MANNESMANN REXROTH

Brueninghaus Hydromatik

Variable displacement pump A4VB

Series 3, closed circuit and prefill operating
axial piston-swashplate design

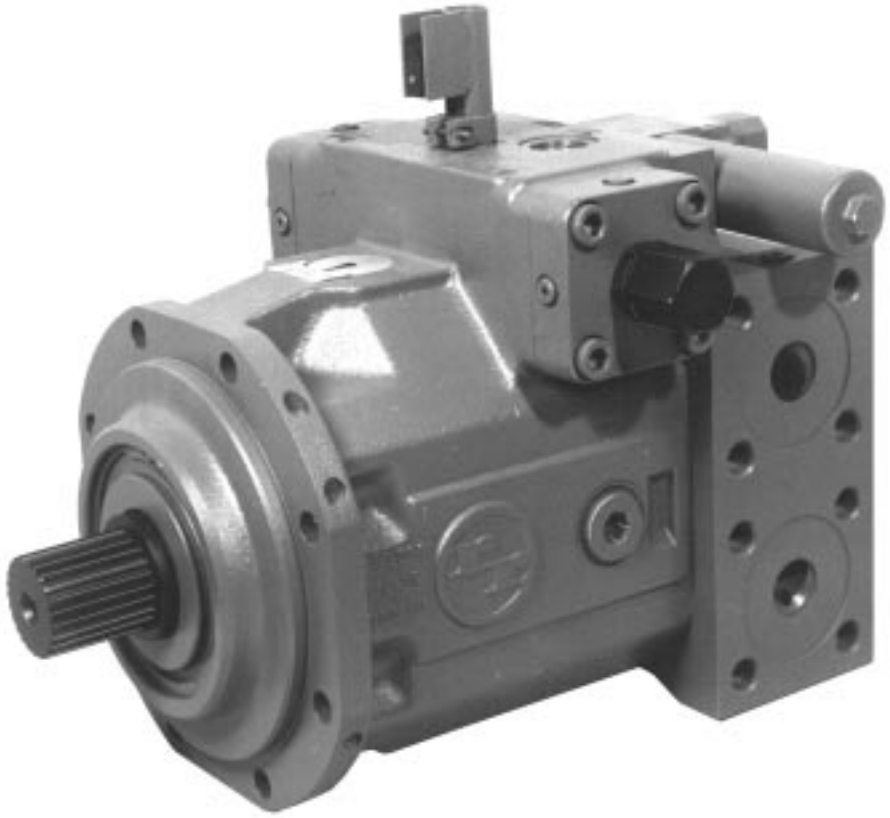
sizes 225...450 | nominal pressure 420 bar peak pressure 450 bar

RE 92120/06.97

Replaces 12.95

High pressure range

for the discription of control-devices see separate sheet RE 92076



Description

Axial piston variable displacement pump A4VB of swashplate design is designed for closed circuit and open circuit with prefill. Flow is proportional to input speed and displacement, and is infinitely variable by adjustment of the swashplate

Range of applications

– Test stands
– Flight simulators
– Presses
– Heavy industry

Special characteristics

– Slot-controlled swashplate design
– Infinitely variable displacement
– Reversible flow (closed circuit)
– Permissible nominal operating pressure 420 bar
– Low noise level
– Long service life
– Drive shaft capable of absorbing axial and radial loads
– High power/weight ratio
– Modular design
– Short control times
– Swivel angle indicator
– Higher housing pressure with mechanical seal possible
– Internal flushing for housing and bearing

Variable displacement pump A4VB, series 3

Ordering code

A4VB				/	30		–		R	H	10		

Hydraulic fluid / version

Mineral oil (no code)	

Axial piston unit

Swash plate design, variable, industrial applications	

Operational mode

Pump, closed circuit	**G**
Pump, prefill operating	**V**

Size

Displacement $V_{g\,max}$ (cm^3)	**225**	**450** (in preparation)

Control devices

Hydraulic control, with servo valve	**HS**
Hydraulic control, with servo proportional valve*	**HS3**
Hydraulic control, without servo valve (HS) or without servo proportional valve (HS3) with flushing plate	**HSE**
Hydraulic control, volume dependent	**HM2**

Series

	30

Direction of rotation

Viewed on shaft end	clockwise	**R**
	anti-clockwise	**L**

Seals

FPM-seals + mechanical shaft seal	**L**
FPM-seals + FPM-shaft seal ring	**V**

Shaft end

Splined DIN 5480 spline run out groove	**R**

Mounting flange

ISO 8-hole	**H**

Service line connections

Port A, B; at the side (same side), metric bolt holes	**10**

Through drive

Without auxiliary pump, without through drive	**N00**
With through drive for boost pump (in preparation)	

Filtration

Without filter	**N**
Sandwich plate filter (for HS-control see RE 92076)	**Z**

*in conjunction with a pressure transducer pressure- and power control is possible

Hydraulic fluid

Mineral oils
For extensive information on the selection of hydraulic fluids and application conditions, please consult our data sheet RE 90220 (mineral oils).

Operating viscosity range
In order to obtain optimum efficiency and service life, we recommend that the operating viscosity (at operating temperature) be selected in the range

ν_{opt} = optimum operating viscosity 16...36 mm²/s

referred to tank temperature (open circuit).

Limits of viscosity range
For critical operating conditions the following values apply:

ν_{min} = 10 mm²/s
for short periods at max. permissible leakage oil temperature of 90° C.

ν_{max} = 1000 mm²/s for short periods upon cold start.

Temperature range
t_{min} = – 25° C
t_{max} = + 90° C

Filtration of hydraulic fluid (axial piston unit)
In order to ensure correct functioning of the unit, a minimum level of cleanliness
9 to NAS 1638
6 to SAE
18/15 to ISO/DIS 4406 is required.

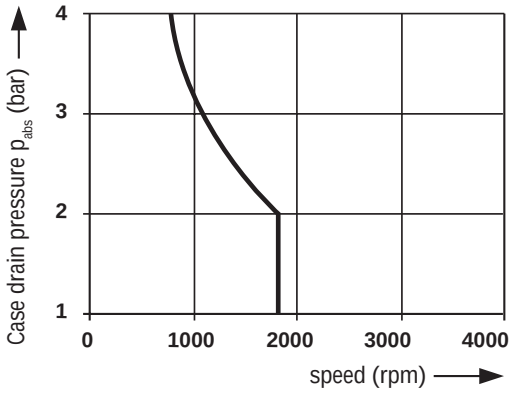
Technical Data (Suitable for operation on mineral oil)

Operating Pressure Range - Outlet Side
Pressure at port B
Nominal pressure p_N ____ 420 bar
Peak pressure p_{max} ____ 450 bar
(Pressure data to DIN 24312)

Precharge operation: Prefill pressure ____ p_e = 16...30 bar
(at n = 1800 rpm p_e = 20 bar)

Closed circuit operation: Boost pressure ____ p_e = 16...30 bar
Flow ____ 20 % $q_{v\,max}$
(at n = 1800 rpm p_e min. 20 bar)

Case drain pressure
The permissible case drain pressure (housing pressure) depends on the drive speed (see diagram)



Max. case drain pressure with FPM-shaft seal ring (housing pressure)
$p_{L\,max}$ ____ 4 bar abs.
When using mechanical seals, the case drain pressure is completely independent of the speed. It is limited by the strength of the housing at:
p_{max} ____ 6 bar abs.

Installation notes

Installation position:
Horizontal. The pump casing must be filled with fluid during commissioning and remain full when operating.

Prefill A4VB Operating mode V
Prefill pressure 16...30 bar

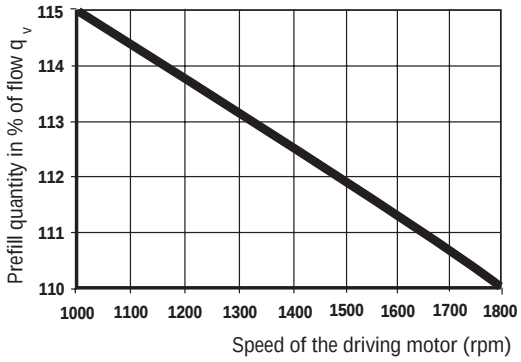
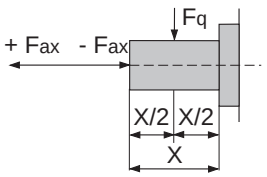


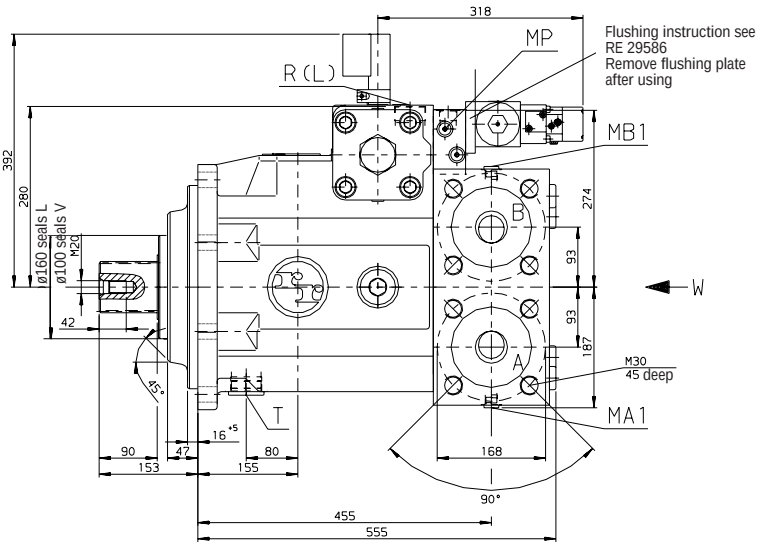
Table of Values (theoretical values, without considering η_{mh} and η_v; values rounded off)

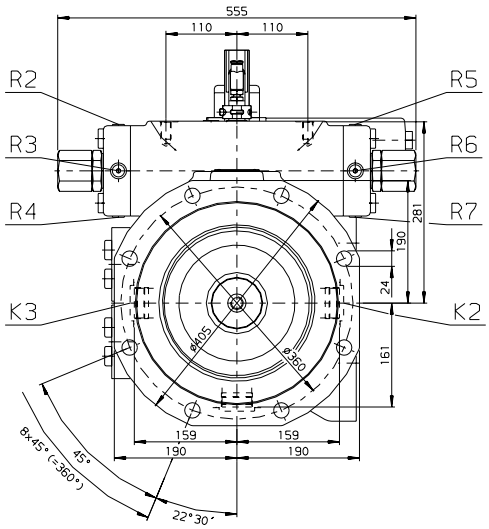
Size				450
Displacement		$V_{g\,max}$	cm³	456
Max. speed		n_{max}	min⁻¹	1800
Max. flow	at n_{max}	$q_{v\,max}$	L/min	821
Max. power (Δp = 420 bar)	at n_{max}	P_{max}	kW	574
Max. torque (Δp = 420 bar)	at $V_{g\,max}$	T_{max}	Nm	3044
Torque (Δp = 100 bar)	at $V_{g\,max}$	T	Nm	725
Moment of inertia about drive axis		J	kgm²	0,3325
Case volume			L	21
Weight approx.		m	kg	420
Max. axial force at housing pressure p_{max} 1 bar abs.		$\pm F_{ax\,max}$	N	2000
Max. radial force		$F_{q\,max}$	N	2500

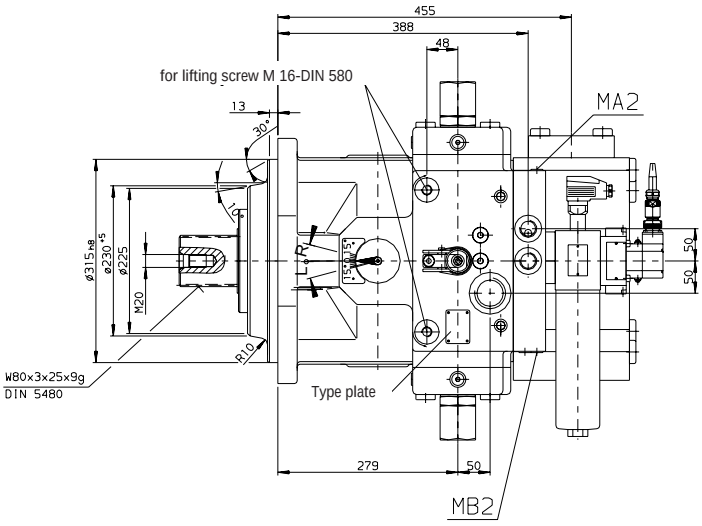
Application of force



Unit dimensions size 450 with sandwich plate filter for pilot oil circuit

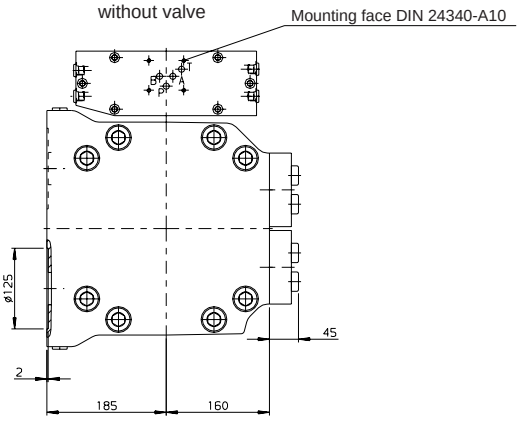






View W

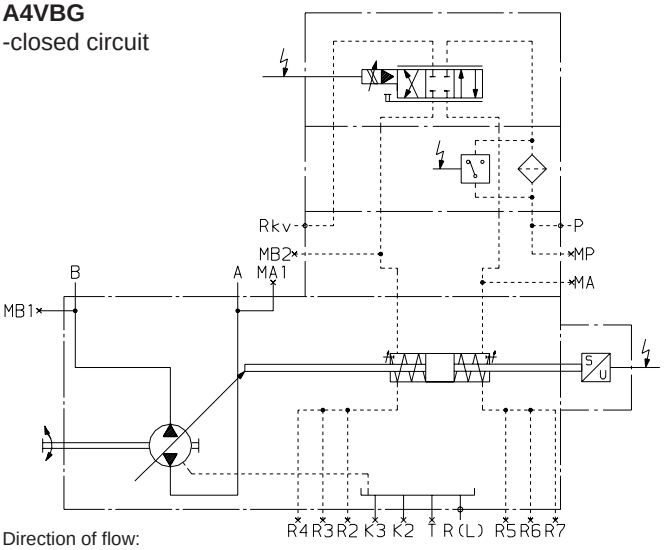
without valve



Service line connections

B	=	pressure port ISO/DIS 6164-3(DN-50)	(450 bar)
A at A4VBG	=	pressure port ISO/DIS 6164-3(DN-50)	(450 bar)
A at A4VBV	=	boost pressure port ISO/DIS 6164-3(DN-50)	
K2, K3	=	flushing port	(M48x2)
MA1, MB1	=	Gauge port, operating pressure	(DIN 3852 – W M18x1,5)
MA2, MB2, MP	=	Gauge port, control oil pressure	(M14x1,5)
P	=	control oil pressure port	(M27x2)
R (L)	=	oil fill + air bleed port	(M48x2)
Rkv	=	control oil flow return	(M27x2)
R2-R7	=	air bleed control	(M14x1,5)
T	=	tank	(M48x2)

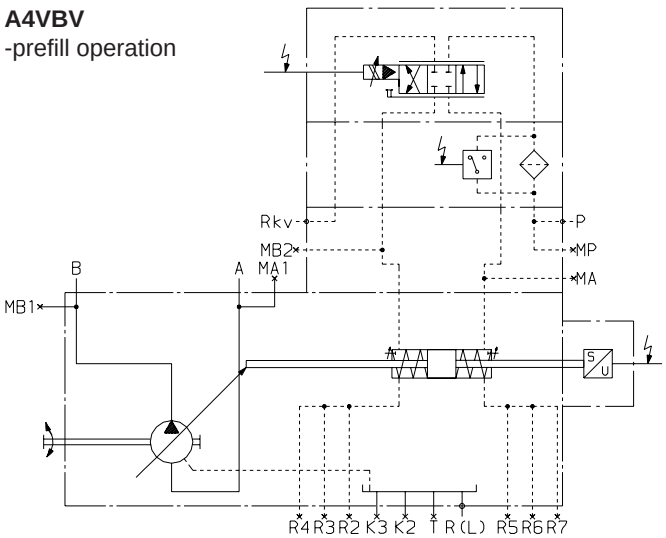
A4VBG
-closed circuit



Direction of flow:
clockwise rotation and left swivel direction: port B
counter-clockwise rotation and right swivel direction: port B

clockwise rotation and right swivel direction: port A
counter-clockwise rotation and left swivel direction: port A

A4VBV
-prefill operation



Direction of flow:
clockwise rotation and left swivel direction: port B
counter-clockwise rotation and right swivel direction: port B