

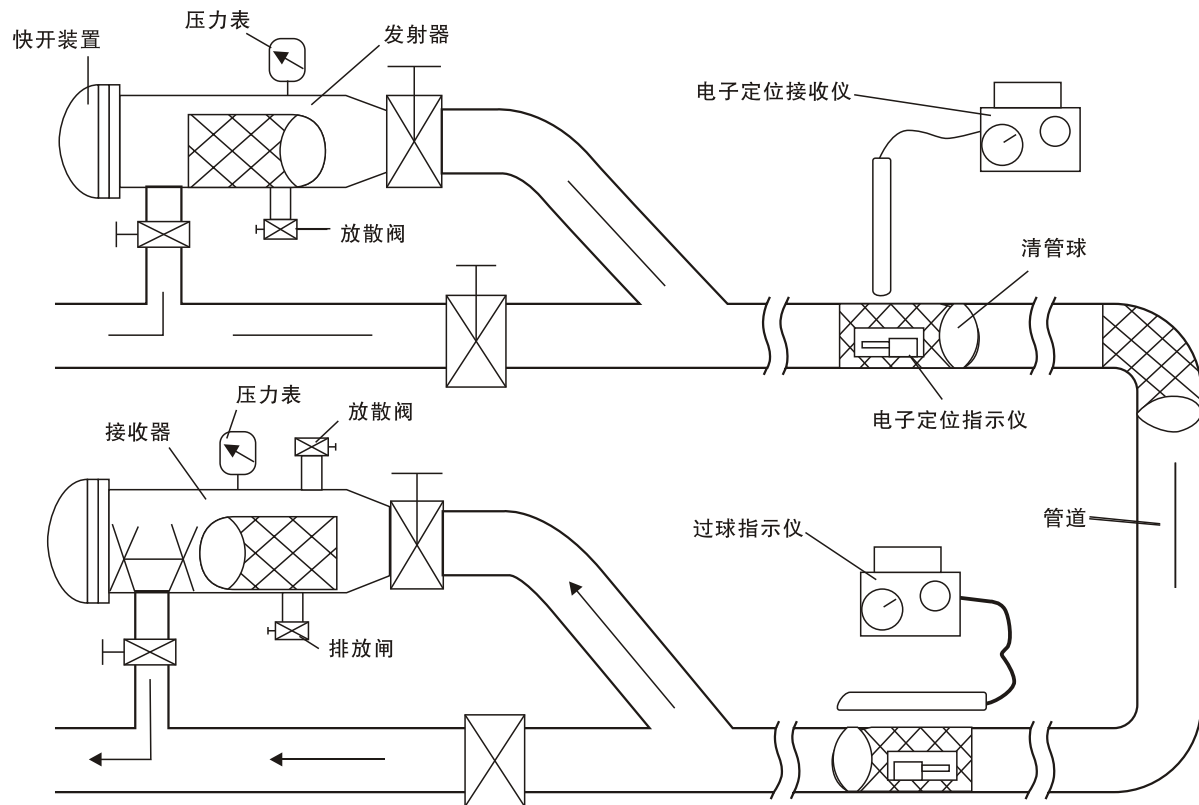
清管系统



Pig Launching & receiving system

管道清洗技术

管道清洗技术主要依靠气压做动力将清管球在管内向前推动，从而将堆积在管内的结垢等污物排出管道。



管道清洁技术示意图 Layout drawing

优点

- 1) 无论90°弯管，T形管，异形管，清管球都可通过。
- 2) 清洗管道只需要一个入口，一个出口，其他部件无需拆卸，施工简便。
- 3) 可以清洗的管道直径为DN5~DN2000。
- 4) 清洗管道工作时间短，无需特殊工作场所。
- 5) 清洗完后管道即刻恢复使用。

Pig cleaning system

Pig cleaning system uses the gas pressure to push the pig to move in the pipe in order to pull the dirty out of the pipe.

ADVANTAGE

- 1) The pig can pass through all the 90° shape pipe, T shape pipe or irregular pipe
- 2) Only an inlet and outlet are required to clean the pipe. No need of dismantle other parts.
- 3) Pipe size range is from DN5~DN2000
- 4) A short time is required for cleaning the pipe.
- 5) The pipe can be used immediately after the cleaning.

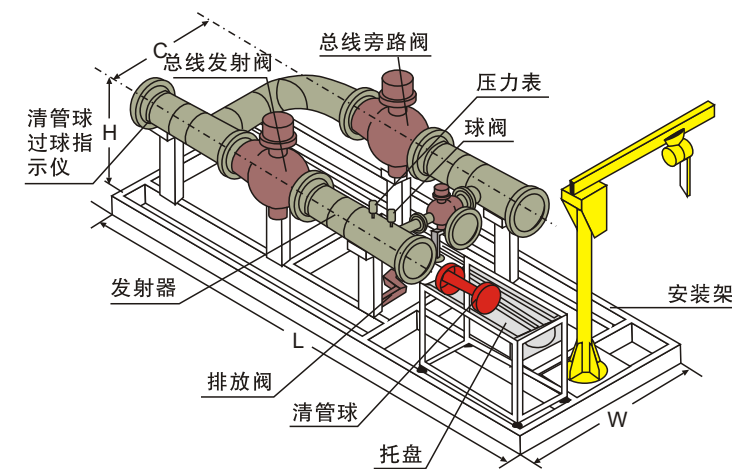
适用范围

- 1) 各种工业和生活用水，污水的管道，城市煤气管道，工厂用各种工艺管道，油田的输油、输气管道等，均可进行清洗。
- 2) 特别是用长距输送流体的管道和生产上不允许停车清洗的管道，以及一些无法采取化学清洗的管道的清洗。清管器根据本身的材质不同，其运行距离有长有短。有可运行3公里的软表面清管器，也有强度很高可运行450公里的清管器。

清管系统组成

清管系统由清管球、发射与接收装置、电子探测定位仪器等部分组成。清管球是管道清洗工具，用于刮削管壁污垢。发射与接收装置分别安装在清管线的始端和末端，用来发射和接收清管球。电子探测定位仪器包括定位发射机、定位接收机、过球指示仪等，用于跟踪在管道中运行的清管球，一旦卡住可精确定位。

典型的撬装式发球装置



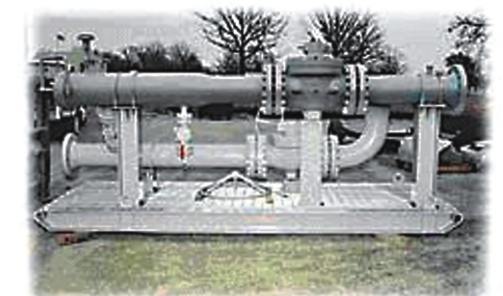
APPLICATION

- 1) Suitable for all industrial or civil water use pipe, drainage pipe, gas distribution pipe, production pipe, oil pipe, gas pipe, etc;
- 2) Specifically suitable for long distance fluid transportation, or the pipe which can not be stopped for cleaning, or the pipe which can not be cleaned by chemical way. The walking distance of the pigs differs according to the different material. Some pig can only run for 3 kilometer. some pig which is composed by hard material can run even for 450 kilometer.

SYSTEM COMPOSITION

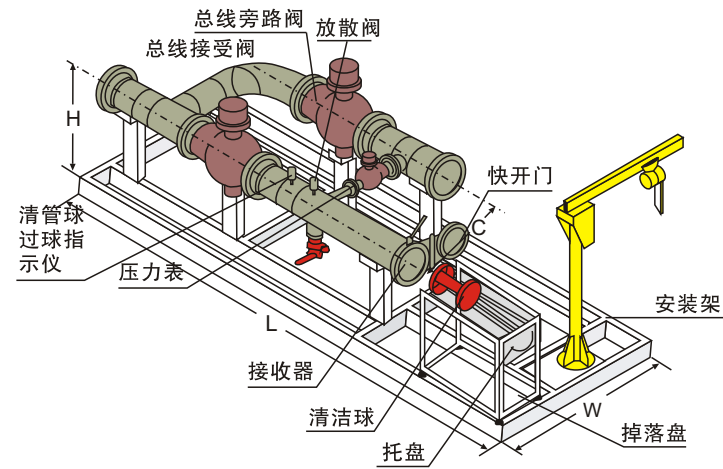
The pig cleaning system is composed by the pig, launching and receiving equipment, electronic indicator and etc. The pig is the tool to scratch the dirty attached on the pipe. The launching and receiving equipment are installed in the beginning and end of the line which is used to launch and receive the pig. The electronic indicator includes position transmitter, position receiver, and pig indicator, which are all to trace the pig.

SYSTEM COMPOSITION



发球装置实物图 Sample picture

典型的撬装式收球装置 TYPICAL PIG RECEIVING EQUIPMENT



收球装置实物图 Sample picture

各种清管球 PIGS



收发球装置的操作步骤 OPERATION FOR PIG LAUNCHING & RECEIVING EQUIPMENT

以下操作程序是一般的操作步骤，不适合培训清管球操作人员。

The following steps are not suitable for training the pig operator.

发射

发球装置（如下图）初始条件：发射器已经加压并充满气体，阀门A、B和C打开，阀门D关闭。

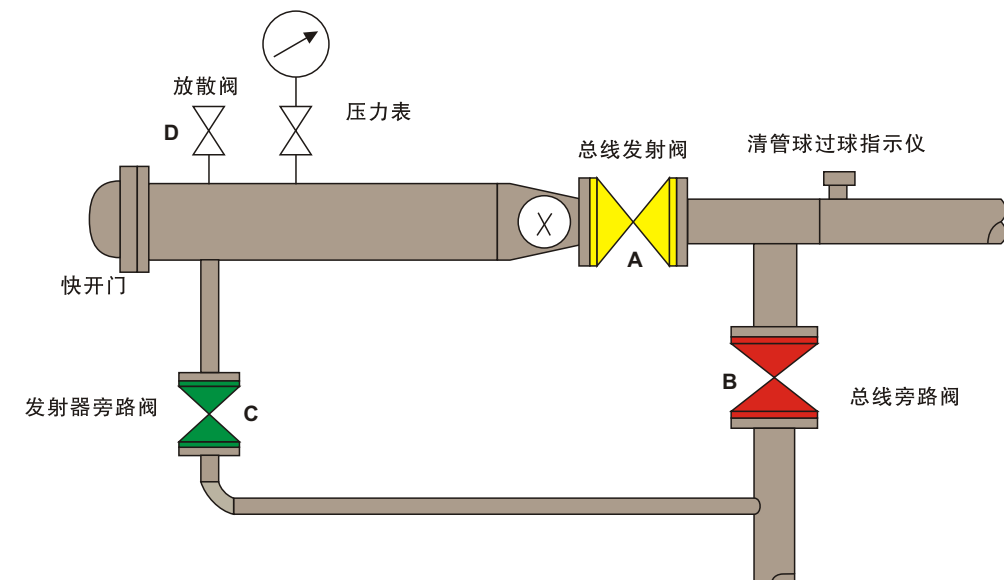
1. 关闭阀门A和C;
2. 打开阀门D，泄放发射器内压力，降到大气压力；
3. 确认发射器已完全放空（容器无内压）时，打开快开门，把清管球放入发射器内并将其推入至变径段，使其在该处与管道形成紧密配合（点处，阀门D仍然处于开启状态）；
4. 正确关闭发射器的快开门；缓慢打开阀门C，吹扫发射器（阀门D此时未关闭），吹扫完毕后关闭阀门D；继续开启阀门C，给发射器升压，达到一定压力后关闭阀门C；
5. 先打开阀门A，然后打开阀门C，准备发射清管球；
6. 部分关闭阀门B以增加通过阀门C的气流，继续关闭阀门B直到清管球被发射进入主管道，并被清管球指示器检测到；
7. 当清管球离开发射器进入主管道，全开阀门B。

LAUNCHING

Pig launching equipment (refer to the drawing) Initial condition:

The launcher has already been pressurized. Valve A, B, C shall be opened and valve D shall be closed.

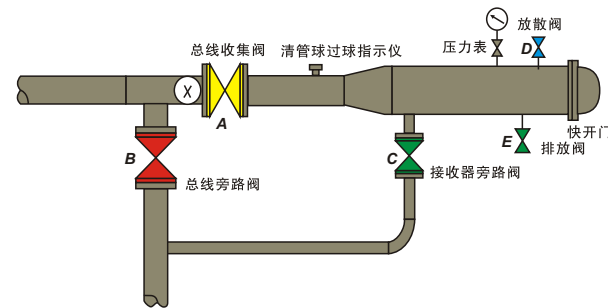
- 1) Close valve A and C
- 2) Open valve D to release the pressure inside the launcher;
- 3) When the launcher is completely depressurized, open the quick opening closure to put the pig inside the launcher till it reaches the smaller pipe (the valve D in the position is still in the open position);
- 4) Close the closure of the launcher correctly and open slowly the valve C to pressurized the launcher then close the valve C;
- 5) Open the valve A and then open the valve C before launching the pig;
- 6) Close partially valve B to increase the gas flow passing through the valve C until the pig has been launched to the main pipe and been detected by the indicator;
- 7) When the pig has been launched and entered into the main pipe, close the valve B.



接收

收球装置（如下图）初始条件：接收器处于常压状态，阀门B、D和E打开，阀门A和C关闭。确认接收器快开门已正确关闭。

1. 关闭阀门E并缓慢打开阀门C以吹扫接收器；
2. 吹扫完毕后关闭阀门D并打开阀门C，给接收器内升压；
3. 阀门C继续开启，同时打开阀门A，接收器准备接收清管球；
4. 当清管球到达后，可能会停在阀门A和三通之间（点处）；
5. 部分关闭阀门B以推动清管球进入接收器；
6. 当清管球进入接收器并被清管球过球指示仪检测到以后，打开阀门B并关闭阀门A和阀门C。
7. 打开阀门D和阀门E，给接收器泄压。
8. 确认接收器无内压后，打开快开门取出清管球。
9. 关闭快开门并确认正确关好。



RECEIVING

Pig receiver (please refer to the below drawing) Initial condition:

The pig receiver is in the normal pressure condition, valve B, D and E are open, while valve A and C are close. Please ensure the receiver are in the close position.

- 1) Close the valve E and open slowly the valve C in order to blow the receiver;
- 2) After blowing the receiver, close the valve D and open the valve C;
- 3) Open the valve C and open the valve A simultaneously in order to receive the pig;
- 4) The pig will possibly arrive in between the valve A and the position;
- 5) Close partially the valve B in order to push the pig into the receiver;
- 6) When the pig goes into the receiver and is detected by the indicator, open the valve B and close the valve A and C;
- 7) Open the valve D and E in order to depressurize the receiver;
- 8) After ensure the receiver is depressurized, open the closure to take out the pig;
- 9) Close the closure correctly.

清管球过球指示仪

清管球过球指示器是安装在管线上检测通过的清管球或球类的装置，大多通常的检测仪都有一个装在焊接管接头处延伸到管线内的触发器。当清管球通过时，触发器被触发，激活信号装置。



几种清管球过球指示仪
Pig indicator

PIG INDICATOR

The pig indicator is the equipment which will be installed in the pipe to detect the pig. Usually the indicator has a trigger welded in the welding joint of the pipe. When the pig passes through, the trigger will be activated and send the signal simultaneously.