



ANCHOR

**Influenza A/B PCR KIT**

Instructions for Use  
ANCHOR Influenza A/B PCR Kit



Qualitative

real-time RT-PCR Kit

for *in vitro* diagnostic use

**IVD** For *in vitro* diagnostic use


**REF** A0400

 100

 A0410-EN, 2025-10-26

**QG** A0411-EN, 2025-10-26

 -30°C to -15°C

 **ANCHOR** Diagnostics GmbH  
Grandweg 64  
D-22529 Hamburg

compatible with

QuantStudio 5 (Applied Biosystems)

LightCycler 480 II (Roche)

cobas z 480 Analyzer (Roche)

CFX96 (Bio-Rad)

Rotor-Gene Q (QIAGEN)

Mic qPCR (Bio Molecular Systems)

1	▶ Contents	
2	Intended Use .....	6
3	Product Description .....	6
4	Kit Components.....	7
5	Storage and Stability .....	8
6	Material Required but Not Provided.....	9
7	Limitations.....	9
8	Warnings and Precautions.....	10
9	Workflow.....	11
9.1	Sample Preparation .....	11
9.1.1	Sample Matrix.....	11
9.1.2	Sample Preparation .....	12
9.1.3	Internal Control.....	13
9.2	PCR Preparation .....	14
9.2.1	Master Mix Set-Up.....	14
9.2.2	PCR Reaction Set-Up .....	16
9.3	PCR Cycler Configuration .....	17
9.3.1	Temperature Profile.....	17
9.3.2	Specific PCR Cycler Settings.....	18
9.4	Data Analysis.....	20
9.4.1	Qualitative Analysis.....	22
10	Performance Data .....	23
10.1	Analytical Performance.....	23
10.1.1	Sensitivity.....	23
10.1.2	Specificity.....	24
10.1.3	Precision .....	27
10.2	Clinical Performance .....	29
11	Quality Control.....	30
12	Technical Assistance & Contact Information.....	30
13	Literature.....	31
14	Symbols .....	32

## 2 ▶ Intended Use

The ANCHOR Influenza A/B PCR Kit is an in vitro nucleic amplification test based on real-time PCR technology for the qualitative detection and differentiation of human Influenza A and B RNA, isolated from human respiratory swabs, bronchoalveolar lavage (BAL) specimen, sputum, and tracheal aspirates.

The product is intended to be used by professional operators, such as technicians and physicians who are trained in molecular biological techniques.

## 3 ▶ Product Description

The ANCHOR Influenza A/B PCR Kit is a real-time PCR technology-based test for the amplification and detection of Influenzavirus-specific nucleic acids. The Master Mixes contain reagents for the reverse transcription, amplification and differentiation of Influenza A (matrix protein) and Influenza B (nucleoprotein) specific RNA.

In addition, a heterologous amplification system (Internal Control) is included to supervise the success of the sample extraction procedure and to identify possible inhibition of the amplification reaction.

The Influenza A- and B-specific RNA and the Internal Control are parallel detected in corresponding detector channels of the real-time PCR instrument using fluorescently labeled probes with distinguishable fluorescent dyes.

A combined Influenza A/B Positive Control and a Negative Control are monitoring the integrity of the analyte-specific reagents of the kit and the proper performance of the reaction.

## 4 ▶ Kit Components

The ANCHOR Influenza A/B PCR Kit is a ready-to-use system.

Master A and Master B reagents contain all necessary components to allow RT-PCR-mediated reverse transcription, amplification, target detection and differentiation of Influenza A- and B-specific RNA and Internal Control in one reaction setup.

PC (Positive Control) Influenza A/B and NC (Negative Control) RNA are supplied with the IC (Internal Control) RNA already incorporated (see also section 9.2.1 Master Mix Set-Up).

The reagents provided with the kit allow the preparation of 100 reactions.

Kit component	Mat. no.	No. of vials	Quantity	Ingredients
<b>Master A</b> Influenza A/B	A0401	4 vials	4x 125 µL	Buffer, bovine serum albumin, polymerase, reverse transcriptase
<b>Master B</b> Influenza A/B	A0402	4 vials	4x 125 µL	Buffer, salt, nucleotides, target- and IC-specific oligonucleotides
<b>IC</b> <b>RNA</b>	AD00022	1 vial	1000 µL	Buffer, IC-specific synthetic polynucleotide
<b>PC</b> Influenza A/B*	A0405	1 vial	200 µL	Buffer, target- and IC-specific synthetic polynucleotide
<b>NC</b> <b>RNA*</b>	AD00023	1 vial	200 µL	Buffer, IC-specific synthetic polynucleotide

\* INTERNAL CONTROL INSIDE !

## 5 ▶ Storage and Stability

- The ANCHOR Influenza A/B PCR Kit is shipped on dry ice and should be stored at -30 to -15°C upon receipt.
- The components are stable until the expiration date stated on the label.
- Do not use components of the kit that have passed their expiration date.
- Store Influenza A/B RNA-positive and/or potentially positive material separated from the kit.
- Repeated thawing and freezing of the Master reagents of > 3x should be avoided, as this may reduce the assay performance. For the PC Influenza A/B, the NC RNA and the IC RNA, thawing and freezing cycles up to 4x are allowed. Alternatively, storage between +2 to +8°C for up to 14 days is possible.
- Due to the components used it might be possible that Master vials do not always freeze completely after initial thawing. This is not a matter of concern and does not influence the stability or performance of the assay.
- If the reagents are to be used only intermittently, they should be frozen in aliquots. Label aliquots clear and unambiguously to avoid a mix-up of reagents.
- During PCR set up the reagents should be kept cooled at +2 to +8°C – use cooling block.
- Master A and Master B Influenza A/B are for immediate use only. Do not store thawed Master reagents for more than 30 minutes at +2 to +8°C.
- Protect all reagents from extensive light exposure.

## 6 ▶ Material Required but Not Provided

- Nucleic acid purification system
- Real-time PCR instrument
- Appropriate PCR reaction vessels and related accessories
- Cooling block (for reaction setup)
- Benchtop centrifuge (rotor holding 2 mL reaction tubes)
- Vortex mixer
- Pipettes (variable volume)
- Single-use pipette filter tips
- 1.5 mL or 2 mL reaction tubes (for Master mix set-up)
- Single-use gloves (powder-free)

Use all materials and equipment according to the manufacturer's instructions. Maintain and calibrate the equipment as recommended.

## 7 ▶ Limitations

- Strict compliance with the user manual is required for optimal PCR results.
- Any diagnostic result generated must be interpreted in conjunction with other clinical and/or laboratory findings.
- The presence of PCR inhibitors may cause invalid results.
- Occurrence of mutations within the target region might result in a reduced sensitivity or a complete detection failure.
- Following good laboratory practices is crucial for the successful usage of the product.
- Appropriate handling of the reagents is essential to avoid contaminations or impurities.

## 8 ► Warnings and Precautions

- For *in vitro* diagnostic use.
- Use of this product is limited to personnel specially instructed and trained in the techniques of real-time PCR and *in vitro* diagnostic procedures.
- Specimens should always be treated as potentially infectious and/or biohazardous material in accordance with safe laboratory procedures.
- The ANCHOR Master A Influenza A/B contains a bovine-sourced potentially infectious component (albumin). The bovine plasma is sourced from New Zealand or USA, which are recognized by the world organization for animal health *Office International des Epizooties* (OIE, Paris) as having a negligible BSE risk.
- Wear protective single-use gloves, a laboratory coat and eye protection when handling specimens or kit components.
- Avoid microbial and nuclease (DNase/RNase) contamination of the specimen and the components of the kit.
- Always use DNase/RNase-free single-use pipette tips with aerosol barriers.
- Use separated working areas for (1) specimen preparation, (2) PCR reaction set-up and (3) amplification/detection activities.
- Dedicate supplies and equipment to the separate working areas and do not move them from one area to another.
- Do not open the reaction tubes/plates post amplification, to avoid contamination with amplicons.
- Additional controls may be tested according to guidelines or requirements of local, state and/or federal regulations or accrediting organizations.
- Discard sample and assay waste according to your local safety regulations.

## 9 ► Workflow

### 9.1 ► Sample Preparation

#### 9.1.1 ► Sample Matrix

The recommended patient sample matrices for sample preparation input are:

- human respiratory swabs
- bronchoalveolar lavage specimen (BAL)
- sputum
- tracheal aspirate fluids

For swab samples only materials specified for the detection of viral targets should be used. If a sample is not directly processed, store samples according to manufacturer's instructions (Collection Tube, Transport Tube, Sample Preparation Kit) before use.

Storage recommendations:

All samples should be processed as soon as possible. Samples could be stored at 4 degrees Celsius for up to 72 hours.

### 9.1.2 ▶ Sample Preparation



Purified RNA is the sample input material for the ANCHOR Influenza A/B PCR Kit. It has to be ensured that the chosen nucleic acid purification method is compatible with real-time PCR technology. The extraction has to be executed according to the manufacturer's instructions.

The diagnostic applicability of the ANCHOR Influenza A/B PCR Kit has been shown using the following sample preparation platforms:

#### Sample Preparation Platforms

NucliSENS® easyMag® System (bioMérieux)
EMAG® (bioMérieux)
EZ1 Advanced XL / EZ2 Connect (QIAGEN)
QIAcube Connect (QIAGEN)
QIASymphony® SP (QIAGEN)
MagNA Pure 96 System (Roche)
MagNA Pure Compact (Roche)
Maxwell® 16 / RSC Instruments (Promega)
KingFisher Systems (Thermo Fisher Scientific)
SEEPREP32™ (Seegene)
GenoXtract® (Hain Lifescience)


#### PLEASE NOTE

-  If sample eluates are not directly used for PCR analysis, store eluates at -30 to -15°C. In case of using eluates repeatedly, avoid frequent thaw/freeze cycles (no more than 3 cycles).
-  Eluates should be labeled clearly and unambiguously to avoid a mix-up of samples.

### 9.1.3 ▶ Internal Control

The Internal Control RNA provided with the ANCHOR Influenza A/B PCR Kit should be co-purified with the nucleic acid of interest to monitor sample preparation efficiency and quality.

#### PLEASE NOTE

-  The Internal Control RNA **MUST NOT** be added directly to the sample.

Always add the Internal Control RNA after lysis buffer has been added to the sample.


The required volume of Internal Control RNA per sample purification is defined by the chosen elution buffer volume.

Ten percent of the elution buffer volume used should be added to the sample/lysis mixture.

Examples:

- Elution buffer per sample: 200 µL → IC RNA volume: 20 µL
- Elution buffer per sample: 60 µL → IC RNA volume: 6 µL

#### PLEASE NOTE

-  Secure the elimination of residual ethanol before elution of nucleic acids. Ethanol may inhibit the amplification process.

If no co-purification of the Internal Control is planned and the IC RNA should be used only as an inhibition control of the reaction, either the amount of IC related to the used elution volume could be added to each eluate or 1.5 µL of the IC RNA / per reaction should be added to the master mix (see section 9.2.1 Master Mix Set-Up).

9.2 ▶ PCR Preparation  
 9.2.1 ▶ Master Mix Set-Up

**PLEASE NOTE**



Consider configuring the run settings of the PCR cycler software to have the instrument ready before starting the PCR reaction preparation (Refer to section 9.3 PCR Cycler Configuration).

Prepare the Master Mix step by step:

- Thoroughly thaw Master components A and B.
- Mix Master A and B by gentle pipetting or short pulse-vortexing.
- Spin Master A and B shortly with a benchtop centrifuge to remove residual droplets from tube lids.
- According to your preferred workflow follow one of the pipette schemes below to mix Master A and B using a 1.5 mL or 2 mL reaction tube:

**IC RNA present in sample eluates** – NO IC RNA added to Master Mix preparation:

Number of reactions	1	10(+1)*	N**
Master A Influenza A/B	5 µL (X)	55 µL	Y µL
Master B Influenza A/B	5 µL (X)	55 µL	Y µL
Volume Master Mix	10 µL	110 µL	Z µL

\*10 reactions + 10%  
 \*\* See formula on the next page

**IC RNA to be used as inhibition control only** – IC RNA added to Master Mix preparation:

Number of reactions	1	10(+1)*	N**
Master A Influenza A/B	5 µL (X)	55 µL	Y µL
Master B Influenza A/B	5 µL (X)	55 µL	Y µL
IC RNA	1.5 µL (X)	16.5 µL	Y µL
Volume Master Mix	11.5 µL	126.5 µL	Z µL

\*10 reactions + 10%  
 \*\* See formula on the next page

**PLEASE NOTE**



We recommend calculating for an additional volume of at least 10% to compensate potential loss during pipetting. The needed volume will be calculated by using the following formula:

$$N \times X \mu L \times 1,1 = Y$$

N = Number of reactions  
 X = Volume of component per reaction  
 Y = Total volume of component  
 Z = Total volume of Master Mix

- Mix prepared Master Mix well by gentle and short pulse-vortexing.
- Spin Master Mix shortly with a benchtop centrifuge to remove residual droplets from tube lids.



It is recommended to test the Positive Control and the Negative Control at least once in each PCR run.




The Positive Control Influenza A/B and the Negative Control RNA already contain the IC RNA in a ready-to-use concentration. No addition of IC necessary!

If you want to use a Master Mix preparation with added IC RNA (as inhibition control) in combination with the Positive Control Influenza A/B and NC RNA, be aware that the IC signal of the controls will slightly shift towards a lower CT value in comparison to the IC signal of the controls using a Master mix without additional IC.

9.2.2 ▶ PCR Reaction Set-Up


**PLEASE NOTE**


 Always use a cooling block for the preparation of the PCR reaction mix.

Prepare the Reaction Mix step by step:

- If previously stored frozen, thaw eluates containing nucleic acid (and IC RNA) thoroughly.
- Mix eluates by gentle pipetting or brief pulse-vortexing.
- Spin eluates shortly with a benchtop centrifuge to remove residual droplets from tube lids.
- Pipette **10 µL of Master Mix** (see section 9.2.1 Master Mix Set-Up) into suitable reaction vessels for PCR analysis. This is also valid for Master Mix spiked with IC RNA.
- Add **15 µL of eluate** or control (Positive Control Influenza A/B or Negative Control RNA). **Mix well by repeated up and down pipetting.**
- Close reaction vessels securely with the appropriate sealing system.
- Immediately transfer closed and ready-to-use reaction vessels to the real-time PCR instrument. Avoid any delays!

**PLEASE NOTE**

 Carefully handle reaction vessels during transfer to avoid mixing up samples.

 Complete mixing of Master Mix reagents with a sample or control during reaction set up should be unconditionally secured by repeated up and down pipetting!

**This is essential for achieving optimal amplification curve performance.**

Master Mix	Eluate / Control	Reaction Mix
10 µL	15 µL	25 µL

9.3 ▶ PCR Cycler Configuration

The ANCHOR Influenza A/B PCR Kit has been evaluated in combination with the following different PCR Cycler platforms:

PCR Cycler Platform	Run Time
QuantStudio 5 (Applied Biosystems)	≈ 30 min.
LightCycler 480 II (Roche)	≈ 32 min.
cobas z 480 Analyzer (Roche)	≈ 32 min.
CFX96 (Bio-Rad)	≈ 35 min.
Rotor-Gene Q (QIAGEN)	≈ 46 min.
Mic qPCR (Bio Molecular Systems)	≈ 37 min.

The listed run times for the different instruments are effectively measured durations and can differ from what is displayed on the graphical user interface of the individual instrument software. For basic information concerning set-up and programming of the respective real-time PCR instrument, refer to the instrument-specific manual.

9.3.1 ▶ Temperature Profile

Temperature cycling profile for **QuantStudio 5, LightCycler 480 II, cobas z 480 Analyzer, CFX96 and Rotor-Gene Q:**

<b>Hold</b>	50°C	120 sec	<b>x 1</b>
<b>Cycling</b>	95°C	1 sec	<b>x 40</b>
	65°C *	2 sec	
	72°C	1 sec	

\*Fluorescence acquisition for Influenza A/B and IC

Temperature cycling profile for **Mic qPCR**:

<b>Hold</b>	50°C	120 sec	<b>x 1</b>
<b>Cycling</b>	95°C	1 sec	<b>x 40</b>
	63°C *	2 sec	
	72°C	1 sec	

\*Fluorescence acquisition for Influenza A/B and IC

Reaction Volume: 25 µL

### 9.3.2 ▶ Specific PCR Cycler Settings

The following tables contain PCR cycler-specific recommendations for the basic configuration of the run settings.

For additional information regarding the cycler settings recommended plastics, color compensation, gain optimization settings, etc. do not hesitate to contact us directly (see section 12 Technical Assistance & Contact Information).

QuantStudio™ 5			
Target	Influenza A	IC	Influenza B
Detection	FAM	HEX	TEXAS RED
Run Settings <ul style="list-style-type: none"> <li>Block Type: 96-Well 0.1-mL Block</li> <li>Experiment Type: Standard Curve</li> <li>Chemistry: TaqMan® Reagents</li> <li>Run Mode: Fast</li> <li>Plate attributes: Passive Reference - None</li> </ul> Consumables: <ul style="list-style-type: none"> <li>96-Well Fast Thermal Cycling Plates (Life Technologies Mat. No. 4346907)</li> <li>MicroAmp™ Optical Adhesive Film (Life Technologies Mat. No. 4311971)</li> </ul> OR <ul style="list-style-type: none"> <li>96-Well-PCR-Plate, Skirted, „Low Profile“, white (Starlab Mat. No. E1403-5209)</li> <li>Xtra-Clear Advanced Polyolefin StarSeal (qPCR) (Starlab Mat. No. E2796-9795)</li> </ul>			

LightCycler® 480 II and cobas z 480 Analyzer			
Target	Influenza A	IC	Influenza B
Detection	465/510	LightCycler 480 II: 533/580 cobas z 480 Analyzer: 540/580	LightCycler 480 II: 618/660 cobas z 480 Analyzer: 610/645
Run Settings: <ul style="list-style-type: none"> <li>Block size: 96</li> <li>If clear plates are used, the sensor of the LightCycler® has to be disabled by selecting the Clear Plates option in the software before the run is started.</li> </ul> Consumables: <ul style="list-style-type: none"> <li>LC480 Multiwell Plate 96, white (Roche Mat. No. 04729692001)</li> <li>LC480 Multiwell Plate 96, clear (Roche Mat. No. 05102413001)</li> <li>LC480 Sealing Foil (Roche Mat. No. 04729757001)</li> </ul>			

Bio-Rad CFX96			
Target	Influenza A	IC	Influenza B
Detection	FAM	HEX	TEXAS RED
Consumables: <ul style="list-style-type: none"> <li>Hard Shell 96-well PCR Plate, white (Mat. No. HSP9655)</li> <li>Optical flat 8 Cap Strip for 0.2 mL (Mat. No. TCS0803)</li> <li>0.2 mL 8-Tube PCR Strips without Caps, low profile, white (Bio-Rad Mat. No. TLS 0851)</li> <li>8-strip optical clear flat caps (Sarstedt Mat. No. 65.1998.400)</li> </ul>			

Rotor-Gene Q			
Target	Influenza A	IC	Influenza B
Detection	Green	Yellow	Orange
Run Settings <ul style="list-style-type: none"> <li>Use 72-Well Rotor</li> <li>Perform Auto-Gain optimization before 1st acquisition.</li> </ul> Consumables: <ul style="list-style-type: none"> <li>Strip Tubes and Caps, 0.1 mL (QIAGEN Mat. No. 981103)</li> </ul>			

Mic qPCR			
Target	Influenza A	IC	Influenza B
Detection	Green	Yellow	Orange
Run Settings			
<ul style="list-style-type: none"> <li>Temperature Control: Standard TAQ</li> </ul>			
Consumables:			
<ul style="list-style-type: none"> <li>Mic Tubes and Caps (Mat. No. 68MIC-60653)</li> </ul>			

9.4 ▶ Data Analysis

The following tables contain cycler-specific references for the configuration of analysis settings. They could serve as an initial orientation. Depending on local cycler- and workflow-related differences adaptations might be necessary. For additional information concerning data analysis, refer to the instrument-specific manual of the respective real-time PCR instrument or contact us (see section 12 Technical Assistance & Contact Information).

QuantStudio™ 5
Analysis Settings (all channels):
<ul style="list-style-type: none"> <li>Plot Type: ΔRn vs Cycle</li> <li>Graph Type: Linear</li> <li>Baseline Start/End: 3/15</li> <li>Threshold:                             <ul style="list-style-type: none"> <li>FAM 40,000</li> <li>HEX 30,000</li> <li>TEXAS RED: 50,000</li> </ul> </li> </ul>

LightCycler® 480 II (cobas z 480 Analyzer)
Analysis Settings:
<ul style="list-style-type: none"> <li>Abs Quant/Fit Points</li> <li>Color Comp (off)</li> <li>Mean</li> <li>High Confidence</li> <li>Threshold LightCycler 480 II:                             <ul style="list-style-type: none"> <li>- 465/510: 0.53</li> <li>- 533/580: 1.6</li> <li>- 618/660: 0.16</li> </ul> </li> <li>Threshold cobas z 480 Analyzer:                             <ul style="list-style-type: none"> <li>- 465/510: 0.53</li> <li>- 540/580: 1.3</li> <li>- 610/645: 0.06</li> </ul> </li> </ul>

Bio-Rad CFX96
Analysis Settings (all channels):
<ul style="list-style-type: none"> <li>Baseline Subtracted Curve Fit</li> <li>C(t) Determination Mode: Single Threshold</li> <li>Baseline Threshold:                             <ul style="list-style-type: none"> <li>- Baseline Cycles: Auto Calculated</li> <li>- Single Threshold                                     <ul style="list-style-type: none"> <li>- FAM: 450</li> <li>- HEX: 100</li> <li>- TEXAS RED: 200</li> </ul> </li> </ul> </li> </ul>

Rotor-Gene Q
Analysis Settings (all channels):
<ul style="list-style-type: none"> <li>Quantitation</li> <li>Linear Scale</li> <li>Dynamic Tube ON</li> <li>Threshold:                             <ul style="list-style-type: none"> <li>- Green: 0.08</li> <li>- Yellow: 0.08</li> <li>- Orange: 0.08</li> </ul> </li> </ul>

Mic qPCR	
Analysis Settings (all channels):	
<ul style="list-style-type: none"> <li>▪ Graph Type: Linear</li> <li>▪ Method: Dynamic</li> <li>▪ Ignore Cycles Before: 3</li> <li>▪ Threshold Start: 1</li> <li>▪ Exclusion: None</li> <li>▪ Threshold:                             <ul style="list-style-type: none"> <li>- Green: 0.7</li> <li>- Yellow: 1.3</li> <li>- Orange: 1.7</li> </ul> </li> </ul>	

9.4.1 ► Qualitative Analysis

For a valid run and as a prerequisite for the interpretation of the individual sample results, the following requirements have to be met by the included kit controls:

Channel/Target	Influenza A	Influenza B	IC
PC Influenza A/B	+	+	+
NC RNA	-	-	+

If one of the conditions has failed, result interpretation of the sample results might be flawed. In case of kit control failure, it is recommended to repeat the PCR run.

In case of a valid run, the following result interpretation can be made:

Qual. result	Influenza A	Influenza B	IC
Influenza A RNA positive	+	-	+/-
Influenza B RNA positive	-	+	+/-
Influenza A and B RNA positive	+	+	+/-
Influenza A and B RNA negative	-	-	+
Invalid	-	-	-

A positive result for Influenza A and/or Influenza B RNA does not necessarily require a positive signal for the IC since high concentrations of the respective target nucleic acid can result in a competitive inhibition of the IC amplification.

An invalid result for a sample can be due to PCR inhibition or a failure during the nucleic acid isolation procedure. In such cases, it is recommended to dilute the nucleic acid extract 1:10 (recommended to be done in elution buffer, if possible) for a PCR retest or to repeat the nucleic acid isolation procedure. Note that the dilution of the nucleic acid extract might also lead to a reduction of the target nucleic acid concentration below the limit of detection of the ANCHOR Influenza A/B PCR Kit.

10 ► Performance Data

10.1 ► Analytical Performance

10.1.1 ► Sensitivity

The LOD for the ANCHOR Influenza A/B PCR Kit was determined by undertaking a probit analysis on the Rotor-Gene Q platform. Dilution series of different concentration levels for Influenza A/PR/8/34 (H1N1) RNA (ATCC VR-95DQ) and Influenza B/Florida/4/2006 (Yamagata) RNA (ATCC VR-1804DQ) were used. Each dilution level was tested with overall 24 replicates using 3 different PCR reagent lots across 3 different days, executed by 2 different persons on 2 different instruments.

The LOD value determined on the Rotor-Gene was then confirmed or re-evaluated on the other 5 instruments.

Instrument	LOD Influenza A	LOD Influenza B	Unit
QuantStudio 5	0.51	0.72	copies/μL
LightCycler 480 II (Roche)	0.34	0.72	copies/μL
cobas z 480 Analyzer	0.34	0.36	copies/μL
CFX96	0.51	1.08	copies/μL
Rotor-Gene Q	0.17	0.36	copies/μL
Mic qPCR	0.17	0.72	copies/μL

## 10.1.2 ► Specificity

Triplicates of 10 Influenza A and 4 Influenza B isolates (whole genome viral RNA) were tested at a concentration near the 3x LOD of the ANCHOR Influenza A/B PCR Kit.

Isolate	Influenza A	Influenza B
A/California/07/2009 pdm09 (H1N1)	+	-
A/California/08/2009 (H1N1)	+	-
A/Florida/3/2006 (H1N1)	+	-
A/Swine/Iowa/15/30 (H1N1)	+	-
A/PR/8/34 (H1N1)	+	-
A/England/195/2009 (H1N1)	+	-
A/Wisconsin/15/2009 (H3N2)	+	-
A/Wisconsin/67/2005 (H3N2)	+	-
A/California/2/2014 (H3N2)	+	-
A/Aichi/2/68 (H3N2)	+	-
B/Brisbane/60/2008 (Victoria)	-	+
B/Wisconsin/1/2010 (Yamagata)	-	+
B/Florida/78/2015 (Victoria)	-	+
B/Florida/4/2006 (Yamagata)	-	+
Influenza B/Taiwan/2/62	-	+

Nucleic acid of selected pathogens with a concentration of  $\approx 5.00E+03$  copies/ $\mu$ L (alternative units CFU/ $\mu$ L or TCID<sub>50</sub>/ $\mu$ L) was added to the PCR reaction and tested in triplicates in the absence or presence of Influenza A and/or B RNA at their 3x LOD concentration on the Rotor-Gene Q.

Pathogen	Influenza A	Influenza B	3x LOD Influenza A	3x LOD Influenza B
Human bocavirus 1	-	-	+	+
Mumps virus	-	-	+	+
Measles virus	-	-	+	+
Adenovirus 1	-	-	+	+
Adenovirus 2	-	-	+	+
Adenovirus 4	-	-	+	+
Adenovirus 5	-	-	+	+
Adenovirus 7	-	-	+	+
Betacoronavirus 1 (OC43)	-	-	+	+
Human coronavirus 1 (229E)	-	-	+	+
Human coronavirus NL63	-	-	+	+
MERS coronavirus 2c	-	-	+	+
SARS coronavirus (2003)	-	-	+	+
SARS coronavirus 2	-	-	+	+
Human enterovirus 68	-	-	+	+
Human enterovirus 71	-	-	+	+
Human parainfluenza virus 1	-	-	+	+
Human parainfluenza virus 2	-	-	+	+
Human parainfluenza virus 3	-	-	+	+
Human parainfluenza virus 4	-	-	+	+
Human RSV A	-	-	+	+
Human RSV B	-	-	+	+
Human rhinovirus 6	-	-	+	+
Human rhinovirus 89	-	-	+	+

Pathogen	Influenza A	Influenza B	3x LOD Influenza A	3x LOD Influenza B
Metapneumovirus	-	-	+	+
<i>Bordetella pertussis</i>	-	-	+	+
<i>Candida albicans</i>	-	-	+	+
<i>Chlamydomytila pneumoniae</i>	-	-	+	+
<i>Haemophilus influenzae</i>	-	-	+	+
<i>Legionella pneumophila</i>	-	-	+	+
<i>Mycoplasma pneumoniae</i>	-	-	+	+
<i>Streptococcus pneumoniae</i>	-	-	+	+
Influenza A/PR/8/34 (H1N1)	+	-	N/A	+
Influenza B/Florida/4/2006	-	+	+	N/A

Limitations:

- Influenza A:
  - When present at concentrations near the detection limit, potentially co-infecting Influenza B will potentially interfere with Influenza A detectability.
    - Cobas z 480 Analyzer: At concentrations > 1,000 copies/μL Influenza B
    - QuantStudio 5: At concentrations > 250 copies/μL Influenza B
    - Mic qPCR: At concentrations > 2,500 copies/μL Influenza B

10.1.3 ▶ Precision

Precision testing was initially performed on the Rotor-Gene Q instrument. For intra-run variability, 6 replicates of each sample dilution were tested within one run using one instrument and reagent lot by one operator. For inter-run variability, 6 replicates of each sample dilution were tested within overall four runs using two instruments and one reagent lot by two operators across days. For inter-batch variability, 6 replicates of each sample dilution were tested within one run using one instrument and three reagent lots by one operator.

PC Influenza A			
Variability	AVE (CT)	SD (CT)	CV (%)
Intra-Run	24.31	0.12	0.48
Inter-Run	24.23	0.17	0.72
Inter-Batch	24.22	0.10	0.43
Total	24.24	0.15	0.61
Influenza A RNA (at PC concentration)			
Variability	AVE (CT)	SD (CT)	CV (%)
Intra-Run	24.72	0.11	0.43
Inter-Run	24.85	0.16	0.66
Inter-Batch	24.74	0.11	0.46
Total	24.81	0.16	0.63
Influenza A RNA (at 5x LOD)			
Variability	AVE (CT)	SD (CT)	CV (%)
Intra-Run	32.51	0.68	2.08
Inter-Run	32.57	0.53	1.62
Inter-Batch	32.84	0.61	1.85
Total	32.68	0.59	1.80

PC Influenza B			
Variability	AVE (CT)	SD (CT)	CV (%)
Intra-Run	25.17	0.07	0.29
Inter-Run	25.34	0.17	0.69
Inter-Batch	25.43	0.18	0.70
Total	25.41	0.18	0.70
Influenza B RNA (at PC concentration)			
Variability	AVE (CT)	SD (CT)	CV (%)
Intra-Run	25.31	0.08	0.32
Inter-Run	25.42	0.10	0.40
Inter-Batch	25.41	0.25	0.97
Total	25.43	0.18	0.72
Influenza B RNA (at 5x LOD)			
Variability	AVE (CT)	SD (CT)	CV (%)
Intra-Run	31.84	0.35	1.11
Inter-Run	31.93	0.32	1.00
Inter-Batch	32.04	0.46	1.44
Total	32.01	0.39	1.23

Internal Control			
Variability	AVE (CT)	SD (CT)	CV (%)
Intra-Run	22.66	0.10	0.45
Inter-Run	22.49	0.16	0.72
Inter-Batch	22.33	0.25	1.14
Total	22.38	0.21	0.93

Precision of the ANCHOR Influenza A/B PCR Kit in combination with the other instruments was evaluated for intra- and inter-run variability.

### 10.2. Clinical Performance

The clinical performance of the ANCHOR Influenza A/B PCR Kit for the qualitative detection of Influenza A and B RNA in human respiratory swab samples was evaluated comparatively against a reference Influenza A/B diagnostic workflow.

176 banked specimens were analysed with the ANCHOR Influenza A/B PCR Kit and with the comparator assays to determine their positive percent agreement (PPA) and negative percent agreement (NPA), respectively. Testing was done using the EZ1 Advanced XL sample preparation system in combination with the LightCycler 480 II (Roche) PCR cyler.

		Influenza A		Comparator	
		∑ 176	POS	NEG	
ANCHOR Influenza A/B PCR Kit	POS		37	5	
	NEG		12	122	
		PPA: 75.5 %	NPA: 96.1 %		

		Influenza B		Comparator	
		∑ 176	POS	NEG	
ANCHOR Influenza A/B PCR Kit	POS		8	1	
	NEG		3	164	
		PPA: 72.7 %	NPA: 99.4 %		

All specimen with discrepant results were detected with Ct values larger than Ct 35. For Influenza A, repeated testing of specimen showing discrepant results lead to the resolution of most discrepancies, resulting in a PPA of 90.7 %. Repeated testing of specimen showing discrepant results for the presence of Influenza B RNA was not possible due to insufficient specimen leftover.

## 11 ▶ Quality Control

In accordance with the implemented ISO 13485-certified Quality Management System, each lot of the ANCHOR Influenza A/B PCR Kit is tested against predetermined specifications to ensure consistent product quality.

## 12 ▶ Technical Assistance & Contact Information

For any questions, a need for technical assistance or if you identify difficulties using our products do not hesitate to contact us:















phone: +49 40 52 471 62 0

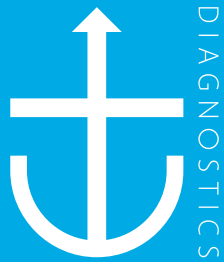
email: [support@anchor-diagnostics.com](mailto:support@anchor-diagnostics.com)

## 13 ▶ Literature

- (1) Johnson et al., Getting the flu: 5 key facts about influenza virus evolution. *PLoS Pathog.* 2017 Aug; 13(8).
- (2) Neverov et al., Coordinated Evolution of Influenza A Surface Proteins. *PLoS Genet.* 2015 Aug; 11(8).
- (3) Su et al., Phylodynamics of H1N1/2009 influenza reveals the transition from host adaptation to immune-driven selection. *Nature Communication*, 2015; 6: 7952.
- (4) Rambaut et al., The genomic and epidemiological dynamics of human influenza A virus. *Nature.* 2008 May 29; 453(7195): 615–619.
- (5) Dudas et al., Reassortment between Influenza B Lineages and the Emergence of a Coadapted PB1–PB2–HA Gene Complex. *Mol Biol Evol.* 2015 Jan; 32(1): 162–172.
- (6) Taubenberger et Morens, The Pathology of Influenza Virus Infections. *Annu Rev Pathol.* 2008; 3: 499–522.
- (7) Zhang et al., Genotyping and detection of common avian and human origin-influenza viruses using a portable chemiluminescence imaging microarray. *Springerplus.* 2016; 5(1): 1871.
- (8) Caini et al., Clinical characteristics and severity of influenza infections by virus type, subtype, and lineage: A systematic literature review. *Influenza Other Respir Viruses.* 2018 Nov; 12(6): 780–792.
- (9) Vemula et al., Current Approaches for Diagnosis of Influenza Virus Infections in Humans. *Viruses.* 2016 Apr; 8(4): 96.
- (10) Davidson, Treating Influenza Infection, From Now and Into the Future. *Front Immunol.* 2018; 9: 1946.
- (11) Principi et al., Drugs for Influenza Treatment: Is There Significant News? *Front Med (Lausanne).* 2019; 6: 109.
- (12) Lehnert et al., Antiviral Medications in Seasonal and Pandemic Influenza. A Systematic Review. *Dtsch Arztebl Int.* 2016 Nov; 113(47): 799–807.
- (13) Duwe. Influenza viruses – antiviral therapy and resistance. *GMS Infect Dis.* 2017; 5.
- (14) Martinez et al., Risk factors associated with severe outcomes in adult hospitalized patients according to influenza type and subtype. *PLoS One.* 2019; 14(1).
- (15) Mertz et al., Populations at risk for severe or complicated influenza illness: systematic review and meta-analysis. *BMJ.* 2013; 347.
- (16) Bouvier et Palese. The Biology of Influenza Viruses. *Vaccine.* 2008 September 12; 26 (Suppl. 4): D49–D53.
- (17) Shao et al., Evolution of Influenza A Virus by Mutation and Re-Assortment. *Int J Mol Sci.* 2017 Aug; 18(8): 1650.
- (18) Caini et al., The epidemiological signature of influenza B virus and its B/Victoria and B/Yamagata lineages in the 21st century. *PLoS One.* 2019; 14(9).
- (19) Moghadani. A Narrative Review of Influenza: A Seasonal and Pandemic Disease. *Iran J Med Sci.* 2017 Jan; 42(1): 2–13.

## 14 ▶ Symbols

-  Component in Kit
-  Volume per vial
-  For *in vitro* diagnostic use
-  Batch code
-  Number of vials
-  Quick Guide - Catalog number and version
-  Product - Catalog number
-  Unique Device Identifier
-  Catalog number and version  
Consult Instructions for Use
-  Important Note
-  Use by
-  Contains sufficient reagents for <N> tests
-  Temperature limits for storage
-  Manufacturer



Grandweg 64  
22529 Hamburg | Germany  
phone: +49 40 52 471 62 0  
[www.anchor-diagnostics.com](http://www.anchor-diagnostics.com)