Plant description

Foaming equipment transformation

No:

Polyplan project No: AU-10213

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Plant:

Model:

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Components of the high pressure polyurethane foam application system高压聚安酯发泡应用系统的组成

Main components of the application system 应用系统的主要成分

- 1x Filling station (200 l barrels) 一个填充站（200 l 桶）
- 1 x MV PUR, Material supply and temperature control unit 1个MVPUR, 材料供给和温度控制设备
- 2x HD PUR 100/HR, Foam application base unit 2个HD PUR 100/HR，发泡应用系统的基本设备
- 1x piping and track system
- 4x High pressure hose packages (12 m length) 个高压软管包（12米长）
- 4x HK-MMI mixhead 个混合头
- 3x Control cabinet incl. SPS 个控制柜包括PLC

Visualization of processes and parameters 程序和参数的可视化

The operating and visualization software enables displaying of all processes and parameters at the display of the operating panel beside the application area.
Even the control of the entire application system follows by visualization software.
操作和可视化软件使所有程序和参数可在操作面板上显示。甚至整个应用系统的操控都依赖可视化软件

Prerequisites for operating操作前准备

Personnel 人员

The HD PUR 100/HR high pressure polyurethane foam application system has to operated only by skilled, educated and trained personnel. 高压聚氨酯发泡应用系统只能由熟练，受过教育和训练有素的人员操作。

Connections 相关

The operator of the HD PUR 100/HR high pressure polyurethane foam application system has to secure that all necessary energy-supplies for a smooth operation are available according and strictly conform to the manufacturer's specifications (e.g. air-supply, electrical energy). HD PUR 100/HR 发泡应用系统的运营商要确保所有必要的能量供应稳定平稳的进行，并严格依照制造商的操作规范说明进行（例如：空气供应，电力，能源）

Compressed air 压缩空气: 6 bar

Water 水: 3/4''

Electrical supply 电源供给:

Voltage 电压	400 V
Contact	3Ph / N / PE
Frequency 频率	50 Hz
Maximum back-up fuse 最大备用熔断器 (inert or class gl)	32 A
CEE-plug = Europlug 设计负载	32 A/5poles
nominal current max.最大电流	30 A
design Output 设计输出	max. 25 kW

Environment 环境

Processing- and tank storage temperature approx. 40 °C 运行中和罐储温度约为 40 度
Stock temperature approx. 20 °C 库存温度约为 20 度

Information!
Please notice the original safety data sheets of foam components.请注意发泡材料原始的安全信息

Functional description功能描述

☞ See following pages for graphical overviews to the functional description 如下页功能描述 ➡

General description of the high pressure polyurethane foam application system from Polyplan® 聚氨酯发泡系统通用描述

- The high pressure polyurethane foam application system was designed for applying polyurethane soft foam into car bodies to reduce noise trough hollow cavities. 聚氨酯软泡应用于汽车车身的高压聚氨酯发泡应用系统，以减少噪声槽。
- Therefore a special designed mixing head has to be placed above the provided application opening of the car body and then a exact dosed volume of the foam will applicated semi automatic. 因此，一个特殊设计的混合头必须放置在所提供的应用开放的车身，然后精确剂量的发泡将应用半自动系统。
- By an accurately defined blending of both components in the mixing chamber of the mixing head. The soft foam is generated by using reverse flow injection technology. 通过精确定义混合头的混合腔中的两个组件的混合。采用逆向流动注射技术产生软质泡沫
- The expanding soft foam runs into the hollow cavities and seals it by the expansion. 膨胀的软质泡沫进入空腔并通过膨胀密封。

The high pressure polyurethane foam application system is divided into two sections: 高压聚胺脂发泡应用系统被分成两部分：

Section 1 includes the material storage of the both components Polyol and Insocyanate in material day tanks, each with a temperature control unit for the regulated tempering of heat exchangers as well as a common re-cooling unit. In addition affiliates the complete pipework up to the HD-PUR100/HR base unit.包括两种成分多元醇及异氰酸酯的日罐料量材料储存，每种都有一个用来调整热交换器温度的温度控制器以及一个冷却装置。以及包括完整的从日储料罐到基本部件HD-PUR 100/HR的管道线路。

Section 2 conists of the HD PUR 100/HR base unit, the pipework from the base unit towards the hose set, the hose set towards the mixing head HK-MMI, the mixing head HK-MMI and the pressure and temperature regulation device at the connection terminals of the hose set. 高压聚氨酯100/HR基本部件的组成包括从基本设备连向软管设备的管道设施，软管设备连向混合头HK-MMI的设施，在软管设备的接线端混合头HK-MMI及压力和温度的调节设备

Description of Section 1: Material storage, tempering and pipework注释第一部分：材料存储，调温及管路

The material barrels (200 l) Polyol and Isocyanate are placed on a collecting tray with gratings, which can collect at least one material container volume. The foam components Polyol and Isocyanate will be filled automatically by feeding pumps from material barrels into

the material daytanks up to the maximum filing level marker. There are ball-valves for maintenance work, pressure limiting valves, and pressure and temperature sensors for automatically control of these paramteres in the material supply pipes. For material supply to machine 1 and 2 there are also 4 ball valves installed. All components of material supply unit (MV PUR) are mounted in a frame with integrated collecting tray. Both material day tanks are equipped with liquid level sensors, overfill protection, ventilation filters and safety valves. There's the possibilty to take a sample by opening the ball-valve of the heat exchanger. Two water heat exchangers bring the material to the correct temperatures:
Polyol: approx. 50 °C
Isocyanate: approx. 45 °C.

The tempering units heat up respective cool down the water in the heat exchangers. The preheated foam components are fed towards the HD PUR 100/HR base unit by electrical feeding pumps.

料桶（200 L）多元醇和异氰酸酯用光栅放置在集料盘上，可收集至少一个物料容器容积。泡沫成分的多元醇和异氰酸酯将自动填充料桶泵从材料到材料日料桶。有维修工作阀，限压阀，在材料供应管道和这些参数自动控制压力和温度传感器。高压站1和高压站2的材料供应也有4个球阀控制。所有物料供应单元组件安装在带有集成收集盘的框架内。日料桶均设有液位传感器，溢流保护，通风过滤器和安全阀。有可能采取样品打开热交换器的球阀。两个水热交换器将材料调制到到正确的温度：

多元醇：约50°C

异氰酸酯：约45°C.

换热器内加热各自的冷却水，调温，预热材料经循环泵传送到高压单元。

Description of Section 2: Dosing unit, hose set and mixing head注释第二部分：定量单元，管束及混合头

Both foam components were fed through motor driven metal edge filters. The base unit HD PUR is also equipped with pressure sensors, temperature sensors, volume meters and two high pressure axial piston pumps (dosing pumps), which are powered by separate speed controlled motors. There are sensors installed for measurement of circulation pressure resp. temperature and there are sensors installed for measurement of application pressure resp. temperature. The Isocyanate pump is additional equipped with a magnetic clutch. The application volume is setted by frequency converters.
Both foam components get compressed by axial piston pumps for a circuit pressure of approx. 60 bar and then to the application pressure, Polyol approx. 170 bar / Isocyanate approx. 140 bar. Cut-off valves are installed to switch over between circulation and application pressure. The application pressure values can be set with pressure limitation valves separate for each foam component. The set pressure values are displayed at the control cabinet.
The base unit is connected to mixing head HK-MMI 1 and 2 with an separate hose package. The hose set consists of high pressure hoses, each for flow and return of both components, the required transmission and control cables as well as the hydraulic hoses for actuating the mixing head.
Hose set and mixing head are mounted at a rail system and balancer for easy handling within the working range at the car body. Temperature and pressure monitoring devices are located at the HD PUR 100/HR base unit.
Starting the application process runs up the dosing pumps to increase the circuit pressure up to the application pressure and the mixing head opens automatically. Retreating the

needle opens the mixing chamber, the opposite placed inlet borings of both components and the application nozzle will be opened. Both foam components flow into the mixing chamber and blends there. After the setted dosing time the needle closes the inlet borings, moves forward and pushes the compound out of the mixing chamber, cleans it and closes the application nozzle. 这两种发泡材料经过电机驱动的金属边缘过滤器过滤。高压单元配备了压力传感器，温度传感器，流量传感器和两个高压计量泵，这是由单独的速度控制电机供电。有用于测量循环压力的传感器。温度和安装有传感器测量应用压力。温度。泵均采用磁力耦合器。应用体积是由频率转换器。 这两种发泡材料得到压缩的轴向活塞泵的电路压力约60巴，然后应用压力，多元醇约140巴/异氰酸酯约120巴。截止阀安装在循环和应用压力之间切换。应用压力值可以设置为每个泡沫组件的压力限制阀分离。设定压力值显示在控制柜上。基本单元连接到混合头hk-mmi 1和2与单独的软管包装。软管组由高压软管组成，分别用于两部件的流量和回流，所需的传输和控制电缆以及用于驱动混合头的液压软管。软管组和混合头安装在轨道系统和平衡器以便于在车体的工作范围内操作。温度和压力监测设备位于HD聚氨酯100 / HR基地单位。启动应用程序运行高压泵，以增加管路压力达到应用压力至混合头自动打开。退出顶针打开混合腔，喷嘴组件和应用程序将被打开。两种发泡材料流入混合腔反应。在设定的发泡时间针关闭进料孔，顶针、喷嘴清洗和关闭应用程序。

Operation 操作

The high pressure polyurethane foam application system normally runs in automatic mode. This means that only the mixing head resp. the manpulator manually has to be placed above the application opening of the car body. 高压聚胺酯发泡应用系统在自动模式下运行。只有在车身上混合头的应用需要手动操作。

After the correct positioning of the mixing head HK-MMI can the application be started by the operator. An application break is possible at any time. 操作人员可在混合头HK-MMI运行在正确的工位后启动应用程序。在任何时候应用程序都可以中断

By an application break will only the actuated foam application stopped, the system keeps going the components circulation. 应用程序的中断只将发泡应用停止，而系统将不会受影响而继续进行其他部件的运转。

Back up 备份

The plant consists of 2 identical machines (base unit HD PUR 100/HR, high pressure hose packages and mixing heads). Only material supply unit MV PURand the material depot (filling station 200l barrels) supplies both machines. If there is any failure at producing machine, operator can change to second machine very easy. 设备由两个相同的机器组成（高压聚安酯的基本组件，高压软管包和混合头）。只有中压聚氨酯材料库供应设备（填料站200L桶）供给两个机器。如果其中一个运行中出现问题，操作人员可很容易的换用第二个机器。

Sampling 抽样

Regular quality checks in order to ensure a constant high quality of the poyurethane foam are recommended, at least once per shift. Therfore a test shot has to be done into a respective test container. After determination of foam weight, expansion time and expansion

height inside the test vessel, these results have to be used as test criteria. 为了确保持续聚安酯发泡的高质量应用应进行至少每班一次定期的质量检查。且测试要在独自的测试容器进行。在发泡的重量，膨胀时间和在测试容器的膨胀高度的测定之后，这些结果数据要用做测试标准。

Material storage unit 储料单元BH-PUR200

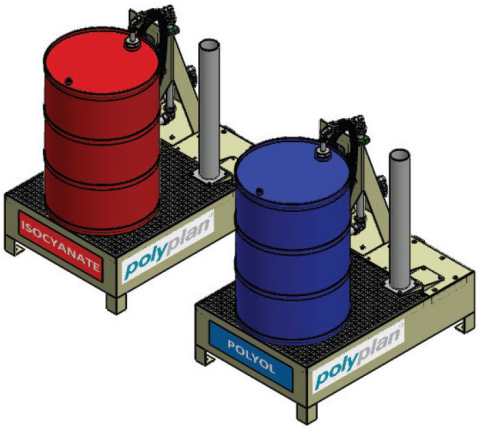


Figure 1a: material storage unit Polyol without agitator 聚氨酯不带搅拌

Figure 1b: material storage unit Polyol incl. agitator 聚氨酯不带搅拌

Overview: Material supply unit 日料单元MV PUR60

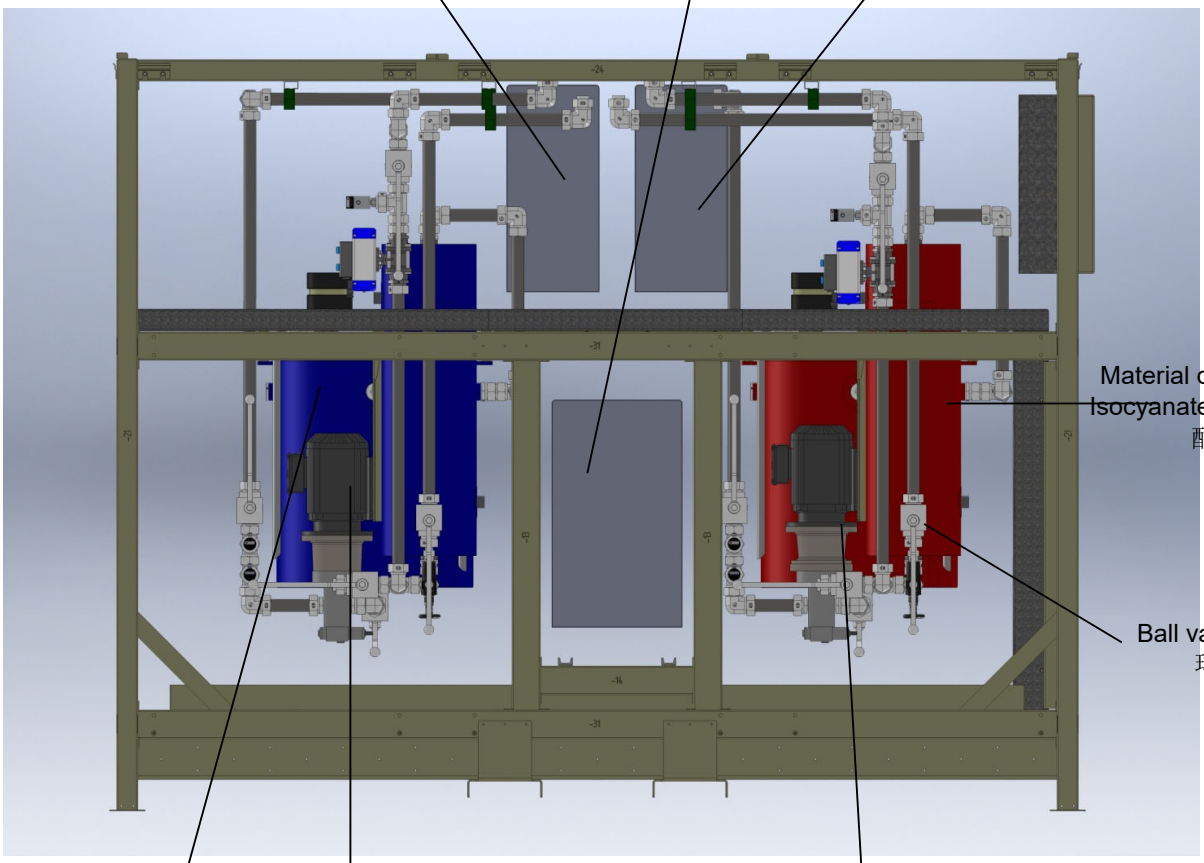


Figure 2: material supply unit 材料供给

Overview: Base unit 高压单元HD PUR 100/HR

(graphic: base unit HD PUR 100/HR, front view)前视图

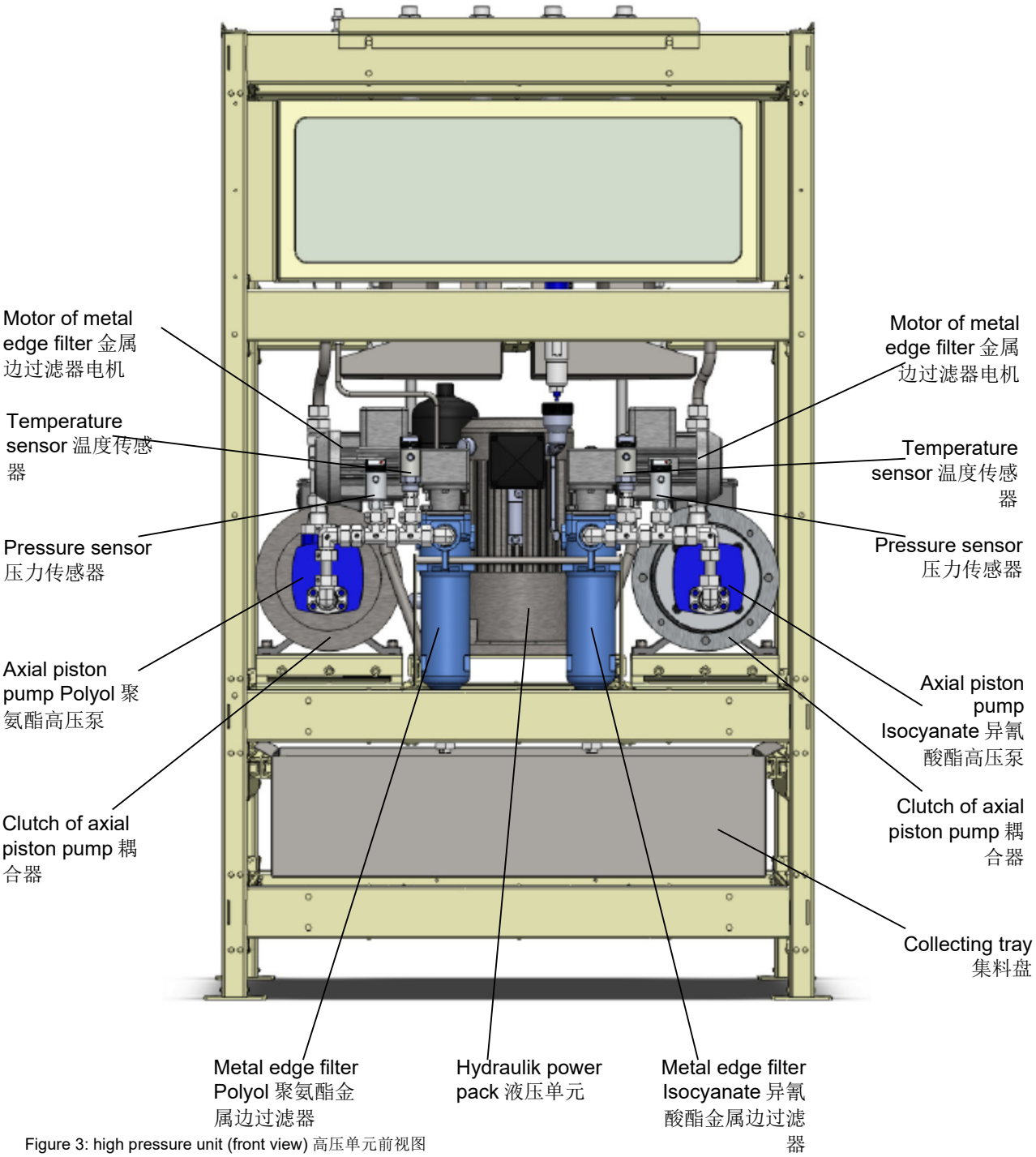


Figure 3: high pressure unit (front view) 高压单元前视图

Continuation: Overview: Base unit 高压单元HD PUR 100/HR

(graphic: base unit HD PUR 100/HR, back view)后视图

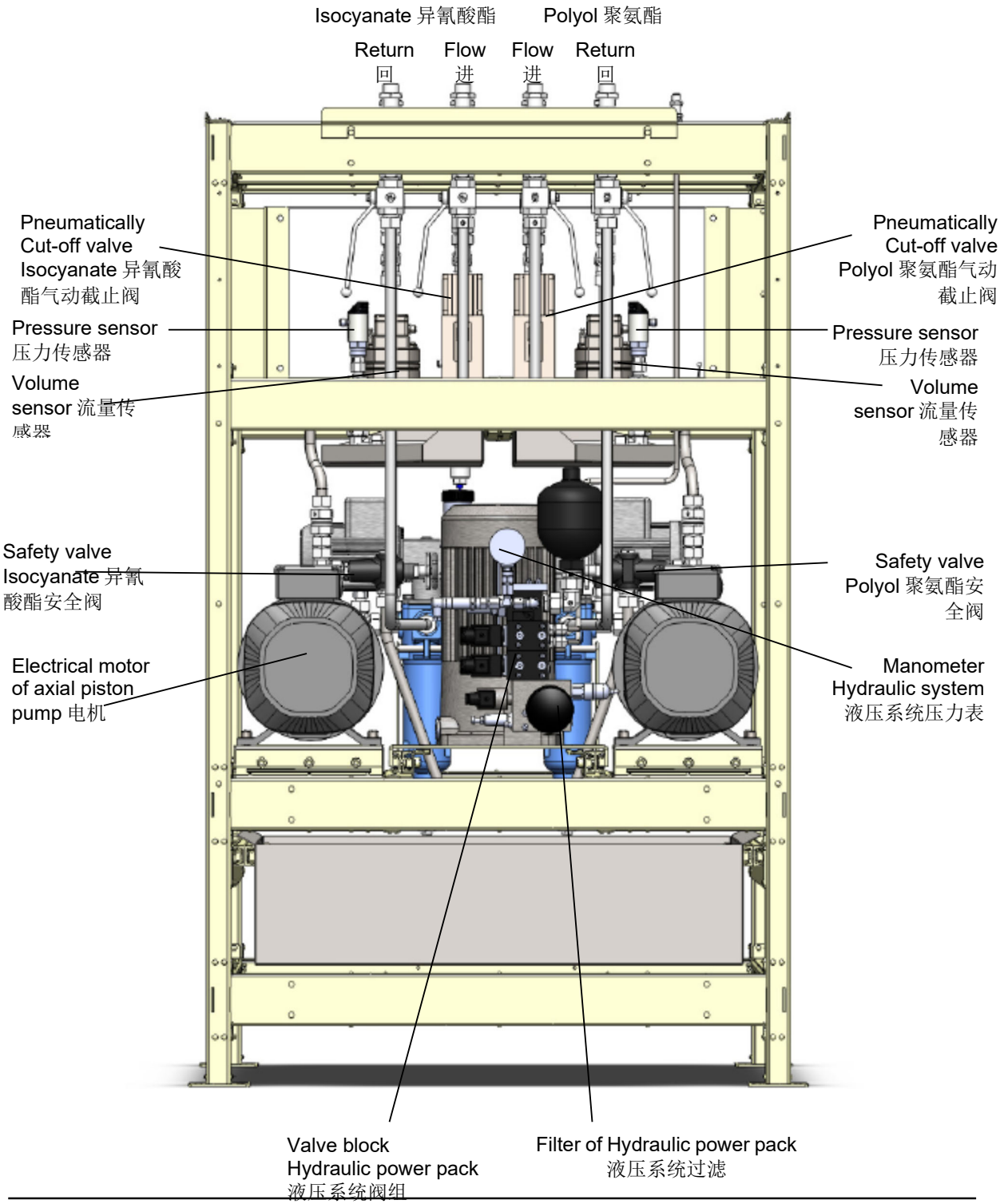
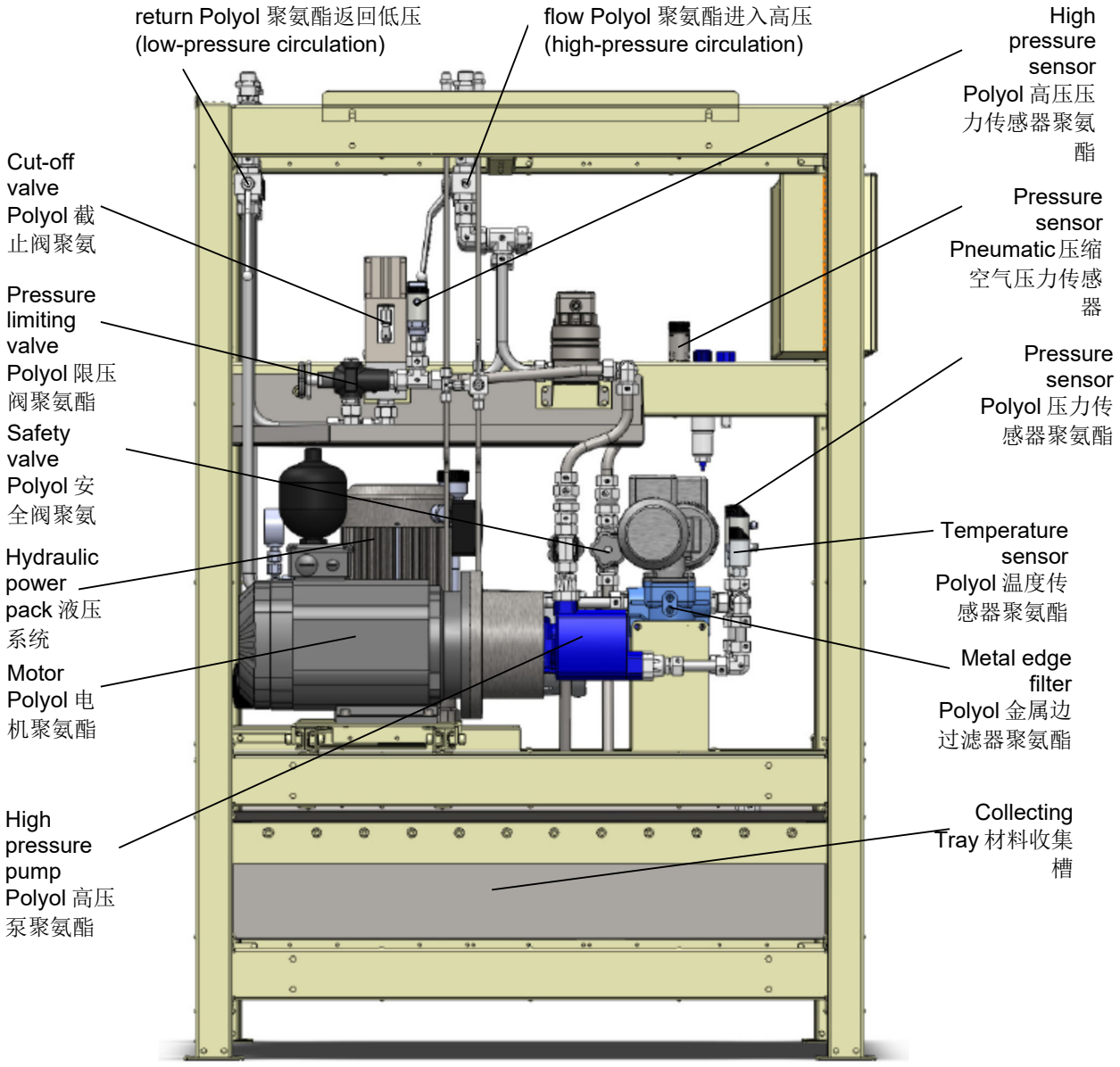


Figure 4: high pressure unit (back view)

Continuation: Overview: 高压单元Base unit HD PUR 100/HR

(graphic: base unit HD PUR 100/HR, side view, Polyol)侧视图

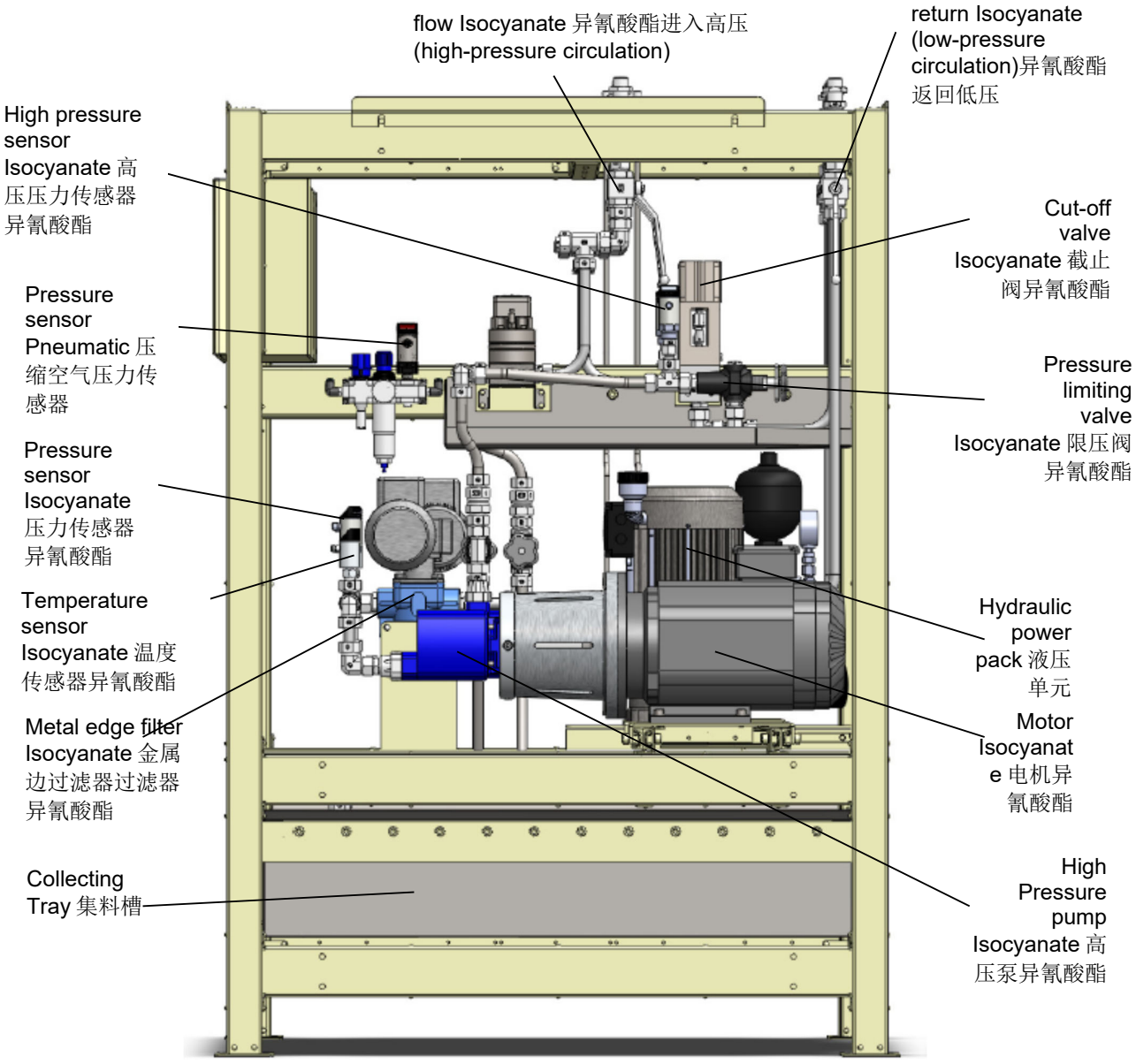


(graphic: base unit HD PUR 100/HR, side view, Polyol)

Figure 5: high pressure unit (side view polyol)高压单元侧视图，聚氨酯

Continuation: Overview: Base unit 高压单元HD PUR 100/HR

(graphic: base unit HD PUR 100/HR, side view, Isocyanate)侧视图



(graphic: base unit HD PUR 100/HR, side view, Isocyanate)

Figure 6: high pressure unit (side view Isocyanate)高压单元侧视图，异氰酸酯

Track system including balancing device and hose package悬挂系统平衡器及管束

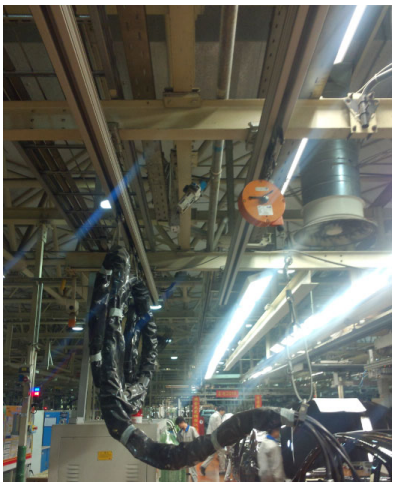


Figure 7: track system incl. balancing device and hose package 悬挂系统包括平衡器及管束

Mix head gun head) and manual operation panel混合头及操作面板

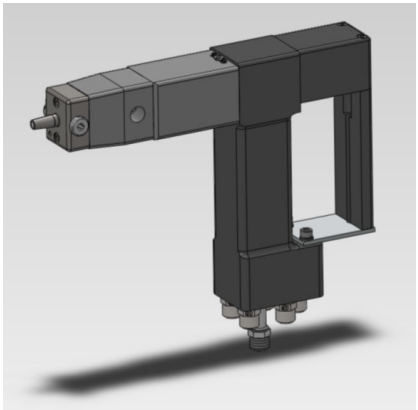


Figure 8: mix head (incl. mounted nozzle)混合头包括喷嘴

Figure 9: manual operation panel 操作面板

Overview to the functional description: Control cabinet功能纵览控制柜

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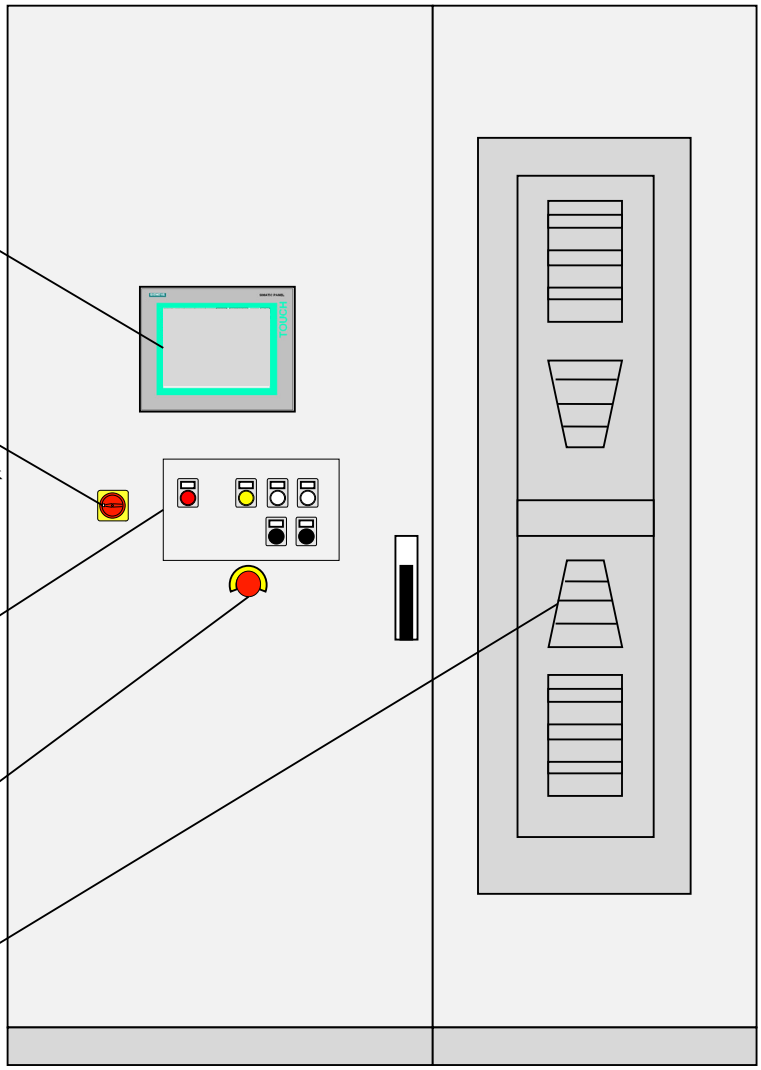

Figure 10: Control cabinet 控制柜

Time table时间表

序号 No.	任务 Task	开始时间 Start time	结束时间 Conclusion time	备注 Remarks
1	发包 Contracting	2017 年 6 月 June 2017	2017 年 6 月 June 2017	
2	项目启动 Project initiation(kick-off)	2017 年 7 月 July 2017	2017 年 7 月 July 2017	
3	方案认可 Scheme approval	2017 年 7 月 July 2017	2017 年 7 月 July 2017	
4	设计制造 Design and manufacture	2017 年 7 月 July 2017	2017 年 7 月 July 2017	
5	预验收 Pre-acceptance	2017 年 9 月 September 2017	2017 年 9 月 September 2017	
6	发货 Shipment	2017 年 10 月 Octomber 2017	2017 年 10 月 Octomber 2017	
7	运输 Transportation	2018 年 1 月 January 2018	2018 年 1 月 January 2018	
8	清关 Customs clearance	2018 年 2 月 February 2018	2018 年 2 月 February 2018	
9	安装 Installation	2018 年 4 月 April 2018	2018 年 4 月 April 2018	
10	调试 Debugging	2018 年 4 月 April 2018	2018 年 4 月 April 2018	
11	VFF	2018 年 5 月 May 2018	2018 年 5 月 May 2018	
12	PVS	2018 年 7 月 July 2018	2018 年 7 月 July 2018	
13	SOP	2018 年 9 月 September 2018	2018 年 9 月 September 2018	
14	验收 Acceptance	2019 年 1 月 January 2019	2019 年 1 月 January 2019	