

# VIASURE MULTIPLEX

## MERS Coronavirus Real Time PCR Detection Kit

### Pathogen and product description

The first case of Middle East respiratory syndrome (MERS) was reported in Saudi Arabia in 2012. Since then, all cases of MERS have been linked to travel to, or residence in, countries in and near the Arabian Peninsula, including the large outbreak occurred in the Republic of Korea in 2015. The disease is caused by a novel coronavirus named MERS-CoV.

Coronaviruses are enveloped, large single positive stranded RNA viruses classified as a family within the *Nidovirales* order. Four coronavirus genera have been identified: alpha, beta, gamma, and delta. All human coronaviruses belong to alpha and beta genera, and MERS-CoV belong to lineage C beta-coronaviruses.

MERS is considered a zoonotic infection. The virus is believed to be originated in bats thanks to the isolation of other lineage C beta-coronaviruses that are very close phylogenetically. However, camels are thought to be the major reservoir host and the animal source of infection in humans, carrying strains of MERS-CoV identical to human strains. Human-to-human transmission occurs due to close contact, probably via infected person's respiratory secretions.

The clinical symptoms of MERS-CoV infection range from asymptomatic or mild respiratory symptoms to severe acute respiratory disease and death in nearly

40% of infected patients. Typical presentation of the disease includes fever, cough and shortness of breath. Pneumonia and gastrointestinal symptoms are also common findings.

Diagnostic of MERS-CoV can be performed by antibody detection tools as enzyme-linked immunosorbent assay (ELISA) or immunofluorescence assay (IFA), but these methods should always be confirmed by neutralization assays. PCR-based diagnostic tests have also been developed. Proper diagnostic should include two different assays: a screening assay targeting the sensitive RNA upstream of the E gene (*upE*), and a confirmatory assay targeting open reading frames 1b (*ORF 1b*) or preferentially 1a (*ORF 1a*).

VIASURE MERS Coronavirus Real Time PCR Detection Kit is designed for the diagnosis of MERS Coronavirus in clinical samples. The detection is done in one step real time RT format where the reverse transcription and the subsequent amplification of specific target sequence occur in the same reaction well. The isolated RNA target is transcribed generating complementary DNA by reverse transcriptase which is followed by the amplification of a conserved region of the E gene (*upE*) (MERS Coronavirus 1), and the open reading frame 1a (*ORF 1a*) (MERS Coronavirus 2), using specific primers and a fluorescent-labelled probe.



Analytical sensitivity

VIASURE MERS Coronavirus Real Time PCR Detection Kit has a detection limit of  $\geq 10$  RNA copies per reaction (Figure 1 and 2).

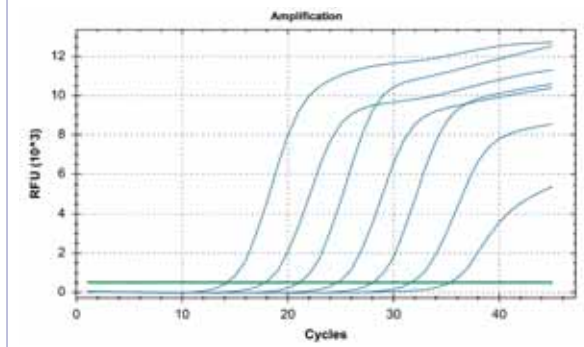


Figure 1. Dilution series of MERS Coronavirus 1 ( $10^7$ - $10^1$  copies/rxn) template run on the Bio-Rad CFX96 Touch™ Real-Time PCR Detection System (channel FAM).

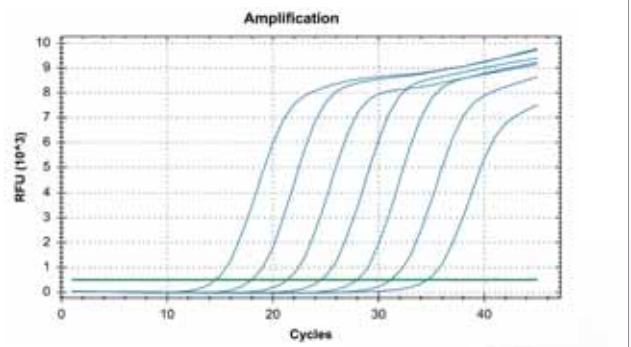
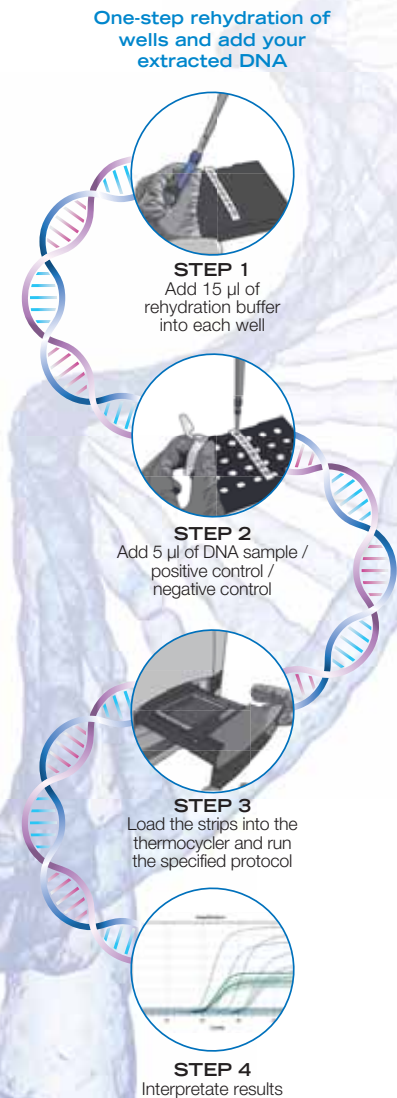


Figure 2. Dilution series of MERS Coronavirus 2 ( $10^7$ - $10^1$  copies/rxn) template run on the Bio-Rad CFX96 Touch™ Real-Time PCR Detection System (channel FAM).

Components

Reagent/Material	Description	Colour	Quantity
MERS Coronavirus 1 8-well strips	A mix of enzymes, primers-probes, buffer, dNTPs, stabilizers and Internal control in stabilized format	White	6/12 x 8-well strip
MERS Coronavirus 2 8-well strips	A mix of enzymes, primers-probes, buffer, dNTPs, stabilizers and Internal control in stabilized format	White	6/12 x 8-well strip
Rehydration Buffer	Solution to reconstitute the stabilized product	Blue	1 vial x 1.8 mL
MERS Coronavirus Positive Control	Non-infectious synthetic lyophilized cDNA	Red	1 vial
Negative Control	Non template control	Violet	1 vial x 1 mL
Water RNase/DNase free	Water RNase/DNase free	White	1 vial x 1 mL
Tear-off 8-cap strips	Optical caps for sealing Wells during thermal cycling	Transparent	6/12 x 8-cap strip

Work Flow



Kit References

Reference	Description
VS-MER106L	VIASURE MERS Coronavirus Real Time PCR Detection Kit 6 x 8-well strips, low profile
VS-MER106H	VIASURE MERS Coronavirus Real Time PCR Detection Kit 6 x 8-well strips, high profile
VS-MER112L	VIASURE MERS Coronavirus Real Time PCR Detection Kit 12 x 8-well strips, low profile
VS-MER112H	VIASURE MERS Coronavirus Real Time PCR Detection Kit 12 x 8-well strips, high profile



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