FLOW-POWERED STATIC PRESSURE AMPLIFIER

DOUBLE-CONE TECHNOLOGY AG

TECHNOLOGY

DOUBLE-CONE TECHNOLOGY'S PATENTED PRESSURE AMPLIFIER creates rapid and controllable pressure build-up by exploiting specialised fluid flows. This compact device offers an alternative to high-pressure pumps and has opened up a new generation of industrial high-pressure circuitry. The DCT Pressure Amplifier enables direct hydraulic conversion from high flow-rate to high pressure and vice versa. The elegant stainless steel amplifier is absolutely static and is the product of DCT's research into the behaviour of fluids in a state of turbulence or subjected to high material deformation rates.

Components:

1. High-pressure circuit.
2. Gas, liquid or multiphase supply that requires pressurising.
3. Pressure Amplifier containing no moving parts. (See Figure right)
4. Application specific circulating liquid.
5. Conventional low-pressure circulation pumps in high-pressure housing.

Results:

1. Clean, continuous, pulse-free pressurised delivery for both gases and liquids.
2. Direct flow-powered pumping (no electrical to mechanical conversion).

Pressure Amplifier: Source inlet connected to supply (centre left), main entry (bottom) and exit (top) connected to the pressure circuit.

APPLICATIONS

DCT'S PRESSURE AMPLIFIER TECHNOLOGY enhances the following applications:

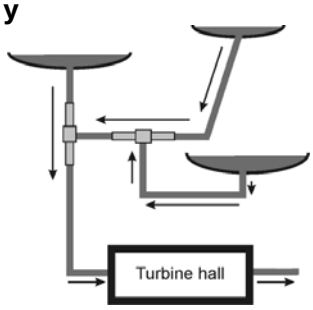
Sweet Water Production

The DCT reverse osmosis plant is an easily transportable water purification unit based on a new, patented circuit and membrane concept that reduces the pressure required to purify seawater. The plant produces high purity water (left hose in Figure) and concentrated brine (right hose).

Storage Pumping and Multi-Reservoir Supply

The DCT storage-pumping unit (see left Figure) pumps water from a low-level reservoir to a higher collection point. The system is purely hydraulic and contains no moving parts or electrical equipment.

The pulse-free unit is also designed to pressurise reticulation systems. Lakes at different altitudes can be linked to a common feed line (see right Figure).



Vehicle Hydraulics

The highly controllable, continuous, pulse-free nature of the Pressure Amplifier is ideal for powering compact high-pressure hydraulic circuits.

Remote Oil Well-Pumps

The static, compact and flow-powered Pressure Amplifier is lowered down the bore hole and the mechanical pump remains at the surface away from the corrosive and high-pressure environment.

Handling of Gases and Hazardous Corrosive Materials

DCT's patented carrier-liquid pumping concepts allow the handling and compression of gases and hazardous substances which must not flow through a moving pump.

Other Applications: Steel Cutting, Water De-Ionisation, Multiphase Pumps, High Pressure Oil-Water Separation

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ADVANTAGES

1. The **DCT Pressure Amplifier** introduces a ***new generation of hydraulic circuitry*** leading directly to new solutions for existing problems (e.g. hydrogen compression) or new achievements (e.g. oil-water separation) and new circuits in which ***the main pumps have no contact with the solution***.
2. DCT's ***amplifiers and circuits are protected by propriety worldwide patents*** issued during the period 1989-2002. In addition, patent applications dating from 1998 are in the pipe-line, some of which have already passed the examiners.
3. The DCT Pressure Amplifier ***reduces the requirement for complexity and precision*** in moving components; e.g. high-pressure pumps are replaced by the entirely static Pressure Amplifiers and conventional low-pressure circulating pumps.
4. Hydraulic power may be used to achieve ***direct hydraulic pumping*** without the need for any moving components, whether they are turbines or mechanical pumps.
5. Low-pressure liquid ***pumps can be upgraded for high-pressure*** operation, such as centrifugal and screw pumps.
6. Liquid pumps of any type can be ***upgraded for gas pumping*** by the addition of the Pressure Amplifier.
7. DCT's technology ***lowers the required pressure for seawater desalination and increases productivity***, purity and brine concentration, with reduced temperature sensitivity.
8. Pressure Amplifier systems demonstrate ***inbuilt operational stability***, allowing for rapid load changes and instant start-up and shut-down.

VALIDATION

Public Demonstration of Mobile Sweet Water Unit

DCT demonstrated the mobile desalination plant at the Rheinfelden Salt Works (Rheinsalinen AG, Basel) on 17th December 2002. The unit produces 100 tons per day of high purity sweet water (<300 ppm salt) from seawater. The brine concentration is 90g/l and the ratio of product to brine exceeds 3:2. The sweet water production per hydraulic power input exceeded 160l/kWh without any form of external energy recovery.

Public Demonstration of Storage Pumping

DCT demonstrated direct hydraulic storage pumping at Fuhren Hydroelectric Power Station, Gadmental, Bern, on 3rd December 2002. The system, comprising two Pressure Amplifiers, pumped 4 tons/hour from one reservoir (1152m) to a central collection point (1332m), and was powered solely and directly from a 28 bar water supply.

Low-Cost Water De-Ionisation

DCT has been producing its own de-ionised water (6µS) from mains water (500µS) for a number of years now.

OPPORTUNITY

For more information or to arrange a visit, please contact DOUBLE-CONE TECHNOLOGY at the following:

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