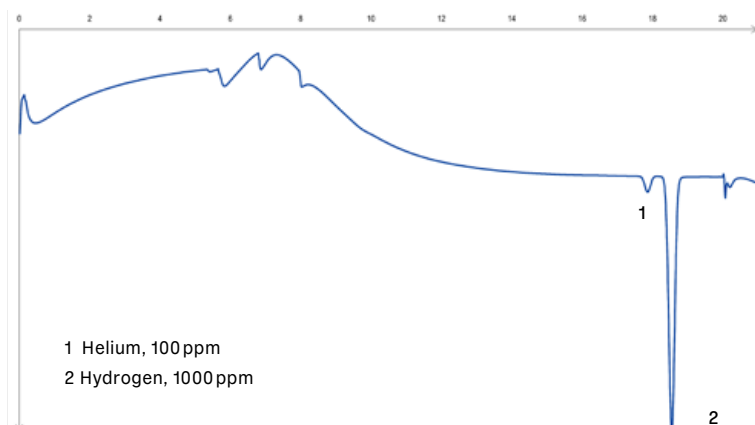


Comprehensive C1-C8 in 61 seconds



Optional helium and hydrogen monitoring

An optional GC unit can be added to any configuration to enable precise and reliable helium and hydrogen measurements. Using nitrogen as a second carrier gas, the additional unit delivers results in as little as 21 seconds while extending the analyzer's capabilities beyond hydrocarbon analysis.



Operation and data processing

Stand-alone operation

The DynamiQ MG2400 series are designed for on-line continuous monitoring and work therefore stand-alone and unattended.

Data processing and communication

The detector data is processed by an integrated processor. The autonomous instrument generates data that can be communicated to external systems via MODBUS or other supported protocols over RS485, RS232 or Ethernet interfaces. Digital I/O interfaces are also available. The DynamiQ MG2400 series integrates easily with supervisory systems, including SCADA platforms.

DynamiQ PC software solutions for enhanced performance

The DynamiQ MG2400 series come with two powerful software packages. DynamiQ Explorer offers efficient troubleshooting with easy-to-use tools for quick issue resolution, saving time and effort. It also provides advanced features for method optimization. DynamiQ Process, which is WELMEC 7.2 compliant, enhances security with password management and limited access levels. Its user-friendly interface simplifies workflows, reduces errors, and saves time.

The DynamiQ PC software is able to:

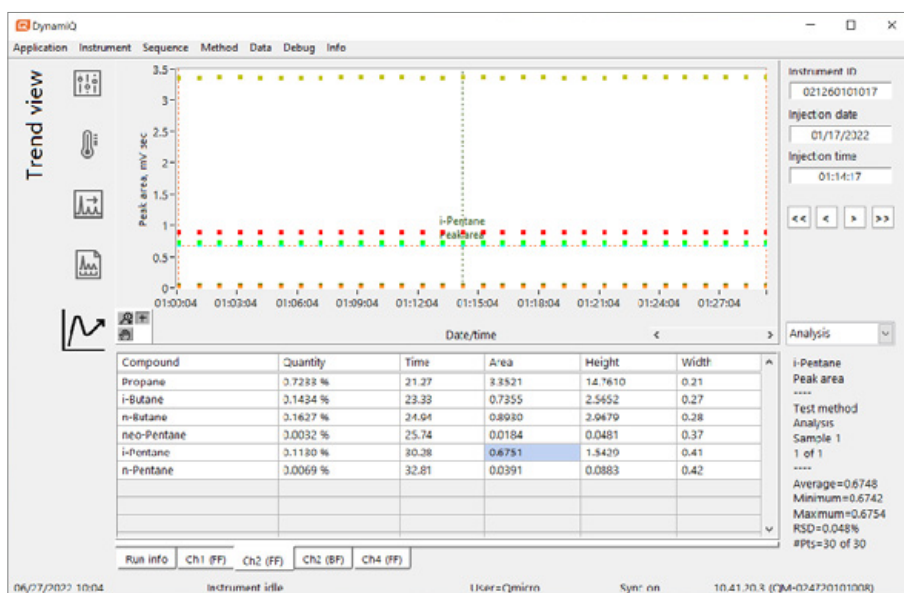
- View and change instrument and method settings;
- Perform calibration and/or validation runs;
- Perform multi-level calibration with polynomial fitting;
- Store factory method and calibration;
- Enable locked state to prevent tampering;
- Enable automatic run mode;
- Analyze collected data in detail;
- Show trend plots of measurement data and calculated results.

Trends

The software is able to show a trend plot for the results of a series of analyses for a selected parameter e.g., component quantity, retention time, area or a status parameter of the instrument at run start.

Historical data

All method parameters, analysis results, calibration results, calculated values and alarms can be stored with date and time stamp with a memory storage inside the DynamiQ MG2400 series. This facilitates problem solving, possibly complying with legislation and enables observation of long-term trends.



Accessories

DynamiQ-S power supply with cable

The DynamiQ power connector and supply cable supplies the DynamiQ-S with 24 Volts direct current (max. 75 Watt).

Junction box with easy-connect cable

An optional junction box enables users to use their own cables (e.g., separate power cable and communication cable) for connecting to the DynamiQ-X easy-connect analyzers. It is an Ex electrical junction box to be placed near the DynamiQ-X in the same zone. The box has a pre-assembled cable with a connector for the DynamiQ-X easy-connect receptacle. Inside the box are terminals for wiring and the box has several (customizable) cable glands.

Easy-connect cable (2 m)

All DynamiQ-X easy-connect analyzers contain a receptacle for powering and communication. Optionally, a 2-meter cable with connector and wiring scheme is provided to enable practical outward connections.



Junction box for DynamiQ-X universal

All DynamiQ-X universal analyzers seamlessly connect to the universal Ex junction box, which includes a cable gland for the Ex cable gland assembly of the DynamiQ-X universal analyzer. Inside you will find several threaded holes for customizable cable glands.

The plastic square-shaped Ex electrical junction box is classified as Class I, Div 2 and Groups A, B, C and D T6.

The round, metal Ex electrical junction box is classified as Class I, Div 1 and Groups B, C and D T6.



Protective case

To ensure safe transportation, a robust customized protective case is offered.



Mounting wall plate

Normally, the DynamiQ-X analyzers are wall-mounted with all gas and electrical connections directed downwards. The DynamiQ-X analyzers are supplied with a backplate, enables them to be mounted the instrument to the wall or setup. In addition, an optional mounting wall plate is available which enables quick mounting and removal of the DynamiQ-X MG2400 series.



Vent adapters

An optional vent adapter set with the correct screw thread facilitates connections between a vent line and the instrument.

Fastener set

A complete spare set of screws for the instrument housing is provided, along with fastener set instructions.

DynamiQ display

The DynamiQ display is designed for placement in the same explosive hazardous zones as the DynamiQ-X easy-connect analyzers, providing users with immediate access to the GC.



Carrier gas combiner

In cases where single carrier gas is used, a T-connector enables one connection from the carrier gas bottle to the two carrier gas instruments inlets.

Technical specifications

DynamiQ MG2400 series

Specifications	Values
Component repeatability	0.1% RSD (for concentrations >0.1%)
Cycle time	from 21s
Operating temperature DynamiQ-X	-20 °C to 55 °C / -4 °F to 131 °F
Operating temperature DynamiQ-S	5 °C to 55 °C / 41 °F to 131 °F
Storage temperature	-25 °C to 70 °C / -13 °F to 158 °F
Moisture (non-condensing)	5 to 95%
Dust/water protection DynamiQ-X	IP65 (only valid with receptacle cap / mating connections), Type 4X*
Power supply	20 VDC to 28 VDC
Power consumption	20 W nominal, 75 W max
Dimensions DynamiQ-X	289 × 258 × 122 mm / 11.4 × 10.2 × 4.8"
Weight DynamiQ-X	< 15 kg / 33 lb. (without mounting brackets)
Dimensions DynamiQ-S	250 × 182 × 96 mm / 9.8 × 7.2 × 3.8"
Weight DynamiQ-S	< 8 kg / 17.6 lb.
Gas ports	1/16" VICI
Carrier gas	Helium 5.0 for hydrocarbons and nitrogen 5.0 for helium + hydrogen
Carrier gas input pressure	450 ± 5% kPa
Carrier gas consumption	2-5 ml/minute per GC unit
Sampling	Pressurized (10 kPa to 100 kPa) or atmospheric (optional integrated pump)
Sample streams	4 (optionally more)
Detectors	micro TCD
Detection limit	< 0.5 ppm
Communication protocols	MODBUS over serial or ethernet
Communication ports DynamiQ-X	1× RS-232 2× RS-485 2× Ethernet 1× Digital Input 1× Digital Output
Communication ports DynamiQ-S	1× RS-232 2× RS-485 1× Ethernet 4× Digital Input 4× Digital Output
Memory storage	up to 256 GB
Certifications DynamiQ-X	 0344  II 2G Ex db IIB+H ₂ T4 Gb  CLASS: 1, DIVISION: 1, GROUPS: B, C, D, T4* EMC 2014/30/EU FCC Part 15 Class B
Certifications DynamiQ-S	 0344  CAN/CSA C22.2 No.61010-1, UL 61010-1-UL EMC 2014/30/EU FCC Part 15 Class B

* Universal options only

Contact

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