制药和精细化工专用

阀门

SchuF

SchuF Valves in Pharmaceutical Applications
SchuF 阀门在制药上的应用

SchuF Pharma Valves have served Pharmaceutical companies world-wide for over half a century.

舒富公司的阀门在全世界制药业的应用已经长达半个多世纪

辉瑞制药采用的SchuF 阀门及现场实景

During that time SchuF has jointly addressed many of the major process and application challenges facing the Pharmaceutical industry. Some of the more prevalent concerns are:

舒富在参与制药工程中积累了丰富经验，帮助客户不断完善工作流程，提供创新支持，克服了诸多制药业技术难题，主要有：

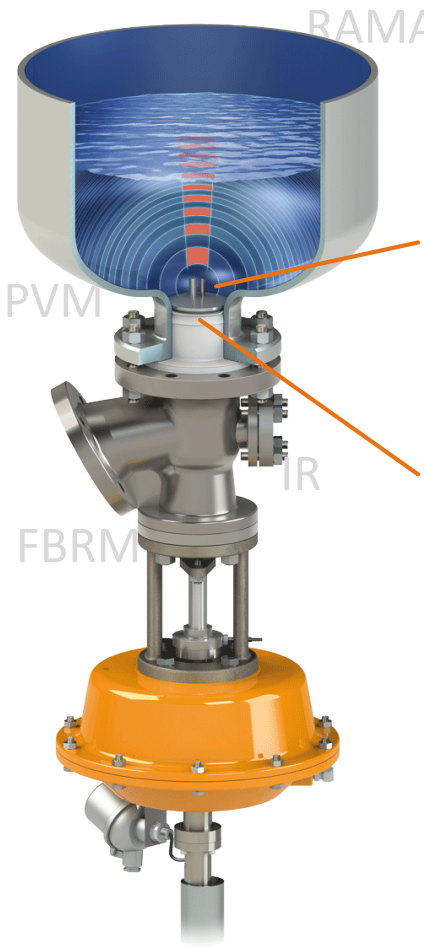
- **Process Analytical Technology (PAT)**
  过程分析技术 (PAT)
- **Contamination**
  污染问题
- **Dead space**
  死区问题
- **Leakage to atmosphere**
  (Stem leakage and lethal service)
  泄漏问题
  （阀杆损坏问题和对致命液体气体零 泄露方案）
- **Tight process shut off**
  过程完全切断
- **Crystallisation - Crust formation**
  结晶-结壳
- **GMP – CIP to prevent product cross**
  GMP 要求的防止产品交叉污染
- **Temperature measurement**
  温度测量
- **Sampling**
  取样
- **Fire Safety**
  火灾安全

Process Analytical Technology (PAT)

过程分析技术 (PAT)

In recent years, there has been a significant increase in the use of Process Analytical Technology to optimise pharmaceutical and fine chemical manufacturing processes. Chemical processes can be monitored with fully-immersed PAT tools such as infra-red (IR), Raman, FBRM, and PVM probes, where direct insertion into a reactor vessel is required. Reactions can be analysed in real time with PAT tools, providing immediate data on critical process control parameters.

近些年来，越来越多的企业采用PAT监测技术来完善 制药和精细化工制造过程。位于储罐最低点的PAT监测器可以最大限度浸入介质中对其化学过程进行监测，因此PAT 特别适用于需要检测器直接探入反应储罐的情况，比较常用的PAT探头有 红外线，Raman, FBRM和 PVM探头。化学反应可在精确的时间点得以测量，提供对关键工艺控制参数的即时数据。



一个排流阀可安装两个传感器
Two sensors in one drain valve

处于反应器最底部的最佳切入点
Optimal entry point at the lowest part of the reactor

适用多种传感器
Various sensor types suitable

The SchuF PAT Solution enables customers to incorporate PAT technology into a reactor bottom outlet valve with built-in PAT probe monitoring capabilities. The PAT probe is installed through the valve actuator, stem and disc and is directly exposed to the medium in the reactor.

舒富PAT方案 为客户提供了内置于反应器底部的出料阀的PAT监测探头，从而达到监控功能。

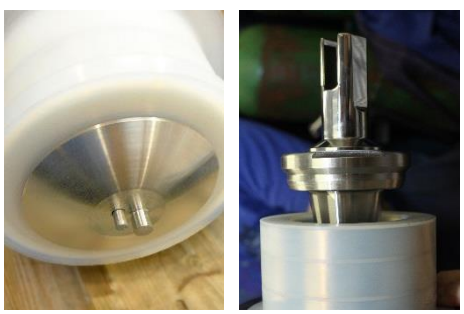
该内置探头依次穿过执行机构，阀杆，阀芯安装按，直接与反应器中的介质接触。

MultiProbe™ Bottom Outlet Valve with in-build PAT and temperature sensor

MultiProbe™ **阀瓣式釜底阀配内置PAT探头和温度测量探头**

SchuF's unique MultiProbe™ patented design ensures that the medium in the reactor does not leak through the valve stem.

舒富独特的MultiProbe专利设计保证了反应器里的介质零泄漏。



MultiProbe™ PAT IR and temperature sensor (left), Liquisonic® sensor for measuring density (right)

Dead Space
死区问题

All valves are fitted exactly to the reactor nozzle to ensure that there is no dead space at the bottom of the reactor which might not take part in the mixing process. The valves are designed to allow the vessel and themselves to drain completely.

所有阀门都精确符合反应器接口尺寸要求，以保证 消除反应器底部的死区。阀门设计能使容器和阀门完全排空。

Media containing solids and crystals
含固体和结晶的介质

Disc valves are compact, offer positive sealing and feature automatic crust breaking on disc rising versions. However a piston valve may be preferred on large reactors as the drainage time may be reduced by up to 5 minutes, allowing more batches to be produced. Because the piston withdraws completely out of the flow path, they are also better able handle large crystals which may get stuck between the disc and the seat. Piston valves are available with either radial or metal to metal sealing surfaces.

上展式的蝶式釜底阀结构紧凑，具有绝对密封和自动除壳性能。相比较下柱塞式釜底阀更适用于大型储罐，因为其介质的排空时间比蝶式釜底阀缩短最多5 分钟以上，允许的生产批量更大。由于柱塞完全从管道中移出，它们能更好的处理可能残留在阀芯和阀座之间的大量结晶体。柱塞式釜底阀即可实

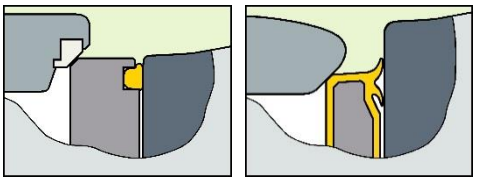
Sealing to the outside
对外部的密封

To eliminate leakage to the outside, all disc rising valves can be fitted with either a PTFE extruded bellows (Model 25BF), a metal bellows (Type 25BH), or a PTFE or PTFE diaphragm (25BM). These seals are also available for disc lowering valves (Models 24BF, 24BH and 24BM). In cases of emergency the stuffing box provides security in the event of a seal failure.

为消除介质外泄，所有的蝶式上展式釜底阀可以配置PTFE 成型波纹管(25BF 型)、金属波纹管(25BH 型)或者PTFE 膜片（25BM 型）。这些密封方式同样也适用于蝶式下展式釜底阀 （24BF 型，24BF 型和24BM 型）。在密封失败等紧急危险情况下填料函将提供安全保障。

All Disc valves have an FDA approved PTFE sealing ring and a fire-safe metal back up seal:

所有的碟式釜底阀门有FDA（美国食品药品监督管理局）认可的PTFE 密封环和防火型金属备密封:



GMP O-Ring: GMP O 型密封圈；GMP Lip-Seal: GMP 唇状密封

Clean-in-place (CIP)
在线清洗

All valves can be fitted with flushing ports (standard with lined valves Type 25BF) allowing cleaning of the valve while a reaction is taking place in the reactor.

所有阀门都可选择安装配置清洗接口（衬里阀门 25BF 的标准结构），能够在储罐进行反应过程时清 洗阀门

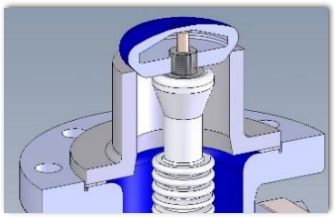
Temperature sensing
温度传感

Placing a temperature‘ sensor in the valve disc or piston ensures that the reactors contents can be measured even when the batches are very small. In addition, a nozzle and space at the top of the reactor is saved by this arrangement. The sensor leads can be terminated in a junction box on the yoke or under the actuator. Here the advantage is that the probe can be removed for calibration or replacement while the reactor is charged.

Metal disc with integrated temperature sensor

在阀芯或柱塞里放置一个温度传感器可以保证反应器的反应状态准确测量，即使批量非常小。此外，这种安排可以省去一个反应器顶端的接口及其空间。传感器的引线能接入固定在阀门支架或执行机构下部的接线盒的端子上。这种结构的优点是当反应器排空时，探头可以拆下来进行调校或者替换

The measuring probe is placed in the tip of the device and a small spring ensures that the probe is pressed against the inner side of the disc or piston, which has been machined to only 1-2mm thickness. As the probe is inside the disc, there can be no leakage to the outside. Accurate measurements can be obtained with response times of approximately one minute.



测量探头装在设备的顶端，一个支撑小弹簧确保探头被顶在阀芯或者柱塞的内侧，该部位被加工到只有1-2mm厚。由于探头在阀芯内，所以不会对外泄露。在大约1分钟的响应时间内，精确测量就可以获取

Right: Bottom Outlet Valve with temperature sensor in-build into the disc and spindle.

右图: 釜底阀配温度传感器探头内置于阀芯与阀杆中.

Sampling Valves
取样阀门

Model 30

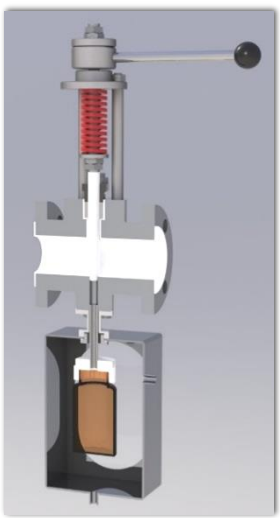
Sampling valves and systems are available to drain a sample from the bottom or side of a reactor (Model 32), to suck a sample from the top of a reactor by means of a vacuum (Type 34) or to trap the sample and push it out using air or Nitrogen. Line sampling valves are also available (Model 30/31).

Right: Ram Valve with integral sampling function and pneumatic actuation

右图: **柱塞式**阀门结合**取**样功能及气动驱动**装置**

Model 32

取样阀门或者取样系统能够从反应器底部或侧面取样（用32型），用真空方式从反应器的顶部抽取样品（用34型），或者捕捉样品并借助空气或氮气推出（用31/33型）。



PTFE-lined Wafer sampling valve (Model 33)
聚四氟乙烯涂层圆片型取样阀（33型）

Powder sampling valve (Model 32)
粉剂取样阀（32型）

Fire-Safe
防火安全

To limit the damage a fire may cause it is vital that reactors, storage vessels and their outlet valves remain intact to prevent feeding the fire or polluting the extinguishing agents. All our valves can be offered in a fire-safe version. We are the only manufacturer to be able to do so. We also offer fire safe variants our for PTFE and glass-lined valves.

为了控制火灾可能导致的危害，至关重要的是反应器，储罐和他们的排放阀门必须保持完好，以防止因介质的混入造成的火势蔓延或灭火剂因介质的污染而不能达到应有的灭火效果。所有舒富阀门都可以提供防火型结构，舒富是唯一一家能够做到的阀门制造商。我们也提供防火型结构的PTFE内衬或搪瓷内衬阀门。

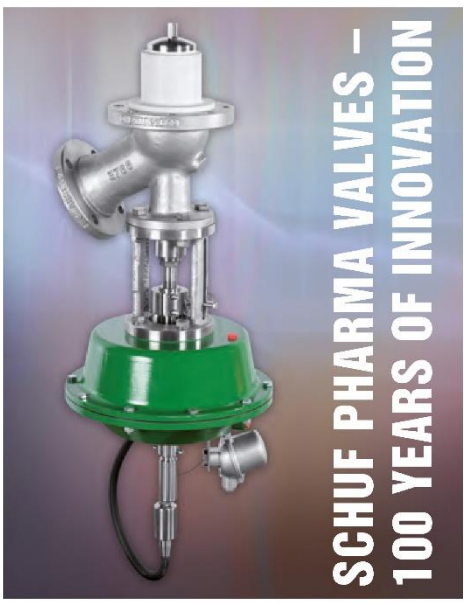
FIRE-SAFE CERTIFIED

Product Portfolio Overview 产品概述

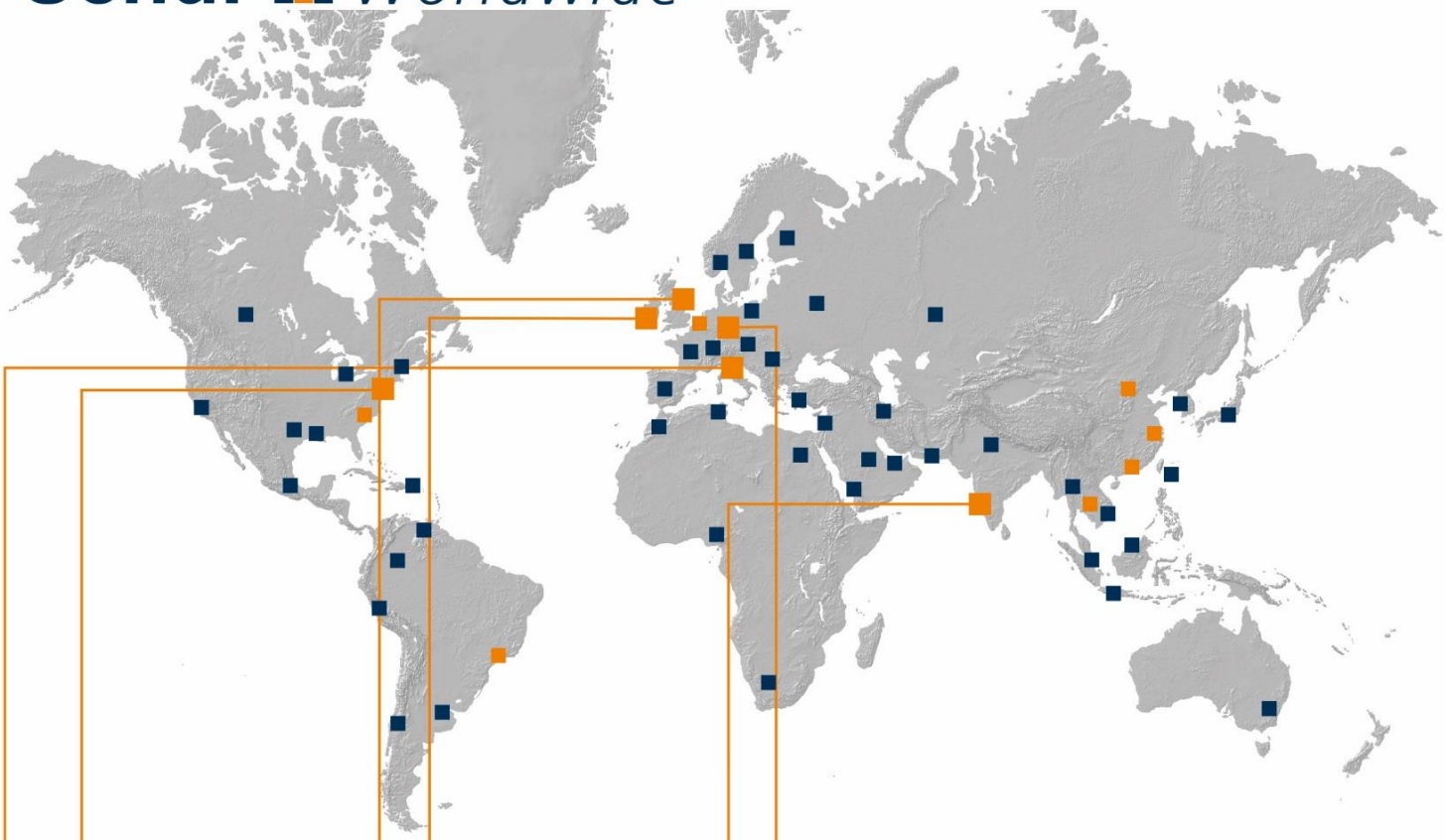
- **Drain & Sampling Valves**
  - Piston Bottom Outlet Valves
  - Disc Bottom Outlet Valves
  - Bottom Outlet Ball Valves
  - Screw-in, Line & Wafer Sampling Valves
  - Complete Sampling Systems
- **Control Valves**
  - Angle Control Valves
  - In-Line Control Valves
  - Multistage Control Valves
  - Cage Control Valves
  - Automatic Recirculation Valve (ARV)
  - Choke Valves
  - Blowdown Valves
- **Isolation Valves**
  - Lift Plug Valves
  - TruEPlug Valves
  - Y- / P- Globe & Straightway Valves
  - High Pressure Angle Valves
  - Special Ball Valves
  - Special Gate Valves
- **Switching Valves**
  - Y, R, & T type Diverter Valves
  - Multiway Diverter Valves
  - SwitchPlug™ Valves
  - Maniflow Selector Valves™ (MSV)
  - Custom Diverter Valves
- **Safety Related Valves**
  - Line Blind Systems
  - Goggle Valves
  - Changeover Valves
  - In-Tank Emergency Shut-Off Valves (TESO)
  - IsoTank External Tank Emergency Shut-Off Valves
  - Non-Slam Check Valves
- **Other Products**
  - Spray Rinse Valves
  - Distributor Valves
  - Steam Injection Valves

Pharma Valves Client List 舒富制药业客户名单

- Abbott
- AbbVie
- Amgen
- Astellas Pharma
- AstraZeneca
- BASF
- Bayer
- BMS
- Boehringer Ingelheim
- Bristol-Myers Squibb
- CAD Middle East
- Dow Chemical
- DSM
- Eisai Co
- Eli Lilly
- GE Healthcare
- GlaxoSmithKline
- Hospira
- Janssen
- Johnson and Johnson
- Lonza
- Merck
- Monsanto
- Novartis
- Pfizer
- Roche
- Sanofi
- Scinopharm
- Shasun
- Syngenta
- Takeda
- UCB



SchuF Worldwide



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