Variable Displacement Mannesmann Rexroth A4VTG Pump

A4VTG90HW/32R-NLD10F001S-S (2023675)
for Drum Drives on Mobile Concrete Mixers Series 3, axial piston swash plate design

Nominal pressure 400 bar Peak pressure 450 bar

Table of values

Size					71	90
Displacement	Variable pump		$V_{g\,max}$	cm^3	71	90
	auxilary pump		$V_{g\,H}$	cm^3	18,7	25,7
Speed	max. speed at $V_{g\,max}$		$n_{maxcontinuous}$	rpm	3300	3050
	limited max. speed		$n_{max\,limited}$	rpm	3600	3300
	intermittent max. speed		$n_{maxintermittend}$	rpm	4100	3800
	minimum speed		n_{min}	rpm	500	500
Flow	at $n_{max\,Dauer}$ and $V_{g\,max}$		Q_{max}	L/min	234	275
Power	at $n_{max\,Dauer}$	p = 400 bar	P_{max}	kW	156	183
Torque	at $V_{g\,max}$	p = 400 bar	T_{max}	Nm	451	572
(Variable pump without aux. pump)		p = 100 bar	T	Nm	112,8	143
Moment of inertia (about drive axis)			J	kgm^2	0,0072	0,0106

MANNESMANN REXROTH

A4VTG Variable Displacement Pump

for Drum Drives on Mobile Concrete Mixers
Series 3, axial piston swashplate design

www.hydpump.com

Size 71...90 | Nominal pressure 400 bar | Peak pressure 450 bar

Technical Data

Operating pressure range – outlet

Variable displacement pump:
Pressure at ports A, B
Nominal pressure p_N 400 bar
Peak pressure p_{max} 450 bar

Auxiliary pump:
Peak pressure $p_{H\ max}$ 40 bar

Operating pressure range – inlet (auxiliary pump):

Suction pressure $p_{s\ min}$ (30 mm²/s) 0,8 bar abs.
at cold start 0,5 bar abs.

(Pressure data to DIN 24312)

Case drain pressure

Permissible case drain pressure at ports T_1 or T_2
p_L 2 bar abs.
short term (at start) 3 bar abs.

Fluid

We request that before starting a project detailed information about the choice of pressure fluids and application conditions are taken from out catalogue sheets RE 90220 (mineral oil), RE 90221 (environmentally acceptable hydraulic fluids) and RE 90223 (fire resistance fluids, HF).

Operating viscosity range

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

$_{opt}$ = Operating Viscosity 16...36 mm²/s

referred to the closed loop temperature.

Viscosity limits

The limiting values for viscosity are as follows:

$_{min}$ = 5 mm²/s, short term at a max. permissible temp. of t_{max} = 115 C.

Please note that the max. fluid temperature of 115 C is not exceeded in certain areas (for instance bearing area).

$_{max}$ = 1600 mm²/s, short term on cold start (t_{min} = -40 C).

At temperatures of -25 C up to -40 C special measures may be required for certain installation positions. Please contact us for further information.

Filtration

The finer the filtration the better the achieved purity grade of the pressure fluid and the longer the life of the axial piston unit. To ensure the functioning of the axial piston unit a minimum purity grade of:

9 to NAS 15, 38
6 to SAE, ASTM, AIA
18/15 to ISO/DIS 4406 is necessary.

In this case we recommend, depending on system and application

filter element 20 ... 30 100

for the A4VTG. With the rising differential pressure at the filter element the -value must **not** decrease.

At very high temperatures of the hydraulic fluid (90 C to max. 115 C) at least cleanless class

8 to NAS 1638
5 to SAE, ASTM, AIA
17/14 to ISO/DIS 4406 is necessary.

If above mentioned grades cannot be maintained please consult supplier.

Standard: Filtration in the suction line of the auxiliary pump, S

Filter type: Filter **without** bypass
Recommendation: **with** contamination indicator

Resistance to flow at the filter element:
at = 30 mm²/s, n = n_{max} p 0,1 bar
at = 1000 mm²/s, n = 1000 rpm p 0,3 bar

Pressure at port S of the auxiliary pump:
at = 30 mm²/s p 0,8 bar
at cold start p 0,5 bar

Table of values (Theoretical values, not considering $_{mh}$ and $_{v}$; values rounded)

Size					71	90
Displacement	Variable pump		$V_{g\ max}$	cm³	71	90
	auxilary pump		$V_{g\ H}$	cm³	18,7	25,7
Speed	max. speed at $V_{g\ max}$		$n_{max\ continuous}$	rpm	3300	3050
	limited max. speed [1])		$n_{max\ limited}$	rpm	3600	3300
	intermittent max. speed [2])		$n_{max\ intermittend}$	rpm	4100	3800
	minimum speed		n_{min}	rpm	500	500
Flow	at $n_{max\ Dauer}$ and $V_{g\ max}$		Q_{max}	L/min	234	275
Power	at $n_{max\ Dauer}$	p = 400 bar	P_{max}	kW	156	183
Torque	at $V_{g\ max}$	p = 400 bar	T_{max}	Nm	451	572
(Variable pump without aux. pump)		p = 100 bar	T	Nm	112,8	143
Moment of inertia (about drive axis)			J	kgm²	0,0072	0,0106
Weight (standard model without through drive)		approx.	m	kg		

[1]) limited max. speed: – at half corner power (e.g. at $V_{g\ max}$ and p_N /2)

[2]) intermittent max speed: – at high idling speed – during engine overspeed: p = 70 ... 150 bar and $V_{g\ max}$
– with reversing heads: p < 300 bar and t < 5 sek.

Ordering Code

A4VT	G	90	HW	/	3	2	R	–	N	L	D	10	F00	1	S

Axial piston pump

Swashplate design, variable displacement for drum drives on mobile concrete mixers	A4VT

Operation

Pump, closed circuit	G

Size

≙ Displacement $V_{g\,max}$ in cm³	71	90

Control device

		71	90	
Hydraulic control, mechanical servo	HW	○	○	HW
Electrical control, with proportional solenoid	12V	○	○	EP1
	24V	○	○	EP2

Series

	3

Index

	2

Direction of rotation

viewed on shaft end	clockwise	R
	anti-clockwise	L

Seals

NBR (nitril-caoutchouc)	P
NBR, shaft seal in FPM (fluor caoutchouc)	N

Shaft end

Splined shaft SAE, without coupling flange	S
with coupling flange	L

Mounting flange

SAE C, 4-hole	D

Service ports

Port A/B SAE, (metric fixing screws), at side (same side)	10

Auxiliary pump and through drive

auxiliary pump	through drive: splined hub	through drive: flange	
○	–	–	F00
○	SAE A (5/8" - 9T 16/32 DP)	SAE A, 2-hole	F01
○	SAE B (7/8" - 13T 16/32 DP)	SAE B, 2-hole	F02

Valves

with high pressure relief valve, pilot controlled (fixed setting 420 bar) with bypass	1

Filtration

Filtration in the suction line of the auxiliary (boost) pump	S

● ○

Installation position

Optional. The housing must be filled prior to commissioning, and must remain full whenever it is operating. For extensive information on the installation position, please read our data sheet RE 90270.

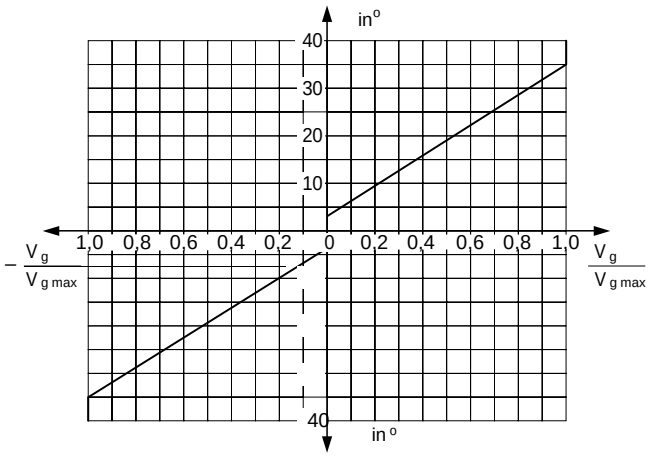
Temperature range of the radial seal rings

The following radial seal rings are to be used in relation of the housing temperature:

-40 C ... -25 C NBR radial seal ring necessary (P);
-25 C ... +90 C NBR radial seal ring standard (P),
FPM radial seal ring possible (N);
+90 C ... +115 C FPM radial seal ring necessary (N).

HW Hydraulic control, mechanical servo

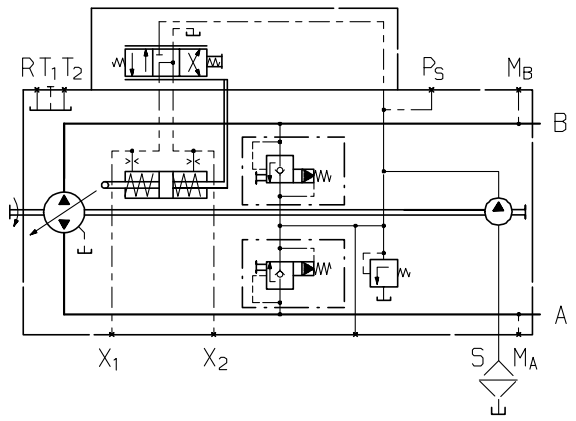
The positioning cylinder of the pump and therefore the swivel angle is varied in proportion to the movement of the control lever. The pump control is steplessly variable.
Each direction of flow is assigned to one direction of lever movement.



Swivel angle of control lever for swivel from 0 to $V_{g\,max}$:
= 0 to 35 , mechanical stop at

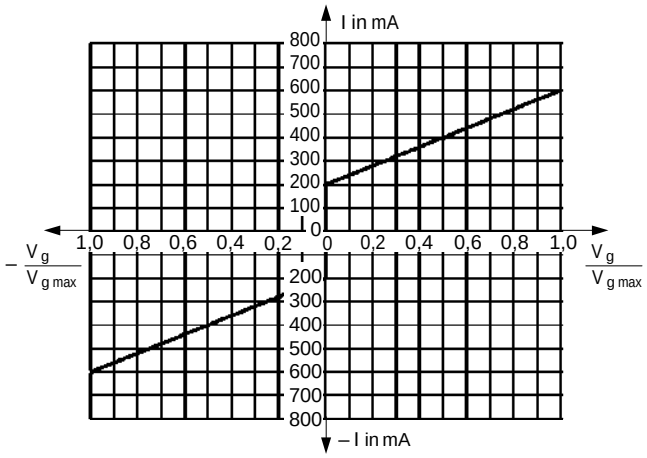
Torque necessary at control lever is between 85 and 210 Ncm

Dependant from the operation conditions of the pump (operation pressure, oil temperature) changes of the curve can occur.



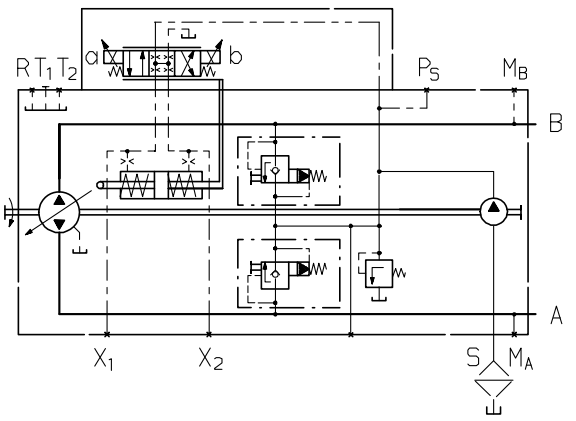
EP Electrical control, with proportional solenoids

In relation to the preselected current, control pressure is applied to the positioning cylinder of the pump via two proportional solenoids on control device EP. The displacement of the pump is thus steplessly variable. One solenoid is assigned to each direction of flow.

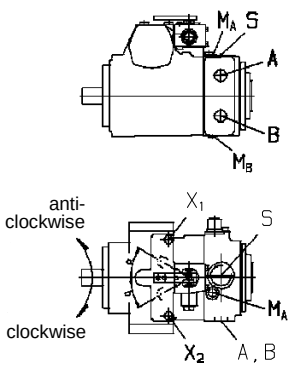


EP2: Control current I = 200 – 600 mA
(24V DC proportional solenoids)

EP1: Control current I = 400 – 1200 mA
(12V DC proportional solenoids)

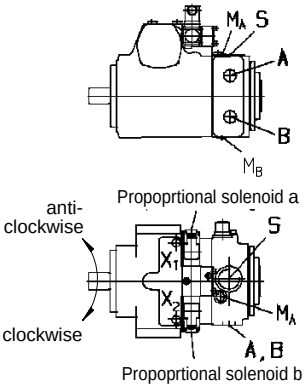


For control of the proportional solenoids are available:
Chopper amplifier **CV** _____ (see RE 95029),
proportional amplifiers **PVR**, **PVRS** _____ (see RE 95022)
electronic control for reversing drives **RVR** _____ (see RE 95031)
constant speed drive **CSD** _____ (see RE 95075)



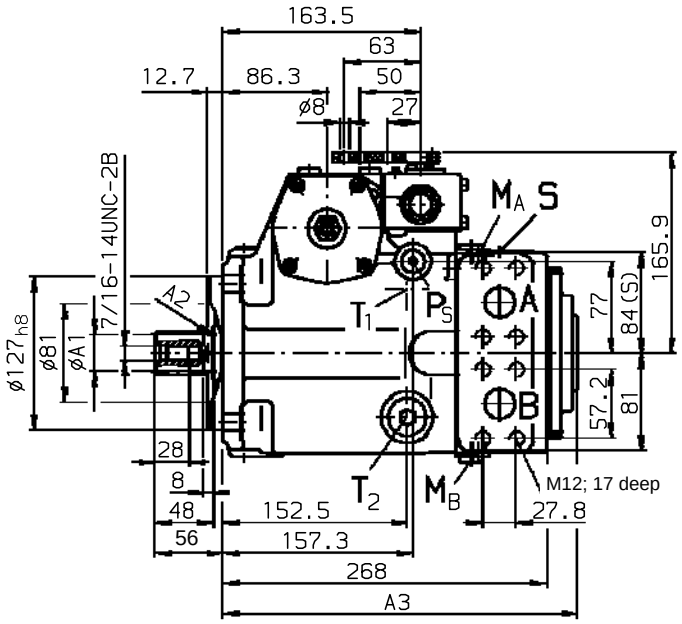
Graph Direction of rotation - Control - Direction of through flow

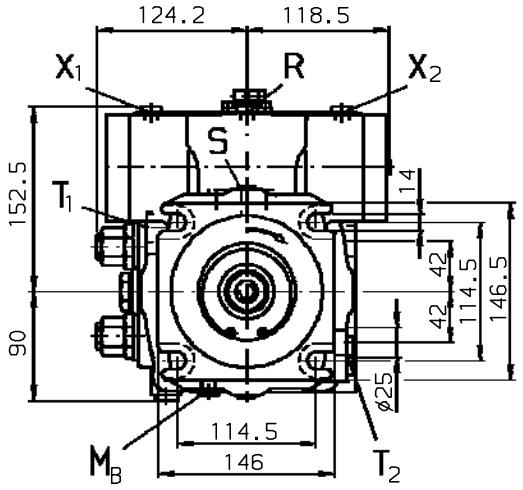
Direction of rotation	clockwise		anti-clockwise	
Lever direction (HW)	a	b	a	b
Solenoid (EP)	b	a	b	a
Control pressure	X_2	X_1	X_2	X_1
Direction of flow	A to B	B to A	B to A	A to B
Operating pressure	M_B	M_A	M_A	M_B

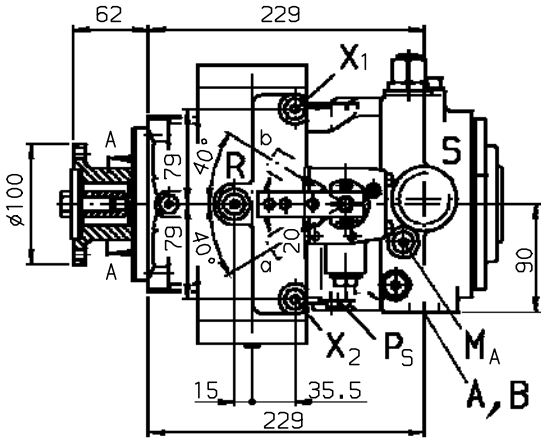


Unit Dimensions Size 71, 90

Hydraulic control, mechanical servo, HW



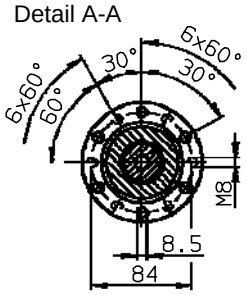




Shaft end L

Splined shaft SAE $1\frac{3}{8}$" **(Size 71)**
Splined shaft SAE $1\frac{1}{2}$" **(Size 90)**
with coupling flange

Detail A-A



Shaft end S

Splined shaft SAE $1\frac{3}{8}$" **(Size71)**
30 pressure angle,
21 tooth, 12/24 Pitch,
Flat root side fit,
Tolerance Class 5
ANSI B92.1a-1976

Splined shaft SAE $1\frac{1}{2}$" **(Size 90)**
30 pressure angle,
23 tooth, 12/24 Pitch,
Flat root side fit,
Tolerance Class 5
ANSI B92.1a-1976

Size	øA1	A2	A3
71	30,2	R1,6	294,4
90	33,4	R2,5	298,9

The port plate of the A4VTG can be turned 180 , when ordering please state in clear text:

"Suction port S to be located above (below)"

Connections

A,B	High pressure ports SAE 1" 420 bar (6000 psi) (high pressure series)	
T_1	Case drain or filling point	M 26x1,5; 16 deep
T_2	Case drain or filling point	M 26x1,5; 16 deep
M_A	Pressure gauge – op. pressure A	M 12x1,5; 12 deep
M_B	Pressure gauge – op. pressure B	M 12x1,5; 12 deep
R	Air bleed	M 16x1,5; 12 deep
S	Boost suction line	M 42x2; 18 deep
X_1, X_2	Control pressure ports (before the orifice)	M 12x1,5; 12 deep
P_S	Control pressure supply (size 71)	M 14x1,5; 12 deep
	Control pressure supply (size 90)	M 18x1,5; 12 deep

Electrical control, with proportional solenoid, EP1, EP2