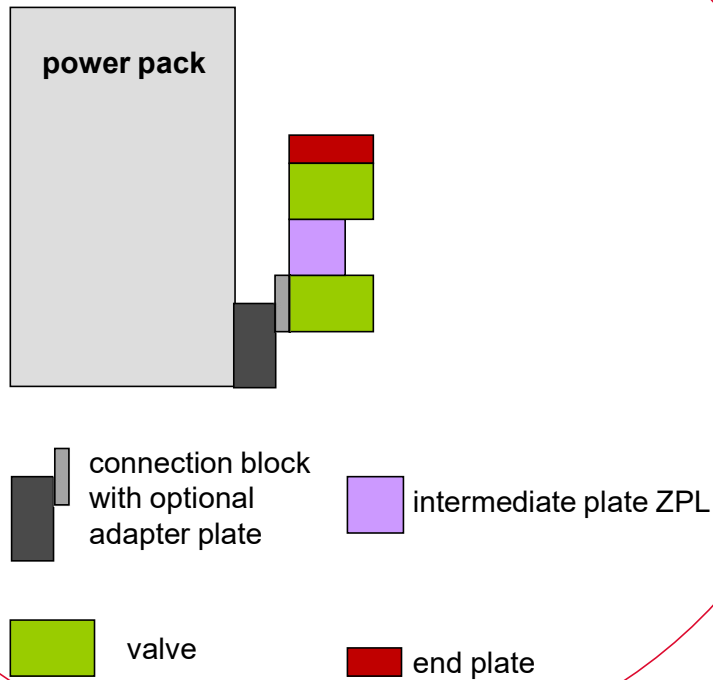


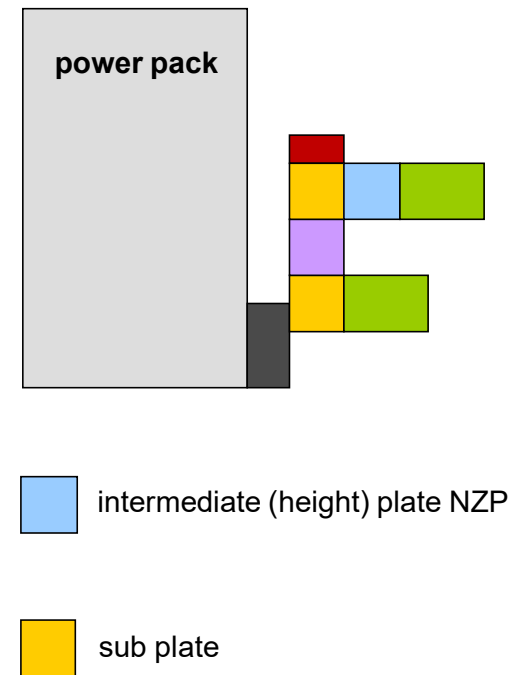
# HAWE Ventilverbände HAWE Valve Banks

# Design of Valve Banks

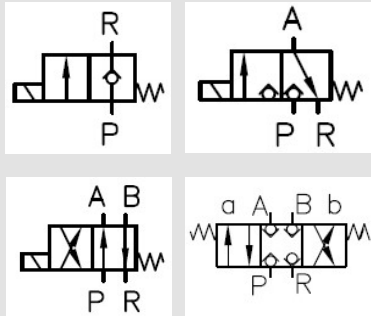
## 1. Without subplate (individual HAWE flange pattern)



## 2. With subplate (for valves with Cetop flange pattern)



## Directional Seated Valve Type G / Valve Bank Type VB

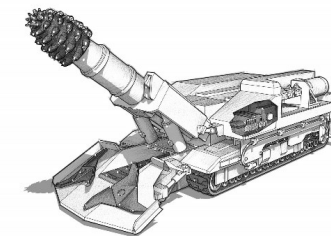
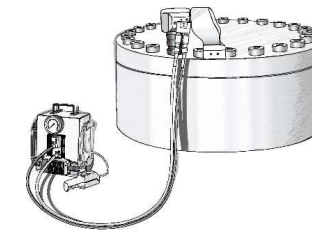


### Technical specifications

Type of device	Directional seated valve
Sizes	0, 1, 2 und 3
Design	Seated ball valve, direct operated
p <sub>max</sub>	700 bar
Q <sub>max</sub>	65 l/min
Actuation	electromagnetic, hydraulic, pneumatic, mechanic or manual actuated
Symbols	2/2-, 3/2-, 3/3-, 4/2-, 4/3-way
Connection	Plate mounting, pipe mounting
Related valve bank	Type VB
Other versions	Type VP1 for grease, Type NG1 with Cetop 3 (NG6) flange pattern, HFA version

### Features and benefits

- High pressure model – 700 bar and more
- Zero-leakage
- Long service life
- Exchangeable solenoid coil
- Version with explosion protection available
- Cetop 3 (NG6) type ≤ 12l/min, 500 bar

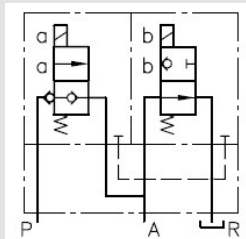
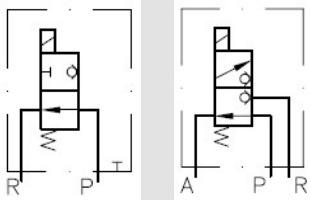


## Directional Seated Valve Type WH and WN / Valve Bank Type BWH and BWN



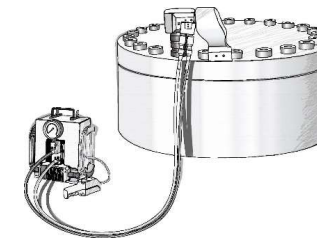
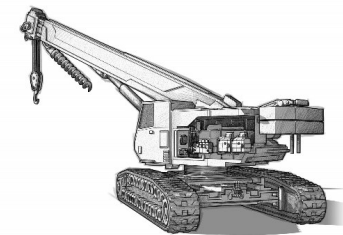
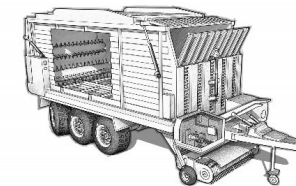
### Technical specifications

Type of device	Directional seated valve
Sizes	1, 2, 3 and 4
Design	Seated ball valve
p <sub>max</sub>	450 bar
Q <sub>max</sub>	60 l/min
Actuation	Electromagnetic
Symbols	2/2-, 3/2-, 3/3-, 4/2-, 4/3-way
Connection	Plate mounting, Pipe mounting
Related valve banks	Type BWH Type BWN
Other versions	Type WN - direct actuation Type WN – also as 4/2-way spool valve



### Features and benefits

- Very compact design, functional parts are integrated in solenoid keeper space
- Excellent price/performance ratio
- Solenoid version with 8-watt technology

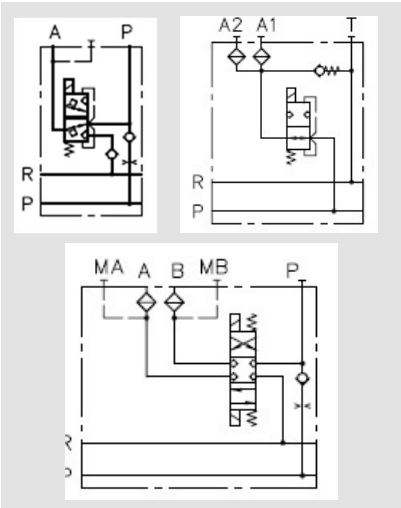


## Directional Seated Valve Bank Type BVH



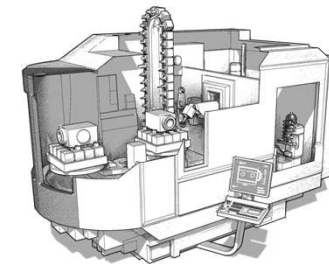
### Technical specifications

Type of device	Directional seated valve bank Banjo bolt design
Sizes	1
Design	Cone seated valve
p <sub>max</sub>	400 bar
Q <sub>max</sub>	20 l/min
Actuation	Electromagnetic
Symbols	2/2-, 3/2-, 4/2- and 4/3-way
Connection	Direct connection to compact hydraulic power packs or connection block for pipe mounting



### Features and benefits

- Valve bank design without subplates
- Valve modules easy to add
- Direct integration of leakage free pressure control valves
- Connection for pressure switches



## Directional Spool Valve Bank Type CWS

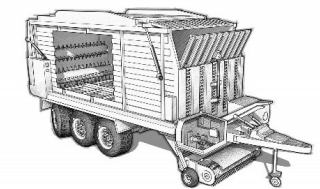
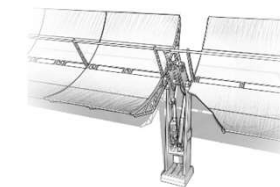
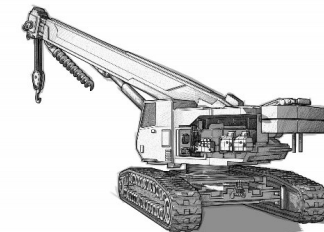
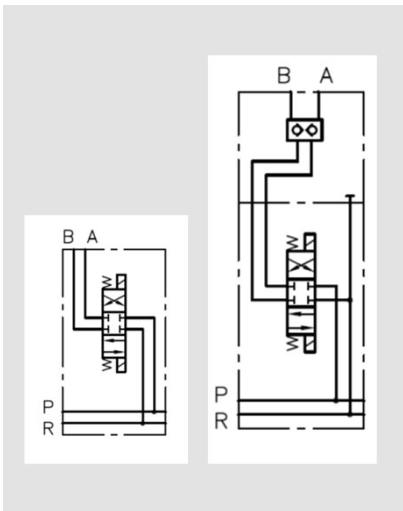


### Technical specifications

Type of device	Directional spool valve bank
Sizes	1
Design	Spool valve
pmax	315 bar
Qmax	80 l/min
Actuation	Electromagnetic, manual
Symbols	4/2- and 4/3-way
Connection	Direct connection to compact hydraulic power packs or connection block for pipe mounting

### Features and benefits

- Valve bank design without subplates
- Valve modules easy to add (stack valve design)
- Manual operation available
- Ancillary blocks with additional components available

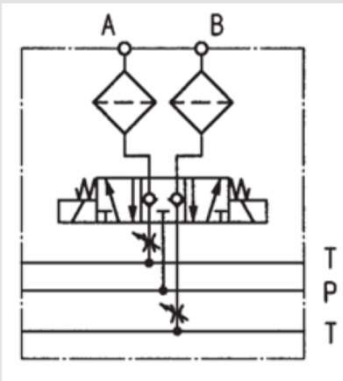


## Directional Spool Valve Bank with Integrated Pilot Operated Check Valves Type TLC3



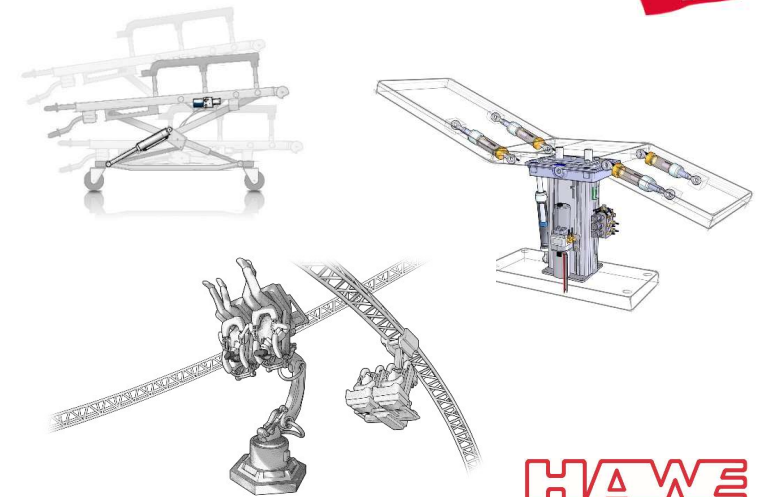
### Technical specifications

Type of device	Directional spool valve bank
Sizes	1
Design	Spool valve with integrated pilot operated check valves
pmax	250 bar
Qmax	3 lpm
Actuation	Electromagnetic with AMP connectors
Symbols	4/3-way
Connection	Direct connection to compact hydraulic power packs A or connection block for pipe mounting



### Features and benefits

- Valve bank design without subplates
- Valve modules easy to add (stack valve design)
- Due to the integrated T-throttles a speed pre-setting of the actuators is possible



## Poppet Valve SP1 in Manifold System SL1

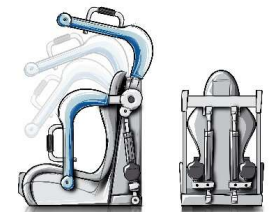
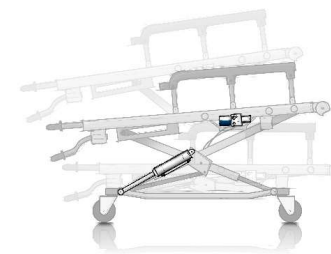
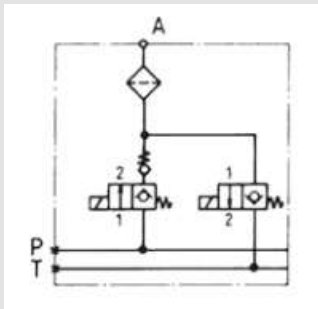


### Technical specifications

Type of device	Poppet valve in manifold system
Sizes	1
Design	Poppet valve directly-operated with elastic seal (KS)
pmax	200 bar
Qmax	1 l/min
Actuation	Electromagnetic
Symbols	2/2-way
Connection	AMP Superseal Serie 1,5
Related valve bank	SL1
Cavity	M10x1
Nominal voltage	12 V / 24 V
Installation position	As required

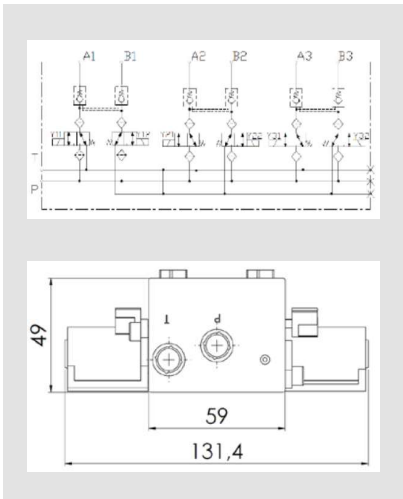
### Features and benefits

- Extremely pressure-tight
- Low power consumption (10 W)
- Smallest dimensions
- Power consumption of 10W of a solenoid





## Valve System Type SLC1 in Mono Block design

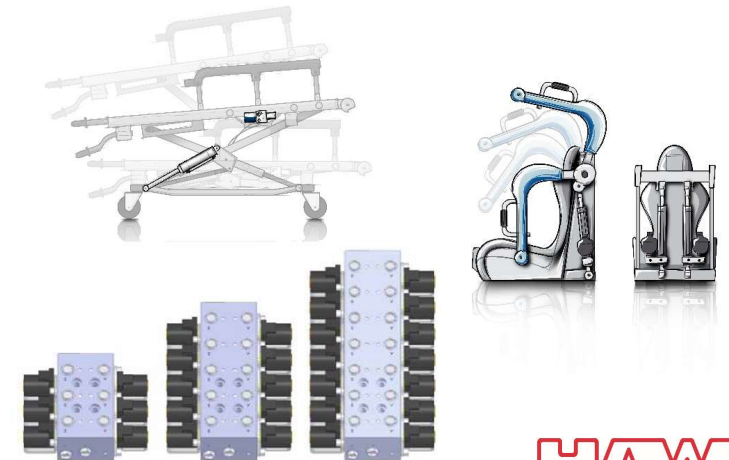


### Technical specifications

Type of device	Valve system
Sizes	1 (3, 5 or 7 sections)
Design	Spool valve with pilot-operated check valves
pmax	150 bar
Qmax	1 l/min
Actuation	Electromagnetic
Connection	MQS from AMP
Cavity	M8x1
Nominal voltage	12 V
Installation position	As required

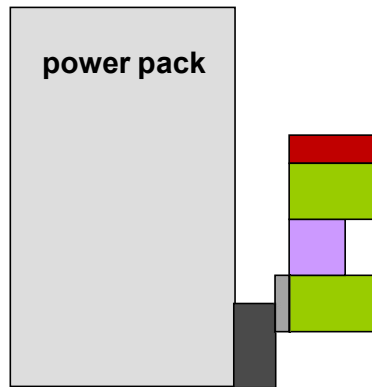
### Features and benefits

- Hydraulic actuators can be positioned for long time cycles
- Standard in hydraulic drive systems used for patient positioning
- To adjust the speed flow control valves are mounted on the cylinders
- Integrated locking function



# Design of Valve Banks

## 1. Without subplate (individual HAWE flange pattern)



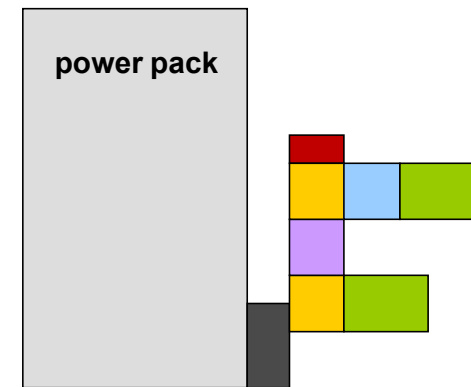
connection block with optional adapter plate

intermediate plate ZPL

valve

end plate

## 2. With subplate (for valves with Cetop flange pattern)



intermediate (height) plate NZP

sub plate

## Directional Spool Valve Type HAM and HAL Cetop2 (NG 4)

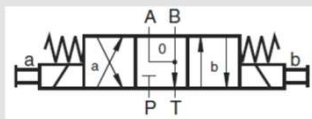
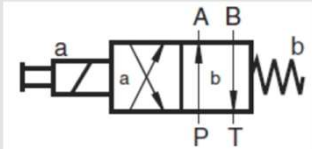
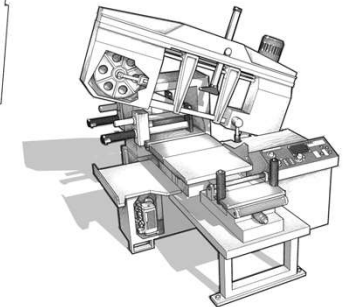
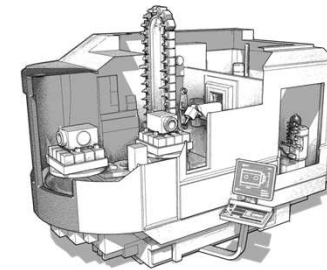


### Technical specifications

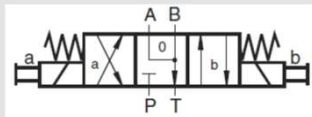
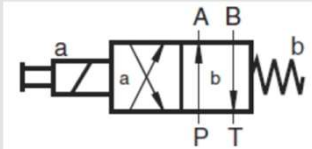
Type of device	Directional spool valve
Sizes	1
Design	Directional spool valve, flangeable
p <sub>max</sub>	320 bar
Q <sub>max</sub>	30 l/min
Actuation	Electromagnetic (HAM) and manual (HAL)
Symbols	4/2-way, 4/3-way
Connection	NG4 (Cetop2)

### Features and benefits

- NG4 (Cetop2) flange pattern
- Fits with subplates VK35 on power pack type H



## Directional Spool Valve Type NSWP Cetop3 (NG 6)

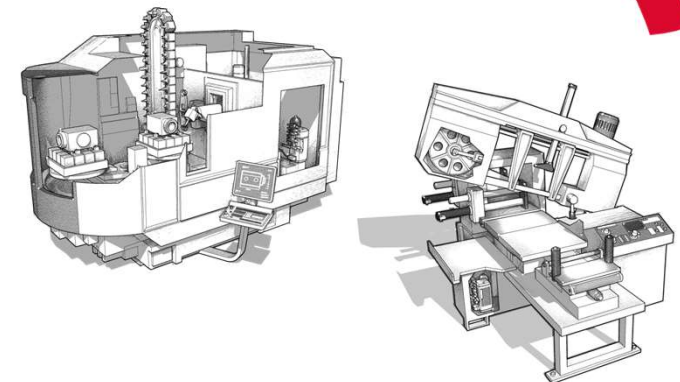


### Technical specifications

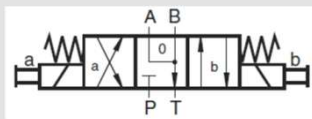
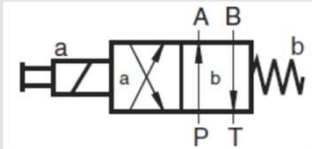
Type of device	Directional spool valve
Size	2
Design	Spool valve
p <sub>max</sub>	315 bar
Q <sub>max</sub>	25 l/min
Actuation	Electromagnetic
Symbols	4/2-, 4/3-way
Connection	Plate mounting Cetop3 (NG6)
Related valve banks	Type BA2 Type BNG2 Type VK35

### Features and benefits

- Many additional functions (consumer-side and pump-side) without any additional subplate available
- Combinable with all Cetop3 valves
- 2-step and proportional versions available



## Directional Spool Valve Type SWPN21 Cetop3 (NG 6)

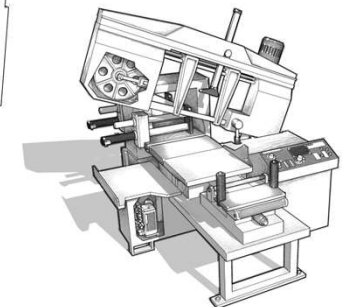
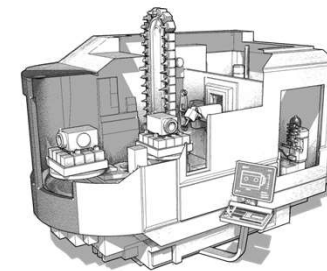


### Technical specifications

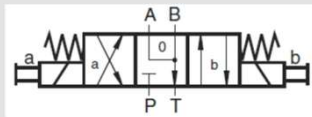
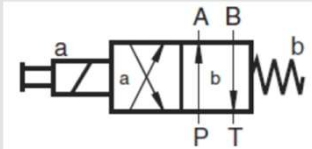
Type of device	Directional spool valve
Size	2
Design	Spool valve
p <sub>max</sub>	350 bar
Q <sub>max</sub>	80 l/min
Actuation	Electromagnetic
Symbols	4/2-, 4/3-way
Connection	Plate mounting Cetop3 (NG6)
Related valve banks	Type BA2 Type BNG2 Type VK35

### Features and benefits

- Combinable with all Cetop3 valves
- High flexibility by means of a great variety of circuit symbols



## Directional Spool Valve Type CWPN Cetop3 (NG 6)

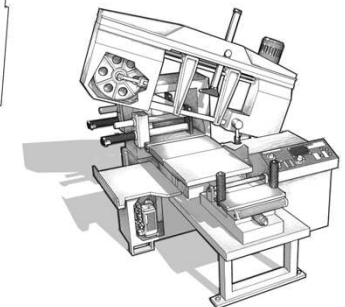
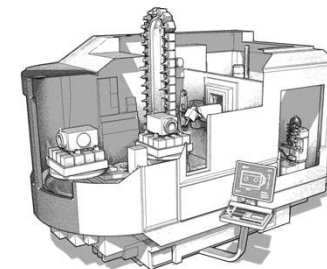


### Technical specifications

Type of device	Directional spool valve
Size	2
Design	Spool valve
p <sub>max</sub>	315 bar
Q <sub>max</sub>	60 l/min
Actuation	Electromagnetic and manual
Symbols	4/2-, 4/3-way
Connection	Plate mounting Cetop3 (NG6)
Related valve banks	Type BA2 Type BNG2 Type VK35

### Features and benefits

- Additional functions (pump-side) without any additional subplate available
- Combinable with all Cetop3 valves and valve banks
- Combination of electromagnetic and manual actuation possible

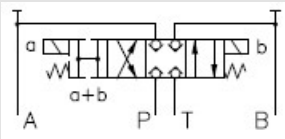
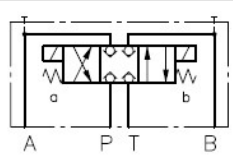
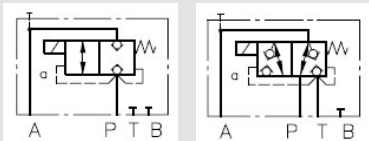


## Directional Seated Valve Type NBVP Cetop 3 (NG 6)



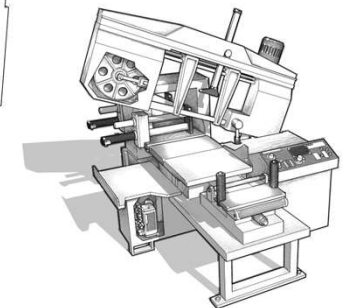
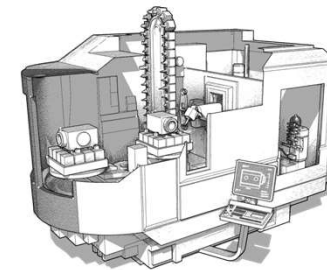
### Technical specifications

Type of device	Directional seated valve
Sizes	16 and 15
Design	Seated cone valve
p <sub>max</sub>	400 bar (16), 500 bar (15)
Q <sub>max</sub>	20 l/min
Actuation	Electromagnetic, hydraulic, pneumatic, mechanic or manual actuated
Symbols	2/2-, 3/2-, 4/2-, 4/3-, 4/4-way
Connection	Plate mounting Cetop 3 (NG6) - Pipe mounting
Related valve banks	Type BA2 Type BNG2
Other versions	Single valve Type BVG Single valve Type BVP



### Features and benefits

- Many additional functions available
- Flow possible in both directions
- Combinable with all Cetop 3 valves
- 8W solenoids available
- Ex-proof version available
- 4. working position: 4/4-way seated valve
- Solutions with position monitoring

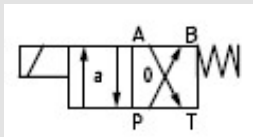
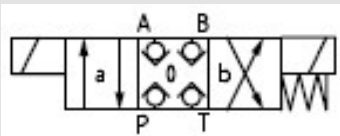


## Directional seated valve type ROLV



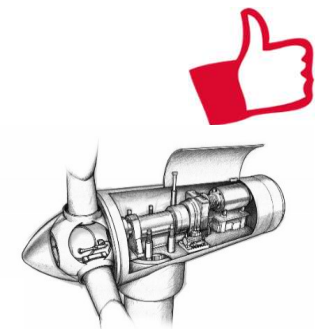
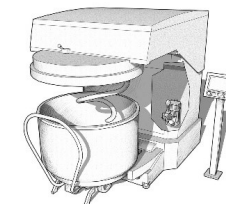
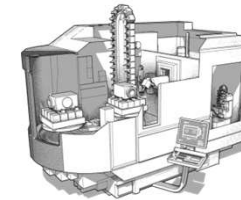
### Technical specifications

Type of device	Directional seated valve
Size	14
Design	Cone-seated valve
p <sub>max</sub>	400 bar
Q <sub>max</sub>	25 l/min
Actuation	Electromagnetic
Symbols	3/2-, 4/2-, 4/3-way
Connection	Plate mounting Cetop 3 (NG6) Connection blocks for pipe mounting
Related valve banks	Type BA2 Type BNG2
Position	Any



### Features and benefits

- Dirt-resistant design with high switching reliability
- Replaceable solenoid coil for more flexibility and easy service
- Improved key data compared to existing series





## Directional spool valve type SWPN81 Cetop5 (NG 10)

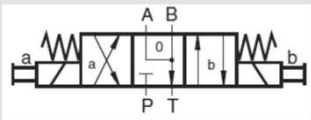
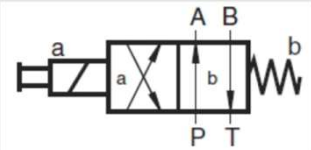
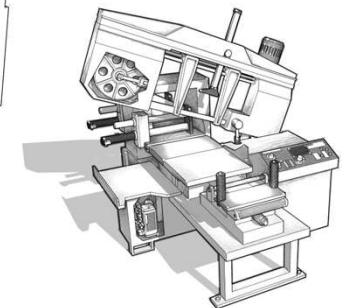
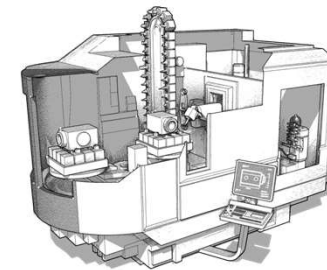


### Technical specifications

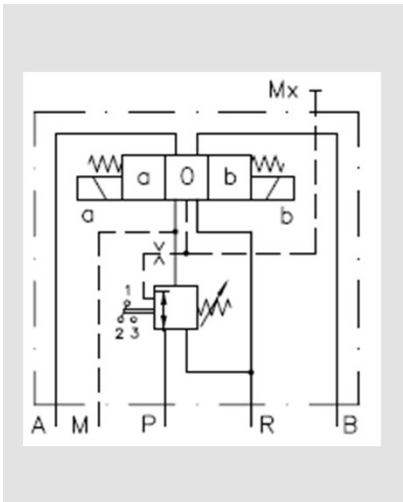
Type of device	Directional spool valve
Size	8
Design	Spool valve
p <sub>max</sub>	350 bar
Q <sub>max</sub>	150 l/min
Actuation	Electromagnetic
Symbols	4/2-, 4/3-way
Connection	Plate mounting Cetop5 (NG10)
Related valve banks	Type BNG8

### Features and benefits

- Combinable with all Cetop5 valves
- High flexibility by means of a great variety of circuit symbols



## Clamping module type NSMD Cetop 3 (NG 6)

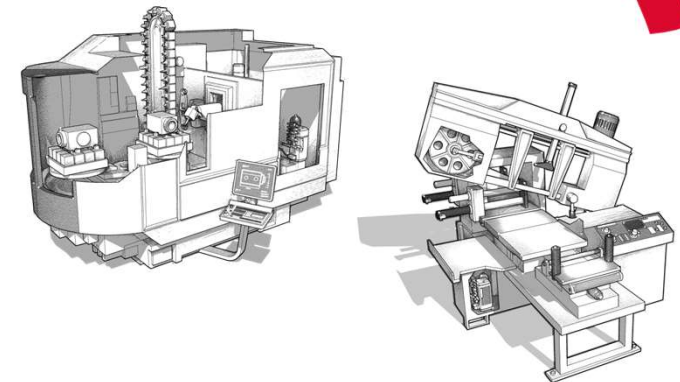


### Technical specifications

Type of device	Directional spool valve with integrated pressure reducing valve and pressure switch
Size	2
Design	Spool valve
pmax	120 bar
Qmax	25 l/min
Actuation	Electromagnetic
Symbols	4/2-, 4/3-way
Connection	Plate mounting Cetop3 (NG6)
Related valve banks	Type BA2 Type BNG2 Typ VK35













### Features and benefits

- Combinable with all Cetop3 valves
- High flexibility by means of a great variety of circuit symbols



## Overview Valve Banks

Valve bank	pmax	Qmax	Seated/spool type	Actuation	NG/Cetop
VB (G valve)	700	65	Seated	Several	HAWE style
BWN/BWH	450	60	Seated	Electromagnetic	HAWE style
BVH	400	20	Seated	Electromagnetic	HAWE style
CWS	315	80	Spool with optional POVs	Electromagnetic, manual	HAWE style
TLC3	250	3	Spool with POVs	Electromagnetic	HAWE style
SL1	200	1	Seated	Electromagnetic	HAWE style
HAM, HAL	320	30	Spool	Electromagnetic, manual	NG4/Cetop2
NSWP2	315	25	Spool	Electromagnetic	NG6/Cetop3
SWPN21, CWPN	350	80	Spool	Electromagnetic	NG6/Cetop3
NBVP16	400	20	Seated	Several	NG6/Cetop3
SWPN81	350	150	Spool	Electromagnetic	NG10/Cetop5
NSMD	120	25	Spool	Electromagnetic	NG6/Cetop3

Product type	Image	P <sub>max</sub> in bar	Q <sub>max</sub> in lpm	Symbol					Connection type				De-sign	Actuation mode			Actuation					EX*	Appli-cable in Valve bank		
				2/2-way	3/2-way	3/3-way	4/2-way	4/3-way	Pipe installation	Manifold mounting	Car-tridge	Serial (Valve bank)		Direct actua-tion	Pilot-con-trolled	Pro-portion-al	Ma-nual	Sole-noid	Pneu-matic	Hy-drau-lic	Me-cha-nical				
SP		250	8	■	■				■		■		▽	■				■							
BVG, BVP		400	20	■	■				■	■			▽	■				■	■	■	■	■			
BVH		400	20	■	■		■	■				■	▽	■				■	■						BVH
G, WG		700	20	■	■	■	■	■	■	■			○	■				■	■	■	■	■	■	■	VB
NBVP		400	20	■	■	■	■	■			■		▽	■				■	■	■	■	■	■	■	BA, BNG, BVH
ROLV		400	25		■		■	■	■	■			▽	■				■	■						BA, BNG, BVH
VH, VHP		700	25					■	■	■		■	○	■				■							VHR
WN, WH		450	60	■	■	■	■	■	■	■			○	■					■						BWN, BWH
SVN, SVS, IVN		350	100	■					■		■		▽		■			■	■						
EM, EMP		450	160	■					■	■	■		▽	■	■	■		■							BEM
BVE		500	300	■	■				■	■	■		▽	■				■	■				■		
MSV, RSV		350	320	■	■				■	■			○	■	■				■						BA, BNG

▽ Cone-seated valve  
○ Ball-seated

\*EX: ATEX, IECEx, NEC, CEC

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