Liquids to Value

VESTA® Multiport

Made by GEA Tuchenhagen

Register

Cost-effective manufacture of high sensitivity products in the pharmaceutical and biotechnology industries requires even more complex processes.
This places high demands on the engineering, in particular with regard to the process reliability of the complete plant system. In this connection directives (FDA, cGMP), legal frameworks such as EU regulations, and concepts such as qualification and validation are gaining greater significance.

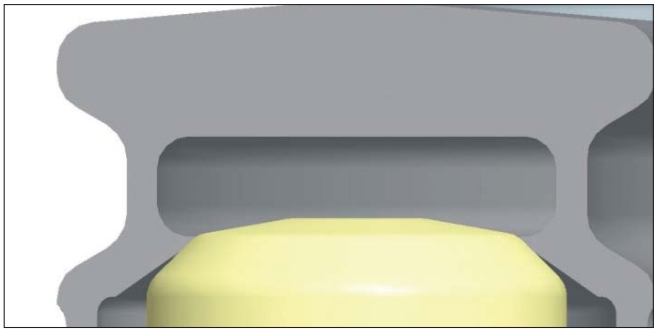
In many cases processes using different operating, cleaning and sterilisation media are often applications in sterile process engineering. At the present time such processes are implemented almost exclusively using diaphragm valves in the form of conventional solutions using individual valves or so-called valve blocks.
Conventional solutions with individual diaphragm valves in a welded design are known to be very labour-intensive. As well as being time consuming to assemble the valves, fittings and pipe components used also require greater clearances. Dead spaces with systems of this kind are unavoidable and must be taken into account. While valve blocks with diaphragm valves in a block of solid material are compact they are not totally free of dead spaces. Moreover valve blocks of this type are only 'optimised for draiing' - complete evacuation of the system is not possible. Large wall thicknesses make systems of this kind require long heating-up times during the sterilisation process. Until now there have been few alternatives to systems using membrane valves for such processes.

This gap is now filled by the novel VESTA® Multiport from GEA Tuchenhagen.

The VESTA® Multiport fitted with VESTA® sterile valves is designed to have zero dead space and be CIP compliant. It provides for total draining, can be located in the smallest of spaces, and at the same time sets new standards in terms of cost effectiveness.

Innovative, new type of media distributor design concept

At the heart of the VESTA® Multiport is a circular ring with an annular passage. The annular passage cross-section is dependent on the overall size of the valve and amounts to about 50% of the valve inlet cross-section. Valves are located on the end faces of the ring in accordance with the process requirements. The preferred installation position of the ring is horizontal with vertically arranged valve actuators.

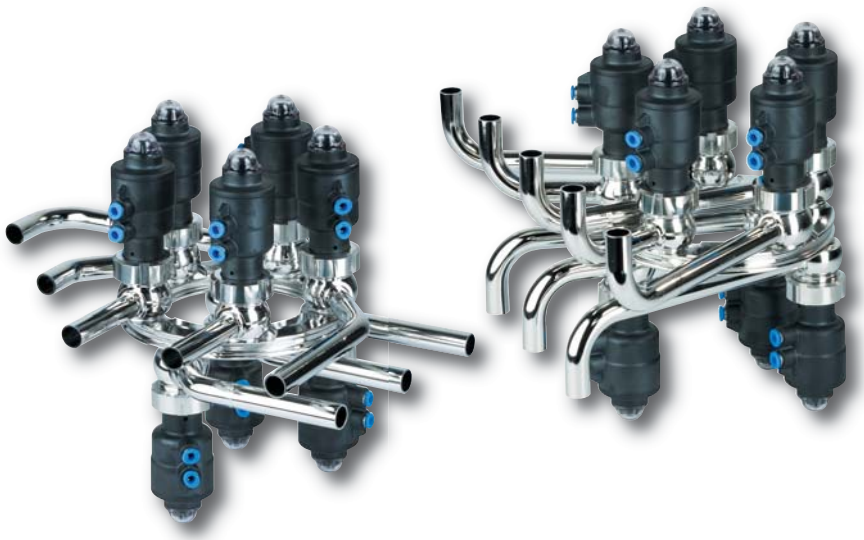


The construction features

- Modular, compact structure
- Flush shut-off at the annular passage
- Individual configuration of valves possible
- Orientation of sockets on choice depending on the design
- Fully drainable system
- Optimal CIP/SIP

New perspectives for systems engineers

- **Pre-planning of the pipe routes with fixed grids**
- **Pre-planning of the VESTA® Multiport as a complete delivery unit with defined interfaces for integration into the process system**
- **Pre-planning of the required space/clearance**
- **Qualification already at the production facility (DQ / IQ) is possible**
- **Reduction of assembly and installation resources (no special fittings required)**
- **Reduction of the time required for planning, supply, installation and commissioning**



Individual configurations possible – *completely new*

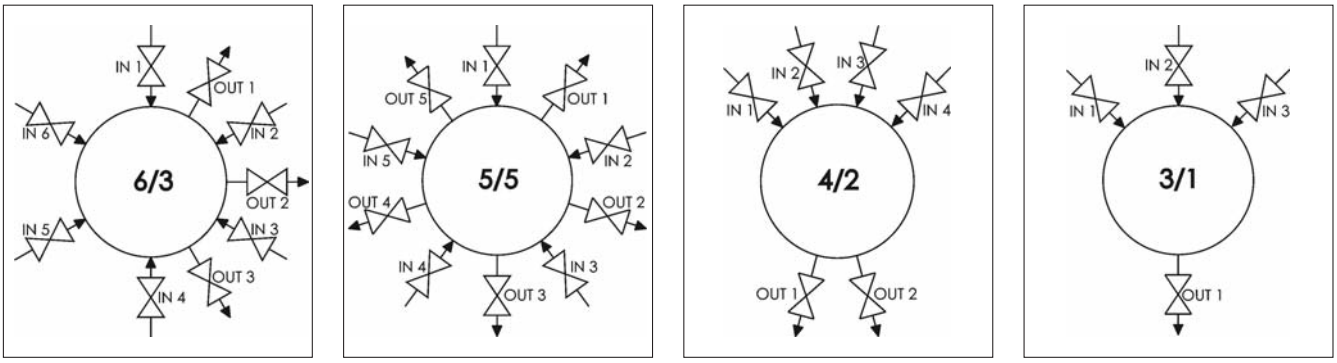
The design concept of the VESTA® Multiport enables the selection of individual configurations according to the requirements. Up to 12 valves (6 valves on the upper side / 6 valves on the lower side) can be positioned on one ring as standard. All configurations with different numbers of valves on the upper side and lower side are possible on an appropriate base ring.

An overview of the configuration variants:

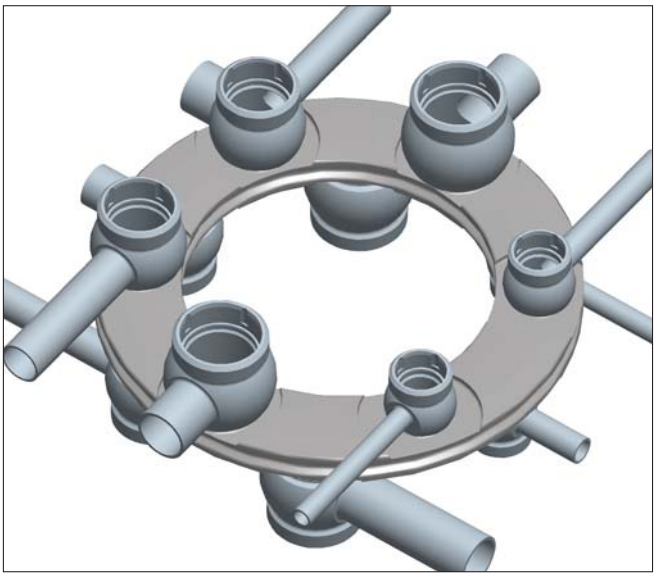
Configuration	Valves **IN** / incoming lines	Valves **OUT** / return lines
6	max. 6 / min. 1	max. 6 / min. 1
5	max. 5 / min. 1	max. 5 / min. 1
4	max. 4 / min. 1	max. 4 / min. 1
3	max. 3 / min. 1	max. 3 / min. 1

For planning the VESTA® Multiport a whole library of configurations in form of icons/pictograms is at hand. The library is available on request.

Example for the selection of R&I pictograms as building blocks for the plant configuration:



A further advantage of the VESTA® Multiport is that different valve sizes (nominal widths/pipe classes) can be positioned on one ring.



VESTA® sterile valves – *the building blocks*

VESTA® sterile valves with PTFE bellows are used as shut-off valves - the ideal pre-requisite for a design of medium distributor that has zero dead space and is fully drainable. All actuator variants from the VESTA® sterile valves programme are available:

- Pneumatic actuators made from synthetic material
- Pneumatic actuators made from stainless steel
- Manual actuators

In addition the valves can be fitted with options such as feedback, control module, stroke limitation, etc.

Overall size – *the available sizes*

VESTA® Multiports are available in small overall sizes and different pipe classes.

Pipe classes	Nominal width / Connection d x s			
DIN	DN 15 / 19 x 1.5	DN 20 / 23 x 1.5		DN 25 / 29 x 1.5
ISO	ISO 17.2 / 17.2 x 1.6	ISO 21.3 / 21.3 x1 .6	ISO 26.9 / 26.9 x 1.6	ISO 33.7 / 33.7 x 2.0
OD	3/4" OD / 19.05 x 1.65	1" OD / 25.4 x 1.65		

DIN Outside diameter to DIN 11850 Row 2 / DIN 11866, Row A
ISO Outside diameter to DIN EN ISO 1127 / DIN 11866, Row B
OD Outside diameter to ASME BPE 2002 / DIN 11866, Row C
Other overall sizes on request.

Materials and surfaces – *an important factor*

Materials

Product contacted	Distributor ring / bodys	1.4435 / AISI 316L Other materials on request
	PTFE bellows	TFM 1705, FDA-conform, biocompatible as per USP Class VI
Non-product contacted	Stainless steel actuators	1.4301/ AISI 304
	Plactic actuators	Polyphenylene sulfide (PPS)

Surface finish

Inside	$R_a \leq 0.8$ µm / $R_z \leq 32$ µin (as standard (weldsexcepted)
	$R_a \leq 0.4$ µm / $R_z \leq 16$ µin (optional (weldsexcepted)
	All interior surfaces are electrolytically polished as standard
Outside	As rolled (distributor ring, body and stainless steel actuators)
	Plastic actuators - surface finish according to VDI 3400, surface roughness 30

Welds in contact with the product are subject to stringent requirements and are of the highest surface quality. They are manufactured using automated TIG welding procedure.

In the development of the VESTA® Multiport much emphasis has been placed on a hygienic external design. All areas of the ring are liquid repellent enabling the external surface to remain hygienic over the long term.

The operative range – *for multiple applications*

VESTA® Multiport systems are suitable for complex sensible processes where it comes to the distribution of different process media for operation cleaning and sterilisation.

Operating pressure	max 6 bar (87 psi)
Control air pressure	NC actuator - min. 5 bar (72.5 psi), max. 10 bar (145 psi)
	NO actuator - min. 5 bar (72.5 psi), max. 6 bar (87 psi)
Operating temperature	-10 °C (+14° F) to max 135 °C (max. 275° F)
Sterilisation temperature	max 150 °C (302° F)

Reproducibility of manufacturing quality – *the quality charateristic*

VESTA® Multiport Systems are subject to the highest quality criteria during the production process. The requirement for this is provided by GEA Tuchenhagen's certified quality assurance system in accordance with DIN ISO 9001. Ongoing quality checks during the production process the identification of all parts and testing for functionality and sealing are the evidence for a constant high quality level.

VESTA® Multiport systems can be supplied with documented verification of the following quality properties:

- Ring and valve body (product wetted parts) with material inspection certificate in accordance with EN 10 204 / 3.1 (on request)
- Documented verification of the surface roughness in the form of a test report in accordance with EN 10 204 / 2.2 (on request)
- Documented verification of the delta ferrite content in the form of a test report in accordance with EN 10 204 (on request)
- Weld seam documentation – in conformance with cGMP, such as weld seam log, weld seam location plan, endoscopy log, etc. (on request)
- Quality certificate for weld seams (on request)

Qualification and validation – *ex works*

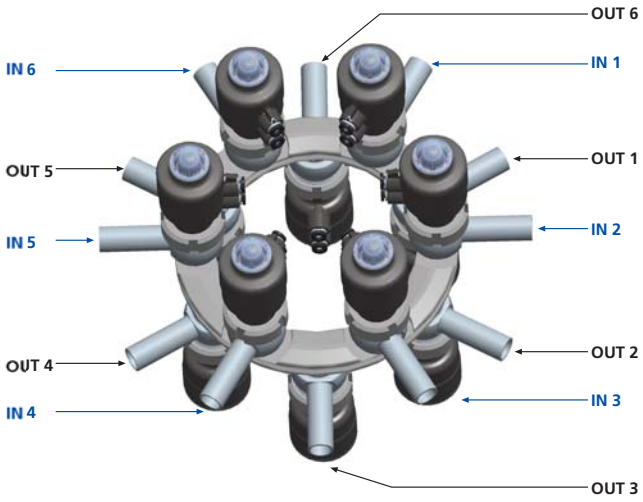
VESTA® Multiport can be qualified and validated ex works (DQ / IQ / OQ). The qualification and validation procedure covers the Multiport and its related documentation. In this way validation times for the complete process plant can be simplified and shortened.

Service and maintenance – *the great strength*

Emphasis must be placed on the easy and rapid accommodation of service and maintenance tasks on the VESTA® Multiport on site. Whether routine checks are being performed or the PTFE bellows are being replaced - simply release the groove nut and remove the complete valve insert from the body – finished! Even where access clearances are reduced rapid maintenance is possible without problems.

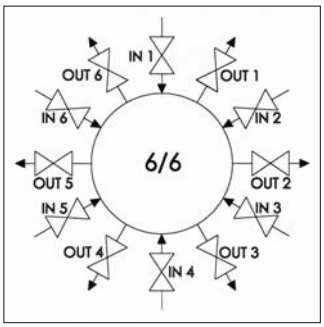
VESTA® valves have no loose fittings, the groove nut is permanently connected to the valve insert. Only standard tools are required for all service tasks.

VESTA® Multiport	HVA	DN 15	6/6	1.4435	Ra 0.8



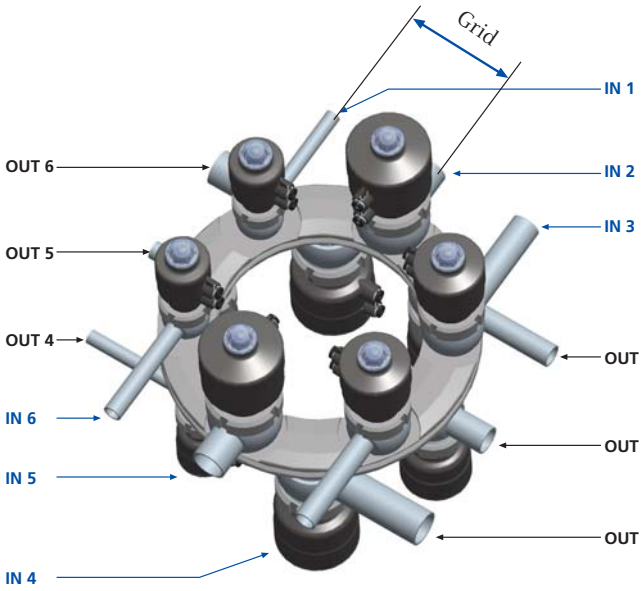
Specification

Operating pressure	customer declaration
Operating temperature	customer declaration
Sterilisation temperature	customer declaration
Product contacted materials	1.4435 (AISI 316L)
Product contacted surfaces	$R_a \leq 0.8$ µm / $R_z \leq 32$ µin (electropolished (standard)
Installation orientation	horizontal / actuators vertical
Pipe orientation	horizontal - starshape arrangement
Valves	valves in the IN lines (IN 6)
	valves in the OUT lines (OUT 6)
Connections	DIN pipe class / welding ends
	Outside diameter to DIN 11850, Row 2 / DIN 11866, Row A
System evacuation	valves IN 1 to IN 6 /into the ring
	valves OUT 1 to OUT 6 /into the pipework



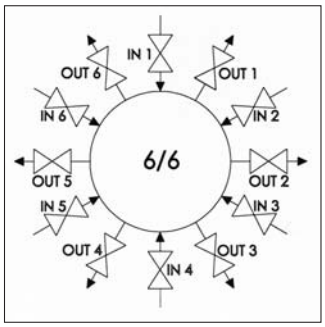
Valves	Nominal width	Connections dxs	Flow direction	Grid mm	Actuator type/ Control function	Accessories	Remarks
IN 1	DN 15	19 x 1.5	starshape (S)	-	s/s / MZ		
IN 2	DN 15	19 x 1.5	starshape (S)	-	s/s / MZ		
IN 3	DN 15	19 x 1.5	starshape (S)	-	s/s / MZ		
IN 4	DN 15	19 x 1.5	starshape (S)	-	s/s / MZ		
IN 5	DN 15	19 x 1.5	starshape (S)	-	s/s / MZ		
IN 6	DN 15	19 x 1.5	starshape (S)	-	s/s / MZ		
OUT 1	DN 15	19 x 1.5	starshape (S)	-	s/s / MZ		
OUT 2	DN 15	19 x 1.5	starshape (S)	-	s/s / MZ		
OUT 3	DN 15	19 x 1.5	starshape (S)	-	s/s / MZ		
OUT 4	DN 15	19 x 1.5	starshape (S)	-	s/s / MZ		
OUT 5	DN 15	19 x 1.5	starshape (S)	-	s/s / MZ		
OUT 6	DN 15	19 x 1.5	starshape (S)	-	s/s / MZ		

VESTA® Multiport	HVA	ISO 33,7	6/6	1.4435	Ra 0.8



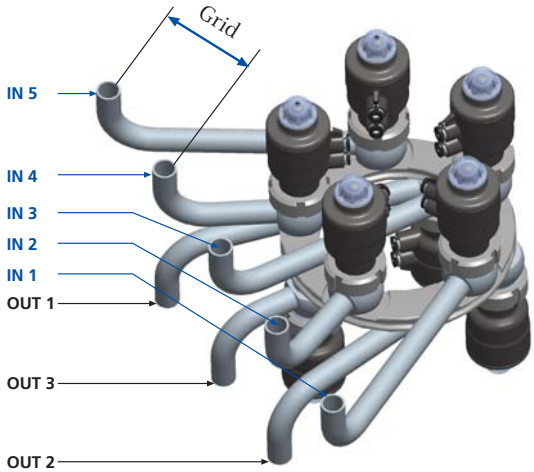
Specification

Operating pressure	customer declaration
Operating temperature	customer declaration
Sterilisation temperature	customer declaration
Product contacted materials	1.4435 (AISI 316L)
Product contacted surfaces	$R_a \leq 0.8$ µm / $R_z \leq 32$ µin (electropolished (standard)
Installation orientation	horizontal / actuators vertical
Pipe orientation	horizontal
Valves	valves in the IN lines (IN 6)
	valves in the OUT lines (OUT 6)
Connections	DIN-pipe class / weld ends
	Outside diameter to DIN EN ISO, Row 2 / DIN 11866, Row B
Flow direction	
System evacuation	valves IN 1 to IN 6 /into the ring
	valves OUT 1 to OUT 6 /into the pipework



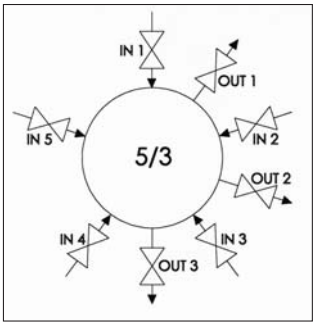
Valves	Nominal width	Connections dxs	Flow direction	Grid mm	Actuator type/ Control function	Accessories	Remarks
IN 1	ISO 13.5	13.5 x 1.6	horizontal-North (HN)	90	s/s / MZ		
N 2	ISO 33.7	33.7 x 2.0	horizontal-North (HN)	90	s/s / MZ		
IN 3	ISO 26.9	26.9 x 1.6	horizontal-Nord (HN)	90	s/s / MZ		
IN 4	ISO 21.3	21.3 x 1.6	horizontal-South (HS)	90	s/s / MZ		
IN 5	ISO 33.7	33.7 x 2.0	horizontal-South (HS)	90	s/s / MZ		
IN 6	ISO 17.2	17.2 x 1.6	horizontal-South (HS)	90	s/s / MZ		
OUT 1	ISO 21.3	21.3 x 1.6	horizontal-East (HE)	90	s/s / MZ		
OUT 2	ISO 26.9	26.9 x 1.6	horizontal-East (HE)	90	s/s / MZ		
OUT 3	ISO 33.7	33.7 x 2.0	horizontal-East (HE)	90	s/s / MZ		
OUT 4	ISO 13.5	13.5 x 1.6	horizontal-West (HW)	90	s/s / MZ		
OUT 5	ISO 21.3	21.3 x 1.6	horizontal-West (HW)	90	s/s / MZ		
OUT 6	ISO 33.7	33.7 x 2.0	horizontal-West (HW)	90	s/s / MZ		

VESTA® Multiport	HVA	DN 15	3/5	1.4435	Ra 0.8



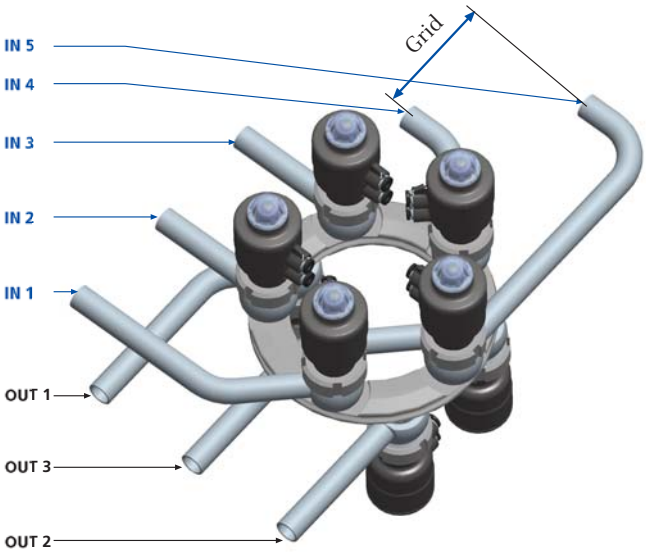
Specification

Operating pressure	customer declaration
Operating temperature	customer declaration
Sterilisation temperature	customer declaration
Product contacted materials	1.4435 (AISI 316L)
Product contacted surfaces	$R_a \leq 0.8$ µm / $R_z \leq 32$ µin (electropolished (standard)
Installation orientation	horizontal / actuators vertical
Pipe orientation	horizontal
Valves	valves in the IN lines (IN 5) valves in the OUT lines (OUT 3)
Connections	DIN-pipe class / welding ends Outside diameter to DIN 11850, Row 2 / DIN 11866, Row A
Flow direction	
System evacuation	valves IN 1 to IN 5 /into the ring valves OUT 1 to OUT 3 /into the pipework



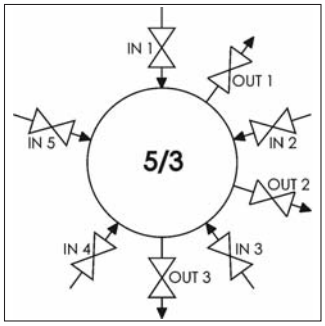
Valves	Nominal width	Connections dxs	Flow direction	Grid mm	Actuator type/ Control function	Accessories	Remarks
IN 1	DN 15	19 x 1.5	vertical-West (VW)	90	plastic / PZ		
IN 2	DN 15	19 x 1.5	vertical-West (VW)	90	plastic / PZ		
IN 3	DN 15	19 x 1.5	vertical-West (VW)	90	plastic / PZ		
IN 4	DN 15	19 x 1.5	vertical-West (VW)	90	plastic / PZ		
IN 5	DN 15	19 x 1.5	vertical-West (VW)	90	plastic / PZ		
OUT1	DN 15	19 x 1.5	vertical-West (VW)	90	plastic / PZ		
OUT2	DN 15	19 x 1.5	vertical-West (VW)	90	plastic / PZ		
OUT3	DN 15	19 x 1.5	vertical-West (VW)	90	plastic / PZ		

VESTA® Multiport	HVA	DN 15	5/3	1.4435	Ra 0.8



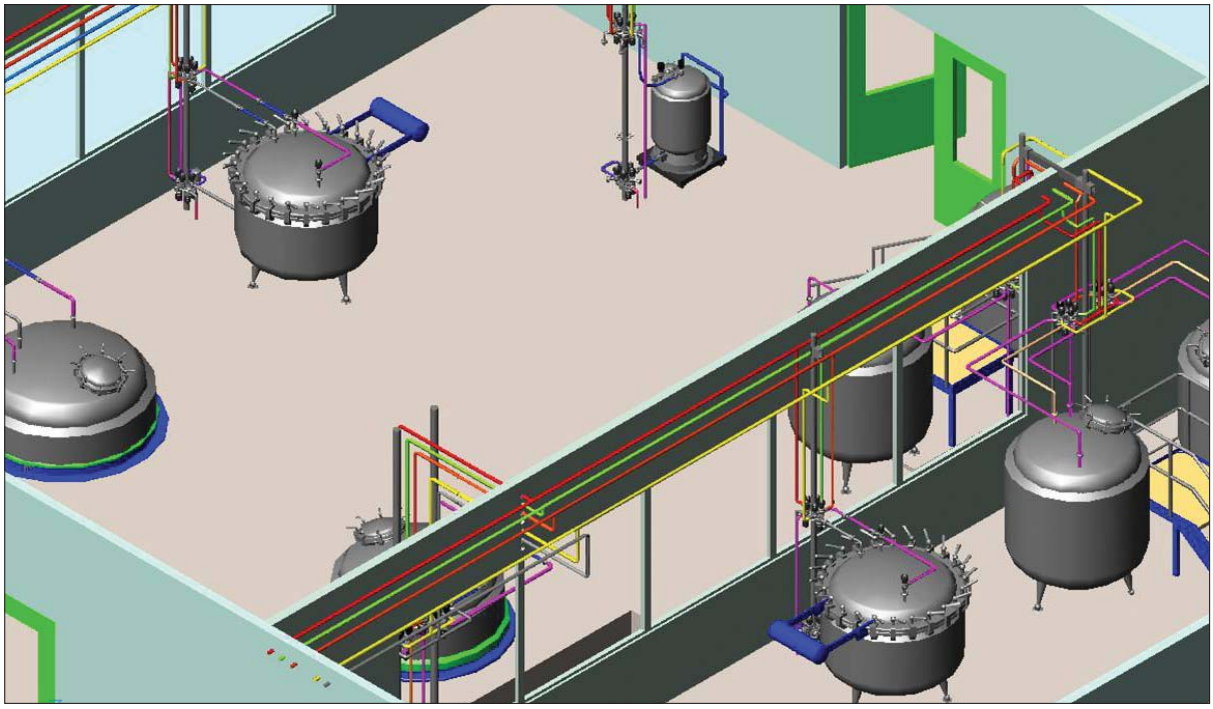
Specification

Operating pressure	customer declaration
Operating temperature	customer declaration
Sterilisation temperature	customer declaration
Product contacted materials	1.4435 (AISI 316L)
Product contacted surfaces	$R_a \leq 0.8$ µm / $R_z \leq 32$ µin (electropolished (standard)
Installation orientation	horizontal / actuators vertical
Pipe orientation	horizontal
Valves	valves in the IN lines (IN 5)
	valves in the OUT lines (OUT 3)
Connections	DIN-pipe class / weld ends
	Outside diameter to DIN 11850, Row 2 / DIN 11866, Row A
Flow direction	
System evacuation	valves IN 1 to IN 5 /into the ring
	valves OUT 1 to OUT 3 /into the pipework



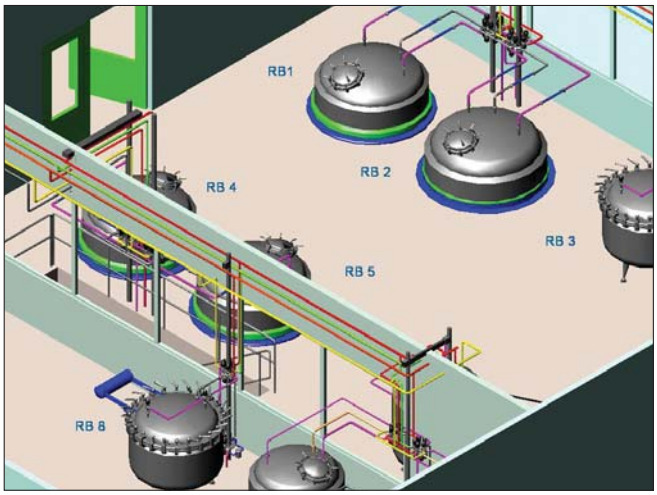
Valves	Nominal width	Connections dxs	Flow direction	Grid mm	Actuator type/ Control function	Accessories	Remarks
IN 1	DN 15	19 x 1.5	horizontal-West (HW)	90	plastic / PZ		
IN 2	DN 15	19 x 1.5	horizontal-West (HW)	90	plastic / PZ		
IN 3	DN 15	19 x 1.5	horizontal-West (HW)	90	plastic / PZ		
IN 4	DN 15	19 x 1.5	horizontal-West (HW)	90	plastic / PZ		
IN 5	DN 15	19 x 1.5	horizontal-West (HW)	90	plastic / PZ		
OUT 1	DN 15	19 x 1.5	horizontal-South (HS)	90	plastic / PZ		
OUT 2	DN 15	19 x 1.5	horizontal-South (HS)	90	plastic / PZ		
OUT 3	DN 15	19 x 1.5	horizontal-South (HS)	90	plastic / PZ		

Application example - *Engineering concept for batch preparation*

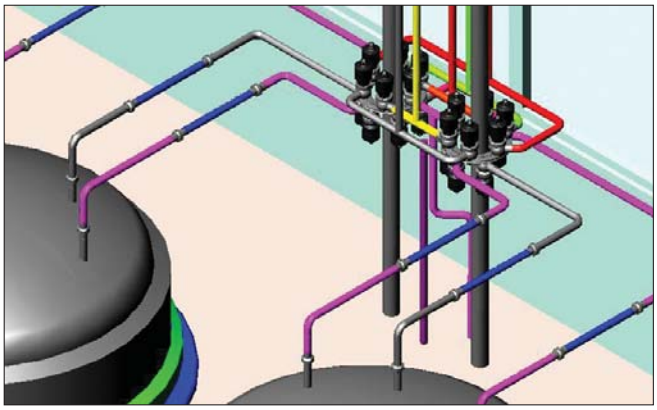


Process requirements

- Process tanks to be continuously supplied with different products
- Process tanks to be filled and cleaned separately
- Intermediate cleaning of the system after each product change
- Cleaning media:
  Drinking water, caustic 80 °C, demin-water, high purity steam, sterile air for conveying product into small containers
- Pipes for product and media to be integrated into existing pipe systems with a 2% slope to the VESTA® Multiport system.
- For small container cleaning, a media column for 5 containers is required
- Reliable emptying of the entire process system must be ensured
- Dead ends and loss of product must be avoided

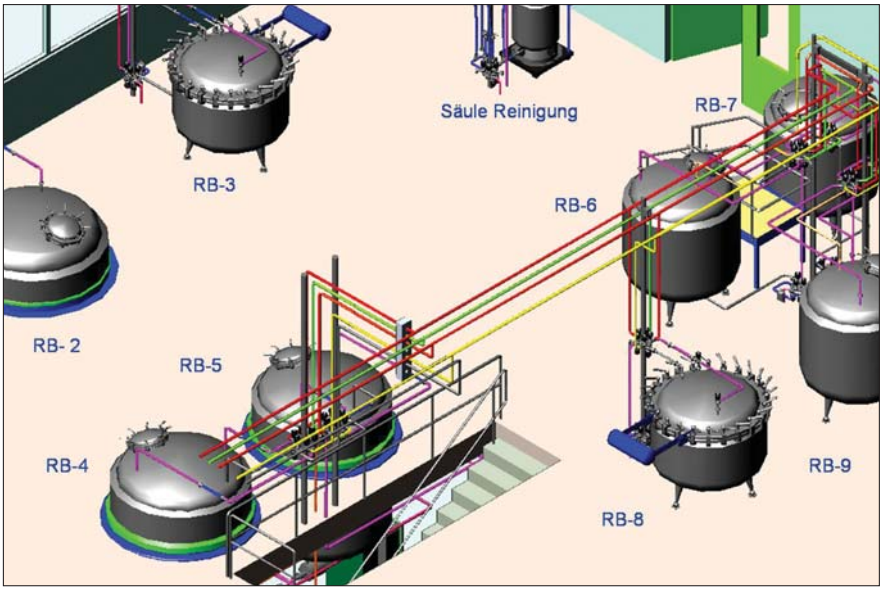


Container arrangement and pipe routing

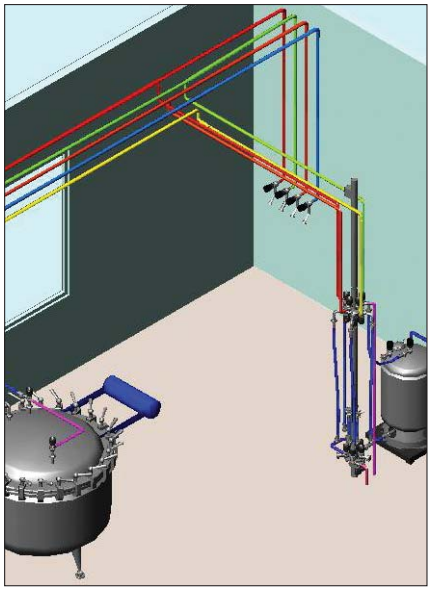


Media distribution agitator tank RB-1 / RB-2 with VESTA® Multiport, Type HVA-6/6

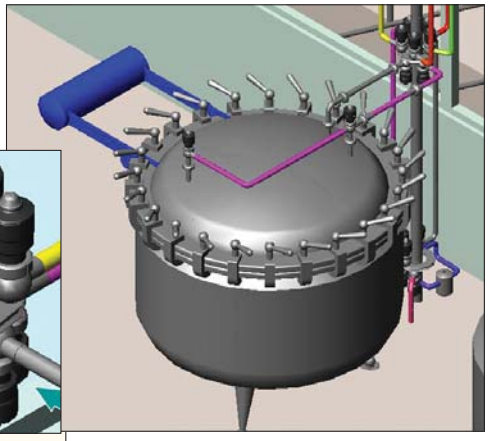
Application example - *Engineering concept for batch preparation*

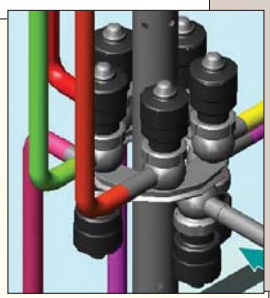


Plant configuration - detail view Agitator tanks RB-2 to RB-8 / Cleaning column

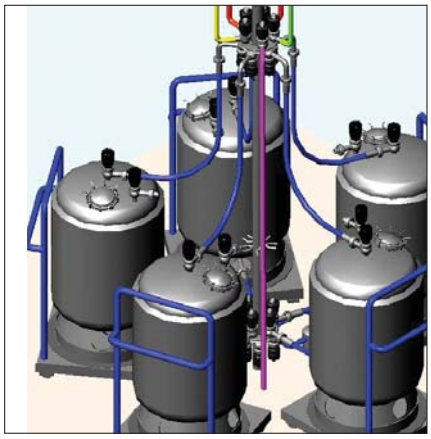


View Agitator tank RB-3, cleaning column, rinsing valves for small containers



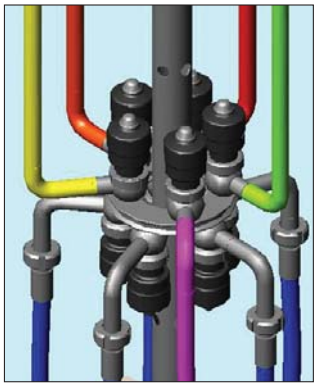


Agitator tank RB-3 with VESTA® Multiport, Type HVA-5/3

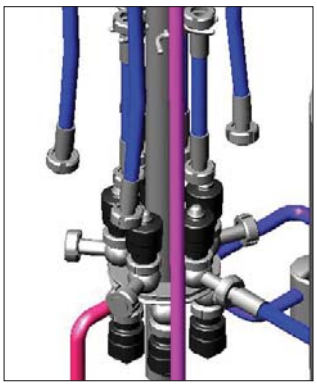


Small mobile media containers for rinsing, cleaning and sterilisation

Distribution small media container

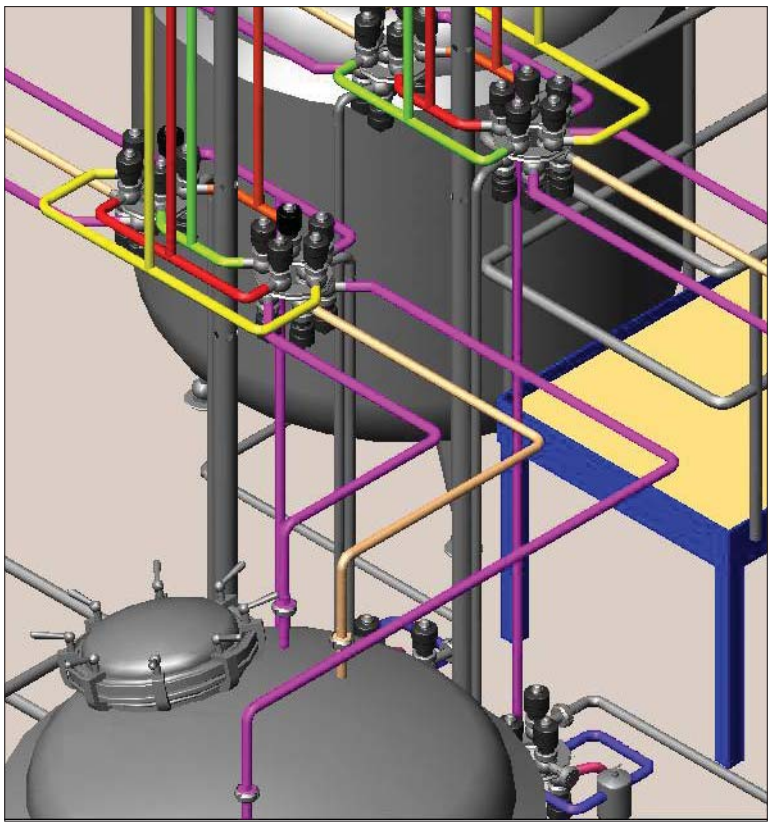


VESTA® Multiport, Type HVA-5/5 (upper part)

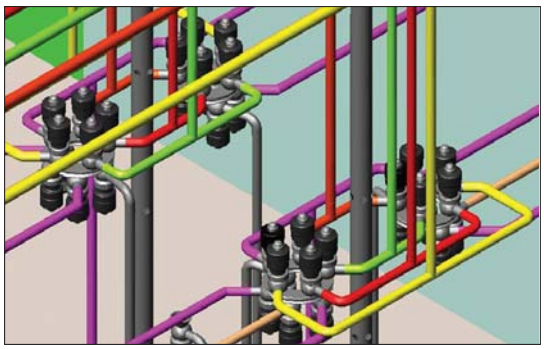


VESTA® Multiport, Type HVA-5/5 (lower part)

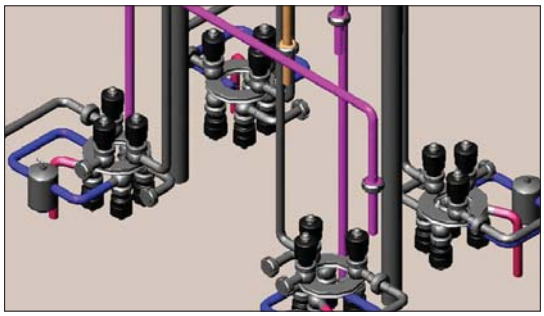
Application example - *Engineering concept for batch preparation*



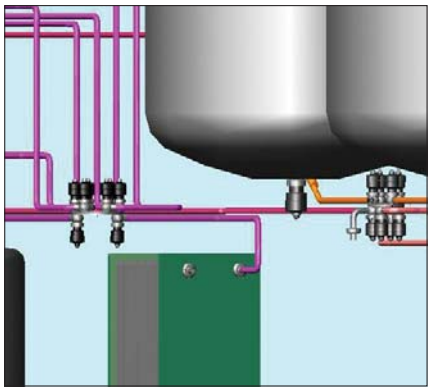
Detail view - Media supply RB-6/7/9/10



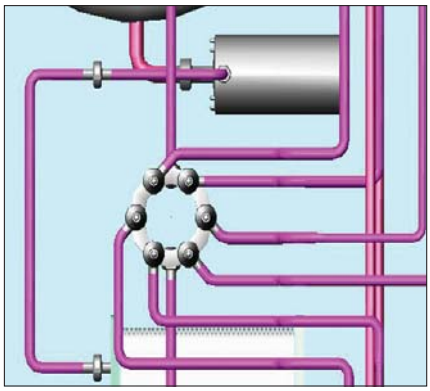
VESTA® Multiport, Type HVA-5/4 (upper part)



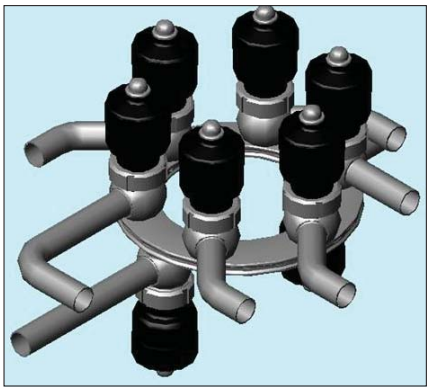
VESTA® Multiport, Type HVA-5/4 (upper part)



Batch preparation tank CIP with HE, UP and distribution



CIP distribution (caustic)



VESTA® Multiport, Type HVA-6/2

VESTA® Multiport – *the new media distribution concept*

VESTA® Multiport systems are the benchmark for applications in the sterile process technology and meet the well-known requirements of complex processes with different operating, cleaning and sterilisation media. Mixproof production, individual configurations with defined flow directions and grids, no dead ends and complete draining, the compact design and last but not least quick and easy maintenance are the outstanding features of the VESTA® Multiport system.

VESTA® Multiport sets new standards in terms of cost effectiveness.

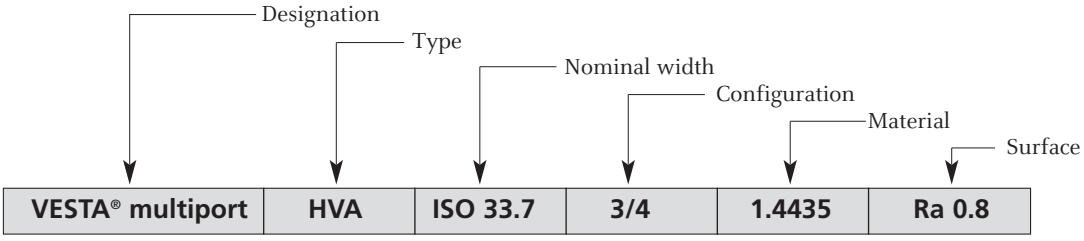
Shall we manage your specific application?

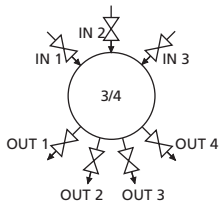
We are ready to set up a quotation free of charge for you, complete with price indication and data sheet showing the overall size and dimensions. If you do agree, we would need some detailed information from you for a precise specification of the VESTA® Multiport.

On the next page we have prepared a form in which you will kindly fill-in operating data, material and surface quality and the desired configuration. The table may be used for the specification of the individual valves. Kindly use the short terms as specified below for the socket orientation, grid, actuator type and accessory. You may use on choice the empty space for preparing a pictogram of the desired configuration or you enclose a P&I diagram or sketch on a separate sheet.

Kindly send the filled-in form to your GEA Tuchenhagen sales partner or to the address shown on the form (Mind to indicate your Name, Address, Telephone and/or Fax Number).

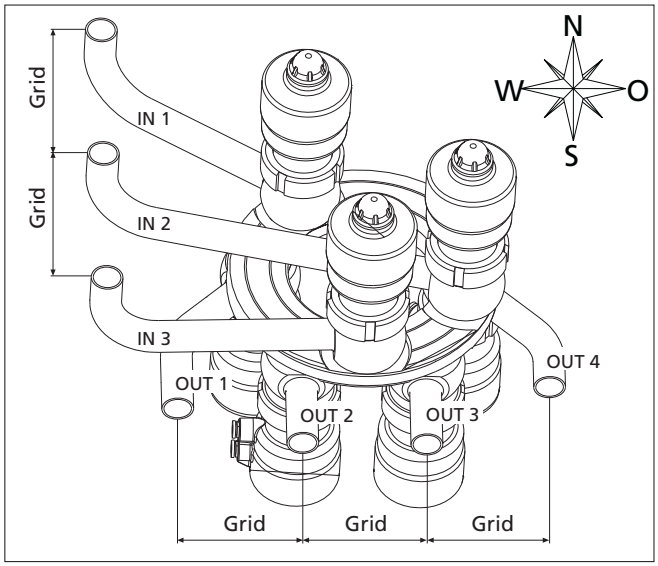
The example below shall help you to fill-in the form.





Meaning of the abbreviations:

IN 1..6	Number of valves on the supply side
OUT 1..6	Number of valves on the return side
S	Socket orientation starshape
HN	Socket orientation horizontal – North
HS	Socket orientation horizontal – South
HW	Socket orientation horizontal – West
HO	Socket orientation horizontal – East
VN	Socket orientation vertical – North
VS	Socket orientation vertical – South
VW	Socket orientation vertical – West
VO	Socket orientation vertical – East
R1	Grid 90 mm (Standard)
R2	Grid 120 mm (in case of pipe insulation)
PZ	Pneumatic actuator made of plastics NC
PA	Pneumatic actuator made of plastics NO
MZ	Pneumatic actuator made of s/s NC
MA	Pneumatic actuator made of s/s NO
H	Manual actuator made of plastics
M	Proximity switch holder (Accessory)
B	Control module (Accessory)
20	Limit stop opening stroke (Accessory)
21	Limit stop closing stroke (Accessory)



Proximity switch holder

Control module

Valves	Nominal width	Connections dxs	Flow direction	Grid mm	Actuator type/ Control function	Accessories	Remarks
IN 1	ISO 33.7	33.7 x 2.0	VW	90	PZ		
IN 2	ISO 33.7	33.7 x 2.0	VW	90	PZ		
IN 3	ISO 33.7	33.7 x 2.0	VW	90	PZ		
OUT 1	ISO 33.7	33.7 x 2.0	HS	90	PZ		
OUT 2	ISO 33.7	33.7 x 2.0	HS	90	PZ		
OUT 3	ISO 33.7	33.7 x 2.0	HS	90	PZ		
OUT 4	ISO 33.7	33.7 x 2.0	HS	90	PZ		

Customer: _____ Address: _____

Tel.: _____ Fax.: _____ e-mail: _____

Contact partner: _____ Division: _____ Date: _____

Technical Data

Operating pressure:___ bar **Medium temperature:**_____ °C / F°

Sterilisation temperature: _____ °C / F°

Material (product contacted): **1.4435** ☐

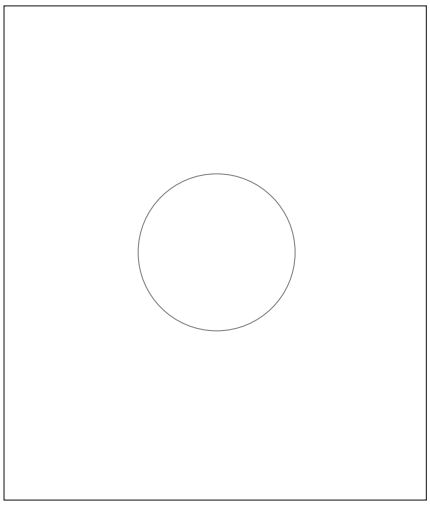
Other material: _____

Surface (product contacted): **Ra ≤ 0.8 µm, e-polished** (Standard) ☐
Rz ≤ 32 µin, e-polished (Standard)

Better surface quality: **Ra ≤ 0.4 µm, e-polished** (Option) ☐
Rz ≤ 32 µin, e-polished (Standard)

Configuration: _____ (Valves IN-OUT)

Quantity: _____



Space for Pictogram or Sketch

Specification (Fill-in table with data for the desired configuration)

Valves	Nominal width	Connections dxs	Socket-orientation	Grid mm	Actuator type Control function	Accessory	Remark
IN 1							
IN 2							
IN 3							
IN 4							
IN 5							
IN 6							
OUT 1							
OUT 2							
OUT 3							
OUT 4							
OUT 5							
OUT 6							

Article brief description (for the quotation)

VESTA® Multiport	HVA				

GEA Tuchenhagen GmbH, Am Industriepark 2-10, 21514 Büchen, Germany,
Phone +49 4155 49-0, Fax +49 4155 49-2423, vesta@tuchenhagen.de, www.tuchenhagen.com

GEA Mechanical Equipment

GEA Tuchenhagen GmbH

Am Industriepark 2-10, 21514 Büchen, Germany
Phone +49 4155 49-0, Fax +49 4155 49-2423
sales.geatuchenhagen@gea.com, www.tuchenhagen.com

Fa 652e-04/2012