RealAccurate® Quadruplex Corona-*plus* PCR Kit

Cat. No. PF0971B-R

50 reactions/kit

Instructions For Use

March 2020

Research Use Only

Disclaimer

The RealAccurate® Quadruplex Corona-*plus* PCR Kit is intended for research use only.

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1. Introduction

Coronaviruses (CoVs) affect the respiratory tracts of birds and mammals including humans. They are a causative agent of common cold, bronchitis, pneumonia and severe acute respiratory syndrome (SARS). Human coronaviruses were first discovered in the sixties and have been circulating globally and constantly in children and adults. The outbreaks of the SARS-CoV in 2002/2003 and the Middle East respiratory syndrome (MERS)-CoV in 2012 have demonstrated animal-to-human and human-to-human transmission of newly emerging CoVs.
Recently, a new coronavirus (SARS-CoV-2) was identified causing outbreaks throughout the world. The disease associated with this virus was named COVID-19.

The RealAccurate® Quadruplex Corona-*plus* PCR Kit is a multiplex PCR test to detect and differentiate within 2 hours SARS-CoV-2, MERS and SARS-CoV. It is a one-step reverse transcriptase PCR assay designed for fast pathogen detection on real-time PCR instruments using 4 different detection channels (Green, Yellow, Orange and Red). The viruses detected with the kit are given in Table 1.

Table 1: Overview RealAccurate® Quadruplex Corona-*plus* PCR Kit

PF0971B-R **RealAccurate® Quadruplex Corona-*plus* PCR Kit**
SARS-CoV-2
MERS-CoV
SARS-CoV
Internal Control

Intended Use
The product is for research use only.

The product is for use by laboratory professionals only.

2. Principle of the test

The product is for research use only.

The RealAccurate® Quadruplex Corona-*plus* PCR Kit is a kit that can detect and differentiate Coronaviruses SARS-CoV-2, MERS-CoV and SARS-CoV. The kit contains ready to use primer and probe mixes and the Master mix containing reverse transcriptase and *Taq* DNA polymerase. Because the pathogens detected by RealAccurate® Quadruplex Corona-*plus* PCR Kits are RNA viruses, the assay begins with a reverse transcription step in which the viral RNA is converted into cDNA. Subsequently, the cDNA is subjected to real-time PCR in the same reaction vessel (one-step RT-PCR).

Detection is performed on a real-time PCR instrument, capable of detection of FAM, MAX, Texas Red and TYE665 (see Table 5), such as LightCycler® 480 (Roche), Rotor-Gene® Q (QIAGEN), CFX96™ (Bio-Rad) or Mic qPCR Cycler (Bio Molecular Systems).

In addition, the RealAccurate® Quadruplex Corona-*plus* PCR Kit contains a Positive Control (PC) and an Internal Control (IC). The PC consists of synthetic nucleic acid fragments representing each pathogen detected by this kit. The IC allows for discrimination between

true negative and false negative sample results that may occur due to nucleic acid degradation, PCR inhibition or test failure.

The input sample is total nucleic acids extracted and purified from nasopharyngeal swabs. Nucleic acid extraction is a separate process, outside of the scope of this product. The RealAccurate® Quadruplex Corona-*plus* PCR Kit can be used with nucleic acid samples obtained by NucliSENS® easyMAG® system (bioMérieux) extraction.

3. Target genes

The sequences targeted by the RealAccurate® Quadruplex Corona-*plus* PCR Kit have been selected from conserved genomic regions of the pathogen of interest. Details are presented in Table 2.

Table 2: Target genes selected for the detection of pathogens with the RealAccurate® Quadruplex Corona-*plus* PCR Kit

Product	Pathogen	Gene
PF0971B-R	SARS-CoV-2 MERS-CoV SARS-CoV Internal Control (MS2 phage)	Nucleocapsid protein (N) gene Envelope (E) gene Nucleocapsid protein (N) gene Phage coat / Lysis protein genes

The target amplicons of RealAccurate® Quadruplex Corona-*plus* PCR Kits are detected by measuring the FAM, MAX, Texas Red and TYE665 fluorescence that is emitted following hydrolysis of the respective probes.
Table 3 gives an overview of the fluorescent labels that are used for the detection of the pathogens in the RealAccurate® Quadruplex Corona-*plus* PCR assay.

Table 3: Pathogens and corresponding fluorescent detection labels

Product	Pathogen	Fluorescent label
PF0971B-R	SARS-CoV-2 MERS-CoV SARS-CoV Internal Control	FAM MAX Texas Red TYE665

4. Contents of the kit

The following materials are provided in the kit (Table 4).

Table 4: Materials provided in RealAccurate® Quadruplex Corona-*plus* PCR Kit

Components	Volume	Color of tube	Color of screw cap
Primer/Probe mix	>400 µl	Amber	Green
Master mix	>650 µl	Transparent	White
Internal Control	>800 µl	Transparent	Black
Positive Control	>125 µl	Transparent	Green
Negative Control	>1500 µl	Transparent	Transparent

5. Equipment and reagents to be provided by user

The following equipment and materials are needed to perform the assays:

- RNA/DNA extraction reagents as outlined in section 10
- Real-time PCR instrument* suitable for detection of fluorescent labels as indicated in Table 5, including suitable sterile RNase/DNase free PCR tubes, strips or plates
- Disposable gloves
- Adjustable pipettes*: 0.1–2 µl, 2–20 µl, 20–200 µl, 100–1000 µl
- Disposable tips containing hydrophobic filters
- Vortex mixer
- Sterile RNase/DNase free 1.5 ml vials
- Centrifuge* capable of centrifuging PCR tubes, strips or plates and 1.5 ml vials
- Cooling block or ice

* Remark: these instruments must be checked and calibrated according to the manufacturer's recommendations

6. Storage and handling

The components of the RealAccurate® Quadruplex Corona-*plus* PCR Kit should be stored in the dark at –30 °C to –15 °C. The expiration date is indicated on the label. Repeated thawing and freezing (>10x) should be avoided.
To avoid contamination, we recommend performing the experimental activities in three separate areas.

Area 1: - Preparation PCR mix
Area 2: - Nucleic acid extraction from samples
- Addition nucleic acid extracts to the mix
- Addition of Positive Control to the mix
Area 3: - PCR reactions

7. General recommendations

The following precautions should be taken to both avoid contamination and allow optimal reproducibility of the assays:

- Physically separate the workplaces as outlined in section 6.
- Wear disposable gloves when performing the assay.
- Use **disposable tips** containing hydrophobic **filters** to prevent cross-contamination.
- Use RNase/DNase free PCR vials.
- Thaw **RNA/DNA samples** always on ice and keep them on **ice** or on a **cooling block**.
- Keep **enzymes** always on **ice** or on a **cooling block** when taken out of the freezer. Handle enzymes with care and mix very gently.
- When thawed, **spin down the reagents** for 5 seconds in a centrifuge and mix by gently pipetting up and down.
- The cycling program should be entered in the real-time PCR instrument before performing the assay.
- Always centrifuge PCR vials and plates briefly and open with care to avoid aerosols.

8. Real-time PCR instrument settings

The RealAccurate® Quadruplex Corona-*plus* PCR assay is a one-step reverse transcriptase PCR assay which is designed for fast pathogens' nucleic acid detection on real-time instruments using 4 different detection channels: FAM, MAX, Texas Red and TYE665. In Table 5 the optimal filter settings are given for detection of these 4 fluorescent labels. For each real-time PCR instrument, select the optimal filters for detection of the fluorescent labels used in the RealAccurate® Quadruplex Corona-*plus* PCR Kit.

Table 5: Filter settings for real-time PCR instruments for a RealAccurate® Quadruplex PCR reaction

Fluorescent label	Source	Detector
FAM	495 nm	516 nm
MAX	524 nm	557 nm
Texas Red	598 nm	617 nm
TYE665	645 nm	665 nm

Programming of the instruments should be carried out according to the manufacturer's instructions. Detection in the FAM, MAX, Texas Red and TYE665 channels should be activated. (See section 13 for PCR instrument-specific detection channels).

Measurement data are displayed as sigmoid-shaped plots (when using a linear scale), in which the fluorescence is plotted against the number of cycles. The threshold cycle (C_t) value increases with a decreasing with a decreasing initial amount of template in the reaction. The threshold is set above the baseline, in the log-linear range of the plot. Before determining the C_t value, check whether the threshold is positioned correctly and adjust if necessary.

9. Specimens

Respiratory pathogen detection depends on the collection of high-quality specimens, their rapid transport to the laboratory and appropriate storage before laboratory testing.

Specimens should be transported to the laboratory as soon as possible, aliquoted and processed. The specimens should be kept at 2–8 °C. If specimens cannot be processed within 48 hours, they should be kept frozen at or below –20 °C, preferably –70 °C. The RealAccurate® Quadruplex Corona-*plus* PCR Kit is suitable for nasopharyngeal swabs in Universal Transport Medium.

10. Preparation of specimen RNA/DNA extraction

Sample preparation is a separate process, outside of the scope of this product, therefore suitable methods or products must be used to handle specimens and extract and purify nucleic acids.

The following RNA/DNA extraction method can be used in combination with the RealAccurate® Quadruplex Corona-*plus* PCR Kit:

- NucliSENS® easyMAG® (bioMérieux).

For nucleic acid extraction on NucliSENS® easyMAG® system, the 'Generic 2.0.1' protocol must be used according to manufacturer's instructions. Two hundred (200) µl of sample material is used with on-board lysis and an elution volume of 100 µl is selected. The Internal Control is added according to the manufacturer's instructions (see section 11).

Prevent freeze-thaw cycles of the extracted DNA/RNA and store nucleic acid extracts at 2–8 °C when processed within one day. For longer periods, store the extracted RNA/DNA at –20 °C or –70 °C.

11. Controls

The RealAccurate® Quadruplex Corona-*plus* PCR Kit contains the following assay controls.

- **Internal Control (IC)**

The Internal Control (IC) supplied in the kits, is an MS2 bacteriophage suspension. It serves as a control for lysis, RNA/DNA extraction, the RealAccurate® Quadruplex Corona-*plus* PCR assay performance, and to check for possible PCR inhibition.

It is important to add the IC after the (pre-treated) sample has been mixed with the lysis buffer, regardless of the extraction protocol used. The lysis inhibits RNases and DNases, thus prevents the degradation of the IC.

In the NucliSENS® easyMAG® nucleic acid extraction procedure, the IC provided with the RealAccurate® Quadruplex Corona-*plus* PCR Kit is added to the silica solution.

For 8 samples, the following mix is prepared using step 1 of the NucliSENS® easyMAG® multi-pipet for addition of the silica:

550 µl silica + 55 µl IC + 495 µl H_2O

Using step 2 of the multi-pipet, 125 µl of the mix is dispensed into each of 8 wells of a micro-titer plate. With step 3 of the multi-pipet, 100 µl of the dispensed silica/IC mix is transferred to each NucliSENS®® easyMAG® vessel containing sample material. In this way 5 µl of the IC are added per sample.

If less than 8 samples are processed, the volumes stated in Table 6 can be used.

Table 6. Protocol for spiking the IC to the silica solution.

Samples	Sterile water (µl)	IC (µl)	Magnetic silica (µl)	Total (µl)
1	63	7	70	140
2	126	14	140	280
3	189	21	210	420
4	252	28	280	560
5	315	35	350	700
6	378	42	420	840
7	441	49	490	980
8	495	55	550	1100

In case of a strong infection, the IC PCR curve might not be visible in the final analysis. This is explained by the fact that high amounts of pathogenic nucleic acids consume most of the reagents in the assay. Consequently, when the IC signal is absent in the presence of one or more positive PCR curves, indicating an infection, the assay is still valid.

- **Positive Control (PC)**

The RealAccurate® Quadruplex Corona-*plus* PCR Kit contains a Positive Control.
The Positive Control consists of synthetic DNA fragments of the targets that can be detected by the assay, including the Internal Control. The Positive Control is handled as a regular nucleic acid extract and controls for PCR reagents and real-time PCR protocol. The Positive Control should not be subjected to nucleic acid extraction.

- **Negative Control (NC)**

A negative control in a RealAccurate® Quadruplex Corona-*plus* PCR run consists of 200 µl Negative Control (provided in the kit) or 200 µl negative sample. Negative Control is handled as a regular sample, including the addition of IC, and is a control for contamination in the extraction or test procedure.

12. RealAccurate® Quadruplex Corona-*plus* PCR protocol

12.1 Preparation of the PCR mix

The PCR reaction is performed in a final volume of 25 µl.

Table 7: Preparation of PCR mix

Component	Volume/reaction
Master mix Primer/Probe mix	12.5 µl 7.5 µl
Total Volume	20 µl

Mix the PCR mix gently but thoroughly and dispense 20 µl per sample or control into a PCR vial or well of a PCR strip or plate.
Add 5 µl of template RNA (or Positive Control) to the PCR mix. Close the PCR vials, strips or plates, centrifuge briefly and place the PCR vials, strips or plates in the real-time PCR instrument.

12.2 PCR program

Table 8 shows the PCR cycling program for the RealAccurate® Quadruplex Corona-*plus* PCR reactions.

Table 8: RealAccurate® Quadruplex Corona-*plus* PCR program

Time	Temperature	Function
10 min	50 °C	Reverse transcription
1 min	95 °C	Activation of *Taq* DNA polymerase, inactivation of reverse transcriptase
10 sec 60 sec	95 °C 60 °C	Denaturation Annealing and extension } PCR 40 cycles

13. PCR instrument related issues

- **LightCycler® 480 (Roche)**

When a LightCycler® 480 II is used in combination with the RealAccurate® Quadruplex Corona-*plus* PCR Kit, the detection channels as stated in Table 9 must be selected:

Table 9: Detection channels LightCycler® 480 II

Product	Pathogen	Fluorescent label	Excitation	Emission
PF0971B-R	SARS-CoV-2 MERS-CoV SARS-CoV Internal Control	FAM MAX Texas Red TYE665	465nm 533nm 533nm 618nm	510nm 580nm 610nm 680nm

Result analysis is performed using "Abs Quant/2nd Derivative Max". Color Compensation is applied to the LightCycler® 480 runs to correct for possible cross-talk between detection

channels, using a CC Object created with the RealAccurate® Quadruplex Color Compensation Kit (PFCC-R).

In rare cases, the LightCycler® software calls C_p (crossing point) values which are not in line with the observed real-time PCR results (e.g. a C_p value of 9 in a background fluorescence part of the PCR graph). Therefore, it is recommended to check the C_p values that are generated by LightCycler® 480 software manually.

- **Rotor-Gene® Q (QIAGEN)**

When a Rotor-Gene® Q is used in combination with the RealAccurate® Quadruplex Corona-*plus* PCR Kit, the detection channels as stated in Table 10 must be selected. Gain 5 is selected for all channels.

Table 10: Detection channels Rotor-Gene® Q

Product	Pathogen	Fluorescent label	Channel	Source	Detector	Gain
PF0971B-R	SARS-CoV-2	FAM	Green	465nm	510nm	5
	MERS-CoV	MAX	Yellow	533nm	580nm	5
	SARS-CoV	Texas Red	Orange	533nm	610nm	5
	Internal Control	TYE665	Red	618nm	680nm	5

For a correct analysis of the results, the Yellow channel needs to be normalized to the Green channel: Open the raw channel Cycling A. Yellow. Click on the "Options" button and select "Normalise to Cycling A. Green".

The analysis of the results must be performed with fluorescence presented in logarithmic scale ("Log. Scale" button under the PCR graph) and with activated "dynamic tube" function (default setting). Thresholds must be set per channel using the background fluorescence level of the Negative Control reaction.

It has been noticed that in some cases the fluorescence signal of a PCR curve obtained on a Rotor-Gene® Q instrument decreases during the first cycles of the PCR reaction. An example is given in figure 1. To avoid incorrect C_t calling, the first cycles can be eliminated in the Rotor-Gene® Q C_t calculation during result analysis.

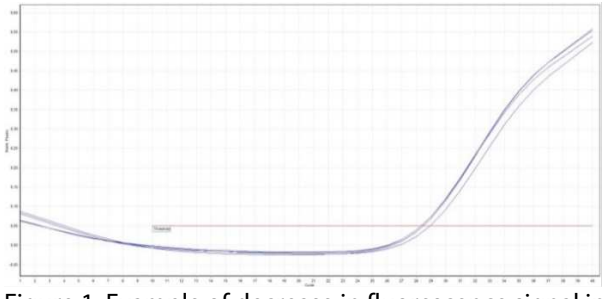

Figure 1: Example of decrease in fluorescence signal in first PCR cycles of a Rotor-Gene® Q PCR run.

- **CFX96™ (Bio-Rad)**

When a CFX96™ is used in combination with the RealAccurate® Quadruplex Corona-*plus* PCR Kit, the fluorophores as stated in Table 11 must be selected as detection channels.

Table 11: Detection channels CFX96™

Product	Pathogen	Fluorescent label	Fluorophore
PF0971B-R	SARS-CoV-2 MERS-CoV SARS-CoV Internal Control	FAM MAX Texas Red TYE665	FAM HEX Texas Red CY5

Clear well Hard-shell®96-Well PCR Plates (Bio-Rad art: HSP9641) must be used. (White well reaction plates should not be used due to a-specific fluorescence)

For result analysis use in in "Settings" Cq Determination Mode: "Single Threshold" and in "Baseline settings": "Baseline subtracted Curve Fit" and "Apply Fluorescence Drift Correction".

- **Mic qPCR Cycler (Bio Molecular Systems)**

When a Mic qPCR Cycler is used in combination with the RealAccurate® Quadruplex Corona-*plus* PCR Kit, the fluorophores as stated in Table 12 must be selected as detection channels. Before appointing the channels, select "Hydrolysis Probe" as chemistry type in the "Information" tab. This results in an auto-gain setting of 10 for all channels.

Table 12: Detection channels Mic qPCR Cycler

Product	Pathogen	Fluorescent label	Fluorophore
PF0971B-R	SARS-CoV-2 MERS-CoV SARS-CoV Internal Control	FAM MAX Texas Red TYE665	FAM HEX Texas Red CY5

In Table 13 an overview is given for the additional Cycling Analysis settings using the Mic qPCR Cycler in combination with the RealAccurate® Quadruplex Corona-*plus* PCR Kit.

Table 13: Software settings Mic qPCR Cycler

Analysing settings	Channel			
	FAM	HEX	Texas Red	Cy5
Auto Set Threshold	Check mark	Check mark	Check mark	Check mark
Method	Dynamic	Dynamic	Dynamic	Dynamic
Threshold Level	0,100*	0,100*	0,100*	0,100*
Threshold Start	1,00	1,00	1,00	1,00
Ignore Cycles Before	5	5	5	5
Exclusion	Extensive	Extensive	Extensive	Extensive
Fluorescence Cut-off Level	5,0%	5,0%	5,0%	5,0%
Initial Y-axis Scale	Linear	Linear	Linear	Linear
Auto generate Analysis	Check mark	Check mark	Check mark	Check mark

** standard value, which is ignored if Auto Set Threshold is check marked*

Select the correct "assay" for the samples to be analyzed in the "Samples" tab.

14. Data analysis

Interpretation RealAccurate® Quadruplex Corona-*plus* PCR data is described below:

14.1 PF0971B-R: RealAccurate® Quadruplex Coronavirus-*plus* PCR Kit

- If a FAM fluorescence signal is detected, the sample contains RNA of SARS-CoV-2 targeted by the FAM-labelled probe.
- If a MAX fluorescence signal is detected, the sample contains RNA of MERS-CoV targeted by the MAX-labelled probe.
- If a Texas Red fluorescence signal is detected, the sample contains RNA of SARS-CoV, targeted by Texas Red-labelled probes.
- If a TYE665 fluorescence signal is detected, the sample contains RNA of the IC targeted by the TYE665-labelled probe.
- If no fluorescence signal is detected see 14.2.

14.2 No signal in a RealAccurate® Quadruplex Corona-*plus* PCR reaction

If no fluorescence signal is present in any of the detection channels in a RealAccurate® Quadruplex Corona-*plus* PCR reaction, the sample is inhibited, one of the assay steps has failed or a manual error has occurred. See section 15 for troubleshooting.

14.3 RealAccurate® Quadruplex Corona-*plus* PCR sample and control results

Samples

C_t (cycle threshold) values obtained in real-time PCR depend on the used real-time PCR instrument and C_t calculation method.

In general, a strong positive sample is characterized by a C_t value lower than 25, whereas a C_t value between 35 and 40 indicates a weak positive sample.

- **Internal Control**

The IC is added in a low concentration to the RealAccurate® Quadruplex Corona-*plus* PCR reaction in order not to compete with pathogen amplification but should be present when no pathogens are detected in the reaction. Depending on the real-time PCR instrument used for the reaction, the C_t value of the IC reaction varies between 32 and 35. Only in samples with a high pathogen load, the IC can be out-competed. In absence of an IC signal in positive samples with relatively high Ct value (≥35), it is recommended to repeat the nucleic acid extraction to exclude inhibiting factors in the sample.

- **Positive Control**

The Positive Control of the RealAccurate® Quadruplex Corona-*plus* PCR Kit consists of synthetic targets representing the pathogens detected by the RealAccurate® Quadruplex Corona-*plus* PCR Kit. These synthetic targets are present in the Positive Control in moderate concentrations and should reveal C_t values of approximately 30 (depending on the used real-time PCR instrument). The IC target in the Positive Control reaction should reveal a slightly higher C_t value than those of the pathogen targets, to be more in line with the low IC concentration in a RealAccurate® Quadruplex Corona-*plus* PCR reaction.

15. Troubleshooting

Problem	Possible cause	Recommendations
Controls remains negative (IC or Positive Control)	The sample is inhibited, one of the assay steps has failed or a manual error has occurred	Ensure that all components have been added
	The Internal Control or Positive Control was not stored properly	Store all components according to the manufacturer's instructions
	Wrong PCR profile	Check programming of real-time cycler
Negative Control gives a fluorescence signal	Carry over / contamination	Repeat the entire experiment with fresh reagents Handle samples, kit components and consumables as prescribed
Very weak fluorescence signals also for controls	Incorrect instrument settings	Check channel settings
	Incorrect real-time PCR mix	Check the preparation of the PCR mix(es)
Very weak fluorescence signal in a detection channel	Remaining cross-talk	Check results with and without cross-talk correction. When the signal significantly decreases with the use of cross-talk correction the weak signal is most probably caused by some remaining cross-talk. Check also signals in neighboring channels.

16. References

- Zhu, N., D. Zhang, et al. (2020). A Novel Coronavirus from Patients with Pneumonia in China, 2019. NEJM 382(8): 727-733.
- Chen, Y., Q. Liu, et al. (2020). Emerging coronaviruses: Genome structure, replication, and pathogenesis. J Med Virol 92(4): 418-423.

17. Notice to the purchaser

RealAccurate® products are manufactured by PathoFinder BV in Maastricht, The Netherlands within quality systems accredited to ISO 13485:2016. The products are sold for use by the end-user only and may not be re-sold, distributed or re-packaged.
It is not recommended to combine RealAccurate® Quadruplex Corona-*plus* PCR Kit reagents of different lots.
If a RealAccurate® Quadruplex Corona-*plus* PCR Kit is received in a damaged packaging, please contact PathoFinder or your local PathoFinder distributor.

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Rotor-Gene® is a registered trademark of QIAGEN Group.
EasyMAG® and NucliSENS® are registered trademarks of bioMérieux.

18. Related products

- **RealAccurate® Quadruplex Color Compensation v2:** kit containing Color Compensation reagents for RealAccurate® Quadruplex assays for LightCycler® 480 instruments.

  Catalog number: PFCC-R

- **RealAccurate® Quadruplex Influenza PCR Kit:** kit containing reagents to detect and differentiate Influenza type A virus, Influenza type B virus and Influenza type A(H1N1)pdm09 virus

  Catalog number: PF0970-R, 50 reactions (CE-IVD)

- **RealAccurate® Quadruplex Corona PCR Kit:** kit containing reagents to detect and (partly) differentiate Coronaviruses 229E, OC43 and NL63/HKU1

  Catalog number: PF0971-R, 50 reactions (CE-IVD)

- **RealAccurate® Quadruplex Parainfluenza PCR Kit:** kit containing reagents to detect and (partly) differentiate Parainfluenza viruses 1, 2, 3 and 4

  Catalog number: PF0972-R, 50 reactions (CE-IVD)

- **RealAccurate® Quadruplex RSV/hMPV PCR Kit:** kit containing reagents to detect and differentiate RSVA, RSVB and hMPV

  Catalog number: PF0973-R, 50 reactions (CE-IVD)

- **RealAccurate® Quadruplex Adeno/Boca/Rhino/Entero PCR Kit:** kit containing reagents to detect and (partly) differentiate Adenovirus, Bocavirus, Rhinovirus and Enterovirus

  Catalog number: PF0974-R, 50 reactions (CE-IVD)

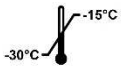
- **RespiFinder® 2SMART:** SmartFinder assay for the detection of 22 respiratory pathogens (16 RNA viruses, 2 DNA viruses and 4 bacteria)
  - Influenza A
  - Influenza B
  - Influenza A(H1N1)pdm09
  - Respiratory syncytial virus A
  - Respiratory syncytial virus B
  - Parainfluenza virus 1
  - Parainfluenza virus 2
  - Parainfluenza virus 3
  - Parainfluenza virus 4
  - Coronavirus OC43
  - Coronavirus 229E
  - Coronavirus NL63(no differentiation from HKU1)
  - Coronavirus HKU1(no differentiation from NL63)
  - Rhinovirus (no differentiation from Enterovirus)
  - Enterovirus (no differentiation from Rhinovirus)
  - Adenovirus
  - Human Metapneumovirus
  - Bocavirus
  - *Chlamydophila pneumoniae*
  - *Mycoplasma pneumoniae*
  - *Legionella pneumophila*
  - *Bordetella pertussis*

Catalog number: PF2600-2S, 50 reactions (CE-IVD)

RealAccurate® Quadruplex Corona-*plus* PCR Kit

Product no.: PF0971B-R

50 reactions



Store at –30 °C to –15 °C

Keep away from sunlight

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