## voith.com



# Hydraulic systems for punching machines Product data sheet



## **Advantages**

- + Highly dynamic punch drive
- Very fast impulse response and precise control behavior
- + Process-safe operation
- + High availability
- + Easy mounting and commissioning

#### Design and mode of operation

Voith punching systems HDM and HDE are integrated hydraulic punching systems. They consist of a hydraulic actuator with a directly flanged control block, as well as an applicationoptimized hydraulic power pack with robust internal gear pumps and an electronic control system. This arrangement of all necessary components and the optimized associated control and regulating valves have been specially developed for punching, nibbling and forming applications. The HDE and HDM punching systems offer highly dynamic motion sequences in the area of punching, nibbling and marking and a high control quality for forming tasks The high performance expected for punching and nibbling machines in terms of force, dynamics and control quality is optimally met with the complete HDE or HDM package. Integration and commissioning of the punching and nibbling machines is simple and fast.

Voith punching systems are very energy efficient and require a low installed electrical power. This is due to the loadcontrolled, two-pressure system. The high stroke frequency for nibbling and fast punching is achieved with the HDM system in low pressure and with the HDE system in low pressure and high pressure through accumulator operation. Intelligent, integrated program modules reduce noise and decrease the load on the machine.

The Voith HS4 control system is the electronic link between the punch drive and the machine control system (PLC/CNC). All parameters (stroke position, speed, etc.) are first transmitted via the data interface. After cycle start, all sensors and hydraulic actuators are managed by the HS4. A robust displacement encoder with digital interface is used to monitor the closed control loop.

#### Energy balance graphic

Theoretical energy demand during punch operation



One pressure system energy demand during punch operation



Two pressure system energy demand during punch operation



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## High performance punch system HDM

#### **Product features**

- Highly dynamic punch drive with closed loop control
- New valve technology DECV: Direct Electronic Copy Valve based on proven Voith H + L copy valve
- · Rugged against mechanical stress
- · Simple oil filtration is sufficient
- · Directly operated, no hydraulic control circuit
- Very fast step response
- Very accurate proportional response
- Predefined machine cycles with programmable stroke parameters
- · Process safety by feedback monitoring
- Improved diagnostics by pressure sensors
- Optimized power consumption with load-controlled active "two-pressure-system"

#### Scope of delivery

Punch drive HDM:

- Optimized punch cylinder
- · Manifold with valves and accumulator charging
- Various damping elements

Electronic control HS4-SV2:

- Intelligent drive control and diagnostics
- Data interface: RS-232, CAN Bus, Profibus, Ethernet, USB

#### Power pack:

- · Application optimized dimensioning
- · Integrated cooling and filtering circuit

#### **Options**

- · Additional sizes of max force
- · Cylinder with alternative fastening possibility
- Cylinder with different stroke length (up to 100mm)
- Customized power pack
- HL-BRIDGE for digital I/O based data interfacee

#### Key performance figures

	HDM 20 to	HDM 30 to
Operating pressure ND/HD	70/285 bar	70/285 bar
Max. load force	220 kN	330 kN
Max. return force	25 kN	45 kN
Max. force in low pressure	35 kN	50 kN
Cylinder stroke (standard)	40 mm	40 mm
Motor rated power	7.5 kW	11 kW
Cycle time punch stroke 4 mm	27 ms	32 ms
Cycle time punch stroke 6 mm	38 ms	46 ms
Cycle time punch stroke 8 mm	49 ms	60 ms
Marking frequency	2 800 strokes/min	2 800 strokes/min

Additional data according to dimensioning protocol

#### High performance punch system HDM







**Power Pack** 

#### System integration



#### **Functional diagram**







Basic dimensional drawing power pack HDM 20t/30t





All dimensions in mm

Application example: Punch press





## High performance punch system HDE

#### **Product features**

- Highly dynamic punch drive with closed loop control
- New valve technology DECV: Direct Electronic Copy Valve based on proven Voith H + L copy valve
- · Rugged against mechanical stress
- · Simple oil filtration is sufficient
- · Directly operated, no hydraulic control circuit
- Very fast step response
- Very accurate proportional response
- Predefined machine cycles with programmable stroke parameters
- · Process safety by feedback monitoring
- Improved diagnostics by pressure sensors
- Optimized power consumption with load-controlled active "two-pressure-system"

#### Scope of delivery

Punch Drive HDE:

- Optimized punch cylinder
- Manifold with valves and accumulator charging
- Various damping elements

Electronic Control HS4-SV2:

- Intelligent drive control and diagnostics
- Data interface: RS-232, CAN Bus, Profibus, Ethernet, USB

#### Power pack:

- · Application optimized dimensioning
- · Integrated cooling and filtering circuit

#### **Options**

- · Additional sizes of max force
- · Cylinder with alternative fastening possibility
- · Cylinder with different stroke length (up to 100mm)
- Customized power pack
- · HL-BRIDGE for digital I/O based data interface

#### Key performance figures HDE

	HDE 20 to	HDE 30 to
Operating pressure ND/HD	70/285 bar	70/285 bar
Max. load force	220 kN	330 kN
Max. return force	25 kN	45 kN
Max. force in low pressure	35 kN	50 kN
Cylinder stroke (standard)	40 mm	40 mm
Motor rated power	11 kW	15 kW
Cycle time punch stroke 4 mm	18 ms	19 ms
Cycle time punch stroke 6 mm	25 ms	27 ms
Cycle time punch stroke 8 mm	33 ms	36 ms
Marking frequency	3200 Strokes/min	3200 Strokes/min

Additional data according to dimensioning protocol.

#### High performance punch system HDE



#### **Functional diagram**



### Basic dimensional drawing HDE 20t/30t

	А	В	С	D	н	S	к	L	М	N	
HDE 20 to	240	145	62	80	180	390	162	164.5	135	272	
HDE 30 to	250	165	62	95	200	450	152	174.5	125	282	

All dimensions in mm





View X









All dimensions in mm

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