

Model K9-102+ & K9-204+ FlexShaft™ 管道疏通机



目录

安全符号	2
通用安全规则	2
工作区域安全	2
电气安全	2
个人安全	2
工具使用和保养	3
维修	3
特定安全信息	3
FlexShaft 管道疏通机安全	3
里奇联系信息	4
说明	4
规格	5
规格-可接受的电池式电钻	5
标准设备	5
运行前检查	5
机器与工作区域设置	6
电池式电钻的设置和操作	7
电钻开关	7
电钻速度	8
电钻可调离合器设置	8
安装/调整链条敲击器	9
操作说明	11
储存	15
维护说明	15
清洁	15
润滑	15
钢索组件的更换	15
故障排除	16
维修和修理	16
可选设备	16

管道疏通机

Model K9-102+ & K9-204+
FlexShaft™ 管道疏通机



⚠ 警告！

使用此工具之前请仔细阅读本操作手册。未理解并遵循本手册中的内容可能会导致电击、火灾和/或严重的人员受伤。

RIDGID®

安全符号

本操作手册及其产品利用安全符号和警示词传达重要的安全信息。本节的内容旨在加深对这些信息词和符号的理解。



这是安全警示符号。用于警告您潜在的人身伤害危险。请遵守此符号后的所有安全讯息，以避免可能造成的伤害或死亡。



“危险”用于指示如未避免将会导致死亡或严重受伤的危险情况。



“警告”用于指示如未避免可能导致死亡或严重受伤的危险情况。



“小心”用于指示如未避免可能导致轻微或中等伤害的危险情况。



“注意”用于指示与财产保护有关的信息。



此符号表示使用设备之前，请仔细阅读操作手册。操作手册包含有关设备安全和正确操作的重要信息。



此符号表示使用本设备时始终佩戴带侧护边的安全眼镜或护目镜，以降低眼睛受伤风险。



此符号表示管道疏通机 FlexShaft 勒住、卷住或挤压手掌、手指或其他部位的风险。



此符号表示点击触电风险。



此符号表示链条敲击器勒住、卷住、挤压或卡住手指或其他身体部位的风险。当钢索末端位于排水管之外时切勿操作机器。



此符号表示处理或使用本设备时始终佩戴手套，以降低排水管中的污物造成感染、灼伤或其他严重人身伤害的风险。

通用安全规则

警告

阅读并理解所有警告和说明。未遵循所有警告和说明可能会导致电击、火灾和/或严重受伤。

请保存这些说明!

工作区域安全

- 工作区域应保持洁净和良好照明。杂乱或黑暗的区域会引发事故。
- 切勿在爆炸性环境中操作工具，例如在有易燃液体、气体或粉尘存在的情况下。工具会产生火花，可能会引燃粉尘或烟雾。
- 操作工具时确保远离儿童和旁观者。注意力不集中可能会导致失控。
- 保持地面干燥且无造成打滑的物料，例如油。

电气安全

- 避免身体接触到接地表面，例如管道、散热器、炉灶和冰箱。如果身体接地，电击风险将会升高。
- 切勿将电动工具暴露于雨雪或潮湿环境。如果有水进入电动工具，将会升高电击风险。

- 如果不可避免地要在潮湿地点使用电动工具，则应使用有接地故障断路器 (GFCI) 保护的电源。使用 GFCI 可降低电击风险。

个人安全

- 操作工具时，请保持警惕、观察您进行的工作并利用常识做出判断。当您疲劳或受到麻醉药、酒精或药物影响时，切勿使用工具。操作工具时，片刻的走神都可能会造成严重的人员伤害。
- 使用个人防护设备。始终佩戴护目用具。

根据相应条件使用防护装备将可减少人身伤害，例如防尘面具、防滑安全鞋、安全帽或听力保护装置。

- 切勿过度伸出肢体。在任何时间，都必须确保站稳和保持平衡。正确地站稳和保持平衡，在意外情况下能够更好地控制工具。

工具使用和保养

- 切勿强行操作工具。根据您的应用使用正确的工具。正确的工具才能更好、更安全地按照设计规格完成任务。
- 将处于闲置的工具存储在儿童无法触及的位置，不要让不熟悉工具或这些说明的人操作工具。未经培训的人员使用工具可能会产生危险。
- 维护工具。检查是否存在运动部件未对准或卡住、部件断裂以及任何其他可能影响工具运行的情况。如果受损，应当先将工具修复，然后才能使用。许多事故都由工具维护不佳而引发。
- 保持手柄干燥、洁净且无油脂。这便于更好地控制工具。

维修

- 工具应由具备资质的修理人员维修，且只能使用相同的更换部件。这样可确保维持工具的安全性。

具体安全信息

▲ 警告

本部分包含这种工具特有的重要安全信息。

使用 FlexShaft™ 管道疏通机之前请认真阅读这些注意事项，以降低引发触电或其他严重伤害的风险。

保存所有警告和说明，以供将来参考！

将本手册保存在机器附近以便于操作员使用。

FlexShaft 管道疏通机安全

- 处理或使用，应始终佩戴质量良好的护目镜和手套。怀疑存在化学物质、细菌或其他有毒或传染性物质时，应使用乳胶或橡胶手套、面罩、防护服、防毒面具或其他适当的防护装备，以降低感染、灼伤或其他严重人身伤害的风险。
- 切勿使用有线的电钻。使用有线的电钻会增加触电和其他伤害的风险。
- 按压电钻开关时切勿使链条敲击器/钢索头停止转动。这样会使钢索上的张力过高，可能导致钢索组件绞合、扭结或断裂，从而可能造成严重的人身伤害。
- 采取良好的卫生措施。处理或操作工具时切勿进食或吸烟。处理或操作管道疏通设备后，用热肥皂水清洗手和其他接触过污物的身体部位。这将有助于降低因接触有毒或传染性物质而产生的健康危害风险。
- 仅将 FlexShaft 管道疏通机用于推荐的排水管道尺寸。使用错误尺寸的管道疏通机可能会导致钢索绞合、扭结或断裂，从而可能会造成人身伤害。
- 在 FlexShaft 机器运行中，始终应将手放在钢索组件上。这能够更好地控制钢索，有助于防止钢索绞合、扭结或断裂，并降低受到伤害的风险。
- 放置机器，使钢索出口位于排水管入口 1m(3') 以内，当距离超过 1m(3') 时应适当地支撑裸露的钢索组件。不过，更大的距离可能会产生控制问题，导致钢索绞合、扭结或断裂。绞合、扭结或断裂的钢索可能会造成击打或挤压伤害。
- 一个人必须同时控制钢索组件和无线电钻。在操作期间，切勿将电钻开关锁定在打开位置。如果钢索停止旋转，操作员必须能够释放电钻开关，以防止钢索绞合、扭结或断裂，并降低受伤风险。

- 切勿穿着宽松的衣服或佩戴首饰。请确保头发和衣服远离运动部件。宽松的衣服、首饰或头发可能会被运动部件夹住。
- 如果操作者或机器处于水中，不得操作本机器。在水中操作机器会增加触电的风险。
- 如果操作过程中存在接触其他管线（例如，天然气或电力）的风险，切勿使用。利用摄像头对排水管进行可视检查是一种良好的做法。横孔、管线布置不当和排水管受损可能会导致割刀接触并损坏管线。这可能会导致触电、气体泄漏、火灾、爆炸或其他严重损坏或人身伤害。
- 操作前，请阅读并理解这些说明、电池式电钻说明以及与本工具一起使用的任何其他设备的说明。未遵循所有说明可能会导致财产损失和/或严重伤害。

普通链条敲除器适用于一般用途，包括润滑脂。在管道清洁流程中，FlexShaft 管道疏通机非常适合与检视摄像头共用。

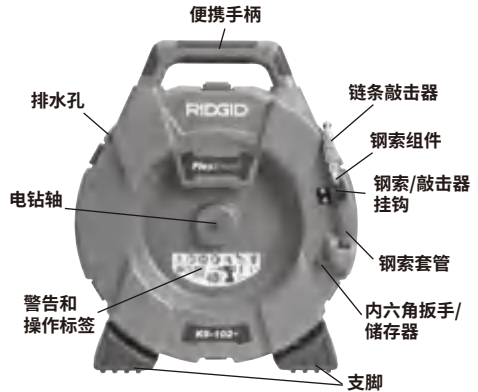


图 1A-RIDGID® FlexShaft 管道疏通机

里奇联系信息

如果您对本里奇产品有任何疑问：

- 请联系艾默生精密工具技术（上海）有限公司
- 客户咨询：400-820-5695
- 网址：www.RIDGID.cn
www.RIDGID.com.cn



图 1B-RIDGID® FlexShaft 管道疏通机

说明

里奇型号K9-102+和K9-204+FlexShaft™ 管道疏通机设计用于对管道和排水管线进行清洁和除垢，如规范所述。

利用由用户提供的电池式钻机来驱动 FlexShaft 管道疏通机。FlexShaft 管道疏通机钢索组件由人工送进和抽出排水管。扩大管道内径的链条敲击器用于破碎堵塞物并清洁管道壁。带有硬质合金切割尖端的链条敲除器可用于根部和清除管壁上的氧化皮。

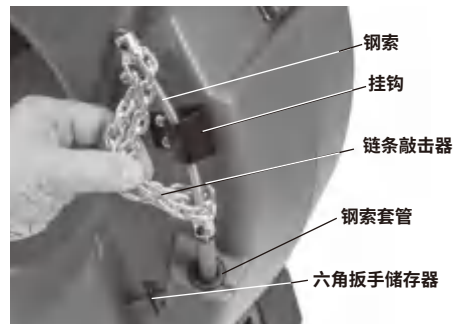


图 1C-钢索端头/链条敲击器

Specifications

型号	K9-102+	K9-204+
排水量 (标称)	1/4" 至 2" (32 – 50 mm)	2" 至 4" (50 – 100 mm)
钢索直径 (不含护套)	1/4" (6 mm)	3/16" (8mm)
钢索组件直径 (包含护套)	3/8" (9.5 mm)	1/2" (12.7 mm)
钢索组件长度	50' (15.2 m)	70' (21.3 m)
旋转速度	最大 2500 RPM	最大 2500 RPM
电钻附件	3/16" 六角头 (8 mm)	3/16" 六角头 (8 mm)
重量 (不含电钻/敲击器)	24.3 磅 (11.0 kg)	37.3 磅 (16.9 kg)
尺寸 (不含电钻)	19.2" × 7.5" × 22.1" (488 mm × 191 mm × 562 mm)	21.1" × 10.8" × 24.2" (536 mm × 274 mm × 615 mm)
工作温度	20°F 至 140°F (-6°C 至 60°C)	20°F 至 140°F (-6°C 至 60°C)

不建议使用FlexShaft 排水清洁剂清洁玻璃、陶器、瓷器或类似固定装置，因为这可能会损坏固定装置。

规格-可接受的电池式电钻

旋转速度 1800 至 2500 RPM
 夹具尺寸 3/8" 或更大
 离合器 扭矩可调
 开关类型 瞬时接触
 开关锁 未配备

电钻必须带有适当的认证标志 (CE标志、c () us标志等)

切勿使用有线电钻、冲击钻或冲击式驱动装置。使用不当的电钻会增加设备损坏和人员受伤的风险。参见电池式电钻的设置和操作部分。

标准配置

请参考RIDGID目录以了解随附有特定管道疏通机目录编号的设备详细信息。

注意 机器的用途是清洁排水管。如果正确使用，不会损坏状况良好、且设计、建造和维护得当的排水管。如果排水管状况不佳，或未正确设计、建造和维护，则排水管清洁过程可能效果不佳，或者可能会导致排水管受损。清洁之前确定排水管状况的最佳方式是通过摄像机进行目视检查。本管道疏通机使用不当可能会损坏管道疏通机和排水管。此机器可能无法清除全部堵塞物。

运行前检查

警告



每次使用之前，检查管道疏通机并纠正任何问题，以降低电击、钢索绞合或断裂、化学灼伤、感染和其他原因造成的严重伤害风险，并防止管道疏通机损坏。

检查管道疏通机时，应始终佩戴护目镜以及其他合适的防护设备。

- 清洁机器，包括手柄和控制装置。这样可协助检查，并有助于防止您在抓住机器和控制装置时发生脱手。按照维护说明清洁和维护机器。
- 对机器进行下列检查：
 - 正确装配且保持完整。
 - 任何部件断裂、磨损、缺失、未对准或卡塞。
 - 警告标签粘贴好且清晰可读 (见图2)。



图2-警告标签

- 钢索组件能够顺畅无阻地收进和拉出机器。
- 任何可能妨碍安全和正常运行的条件。

如果发现任何问题，在问题得到修复之前切勿使用管道疏通机。

- 清除钢索组件和链条敲击器上的所有碎屑。检查护套有无磨损和损坏。不应有任何切口、扭结、断裂或过度磨损。检查链条敲击器附近的钢索。钢索组件不应弯曲或变形。每股钢索应相互缠紧，不得分离。检查链条敲击器的碳化物刀片（如果配备）是否受损或缺失以及链条本身是否磨损。如果链环磨损超过1/4或损坏，则应更换链条敲击器。使用管道疏通机之前，应更换磨损和损坏的设备。

确认链条敲击器安装正确，且牢固地连接在钢索上。

- 按照其说明检查电池式电钻。确保电钻处于良好的工作条件，并且开关可控制电钻运行。确认电钻符合“规格”部分的要求，并正确地设置以便与疏通机配合使用。
- 按照其说明检查和维护正在使用的任何其他设备，以确保其正常运行。

机器与工作区域设置

警告



按照这些程序设置管道疏通机和工作区域，以降低触电、火灾、机器翻倒、钢索绞合或断裂、化学灼伤、感染和其他原因造成的伤害风险，并防止机器损坏。

设置管道疏通机时，应始终佩戴护目镜和其他合适的防护装备。

- 检查合适的工作区域。在清洁、水平、稳定且干燥的位置操作。切勿站在水中使用管道疏通机。
- 检查待清洁的排水管。如有可能，确定排水管的进入点、排水管的大小、长度和材料、与主管道的距离、堵塞物的性质、是否存在管道清洁化学物质或其他化学物质等。

如果排水管中存在化学物质，务必了解在这些化学物质周围作业时时必须采取的具体安全措施。请联系化学物质制造商以获得所需的信息。确认排水管中或所处区域中无其他管线存在，以降低损坏风险。利用摄像头对排水管进行可视检查是一种良好的做法。

如果需要，拆除固定装置（抽水马桶等）以便进入排水管。切勿在固定装置中运行链条敲击器。这可能会损坏 FlexShaft 机器或固定装置。

如果在清洁排水管的过程中有水流冲走碎屑，将会获得最佳的管道疏通效果。对于1 1/4"和1 1/2"洗涤槽下水管，可使用切孔壁管。请参考图3进行安装。放置一个容器接住所有可能从排水管溢出的液体或碎屑。

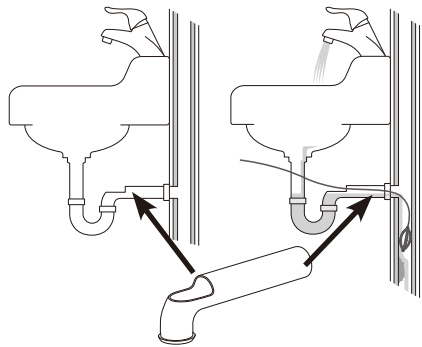


图 3- 壁管安装

- 确定适合应用的正确设备。请参阅“规格”。通过 RIDGID.com 在线查询 Ridge Tool 目录，以了解用于其他应用的管道疏通机。
- 确保所有设备均已正确检查。

5. 如果需要，在工作区域放置保护罩。管道清洁流程可能脏乱。
6. 将管道疏通机放在地面上，电钻轴保持水平。机器应牢固地竖直放在地面上。切勿在电钻轴处于垂直方向时运行。这样将可降低翻倒风险。
7. 从电钻上拆下电池。正确设置电钻。（参见电池式电钻的设置和操作部分。）牢固地将电钻夹具卡在电钻轴的六角头上（图4）



图4 - 将电钻连接到电钻轴



图5 - 将排水管进入点延长到机器钢索出口3' 以内的示例

8. 放置管道疏通机，使钢索出口位于排水管进入点1m(3')以内。距离排水管进入点越远，钢索组件绞合或扭结的风险就越大。如果 FlexShaft 机器无法放置在钢索出口与排水管进入点的距离小

于1m(3')的位置，使用相似尺寸的管道和接头延伸排水管进入点（见图5）。不当的钢索组件支撑可能会使钢索扭结和绞合，并可能会损坏钢索或伤及操作员。向管道疏通机方向延长排水管也有利于将钢索组件送入排水管中。

9. 从吊钩上断开链条敲击器，并将大约1.2m(4')的钢索组件拉出机器。
10. 标记护套以指示拉回过程中链条敲击器何时达到排水管开口。在此操作中可使用胶带。这样可降低链条敲击器从排水管脱出后抽打到人的风险。与链条敲击器的距离取决于排水管的配置，但至少应达到1.2m(4')。
11. 确保链条敲击器正确安装（参见安装/调节链条敲击器）。
12. 将链条敲击器末端插入排水管至少0.3 m (1')。
13. 评估工作区域，确定是否需要树立任何屏障以使旁观者远离管道疏通机和工作区域。排水管清洁过程可能很艰难，旁观者可能会分散操作人员的注意力。
14. 适当放置机器以便轻松控制。您必须能够抓住并控制钢索组件和电钻开关。
15. 用干燥的手将电池放入电钻。

电池式电钻的设置和操作

有关可与FlexShaft管道疏通机一起使用的可接受电池式电钻的信息，请参阅本节中的“规格”部分。有许多类型的电池式电钻可供使用，但并非所有类型的电钻都适用于FlexShaft管道疏通机。如果对该应用程序的电钻适用性有任何疑问，请不要使用它。在进行任何调整或连接到管道疏通机或从管道疏通机上取下之前，从电钻上取下电池。

电钻开关

电钻必须配备无开关锁的瞬时接触开关。这意味着只有当操作员按下电钻开关时，电钻

才会转动。如果松开电钻开关，电钻将关闭。将电钻旋转设置为“FOR”旋转（见图4）。

电钻速度

使用 FlexShaft 管道疏通机时，所需转速范围为1800–2500 rpm。通过将链条敲击器旋转至更接近最大转速2500rpm，可优化清洁。要做到这一点，请了解您的电池式电钻规格和设置，以优化运行。许多电池式电钻具有多种速度设置，通常最高速度在FlexShaft设备的运行范围内。钻孔速度设置示例见图6。FlexShaft排水管清洗机的转速不得超过2500rpm。

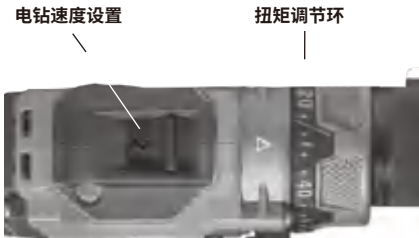



图6 - 电钻设置

电钻可调离合器设置

始终使用配备有正确设置的可调节离合器的电池式电钻。这将有助于降低管道疏通机滚筒中钢索损坏的风险，并减少手柄力。

配备可调离合器的电池式电钻通常有一个扭矩调节环（图6），标有从1开始并递增的数字刻度，以指示离合器分离时扭矩的增加。可调节式离合器多次用于传动螺杆，并可能有一个需要设置为“螺丝驱动模式”（) 的选择器，以便可调节离合器工作。当可调节离合器松开时，电机继续转动，但电钻卡盘不转动。很多时候，这伴随着来自电钻的振动/噪音。





电池式电钻通常还配有“电钻”（) 和“冲击钻”（) 的运行模式（图7）。在这些模式下，可调节离合器不工作，这些模式永远不该应用于FlexShaft管道疏通机操作。



图7 - 选择正确模式

使用FlexShaft管道疏通机时，始终将电钻可调离合器设置为总离合器可调节范围的25%左右再开始运行（例如，如果钻头上的扭矩调整卡圈标记为1至20，则初始设置应为5）。

按照这些说明操作管道疏通机。清除堵塞时，应全速操作电钻，以便进行保证最佳清洁效果。不要强行将链条敲击器推入堵塞中-如果链条敲击器无法转动，则无法清洁排水管。可能需要将链条敲击器移离堵塞，以恢复速度。如果在操作过程中钻机离合器持续松开（“离合器分离”），则松开电钻开关并将钢索从排水管道中取出。检查管道疏通机的设置和操作，并确认一切正确-正确操作设置的一个重要部分是链条敲击器的选择（详见图9）和调整。进行任何必要的更改并继续疏通管道。

如果在操作过程中继续释放钻机离合器，则可以增加钻机可调离合器的设置。电钻离合器可逐步增加至总离合器调整范围的75%（例如，如果钻头上的扭矩调整卡圈标记为1至20，则最大设置不应超过15）。不要超过离合器总调整范围的75%。切勿将钻机置于“电钻”（) 或“冲击钻”（) 模式-这会导致可调节离合器不工作。这增加了管道疏通机滚筒中钢索损坏的风险。

如果电钻离合器在设置为总离合器调整范围的75%时继续分离，请考虑使用另一台RIDGID管道疏通机。

安装/调整链条敲击器

1. 根据情况选择合适的链条敲击器。

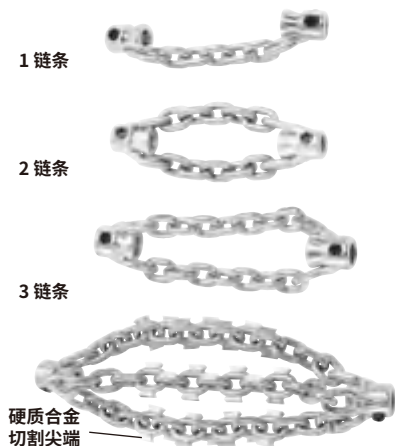


图 8 - 链条敲击器

链条敲击器的尺寸依赖卡圈内径，针对具体的钢索尺寸设计。 $\frac{1}{4}$ " 链条敲击器用于 $\frac{1}{4}$ " 钢索，依此类推。切勿将较大尺寸的链条敲击器用于较细的钢索（例如， $\frac{5}{16}$ " 用于 $\frac{1}{4}$ " 钢索）。请参考图8以及卡圈距离图。

无碳化物刀片的链条敲击器可用于常见管道类型。这些链条敲击器能够很好地疏通油脂或类似堵塞。

带碳化物刀片的链条敲击器用于清除管道内的水垢，也可用于疏通树枝堵塞。碳化物刀片用于强力疏通，可能会损坏管道，尤其是对于较软的材料（例如，塑料和Orangeburg）、薄壁管道，或链条敲击器长时间留在一个位置的情况。参见图9，锚链敲击器选择表。

不要在玻璃、陶器、瓷器或类似材料固定装置或管道中使用链式敲击器进行清洁。它们可能会被损坏。

2. 图10显示了正确安装和调节链条敲击器的示意图。链条敲击器的安装/调节有两个要点。

卡圈距离：为链条敲击器卡圈设置正确的间隔距离（“卡圈距离”），使链条在旋转时分布到适当的范围以清洁管壁。卡圈距离根据钢索尺寸和管道直径而变化，通常使用由护套制成的间隔柱（“卡圈间隔柱”）设置。如果需要达到更大的灵活性以便通过弯曲段，可以取下间隔柱，并可使用卷尺设置卡圈距离。如果操作时不使用间隔柱，钢索在使用中会更容易挥出并损坏。**切勿在无卡圈间隔柱的情况下操作碳化物割刀，以降低钢索受损的风险。**

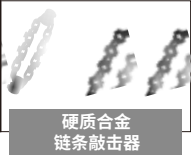
尽可能减少裸露的钢索（未被护套管覆盖的钢索）长度。裸露的钢索越多，钢索在使用中挥出和损坏的可能性就越大。裸露的钢索应限制为不超过6mm（ $\frac{1}{4}$ "），并利用护套管构成的衬套（“敲击器衬套”）设置。裸露的钢索随钢索从卷筒中出来的长度而变化。卷筒外的钢索越多，裸露的钢索越小。为了获得最佳效果，可能需要将裸露钢索固定在钢索卷筒外。

护套管随管道疏通机提供，可用作维修部件以根据具体应用中的需要进行配置。仅使用正确尺寸钢索的RIDGID FlexShaft 管道疏通机护套管。每次切割护套管时，都应整齐且垂直地切割。切割护套管时切勿损坏钢索。

3. 链条敲击器借助提供的3mm内六角扳手通过定位螺丝固定到钢索。松开定位螺丝，从钢索拆下链条敲击器、间隔柱和衬套。
4. 检查护套管末端有无损坏或磨损。护套管末端应垂直且平整。如果需要，可以稍微修剪护套管末端。

K9-102+ 机器

K9-204+ 机器



目录编号	64293	64298	64283	64288	64323	64328	64333	64308	64313	64318	
说明	K9-102+ 1.5"	K9-102+ 2"	K9-102+ 1.5" 硬质合金	K9-102+ 2" 硬质合金	K9-204+ 2"	K9-204+ 3"	K9-204+ 4"	K9-204+ 2" 硬质合金	K9-204+ 3" 硬质合金	K9-204+ 4" 硬质合金	
管道尺寸	1.25'-1.5' (32-40 mm)	1.5'-2' (40-50 mm)	1.25'-1.5' (32-40 mm)	1.5'-2' (40-50 mm)	2" (50 mm)	3" (75 mm)	4" (100 mm)	2" (50 mm)	3" (75 mm)	4" (100 mm)	
管道类型	铜	☑	☑	☑	☑	☑	☑	☑	☑	☑	
	镀锌	☑	☑	☑	☑	☑	☑	☑	☑	☑	
	铸铁	☑	☑	☑	☑	☑	☑	☑	☑	☑	
	聚乙烯	☑	☑			☑	☑	☑			
	防抱死 制动系统	☑	☑			☑	☑	☑			
	橙堡	☑	☑			☑	☑	☑			
	波纹状的	☑	☑			☑	☑	☑			
	粘土	☑	☑			☑	☑	☑			
堵塞物	油脂	☑	☑	☑	☑	☑	☑	☑	☑	☑	
	软堵塞物	☑	☑	☑	☑	☑	☑	☑	☑	☑	
	清垢			☑	☑			☑	☑	☑	
	轻质的根			☑	☑			☑	☑	☑	
	随套件提供	☑	☑			☑		☑			

图9 - 链条敲击器选择图表

机器	钢索尺寸	链条数量	敲击器		
			链环数量/链条	标准管道尺寸	建议卡圈距离
K9-102+	1/4"	1	7	1 1/4" to 1 1/2" (32 mm to 40 mm)	1 3/4" (44.5 mm)
		2	7	1 1/2" to 2" (40 mm to 50 mm)	
K9-204+	5/16"	2	9	2" (50 mm)	2 1/2" (63.5 mm)
		3	13	3" (75 mm)	4" (101.6 mm)
		3	15	4" (100 mm)	4 1/2" (114.3 mm)

Collar Distance Chart

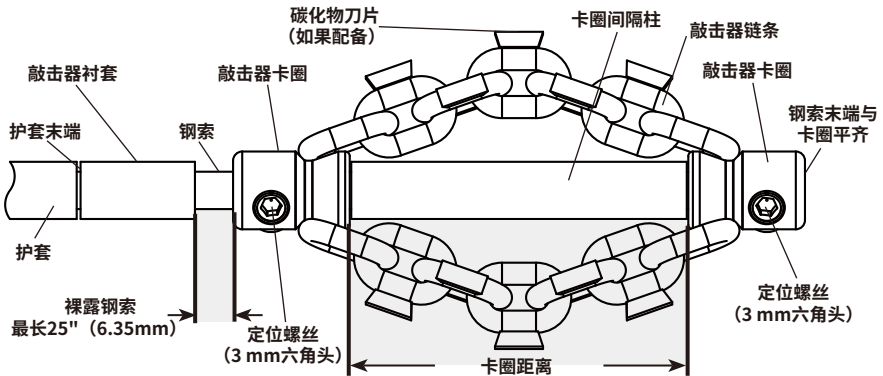


图10-链条敲击器的安装/调整

5. 如果需要，剪一段适当尺寸的护套管作为卡圈间隔柱（请参阅“卡圈距离图”。）

卡圈距离可根据您对特定管道/应用的偏好进行修改。当卡圈距离增加时，链条直径缩小，反之亦然。设置不当的卡圈距离可能会降低管道清洁的效率。

6. 如图10所示，剪切之前在钢索上测试链条敲击器、敲击器衬套和卡圈间隔柱。链条应当拉直-组装链条后切勿使其绞合。为了防止钢索头过度磨损，钢索头应与卡圈末端平齐。

检查裸露钢索的长度。为了降低钢索挥出和损坏的风险，裸露的钢索长度不应超过6mm (1/4")。如果需要，剪切护套管作为敲击器衬套以限制裸露的钢索长度。始终利用敲击器衬套来减少护套管末端处的磨损。

7. 按照图10中所示的方式将链条敲击器正确地安装在钢索上之后，利用提供的内六角扳手紧固定位螺丝。

紧靠钢索放置固定螺钉头端，然后再拧紧1/8至1/4圈（45°至90°）。如果定位螺丝未拧紧，链条敲击器可能会滑动、损坏钢索或掉在排水管中。

操作说明

警告



处理或使用，时应始终佩戴护目镜和手套。怀疑存在化学物质、细菌或其他有毒或传染性物质时，应使用乳胶或橡胶手套、面罩、防护服、防毒面具或其他适当的防护装备，以降低感染、灼伤或其他严重人身伤害的风险。

切勿使用有线的电钻。使用受到腐蚀的电钻会增加触电风险。

按压电钻开关时切勿使链条敲击器/钢索头停止转动。这样会使钢索上的张力过高，可能导致钢索组件绞合、扭结或断裂，从而可能造成严重的人身伤害。

采取良好的卫生措施。处理或操作工具时切勿进食或吸烟。处理或操作管道疏通设备后，用热肥皂水清洗手和其他接触过污物的身体部位。这将有助于降低因接触有毒或传染性物质而产生的健康危害风险。

在 FlexShaft 机器运行中，始终应将手放在钢索组件上。这能够更好地控制钢索，有助于防止钢索绞合、扭结或断裂，并降低受到伤害的风险。

放置 FlexShaft 机器，使钢索出口位于排水管入口 1m(3') 以内，当距离超过 1m(3') 时应适当地支撑裸露的钢索组件。不过，更大的距离可能会产生控制问题，导致钢索绞合、扭结或断裂。绞合、扭结或断裂的钢索可能会造成击打或挤压伤害。

一个人必须同时控制两个钢索组件和无线电钻。在操作期间，切勿将电钻开关锁定在打开位置。如果钢索停止旋转，操作员必须能够释放电钻开关，以防止钢索绞合、扭结或断裂，并降低受伤风险。

遵守操作说明，以降低由于钢索扭曲或损坏、钢索头撞击、机器翻倒、化学灼烧、感染以及其他原因造成的人身伤害风险。

1. 确保正确地设置机器和工作区域，且工作区域中无旁观者和其他干扰。
2. 从机器中拉出钢索组件，将其送入排水管。必须将至少 0.3m(1') 的钢索送入排水管，以防止机器启动时链条敲击器从排水管甩出并产生抽打动作。

直接将钢索组件从机器钢索出口布设到排水管开口，尽可能减少暴露的钢索以及方向变化。切勿过紧地弯曲钢索组件—这样可能会增加绞合或断裂风险。

如果使用摄像头查看管道疏通过程，可以同时送进摄像头。通常，钢索组件和摄像头推杆可以扎在一起，并同时推进/退出。使摄像头位于链条敲击器后方至少 0.5 m(1.5') 处。

注意 切勿使旋转的链条敲击器撞击摄像头/推杆。否则，可能会导致其受损。

3. 选定正确的操作位置，以帮助保持对钢索组件和电钻的控制（见图 11）：

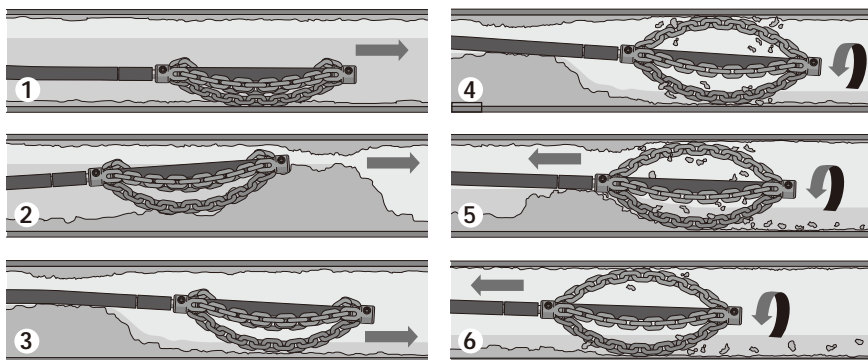
- 确保您能够快速释放电钻开关。
- 必须用戴有手套的手扶住钢索组件，以在钢索组件进入排水管和堵塞点时提供控制和支撑。
- 确保身体保持良好的平衡，不要过度伸出，且不会跌到机器上、排水管等位置。此操作位置将有助于保持对钢索组件和 FlexShaft 机器的控制。



图 11 – 操作中的位置

4. 确认钢索组件至少有 0.3 m(1') 处在排水管中。
5. 确认电钻方向开关处于正转方向，按下并释放电机开关，注意电钻夹具的方向。电钻旋转方向应与鼓轮上的 FOR 箭头一致（见图 4）。除了这些说明中明确规定的情况，切勿反向旋转钢索。反向运行可能会损坏钢索。
6. 将一只手放在钢索组件上，另一只握住电钻手柄。
7. FlexShaft 管道疏通机利用高转速和低扭矩来清洁管道。FlexShaft 钢索组件比其他类型的管道疏通钢索更加柔软。FlexShaft 机器最适合施加很小的力并缓慢地将链条敲击器送入堵塞点的应用。

FlexShaft 管道疏通机的常规操作步骤（见下文）：



1. 将链条敲击器推进（一般不旋转）到排水管道中需要疏通的区域。
2. 如果存在堵塞，将链条敲击器穿过堵塞。
3. 如有可能，开始让水流过排水管道，以便随着排水管道被清洁，水可以冲走枝条和碎屑。
4. 全速旋转钢索/链条敲击器。
5. 继续旋转敲击器。逐渐抽出钢索组件，使链条敲击器可以打碎堵塞物。
6. 在旋转的同时继续逐渐抽出钢索组件，以便链条敲击器能够清洁排水管道壁。

图 12-常规操作步骤

请务必利用链条敲击器的速度来清洁排水管道 - 不要用力将链条敲击器推进堵塞点。

8. 推进/回收钢索组件 - FlexShaft 润滑剂

在有些情况中，将钢索送入排水管道时，在护套管外涂抹 RIDGID FlexShaft 润滑剂可能会收到更好的效果。这样，沿着排水管道推进钢索组件会更加轻松，并可达到更大的疏通距离。如果这样做，应当在推进钢索组件的戴有手套的手掌中放一块蘸了润滑剂的干净毛巾，随着钢索组件的送入为其涂抹润滑剂（图 13）。在此过程中，根据需要向毛巾上添加润滑剂。RIDGID FlexShaft 标记每隔 5' (1.5m) 印在护套上，以帮助确定从机器馈送了多少钢索组件。

只使用 RIDGID FlexShaft 润滑剂。其他润滑剂可能不适合用于排水管道，有可能会污染水。

回收钢索组件时，最好在将钢索从排水管道抽出并收回到鼓轮中时使用毛巾

9. 旋转链条敲击器

当收回钢索时，链条敲击器一般是在旋转着疏通管道的。

仅当链条敲击器至少有 1' 处在排水管道中时旋转钢索/链条敲击器。要旋转钢索，牢牢抓住电钻手柄并按下电钻开关。控制钢索组件的人也必须控制电钻开关。操作机器时，不能由一个人控制钢索组件，而由另一个人控制电钻。切勿使钢索组件堆积在排水管道外、形成弓形或弯曲。那样可能会导致钢索绞合、扭结和断裂。随时可以释放电钻扳机以停止钢索旋转。当疏通堵塞物时，全速运行钢索以获得最好的清洁效果。切勿用力将链条敲击器插进堵塞点。在有些情况下，变速运行有助于通过转弯部位。推进钢索组件时短时地正向或反向旋转链条敲击器可能有助于通过排水管道和堵塞点。



图 13-向钢索护套管涂抹润滑剂

10. 要将钢索组件推进排水管中，通常不旋转。在靠近护套管从机器外壳引出的位置握住护套管。从 FlexShaft 机器拉出 150到300mm (6"到12") 钢索组件，使钢索略成弓形。必须用戴有手套的手扶住钢索，以便控制和支撑。不当的钢索支撑可能会使钢索扭结或绞合，并可能会损坏钢索或伤及操作员。将钢索送进排水管中。（图12第1步）
 11. 继续推进钢索组件，直到其遇到阻力。小心地操作链条敲击器，使其通过阻塞点。**切勿对钢索组件施加力 - 如果链条敲击器无法旋转，则无法疏通排水管。**注意钢索进入的距离。切勿将钢索放进过大的排水管道中。那样可能会导致钢索打结或造成其他损坏。（图12第2步）
 12. 当排水管疏通后，如有可能，开始向排水管中倒水以冲洗管道中的碎屑，并在钢索收回的过程中帮助清洗钢索组件。为此，可打开清洗系统中的水龙头或使用其他方法。请注意水位，防止排水管再次堵塞。（图12第3步）
 13. 当链条敲击器通过需要疏通的堵塞点/区域后，完全按下电钻开关以使链条敲击器旋转。
- 缓慢地从排水管拉出钢索组件，使旋转的链条敲击器清洁排水管壁，并打碎堵塞物。（图12，步骤4和5）。**如果钢索停止转动，切勿继续运行电钻。**那样可能会导致钢索绞合和扭结。随时可释放电钻开关以使钢索停止旋转。
- 监测钢索组件的手感反馈以及电钻/排水管中的敲击器的声音。如果电钻离合器分离，则钢索可能停止转动。参见“设置”一节中的“电钻可调节离合器设置”。不要将电钻扭矩调节置于“钻头”设置。这样会增加钻头手柄的作用力，并可能导致钻头打转。紧握钻头手柄以保持控制。
- 可能需要将链条敲击器移出堵塞部位，以使其恢复转速。
- 如果链条敲击器被卡住，可能需要短时地反向运转电钻以使其摆脱。切勿反向运转几秒以上，以防止钢索损坏。在有些情况下，可以用手将钢索组件连同堵塞物一起从排水管中拉出。如果出现这种情况，小心不要损坏钢索组件。除去敲击器和钢索上的堵塞物，并按上述方式继续疏通排水管。
- 如果使用摄像头，切勿使链条敲击器进入摄像头或推杆。**
- 在某些情况下，为了清洁电钻轴的另一侧，可在 REVERSE 模式下短时间运行电钻。
14. 收回钢索，同时继续清洁排水管的其余部分。排水管疏通完毕之后，收回钢索并将其送回管道疏通机。操作时应特别小心，因为收回时钢索可能卡在堵塞物中。（图12，步骤6）。
 15. 收回钢索组件时，观察护套管上的标记。当链条敲击器接近排水管开口时，释放电钻开关。切勿在链条敲击器旋转时将其拉出排水管。链式敲击器可能会晃动并造成严重伤害。
 16. 如果完成疏通需要重复操作，可重复上述步骤。

17. 用手从管道中拉出剩余的钢索组件，将其收回到鼓轮中。为机器做好运输准备。

鼓轮排水

如果需要，可反转管道疏通机，以便排出机器内的任何液体（参见图1，了解排水孔位置）。

运输

将所有钢索组件和链条敲击器推进鼓轮中，并将钢索盖固定好。从电钻轴拆下电钻。在运输和储存过程中，不要将钻机留在附件上，以免翻倒和损坏管道疏通机。参见图1。

储存

▲警告 管道疏通机必须存放在干燥的室内位置，如果存放在室外则应盖好。管道疏通机应存放在儿童和不熟悉机器的人无法进入的上锁区域。在未受过培训的用户手上，此机器可能会造成严重伤害。

维护说明

▲警告

在进行任何维护之前，应从将电钻从管道疏通机上拆除。

进行任何维护时，应始终佩戴护目镜和其他合适的防护装备。

清洁

最好在将钢索组件从排水管抽出并收回到鼓轮中时使用毛巾擦去护套管上的污垢和碎屑。这样将有助于保持鼓轮洁净，降低钢索组件卡在鼓轮中的可能性。如果需要，可将钢索组件从机器拉出，并打开壳体进行冲洗/清洁。根据需要，用热肥皂水和/或温和的消毒剂清洁机器。根据需要，排出机器中的液体。

润滑

FlexShaft管道疏通机由工厂提供终身润滑。

钢索组件的更换

1. 将整个钢索组件从壳体中拉出。
2. 使用提供的六角扳手（或类似工具）打开携带手柄下的锁扣（图14）。打开保持外壳关闭的其他门锁。



图14 - 携带手柄下方打开的锁扣（使用六角扳手）

3. 打开外壳（图15）

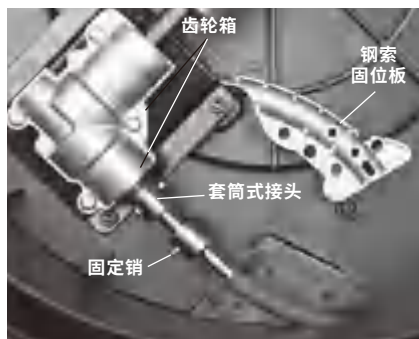


图15 - 管道疏通机外壳打开

4. 拆下固位板紧固件和固位板（图15/16）。
5. 从钢索接头拆下固定销。
6. 从套筒式接头拆下钢索接头，然后拆下钢索组件。
7. 按照与装配时相反的流程，牢固连接所有紧固件。确保护套一直延伸到钢索固位板中现场窗口的末端（见图16）。

故障排除

征兆	可能原因	解决方案
钢索扭结或断裂。	钢索组件强制受力。	切勿强行安装钢索组件。遵循操作说明。
	FlexShaft机器或链条敲击器用于错误的管道直径。	根据管道直径使用正确的FlexShaft机器或链条敲击器。
	电钻反向运行。	仅当挠性轴卡在管道中时，才使用反向。
	钢索组件接触到酸/受到腐蚀。	定期清洁钢索组件。
	钢索/护套磨损。	更换磨损的钢索组件。
	钢索组件支撑不当。	正确支撑钢索组件，请参见说明。
	链条敲击器未正确设置/调整	正确设置/调整链条敲击器，请参见说明。
疏通排水管时，FlexShaft机器摇摆或移动。	电钻或电钻设置不当。	选择正确的电钻和设置，请参见说明。
	地面不平。	放置在水平稳定的表面上。

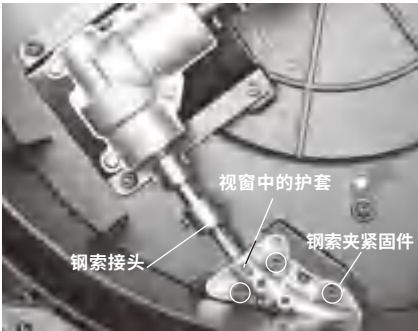


Figure 16 – Changing the Cable Assembly

维修和修理

警告

维修或修理不当会导致机器操作不安全。

“维护说明”将可解决本机器的大部分维修需求。本部分未解决的任何问题只能由RIDGID授权的独立维修中心处理。仅使用RIDGID维修部件。

有关您最近的RIDGID授权独立维修中心或任何维修或修理问题的信息，请参阅本手册中的“联系信息”部分。

可选设备

警告

为了降低严重受伤的风险，只能使用专门设计并推荐用于RIDGID FlexShaft管道疏通机的附件，如所列。

目录号	说明
64283	敲击器，1/4"钢索，11/2，-2"管道，单链条，碳化物刀片
64288	敲击器，1/4"钢索，2"管道，双链条，碳化物刀片
64293	敲击器，1/4"钢索，11/2"-2"管道，单链条
64298	敲击器，1/4"钢索，2"管道，双链条
64308	敲击器，5/16"钢索，2"管道，双链条，碳化物刀片
64313	敲击器，5/16"钢索，3"管道，3链条，碳化物刀片
64318	敲击器，5/16"钢索，4"管道，3链条，碳化物刀片
64323	敲击器，5/16"钢索，2"管道，双链条
64328	敲击器，5/16"钢索，3"管道，3链条
64333	敲击器，5/16"钢索，4"管道，3链条
64338	FlexShaft 润滑剂，8盎司，每合12件
64343	1/4"组件，钢索，护套，接头，50'
64348	5/16"组件，钢索，护套，接头，70'
64363	11/4"RIDGID壁管配件"
64368	11/2"RIDGID壁管配件"

有关可用于这些工具的RIDGID设备的完整列表，请通过RIDGID.com在线浏览Ridge工具目录，或参阅“联系信息”。

处置

这些工具的部件包含有价值的材料，可以回收利用。可以在当地寻找专业从事回收利用的公司。请按照所有适用法规处理部件。有关更多信息，请联系当地废弃物管理机构。

Model K9-102+ & K9-204+ FlexShaft™ Drain Cleaning Machines



RIDGID.com/qr/k9-102p



RIDGID.com/qr/k9-204p

Table of Contents

Safety Symbols	21
General Safety Rules	
Work Area Safety.....	21
Electrical Safety.....	21
Personal Safety.....	21
Tool Use and Care.....	22
Service.....	22
Specific Safety Information	22
FlexShaft Drain Cleaning Machine Safety	22
RIDGID Contact Information	23
Description	23
Specifications	24
Specifications - Acceptable Battery Powered Drills.....	24
Standard Equipment.....	24
Pre-Operation Inspection	24
Machine and Work Area Set-up	25
Battery Powered Drill Set-up and Operation	26
Drill Switch.....	26
Drill Speed.....	27
Drill Adjustment Clutch Setting	27
Installing/Adjusting Chain Knocker	28
Operating Instructions	30
Draining the Drum	34
Transportation.....	34
Storage	34
Maintenance Instructions	34
Cleaning	34
Lubrication.....	34
Cable Assembly Replacement	34
Troubleshooting	35
Service And Repair.....	35
Optional Equipment	35
Disposal	36
EC Declaration of Conformity	Inside Back Cover
Lifetime Warranty	Back Cover

*Original Instructions - English

Drain Cleaning Machines

Model K9-102+ & K9-204+ FlexShaft™ Drain Cleaning Machines



WARNING!

Read this Operator's Manual carefully before using this tool. Failure to understand and follow the contents of this manual may result in electrical shock, re and/or serious personal injury.

RIDGID[®]

Safety Symbols

In this operator's manual and on the product, safety symbols and signal words are used to communicate important safety information. This section is provided to improve understanding of these signal words and symbols.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.



DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.



WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.



NOTICE indicates information that relates to the protection of property.



This symbol means read the operator's manual carefully before using the equipment. The operator's manual contains important information on the safe and proper operation of the equipment.



This symbol means always wear safety glasses with side shields or goggles while using this equipment to reduce the risk of eye injury.



This symbol indicates the risk of hands, fingers or other body parts being caught, wrapped or crushed in the drain cleaning FlexShaft.



This symbol indicates the risk of the electrical shock.



This symbol indicates the risk of fingers or other body parts being caught, wrapped, crushed or struck by the chain knocker. Do not operate tool with the cable end outside of the drain.



This symbol means always wear gloves when handling or using this equipment to reduce the risk of infections, burns or other serious personal injury from the drain contents.

General Safety Rules

WARNING

Read and understand all warnings and instructions. Failure to follow all warnings and instructions may result in electrical shock, fire, and/or serious injury.

SAVE THESE INSTRUCTIONS!

Work Area Safety

- **Keep work area clean and well lit.** Cluttered or dark areas invite accidents.
- **Do not operate tools in explosive atmospheres, such as in the presence of flammable liquids, gases, or dust.** Tools create sparks which may ignite the dust or fumes.
- **Keep children and by-standers away while operating tools.** Distractions can cause you to lose control.
- **Keep floors dry and free of slippery materials such as oil.** Slippery floors invite accidents.

Electrical Safety

- **Avoid body contact with earthed or grounded surfaces such as pipes, radiators, ranges and refrigerators.** There is an increased risk of electrical shock if your body is earthed or grounded.
- **Do not expose power tools to rain or wet conditions.** Water entering a power tool will increase the risk of electrical shock.
- **If operating a power tool in a damp location is unavoidable, use a ground fault circuit interrupter (GFCI) protected supply.** Use of a GFCI reduces the risk of electric shock.

Personal Safety

- **Stay alert, watch what you are doing and use common sense when operating tools. Do not use tools while you are tired or under the influence of drugs, alcohol, or medication.** A moment of inattention while operating tools may result in serious personal injury.
- **Use personal protective equipment.**

Always wear eye protection. Protective equipment such as dust mask, non-skid safety shoes, hard hat, or hearing protection used for appropriate conditions will reduce personal injuries.

- **Do not overreach. Keep proper footing and balance at all times.** Proper footing and balance enables better control of the tool in unexpected situations.

Tool Use and Care

- **Do not force tool. Use the correct tool for your application.** The correct tool will do the job better and safer at the rate for which it is designed.
- **Store idle tools out of the reach of children and do not allow persons unfamiliar with the tool or these instructions to operate the tool.** Tools can be dangerous in the hands of untrained users.
- **Maintain tools. Check for misalignment or binding of moving parts, breakage of parts and any other condition that may affect the tool's operation. If damaged, have the tool repaired before use.** Many accidents are caused by poorly maintained tools.
- **Keep handles dry, clean and free from oil and grease.** Allows for better control of the tool.

Service

- **Have your tool serviced by a qualified repair person using only identical replacement parts.** This will ensure that the safety of the tool is maintained.

Specific Safety Information

WARNING

This section contains important safety information that is specific to this tool.

Read these precautions carefully before using the FlexShaft™ Drain Cleaning Machine to reduce the risk of electrical shock or other serious injury.

SAVE ALL WARNINGS
AND INSTRUCTIONS FOR
FUTURE REFERENCE!

Keep this manual with machine for use by the operator.

FlexShaft Drain Cleaning Machine Safety

- **Always use safety glasses and gloves in good condition while handling or using.** Use latex or rubber gloves, face shields, protective clothing, respirators or other appropriate protective equipment when chemicals, bacteria or other toxic or infectious substances are suspected to be present to reduce the risk of infections, burns or other serious personal injury.
- **Do not use with a corded drill.** Operating with a corded drill increases the risk of electrical shock and other injuries.
- **Do not allow the chain knocker/end of cable to stop turning while drill switch is depressed.** This can over-stress the cable and may cause twisting, kinking or breaking of the cable assembly and may result in serious personal injury.
- **Practice good hygiene. Do not eat or smoke while handling or operating the tool. After handling or operating drain cleaning equipment, use hot, soapy water to wash hands and other body parts exposed to drain contents.** This will help reduce the risk of health hazards due to exposure to toxic or infectious material.
- **Only use the FlexShaft Drain Cleaning Machine for the recommended drain sizes.** Using the wrong size drain cleaner can lead to twisting, kinking or breaking of the cable and may result in personal injury.
- **Keep hand on the cable assembly whenever the FlexShaft Machine is running.** This provides better control of the cable and helps prevent twisting, kinking and breaking of the cable and reduces the risk of injury.
- **Position machine cable outlet within 3' (1 m) of the drain inlet or properly support exposed cable assembly when the distance exceeds 3' (1 m).** Greater distances can cause control problems leading to twisting, kinking or breaking of the cable. Twisting, kinking or breaking cable may cause striking or crushing injuries.
- **One person must control both the cable assembly and cordless drill.** Do not lock drill switch in the ON position during operation. If the cable stops rotating, the operator must be able to release the drill switch to prevent twisting, kinking

and breaking of the cable and reduce the risk of injury.

- **Do not wear loose clothing or jewelry. Keep your hair and clothing away from moving parts.** Loose clothing, jewelry or hair can be caught in moving parts.
- **Do not operate this machine if operator or machine is standing in water.** Operating machine while in water increases the risk of electrical shock.
- **Do not use if there is the risk of contact with other utilities (such as natural gas or electric) during operation.** Visual inspection of the drain with a camera is a good practice. Crossbores, improperly placed utilities and damaged drains could allow the cutter to contact and damage the utility. This could cause electrical shock, gas leaks, fire, explosion or other serious damage or injury.
- **Read and understand these instructions, the battery drill instructions and the instructions for any other equipment used with this tool before operating.** Failure to follow all instructions may result in property damage and/or serious injury.

for use on roots and cleaning the pipe wall of scale. Plain chain knockers are for general use, including grease. FlexShaft Drain Cleaners are well suited to use with inspection cameras during the drain cleaning process.

The FlexShaft Machines are lightweight and compact for ease of transport.

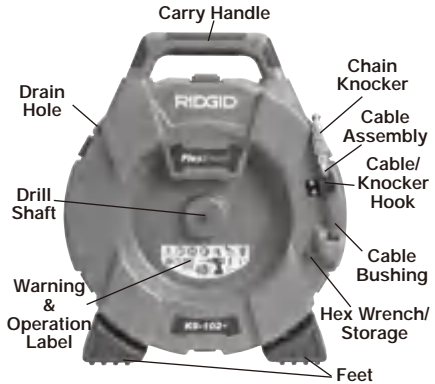


Figure 1A – RIDGID® FlexShaft Drain Cleaning Machine

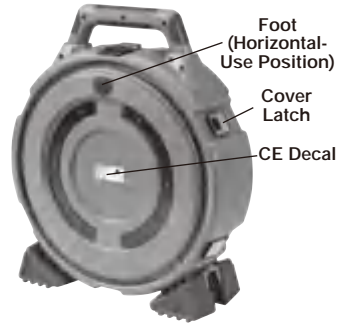


Figure 1B – RIDGID® FlexShaft Drain Cleaning Machine

RIDGID Contact Information

If you have any question concerning this RIDGID® product:

- Contact your local RIDGID distributor.
- Visit RIDGID.com/www.RIDGID.com.cn to find your local RIDGID contact point.
- Contact Ridge Tool Technical Service Department at ProToolsTechService@Emerson.com, or in the U.S. and Canada call 844-789-8665.

Description

The RIDGID® Model K9-102+ and K9-204+ FlexShaft™ Drain Cleaning Machines are designed to clean and descale pipes and drain lines as called out in the *Specifications*.

A user supplied battery powered drill is used to drive the FlexShaft Drain Cleaning Machines. The FlexShaft Drain Cleaning Machine cable assembly is manually fed in and out of the drain. A chain knocker that expands to the pipe inside diameter is used to break up the blockage and clean the walls of the pipe. Chain knockers with carbide cutting tips are available

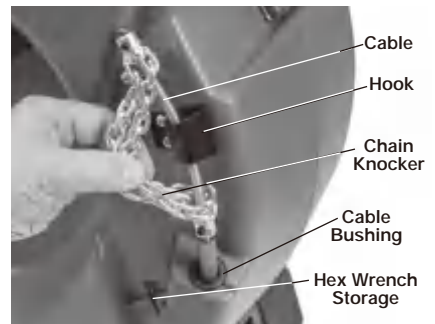


Figure 1C – Cable End/Chain Knocker

Specifications

Model.....	K9-102+	K9-204+
Drain Capacity (Nom.).....	1/4" to 2" (32 – 50 mm)	2" to 4" (50 – 100 mm)
Cable Diameter (without Sheath).....	1/4" (6 mm)	3/16" (8mm)
Cable Assy. Diameter (with Sheath).....	3/8" (9.5 mm)	1/2" (12.7 mm)
Cable Assembly Length.....	50' (15.2 m)	70' (21.3 m)
Rotational Speed.....	Maximum 2500 RPM	Maximum 2500 RPM
Drill Attachment.....	3/16" Hex (8 mm)	3/16" Hex (8 mm)
Weight (without Drill/Knocker).....	24.3 lbs. (11.0 kg)	37.3 lbs. (16.9 kg)
Dimension (without Drill).....	19.2" x 7.5" x 22.1" (488 mm x 191 mm x 562 mm)	21.1" x 10.8" x 24.2" (536 mm x 274 mm x 615 mm)
Operating temperature.....	20°F to 140°F (-6°C to 60°C)	20°F to 140°F (-6°C to 60°C)

It is not recommended to clean glass, ceramic, porcelain or similar fixtures with the FlexShaft Drain Cleaners as it may damage the fixture.

Specifications - Acceptable Battery Powered Drills

Rotational Speed..... 1800 to 2500 RPM

Chuck Size..... 3/8" or greater

Clutch..... With adjustable torque

Switch Type..... Momentary Contact

Switch Lock..... Not equipped with

Drill must carry appropriate certification mark for the market (CE mark, c(us)us mark, etc.)

Do not use corded drills, hammer drills or impact drivers. Use of an inappropriate drill increases the risk of equipment damage and personal injury. See *Battery Powered Drill Set-up and Operation section*.

Standard Equipment

Refer to the RIDGID catalog for details on equipment supplied with specific drain cleaning machine catalog numbers.

NOTICE This machine is made to clean drains. If properly used it will not damage a drain that is in good condition and properly designed, constructed and maintained. If the drain is in poor condition, or has not been properly designed, constructed and maintained, the drain cleaning process may not be effective or could cause damage to the drain. The best way to determine the condition of a drain before cleaning is through visual inspection with a camera. Improper use of this drain cleaning machine can damage the drain cleaning machine and the drain. This machine may not clear all blockages.

Pre-Operation Inspection

⚠ WARNING



Before each use, inspect your Drain Cleaning Machine and correct any problems to reduce the risk of serious injury from electric shock, twisted or broken cables, chemical burns, infections and other causes and prevent Drain Cleaning Machine damage.

Always wear safety glasses, and other appropriate protective equipment when inspecting your Drain Cleaning Machine.

- Clean the machine, including handles and controls. This aids inspection and helps prevent the machine or control from slipping from your grip. Clean and maintain the machine per the maintenance instructions.
- Inspect the machine for:
 - Proper assembly and completeness.
 - Any broken, worn, missing, misaligned or binding parts.
 - Presence and readability of the warning label (see Figure 2).



Figure 2 – Warning Label

- Smooth and free movement of the cable assembly in and out of the machine.
- Any condition which may prevent safe and normal operation.

If any problems are found, do not use the drain cleaning machine until the problems have been repaired.

3. Clean any debris from the cable assembly and chain knockers. Inspect sheath for wear and damage. There should not be any cuts, kinks, breaks or excessive wear. Inspect the cable near the chain knocker. Cable assemblies should not be bent or deformed. Cable strands should be tight to one another without separation. Inspect chain knocker for damaged or lost carbide cutting tips (if equipped) and wear of the chain itself. If chain links are worn more than ¼ through or damaged, replace the chain knocker. Replace worn and damaged equipment before using drain cleaning machine.

Confirm that the chain knocker is properly set up and is secure on the cable.

4. Inspect the battery powered drill per its instructions. Make sure that the drill is in good operating condition and the switch controls the drill operation. Confirm that the drill meets the requirements in the Specification section and is properly set for use with the machine.
5. Inspect and maintain any other equipment being used per its instructions to make sure it is functioning properly.

Machine and Work Area Set-up

⚠ WARNING



Set up the Drain Cleaning Machine and work area according to these procedures to reduce the risk of injury from electric shock, re, machine tipping, twisted or broken cables, chemical burns, infections and other causes, and prevent machine damage.

Always wear safety glasses and other appropriate protective equipment when setting up your Drain Cleaning Machine.

1. Check for an appropriate work area. Operate in a clear level, stable, dry location. Do not use the Drain Cleaning Machine while standing in water.
2. Inspect the drain to be cleaned. If possible, determine the access point(s) to the drain, the size(s), length(s), and material(s) of the drain, distance to mainlines, the nature of the blockage, presence of drain cleaning chemicals or other chemicals, etc.

If chemicals are present in the drain, it is important to understand the specific safety measures required to work around those chemicals. Contact the chemical manufacturer for required information. Confirm no other utilities are present in the drain or area to reduce the risk of damage. Visual inspection of the drain with a camera is a good practice.

If needed, remove fixture (water closet, etc.) to allow access to drain. Do not run the chain knocker in a fixture. This could damage the FlexShaft Machine or the fixture.

Best drain cleaning results will occur if water is flowing during the drain cleaning process to wash away debris. For 1¼" and 1½" sink drains, cut away wall pipes are available to allow this. See Figure 3 for installation. Place a container to catch any drain contents that may spill.

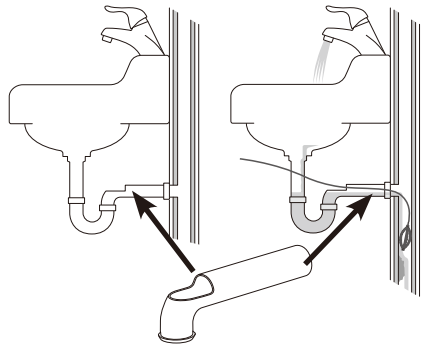


Figure 3 – Wall Pipe Installation

3. Determine the correct equipment for the application. See *Specifications*. Drain Cleaning Machines for other applications can be found by consulting the Ridge Tool Catalog, online at RIDGID.com.
4. Make sure all equipment has been properly inspected.

5. If needed, place protective covers in the work area. The drain cleaning process can be messy.
6. Place the Drain Cleaning Machine on the ground with the drill shaft vertical. Machine should sit squarely and firmly on the ground. Do not operate with the drill shaft horizontal. This will reduce the risk of tipping.
7. Remove the battery from the drill. Properly set-up the drill. (See *Battery Powered Drill Set-up and Operation* section.) Securely attach the drill chuck to the hex of the drill shaft (Figure 4).



Figure 4 – Attaching Drill To Drill Shaft



Figure 5 – Example of Extending Drain Access to within 3' of Machine Cable Outlet

8. Position the Drain Cleaning Machine so that the cable outlet is within 3' (1 m) of the drain access. Greater distances from the drain access increases the risk of the cable assembly twisting or kinking. If the FlexShaft Machine cannot be placed with the cable outlet within 3' (1 m) of the

drain access, extend the drain access with similar sized pipe and fittings (see *Figure 5*). Improper cable assembly support can allow the cable to kink and twist and can damage the cable or injure the operator. Extending the drain back to the Drain Cleaning Machine also makes it easier to feed cable assembly into drain.

9. Disconnect the chain knocker from the hook and pull approximately 4' (1.2 m) of cable assembly out of the machine.
10. Mark the sheath to indicate when the chain knocker is approaching the drain opening when withdrawn. This can be done with tape. This reduces the risk of the chain knockers coming out of the drain and whipping around. The distance depends on the configuration of the drain, but should be at least 4' (1.2 m) from the chain knocker.
11. Ensure chain knocker is properly installed (see *Installing/Adjusting Chain Knocker*).
12. Insert chain knocker end at least 1' (0.3 m) into drain.
13. Evaluate the work area and determine if any barriers are needed to keep bystanders away from the drain cleaning machine and work area. The drain cleaning process can be messy, and bystanders can distract the operator.
14. Position the machine for easy accessibility. You must be able to hold and control the cable assembly and the drill switch.
15. With dry hands, insert the battery into the drill.

Battery Powered Drill Set-Up and Operation

See the *Specifications* section along with this section for information on acceptable battery powered drills for use with the FlexShaft Drain Cleaning Machines. There are many types of battery powered drills available, and not all are appropriate for use with the FlexShaft Drain Cleaning Machines. If there is any question about appropriateness of a drill for this application, do not use it. Remove the battery from the drill before making any adjustments or attaching to/removing from the drain cleaning machine.

Drill Switch

The drill must be equipped with a momentary contact switch without a switch lock. This

means that the drill will only turn when the operator is depressing the drill switch. If the drill switch is released, the drill will turn OFF. Set drill in "FOR" rotation (see Figure 4).

Drill Speed

When using your FlexShaft Drain Cleaning Machine, the required rotational speed range is 1800 – 2500 rpm. Cleaning will be optimized by rotating the chain knockers closer to the 2500 rpm maximum. To do this, know your battery powered drill specifications and settings to optimize operation. Many battery powered drills have multiple speed settings, and typically the highest speed is in the range for operation of the FlexShaft equipment. See Figure 6 for an example of drill speed settings. Do not operate the FlexShaft drain cleaning machine at over 2500 rpm.

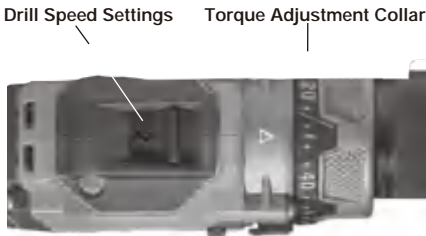


Figure 6 – Drill Settings

Drill Adjustable Clutch Setting

Always use a battery powered drill equipped with a properly set adjustable clutch. This will help reduce the risk of cable damage in the drum of the drain cleaner and reduce handle forces.

Battery powered drills equipped with adjustable clutches will typically have a torque adjustment collar (Figure 6) marked with a scale in numbers starting at one and increasing to indicate increasing torque at clutch disengagement. The adjustable clutch is many times used for driving screws, and may have a selector that needs to be set to the "Screw Driving Mode" (⬅️) for the adjustable clutch to work. When the adjustable clutch releases, the motor continues to turn but the drill chuck does not. Many times this is accompanied by vibration/noise from the drill.

Battery powered drills are often also equipped with "Drill" (⚙️) and "Hammer" (🔨) modes of operation (Figure 7). In these modes, the adjustable clutch does not work, and these modes should never be used for FlexShaft Drain Cleaning Machine operation.



Figure 7 – Selecting Proper Mode

When using the FlexShaft Drain Cleaning Machines, always start with the adjustable clutch set to approximately 25% of the total clutch adjustment range (example – if the torque adjustment collar on the drill is marked from 1 to 20, the initial setting should be 5).

Operate the drain cleaner per these instructions. When clearing blockages, operate drill at full speed for best cleaning. Do not force the chain knocker into the blockage – if the chain knocker cannot turn, it cannot clean the drain. The chain knocker may need to be moved away from the blockage to come back up to speed. If during operation the drill clutch continuously releases ("clutches out"), release the drill switch and withdraw the cable from the drain. Review the drain cleaner set up and operation and confirm everything is correct – an important part of the set up for proper operation is chain knocker selection (See Figure 9 for details) and adjustment. Make any needed changes and continue cleaning drain.

If the drill clutch continues to release during operation, the drill adjustable clutch setting can be increased. The drill clutch can be increased in steps up to 75% of the total clutch adjustment range. (example – if the torque adjustment collar on the drill is marked from 1 to 20, the maximum setting should be no more than 15). **Do not exceed 75% of the total clutch adjustment range. Never place drill in "Drill" (⚙️) or "Hammer" (🔨) mode – this disables the adjustable clutch. This increases the risk of cable damage in the drum of the drain cleaner.**

If the drill clutch continues to release when set at 75% of the total clutch adjustment range, consider using another RIDGID drain cleaning machine.

Installing/Adjusting Chain Knocker

1. Select proper chain knocker for the conditions.

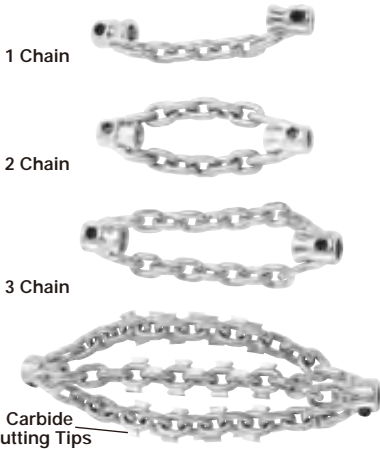


Figure 8 – Chain Knockers

Chain knockers are sized based on collar inside diameter and are designed for specific cable sizes. ¼" chain knockers are used on ¼" cable, etc. Do not use a larger size chain knocker on a smaller cable (for instance 5/16" on ¼"). See *Figure 8 and Collar Distance Chart*.

Chain knockers without carbide cutting tips can be used in common pipe types. These chain knockers work well in grease and similar blockages.

Chain knockers with carbide cutting tips are used for removing scale from the inside of the pipe and can be used for roots. Carbide cutting tips are used for aggressive cleaning and could damage pipe, especially softer materials (such as plastics and Orangeburg), thin walled pipe, or if the chain knocker is kept in one position for an extended time. See *Figure 9, Chain Knocker Selection Chart*.

Do not use chain knockers for cleaning in glass, ceramic, porcelain or similar material fixtures or pipes. They could be damaged.

2. *Figure 10* shows a schematic of proper chain knocker installation and adjustment. There are two key points when installing/adjusting chain knockers.

Collar Distance: Set the chain knocker collars the correct distance apart ("Collar Distance") to allow the chains to spread an appropriate amount when rotated to clean the pipe walls. Collar Distance varies based on cable size and pipe diameter, and is generally set using a spacer made from sheath ("Collar Spacer"). If additional flexibility is required to navigate a bend, the collar spacer can be removed and the collar distance can be set with a tape measure. Operating without a collar spacer makes it more likely for the cable to flip over in use and be damaged. **Do not operate carbide cutters without a collar spacer to reduce risk of cable damage.**

Exposed Cable: Minimize the amount of exposed cable (cable not covered by sheath). The more exposed cable there is, the more likely the cable will flip over in use and be damaged. Exposed cable should be limited to no more than ¼" (6 mm), and is set with a bushing made from sheath ("Knocker Bushing"). Exposed cable varies with the amount of cable out of the drum. The more cable out of the drum, the smaller the exposed cable. Exposed cable may need to be set with cable out of the drum for best results.

Sheath is supplied with the drain cleaner and is available as a service part to allow configuration as needed for your specific application. Only use RIDGID FlexShaft Drain Cleaner sheath of the correct size for the cable. Any time sheath is cut, it should be cut cleanly and squarely. Do not damage the cable when cutting the sheath.

3. Chain knockers are retained to the cable with set screws that use a supplied 3 mm hex key. Loosen set screws and remove chain knocker, spacer and bushing from cable.
4. Inspect the sheath end for damage or wear. The sheath end should be square and clean. If needed, the sheath end can be trimmed slightly.

K9-102+ MACHINE

K9-204+ MACHINE



Chain Knockers



Carbide Tipped Chain Knockers



Chain Knockers



Carbide Tipped Chain Knockers

		64293	64298	64283	64288	64323	64328	64333	64308	64313	64318
		K9-102+ 1.5"	K9-102+ 2"	K9-102+ 1.5" CARBIDE	K9-102+ 2" CARBIDE	K9-204+ 2"	K9-204+ 3"	K9-204+ 4"	K9-204+ 2" CARBIDE	K9-204+ 3" CARBIDE	K9-204+ 4" CARBIDE
		1.25"-1.5" (32-40 mm)	1.5"-2" (40-50 mm)	1.25"-1.5" (32-40 mm)	1.5"-2" (40-50 mm)	2" (50 mm)	3" (75 mm)	4" (100 mm)	2" (50 mm)	3" (75 mm)	4" (100 mm)
PIPE TYPE	COPPER	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
	GALVANIZED	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
	CAST IRON	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
	PVC	☑	☑			☑	☑	☑			
	ABS	☑	☑			☑	☑	☑			
	ORANGEBURG	☑	☑			☑	☑	☑			
	CORRUGATED	☑	☑			☑	☑	☑			
	CLAY	☑	☑			☑	☑	☑			
BLOCKAGE	GREASE	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
	SOFT BLOCKAGE	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
	SCALING			☑	☑				☑	☑	☑
	LIGHT ROOTS			☑	☑				☑	☑	☑
	INCLUDED WITH KIT	☑	☑			☑		☑			

Figure 9 – Chain Knocker Selection Chart

Machine	Cable Size	Number of Chains	Knocker		Recommended Collar Distance
			Number of Links/Chain	Nominal Pipe Size	
K9-102+	1/4"	1	7	1 1/4" to 1 1/2" (32 mm to 40 mm)	1 3/4" (44.5 mm)
		2	7	1 1/2" to 2" (40 mm to 50 mm)	
K9-204+	5/16"	2	9	2" (50 mm)	2 1/2" (63.5 mm)
		3	13	3" (75 mm)	4" (101.6 mm)
		3	15	4" (100 mm)	4 1/2" (114.3 mm)

Collar Distance Chart

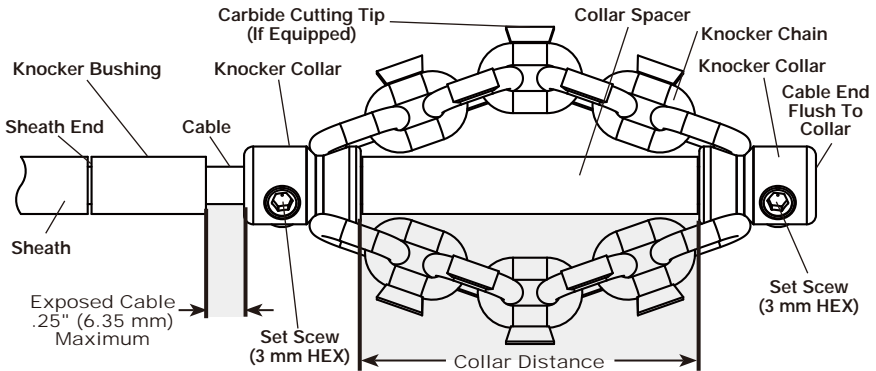


Figure 10 – Chain Knocker Installation/Adjustment

- If needed, cut a section of sheath to use as the collar spacer to the appropriate size (See *Collar Distance Chart*).

Collar distance can be modified to your preference for the specific pipe/application. As collar distance increases, the diameter of the chains decreases, and vice versa. Improperly set collar distance can reduce the efficiency of pipe cleaning.

- Test fit the chain knocker, knocker bushing and collar spacer on the cable as shown in *Figure 10*. Chains should be straight – do not assemble with chains twisted. To prevent excessive cable end wear, cable end should be flush with the end of the collar.

Check length of exposed cable. To reduce the risk of cable flip over and damage, exposed cable cannot exceed 1/4" (6 mm). If needed, cut a knocker bushing from sheath to limit exposed cable. **Always use a knocker bushing to reduce wear on the sheath end.**

- With the chain knocker correctly installed on the cable as shown in *Figure 10*, use the supplied hex wrench to securely tighten the collar set screws. Place set screw tip against cable, then tighten an ad-

ditional 1/8 to 1/4 turn (45° to 90° degrees). If the set screws are not secure, the chain knocker could slip and damage the cable or be lost down the drain.

Operation Instructions

⚠ WARNING



Always use safety glasses and gloves in good condition while handling or using. Use latex or rubber gloves, face shields, protective clothing, respirators or other appropriate protective equipment when chemicals, bacteria or other toxic or infectious substances are suspected to be present to reduce the risk of infections, burns or other serious personal injury.

Do not use with a corded drill. Operating with a corded drill increases the risk of electrical shock.

Do not allow the chain knocker/end of cable to stop turning while drill switch is depressed. This can overstress the cable and may cause twisting, kinking or breaking of the cable assembly and may result in serious personal injury.

Practice good hygiene. Do not eat or smoke while handling or operating the tool. After handling or operating drain cleaning equipment,

use hot, soapy water to wash hands and other body parts exposed to drain contents. This will help reduce the risk of health hazards due to exposure to toxic or infectious material.

Keep hand on the cable assembly whenever the FlexShaft Machine is running. This provides better control of the cable and helps prevent twisting, kinking and breaking of the cable and reduces the risk of injury.

Position the FlexShaft Machine cable outlet within 3' (1 m) of the drain inlet or properly support exposed cable assembly when the distance exceeds 3' (1 m). Greater distances can cause control problems leading to twisting, kinking or breaking of the cable. Twisting, kinking or breaking cable may cause striking or crushing injuries.

One person must control both the cable assembly and cordless drill. Do not lock drill switch in the ON position during operation. If the cable stops rotating, the operator must be able to release the drill switch to prevent twisting, kinking and breaking of the cable and reduce the risk of injury.

Follow operating instructions to reduce the risk of injury from twisted or broken cable, cable ends whipping around, machine tipping, chemical burns, infections and other causes.

1. Make sure that machine and work area is properly set-up and that the work area is free of bystanders and other distractions.
2. Pull cable assembly from the machine and feed into drain. At least 1' (0.3 m) of cable must be in drain so that the chain knocker will not come out of the drain and whip around when the machine is started.

Directly route the cable assembly from the machine cable outlet to the drain opening, minimizing exposed cable and changes in direction. Do not tightly bend the cable assembly – this can increase the risk of twisting or breaking.

If using a camera to view the drain cleaning process, the camera can be fed in at the same time. Typically the cable assembly and the camera push rod can be gripped and advanced/retrieved at the same time. Keep the camera at least 1.5' (0.5 m) behind the chain knocker.

NOTICE Do not allow the spinning chain knocker to hit the camera head/push rod. It can damage it.

3. Assume a proper operating position to help maintain control of the cable assembly and drill (see Figure 11):

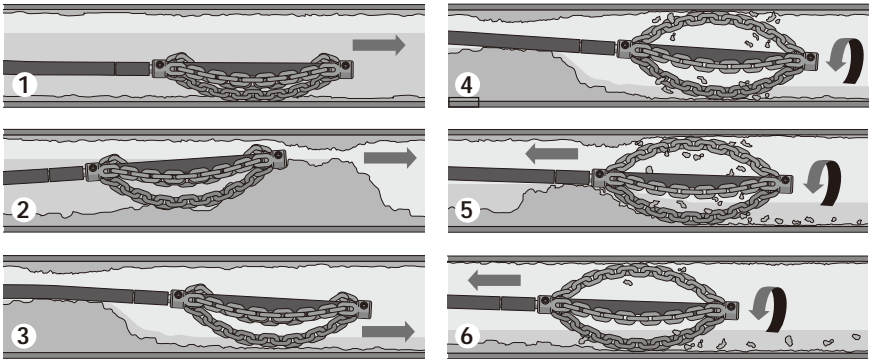
- Be sure you can quickly release the drill switch.
- Your gloved hand must be on the cable assembly to control and support as the cable assembly is fed into the drain and blockage.
- Be sure that you have good balance, do not have to overreach, and cannot fall on machine, drain, etc.. This operating position will help to maintain control of the cable assembly and FlexShaft Machine.



Figure 11 – In Operating Position

4. Confirm that at least 1' (0.3 m) of cable assembly is in the drain.
5. Confirm that the drill is properly set-up, and depress and release the drill switch, noting the direction of the drill chuck. Drill rotation should match the FOR arrow on the drum (See Figure 4). Do not rotate the cable in reverse except as specifically described in these instructions. Running in reverse can damage the cable.
6. Place one hand on the cable assembly and other hand on the drill grip.
7. The FlexShaft Drain Cleaning Machine utilizes high rotational speed and low torque to clean drains. FlexShaft cable assemblies are more flexible than other types of drain cleaning cables. The FlexShaft machine is best used by applying light pressure and slowly working the chain knocker into the blockage when withdrawing the cable. **It's important to let the**

The general operating steps for the FlexShaft Drain Cleaning Machines (*see below*):



1. Advance the chain knocker (generally not rotating) to the area of the drain that needs cleaned.
2. If there is a blockage, pass the chain knocker through the blockage.
3. If possible, start a flow of water through the drain to carry cuttings and debris away as the drain is cleaned.
4. Rotate the cable/chain knocker at full speed.
5. Continue to rotate knocker. Gradually withdraw the cable assembly so that the chain knocker can break up the blockage.
6. Continue to gradually withdraw the cable assembly while rotating so that the chain knocker can clean the walls of the drain.

Figure 12 – General Operating Steps

speed of the chain knocker clean the drain – do not force chain knockers into blockages.

8. Advancing/Retrieving the Cable Assembly – FlexShaft Lubricant

In some cases it may be beneficial to apply RIDGID FlexShaft lubricant to the outside of the sheath when feeding the cable down the drain. This can make it easier to advance the cable assembly down the drain and allow greater cleaning distance. If doing so, place a clean towel with lubricant on it in the palm of the gloved hand used for advancing the cable assembly, and apply lubricant as feeding the cable assembly (*Figure 13*). Add lubricant to the towel as needed during the process. RIDGID FlexShaft markings are printed on the sheath every 5' (1.5 m) to aid in determining how much cable assembly has been fed from the machine.

Only use RIDGID FlexShaft lubricant. Other lubricants may not be appropriate for use in a drain and could contaminate the water.

When retrieving the cable assembly, it is good practice to use a towel to wipe dirt and debris from the cable sheath as it is

pulled from the drain and fed back into the drum.

9. Rotating the Chain Knocker

Generally the chain knocker is rotated for cleaning while withdrawing the cable.

Only rotate the cable/chain knocker when the chain knocker is at least 1' in the drain. To rotate the cable, firmly grip the drill handle and depress the drill switch. The person controlling the cable assembly must also control the drill switch. Do not operate the machine with one person controlling the cable assembly and another person controlling the drill. Do not allow cable assembly to build up outside the drain, bow or curve. This can lead to twisting, kinking and breaking of the cable. At any time, release the drill trigger to stop cable rotation. When clearing blockages, operate the cable at full speed for best cleaning. **Do not force the chain knocker into blockages.** In some cases, using variable speed will assist with navigating turns. Rotating the chain knocker in FORWARD or REVERSE for a short time while advancing the cable assembly can help it negotiate the drain and blockages.



Figure 13 – Applying Lubricant to the Cable Sheath

10. Advance the cable assembly into the drain, generally not rotating. Grasp the sheath near where it exits the machine housing. Pull 6" to 12" (150 to 300 mm) of cable assembly out of the FlexShaft Machine so that there is a slight bow in the cable. Gloved hand must be on cable assembly to control and support. Improper cable support can allow the cable assembly to kink or twist and can damage the cable or injure the operator. Feed the cable assembly into the drain (*Figure 12, Step 1*).
 11. Continue to advance the cable assembly until the resistance is encountered. Carefully work the chain knocker through the blockage. **Do not force the cable assembly – if the chain knocker cannot turn, it cannot clean the drain.** Pay attention to how far the cable has gone. Do not overrun the cable into a larger drain. This can cause the cable to knot up or cause other damage (*Figure 12, Step 2*).
 12. If possible, start a flow of water down the drain to flush the debris out of the line and help clean the cable assembly as it is retrieved. This can be done by turning on a faucet in the system or other methods. Pay attention to the water level, as the drain could plug again (*Figure 12, Step 3*).
 13. With the chain knocker past the blockage/area to be cleaned, fully depress the drill switch to rotate the chain knocker. Slowly pull the cable assembly from the drain, allowing the rotating chain knocker to clean the drain walls and break up the blockage (*Figure 12, Steps 4 & 5*). **If the cable stops turning, do not continue operating the drill.** This may cause the cable to twist and kink. At any time, release the drill switch to stop cable rotation.
- Monitor the feedback from the feel of the cable assembly in your hand and the sound of the drill/knocker in the drain. If the drill clutch disengages, the cable has likely stopped turning. See *Drill Adjustable Clutch Setting in Set-up section*. Do not place the battery drill torque adjustment in the "drill" setting. This increases the force that is felt at the drill handle, and can cause the drill to spin around. Firmly grip the drill handle to maintain control.
- It may be necessary to move the chain knocker out of the blockage to allow it to come back up to speed.
- If the chain knocker becomes stuck, it may be able to be freed by running the drill in reverse for a short time. Do not run in reverse for more than a few seconds to prevent cable damage. In some cases, it may be possible to pull the cable assembly and the blockage out of the drain by hand. If this is done, be careful to not damage the cable assembly. Remove the blockage from the knocker and cable and continue cleaning the drain as detailed above.
- If using with a camera, do not run the chain knocker into the camera head or push rod.**
- In some cases, to clean the opposite side of the pipe it may help to run the drill in REVERSE for a short time.
14. Continue to clean the rest of the drain while retrieving the cable. Once the drain has been cleaned, retrieve the cable and feed back onto the drain cleaning machine. Pay close attention, as the cable may lodge in a blockage while being retracted (*Figure 12, Step 6*).
 15. Watch for your sheath marking as the cable assembly is retrieved. Release the drill switch when the chain knocker nears drain opening. Do not pull the chain knocker from drain while it is rotating. The chain knocker can whip around and could cause serious injury.
 16. If needed for complete cleaning, repeat the above procedure.

- Pull any remaining cable assembly from the line by hand and push back into the drum. Prepare the machine for transport.

Draining the Drum

If needed, the drain cleaner can be turned to allow any liquid in the housing to be drained (see *Figure 1* for drain hole location).

Transportation

Feed all of cable assembly into the drum and secure the chain knocker in the hook. Remove the drill from the drill shaft. Do not leave the drill attached during transport to prevent tipping and damage to the drain cleaner. See *Figure 1*.

Storage

⚠ WARNING The Drain Cleaning Machine must be kept dry and indoors or well covered if kept outdoors. Store the machine in a locked area that is out of reach of children and people unfamiliar with drain cleaning machines. This machine can cause serious injury in the hands of untrained users.

Maintenance Instructions

⚠ WARNING

Drill should be removed from drain cleaner before any maintenance is performed.

Always wear safety glasses and other appropriate protective equipment when performing any maintenance.

Cleaning

It is good practice to use a towel to wipe dirt and debris from the sheath as the cable assembly is pulled from the drum and fed back into the drum. This will help to keep the drum clean and reduce the likelihood of the cable assembly sticking in the drum. If needed, cable assembly can be pulled from the machine and the housing opened for flushing/cleaning.

Clean the machine as needed with hot soapy water and/or mild disinfectants. Drain the machine as needed.

Lubrication

The FlexShaft Drain Cleaning Machines are lubricated for life from the factory.

Cable Assembly Replacement

- Pull entire cable assembly from housing.
- Using the provided hex wrench (or a similar tool) open the latch under the carry handle (*Figure 14*). Open other latches holding housing closed.



Figure 14 – Open Latch Under Carry Handle (Use Hex Wrench)

- Open the housing (*Figure 15*).

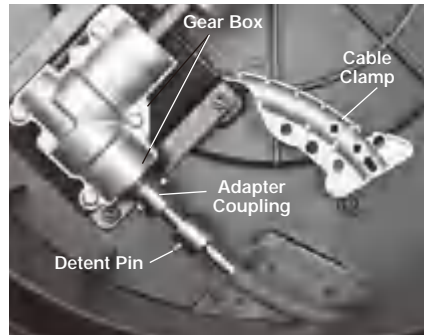


Figure 15 – Drain Cleaner Housing Opened

- Remove cable clamp fasteners, cable clamp (*Figure 15/16*).
- Remove the ball detent pin from the cable coupling.
- Remove the cable coupling from the adapter coupling and remove the cable assembly.
- Reverse process to assemble, securely attaching all fasteners. Ensure sheath is all the way to the end of the site window in the cable clamp (see *Figure 16*).

Troubleshooting

SYMPTOM	POSSIBLE REASON	SOLUTION
Cable kinking or breaking.	Cable assembly is being forced..	Do no force cable assembly. Follow operating instructions.
	Incorrect FlexShaft Machine or chain knocker used for pipe diameter.	Use correct FlexShaft Machine or chain knocker for pipe size.
	Drill being run in reverse.	Use reverse only if flex shaft gets caught in pipe.
	Cable assembly exposed to acid/ corroded.	Clean cable assembly routinely.
	Cable/sheath worn out.	Replace worn cable assembly.
	Cable assembly not properly supported.	Support cable assembly properly, see instructions.
FlexShaft Machine wobbles or moves while cleaning drain.	Chain knocker not properly set up/ adjusted	Properly set up/adjust chain knocker, see <i>instructions</i> .
	Improper drill or drill settings.	Choose proper drill and settings, see instructions.
	Ground not level.	Place on level stable surface.

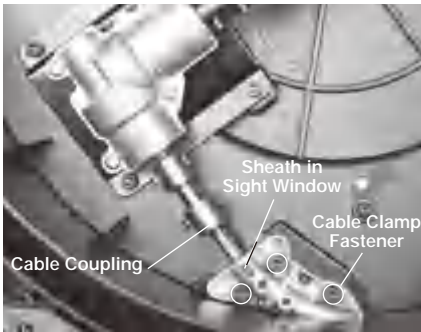


Figure 16 – Changing the Cable Assembly

Optional Equipment

⚠ WARNING

To reduce the risk of serious injury, only use accessories specifically designed and recommended for use with the RIDGID FlexShaft Drain Cleaning Machine, such as those listed.

Catalog No.	Description
64283	Knocker, 1/4" cable, 1 1/2"-2" pipe, single chain, carbide tip
64288	Knocker, 1/4" cable, 2" pipe, 2 chain, carbide tip
64293	Knocker, 1/4" cable, 1 1/2"-2" pipe, single chain
64298	Knocker, 1/4" cable, 2" pipe, 2 chain
64308	Knocker, 1/4" cable, 2" pipe, 2 chain, carbide tip
64313	Knocker, 1/4" cable, 3" pipe, 3 chain, carbide tip
64318	Knocker, 1/4" cable, 4" pipe, 3 chain, carbide tip
64323	Knocker, 1/4" cable, 2" pipe, 2 chain
64328	Knocker, 1/4" cable, 3" pipe, 3 chain
64333	Knocker, 1/4" cable, 4" pipe, 3 chain
64338	FlexShaft Lubricant, 8 oz, 12 per case
64343	1/2" Assembly, cable, sheath, couplings, 50'
64348	3/4" Assembly, cable, sheath, couplings, 70'
64363	1 1/2" RIDGID Wallpipe Accessory
64368	1 1/2" RIDGID Wallpipe Accessory

For a complete listing of RIDGID equipment available for these tools, see the Ridge Tool Catalog online at RIDGID.com or see *Contact Information*.

Service and Repair

⚠ WARNING

Improper service or repair can make the machine unsafe to operate.

The "Maintenance Instructions" will take care of most of the service needs of this machine. Any problems not addressed by this section should only be handled by a RIDGID Authorized Independent Service Center. Use only RIDGID service parts.

For information on your nearest RIDGID Authorized Independent Service Center or any service or repair questions see *Contact Information* section in this manual.

Disposal

Parts of these tools contain valuable materials and can be recycled. There are companies that specialize in recycling that may be found locally. Dispose of the components in compliance with all applicable regulations. Contact your local waste management authority for more information.