



Allegro™ Connect Depth Filtration System

Contents

Introduction	3
The Allegro Connect Depth Filtration System	3
The solution	4
Increased assurance	5
Automated pre-use manifold leak test	6
A total depth filtration solution	10
Technical specifications	13
Ordering information	16



Introduction

Executing any process without the right degree of monitoring, control or reporting runs the risk of process deviations. This could potentially lead to the adulteration of valuable drug substance and intermediates, whilst wasting valuable operator time. Allegro Connect Systems provide robust, accurate and automated platforms that integrate with your manufacturing processes on every level, keeping unit operations within critical parameters to ensure that you spend less time collating data and more time optimizing your process.

Our range of Allegro Connect Systems share a compact form factor, designed with operators in mind, that are configurable to meet your process requirements without the time-consuming pain of modification.

The Allegro Connect Depth Filtration System

The Allegro Connect Depth Filtration System is a single-use automated filtration system designed to deliver robust process control during the clarification/harvest step.

This next generation compact and elegant system is designed to minimize risk through a fully automated process with recipe-controlled steps, including pre-use manifold leak test, system priming, product filtration and buffer chase, with all data stored in a batch reporting system, significantly reducing non-conformities and manual labor.

New design features enable manifolds to be configured to meet various process needs; supporting different process trending sensors and a wide range of liquid filter capsules, also accommodating non-Pall filters.

The problem

Manual and semi-automated filtration often lacks robustness, increasing the risk of critical deviations, non-conformities and sometimes even batch loss. The process data that is generated by the current systems is often insufficient and hard to access, making it very difficult to accurately evaluate any deviations or routine process analysis and causing a significant impact on both cost and labor.

Current trends show an increasing number of multi-product facilities being built and/or being retrofitted together with significant investments in automated bioprocessing equipment.

Most of the existing automated depth filtration systems are designed to fit a specified process scale and are therefore less flexible.

80%
of process deviations in
pharmaceutical manufacturing
environments can be attributed to
human error*



* Eliminating Human Error From Your List of Manufacturing Deviations, (podcast), Ginette Collazo, March 23, 2021

The solution

Maximize flexibility

Standard and advanced system to suit user requirements

Manifold and filter diversity

Good fit across 200 L pilot to 2000 L production scale

Minimize process risk

Fully automated process

Minimal operator intervention

Seamless data mining with all data in one place

Maximize usability

Compact 3D footprint and elegant design

Improved usability and upgraded process sensor/probes

Ease of manifold installation



The solution is automated and configurable

The Allegro Connect Depth Filtration System is a fully automated and highly configurable depth filtration system, designed with the following key features:

- Automatically performs pre-use water flushing, product filtration and buffer chase – utilizing standard manifolds.
- Filters up to 2000 L¹ of process stream from a bioreactor scale.
- Supports a total of 30 m² first stage, 20 m² second stage installed filter chassis and up to 2 × 762 mm (30 in.) in-line bioburden reduction filters installed on the system cabinet to reduce footprint.
- Combined manifold and installed filter leak test to ensure a correctly assembled flow path with no leaks prior to application of process fluid.
- Electronic batch records (summary and detailed), compiling data from the single-use sensors within the flow path and other critical process parameters.
- Common automation software (Wonderware[®] based) used across Pall's Allegro Connect range, which aids ease of recipe creation and operator usability.
- A complete single-use flow path can be installed or uninstalled by a single operator in <90 minutes.

¹Larger volumes may be possible for less challenging process streams.

Increased assurance

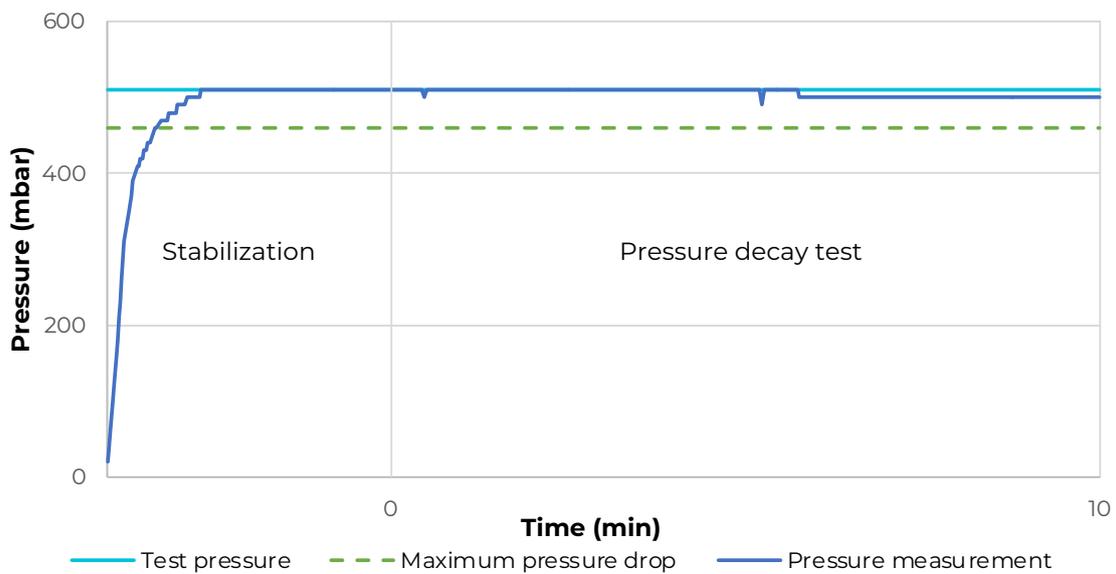
Pre-use manifold leak test provides flow path integrity assurance prior to flushing and product filtration. Pressure and flow measurements enable different processing modes to maximize process flexibility. In addition, the optional turbidity and conductivity sensors enhance process monitoring and control to minimize process deviations.



Allegro Connect Depth Filtration System showing depth filtration stages.

Automated pre-use manifold leak test

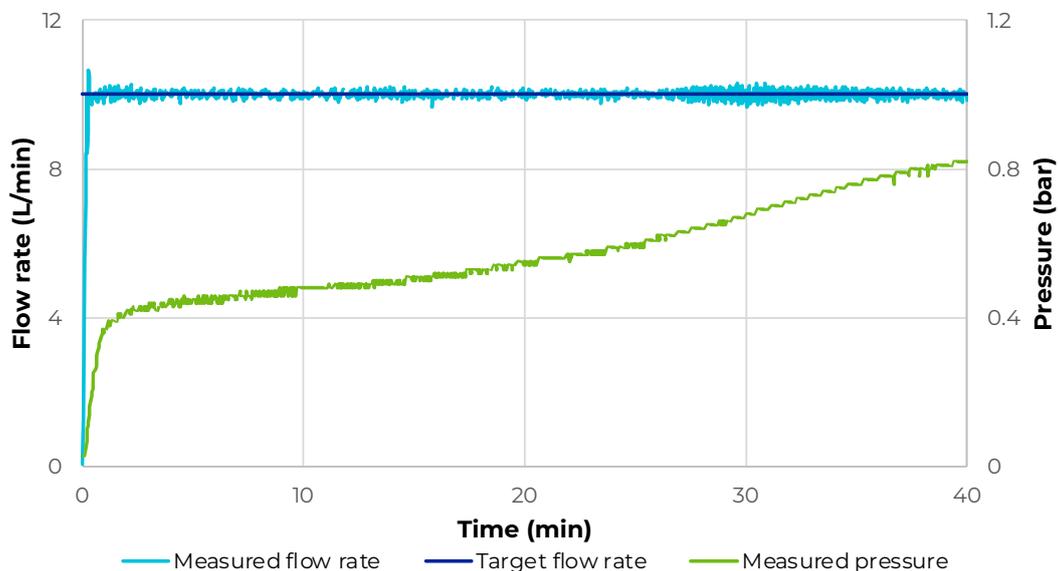
Automated pre-use manifold leak test



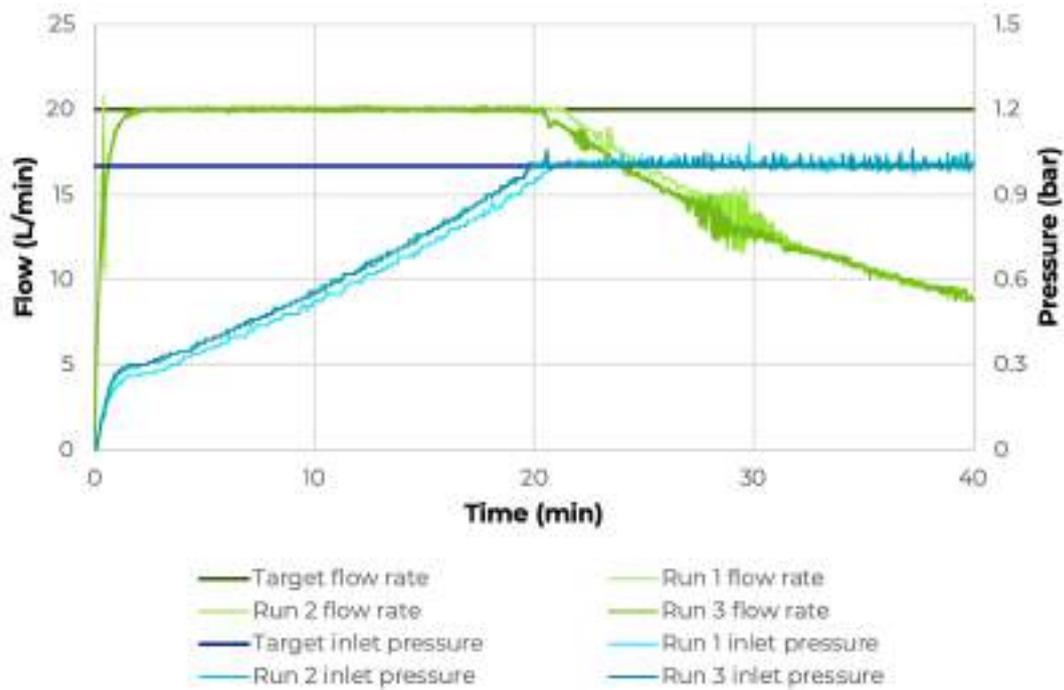
Robust filtration

Three modes of pump operation to allow additional process flexibility: inlet pressure, flow control and sequential control (constant flow – constant inlet pressure).

Fixed flow control



Sequential control: constant flow – constant inlet pressure



Maximizing productivity

The Allegro Connect Depth Filtration System utilizes single-use technology (SUT) to ensure faster turnaround times between product batches, eliminating the need for clean-in-place (CIP) and sterilization-in-place (SIP) operations and associated cleaning validation, and reducing maintenance costs and system downtime to ensure plant productivity is higher.

The entire flow path has been designed for easy installation and removal, with clearly marked connections and a shadow board to visibly guide the user, reducing the risk of human error and improving equipment turnaround between batches.



Designed for ease of use

The Allegro Connect Depth Filtration System has undergone extensive usability trials, to ensure the system is simple and intuitive to use.

Visual instructions for installation (IFI) screens have been created and are accessible via the human machine interface (HMI) screen providing operators with a step-by-step guide to installing the single-use flow paths and making the relevant fluid connections. Sample IFI screens can be seen below.



Guided IFI, where the operator is instructed by the recipe to prepare the system for installation.



Guided IFI, where the operator is instructed by the recipe to install the waste manifold.



Guided IFI, where the operator is instructed by the recipe to install bioburden filters.



Operator using the intuitive HMI screen for process monitoring.

A total depth filtration solution

The Allegro Connect Depth Filtration System can also be connected with some of our other single-use systems to provide a total depth filtration solution for your process, such as Allegro STR Bioreactors, LevMixer® Systems and Allegro Mixers for product and the Allegro Totes for buffer and water for injection (WFI) storage.

Application

The Allegro Connect Depth Filtration System is the optimal solution for the initial process step of whole cell/cellular debris removal, post bioreactor, in drug substance manufacturing and for post virus inactivation filtration where precipitation can occur after acidification/neutralization of the process stream.

The depth filtration system is available in two versions for flexibility to meet end user process requirements:

Allegro Connect Depth Filtration System – standard

The standard Allegro Connect Depth Filtration System includes:

- Feed pump
- Flow sensor
- Inlets (WFI, product, buffer)
- Outlets (product, process waste)
- Backpressure valve for leak test and blow down procedure
- Filter area ratio up to a maximum 3:2
- Bioburden filters: 1 × 254 mm (10 in.) up to 2 × 762 mm (30 in.) capsules
- Automated product recovery phase
- Pressure sensors (differential pressure (ΔP) across 1st stage, ΔP across 2nd stage and ΔP across bioburden filters)

Allegro Connect Depth Filtration System – advanced (additional components)

The advanced Allegro Connect Depth Filtration System includes all items within the standard system, with the following additional components:

- Depth filter chassis bypass of post stage 1
- Depth filter chassis bypass of post stage 2
- SU turbidity sensors ($\times 2$)
- SU conductivity sensor
- Individual control valve for each installed depth filter chassis



System options

The Allegro Connect Depth Filtration System is available with three automation options:

- Programmable logic controller (PLC), Rockwell® or Siemens®, and human machine interface (HMI) for local stand-alone control
- Remote input/output (I/O) (no PLC) for integration into a DCS or supervisory control and data acquisition (SCADA) system
- Remote I/O (no PLC) controlled by centralized PLC system

The automation architecture is based on either Siemens S7 PLC or Rockwell CompactLogix® PLC, an industrial PC, and a 22 in. thin client which is applied across our range of bioprocessing systems enabling a truly modular 'plug-and-play' concept, with the ability to control single or multiple unit operations from one centralized cabinet.

The Allegro Connect Depth Filtration System is compatible with all Pall Corporation single-use mixing technology and can also be integrated with most mixing equipment from other suppliers.



Quality standards

The Allegro Connect Depth Filtration System has a detailed validation package for all configurations according to ASTM 2500 Standards (a standard guide for specification, design and verification of pharmaceutical and biopharmaceutical manufacturing systems and equipment).

The regulatory dossier includes:

- Regulatory compliance ROHI to ROHS III directives
- Raw material compliance data (USP standards)
- Packaging and packaging waste directive 94/62/EV
- System designed in accordance with the American Society of Civil Engineers (ASCE), ASCE 7, Minimum Design Loads and Associated Criteria for Buildings and Other Structures

The Pall automation platform enables compliance with 21 CFR Part 11 and follows the GAMP® V life cycle for software development.

Technical specifications

Process specifications

Equipment	Specification
Functionality	Filtration
Filtration configurations	Depth filter stages in series with bioburden filters
Minimum bioburden filter size	254 mm (10 in.)
Maximum bioburden filter size	762 mm (30 in.)
Feed pump	1
Pump flow rate range	50 – 5000 L/h
Number of inlets	3 (2 × WFI/buffer and 1 × product)
Number of outlets	2 × process waste outlet (1 × vent line, 1 × pre bioburden reduction stage drain)
Tube dimension (ID)	1 in. (internal diameter (ID))
Flow path operating pressure	0 – 3 bar ² (0 – 44 psi) and 0 – 2.4 bar ³ (0 – 35 psi)
Installation test pressure	2 bar max, <1 bar recommended
Flow path operating temperature range	4 – 40 °C
Pressure sensor	Up to 4 (1 after feed pump with integrated, hard-wired pressure switch; 1 before first filtration stage, 1 after second filtration stage and 1 after bioburden reduction filter stage)
Flow sensor	1 electromagnetic flow sensor after the feed pump
Conductivity sensor	1 (at the system outlet)
Turbidity sensor	2 (1 at Stage-1 outlet and 1 at Stage-2 outlet)
External connections	6 (2 × ethernet for mixer, 2 × HC-DD24 for mixers, 2 × HAN16E for scales)

² All the system manifolds except the depth filter inlet manifold. ³ Depth filter inlet manifold.

Engineering specifications

Main system	Specification
Floor clearance	110 mm (4.3 in.)
Environmental conditions	5 – 30 °C, relative humidity (RH) 10 – 70% (non-condensing)
Noise	77 dB(A) at full pump load, 57 dB(A) at typical process conditions
Materials of construction	Stainless steel 1.4301 (304)
Surface finish	Cold rolled steel (typically Ra < 1 µm)
Ingress protection rating	IP54 (main, outer panel or chassis)

Component specifications

Component specifications, sensor range and accuracies are as per OEM datasheets and correct at the time of compiling this proposal. Pall Corporation does not accept any responsibility in the case of deviation to the specifications outlined below.

Process equipment	Type	Specification
Primary pump	QF5050 single-use diaphragm pump	Flow range: 50 – 5000 L/h
Flow sensor	Krohne FLEXMAG• 4050	Range: 0.5 – 75 L/min Accuracy: ± 2% of MV
Process valves	Norgren Acro• 935 and 936	Pneumatically operated pinch valve
Pressure	PendoTECH• – single-use sensor with pressure sensitivity chip	Range: -0.48 to 5.20 bar Accuracy: ± 2% from 0 to 0.41 bar ± 3% from 0.41 to 2.07 bar ± 5% from 2.07 to 4.10 bar
Level detector	Rechner• – capacitive sensor	Operating distance: 0.5 mm minimum – 15 mm maximum
Conductivity sensor	Optek• ACF60 single-use sensor	Range: 0 µS/cm to 150 mS/cm Accuracy: ± 2% of MV ± 0.4 µS/cm
Turbidity sensor	Optek• AF16 single-use sensor	Range: 0 to 0.05 CU to 4 CU Resolution: < ± 0.05% of MV

Dimensions and weight

Main system	Specification
Mass	650 kg (1433 lb)
Dimensions (W × D × H)	142 × 122 × 198 cm (59 × 48 × 78 in.)
Single Stax™ Trolley	Specification
Mass	300 kg (661 lb)
Dimensions (W × D × H)	94 × 93 × 198 cm (38 × 37 × 78 in.)
Double Stax Trolley	Specification
Mass	600 kg (1323 lb)
Dimensions (W × D × H)	159 × 93 × 198 cm (63 × 37 × 78 in.)
Triple Stax Trolley	Specification
Mass	850 kg (1874 lb)
Dimensions (W × D × H)	237 × 93 × 198 cm (93 × 37 × 78 in.)

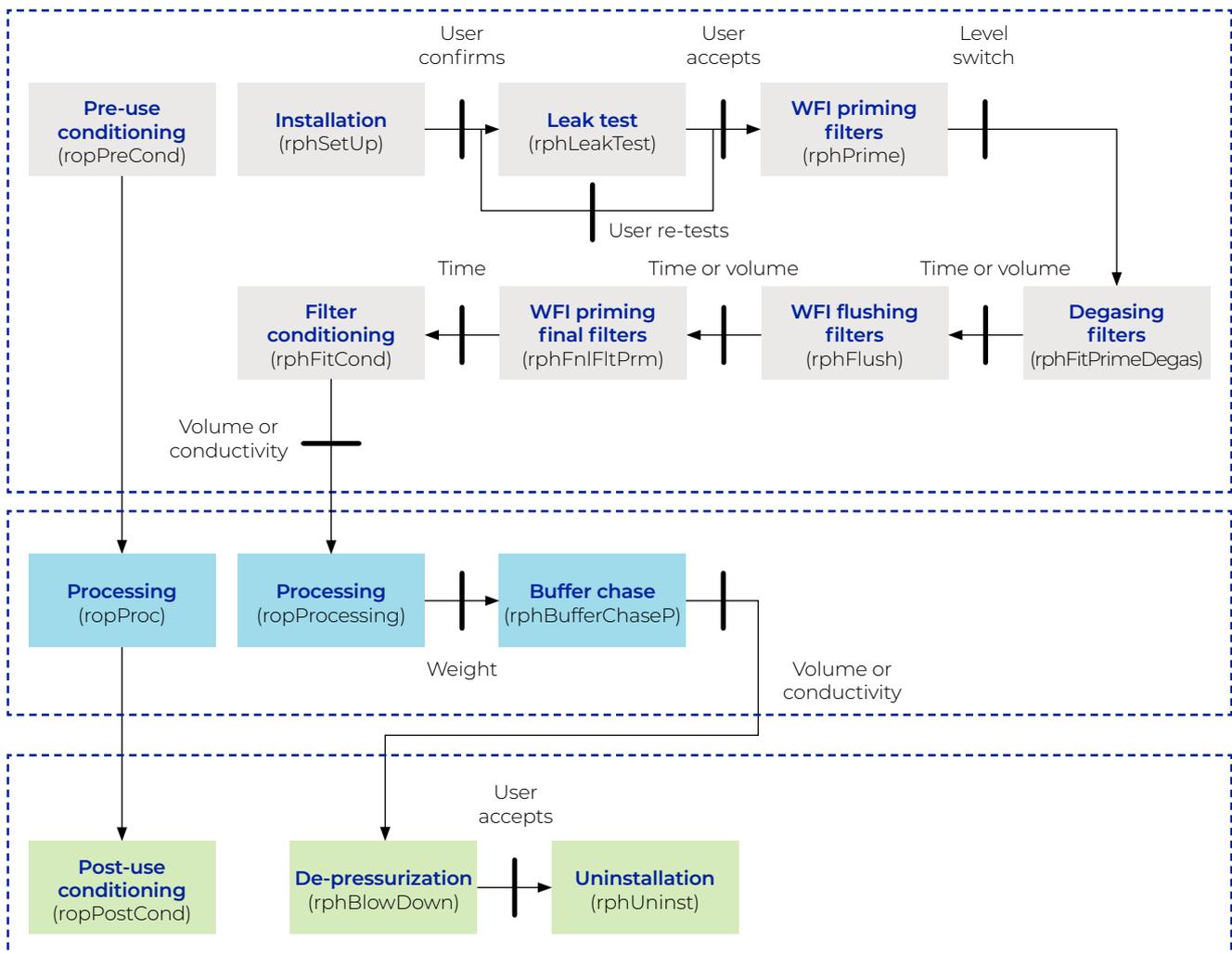
Cleaning

The system is stable to cleaning with the following typical cleaning solutions:

- 70% ethanol
- 70% IPA
- 0.5% sodium hypochlorite
- 0.02% w/w benzalkonium chloride
- 2% sodium hydroxide
- Spor-Klenz® Ready-to-Use (RTU)

Process sequence

The generalized configurable depth filtration phases are shown below.



Key:



Process screens

Process screens have been created to summarize and expand on critical process information throughout the operation. Example screens are shown below.



Batch report

Upon operator selection, batch reports will be generated automatically at the end of a batch for each single step. Both a summary and detailed batch report is generated, and the content of these batch reports is predefined. Batch reports can be configured to specific needs by the end user via AVEVA Reports (Dream Reports). Sample batch reports can be provided upon request.

Predefined batch records contain the following major information:

- General batch information, phase information and transition conditions
- Global and recipe parameters including controller parameterization
- Audit trails excerpt
- Alarms summary
- List of SU components that were registered during recipe execution
- Trends for differential pressure across filters

Ordering information

System hardware and accessories

Part number	Part number description
Standard system	
ACDFSBEUPLC	Allegro Connect Depth Filtration Standard System: PLC 400 VAC, software automation
ACDFSBWHPLC	Allegro Connect Depth Filtration Standard System: PLC 480 VAC, software automation
ACDFSBEUIO	Allegro Connect Depth Filtration Standard System: I/O 400 VAC, DCS ready no automation
ACDFSBWHIO	Allegro Connect Depth Filtration Standard System: I/O 480 VAC, DCS ready no automation
Advanced system	
ACDFSAEUPLC	Allegro Connect Depth Filtration Advanced System: PLC 400 VAC, software automation
ACDFSAWHPLC	Allegro Connect Depth Filtration Advanced System: PLC 480 VAC, software automation
ACDFSAEUIO	Allegro Connect Depth Filtration Advanced System: I/O 400 VAC, DCS ready no automation
ACDFSAWHIO	Allegro Connect Depth Filtration Advanced System: I/O 480 VAC, DCS ready no automation
Trolley	
ACDFSSTAX1	Allegro Connect Depth Filtration trolley with max of 1 Stax chassis (1 – 10 m ² installed filter membrane area)
ACDFSSTAX2	Allegro Connect Depth Filtration trolley with max of 2 Stax chassis (1 – 20 m ² installed filter membrane area)
ACDFSSTAX3	Allegro Connect Depth Filtration trolley with max of 3 Stax chassis (1 – 30 m ² installed filter membrane area)
FAT	
ACDFSFAT	Allegro Connect Depth Filtration System FAT 2.5 days with flow kit
ACDFSFATEXT	Allegro Connect Depth Filtration System FAT 5 days with flow kit
Seismic feet	
ACSEISMIC	Allegro Connect System seismic leveling feet
Other accessories	
ACGEN3COMSCBL	Allegro Connect System GEN3 mixer communication cable
ACGEN4COMSCBL	Allegro Connect System GEN4 mixer communication cable
ACLGRCOMSCBL	Allegro Connect System LGR mixer communication cable

Contact our sales representative for UL61010 certification requirement.

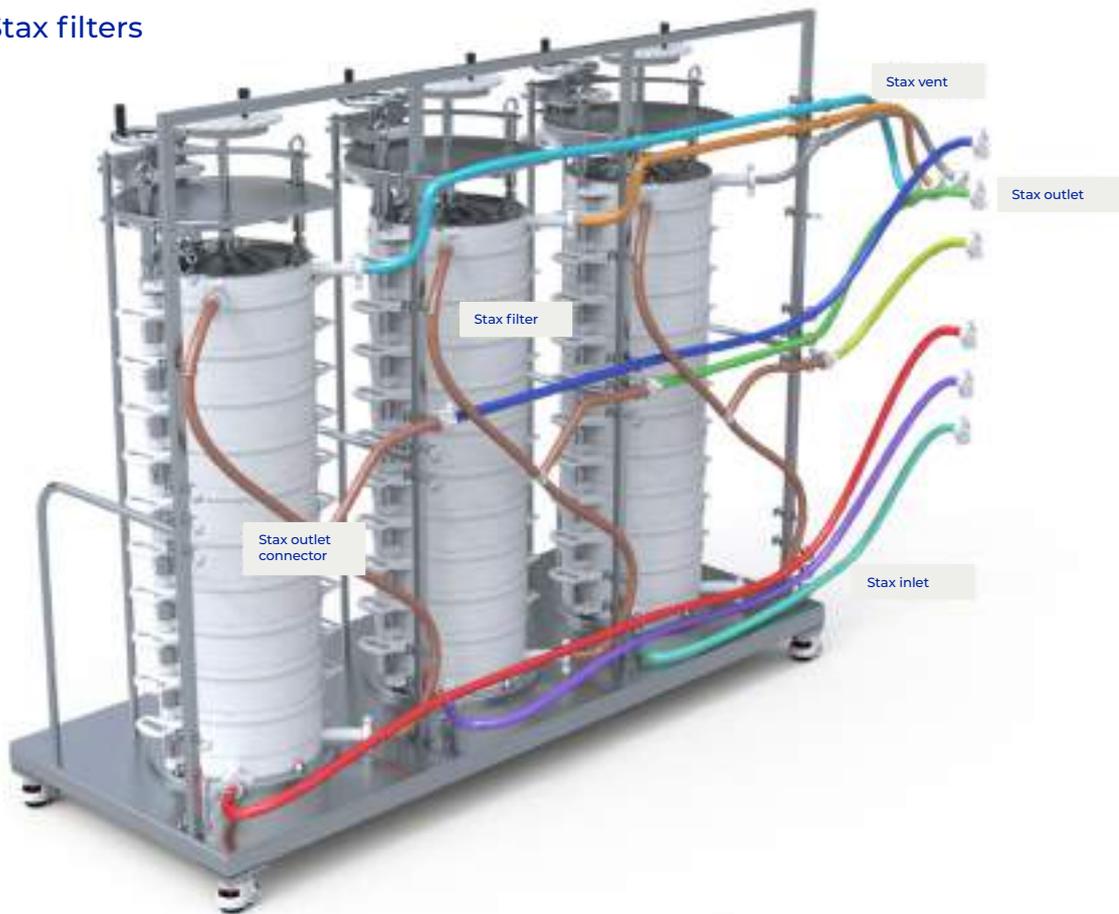
Single-use assemblies

Below is the list of part numbers that have been designed and approved to support the depth filtration system. Given the configurable nature of the system as well as the numerous combinations of filter capsules (membrane and size) possible, only a limited number of filtration assemblies are shown below. If a specific filtration combination set does not appear but falls within the limits of the system, these can be created by Pall Corporation. An entire custom depth filtration manifold can be built for a specific process by following the steps below.

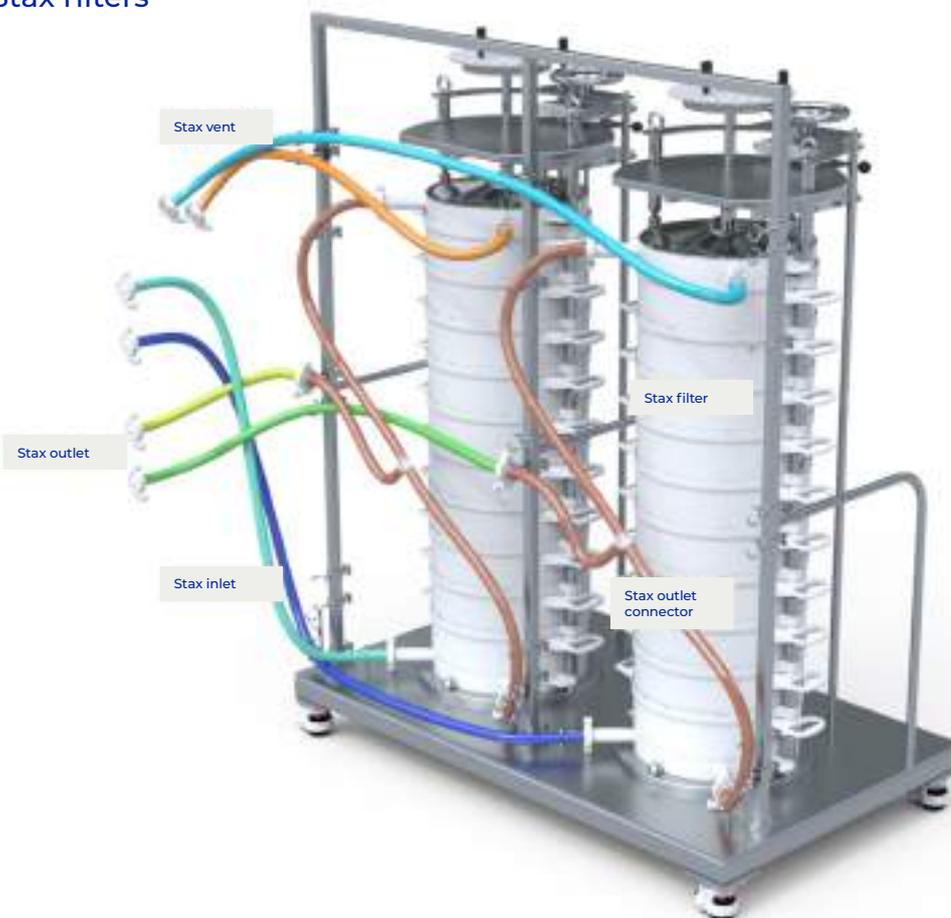
Standard system



Stage-1 Stax filters



Stage-2 Stax filters



Single-use ordering guide for depth filtration standard system

Flow path selection	Part number	Part number description
Step 1: Pick all mandatory manifolds (inlet, pump and bypass drain)		
Inlet	7424-1527K	1 in. system inlet manifold
Pump	7424-1527L	1 in. single-use pump head assembly
Pump outlet	7424-1527M	1 in. pump outlet manifold
Bypass/drain	7424-1527N	1 in. bypass/drain manifold
Step 2: Choose one air line manifold for the system		
Air line manifold CPC	7424-1529B	½ in. filter air line 1 with CPC connector at the outlet manifold
Air line manifold TC	7424-1528A	½ in. filter air line 1 with 1½ in. tri clamp connector at the outlet manifold
Step 3: Stage-1 Stax distribution manifold		
Stage-1 inlet manifold	7424-1527W	1 in. left hand distribution option 1 manifold
Stage-1 outlet manifold	7424-1527X	1 in. distribution option 2 manifold
Step 4: Choose stage-1 Stax inlet manifold depending on the number of chassis used		
Stax chassis, 1 inlet	7424-1615N	Stax ¾ in. inlet short manifold
Stax chassis, 2 inlet	7424-1615P	Stax ¾ in. inlet medium manifold
Stax chassis, 3 inlet	7424-1615Q	Stax ¾ in. inlet long manifold
Step 5: Choose stage-1 Stax outlet manifold depending on the number of chassis used		
Stax chassis, 1 outlet	7424-1615S	Stax ¾ in. outlet short manifold
Stax chassis, 2 outlet	7424-1615T	Stax ¾ in. outlet medium manifold
Stax chassis, 3 outlet	7424-1615U	Stax ¾ in. outlet long manifold
Step 6: Select stage-1 Stax inlet-outlet connector manifold depending on the number of chassis used		
Stage-1 Stax inlet-outlet connector manifold	7424-1615R	Stax ¾ in. outlet connector manifold
Step 7: Choose stage-1 Stax vent manifold depending on the number of chassis used		
Stax 1 vent	7424-1615V	Stax ½ in. air line short manifold
Stax 2 vent	7424-1615W	Stax ½ in. air line medium manifold
Stax 3 vent	7424-1615X	Stax ½ in. air line long manifold
Step 8: Select stage-1 air line manifold		
Air line manifold	7424-1528B	Stax ½ in. air line 2 manifold
Step 9: Choose one stage-2 Stax distribution manifold		
Stage-2 inlet manifold (for 1 × chassis)	7424-1527Y	1 in. distribution option 3 manifold
Stage-2 outlet manifold (for 1 × chassis)	7424-1527Z	1 in. distribution option 4 manifold
Stage-2 second inlet manifold (for 2 × chassis)	7424-1790Y	1 in. distribution option 5 manifold
Stage-2 second outlet manifold (for 2 × chassis)	7424-1790Z	1 in. distribution option 6 manifold
Step 10: Choose stage-2 Stax inlet manifold depending on the number of chassis used		
Stax 1 inlet	7424-1615T	Stax ¾ in. outlet medium manifold
Stax 2 inlet	7424-1615U	Stax ¾ in. outlet long manifold
Step 11: Choose stage-2 Stax outlet manifold depending on the number of chassis used		
Stax 1 outlet	7424-1615S	Stax ¾ in. outlet short manifold
Stax 2 outlet	7424-1615T	Stax ¾ in. outlet medium manifold

Step 12: Choose stage-2 Stax inlet-outlet connector manifold depending on the number of chassis used		
Stage-2 Stax inlet-outlet connector manifold	7424-1615R	Stax ¾ in. outlet connector manifold
Step 13: Choose stage-2 Stax vent manifold depending on the number of chassis used		
Stax 1 vent	7424-1615W	Stax ½ in. air line medium manifold
Stax 2 vent	7424-1615X	Stax ½ in. air line long manifold
Step 14: Choose stage-2 air line manifold depending on the number of chassis used		
Air line for 2 × Stax	7424-1528C	Stax ½ in. air line 3 manifold
Air line for 1 × Stax	7424-1529E	Stax ½ in. air line 4 manifold
Step 15: Select one bioburden filter inlet manifold		
Filter inlet manifold	7424-1527R	1 in. filter inlet
Step 16: Choose one bioburden filter outlet manifold		
Bioburden filter outlet manifold 254 mm (10 in.)	7424-1527T	1 in. outlet manifold for 254 mm (10 in.) filter capsule
Bioburden filter outlet manifold 508 mm (20 in.)	7424-1527U	1 in. outlet manifold for 508 mm (20 in.) filter capsule
Bioburden filter outlet manifold 762 mm (30 in.)	7424-1527V	1 in. outlet manifold for 762 mm (30 in.) filter capsule
Step 17: Choose stage-1 and stage-2 filter capsules		
Please refer to Pall.com/Stax (USD3245 Stax mAx Clarification Platform), or your local Pall representative for additional support		
Step 18: Choose Bioburden filters		
Please refer to Pall.com (USD3245 Stax mAx Clarification Platform), or your (USD2342 Kleenpak™ Capsules with Supor® EAV Membrane) or your local Pall representative for additional support. The manifold example is for connecting 3 Stax chassis, for 1 or 2 Stax chassis contact Pall.		

In order to reduce our carbon footprint, we strive to provide single-use systems manufactured regionally. However, to ensure security of supply you may receive products from multiple global sites.

Advanced system



Single-use ordering guide for depth filtration advanced system

Flow path selection	Part number	Part number description
Step 1: Add all mandatory manifolds (inlet, pump and bypass drain)		
Inlet	7424-1527K	1 in. system inlet manifold
Pump	7424-1527L	1 in. single-use pump head assembly
Pump outlet	7424-1527M	1 in. pump outlet manifold
Bypass/drain	7424-1527N	1 in. bypass/drain manifold
Step 2: Choose one air line manifold for the system		
Air line manifold CPC	7424-1529B	½ in. filter air line 1 with CPC connector at the outlet manifold
Air line manifold TC	7424-1528A	½ in. filter air line 1 with 1½ in. tri clamp connector at the outlet manifold
Step 3: Add stage-1 Stax distribution manifold		
Stage-1 distribution	7424-1527P	1 in. left hand distribution manifold
Step 4: Choose stage-1 Stax inlet manifold depending on the number of chassis used		
Stax 1 inlet	7424-1615N	Stax ¾ in. inlet short manifold
Stax 2 inlet	7424-1615P	Stax ¾ in. inlet medium manifold
Stax 3 inlet	7424-1615Q	Stax ¾ in. inlet long manifold
Step 5: Choose stage-1 Stax outlet manifold depending on the number of chassis used		
Stax 1 outlet	7424-1615S	Stax ¾ in. outlet short manifold
Stax 2 outlet	7424-1615T	Stax ¾ in. outlet medium manifold
Stax 3 outlet	7424-1615U	Stax ¾ in. outlet long manifold
Step 6: Select stage-1 Stax outlet connector manifold depending on the number of Stax chassis used		
	7424-1615R	Stax ¾ in. outlet connector manifold
Step 7: Choose stage-1 Stax vent manifold depending on the number of Stax chassis used		
Stax 1 vent	7424-1615V	Stax ½ in. air line short manifold
Stax 2 vent	7424-1615W	Stax ½ in. air line medium manifold
Stax 3 vent	7424-1615X	Stax ½ in. air line long manifold
Step 8: Select stage-1 air line manifold		
	7424-1528B	Stax ½ in. air line 2 manifold
Step 9: Choose one stage-2 Stax distribution manifold		
Stage-2 distribution	7424-1528D	1 in. right hand distribution manifold without turbidity sensor
	7424-1527Q	1 in. right hand distribution manifold with turbidity sensor
Step 10: Choose stage-2 Stax inlet manifold depending on the number of chassis used		
Stax 1 inlet	7424-1615T	Stax ¾ in. outlet medium manifold
Stax 2 inlet	7424-1615U	Stax ¾ in. outlet long manifold
Step 11: Choose stage-2 Stax outlet manifold depending on the number of chassis used		
Stax 1 outlet	7424-1615S	Stax ¾ in. outlet short manifold
Stax 2 outlet	7424-1615T	Stax ¾ in. outlet medium manifold
Step 12: Select stage-2 Stax inlet-outlet connector manifold depending on the number of chassis used		
	7424-1615R	Stax ¾ in. outlet connector manifold
Step 13: Choose stage-2 Stax vent manifold depending on the number of chassis used		
Stax 1 vent	7424-1615W	Stax ½ in. air line medium manifold
Stax 2 vent	7424-1615X	Stax ½ in. air line long manifold

Step 14: Choose stage-2 air line manifold depending on the number of chassis used		
Air line for 2 × Stax	7424-1528C	Stax ½ in. air line 3 manifold
Air line for 1 × Stax	7424-1529E	Stax ½ in. air line 4 manifold
Step 15: Choose one bioburden filter inlet manifold		
Filter inlet manifold	7424-1557V	1 in. filter inlet with conductivity sensor manifold
Filter inlet manifold	7424-1527S	1 in. filter inlet with conductivity and turbidity sensor manifold
Step 16: Choose one bioburden filter outlet manifold		
Filter outlet manifold	7424-1527T	1 in. outlet manifold for 254 mm (10 in.) filter capsule
Filter outlet manifold	7424-1527U	1 in. outlet manifold for 508 mm (20 in.) filter capsule
Filter outlet manifold	7424-1527V	1 in. outlet manifold for 762 mm (30 in.) filter capsule
Step 17: Choose stage-1 and stage-2 filter capsules		
Please refer to Pall.com/Stax (USD3245 Stax mAx Clarification Platform), or your local Pall representative for additional support		
Step 18: Choose bioburden filters		
Please refer to Pall.com (USD2461 Supor EKV Sterilizing Grade Filters), or (USD2342 Kleenpak Capsules with Supor EAV Membrane) or your local Pall representative for additional support. The manifold example is for connecting 3 Stax chassis, for 1 or 2 Stax chassis contact Pall.		



Scientific and laboratory services

The scientific and regulatory knowledge that supports the selection, adoption, and ongoing use of critical process technology – coupled with analytical, imaging and measurement capabilities – creates a versatile and practical resource ready to respond to an ever-changing industry. Pall duplicates these laboratories across the globe and leverages their cumulative knowledge to deliver practical scientific and regulatory support to all process technologies, to keep you moving forward.

Technical services

The accessibility of local technical support networks minimizes delays in your journey at all points. From the early stage of process development to on-site support for mature processes, Pall's technical support groups are there to help remove barriers to progress and make your journey as rapid and stress-free as possible. Our knowledge of the technology and the process can be applied to everything from training to troubleshooting and consultancy. Our global team of technology experts is on hand to respond to your changing needs.

Advanced separation systems

Operating within the defined design space demands the monitoring and control of critical process parameters to assure product quality. Systems that control critical unit operations and communicate with your existing process components can control process risks and maximize productivity by reducing operator involvement for many processes. Pall applies strong engineering and regulatory understanding to deliver compliant and qualified systems that safeguard and simplify your journey.

Process development services

Prior knowledge is a rare and valuable commodity, especially when preparing to take a new direction or when under pressure to deliver to a tight deadline. Take advantage of Pall's experience, process knowledge and technical know-how to help you achieve your goals. From the optimization of an end-to-end continuous process to establishing the right parameters for a single unit operation, our teams of scientists are ready to work with you and to generate the data you need to make the critical decisions necessary for success.

Validation services

Arriving at your destination counts for nothing without the necessary paperwork to proceed to the next stage. Pall's Validation Services are committed to delivering the supporting data packages and analysis required to quantify process risk and support regulatory submission. Our strengths include critical filtration technologies, such as the performance validation of sterilizing grade filtration, and we are at the forefront of the evolving needs in the area of extractables and leachables for all product contact components. We combine the generation of data with interpretation and consultancy to deliver data packages that are ready for regulatory scrutiny, and to ensure there are no barriers to progress.

Servicing and maintenance

Our range of service packages keeps your equipment protected and well maintained, and includes itemized, pay-as-you-go services, start-up care and training packages, and a variety of post-warranty service plans that include priority response times, discounts for emergency repairs, and flexible payment options. Pall service plans provide total peace of mind and worry-free support throughout the coverage period.



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