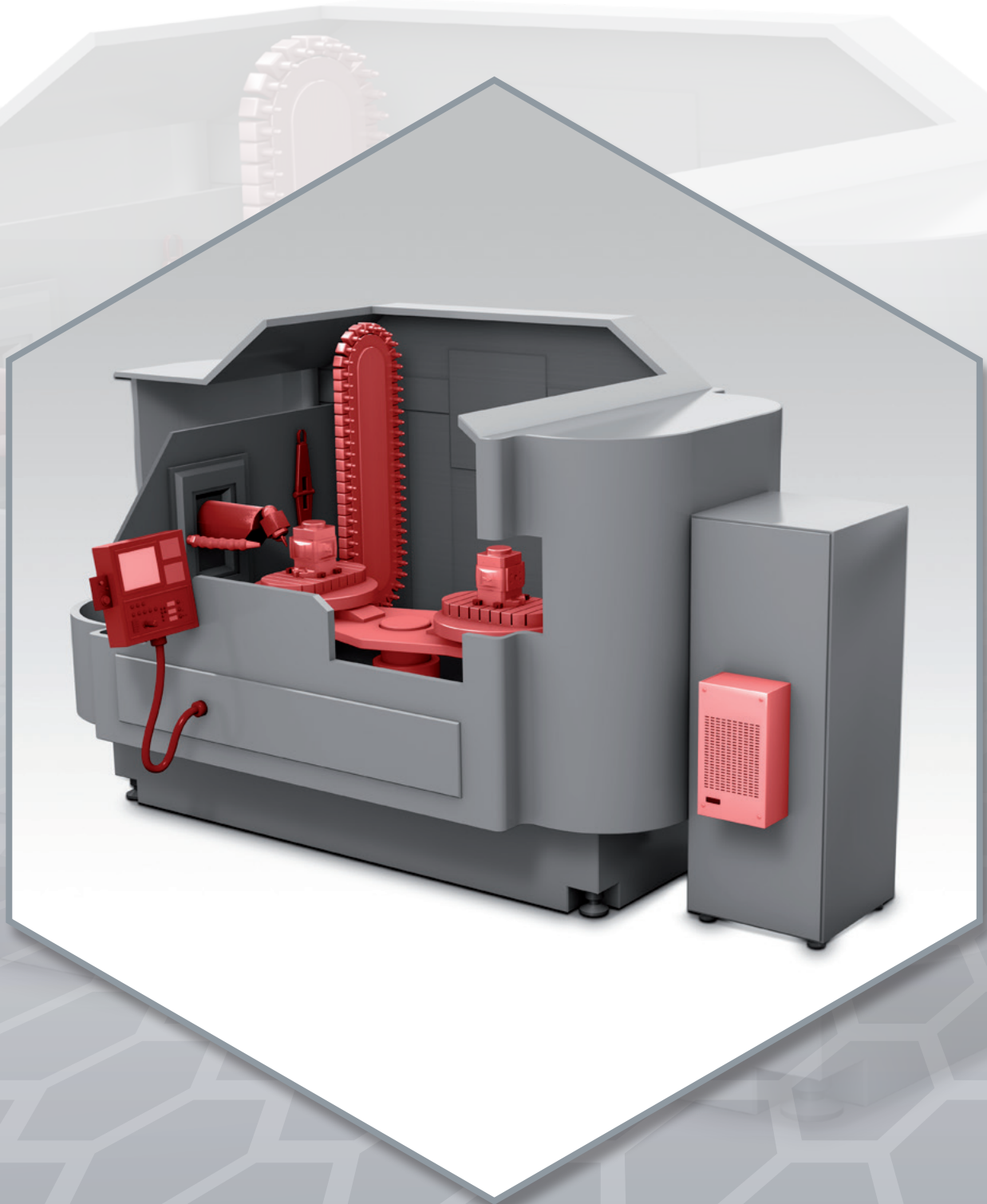


Components, Systems and Service for Machining Centres



Innovative solutions specially for machining centres...

Your partner for expertise in machining centres

HYDAC has been one of the leading suppliers of fluid technology, hydraulics, electronics and cooling equipment for more than 60 years and has over 9,500 members of staff worldwide.

The breadth and depth of our product range, combined with our recognised expertise in development, manufacturing and service, allow us to provide solutions worldwide for the wide range of requirements in the machine tool industry.

In addition to standard products, HYDAC has a wealth of components specifically developed for use in machining centres. These components have evolved from the fields of hydraulics, cooling, electronics and cooling lubricant management. Intelligent integration of HYDAC products creates innovative and technologically advanced subsystems and complete systems for use in machining centres.

Customer benefits

- Cost optimisation achieved by customised system solutions which use standard components
- Reduction in number of models through standardisation and modular construction
- Global yet local: More than 45 HYDAC subsidiaries and over 500 sales and service partners
- Fluid engineering and service: Support in technical design, in the case of complaints, commissioning, maintenance and training
- Customised solutions: Designs can be tailored to individual customer requirements – made-to-order solutions for your machining centre

Software

Digitalisation of machine functions, states and processes:

- Visualisation, evaluation and interpretation
- Documentation, warnings and recommendations

Electronics

- Sensors (IO-Link, smart)
- Measuring equipment and data recorders
- Network interface modules
- Accessories

Cooling

- Active and passive cooling systems for cooling drives, machine elements, hydraulic fluids and cooling lubricants
- Cold plates for cooling power electronics

Hydraulics

- Start-stop power units for energy-optimised, needs-based provision of hydraulic energy

Filtration

- Inline filter for ultrafine filtration to protect components
- Filter housing with optional change-over and monitoring functions
- Compact back-flushing filter, low-maintenance

Valve technology

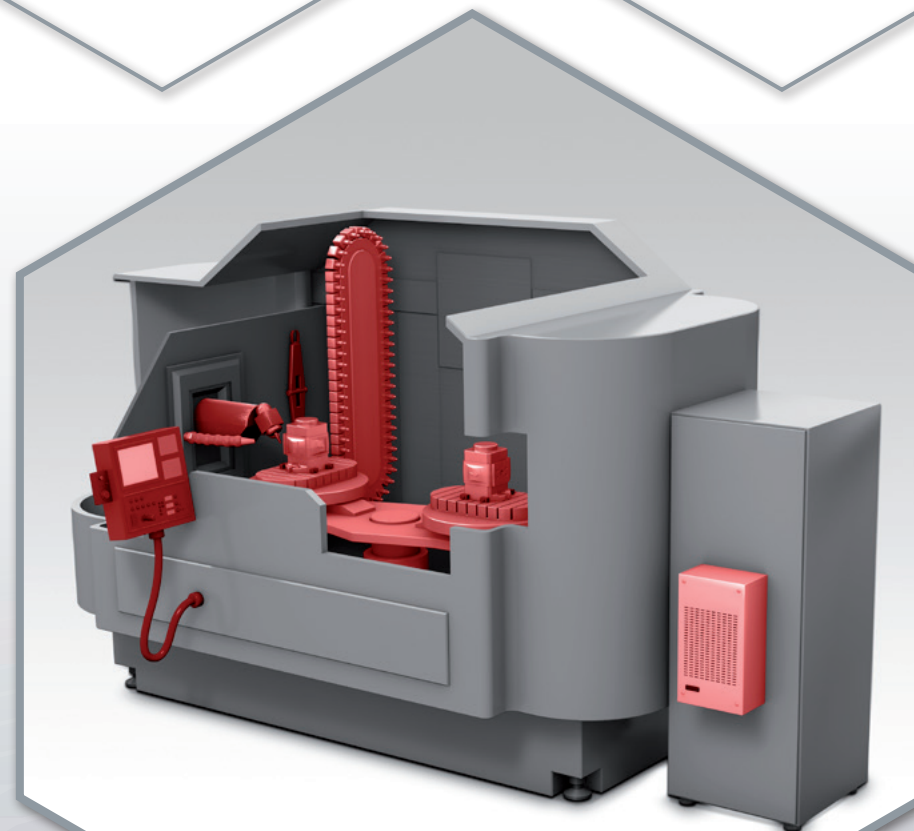
- Valve stacking systems to control hydraulic functions
- Coaxial valves to control non-hydraulic media

Accessories

- Ball valves
- Fluid level gauges and fluid level sensors
- Mounting technology

System solutions

- Customised, self-supporting units with all the components for fluid control
- Project-oriented solutions for complex fluid control requirements including the necessary calculations



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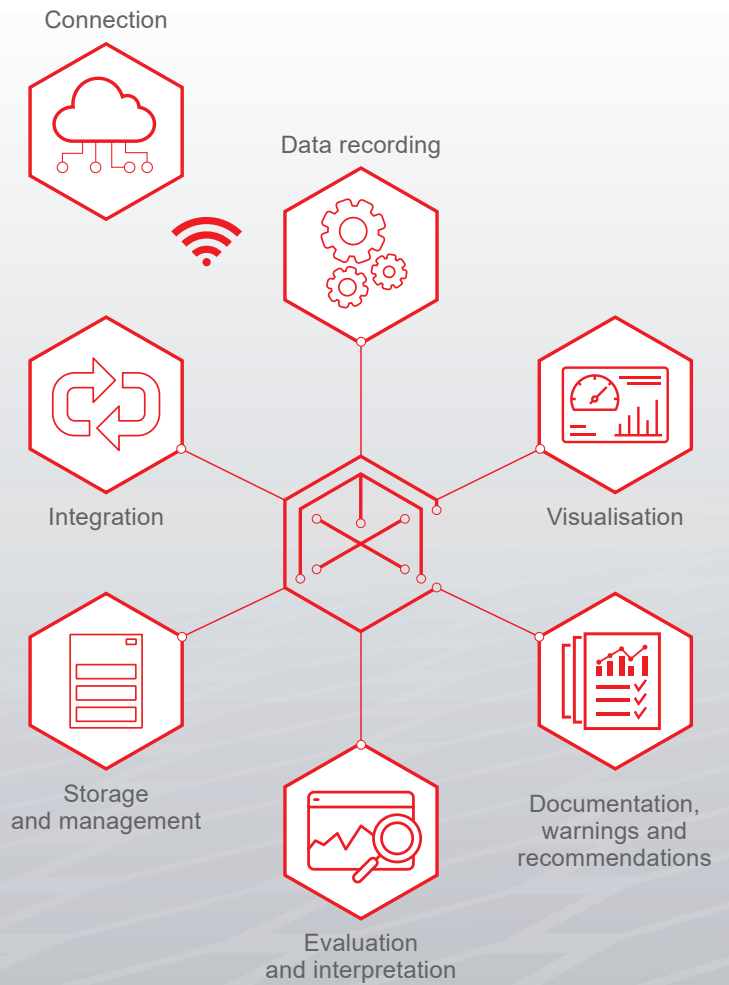
Software – your way to Industry 4.0

HYDAC CMX hardware and software suite for the digitalisation of hydraulic processes

HYDAC's CMX suite is equipped with hardware and software kits that provide individual modules for digitalising machine functions, states and processes either on local servers on the customer's premises or in the cloud.

In addition to sounding malfunction alarms and providing visual representations of machines and production lines, the suite is able to suggest recommended actions and identify potential optimisations. The user can programme their own logic or integrate their own algorithms.

The CMX suite undergoes constant development, especially in terms of responding to customer requirements.



Further information:



Connecting data sources – CMX FieldIntegrator

The CMX FieldIntegrator enables the connection of sensors, modules and machines from different manufacturers via standardised industry interfaces such as Modbus and OPC.

Integrating data from third party systems – CMX Integrator

Data from third party systems, such as inventory management systems, production systems and maintenance systems is loaded via the integrated programming interface (REST-API/WebSocket) in CMX.

Evaluation and interpretation – CMX Analytics

The CMX Analytics module enables the intelligent use of machines and process data on the basis of HYDAC's own algorithms. Possible applications are, among other things, condition monitoring of hydraulic components, service life and wear prognoses as well as the early detection of atypical process states and machine states.

Visualisation – CMX Dash

The CMX Dash module enables measurands and operands to be displayed with widgets. These modules are freely configurable and allow data to be represented in graphs and multiple sets of data to be combined and displayed in a widget etc.

Documentation, warnings & recommendations – CMX Alert

With the CMX Alert module, alerts for critical system states can be generated via SMS and/or e-mail. The module enables flexible editing of the alert message. This means that suitable recommendation messages can be inserted for each alarm.

Relevant documentation (manuals, data sheets etc.) can also be uploaded and then accessed using the dashboard.

Storage and management – CMX Core

The CMC Core database and user management system enables comprehensive rights management. Trend graphs are automatically provided along with any data loaded from the database.

Connecting – CMX CloudConnect

With the CMX CloudConnect module, edge systems with CMX software installed can be connected to the CMX cloud. Data distributed in various system installations can be displayed and processed centrally in the CMX cloud.

If there is a failure in the communication medium (e.g. mobile communications), any data is temporarily stored and transferred when a new connection is established.

What are the fields of application for HYDAC CMX?

The stipulations in the machine or system operating instructions must be followed. Edge at the machine (Data+)

- Requirements**
- Low computing power/storage capacity
 - User requires little IT expertise
 - No internet connection (only requires firewall / 4G in combination with the CMX Cloud)
 - Numerous interfaces

- Main applications**
- Focus on data collection
 - Interfaces
 - Storage
 - "Private cloud" on the machine
 - User-configurable dashboards
 - User-configurable alarms
 - The user is able to calculate KPIs

On customer servers (SCADA)

- Requirements**
- High computing power/storage capacity
 - Administrator with IT expertise
 - Internet connection possible
 - Management of multiple users/groups
 - Programming interfaces (REST-API, connection to SAP, third-party software)

- Main applications**
- Focus on monitoring/integration/analysis/visualisation
 - Algorithms for data analysis
 - More complex visualisations
 - Flexibility
 - Different information for different user groups

As a CMX cloud service

- Requirements**
- Flexible computing power/storage capacity
 - System managed by HYDAC
 - User requires little IT expertise
 - Customers can release data for use
 - Management of many customers and their customers
 - Management of many (distributed) assets (e.g. connected using Data+)
 - IoT interfaces (e.g. MQTT, REST-API, connection to other cloud systems)

- Main applications**
- Similar to SCADA+
 - Software as a Service
 - IoT/distributed applications
 - Algorithms for data analysis and PM/developing AI models
 - GM solution provider

No time-consuming installation – easy-to-use

The right hardware for your application, such as our edge computing solution "HYDAC DATA+", can be combined with the HYDAC CMX software suite and its standardised modules to provide an easy way for you to use your data intelligently.

Simple set-up

The software runs on the edge computer and the web application is displayed in the browser via a web server – no additional installation is necessary.

Open interfaces

The software can easily be integrated into other systems thanks to the programming interface. Common interfaces are supported at the field level. CMX is future-proof due to OPC UA.

Concentrating on what matters most

You can create your own dashboards quickly and easily straight from your browser or calculate performance data using graphical programming.



Sensor systems and condition monitoring components contribute to increased productivity, a high level of machine safety, effective mechanical efficiency and the achievement of high quality machining.

To this end, HYDAC ELECTRONIC provides sensors for pressure, temperature, level, position, oil level monitoring and flow with analogue or digital output signals as well as communication interfaces.

In the context of increasing digitalisation, the sensors are also available as smart sensors with IO-link interfaces and a variety of diagnostic options such as device temperature, temperature-standardised operating times and measuring range monitoring, to mention but a few.

The product range also encompasses data recorders and measuring equipment for the parameterisation and analysis of smart sensors. In addition, the HYDAC ELECTRONIC product range includes network interface modules (IO-Link Master) which enable connection to the control level and the Internet of Things.

Further information:

Sensors



Measurement units, display units and analysis units



Pressure sensors



Features

- Robust, wear-free measurement technology
- Long-term stability
- Simple and accurate adjustment:
 - Automated, e.g. via an IO-Link interface
 - Manual, e.g. based on a VDMA menu navigation
- Application-specific and customer-specific models
- Model for applications with increased functional safety
- Additional functions/diagnostic functions via smart sensors

Function

- Reliable pressure monitoring is of prime importance for the machine's function and the quality of the component. Pressure transmitters and switches are deployed to monitor:
 - Clamping pressure
 - Workpiece support
 - Cooling lubricant systems
 - Hydrostatic bearings
 - Accumulator charging pressure
 - Pneumatics
- Ensuring that machine operation meets the specification and simplifying troubleshooting in the event of errors, e.g. overload detection

Advantages

- Increased machine availability
- Accuracy stability over the entire useful life
- Consistently high machining quality
- Time savings thanks to Plug & Play technology
- Optimised stock control
- Operating errors minimised thanks to self-parameterisation (with IO-Link)
- Simplified or optimised machine architecture/cabling
- Increased machine safety
- Smart sensors with added benefits:
 - Storage of diagnosis information in the sensor
 - Measurement range and device temperature monitoring
 - Automatic self-parameterisation
 - Remote diagnosis, remote maintenance
 - Condition-based, predictive maintenance

Temperature sensors



Features

- Robust, wear-free measurement technology
- Long-term stability
- Simple and accurate adjustment:
 - Automated, e.g. via an IO-Link interface
 - Manual, e.g. based on a VDMA menu navigation
- Application-specific and customer-specific models
- Additional functions/diagnostic functions via smart sensors
- Different probe lengths or remote temperature probe (TFP 100)

Function

- A consistently high product quality can only be achieved when the machining tools are at a constant temperature
- Temperature transmitters and switches are used to monitor the temperature of cooling media and hydraulic fluids
- Ensuring that machine operation meets the specification and simplifying troubleshooting in the event of errors via overload detection

Advantages

- Increased machine availability
- Accuracy stability over the entire useful life
- Consistently high machining quality
- Time savings with Plug & Play technology
- Optimised stock control
- Minimal operating errors
- Simplified or optimised machine architecture/cabling
- Smart sensors with added value:
 - Storage of diagnostic information in the sensor
 - Measuring range and device temperature monitoring
 - Automatic self-parameterisation
 - Remote diagnosis, remote maintenance
 - Condition-based, predictive maintenance

Level sensors



Features

- Wear-free measurement method
- Indication of fluid level
- Simple and accurate adjustment:
 - Automated, e.g. via an IO-Link interface
 - Manual, e.g. based on a VDMA menu navigation
- Analogue resolution over the whole measurement range
- Combined sensors fill level + temperature

Function

- Measuring and monitoring of fill levels in oil tanks or coolant tanks

Advantages

- Increased machine availability
- Time savings with Plug & Play technology
- Accuracy stability over the entire useful life
- Consistently high machining quality
- Continuous, smooth level detection over the entire measurement range
- Active suppression of short-term level fluctuations
- Automatic fill level detection and readjustment to central systems
- Level measurement and temperature measurement combined

Position sensors:
Linear position, distance, angle, tilt



Features

- Linear position sensors/distance sensors are based on various measuring methods
 - Magnetostrictive:
 - Wear-free and robust
 - High accuracy
 - Automated, e.g. via an IO-Link interface
 - Other linear position and distance sensors based on LVDT, Hall sensors, ultrasonic sensors and optical sensors
- Angle sensors
 - Detection of the angle of rotation using a non-contact, robust and magnetic measuring method
 - Various models
 - Single-turn angle sensor with absolute measurement
- Tilt sensors
 - Based on MEMS technology
 - Very robust sensor element
 - Highly dynamic
 - Good long-term stability
 - Motion compensated

Function

Increasing demands for precision, machine availability and improved safety require reliable measuring technology which is perfectly adapted to the application.

Linear position and position sensors are used in:

- Tailstock monitoring
- Valve position monitoring
- Position detection e.g. on locks
- Detection of traverse paths

Advantages

- Increased machine availability
- Consistently high machining quality
- Simplified or optimised machine architecture/cabling
- Increased machine safety
- For general applications and applications with increased functional safety SIL 2/PL d

Oil condition sensors



Features

- Online oil condition monitoring
- Stationary online particle sensor for continuous measurement of the solid particle contamination in fluids; output of cleanliness class acc. to ISO, SAE or NAS
- 2 in 1 combined sensor: for the detection of water in oil
 - Saturation level
 - Temperature
- 4 in 1 combined sensor: for the detection of oil ageing or mixing with other fluids
 - Saturation level (rel. humidity)
 - Temperature
 - Dielectric constant
 - Electrical conductivity

Function

The humidity, contamination and oil-condition sensors enable hydraulic oils and lubrication oils to be monitored – accurately, continuously and online.

Advantages

- Early detection of water, particulate contamination in the system and oil degradation enables needs-based maintenance and fluid conditioning
- Increased machine availability
- Consistently high machining quality

Flow sensors / flow meters



Flow rate transmitters: EVS 3100, HFT 2100, HFT 2500 (structurally identical);
Flow switch: HFS 2000; Flow meter: HFS 256

Features

- For water, oils, cooling lubricants
- High level of measuring accuracy and switching accuracy
- Robust design
- Viscosity compensated
- Low Δp
- Ensures sufficient cooling/lubrication

Function

Flow sensors are used to measure and monitor the flow rates of fluid media:

- Monitoring hydraulic oil circuits
- Monitoring the flow rates to the tool in internally cooled tools

Advantages

- Process analysis and optimisation e.g. optimising tool use by monitoring the flow rates
- Pump dry-running protection
- Early detection of leaks
- Increased machine availability

Measurement technology



Features

- Measuring instrument / data recorder HMG 4000
 - Up to 38 sensors can be connected
 - Up to 100 measurement channels can be displayed simultaneously
 - 5.7" colour graphics touch display
 - IO-Link interface for parameterisation
- Programming adapter ZBE P1 for programming HYDAC sensors in connection with a PC

Function

The HMG 4000 measuring instrument and data recorder is designed for:

- Data collection and analysis, data storage
- Sensor parameterisation

Advantages

- Simplifies service and commissioning
- Remote diagnostics, remote maintenance, condition-based, predictive maintenance
- Measurement and analysis
- Connecting to the Internet of Things

Network interface



Features

- IO-Link Master network interface module
 - with 4 or 8 ports
 - Class A or Class B

Function

- Connection between IO-Link field device and automation system/PLC

Advantages

- Simplifies service and commissioning
- Remote diagnostics, remote maintenance, predictive maintenance
- Measurement and analysis
- Connecting to the Internet of Things
- Simplified, faster and more cost-effective cabling for the entire system via IO-Link Master

Cooling

Fluid / air cooling systems FLKS



Fluid / air cooling systems FLKS 2EC

Features

- Cooling of circuits which use mineral oil or water-glycol
- Compact design with plastic tank, circulation pump, cooling element and fan
- Various sizes with cooling capacities up to 4.5 kW/K and flow rates up to 300 l/min

Function

The pump conveys the cooled operating fluid from the tank through the component that is to be cooled. The fluid absorbs heat from the component and then flows back to the heat exchanger, where it is returned to a cooler temperature by the air flowing from the installed fan.

Advantages

- Cost-effective and efficient cooling system
- Compact and lightweight: sizes FLKS-1 to FLKS-5 are equipped with plastic tank housings
- Energy efficient as optimised, specially designed drives are used and heat is dissipated directly to the environment
- Optional: speed-controlled systems: The temperature of the operating fluid is controlled by adjusting the fan speed to a defined differential to the ambient temperature

Further information:



Fluid / water cooling systems FWKS



Fluid / water cooler FWKS-2-2

Features

- Cooling of circuits which use mineral oil or water-glycol
- Compact design with plastic tank, circulation pump and plate heat exchangers
- Various sizes with cooling capacities up to 250 kW and flow rates up to 300 l/min
- Can be used as a temperature-controlled intermediate circuit; in this way, the contamination and corrosion in the coolant circuits which could arise as a result of direct cooling with poor water quality is prevented

Function

The pump conveys the cooled operating fluid from the tank through the component that is to be cooled. Once there, it absorbs the heat and flows back to the plate heat exchanger where it is cooled again by the cooling water.

Advantages

- It is also possible to cool to temperatures below the ambient temperature (depending on the temperature of the available cooling water)
- Low heat dissipation to the environment and low noise emissions
- Thermostatically or electronically controlled proportional valve available as an option: the temperature of the operating fluid can therefore be maintained at a specific temperature value

Further information:



Plate heat exchanger with closed-loop control WTRE



Plate heat exchanger with closed-loop control

Features

Water cooling system, consisting of:

- Brazed plate heat exchanger
- Flow control valve
- Electronic controller
- Temperature sensor for measuring the fluid temperature or, additionally, the air temperature

Function

The WTRE is used as an intermediate circuit for cooling motor spindles, gears, hydraulic power units and cooling lubricants. It is generally used in combination with the existing cooling unit. The coolant is pumped from the cooling unit pump through the WTRE plate heat exchanger to the machine tool. If the available plant cooling water is cold enough, the compressor is not needed and remains continuously switched off.

Advantages

- Continuous value control of the fluid temperature; As an option, the temperature of the operating fluid can also be kept at the ambient temperature (air or machine bed temperature)
- Highly accurate electronic controller
- Reduced operating costs due to energy savings
- Simple retrofitting: interference with the machine tool's electrics or PLC is not necessary

Further information:



Refrigerated Fluid Cooler RFCS



Refrigerated Fluid Cooler RFCS

Features

- Fluid cooling system as separate auxiliary cooler or for integration into a machine
- Cooling capacities from 0.3 to 200 kW
- Can be used for any cooling tasks
- Stand-alone control of the system due to innovative controller design
- Condenser available as water-cooled or air-cooled version
- Several cooling circuits possible
- Precise temperature control accuracies of up to ± 0.1 K

Function

The RFCS cooling unit cools various fluids such as water, DI water, water-glycol and oil. The cooling system, which consists of a chiller, pump, tank and control, controls the operating medium temperature independently to a specific setpoint. The energy-efficient, patented mixer principle, combined with a seal-less submersible pump, makes this system the ideal component for your machine tool.

Advantages

- Leakage-free, seal-less submersible pump
- Compact dimensions
- User-friendly control interface
- Cleanable air filter
- Plug & Play solution
- Easy to service and user-friendly

Further information:



Cold Plates



Cold Plates

Features

- Fluid cooling plates for cooling power electronics, batteries, laser sources etc.
- Customer-specific design and construction
- Manufactured in solid aluminium and joined with high-quality joining processes such as vacuum brazing and friction stir welding
- Dimensions of up to 1,600 mm x 750 mm possible

Function

Cold plates are used wherever electronic components have to operate at a high performance level and have to be cooled efficiently.

When electronic components are mounted directly on the cool plates, the heat is transferred to a fluid and carried away effectively.

The coolant is supplied by HYDAC fluid cooling systems (FLKS or FWKS), cooling units (RFCS) or closed water-glycol circuits (WKG) and re-cooled.

Further information:



Smart Compact Power Unit CO1S

HYDAC combines established power-unit technology with features from Industry 4.0 technology

In the tasks that are typical for machining centres, such as clamping axles and tool changes, HYDAC's start-stop power unit family CO1 has become established thanks to its compact design and energy-efficient technology.

In the new generation CO1S, the power unit is now able to monitor its own operating parameters thanks to a smart sensor system. It can also share these with the machine control if necessary via an IO-Link interface.

The main smart features are:

- IO-Link interface
- Regular p_0 monitoring via pressure sensor
- Pressure peak monitoring incl. logging
- Monitoring of power unit runtimes including operating hours counter
- Monitoring of the hydraulic temperature
- Filter differential pressure measurement

The advantages for machine manufacturers and operators:

- Constant data exchange via IO-Link provides the desired transparency for the pressure supply
- Data can be used for error analysis as well as new payment models (pay-per-use)
- The costs for preventive maintenance are reduced while the risk of system failure is minimised



Conservation of resources

- Power on demand
- Low oil consumption
- Quiet
- Low space requirements
- Energy-efficient



Connectivity

- Communication with the machine control
- Fast processes
- Can be combined with ML stacking system

Further information:



Smart Compact Power Unit CO1S



Service

- Simple and time-saving commissioning
- Low maintenance costs



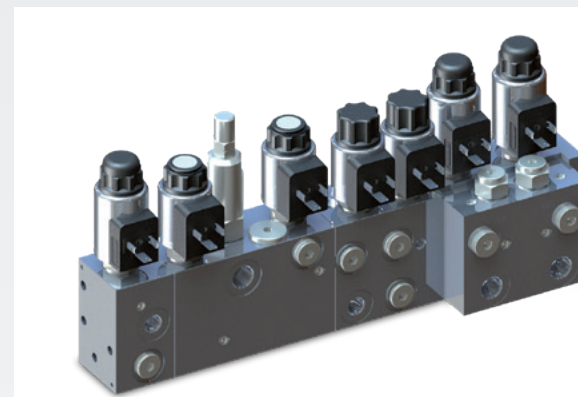
Safety

- Notification when operating parameters are outside the permitted range

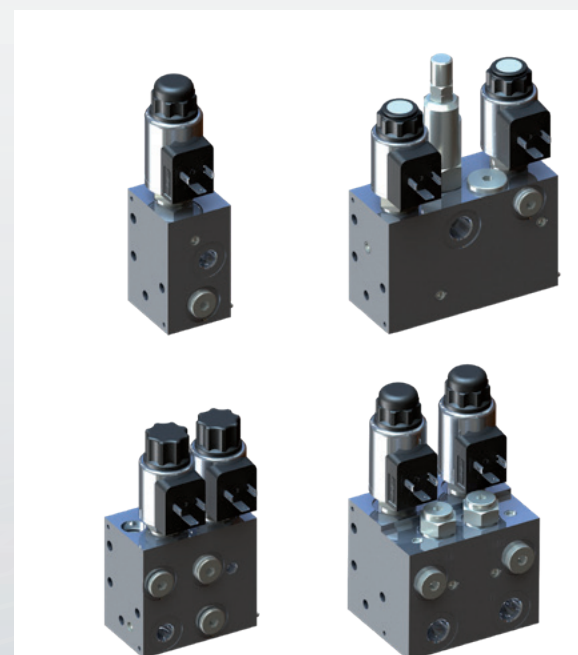


Globalisation

- Can be used worldwide
- Rapid delivery



Stacking system



Individual modules for different functions



CO1 power unit with valve stacking system

Valve stacking system ML

Compact, modular valve stacking system, optimised for use with CO1 power units

The HYDAC valve stacking system type ML is a control block for oil-hydraulic systems composed of individual standard modules. This system is primarily designed for controlling low-volume consumers and for pressure/force resistance tasks.

Different function modules can be flanged to the base module. The sequence of modules depends on the control task, as does the use of pressure, flow control, shut-off and directional control valves on the module. Additional modules such as pressure switches, pressure gauges and accumulators can also be incorporated. An end module completes the block.

For the ML stacking system, a specially adjusted base module has been developed for optimised use in conjunction with HYDAC CO1 start-stop power units; the control can also be used on a stand-alone basis, however.

Features

- Zero-leakage directional poppet valves ensure that the consumer is securely positioned and maintain the pressure over a prolonged period without repeated oil supply
- Various base and function modules for individual control of the hydraulic consumers
- The smallest dimensions provide high power density through the use of cartridge valve technology
- Can be flanged directly to the CO1 power units
- The ML valve stacking system combines with the CO1 hydraulic power unit to form a ready-to-install oil supply unit
- Function modules can be added at a later date

Advantages

- Leakage-free
- Modular

Further information:



Inline filters DF/FLND/FMND



Finest filtration for component protection

Features

- Removal of solid particles from hydraulic lubricants and cooling lubricants
- Filtration ratings from 3 to 50 µm
- Flow rate up to 420 l/min
- Pressure up to 420 bar
- Filters to DIN 24550 available
- Change-over filters possible

Function

As the fluid passes through the filter element, the particles are retained and become embedded in the deep structure of the element. The large internal surface provides a high contamination retention capacity and long filter service life. The excellent filtration of even the smallest particles protects the downstream components, such as the rotary joint, internally cooled tools and high pressure valves, from damage.

Advantages

- Desired cleanliness class is guaranteed
- Protects downstream components
- Low pressure drops
- Compact and space-saving design
- 24 hour operation with duplex change-over filters
- Low leakage when changing element
- Available with/without bypass valve
- Clogging indicator optional

Further information:



Automatic back-flushing filter AutoFilt® RF4



Tried-and-tested function principle, compact design

Features

- Removal of solid particles from low viscosity fluids
- Filtration ratings from 20 to 1,000 µm
- Flow rates up to 385 l/min
- Compact design
- Efficiency thanks to automation
- Performance enhanced by isokinetics
- Optional: AutoFilt® Control Unit ACU with open connectivity to all common interfaces (Ethernet, RS-232 C, RS 485) for self-diagnostics, system diagnosis, remote monitoring and process monitoring

Function

The medium flows through the filter elements from the inside to the outside. Contamination particles then collect on the smooth inside of the filter element surface. As the level of contamination increases, the differential pressure between the contaminated and clean sides of the filter increases. When the differential pressure reaches the pre-set trigger point, back-flushing starts automatically.

Advantages

- Fully automatic operation
- Ready-to-operate unit
- Maximum utilisation of the filter area
- Full filtration performance following back-flushing
- Complete cleaning of the conical filter elements
- Low maintenance costs
- Low operating costs

Further information:



Online sensors for cooling lubricant applications FCU 5000 and CMP 5000



Features

- Continuous monitoring of concentration, pH value, conductivity, refractive index, temperature and inlet pressure
- The system's target concentration can be kept virtually constant with automatic dosing of the cooling lubricant concentrate
- If there is any deviation from the permitted parameter ranges, an alarm is given via a display (FCU5000) and the electronic interfaces
- Measured values can be evaluated with HYDAC's own CoolTools software

Applications

- FCU5000: MRO version for retrofitting existing centralised and decentralised systems
- CMP5000: OEM version for immediate integration at the system manufacturer

Advantages

- Reliable determination of cooling lubricant concentration in machining processes
- Defined sampling in bypass
- Transfer of measured values and automatic alarms via Profinet/Modbus TCP when limit values are exceeded
- Switching output for 2 fully-automatic dosing pumps (e.g. concentrate/pH stabiliser)
- Self-monitoring function via automated flushing intervals
- Creation of digital lab reports
- Cost-efficient solutions for single systems

Further information:



Process Booster Block PBB



Safe high pressure cooling and lubrication

Features

- Pressure boost, pressure control, pressure monitoring and safety filtration in one unit
- Compact design
- Flow rates up to 80 l/min
- Max. operating pressure of 70 bar on the high pressure side
- Protective filter – Automatic back-flushing filter AutoFilt® RF4
- Filtration ratings of 20 – 100 µm
- High pressure pump, pressure control valve, high pressure valves, pressure relief, pressure monitoring
- Adjusted and adapted to specific customer needs

Function

The design consists of a supply block with filtration and an adaptable pump block and contains the full functionality for the high-pressure supply of internally cooled tools. The block incorporates the actuators and sensors in a minimum of space. In addition, the block can be expanded according to customer requirements. An adapter plate enables all common high pressure pumps to be used with the machine tool.

Advantages

- Compact design
- Simple design
- Modular system
- Standard components
- Block design of components
- Minimises pipework
- Automatic protective filter HYDAC AutoFilt®
- Ready-to-install unit
- Simple commissioning

Accessories

HYDAC offers a good standard range of common valves available on demand and from stock for use with vacuum, gaseous, liquid, gelatinous, abrasive, contaminated and aggressive media.

Coaxial valves – direct-acting and pilot-operated



Coaxial valves, modular design

Available as individual valves and in a modular design

Features

- High flow rates with low pressure loss
- Flow rates up to $47.2 \text{ m}^3/\text{h} = 787 \text{ l/min}$
- Safety assured by proven technology and experience
- Compact design
- Robust design and high level of protection against back pressure

Function

Coaxial valves open and close by axial movement. Compressed air or solenoid force moves a tube in a horizontal direction and opens the valve seat. Coaxial valve technology is a tried-and-tested means of controlling different types of media, e.g. vacuum, gaseous, fluid, abrasive, contaminated and aggressive, and is therefore universally applicable. A broad range of sizes and connection types combined with seal materials and housing materials which are compatible with the medium make it possible to develop tailor-made solutions for an almost unlimited range of applications.

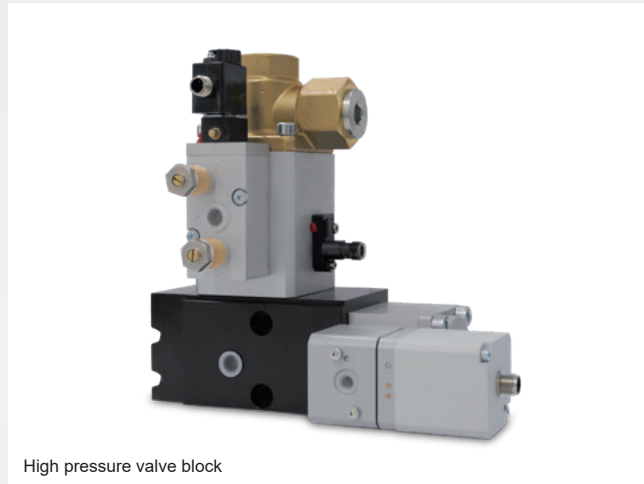
Advantages

- Rapid opening and closing times
- Highly contamination-resistant and durable
- High Kv values and viscosities are possible, therefore also suitable for gelatinous, highly viscous, paste-like and contaminated media
- Very compact design
- The geometry of these valves allows them to be built as module blocks (space-saving, maintenance-friendly and minimises the installation expense)
- No pressure differential required
- Resistant to back pressure and flow possible in both directions

Further information:



High pressure valve block CX + DBV



High pressure valve block

Valve block made of 2/2-way CX valve and pressure relief valve DBV

Features

- Robust design
- Very compact construction of pressure relief valve, switch valve and sensors
- Standardised seal packages
- Small installation space
- Pressure up to 120 bar

Function

Efficient handling of the high-pressure cooling lubricant supply in machine tools is becoming ever more important due to the rising costs of energy, operating materials and maintenance. The wide range of HYDAC Accessories products enables the relevant components to be optimised. The robust design of the coaxial valves means that they are not just suited to control, closed-loop control and monitoring of cooling lubricants (e.g. emulsions and low viscosity oils). They also fulfil the demanding requirements of the latest technology, leading to a virtually limitless range of applications.

Advantages

- Minimisation of time and effort required for installation
- Considerably reduced installation space
- Electrical approval certifications according to North American standards for all products (pilot valve, proportional valve and sensors)
- Less susceptible to leaks due to its compact design

Further information:



Ball Valves



Ball valves

Manual or with pneumatic actuator

Function

Due to a high level of in-house manufacturing and state-of-the-art machinery, HYDAC ball valves enable efficient series production as well as customer-specific solutions. Our products are known for their quality, functionality, value for money, safety, service life and flexibility.

Advantages

- Full-flow passage to ensure unrestricted flow of the medium
- Self-sealing due to sealing principle with floating ball
- Easy actuation, even at high pressures
- Maintenance-free, no adjustment of the seal necessary
- 100% individual testing of the ball valves

Further information:



Fluid level gauges and fluid level sensors



FSA and FSK

Fluid Level Gauge FSA / Fluid Level Sensor FSK

Function

The FSA and FSK are used to check and monitor the operating fluid level. HYDAC offers a variety of sizes and configuration options. Fields of application include: Machine tools, system engineering, tanks for hydraulic oils, lubricating oils and cutting oils and gearboxes.

Advantages

- Simple, standardised installation conditions
- Simple, robust and break-proof
- Can be used in all industrial sectors

Further information:



Mounting technology



Series strips, DIN 3015, HY-Loop

Series strips, DIN 3015 and HY-Loop

Function

If you need to attach pipes, hoses, cables, sensors, switches and/or any other rounded or angular parts wherever you wish, HYDAC's product range offers perfect solutions for a variety of applications.

Advantages

- Series strips:**
- Bundled, clear and safe laying system
 - Space-saving and compact
 - Simple and rapid installation
 - Protection of sensitive components
 - Compensation of pipe and cable tolerances
 - Different diameters in one series strip

- DIN 3015:**
- Damping of shocks, vibrations and noise, as well as compensation of pipe tolerances
 - High strength
 - Surface protection
 - Safe overhead installation

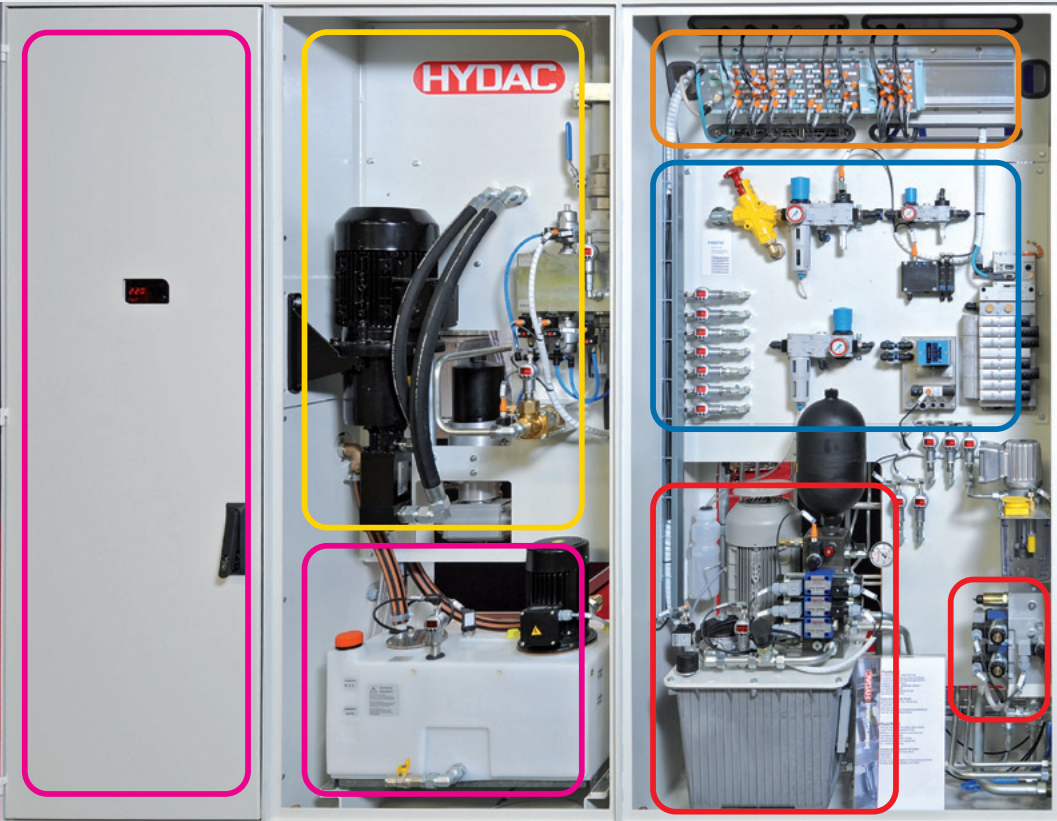
- HY-Loop:**
- Reusable
 - Variable, simple handling
 - Tool-free
 - Gentle cable mounting
 - Self-extinguishing

Further information:



System solutions

Fluid panel



	Cooling	Air, water and/or refrigeration cooling system
	Electronics	Sensors, electrical control
	Coolant	CX valves, piston control valves, high pressure pump, automatic back-flushing filter
	Hydraulics	Hydraulic power unit, valve stacking systems and hydraulic accumulator units
	Pneumatics	Supply unit, valves, modules, etc.

Function

A fluid panel is a self-supporting unit which combines all the fluid control components of a machine tool. It includes the cooling, electronics, cooling lubricant, hydraulics and pneumatics.

By using defined interfaces accurately coordinated with the machine tool manufacturer, it is possible to design a subsystem which concentrates all the fluid control for a machine tool in one area. From the technical calculation, through to the installation including piping and wiring, right up to function testing the unit, HYDAC is your system partner with all the expertise.

Advantages

- Quick and simple installation through the use of defined hydraulic, pneumatic and electronic interfaces (quick release couplings, connectors, etc.)
- Concentration of all the fluid control in the machine
→ Clearer overview, improved maintenance, simpler error diagnostics
- Machine tool manufacturer has one contact for the following different fields: cooling, electronics, cooling lubricant, hydraulics and pneumatics
- Everything from a single source – reduces the number of interfaces and minimises number of suppliers

Project-specific solutions



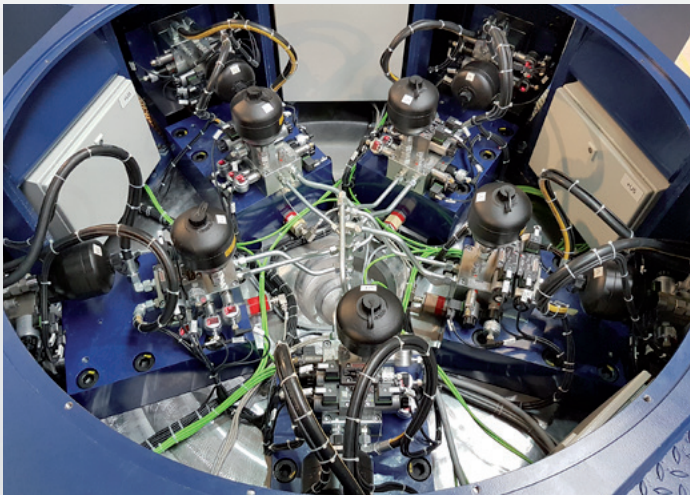
Expert support – for the functional configuration and safety-related configuration

HYDAC not only has an impressively broad and extensive product portfolio for use with machine tools: we also know how to combine these products to form project-specific subsystems for the benefit of the customer.

This specific case involved a large centre used to machine excavator base frames. The complex welded structures, weighing up to 80 tonnes, first needed to be centred and then tensioned for suspended machining. The challenge was to implement a hydraulic solution that was both functional and demonstrably safe. The proof needed to be provided in accordance with DIN EN ISO 13849.

The HYDAC specialists joined forces with the customer's designers and narrowed the requirements for the solution down to the key elements. The circuit diagram was then drafted, the necessary calculations (functional and safety-related) were performed and suitable valves, sensors, accumulators etc. were selected from the extensive HYDAC range. Working with the customer, HYDAC then installed and commissioned the subsystem at the customer's site.

Ultimately, HYDAC was able to provide the customer with a solution that works excellently in terms of its function, cost-effectiveness and safety.



Everything from a single source – we are geared towards your requirements



Product innovations

Stat-X® filter element technology



Filter elements to combat electrostatic charging in the system

Features

Over the past few years, the trend towards ash-free hydraulic fluids, more compact systems and finer filtration has led to increasing problems of electrostatic charging and discharging in hydraulic and lubrication oil systems.

By using the cutting-edge Stat-X® element technology, you will significantly reduce electrostatic discharges and high oil charges, even in extremely critical systems with excellent ultra-fine filtration.

Advantages

- Maximum safety for employees and the system due to proven reduction in sparking
- Reduction in oil degradation products (varnish), longer oil change intervals
- Safe operation in potentially explosive atmospheres
- Reduction in unscheduled downtimes
- Reduced maintenance costs and longer maintenance intervals

Further information:



MULTI approval accumulators



MULTI approval accumulators for worldwide use

Features

Hydraulic accumulators and pressure vessels are subject to legal regulations and requirements which depend on the country of installation. HYDAC hydraulic accumulators fulfil these requirements and can be supplied worldwide.

By combining common approvals, HYDAC is able to offer a MULTI approval accumulator in addition to single approval accumulators. MULTI approval accumulators come with several approval classifications straight from the factory.

With this expansion to our product range, the same accumulator can be used flexibly in several countries.

Advantages

- Wide variety of uses in the original equipment sector and the spare parts business
- Reduced costs for machine documentation
- Optimised warehouse management and logistics management

Further information:



Innovative valve technology



Broad and innovative product range – all from a single supplier!

Features

- Complete range of directional valves for applications in machine tools; up to 350 bar and nominal size 32
- Valves with switch position monitoring; sensor (Hall principle) with analogue output or IO-Link type A
- Valves with reduced power consumption; 8 Watt valves for control straight from the PLC
- Valves with on-board electronics and integrated pressure sensors

Advantages

The switch position-monitored valves enable system monitoring and an increase in the diagnostic coverage. Information on all the completed switching cycles is also provided.

In addition to saving energy during operation, the valves with reduced power consumption lead to cost savings due to reduced electronics expenses.

The valves with on-board electronics and the integrated pressure sensors enable a closed-loop control circuit to be formed. They also allow continuous condition diagnostics combined with a compact design.

Further information:



Variable-speed CO3 compact power unit



Reduced to the essentials

Features

The speed-controlled CO3 hydraulic power unit boasts effective pressure control and is fully equipped for continuous operation with its integrated motor cooling, drive controller cooling and oil cooling. The robust gear pump and electrical drive control work together in a symbiosis which perfectly combines the benefits of hydraulics and electronics.

Advantages

- The power unit enables large volume ranges with consistent pressure ratios
- System-related pressure losses, for example those caused by leakage in rotary distributors, are compensated for as needed
- Compact design facilitates integration into the machine tool

Further information:



CX plug-in valves



Modular coaxial valves

Features

Coaxial valves are designed and tested as pipe valves or modular valves. If a customer wishes to use valves in their own blocks or exchange them when servicing is required, they face the following difficulties:

- Either the entire block will need to be removed or
- valves will have to be removed from the module block on site (voiding the manufacturer's warranty)
- The spring preload in the valve must be overcome during assembly and can lead to problems during installation (leakage problems)

With the patented CX-Plug in, valves are also secured in a modular design without a module block. This means that the valves can be removed and exchanged as a complete unit (without the module blocks).

Advantages

- CX valves can be easily removed as a complete unit
- Module block does not need to be dismantled, fits in existing valve nest
- Can be used as a standard part or during servicing
- Minimises the risk of seals being damaged during installation work
- Functional safety of the unit under inspection
- Reduction in maintenance/ service times

Further information:



FluidControl Unit FCU 1000



Flexible fluid monitoring

Features

The FluidControl Unit FCU 1000 is a portable service instrument designed for short-term measurement of solid particle contamination, water saturation (in %) and fluid temperature in hydraulic systems and diesel fuels.

The integrated pump and the hoses included in the FCU 1000 series scope of delivery allow operation in:

- control circuits (oil hydraulics only)
- pressure circuits (oil hydraulics only) and
- unpressurized tanks (oil hydraulics and diesel)

All measurement data are stored with a timestamp and in files (measurement value file) and folders (measurement points) in the FCU 1000's internal data memory. The measured values can be transmitted to a PC via the USB port and analysed using HYDAC's own fluid monitoring software FluMoS.

Advantages

- Suitable for hydraulic oils up to 350 mm²/s (hydraulic oils up to ISO VG 68)
- Suitable for diesel fuels according to DIN EN 590 and ASTM D975
- Cleanliness classes according to ISO and SAE or NAS
- Integrated Bluetooth interface for direct connection to HYDAC's FluMoS mobile app
- USB interface for data transmission

Further information:





HYDAC Headquarters Germany



HYDAC China



HYDAC USA



HYDAC Japan



HYDAC Korea



HYDAC India



HYDAC Czech Republic



HYDAC Poland

**Global Presence.
Local Expertise.**
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**Further
information**



Note

The information in this brochure relates to the operating conditions and applications described. For applications and/or operating conditions not described, please contact the relevant technical department. Subject to technical modifications.