HYDAC INTERNATIONAL

Safe High Pressure Cooling and Lubrication: **Process Booster Unit PBB For Machine Tools.**

E 7.809.0/02.12

Quality not Quantity: Cutting Fluid

The Current Situation

With the increasing use of internally cooled tools in machining processes, the high pressure supply of cutting fluid has gained in importance.

Consequently, complex systems have been developed which incorporate typical components such as screw pumps, security filters, control valves, valves and sensors.

The conventional design of these systems is in the form of a so-called fluid panel whereby the individual components are connected and pre-assembled on a mounting panel.

The ever greater demands on productivity necessitate faster, more compact and low-maintenance machine tools. Extremely short project lead times mean tighter installation and commissioning times.
In this environment, the fluid panel concept is reaching its limit:

Integration in the machine:		
Large space requirement Complex design	– –	Difficult to integrate in compact machines Less degree of freedom when integrating
Machine performance:		
Leaking pipes	– –	Increased cycle time Loss of production time
Installation:		
Complex design Leaking connections	– –	Difficult handling Time wasted by monitoring and extra work
Commissioning:		
Leaking connections	–	Time wasted by monitoring and extra work
Maintenance:		
Complex, confusing design Leaking pipes	– – – – – –	Error analysis made difficult Replacing components is time-consuming High level of training required for maintenance personnel Recurrent monitoring costs Contamination of machine High labour costs

Supply for Machine Tools in Minimum of Space.

The HYDAC Solution

The HYDAC Process Booster Unit is designed to meet the requirements of the new generation of powerful and compact machine tools.

The design consists of a supply block with filtration and an adaptable pump block, and has full functionality for high pressure supply of internally cooled tools.

The block incorporates the actuators and sensors in the minimum of space. In addition the block can be extended according to customer requirement. An adapter plate ensures that all standard high pressure pumps can be adapted to suit the machine tools.

Integration in the machine:		
Compact design	+	Saves space in the machine
Simple design	+	Integration is easy
Modular system with standardized components	+	Greater degree of freedom, e.g. skid-mounting
	+	Simple and flexible adaptation to machine series
Machine performance and operating costs:		
Elimination of piping	+	No loss of production time as a result of leakage
Automatic filter	+	Minimum demands on staff and maintenance
Installation:		
Simple design	+	Easy handling
	+	Simplified logistics
Commissioning:		
Ready-to-install unit	+	Time not wasted by monitoring and extra work
Maintenance:		
Clear design	+	Quick and easy error analysis
Block design of components	+	Replacing components is simple
Elimination of piping	+	Reduced monitoring costs
Automatic back-flushing filter	+	Minimum maintenance costs

Operating Data

Maximum operating pressure
70 bar

Maximum flow rate
80 l/min for cutting fluid

Minimum supply pressure
2.0 bar (depending on the application, higher supply pressures may be necessary)

Maximum contamination load before the security filter
120 mg/l

Maximum operating temperature
80 °C

Ports
- Inlet: G1"
- Outlet, low pressure: up to G 1"
- Outlet, high pressure: up to G 1"
- Tank line / backflush line: up to G ¾"

Security filter
Type: Automatic Backflush Filter AutoFilt® RF4
Filtration rate: 20 µm – 100 µm
Filter area: 548 cm²
Option:
Strainer basket

High pressure pump
HYDAC screw pump integrated in manifold
Pump rating is project-dependent within its defined operating range
Option:
Adapted high pressure pump

Control valve
HYDAC proportional valve CX CBB
Option:
Manually adjustable pressure control valve

High pressure valves
HYDAC CX coaxial valves

Pressure monitoring
- Inlet pressure: EDS 8000
- Pump protection: EDS 8000
- High pressure: EDS 8000

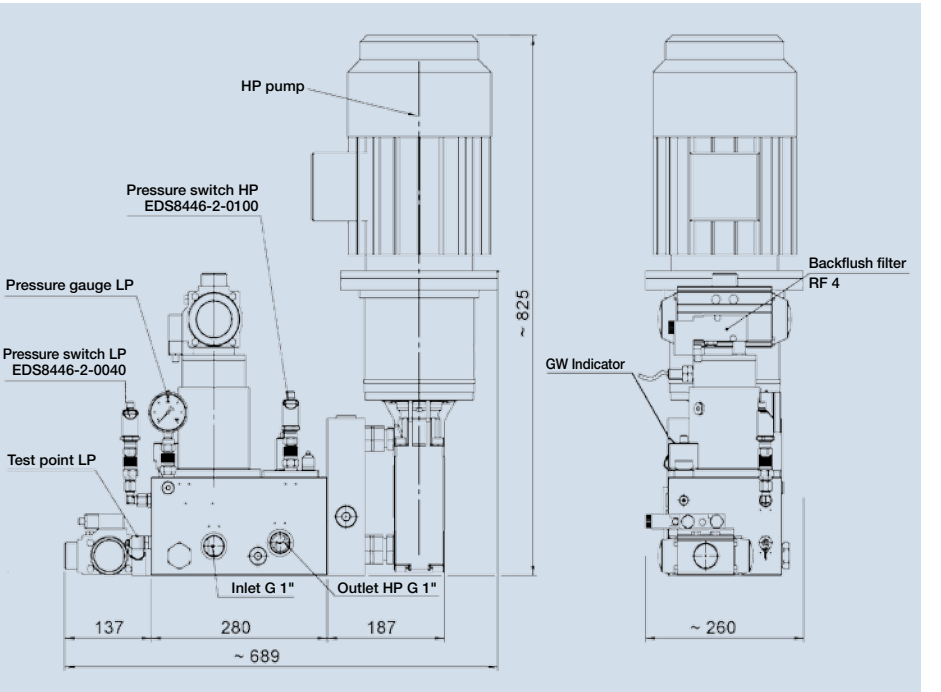
Option:
- HYDAC EDS 3000

Operational weight
(excluding pump unit)
Type-dependent

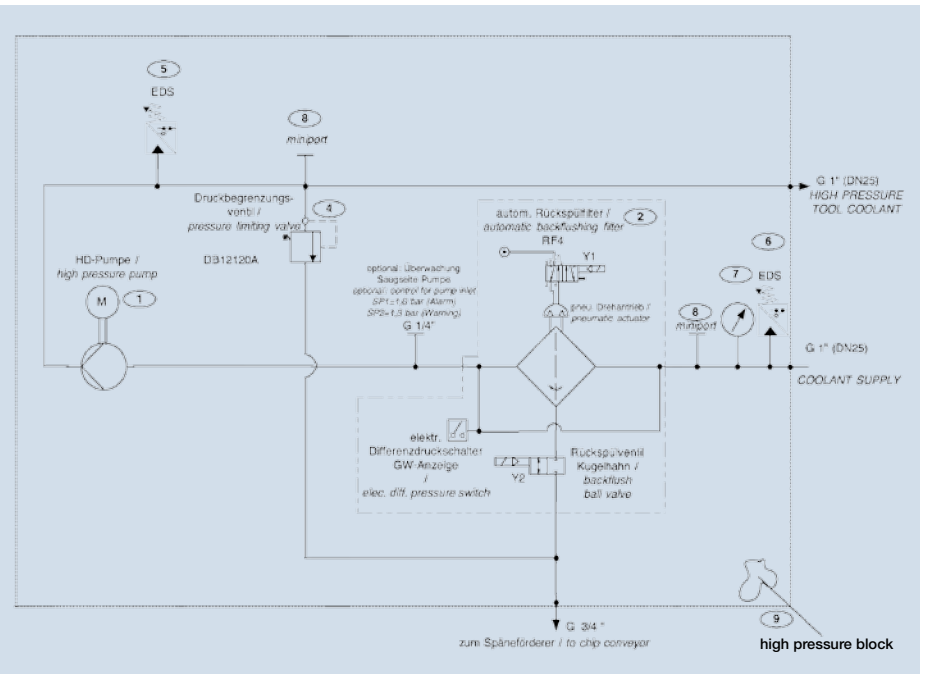
Materials
High pressure block: aluminium, anodized
Pump housing: cast iron

Dimensions (in mm)
Dependent on model

Dimensions of Standard Model

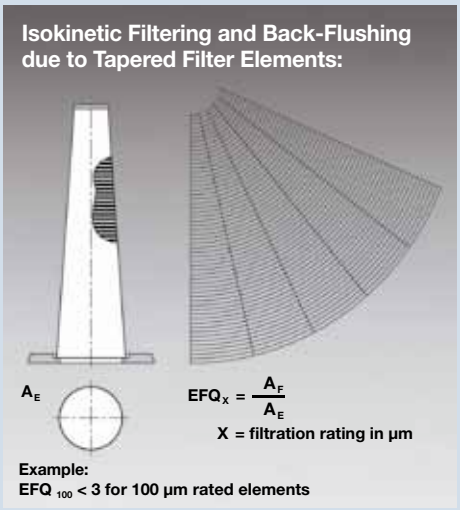


Hydraulic Diagram



Everything You Need:

Protective Filter



Automatic Backflush Filter AutoFilt® RF4
- High reliability
- Minimum maintenance costs
- Excellent filtrate quality

Process Monitoring

Electronic Pressure Switch EDS 8000
- Monitoring of the inlet pressure
- Monitoring of the pump inlet pressure
- Monitoring in the high pressure circuit
- Guarantees process reliability
- Robust sensor cell
- Function monitoring

Electronic Differential Pressure Switch EVA Wind HPT
- Monitoring of the backflush filter

Backflushing

KHM ball valve with pneumatic actuator
- Safety
- Long service life

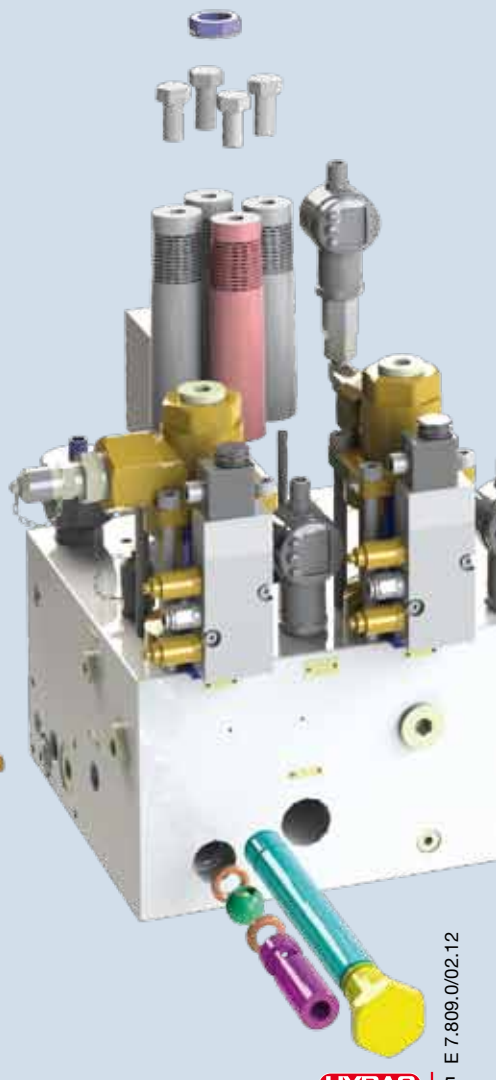
High Pressure Distribution

HYDAC CX valve, 2/2 way
- Pilot-operated

We bring it all together!

A modern high pressure supply is made up of a number of function-specific components.

HYDAC manufactures the majority of these components itself. This know-how is brought together in the Process Booster Unit – a fine-tuned, functional unit.



Process Booster Unit PBB.

Pressure control

HYDAC CX CBB valve

- Quick and accurate pressure control
- Pressure-less-circulation

Pressure boost

Screw pump integrated in manifold
(Compact solution)

Adapted high pressure pump

- Flexible solution
- Adapted to specific customer pump types

Pressure relief

Pressure relief valve DB12

- Short reaction time
- High level of reliability

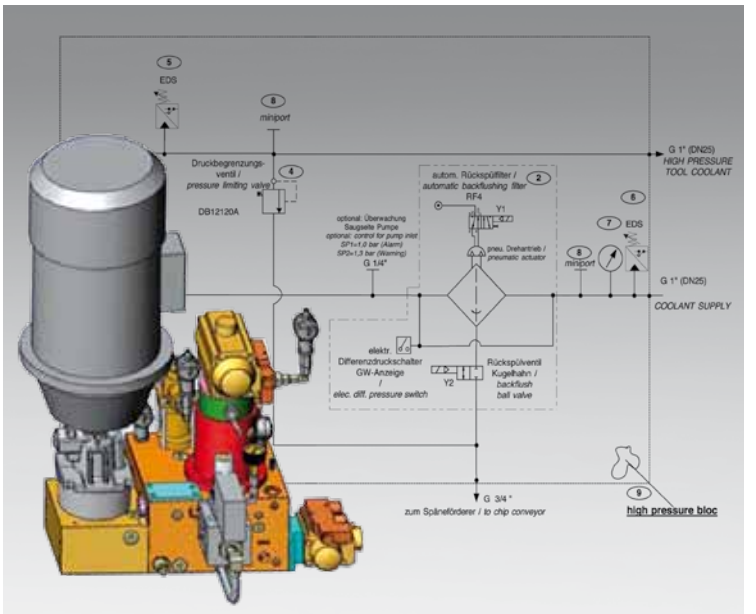
The Demands

Automotive industry

- Increasing pressure for rationalization
- More restricted production area

Machine tool

- Push for faster, more compact machine tools
- hence the necessity for more compact design
- and also for integrated high pressure supply



Design

Design of the Process Booster Unit:

- Will adapt to customer specifications
- Will adapt to specific installation space
- Quick and simple installation
- Easy to maintain

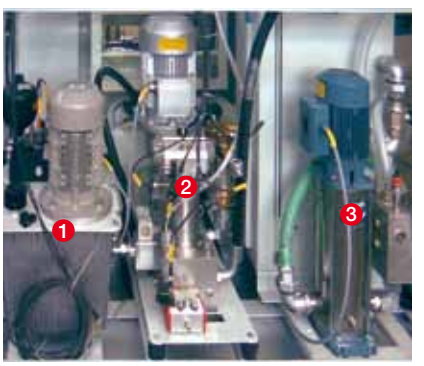
Solution-Focused Approach from HYDAC

Compact Process Booster Unit.
Coordination and adaptation to specific customer needs

- Protective filter: automatic backflush filter
- High pressure pump:
  integrated HYDAC pump (25 l/min / 50 bar)
- Pressure control: HYDAC proportional valve
- High pressure valves:
  2 pieces HYDAC CX 2/2 way coaxial valves
- Sensors: pressure measurement of the inlet pressure,
  of the pump inlet pressure and the spindle supply
- 1 test point in low pressure line
- 1 test point in high pressure line

Manufacture and Shipping of the Process Booster Unit

- High quality
- ISO certified process
- Precision processing
- Pressure and function testing



Installation clearance

Installation in Space-Optimized Machine Tool

- With integrated centralized media supply
- Ready-to-install unit for simple integration
  into the machine CPU

1. Oil supply
2. High pressure supply (Process Booster Unit)
3. Low pressure supply

Accumulators E 30.000

Filter Technology E 70.000

Filters for Ind. Process E 77.000

Filter Systems E 79.000

Compact Hydraulics E 53.000

Accessories E 61.000

Electronics E 180.000

Cooling Systems DEF 5.700

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