

Smart Drain

智能零气耗排水器

Electronic Zero Air-loss Drain

产品简介 Brief Introduction

压缩空气系统在工作过程中会产生冷凝水，含有油污及颗粒杂质的冷凝水若不能及时排放，会严重影响气体品质。

乔克念承 Smart Drain 是一种液位感应智能零气耗排水器，其采用液位传感器与单片机控制系统相配合，可根据冷凝水的实际产生量进行有效排放，只排水，不排气，避免压缩空气损失。

乔克念承 Smart Drain 采用创新的模块化结构设计，替代传统的老式结构。老式的粘连结构需要复杂的内部端子接线，工作中自身无法断电，传感器和排放阀的拆装非常繁复，而 Smart Drain 的模块化结构克服了这一系列弊端，使用和维护更加便捷。

Smart Drain 的设计排放速度快，动作频率高，过载能力强。

Smart Drain 规格齐全，在排水量、工作压力、适用电压和产品材质等方面为用户提供广泛选择。

乔克念承 Smart Drain 经过压力试验、流量试验、杂质试验、电磁干扰试验、淋水试验和寿命试验六大考核而定型，确保了长寿命和高可靠性。

Condensate water will be produced in the process of compressed air system. Quality of compressed air will be seriously affected if the condensate containing oil and particle impurities can not be discharged in time.

Smart Drain from NIANCHENG is a kind of electronic zero air-loss drain. It adopts level sensor and CPU control system, which can effectively discharge condensate according to its actual amount. It drains only condensate water but not exhaust, so as to avoid loss of compressed air.

Smart Drain's innovative modular structure design replaces the traditional old structure. The old adhesive structure requires complex internal terminal wiring, and it cannot cut off power in itself during work. The disassembly and assembly of sensors and valves are very complicated. The modular structure of Smart Drain overcomes this series of disadvantages and makes use and maintenance more convenient.

Smart Drain is designed with fast acting, high frequency and large overload capacity.

Smart Drain has complete specifications, providing users with a wide range of choices in terms of discharge volume, working pressure, applicable voltage and product materials.

Smart Drain has been finalized through six tests: Pressure Test, Flow Test, Impurity Test, Electromagnetic interference Test, Water spraying Test and Life-time Test, ensuring long service life and high reliability.

产品特性 Features

创新的模块化结构，使用和维护更便捷

根据冷凝水产生量实时排放，零气耗

指示灯直观显示运行状态

故障信号输出功能

半透明壳体，冷凝水变化过程可视

手动测试功能

排水阀孔径大，配有过滤网，无堵塞

超大水量、特殊电压、高压力型、全不锈钢型产品可选

寒冷地区可配加热棒防止冰冻

Innovative modular structure, more convenient to use and maintain

Real-time discharge according to actual condensate amount, zero air-loss

LED shows running state

Output of alarm signal

Visible change of condensate with translucent housing

Manual test

Large orifice matched with strainer, no blockage

Excessive volume, special voltage, high pressure, all stainless steel products are optional

Heating bar can be used for anti-freezing

工作原理 Operating Principle

冷凝水从入水口流入储水罐，储水罐水位持续升高；

当水位升到感应点时，传感器发出信号，电磁阀打开，开始排放冷凝水；

当冷凝水快排完时，电磁阀自动关闭，残留少许冷凝水，形成水封；

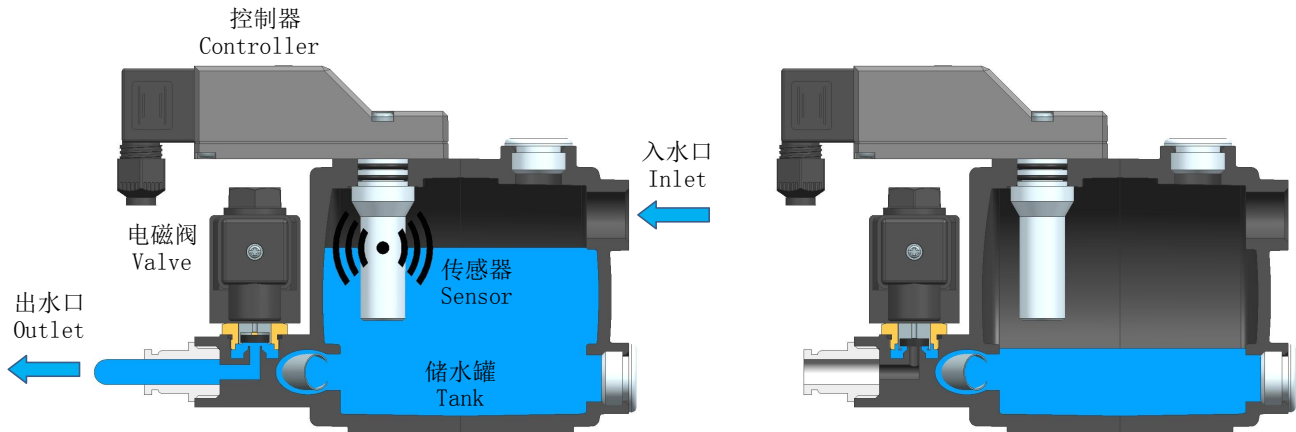
当排水器出现故障导致水位过高时，传感器实时感应，自动进入自洁排水模式，并可远程输出故障信号。

Condensate water flows into storage tank from inlet, and water level of the tank continues to rise;

When water level rises to induction point, the sensor sends a signal and the solenoid valve opens to discharge condensate water;

When condensate water is nearly exhausted, the solenoid valve will automatically close, leaving a small amount of condensate water, forming a water seal;

When drain valve fails and water level is too high, the sensor inducts by real-time, drain valve enters self-cleaning drainage mode automatically, and outputs alarm signal remotely.

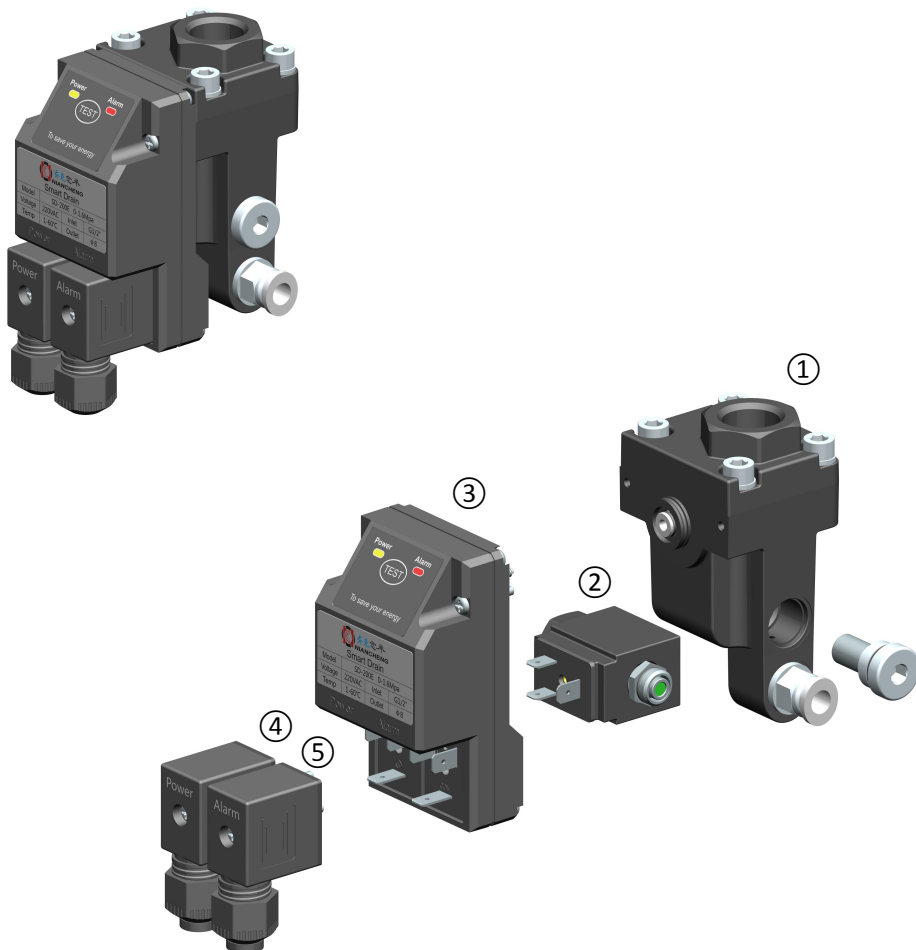


乔克念承 Smart Drain 工作原理
Operating Principle of Smart Drain

乔克念承 Smart Drain 创新的模块化结构

Modular structure of Smart Drain

SD-200E



①储水罐组件 (含外置过滤网)

Assembly of water storage tank(including outer strainer)

②电磁阀组件

Assembly of solenoid valve

③控制器组件

Controller assembly

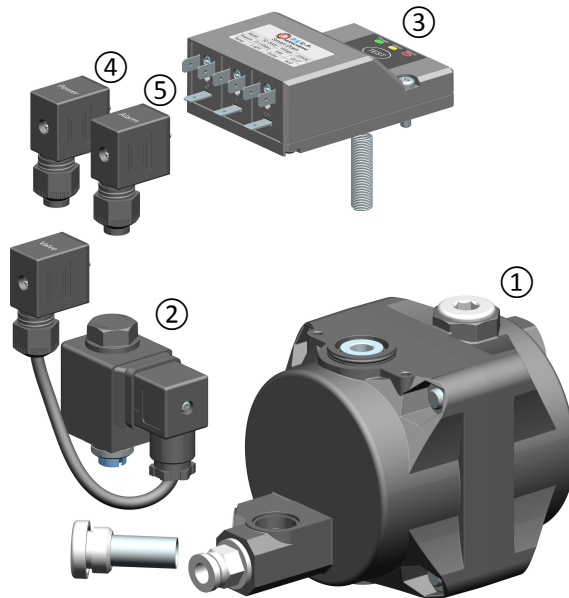
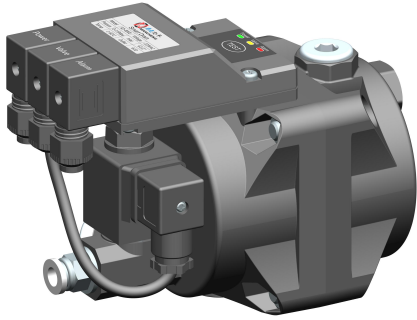
④电源接线盒

Power connector

⑤报警信号接线盒

Alarm connector

SD-800E



①储水罐组件（含外置过滤网）

Assembly of water storage tank(including outer strainer)

②电磁阀组件

Assembly of solenoid valve

③控制器组件

Controller assembly

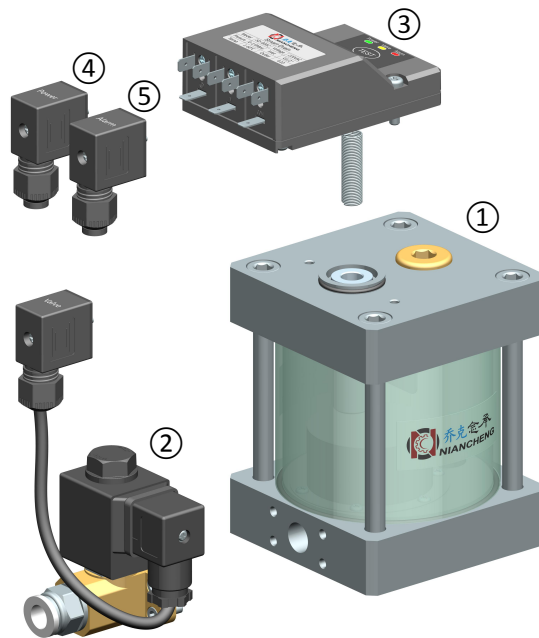
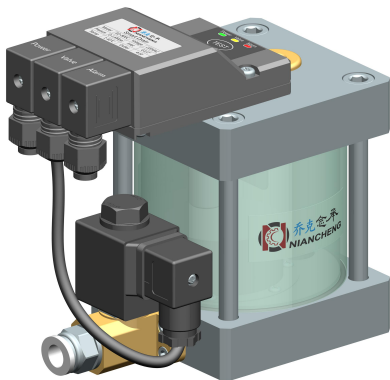
④电源接线盒

Power connector

⑤报警信号接线盒

Alarm connector

SD-800C



①储水罐组件（含内置过滤网）

Assembly of water storage tank(including inner strainer)

②电磁阀组件

Assembly of solenoid valve

③控制器组件

Controller assembly

④电源接线盒

Power connector

⑤报警信号接线盒



Alarm connector

技术参数-智能零气耗排水器 Technical Specification

		
产品型号 Product model	SD-200E	SD-200
产品特点 Product features	①模块化结构, 体积小, 重量轻 Modular structure, small size and light weight ②适用过滤器和小型冷干机等 Applicable to filters and small-sized dryers	
应用场合 Applications	小水量排放, 如过滤器、小型冷干机等 Small water volume, such as filters and small-sized dryers	
工作压力 Working pressure	0-1.6 Mpa	
最大排水量 Max. discharge volume	12 L/h	
推荐适用空压机容量 Recommended Compressor Capacity	10 m ³ /min	
推荐适用冷干机容量 Recommended refrigeration dryer capacity	20 m ³ /min	
推荐适用过滤器容量 Recommended filter capacity	100 m ³ /min	
适用介质 Applicable media	水、含油冷凝水 Water、Oil-containing condensate	
介质温度 Temperature of medium	1-60 °C	
环境温度 Temperature of ambient	1-60°C (零下温度可选用加热棒附件) 1-60°C (Heating bar is optional for sub-zero temperature)	
入口尺寸 Inlet	1 * G1/2" (垂直入水口)	1 * G1/2" (水平入水口)
出口尺寸 Outlet	Φ8 (G1/4")	
排放阀类型 Type of discharge valve	电磁阀 Solenoid valve	
排放阀前置过滤网 Front mesh strainer of discharge valve	有 (外置) Yes (Outer set)	有 (内置) Yes (Inner set)
容器壳体材质 Material of housing	铝 Aluminum	304 不锈钢 Stainless steel
手动排水功能 Manual function	有 Yes	
防护等级 Protective class	IP65	
标准电压 Supply voltage options	24V AC/DC、110V AC、220V AC	
报警功能 Alarm function	同时提供 N. O (报警接通) 和 N. C (报警断开) 两种形式的无源触点输出 Two kinds of alarm contacts of normally open (N. O) (switch on when alarm) and normally closed (N. C) (switch off when alarm) are available at the same time	
报警触点负载 Load of alarm contacts	交流电最大负载 62.5VA, 直流电最大负载 60W Max. 62.5VA for alternating current, Max. 60W for direct current	
外形尺寸 长*宽*高 (mm) Overall dimensions L*W*H (mm)	93 * 79 * 124	142 * 74 * 117
产品净重 N. W.	0.6 kg	1.3 kg

				
产品型号 Product model	SD-400E		SD-400	
产品特点 Product features	①零气耗 Zero air-loss ②创新的模块化结构 Innovative modular structure ③规格齐全, 满足所有空压系统需求 Complete specifications to meet needs of all air compression systems			
应用场合 Applications	通用型, 如空压机冷却器、分离器、储气罐、冷干机等 General purpose, such as cooler, separator, air tank, refrigeration dryer			
工作压力 Working pressure	0-0.3 Mpa	0.3-1.6 Mpa	0-0.3 Mpa	0.3-1.6 Mpa
对应工作压力的最大排水量 Max. discharge volume corresponding to working pressure	70 L/h	65 L/h	70 L/h	65 L/h
推荐适用空压机容量 Recommended Compressor Capacity	50 m ³ /min			
推荐适用冷干机容量 Recommended refrigeration dryer capacity	100 m ³ /min			
推荐适用过滤器容量 Recommended filter capacity	500 m ³ /min			
适用介质 Applicable media	水、含油冷凝水 Water, Oil-containing condensate			
介质温度 Temperature of medium	1-60 °C			
环境温度 Temperature of ambient	1-60°C (零下温度可选用加热棒附件) 1-60°C (Heating bar is optional for sub-zero temperature)			
入口尺寸 Inlet	2 * G1/2"			
出口尺寸 Outlet	Φ10 (G1/2")			
排放阀类型 Type of discharge valve	电磁阀 Solenoid valve			
排放阀前置过滤网 Front mesh strainer of discharge valve	有(外置) Yes (Outer set)		有(内置) Yes (Inner set)	
容器壳体材质 Material of housing	铝 Aluminum		304 不锈钢 Stainless steel	
手动排水功能 Manual function	有 Yes			
防护等级 Protective class	IP65			
标准电压 Supply voltage options	24V AC/DC、110V AC、220V AC			
报警功能 Alarm function	同时提供 N.O(报警接通)和 N.C(报警断开)两种形式的无源触点输出 Two kinds of alarm contacts of normally open(N.O) (switch on when alarm) and normally closed(N.C) (switch off when alarm) are available at the same time			
报警触点负载 Load of alarm contacts	交流电最大负载 62.5VA, 直流电最大负载 60W Max. 62.5VA for alternating current, Max. 60W for direct current			
外形尺寸 长*宽*高 (mm) Overall dimensions L*W*H (mm)	177 * 110 * 147		172 * 110 * 147	
产品净重 N.W.	2.2 kg		3.3 kg	

						
产品型号 Product model	SD-800E		SD-800C		SD-800	
产品特点 Product features	①模块化结构 Modular structure ②多种材质可选 Multiple materials optional ③液位可视可选 Visible water level optional					
应用场合 Applications	通用型, 如空压机冷却器、分离器、储气罐、冷干机等 General purpose, such as cooler, separator, air tank, refrigeration dryer					
工作压力 Working pressure	0-0.3 Mpa	0.3-1.6 Mpa	0-0.3 Mpa	0.3-1.6 Mpa	0-0.3 Mpa	0.3-1.6 Mpa
对应工作压力的最大排水量 Max. discharge volume corresponding to working pressure	100 L/h	90 L/h	100 L/h	90 L/h	100 L/h	90 L/h
推荐适用空压机容量 Recommended Compressor Capacity	100 m ³ /min					
推荐适用冷干机容量 Recommended refrigeration dryer capacity	200 m ³ /min					
推荐适用过滤器容量 Recommended filter capacity	1000 m ³ /min					
适用介质 Applicable media	水、含油冷凝水 Water, Oil-containing condensate					
介质温度 Temperature of medium	1-60 °C					
环境温度 Temperature of ambient	1-60°C (零下温度可选用加热棒附件) 1-60°C (Heating bar is optional for sub-zero temperature)					
入口尺寸 Inlet	3 * G1/2"					
出口尺寸 Outlet	Φ10 (G1/2")					
排放阀类型 Type of discharge valve	电磁阀 Solenoid valve					
排放阀前置过滤网 Front mesh strainer of discharge valve	有(外置) Yes (Outer set)		有(内置) Yes (Inner set)		有(内置) Yes (Inner set)	
容器壳体材质 Material of housing	铝 Aluminum		半透明复合材料 Translucent composite		304 不锈钢 Stainless steel	
手动排水功能 Manual function	有 Yes					
防护等级 Protective class	IP65					
标准电压 Supply voltage options	24V AC/DC、110V AC、220V AC					
报警功能 Alarm function	同时提供 N.O(报警接通)和 N.C(报警断开)两种形式的无源触点输出 Two kinds of alarm contacts of normally open(N.O) (switch on when alarm) and normally closed(N.C) (switch off when alarm) are available at the same time					
报警触点负载 Load of alarm contacts	交流电最大负载 62.5VA, 直流电最大负载 60W Max. 62.5VA for alternating current, Max. 60W for direct current					
外形尺寸 长*宽*高 (mm) Overall dimensions L*W*H (mm)	207 * 110 * 147		186 * 110 * 173		202 * 110 * 147	
产品净重 N.W.	2.5 kg		2.5 kg		3.8 kg	

				
产品型号 Product model	SD-1800C		SD-1800	
产品特点 Product features	半透明复合材料罐体, 液位可视 Translucent composite housing, visible level		铝罐体 Aluminum housing	
应用场合 Applications	水量略大场合 Slightly large water volume			
工作压力 Working pressure	0-0.3 Mpa	0.3-1.6 Mpa	0-0.3 Mpa	0.3-1.6 Mpa
对应工作压力的最大排水量 Max. discharge volume corresponding to working pressure	200 L/h	240 L/h	200 L/h	240 L/h
推荐适用空压机容量 Recommended Compressor Capacity	200 m ³ /min			
推荐适用冷干机容量 Recommended refrigeration dryer capacity	400 m ³ /min			
推荐适用过滤器容量 Recommended filter capacity	2000 m ³ /min			
适用介质 Applicable media	水、含油冷凝水 Water、Oil-containing condensate			
介质温度 Temperature of medium	1-60 °C			
环境温度 Temperature of ambient	1-60°C (零下温度可选用加热棒附件) 1-60°C (Heating bar is optional for sub-zero temperature)			
入口尺寸 Inlet	3 * G1/2"			
出口尺寸 Outlet	Φ12 (G1/2")			
排放阀类型 Type of discharge valve	电磁阀 Solenoid valve			
排放阀前置过滤网 Front mesh strainer of discharge valve	有(内置) Yes (Inner set)			
容器壳体材质 Material of housing	半透明复合材料 Translucent composite		铝 Aluminum	
手动排水功能 Manual function	有 Yes			
防护等级 Protective class	IP65			
标准电压 Supply voltage options	24V AC/DC、110V AC、220V AC			
报警功能 Alarm function	同时提供 N. O(报警接通) 和 N. C(报警断开) 两种形式的无源触点输出 Two kinds of alarm contacts of normally open(N. O) (switch on when alarm) and normally closed(N.C) (switch off when alarm) are available at the same time			
报警触点负载 Load of alarm contacts	交流电最大负载 62.5VA, 直流电最大负载 60W Max. 62.5VA for alternating current, Max. 60W for direct current			
外形尺寸 长*宽*高 (mm) Overall dimensions L* W * H (mm)	186 * 110 * 238		186 * 110 * 238	
产品净重 N. W.	2.8 kg		3.0 kg	

				
产品型号 Product model	SD-2800C		SD-2800	
产品特点 Product features	半透明复合材料罐体, 液位可视 Translucent composite housing, visible level		铝罐体 Aluminum housing	
应用场合 Applications	大水量 Large water volume			
工作压力 Working pressure	0-0.3 Mpa	0.3-1.6 Mpa	0-0.3 Mpa	0.3-1.6 Mpa
对应工作压力的最大排水量 Max. discharge volume corresponding to working pressure	480 L/h	560 L/h	480 L/h	560 L/h
推荐适用空压机容量 Recommended Compressor Capacity	600 m ³ /min			
适用介质 Applicable media	水、含油冷凝水 Water、Oil-containing condensate			
介质温度 Temperature of medium	1-60 °C			
环境温度 Temperature of ambient	1-60°C (零下温度可选用加热棒附件) 1-60°C (Heating bar is optional for sub-zero temperature)			
入口尺寸 Inlet	3 * G3/4"			
出口尺寸 Outlet	G1/2"			
排放阀类型 Type of discharge valve	电磁阀 Solenoid valve			
排放阀前置过滤网 Front mesh strainer of discharge valve	有(内置) Yes (Inner set)			
容器壳体材质 Material of housing	半透明复合材料 Translucent composite		铝 Aluminum	
手动排水功能 Manual function	有 Yes			
防护等级 Protective class	IP65			
标准电压 Supply voltage options	24V AC/DC、110V AC、220V AC			
报警功能 Alarm function	同时提供 N.O(报警接通)和 N.C(报警断开)两种形式的无源触点输出 Two kinds of alarm contacts of normally open(N.O) (switch on when alarm) and normally closed(N.C) (switch off when alarm) are available at the same time			
报警触点负载 Load of alarm contacts	交流电最大负载 62.5VA, 直流电最大负载 60W Max. 62.5VA for alternating current, Max. 60W for direct current			
外形尺寸 长*宽*高 (mm) Overall dimensions L* W * H (mm)	229 * 176 * 292		229 * 176 * 292	
产品净重 N.W.	7.8 kg		8.8 kg	

				
产品型号 Product model	SD-3800		SD-4800	
产品特点 Product features	①适用于超大水量排放 Suitable for excessive water volume ②双套控制组件，一用一备，高可靠性 Two sets of control assembly, one for use and one for standby, high reliability ③液位可视 Visible water level			
应用场合 Applications	超大水量排放，如空分等 Excessive water volume, such as air separation			
工作压力 Working pressure	0.1-0.3 Mpa	0.3-0.8 Mpa	0.1-0.3 Mpa	0.3-0.8 Mpa
对应工作压力的最大排水量 Max. discharge volume corresponding to working pressure	3000 L/h	3000 L/h	8000 L/h	8000 L/h
适用介质 Applicable media	冷凝水 Condensed water			
介质温度 Temperature of medium	1-60 °C			
环境温度 Temperature of ambient	1-60°C (零下温度可选用加热棒附件) 1-60°C (Heating bar is optional for sub-zero temperature)			
入口尺寸 Inlet	R1"		R1-1/2"	
出口尺寸 Outlet	G3/4"		G1"	
排放阀类型 Type of discharge valve	电磁阀 Solenoid valve			
排放阀前置过滤网 Front mesh strainer of discharge valve	有(外置) Yes (Outer set)			
容器壳体材质 Material of housing	304 不锈钢 Stainless steel			
手动排水功能 Manual function	有 Yes			
防护等级 Protective class	IP65			
标准电压 Supply voltage options	24V AC/DC、110V AC、220V AC			
报警功能 Alarm function	同时提供 N. O(报警接通) 和 N. C(报警断开) 两种形式的无源触点输出 Two kinds of alarm contacts of normally open(N. O) (switch on when alarm) and normally closed(N. C) (switch off when alarm) are available at the same time			
报警触点负载 Load of alarm contacts	交流电最大负载 62.5VA, 直流电最大负载 60W Max. 62.5VA for alternating current, Max. 60W for direct current			
外形尺寸 长*宽*高 (mm) Overall dimensions L* W * H (mm)	765 * 250 * 365		945 * 350 * 465	
产品净重 N. W.	15 kg		25 kg	

技术参数-高压力型 Technical Specification - High pressure model

			
产品型号 Product model	SD-HP25	SD-HP50	SD-HP80
产品特点 Product features	①高压力 High pressure ②零气耗 Zero air-loss ③创新的模块化结构 Innovative modular structure		
应用场合 Applications	高压力场合 High pressure applications		
工作压力 Working pressure	0-2.5 Mpa	0-5.0 Mpa	0-8.0 Mpa
最大排水量 Max. discharge volume	90 L/h	44 L/h	24 L/h
适用介质 Applicable media	水、含油冷凝水 Water、Oil-containing condensate		
介质温度 Temperature of medium	1-60 °C		
环境温度 Temperature of ambient	1-60°C (零下温度可选用加热棒附件) 1-60°C (Heating bar is optional for sub-zero temperature)		1-60°C
入口尺寸 Inlet	2 * G1/2"	2 * G1/2"	1 * Rc1/2"
出口尺寸 Outlet	G1/2"	G1/2"	G1/2"
排放阀类型 Type of discharge valve	电磁阀 Solenoid valve		
排放阀前置过滤网 Front mesh strainer of discharge valve	有(内置) Yes (Inner set)		
容器壳体材质 Material of housing	304 不锈钢 Stainless steel		
手动排水功能 Manual function	有 Yes		
防护等级 Protective class	IP65		
标准电压 Supply voltage options	24V AC/DC、110V AC、220V AC		
报警功能 Alarm function	同时提供 N. O(报警接通)和 N. C(报警断开)两种形式的无源触点输出 Two kinds of alarm contacts of normally open(N. O) (switch on when alarm) and normally closed(N. C) (switch off when alarm) are available at the same time		
报警触点负载 Load of alarm contacts	交流电最大负载 62.5VA, 直流电最大负载 60W Max. 62.5VA for alternating current, Max. 60W for direct current		
外形尺寸 长*宽*高 (mm) Overall dimensions L* W * H (mm)	172 * 110 * 147	161 * 102 * 137	151 * 92 * 137
产品净重 N. W.	3.3 kg	2.8 kg	2.5 kg

技术参数-不锈钢型 Technical Specification - Stainless steel model

					
产品型号 Product model	SD-200Cr	SD-800Cr	SD-3000Cr		
产品特点 Product features	不锈钢材质 Stainless steel material				
应用场合 Applications	腐蚀性介质、锂电行业等 Corrosive media, lithium battery industry, etc				
工作压力 Working pressure	0-1.6 Mpa	0-0.3 Mpa	0.3-1.6 Mpa	0-0.3 Mpa	0.3-0.8 Mpa
最大排水量 Max. discharge volume	12 L/h	100 L/h	90 L/h	900 L/h	900 L/h
适用介质 Applicable media	水、含油冷凝水 Water, Oil-containing condensate				
介质温度 Temperature of medium	1-60 °C				
环境温度 Temperature of ambient	1-60°C				
入口尺寸 Inlet	1 * G1/2"	3 * G1/2"	1 * R1"		
出口尺寸 Outlet	G1/4"	G1/2"	G1/2"		
排放阀类型 Type of discharge valve	电磁阀 Solenoid valve				
排放阀前置过滤网 Front mesh strainer of discharge valve	有 Yes				
容器壳体材质 Material of housing	304 不锈钢 Stainless steel				
手动排水功能 Manual function	有 Yes				
防护等级 Protective class	IP65				
标准电压 Supply voltage options	24V AC/DC、110V AC、220V AC				
报警功能 Alarm function	同时提供 N. O(报警接通) 和 N. C(报警断开) 两种形式的无源触点输出 Two kinds of alarm contacts of normally open(N. O) (switch on when alarm) and normally closed(N. C) (switch off when alarm) are available at the same time				
报警触点负载 Load of alarm contacts	交流电最大负载 62.5VA, 直流电最大负载 60W Max. 62.5VA for alternating current, Max. 60W for direct current				
外形尺寸 长*宽*高 (mm) Overall dimensions L* W * H (mm)	142 * 74 * 117	202 * 110 * 147	444 * 220 * 327		
产品净重 N. W.	1.3 kg	3.8 kg	9.5 kg		

关于智能零气耗排水器的几点说明

A few points about electronic zero air-loss drain

1、关于气堵 About air blockage

排水器在安装使用过程中最常遇到的问题就是冷凝水无法进入储水罐，其主要原因是气堵。

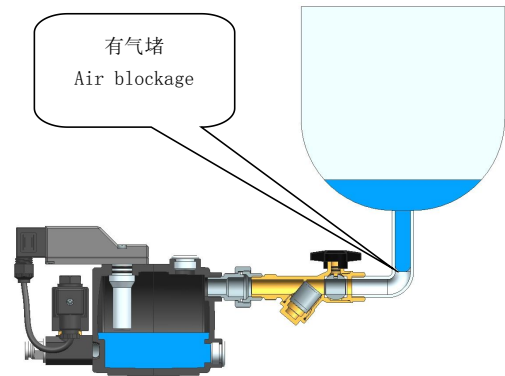
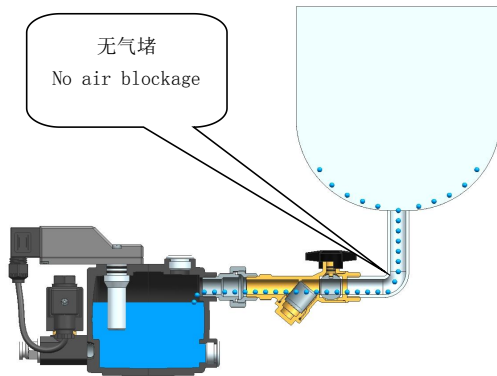
The most common problem encountered in installation and use of drain valves is that condensate can not enter water storage tank, and the main reason is air blockage.

当冷凝水水量较小时，没有气堵，无需加装回路（如下图）。

When amount of condensate water is small, there is no air blockage and no need to set an air balance pipe, as shown in the below figure.

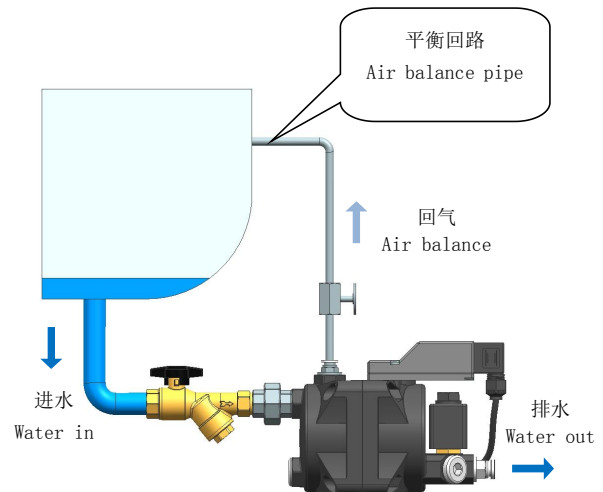
当冷凝水水量较大时，这时产生气堵（如下图），要加装回路，水才能顺利进入罐中。

When amount of condensate water is large, air blockage occurs, as shown in the below figure. It is necessary to set an air balance pipe so that water can enter tank smoothly.



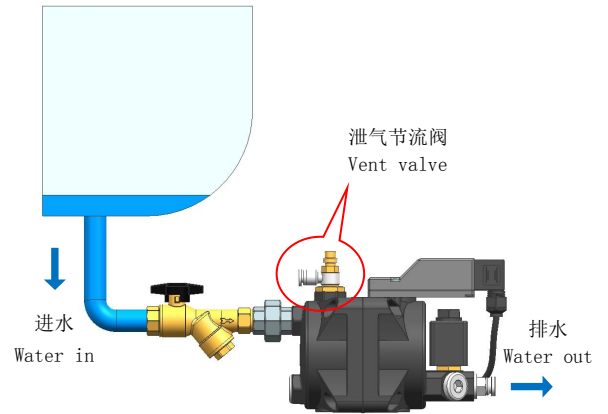
正规的安装方法是排水器要加装平衡回路，且平衡回路上要装手动隔离阀，以便维护时隔离气源（如右图）。

Drain valve should be set an air balance pipe, which is a normal installation method. And manual valve should be set in air balance pipe to isolate air source during maintenance, as shown in the right figure.



在无法安装回路的情况下，作为一种变通方法，可在排水器的回路接口上装一只泄气节流阀，微量跑气，以便冷凝水能够流入储水罐中。该节流阀流量极小，耗气极其微小（如右图）。

In case that it is impossible to set an air balance pipe, as an alternative method, a vent valve can be set in the port used for air balance to allow a small amount of air leakage, so that the condensate water can flow into tank. Flow rate of the vent valve is low and air consumption is extremely small (as shown in the right figure).



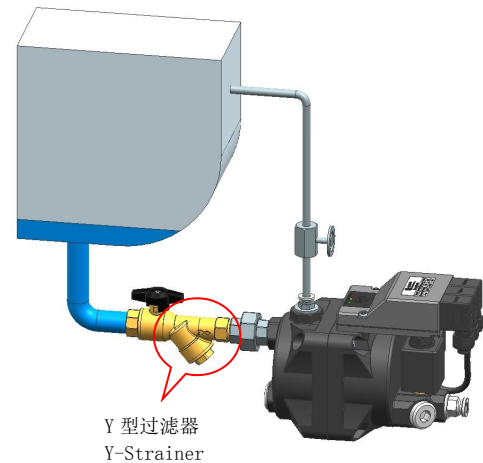
2、关于杂质 About impurities

排水器入水端要装手动球阀和 Y 型过滤器，手动球阀用于隔离气源，Y 型过滤器用于过滤粗大的杂质。

Y 型过滤器的滤网要略微稀疏一些，只需挡住粗大的杂质即可，细小杂质进入储水罐，由排水器内置滤网进行阻挡。如果 Y 型过滤器的滤网过密，有可能堵塞进水通道，形成气堵。

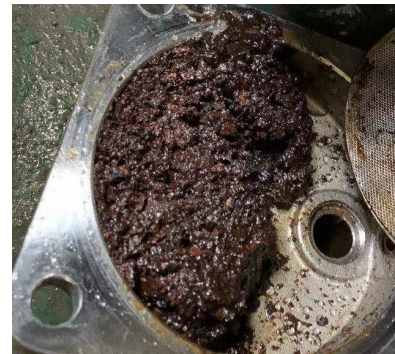
Manual valve and Y-strainer should be set at the condensate inlet pipe of drain valve. Manual valve is used to isolate air source and Y-strainer is used to filter coarse impurities.

The strainer should be slightly sparse. It only needs to block coarse impurities. Small impurities enter tank and are blocked by the inner set strainer of drain valve. If the strainer is too dense, it may block condensate inlet pipe and form air blockage.



不装 Y 型过滤器，可能会有大量粗大杂质直接进入储水罐，造成排水器无法工作，如右图。

Without Y-strainer, a big number of large particles of impurities will enter water storage tank directly, resulting in the failure of drain valve, as shown in the right figure.



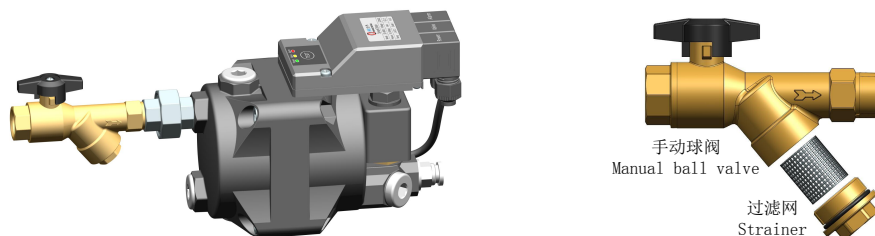
Smart Drain 附件 Accessories

1、零气耗排水器专用球阀过滤器 BVS

Ball Valve Strainer specially for zero air-loss drain

BVS 专为配套零气耗排水器而设计，集手动球阀和过滤器于一体，可阻挡粗大杂质。

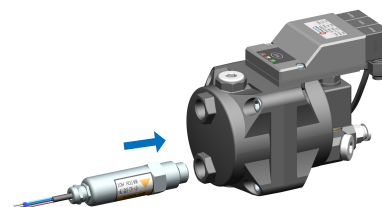
BVS is specially designed for zero air-loss drain, which integrates manual ball valve and filter, block coarse impurities.



2、外置加热棒 External Heating Bar

寒冷地区可配加热棒，低温时自动加热，适温时自动停止，防止排水器中的冷凝水结冰。

A heating bar is used in cold area. It heats at low temperature automatically and stop heating at appropriate temperature to prevent condensate water from freezing.

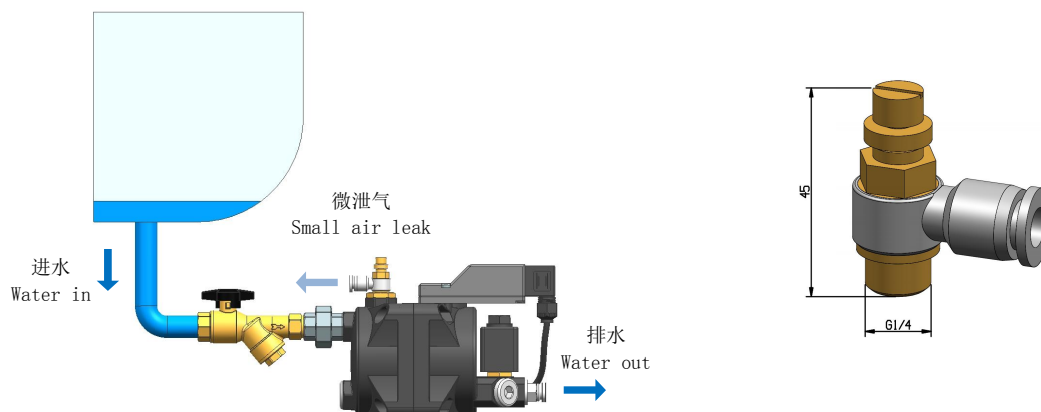


供电电压及相应加热功率 Power supply voltage and corresponding heating power	24VDC (100W) / 110VAC (45W) / 220VAC (80W)
接口尺寸 Thread size	G1/2"
适用温度 Applicable temperature	-40℃ ~ +5℃
温控器参数 Parameter of temperature switch	7℃ ≤ 控制温度 ≤ 30℃ (±5℃) 7℃ ≤ Controlled temperature ≤ 30℃ (±5℃)
壳体材质 Housing material	黄铜镀镍 Nickel-plated brass
电线长度 Cable length	0.7m
产品重量 N. W.	0.38 Kg
接线方式 Connection mode	直流电: 棕色线接正极 (+), 蓝色线接负极 (-)。 Direct current: Brown wire is connected to positive (+) Blue wire is connected to negative (-)
	交流电: 棕色线接火线 (L), 蓝色线接零线 (N), 黄绿双色线接地。 Alternating current: Brown wire is connected to live line (L) Blue wire is connected to neutral line (N) Yellow green double color wire is connected to ground
外形尺寸 Overall dimension	

3、防气堵用泄气节流阀 Vent valve for preventing air blockage

在无法安装回路的情况下，作为一种变通方法，可在排水器的回路接口上装一只泄气节流阀，微量跑气，以便冷凝水能够流入储水罐中。该节流阀流量极小，耗气极其微小（如下图）。

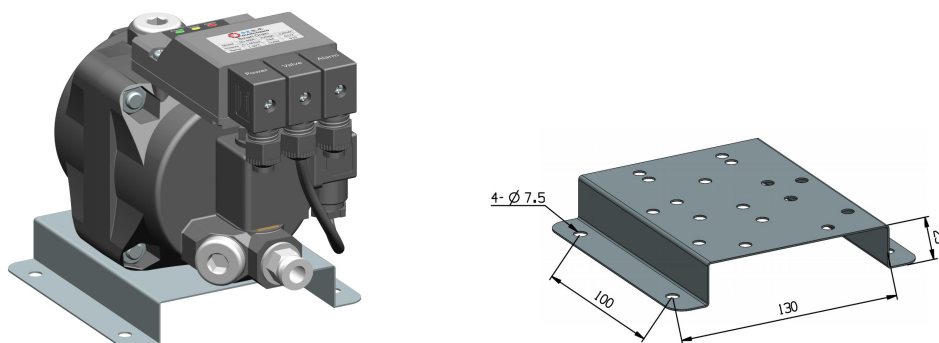
In case that it is impossible to set an air balance pipe, as an alternative method, a vent valve can be set in the port used for air balance to allow a small amount of air leakage, so that the condensate water can flow into tank. Flow rate of the vent valve is low and air consumption is extremely small(as shown in the below figures).



4、安装支架 Mounting Bracket

安装支架可以很方便的将排水器固定在机器内部或者地面上。

Mounting bracket can conveniently fix Smart Drain onto the machine or on the ground.



Smart Drain 使用说明

User's Instruction

在安装和运行之前，请仔细阅读本说明。严格按照说明书的建议进行操作，方可确保您的排水器正常工作。

Please read this instruction carefully before installation and operation. Strictly follow the instructions to ensure normal and effective operation of your drain valve.

1、安全说明 Safety Instruction

- 1.1 不能在危险的环境中使用 Smart Drain 智能排水器（如易燃、易爆环境）；
- 1.2 不能安装在户外没有任何防水措施的地方；
- 1.3 不能连接标贴上规定以外的其他电压；
- 1.4 只能在标贴上规定的工作压力范围内使用，不能超过或低于该工作压力；
- 1.5 不能超过所允许的温度范围（+1 到+60℃），若使用在寒冷地区可选配加热棒；
- 1.6 只能使用耐压材料进行安装；
- 1.7 进水管和排水管必须安装牢固！并保证不要将冷凝水排到人身或物体上；
- 1.8 按照现行安全规范进行电气连接；
- 1.9 不能用测试按钮连续排放冷凝水；
- 1.10 安装或维护之前需确保 Smart Drain 智能排水器处于无气压、断电状态；
- 1.11 只能使用原厂配件，否则不能得到质量保证。

- 1.1 Do not use Smart Drain in dangerous environment (such as flammable or explosive environment);
- 1.2 Can not be installed outdoors without any waterproof;
- 1.3 Do not connect voltage other than specified on the label;
- 1.4 It can only be used within the working pressure range specified on the label, and cannot be higher or lower than the working pressure;
- 1.5 The allowable temperature range (+ 1 to + 60 °C) should not be exceeded. Heating bar can be used for anti-freezing in cold areas;
- 1.6 Only pressure resistant materials can be used for installation;
- 1.7 The inlet and outlet pipes must be installed firmly! And ensure that condensate water is not discharged to persons or objects;
- 1.8 Electrical connection in accordance with current safety specifications;
- 1.9 Test button cannot be used to discharge condensed water continuously;
- 1.10 Before installation or maintenance, ensure that Smart Drain is in a state of no pressure and power off;
- 1.11 Only the parts provided by the original factory can be used, otherwise quality cannot be guaranteed.

如果本型号排水器另作他用或客户未遵守本说明书的规定，那么将不能得到质量保证。

If this type of drain valve is used for other purposes or customer does not comply with the provisions of this manual, then quality will not be guaranteed.

2、安装说明 Installation Instruction

2.1 开箱检验 Open-box inspection

包装内含：

- ①智能排水器
- ②产品合格证
- ③产品说明书

Package includes:

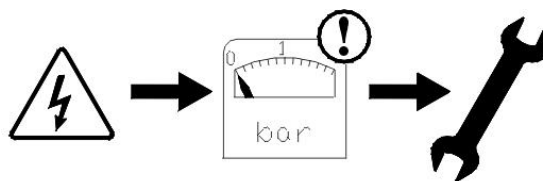
- ①Smart Drain
- ②Qualification certificate
- ③Instruction manual

安装排水器前请确保它符合您的要求，适合您的应用。

Make sure the drain valve meets your requirements and is suitable for your application before installing it.



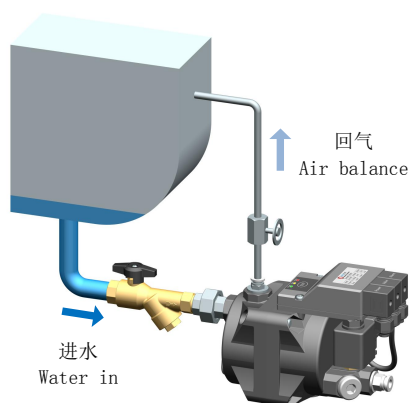
2.2 注意事项 Attention



警告：安装排水器之前，排水器必须处于断电、无气压状态！

Warning: The drain valve must be in a state of power off and no pressure before installing it!

2.3 侧入口进水 Side inlet connection



采用侧入水口连接，需在入口前端加装一根水平的短管，且短管需要往下倾斜 1° - 5° ，以便水能流入排水器腔体内。

若水量大，需要从顶部入口设置回路（排气管）以防气阻。

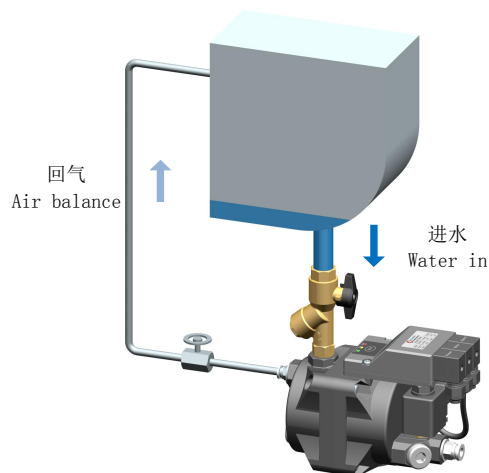
注：部分型号产品没有顶部入水口，只有侧入水口，但在顶部留有一个 $1/4''$ 的回路口。

Using side inlet connection, a short horizontal pipe should be installed at the inlet. And the short pipe needs to be tilted down by 1° - 5° , so that water can flow into the tank.

An air balance pipe from the top inlet is required to prevent air block if the amount of water is larger.

Notes: Some models do not have top inlet, only side inlet, but there is a $1/4''$ port on the top as air balance pipe connection.

2.4 顶部入口进水 Top inlet connection



采用顶部入口连接，若水量少，水可正常流入排水器腔体内，水位到达感应点自动排放；

若水量大，需要从侧入口设置回路（排气管）以防气阻。

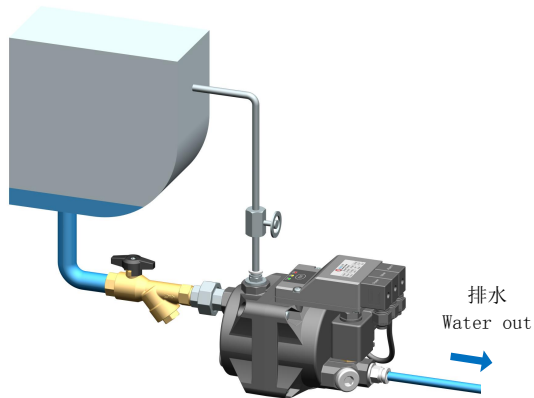
智能排水器入水管道需要安装手动阀和Y型过滤器，回气管道上需要安装手动阀，以便隔离气源和过滤杂质。

Using top inlet connection, water can flow into the tank of drain valve normally if amount of water is smaller. The drain valve will discharge automatically when water level reaches the sensing point.

An air balance pipe from the side inlet is required to prevent air block if amount of water is larger.

Manual valve and Y-strainer should be set in the inlet pipe and manual valve should be set in the air balance pipe, so as to cut off air pressure and filter impurities.

2.5 出水口连接 Outlet connection



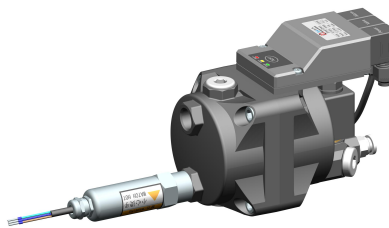
请将出水口连接至污水管道或冷凝水油水分离器中（我有售），排水管安装必须牢固。

为方便用户，我司部分产品出厂时出水口配有快插接头，但只限压力不超过 0.8Mpa 场合，更大压力需拧下快插接头，用 1/2" 内螺纹连接排水管。

Please connect the outlet to the sewage pipe or condensate oil water separator (available at our company). The drain pipe must be installed firmly.

For convenience of users, outlets of some products are equipped with quick-insert connectors, but only for situations where the pressure is not more than 0.8Mpa. For bigger pressure, the quick-insert connector needs to be unscrewed and 1/2" internal thread is used to connect the drain pipe.

2.6 备用接口用途 Use of spare port



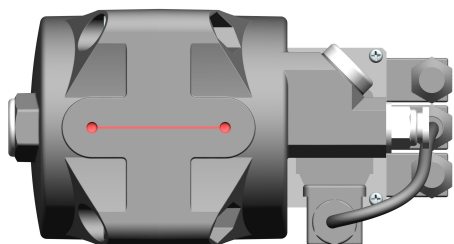
备用接口可安装加热棒（我有售），低温时自动加热，适温时自动停止，防止排水器中的冷凝水结冰。

注：SD-200/200E 没有备用接口，但可选用 T 型转接头安装加热棒。

The spare port can be installed with heating bar (available at our company), which can automatically heat at low temperature and stop heating at appropriate temperature to prevent condensed water in the drain valve from freezing.

Notes: SD-200/200E has no spare port, but a T-adaptor can be used to install heating bar.

2.7 底部固定 Bottom fixing



排水器底部设有两个或四个 M5 的螺纹孔。

由于排水器重量较大，建议客户将排水器完全固定住。

注：SD-200/200E、SD-2800/2800C 底部没有固定螺纹孔。

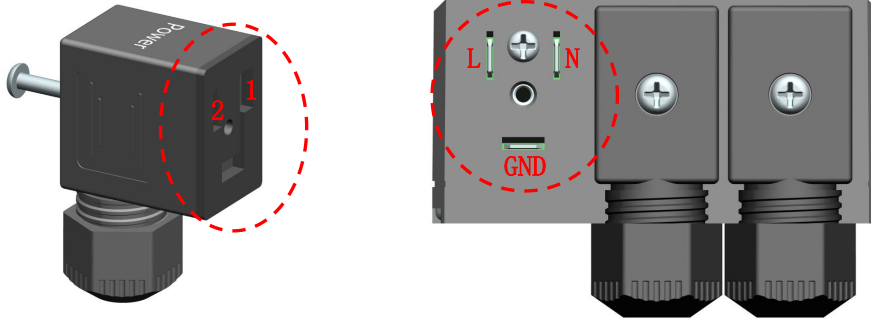
The bottom of the drain valve is provided with two or four M5 threaded holes.

Due to big weight of the drain valve, it is recommended that the users completely fix the drain valve.

Notes: SD-200/200E、SD-2800/2800C have no threaded holes on the bottom.

3、电气连接 Electrical Connection

3.1 电源接线 Connection of power supply



排水器左侧接线盒 (Power) 接电源, 电缆线外径范围 $\phi 5-8\text{mm}$, 剥线长度 7mm。

直流电: 1号插口接正极 (+), 2号插口接负极 (-)。

交流电: 1号插口接火线 L, 2号插口接零线 N, 地线口接地。

接好线后, 锁紧电缆线, 装好密封垫, 锁紧螺钉, 扭力 1.0N.m。

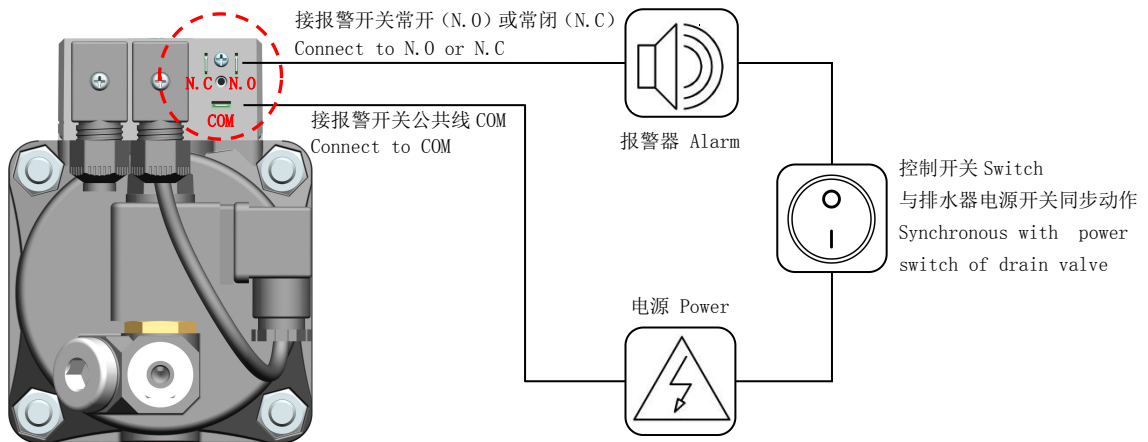
The connector on the left side of the drain valve is connected to power supply, the diameter of the cable ranges between 5-8mm, and the stripping length is 7mm.

For direct current: Terminal 1 is connected to positive (+), terminal 2 is connected to negative (-).

For alternating current: Terminal 1 is connected to live line (L), terminal 2 is connected to neutral line (N), and ground terminal is grounded.

Lock the cable, put the gasket in position, lock the screw at torque of 1.0 N.m after wiring.

3.2 报警接线 Connection of alarm signal



排水器右侧接线盒 (Alarm) 接报警器, 同时提供 N.O (报警接通) 和 N.C (报警断开) 两种形式的无源触点输出。

接好线后, 锁紧电缆线, 装好密封垫, 锁紧螺钉, 扭力 1.0N.m。

The connector on the right side of the drain valve is connected to alarm. Two kinds of alarm contacts of normally open(N.O) (switch on when alarm) and normally closed(N.C) (switch off when alarm) are available at the same time.

Lock the cable, put the gasket in position, lock the screw at torque of 1.0 N.m after wiring.

断电时: COM 与 N.O 接通, 与 N.C 断开

通电时: COM 与 N.O 断开, 与 N.C 接通

报警时: COM 与 N.O 接通, 与 N.C 断开

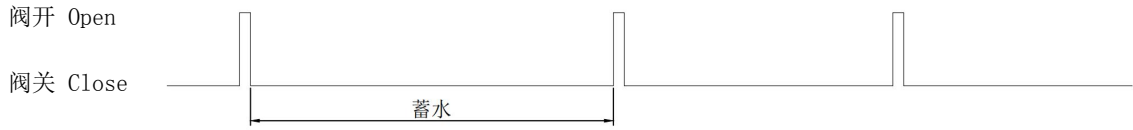
COM is connected to N.O and disconnected from N.C when power-off

COM is disconnected from N.O and connected to N.C when power-on

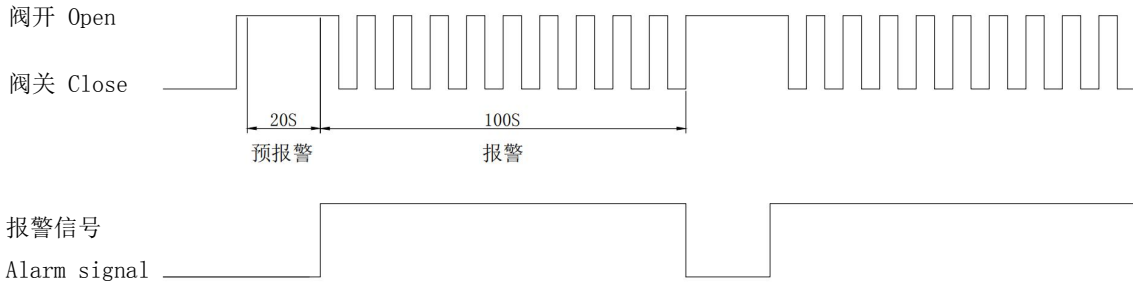
COM is connected to N.O and disconnected from N.C when alarm

3.3 报警模式说明 Description of alarm mode

排水器正常工作模式 Normal working mode of drain valve



遇到故障时，进入报警模式 Enter alarm mode in case of failure



排水器正常工作时水位到了感应点，自动排放一次，水位下降，再蓄水进入下一循环。

当水位达到感应点，排放一次，水位持续未下降，则进入 20 秒预报警模式，接着会进入 100 秒报警模式：面板上的 Alarm 红色报警指示灯变亮；外接报警装置开始报警。以上过程中，只要水位下降，则立即退出以上模式，转为正常工作状态。

When water level reaches the sensing point, water will be discharged automatically once, water level will drop down, and then the drain comes into next working cycle.

When water level reaches the sensing point, discharge once, water level has not dropped down continuously, the drain enters 20S pre-alarm mode, then enters 100S alarm mode: the red alarm indicator on the panel will light up and the external alarm starts alarming. In the above process, as long as the water level drops down, the drain will immediately withdraw from the above-mentioned mode, enters normal working state.

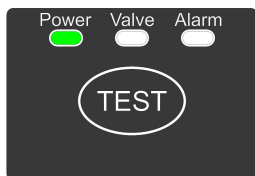
故障可能产生的原因

- 冷凝水产生量过多，超过最大排水量
- 排水管堵塞或被关闭
- 极多的颗粒杂质
- 阀门故障，不动作

Possible causes of failure

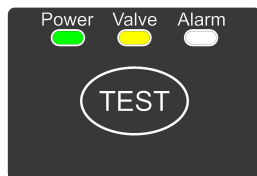
- Excessive volume of condensed water, exceeding Maximum discharge volume
- Drain pipe is blocked or closed
- Large amount of particulate impurities
- Valve failure, no action

3.4 控制面板说明 Control panel description



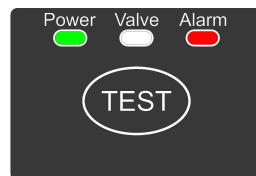
① 电源开启，进入工作状态

Power on, enter working state



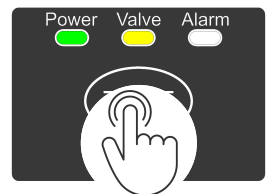
② 排水器阀门打开，排放冷凝水

Drain valve open, discharge condensate



③ 出现故障，报警模式激活

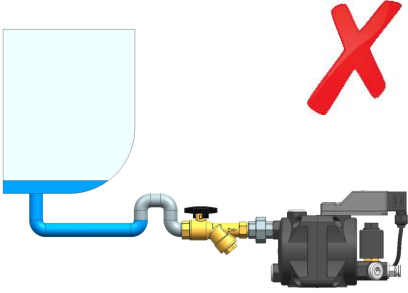
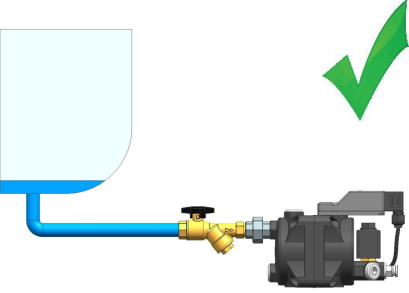
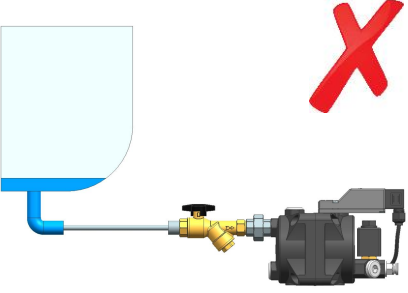
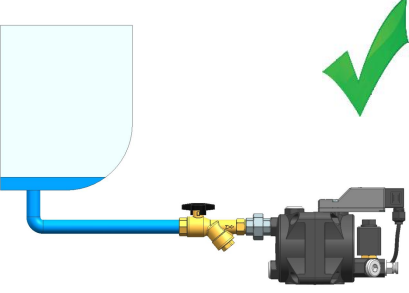
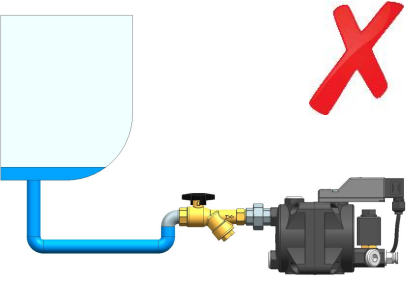
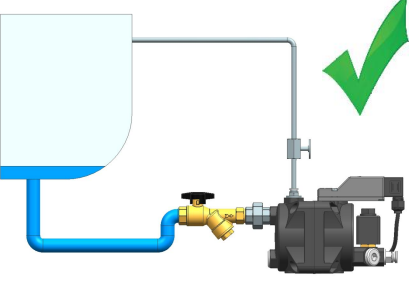
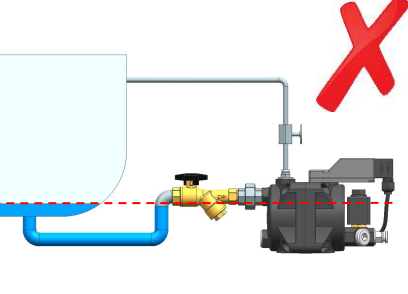
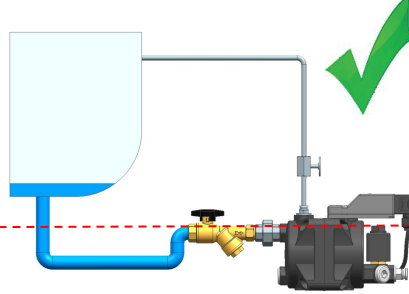
Valve failure, activate alarm mode



④ 手动按 TEST 排水，检测排水器功能

Push TEST to check drain valve

4、其它安装注意事项 Installation Precautions

 <p>小水量，入水管过于曲折，形成气堵 Small amount of water, inlet pipe is too tortuous, create air blockage</p>	 <p>小水量，入水管简捷，没有气堵 Small amount of water, simple inlet pipe, no air blockage</p>	<p>4.1 冷凝水进水管必须保持连续向下倾斜。 水平管需要往下倾斜1°~5°。 Condensate inlet pipe must be kept downwards sloping continuously. The horizontal pipe needs to be tilted down by 1°~5°.</p>
 <p>小水量，入水管突然变窄，形成气堵 Small amount of water, inlet pipe narrows suddenly, create air blockage</p>	 <p>小水量，入水管足够宽，没有气堵 Small amount of water, inlet pipe is wide enough, no air blockage</p>	<p>4.2 冷凝水进水管必须保证管道尺寸一致，建议管道内径≥13mm。 The condensate water inlet pipe must be at same size, and it is recommended that the inner diameter of the pipe be ≥ 13mm.</p>
 <p>大水量，产生气堵 Large amount of water, air-block occurs</p>	 <p>大水量，安装回路，气堵消除 Large amount of water with air balance pipe, no air blockage</p>	<p>4.3 如果安装空间受限，或者水量大时，导致冷凝水不能顺畅流入排水器内，则需要设置回路（排气管）。 An air balance pipe should be set if condensate cannot flow smoothly into the drain valve due to limited installation space or large amount of water.</p>
 <p>排水器入水口高于容器内水位 Inlet of drain valve is above the water level in container</p>	 <p>排水器入水口低于容器内水位 Inlet of drain valve is below the water level in container</p>	<p>4.4 排水器上冷凝水入口应低于储气罐或容器的最低点。 The inlet of condensate water shall be below the lowest point of the air tank or container.</p>

5、维修保养 Maintenance

维护建议

Maintenance advice

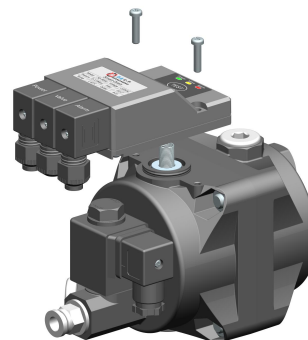
- 定期按下 TEST 按键，检测排水器功能。
 - 储水罐和过滤网每年至少清理一次，冷凝水杂质多的工况需要增加清理次数，必要时更换易损件。
- Push TEST regularly to check drain valve.
- The water storage tank and strainer should be cleaned at least once a year. Number of cleaning times shall be increased for the working condition with lots of impurities. Wearing parts shall be replaced when necessary.

5.1 控制器组件更换

Controller assembly replacement

在断电、无气压状态下使用十字起拧开控制器上面的两颗 M5 锁紧螺钉，取下控制器组件，更换该组件。

Under the condition of power off and no pressure, unscrew the two M5 screws in the controller, remove controller assembly, and replace it.

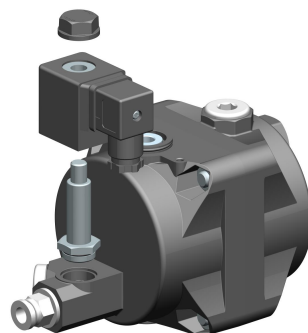


5.2 电磁阀组件更换

Solenoid valve assembly replacement

在断电、无气压状态下依次拆下线圈和阀芯，更换电磁阀组件。

Under the condition of power off and no pressure, disassemble coil and valve kit, replace assembly of solenoid valve.



5.3 滤网清洗

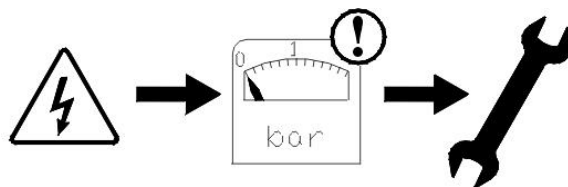
Strainer cleaning

在断电、无气压状态下使用 10mm 内六角扳手拧开滤网堵头，清理滤网。

Under the condition of power off and no pressure, unscrew strainer plug by inner hex wrench of 10mm, clean strainer.



6、拆解说明 Instructions for Disassemble

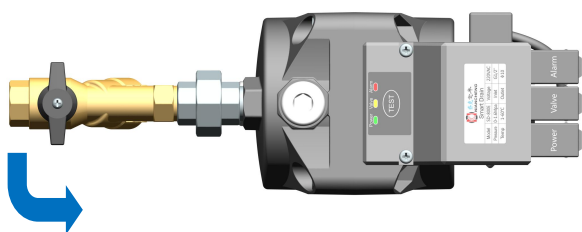


警告：清理排水器之前，排水器必须处于断电、无气压状态！

Warning: The drain valve must be in a state of power off and no pressure before cleaning it!

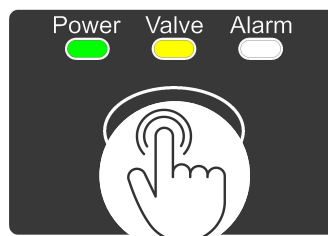
6.1 关闭冷凝水入口，即关闭安装在排水器前面的手阀，同时关闭回气管手阀。

Close manual valves in the pipes of inlet and air balance.



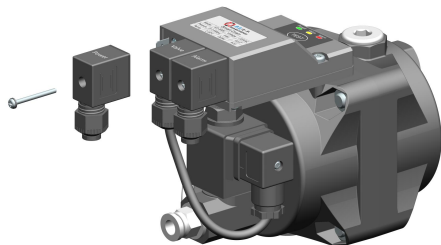
6.2 按下面板上的 TEST 按钮，排除储水罐中的残余压力。

Push TEST to depressure the tank.



6.3 拔掉电源接线盒，断电，控制面板上的电源指示灯灭掉。

Unplug the power connector to turn off the power, and the power indicator on the control panel goes out.



6.4 按照维修保养的拆解方式拆解控制器、电磁阀以及储水罐，将储水罐清洗干净后依次按顺序组装好。

组合完好后通电、打开冷凝水入口，查看密封处是否有泄露现象。

按下面板上的 TEST 按钮，检测排水器能否正常工作。

Disassemble the controller, solenoid valve and water storage tank according to the disassembly method of maintenance. Clean the strainer and assemble it in order.

Turn on power and open the inlet ball valve after assembling is complete, check whether there is leakage at the sealing place or not.

Check whether the drain valve is working properly or not by pushing TEST.

7、故障与维修 Failure and Maintenance

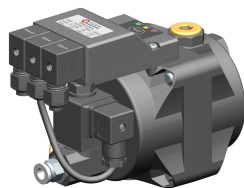
	<p>面板 LED 灯不亮 The panel LED doesn't light up</p>		<p>按下测试按钮, Valve 指示灯亮, 无冷凝水排放 Push TEST, Valve indicator is on, no condensate water is discharged</p>
<p>可能原因:</p> <ul style="list-style-type: none"> • 电源未接好 • 电路板故障 <p>possible cause</p> <ul style="list-style-type: none"> • The power is not properly connected • PCB fault 	<p>排除方法:</p> <ul style="list-style-type: none"> • 检查标牌电压值 • 检查插头和电源线连接情况 <p>elimination methods</p> <ul style="list-style-type: none"> • Check voltage on the label • Check the connection between plug and power cord 	<p>可能原因:</p> <ul style="list-style-type: none"> • 入水管道阀门关闭 • 电路板故障 • 电磁阀故障 <p>possible cause</p> <ul style="list-style-type: none"> • Inlet manual valve is closed • PCB fault • Solenoid valve fault 	<p>排除方法:</p> <ul style="list-style-type: none"> • 检查入水管道阀门 • 按测试键, 检查能否听见电磁阀动作“咔哒”声 <p>elimination methods</p> <ul style="list-style-type: none"> • Check inlet manual valve • Check whether you can hear the click of solenoid valve by pushing TEST
	<p>只有按下测试按钮, 才排放冷凝水 The drain valve discharges condensate water only by pushing TEST</p>		<p>持续排放压缩空气 Continuous discharge of compressed air</p>
<p>可能原因:</p> <ul style="list-style-type: none"> • 入水管道有气阻, 冷凝水进入不到排水器内 • 传感器被油污覆盖 <p>possible cause</p> <ul style="list-style-type: none"> • condensate water cannot enter the drain valve because there is air blockage in the inlet pipe • The sensor is covered with lubrication 	<p>排除方法:</p> <ul style="list-style-type: none"> • 调整入水管道或安装回气管 • 清洗传感器套管 <p>elimination methods</p> <ul style="list-style-type: none"> • Adjust inlet pipe or set an air balance pipe • Clean sensor 	<p>可能原因:</p> <ul style="list-style-type: none"> • 阀嘴、阀芯异物卡住 • 阀芯胶头磨损 • 传感器被油污覆盖 <p>possible cause</p> <ul style="list-style-type: none"> • Solenoid valve is stuck by impurities • Valve seal wears • The sensor is covered with lubrication 	<p>排除方法:</p> <ul style="list-style-type: none"> • 清洗或更换电磁阀组件 • 清洗传感器套管 <p>elimination methods</p> <ul style="list-style-type: none"> • Clean or replace solenoid valve assembly • Clean sensor

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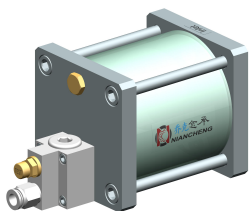
Smart Drain

智能零气耗排水器
Zero Air-loss Drain



X-drain

智能零气耗排水器
Zero Air-loss Drain

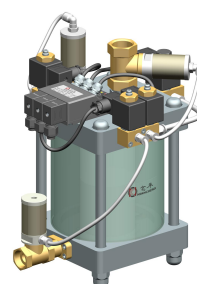


Mag-drain

气动零气耗排水器
Pneumatic Drain

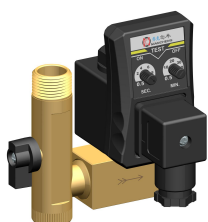


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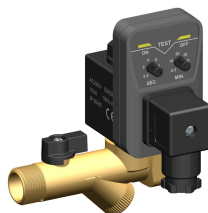
Vac-drain

真空排水器
Vacuum Drain



Mic-drain

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