



FlexAct® Modular

Single-use Automation Solution

Benefits

- Modular design, functionality, satellite layout & build
- Utilizing complete single use product contact surface
- Flexible integration to plant-wide automation infrastructures
- CE and UL Certification for cGMP production & CFR21/11 compliance
- 360° operator interaction & display screen (HMI)
- Advanced tubing & cable management
- Broad range of sensors, monitoring and control parameters

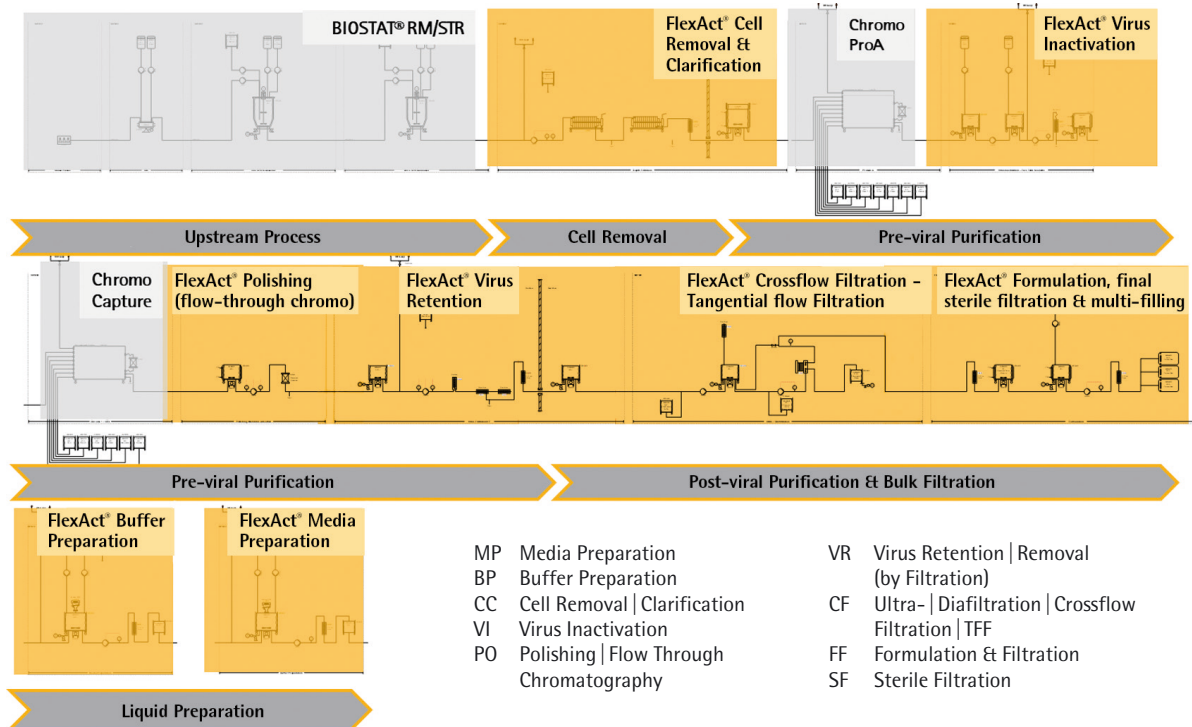


Product Information

The FlexAct® Modular is a platform solution bringing together hardware, software, wetware and documentation into a ready to produce package for single-use bioprocessing. Within the wide range of application and process throughputs available on the platform, a unit operation can be selected with recommended mass balance volumes, filtration areas, closures and process control levels. The platform uses pre-defined rules and a validated software library to generate the recipe based control of your process.

The software architecture allows easy interface to a Distributed Control Systems (DCS) for plant-wide integration. The build and connection of sensor, actuator and holder components allows them to be shared between unit operations, enabling a FlexAct® Modular to perform up to 8 distinct unit operations at various process throughputs & volumetric scales as highlighted in the example below of a mAb Fed Batch Production Process Flow Diagram (PFD).

Example mAb Fed Batch Production Process Flow Diagram



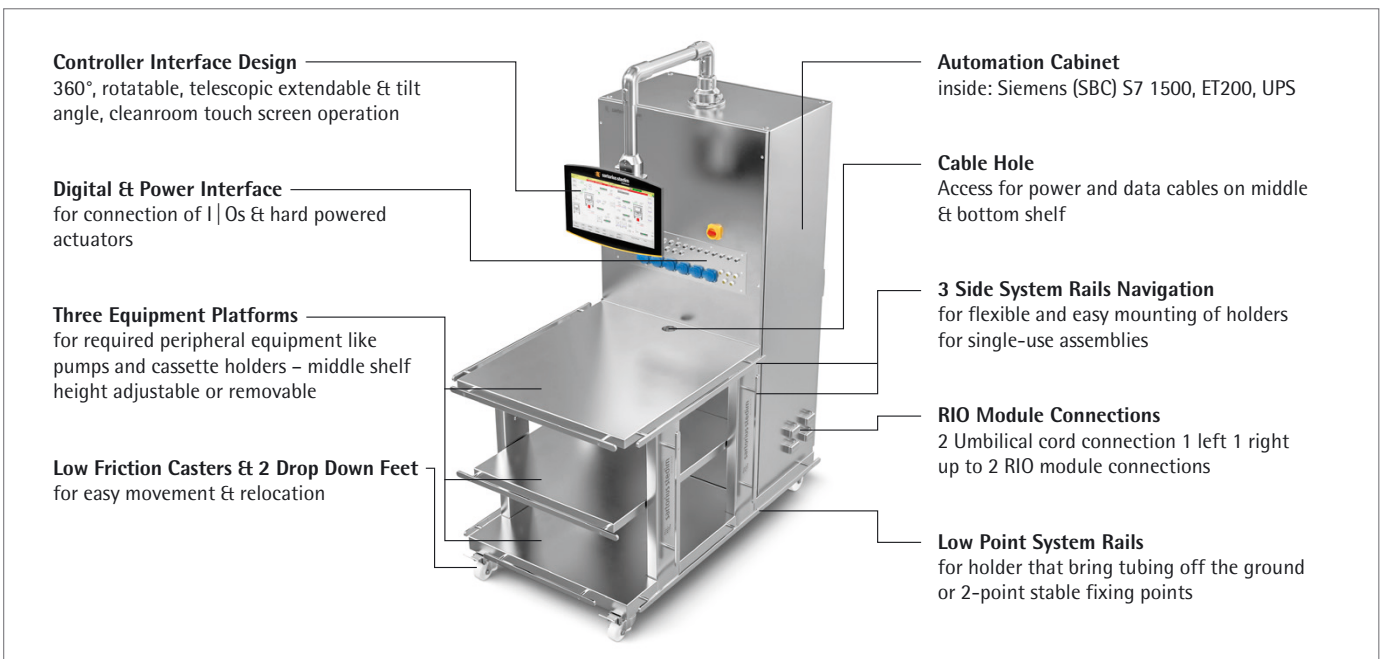
Core Modules



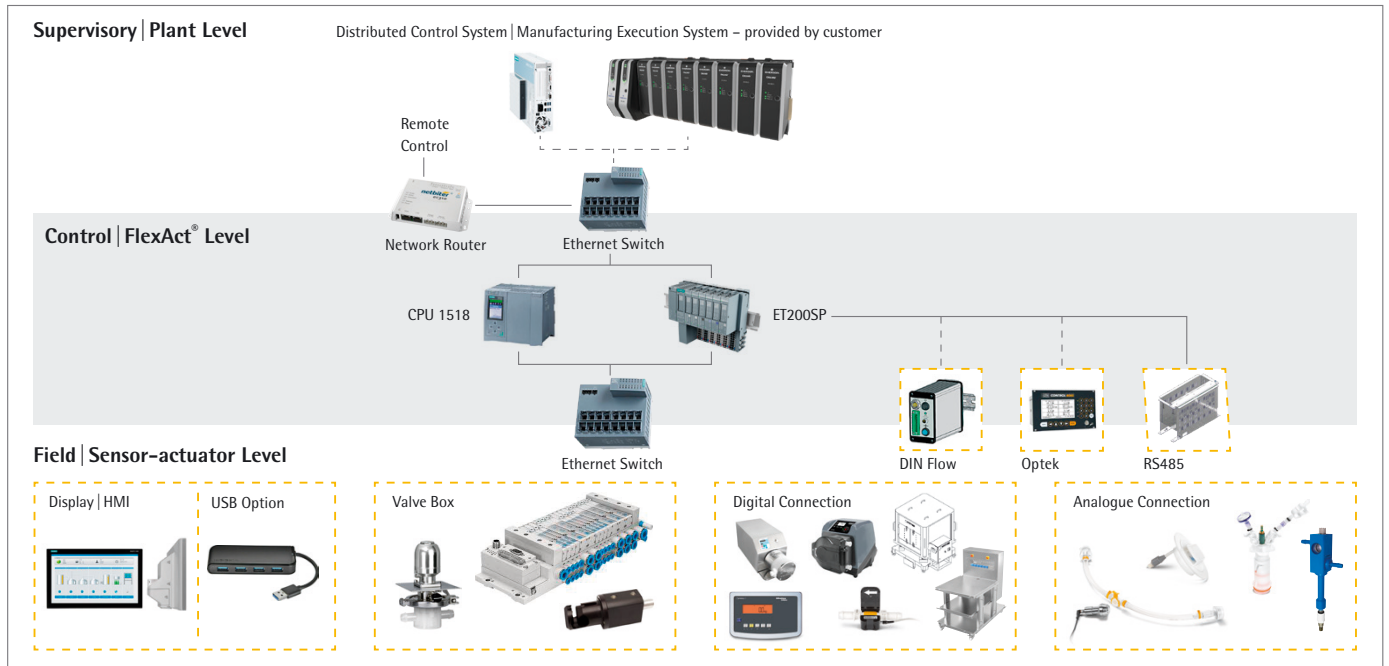
FlexAct® Modular Control

The main unit of the FlexAct® modular is the controller, equipped with an HMI and PLC. It is the central point of interaction for your operator in any given unit operation. The clean room compliant touch screen is fully 360 degree rotatable, telescopic at 2 points and tilt angle adjustable at the screen – making it both ergonomic for all operators and allowing the system to be used in different modes (back to the wall, side to the wall or as an island). In these dimensions of flexibility the three equipment platforms (each 0.72 m², the middle shelf height adjustable & removable)

and three sides of system rails (spanning 2.6 m) can accommodate holders, actuators & sensors needed to perform the unit operation. The central panel is equipped with (regionally adapted) covered power outlets and a laser etched I | O panel for all the sensor and actuator communications connections. On the sides of the control unit it can connect and power two FlexAct® Modular RIO (Remote Input | Output) units (one to the left side, one to the right side). Additionally, it can digitally connect & control up to 4 RIO equipped Pallettanks.



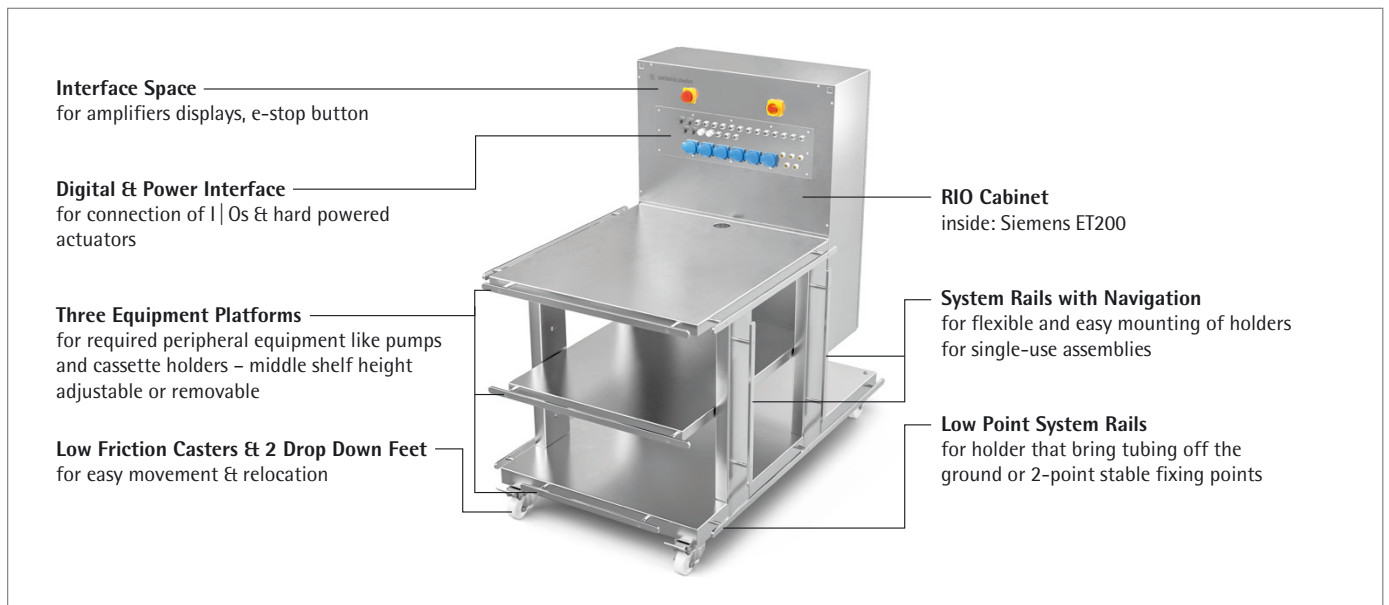
Digital Connections



FlexAct® Modular RIO

The FlexAct® Modular RIO unit extends the functional & operating space of the solution. When higher complexity unit operation is needed it manages the cable and tubing distance by offering a satellite station to spread to or from. In contrast to the FlexAct® Cleanroom Cart it has an incorporated electrical cabinet that extends the number of power, input and output connections to the FlexAct® Modular Solution. The mechanical & structural

frame is the same as the FlexAct® Modular Control unit, enabling it to have the same number and variation of peripherals connected to it and still remain flexible. The FlexAct® Modular RIO unit is without an inbuilt Programmable logical controller (PLC) and offers the basis of field level connection for a Distributed Control System (DCS) outside of the FlexAct® Modular Control unit.



FlexAct® Cleanroom Cart

The FlexAct® modular cleanroom cart offers a mechanical work space extension to the FlexAct® Modular Solution where peripherals (e.g. Pumps & 2D bags) can be held off the clean room floor. The height and dimensions of the cart's equipment platform and system rails match that of both the FlexAct® Modular Control & RIO units. In that, it can be fixed to one of them without shelving steps or offering satellite stations where tubing lines can be made horizontal over a fixed distance.

Remote I | O Box for Palletank for Mixing

The Remote I | O Box is a configurable electrical cabinet mounted on standard Palletank for Mixing designed for collecting all critical mixing parameters on that system. The connection of the Remote I | O Box to a FlexAct® Modular Controller ensures remote monitoring and recording of mixing parameters for process traceability and management along with remote control capabilities via a single point of connection.

For more details please see the Remote I | O Box on Palletank datasheet.

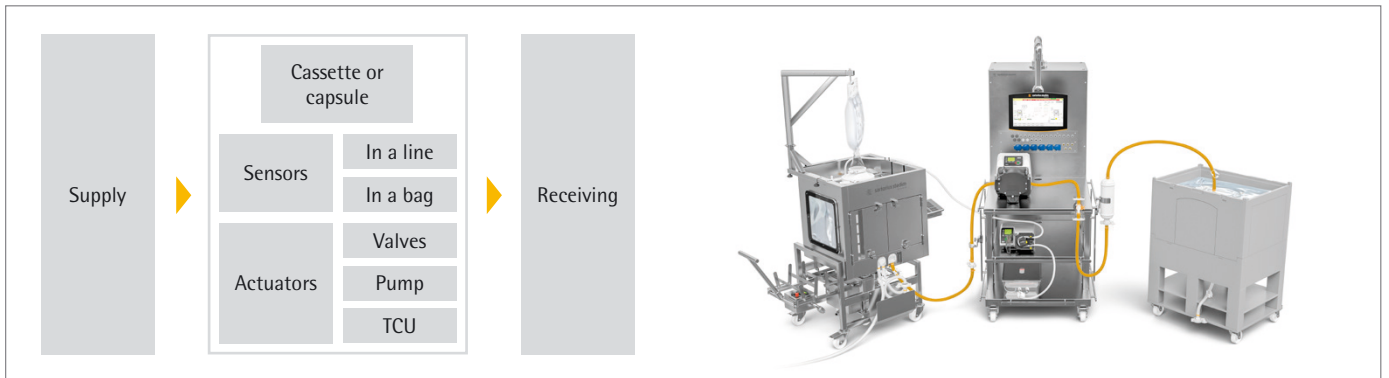
Single-use sensors and actuators

Technology	Parameter	Location	Parameter range*
BioPAT® Pressure	Pressure	in-line pipe	0 – 4 bar(g)
BioPAT® Flow	Flow	in-line pipe	1.2 – 77 L/min (30% – 100% Q _{max}) over 5 ID sizes
Optek 01	pH	in-line body	Technology depending typical range of 2.00 – 12.00 pH
Optek 03	Conductivity	in-line body	0 – 150 mS/cm
Optek 05	Ultraviolet (UV)	in-line body	0 – 0.05 to 3 CU or 0 – 0.05 to 2 CU OPL (1, 2.5 & 10 mm)
ACRO pinch valve	Pneumatic open – closed	on tubing (Si & rSi)	Start point; open or closed
GEMÜ diaphragm valve	Pneumatic variable open – closed	in-line body	10 bit. start point; open or closed
Peristaltic pump	Liquid; fill, addition & transfer	on tubing (Si)	0.005 (1/4" ID) – 780 L/hr (1/2" ID) 1500 L/hr (3/4" ID")
Diaphragm pump	Low pulsation liquid transfer & recirculation	in-line body	0.01 (1/4" ID) – 5000 L/hr (1" ID)
Centrifugal pump	high flow, low pressure transfer	in-line body	0.1 (3/4") – 4000 L/min (3/4")
Temperature Control Unit with Jacketed Palletank	Temperature Control	Palletank	5.0 – 40.0°C operating range for Flexsafe® bags
P1000	Temperature	Bag	0.0 – 150.0°C
ProMixer, LevMixer®, Magnetic Mixer	Mixing speed	Bag	Technology depending
Gen 1 & 2 BioPAT® pH	pH	Bag	2.00 – 12.00 pH
Gen 1 & 2 BioPAT® Conductivity	Conductivity	Bag	100 µS/cm – 200 mS/cm
Integrated load cell, Floor balance	Mass Volume	Palletank	Size depending

* all parameter technology performance & range is influence by the single-use component | material and the hardware transmitter | drive.

Operation Functionalities & Modules

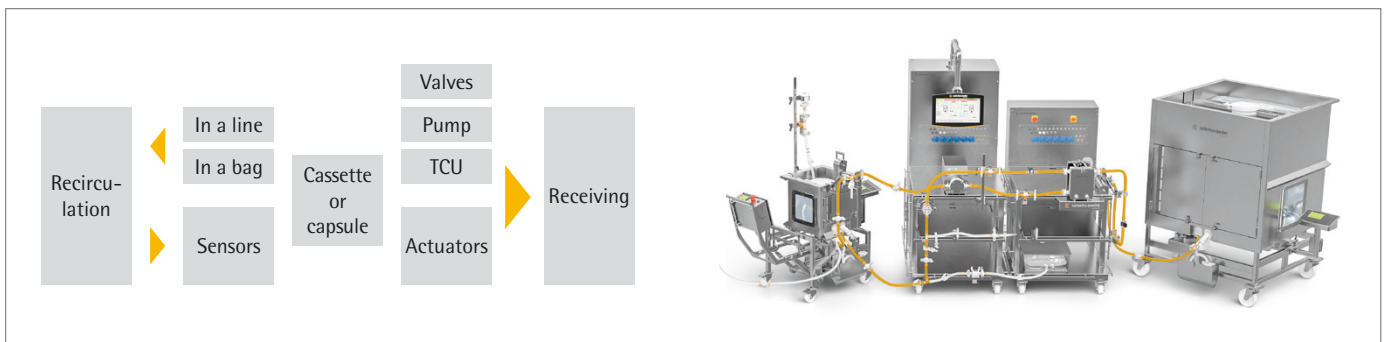
Dead-end Filtration



Dead-end separation functionality enables a controlled uni-directional flow of a process stream from left (supply) to right (receiving). Depending on the software | hardware configuration, the system provides monitoring and | or control of process

parameters such as pressure, temperature, pH, conductivity, flow, pump speed and weight. The integrated local control allows end-users to perform other tasks during the separation operation.

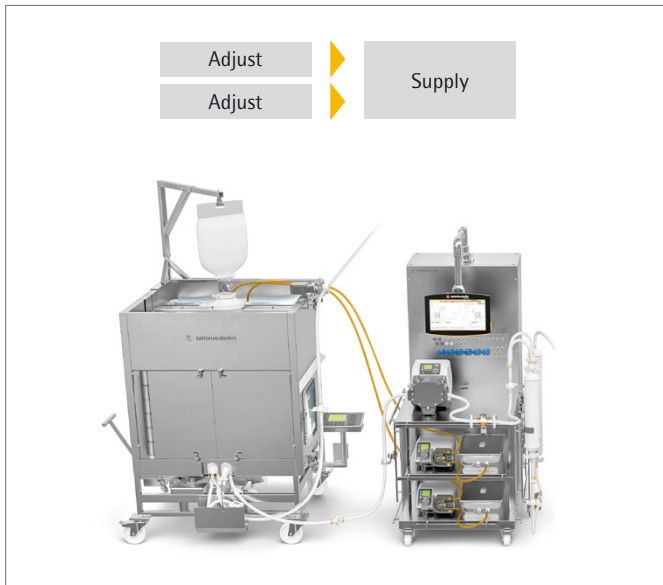
Crossflow Filtration | TFF



Crossflow or tangential flow filtration is a filtration variant where the feed flow is split at the filter surface into retentate and permeate fluid flows. The retentate does not pass through the filtration membrane whereas the permeate does. Thus, there are two outlets of the filter element and a transmembrane flow across the filtration surface. In this case, the supply container to this

setup retains the retentate flow and is typically named recirculation tank and the receiving palletank captures the permeate fluid stream. Commonly the dissolved protein product of interest is retained with the recirculation and when the desired concentration | diafiltration level is achieved, the material recovered (internally or externally) for further processing.

Preparation & Adjustment



The material (liquid and | or solid) filling with optional fine (appropriate sensor | actuator) controlled adjustment of a mixed pallettank for the purpose of preparing, combining or reacting liquid solutions prior to use in subsequent unit operations.

Combined with a Flexsafe® for Magnetic | LevMixer® | ProMixer and Pallettank the FlexAct Modular Control enables the user to install, operate and monitor a fully single-use liquid preparation unit operation.

Common add-on Packages

High Pressure Separation

- Use case Virus filtration:
The connections and tubing material of the transfer sets designs that are exposed to internal pressures of more than 1 bar are switch to re-enforced braided tubing. This increases the maximum allowable operating pressure to 3.0 barg enabling the required processing conditions

Pallettank Temperature Control

- Use case Receiving tank Virus inactivation:
Up to two pallettanks can be independently temperature controlled. Function, the thermowell inserted temperature sensor acts as the set-point guidance for temperature control unit (TCU). The system will send signals to a TCU which circulates warm or cool WFI around a jacketed pallettank to reach the internal temperature set-point.

Functionally Closed – Aseptic processing

- Use case – Self-contained Crossflow filtration | Virus Filtration:
The option changes the wetware connection technology from non-aseptic to aseptic. In the case of Crossflow and Virus Filtration this updates the connections to CPC AseptiQuik®.
- Use case – Buffer | Media Preparation:
This options changes design of wetware products and integrates the sterilizing grade filter onto the receiving bag filling line as well as updating the receiving bag(s) connections to aseptic connections.

Integrity | Leak Testing with Sartocheck® 5

- Single-use filter assemblies
- Cassettes & Filters
- Preuse Post Sterilization Integrity Testing PUPSIT

Shared Operational or Intermediate Pallettanks

The interconnecting of unit operations where the receiving bag of one unit operation is the supply bag of subsequent unit operation. This function enables the sending of data to two controllers and the intercommunication of the controller units to achieve a safe steady state within that Pallettank

Inter-Cleanroom Transfer

- Use case Virus Filtration:
Typically the receiving bag of the virus filtration unit operation is placed in higher classification room. Thus, the inter-cleanroom transfer allows the length and connection technology to span the rooms and enable room to room connection. The automation architecture and operator HMI(s) can be configured to enable operation in either room and maintain safe processing.

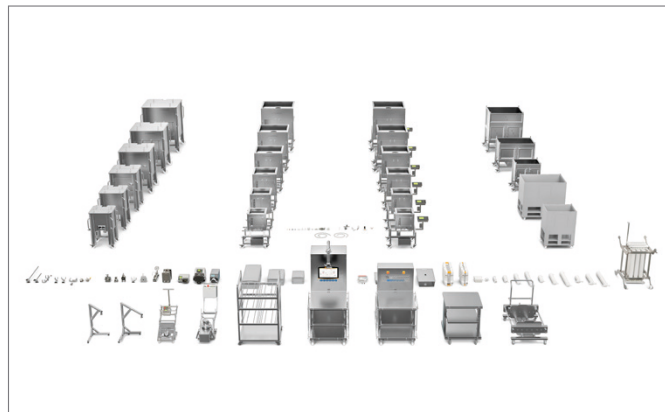
Processing Throughput | Volumetric Scale | Speed

In order to accommodate the needs of different process streams, modules can be combined and reconfigured with other peripherals and Pallettanks to tailor the working space, fluid dimensions & overall footprint.

- FlexAct® Modular Control
- FlexAct® Modular RIO
- FlexAct® Cleanroom Cart
- RIO on Pallettank

Processing Engineering Capabilities

- Pump Flow rates from 0.005 mL/min (1/4" ID tubing) to 5000 L/h (@ 5 bar – 1" ID tubing)
- In process volumes from 1 L to 3000 L
- Storage volumes from 1 L to 3000 L
- In-line tubing pressure range from -150 mbar to 3.5 bar (4 transfer set tubing variants)



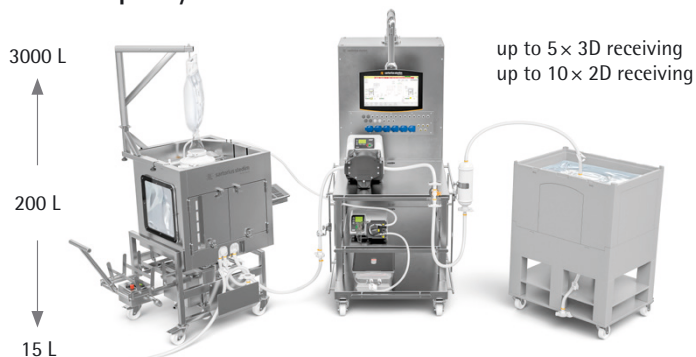
Example Sequence Execution and Unit Operation Layout

Buffer Preparation

Automation sequence

- (• optional pre-flush)
- prefill supply tank
- powder addition
- homogenization (conductivity monitoring)
- final fill and adjustment
- filter transfer to receiving tank

Example layout



Media Preparation

Automation sequence

- (• optional pre-flush)
- prefill supply tank
- powder addition
- homogenization (pH adjustment)
- final fill and pH adjustment (acid & base)
- filter transfer to receiving tank

Example layout

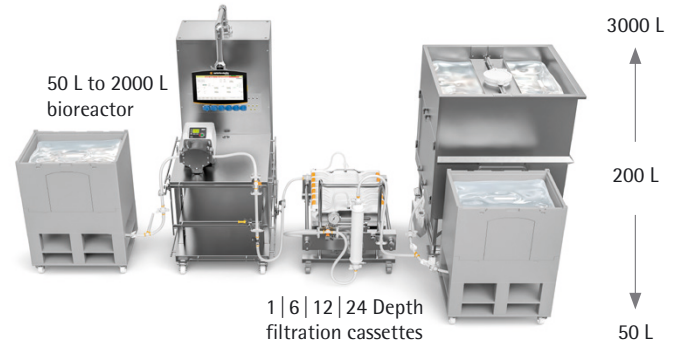


Depth Filtration

Automation sequence

- pre-flush & drain
- filter transfer from bioreactor to receiving tank
- buffer flush

Example layout

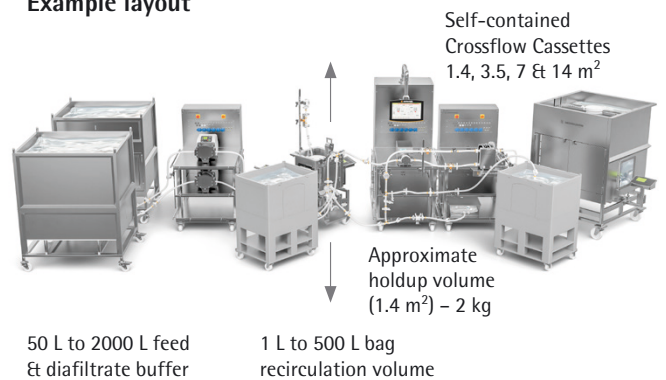


Crossflow Filtration | TFF

Automation sequence

- fill recirculation tank
- isolated buffer flush (optional sanitization)
- concentrate (TMP or constant flux control)
- diafiltrate
- final concentrate (TMP or constant flux control)
- (• optional filter transfer to external recovery)

Example layout



Virus Inactivation (1-tank)

Automation sequence

- (• optional pre-flush)
- fill supply tank
- low pH adjustment (acid)
- timed incubation in tank 1
- neutralization (base)
- filter transfer to receiving tank

Example layout



Virus Inactivation (2-tank)

Automation sequence

- optional pre-flush
- fill supply tank
- low pH adjustment (acid)
- timed incubation in the 1st tank
- transfer to 2nd tank
- neutralization (base)
- filter transfer to TC receiving tank

Example layout

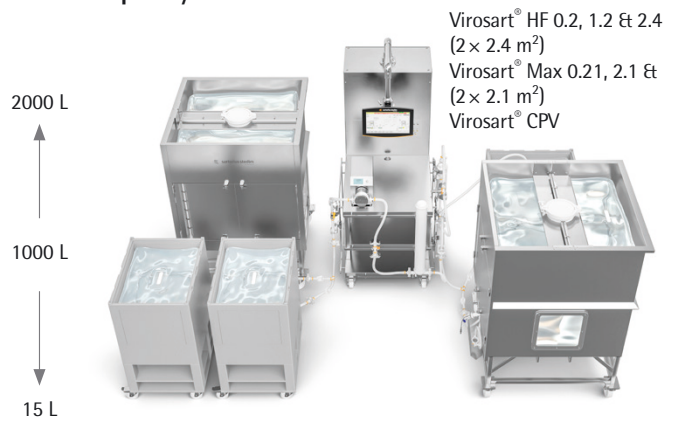


Virus Removal

Automation sequence

- pre-flush & wetting (for optional pre IT test via Sartocheck®)
- equilibration
- filtration
- post-flush (for post IT test via Sartocheck®)
- Post use integrity test

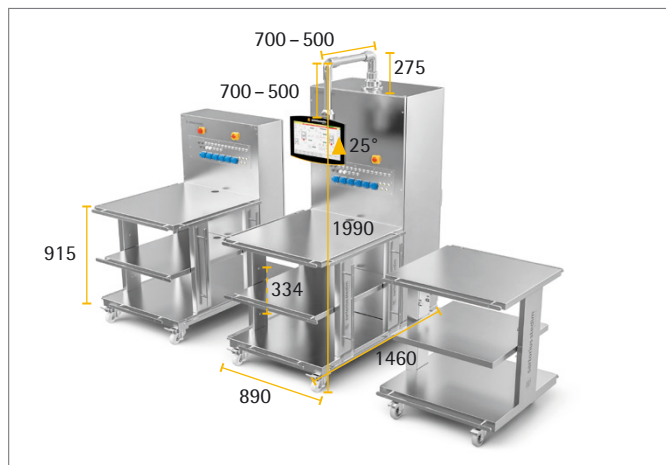
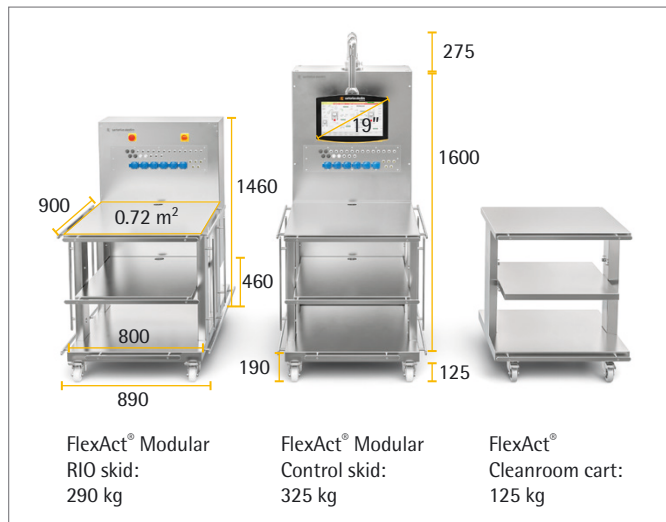
Example layout



Technical Specification

FlexAct® Modules

- Modules are designed for cGMP clean room use
- Mobile when not in process use
- Adequate cleanroom cleaning clearance between floor & lowest equipment platform
- Peripheral sizing & weight accommodated in the design and build



Materials of Construction

314L Stainless steel

Work Surfaces and System Cleaning

Roughness of working surfaces: $Ra \leq 1.2 \mu m$

Design and edge finishing: Plane without visible gaps or cavities

Suitable cleaning solutions

- Vesphene®
- LpH® family
- sporicidal agents like Spor-Klenz® and bleach
- 70:30 IPA
- 70% ethanol with a max exposition time of 0.5 hours
- 1% Sodium dodecyl sulphate solution with a max exposition time of 0.5hours
- 0.5M NaOH with a max exposition time of 0.5 hours
- Meliseptol®
- Kleralcohol
- Sodium hypochlorite
- quarternary ammonium compounds
- 0.5% Perform®
- fumigants such as formaldehyde

Utility Supply

Standard Control cabinet is supplied with:

- 230 | 400 VAC, L1-L3, N, PE (TNS net), 50 – 60 Hz
- Uninterrupted Power Supply (UPS)
- In the event of power outage the system must be powered by the UPS until the diesel generator is started
 - The electric power supply will be 400 V, 50 Hz
 - UPS supply will be provided by the CLIENT
 - A diesel generator will be provided by CLIENT
- The control system together with the communication network must continue to work uninterruptedly in case of power failure
- 7.0 barg compressed air required for Festo Pilot Valve Box and pneumatic valves

	Unit	Value	Value
		400 V Version	380 V Version
Voltage	VAC	400 ± 10%	380 ± 10%
Frequency	Hz	50	60
Fuse	A		

Electrical Power Calculation

	FlexAct® Modular CC, VI, MP, BP, MF, FF	FlexAct® Modular CF (3.5 m²), VR, PO	FlexAct® Modular CF (7 m², 14 m²)
Electrical Devices	Power consumption (approx.)		
Supply Pumps	0.5 kW	0.95 kW	3.25 kW
Power supply for Electrical Cabinets, Instruments, lights, fans, etc.	2.5 kW	2.5 kW	2.5 kW
Total Effective Power Required	3.0 kW	3.45 kW	5.75 kW

Conditions at the Installation Site

	Unit	Value
Installation site: Conventional cleanrooms max. height above sea level	m	2000
Temperature	°C	+5 – +40
Relative humidity at temperatures of up to 31°C	%	30 – 80
Decreasing linearly there after: At temperatures of 31°C to 40°C	%	< 50
Explosion protection		None
Pollution degree in accordance with EN 61010		2
Base Protection class according to EN 60529		IP54
Base Protection class according to EN 61140		1
Acoustic pressure level, max., without components	dB (A)	< 70

Emergency Button Locations

- FlexAct® Modular Control
 - One Emergency pushbutton at the front of the HMI support arm
- FlexAct® Modular RIO
 - One Emergency pushbutton at the front of the electrical cabinet

Emergency Stop Functions

- Switch off all devices at the plugs
- Force all digital outputs to 0 V
- Force all analogue outputs to 0 V | 0 mA
- Bring phases to HOLD condition
- Bring actuators to "off" position (normally closed | normally open | off)

Manufacturer Certification

CE certification:	Yes
UL 508 certification NEMA 4X:	Option
Electrical certification EN 6204-1:	Yes
Machine directive 2006/-42-EG:	Yes
EMV 2014/30/EU:	Yes
Low voltage Directive 2014/35/EU:	Yes

Applied Standards

DIN EN ISO 12100:	Safety of machinery
EN 60204-1:	Safety of machinery – Electrical equipment of machinery
EN ISO 13849-1:	Safety of machinery – Safety-related parts of control systems

Basics of Planning

The detailed hardware design will be done by using the Software tool Eplan V8 or higher.

- Symbols: Acc. to EN 81 346
- Language: Operator messages, alarm messages, main HMI screen will be provided in English or local language. Labels on the system (e.g. cabinet sockets, on-off) in English or local language.

Sartorius uses the following software for creation of engineering documents.

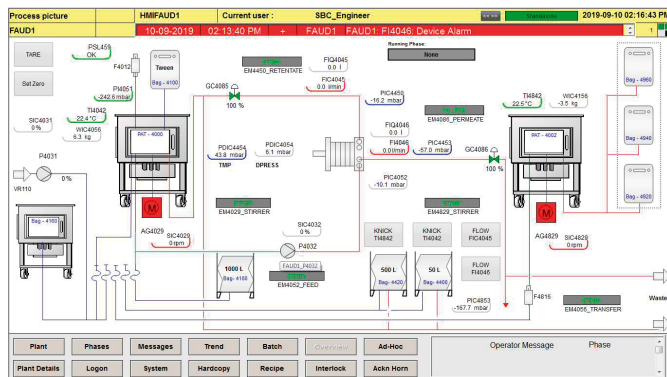
- Layout drawing of cabinets: Eplan
- Wiring diagrams: Eplan
- I | O-List: Excel
- Equipment List: Eplan

The documents will be provided within the turn over package as PDF file.

Sartorius Biotech Controller (SBC) Intuitive and Industry-Proven Local Control

For safety and user-friendly operation, an automation system for a bioprocess requires a proper strategy. The automation based on industrial S7 logic controller, local panels for operation, I/O boards and pilot valves as well as the usage of industrial interfaces like Profibus DP mean secure and expandable system design. SBC is a scalable automation platform which is designed with core functionality like faceplates, Equipment Module and Phase Manager and a software framework to implement specific functionality like phases based on the individual process requirements. The network structures allow even integration in existing IT environment like domains.

- Industrial Automation
- Modular System Design
- Electronic Batch Record
- Validatable
- CFR Part11 compliant
- Expandable
- ISO 88 GAMP

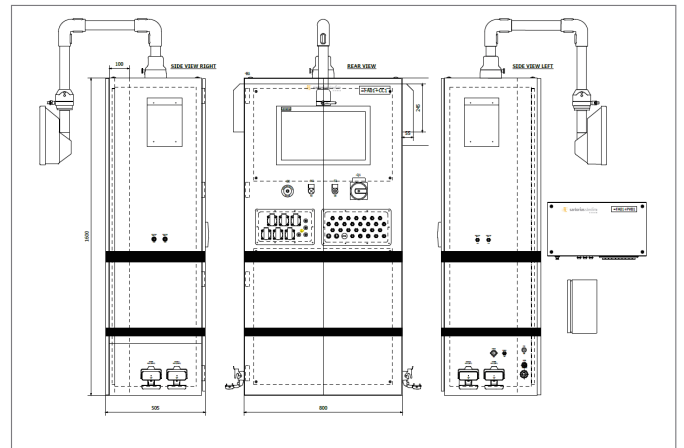


Example HMI user interface

Software System Features

Please refer to the SBC_SartoriusBiotechControl datasheet

Control Cabinet



The control cabinet will be built according to EN 60 204-1 and will contain:

- PLC Simatic S7 1500 series
- Fuses
- Contactors
- Industrial PC
- Emergency Stop Relay
- Power supply
- IO-Modules
- Measurement transmitters
- Power supply 24 VDC (for internal equipment and for balances)
- Uninterruptible Power Supply (UPS)

Internal Wiring

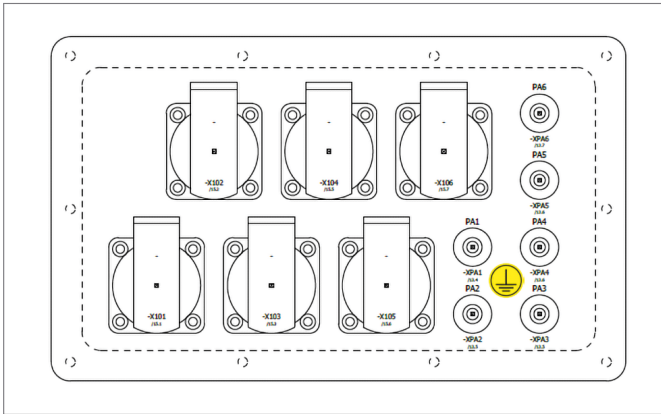
Each module's internal electrical wiring is color identifiable & bundled from their source to terminal.

Wire Labeling

All wires (included cable wires) must be labeled on both ends with the particular tag of the connection point.

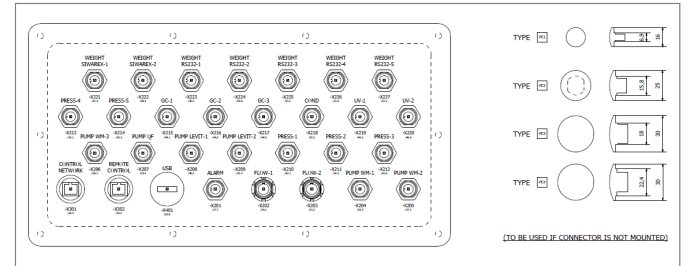
For instance: connection on terminal strip X2, terminal 001 -> X2:001

Power Panel



Exemplar

Sensor & Actuator Panel



Exemplar









Operator Station




Operations will be controlled by a Siemens WinCC V7 Server-Client-System. A Touch Panel will be located on the FlexAct® Modular Control skid.

Ordering Information

System Configurable Toolbox

Peripheral list

	Description	Order Code
Pumps (2 Main & 4 dose per module)		
	530UN/R2 (f. 2,4 mm WS), 200 – 240 V, 50 Hz, 220 rpm, IP66	4ZF---0044
	630UN/R (f. 3,2 mm WS) 200 – 240 V, 50 Hz, 265 rpm	4ZF---0048
	730UN/R 200 – 240 V, 50 Hz, 360 rpm	4ZF---0109
	Maglev pump LT 600 SU	4ZF---0068
	QF-150 compact diaphragm pump, 110 – 230 VAC	4ZF---0003
	QF-1200 compact diaphragm pump, 110 – 230 VAC	4ZF---0001
	QF-5050 SU diaphragm pump	tba.
	QF-5050 SU trolley incl. cabinet	tba.

	Description	Order Code
Bag mixing technologies		
	Magnetic Mixing Drive Unit 230 V, EU Power Cord	LT-DU-006-EU
	LevMix Drive Unit, Gen3	LT-DBTL300
	Flexsafe® ProMixer Drive Unit	FMD300001

Accessories

Filter Management

Description	Order Code
Filter capsule holder	
Connects the holder to the FlexAct® system rail. Single point rotatable For vent filters capsules, 72 mm	BB-34164020
Connects the holder to the FlexAct® system rail. Single point rotatable For Sartobind® capsules, 85 mm	tbc
Connects the holder to the FlexAct® system rail. Single point rotatable For filter capsules type a, 92 mm	4ZF---0017
Connects the holder to the FlexAct® system rail. Single point rotatable For filter capsules type b, 100 mm	4ZF---0016

UF DF cassette and self-contained crossflow holder	
Sartocon® 2 holder for self-contained single-use filters with pump on base plate, Standard configuration with manual pump on right hand side	BB-34164022
Sartocon® 2 holder for self-contained single-use filters with pump on base plate, Mirror configuration with manual pump on left hand side	BB-34164021
Sartocon® 2 SU filter holder for 7 m ² filter area (for Sartocubes)	1000060877
Sartocon® 2 SU filter holder for 14 m ² filter area (for Sartocubes)	
Sartocon® 2 plus filter holder (integrated adaptor for 3 rd party cassettes)	
Dummy-module, 20 mm thick (1 Cassette equivalent); spacer block	302020D-C

Type	Description	Variant Order Code
Filter Cassette holders for Sartoclear® Sartobind®	Cassette holder for Sartoclear® Depth Filters Sartobind® Membrane Adsorbers	Pilot: 2ZGL--0005 Process: 2ZGL--0006 Double process: 2ZGL--0007
Drip Pan	For easy cleaning of spilled fluids	Pilot: 2ZGL--0008 Process Double process: 2ZGL--0015
Sartoclear® Separation Plate	For serial or parallel filtration on one layer	2ZGL--0013
Sartoclear® Pressure Safety Device	Prevents excessive pressure during compressed air draining of the filter cassettes	2ZGL--0014

Sensor & Actuator Management

Description	Order Code
Holder	
Holder for Flow Clamp ON 1/4"	4ZF---0036
Holder for Flow Clamp ON 3/8"	4ZF---0037
Holder for Flow Clamp ON 1/2"	4ZF---0009
Holder for Flow Clamp ON 3/4"	4ZF---0066
Holder for Flow Clamp ON 1"	4ZF---0010
Sensor	
Flow Sensor BioPAT® Clamp ON 1/4"	BPL0010
Flow Sensor BioPAT® Clamp ON 3/8"	BPL0011
Flow Sensor BioPAT® Clamp ON 1/2"	BPL0012
Flow Sensor BioPAT® Clamp ON 3/4"	BPL0028
Flow Sensor BioPAT® Clamp ON 1"	BPL0013
Pressure sensor w/ holder 1/4" 0–4 bar	4ZF---0123
Pressure sensor w/ holder 3/8" 0–4 bar	4ZF---0118
Pressure sensor w/ holder 1/2" 0–4 bar	4ZF---0119
Pressure sensor w/ holder 3/4" 0–4 bar	4ZF---0120
Pressure sensor w/ holder 1" 0–4 bar	4ZF---0121
SU inline Conductivity sensor (Optek SUC 01)	
SU inline Conductivity + pH sensor (Optek SUC 03)	
SU inline Conductivity + UV sensor (Optek SUC 05)	
SU inline Conductivity + pH + UV sensor (Optek SUC 07)	
Pneumatic Valve	
Holder for GEMÜ valve	tba
Gemü Supm Sumondo Size B normaly open	
Gemü Supm Sumondo Size C normaly open	1000040266
Gemü Supm Sumondo Size D normaly open	
Festo Pilot Valve Box for instrument air for GEMÜ or ACRO valves	tba
Holder for ACRO pinch valve	1000061342
ACRO pneumatic pinch valv, stainless-steel 316L, N O for reinforced tubing for silicon tubing	

Fluid and Transfer set Management

Type	Description	Order Code
FlexAct® Modular Cleanroom Cart		4ZF---0021
FlexAct® worktop extension	Fixed to the systems rail to extend the working surface area	BB-8840280
FlexAct® system rails extension	Tube holder for system rail 1/4" & 3/8"	4ZF---0062
	Tube holder for system rail 1/2"	4ZF---0039
	Tube holder for system rail 3/4"	4ZF---0064
	Tube holder for system rail 1"	4ZF---0065
Hose Guide	Tube guide 1/2 – 1"	4ZF---0013
Palletank for mixing Storage In process	Please refer to the ProMixer Family datasheet for full product listings and materials	DIR No.: 2548196-000-00
Powder Bag Holder Palletank Cubical Mixing	Please refer to the ProMixer Family datasheet for full product listings and materials	DIR No.: 2548196-000-00
Flexboy® Tray and Rack Systems	Flexboy® Rack	
	Flexboy® Rack Base Module 1	FFA102707
	Flexboy® Rack Module 2	FFA102714
	Flexboy® Rack 5x 50 L	FFA103023
	Flexboy® Trays	
	Flexboy® Tray + Lid 5 L	FFA102705
	Flexboy® Tray + Lid 10 L	FFA102715
	Flexboy® Tray + Lid 20 L	FFA102716
	Plastic Tray Flexel® Flexboy® 5 L + Lid	FFA113141
	Plastic Tray Flexel® 10 L Flexboy® 10 – 20 L + Lid	FFA113142
Plastic Tray Flexel® 20 L, no Lid	FFA113143	
Vertical 2D bag holder	Bagholder for FlexAct® trolley including load cells for weighing (with Transmitter)	4ZF---0022
Floor Scale	300 kg 10 g (1000 × 1000 mm)	4ZF---0031
	600 kg 20 g (1000 × 1000 mm)	4ZF---0032
	1000 kg 50 g (1500 × 1250 mm)	4ZF---0033
	1500 kg 50 g (1500 × 1500 mm)	4ZF---0034
	3000 kg 100 g (1500 × 1500 mm)	4ZF---0035
Temperature Control Unit	Temp. control unit Lauda Cooling 10 kW, Heating 7.5 6.9 kW, inkl. interface cable)	
	400 V	4ZF---0023
	208 V	4ZF---0024
	208 V + UL certificate	4ZF---0025
	Connection cable FlexAct®-Lauda TCU 3.0 m	4ZF---0030
	TCU supply connection kit, 4 m	4ZF---0129
	TCU-Palletank connection kit, 4 m	4ZF---0126
	Quick couplings Palletank, TC-TC	4ZF---0127
	Quick couplings Palletank, Thread-TC	4ZF---0128

Cable Management

Description	Order Code
FlexAct® System Power Cord	
A Europe	BB-8847852
B USA	BB-8847909
C Ireland, UK	BB-8847879
E Italy	BB-8847887
F Australia	BB-8847941
G Denmark	BB-8847861
H Switzerland	BB-8847895
I Israel	BB-8847933
K Argentina	BB-8847917
L China	BB-8847925

Type	Description	Variant Order Code
BioPAT® Pressure transmitter cable	Cable Pressure Transmitter	1.5 m, BB-34147271
	M12ST to M12BU, 5pol.	3 m, BB-34149854
Main Pump cable	M12ST to M12BU, 8pol. SHD	1.5 m
	Cable for WM730, QF1200 & QF150)	3.0 m, BB-34147296
Secondary pump valve cable	M12 M12, 5-pol, A-Kod., SHD	3.0 m, BB-34149854
	Cable for WM530 Gemü valve	
Cable pH Probe Connection	Cable Conductivity Probe Connection	BPT0031
	Adapter DIN – VP8 for SU pH sensor	BPP0010
	Cable Ethernet – 3.0m	BB-34147260
	Cable Connection FlexAct® - Levmixer® 3G	4ZF---0124
	Temperature Probe, PT100, 3m	1000033315

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