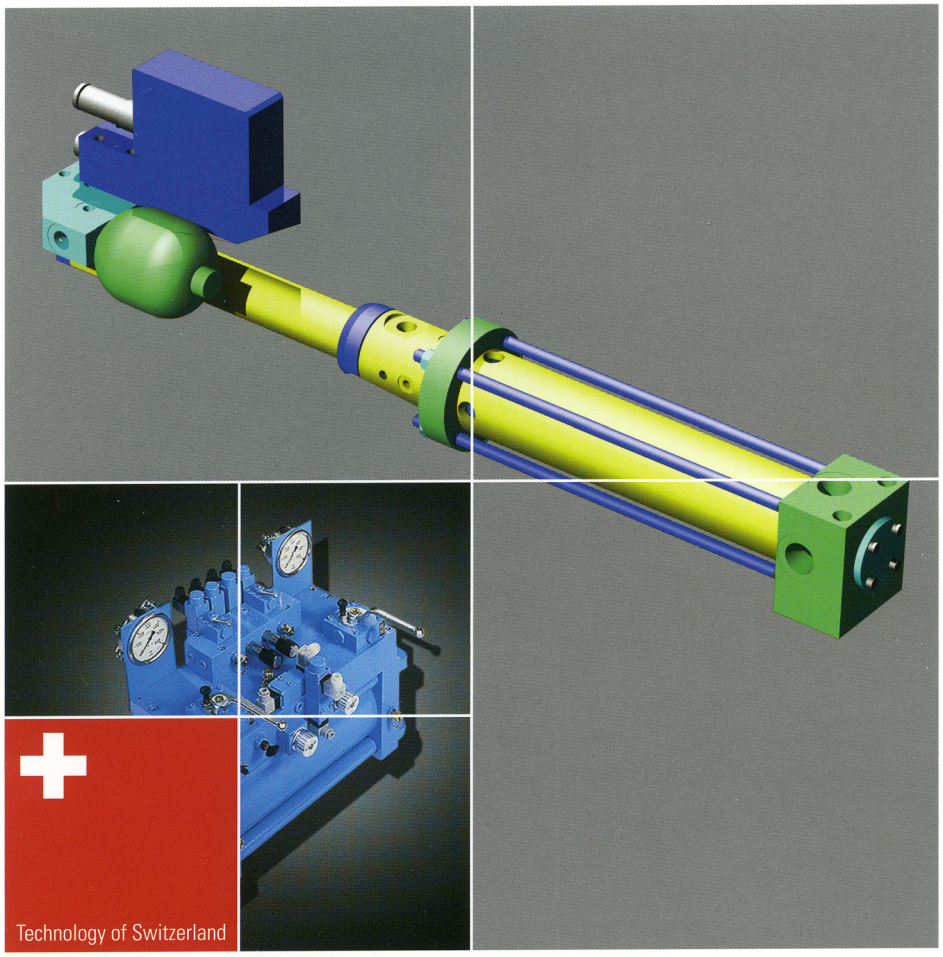
Pressure Intensifier

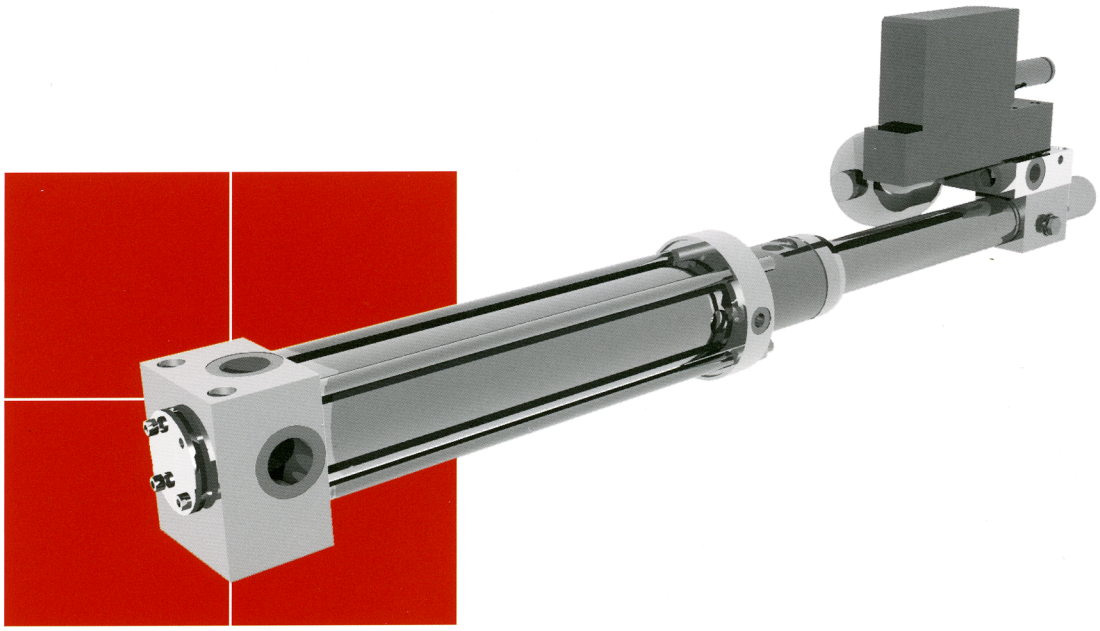
High-precision, high-speed pressure control for test rigs using different fluids



Your benefits:

- *Part of a complete control and regulation system*
- *Pressures up to 1000 bar*
- *Highly accurate*
- *Extensive monitoring and logging facility*

HAGENBUCH
Hydraulic Systems



Innovation and 50 years' experience

50 years' experience in hydraulic drive technology and a wealth of innovation enable us to design efficient solutions tailored to your needs. Our team of engineers combines hydraulics, servo technology, electronics and software to deliver high-quality customised products and systems.

Our focus is on products that contain a fluid subjected to changing pressures (e.g. car radiators) or products that come into contact with a hydraulic fluid (e.g. pressure sensors). We employ test rigs to simulate changing pressures as they occur in the field. This provides both quality assurance and engineering support during product development.

Hagenbuch is your partner for complete test rig solutions. This starts with dimensioning a suitable pressure intensifier and its peripheral components – its power unit, environmental chambers, housings, etc. – and finishes with joint commissioning.

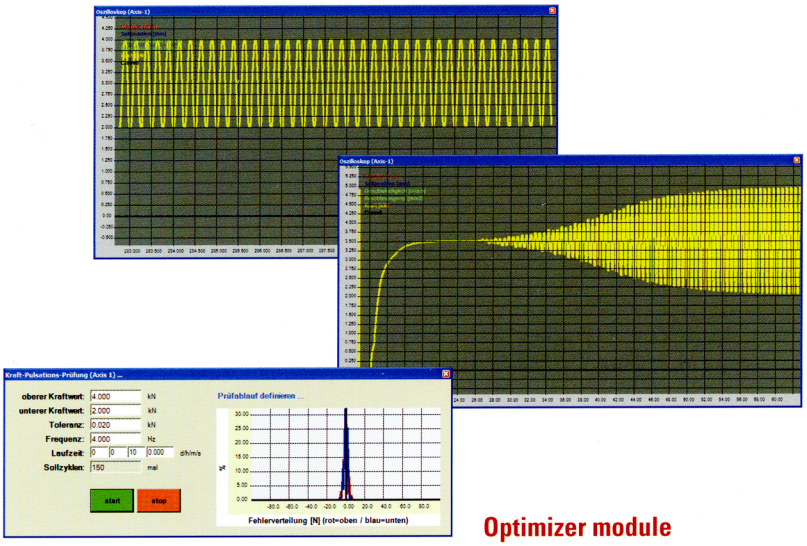
The pressure intensifier

The drive comprises a highly dynamic hydraulic servo actuator. The cylinder stroke and piston diameter are tailored to the respective application – in principle, we can cater for all sizes of cylinder. Although the pressure is controlled in the device under test, the servo actuator itself is positioned by the primary pressure and incorporates a highly accurate and robust displacement measuring system boasting a resolution of 0.001 mm.

The servo actuator piston rod enters the pressure chamber via a special o-ring seal. The area ratios between the servo piston diameter and the piston cross-section in the pressure chamber determine the maximum possible pressure intensification factor. The change in position of the piston in the pressure chamber leads to a change in volume in the fluid chamber and thus to a change in pressure. Using suitable transmission control software, the pressure in the device under test can be controlled dynamically and very accurately.

Some technical highlights:

- Supports up to eight independent drives/test rigs
- Digital displacement measuring system, absolute with a resolution of 0.001 mm
- Pressures of up to 1000 bar (higher pressures on request)
- Series can be easily adapted to different volumes
- Excellent accuracy (up to 0.1% over the nominal range)
- Automatic compensation for leaks and suctioning, if required
- Also suitable for difficult fluids



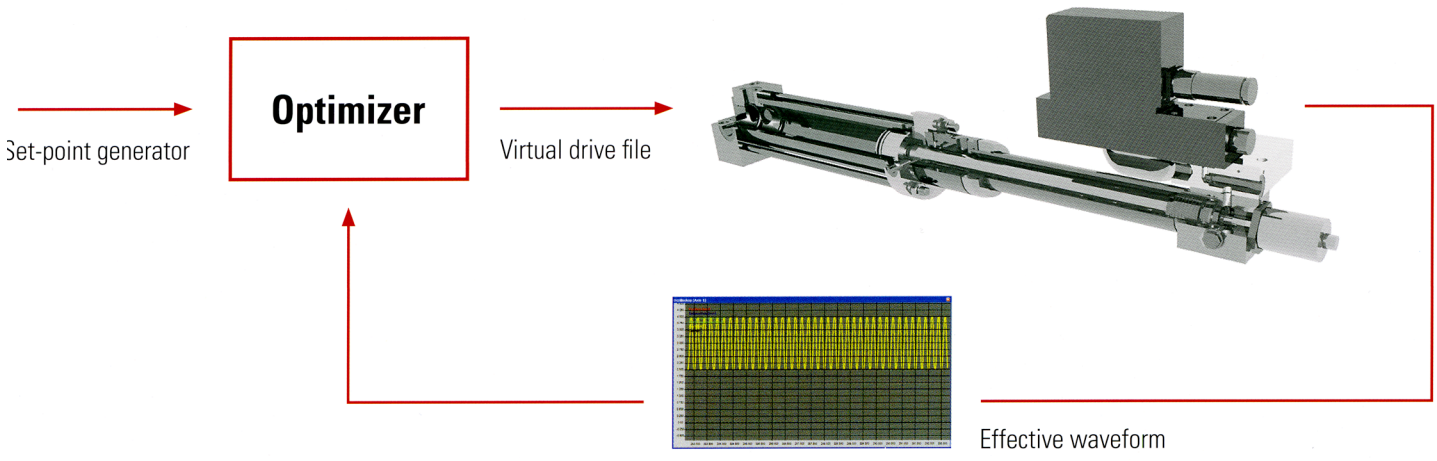
Optimizer module

The optimizer module is a key element of the overall control concept. It analyses the set-point function and changes the parameters for the servo controller in such a way that its drive profile generates the desired pressure profile in the pressure chamber. This not only results in surprisingly good accuracy but also provides for a wide range of applications.

With closed fluid circuits, the ventilation quality, size of the enclosed volume, thermal effects, leakages, etc. exert a major impact on the operation of a test rig of this nature. The optimizer compensates for all this interference and ensures that the device under test is subjected to precise and constant loading throughout the process. In addition, this adaptive concept simplifies considerably the operation of the test rig, resulting in quicker set-up times and easier handling.

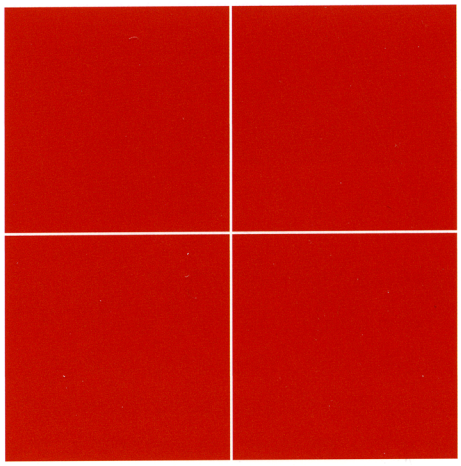
Some control highlights:

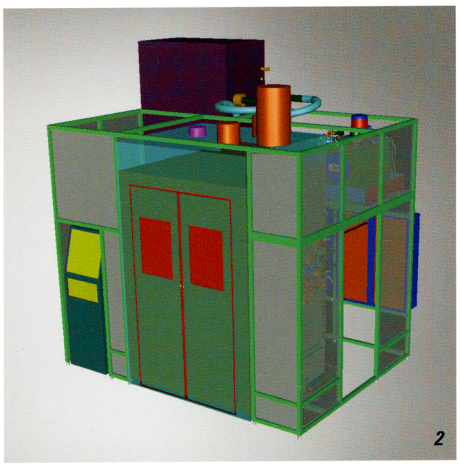
- Real-time control system for rapid control tasks
- Fibre optic bus system
- Control integrated in the LAN via Ethernet (IP address)
- Supports up to eight independent drives/test rigs
- Drives for frequencies up to 100 Hz
- Digital function generator
- Processing of virtual drive files
- Extensive test data recording software
- Oscilloscope function
- Message logging system
- Optimizer module for flexible control
- State-of-the-art Windows interface
- Test rig can be operated from a network of several terminals
- Analysis tools for error evaluation (error distribution curve)
- Digital function generator for various waveforms (sine, trapeze, triangle, square, etc.)



Fields of application:

- *Test rigs*
- *Automotive industry*





1 Sensor test rig with three test stations

A modular test rig concept featuring individual test stations is ideal for testing smaller components, and allows additional stations to be added at any time. The control system can support up to eight servo-driven pressure intensifiers, i.e. eight independent test stations. The single power unit powers all the pressure intensifiers centrally.

2 Test rig with environmental chamber

The adjacent illustration shows a test rig with an environmental chamber. The pressure intensifier itself is installed outside the environmental chamber and connected to the device under test via special inlets. The displacement volume is calculated in such a way that allows the testing of both small and large devices – and even several devices simultaneously. The control system automatically compensates for the thermal expansion of the pressure fluid. The system detects leakages on devices under test and, depending on the situation, will interrupt the process.

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