

Varahamurti Flexirub Industries Pvt. Ltd  
Village-Gejha, Pargana  
Khasra No. 863, Meerut  
Uttar Pradesh, India- 250205

Christian Becker  
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2022-07-25

## Order Confirmation A0100-50312

Dear Sir or Madam,

We thank you for your order which we are pleased to confirm as follows on the basis of our "General Terms and Conditions of Delivery"

### MULTIFLEX including FLAT TOP SYSTEM



according to the following specification

Hennecke GmbH  
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D-53757 Sankt Augustin  
Tel.: +49 (0) 2241 339-0 Fax: +49 (0) 2241 339-204  
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Steuernummer: 222/5707/3796 USt.-IdNr.: DE811138420  
Geschäftsführer: Rolf Trippler, Svend Weidemann, Thomas Wildt

#### Bank details

Commerzbank AG Bonn, BLZ: 380 400 07, Konto: 3322161  
BIC: COBADEFF380, IBAN: DE40 3804 0007 0332 2161 00

**Your Order No.:** AGREEMENT

**Your Order from:** 2022-07-12

**Delivery adress:** Varahamurti Flexirub Industries Pvt. Ltd  
Village-Gejha, Pargana  
Khasra No. 863, Meerut  
Uttar Pradesh, India- 250205

**Invoice recipient:** Varahamurti Flexirub Industries Pvt. Ltd  
Village-Gejha, Pargana  
Khasra No. 863, Meerut  
Uttar Pradesh, India- 250205

**End Customer:** Varahamurti Flexirub Industries Pvt. Ltd  
Village-Gejha, Pargana  
Khasra No. 863, Meerut  
Uttar Pradesh, India- 250205

**VAT REG No.:**

**Quotation Number:** 00012887-001

**Hennecke Group-ID:** NM25HEN50312

**Net Amount:** 1.300.000,00 €

## 1 Delivery Time

**Time of Delivery (external)** 2023-09-15

## 2 Terms of Delivery

**CIF Mumbai seaport**

incl. adequate packaging

## 3 Payment terms

10% upon conclusion of the contract

20 % 60 days after the conclusion of the contract

For the remaining 70%, an irrevocable and confirmed L/C is to be opened free of charge for Hennecke and must be received by Hennecke within 3 months after the second (20%) advanced payment. The L/C is to be opened via a German bank, preferably the Commerzbank AG in Bonn.  
In the event that Hennecke does not receive the L/C by the agreed date, the delivery will be delayed accordingly.

30% to be paid 4 months after conclusion of contract

30% against shipping documents

10 % against acceptance certificate, but at the latest 6 months after delivery, against simple invoice

The invoice amount is due within 14 days of receiving the invoice, net

## **4 Conditions for order processing**

### **Warranty**

The warranty-period (Gewährleistung) is limited to 12 months from the date of installation.

### **COVID-19**

"In addition to the remaining contractual provisions, the parties agree the following with regard to extra, corona-related expenses:

1. For deployments of the Supplier's staff arranged by the Customer, the Customer shall bear additional costs that may result from possible corona measures and that are incurred on the way to and at the site of deployment. This includes in particular the costs incurred by extended hygiene and quarantine measures, corona tests, medical care, expenses for board and lodging as well as continued payment of wages and the costs for deploying any additional employees required as a replacement. The Supplier currently anticipates costs in the amount of 900 EUR per employee and day. These costs include board and lodging as well as pure labor costs. All other costs are extra.
2. If the Supplier is unable to counterbalance the repercussions from corona e.g. by timely dispatching replacement employees or due to the serious illness of the responsible expert - and if, for this reason, the contractually agreed time frame is delayed, the agreed deadlines are extended accordingly by the duration of the corona-related delays. Agreed penalties will be suspended accordingly during this period and cannot be demanded for the duration of the corona-related delay.
3. Corona-related costs that may be incurred in the country of the Supplier's registered office shall be borne by the Supplier. This includes in particular the costs listed above under point 1.
4. An essential requirement for the assignment of employees by the Supplier to areas designated as international risk areas by the responsible German authorities (the Federal Foreign Office, the Federal Ministry of Health and the Federal Ministry of the Interior, Building and Community) is that the Customer guarantees compliance with the SARS-CoV-2 Occupational Safety and Health Standard of the Federal Ministry of Labor and Social Affairs and the provision of medical care at the site of deployment. Should it transpire during a deployment that the appropriate measures are not being observed, the Customer shall be liable for any resulting damage unless he is not responsible for this damage. In any case the Supplier may suspend the performance of the contract and withdraw its employees until the Customer proves compliance with the hygiene standards. The Customer shall also bear any additional expenses that may arise as a result; this shall also apply in the event that an employee of the Supplier does not fall ill.
5. For its part, the Supplier shall ensure that its employees have a negative test result before departure, that they are instructed in the hygiene and protective measures for business trips as well as in the relevant entry and exit regulations and that they can reach a medical contact person at the Supplier's premises at any time.
6. The Customer shall inform the Supplier as well as the affected employees additionally and, in case of changes immediately, and sufficiently about the specific conditions and restrictions that apply at the site of deployment."

### **Note**

Under the current EU sanctions against Russia, the sale, supply, transfer and export of our goods to specific individuals, institutions and companies within the Russian territory is prohibited, if these goods are or may be intended, in whole or in part, for military use or for a military end-user or for various applications in the energy

sector, telecommunication as well as transportation. In addition, a large number of other sanctions against Russia apply worldwide (e.g. on the part of the USA, UK, Canada, Switzerland, South Korea, Japan, Australia etc.) which are also observed by Hennecke. Before entering into any contract with us, please note that Hennecke will not participate in any way in activities that seek to circumvent or facilitate circumvention of the existing sanctions. If, during an ongoing project, the suspicion should substantiate or it should be clearly established that promised deliveries to the customer or to third parties serve to circumvent the above-mentioned Russian sanctions, Hennecke shall have the right to terminate the contract immediately and extraordinarily. In the event of such a termination, Hennecke shall retain the claim to the agreed remuneration, less the expenses saved as a result of the termination. The same applies to deliveries intended for use in Belarus.

We thank you for placing your order with us and assure you a careful completion of your order.

Best regards  
Hennecke GmbH

i.V.



Dr. Joachim Berthold  
Senior Director of Sales  
Slabstock, Moulded Foam and  
Refrigerated Appliance Lines

i.V.



Christian Becker  
Director Sales South East Asia/ India  
Slabstock Lines

## 5 Technical Specification

### 1 1 pc. **Big operating platform**

approx. width: 7.400 mm

The platform is a steel weldment. Stud plates cover the complete platform walkway. At the front of the platform, seen in foaming direction, two staircases are located. The platform walkways as well as the two stairs are secured by a railing. There is a direct connection to the catwalk of the tunnel.

On the side of the platform the control and computer cabinet is installed.

### 2 **Machine Portal with Mixer Unit**

#### 2.1 1 pc. **Machine portal**

consisting of:

- 1 portal support, which is a torsion-resistant steel weldment.  
The mixer unit is located in the support centre.

#### 2.2 1 pc. **Mixer unit for the production of flexible slabstock foams**

consisting of:

- 1 frequency-controlled AC-motor driving the stirrer with temperature protection

power: 25 kW at 5.000 rpm

continuously adjustable stirrer speed range: 1.000-5.000 rpm

The stirrer speed is computer controlled depending on the formulation.

The actual value is displayed on the monitor.

#### **The following equipment is installed underneath the drive motor:**

- 1 chamber with the rotary shaft seal and leakage sealing system

At a stirrer speed of 5000 rpm the rotary shaft seal is suitable for a max. mixing chamber pressure of 2,5 bar.

The chamber has 3 ports:

1 port for Polyol

2 ports for Additives

- 1 mixing chamber with several connecting options

The component ports are located on the following 2 levels:

upper level: 4 ports for Isocyanates

lower level: 4 ports for Additives

#### **Please note:**

The idle mixing chamber ports are closed by plugs.

- 1 mixing cylinder

2.2.1 1 pc. **Scew type stirrer**

The mixing cylinder is equipped with a scew type stirrer stirrer.

2.2.2 1 pc. **Height adjustable mixer**

The mixer is fixed in a height adjustable device. This allows a direct pouring out of the mixer.

Between the additive collector block and the mixer a hose will be connected. Instead of the manual mixer throttle a motorized mixer throttle will be installed. All components injected into the mixer (water, isocyanate and tin) will receive also hoses to the injectors. The 3 flexible hoses to connect the mixer with the pouring hopper are not required.

The usage of the height adjustable mixer results in a better cell structure in comparison to the mixer in fixed height using a pouring hose.

2.3 1 pc. **Mixer piping**

consisting of:

- 1 collecting block with venting valve for the supply of max. 8 Polyols

All idle spare ports are closed by a blind flange.

- 1 pipe line for the connection of the Polyol collecting block with the mixing chamber

The following is integrated:

- 1 collecting block with 24 ports for Additives and colours

All idle ports are closed by plugs.

- 1 electro/pneumatic controlled shut-off valve between the collecting block for Additives and the mixing chamber

- 1 injector block between the shut-off valve and the mixing chamber

The following is integrated in the injector block:

- 1 port, usually used for Blowing agent
- 1 pressure sensor for measuring of the mixing chamber pressure

**The mixer cleaning procedure is as follows:**

The cleaning operation means flushing with Polyol and it is started by pressing the cleaning button and it continues as long as the button is pressed.

2.3.1 1 pc. **Device for introducing air into the Polyol mixture stream in front of the main mixer**

consisting of:

- 1 air flow controller, controlled manually with max capacity of 550 NL/h

2.4 1 pc. **Motorized mixing chamber pressure setting device**

Adjustable motorized mixing chamber pressure setting device with dispense devices.

3 **Metering Equipment**

3.1 1 pc. **Metering system**

Metering list – Table 1 of 2

Pos	Metering line	Density kg/dm <sup>3</sup>	Viscosity at processing temperature mPa.s	Output		Pressure	
				kg/min		bar	
				min	max	Work	safety
1.	Polyol, pure	1,02	400 – 1.000	30,0	300,0	20	25
2.	Polyol, polymeric	1,04	3.000 – 6.000	10,0	150,0	20	25
3.	Polyol, special	1,03	500 – 2.000	10,0	150,0	20	25
4.	Polyol, visco	1,02	500 – 1.500	25,0	250,0	20	25
5.	Polyol, CaCo3 (1:1)	1,48	4.500	30,0	300,0	20	25
6.	Isocyanate TDI T80	1,22	3	15,0	150,0	120	150
7.	Water	1,00	1	1,0	10,0	60	80
8.	Tin	1,25	200 – 500	0,03	1,0	60	80
9.	Amine, A33	1,033	100 – 500	0,15	3,0	60	80
10.	Amine, A1	1,033	100 – 500	0,09	1,0	60	80
11.	Amine DEOA	1,033	100 – 500	1,0	10,0	60	80
12.	Silicone 1	1,03	500 – 2.500	0,5	5,0	60	80
13.	Silicone 2	1,03	500 – 2.500	0,5	5,0	60	80
14.	Silicone 3, visco	1,03	500 – 2.500	0,5	5,0	60	80
15.	FR	1,2	1.000 – 3.000	3,0	40,0	60	80
16.	Glycerine / FLE	1,25	500 – 1.500	0,3	5,0	60	80
17.	Cell Opener	1,2	500 – 2.000	2,0	20,0	60	80
18.	Antimicrobial	1,27	4.000 – 8.000	0,1	1,0	60	80
19.	Blowing Agent	1,33	0,4	3,0	26,0	60	80
20.	Colour 1, Milliken	1,00	1.000	0,025	3,0	60	80



21.	Colour 2, Milliken	1,00	1.000	0,025	3,0	60	80
22.	Colour 3, Milliken	1,00	1.000	0,025	3,0	60	80
23.	Colour 4, Milliken	1,00	1.000	0,025	3,0	60	80
24.	Colour 5, black	1,00	4.000 – 10,000	0,1	6,0	60	80

Metering list – Table 2 of 2

Pos	Metering line	Piping/ fitting / tank material	Tank size / pressure l / bar
1.	Polyol	St / St / --	--
2.	Polyol, polymeric	St / St / --	--
3.	Polyol, special	St / St / --	--
4.	Polyol, visco	St / St / --	--
5.	Polyol, CaCo3	St / St / --	--
6.	Isocyanate TDI T80	St / St / --	--
7.	Water	CrNi / St / PE	500 / 0
8.	Tin	St / St / --	- / 3
9.	Amine, A33	CrNi / St / PE	300 / 0
10.	Amine, A1	CrNi / St / PE	300 / 0
11.	Amine DEOA	CrNi / St / PE	300 / 0
12.	Silicone 1	St / St / PE	300 / 0
13.	Silicone 2	St / St / PE	300 / 0
14.	Silicone 3, visco	St / St / PE	300 / 0
15.	FR	St / St / --	--
16.	Glycerine / FLE	St / St / PE	300 / 0
17.	Cell Opener	St / St / --	--
18.	Antimicrobial	St / St / --	- / 3
19.	Blowing Agent	St / St / --	- / 3
20.	Colour 1, Milliken	St / St / --	- / 3
21.	Colour 2, Milliken	St / St / --	- / 3
22.	Colour 3, Milliken	St / St / --	- / 3
23.	Colour 4, Milliken	St / St / --	- / 3
24.	Colour, Black Milliken	St / St / --	- / 3

St - Carbon steel /  
CrNi- CrNi steel  
PE Polyethylene

Metering lines for raw materials with water content or corrosive properties have to be equipped with appropriate materials such as chrome-nickel-steel. The properties of raw materials have to be checked by the customer and Hennecke has to be informed about the results.

All metering lines are not designed for the processing of fillers such as calcium carbonate unless explicitly mentioned.

The number of metering units can be extended and the metering outputs can be modified depending on the individual requirements of the customer.

**Please note:**

Metering data need to be confirmed by the customer.

**Description of Metering units:**

**Pos. 1 - 5**

**5 Metering unit for Polyol**

designed according to metering list

**The pump set consists of:**

- 1 precision metering pump with continuously variable metering output
- 1 mechanical coupling for connecting the metering pump with the motor
- 1 frequency-controlled AC motor
- 1 base frame for the metering pump and the drive unit

**In the suction side of the metering pump set are integrated:**

- 1 joining piece with connection flange
- 1 shut-off valve without electric locking system
- 1 strainer
- 1 electronic pressure switch with digital display

**In the discharge side of the metering pump set are integrated:**

- 1 joining piece with connection flange
- 1 safety valve with overflow line back into the suction side of the metering pump
- 1 electronic pressure switch with digital display
- 1 flow meter with pulse generator

- 1 thermometer with electrical temperature sensor, mounted just upstream of the recirculation valve  
The temperature is displayed on the computer screen.
- 1 electric-pneumatic recirculation/production device for switching the feed stream as follows:  
recirculation: tank-pump-tank  
production: tank-pump-mixer  
each consisting of:
  - 1 shut-off valve for the production
  - 1 shut-off valve for the recirculation

The switching between recirculation and production is performed by electro-pneumatically controlled actuators.

The ball valve end positions are electrically locked by limit switches ensuring the correct valve position.

In the event of a malfunction, a visual and audible signal will be released and the production line cannot be started.

The two valves will be mounted to the Polyol collecting block.

## **Pos. 6**

### **1 Metering unit for Isocyanate TDI T80**

designed according to metering list

#### **The pump set consists of:**

- 1 Axial piston pump with continuously variable metering output
- 1 magnetic coupling for connecting the metering pump with the motor
- 1 frequency-controlled AC motor
- 1 base frame for carrying metering pump and drive unit

#### **In the suction side of the metering pump set are integrated:**

- 1 joining piece
- 1 shut-off valve, without electric locking system
- 1 edge filter with solids outlet valve, pressure-proof design
- 1 electronic pressure switch with digital display

#### **Please note:**

- the pump has to be positioned under the tank with the shortest possible suction line length and connection diameter 80 mm
- the min. isocyanate level above pump the is 2 m

#### **In the discharge side of the metering pump set are integrated:**

- 1 pipe line from the metering pump to the recirculation/production device made of normal steel
- 1 safety valve with overflow line back into the suction side of the metering pump
- 1 electronic pressure switch with digital display
- 1 flow meter with pulse generator
- 1 manual valve
- 1 thermometer with electrical temperature sensor mounted just upstream of the recirculation valve  
The temperature is displayed on the computer screen.
- 1 electric-pneumatic recirculation/production device for switching the feed stream as follows:
  - recirculation: tank-pump-tank
  - production: tank-pump-mixer
  - consisting of:
    - 2 two-way ball valves for the recirculation and production  
 The switching between recirculation and production is performed by electro-pneumatically controlled actuators.  
 The ball valve end positions are electrically locked via limit switches ensuring the correct valve position.  
 In the event of a malfunction, a visual and audible signal will be released and the production line cannot be started.
- 1 pipe line from the recirculation/production device to the mixer made of normal steel
- 1 pipe line from the recirculation/production device to the test unit made of normal steel

**The following items are attached to the mixer and will be used for included Isocyanates:**

- 1 collecting block for Isocyanate with electronic pressure switch, inlet and outlet ports.  
The idle ports are closed by plugs.
- 3 lines for connecting the collecting block with the main mixing chamber each with integrated shut-off valve (without electric locking)
- 3 pneumatically controlled injectors with white oil sealing liquid system installed in the mid level of the mixing chamber  
Controlled manually at the pneumatic pressure control valve in the portal area

**For equalising of the recirculation pressure to the working pressure the following equipment is integrated into the recirculation line:**

- 1 manual adjustable pressure maintaining valve
- 1 test unit with 2 manually adjustable shut-off valves without electric locking device

**Pos. 7**

**1 Metering unit for Water**

designed according to metering list

**The pump set consists of:**

- 1 precision metering pump with continuously variable metering output and seals designed for operating conditions
- 1 mechanical coupling for connecting the metering pump with the motor
- 1 frequency-controlled AC motor
- 2 clamping rails for the installation of the pump and the drive unit on the pump table

**In the suction side of the metering pump set are integrated:**

- 1 hose for the connection of the tank with the metering pump
- 1 shut-off valve without electric locking system
- 1 strainer

**In the discharge side of the metering pump set are integrated:**

- 1 pipe line for connecting the metering pump with the recirculation/production device
- 1 safety valve with overflow line back into the tank
- 1 electronic pressure switch with digital display
- 1 flow meter with pulse generator
- 1 manual valve
- 1 electric-pneumatic recirculation/production device for switching the metering stream as follows:

recirculation: tank - pump - tank

production: tank - pump - mixer

consisting of:

- 1 two-way ball valve for production and recirculation

The switching between recirculation and production is performed by electro-pneumatically controlled actuator.

The ball valve end positions are electrically locked via limit switches ensuring the correct valve position.

In the event of a malfunction, a visual and audible signal will be released and the production line cannot be started.

- 1 pipe line for connecting the recirculation/production device with the mixer including a connecting flexible hose
- 1 pneumatically controlled injector installed in the upper level of the mixing chamber
- 1 pipe line for the connecting of the recirculation/production device with the tank

**Pos. 8**

**1 Metering unit for Tin**

designed according to metering list and described under metering unit for water with following differences: the pressure maintaining manual valve is installed in the recirculation line and the pneumatically controlled injector is mounted in the lower level of the mixing chamber. The safety valve with overflow line goes into the suction side of the metering pump.

#### **Pos. 9 - 11**

##### **3 Metering unit for Amines**

designed according to metering list and described under metering unit for water with following differences: a pressure maintaining manual valve is installed in the recirculation line and the adequate injection valve is mounted in the component injection block which is integrated in the Polyol line before the mixer shut-off valve.

#### **Pos. 12 - 14**

##### **3 Metering unit for Silicone**

designed according to metering list and described under metering unit for water with following difference: the adequate injection valve is mounted in the component injection block which is integrated in the Polyol line before the mixer shut-off valve. The safety valve with overflow line goes into the suction side of the metering pump.

#### **Pos. 15**

##### **1 Metering unit for FR**

designed according to metering list and described under metering unit for water with following difference: the adequate injection valve is mounted in the component injection block which is integrated in the Polyol line before the mixer shut-off valve. The safety valve with overflow line goes into the suction side of the metering pump.

#### **Pos. 16 - 19**

##### **3 Metering units for Additives (Glycerine, Cell Opener, Antimicrobial)**

designed according to metering list and described under metering unit for water with following difference: the adequate injection valve is mounted in the component injection block which is integrated in the Polyol line before the mixer shut-off valve. The safety valve with overflow line goes into the suction side of the metering pump.

#### **Pos. 20**

##### **1 Metering unit for Blowing agent**

designed according to metering list and described under metering unit for water with following differences: the adequate injection unit is mounted in a block directly at the mixer entry and the pump with drive motor is mounted on a base frame. The safety valve with overflow line goes into the suction side of the metering pump and the suction side is equipped with an electronic pressure switch with digital display.

The overflow line goes back into the suction side of the metering pump.

The non-return valve is installed in a collector block between the production valve and the mixer.

**Please note:**

The metering pump requires a minimum pressure of 2 bar on the suction side.

**For Blowing agent, the following is not included:**

- the pressure bulk tank with filling, safety and monitoring devices

**Pos. 20 - 24**

**5 Metering unit for Colours 1 – 4 ( Milliken) + Black (Pigment)**

designed according to metering list

**Each pump set consists of:**

- 1 precision metering pump with seals designed for operating conditions
- 1 mechanical coupling for connecting the metering pump with the motor
- 1 frequency-controlled motor
- 2 clamping rails for the installation of the pump and the drive unit on the pump table

**In the suction side of the metering pump set are integrated:**

- 1 hose for the connection with the tank
- 1 shut-off valve without electric locking system

**In the discharge side of the metering pump set are integrated:**

- 1 pipe line for connecting the metering pump with the recirculation/production device
- 1 safety valve with overflow line back into the suction side of the metering pump
- 1 electronic pressure switch with digital display
- 1 manual valve
- 1 electric-pneumatic recirculation/production device for switching the metering stream as follows:

recirculation: tank - pump - tank

production: tank - pump - mixer

consisting of:

- 1 three-way ball valve for production and recirculation

The switching between recirculation and production is performed by electro-pneumatically controlled actuator.

The ball valve end positions are electrically locked via limit switches ensuring the correct valve position.

In the event of a malfunction, a visual and audible signal will be released and the production line cannot be started.

The recirculation/production device is mounted to the Additive collecting block in which a direct injection is realized.

- 1 pipe line for connecting the recirculation/production device with the tank

**Please note:** All Milliken Colours (POS 20 – 23) are equipped with pneumatically controlled injectors

### 1 Pump rack for the metering units for additives and colours.

**Remark:**

All injection valves described with "adequate" are either spring load injectors (for components with smaller output) or recirculation/production injectors (for components with bigger output).

#### 3.2 1 pc. **Polyethylene tanks 500 liter**

For the additives – acc. to the metering list - unpressurised tanks made of polyethylene will be supplied.

Tank size: 500 liter

The operator can easily see the liquid levels due to transparency of the plastic tanks.

A liquid level probe is not included in the scope of supply.

#### 3.3 7 pc. **Polyethylene tanks 300 liter**

For the additives – acc. to the metering list - unpressurised tanks made of polyethylene will be supplied.

Tank size: 300 liter

The operator can easily see the liquid levels due to transparency of the plastic tanks.

A liquid level probe is not included in the scope of supply.

### 4 **Fall-plate section**

#### 4.1 1 pc. **Pouring plate**

approx. total length: 1.900 mm

approx. total width: 2.600 mm

continuously adjustable inclination angle: -1° - 4°



This angle of pouring plate is depending on individual formulation and the range from above will be achieved in the most of adjustments.

above bottom conveyor level: 400-900 mm  
approx. continuously adjustable height

consisting of:

- 1 supporting frame made of a high-precision aluminium profiles.

A carriage on rollers is mounted on each side of the sectional frame, which enables the positioning of the calibrating unit. The parallel movement of the carriage is ensured by gear racks and gearwheels mounted on both sides connected to each other. A plane-parallel, easily accessible aluminium plate is mounted on the supporting frame.

#### 4.2 1 pc. **Fall-plates**

approx. total length: 6.800 mm

foaming width: 1.400 mm - 2.500 mm

The entire fall-plate section consists of 5 individual segments.

All fall plates consist of three sections in order to enable continuous width adjustment.

The fixed middle section is made of an aluminium plate. The two outer sections are made of stainless steel and mounted on roller bearings. They can be moved below the centre plate or removed according to the foaming width. Each plate is supported by a torsion-resistant frame. All fall-plates and the feed table are connected with each other by hinges.

#### **Computer control for feed table and fall-plate section**

The setting of the pouring and fall plate according to the formulation profile is controlled by a computer and graphically displayed on the monitor. An additional adjustment can always be made via computer keyboard.

#### 4.3 1 pc. **Height adjustment of the fall-plates**

The height of each fall plate is adjusted via computer by motor-driven lifting spindle elements according to the foaming curve. The end positions of the lifting spindle are secured by micro switches.

#### 4.4 1 pc. **Width adjustment of the fall-plates**

Bowden cables are used to adjust the width of the fall-plate section synchronously with the supporting walls.

### 5 **Bottom Plate Conveyor**

5.1 1 pc. **Support structure**

is a frame steel weldment. The bottom conveyor as well as the two supporting walls with catwalks are integrated in the supporting frame.

5.2 1 pc. **Bottom plate conveyor**

mounted on the supporting frame.

approx. bottom conveyor length 24.000 mm

bottom conveyor height: 950 mm

adjustable conveyor speed: 2,5 - 10 m/min

The high-performance sprocket chains with a pitch of 100 mm are running on both sides in the supporting frame.

Steel profile bars with a width of approx. 100 mm are riveted on both chain tracks. The profile bars are supported in the middle by a plastic rail in order to prevent the deformation in the case of an uneven load.

The bottom conveyor is equipped with a tensioning and driving station.

6 **Side walls**

6.1 1 pc. **Conveyrised side walls**

approx. side wall length: 22.400 mm

approx. useful supporting wall height: 1.550 mm

Each side wall conveyor consists of a reversing and driving station as well as 2 special roller chains with a pitch of 50 mm. The two chain tracks are equipped with galvanized profiles of approx. 100 mm width resulting in an almost jointless conveyor. Each movable side wall is equipped with an automatic tensioning station. For protection purposes, the two supporting walls are covered with steel plates to the catwalk side.

The side wall conveyors are equipped with a non-slip three-phase gear motor with pulse generator and frequency converter and are synchronized with the bottom conveyor. The side wall conveyors cannot be used for a reversing operation (backward motion).

6.2 1 pc. **Width adjustment of the side walls**

The two supporting walls are carried by sledges on roller bearings, mounted below the supporting walls, and adjusted by spindles. The spindles are driven by one common drive.

The foaming width is set according to the formulation and displayed on the monitor. It can be adjusted via plus/minus buttons in the control cabinet.

6.3 1 pc. **Extraction duct with suction hood**

The conveyor is equipped with a tunnel-type cladding in order to prevent released reaction gases from escaping into the working area. The clearance height from the catwalks to the lower tunnel edge is approx. 2.180 mm.

The transparent sliding windows between the supporting walls and the tunnel cladding enable the insight into the foaming tunnel in the Flat-Top System area in a length of approx. 9.000 mm.

The suction hoods are placed on the top of the tunnel.

6.4 1 pc. **Catwalks**

Catwalks with a width of approx. 650 mm are installed along the both supporting walls in full length. The catwalks are secured by a railing.

The height from the upper edge of the supporting walls to the catwalk is approx. 1.000 mm.

The pedestals with stairs are installed at the beginning of the catwalks.

6.5 1 pc. **Block height measuring device**

according to the laser principle. The measuring head will be installed in the machine conveyor tunnel in the area of the blow off point.

The actual value is displayed on the computer screen.  
A print-out of the block height is feasible.

7 **Three Paper System**

7.1 1 pc. **Bottom paper system**

consisting of:

**1 bottom paper/plastic unwinding device**

The unwinding device is equipped with disk brake, which enables the manual adjusting of the bottom paper/plastic tension.

The unwinding shaft is equipped with mandrils for paper/plastic rolls.

The paper/plastic roll dimensions are:

max. roll diameter:	600 mm
max. roll width:	2.800 mm
paper roll sleeve inner diameter:	76 mm

1 frame for the unwinding shaft

**1 guidance roller**

mounted between unwinding device and trimming unit used for paper path adjusting

### **1 trimming unit for the bottom paper/plastic**

The bottom paper/plastic is cut on both sides by pneumatically operated roller cutters.

The cutter force acting against the hardened shaft is set by compressed air via pressure reducer with pressure gauge. The cutting width of the two roller cutters is adjusted synchronously by hand wheel independently of the position of the supporting walls.

A mechanical counter is used to measure the position.

Furthermore, two roller cutters can be adjusted approx. 2x150 mm wider than the max. foaming width.

### **1 folding device the bottom paper/plastic**

The max. folding height on each side is approx. 150 mm.

The bottom paper/plastic is folded upwards by using two adjustable folding levers.

The folding height is manually adjusted synchronously to the roller cutters.

The trimming and folding device are designed as a unit and will be fitted to the feed table front.

### **1 Block starting device**

for introducing the paper/plastic into the foaming tunnel and for starting the foaming process.

## **7.2 1 pc. Unwinding device on each side for the side paper/plastic**

Each unwinding device consists of:

- 1 pivoted supporting plate with mandril
- 1 upper pivoted fixing mandril
- 1 disk brake for setting the required side paper/plastic tension

The height of the upper pivoted fixing mandril can be manually adjusted for quick and easy changing of the paper/plastic rolls. In addition, the mandrils can be moved to the side for easy changing the paper/plastic rolls

The paper/plastic roll dimensions are:

max. roll diameter:	600 mm
max. roll height:	max. block height + 70 mm
paper roll sleeve inner diameter:	76 mm

- 2 adjustable side paper/plastic guiding rollers mounted at the beginning of the supporting walls

The papers/plastic coming from the unwinding devices are fed to the foaming tunnel via guiding rollers.

- 1 set of side paper/plastic holding devices

7.3 1 pc. **Device for pulling off and winding the bottom paper/plastic**

consisting of:

- 1 bottom paper/plastic pulling off and winding device located beneath the roller conveyor before the block cutting machine

consisting of:

- 1 special motor with coupling for the drive of the winding mandril
- 1 counter bearing for the winding mandril
- 1 winding mandril with eccentric clamping segments for carrying the paper/plastic roll

The paper/plastic roll dimensions are:

max. roll diameter:	800 mm
max. length:	2.800 mm
paper roll sleeve inner diameter:	76 mm

- 1 carriage on wheels for the winding device

This device is equipped with a potentiometer, on/off switch and a signal lamp for controlling of the bottom paper/plastic tension.

7.4 1 pc. **Set of 2 Pulling off and winding devices, one on each side for the side papers/plastics**

Each winding device consists of:

- 1 adjustable side paper/plastic guiding roller mounted at the end of the supporting walls

The side paper/plastics are fed to the pulling off and winding devices via guiding rollers.

- 1 side paper/plastic pulling off and winding device with attached winding motor, supporting plate and receiving mandril, mounted at the end of the side walls

The paper/plastic roll dimensions are:

max. roll diameter:	800 mm
paper roll sleeve inner diameter:	76 mm

The paper roll sleeve is fixed by a pneumatic cylinder with mandril.

This device is equipped with a potentiometer, on/off switch and a signal lamp for controlling of the bottom paper/plastic tension.

8 **Flat Top System**

8.1 1 pc. **Top paper unwinding device**

The top paper/plastic unwinding device is equipped with a disc brake in order to allow the manual setting of the top paper tension.

The unwinding shaft is equipped with two locking mandrils for carrying and fastening of the paper/plastic roll.

The paper/plastic roll dimensions are:

max. roll diameter: 600 mm  
max. roll width: 2.500 mm  
paper roll sleeve inner diameter: 76 mm

1 frame for supporting the roller bearing unwinding shaft mounted in front of the main platform

## 8.2 1 pc. **Roller for top paper alignment**

The roller is mounted between the trimming device and the calibrating device near the top paper guiding platform.

The exact path of the top paper/plastic is set by a remote adjusting lever.

## 8.3 1 pc. **Trimming device for the top paper**

trimming width: 800 – 2.400 mm

1 frame made of aluminium for the trimming device

Cutting of the top paper on both sides is performed by pneumatically driven roller cutters.

The cutter force acting against the hardened shaft is set by compressed air via pressure reducer with pressure gauge. The cutting width of the two roller cutters is adjusted by motor and measured by helical potentiometer.

The control elements as well as the two digital display units for the cutter width adjustment are incorporated in the control cabinet.

The width of the cutters can either be adjusted independently or synchronously and the cutter width is displayed in "mm":

- 1 digital display unit for indicating the range of adjustment of the right cutter
- 1 digital display unit for indicating the range of adjustment of the left cutter

The position of the right and left cutter is always measured from the central line of the foaming track.

The trimming device is integrated in the top paper guiding platform.

The actual and target values are shown on the monitor and this information can be printed.

## 8.4 1 pc. **Calibrating device**

The calibrating device introduces the top paper into the foaming tunnel and distributes the reaction mixture uniformly over the entire foaming width. This is performed by a vertically and horizontally movable calibration bar.

consisting of:

## **1 vertically and horizontally adjustable calibration bar**

Vertical adjustment:

The calibration bar is manually adjusted in vertical direction and the adjustment is visually controlled using a hand wheel and can be fixed in any desired position by a lever.

Range of adjustment above mixture pouring plate is approx. 300 mm.

Horizontal adjustment:

Range of adjustment is max. 1.080 mm

The calibration bar can be adjusted by motor in the production direction. The adjustment value depends from the formulation and it is displayed on the monitor. This value can be manually modified by push buttons and the information about the calibrating bar position can be printed.

The adjustment of the calibration bar to the individual foaming widths is possible by using bars of different lengths, which can be exchanged by quick-locking system. 4 calibrating bars of different lengths will be delivered for the range from 1.200 to 2.250 mm.

### **8.5 1 pc. Sliding mats set with five-point guides**

consisting of:

#### **7 Five-point guides in special design**

The individual five-point guides are mounted below the tunnel roof.

Each five-point guide carries one sliding mat and enables its almost linear vertical movement over the entire range of adjustment.

As a result of the linear mat guidance the mat weights from the lowest to the highest adjusting point are almost constant. This enables a production of blocks of different heights without constantly adjusting the mat weights.

#### **7 Manual height and weight setting devices**

each consisting of:

1 cable with cable guide and guiding rollers

1 holder with counter weights and lock

Each sliding mat can be lifted/lowered independently.

**Mats set consists of:**

#### **2 trapezoid sliding mats with fixing bracket**

approx. length:	1.250 mm
min. width front:	920 mm
max. width front:	2.100 mm
min. width rear:	1.020 mm
max. width rear:	2.200 mm

#### **5 rectangular-shaped sliding mats with fixing bracket**

approx. length:	1.250 mm
min. width:	1.200 mm
max. width:	2.300 mm

The individual sliding mats consist of 3 segments made of specially profiled metal sheets. The centre segment is mounted joint-like to the five-point guide. The two outer segments are manually inserted into/pulled out from the centre segment of the sliding mats.

The mats can be continuously adjusted in order to correspond to the foaming width.

The adjustment of the mats is done from the right side of the machine seen in the foaming direction.

8.6 1 pc. **Top paper guiding roller**

1 top paper guiding roller, which is adjustable in height.

8.7 1 pc. **Top paper pulling off and winding device**

consisting of:

- 1 special winding motor with coupling for driving the winding mandril
- 1 counter-bearing for the mandril
- 1 mandril with eccentric clamping segments for the paper roll sleeve:

max. roll diameter: 1.000 mm

max. length: 2.600 mm

paper roll sleeve inner diameter: 76 mm

This device is equipped with a potentiometer, on/off switch and a signal lamp for controlling of the bottom paper/plastic tension.

9 **Electrical Control and Tools**

9.1 1 pc. **Electrical equipment**

consisting of:

Several control cabinets, protection class IP 54

The complete power pack is incorporated into the control cabinet.

A freely programmable controller made by Siemens and including the required digital and analog units is used for the centralized control of the foaming plant.

The control cabinet, the desktop PC on a desk and the control panel will be installed on the right side of the main platform seen in the direction of the block flow.

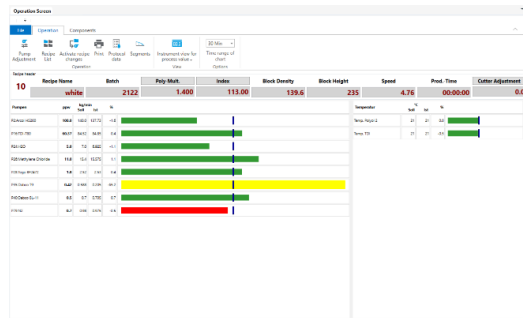
**Control design**

The plant processor provides the communication with the Siemens plant control system and has direct access to the plant process.

**Process data acquisition / monitoring / control unit**



Based on an industrial PC with hard-disk mirroring (computer, monitor, keyboard, mouse and printer), intended for integration with the above-mentioned modules. The FoamWare is the latest version of Hennecke's software for slabstock foaming equipment. The software provides a high production transparency and a highly comfortable machine handling.



## Functions

### Production screen / logging

The following data will be displayed on screen for the individual components in the form of a production screen and can be printed out in full detail or in part as a compressed production log:

- flow rates (target/actual) for x components
- deviation of flow rates in %
- temperatures and pressures, based on the data provided by the sensors available
- production speed (target/actual)
- lot/run
- production length over production time
- calculated foam density
- formulation name and number
- and further process data if sensors installed

### Trends

A trend display (graphic) of component pressure, component temperature and component flow rate in the production screen permits an early detection of change trends in the process variables.

The trend feature can provide an online indication of process variable behavior over a period between 10 to 300 minutes while a production run is proceeding. Trend displays are not stored on hard disk.

### Alarm indication

Any alarms or messages generated will be instantly displayed on the screen in an online module. For each individual alarm, additional information as well as an image can be displayed following one-off configuration by the user.

### Production / consumption / alarm log

All logs can be displayed on screen and sent to a printer, whether for individual production runs, time periods, shifts or lots, respectively.

The production log comprises all relevant process parameters (target/actual) of a given production run.

The consumption log contains the aggregate consumption data for components employed in the production run and hence, for the raw materials defined in the formulation.

The alarm log shows all alarms and messages occurring over a given production

run or time period.

The historical storage depth for data appearing in these logs depends on the following criteria:

- More than 10.000 alarms or messages can be archived (when this number is exceeded, the oldest alarms or messages are deleted)
- More than 5.000 production runs can be archived (when the maximum number is exceeded, the oldest production runs will be deleted).

### **Formulation management**

The formulation management feature can be used to manage and run up to 9.999 formulations.

In each formulation the relevant process parameters are defined as target values, partly with tolerances to be observed. The potential discharge capacities of pumps are taken into account at the formulation input stage. The formulation management feature embodies a raw material management capability; these raw material data are used in the formulations themselves and in the consumption log.

Stored formulations can be conveniently selected for production in the production screen.

### **Backup / Restore**

The software has an integrated backup, which is made daily/ restore functionality for manual archiving of the relevant data.

### **Hardware**

- industrial PC, manufacturer: Siemens with Windows operating system and Ethernet-interface to the PLC
- standard keyboard and mouse
- 32 Zoll 4k Monitor
- laser printer
- router for internet
- uninterruptible power supply

### **Please note:**

Hennecke offers a remote service with an own service portal for VPN connections. In case internet is not available, the customer will install a 3G (or higher) surfstick.

### **Electrical cables and installation material**

Cables and installation material for connecting the individual machine components with electrical cabinets.

## **9.2 1 pc. Tools**

- 1 tool box for the maintenance of the plant
- 1 tool for changing the stirrer shaft sealing
- 1 special spanner for mounting and dismounting the stirrer
- various seals for the mixer unit

## 6 Services

### Assembly, Commissioning and Training

For assembly and commissioning Hennecke will delegate the following staff:

- mechanical supervisor(s)
- electrical supervisor(s)
- electronic engineer(s)
- application engineer(s)

The number of staff, duration of their staying and their arrival depends on scope of supply and progress on site.

All this will be determined by the assembly, commissioning and training schedule. This schedule, together with all other information about this phase of project, will be provided by the project manager as soon as available after the official order confirmation.

Their arrival depends on the progress on site.

If visa or working permit is needed, the customer will support Hennecke in the application procedure. If Hennecke personnel do not get visa or working permit on time for reasons Hennecke is not responsible for, the time schedule will be adjusted accordingly.

The customer will provide staff for assistance of our supervisor.

If visa or working permit is needed, the customer will support Hennecke in the application procedure. If Hennecke personnel do not get visa or working permit on time for reasons Hennecke is not responsible for, the time schedule will be adjusted accordingly.

The assembly and electric installation will be performed by the customer in the presence of the Hennecke supervisors.

In the scope of work for commissioning, the following will be carried out in the timeframe determined by the assembly, commissioning and training schedule:

- Pumps will be calibrated according to the metering list.
- Foaming capability of the delivered scope of supply will be proven by foaming of two formulation per foam grade of customer's choice in connection with one foaming width e.g. standard foam in connection with density 20 kg/m<sup>3</sup> and one foaming width.
- If the delivered machine is capable of producing more than one foam type (e.g. standard, visco, CO<sub>2</sub>-foam or HR), two formulation in connection with one foaming width per foam type will be tested. If additional formulation tests are requested, this can be done if the timeframe allows it, otherwise the additional time will be invoiced separately
- In addition, Hennecke will provide production support / guidance / fine tuning based on the customer's foam production until the end of the above mentioned timeframe
- The quality of the foam which may be influenced by raw materials and/or weather conditions and/or similar influences will not impact and have no relevance for the evaluation of machine foaming capability since these factors are not connected to the machine performance; all further support needed to improve the foam quality can be discussed and may be available at additional cost
- The whole duration of the assembly, commissioning and training can be understood as theoretical and practical training of the customer's staff

The application engineer has to be supported by a chemist, in charge of formulations, and by a machine operator, in charge of operating the equipment throughout the commissioning phase.

The customer is encouraged to provide Hennecke with the formulations targeted for the commissioning in

advance to allow Hennecke to be well prepared for the job and to support a smoother commissioning phase.

The scope of equipment delivery contains no further action to be taken following the above measures and once acceptance has been achieved; acceptance will be confirmed by the client's signature on the certificate provided (FAC).

Hennecke will provide an assembly, commissioning and training schedule in time and the customer will receive information concerning the required staff and equipment.

The special tools needed for assembly and commissioning are going to be provided by Hennecke. The customer is responsible for temporary import and re-export procedure. For this procedure Hennecke will provide all needed documents. In case the special tools are not available on site due to reasons Hennecke is not responsible for, the customer has to provide the tools.

The communication language during assembly and commissioning is English or German. If the staff for assistance cannot communicate in English or German, the customer has to provide a full-time interpreter for the whole duration of these activities.

The price includes flight costs. The lodging accommodation (hotel) and local transport is not included.

Additional services will be charged according to the current assembly rates if the scheduled times are exceeded due to reasons for which Hennecke is not responsible.

## **7 Customer obligation and delivery exclusions**

**The following items are not included in the seller's scope of supply, if they are not mentioned in the specification:**

- the conditioning of all raw materials to a constant processing temperature of 20° – 22° C
- the transfer pumps for filling the components from the supply drums into the tanks
- the roller conveyor upstream the cutting machine
- the cutting machine with exhaust device
- the transportation system downstream the cutting machine
- the compressor with air drier and connection lines to the foaming plant
- the supply lines of all connectors for electric energy, water and compressed air to the connecting points indicated by the seller
- the air-conditioning and ventilation as well as plant and lighting
- all supply exclusions described in the plant text

**The following materials need to be provided by the customer (detailed specification will be communicated during order processing):**

- syn. resin primers and Syn. resin top coats in the agreed colours
- different sprays (zinc, paint, gas leak, cleaner)
- corrosion inhibiting oil
- thread lock fluid medium strength

**For the electrical equipment, the following items are not included in the scope of supply:**

- electrical infeed into the control cabinet line

**For the Polyol metering unit the following items are not included in the scope of supply:**

- the tanks with safety and filling devices
- the connecting lines with shut-off valves from the tanks to the metering pump
- the connecting line from the metering pump to the Polyol collecting block
- the return line from the recirculation valve to the tanks
- the raw material temperature conditioning

**For the Isocyanate metering unit the following items are not included in the scope of supply:**

- the tanks with safety and filling device
- the connecting lines with shut-off valves from the tank to the metering pump
- the recirculation line from the test unit to the tanks
- the raw material temperature conditioning

**For the Additives metering units the following is not included in the scope of supply:**

- the devices for filling the individual tanks from the supply drums
- the tank for Blowing agent
- all support elements for connecting piping

**For the Conveyor system, the following is not included in the scope of supply:**

- the complete exhaust equipment above the suction tunnel
- the complete extraction device with fan, adjustable flaps, air channels etc. above the suction tunnel
- the safety fence around the whole plant

**For the Three-paper-track separating system, the following is not included in the scope of supply:**

- the two platforms with staircase in the area of the side paper/plastics pulling off and winding device
- the connection lines for air from the compressor to the trimming device and to two pneumatic tensioning devices of the side paper/plastic unwinding and winding devices
- the hoists for introducing the full bottom and side paper/plastic rolls into the unwinding devices
- the hoists for removing the bottom and side paper/plastic rolls from the winding stations

**For the Flat Top System, the following items are not included in the seller's scope of supply:**

- the top paper guide platform
- the steel platform for carrying a top paper pulling off and winding up device  
Please note: Hennecke will provide example drawings.
- the connection pipe for air from the compressor to the trimming device
- the hoists for supplying and removing the paper reels

## 8 Price Overview

1	1	pc.	Big operating platform
2	1	pc.	Machine Portal with Mixer Unit
2.1	1	pc.	Machine portal
2.2	1	pc.	Mixer unit for the production of flexible slabstock foams
2.2.1	1	pc.	Screw type stirrer
2.2.2	1	pc.	Height adjustable mixer
2.3	1	pc.	Mixer piping
2.3.1	1	pc.	Device for introducing air into the Polyol mixture stream in front of the main mixer
2.4	1	pc.	Motorized mixing chamber pressure setting device
3	1	pc.	Metering Equipment
3.1	1	pc.	Metering system
3.2	1	pc.	Polyethylene tanks 500 liter
3.3	7	pc.	Polyethylene tanks 300 liter
4	1	pc.	Fall-plate section
4.1	1	pc.	Pouring plate
4.2	1	pc.	Fall-plates
4.3	1	pc.	Height adjustment of the fall-plates
4.4	1	pc.	Width adjustment of the fall-plates
5	1	pc.	Bottom Plate Conveyor
5.1	1	pc.	Support structure
5.2	1	pc.	Bottom plate conveyor
6	1	pc.	Side walls
6.1	1	pc.	Conveyrised side walls
6.2	1	pc.	Width adjustment of the side walls
6.3	1	pc.	Extraction duct with suction hood

6.4	1	pc.	Catwalks
6.5	1	pc.	Block height measuring device
7	1	pc.	Three Paper System
7.1	1	pc.	Bottom paper system
7.2	1	pc.	Unwinding device on each side for the side paper/plastic
7.3	1	pc.	Device for pulling off and winding the bottom paper/plastic
7.4	1	pc.	Set of 2 Pulling off and winding devices, one on each side for the side papers/plastics
8	1	pc.	Flat Top System
8.1	1	pc.	Top paper unwinding device
8.2	1	pc.	Roller for top paper alignment
8.3	1	pc.	Trimming device for the top paper
8.4	1	pc.	Calibrating device
8.5	1	pc.	Sliding mats set with five-point guides
8.6	1	pc.	Top paper guiding roller
8.7	1	pc.	Top paper pulling off and winding device
9	1	pc.	Electrical Control and Tools
9.1	1	pc.	Electrical equipment
9.2	1	pc.	Tools
	1	pc.	Freight and Packing
	1	pc.	Services

**Total Price without options**

**1.300.000,00 €**



## 9 General requirements

**Customer has to check following data and has to inform Hennecke GmbH in case of changes.**

### Declaration of conformity or incorporation

A declaration of conformity or incorporation is only issued for deliveries into the European Economic Area EEA (all EC countries as well as Norway, Iceland, Liechtenstein and Turkey.)

### Directive 2006/42/EC Machinery

deliveries without declaration

### Other national directives

not relevant

### Colours

<b>Movable parts</b>	RAL 1005 (Honey yellow)
<b>Fixed parts</b>	
Plant and machine components incl. hydraulic tanks	RAL 5015 (Sky blue)
Front sheathing	RAL 7035 (Light grey)
<b>Drives</b>	RAL 9005 (Jet black)
<b>Protection Devices</b>	RAL 1005 (Honey yellow)
<b>Tank</b>	RAL 9006 (White aluminium)
<b>Control cabinets</b>	RAL 7035 (Light grey)
<b>Piping</b>	without
<b>Railings</b>	zinc coated
<b>Platforms</b>	zinc coated
<b>Cylinders</b>	RAL 9005 (Jet black)
<b>Heat exchanger</b>	without

### Energy data

Type of current:	three-phase TN (System with a directly earthed point in the generator / transformer (star point in a three – phase system). This point is not connected to the protective earth conductor (PE)) <b>For systems in USA: For use on a solidly grounded wye source only, 480Y/277V</b>
Type of power:	
Frequency:	50 Hz (Standard)
Number of phase conductors:	3
Voltage between 2 phase conductors/ voltage between phase cond. and neutr. conductor:	400 V/ 230 V
Voltage deviations:	<= 10 %
Neutral conductor (N) loadable: disconnection of the neutral conductor required:	Yes  No
air humidity:	max. 80 %
Compressed air:	standard: 5-10 bar quantity by design (layout) -24 °C (Tanks) -3 °C (pneumatic elements)
Dew point of compressed air:	max. 1000 m above sea level
Elevation:	18-30 °C
Ambient temperatur in the hall (min./max.):	No
<b>Remote Service Router (RSR):</b>	

### Machine / plant labeling:

symbols and English language

**Documentation (link)**

English

According to Directive 2006/42/EG (Machinery Directive) EU regulations, safety regulations and safety related operating instructions are issued in national language.

**Attention!**

**Deviations from the above standard may lead to price and / or delivery time changes.**

**Technical directives**

Unless otherwise specified, Hennecke's scope of delivery will be executed exclusively according to the relevant European directives without regard to any national directives in force in the country of the operator.

**Directive 2006/42/EC – Machinery**

For machines provided with a declaration of conformity, the requirements are fully complied with, for machines with declaration of incorporation, the requirements are fulfilled where applicable.

A CE-declaration is only applicable to and will only be provided for the European market.

**Directive 2014/68/EU Pressure equipment**

Unless otherwise specified, Hennecke's scope of delivery is only suitable for processing non-hazardous fluids of Group II.

**Directive 2014/34/EU ATEX**

Unless otherwise specified, Hennecke's scope of delivery is only suitable for processing non-explosive materials and for use in non-hazardous areas.

Other provisions that apply to the operating company and from which further requirements on the scope of delivery and the processes may arise will not be taken into consideration in the design. The operating company shall determine on the basis of the raw materials processed by him whether such requirements exist. In such a case, Hennecke GmbH can assist with the implementation and offer suitable components.

## 10 General Terms and Conditions of Delivery

### GENERAL TERMS AND CONDITIONS OF DELIVERY

(as of: October 2018)

#### 1. General, Scope of Application

- 1.1 These General Terms and Conditions of Delivery by Hennecke GmbH (hereafter: "Supplier") apply to all business relations with contractors ("Unternehmer", section 14 of the German Civil Code), legal entities under public law or special funds under public law (hereinafter: "Customer") concerning the delivery of new machines and/or equipment. If between Supplier and Customer further services have been agreed upon, the supplier's distinct terms and conditions apply; those terms can be found here: <https://www.hennecke.com/en/gtc>. The General Terms and Conditions of Delivery in their respective version also apply as a framework agreement for future contracts for the above mentioned deliveries or offers to the Customer, without the Supplier having to refer to them in each individual case.
- 1.2 Any deviating or supplementary terms and conditions of the Customer shall only become part of the contract if and to the extent that the supplier has expressly agreed to their validity.
- 1.3 Deviating or supplementary agreements to these terms of delivery as well as modifications of content require the text form ("Textform", section 126b of the German Civil Code) and are to be agreed individually. This also applies to a waiver of the text form requirement itself.

#### 2. Offer and Conclusion of Contract

- 2.1 All offers made by the Supplier are subject to change and non-binding. All orders placed by the Customer are considered as binding contractual offers. The Supplier may accept these offers within 4 weeks upon reception. Acceptance can be declared either in text form (e.g. by order confirmation) or by delivery of the goods to the Customer.
- 2.2 The information provided by the supplier regarding the deliveries or services (e.g. weights, dimensions, utility values, load-bearing capacity, tolerances, technical data or product designations) as well as presentations are subject to change without notice, provided that the delivery item is not substantially changed or its quality improved as a result and that the changes or deviations are reasonable to the Customer.

Information's provided by the supplier regarding the delivery item or services are merely descriptions and do not constitute any warranty or guaranty.

- 2.3 The supplier retains ownership and copyright to all documents. They may not be made accessible to third parties or used for advertising purposes and must be returned on request and, if necessary, verifiably deleted. Documents are only to be used within the framework of the contract, in particular they may not be used for the reproduction of identical or similar products (reverse engineering). Construction drawings are not submitted.

#### 3. Pricing and Payment

- 3.1 Unless otherwise agreed upon, prices are ex works plus statutory value-added tax, assembly, commissioning and packaging, in the case of export deliveries plus customs duty and other fees or public charges. The Supplier will not take back the transportation packaging or any other packaging under the Packaging Directive (Verpackungsverordnung); said packaging shall become the property of the Customer.
- 3.2 If the agreed prices are based upon Supplier's list prices and delivery is not to be effected within four months after conclusion of the contract, the Supplier's list prices valid at the time of delivery (less any agreed percentage or fixed discount) shall apply.
- 3.3 Invoices are issued upon transfer of risk and are due immediately without any deductions. The Customer is in default ("Verzug") 14 calendar days after transfer of risk and invoicing without further ado. The date of receipt by the supplier shall be decisive for the date of payment. Cheques are only considered as payment after they have been successfully cashed. Regardless of any other claims for compensation, if the Supplier is not at fault, he is entitled to suspend his own contractual obligations in the event of payment arrears until the outstanding payments have been settled.
- 3.4 The Customers offsetting with counterclaims or the retention of payments due to such claims is only permissible if the counterclaims are undisputed or have been legally established (res judicata).
- 3.5 The Supplier is entitled to carry out or render outstanding deliveries or services only against advance payment or provision of security if, after conclusion of the contract, he becomes aware of circumstances which are capable of substantially reducing the creditworthiness of the Customer and which jeopardize the payment of Customers debts owed to Supplier under any contract (including other individual orders subject to the same framework agreement).

#### 4. Delivery and Delays

- 4.1 Delivery shall be ex works, which also constitutes the place of performance. At the request and expense of the Customer, the goods will be dispatched to another destination (sale by delivery to a place other than the place of performance ("Versendungskauf")). Unless otherwise agreed upon, the Supplier is entitled to determine the type of dispatch (in particular transport company, dispatch route, packaging). The costs of shipment shall be borne by the Customer.
- 4.2 The delivery periods stated by the supplier are non-binding, unless expressly binding deadlines are stated in the order confirmation. If dispatch has been agreed upon, delivery periods and delivery dates refer to the time at which the purchased item leaves the Supplier's warehouse or at which the Supplier has notified the Customer that it is ready for dispatch
- 4.3 Compliance with delivery deadlines by the supplier presupposes that all commercial and technical questions between the contracting parties have been resolved and the Customer has fulfilled all obligations incumbent upon it, e.g. the provision of the necessary official certificates or permits or the furnishing of a deposit. If this is not the case, the delivery period shall be extended accordingly. The latter does not apply if the Supplier is responsible for the delay.
- 4.4 If the customer is in default of acceptance ("Annahmeverzug") or consciously in negligence the Supplier is entitled to demand compensation for the resulting damages, including any additional expenses. The Supplier also reserves explicitly the right to assert further claims. If the above conditions are met, the risk of accidental loss or accidental deterioration of the object of purchase shall pass to the Customer at the point in time at which the latter is in default of acceptance or debtor's delay ("Schuldnerverzug").
- 4.5 The Supplier shall not be liable for the impossibility of delivery or for delays in delivery if these are caused by force majeure (e.g. natural disasters, war, unrest) or other events not foreseeable at the time the contract was concluded (e.g. the Supplier is not responsible for any interruptions of operations of any kind, transport delays, strikes, legal lock-outs, lack of manpower, energy or raw materials, difficulties in obtaining necessary official approvals, official measures or the lack of, incorrect or untimely delivery by suppliers). If such events make the delivery or service considerably more difficult or impossible for the Supplier and the hindrance is not only of a temporary duration, he is entitled to withdraw from the contract. In the event of obstacles of temporary duration, the delivery deadlines or service periods shall be extended or the delivery or service periods postponed by the duration of the hindrance plus an appropriate start-up period. If acceptance of the delivery or service cannot reasonably be expected of the Customer as a result of the delay, the Customer may withdraw from the contract by immediate declaration in text form to the Supplier.

- 4.6 The Supplier is only entitled to make partial deliveries if those can be used by the Customer within the scope of the contractual purpose, the delivery of the remaining ordered goods is guaranteed and the Customer does not incur any considerable additional expenditure or costs as a result.
- 4.7 If the supplier is in default with any delivery or service or if a delivery or service becomes impossible for him, for whatever reason, the liability of the Supplier is limited to damages in accordance with Clause 7 of these General Terms and Conditions of Delivery.
- 4.8 In the case of deliveries that are – at the request of the Customer and after conclusion of the contract – to be made later than originally agreed upon, payment shall be made as originally agreed upon. This also applies in the case, if the customer does not accept the delivery at the contractually agreed time. The costs for any necessary storage of the goods and other costs incurred by the delay will be charged to the Customer.

## 5. Passing of risk and Acceptance

The risk shall pass to the Customer at the latest when the delivery item has left the factory. This also applies if partial deliveries are made or if the Supplier has undertaken to provide other services (e.g. dispatch or installation). If dispatch or delivery is delayed due to a circumstance caused by the Customer, the risk shall pass to the customer from the day on which the Supplier is ready for dispatch and has notified the customer thereof.

If the Customer is obliged to accept the goods, acceptance must take place immediately at that time or, if no acceptance date has been specified, after notification of readiness for acceptance by the Supplier. The Customer may not refuse acceptance in the event of a minor defect.

## 6. Title retention

- 6.1 Goods delivered by the Supplier shall remain the Supplier's property until all the Supplier's claims arising out of the entire business relationship with the Customer have been fulfilled in full, in particular until he has settled the account balance ("Kontokorrentvorbehalt").
- 6.2 The customer is obliged to carefully store, maintain and repair the goods delivered under retention of title at his own expense and to insure them against fire, water damage, burglary and theft and damage. The Customer shall be obliged to notify the Supplier immediately of any damage to the reserved property. On request, the insurance policy is to be sent to the supplier for inspection. The Customer assigns to the Supplier in advance all claims against the insurance company arising from the insurance contract. The assignment is accepted by the Supplier. If the Customer has not sufficiently insured the goods/services to be delivered, the Supplier is entitled but not obliged to insure the delivery item at the Customer's expense.
- 6.3 In the event of seizure or other access by third parties to the reserved property, the Customer must inform the Supplier immediately in text form.
- 6.4 The customer is entitled to sell the goods subject to retention of title within the framework of proper business transactions as long as he is not in default of payment. The goods may not be pledged nor shall title thereto be transferred as security. The claims arising from the resale or any other legal reason (in particular transfer of ownership to the end customer, insurance case, tort) in respect of the reserved goods are hereby assigned by the Customer to the Supplier in full by way of security. The assignment shall be accepted by the Supplier. The supplier revocably authorizes the customer to collect the claims assigned to the Supplier for the Supplier's account in his own name. If the Customer is in breach of contract – in particular if he is in default with the payment of a claim for payment – the Supplier may demand of him to disclose the assignment and to hand over all information's and documents necessary to enforce the claim.
- 6.5 In the event of breach of contract by the Customer, in particular in the event of default in payment, the Supplier shall be entitled, after setting a reasonable deadline, to take back the reserved goods at the Customers expense. If the Supplier takes back the goods, this shall constitute a withdrawal from the contract. After taking back the goods, the supplier is authorized to dispose of them. The proceeds of the sale shall be set off against the customer's liability - less reasonable costs of sale.
- 6.6 If the goods subject to retention of title are combined with other objects to form a new object, the title retention shall stay valid and continue in respect of the newly created object. The Supplier thereby acquires a co-ownership share in proportion to the value of the reserved goods ("Fakturenwert") to the value of the new item. If one of the combined items ("verbundene Sachen") is to be regarded as the main item ("Hauptsache"), the Customer shall transfer co-ownership to the Supplier in the ratio of the value of the goods delivered by the Supplier to the value of the new item. The Customer shall keep the new item in safe custody free of charge with regard to the Supplier's co-ownership share. If the goods subject to retention of title are resold as part of the new item, the advance assignment agreed in accordance with Clause 6.4 shall only apply in the amount of the invoice value of the goods subject to retention of title by the Supplier.
- 6.7 If the value of the securities to which the Supplier is entitled according to the provisions above exceeds his claims by more than 20%, the Supplier is obliged to release the excess value. The Supplier has the right to select the securities to be released.
- 6.8 If the law of the country in which the delivery item is located does not permit a retention of title or only in a limited form, the Supplier may reserve other rights to the delivery item. The Customer is obliged to cooperate by any means necessary (e.g. registrations) to safeguard the retention of title or to create such other rights, which replace the retention of title, and to further the protection of these rights.

## 7. Damages

- 7.1 The Supplier shall be liable for any breach of material contractual obligations (i.e. contractual obligations, the fulfilment of which gives the contract its character and makes its proper performance possible in the first place), in accordance with the statutory provisions (negligence), unless otherwise agreed below. The Supplier shall not be liable for any other breaches of contract, unless damage has been caused intentionally or grossly negligently by one of its legal representatives or by a leading vicarious agent (leitender Erfüllungsgehilfe). Likewise, the Supplier shall only be liable for consequential damages, if the consequential damage can be attributed to a breach of duty caused by wilful intent or gross negligence by the Supplier
- 7.2 In the absence of intentional conduct attributable to Supplier, the latter shall be liable only for the reasonably foreseeable damage that occurs in a typical case.
- 7.3 Liability under the German Product Liability Act ("Produkthaftungsgesetz") remains unaffected; this also applies to liability for culpable ("schuldhaft") injury to life, body or health.
- 7.4 Unless otherwise provided above, claims against the Supplier for damages arising out of a breach of duties ("Pflichtverletzungen") shall be excluded.
- 7.5 The claims for damages under Clauses 7.1 to 7.3 above shall prescribe in accordance with the statutory periods.

## 8. Warranty

- 8.1 Warranty claims ("Mängelansprüche") against the Supplier are subject to the fulfilment of the inspection and notification obligations incumbent on the Customer under § 377 HGB (German Commercial Code).
- 8.2 If the Supplier's deliveries or services prove to be defective, the Supplier shall be obliged to remedy the defects at its discretion by elimination of the defect ("Mängelbeseitigung") or by making a replacement delivery ("Ersatzlieferung"). In the event of a replacement delivery, the customer must return the defective item to the Supplier in accordance with the statutory provisions. The Supplier shall bear the expenses necessary for the purpose of supplementary performance ("Nacherfüllung"), in particular transport, labour and material costs; however, this shall not apply if the costs increase

because the delivery item is located at a location other than the location of the intended use.

- 8.3 The Supplier shall be entitled to make the supplementary performance owed conditional upon the Customer paying the purchase price. However, the customer is entitled to retain a reasonable part of the purchase price in proportion to the defect.
- 8.4 If the subsequent performance fails twice, the customer can reduce ("mindern") the purchase price or withdraw from the contract ("Rücktritt"). However, a right of withdrawal does not exist in the case of a negligible defect. In addition, the Customer may claim damages in accordance with Clause 7. Further warranty claims for defects are excluded.
- 8.5 Save in the case of bad faith ("Arglist") and subject to the provisions of Clause 7.5, all warranty claims shall prescribe 12 months after delivery or, if acceptance is required, after acceptance.
- 8.6 Ordinary wear and tear is excluded from the warranty. Ordinary wear particularly affects wear parts such as, without limitation, filter elements, shaft seals (e.g. on pumps, stirrers etc.), seals in general, injectors, diaphragms, high pressure lines etc.
- 8.7 Any form of warranty is excluded if the Customer himself or a third party not commissioned by the Supplier causes a failure or damage, by use not in accordance with the contractual purpose, by assembly, installation or commissioning instructions not in compliance with the instructions provided by the Supplier, by an operating error or by improper maintenance, e.g. by the use of unsuitable maintenance equipment, or if the Customer himself or a third party not commissioned by the Supplier makes a substantial modification to the delivered item.
- 8.8 The machine components are designed and selected for the use with commercially available, non-aggressive PU raw materials. Raw materials with a corrosive or abrasive effect, which react strongly acidic or alkaline due to additives, or which contain crystalline or mineral solids, can lead to increased wear and thus reduced service life. The customer is solely responsible for the consequences of the use of such raw materials.

## 9. Information and Technical Advice

The information and recommendations of the supplier are non-binding and without any liability, unless the supplier has expressly and in text form undertaken otherwise. The Customer shall be responsible to investigate whether a product is suitable for the Customer's particular requirements. Any details and information provided by the Supplier in relation to its goods do not constitute any promise as to their suitability for the Customer's purposes.

## 10. Software

- 10.1 If software is included in the scope of delivery, the customer is granted a non-exclusive right to use the delivered goods including their documentation. However, software is made available solely for use with those deliverables for which it is intended. Use of the software on more than one system is prohibited.
- 10.2 The customer may only copy, revise, translate the software or convert the object code into the source code within the legally permissible scope (§§ 69 a ff. UrhG, German Copyright Act). The customer undertakes not to remove manufacturer's details - in particular copyright notices - or to alter them without the Supplier's prior express consent.
- 10.3 All other rights to the software and the documentation, including copies thereof, shall remain with the supplier or the supplier of the software respectively. The granting of sublicenses is not permitted.
- 10.4 To the extent that software is included in the scope of delivery in the machine and plant documentation, this shall be limited to the software required in the event of a failure, loss or similar event to restore the original condition of the delivered machine/plant (backup software).
- 10.5 Insofar as the scope of delivery includes software for which the supplier only has a derived right of use, i.e. software whose rights holder is a third party, the terms of use of the rights holder shall take precedence. If the terms and conditions of use of the rights holder are not contained in the machine and plant documentation, the Supplier shall make the terms and conditions of use communicated to him by the third party available on request. Actions requiring consent pursuant to Sections 69a et seq. of the German Copyright Act (UrhG) are in any case only permissible with the consent of the rights holder. If the Customer wishes to carry out such an act requiring consent, the Supplier shall, upon the Customer's instruction, request the consent of the rights holder.
- 10.6 Modifications to the machine code included in the control software are subject to the express approval of Supplier's Electrical Design Department.
- 10.7 If the Supplier installs software by means of remote maintenance without being personally on site for its commissioning, the Customer shall take all appropriate measures at the time of commissioning and during the initial phase of operation to keep any damage caused by possible malfunctions of the software to a minimum. This includes the performance of functional system tests affected by remote maintenance, increased monitoring of the functional and machine parameters during the initial period and the possibility of an immediate shutdown of the system in the event of malfunctions.

## 11. Choice of Law, Jurisdiction, Place of Fulfilment

- 11.1 The place of fulfilment for all Supplier's and Customer's obligations shall be the Supplier's registered office, unless otherwise specified or another place of performance arises from the nature of the obligation.
- 11.2 German law shall apply to the exclusion of the UN Convention on Contracts for the International Sale of Goods (CISG).
- 11.3 It is agreed that the place of jurisdiction shall be Cologne. In addition, we may assert any of our claims at the Customer's place of general jurisdiction. We may also opt to have any and all disputes arising out of the business relationship with the Customer finally resolved in accordance with the Rules of Arbitration of the International Chamber of Commerce (ICC) by one or more arbitrators appointed in accordance with said Rules. At the Customer's request, we must exercise this option with respect to a specific dispute within a period of one week from receipt of such request by making a statement to that effect vis-à-vis the Customer, if the Customer intends to initiate legal proceedings against us.
- 11.4 Agreements concluded in accordance with these Terms and Conditions of Delivery shall remain binding even if individual provisions are void. In that case all remaining provisions remain in force.

**Hennecke GmbH**