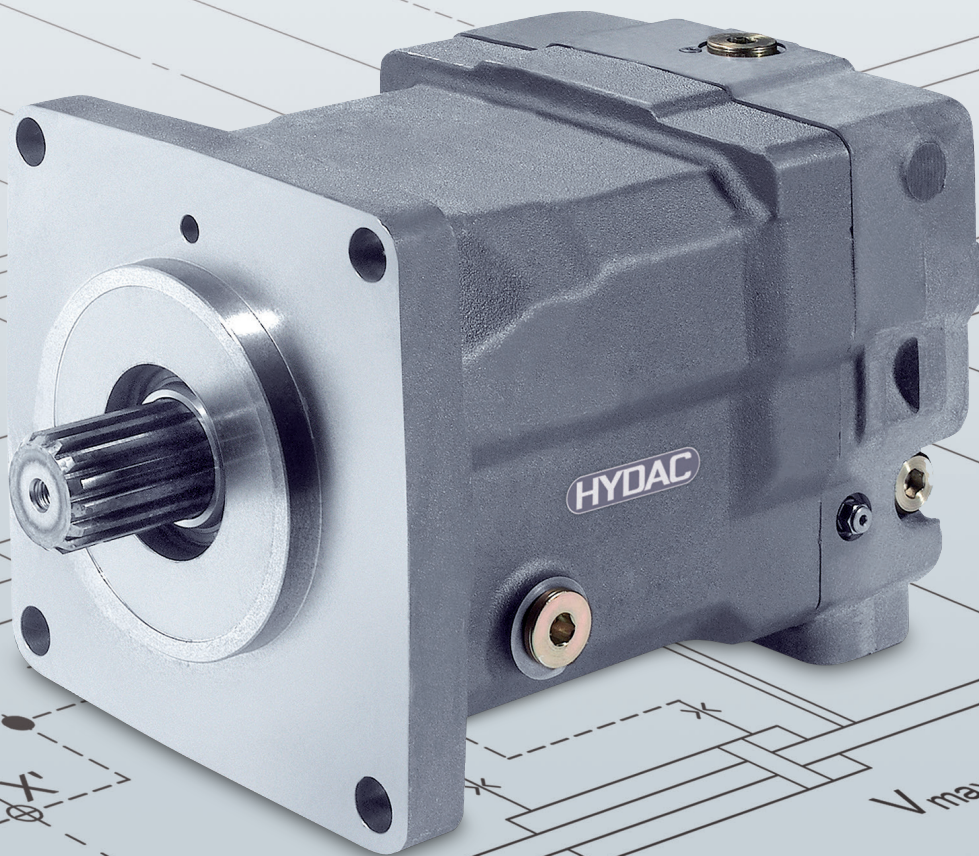
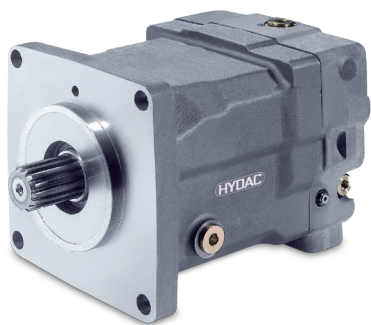


## HYDAC Hydraulic Motors MPF/A/V/R200







## HYDRAULIC MOTORS

### MPF200 / MPA200 / MPV200 / MPR200

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# ORDERING CODE

## 1.1 MPF200 – Fixed displacement motor

MPF200 - 055 N - 000 N10 N0 U07 - M ...

>>

### Type

MPF200

Sizes							
028	035	055	063	075	085	105	135
●							
	●						
		●					
			●				
				●			
					●		
						●	
							●

### Size

028	28 cm <sup>3</sup> /rev.
035	35 cm <sup>3</sup> /rev.
055	55 cm <sup>3</sup> /rev.
063	63 cm <sup>3</sup> /rev.
075	75 cm <sup>3</sup> /rev.
085	85 cm <sup>3</sup> /rev.
105	105 cm <sup>3</sup> /rev.
135	135 cm <sup>3</sup> /rev.

### Direction of rotation

N	clockwise rotation/ anti-clockwise rotation
---	--

●	●	●	●	●	●	●	●
---	---	---	---	---	---	---	---

### High-pressure valves

	on request
B00	Sealing plug
000	without High-pressure valve

○	○	○	○	○	○	○	○
●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●

### Purge relief valve

N10	10 bar standard flow
N14	14 bar standard flow
R10	10 bar reduced flow
R14	14 bar reduced flow
H10	10 bar increased flow
Q06	Flow controlled 6 l/min
B00	Sealing plug (*7B)
000	without purge relief valve

●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●

### Purge shuttle valves

N0	Standard
D0	Damped
B0	Blocked (*6B)
00	without purge shuttle valve

●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●

### Speed sensor in housing

U07	7 pulses per rotation
U09	9 pulses per rotation
000	Without speed sensor

●	●						
			●		●		
●	●	●	●	●	●	●	●

### Porting

M	Metric ISO 6149-1
D	DIN 3852-1 (ISO 9974-1)

●	●	●	●	●		●	●
●	●	●	●	●	●	●	●

Sizes							
028	035	055	063	075	085	105	135

●	●	●	●	●	●	●	●
		●		●		●	
		●					

**Mounting flange**

- S0 SAE J744 Standard (SAE 2-hole flange)
- S4 SAE J744 (SAE 4-hole flange)
- P0 Installation flange

●	●						
		●	●	●	●	●	
							●
		●	●	●	●	●	
						●	
						●	
		○	○	●	●	●	○

**Output shaft**

- S25 Splined shaft ANSI B92.1 16/32 – 15 teeth (SAE J744 B-B)
- S32 Splined shaft ANSI B92.1 12/24 – 14 teeth (SAE J744 C)
- S44 Splined shaft ANSI B92.1 8/16 – 13 teeth (SAE J744 D&E)
- T21 Splined shaft ANSI B92.1 16/32 – 21 teeth
- T23 Splined shaft ANSI B92.1 16/32 – 23 teeth
- T27 Splined shaft ANSI B92.1 16/32 – 27 teeth
- F40 Coupling flange size 4 (\*SF0) / (\*11F)

●	●	●	●	●	●	●	●
		●	●	●	●	●	●

**Ports and through drive**

- R00 Radial ports / no through drive
- L00 Axial ports / no through drive

●	●	●	●	●	●	●	●
---	---	---	---	---	---	---	---

**Attachment parts**

- 000 Without attachment parts

●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●

**Surface protection / paint**

- R00 Rust protection oil (standard)
- P01 primed, RAL 3009 (red)
- P03 primed, blue
- P06 primed, grey (RAL 7043)
- V03 Primed + painted, RAL 9005 (black)
- V07 Primed + painted, RAL 7015 (grey)

●	●	●	●	●	●	●	●
▲	▲	▲	▲	▲	▲	▲	▲

**Special requirements**

- N no special requirements (standard)
- C Special requirements

(\*6B) with blind plug instead of pressure relief valve  
 (\*7B) only with blocked shuttle valve  
 (\*11F) sizes/shafts: 55/T21, 63/T21, 75/T21, 85/T23; 105/T23, 135/T27  
 (\*SF0) acc. to SAE J1946 Type A (120/75/101.5/8xM10)

- available option
- preferred option
- option on request
- ▲ separate specification required

# ORDERING CODE

## 1.2 MPA200 – manually adjustable fixed displacement motor

MPA200 - 165 N - N10 N0 - M S0 S44 - R00 - 000 - ... >>

### Type

MPA200

### Sizes

165	210	280
●		
	●	
		●

### Size

165 165 cm³/rev.  
 210 210 cm³/rev.  
 280 280 cm³/rev.

### Direction of rotation

●	●	●
---	---	---

N clockwise rotation/  
 anti-clockwise rotation

### Purge relief valve

●	●	●
●	●	●
●	●	●
●	●	●
●	●	●
●	●	●

N10 10 bar standard flow  
 N14 14 bar standard flow  
 R10 10 bar reduced flow  
 R14 14 bar reduced flow  
 H10 10 bar increased flow  
 Q06 Flow controlled 6 l/min

### Purge shuttle valve

●	●	●
●	●	●

N0 Standard  
 D0 Damped

### Porting

●	●	●
---	---	---

M Metric ISO 6149-1

### Mounting flange

●	●	●
---	---	---

S0 SAE J744 Standard

### Output shaft

●		
	●	●
●	●	
		●
●	●	●

S44 Splined shaft ANSI B92.1 8/16 – 13 teeth (SAE J744 D&E)  
 S50 Splined shaft ANSI B92.1 8/16 – 15 teeth (SAE J744 F)  
 T27 Splined shaft ANSI B92.1 16/32 – 27 teeth  
 T33 Splined shaft ANSI B92.1 16/32 – 33 teeth / size 280: (\*10M)  
 F40 Coupling flange size 4 (\*SF0) / (\*09F)

### Ports and through drive

●	●	●
		●
	●	●
	●	●
	●	●
		●
	●	●
	●	●
○	●	●

R00 Radial ports / no through drive  
 S27 Radial ports / through drive shaft ANSI B92.1 16/32 - 27T  
 F40 Radial ports/coupling flange size 4 (\*SF0)  
 A00 SAE J744 A / without shaft coupling  
 E00 SAE J744 E without shaft coupling  
 E27 SAE J744 E / ANSI B92.1 16/32 – 27 teeth (\*10T)  
 E33 SAE J744 E / ANSI B92.1 16/32 – 33 teeth (\*10T)  
 U35 Radial ports/speed sensor mounted on through drive  
 (35 pulses per rotation)

### High pressure relief valve block

○	○	○
○	○	○
●	●	●
●	●	●
○	○	○
●	●	●
●	●	●
●	●	●

P15 Pressure relief valve with recharge function 150 bar (\*10R)  
 P20 Pressure relief valve with recharge function 200 bar (\*10R)  
 P25 Pressure relief valve with recharge function 250 bar (\*10R)  
 P30 Pressure relief valve with recharge function 300 bar (\*10R)  
 P35 Pressure relief valve with recharge function 350 bar (\*10R)  
 P38 Pressure relief valve with recharge function 380 bar (\*10R)  
 P42 Pressure relief valve with recharge function 420 bar (\*10R)  
 000 without high pressure relief valve block

Sizes

165	210	280
-----	-----	-----

**Surface protection / paint**

● ● ●	R00	Rust protection oil (standard)
● ● ●	P01	primed, RAL 3009 (red)
● ● ●	P03	primed, blue
● ● ●	P06	Primed, grey / (RAL 7043)
● ● ●	V03	Primed + painted, RAL 9005 (black)
● ● ●	V07	Primed + painted, RAL 7015 (grey)

**Displacement setting**

●	V	135–165 cm <sup>3</sup> /rev. (numerical 3-digit)
●	V	165–210 cm <sup>3</sup> /rev. (numerical 3-digit)
●	V	210–280 cm <sup>3</sup> /rev. (numerical 3-digit)

**Special requirements**

● ● ●	N	no special requirements (standard)
▲ ▲ ▲	C	Special requirements

- (\*09F) sizes/shafts: 280/T33; 210/S50; 165/T27
- (\*10R) only radial ports
- (\*10M) recommended for the primary stage of a tandem motor
- (\*10T) suitable for tandem configurations, specification of tandem motor in plain text
- (\*SF0) acc. to SAE J1946 Type A (120/75/101.5/8xM10)

- available option
- preferred option
- option on request
- ▲ separate specification required

# ORDERING CODE

## 1.3 MPV200 – variable displacement motor

MPV200 - 055 N - H100 HF5 00 ...

>>

### Type

MPV200

Sizes						
055	075	105	135	165	210	280
●						
	●					
		●				
			●			
				●		
					●	
						●

### Size

055	55 cm <sup>3</sup> /rev. ( 28– 55 cm <sup>3</sup> /rev. max. adjusting range)
075	75 cm <sup>3</sup> /rev. ( 55– 75 cm <sup>3</sup> /rev. max. adjusting range)
105	105 cm <sup>3</sup> /rev. ( 75–105 cm <sup>3</sup> /rev. max. adjusting range)
135	135 cm <sup>3</sup> /rev. (105–135 cm <sup>3</sup> /rev. max. adjusting range)
165	165 cm <sup>3</sup> /rev. (135–165 cm <sup>3</sup> /rev. max. adjusting range)
210	210 cm <sup>3</sup> /rev. (165–210 cm <sup>3</sup> /rev. max. adjusting range)
280	280 cm <sup>3</sup> /rev. (210–280 cm <sup>3</sup> /rev. max. adjusting range)

### Direction of rotation

N clockwise rotation/  
anti-clockwise rotation

●	●	●	●	●	●	●
---	---	---	---	---	---	---

### Control options

H100	H1 hydraulically proportional / standard / $V_{max} \rightarrow V_{min}$ ( $V_{min} = 0.3 * V_{max}$ )
H200	H2 hydraulically switching / $V_{max} \rightarrow V_{min}$ ( $V_{min} = 0$ (*7S))
H400	H4 H-prop / min. ( $V_{min} = 0$ / $V_{max} \rightarrow V_{min}$ (~0))
E100	E1 electrically proportional / standard / $V_{max} \rightarrow V_{min}$ ( $V_{min} = 0.3 * V_{max}$ ) (*7S)
E200	E2 electrically switching / $V_{max} \rightarrow V_{min}$ ( $V_{min} = 0$ (*7S))
E400	E4 min. ( $V_{min} = 0$ (*7S))
E600	E6 electrically proportional / $V_{min} \rightarrow V_{max}$ ; $V_{min} = 0$ (*7R)
E1F0	E1F electrically proportional / side-mounted / $V_{max} \rightarrow V_{min}$ (*7R)
E2F0	E2F electrically switching / min. ( $V_{min} = 0$ / side-mounted (*7R)
E4F0	E4F electrically proportional / min. ( $V_{min} = 0$ / side-mounted / $V_{max} \rightarrow V_{min}$ (~0) (*7R)
E6F0	E6F electrically proportional inverse / min. ( $V_{min} = 0$ / side-mounted (*7R)
H1P0	EH1P hydr. prop. / with max. closed loop pressure control / with electrical master control (*5MR) / (*7S)
H1PC	EH1P-CA hydr. prop. / speed-dependent / with max. closed loop pressure control / with electrical master control (*5C)

●	●	●	●	●	●	●	●	●	●
	●	●							○
●	●	●	●	●	●	●	●	●	○
●	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●
	●	●	●	●	●	●	●	●	●
○	○	○	○						
	●	●	●						
	●	○	●						
	●	●	●	●	○	○			
	●	●	●	●	●	○			

### Control pressure range

HA0	4.0 bar (H4)
HF0	7.0 bar (H1; EH1P)
HF5	7.5 bar (H1; EH1P; H1-CA; EH1P-CA)
HH0	8.0 bar (H1; EH1P)
HH5	8.5 bar (H1; EH1P)
HK0	9.0 bar (H1; EH1P)
HK5	9.5 bar (H1; H4; EH1P)
000	Not applicable (E1(F); E4(F); E6(F))

●	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●

### Control solenoids

A1	AMP / 12 V
A2	AMP / 24 V
H1	DIN / 12 V
H2	DIN / 24 V
D1	Deutsch / 12 V
D2	Deutsch / 24 V
00	Not applicable (H1; H1-CA; H2; H4)

●	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●





Sizes						
055	075	105	135	165	210	280

●	●	●	●	●	●	●
		●	●	●		
		○				
			○			
				○		
					●	
						●
			●	●	●	●
					●	●
					●	●
					●	●
●	●	●	●	●	●	●

**Ports and through drive**

- R00 Radial ports / no through drive
- L00 Axial ports / no through drive
- S19 Radial ports / through drive shaft ANSI B92.1 16/32 – 19 teeth
- S21 Radial ports / through drive shaft ANSI B92.1 16/32 – 21 teeth
- S22 Radial ports / through drive shaft ANSI B92.1 16/32 – 22 teeth
- S24 Radial ports / through drive shaft ANSI B92.1 16/32 – 24 teeth
- S27 Radial ports / through drive shaft ANSI B92.1 16/32 – 27 teeth
- F40 Radial ports / coupling flange size 4 (\*SF0)
- A00 SAE J744 A / tandem flange
- E00 SAE J744 E no coupling sleeve (\*5H) / (\*5MR)
- E27 SAE J744 E / ANSI B92.1 16/32 – 27 teeth (\*5H) / (\*5MR) / (\*14T)
- E33 SAE J744 E / ANSI B92.1 16/32 – 33 teeth (\*5H) / (\*5MR) / (\*14T)
- U35 Radial ports / speed sensor mounted on through drive (35 pulses per rotation)

			○	○	●
			○	○	○
			●	●	●
			●	●	●
			○	○	○
			●	●	●
			●	●	●
●	●	●	●	●	●

**High pressure relief valve**

- P15 Pressure relief valve 150 bar (\*14R)
- P20 Pressure relief valve 200 bar (\*14R)
- P25 Pressure relief valve 250 bar (\*14R)
- P30 Pressure relief valve 300 bar (\*14R)
- P35 Pressure relief valve 350 bar (\*14R)
- P38 Pressure relief valve 380 bar (\*14R)
- P42 Pressure relief valve 420 bar (\*14R)
- 000 without high pressure relief valve

●	●	●	●	●	●	●
●	●	●	●	●	●	●
●	●	●	●	●	●	●
●	●	●	●	●	●	●
●	●	●	●	●	●	●
●	●	●	●	●	●	●

**Surface protection / paint**

- R00 Rust protection oil (standard)
- P01 primed, RAL 3009 (red)
- P03 primed, blue
- P06 primed, grey (RAL 7043)
- V03 Primed + painted, RAL 9005 (black)
- V07 Primed + painted, RAL 7015 (grey)

●						
●						
	●					
	●					
		●				
		●				
			●			
			●			
				●		
				●		
					●	
					●	
						●
						●

**Min. displacement setting**

- V<sub>min</sub> 000–035 cm<sup>3</sup>/rev. (numerical 3-digit) (\*5V0)
- V<sub>min</sub> 016–035 cm<sup>3</sup>/rev. (numerical 3-digit) (\*5V1)
- V<sub>min</sub> 000–055 cm<sup>3</sup>/rev. (numerical 3-digit) (\*5V0)
- V<sub>min</sub> 022–055 cm<sup>3</sup>/rev. (numerical 3-digit) (\*5V1)
- V<sub>min</sub> 000–075 cm<sup>3</sup>/rev. (numerical 3-digit) (\*5V0)
- V<sub>min</sub> 031–075 cm<sup>3</sup>/rev. (numerical 3-digit) (\*5V1)
- V<sub>min</sub> 000–088 cm<sup>3</sup>/rev. (numerical 3-digit) (\*5V0)
- V<sub>min</sub> 040–088 cm<sup>3</sup>/rev. (numerical 3-digit) (\*5V1)
- V<sub>min</sub> 000–108 cm<sup>3</sup>/rev. (numerical 3-digit) (\*5V0)
- V<sub>min</sub> 045–108 cm<sup>3</sup>/rev. (numerical 3-digit) (\*5V1)
- V<sub>min</sub> 000–150 cm<sup>3</sup>/rev. (numerical 3-digit) (\*5V0)
- V<sub>min</sub> 055–150 cm<sup>3</sup>/rev. (numerical 3-digit) (\*5V1)
- V<sub>min</sub> 000–170 cm<sup>3</sup>/rev. (numerical 3-digit) (\*5V0)
- V<sub>min</sub> 085–170 cm<sup>3</sup>/rev. (numerical 3-digit) (\*5V1)

**Pressure control start for V<sub>max</sub> setting**

- PC0 150–260 bar (numerical 3-digit) (\*5P0)
- 999 Not applicable (\*5P9)

●	●	●	●	●	●	●
●	●	●	●	●	●	●

Sizes						
055	075	105	135	165	210	280
●	●	●	●	●	●	●
▲	▲	▲	▲	▲	▲	▲

**Special requirements**

- N no special requirements (standard)
- C Special requirements

- (\*5H) only hydraulically actuated controls
- (\*5EH) hydraulic controller, electrically actuated
- (\*5C) CAO = CA control (CA control with closed-loop pressure control function)
- (\*5D) DOR =  $V_{max}$  switching (2 positions)
- (\*5P) with closed-loop pressure control function as master control
- (\*5P0) only control with closed-loop pressure control function as master control (EH1P; EH1P-CA)
- (\*5P9) only control without closed-loop pressure control function as master control
- (\*5V0) for controller with min. ( $V_{min}$ ) = 0 only: H4; E2(F); E4(F); E6(F)
- (\*5V1) for controller with min. ( $V_{min}$ )  $\geq$  0 only: H1(-CA); EH1P(-CA); E1(F)
- (\*5MR) side-mounted controller
- (\*7R) round magnets
- (\*7S) rectangular magnets
- (\*9B) with blind plug instead of pressure relief valve
- (\*10B) only with blocked shuttle valve
- (\*11M) only with metric ISO ports
- (\*11D) only with DIN 3852 ports
- (\*13F) sizes/shafts: 280/T33; 210/S50; 165 & 135/T27; 105/T23; 75/T21
- (\*14R) only radial ports
- (\*14M) recommended for the primary stage of a tandem motor
- (\*14T) suitable for tandem configurations, specification of tandem motor in plain text
- (\*SF0) acc. to SAE J1946 Type A (120/75/101.5/8xM10)

- available option
- preferred option
- option on request
- ▲ separate specification required

# ORDERING CODE

## 1.4 MPR200 – regulating motor

MPR200 - 075 N - P S H 00 10 - ... >>

### Type

MPR200

Sizes					
075	105	135	165	210	280
●					
	●				
		●			
			●		
				○	
					○

### Size

075	75 cm <sup>3</sup> /rev.
105	105 cm <sup>3</sup> /rev.
135	135 cm <sup>3</sup> /rev.
165	165 cm <sup>3</sup> /rev.
210	210 cm <sup>3</sup> /rev.
280	280 cm <sup>3</sup> /rev.

### Direction of rotation

●	●	●	●	○	○
---	---	---	---	---	---

N clockwise rotation/  
anti-clockwise rotation

### Control

●	●	●	●	○	○
---	---	---	---	---	---

P Pressure controller

### Pressure control side selection

●	●	●	●	●	●
●	●	●	●	○	○

S through shuttle valve  
E Electrical actuated

### V<sub>max</sub> displacement override

●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●

E Electrical / 260 bar max. with closed-loop pressure control function as master control  
H Hydraulic, low pressure / 290 bar max. with closed-loop pressure control function as master control  
0 Without / 290 bar max. with closed-loop pressure control function as master control

### Switching solenoids

●	●	●	●	○	○
○	○	○	○	○	○
●	●	●	●	○	○
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●

A1 AMP / 12 V  
A2 AMP / 24 V  
H1 DIN / 12 V  
H2 DIN / 24 V  
D1 Deutsch / 12 V  
D2 Deutsch / 24 V  
00 Not applicable

### Response orifices

●	●	●	●	●	●
●	●	●			
●	●	●	●	●	●
●	●	●			
●	●	●	●	●	●
●	●	●			
●	●	●	●	●	●
●	●	●			
●	●	●	○	○	○
●	●	●	○	○	○
●	●	●			
●	●	●	●	●	●

06 0.6 mm  
07 0.7 mm  
08 0.8 mm  
09 0.9 mm  
10 1.0 mm  
11 1.1 mm  
12 1.2 mm  
14 1.4 mm  
15 1.5 mm  
18 1.8 mm  
21 2.1 mm  
99 Without response orifices

Sizes					
075	105	135	165	210	280

○	○	○	○		
○	○	○	○		
○	○	○	○		
●	●	●	●		
●	●	●	●		
●	●	●	●		
○	○	○	○		
●	●	●	●		
●	●	●	●	●	●

**High pressure valves**

- 25N Single-stage 250 bar (size 75, 165: (\*16L))
- 27N Single-stage 270 bar (size 75, 165: (\*16L))
- 30N Single-stage 300 bar (size 75, 165: (\*16L))
- 33N Single-stage 330 bar (size 75, 165: (\*16L))
- 35N Single-stage 350 bar (size 75, 165: (\*16L))
- 42N Single-stage 420 bar (size 75, 165: (\*16L))
- 44N Single-stage 440 bar (size 75; 165: (\*16L))
- B00 Sealing plug
- 000 without high pressure valve

●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●		

**Purge relief valve**

- N10 10 bar standard flow
- N14 14 bar standard flow
- R10 10 bar reduced flow
- R14 14 bar reduced flow
- H10 10 bar increased flow
- Q06 flow controlled 6 l/min
- B00 Sealing plug (\*12B)
- 000 without purge relief valve

●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●		

**Purge shuttle valve**

- N0 Standard
- D0 Damped
- B0 Blocked (\*11B)
- 00 without purge shuttle valve

●	○	●	●	●	●
●	●	●			

**Porting**

- M Metric ISO 6149-1
- D Metric DIN 3852-1 (ISO 9974-1)

●	●	●	●	●	●
●	●	●			

**Mounting flange**

- S0 SAE J744 Standard
- P0 Plug-in flange

●	●				
		●	●		
				●	●
●					
	●				
		●	●	●	
					●
●	●	●	○	●	

**Output shaft**

- S32 Splined shaft ANSI B92.1 12/24 – 14 teeth (SAE J744 C)
- S44 Splined shaft ANSI B92.1 8/16 – 13 teeth (SAE J744 D&E)
- S50 Splined shaft ANSI B92.1 8/16 – 15 teeth (SAE J744 F)
- T21 Splined shaft ANSI B92.1 16/32 – 21 teeth
- T23 Splined shaft ANSI B92.1 16/32 – 23 teeth
- T27 Splined shaft ANSI B92.1 16/32 – 27 teeth
- T33 Splined shaft ANSI B92.1 16/32 – 33 teeth
- F40 Coupling flange size 4 (\*SF0)

●	●	●	●	●	●
●	●	●	●		

**Ports and through drive**

- R00 Radial ports / no through drive
- L00 Axial ports / no through drive

Sizes					
075	105	135	165	210	280

			○	○	○
			●	●	●
			●	●	●
			○	○	○
			●	●	●
			●	●	●
●	●	●	●	●	●

**High pressure relief valve**

- P20 Pressure relief valve 200 bar (\*16R)
- P25 Pressure relief valve 250 bar (\*16R)
- P30 Pressure relief valve 300 bar (\*16R)
- P35 Pressure relief valve 350 bar (\*16R)
- P38 Pressure relief valve 380 bar (\*16R)
- P42 Pressure relief valve 420 bar (\*16R)
- 000 without high pressure relief valve

●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●

**Surface protection / paint**

- R00 Rust protection oil (standard)
- P01 primed, RAL 3009 (red)
- P03 primed, blue
- P06 primed, grey (RAL 7043)
- V03 Primed + painted, RAL 9005 (black)
- V07 Primed + painted, RAL 7015 (grey)

●					
	●				
		●			
			●		
				●	
					●

**Min. displacement setting**

- V<sub>min</sub> 022–055 cm<sup>3</sup>/rev. (numerical 3-digit)
- V<sub>min</sub> 031–075 cm<sup>3</sup>/rev. (numerical 3-digit)
- V<sub>min</sub> 041–088 cm<sup>3</sup>/rev. (numerical 3-digit)
- V<sub>min</sub> 052–108 cm<sup>3</sup>/rev. (numerical 3-digit)
- V<sub>min</sub> 055–150 cm<sup>3</sup>/rev. (numerical 3-digit)
- V<sub>min</sub> 085–170 cm<sup>3</sup>/rev. (numerical 3-digit)

●	●	●	●	●	●
---	---	---	---	---	---

**Pressure control start for V<sub>max</sub> setting**

- V<sub>max</sub> 150–290 bar (numerical 3-digit)

●	●	●	●	●	●
▲	▲	▲	▲	▲	▲

**Special requirements**

- N no special requirements (standard)
- C With special requirements

- (\*11B) with blind plug instead of pressure relief valve
- (\*12B) only with blocked shuttle valve
- (\*16L) only axial ports
- (\*16R) only radial ports
- (\*SF0) acc. to SAE J1946 Type A (120/75/101.5/8xM10)

- available option
- preferred option
- option on request
- ▲ separate specification required

# TECHNICAL INFORMATION

## 2.1 Specifications

Motor size			28	35	55	63	75	85	105	135	165	210	280
Displacement	V <sub>max</sub>	[cm <sup>3</sup> /rev]	28.6	35.6	54.7	63	75.9	85	105	135.6	165.6	210.1	281.9
	V <sub>min</sub> (Only for displacement and regulating motors)		–	–	18.3	25.3	25.3	35	35	45.2	55.2	70	93
Pressure	Nominal pressure	[bar]	450										
	Peak pressure (short-term)		500										
	Min. pressure HP side "P"		20										
	Min. pressure LP side "S"		10										
	Permissible housing inner pressure		2.5										
	Pressure acceleration speed	[bar/s]	10,000										
Drive speed	Max. operating drive speed (at 100 % duty cycle) at max. displacement	[rpm]	4,300	4,300	4,300	3,800	3,800	3,700	3,700	3,200	3,100	2,700	2,400
	Peak drive speed (short-term < 10 sec.) At max. displacement, higher drive speeds on request		4,400	4,400	4,400	4,100	4,100	3,800	3,800	3,500	3,400	3,000	2,700
	Max. operating drive speed (at 100 % duty cycle) at min. displacement		–	–	4,700	4,400	4,400	4,100	4,100	3,700	3,500	3,200	2,900
	Peak drive speed (short-term < 10 sec.) At min. displacement, higher drive speeds on request		–	–	5,300	5,000	5,000	4,700	4,700	4,000	3,900	3,500	3,200
Power	Switching capacity (at 100 % V <sub>max</sub> max. operation speed, at V <sub>min</sub> nominal pressure and 20 bar charge pressure -> Δp 430 bar)	[kW]	86	108	184	239	239	309	309	360	415	482	586
Torque	Max. output torque (under nominal pressure)	[Nm]	196	244	374	519	519	719	719	928	1,133	1,438	1,929
Permissible housing temperature with permissible viscosity > 10 cSt		[°C]	90										
Weight	Fixed displacement motor (With 2-hole flange)	[kg]	16	16	19	26	26	33	33	39	76	101	146
	Variable displacement and regulating motor (With 2- or 4-hole flange)		–	–	28	32	32	42	42	56	76	101	146
Moment of inertia		[kgm <sup>2</sup> ]	0.0025	0.0025	0.0049	0.0076	0.0079	0.0144	0.0144	0.0215	0.0306	0.0468	0.0936
Permissible radial force on output shaft		[N]	on request										
Permissible axial force on output shaft		[N]	2000, higher values on request										

## 2.2 Flanges and shafts

### 2.2.1 MPF200

Motor size		28		35		55		63					
SAE J744 mounting flange	Flange	SAE B		SAE B		SAE C, 2-hole		SAE C, 2-hole					
	K [mm]	146.0		146.0		181.0		181.0					
	J [mm]	17.5		17.5		17.5		17.5					
	N [mm]	127		127		127		127					
	d [mm]	-		-		-		-					
Output shaft	Shaft spline according to ANSI B92.1	SAE B-B 16/32, 15 t		SAE B-B 16/32, 15 t		SAE C 12/24, 14 t		16/32, 21 t		SAE C 12/24, 14 Z		16/32, 21 t	
	Max. permissible output torque [Nm]	354		354		676		1067		676		1067	
	External diameter [mm]	24.98		24.98		31.22		34.51		31.22		34.51	
	Usable spline length [mm]	29		29		30		39.5		30		39.5	
	Shaft type	without undercut				with undercut		without undercut		with undercut		without undercut	

Motor size		75		85		105			135										
SAE J744 mounting flange	Flange	SAE C, 2-hole		SAE C, 2-hole		SAE C, 2-hole			SAE D, 2-hole										
	K [mm]	181.0		181.0		181.0			228.6										
	J [mm]	17.5		17.5		17.5			20.6										
	N [mm]	127		127		127			152.4										
	d [mm]	-		-		-			-										
Output shaft	Shaft spline according to ANSI B92.1	SAE C 12/24, 14 t		16/32, 21 t		SAE C 12/24, 14 t		16/32, 21 t		16/32, 21 Z		16/32, 23 t		SAE C 12/24, 14 t		SAE D 8/16, 13 t		16/32, 27 t	
	Max. permissible output torque [Nm]	676		1067		676		1067		1067		1431		676		1802		2390	
	External diameter [mm]	31.22		34.51		31.22		34.51		34.51		37.68		31.22		43.71		44.05	
	Usable spline length [mm]	30		39.5		30		39.5		39.5		38.5		30		50		62	
	Shaft type	with undercut		without undercut		with undercut		without undercut		without undercut		without undercut		with undercut		with undercut		without undercut	

### 2.2.2 MPA200

Motor size		165		210		280							
SAE J744 mounting flange	Flange	SAE D, 2-hole		SAE E, 4-hole		SAE E, 4-hole							
	K [mm]	228.6		224.5		224.5							
	J [mm]	20.6		27		27							
	N [mm]	152.4		165.1		165.1							
	d [mm]	-		22		22							
Output shaft	Shaft spline according to ANSI B92.1	SAE D 8/16, 13 t		16/32, 27 t		SAE F 8/16, 15 t		16/32, 27 t		SAE F 8/16, 15 t		16/32, 33 t	
	Max. permissible output torque [Nm]	1802		2390		2904		2390		2904		4510	
	External diameter [mm]	43.71		44.05		50.06		44.05		50.06		53.57	
	Usable spline length [mm]	50		62		58		62		58		58	
	Shaft type	with undercut		without undercut		without undercut		without undercut		without undercut		without undercut	



### 2.2.3 MPV200

Motor size		55		75		105	
SAE J744 mounting flange	Flange	SAE C, 2-hole		SAE C, 2-hole		SAE C, 2-hole	
	K [mm]	181.0		181.0		181.0	
	J [mm]	17.5		17.5		17.5	
	N [mm]	127		127		127	
	d [mm]	-		-		-	
Output shaft	Shaft spline according to ANSI B92.1	SAE C 12/24, 14 t	16/32, 21 t	SAE C 12/24, 14 t	16/32, 21 t	16/32, 23 t	SAE C 12/24, 14 t
	Max. permissible output torque [Nm]	676	1067	676	1067	1431	676
	External diameter [mm]	31.22	34.51	31.22	34.51	37.68	31.22
	Usable spline length [mm]	30	39.5	30	39.5	38.5	30
	Shaft type	with undercut	without undercut	with undercut	without undercut	without undercut	with undercut
Motor size		135		165			
SAE J744 mounting flange	Flange	SAE D, 2-hole		SAE D, 2-hole			
	K [mm]	228.6		228.6			
	J [mm]	20.6		20.6			
	N [mm]	152.4		152.4			
	d [mm]	-		-			
Output shaft	Shaft spline according to ANSI B92.1	SAE D 8/16, 13 t	16/32, 27 t	SAE D 8/16, 13 t		16/32, 27 t	
	Max. permissible output torque [Nm]	1802	2390	1802		2390	
	External diameter [mm]	43.71	44.05	43.71		44.05	
	Usable spline length [mm]	50	62	50		62	
	Shaft type	with undercut	without undercut	with undercut		without undercut	
Motor size		210		280			
SAE J744 mounting flange	Flange	SAE E, 4-hole		SAE E, 4-hole			
	K [mm]	224.5		224.5			
	J [mm]	27		27			
	N [mm]	165.1		165.1			
	d [mm]	22		22			
Output shaft	Shaft spline according to ANSI B92.1	SAE F 8/16, 15 t	16/32, 27 t	SAE F 8/16, 15 t		16/32, 33 t	
	Max. permissible output torque [Nm]	2904	2390	2904		4510	
	External diameter [mm]	50.06	44.05	50.06		53.57	
	Usable spline length [mm]	58	62	58			
	Shaft type	without undercut		without undercut			

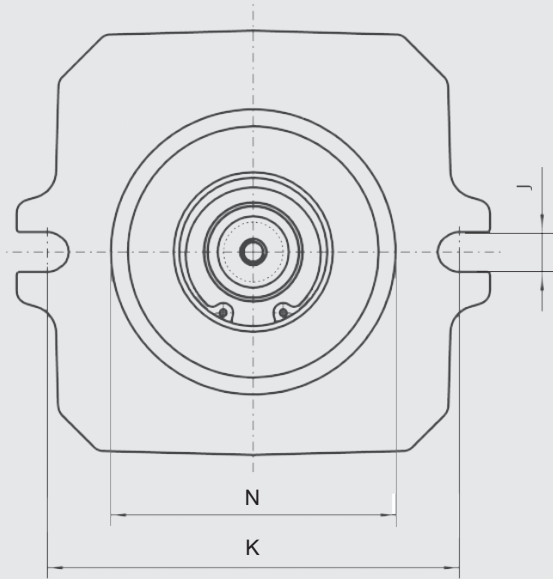
## 2.2.4 MPR200

Motor size		75		105			135	
SAE J744 mounting flange	Flange	SAE C, 2-hole		SAE C, 2-hole			SAE D, 2-hole	
	K [mm]	181.0		181.0			228.6	
	J [mm]	17.5		17.5			20.6	
	N [mm]	127		127			152.4	
	d [mm]	-		-			-	
Output shaft	Shaft spline according to ANSI B92.1	SAE C 12/24, 14 t	16/32, 21 t	16/32, 21 Z	16/32, 23 t	SAE C 12/24, 14 t	SAE D 8/16, 13 t	16/32, 27 t
	Max. permissible output torque [Nm]	676	1067	1067	1431	676	1802	2390
	External diameter [mm]	31.22	34.51	34.51	37.68	31.22	43.71	44.05
	Usable spline length [mm]	30	39.5	39.5	38.5	30	50	62
	Shaft type	with undercut	without undercut	without undercut	without undercut	with undercut	with undercut	without undercut

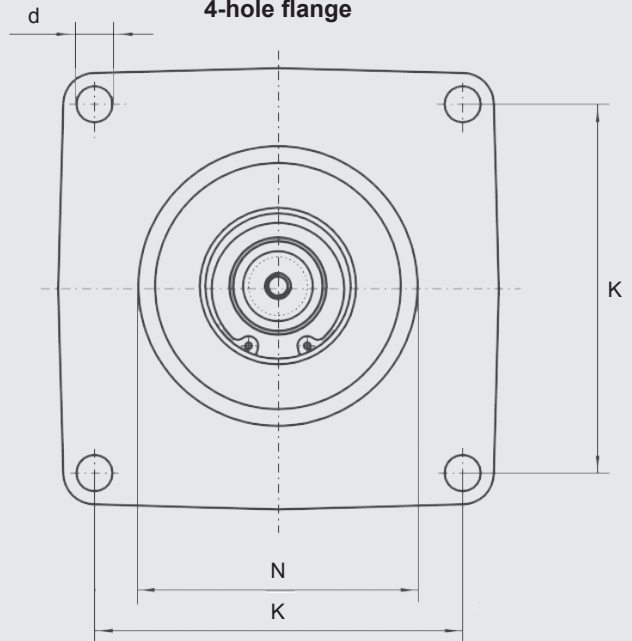
Motor size		165		210		280	
SAE J744 mounting flange	Flange	SAE D, 2-hole		SAE E, 4-hole		SAE E, 4-hole	
	K [mm]	228.6		224.5		224.5	
	J [mm]	20.6		27		27	
	N [mm]	152.4		165.1		165.1	
	d [mm]	-		-		-	
Output shaft	Shaft spline according to ANSI B92.1	SAE D 8/16, 13 t	16/32, 27 t	SAE F 8/16, 15 t	16/32, 27 t	SAE F 8/16, 15 t	16/32, 27 t
	Max. permissible output torque [Nm]	1802	2390	2904	2390	2404	4510
	External diameter [mm]	43.71	44.05	50.06	44.05	50.06	44.05
	Usable spline length [mm]	50	62	58	62	58	
	Shaft type	with undercut	without undercut	without undercut		without undercut	

## Mounting flange

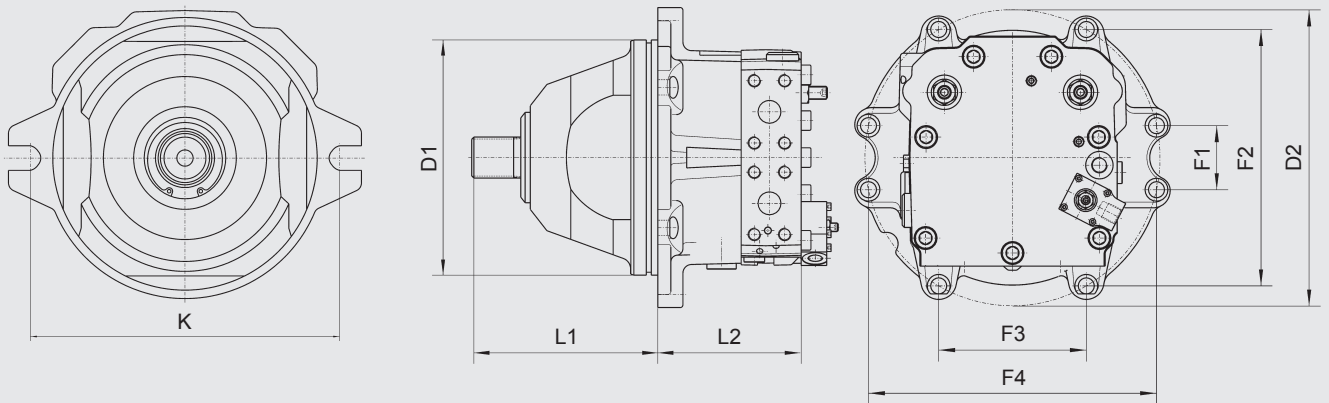
### 2-hole flange



### 4-hole flange

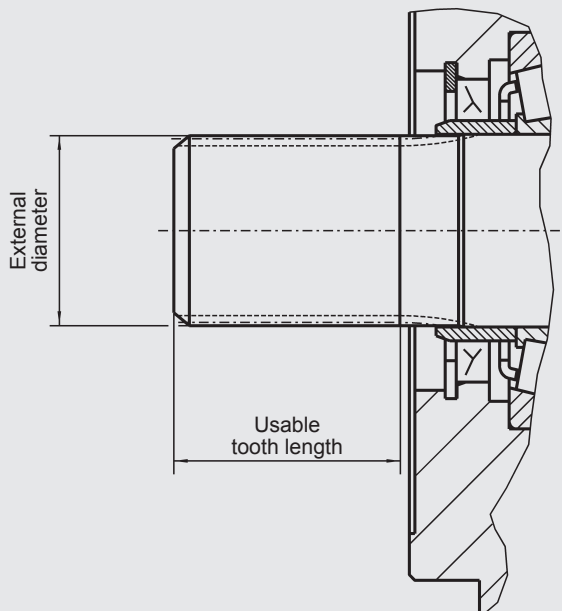


## Plug-in housing for MPF200 / MPV200 / MPR200 Size 75 / 105 / 135

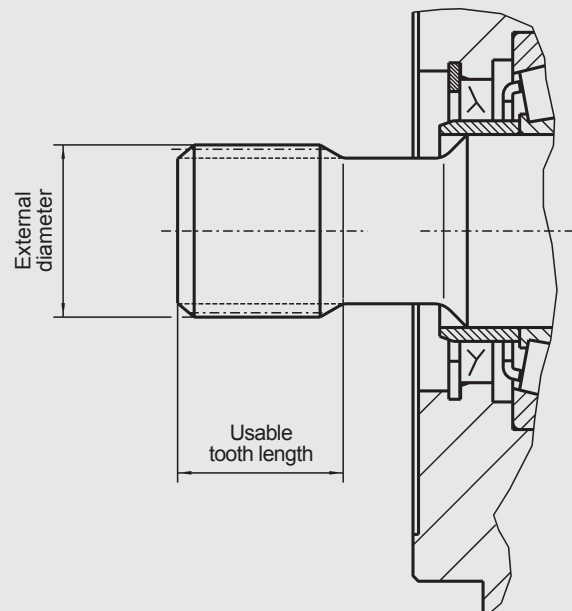


## Output shafts

### Dimensions of output shaft without undercut

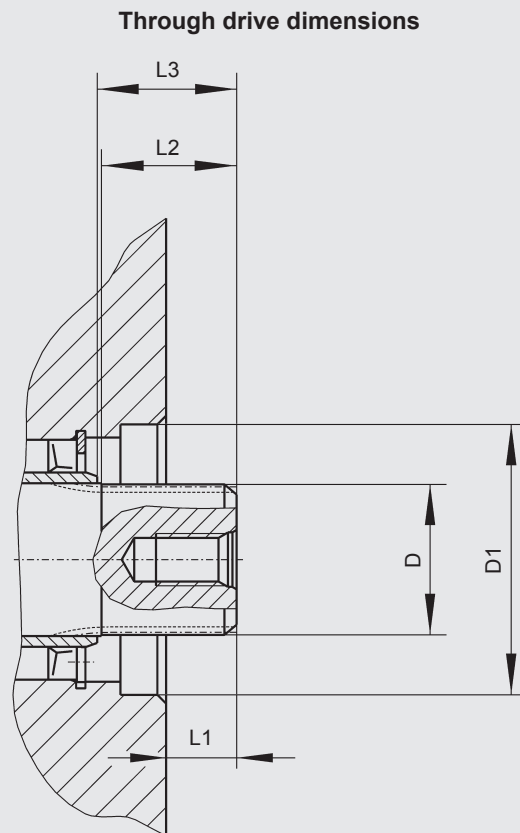


### Dimensions of output shaft with undercut



## 2.3 MPA200 / MPV200 with through drive option

Based on a standard hydraulic variable displacement motor of series MPA200 / MPV200 with only one shaft end, the PTO motor has two shaft ends available for outputting the torque. This enables the hydraulic motor to be installed into the drive train directly without any distribution gearbox. This reduces noise emissions and fuel consumption. At the same time, the overall efficiency increases.



### 2.3.1 MPA200

Motor size		165	210	280
Dimensions, through drive	D [mm]	36.05	39.27	44.05
	D1 [mm]	*	82.55	82.55
	L1 [mm]	-0.5	20.9	18
	L2 [mm]	31	44	47
	L3 [mm]	32.8	57.2	62
Through drive	Shaft spline according to ANSI B92.1	16/32, 22 t	16/32, 24 t	16/32, 27 t
	max. through drive torque [Nm]	1305	1654	2221

### 2.3.2 MPV200

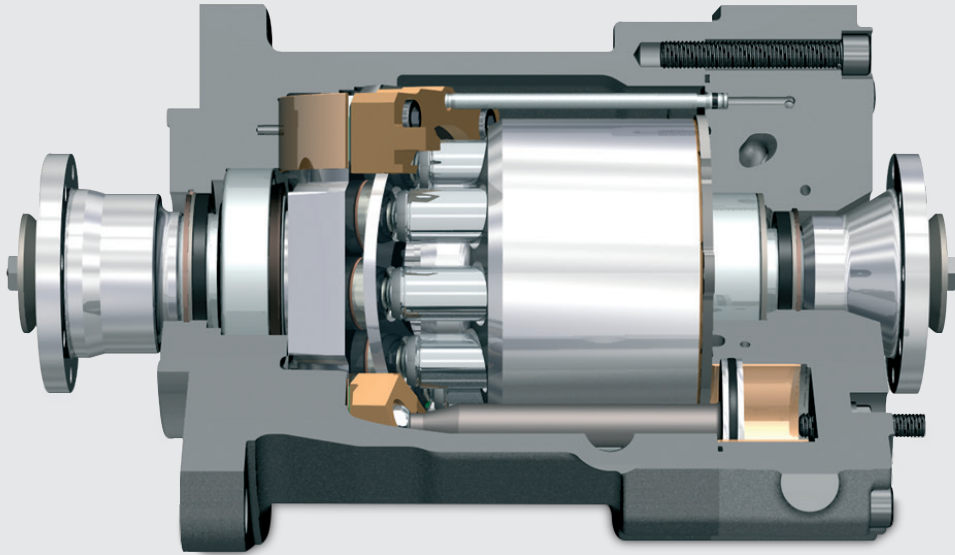
Motor size		105	135	165	210	280
Dimensions, through drive	D [mm]	31.2	34.51	36.05	39.27	44.05
	D1 [mm]	*	*	*	82.55	82.55
	L1 [mm]	30.1	16.2	-0.5	20.9	18
	L2 [mm]	41.5	31	31	44	47
	L3 [mm]	49.6	32	32.8	57.2	62
Through drive	Shaft spline according to ANSI B92.1	16/32, 19 t	16/32, 21 t	16/32, 22 t	16/32, 24 t	16/32, 27 t
	max. through drive torque [Nm]	763	1068	1305	1654	2221

\* Dimensions on request.

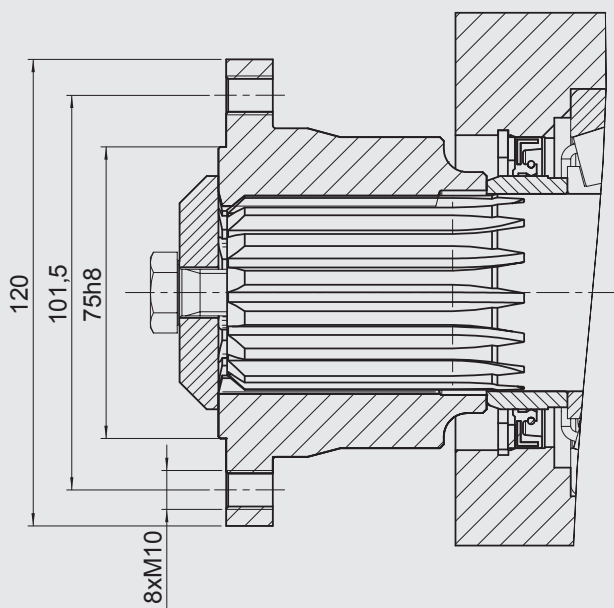
## 2.4 MPA200 / MPV200 with coupling flange (option F40)

In addition to the PTO motor with two shaft ends, there is a coupling flange for the drive side and one for the output side. They are used for direct incorporation into the drive train.

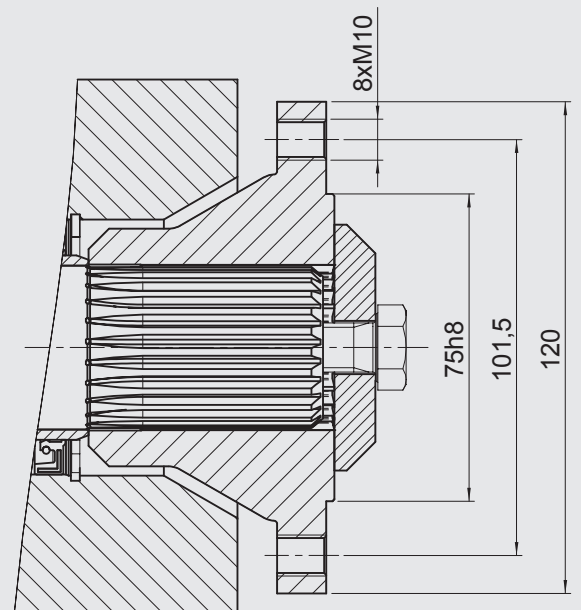
**With coupling flange**  
for direct installation into the drive train



Dimensions of coupling flange, drive side



Dimensions of coupling flange, output side



Other flanges upon request.

## 2.5 Seals

The motor series is equipped with fluorocarbon (FPM) seals as standard.

When using special fluids or in a particularly low ambient temperature, the seal material might need to be replaced.

For use with other sealing materials, please contact HYDAC Drive Center.

## 2.6 Filtration

High oil cleanliness greatly contributes to lengthening the service life of the hydraulic system.

**For high functional reliability and service life** 18/16/13 as per ISO 4406 or better

**Minimum requirement** 20/18/15 as per ISO 4406

**Delivery** The minimum requirement for the cleanliness of the hydraulic oil is based on the most sensitive component in the system.

**Filling and operating hydraulic systems** When filling or refilling, it must be guaranteed that the required cleanliness of the hydraulic oil is adhered to. As a rule, filling from barrels, canisters or large tanks necessitates pre-filtering of the oil. It is recommended to take appropriate measures (e.g. filters) to ensure that the required oil cleanliness is maintained even during operation.

<b>International standards</b>	Code number according to ISO 4406	Code number according to NAS:
	18/16/13	7
	20/18/15	9

## 2.7 Hydraulic fluids

The motor series is designed for use with:

**HLP** Hydraulic oils of R&O type (rust and oxidation inhibitor)

**Biodegradable oils** according to ISO 15 380, on request

For use with other fluids, please contact HYDAC Drive Center.

## 2.8 Temperature range

**-20 °C to +90 °C oil temperature**

### Notice:

The highest fluid temperature will be at the drain port of the motor. This is up to 20 °C higher than in the reservoir.

## 2.9 Viscosity range

**Minimum viscosity:** 10 cSt (mm<sup>2</sup>/s)

**Operating viscosity:** 20–80 cSt (mm<sup>2</sup>/s)

**Maximum viscosity:** 1,000 cSt (mm<sup>2</sup>/s)

**Minimum viscosity =** 10 mm<sup>2</sup>/s short-term (t ≤ 1 min) at a maximum permissible leakage fluid temperature of +95 °C

**Maximum viscosity =** 1,000 mm<sup>2</sup>/s short-term (t ≤ 1 min) on cold start (p ≤ 30 bar, n ≤ 1,000 rev./min, t<sub>min</sub> -10 °C)

For low temperature applications, please contact HYDAC Drive Center.

## 2.10 Installation instructions

The installation of the hydraulic assembly must be performed according to the wire and piping diagram and according to the device-specific installation instruction as well as the technical data sheets and installation drawings.

If electro-hydraulic circuits are performed, it must be observed that the prescribed electrical values are adhered to and, for example, the device has the prescribed voltage.

For the hydraulic pipes, seamless precision steel pipes according to EN 10305/C or hoses with suitable pressure resistance must be used. The pipes must be deburred, washed out and blown through. Scaled or rusted pipes must be pickled and then neutralised; brush out any decontaminated hoses and then rinse.

Cleanliness is the priority during installation of the entire hydraulic unit. Do not plug or close finished pipes with cleaning cloths but rather with plastic film or tape. Never use cleaning wool.

### General information on the mechanical connection

The mechanical connection of a HYDAC axial piston motor to the drive system is performed via its housing flange and the primary output shaft. The coupling with the output shaft must be set up without any radial or axial shaft offset. See the technical data sheet, the installation diagram or the catalogue for the relevant permissible values of the transmitted shaft torques and the acting axial forces.

Radial forces on the shaft end must be prevented. If, for specific drive technique reasons or construction considerations, radial forces on the shaft end of a HYDAC axial piston motor cannot be avoided, please consult us already at the project design range.

### Shafts

In HYDAC axial piston motors, the shaft ends of the primary drive or output shafts are usually designed as flange centring splined shafts with involute reference profiles according to ANSI B92.1. The prescribed counter fitting in connection, gear or belt pulley must be observed.

Generally, during both the installation and dismantling of the output elements, no shock or impact forces (e.g. hammer blows) may act on the shaft ends of HYDAC axial piston motors, as this will inevitably result in damage to the transmission gear and in particular to the shaft bearing.

To avoid rotary oscillation in the output train, flexible connections must be used with dynamic transmission characteristics coordinated to the output system. In particular, it must be ensured that the system is resonance-free.

### Cardan shafts

The installation instructions of the cardan shaft manufacturer must be observed!

Please contact HYDAC Drive Center before installation. In order to avoid rotary oscillations, it must be observed that cardan shaft pieces on the outlet side are at the same angle and in one level. Only use balanced cardan shafts and ensure correct positioning when plugging the cardan joints!

### Permissible output and through drive torques

It must be ensured that the permissible torque is not exceeded in any operational state. Please see the permissible values in the technical data sheet or catalogue.

### Hydraulic motors

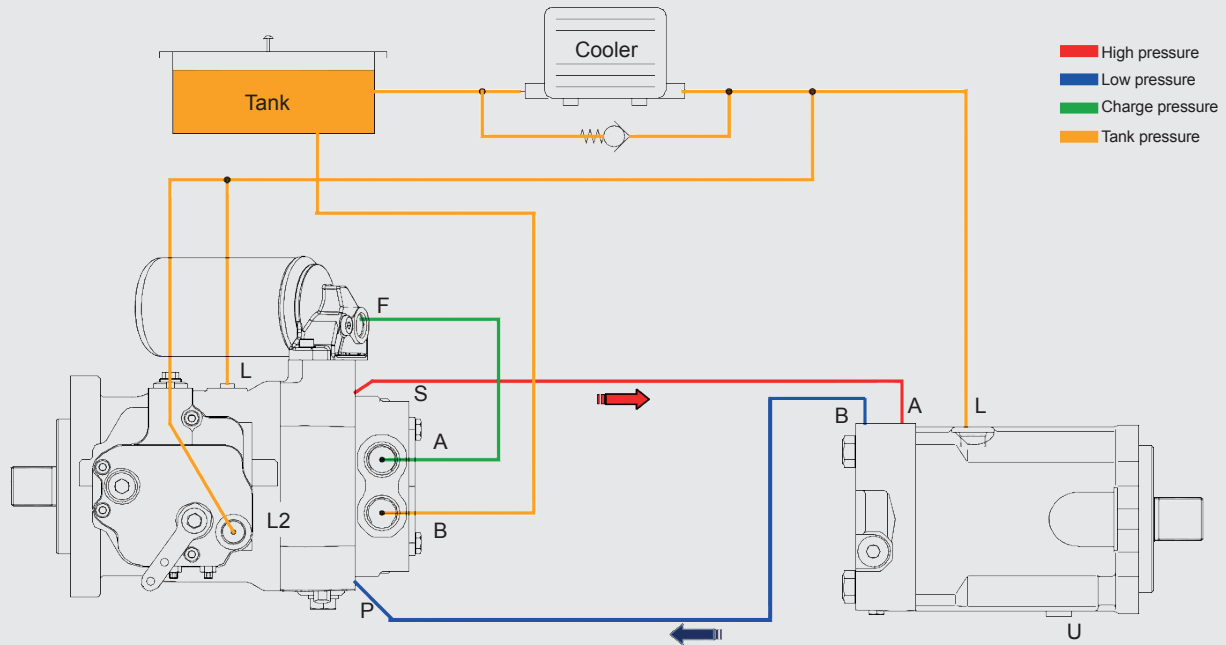
When planning the overall system and in the subsequent implementation of the installation, it must be ensured that the housing of the hydraulic pump and of the hydraulic motor is fully filled with hydraulic fluid in all operating modes after first filling and bleeding within the framework of the initial start-up, and cannot run empty during operation nor during temporary or longer standstill.

### Installation

Ideally horizontal installation.

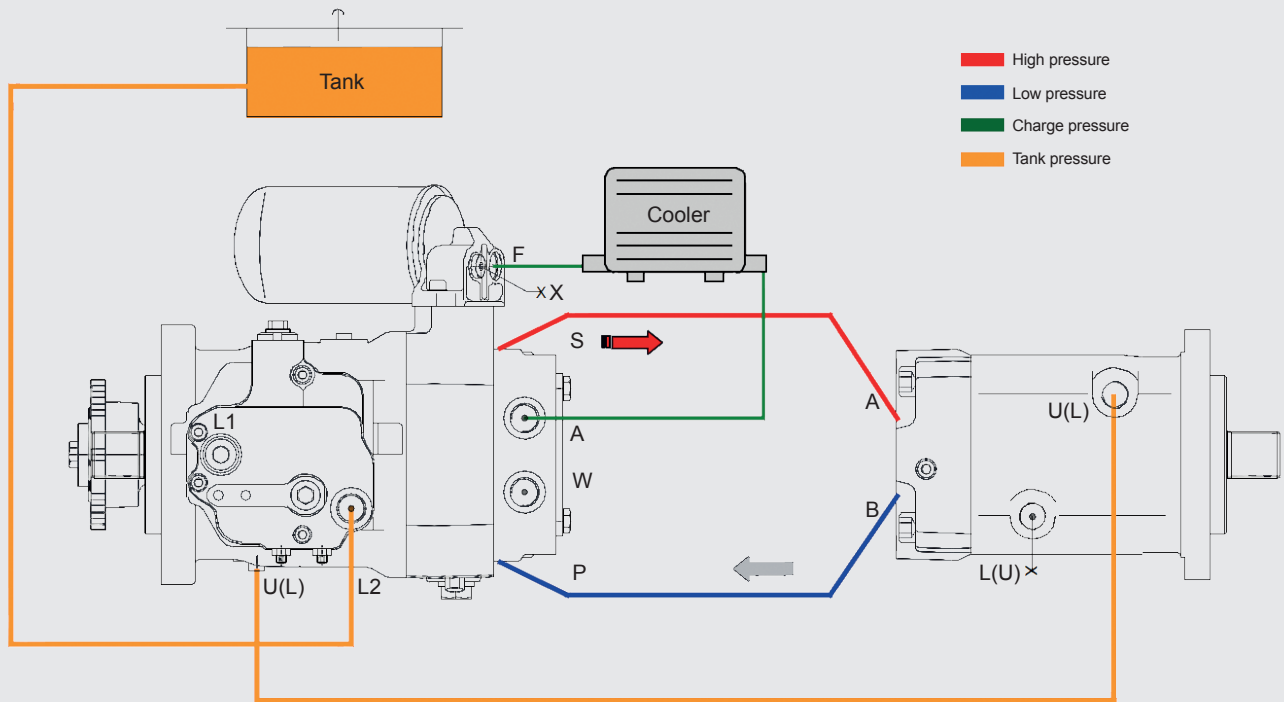
For alternative installations please contact the HYDAC Drive Center.

## 2.11 Piping example



On request:

- charge pump with internal suction
- oil cooler in low-pressure circuit
- only for nominal sizes 55–135



- Pressure entry at A: clockwise rotation\*
- Pressure entry at B: anti-clockwise rotation\*

Diagrams valid for clockwise drive rotation.

\* Dependent on motor type, see 5.5 Connections – Flow direction



## MOTOR VARIANTS

### 3.1 Function overview

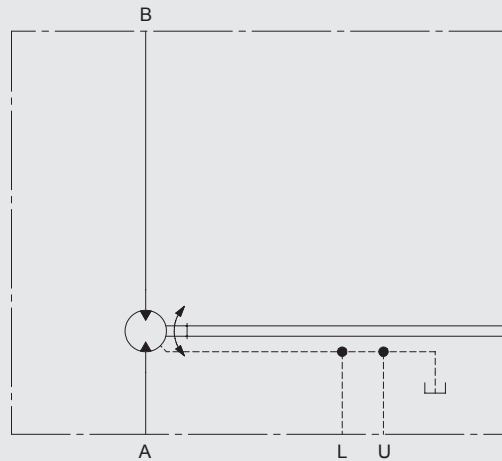
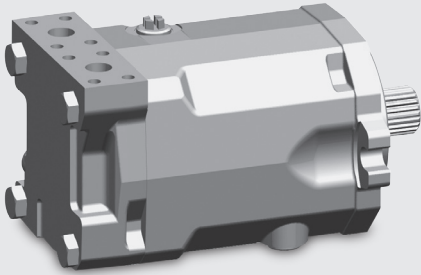
HYDAC supplies fixed displacement, regulating and variable displacement motors with high start-up torques for the open and the closed circuit. The motors are controlled electrically or hydraulically.

Motor type	Control / function	Product
Fixed displacement motor	–	MPF200
	Displacement manually adjustable	MPA200
Variable displacement motor	Variable adjustable, hydraulic	MPV200 H1, H4
	Variable adjustable, electrical	MPV200 E1 (E1F), E4 (E4F), E6 (E6F)
	Two position control, hydraulically switchable	MPV200 H2
	Two position control, electrically switchable	MPV200 E2 (E2F)
	Variable adjustable, pressure override, electrical selection of pressure signal	MPV200 EH1P / MPV200 EH1P CA
regulating motor	$V_{\max}$ hydraulic, low pressure	MPR200
	$V_{\max}$ electrical	MPR200

### 3.2 MPF200

The motor MPF200 can be used for open and closed circuits.

#### Fixed displacement motor MPF200



A, B	Work ports
L, U	Drain ports

#### Design features:

- Optimised start-up and low-speed performance
- Optionally with purge relief valves to rinse out circuit and housing
- Fixed-setting and switchable high pressure relief valve optional

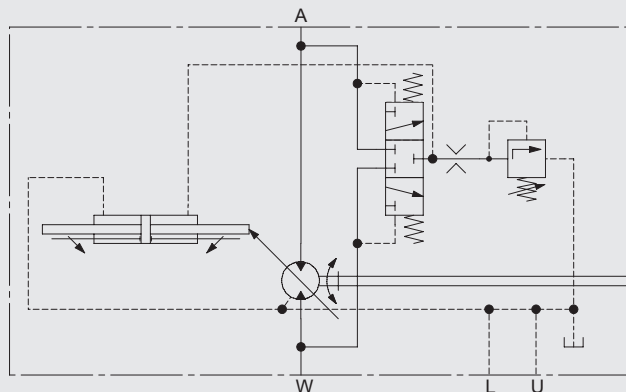
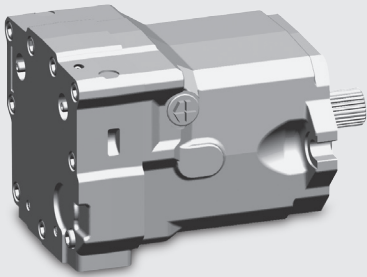
### 3.3 MPA200

The motor MPA200 can be used for open and closed circuits.

The specific displacement is set to a particular value.

The specific displacement is set mechanically by means of an adjustment screw.

#### MPA200 as manually adjustable fixed displacement motor

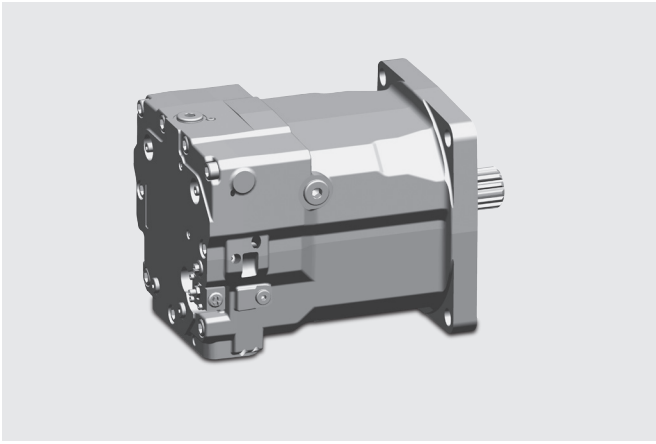


A, B	Work ports
L, U	Drain ports
	purge relief optional

#### Design features:

- Optimised start-up and low-speed performance

### 3.4 MPV200



#### Design features:

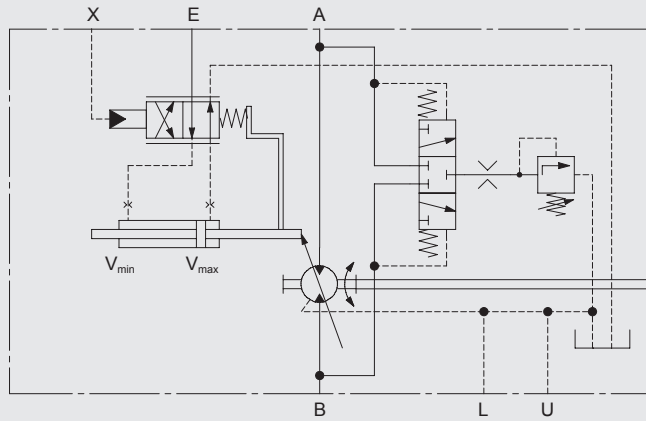
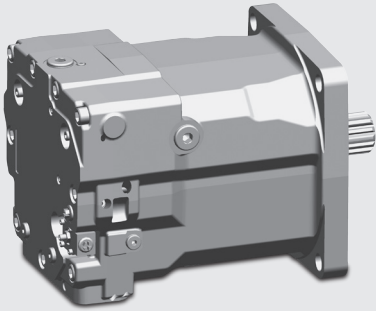
- Stepless or two position control
- Electric or hydraulic control
- Pressure override control possible
- Signal selection for pressure regulator possible
- Can be set to 0 cm<sup>3</sup>/rev.
- Optimised start-up and low-speed performance

#### 3.4.1 MPV200 H1/H4 and E1 (E1F)/E4 (E4F)/E6 (E6F) variable adjustable

The motor MPV200 can be used for open and closed circuits. It is variable adjustable, either hydraulically or electrically. The servo pressure supply can be either internal or external.

Characteristics of continuous control					
<b>External servo pressure supply E</b>	min.	bar	20		
	max. permissible		40		
<b>Hydraulic control X</b> if $V_{\text{max-eff}} < V_{\text{max-minimum}}$ the resolution is lower	Control range	bar	$\Delta p = 6$		
	Control begin		H1 / EH1P control: 7–9.5 H4 control: 4 and 9.5		
	Max. permissible pressure		40		
<b>Electrical control</b>	Connector type		DIN EN 175301-803, Deutsch, AMP Junior Timer (2-pin, cod. 1)		
	Rated voltage = max. continuous voltage	V	12	24	
	Type of voltage		DC voltage		
	Power input	W	15.6		
	Rated current = max. continuous current	mA	1300	650	
	Control current	Start of control	mA	450	225
		End of control		1200	600
	Relative duty cycle	%	100		
	Protection class		IP54 (DIN), IP67 (Deutsch), IP6K6K (AMP)		
	Control types	Digitally via pulse width modulation PWM		100 Hz, rectangular dither, pulse duty ratio variable over control range	
Analogue			Direct current with dither overlay (dither frequency nom. 35 Hz/duty cycle 1:1)		

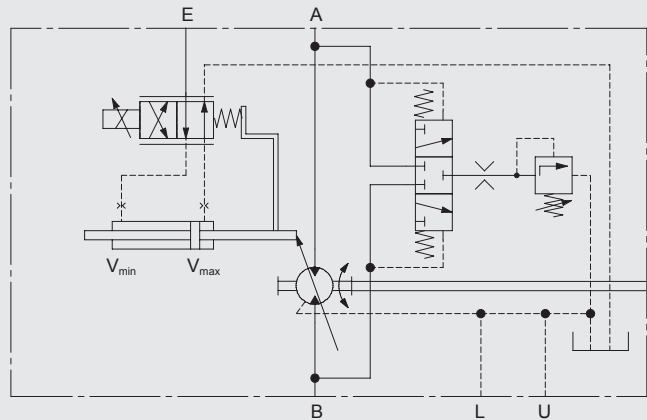
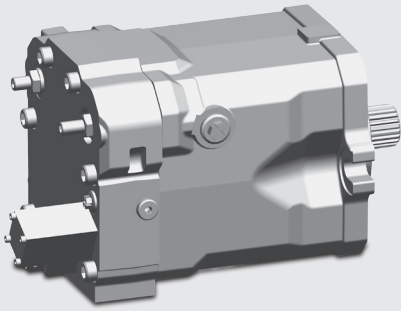
# H1/H4 – variable adjustable motor with hydraulic pilot pressure supply and external servo pressure supply



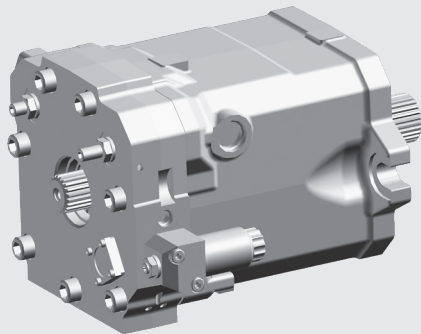
A, B	Work ports
L, U	Drain ports
E	Servo pressure port
X	Pilot pressure port
	Purge relief optional

E1 (E1F)/E4 (E4F) – variable adjustable motor with electrical pilot pressure supply and external pressure supply

MPV200 with E1 / E4 control

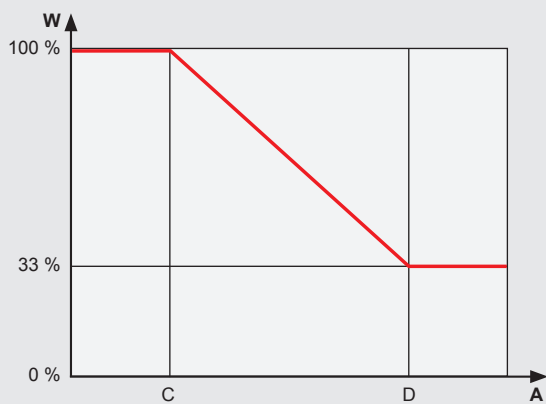


MPV200 with E1F / E4F control

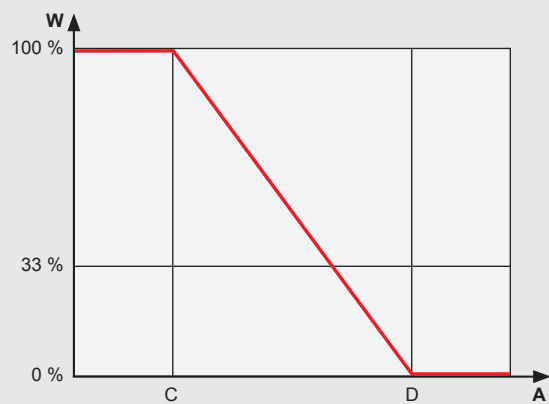


A, B	Work ports
L, U	Drain ports
E	Actuating pressure port
	Purge relief optional

Performance E1 (E1F), H1 control



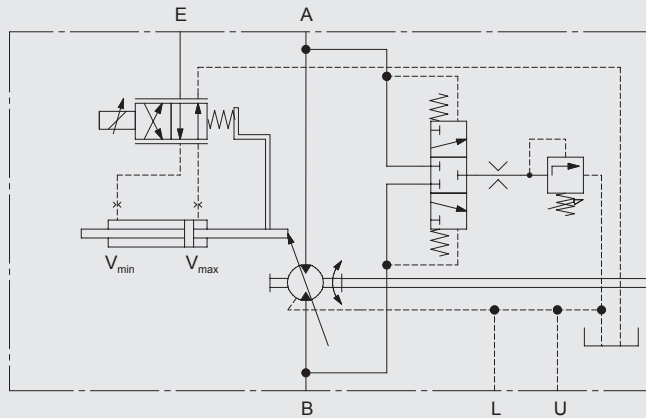
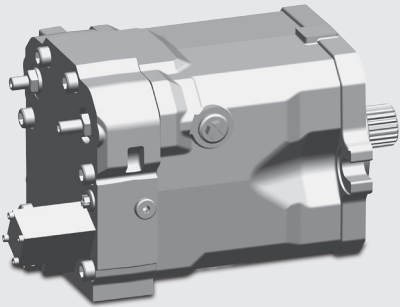
Performance E4 (E4F), H4 control



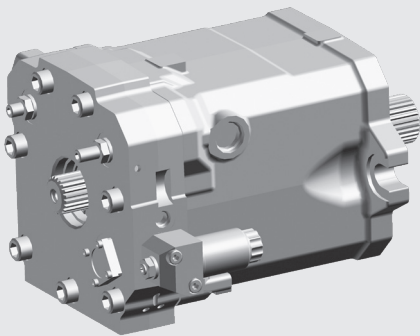
A	Pilot pressure/pilot current
B	Specific displacement of motor
C	Start of control
D	End of control

**E6 (E6F) – variable adjustable motor with electrical pilot pressure supply and external servo pressure supply (side-mounted)**

**MPV200 with E6 control**

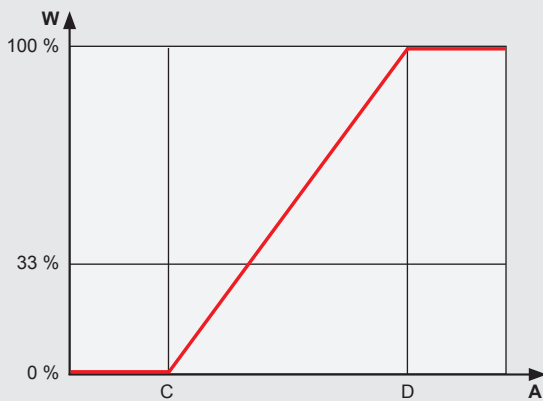


**MPV200 with E6F control**



A, B	Work ports
L, U	Drain ports
E	Servo pressure port
	Purge relief optional

**Performance E6(E6F) control**



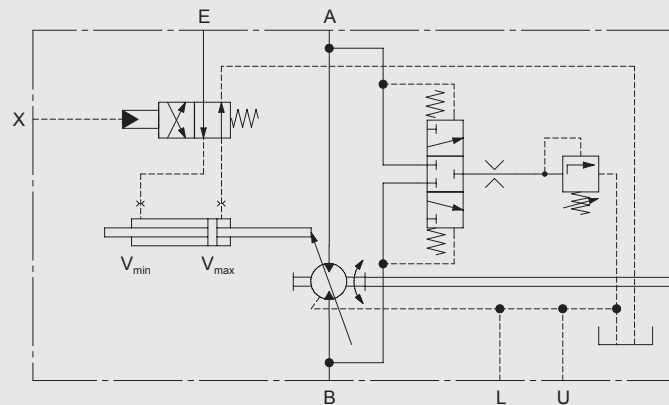
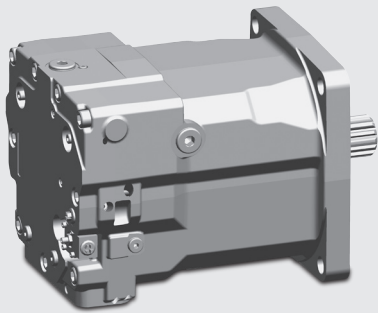
A	Pilot pressure/pilot current
B	Specific displacement of motor
C	Start of control
D	End of control

### 3.4.2 MPV200 H2 and E2(E2F) two-position

The motor MPV200 with two-position control can be used for open and closed circuits. Without a control signal, the motor is set to maximum specific displacement. The motor can be switched either electrically or hydraulically. The hydraulic control can be either internal or external.

Characteristics of 2-stage control			
External servo pressure supply E	min.	bar	20
	max. permissible		40
Hydraulic control X	Shifting pressure Minimum tripping	bar	20
	Shifting pressure Maximum permissible tripping		40
Electrical control	Connector type	DIN EN 175301-803, Deutsch, AMP Junior Timer (2-pin, cod. 2)	
	Rated voltage = max. continuous voltage	V	12      24
	Type of voltage	DC voltage	
	Power input (cold performance)	W	≤ 26
	Relative duty cycle	%	100
	Protection class	IP54 (DIN), IP67 (Deutsch), IP6K6K (AMP)	

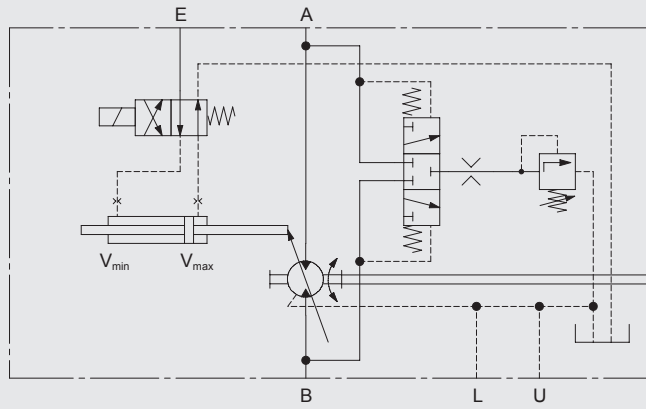
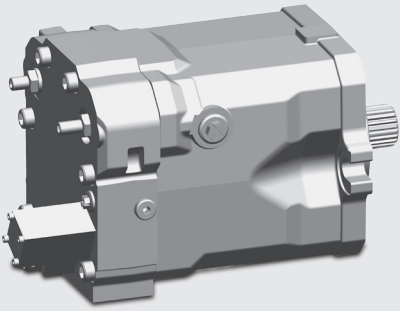
#### H2 – two-position motor with hydraulic pilot pressure supply and external servo pressure supply



A, B	Work ports
L, U	Drain ports
E	Servo pressure port
X	Pilot pressure port
	Purge relief optional

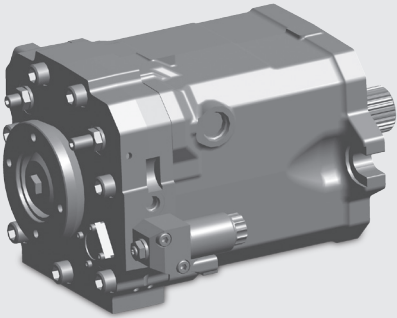
## E2 (E2F) – two-position motor with electrical pilot pressure supply and external servo pressure supply

### MPV200 with E2 control

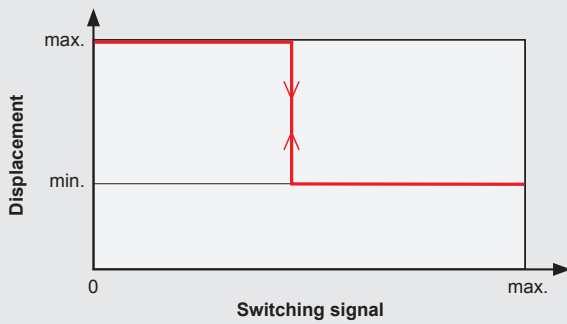


A, B	Work ports
L, U	Drain ports
E	Servo pressure port
	Purge relief optional

### MPV200 with E2F control



### Performance MPV200 H2 and E2 (E2F) two-position





### 3.4.3 MPV200 EH1P, EH1P-CA variable adjustable with pressure override

The MPV200 motor can be used for both open and closed circuits.

#### EH1P:

Without control signal, the EH1P control is set to maximum specific displacement  $V_{max}$ . The continuous control from  $V_{max}$  to  $V_{min}$  is hydraulically proportional, via the external control pressure at port X.

This control function is overlain by a pressure override: if the pressure exceeds a particular level in one of the two working lines, the control pressure at port X is depressurised to the tank and the motor swivels back to its maximum specific displacement  $V_{max}$ . The pressure level for control start must be defined when the order is placed.

The EH1P control also provides the option of pressure control side preselection via solenoid valve M2.

#### EH1P-CA:

Without control signal, the EH1P-CA control is set to maximum displacement  $V_{max}$ . The continuous control from  $V_{max}$  to  $V_{min}$  is hydraulically proportional in accordance with the pressure difference between control pressure port X and servo pressure supply at port Psp. In combination with the PPV200 with CA control, the motor swivels back to the minimum displacement  $V_{min}$  with increasing speed of the drive motor.

This control function is overlain by a pressure override: if the pressure exceeds a particular level in one of the two working lines, the motor swivels back to its maximum displacement  $V_{max}$ . The pressure level for control start must be defined when the order is placed.

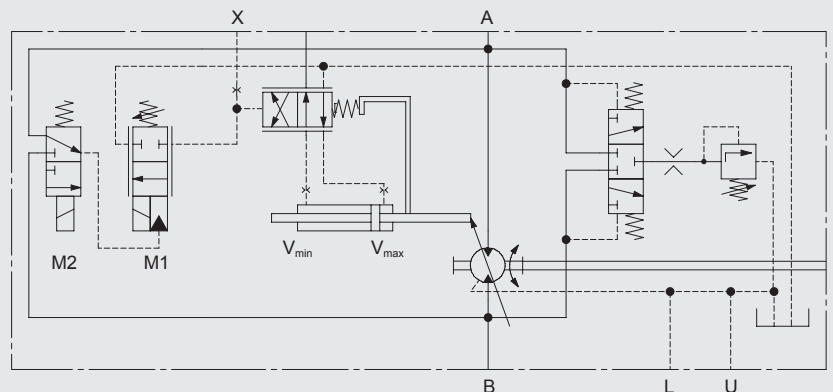
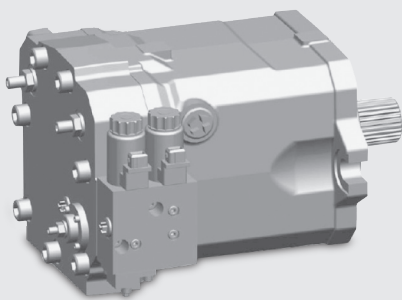
The EH1P-CA control also provides the option of pressure control side preselection via solenoid valve M2.

Characteristics of continuous control with superimposed control			
Hydraulic control X	Start of control	bar	EH1P: 7–9.5 EH1P-CA: 7.5
	Maximum permitted pressure		40
	Adjusting range		$\Delta p = 6$
Hydraulic closed-loop control	Start of pressure control	bar	190–260
	Adjustable, specify while ordering		
	End of pressure control		5 % above start of pressure control
Electrical override	$V_{max}$ switching and pressure control side selection (for technical data, see E2 control)		

#### Additional functions, integrated:

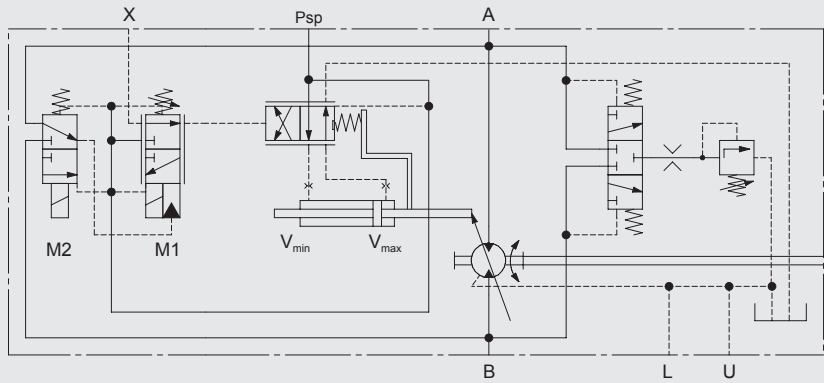
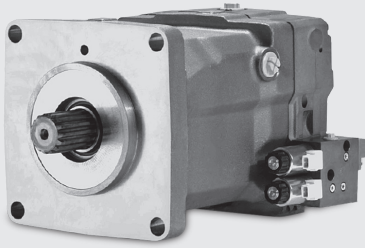
- Electrical  $V_{max}$  switching independent of control pressure for fixed displacement motor operation with electric master control function
- Electrical pressure control side selection

#### EH1P



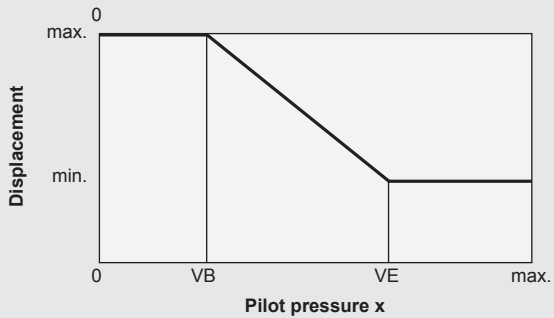
A, B	Work ports
L, U	Drain ports
X	Pilot pressure port
M1	Solenoid for maximum displacement override
M2	Solenoid for signal selection for pressure regulator
	Purge relief optional

# EH1P-CA

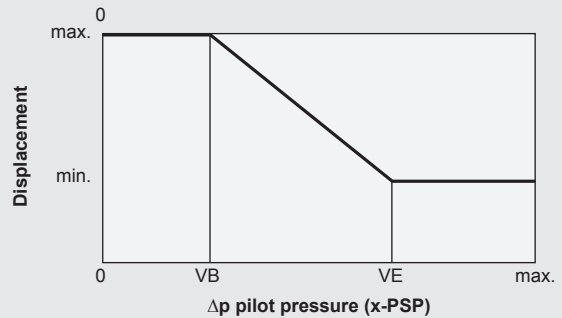


A, B	Work ports
L, U	Drain ports
X	Pilot pressure port
M1	Solenoid for maximum displacement override
M2	Solenoid for signal selection for pressure regulator
Psp	Pilot pressure port (charge pressure reduced)
	Purge relief optional

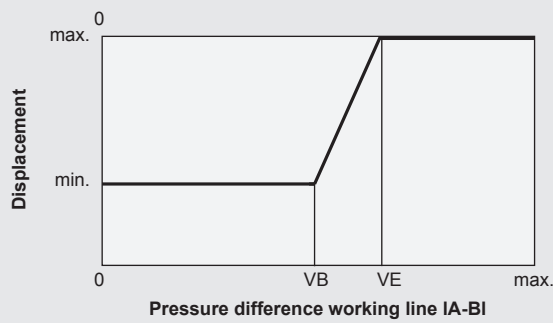
control characteristics EH1P



control characteristics EH1P - CA



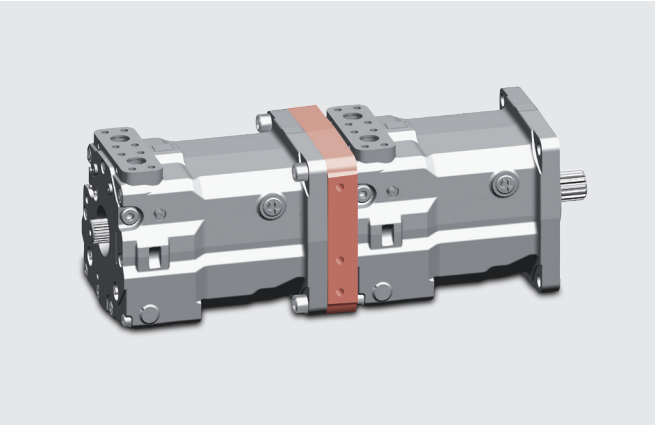
control characteristics EH1P and EH1P-CA



VB	Start of control
VE	End of control

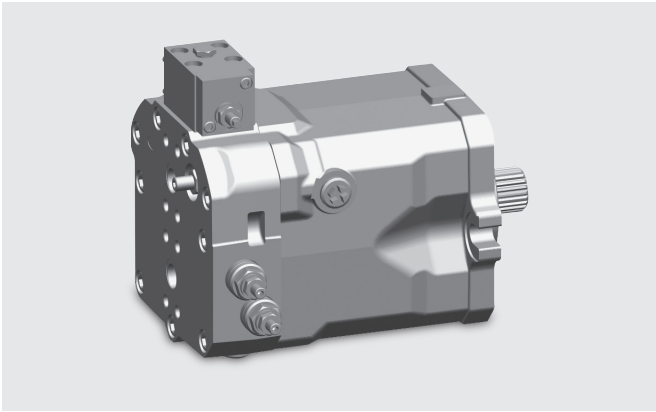
### 3.4.4 MPV200 T tandem motor

The tandem motor can be used for open and closed circuits. In both cases, it has separate ports for the working lines. Individual configurations can be applied to each motor stage.



#### Design features:

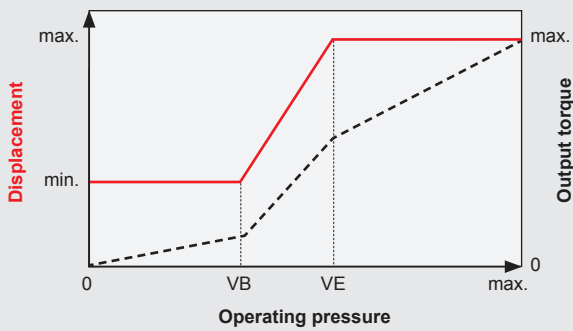
- Two MPVs, arranged face-to-back
- Available for MPV200-210 and -280
- Separate ports for high pressure, charge pressure
- Individual control
- Both motors can be swivelled to 0
- Same flange interface as individual motor



**Design features:**

- Optionally with purge relief valve for circuit and case flashing in closed loop circuit
- System pressure control, no external lines required
- Pressure control side selection for closed circuit
- Brake valve optional
- Optimised start-up and low-speed performance

**Characteristics of regulated motor**



RB	Start of pressure control
RE	End of pressure control
—	Displacement
-----	Output torque

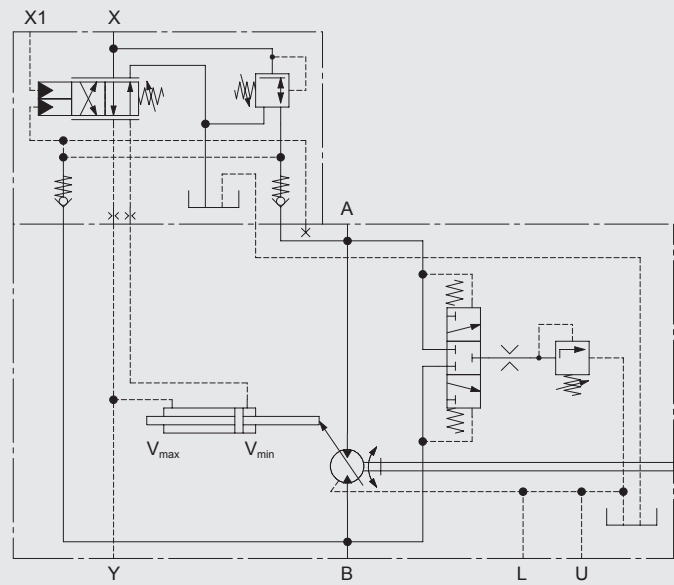
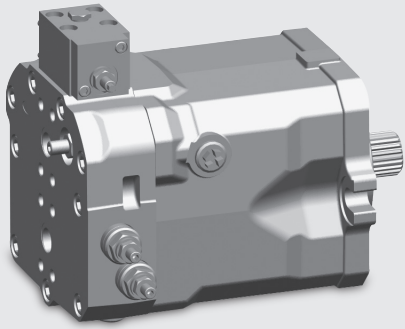
The MPR200 motor can be used for open and closed circuits. The regulating motor is controlled by high pressure in the working line. Below the regulation beginning point, the motor is set to the minimum specific displacement  $V_{min}$ . If this pressure level is exceeded, the motor swivels out and controls to a required torque as determined by the system. The following data apply regardless of the motor size.

Characteristics of regulating motor				
Hydraulic regulation	Regulation begin pressure Adjustable, please specify with the order	bar	150–290	
	Regulation end pressure		5 % above regulation begin pressure	
Hydraulic $V_{max}$ override control X1	Shift pressure min./max.	bar	20–30	
	Regulation end pressure		5 % above regulation begin pressure	
Electrical control signal	Regulation begin pressure	bar	150–260	
	Connector type		DIN EN 175301-803, Deutsch, AMP Junior Timer (2-pin, cod. 2)	
	Rated voltage = max. continuous voltage	V	12	24
	Type of voltage		DC voltage	
	Power input (cold performance)	W	≤ 26	
	Relative duty cycle	%	100	
	Protection class		IP54 (DIN), IP67 (Deutsch), IP6K6K (AMP)	

### 3.5.1 MPR200 with $V_{max}$ override control

The additional  $V_{max}$  control enables fixed displacement motor operation independent of the control pressure.

#### Regulated motor with hydraulic $V_{max}$ override control

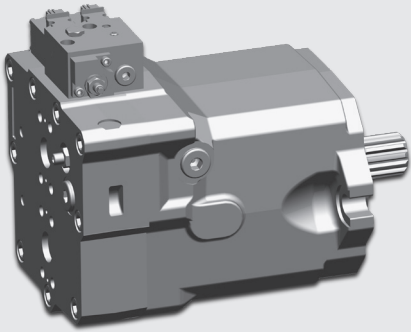


A, B	Work ports
L, U	Drain ports
X, X1, Y	Pilot pressure ports
	Purge relief optional

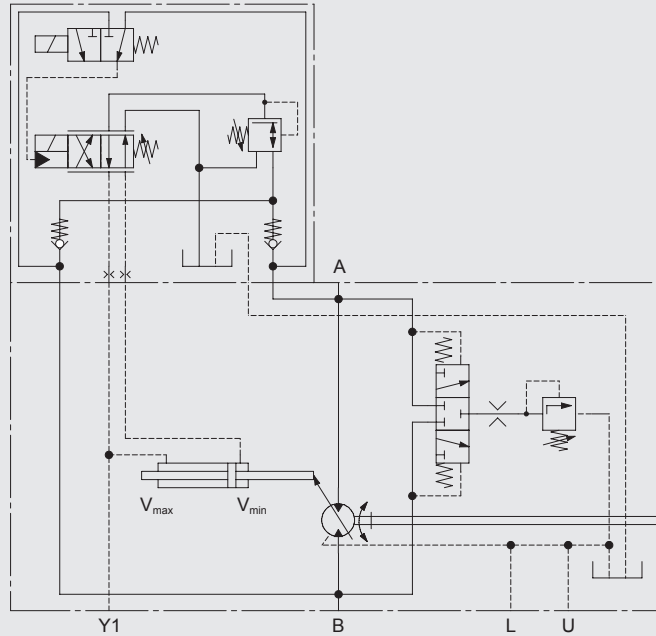
### 3.5.2 MPR200 pressure control side selection

Regulating motors generally swivel the transmission gear to the maximum displacement when operating pressure is high, regardless of which side this high pressure is on. In transmission drives this can result in unpleasant effects, such as an extremely severe braking effect being produced during the transition from driving on a level surface with low system pressure to coasting. Selecting the pressure control side prevents the controller from being exposed to the braking pressure, ensuring that only the driving pressure is switched to the pressure control and that the motor remains in minimum displacement.

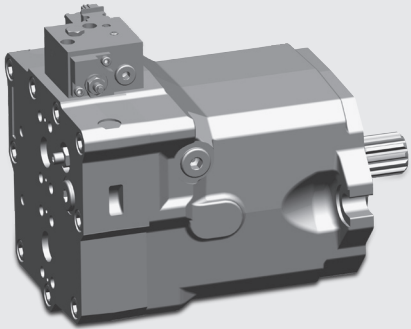
#### MPR200 with electrical $V_{max}$ override control and signal selection for pressure regulator



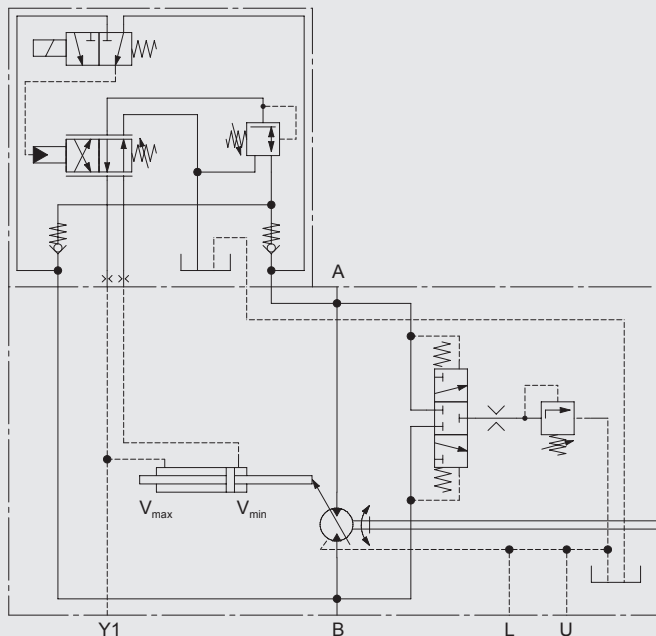
A, B	Work ports
L, U	Drain ports
Y1	Pilot pressure port
	Purge relief optional



#### MPR200 with electrical signal selection for pressure regulator



A, B	Work ports
L, U	Drain ports
Y1	Pilot pressure port
	Purge relief optional



# ACCESSORIES

## 4.1 Purge relief valve options

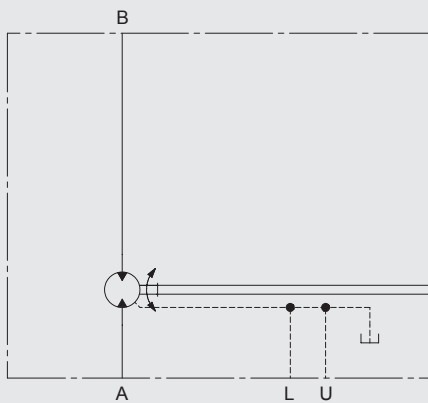
The purge relief valve option serves

- to reduce the temperature of the motor or the system in the closed circuit
- to exchange the oil in the closed circuit

### Purge flow in closed loop circuit

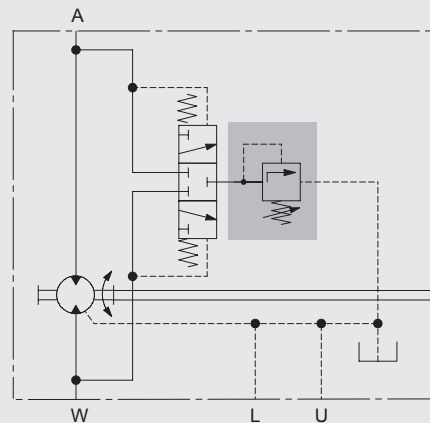
Version	Purge flow in closed circuit	Diagram	Purge flow	Diameter of orifice
Standard	10 bar	3	10 l/min with 20 bar low pressure	2.5 mm
Standard	14 bar	2	10 l/min with 20 bar low pressure	without orifice
Reduced	10 bar	3	5 l/min with 20 bar low pressure	2 mm
Reduced	14 bar	3	5 l/min with 20 bar low pressure	2.5 mm
Increased	10 bar	2	20 l/min with 20 bar low pressure	without orifice
Quantity-controlled	14 bar	4	6 l/min	No output

Purge valve 1. – without (0 l/min)



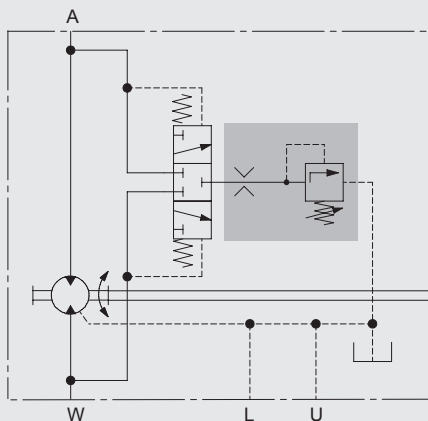
A, B Work ports  
L, U Drain ports

Purge valve 2. – standard and increased



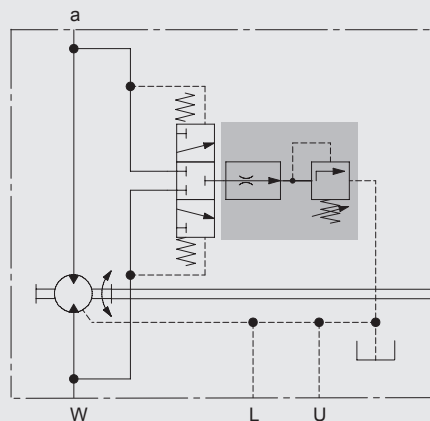
A, B Work ports  
L, U Drain ports

Purge valve 3. – restricted



A, B Work ports  
L, U Drain ports

Purge valve 4. – flow controlled

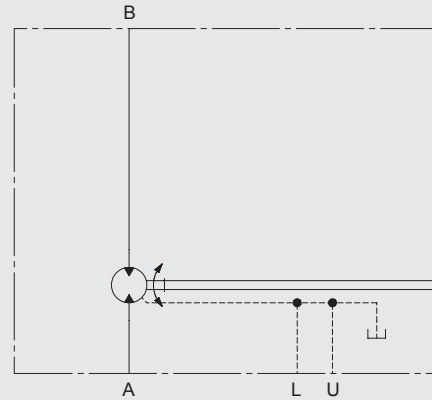


A, B Work ports  
L, U Drain ports

## 4.2 High pressure relief valve (only for MPF200 / MPR200)

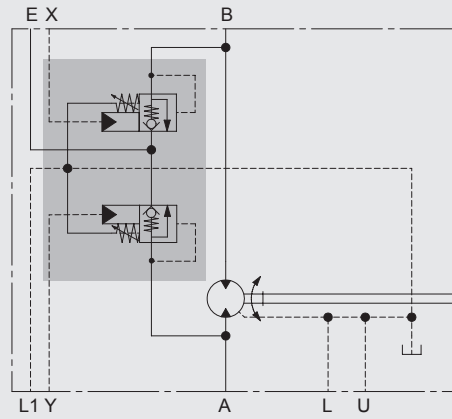
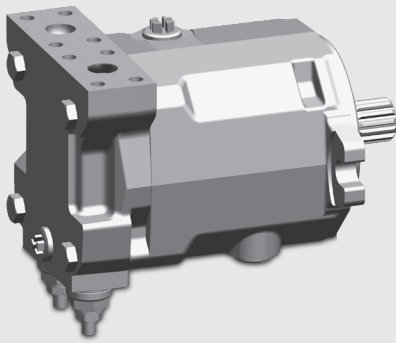
The high pressure relief valve protects the motor from pressure overload, where no other protection function is provided. A recharge function is also integrated. This prevents cavitation in the motor in the case of undesired motor overrun.

### Without high pressure relief valve



A, B	Work ports
L, U	Drain ports

### With high-switchable high pressure relief valve (MPF200)

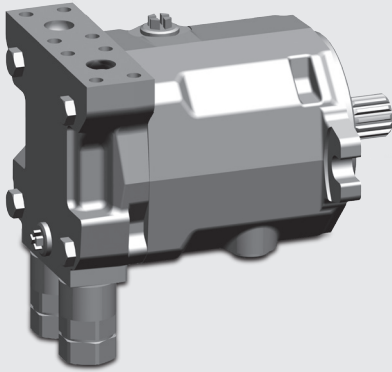


A, B	Work ports
L, L1, U	Drain ports
X, Y	Ports for applying control pressure
E	Port for recharging

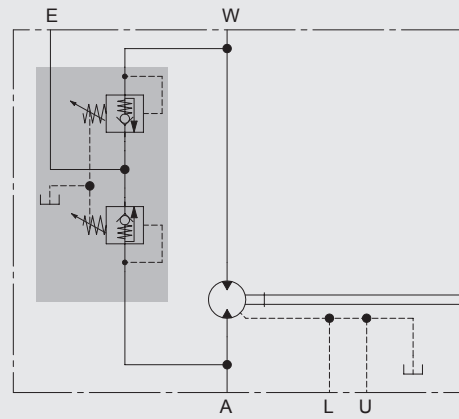
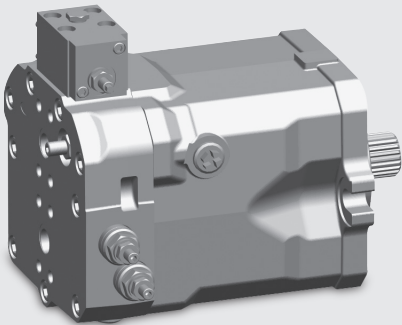


With fixed high pressure relief valve (MPF200 / MPR200)

MPF200



MPR200

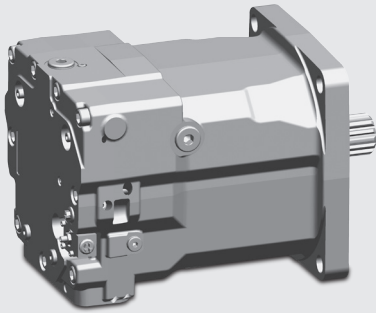


A, B	Work ports
L, U	Drain ports
E	Port for recharging

### 4.3 Speed sensor

Speed sensors detect the motor rotation speed electronically. The following illustrations are given as examples. Speed sensors provided by HYDAC can be used to detect the rotation speed and the direction of rotation.

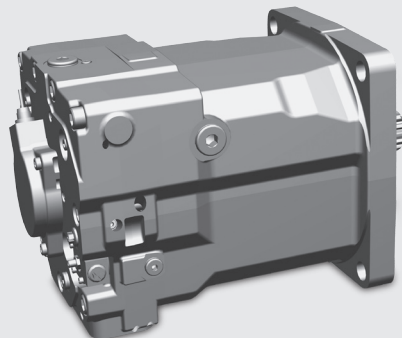
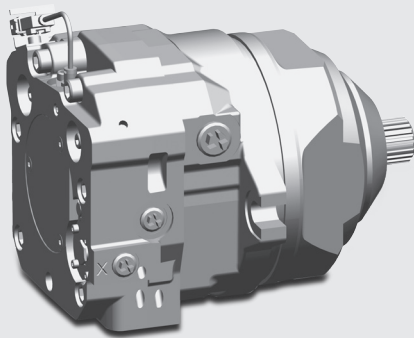
Without speed sensor



Pulse data

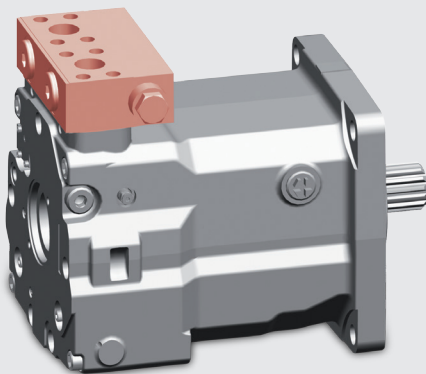
Operation voltage range UB	7 to 32 V	
Nominal voltage	15 V	
Amplitude of signal outputs:	High level	$\geq (+UB - 0.5 \text{ V})$
	Low level	$\leq +0.5 \text{ V}$
Operating temperature range	-32 °C to +140 °C	

With speed sensor for MPF200 / MPA200 / MPV200 / MPR200



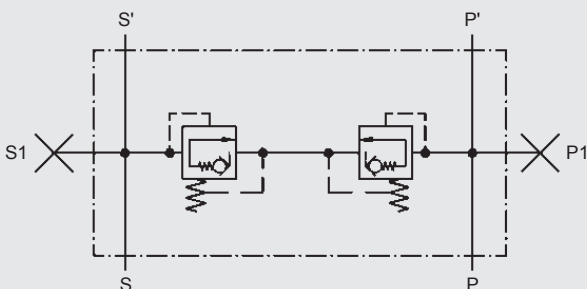
### 4.4 Cross over relief valve block

The Cross over relief valve block provides optional additional high-pressure protection for motors of the series MPA200 / MPV200 / MPR200. It is mounted on the radial high-pressure ports. In addition to the protection function, the block reduces the amount of connecting hoses required to attach a second motor, thanks to two branching ports.



#### Design features:

- Modular add-on functionality
- For radial ports
- For all MPA200 / MPV200 / MPR200  
Size 165–210 motors



# DIMENSIONS

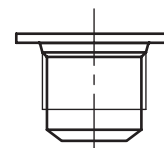
## 5.1 MPF200

Nominal size	28	35	55	63	75	85	105	135
D1 [mm]	101.6		127				152.4	
B1 [mm]	146		181				228.6	
B2 [mm]	162		200				250	
B3 [mm]	146			166				
B4 [mm]	149			169				
H1 [mm]	61	70	73	82	86			
H2 [mm]	61	70	73	82	86			
H3 [mm] Cross over relief valve	without	67	72	78	83	89		
	fixed setting	108	116	119	128	137		
	switchable	129	137	140	149	158		
H4 [mm]	69		79	83	88			
H5 [mm]	64	69	75	80	86			
L1 [mm]	41	56				75		
L2 [mm]	193	202	202.8	229	254	277		
L3 [mm]	191	200	200.8	227	252	275		
U1 [mm]	*							
U2 [mm]	*							
L, U	M22x1.5	M22x1.5	M22x1.5	M22x1.5	M22x1.5	M22x1.5	M22x1.5	M22x1.5
E Connection for anti-cavitation oil supply	M18x1.5	M18x1.5	M18x1.5	M22x1.5	M22x1.5	M22x1.5	M22x1.5	M22x1.5
A	See section 5.5 Connections							
B	See section 5.5 Connections							

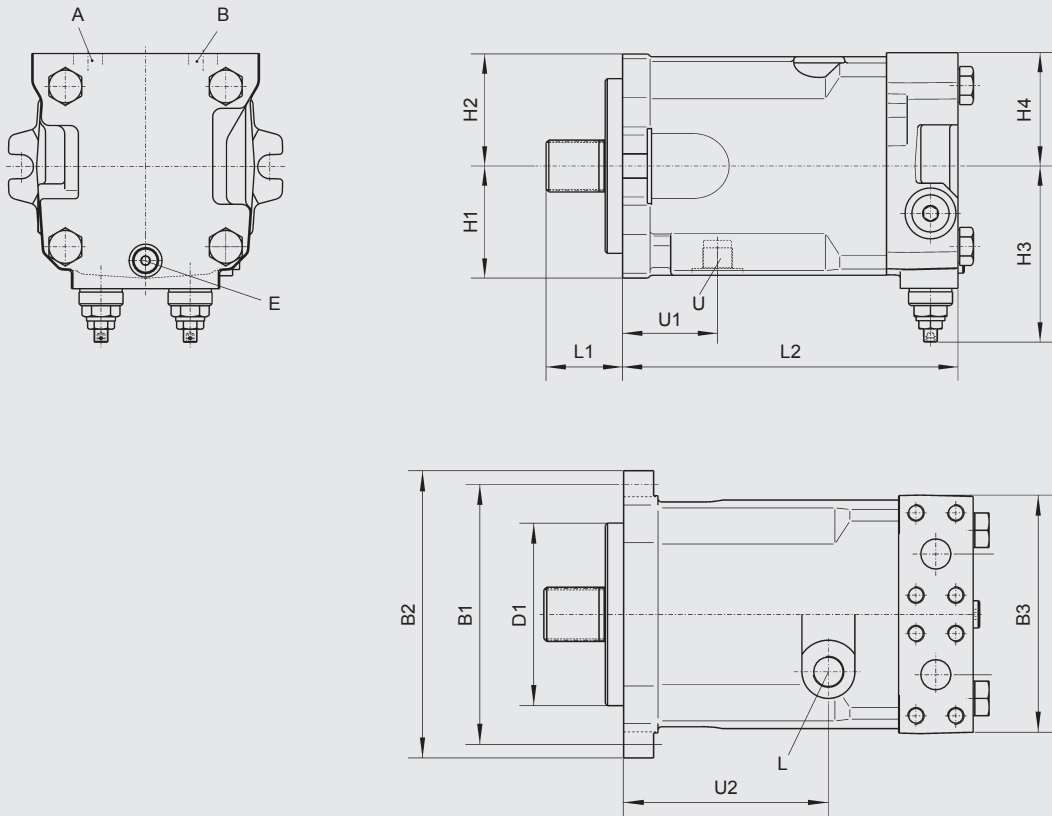
\* Dimensions on request

Threaded connection, metric in acc. with ISO 6149-1  
Fastening thread at the SAE high-pressure ports metric in acc. with ISO 261  
Cylinder head screws in acc. with ISO 4762  
Additional threads, dimensions and designs with speed sensor on request.  
Mounting flange to ISO 6162-2

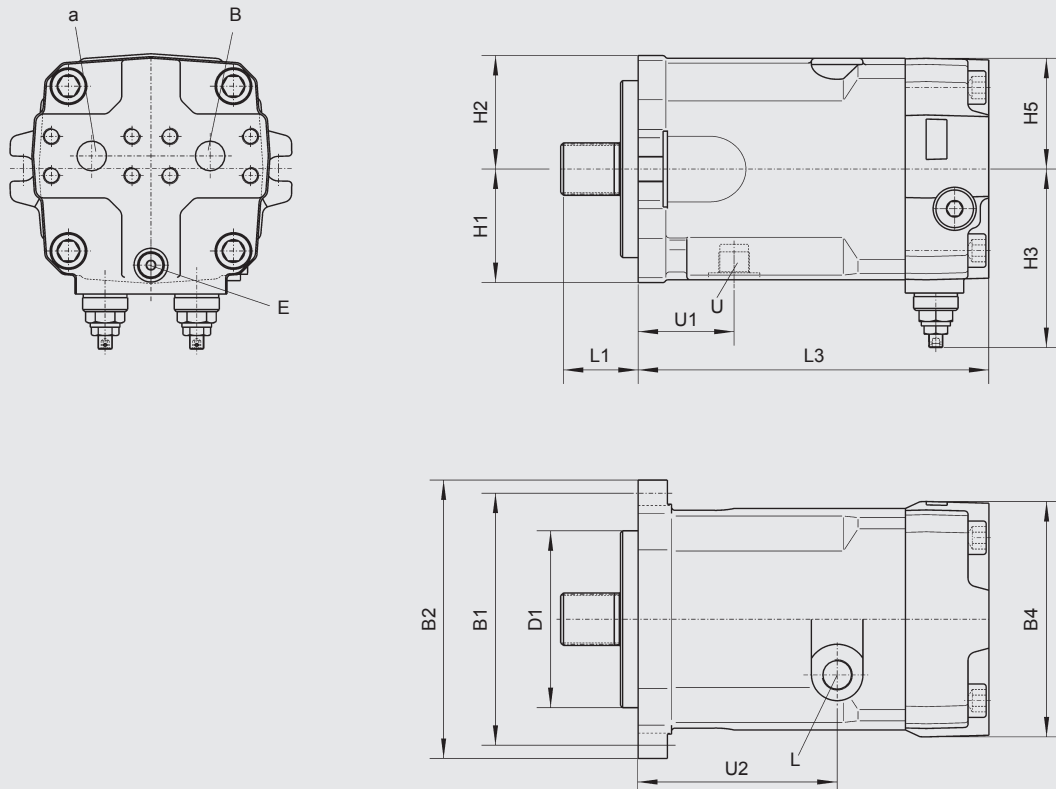
Threaded connection, metric in acc. with ISO 6149-1



## Radial high-pressure ports with high-pressure valves



## Axial high-pressure ports with high-pressure valves



## 5.2 MPA200

Nominal size	165	210	280
D1 [mm]	152.4	165.1	
B1 [mm]	228.6	224.5	
B2 [mm]	258	269	
B3 [mm]	250	268	
B4 [mm]	250	268	
H1 [mm]	98	135	
H2 [mm]	98	135	
H3 [mm]	120	134	151.5
H4 [mm]	132	133	152.5
H5 [mm]	132	133	-
L1 [mm]	75		
L2 [mm]	314	336	381
L3 [mm]	305	336	381
U1 [mm]	*		
U2 [mm]	*		
L, U	M27x2	M27x2	M33x2
A	See section 5.5 Connections		
B	See section 5.5 Connections		

\* Dimensions on request

Threaded connection, metric in acc. with ISO 6149-1

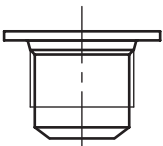
Fastening thread at the SAE high-pressure ports metric in acc. with ISO 261

Cylinder head screws in acc. with ISO 4762

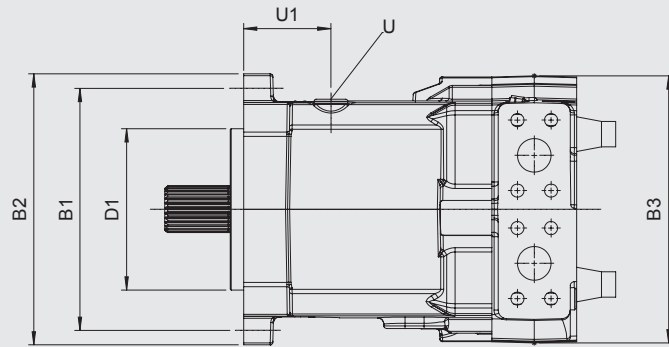
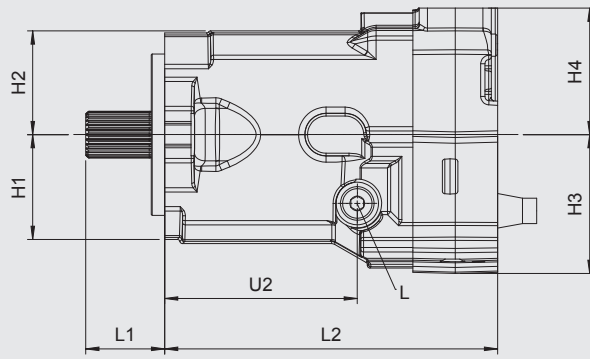
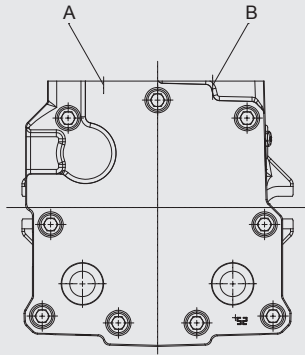
Additional threads, dimensions and designs with speed sensor on request.

Mounting flange to ISO 6162-2

Threaded connection, metric in acc. with ISO 6149-1



## Radial high-pressure ports



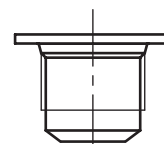
### 5.3 MPV200

Nominal size	55	75	105	135	165	210	280
<b>D1 [mm]</b>	127		152.4		165.1		
<b>B1 [mm]</b>	181		228.6		224.5		
<b>B2 [mm]</b>	208		258		269		
<b>B3 [mm]</b>	86	95	96	108	125	134	156
<b>B4 [mm]</b>	95		96	108	125	134	156
<b>B5 [mm]</b>	86	95	96	108	125	*	*
<b>B6 [mm]</b>	85	95	96	108	125	*	*
<b>B7 [mm]</b> With electric override control	–	180	181	193	210	*	*
<b>B8 [mm]</b> With electric override control	–	180	181	193	210	*	*
<b>H1 [mm]</b>	80	86	91	98	98	135	
<b>H2 [mm]</b>	83	93	99	103	98	135	
<b>H3 [mm]</b>	84	93	95	108	120	134	151.5
<b>H4 [mm]</b>	90	105	106	114	132	133	152.5
<b>H5 [mm]</b>	84	93	96	107	118	*	*
<b>H6 [mm]</b>	90	105		114	132	*	*
<b>H7 [mm]</b> With electric override control	–	88		102.5		*	*
<b>H8 [mm]</b> With electric override control	–	92		77.5		*	*
<b>L1 [mm]</b>	41	56		75			
<b>L2 [mm]</b>	212	226	247	270	314	336	381
<b>L3 [mm] control</b>	Hydraulic	33			5	5	8
	Electrical	75			58	55	59
<b>L4 [mm]</b>	217	231	252	275	305	*	*
<b>L5 [mm] control</b>	Hydraulic	18			5	*	*
	Electrical	70			58	*	*
<b>L6 [mm]</b> With electric override control	–	33		32.5		*	*
<b>L7 [mm]</b> With electric override control	–	28		32.5		*	*
<b>L8 [mm]</b> With electric override control	–	80		80.5		*	*
<b>U1 [mm]</b>	*						
<b>U2 [mm]</b>	*						
<b>L, U</b>	M22x1.5			M27x2		M33x2	
<b>E</b> Port for external servo pressure supply	M14x1.5						
<b>X</b> Port for hydraulic control	M14x1.5						
<b>M, M1</b> Solenoid for electrical control	See section 3.4 MPV200						
<b>M2</b> Solenoids for signal selection for pressure regulator	See section 3.4 MPV200						
<b>A</b>	See section 5.5 Connections						
<b>B</b>	See section 5.5 Connections						

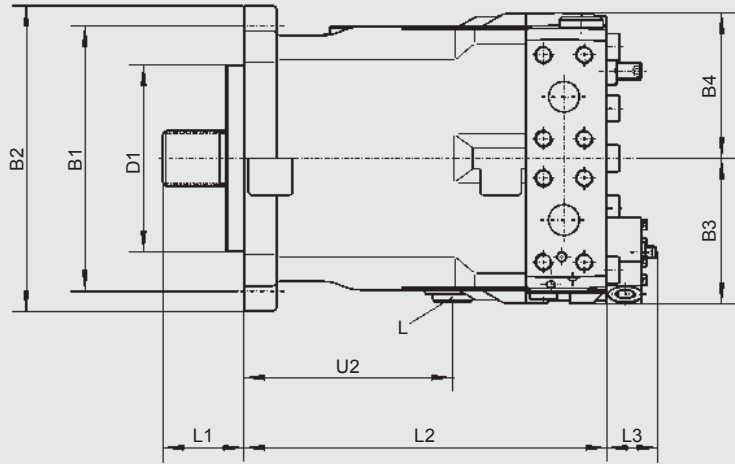
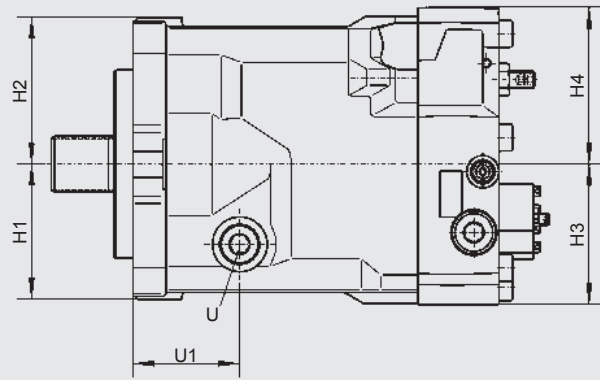
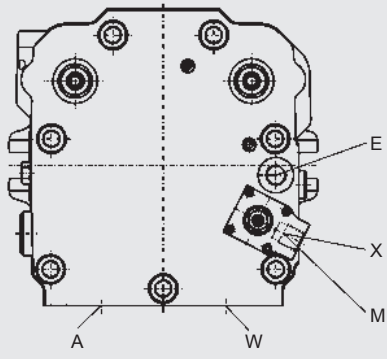
\* Product version/dimensions on request

Threaded connection metric in acc. with ISO 6149-1.  
Fastening thread at the SAE high-pressure ports metric in acc. with ISO 261.  
Cylinder head screws in acc. with ISO 4762.  
Additional threads, dimensions and designs with speed sensor on request.  
Mounting flange to ISO 6162-2.

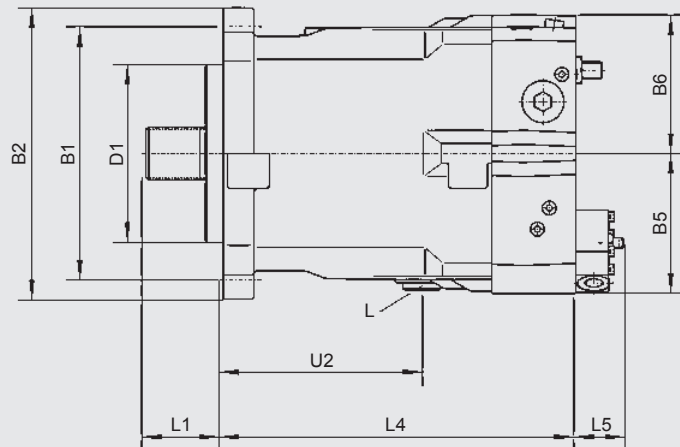
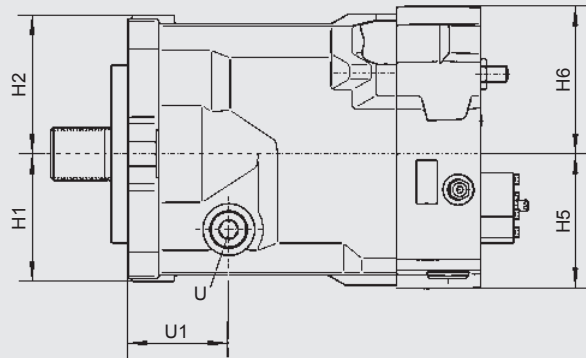
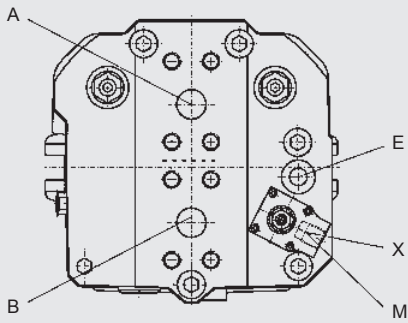
Threaded connection, metric  
in acc. with ISO 6149-1



### Radial high-pressure ports

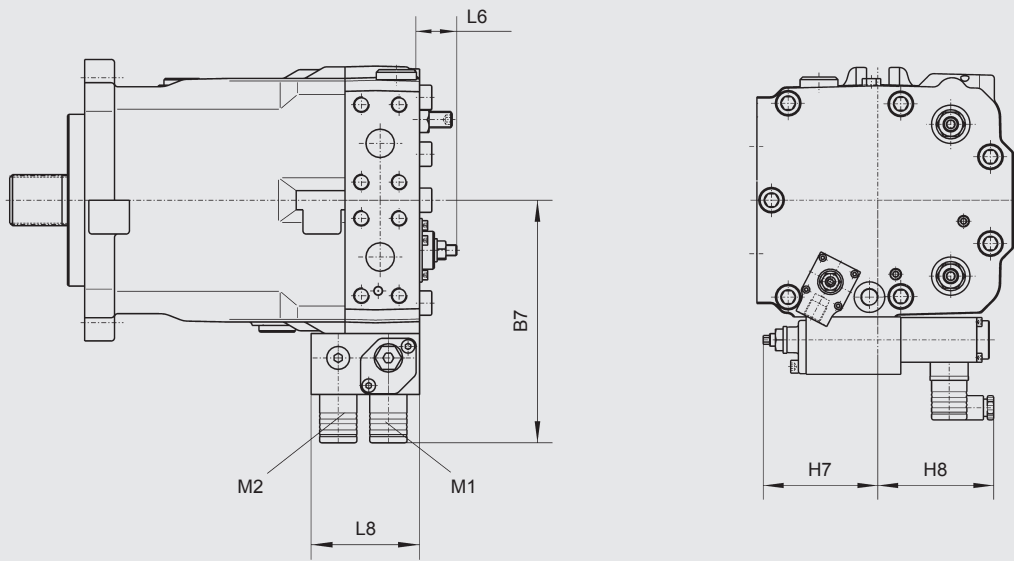


### Axial high-pressure ports

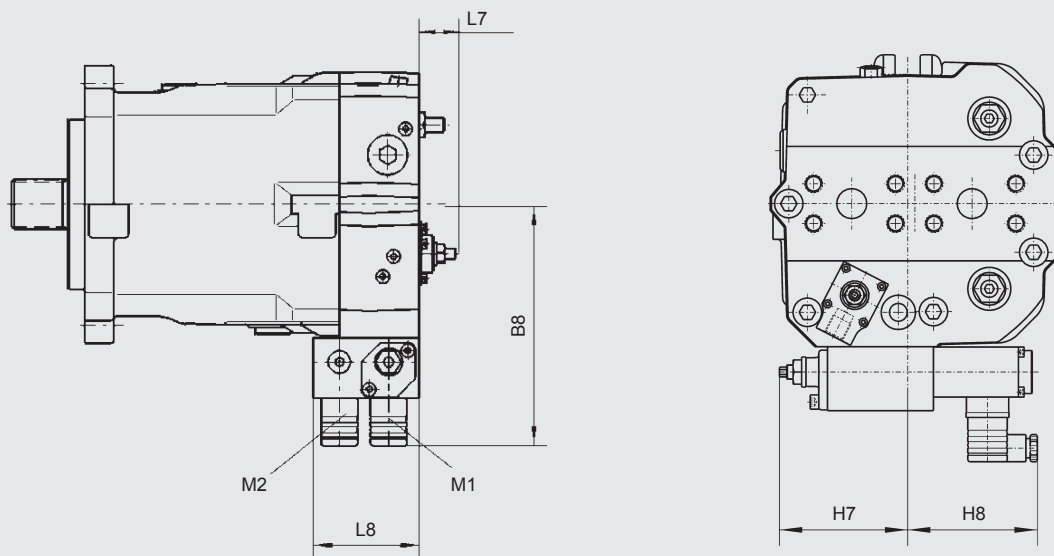




### EH1P with pressure override – radial high-pressure ports



### EH1P with pressure override – axial high-pressure ports



## 5.4 MPR200

Nominal size		75	105	135	165	210	280
<b>D1 [mm]</b>		127		152.4		165.1	*
<b>B1 [mm]</b>		181		228.6		224.5	*
<b>B2 [mm]</b>		208		256		269	*
<b>B3 [mm]</b> Secondary relief valve	without	95	99	108	–	134	*
	with	135	136	140	–	134	*
<b>B4 [mm]</b> Secondary relief valve	without	95	105	108	–	134	*
	with	12	105	114	–	134	*
<b>B5 [mm]</b> Secondary relief valve	without	95	99	108		*	*
	with	135	139	141	148	*	*
<b>B6 [mm]</b>		102	105	114	125	*	*
<b>B7 [mm]</b>		62			46	*	*
<b>B8 [mm]</b>		78				*	*
<b>B9 [mm]</b>		103				108	*
<b>H1 [mm]</b>		86	91	96	98	135.5	*
<b>H2 [mm]</b>		93	99	100	105	135.5	*
<b>H3 [mm]</b>		93	98	108	–	134	*
<b>H4 [mm]</b>		102		110	–	133.5	*
<b>H5 [mm]</b>		56					*
<b>H6 [mm]</b>		91	96	107	118	134	*
<b>H7 [mm]</b>		102	107	109	125	133.5	*
<b>H8 [mm]</b>		81					*
<b>L1 [mm]</b>		56		75			*
<b>L2 [mm]</b>		229	247	270	–	336	*
<b>L3 [mm]</b>		231	252	275	304	–	*
<b>L4 [mm]</b>		53					*
<b>L5 [mm]</b> regulator with electric max. displacement override and signal selection for pressure regulator		80					*
<b>U1 [mm]</b>						*	
<b>U2 [mm]</b>						*	
<b>L, U</b>		M22x1.5			M27x2		*
<b>X1</b> Port for hydraulic and pneumatic max. displacement override		M14x1.5					*
<b>M1</b> Solenoid for electric max. displacement override		See section 3.5 MPR200					
<b>M2</b> solenoid for signal selection for pressure regulator		See section 3.5 MPR200					
<b>A</b>		See section 5.5 Connections					
<b>B</b>		See section 5.5 Connections					

\* Product version/dimensions on request

Threaded connection metric in acc. with ISO 6149-1.

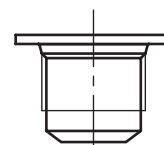
Fastening thread at the SAE high-pressure ports metric in acc. with ISO 261.

Cylinder head screws in acc. with ISO 4762.

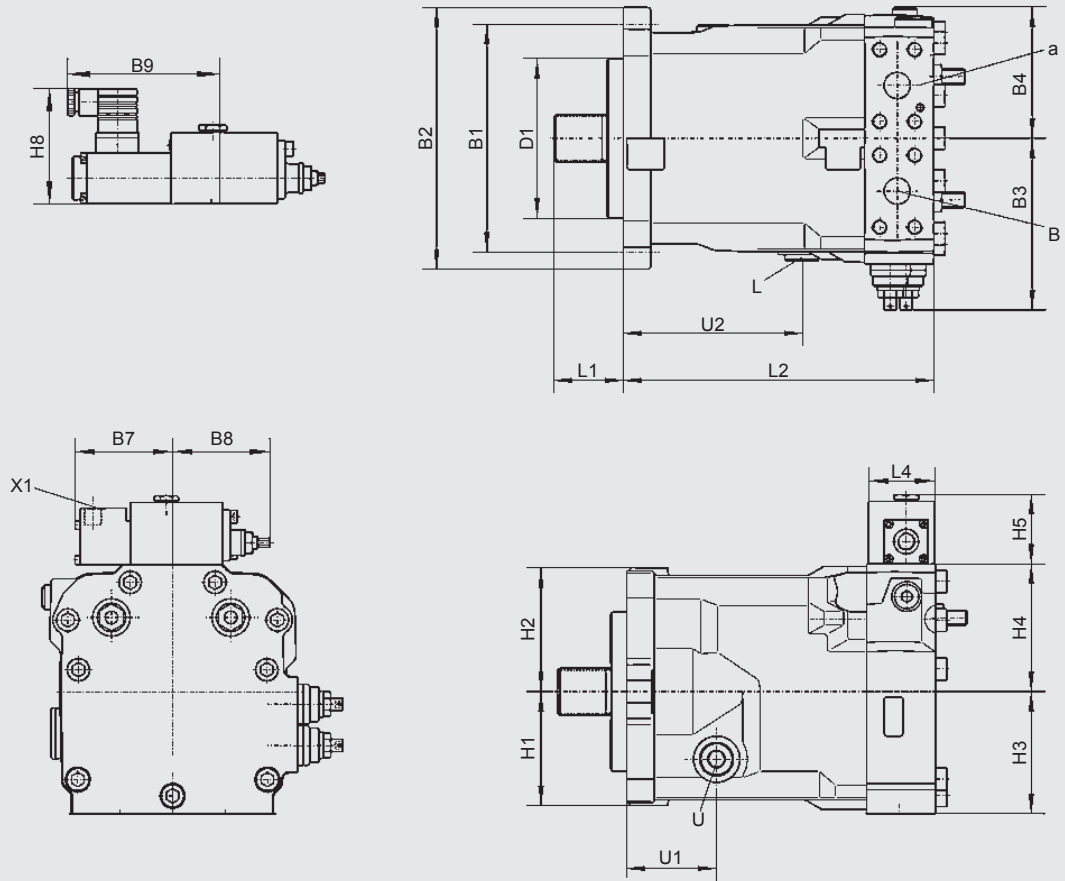
Additional threads, dimensions and designs with speed sensor on request.

Mounting flange to ISO 6162-2.

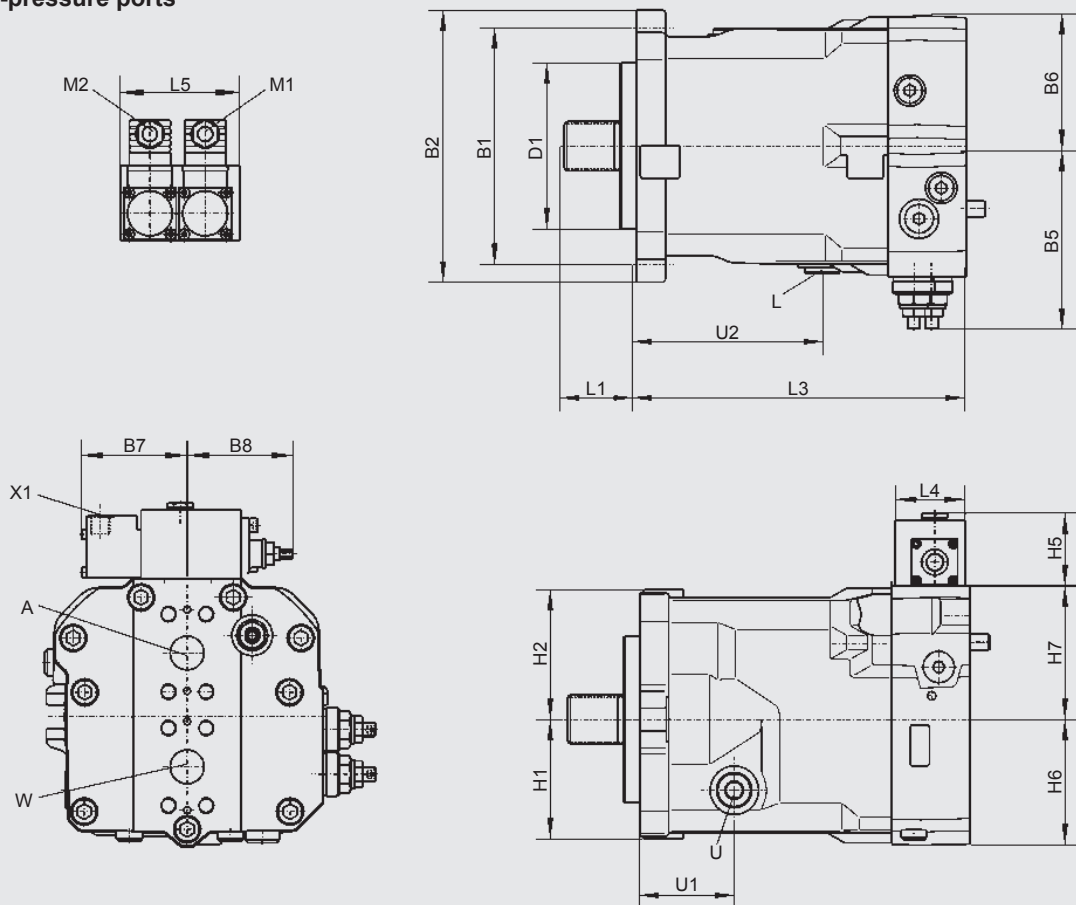
Threaded connection, metric  
in acc. with ISO 6149-1



### Radial high-pressure ports

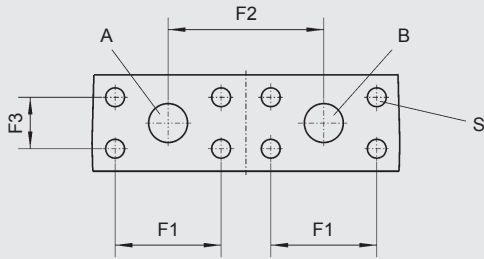


### Axial high-pressure ports



## 5.5 Connections

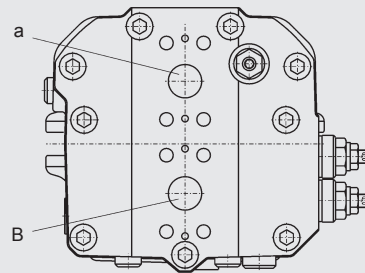
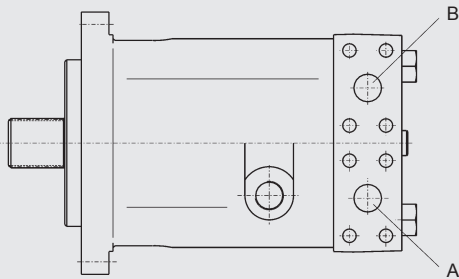
### Operating ports A and B



Size of motors	28/35	55	63	75	85	105	135	165	210	280
F1 [mm]	50.8			57.2			66.6		79.3	
F2 [mm]	74			84			102		116	
F3 [mm]	23.8			27.8			31.8		36.5	
A, B	¾"			1"			1¼"		1½"	
S	M10			M12			M14		M16	

### Flow direction

### High-pressure ports



The shaft's drive rotation direction	Clockwise	Anti-clockwise
	B A	B A
Series		
MPV200	B	A
MPV200 [E6]	A	B
MPR200	B	A
MPA200		
MPF200	A	B

NOTES

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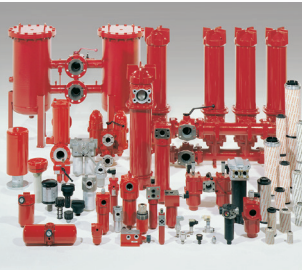
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Accumulator Technology 30.000



Filter Technology 70.000



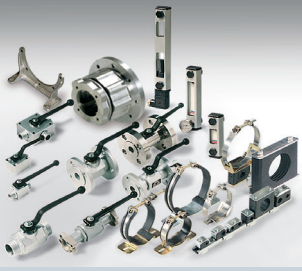
Process Technology 77.000



Filter Systems 79.000



Compact Hydraulics 53.000



Accessories 61.000






Electronics 180.000



Cooling Systems 57.000

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