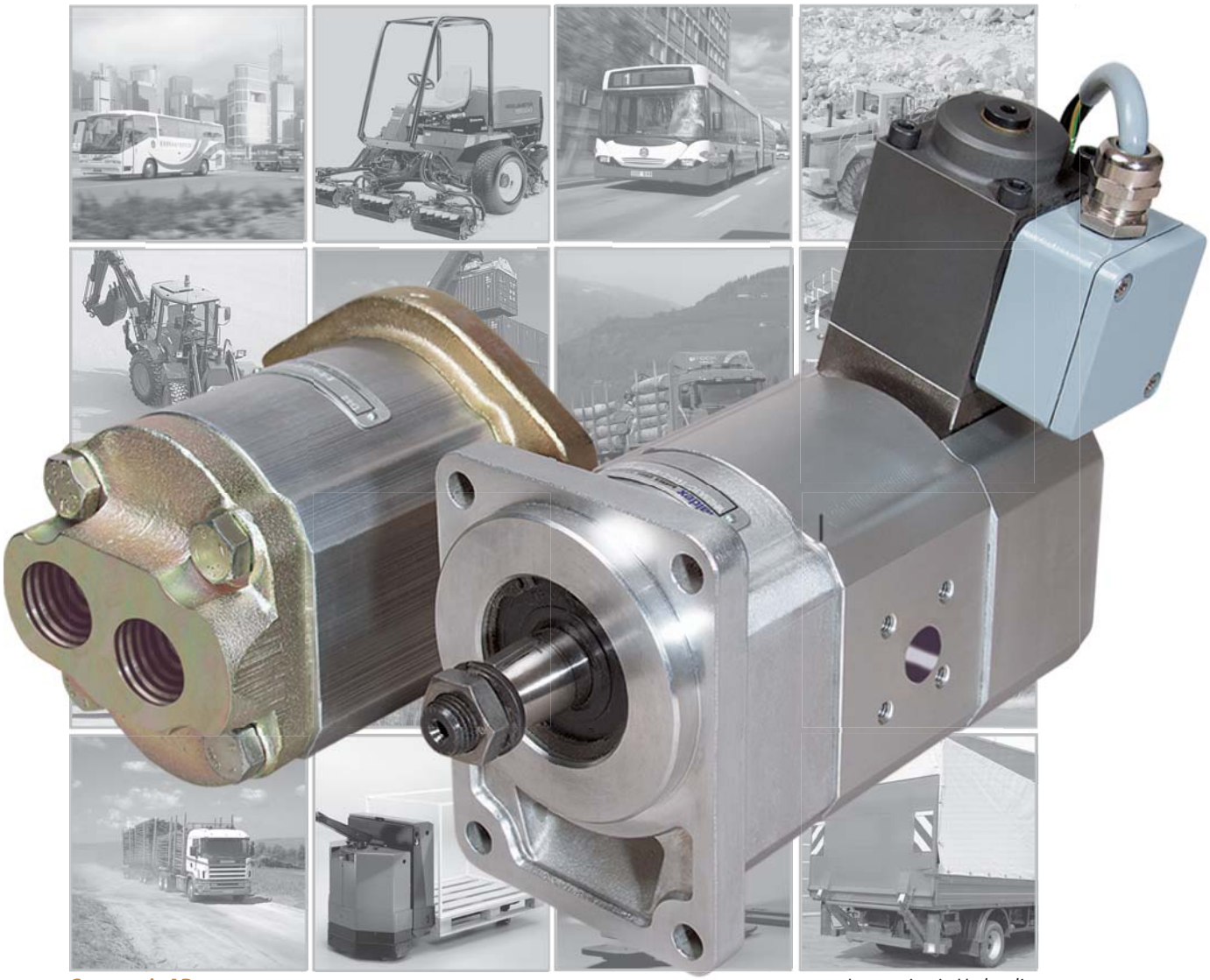
W-SERIES ADVANCED HYDROSTATIC FAN DRIVE SYSTEM



Concentric AB

Innovation in Hydraulics

Background

In a traditional fan drive the fan is linked to the engine through a belt drive or mounted to the crank shaft. This means that the fan will run at a speed determined by the engine and not determined by the required cooling power. In an electric on/off installation it will either run at full speed when above the cut-in temperature limit or stall when below the cut-off temperature. These systems will cool the engine in quite a wide temperature range, in some cases even "more than needed" at the cost of fuel, noise, energy and emission.

"The Concentric design"

In the Concentric fan drive, the fan speed is controlled independently from engine speed and will only run to supply the cooling power exactly as required – not less and not more and independent of the engine speed.

Fail safe

It has an integrated failsafe feature. If a failure occurs in the electric system, cables, sensors or control unit, the fan speed is automatically adjusted to maximum cooling power and prevents the engine from overheating and costly engine damage. Times are gone with engine breakdowns caused by a defective fan belt.

Flexible

This hydraulic fan drive system enables design flexibility since units can be located remote from the engine. Additionally this means the radiator airflow can be optimized with regard to minimum noise emission.

Correct speed

A smooth ramping up and down of fan speed by a proportional pressure control avoids mechanical shock loads compared to systems with simple on/off coupling systems.

Temperature

Engine cooling temperature and hydraulic fluid temperature are presisely controlled within a narrower temperature range compared to other systems. The fan speed is essential on the machine for emission, noise and fuel consumption.

Example:

A fan running at 1000 rpm and 2 kW power input, will need 8 kW to run at 2000 rpm. So by making the fan independent from the engine speed the fan will run only at required speed and consequently consume just the power needed.

The proportional pressure relief valve controls the torque of the fan and generates the most precise speed control.

Complete solution

Concentric supplies complete systems including hydraulic pump, hydraulic motor. Other features like AC-valve, reversible fan direction, pressure gauges etc. are optional. All motors are equipped with a shaft seal designed for high back pressure and pressure spikes in the return line. This eliminates the need for a case drain line of uni-rotational motors in many applications. Bi-rotational motors are available as well. The system offers the capability of being integrated into existing hydraulic and electronic systems of the machines.

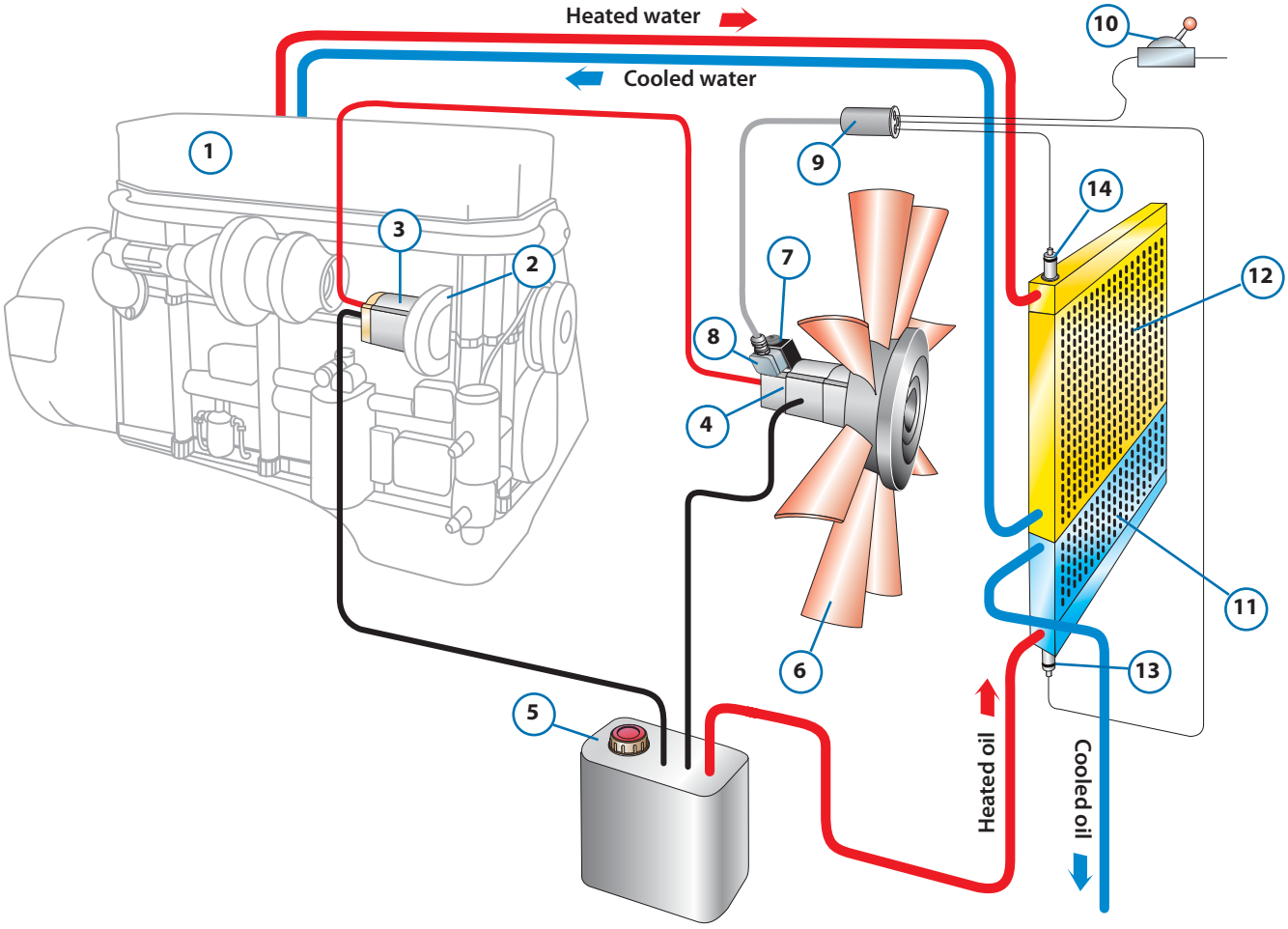
Hydrostatic Fan Drive Systems:

Hydrostatic fan drive systems basically consist of three main components:

• Hydraulic pump • Hydraulic motor (with fan) • Cooling unit

In CONCENTRIC Fan Drives the hydraulic pump and hydraulic motor are designed as a compact and cost efficient gear unit with optional integrated control features.

The following sketch shows the schematic design of a hydrostatic fan drive system:



Concentric Fan Drive Systems

Pumps	Motors
• W-series pump W600, W900, W1500 • Displacement range 3 … 50 cc/rev • Pressure range p_1 up to 276 bar • Optional valve features: - Priority flow control - LS priority flow control - Relief valve	• W-series motors WM600, WM900, WM1500 • Displacement range 3 … 50 cc/rev • Pressure range p_1 up to 276 bar • Uni- or birotational • Outboard bearing optional • Optional valve features: - Anticavitation check valve - Relief valve - 2-speed selection valve - Thermal valve - Prop-pressure relief valve - Reversible rotation valve - Electronic control unit & temperature sensor

For more details please see individual product brochures or contact your local Concentric representative.

PRODUCT RANGE

HE Powerpacks
12/24/48 VDC 0.3 – 4.5 kW and
0.75 – 3 kW AC modular power packs

HE Box Powerpacks
12/24/48 VDC modular powerpacks
in weatherproof boxes

Pressure Switches
5 - 350 bar, connecting/disconnecting

W100 Hydraulic pumps
0,5 - 2,0 cc 227 bar

W300 Hydraulic pumps
0,8 – 5,7 cc 230 bar

W600 Hydraulic pumps / motors
3 – 12 cc 276 bar

W900 Hydraulic pumps / motors
5 – 31 cc/section 276 bar

Calma The new quiet pumps
6,2 - 23,7 cc/section 250 bar

WQ900 The quiet pumps
5 - 23 cc/section 230 bar

WP900X Hydraulic pumps
16 - 31 cc/section 276 bar

W1500 Hydraulic pumps / motors
19 - 50 cc/section 276 bar

F12 FERRA Heavy duty pumps
16 - 41 cc/section 276 bar

F15 FERRA Heavy duty pumps
19 - 50 cc/section 276 bar

F20/F30 (LS) Hydraulic pumps / motors
23 – 161 cc/section 276 bar

GPA Internal Gear pumps
1,7 – 63 cc/section 100 bar

GC Hydraulic pumps / motors
1,06 – 11,65 cc/section 276 bar

D Hydraulic pumps
3,8 – 22,9 cc/section 207 bar

H Hydraulic pumps
9,8 – 39,4 cc/section 207 bar

II-Stage Hydraulic pumps
4,2 – 22,8 cc/section 276 bar

Rotary Flow Dividers
3,8 – 13,3 cc/section 300 bar

Transmission pumps

Concentric AB-Fan Drive-EU-2011-7

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Concentric is an innovator in flow control and fluid power, supplying proprietary systems and components for trucks, buses and industrial vehicles, worldwide. With 1,156 employees and yearly sales exceeding 1,977 million Swedish Kronor, Concentric AB is listed on the Stockholm Stock Exchange (www.concentricAB.com).