QIAsymphony® — Pure Performance

QIAGEN®

Sample & Assay Technologies

Relax and let QIAGEN® automate your complete workflow

QIAGEN now provides everything that you need to standardize and fully automate your routine sample preparation and analysis workflow. With our dedicated range of QIAsymphony Kits, the QIAsymphony SP enables sample preparation of DNA, RNA, bacterial and viral nucleic acids, and 6xHis-tagged protein from a wide range of starting materials. The QIAsymphony AS extends the capabilities of the QIAsymphony SP by integrating automated PCR assay setup which, in combination with the Rotor-Gene® Q and QIAGEN real-time and end-point PCR kits, enables you to complete your automated PCR workflow and maximize your efficiency — from sample to result.

The QIAsymphony provides:

- Standardized sample preparation and PCR assay setup
- In-built touchscreen and prefilled reagent cartridges for ease of use
- Liquid-level detection, active cooling, and UV lamp for decontamination
- Applications for certified QIAGEN and in-house assays
- Service for laboratory-developed tests*

* For customization service for in-house assays, please inquire.

Cutting-edge system for standardized sample preparation and PCR setup

The QIAsymphony system is ideal for laboratories that perform sample processing and PCR analysis on a day-to-day basis. With predefined protocols and automatable QIAGEN kits for sample preparation and PCR setup, the QIAsymphony system will optimize your workflow, increasing the productivity in your laboratory. The QIAsymphony SP is already the first choice for many laboratories, enabling success in virus and bacterial analysis, gene expression analysis, and in forensics and genomics applications. The high level of standardization that the QIAsymphony system achieves allows you to directly compare your results with laboratories around the world. QIAGEN offers tailored IQ/OQ products to support laboratory certification for full instrument qualification.*

Modular system for maximum convenience and process safety

Laboratories already operating a QIAsymphony SP can easily upgrade their system onsite with a QIAsymphony AS module. The QIAsymphony AS directly interfaces with the QIAsymphony SP, delivering fast, highly reproducible PCR setup. To reduce manual handling steps and minimize the risk of sample contamination, samples processed on the QIAsymphony SP can be transferred automatically to the QIAsymphony AS (integrated operation). For extra flexibility, the QIAsymphony SP and AS can also be operated independently.† Samples that have been processed earlier in the day, or that have been processed on a different QIAsymphony SP, can be manually transferred to the QIAsymphony AS.

QIAsymphony workflows

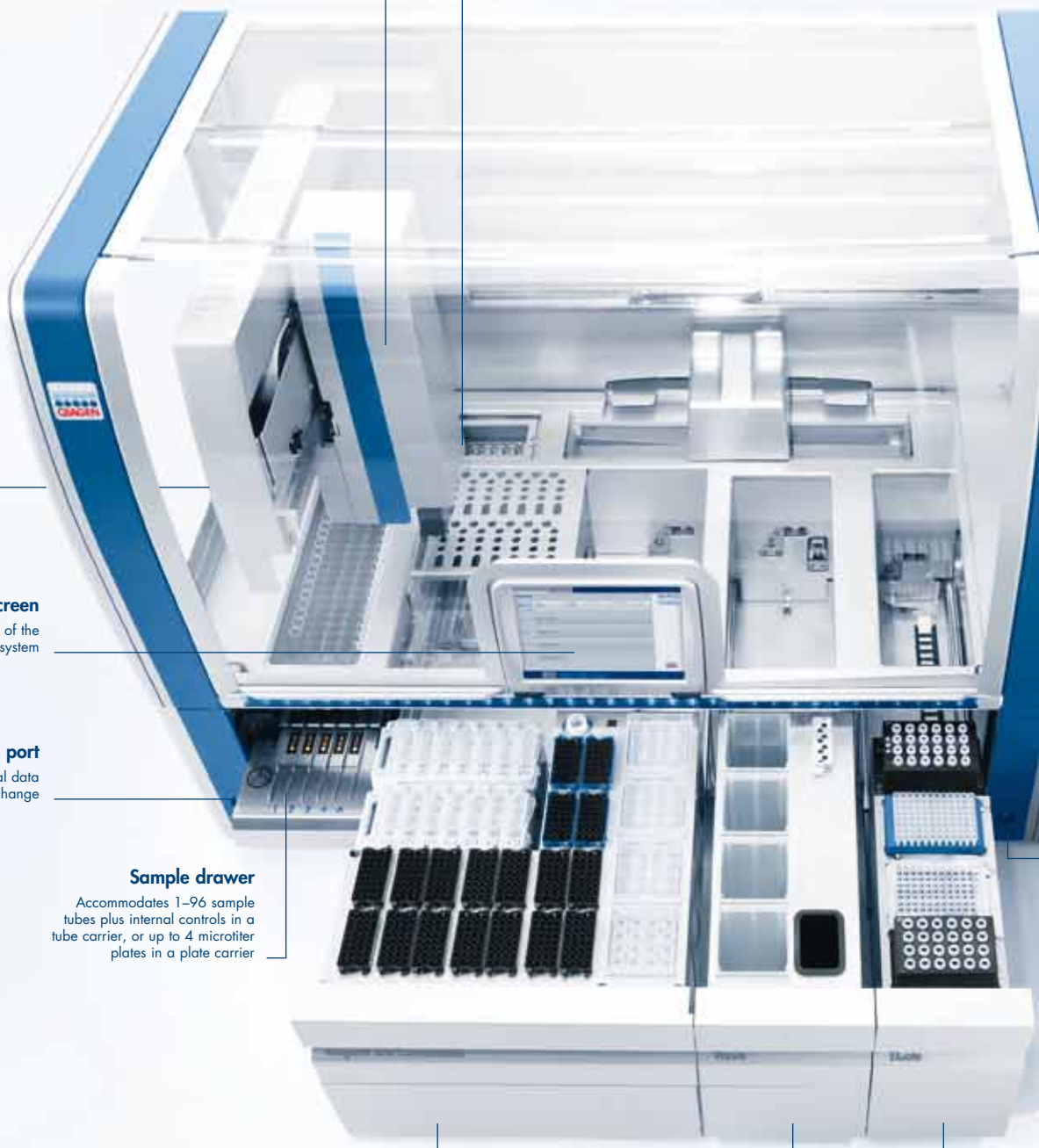
Independent operation

Integrated operation

* For a full list of QIAsymphony service agreements, please inquire. † The QIAsymphony SP and AS remain physically connected during independent operation.

UV lamp
Decontaminates the worktable and minimizes sample cross-contamination

Robotic arm
4-channel with tip guards



Ethernet adapter
For connecting the QIAsymphony system to local networks

Touchscreen
For intuitive operation of the complete system

USB port
For bi-directional data exchange

Sample drawer
Accommodates 1–96 sample tubes plus internal controls in a tube carrier, or up to 4 microtiter plates in a plate carrier

Reagent and consumables drawer
Supports consumables and 2 reagent cartridges

Waste drawer
Stores solid and liquid waste separately

Eluate drawer
Provides a choice of elution formats, including cooling and transfer of eluate racks to the QIAsymphony AS from the rear position

Unmatched flexibility in your workflow

The QIAsymphony SP can process 1–96 samples per run with sample volumes up to 1 ml. To suit your needs, a wide range of bar code labeled primary and secondary sample tubes (diameter 10–16.9 mm), microtiter plates, and blocks are supported.* Continuous loading in batches of up to 24 samples plus internal controls, and the option to assign different protocols to each batch delivers increased efficiency and walk-away time. The QIAsymphony AS enables setup of single or multiple PCRs per run or sample, splitting of eluates for panel testing, and also supports active cooling of eluates, reagents, and PCRs.

Convenient and fast setup

Drawers are loaded with the required samples, reagents, and consumables, and when each drawer is closed a detailed inventory scan is performed. This ensures that the worktable is correctly set up for the selected protocols. After sample preparation, eluates can be automatically transferred via the transfer module to the eluate and reagents drawer for assay setup. Assays are manually removed from the assays drawer. Throughout sample preparation and assay setup, tip guards and disposable filter-tips minimize the risk of cross-contamination and UV lamps provide effective worktable decontamination.

* For a full list of compatible labware, please inquire.

Sample information after sample loading

Easy-to-use software

QIAsymphony operating software guides the user through setting up a sample preparation or assay setup run in a step-by-step fashion, with options to select and adapt standardized protocols. Required volumes of buffers, reagents, master mix, and controls are automatically calculated and the user is informed of the number and type of consumables to be loaded. Transfer of sample loading information from the QIAsymphony SP to the QIAsymphony AS is convenient and reduces the number of steps required for assay definition.

Assay definition of 2 PCR assays

Standardized data exchange permits LIMS compatibility

The QIAsymphony system provides standardized communication interfaces. Work lists and rack files can be imported to the QIAsymphony system, enabling automatic run definition before samples are received in the laboratory. After assay setup, sample lists can be exported to selected real-time PCR cyclers, including the Rotor-Gene Q. This bi-directional data exchange allows integration of QIAsymphony systems into laboratory information management systems (LIMS).

Reagent loading information for the QIAsymphony AS

Seamless sample traceability

Bar code reading of samples and reagents enables full sample tracking throughout the entire purification and assay setup procedure. The QIAsymphony system provides chronological electronic documentation of results, including information about sample IDs, their positions on the worktable, and the lot number and expiry date of sample preparation and PCR reagents. Multi-level user management provides a record of which user was responsible for sample processing. Electronic result files can be automatically printed via a networked printer, or can be downloaded using a USB stick for archiving purposes.

▶ Unrivaled application range on the QIAsymphony SP

QIAsymphony Kits — backed by QIAGEN Quality® — increase laboratory efficiency since just a few kits in combination with optimized protocols cover an extensive range of starting materials and applications (Table 1). Sample volumes of up to 1 ml, and up to 50 mg of tissue or 10^7 cells can be processed, providing increased nucleic acid yields for gene expression and genomics applications and higher sensitivity in virology and microbiology applications.

The QIAsymphony SP delivers pure performance in virus and bacteria applications and makes no compromise when purifying DNA from blood, RNA from tissues and cells, or His-tagged proteins from *E. coli* or eukaryotic cells. For up-to-date information about QIAsymphony applications, visit www.qiagen.com/goto/QIAsymphony.

Innovative reagent cartridges for ultra-efficient purification

QIAsymphony Kits are safe and exceptionally easy to use. Ready-to-run, bar code labeled reagent cartridges are prefilled with all reagents required for the purification procedure, including accessory enzymes. Worktable setup is rapid and saves you valuable time. Simply place up to 2 reagent cartridges in the QIAsymphony drawer. The reagent cartridges can be either from the same kit or different kits, enabling different purification procedures to be performed within the same run of 96 samples. Reagent cartridges are automatically opened by the instrument and reagent volumes only for the selected number of samples are used, giving you complete cost control.

Table 1. Dedicated QIAsymphony Kits for a wide range of starting materials

QIAsymphony Kit	Starting material and amount
▶ **QIAsymphony Virus/Bacteria**	Purification of viral nucleic acids from up to 1000 µl plasma, serum, or CSF. Purification of viral nucleic acids and bacterial DNA from up to 800 µl respiratory samples, urine, stool, transport media, or air-dried swabs
▶ **QIAsymphony DNA**	Purification of DNA from up to 1000 µl human whole blood, 400 µl buffy coat, 50 mg tissue, or 1 x 10^7 cells
▶ **QIAsymphony DNA Investigator**	Purification of reference and casework samples for human identity testing and forensics
▶ **QIAsymphony AXpH DNA**	Purification of DNA from liquid-based cytology samples using AXpH technology
▶ **QIAsymphony RNA**	Purification of total RNA from up to 50 mg tissue or 1 x 10^7 cells
▶ **QIAsymphony PAXgene® Blood RNA***	Purification of cellular RNA from 2.5 ml human whole blood collected in PAXgene Blood RNA Tubes
▶ **QIAsymphony Ni-NTA Native**	Purification of 6xHis-tagged proteins from up to 5 ml *E. coli* or up to 2.5 x 10^7 eukaryotic cells
▶ **QIAsymphony Ni-NTA Denaturing**	Purification of 6xHis-tagged proteins from up to 5 ml *E. coli* or up to 2.5 x 10^7 eukaryotic cells

* Up to 48 samples can be processed per run.

Table 3. Real-time PCR detection of HIV RNA from plasma

Input titer (IU/ml)	Number of replicates	Number of positives	Percentage of positives
600	12	12	100
200	14	14	100
100	14	14	100
75	14	14	100
50	14	13	92.9
25	14	10	71.4
12.5	14	5	35.7
6	14	6	42.9
3	14	1	7.1
0	8	0	0

Serial dilutions from a negative plasma pool spiked with WHO HIV-1 RNA 2nd International Standard NIBSC Code: 97/650 were processed in replicates of 8–14 per titer using the QIAsymphony SP with the Virus Cellfree 1000 protocol (60 µl elution volume) and the QIAsymphony Virus/Bacteria Midi Kit. HIV RNA was detected using an HI Virus-1 RT-PCR assay.

Table 4. Real-time PCR detection of CMV DNA from plasma

Input titer (Copies/ml)	Number of replicates	Number of positives	Percentage of positives
1000	24	24	100
316	24	24	100
100	24	24	100
32	24	23	95.8
10	24	15	62.5
3.2	24	4	16.7
1	24	2	8.3
0.32	24	1	4.2
0	9	0	0

Serial dilutions from a negative plasma pool spiked with CMV material with known titer were processed in replicates of 24 or 9 per titer using the QIAsymphony SP with the Virus Cellfree 1000 protocol (60 µl elution volume) and the QIAsymphony Virus/Bacteria Midi Kit. CMV DNA was detected using a CMV PCR assay.

Purify viral nucleic acids or bacterial DNA

High-quality viral DNA and RNA, and bacterial nucleic acids can be purified from a wide range of sample types (Tables 2–4) using QIAsymphony Virus/Bacteria Kits on the QIAsymphony SP. Optimized protocols deliver high yields of pure nucleic acids, and flexible elution volumes support your downstream assays. The QIAsymphony SP is provided with standardized sample preparation protocols that define sample transfer, purification, and then elution. For purification of difficult samples or inactivation of samples, additional lysis procedures can be combined with the purification protocols.

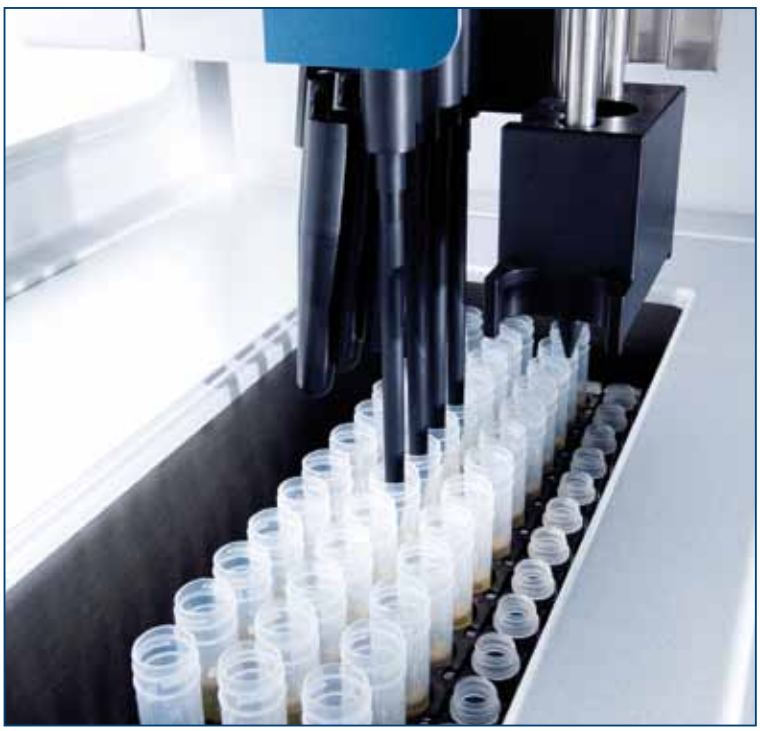


Table 2. Successful purification of a wide range of respiratory viruses from different sample types using the QIAsymphony SP

Respiratory Virus	Sample type
Adenovirus	aspirates, swab
HSV1	swab
Influenza A/B	aspirates, BAL, sputum, swab, pharyngeal lavage
hMPV	nasal secretion
Paraninfluenzavirus 1–4	aspirates, BAL, nasal secretion, swab
Coronavirus	aspirates, nasal secretion, sputum, swab
Rhinovirus	nasal secretion, tracheal and pharyngeal lavage
Enterovirus	nasal secretion, pharyngeal lavage
RSV	aspirates, sputum, swab, nasal secretion, pharyngeal lavage
Bocavirus	nasal secretion, tracheal and pharyngeal lavage

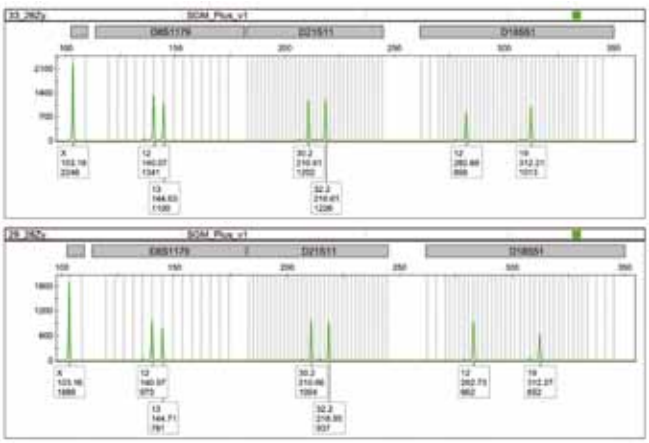
Unmatched yield and purity

QIAsymphony DNA Kits enable automated purification of DNA from a broad range of sample types with sample volumes up to 1 ml. Genomic DNA can be purified from human and animal whole blood (Figure 1), buffy coat, human and animal tissues (up to 50 mg), cultured cells (up to 1 x 10^7), and bacterial cultures (up to 4 x 10^9 cells) (Table 5). The QIAsymphony DNA Mini Kit is also suited for purification of viral DNA from human whole blood (Table 6). There is a dedicated QIAsymphony DNA Investigator Kit for processing forensic reference and casework samples.

Optimized protocols provide high yields of pure, inhibitor-free DNA. Flexible elution volumes allow DNA concentration to be easily adapted to your needs. Purified DNA is ready for use in even the most demanding downstream applications, such as multiplex ligation-dependent probe amplification (MLPA), array comparative genomic hybridization (aCGH), SNP analyses, Southern hybridizations, and STR profiling (Figure 2).

Table 5. Different DNA yields obtained from a range of sample types

Sample type	Sample amount or volume	Elution volume (µl)	Typical DNA yield (µg)
Whole blood	200 µl	200	4–12
	400 µl	400	8–24
	1000 µl	500	15–45
Buffy coat	200 µl	200	12–40
	400 µl	400	24–72
Spleen	25 mg	200	40–80
Liver	25 mg	200	25–50
Muscle	50 mg	200	5–15
Lung	25 mg	200	10–25
Kidney	25 mg	200	15–30
Rat tail	50 mg	200	20–40
Jurkat cells	1 x 10^7 cells	200	60–80



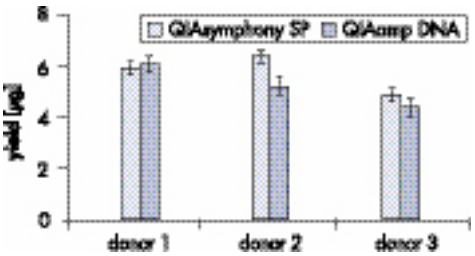


Figure 1. Equivalent performance to QIAamp. DNA was purified from 200 µl human whole blood. Replicates of 6, from 3 blood donors, were processed on the QIAsymphony SP using the QIAsymphony DNA Mini Kit and the QIAamp DNA Blood Mini Kit.

Table 6. Real-time PCR detection of CMV DNA in human whole blood

Input titer (Copies/ml)	Number of replicates	Number of positives	Percentage of positives
250	33	33	100
200	33	33	100
150	39	38	97
100	45	40	89
75	12	8	67
50	45	27	60
25	26	6	23
10	24	5	21
0	15	0	0

Dilutions of CMV stock (Acrometrix) were processed in replicates of 12–45) using the QIAsymphony SP with the Virus Blood 200 protocol (60 µl elution volume) and the QIAsymphony DNA Mini Kit. CMV DNA was detected using a CMV PCR assay.

Figure 2. STR profiling using the QIAsymphony SP and the EZ1® Advanced. DNA from saliva (10 µl) was purified on the QIAsymphony SP using the Casework 200 µl protocol and the QIAsymphony DNA Investigator Kit, or on the EZ1 Advanced using the Trace protocol and the EZ1 DNA Investigator Kit. DNA was eluted in 50 µl of Buffer ATE. DNA (1 ng) was analyzed by short tandem repeat (STR) profiling in 12.5 µl reactions. Data are shown for amelogenin, D8S1179, D21S11, and D18S51 loci.

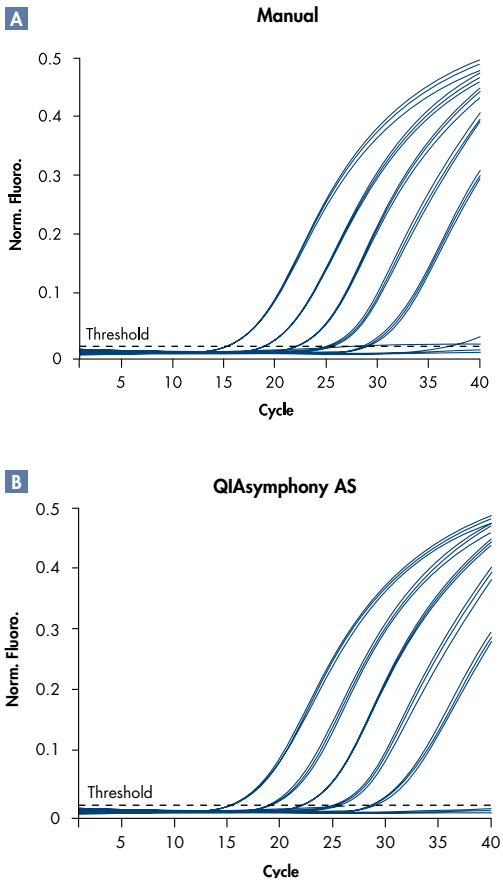


Figure 3. Highly reproducible assay setup. A series dilution of leukocyte cDNA (100 ng to 0.01 ng) was performed A manually and B using the QIAsymphony AS. GAPDH was amplified from these dilutions, using the Rotor-Gene Q and the QuantiFast® Probe PCR Kit. Reactions were set up in replicates of 4 in Strip Tubes.

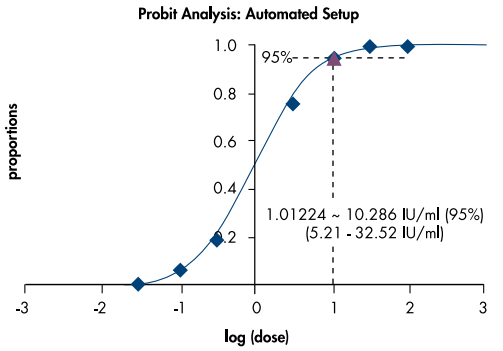


Figure 4. Automated assay setup is as sensitive as manual assay setup. Half-log dilutions of WHO HBV standard (n=8) were performed in replicates of 8. Assay setup was performed manually and using the QIAsymphony AS. Amplification was performed using the Rotor-Gene Q and a validated, in-house real-time PCR assay. Automated and manual assay setup were equally sensitive. Manual setup: 1,04698 ~ 11,142 IU/ml, (6,039–33,22 IU/ml)

Transfer your purified samples directly to the ▶ QIAsymphony AS

The QIAsymphony AS can simplify your routine work processes — even setting up complex PCR assays is fast and easy. Manual pipetting steps that are prone to human error are eliminated, so the QIAsymphony AS delivers more accurate pipetting on a day-to-day basis than even highly experienced laboratory staff (Figure 3 and 4). Pipetting of master mix and sample transfer for 96 samples takes less than 25 minutes, leaving you and your staff with more valuable time for other tasks.

The QIAsymphony AS is provided with predefined protocols, specifically designed for use with QIAGEN's expanding portfolio of real-time, end-point, and *artus*® PCR kits (Table 7). Standardized pipetting schemes can be adapted as required by QIAGEN customization services. A choice of output adapters enables use of different real-time PCR cyclers (e.g., Rotor-Gene Q, 96-well cyclers, 32-capillary cyclers) for detection. You can now relax and let QIAGEN's automated solutions do the hard work for you — prepare your samples on the QIAsymphony SP and then directly transfer your eluates to the QIAsymphony AS for assay setup. To use the Rotor-Gene Q for detection, simply set up your PCRs in Strip Tubes or Rotor-Discs. Your workflow has never been easier!

Table 7. Automate proven QIAGEN PCR kits with the QIAsymphony AS*

Application	Method	Kit	Description
▶ Gene expression analysis	Real-time RT-PCR	▶ Rotor-Gene Kits	Rapid and reliable RT-PCR on the Rotor-Gene Q
	Real-time RT-PCR	▶ QuantiFast Kits	Fast, sensitive RT-PCR on any real-time cycler
	Real-time RT-PCR	▶ QuantiTect® Kits	Sensitive RT-PCR on any real-time cycler
	End-point RT-PCR	▶ QIAGEN OneStep RT-PCR Kit	Sensitive RT-PCR, with simple setup, using any RNA template
▶ Virus detection	Real-time PCR and RT-PCR	▶ QuantiTect Kits	Highly sensitive detection of multiple viral DNA and RNA targets in the same tube
	End-point RT-PCR	▶ QIAGEN OneStep RT-PCR Kit	Highly sensitive detection of viral RNA
▶ Pathogen detection	Real-time PCR and RT-PCR	▶ *cador*™ veterinary	Ready-to-use, validated real-time PCR assays to detect veterinary pathogens
	Real-time PCR and RT-PCR	*artus* PCR and RT-PCR Kits‡	Ready-to-use real-time PCR assays for pathogen detection

* For a full list of QIAGEN PCR kits, including kits for genotyping and other specialized applications, visit www.qiagen.com/goto/PCR. For availability of QIAsymphony AS protocols, please inquire. † *cador* veterinary PCR and RT-PCR Kits are not available in the US or Canada. ‡ *artus* PCR and RT-PCR Kits are not available in the US.

Ordering Information

Product	Contents	Cat. no.
▶ QIAsymphony SP	QIAsymphony sample prep module, 1-year warranty on parts and labor	9001297
▶ QIAsymphony AS	QIAsymphony assay setup module, 1-year warranty on parts and labor	9001301
▶ Rotor-Gene Q 5plex HRM	Real-time PCR cycler and High Resolution Melt analyzer with 5 channels	9001580
▶ QIAsymphony Cabinet SP/AS	For correct positioning of the QIAsymphony SP/AS instruments	9020246
▶ Starter Pack, QIAsymphony AS	Pack includes consumables required for operating the QIAsymphony AS	997199
▶ Filter-Tips, 50 µl, Qsym AS (1024)	Disposable Filter-Tips; racked; (8 x 128)	997120
▶ QIAsymphony Virus/Bacteria Mini Kit (192)	For up to 192 preps of 200 µl each: Includes 2 reagent cartridges and enzyme racks and accessories	931036
▶ QIAsymphony Virus/Bacteria Midi Kit (96)	For up to 96 preps of 1000 µl each: Includes 2 reagent cartridges and enzyme racks and accessories	931055
▶ QIAsymphony DNA Mini Kit (192)	For 192 preps of 200 µl each: Includes 2 reagent cartridges and enzyme racks and accessories	931236
▶ QIAsymphony DNA Midi Kit (96)	For 96 preps of 1000 µl each: Includes 2 reagent cartridges and enzyme racks and accessories	931255
▶ QIAsymphony AXpH DNA Kit (192)	For 192 preps: Includes 2 reagent cartridges and enzyme racks and accessories	937156
▶ QIAsymphony DNA Investigator Kit	For 192 preps from casework and reference samples: Includes 2 reagent cartridges and enzyme racks and accessories	931436
▶ QIAsymphony RNA Kit (192)	For 192 preps: Includes 2 reagent cartridges and enzyme racks and accessories	931636
▶ QIAsymphony PAXgene Blood RNA Kit (96)	For 962 preps: Includes 2 reagent cartridges and enzyme racks and accessories	762535

For up-to-date licensing information and product-specific disclaimers, see the respective QIAGEN kit handbook or user manual. QIAGEN kit handbooks and user manuals are available at www.qiagen.com or can be requested from QIAGEN Technical Services or your local distributor.

Visit www.qiagen.com/goto/QIAsymphony to find out more!

www.qiagen.com

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Brazil ▪ Orders 0800-557779 ▪ Fax 55-11-5079-4001 ▪ Technical 0800-557779

Canada ▪ Orders 800-572-9613 ▪ Fax 800-713-5951 ▪ Technical 800-DNA-PREP (800-362-7737)

China ▪ Orders 86-21-3865-3865 ▪ Fax 86-21-3865-3965 ▪ Technical 800-988-0325

Denmark ▪ Orders 80-885945 ▪ Fax 80-885944 ▪ Technical 80-885942

Finland ▪ Orders 0800-914416 ▪ Fax 0800-914415 ▪ Technical 0800-914413

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Germany ▪ Orders 02103-29-12000 ▪ Fax 02103-29-22000 ▪ Technical 02103-29-12400

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Korea (South) ▪ Orders 080-000-7146 ▪ Fax 02-2626-5703 ▪ Technical 080-000-7145

Luxembourg ▪ Orders 8002-2076 ▪ Fax 8002-2073 ▪ Technical 8002-2067

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Sweden ▪ Orders 020-790282 ▪ Fax 020-790582 ▪ Technical 020-798328

Switzerland ▪ Orders 055-254-22-11 ▪ Fax 055-254-22-13 ▪ Technical 055-254-22-12

UK ▪ Orders 01293-422-911 ▪ Fax 01293-422-922 ▪ Technical 01293-422-999

USA ▪ Orders 800-426-8157 ▪ Fax 800-718-2056 ▪ Technical 800-DNA-PREP (800-362-7737)

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