

Wilo-DrainLift SANI-S



zh-CHS 安装及操作说明

en Installation and operating instructions



Chinese (simplified).....	4
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1 概述

1.1 关于本说明书

本说明书是产品的固定组成部分。遵守本说明书中列出的要求和操作步骤，是按规定使用及正确操作产品的前提条件：

- 在执行所有工作前或使用产品前请仔细阅读本说明书。
- 请妥善保管说明书，以备随时使用。
- 另外注意遵守产品上标注的所有产品相关参数和标识。

原版操作说明书以德语撰写。所有其它语种的说明书均为其翻译件。

1.2 版权

本说明书的版权归Wilo所有。所有内容禁止以任何形式：

- 翻版。
- 传播。
- 出于竞争目的非法使用。

Wilo保留更改所述数据的权利，恕不另行通知，对于技术性描述不准确和/或遗漏不承担任何责任。

1.3 保留更改权力

Wilo保留对产品以及单个部件进行技术变更的权利。说明书中使用的图片可能与实际设备存在偏差，仅用于举例介绍产品。

1.4 保修和免责声明

Wilo对于如下情况，不承担任何保修义务或责任：

- 由于运营者或委托方提供的数据存在缺陷或者错误，导致出现配置欠缺问题
- 不遵守本说明书的内容
- 未按规定使用
- 不按规范存放或运输
- 错误安装或拆卸
- 缺乏维护
- 无授权维修
- 安装基础有缺陷
- 化学、电气或电化学影响
- 磨损

2 安全

本章节主要介绍各生命阶段适用的基础提示信息。不遵守提示会导致下列危险：

- 电气、机械和细菌作用以及电磁场危害人身安全
- 有害物质泄漏会污染环境
- 物资损失
- 产品重要功能失灵

不遵守提示信息会导致丧失索赔权利。

此外也应遵守其他章节列出的各项指导说明和安全说明！

2.1 安全说明的标识

本安装及操作说明针对物资损失和人身安全问题列举了多项安全说明。其表现形式各有不同：

- 涉及到人身安全问题的安全说明以一个信号词作为开端，配套使用相应的符号并使用灰色作为背景色。



危险

危险类型和危险源！

危险产生的影响以及避免危险说明。

- 涉及到物资损失问题的安全说明也以一个信号词作为开端，但是没有符号。

小心

危险类型和危险源！

影响或信息。

信号词

- 危险！
- 如不注意，会导致死亡或重伤！

- 警告！
如不注意，可能导致人员受伤（重伤）！
- 小心！
如不遵守，可能造成物资损失，甚至导致全损。
- 提示！
操作产品时有用的注意事项

文本说明

- ✓ 前提条件
 1. 操作步骤/细目列举
 - ⇒ 提示/指导
 - 结果

图标

在本说明书中使用以下图标：



电击危险



细菌感染危险



爆炸危险



高温表面警告



个人防护装备：戴安全头盔



个人防护装备：穿劳保鞋



个人防护装备：戴防护手套



个人防护装备：佩戴口罩



个人防护装备：戴护目镜



禁止独自工作！必须两人在场。



实用注意事项



2.2 工作人员资格鉴定

- 电气作业：受过培训的专业电工
是指接受过相关培训，具备所需知识和经验，能够发现并且规避电力危险的人员。
- 安装/拆卸工作：受过培训的卫生设施系统技术专家
固定件和抗浮措施，连接塑料管
- 保养工作：专业人员（受过培训的卫生设施系统技术专家）
污水造成的危害，提升系统的基础知识，EN 12056 要求
- 工作人员必须了解当地现行的事故防范规定。
- 工作人员已阅读安装及操作说明并且理解其中内容。

2.3 电气作业

- 电气作业由专业电工负责执行。
- 将产品断电并采取安全措施防止意外接通。
- 通电时注意遵守当地相关法规。
- 注意遵守当地能源供应公司的相关规定。
- 将电气连接方式等知识告知相关人员。
- 告知相关人员如何关闭产品。
- 遵守本安装及操作说明以及铭牌上给出的技术参数。
- 将产品接地。
- 安装开关设备时，注意使其具有防溢流特性。
- 更换损坏的接线电缆。请咨询客户服务部。

2.4 监控设备

安装方必须准备下列监控设备：

断路器

断路器的规格和开关属性取决于所连接产品的额定电流。注意遵守当地相关法规。

漏电断路器 (RCD)

- 根据当地能源供应公司的规定安装漏电断路器 (RCD)。
- 如果人员可能接触到产品和导电液体，则安装漏电断路器 (RCD)。

2.5 泵送危害健康的流体

接触危害健康的流体可能导致细菌感染危险！拆卸过程中以及再次使用之前，应该彻底清洁蓄水罐并进行消毒。确保以下几点：

- 进行蓄水罐清洁时，穿戴下列防护装备：
 - 封闭式护目镜
 - 氧气面罩
 - 防护手套
- 告知所有工作人员，流体会导致危险，并普及正确的流体处理方法！

2.6 集水箱中的易爆环境

含有粪便的污水会导致蓄水罐中积聚气体。如果安装或维护工作不当，这些积聚气体会泄漏到运行空间中并形成易爆环境。这种环境易燃并可导致爆炸。因此请注意以下几点，以避免易爆环境：

- 蓄水罐不得出现任何损坏迹象（裂纹、泄漏、多孔材料）！停止运行损坏的提升系统。
- 按照规定连接入口、压力管路和通风排气的所有连接，不得泄漏！
- 排气和通风管路穿过屋顶。
- 如果打开了蓄水罐（例如在维护工作中），请确保进行适当的空气交换！

2.7 运输

- 注意穿戴以下防护装备：
 - 安全鞋
 - 安全头盔（使用提升设备的情况下）
- 遵从当地有关作业安全和事故防范措施的现行法律法规。
- 搬动产品时抓住蓄水罐。不得拉扯接线电缆！
- 重量大于 50 kg (110 lbs) 的产品必须由两个人一起运输。原则上建议安排两名人员进行运输。
- 使用提升设备时注意以下几点：
 - 只使用合法且获得认证的升降装置和提升装置。
 - 根据实际情况（天气、吊装孔、负载等）选择提升装置。
 - 检查提升装置是否已牢固地固定好。
 - 确保升降装置的稳定性。
 - 如果需要（比如视线受阻），安排另外一位工作人员负责协调。
 - 人员不得在悬挂物下停留。悬挂物切勿从有人员停留的工作位置上方经过。

2.8 安装/拆卸工作

- 注意穿戴以下防护装备：
 - 安全鞋
 - 安全手套，用以预防切割伤害
 - 遵从当地有关作业安全和事故防范措施的现行法律法规。
 - 将产品断电并采取安全措施防止意外接通。
 - 锁闭入口和排放压力管。
 - 密闭空间保持通风顺畅。
 - 在密闭空间内作业时，为安全起见，必须有第二个人在场。
 - 在密闭的室内或建筑内有毒气体或窒息气体会不断聚集。遵守工作规程要求的保护措施，例如随身携带气体报警设备。
 - 彻底清洁产品。
- 警告！穿着不当和使用易燃的清洁剂会引起火灾危险！**

清洁塑料件时可能会产生静电。有着火危险！仅穿着防静电服装，不使用易燃的清洁剂。

2.9 运行期间

- 打开入口和排放压力管中的所有闸阀！
- 最大入口流量小于系统的最高输出量。
- 不要打开检视窗！
- 确保排气！

不允许的操作方式和过大负荷会导致提升系统损坏。严格遵守以下使用极限：

- 每小时最大入口流量：1500 l (396 US.liq.gal)
- 最高正吸入压头：5 m (16 ft)
- 排放管路中的最大压力：2.5 bar (36 psi)
- 流体温度：3 ...40 °C (37 ...104 °F)，最高 65 °C (149 °F) 持续 5 min
- 环境温度：3 ...40 °C (37 ...104 °F)

小心

蓄水罐中过压！

如果蓄水罐中出现过压，则蓄水罐可能破裂。为了避免过压，请注意以下几点：

- 最高正吸入压头为 5 m (16.5 ft)
- 最大入口流量必须小于工况点中的最大流量！

2.10 维护工作

- 维护工作只能由专业人员（受过培训的卫生设施系统技术专家）进行。
- 注意穿戴以下防护装备：
 - 封闭式护目镜
 - 安全手套，用以预防切割伤害
 - 安全鞋
- 将产品断电并采取安全措施防止意外接通。
- 锁闭入口和排放压力管。
- 只使用生产商提供的原装部件。由于使用非原装部件而造成的任何损失，生产商概不承担任何责任。
- 一旦发生流体和工作介质泄露事故，立即收集泄漏物并按照当地现行法规进行废弃处理。
- 彻底清洁产品。

警告！穿着不当和使用易燃的清洁剂会引起火灾危险！

清洁塑料件时可能会产生静电。有着火危险！仅穿着防静电服装，不使用易燃的清洁剂。

2.11 运营者的责任

- 为工作人员提供以其母语写成的安装及操作说明。
- 为工作人员提供必要的培训，确保其能胜任指派的工作。
- 提供防护装备。保证工作人员穿戴防护装备。
- 使产品上安装的安全和信息标志牌长期保持清晰可读状态。
- 使工作人员了解设备的功能原理。
- 谨防触电危险。
- 标记并封锁工作区域。

处理产品时注意以下几点：

- 禁止 16 岁以下人员处理。
- 18 岁以下人员需由专业人员监督！
- 禁止身体、感官或精神上能力不足的人员处理该产品！

3 应用/使用

3.1 规定用途

泵送含有粪便的污水：

- 如果污水无法通过自然回落进入下水道系统。
- 当排放点在回流水位之下时用于排水，确保不会回水。

注意！如果泵送含油脂的污水，则在提升系统前安装隔油池！

用于腐蚀性液体的规格 (SANI...C) 适用于泵送以下流体：

- 氯化物含量不超过 1.2 mg/l 的游泳池水
- pH 值在 5 至 12 之间的腐蚀性污水：
 - 雨水（注意遵守当地相关法规，例如 DIN 1986-100）
 - 清洁剂、消毒剂、洗涤剂 and 去污剂
 - 冷凝锅炉技术中的冷凝水

3.2 未按规定使用

小心！集水箱中的流体不得超过或低于 5 到 12 的 pH 值！



危险

导入爆炸性流体会导致爆炸！

严禁以纯粹的形态导入易燃易爆的流体（汽油、煤油等）。爆炸导致生命危险！提升系统不是针对这类流体设计出的产品。

不要导入以下流体：

- 高于回流水位，能够通过自由回落排水的排水物中流出的污水。
- 粗石、灰尘、垃圾、玻璃、沙子、石膏、水泥、石灰、灰泥、纤维材料、纺织品、纸巾、湿抹布（无纺布、湿厕纸等）、尿布、板纸、粗纸、合成树脂、焦油、厨房垃圾、脂、油
- 屠宰场垃圾、动物尸体处理垃圾和畜牧业垃圾（粪水等）
- 侵蚀性、腐蚀性和有毒流体，比如重金属、杀菌剂、杀虫剂、酸液、碱液、盐水、游泳池水等
- 含有过量清洁剂、消毒剂、洗涤剂 and 去污剂的流体，以及包含过量泡沫的流体
- 饮用水

符合规定的使用还包括遵守本说明的规定。任何超出规定范围的应用均视为不合规定。

4 产品说明

4.1 结构



Fig. 1: 概述

紧凑、即连即用、完全潜水式的单头泵提升系统，用于泵送含有粪便的污水。

1	集水箱
2	集水箱检视窗
3	集水箱的通风和排气连接
4	压力连接
5	止回阀检视窗
6	握手凹槽
7	紧急清空接口
8	电机

气密和防水的集水箱，带倾斜的流入收集空间和有透明盖的检视窗。入口可自由选择，利用模拟输出信号 4...20 mA 实现液位监测。压力连接加装了带检视窗的止回阀。

通过表面冷却的电机驱动，带电机过热保护。

用于自动运行的预安装开关设备：

- Wilo-Control MS-L**
 - 利用无电势触点发出系统故障信号
 - 独立于电网的集成式报警装置
 - 可调节的空转时间
- Wilo-Control EC-L**
 - 通过显示屏和基于图标、字母数字的菜单操作
 - 利用无电势触点发出系统故障信号
 - 利用无电势触点发出独立故障信号
 - ModBus 接口
 - 独立于电网的集成式报警装置
 - 可调节的空转时间
- 材料**
 - 电机外壳：1.4404 (AISI 316L)
 - 水力部件：PP-GF30
 - 叶轮：PP-GF30
 - 蓄水罐：PE
 - 止回阀：PPS

4.2 材料

4.3 监控设备

电机绕组监控

电机配备有一个利用双金属片实现的电机过热监测装置：

- 单相交流电机：电机监测装置是自开关型。在过热时电机关闭。电机冷却后自动重启。
- 三相交流电机：通过所连接的开关设备显示和复位电机监测装置。

带系统故障信号的高液位警报

如果达到高水位，则发出声学 and 视觉上的警报信号。强制启动水泵。此外，系统故障信号触点被激活。通过该无电势触点可以触发外部报警（蜂鸣器、通过 SmartHome 连接的 SMS）。

如果低于高水位，将在空转时间结束之后关闭水泵。警报信号将自动确认。

4.4 功能原理

产生的污水通过进水管导入集水箱中收集。如果水位达到了激活液位，则水泵开启。收集的污水将输送到所连接的压力管中。如果达到了关闭液位，水泵在设定的空转时间过后关闭。

如果达到了高水位，则水泵开启（强制启动）。通过高水位 LED 或显示屏显示警报信息。通过内部蜂鸣器可发出声音警报信号。此外，系统故障信号 (SSM) 的输出端激活。

4.5 使用变频器运行

运行时不允许使用变频器。

4.6 型号代码

比如：**DrainLift SANI-S.11M/3C**

DrainLift	产品系列
SANI	污水提升系统
S	结构尺寸
11	最大扬程
M	电源连接： → M = 1~ → T = 3~
3	电机和开关设备规格： → 1 = 运行模式：S3，开关设备：Control MS-L → 3 = 运行模式：S3，开关设备：Control EC-L
C	用于腐蚀性液体的规格

4.7 技术数据

允许的应用领域	
每小时最大入口流量	1500 l (396 US.liq.gal.)
压力管中的最大压力	2.5 bar (36 psi)
最大扬程	见铭牌
最大流量	见铭牌
最高正吸入压头	5 m (16.5 ft)
介质温度	3 ...40 °C (37 ...104 °F)，最高 65 °C (149 °F) 持续 5 min
环境温度	3 ...40 °C (37 ...104 °F)
电机数据	
电源连接	→ SANI-S...M/...:1~230 V, 50 Hz → SANI-S...T/...:3~400 V, 50 Hz
功耗 [P ₁]	见铭牌
电机额定功率 [P ₂]	见铭牌
额定电流 [I _N]	见铭牌
转速 [n]	见铭牌
启动方式	直接

运行模式	S3 10%/60 s → 工作循环持续时间：60 s → 激活持续时间：6 s → 休止状态时间：54 s
防护等级	IP68
至插头的电缆长度	1.5 m (5 ft)
至开关设备的电缆长度	→ SANI-S.../1...:4 m (13 ft) → SANI-S.../3C...:10 m (33 ft)
插头	→ 单相交流电：Schuko 插头 → 三相交流电：CEE 16A, 3P+N+PE, 6h
连接	
压力连接	DN 80, PN 10
输送接口	DN 100/150
集水箱的通风和排气连接	50 mm (2 in)
紧急清空接口	DN 50
尺寸和重量	
总容积	47 l (12.5 US.liq.gal.)
基于正吸入压头的最大有效容积*	25 l/6.5 US.liq.gal.(180 mm*)/32 l/8.5 US.liq.gal. (250 mm*)
对角尺寸	630 mm (25 in)
重量	28 kg (62 lb)

系统不是为连续运行而设计的！最大流量适用于断续周期工作方式 S3！

4.8 供货范围

- 带开关设备的提升系统和带插头的接线电缆
- 法兰套管接头 DN 80/100
- 用于压力连接的轴环 DN 100
- HT 双头接合套筒 50 mm (2 in) 用于通风连接
- HT 双头接合套筒 DN 50 用于排空接口
- 带孔锯 124 mm (5 in) 和密封 DN 100 的入口套件
- 地板固定件
- 阻尼保护垫
- 9 V 蓄电池
- 操作和维护手册

4.9 附件

- 出口侧
- 法兰套管 DN 80, 用于连接压力管 DN 80
 - 法兰闸阀 DN 80, 铸造而成, 具有平垫片和安装材料
- 入口侧
- 闸阀 DN 100/DN 150, 塑料制成, 具有固定管端
 - 入口密封 DN 100/DN 150
 - 入口套件 (密封垫和锯) DN 100/DN 150

- 概述
- 配备 R 1½ 接口的手动隔膜泵 (无软管)
 - 三通截止阀, 用于切换为手动抽吸
 - 蜂鸣器 230 V, 50 Hz
 - 闪光灯 230 V, 50 Hz
 - 信号灯 230 V, 50 Hz
 - SmartHome 无线发送器, 用于与 Wilo wibutler 联网

5 运输和存放
5.1 交货

收到货物之后, 必须立刻检查货物有无缺陷 (损坏、完整性)。如有缺陷, 必须标注在运单上！此外还必须在到货当天, 将损坏情况告知运输公司或者生产商。如果不在当天通知, 就会丧失索赔权利。

5.2 运输



警告

不佩戴防护装备会导致脚受伤！

工作时存在（严重）受伤危险。穿安全鞋！

为了避免提升系统在运输途中受损，到达使用地之后再拆除包装。发运使用过的提升系统时，必须使用尺寸足够大而且不易撕破的塑料袋进行包装，包装时注意收口。

- 集水箱上有两个提手袋用于运输。
- 不得拉扯接线电缆！
- 建议安排两名人员进行运输。
- 遵守包装规定：
 - 抗撞击
 - 确保产品固定。
 - 防尘、防油、防潮。

5.3 存放



危险

危害健康的流体会导致危险！对提升系统进行消毒！

拆卸后和执行所有其他工作前，需要对提升系统进行消毒处理！有生命危险！遵守工作规程的相关规定！运营者必须保证工作人员已经收到并阅读工作规程！

小心

渗入湿气导致全损

液体进入接线电缆会损坏电缆和电机！切勿将接线电缆敞开的端部浸入液体中，存放时须将其牢牢封住以防水。

新的提升系统到货后，可以存放一年。更长时间的存放请咨询客户服务部。

存放时注意以下几点：

- 将提升系统放置在坚固的基底上并固定好，防止其翻倒或滑倒！
- 允许的存储温度：-15 ...60 °C (5 ...140 °F)，最高空气湿度：90 %，非冷凝。建议存储在无霜冻的环境中。存储温度：5 ...25 °C (41 ...77 °F)，相对空气湿度：40 ...50 %。
- 将集水箱完全排水。
- 将接线电缆捆扎成卷，固定在电机上。
- 封住接线电缆的敞开端和插头，要求达到防水效果。
- 按照说明存放开关设备。
- 牢牢封住所有敞开的套管。
- 切勿在执行焊接作业的室内存放提升系统。因为焊接时形成的气体或辐射可能侵蚀塑料件和弹性体零件。
- 保护提升系统免受阳光直射和热侵蚀。外部热量可能导致塑料件受损！
- 弹性体零件会自然脆化。如果存放时间超过 6 个月，必须咨询客户服务部。

6 安装及电气连接

6.1 工作人员资格鉴定

- 电气作业：受过培训的专业电工
是指接受过相关培训，具备所需知识和经验，能够发现并且规避电力危险的人员。
- 安装/拆卸工作：受过培训的卫生设施系统技术专家
固定件和抗浮措施，连接塑料管

6.2 安装方式

- 落地式安装在建筑物内部
- 隐藏落地式安装在建筑物外的集水坑内

6.3 运营者的责任

- 遵守本地现行的事故防范规定和安全规定。
- 使用提升设备时遵守在悬挂物之下工作的所有法律法规。
- 提供防护装备。保证工作人员穿戴防护装备。
- 运行污水处理技术设备时，注意遵守当地实施的废水处理技术法规。

- 建筑/地基必须具有足够的强度，这样才能安全可靠地固定并确保功能正常。准备建筑/地基并保证其适用性，是运营者的责任！
- 确保安放位置畅通无阻。
- 按照当地适用的法规进行安装。
- 检查现有的咨询文件（安装图、安放位置、入口条件）是否齐全和正确。
- 根据咨询文件铺设和准备管路。
- 电源连接应该具有防溢流特性。

6.4 安装



警告

不佩戴防护装备会导致手脚受伤！

工作时存在（严重）受伤危险。穿戴以下防护装备：

- 安全手套
- 安全鞋

建筑布局

- 运行空间保持通风顺畅。
- 系统周围至少留出 60 cm (2 ft) 的自由空间。
- 事故案例：运行空间内设有泵井，最小尺寸：500x500x500 mm (20x20x20 in)。相应选择水泵。可以手动排水。
- 按规定铺设所有接线电缆。接线电缆不得引发任何危险（绊倒危险，运行中损坏）。检查电缆横截面和电缆长度对于选择的铺设方式来说是否足够。
- 安装的开关设备不具有防溢流特性。在足够高的位置安装开关设备。注意正确操作！

在集水坑中安装



危险

独自执行危险作业导致生命危险！

需要在竖井和狭窄空间内完成的工作，以及存在坠落危险的工作，这两个都是危险工种，不允许单人独自作业！为安全起见，必须有第二个人在场。



警告

不佩戴防护装备会导致头部受伤！

工作时存在（严重）受伤危险。如果使用提升设备，必须佩戴安全头盔！

小心

小心霜冻！

霜冻可能导致功能故障和损坏。注意当地冻结深度。如果系统或压力出口在霜冻区域，则在霜冻期间使系统停止运行。

将提升系统安装到集水坑中时，另外要注意以下几点：

- 工作期间，有毒气体或窒息气体会不断聚集。确保充分的通风。遵守工作规程要求的保护措施（随身携带气体测量装置、气体报警设备）。
- 如果出现有毒气体或窒息气体汇集的情况，立刻采取对策！
- 注意提升系统的对角尺寸。
- 放置提升设备：平坦的表面，清洁、牢固的地基。存放地点和安放位置必须易于接近。
- 将两条运输带固定到提升系统上。防止运输带打滑！只使用建筑技术允许使用的提升装置。
- 如果由于天气原因（比如结冰、强风天气等）导致无法安全工作，则停止工作。

6.4.1 关于固定材料的注意事项

产品可安装在多种建筑物上（混凝土、钢结构等）。相应选择适合各种建筑物的固定材料。为了确保正确安装，请注意以下关于固定材料的注意事项：

- 避免建筑物表面出现裂缝和剥落，注意最小边缘距离。
- 确保牢固安全的安装，遵守规定的钻孔深度。
- 钻孔灰尘会影响保持力，始终吹扫或抽吸钻孔。

6.4.2 关于管道的注意事项

→ 只使用合格的部件（例如螺钉、膨胀螺钉、复合锚钉盒）。

在运行过程中，管道承受不同的压力。此外还会出现压力峰值（例如在关闭止回阀时），根据具体运行情况而定，生成的压力可能是输送压力的数倍。这些不同的压力施加在管路和管接头上。为了确保安全无误地运行，请检查管路和管接头的以下参数，并根据要求进行布置：

- 管路是自承重的。
不得有任何压力或拉力作用在提升系统上。
- 管道和管接头的耐压性
- 管接头的抗拉强度（= 纵向力锁合的连接）
- 连接管路时避免张力和振动。

6.4.3 工作步骤

提升系统的安装步骤如下：

- 准备工作。
- 放置提升系统。
- 连接压力管。
- 连接入口。
- 连接排气。
- 连接紧急清空装置。

6.4.4 准备工作

- 提升系统拆包装。
- 移除紧固机构。
- 检查供货范围。
- 检查所有部件的状态是否正常。
小心！不得安装损坏的部件！损坏的部件会导致系统故障！
- 将附件放在一边，以备日后使用。
- 准备安放位置：
 - 水平和平坦的安装面！
 - 至少要额外留出 60 cm (2 ft) 的自由空间！
 - 可以使用膨胀螺栓固定。
 - 干净，无大颗粒固体物
 - 干燥
 - 不上冻
 - 良好的照明

6.4.5 放置提升系统

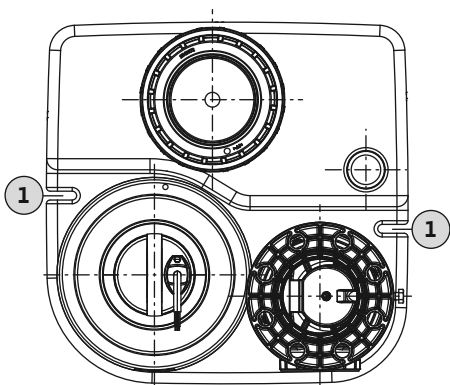


Fig. 2: 提升系统俯视图

1 用于地面锚定的固定槽

安装提升系统，使其固定、防扭转。为此，将提升系统锚定在地面上。

- ✓ 准备工作已完成。
 - ✓ 根据咨询文件准备安放位置。
 - ✓ 适用于现有安装基础的固定材料。注意！注意固定材料的说明！
1. 将提升系统放在安放位置，并将其与管道对齐。
小心！将开关设备固定在提升系统上，防止掉落。如果掉落，开关设备可能会被破坏！
注意！提升系统必须处于平衡状态！
 2. 标记固定件的钻孔。
 3. 将提升系统放在一旁。
 4. 钻孔并清洁。放入膨胀螺栓。
 5. 布置并对齐阻尼保护垫。
 6. 将提升系统放在阻尼保护垫上并对齐。
 7. 将紧固螺钉和垫圈穿过固定槽。将紧固螺钉旋入膨胀螺栓。
 8. 将提升系统固定在地面上。
 9. 将开关设备固定在墙上，注意使其具有防溢流特性（参见开关设备的说明）。
 10. 按规定铺设接线电缆。
- 安装提升系统，使其固定、防扭转。下一步：连接排放管路。

6.4.6 连接压力管

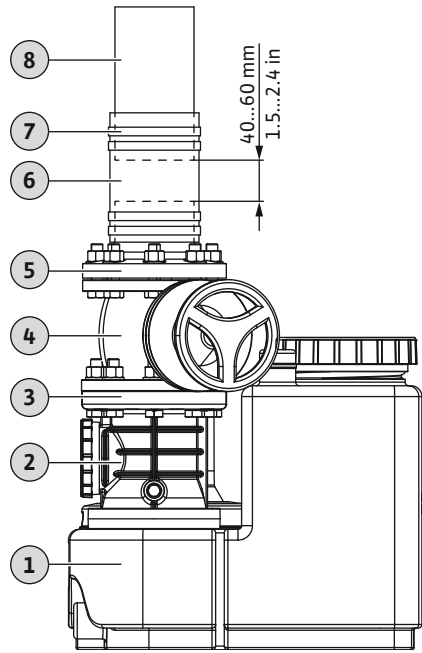


Fig. 3: 安装压力连接

1	提升系统
2	带通风装置的止回阀
3	压力连接
4	闸阀
5	法兰套管
6	轴环，柔性
7	管夹
8	压力管

- 连接压力管时注意以下方面：
- 使用 DN 80 或 DN 100 压力管！
 - 压力管中的流速：0.7 m/s (2.3 ft/s) 至 2.3 m/s (7.5 ft/s)！
 - 禁止缩小管径！
 - 所有连接均完全密封！
 - 为了避免发生从公共排水管回流的情况，应将压力管设计成“管路回线”。管路回线下边缘必须在当地规定的回流水位上方最高点上！
 - 铺设压力管时采用防冻保护措施。
 - 安装闸阀。
- ✓ 提升系统已正确放置。
- ✓ 根据咨询文件，正确安装压力管并垂直于出水口。
- ✓ 可用安装材料：
- 1x 闸阀
 - 1x 轴环
 - 4x 管夹
1. 将闸阀装到出水口上。
 2. 将法兰套管装到闸阀上。
 - ⇒ 为了使压力管末端与法兰套管末端之间的压力管能够隔音连接，请保持 40 ... 60 mm (1.5 ... 2.4 in) 的距离！
 - 如果距离过小，请缩短排放管。
 - 如果距离过大，则加长或更换排放管。
 3. 将管夹插到法兰套管上。
 4. 将轴环推过排放管。
 5. 将轴环推过法兰套管。
 6. 将轴环在法兰套管和排放管之间居中对齐。
 7. 分别用两个管夹将轴环固定到法兰套管和排放管上。拧紧扭矩：5 Nm (3.7 ft·lb)！
- 压力管已连接。下一步：连接入口。

6.4.7 连接入口

入口可以选在后壁、两个侧壁和蓄水罐顶部的标记面中。

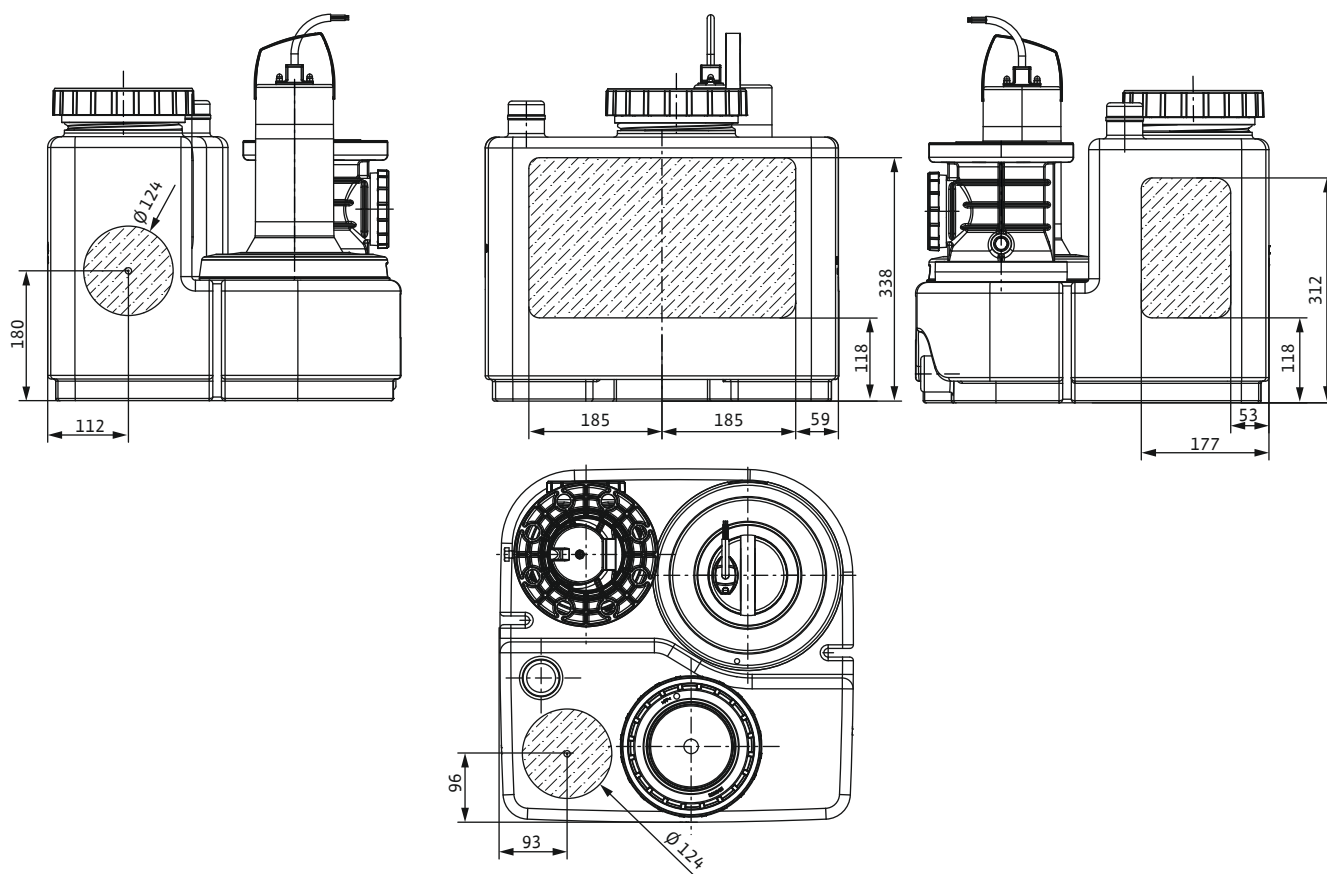


Fig. 4: 入口面

在连接入口时注意以下方面：

- 在标记的区域内连接入口。如果入口在标记的区域以外，可能导致以下问题：
 - 连接不密封。
 - 连接的入口管中出现回流。
- 避免在集水箱中存在浪涌式入口和/或进气口。正确地铺设入口。
 小心！一旦集水箱中存在浪涌式入口和/或进气口等情况，可能导致提升系统出现功能故障！
- 为了使入口管可以自行排空，请以倾斜方式将入口管铺设到提升系统上。
- 最低连接高度为 180 mm (7 in)。
- 所有连接均完全密封！
- 在入口中安装闸阀！

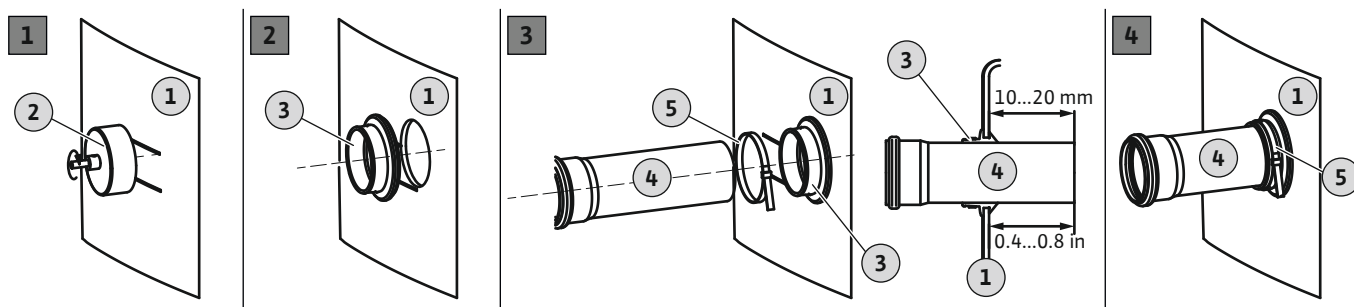


Fig. 5: 连接入口

1	蓄水罐壁
2	钻机的孔锯
3	入口密封
4	进水管
5	管夹

- ✓ 提升系统已正确放置。
- ✓ 根据咨询文件，将入口管正确地安装连接至集水箱。

- ✓ 可用安装材料：
1x 孔锯（DN 100，包含在供货范围内）
1x 钻机
1x 入口密封件（DN 100，包含在供货范围内）
1x 管夹
1. 在集水箱上标记入口点。
2. 使用孔锯在蓄水罐壁中钻出用于入口的钻孔。
在集水箱上钻孔时注意以下几点：
- 注意入口面的尺寸。小心！钻孔必须完全在标记的入口面内！
- 钻机的最大转速：200 rpm
- 检查孔径！注意！小心地钻出接口。接口的密封性取决于钻孔！
注意彻底地清除切屑！如果遗留切屑，材料会过快地升温并熔化。
⇒ 取消钻孔过程，让材料冷却下来，并清洁孔锯！
⇒ 降低钻机的转速。
⇒ 钻孔时的进给压力不同。
3. 将切割面去毛刺，并对其进行平整处理。
4. 将入口密封件放入孔中。
5. 将管夹推到入口密封件上。
6. 使用润滑剂润湿入口密封的内表面。
7. 将进水管推入入口密封件中。
将进水管 10 ... 20 mm (0.4 ... 0.8 in) 推入集水箱。
8. 用管夹固定连接入口密封件和进水管。拧紧扭矩：5 Nm (3.7 ft·lb)。
- 入口已连接。下一步：连接通风和排气装置。

6.4.8 连接通风和排气装置

规定必须连接排气和通风管路。此外，通风和排气对于提升系统的正常功能运行至关重要。连接排气和通风管路时注意以下几点：

→ 排气和通风管路穿过屋顶。

→ 所有连接均完全密封。

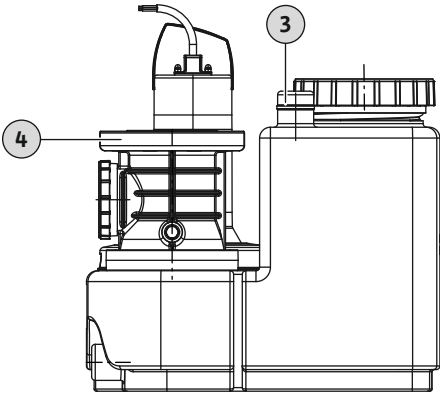


Fig. 6: 集水箱的通风和排气连接

3	集水箱的通风和排气连接
4	压力连接

- ✓ 提升系统已正确放置。
- ✓ 正确地铺设排气和通风管路。
1. 将 HT 双头接合套筒插在打开的通风和排气套管上。
2. 将通风和排气管插入 HT 双头接合套筒。
- 已安装通风和排气装置。必要时，将手动隔膜泵连接到接口上进行紧急清空。

6.4.9 安装手动隔膜泵



注意

不要将入口连接到紧急清空装置！

进行检查工作或发生事故时，通过紧急清空装置将集水箱泵空。不要将入口连接到紧急清空装置！否则在紧急情况下无法排空集水箱！

进行维护工作或提升系统出现故障时，必须手动将集水箱泵空。为此，建议安装手动隔膜泵。

小心！ 如果提升系统出现故障，则入口会发生倒流，并且集水箱可能破裂！锁闭入口并为集水箱排水。

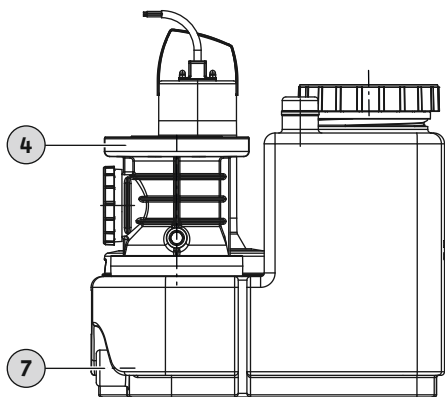


Fig. 7: 手动隔膜泵连接

6.5 电气连接



危险

小心触电死亡！

执行电气作业时不按规定操作，会发生电击致死事故！电气作业必须由专业电工按照当地的相关规定执行。

6.5.1 在电源侧的保险丝

断路器

断路器的规格和开关属性取决于所连接产品的额定电流。注意遵守当地相关法规。

漏电断路器 (RCD)

- 根据当地能源供应公司的规定安装漏电断路器 (RCD)。
- 如果人员可能接触到产品和导电液体，则安装漏电断路器 (RCD)。

6.5.2 电源连接

- 遵守铭牌上的说明。
- 按照当地法规的相关要求进行接地。
- 安装插座时，注意采取防溢流措施。
- 插座规格：
 - 单相交流电：Schuko 插座
 - 三相交流电：CEE 16A, 3P+N+PE, 6h, 顺时针旋转磁场

6.5.3 开关设备

开关设备已预先接线并在出厂时设置完毕。按当地规范铺设所有至开关设备和电源连接的接线电缆。小心！安装开关设备时，注意采取防溢流措施！

开关设备具有以下基本功能：

- 根据液位控制
- 电机保护
- 旋转方向监控（仅限三相交流电）
- 高液位警报

详细信息参见开关设备的安装及操作说明：

- 提升系统与开关设备的电气连接
- 功能概览和说明
- 设置切换点

切换点

提升系统的切换点可以根据正吸入压头进行调整。由此实现更大的有效容积。切换点的参数说明始终是基于地面的。

注意！如果入口低于“水泵开”切换点，则入口管中会出现回流！

开关设备 Wilo-Control MS-L

开关设备 Micro Control MS-L 通过固定保存的参数组设置切换点。在 DIP 开关 3 设置此处所需的参数组：

切换点	DIP 开关 3 的设置	工厂设定/可选择
水泵开：180 mm (7 in) 水泵关：115 mm (4.5 in) 高液位警报：200 mm (8 in)		•
水泵开：250 mm (10 in) 水泵关：115 mm (4.5 in) 高液位警报：270 mm (10.5 in)		o

图例
• = 工厂设定， o = 可设

注意！ DIP 开关 3 的位置参见开关设备的安装及操作说明！

Wilo-Control EC-L 开关设备

开关设备 Control EC-L 通过菜单设置切换点。在给定的菜单中设置此处所需的数值：

切换点	工厂设定/可选择	菜单 5.09	菜单 1.12	菜单 1.13	菜单 5.51
水泵开：180 mm (7 in) 水泵关：115 mm (4.5 in) 高液位警报：200 mm (8 in)	•	1.00	0.60	0.27	0.69
水泵开：250 mm (10 in) 水泵关：115 mm (4.5 in) 高液位警报：270 mm (10.5 in)	o	1.00	0.91	0.27	0.97

图例
• = 工厂设定， o = 可设， 切换点的单位：米 (m)

注意！ 菜单的功能方式和说明参见开关设备的安装及操作说明！

6.5.4 使用变频器运行

运行时不允许使用变频器。

7 试运行



警告
不佩戴防护装备会导致脚受伤！
工作时存在（严重）受伤危险。穿安全鞋！



注意
断电后自动接通
通过单独的控制器根据流程接通和断开产品。在停电之后，可自动接通产品。

7.1 工作人员资格鉴定

- 电气作业：受过培训的专业电工
是指接受过相关培训，具备所需知识和经验，能够发现并且规避电力危险的人员。
- 操作/控制：操作人员接受了整个系统功能原理的培训

7.2 运营者的责任

- 在提升系统上或者指定位置放置安装及操作说明。
- 为工作人员提供以其母语写成的安装及操作说明。
- 保证所有工作人员均已阅读安装及操作说明书并且理解其中内容。
- 所有安全装置和紧急停机开关回路都处于激活状态，并经检查确认功能正常。
- 提升系统适合于规定的工作条件下使用。

7.3 操作

小心

错误操作开关设备导致功能故障！

插入插头之后，开关设备在断电前最后设置的运行模式下启动。插入插头之前，请先阅读开关设备的安装及操作说明，了解开关设备的操作。

通过开关设备操作提升系统。已针对提升系统对开关设备进行了预设置。为了正确操作开关设备，请阅读开关设备的安装及操作说明：

- 设置
- LED 显示/LC-Display
- 警报信号

7.4 测试运行

在将提升系统切换到自动模式前，执行测试运行。通过测试运行检查系统的正常功能和密封性。为了确保系统的最佳运行，必要时调整水泵的空转时间。

- ✓ 提升系统已正确放置。
- ✓ 检查所有连接是否正确连接。
 1. 开启提升系统：将插头插入插座中。
 2. 在开关设备上选择自动模式
 3. 打开压力管中的止回阀。
注意！入口中的止回阀保持关闭！
 4. 拧下集水箱上的检修盖。
 5. 通过检视窗用一根软管慢慢将水注入集水箱。
注意！功能故障！喷水不要直接对准浮子开关！
 6. 通过液位控制装置开启和关闭提升系统。
 - ⇒ 在所有水泵中至少执行两次完整的泵送操作才能完成测试运行。
 - ⇒ 为了检查工况点，用水完全注满压力管。重复测试运行，直到压力管完全注满。
 7. 重新拧上检修盖。注意！密封集水箱上的检视窗！
 8. 检查所有连接的密封性。
 - ⇒ 如果所有连接都密封，则提升系统可以进入自动模式。
- ▶ 测试运行已完成。
- ▶ 提升系统开始运行：使压力管中的闸阀敞开。
- ▶ 提升系统在待机模式：关闭压力管中的闸阀。

7.5 空转时间

空转时间在出厂时预设为 3 s。必要时可以调整空转时间：

- 增加每个泵送过程的有效容积。
- 通过集成的清淤装置，尽量抽吸蓄水罐底部的沉淀物。
- 开合操作可避免压力冲击。

阅读开关设备的安装及操作说明，以设置空转时间！

小心！如果更改了空转时间，注意运行模式。运行模式规定了激活持续时间和休止状态时间！

7.6 通风螺栓的设置

止回阀配有一个通风螺栓。通过该螺栓可以打开止回阀进行检修工作。由此可以使剩余的流体从压力管流回集水箱。为了止回阀正常运行，将通风螺栓恢复为工厂设定。

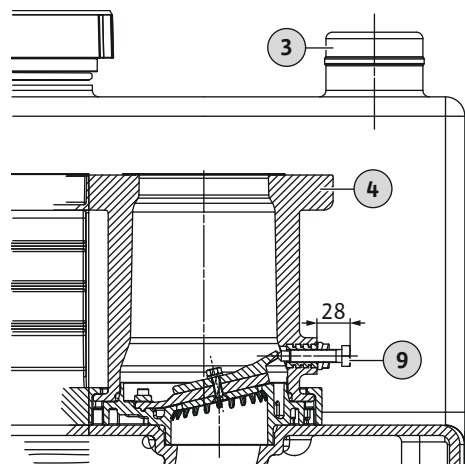


Fig. 8: 通风螺栓的位置

3	集水箱的通风和排气连接
4	压力连接
9	通风螺栓

- ✓ 提升系统在待机模式。
1. 检查通风螺栓的工厂设定：28 mm (1.1 in)
 2. 如果将通风螺栓旋入过多 (> 28 mm/1.1 in)，则旋出通风螺栓。

小心！如果通风螺栓旋入过多，可能导致止回阀损坏。此外，还会产生强烈的噪音！

8 运行

提升系统默认以自动模式运行，通过内置安装的液位控制装置进行开关。



警告
高温表面可能导致烫伤！
电机外壳在运行过程中温度较高，可能导致烫伤。关闭后使电机冷却到环境温度！

- ✓ 试运行已执行。
- ✓ 已成功进行测试运行。
- ✓ 已了解提升系统的操作和功能原理。
- ✓ 已用水完全注满压力管。
1. 开启提升系统：将插头插入插座中。
 2. 在开关设备上选择自动模式。
 3. 打开入口和排放压力管中的闸阀。
- 提升系统以自动模式工作并根据液位进行控制。

8.1 使用极限

- 不允许的操作方式和过大负荷会导致提升系统损坏。严格遵守以下使用极限：
- 每小时最大入口流量：1500 l (396 US.liq.gal)
 - 最高正吸入压头：5 m (16 ft)
 - 排放管路中的最大压力：2.5 bar (36 psi)
 - 流体温度：3 ...40 °C (37 ...104 °F)，最高 65 °C (149 °F) 持续 5 min
 - 环境温度：3 ...40 °C (37 ...104 °F)

8.2 运行期间

小心
压力冲击造成物资损失
水泵关闭时可能出现压力冲击。这种压力冲击可能损坏压力管和提升系统。为了避免压力冲击，增加空转时间。较长的空转时间导致开合操作并且更加柔和地关闭止回阀。



注意
扬程过短时的系统问题
如果在测地学意义上，扬程小于 2 m (6.5 ft)，则集水箱中可能存在泄漏。由于缺少必要的背压，止回阀无法紧密关闭。这可能导致提升系统反复开启（同步）。

- 打开入口和压力管中的闸阀！

- 最大入口流量小于系统的最高输出量。
- 不要打开集水箱上的检视窗和止回阀！
- 确保集水箱的通风和排气！

8.3 紧急运行

8.3.1 液位控制装置故障

如果液位控制装置故障，以手动模式为集水箱排水。手动运行的所有信息参见开关设备的安装及操作说明。

小心！不允许连续运行！注意运行模式。运行模式规定了激活持续时间和休止状态时间！

8.3.2 提升系统故障

如果提升系统完全失灵，则通过手动隔膜泵泵送污水。

1. 关闭入口中的闸阀。
2. 关闭压力管中的闸阀。
3. 用手动隔膜泵将污水泵入排放管路。

8.3.3 提升系统高水位（事故）



危险

危害健康的流体会导致危险！

发生事故时，会接触到积聚的污水。注意以下几点：

- 佩戴防护装备：
 - ⇒ 一次性全身套装
 - ⇒ 封闭式护目镜
 - ⇒ 口罩
- 工作结束后，彻底清洁和消毒所使用的附件（例如手动隔膜泵、软管）。
- 为提升系统和运行空间消毒。
- 将冲洗水引入污水管道系统。
- 按照当地适用的法规对防护服和清洁材料进行废弃处理。
- 遵守工作规程的相关规定！运营者必须保证工作人员已经收到并阅读工作规程！



注意

发生故障后运行提升系统

控制开关不具备防溢流功能。为了在高水位条件下安全运行提升系统，需要安装电气接口并将控制开关安装在足够高的位置！

9 停止运行/拆卸

9.1 工作人员资格鉴定

- 操作/控制：操作人员接受了整个系统功能原理的培训
- 安装/拆卸工作：受过培训的卫生设施系统技术专家固定件和抗浮措施，连接塑料管
- 电气作业：受过培训的专业电工
是指接受过相关培训，具备所需知识和经验，能够发现并且规避电力危险的人员。

9.2 运营者的责任

- 遵守本地现行的同业工伤事故保险联合会事故防范规定和安全规定。
- 提供必要的防护装备并保证工作人员佩戴防护装备。
- 密闭空间保持通风顺畅。
- 如果出现有毒气体或窒息气体汇集的情况，立刻采取对策！
- 在集水坑和封闭空间内作业时，为安全起见，必须有第二个人在场。
- 如果使用提升设备，必须遵守有关处理重物或在悬挂物之下工作的所有法律法规！

9.3 停止运行

1. 关闭入口管中的闸阀。
2. 将开关设备切换到待机模式。
3. 为集水箱排水。
以手动模式开启提升系统并为集水箱排水。

4. 关闭压力管中的闸阀。
5. 关闭提升系统。
从插座中拔出插头。小心！确保提升系统不会意外重启！
- 提升系统已停止运行。

如果提升系统长时间停用，则应定期（每季度）进行一次功能运行。小心！按照“测试运行”中所述进行功能运行。

9.4 拆卸



危险

在拆卸过程中，有害健康的介质会导致危险！

拆卸过程中可能会接触到有害健康的介质。注意下列事项：

- 佩戴防护装备：
 - ⇒ 封闭式护目镜
 - ⇒ 口罩
 - ⇒ 防护手套
- 一旦有介质滴落，立刻进行收集。
- 遵守工作规程的相关规定！运营者必须保证工作人员已经收到并阅读工作规程！



危险

有害健康的流体会导致危险！对提升系统进行消毒！

拆卸后和执行所有其他工作前，需要对提升系统进行消毒处理！有生命危险！遵守工作规程的相关规定！运营者必须保证工作人员已经收到并阅读工作规程！



危险

小心触电死亡！

执行电气作业时不按规定操作，会发生电击致死事故！电气作业必须由专业电工按照当地的相关规定执行。



危险

独自执行危险作业导致生命危险！

需要在竖井和狭窄空间内完成的工作，以及存在坠落危险的工作，这两个都是危险工种，不允许单人独自作业！为安全起见，必须有第二个人在场。



警告

高温表面可能导致烫伤！

电机外壳在运行过程中温度较高，可能导致烫伤。关闭后使电机冷却到环境温度！

- ✓ 提升系统已停止运行。
 - ✓ 防护装备就位。
 - ✓ 所有闸阀已关闭。
1. 为了使排放管路排水到蓄水罐中，通过通风装置打开止回阀。
 2. 通过手动隔膜泵泵送剩下的输送流体。
 3. 松开入口上的连接。从入口密封中拔出进水管。
 4. 松开压力管的连接。拆卸轴环。
 5. 松开集水箱的通风和排气接口处的通风连接。从 HT 套管中拔出排气管。

6. 从紧急清空连接上拆下手动隔膜泵的吸入管路。
危险！污水对健康有害！剩余的污水通过紧急清空装置连接从集水箱中流出。
将污水收集到合适的蓄水罐中并引向污水管道系统。
 7. 松开地脚螺栓。
 8. 从管道中小心地拉出提升系统。
- 提升系统已拆卸。清洁和消毒提升系统和运行空间。

9.5 清洁和消毒



危险

危害健康的流体会导致危险！

执行所有其他工作之前，需要对提升系统进行消毒处理！进行清洁时需要佩戴下列防护装备：

- 封闭式护目镜
- 呼吸面罩
- 防护手套

⇒ 所列设备是最低要求，注意工作规程中的相关规定！运营者必须保证工作人员已经收到并阅读工作规程！

- ✓ 提升系统已拆卸。
 - ✓ 开关设备防水包装。
 - ✓ 根据当地法规将冲洗水引入污水管道。
 - ✓ 按照工作规程提供消毒剂。
注意！严格遵守生产商规定的使用注意事项！
1. 从上到下，向提升系统喷射清水。
 2. 打开集水箱上的检视窗和止回阀并冲洗。
 3. 从内部冲洗所有连接套管。
 4. 彻底冲洗通道底部残留的污垢残渣。
 5. 使提升系统干燥。
 6. 重新封闭集水箱上的检视窗和止回阀。

10 维护和维修

只能由专业人员（例如客户服务）进行维护和维修。保养间隔遵照 EN 12056-4：

- 用于商业运营时，每季度维护一次
- 多户住宅中使用时，每隔半年维护一次
- 单户住宅中使用时，每年维护一次

记录所有保养和维修工作。这些记录需要专业人员和运营者签字。

完成保养工作后，执行测试运行。

11 备件

请在客户服务部订购备件。为了减少询问，同时避免出现订购错误，请提供序列号或商品号。保留技术变更权利！

12 废弃处置

12.1 防护服

穿过的防护服必须根据当地现行的指令废弃处置。

12.2 油和润滑剂

工作介质必须被收集到一个适当的容器中，并根据当地现行的指令废弃处置。一旦有介质滴落，立刻进行收集！

12.3 关于收集损耗的电气产品和电子产品的的相关信息

按规定废弃处置和正确回收这些产品，能避免环境污染、保护人身健康。



注意

禁止作为生活垃圾废弃处置！

在欧盟地区，该标志张贴在产品、包装或随附的资料中。它的意思是，相关的电气和电子产品不得作为生活垃圾废弃处置。

在按规定处理、回收和废弃处置相关旧产品时，要注意以下几点：

- 这些产品只能交给专门为此设立且获得认证的垃圾处理场。
- 注意当地现行的规定！

有关按规定废弃处置的信息，请咨询当地社区、最近的垃圾处理场或您购买产品的经销商。关于回收的详细信息请访问www.wilo-recycling.com。

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1 General information

1.1 About these instructions

These instructions form part of the product. Adherence to these instructions is a requirement for the intended use and correct operation of the product:

- Carefully read the instructions prior to any activities on and with the product.
- Keep the instructions in an accessible place at all times.
- Observe all product specifications and labels on the device.

The language of the original operating instructions is German. Versions of these instructions in any other language are translations of the original operating instructions.

1.2 Copyright

Copyright remains with Wilo. Do not:

- Reproduce any content.
- Distribute any content.
- Use any content for competition purposes without authorisation.

Wilo shall reserve the right to change the listed data without notice and shall not be liable for technical inaccuracies and/or omissions.

1.3 Subject to change

Wilo shall reserve the rights to make technical changes to the product and individual components. The illustrations used may differ from the original and are intended as a sample representation of the device.

1.4 Exclusion from warranty and liability

Wilo shall specifically not assume any warranty or liability in the following cases:

- Inadequate configuration due to inadequate or incorrect instructions by the operator or the client
- Non-compliance with these instructions
- Improper use
- Incorrect storage or transport
- Incorrect installation or dismantling
- Insufficient maintenance
- Unauthorised repairs
- Inadequate construction site
- Chemical, electrical or electrochemical influences
- Wear

2 Safety

This chapter contains basic information for the individual phases of the life cycle. Failure to observe this information carries the following risks:

- Injury to persons from electrical, mechanical and bacteriological factors as well as electromagnetic fields
- Environmental damage from discharge of hazardous substances
- Property damage
- Failure of important functions of the product

Failure to observe the information contained herein will result in the loss of claims for damages.

The instructions and safety instructions in the other chapters must also be observed!

2.1 Identification of safety instructions

These installation and operating instructions set out safety instructions for preventing personal injury and damage to property. These safety instructions are shown differently:

- Safety instructions relating to personal injury start with a signal word, are **preceded by a corresponding symbol** and are shaded in grey.



DANGER

Type and source of the danger!

Consequences of the danger and instructions for avoidance.

- Safety instructions relating to property damage start with a signal word and are displayed **without** a symbol.

CAUTION

Type and source of the danger!

Consequences or information.

Signal words

→ DANGER!

Failure to observe the safety instructions will result in serious injuries or death!

→ WARNING!

Failure to follow the instructions can lead to (serious) injuries!

→ CAUTION!

Failure to follow the instructions can lead to property damage and a possible total loss.

→ NOTICE!

Useful information on handling the product

Markups

✓ Prerequisite

1. Work step/list

⇒ Notice/instructions

► Result

Symbols

These instructions use the following symbols:



Danger caused by electric voltage



Danger of bacterial infection



Danger of explosion



Warning – hot surfaces



Personal protective equipment: wear a safety helmet



Personal protective equipment: wear safety footwear



Personal protective equipment: wear protective gloves



Personal protective equipment: wear face mask



Personal protective equipment: wear safety goggles



Working alone is prohibited! A second person must be present.



Useful information

- 2.2 Personnel qualifications**
- Electrical work: qualified electrician
Person with appropriate technical training, knowledge and experience who can identify and prevent electrical hazards.
 - Installation/dismantling work: trained specialist in plant technology for sanitary facilities
Fixation and buoyancy safeguards, connection of plastic pipes
 - Maintenance work: Skilled person (trained specialist in plant technology for sanitary facilities)
Hazards caused by sewage, basic knowledge of lifting units, requirements EN 12056
 - Personnel have been instructed on locally applicable regulations governing accident prevention.
 - Personnel have read and understood the installation and operating instructions.
- 2.3 Electrical work**
- Electrical work must be carried out by a qualified electrician.
 - Disconnect device from the mains and secure it against being switched on again without authorisation.
 - Observe applicable local regulations when connecting to the mains power supply.
 - Comply with the requirements of the local energy supply company.
 - Train personnel on how to make electrical connections.
 - Train personnel on the options for switching off the device.
 - Observe the technical information in these installation and operating instructions as well as on the rating plate.
 - Earth the device.
 - Arrange switchgears so as to be overflow-proof.
 - Replace defective connection cables. Contact customer service.
- 2.4 Monitoring devices**
- The following monitoring devices must be provided on-site:
- Circuit breaker**
- The size and switching characteristics of the circuit breakers must conform to the rated current of the connected product. Observe local regulations.
- Residual-current device (RCD)**
- Install a residual-current device (RCD) in accordance with the regulations of the local energy supply company.
 - If people can come into contact with the device and conductive fluids, install a residual-current device (RCD).
- 2.5 Pumping fluids that are hazardous to health**
- There is a risk of bacterial infection if the user comes into contact with fluids that are hazardous to health! Thoroughly clean and disinfect tank during removal and prior to further use. Ensure the following points:
- The following protective equipment is worn when cleaning the tank:
 - Sealed safety goggles
 - Breathing mask
 - Protective gloves
 - All persons are informed about the fluid, the associated danger and its correct handling!
- 2.6 Explosive atmosphere in the collection reservoir**
- Sewage containing faeces can lead to gas accumulations in the tank. These gas accumulations can escape into the operating space and create an explosive atmosphere as a result of incorrect installation or maintenance work. This atmosphere can ignite and lead to an explosion. In order to prevent an explosive atmosphere, observe the following points:
- Tank must be undamaged (no cracks, leaks, porous material)! Take any defective lifting units out of operation.
 - Ensure all connections for the inlet, pressure pipe and aeration and venting are sealed tightly and in accordance with regulations!
 - Guide the aeration and venting line over the roof.
 - When opening the tank (e.g. during maintenance work), ensure appropriate exchange of air!
- 2.7 Transport**
- Wear the following protective equipment:
 - Safety footwear
 - Safety helmet (when using lifting equipment)

- Locally applicable laws and regulations on work safety and accident prevention must be complied with.
- Hold the tank when moving the device. Never pull the device by the connection cable!
- Devices weighing 50 kg (110 lbs) and over must be transported by two persons. It is generally recommended that two persons transport the device.
- If lifting equipment is used, observe the following points:
 - Only use legally prescribed and approved lifting and hoisting gear.
 - Select the lifting gear based on the prevailing conditions (weather, attachment point, load, etc.).
 - Ensure that the lifting gear is securely attached.
 - Ensure that the hoisting gear is stable.
 - Ensure a second person is present to coordinate the procedure if required (e.g. if the operator's field of vision is blocked).
 - Standing under suspended loads is not permitted. Do **not** move suspended loads over workplaces where people are present.

2.8 Installing/dismantling

- Wear the following protective equipment:
 - Safety footwear
 - Safety gloves for protection against cuts
- Locally applicable laws and regulations on work safety and accident prevention must be complied with.
- Disconnect device from the mains and secure it against being switched on again without authorisation.
- Close the inlet and pressure pipe.
- Ensure enclosed spaces have sufficient ventilation.
- When working in enclosed spaces, a second person must be present for safety reasons.
- Toxic or asphyxiating gases may build up in enclosed spaces or buildings. Observe protective measures in accordance with work regulations, e.g. carry a gas detector with you.
- Clean the device thoroughly.

WARNING! Risk of fire if inappropriate clothing is worn and highly flammable cleaning agents are used!

Static charging may occur when cleaning plastic parts. There is a risk of fire! Only wear anti-static clothing and do not use highly flammable cleaning agents.

2.9 During operation

- Open all gate valves in the inlet and pressure pipe!
- The maximum inflow must be lower than the maximum output of the system.
- Do not open the inspection openings!
- Ensure ventilation!

Improper use and overstraining leads to damage to the lifting unit. The following application limits must be strictly observed:

- Max. intake/h: 1500 l (396 US.liq.gal)
- Max. positive suction head: 5 m (16 ft)
- Max. pressure in the pressure pipe: 2.5 bar (36 psi)
- Fluid temperature: 3 ... 40 °C (37 ... 104 °F), max. 65 °C (149 °F) for 5 min
- Ambient temperature: 3 ... 40 °C (37 ... 104 °F)

CAUTION

Overpressure in the tank!

If there is overpressure in the tank, it can burst. Observe the following points to prevent overpressure:

- The maximum positive suction head is 5 m (16.5 ft)
 - The maximum inlet volume flow must be less than the maximum flow rate at the duty point!
-

2.10 Maintenance tasks

- Maintenance work may **only** be carried out by qualified personnel (trained specialists in plant technology for sanitary facilities).
- Wear the following protective equipment:
 - Sealed safety goggles
 - Safety gloves for protection against cuts
 - Safety footwear

- Disconnect device from the mains and secure it against being switched on again without authorisation.
- Close the inlet and pressure pipe.
- Only original parts of the manufacturer may be used. The use of any non-original parts releases the manufacturer from any liability.
- Collect any leakage of fluid and operating fluid immediately and dispose of it according to the locally applicable guidelines.
- Clean the device thoroughly.

WARNING! Risk of fire if inappropriate clothing is worn and highly flammable cleaning agents are used!

Static charging may occur when cleaning plastic parts. There is a risk of fire! Only wear anti-static clothing and do not use highly flammable cleaning agents.

2.11 Operator responsibilities

- Provide installation and operating instructions in a language which the personnel can understand.
- Make sure that the personnel have received the required training for the specified work.
- Provide protective equipment. Ensure that the protective equipment is worn by personnel.
- Ensure that safety and information signs mounted on the device are always legible.
- Train the personnel on how the system operates.
- Eliminate any risk from electrical current.
- Demarcate and cordon off the working area.

Observe the following points when handling the device:

- Use is not permitted for persons under the age of 16.
- Persons under the age of 18 must be supervised by a technician!
- Use is not permitted for persons with limited physical, sensory or mental capacities!

3 Application/use

3.1 Intended use

Pumping of sewage containing faeces:

- In cases where sewage cannot be led to the sewer system via a natural fall.
- For the backflow resistant drainage in cases where the discharge point is below the backflow level.

NOTICE! Install grease traps upstream of the lifting unit if pumping greasy sewage!

The version for aggressive fluids (SANI...C) is suitable for pumping:

- Swimming pool water with a max. chloride content of 1.2 mg/l
- Aggressive sewage with a pH value of 5 to 12:
 - Rainwater (observe local regulations, e.g. DIN 1986-100)
 - Cleaning agents, disinfectants, dishwashing or laundry detergents
 - Condensate from condensing boiler technology

CAUTION! The fluid in the collection reservoir may not exceed or fall short of the pH value of 5 to 12!

3.2 Improper use



DANGER

Explosion due to use of explosive fluids!

Use of highly flammable and explosive fluids (gasoline, kerosene, etc.) in their pure form is prohibited. There is a risk of fatal injury due to explosion! The lifting unit is not designed for these fluids.

Do **not** use the following fluids:

- Sewage from drainage objects that are located above the backflow level and can be drained by natural fall.
- Debris, ash, rubbish, glass, sand, plaster, cement, lime, mortar, fibrous materials, textiles, paper towels, wet-wipes (e.g. fleece cloths, moist toilet paper wipes), nappies, cardboard, coarse paper, synthetic resins, tar, kitchen waste, grease, oil
- Slaughterhouse waste, disposal of slaughtered animals and animal waste (liquid manure etc.)
- Toxic, aggressive and corrosive fluids, such as heavy metals, biocides, pesticides, acids, bases, salts, swimming-pool water

- Cleaning agents, disinfectants, dishwashing or laundry detergents in excess amounts, and such that have a disproportionately high degree of foam formation
- Drinking water

Intended use also includes compliance with this manual. Any other use is regarded as non-compliant with intended use.

4

Product description

4.1

Design



Fig. 1: Overview

Compact, ready for connection and fully submersible single pump lifting unit for pump-ing sewage containing faeces.

1	Collection reservoir
2	Inspection opening of collection reservoir
3	Collection reservoir aeration and venting connection
4	Discharge connection
5	Inspection opening of swing check valve
6	Grip strap
7	Emergency drain connection
8	Motor

Gas- and watertight collection reservoir with collecting space that slopes at an angle and inspection opening with transparent cover. The inlets are freely configurable, level measurement is performed with an analogue output signal 4...20 mA. Pressure connec-tion with attached non-return valve with inspection opening.

Drive via surface-cooled motor with thermal motor monitoring.

Pre-installed switchgear for automatic operation:

Wilo-Control MS-L

- Collective fault signal with potential-free contact
- Integrated and mains-independent alarm
- Adjustable follow-up time

Wilo-Control EC-L

- Operation via display and icon-based, alphanumeric menu
- Collective fault signal with potential-free contact
- Individual fault signal with potential-free contact
- ModBus interface
- Integrated and mains-independent alarm
- Adjustable follow-up time

4.2

Materials

- Motor housing: 1.4404 (AISI 316L)
- Hydraulics: PP-GF30
- Impeller: PP-GF30
- Reservoir: PE
- Non-return valve: PPS

4.3

Monitoring devices

Monitoring of motor winding

The motor is equipped with thermal motor monitoring with bimetallic strips:

- Single-phase AC motor: The motor monitoring is self-switching. The motor is switched off if it overheats. The motor is automatically switched on again once it has cooled down.
- Three-phase AC motor: The motor monitoring is displayed and reset via the connec-ted switchgear.

High water alarm with collective fault signal

When the high water level is reached, there is an audible and visual alarm signal. Forced switch-on of the pump takes place. Furthermore, the collective fault signalling contact is activated. An external alarm (horn, SMS via SmartHome connection) can be triggered via the potential-free contact.

If the water drops below the high water level, the pump is deactivated once the follow-up time has elapsed. The alarm signal is acknowledged automatically.

4.4 Operating principle

The sewage produced is channelled into the collection reservoir via the inlet pipe, where it collects. When the water level reaches the switch-on level, the pump is switched on. The collected sewage is pumped into the connected pressure pipe. When the switch-off level is reached, the pump is deactivated after the set follow-up time.

The pump is switched on (forced switch-on) when the high water level is reached. The high water LED or display shows an alarm signal. Additionally, the internal buzzer can emit an audible alarm signal. Furthermore, the output for the collective fault signal (SSM) is activated.

4.5 Operation with frequency converter

Operation on the frequency converter is not permitted.

4.6 Type key

Example: **DrainLift SANI-S.11M/3C**

DrainLift	Product family
SANI	Sewage lifting unit
S	Size
11	Max. delivery head
M	Mains connection: → M = 1~ → T = 3~
3	Version for motor and switchgear: → 1 = operating mode: S3, switchgear: Control MS-L → 3 = operating mode: S3, switchgear: Control EC-L
C	Version for aggressive fluids

4.7 Technical data

Approved field of application

Max. intake per hour	1500 l (396 US.liq.gal.)
Max. pressure in the pressure pipe	2.5 bar (36 psi)
Max. delivery head	See rating plate
Max. volume flow	See rating plate
Max. positive suction head	5 m (16.5 ft)
Fluid temperature	3 ... 40 °C (37 ... 104 °F), max. 65 °C (149 °F) for 5 min
Ambient temperature	3 ... 40 °C (37 ... 104 °F)

Motor data

Mains connection	→ SANI-S...M/...: 1~230 V, 50 Hz → SANI-S...T/...: 3~400 V, 50 Hz
Power consumption [P ₁]	See rating plate
Rated power [P ₂]	See rating plate
Rated current [I _N]	See rating plate
Speed [n]	See rating plate
Activation type	Direct
Operating mode	S3 10%/60 s → Cycle duration: 60 s → Activation period: 6 s → Downtime: 54 s
Protection class	IP68
Cable length to plug	1.5 m (5 ft)
Cable length to switchgear	→ SANI-S.../1...: 4 m (13 ft) → SANI-S.../3C...: 10 m (33 ft)
Plug	→ Single-phase current: Shockproof plug → Three-phase current: CEE 16A, 3P+N+PE, 6 h

Connections

Discharge connection	DN 80, PN 10
----------------------	--------------

Inlet connection	DN 100/150
Collection reservoir aeration and venting connection	50 mm (2 in)
Emergency drain connection	DN 50
Dimensions and weights	
Gross volume	47 l (12.5 US.liq.gal.)
Max. usable volume with regard to the positive suction head*	25 l/6.5 US.liq.gal. (180 mm*)/32 l/8.5 US.liq.gal. (250 mm*)
Diagonal dimension	630 mm (25 in)
Weight	28 kg (62 lb)

The unit is not designed for continuous duty! The max. volume flow applies to intermittent periodic duty S3!

4.8 Scope of delivery

- Lifting unit with switchgear and connection cable with plug
- Flange connector DN 80/100
- Collar DN 100 for pressure connection
- HT double socket 50 mm (2 in) for ventilation connection
- HT double socket DN 50 for evacuation connection
- Inlet set with hole saw 124 mm (5 in) and gasket DN 100
- Floor fixation
- Insulation mat
- 9 V rechargeable battery
- Operating and maintenance manual

4.9 Accessories

On the pressure side

- DN 80 flange connector for connection of a DN 80 pressure pipe
- DN 80 flange gate valve made of cast material with flat gasket and assembly material

On the inlet side

- DN 100/DN 150 gate valve made of plastic with fixed pipe ends
- DN 100/DN 150 inlet seals
- DN 100/DN 150 inlet sets (gasket and saw)

General

- Diaphragm hand pump with R 1½ connection (without hose)
- 3-way stopcock for switching over to manual suctioning
- Horn 230 V, 50 Hz
- Flash light 230 V, 50 Hz
- Signal lamp 230 V, 50 Hz
- SmartHome radio transmitter for connectivity with the Wilo wibutler

5 Transportation and storage

5.1 Delivery

After receiving the shipment, this must be checked immediately for defects (damage, completeness). Defects must be noted on the freight documentation! Furthermore, defects must be notified to the transport company or the manufacturer immediately on the day of receipt of shipment. Subsequently notified defects can no longer be asserted.

5.2 Transport



WARNING

Foot injuries due to a lack of protective equipment!

Danger of (serious) injuries during work. Wear safety shoes!

Only remove the outer packaging at the place of use to ensure that the lifting unit is not damaged during transport. Use tear-proof plastic bags of sufficient size to package used lifting units for transport in a leak-proof manner.

- Two grip pockets are provided on the collection reservoir for transport.

- Never pull the device by the connection cable!
- It is recommended to deploy two persons for the transport.
- Observe packaging regulations:
 - Impact-resistant
 - Ensure the device is properly fixed in place.
 - Protect it against dust, oil and moisture.

5.3 Storage



DANGER

Danger due to fluids hazardous to health! Disinfect the lifting unit!

Decontaminate the lifting unit after dismantling and before carrying out any other work. There is a risk of fatal injury! Observe the specifications of the work regulations! The operator must make sure that personnel have received and read the work regulations!

CAUTION

Total damage due to moisture ingress

The ingress of moisture into the connection cables damages the cable and motor! Never immerse open ends of the connection cables in fluid. Seal them in a watertight manner during storage.

Newly supplied lifting units can be stored for one year. For longer storage periods, contact customer service.

When storing the pump, please note the following points:

- Place the lifting unit securely on a firm surface and secure it against slipping and falling over!
- Permitted storage temperature: -15 ... 60 °C (5 ... 140 °F), max. humidity: 90 %, non-condensing.
We recommend frost-proof storage. Storage temperature: 5 ... 25 °C (41 ... 77 °F), relative humidity: 40 ... 50 %.
- Drain the collection reservoir completely.
- Coil up connection cables and attach to the motor.
- Seal open ends of the connection cables and plugs in a watertight manner.
- Store switchgear according to the instructions.
- Tightly seal all open connections.
- Do not store the lifting unit in spaces where welding work is carried out. The resulting gases or radiation can corrode the plastic and elastomeric parts.
- Protect the lifting unit from direct sunlight and heat. Extreme heat can cause damage to the plastic parts!
- Elastomeric parts are subject to natural brittleness. Contact customer service if storage is required for more than 6 months.

6 Installation and electrical connection

6.1 Personnel qualifications

- Electrical work: qualified electrician
Person with appropriate technical training, knowledge and experience who can identify and prevent electrical hazards.
- Installation/dismantling work: trained specialist in plant technology for sanitary facilities
Fixation and buoyancy safeguards, connection of plastic pipes

6.2 Installation types

- Floor-mounted installation in buildings
- Concealed floor installation in pump chambers outside of buildings

6.3 Operator responsibilities

- Observe locally applicable accident prevention and safety regulations.
- Observe all regulations for working under suspended loads when using lifting equipment.
- Provide protective equipment. Ensure that the protective equipment is worn by personnel.
- Observe local sewage technology regulations for the operation of sewage systems.

- Structural components and foundations must be of sufficient stability in order to allow the device to be fixed in a secure and functional manner. The operator is responsible for the provision and suitability of the structural component/foundation!
- Ensure free access to the installation location.
- Carry out the installation work according to locally applicable regulations.
- Check that the available consulting documents (installation plans, installation location, inflow conditions) are complete and accurate.
- Lay and prepare the pipes according to the consulting documents.
- Mains connection is overflow-proof.

6.4 Installation



WARNING

Hand and foot injuries due to lack of protective equipment!

Danger of (serious) injuries during work. Wear the following protective equipment:

- Safety gloves
- Safety shoes

Building

- Ensure operating space has sufficient ventilation.
- Ensure a clearance area of min. 60 cm (2 ft) around the unit.
- In the event of an accident: Provide pump sump in the operating space, min. dimensions: 500x500x500 mm (20x20x20 in). Select pump accordingly. Ensure that manual drainage is possible.
- All connection cables must be laid properly. The connection cables must not pose any risk (i.e. tripping, damage during operation). Check whether the cable cross-section and the cable length are sufficient for the selected installation type.
- The mounted switchgear is not overflow-proof. Install the switchgear at an adequate height. Ensure good operation!

Installation in the pump chamber



DANGER

Risk of fatal injury due to dangerous lone working practices!

Work in chambers and narrow rooms as well as work involving risk of falling are dangerous work. Such work may not be carried out autonomously! A second person must be present for safety reasons.



WARNING

Head injuries due to lack of protective equipment!

Danger of (serious) injuries during work. If lifting equipment is used, wear a safety helmet!

CAUTION

Beware of frost!

Frost can cause malfunctions and damage. Pay attention to local frost depths. If the unit or pressure outlet are in the freezing zone, take the unit out of operation during freezing periods.

Also adhere to the following points if the lifting unit is installed in a pump chamber:

- Toxic or asphyxiating gases may build up during work. Ensure adequate ventilation. Observe protective measures in accordance with work regulations (gas measurement, carry a gas detector with you).
- Take immediate countermeasures if there is a build-up of toxic or asphyxiating gases!
- Note the diagonal dimension of the lifting unit.
- Install lifting equipment: even surface, clean, firm base. Warehouse and installation location must be easily accessible.

- Attach two transport straps to the lifting unit. Secure the transport straps against slipping! Only use lifting gear that has been technically approved.
- If the weather conditions (e.g. ice formation, strong wind) mean it is no longer possible to work safely, stop work.

6.4.1 Note on fixation material

The lifting unit can be installed on various constructions (concrete, steel, etc.). Select the fixation material which is suitable for the relevant construction. For correct installation, observe the following instructions for the fixation material:

- Avoid tearing or chipping of the construction surface, **observe the minimum edge distances**.
- Ensure tight and secure installation, **adhere to the prescribed borehole depth**.
- Drilling dust impairs holding strength, **always blow out or vacuum out the borehole**.
- Only use components (e.g. screws, anchors, mortar cartridges) which are in perfect condition.

6.4.2 Note on pipework

The pipework is subjected to different pressures during operation. Pressure peaks can also occur (e.g. when closing the swing check valve) which may be several times higher than the pump pressure, depending on the operating conditions. These different pressures put a strain on the piping and the pipe adaptors. In order to ensure safe and faultless operation, the piping and pipe adaptors must be checked based on the following parameters and designed according to the requirements:

- Pipes are self-supporting.
No tensile or compressive forces must act on the lifting unit.
- Pressure resistance of pipework and pipe adaptors
- Tensile strength of the pipe adaptors (= longitudinal force fit connection)
- Connect the pipes free of stress and vibrations.

6.4.3 Work steps

The lifting unit is installed in the following steps:

- Preparatory tasks.
- Install the lifting unit.
- Connect the pressure pipe.
- Connect the inlet.
- Connect the vent.
- Connect the emergency drain.

6.4.4 Preparatory tasks

- Unpack the lifting unit.
- Remove the securing mechanisms.
- Check the scope of delivery.
- Check all components are in proper working condition.
CAUTION! Do not install defective components! Defective components can lead to system failures!
- Place accessories to one side and keep them for later use.
- Prepare the installation location:
 - Horizontal and flat installation surface!
 - Space for an additional clearance area of at least 60 cm (2 ft) provided!
 - Fixation with dowels possible.
 - Clean, free of coarse solids
 - Dry
 - Frost-free
 - Well lit

6.4.5 Placing the lifting unit

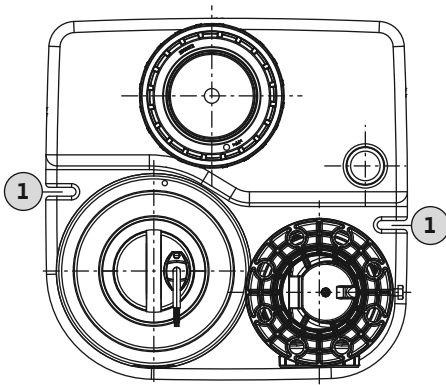


Fig. 2: Lifting unit top view

1 Fastening grooves for floor anchoring

Install lifting unit so as to protect against buoyancy and twisting. Anchor the lifting unit to the floor for this.

- ✓ Preparatory tasks have been completed.
- ✓ Installation location prepared according to consulting documents.
- ✓ Suitable fixation material provided for the existing building ground. **NOTICE! Observe the information on the fixation material!**

1. Place the lifting unit at the installation location and align to the pipework.
CAUTION! Secure the switchgear to the lifting unit to prevent it from falling down. The switchgear may be destroyed if it falls down!
NOTICE! Lifting unit must be standing level!

2. Mark out the boreholes of the fastening grooves.
3. Place the lifting unit to one side.
4. Drill and clean the boreholes. Insert the dowels.
5. Lay out and align the insulation mat.
6. Position and align the lifting unit to the insulation mat.
7. Guide the fastening screw and disc through the fastening groove. Screw the fastening screw into the dowel.
8. Attach the lifting unit to the floor.
9. Attach the switchgear to the wall so as to be overflow-proof (see switchgear instructions).

10. Lay the connection cable in accordance with regulations.

- Lifting unit installed so as to protect against buoyancy and twisting. Next step: Connect the pressure pipe.

6.4.6 Connecting the pressure pipe

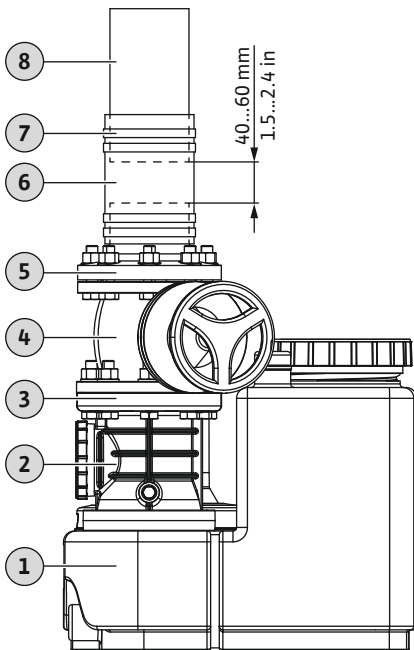


Fig. 3: Fit discharge connection

1	Lifting unit
2	Swing check valve with ventilation device
3	Discharge connection
4	Gate valve
5	Flange connector
6	Collar, flexible
7	Pipe clamps
8	Pressure pipe

Observe the following information when connecting the pressure pipe:

- Pressure pipe must be DN 80 or DN 100!
- Flow rate in the pressure pipe: 0.7 m/s (2.3 ft/s) to 2.3 m/s (7.5 ft/s)!
- Reducing the pipe diameter is not permitted!
- All connections must be completely tight!
- Install the pressure pipe as a "pipe loop" to avoid backflow from the main public sewer.
At its highest point, the bottom edge of the pipe loop must be above the locally determined backflow level!
- Install the pressure pipe so that it is protected from frost.
- Install the gate valve.

- ✓ Lifting unit installed properly.
 - ✓ Pressure pipe installed correctly according to consulting documents and perpendicular to the pressure port.
 - ✓ Assembly materials provided:
 - 1x gate valve
 - 1x collar
 - 4x pipe clamps
1. Install the gate valve on the pressure port.

2. Install flange connector on the gate valve.

⇒ To ensure that the pressure pipe is connected in an acoustically isolated manner, maintain a distance between the end of the pressure pipe and the end of the flange connector of 40 ... 60 mm (1.5 ... 2.4 in)!

- Shorten the discharge pipe if the distance is too small.
- Extend or use a new discharge pipe if the distance is too great.

3. Connect the pipe clamps to the flange connector.

4. Slide the collar over the discharge pipe.

5. Slide the collar over the flange connector.

6. Align the collar centrally between the flange connector and the discharge pipe.

7. Attach the collar to the flange connector and discharge pipe with two pipe clamps each. **Tightening torque: 5 Nm (3.7 ft-lb)!**

► Pressure pipe connected. Next step: Connect the inlet.

6.4.7 Connect the inlet.

The inlet can be in the areas indicated for the rear wall, both side walls and the tank roof, as desired.

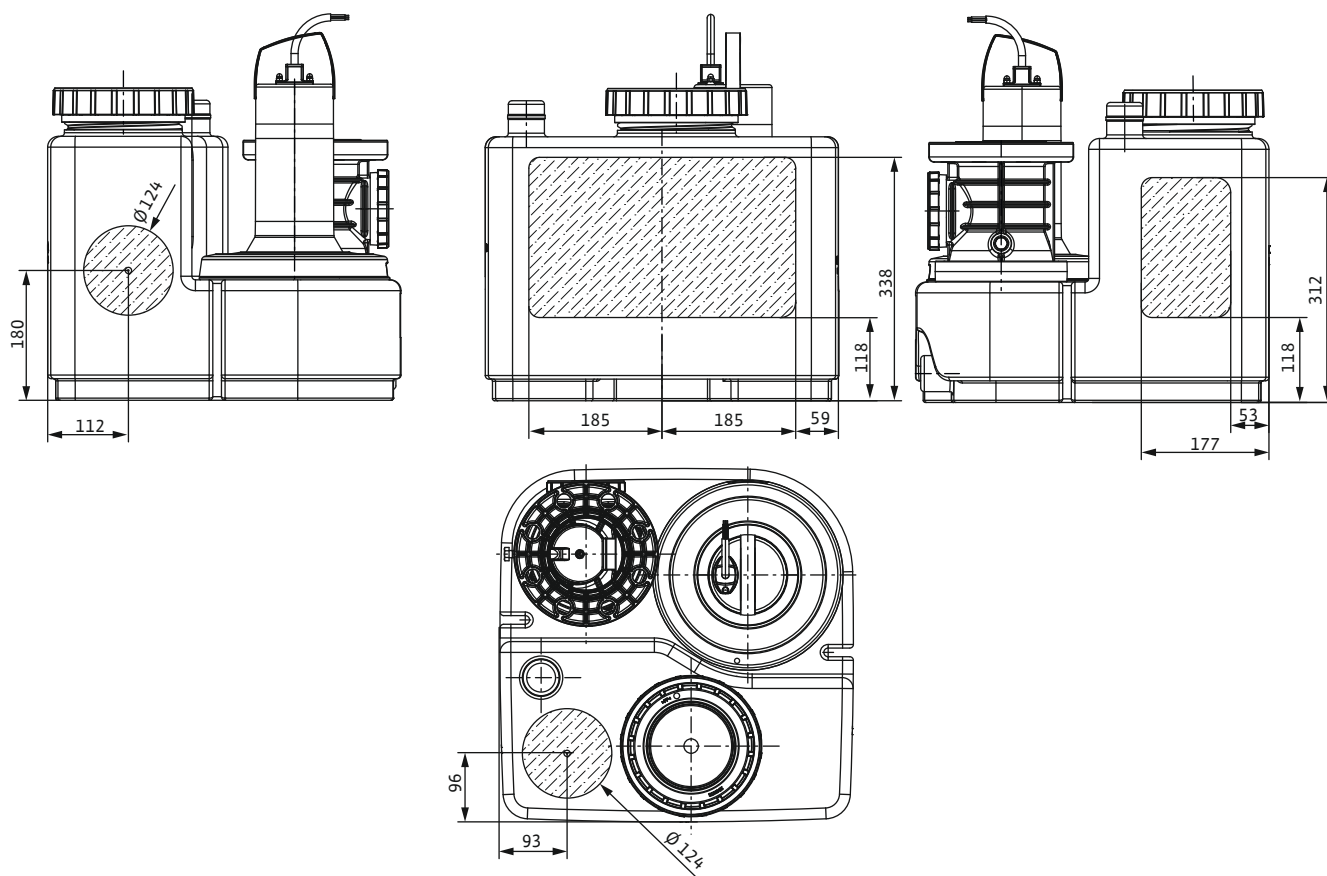


Fig. 4: Inlet areas

Note the following when connecting the inlet:

- Connect the inlet within the marked areas. If the inlet is outside the marked areas, the following problems can occur:
 - The connection will leak.
 - Backflow into the connected inlet pipe.
- Avoid an inlet surge and air intake into the collection reservoir. Lay the inlet properly.

CAUTION! Inlet surges or air intake into the collection reservoir can cause the lifting unit to malfunction!
- Lay the inlet pipe with a slope to the lifting unit so that it can drain automatically.
- The minimum connection height is 180 mm (7 in).
- All connections must be completely tight!
- Install gate valve in the inlet!

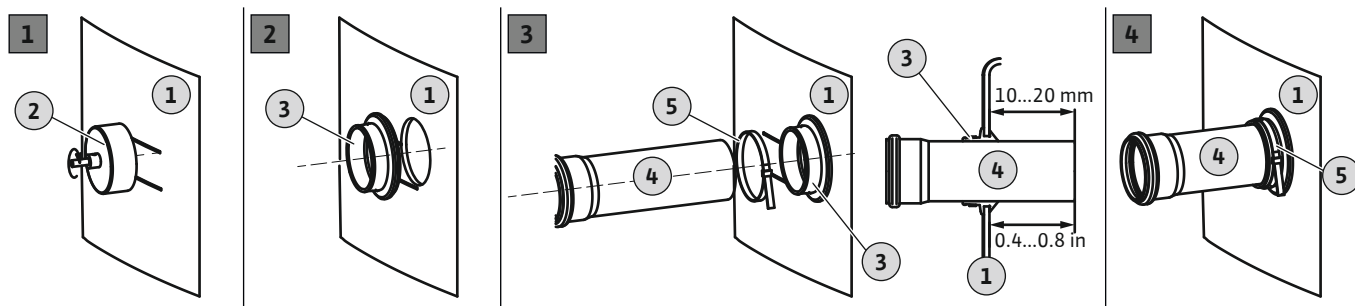


Fig. 5: Connect the inlet.

1	Tank wall
2	Hole saw for drill
3	Inlet seal
4	Inlet pipe
5	Pipe clamp

- ✓ Lifting unit installed properly.
 - ✓ Inlet pipe installed properly up to collection reservoir and according to consulting documents.
 - ✓ Installation materials provided:
 - 1x hole saw (DN 100 included in delivery)
 - 1x drill
 - 1x inlet seal (DN 100 included in delivery)
 - 1x pipe clamp
1. Mark the inlet point on the collection reservoir.
 2. Use a hole saw to cut the hole for the inlet into the reservoir wall.
When drilling holes on the collection reservoir, observe the following points:
 - Observe the dimensions of the inlet surfaces. **CAUTION! The drilled hole must be completely within the marked inlet surfaces!**
 - Max. speed of the drill: 200 rpm.
 - Check the hole diameter! **NOTICE! Drill the connection carefully. Impermeability of the connection depends on the drilled hole!**
 - Make sure the excess material in the drill bit is removed completely! If the excess material removal rate decreases, the material will heat up too quickly and melt.
 - ⇒ Stop the drilling process, allow the material to cool down and clean the hole saw!
 - ⇒ Reduce the speed of the drill.
 - ⇒ Vary the feed pressure when drilling.
 3. Deburr and smooth the cut surface.
 4. Insert the inlet seal into the hole.
 5. Push the pipe clamp onto the inlet seal.
 6. Coat the inner surface of the inlet seal with lubricant.
 7. Push the inlet pipe into the inlet seal.
Push the inlet pipe 10 ... 20 mm (0.4 ... 0.8 in) into the collection reservoir.
 8. Connect the inlet seal and pipe firmly to the pipe clamp. **Tightening torque: 5 Nm (3.7 ft·lb).**
 - Inlet connected. Next step: Connect the aeration and venting.

6.4.8 Connect aeration and venting

The connection of an aeration and venting line is a specified requirement. Furthermore, aeration and venting is an absolute necessity to ensure the correct functioning of the lifting unit. Observe the following points when connecting the aeration and venting line:

- Guide the aeration and venting line over the roof.
- All connections must be completely tight.

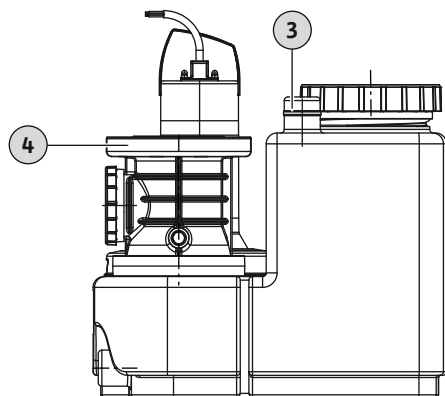


Fig. 6: Collection reservoir aeration and venting connection

6.4.9 Installation of a diaphragm hand pump



NOTICE

Do not connect inlet to the emergency drain!

The collection reservoir is pumped out via the emergency drain for inspection work or in the event of an accident. Do not connect inlets to the emergency drain! The collection reservoir cannot be drained in case of emergency otherwise!

The collection reservoir must be manually pumped out if maintenance work is carried out or if the lifting unit malfunctions. It is recommended to install a diaphragm hand pump for this purpose.

CAUTION! If the lifting unit malfunctions, there is backflow into the inlet and the collection reservoir can burst! Shut off the inlet and drain the collection reservoir.

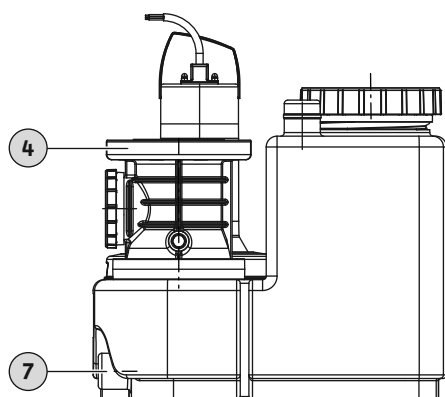


Fig. 7: Connection of diaphragm hand pump

6.5 Electrical connection



DANGER

Risk of death due to electrocution!

Improper conduct when carrying out electrical work can lead to death due to electric shock! Electrical work must be carried out by a qualified electrician in accordance with the locally applicable regulations.

3	Collection reservoir aeration and venting connection
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4	Discharge connection
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✓ Lifting unit is properly installed.

✓ Aeration and venting line is laid properly.

1. Place the HT double socket onto an open aeration and venting connection.

2. Insert the aeration and venting pipe into the HT double socket.

► Aeration and venting installed. If required, connect a diaphragm hand pump to the connection for emergency draining.

4	Pressure connection
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7	Emergency drain connection
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Observe the following points when installing a diaphragm hand pump:

→ Select an installation height which is optimal for operation.

→ Connect the diaphragm hand pump to the emergency drain (lowest point, almost complete drain possible).

→ A hole saw 30 mm (1.3 in) is required to open the drain connection.

→ Connect the pressure pipe downstream of the gate valve on the pressure side. Alternatively, the connection can be made via a pipe loop directly to the sewer.

→ All connections must be completely tight!

→ Observe the installation and operating instructions for the diaphragm hand pump!

6.5.1 Fuse on mains side

Circuit breaker

The size and switching characteristics of the circuit breakers must conform to the rated current of the connected product. Observe local regulations.

Residual-current device (RCD)

- Install a residual-current device (RCD) in accordance with the regulations of the local energy supply company.
- If people can come into contact with the device and conductive fluids, install a residual-current device (RCD).

6.5.2 Mains connection

- Observe information on the rating plate.
- Earth the device in accordance with local regulations.
- Install the socket so that it is overflow-proof.
- Socket version:
 - Single-phase current: Shock-proof socket
 - Three-phase current: CEE 16A, 3P+N+PE, 6 h, clockwise rotating field

6.5.3 Switchgear

The switchgear is pre-wired and factory-set. Lay all connection cables to the switchgear and mains connection in accordance with local regulations. **CAUTION! Install the switchgear so that it is overflow-proof!**

The switchgear has the following basic functions:

- Level-dependent control
- Motor protection
- Direction of rotation monitoring (only for the three-phase current)
- High water alarm

For detailed information, refer to the installation and operating instructions for the switchgear:

- Electrical connection of the lifting unit to the switchgear
- Overview and description of functions
- Setting the switching points

Switching points

The switching points of the lifting unit can be adjusted to the positive suction head. This results in a greater usable volume. The switching point data always refers to the floor.

NOTICE! If the inlet is lower than the “Pump ON” switching point, there is backflow into the inlet pipe!

Wilo-Control MS-L switchgear

The switching points are set via firmly defined parameter sets for the Wilo-Control MS-L switchgear. To this end, set the required parameter set to DIP switch 3:

Switching points	Setting DIP switch 3	Factory setting/se- lectable
Pump ON: 180 mm (7 in) Pump OFF: 115 mm (4.5 in) High water alarm: 200 mm (8 in)		•
Pump ON: 250 mm (10 in) Pump OFF: 115 mm (4.5 in) High water alarm: 270 mm (10.5 in)		o

Key

- = factory setting, o = adjustable

NOTICE! For the position of DIP switch 3, refer to the installation and operating instructions for the switchgear!

Wilo-Control EC-L switchgear

The switching points are set via the menu for the Wilo-Control EC-L switchgear. To this end, set the following values in the specified menus:

Switching points	Factory setting/se- lectable	Menu 5.09	Menu 1.12	Menu 1.13	Menu 5.51
Pump ON: 180 mm (7 in) Pump OFF: 115 mm (4.5 in) High water alarm: 200 mm (8 in)	•	1.00	0.60	0.27	0.69
Pump ON: 250 mm (10 in) Pump OFF: 115 mm (4.5 in) High water alarm: 270 mm (10.5 in)	o	1.00	0.91	0.27	0.97

Key

• = factory setting, o = adjustable, switching point unit: Metres (m)

NOTICE! Refer to the switchgear installation and operating instructions for functional details and a description of the menu!

6.5.4 Operation with frequency converter

Operation on the frequency converter is not permitted.

7 Commissioning

**WARNING****Foot injuries due to a lack of protective equipment!**

Danger of (serious) injuries during work. Wear safety shoes!

**NOTICE****Automatic activation after power cut**

Depending on the process, the product is switched on and off using separate controls. The product may automatically switch on following power cuts.

7.1 Personnel qualifications

- Electrical work: qualified electrician
Person with appropriate technical training, knowledge and experience who can identify and prevent electrical hazards.
- Operation/control: Operating personnel, trained in the functioning of the complete system

7.2 Operator responsibilities

- Providing installation and operating instructions by the lifting unit or at a place specially reserved for it.
- Making the installation and operating instructions available in the language of the personnel.
- Making sure that the installation and operating instructions are read and understood by all personnel.
- All safety devices and emergency cut-outs must be active and checked to ensure that they function properly.
- The lifting unit is suitable for use under the specified operating conditions.

7.3 Operation

CAUTION

Malfunction due to incorrect operation of the switchgear!

When the plug is inserted, the switchgear starts in the last operating mode that was set. In order to be familiar with the operation of the switchgear, the installation and operating instructions for the switchgear must be read before inserting the plug.

The lifting unit is operated by the switchgear. The switchgear is pre-set for the lifting unit. Read the installation and operating instructions for the switchgear to ensure it is correctly operated:

- Settings
- LED displays/LC display
- Alarm signals

7.4 Test run

Carry out a test run before operating the lifting unit in automatic mode. A test run checks the proper functioning and impermeability of the unit. It might be necessary to adjust the pump's follow-up time to guarantee optimum operation of the unit.

- ✓ Lifting unit installed properly.
- ✓ Connections to correct connection checked.
 1. Activate the lifting unit: Insert plug into socket.
 2. Select automatic mode on the switchgear.
 3. Open the shut-off valve in the pressure pipe.

NOTICE! The shut-off valve in the inlet remains closed!
 4. Unscrew the inspection cover on the collection reservoir.
 5. Slowly fill the collection reservoir with water via the inspection opening with a hose.

NOTICE! Malfunction! Do not hold water jet directly above the float switch!
 6. Lifting unit is switched on and off using the level control.
 - ⇒ Carry out at least two complete pumping procedures of all pumps when conducting a test run.
 - ⇒ Fill the pressure pipe completely with water to check the duty point. Repeat the test run until the pressure pipe is completely full.
 7. Screw the maintenance cover back on. **NOTICE! Tightly seal the inspection opening on the collection reservoir!**
 8. Check all connections for impermeability.
 - ⇒ If all connections are leak-proof, the lifting unit can run in automatic mode.
- ▶ Test run completed.
- ▶ Lifting unit **is put into operation**: Keep gate valve open in the **pressure pipe**.
- ▶ Lifting unit **in standby mode**: Close the gate valve in the **pressure pipe**.

7.5 Follow-up time

The follow-up time is pre-set at the factory to 3 seconds. The follow-up time can be adjusted as required:

- Increasing the usable volume per pumping process.
- Extensive suction of settling sediments on base of tank through integrated depth suction.
- Slurping operation for avoiding pressure surges.

To set the follow-up time, read the installation and operating instructions for the switchgear!

CAUTION! Pay attention to the operating mode if the follow-up time is changed. The operating mode indicates the activation period and the downtime!

7.6 Setting for venting screw

The swing check valve is equipped with a venting screw. The swing check valve can be opened via the venting screw for inspection work. As a result, the remaining fluid can flow back into the collection reservoir from the pressure pipe. You should then restore

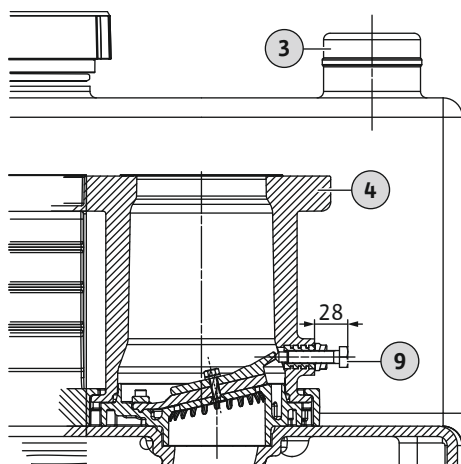


Fig. 8: Position of the venting screw

the factory setting of the venting screw to ensure proper operation of the swing check valve.

3	Collection reservoir aeration and venting connection
4	Discharge connection
9	Venting screw

✓ Lifting unit in standby mode.

1. Check factory setting of the venting screw: 28 mm (1.1 in)
2. Unscrew the venting screw if it is screwed in too far (> 28 mm/1.1 in).

CAUTION! If the venting screw is screwed in too far, this can cause damage to the swing check valve. This can also lead to loud noises being produced!

8 Operation

The lifting unit operates in automatic mode by default and is switched on and off using the integrated level control device.



WARNING

Risk of burns from hot surfaces!

Motor housing can become hot during operation. It may cause burns. Allow the motor to cool down at ambient temperature after switching it off!

- ✓ Commissioning has been carried out.
 - ✓ Test run has been completed successfully.
 - ✓ The operation and functioning of the lifting unit are known.
 - ✓ Pressure pipe completely filled with water.
1. Activate the lifting unit: Insert plug into socket.
 2. Select automatic mode on the switchgear.
 3. Open the gate valve in the inlet and pressure pipe.
- The lifting unit operates in automatic mode and is controlled depending on level.

8.1 Application limits

Improper use and overstraining leads to damage to the lifting unit. The following application limits must be strictly observed:

- Max. intake/h: 1500 l (396 US.liq.gal)
- Max. positive suction head: 5 m (16 ft)
- Max. pressure in the pressure pipe: 2.5 bar (36 psi)
- Fluid temperature: 3 ... 40 °C (37 ... 104 °F), max. 65 °C (149 °F) for 5 min
- Ambient temperature: 3 ... 40 °C (37 ... 104 °F)

8.2 During operation

CAUTION

Material damage due to pressure surges

Pressure surges can occur when switching off the pump. These pressure surges can damage the pressure pipe and the lifting unit. Increase the follow-up time to prevent the pressure surges. An extended follow-up time results in slurping operation and the swing check valve closes more smoothly.

**NOTICE****System problems when delivery head is too low**

If the geodesic delivery head is below 2 m (6.5 ft), a leakage can occur in the collection reservoir. The swing check valve does not close tightly due to a lack of required counter pressure. This can result in repeated activation (cycling) of the lifting unit.

- Open gate valves in the inlet and pressure pipe!
- The maximum inflow must be lower than the maximum output of the system.
- Do not open inspection openings on the collection reservoir and swing check valve!
- Ensure aeration and venting of the collection reservoir!

8.3 Emergency operation

8.3.1 Failure of the level control

If the level control fails, drain the collection reservoir in manual mode. For all relevant information on manual mode, refer to the installation and operating instructions for the switchgear.

CAUTION! Continuous duty is not permitted! Observe the operating mode. The operating mode indicates the activation period and the downtime!

8.3.2 Failure of the lifting unit

If the lifting unit completely fails, pump out the sewage using a diaphragm hand pump.

1. Close the gate valve in the inlet.
2. Close the gate valve in the pressure pipe.
3. Pump sewage into the pressure pipe using the diaphragm hand pump.

8.3.3 Overflow of the lifting unit (accident)

**DANGER****Danger due to fluids hazardous to health!**

In the event of an accident, there is contact with the collected sewage. Observe the following points:

- Wear protective equipment:
 - ⇒ single-use body suit
 - ⇒ sealed safety goggles
 - ⇒ mouth protection
- Accessories used (e.g. diaphragm hand pump, hoses) must be thoroughly cleaned and disinfected after completing work.
- Disinfect the lifting unit and operating space.
- Flush rinsing water into the sewer system.
- Dispose of protective clothing and cleaning material in accordance with local regulations.
- Observe the specifications in the work regulations! The operator must make sure that personnel have received and read the work regulations!

**NOTICE****Operation of the lifting unit in the event of high water**

The switchgear is not overflow-proof. To ensure operation of the lifting unit even in the event of high water, install the electrical connections and the switchgear at a suitably high level!

9 Shut-down/dismantling

9.1 Personnel qualifications

- Operation/control: Operating personnel, trained in the functioning of the complete system
 - Installation/dismantling work: trained specialist in plant technology for sanitary facilities
- Fixation and buoyancy safeguards, connection of plastic pipes

9.2 Operator responsibilities

- Electrical work: qualified electrician
Person with appropriate technical training, knowledge and experience who can identify and prevent electrical hazards.
- Observe locally applicable accident prevention and safety regulations of trade associations.
- Provide the necessary protective equipment and make sure that the personnel wears it.
- Ensure enclosed spaces have sufficient ventilation.
- Take immediate countermeasures if there is a build-up of toxic or suffocating gases!
- When working in chambers and closed spaces, a second person must be present for safety reasons.
- When using lifting equipment, all regulations for working with and under suspended loads must be observed!

9.3 Shut-down

1. Close the gate valve in the inlet pipe.
 2. Switch the switchgear to standby mode.
 3. Drain the collection reservoir.
Activate the lifting unit in manual mode and drain the collection reservoir.
 4. Close the gate valve in the pressure pipe.
 5. Switch off the lifting unit.
Pull the plug out of the socket. **CAUTION! Secure the lifting unit against unauthorised reactivation!**
- The lifting unit is now out of operation.

If the lifting unit is out of operation for an extended period, carry out a functional check at regular intervals (quarterly). **CAUTION! Carry out the functional check as described under "Test run".**

9.4 Removal



DANGER

Danger due to fluids hazardous to health during removal!

During removal, contact with fluids that are hazardous to health may occur. Observe the following points:

- Wear protective equipment:
 - ⇒ Closed safety goggles
 - ⇒ Mouth protection
 - ⇒ Protective gloves
- Immediately wipe up drips.
- Observe the specifications in the work regulations! The operator must make sure that the personnel have received and read the work regulations!



DANGER

Danger due to fluids hazardous to health! Disinfect the lifting unit!

Decontaminate the lifting unit after dismantling and before carrying out any other work. There is a risk of fatal injury! Observe the specifications of the work regulations! The operator must make sure that personnel have received and read the work regulations!



DANGER

Risk of death due to electrocution!

Improper conduct when carrying out electrical work can lead to death due to electric shock! Electrical work must be carried out by a qualified electrician in accordance with the locally applicable regulations.

**DANGER****Risk of fatal injury due to dangerous lone working practices!**

Work in chambers and narrow rooms as well as work involving risk of falling are dangerous work. Such work may not be carried out autonomously! A second person must be present for safety reasons.

**WARNING****Risk of burns from hot surfaces!**

Motor housing can become hot during operation. It may cause burns. Allow the motor to cool down at ambient temperature after switching it off!

- ✓ Lifting unit taken out of operation.
 - ✓ Protective equipment used.
 - ✓ All gate valves closed.
1. To drain the pressure pipe into the tank, open the swing check valve using the ventilation device.
 2. Pump out the remaining fluid using the diaphragm hand pump.
 3. Remove connection to inlet. Pull the inlet pipe out of the inlet seal.
 4. Remove connection from the pressure pipe. Remove the collar.
 5. Loosen the connection at the aeration and ventilation connection of the collection reservoir. Pull ventilation pipe out of HT bushing.
 6. Remove suction line of the diaphragm hand pump from emergency drain connection.
- DANGER! Health risk due to contact with sewage! The remaining sewage flows out of the collection reservoir via the emergency drain connection. Collect sewage in suitable tanks and flush into the sewer system.**
7. Release the floor anchoring.
 8. Pull the lifting unit carefully out of the pipework.
- Lifting unit is dismantled. Clean and disinfect the lifting unit and operating space.

9.5 Clean and disinfect

**DANGER****Danger due to fluids hazardous to health!**

Disinfect the lifting unit before carrying out any further work! Wear the following protective equipment while performing cleaning tasks:

- Sealed safety goggles
- Breathing mask
- Protective gloves

⇒ The equipment listed here is the minimum requirement. Observe the specifications of the work regulations! The operator must make sure that personnel have received and read the work regulations!

- ✓ Lifting unit is dismantled.
 - ✓ Switchgear packaged watertight.
 - ✓ Flush rinsing water into the sewer in accordance with local regulations.
 - ✓ A disinfectant in accordance with work regulations is available.
- NOTICE! Strictly observe the manufacturer's specifications concerning use!**
1. Spray the lifting unit with clean water from top to bottom.
 2. Open and rinse the inspection opening on the collection reservoir and the swing check valve.
 3. Spray all connection ports on the inside.

4. Flush any dirt residues on the floor into the drain.
5. Let the lifting unit dry out.
6. Close inspection opening on the collection reservoir and swing check valve again.

10 Maintenance and repair

Maintenance and repair work may **only** be carried out by qualified personnel (e.g. customer service). Carry out the maintenance intervals in accordance with EN 12056-4:

- ¼ year in the case of commercial operations
- ½ year for multi-family houses
- 1 year for single-family houses

Keep a record of all maintenance and repair work in a log. The log must be signed by the qualified employee and the operator.

Carry out a test run after completing the maintenance work.

11 Spare parts

Spare parts are ordered via customer service. To avoid return queries and incorrect orders, the serial or article number must always be supplied. **Subject to change without prior notice!**

12 Disposal

12.1 Protective clothing

Used protective clothing must be disposed off in accordance with the locally applicable guidelines.

12.2 Oils and lubricants

Operating fluid must be collected in suitable tanks and disposed of in accordance with the locally applicable guidelines. Wipe up drips immediately!

12.3 Information on the collection of used electrical and electronic products

Proper disposal and appropriate recycling of this product prevents damage to the environment and putting your personal health at risk.



NOTICE

Disposal in domestic waste is prohibited!

In the European Union this symbol may be included on the product, the packaging or the accompanying documentation. It means that the electrical and electronic products in question must not be disposed of along with domestic waste.

Please note the following points to ensure proper handling, recycling and disposal of the used products in question:

- Hand over these products at designated, certified collection points only.
- Observe the locally applicable regulations!

Please consult your local municipality, the nearest waste disposal site, or the dealer who sold the product to you for information on proper disposal. See www.wilo-recycling.com for more information about recycling.









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Local contact at
www.wilo.com/contact

Pioneering for You

WILO SE
Wilopark 1
44263 Dortmund
Germany
T +49 (0)231 4102-0
T +49 (0)231 4102-7363
wilo@wilo.com
www.wilo.com