

QC1F16 **WEBFREX_{NV}** O-type Frame for the Online Thickness Gauge

To help achieve a decarbonized society, the auto industry is shifting to EVs at an accelerated pace. Accordingly, the market for in-vehicle lithium-ion batteries is growing rapidly. To help manufacturers of separator sheets (films), which are a major part of a lithium-ion battery, improve quality and productivity, Yokogawa has developed the QC1F16 O-type frame online thickness gauge as the next-generation platform of the WEBFREX NV series.

MAJOR FEATURES

■ Structural design of the frame

(improving maintainability and measurement accuracy)

H-type steel is used to make the frame lighter and reduce the impact of frame deformation on measurement accuracy under self-weight.

The use of H-type steel also improves manufacturability and maintainability. Previous models used I-type steels in a tapered structure with the thickness decreasing from the center toward both ends between two flanges. Therefore, the parts for the drive mechanism had to be tailored to fit the tapered structure and adjusted after assembling. In contrast, H-type steel allows a planar structure and does not require adjustment after parts assembling, thus reducing the number of parts, assembly man-hours, and environmental load during transportation.

The impact of the change of steel type on frame deflection has been evaluated by structural analyses, and the beam structure has been optimized to maximize the frame stiffness. As a result of the light-weight beam with H-type steel and the improved beam stiffness, the frame deflection has been reduced by 30% as compared with the previous frames.

■ Digitized frame data

(supporting IoT and improving measurement accuracy)

Monitoring circuits and operating circuits have been added on each device in the sensor head and the frame control board to digitize the data from each device and transmit them digitally. As a result, the amount of data handled remotely has increased by more than fifty times as compared with the previous models. Thus, information on the soundness of the frame can be checked in real time on the screens in the operator station without interrupting the operation. This makes it easier to identify the causes of troubles and reduces downtime significantly. It also reduces the sensor tuning time and improves accuracy during start-up and maintenance of the frame.

Moreover, digitized signals reduce the impact of noise, which has been a problem in analog signal transmission.

■ Compliance with regulations and standards in countries which are major producers of lithium-ion batteries

This product complies with chemical regulations (RoHS II and REACH), CE marking, and GB standards.



QC1F16

MAJOR SPECIFICATIONS

● Frame body

Measurement width	: 0.3 to 6.0 m
Measurement system	: Sensor scanning system
Measurement points	: Varies depending on the cross-machine direction (60 to 4000 points)
Pitch width (period)	: Selectable from 0.5, 1.0, 2.0, 2.5, 5.0, 8.0, or 10.0 mm
Head speed	: 1 to 20 m/min.
Sensor head angle	: 0 to 8°
Built-in contact input/output	: 32 points for each of contact input and output (frame)
Contact unit	: 8 points for each of contact input and output (system)
Options	: 8 analog input/output, operation pendant

● Sensor Beta-ray detector

(Beta-ray source is not included in this product.)

Measurement principle	: Beta-ray transmission
Measurement range	: 0 to 5,000 g/m ²
Source container	: Fail-safe rotary shutter-type with a temperature fuse and constant temperature block
Detector	: Ionization chamber, ionization chamber with constant temperature block

● Sensor X-ray detector

Measurement principle	: X-ray transmission
Measurement range	: 0 to 600 g/m ²
X-ray source	: Reflection X-ray tube with a tungsten target. Shutter mechanism is included.
Detector	: Silicon photodiode with constant temperature block

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