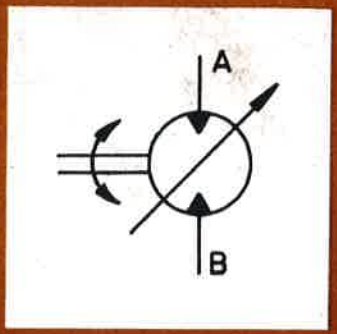
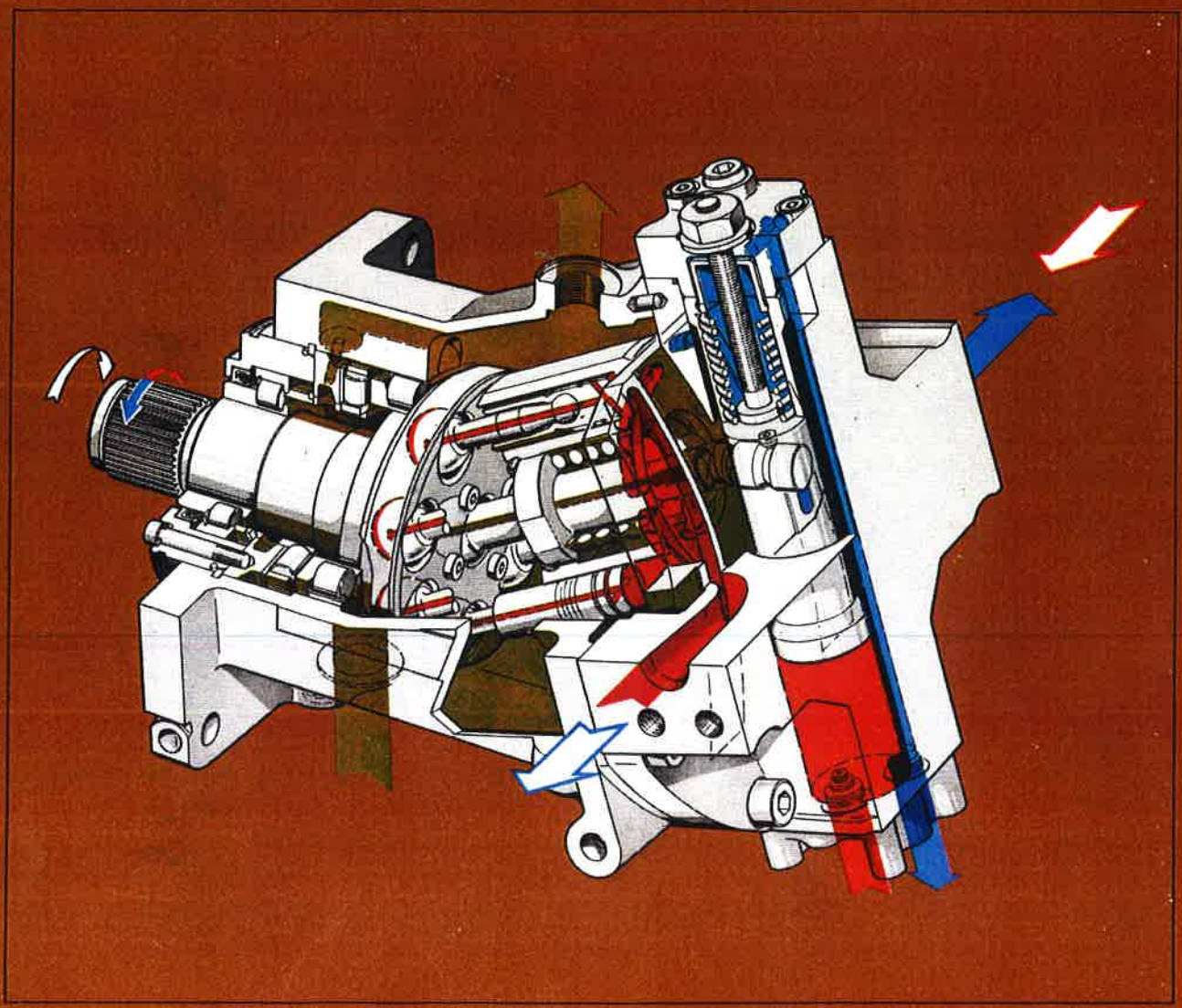
Linde

BMV

(B = B series)
(MV = variable motor)



VARIABLE MOTOR for open and closed circuit



Order code

B	M			TF
Series	Motor	**V** = pilot pressure controlled (low pressure) **R** = system pressure regulated (high pressure)	Nominal size (cm³/rev) (max. displacement) **50,75,105, 140,186,260**	Bent axis motor with SAE flange ports

Basic order information

- minimum displacement
- size

Additional information for BMR

- regulation starting at . . bar (see controls)

Description

The BMV/BMR motor displacement can be set to maximum or minimum displacement by changing the head tilt angle.

For equal pressure and input flow the

✳ **maximum** displacement provides high output torque at low speed

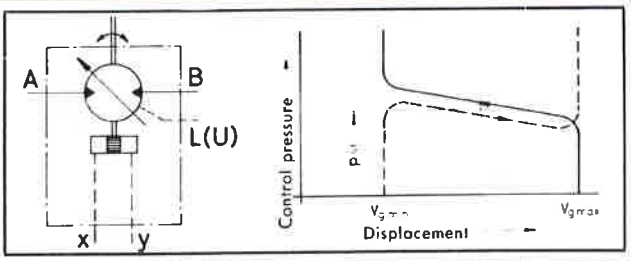
✳ **minimum** displacement provides low output torque at high speed.

Controls

1. Two step motor (BMV, flip-flop) ✳

Smooth change under load from maximum to minimum displacement and vice-versa.

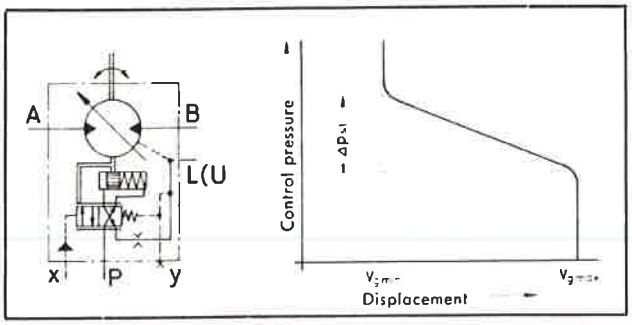
Control pressure $p_{st} \approx 15$ bar; control by 4/2 valve



2. Stepless motor (BMV, remote controlled) ✳

Head tilt angle progressively changed between maximum and minimum displacement by means of pilot pressure.

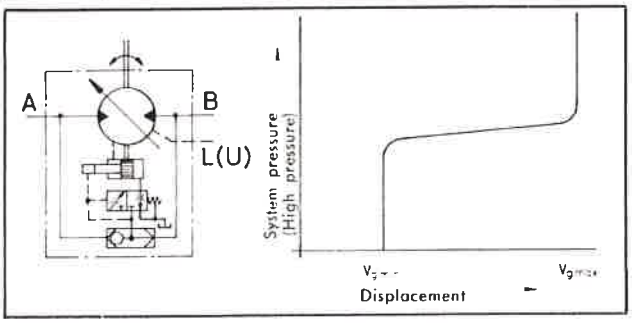
Control pressure range $\triangle p_{st}$ = 8 to 15 bar pilot valve operated



3. High pressure regulated motor

Automatic smooth change from minimum to maximum displacement and vice-versa at prescribed system pressure (to be stated when ordering)

Regulation begin range 140 . . . 250 bar



✳ New: Optionally with or without purge valve!

Linde AG
Werksgruppe Güldner
Aschaffenburg

Special technical and design features

- ✳ **extremely compact**
- ✳ **mounting dimensions correspond exactly with those of equal displacement fixed motors**

thus: –

- ✳ **optional application of fixed and variable motors and hence easy extension of the output torque and speed range**

thus: –

- ✳ **cost saving due to the possibility of using smaller displacement pumps for the same torque/speed variation**
- ✳ **improved efficiency**

furthermore:

- ✳ **very rugged and robust rotating group with output shaft capable of accepting side loads**
- ✳ **particularly quiet operation**
- ✳ **maximum tilt angle 28 degrees**
- ✳ **minimum tilt angle 8 degrees**

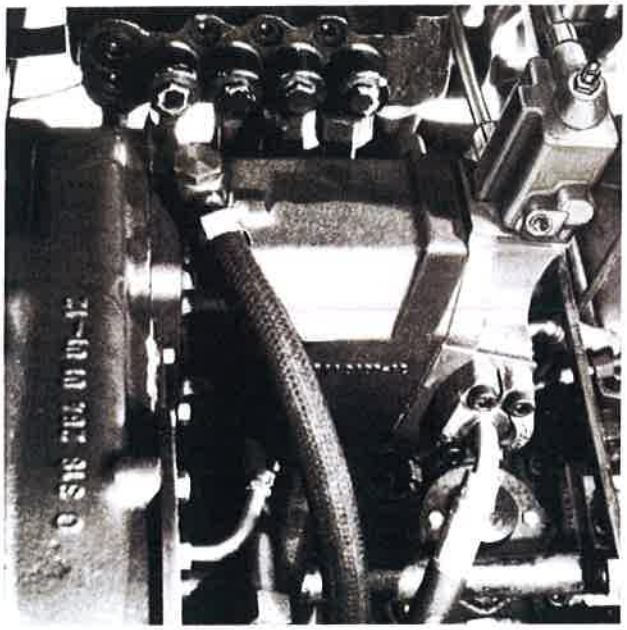


Fig. 1. Single wheel drive of a fork lift truck

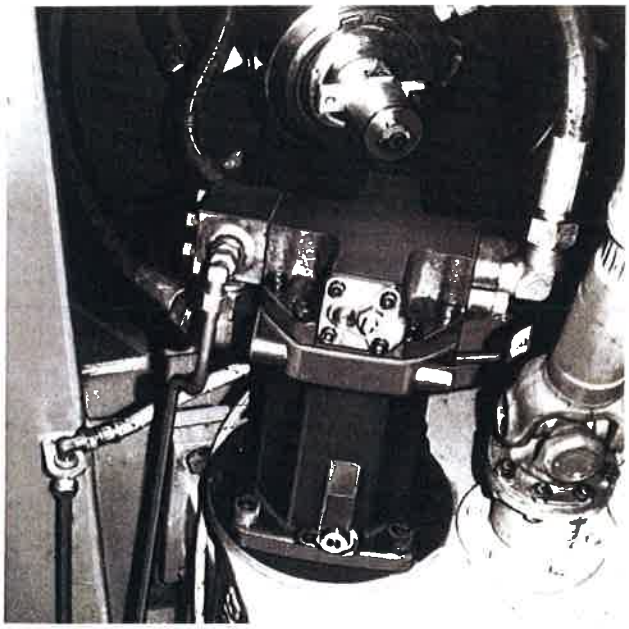


Fig. 2. Differential axle drive of a wheeled excavator

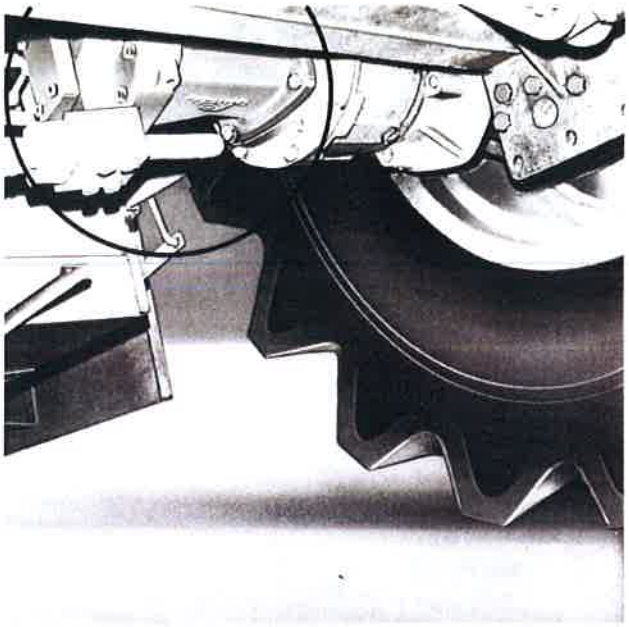


Fig. 3. Single wheel drive of a combine harvester

Fig. 4. Drive to both wheels of a fork lift truck

Linde AG
Werksgruppe Güldner
Aschaffenburg

Technical data

Pressures in bar

Rated size	50 . . . 186	260
Peak pressure*	500	400
Max. working pressure	420	350
Continuous pressure (100% working cycle**)	250	200
Casing pressure (permissible back pressure)	1,5	1,5

Nominal Size	50	75	105	140	186	260
Displacement in cm³/rev						
at max. tilt angle (28°)	50,2	74,9	104,9	139,5	186,2	260,3
at min. tilt angle (8°)	15	22	31	41	55	77
Max. output speed in rev/min (100% working cycle)						
at max. tilt angle (28°)	4200	3700	3300	3000	2800	2500
at min. tilt angle (8°)	5200	4600	4100	3700	3400	3000
Peak output speed in rev/min (intermittent)						
at max. tilt angle (28°)	4500	4000	3600	3300	3000	2700
at min. tilt angle (8°)	6000	5400	4800	4300	3800	3400

The peak output speeds quoted are well within the overspeed reserves of Linde motors. However for noise and efficiency reasons these peak speeds should only be used occasionally e. g. when braking and in bends.

Rotation

Clockwise and anti-clockwise

Response Time

over full stroke – typical (at cont. pressure and max. speed) 1 s

other response times feasible

* Transient pressure over the working pressure, when the motor is still in function.

** Continuous pressure to which all the parts of the motor are able to resist.

Miscellaneous

Pressure fluid

Temperature range	–20° . . . +90° C
Viscosity range	10 . . . 80 cSt
Optimum viscosity	15 . . . 25 cSt
Starting viscosity	1000 cSt
Pressure fluid	Mineral oils HL or HLP acc DIN 51 524

recommended at

working temperature for approx	viscosity class (mm²/s = cSt) HL or HLP
30 . . . 40° C	22 mm²/s bei 40° C
60 . . . 70° C	68 mm²/s bei 40° C
80 . . . 90° C	100 mm²/s bei 40° C

Beside the minimum requirements as per DIN 51 524 a qualified hydraulic fluid must also comply with all requirements of a high pressure hydraulic plant. This applies especially to so-called H LPD (detergent) fluids.

Linde recommends to use only such oils whose suitability for high pressure hydraulic installations is confirmed by their producer.

Filtration

Filtration of the hydraulic circuit is mandatory

Recommended filtration ..... 10 µm
(filtration rates of 25 . . . 40 µm are also acceptable)

Linde recommend 10 µm:

- since 10 µm filters are readily available without additional cost
- since unit life will **definitely** be increased with finer filtration (less wear)

Calculations to determine required motor size

Torque

$$M_d = \frac{\Delta p \cdot V_g \cdot \eta_{mech}}{20 \cdot \pi};$$

Speed

$$n = \frac{Q_{eff} \cdot 1000 \cdot \eta_{vol}}{V_g};$$

Reduced tilt angle

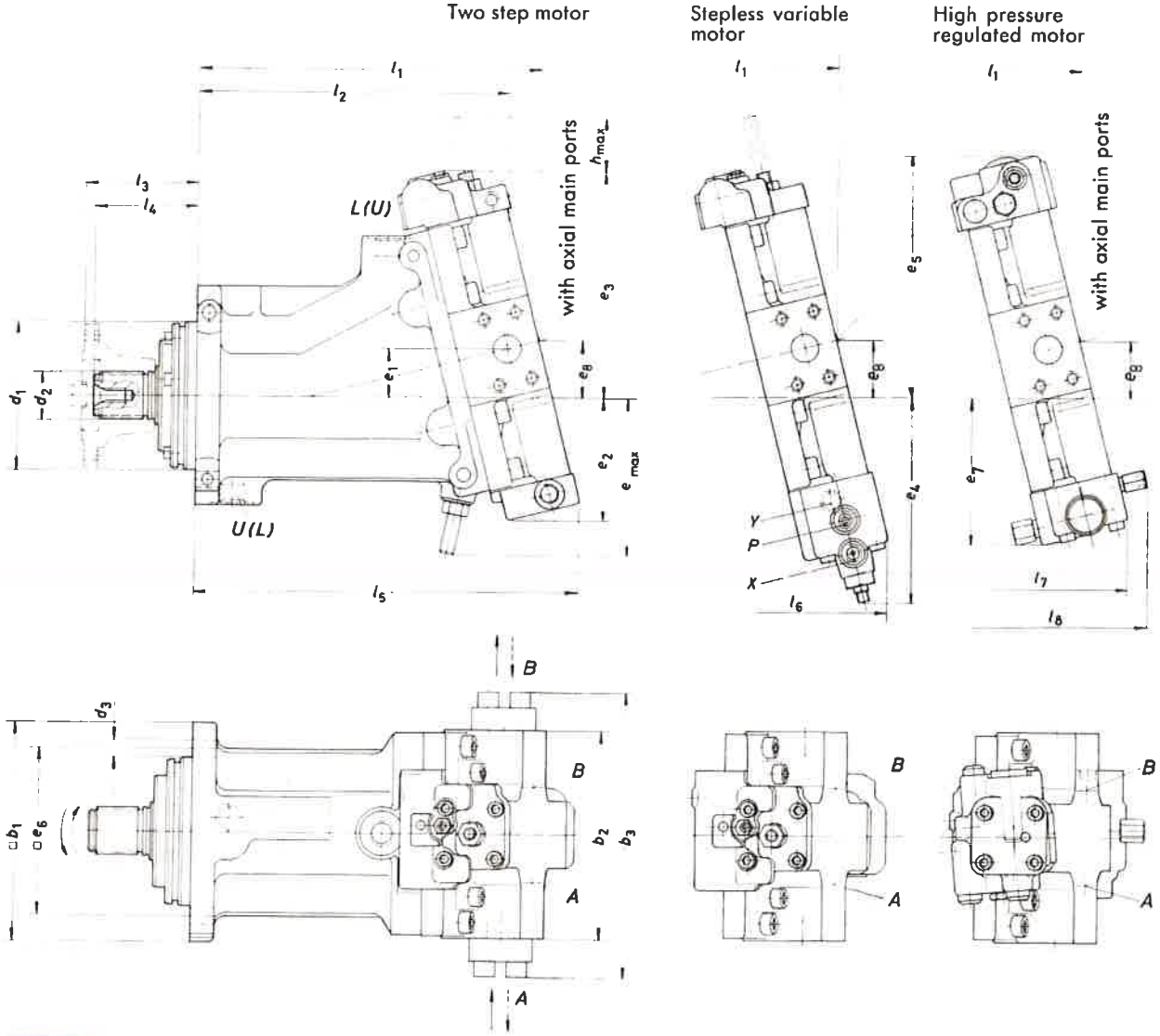
$$\sin \alpha_{red} = \frac{V_{g\,red}}{V_{g\,max}} \cdot \sin \alpha;$$

M_d (Nm)	= Shaft output torque	Q_{eff} (l/min)	= effective flow
Δp (bar)	= in-out pressure differential	n (rev/min)	= outpulspeed
V_g (cm³/rev)	= geometric displacement	α_{max} (°)	= 28 (max. tilt angle)
$V_{g\,red}$ (cm³/rev)	= geometric displacement at reduced tilt angle (α_{red})	η_{mech} (%)	≈ 98 (mean mech. efficiency)
$V_{g\,max}$ (cm³/rev)	= geometric displacement at maximum tilt angle (α_{max})	η_{vol} (%)	≈ 97 (mean vol. efficiency)

Dimensions

Motor drawing, dimensions in mm

A and B	=	Main ports
L	=	Drainport
P	=	Internal control port
X and Y	=	Remote control ports
U	=	Flushing port



Rated size (NG)	□b_1	b_2	b_3	d_1	d_2 DIN 5482 e9	d_2 DIN 5480	d_3	e_{max}	e_1	e_2	e_3 (maximal)	e_4	e_5 (maximal)	□e_6
50	150	147	–	100	B 30 x 27	–	12	–	33	93	165	160	–	113,2
75	172	172	237	115	B 35 x 31	–	14	129	38,7	107	220	170	201	127,2
105	184	175	237	125	B 40 x 36	–	18	123	41,6	108	227	172	208	141,4
140	196	196	262	140	B 45 x 41	–	18	139	46	124	252	189	268	141,4
186	210	196	–	160	B 50 x 45	–	18	135	49	126	258	185	258	158,4
260	210	246	–	165	–	W 50x2x9g	22	142	51,4	–	237	184	258	162

Rated size (NG)	e_7	e_8	h_{max}	l_1	l_2	l_3	l_4	l_5	l_6	l_7	l_8	A and B SAE-Flange Size	A and B SAE-Flange Pressure	P, X and Y	L and U	Weight (maximal) in kg
50	–	43	23	245	203	81,5	74	255	265	–	–	¾"	6000 psi	M 14 x 1,5	M 22 x 1,5	24
75	125	53	28	272	242	87,5	77,5	305	315	311	–	1 "		M 14 x 1,5	M 22 x 1,5	37
105	124	56,5	31	291,5	261,5	95,5	86,5	324	335	331	–	1 "		M 14 x 1,5	M 22 x 1,5	47
140	153	56	–	332	290	115	104	373	382	378	–	1¼"		M 14 x 1,5	M 22 x 1,5	68
186	151	59,5	–	346	304	131	120	386	395	396	–	1¼"		M 14 x 1,5	M 22 x 1,5	71
260	151	62,5	–	419,5	375	76,5	76	–	460	460	473	1¼"		M 14 x 1,5	M 26 x 1,5	79

BMV . . TF
Variable motors have been quality proven in practical applications!

Also from Linde:

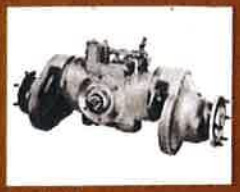

BPV . . SG


PV . . TG


PR . . TS


MF . . T


B 2 PV . . TS


KA 2018


4W . . F

Linde worldwide:

Argentina Australia Austria Belgium Brazil
Canada Denmark Egypte Finland
France Germany Great Britain
Greece Hungaria Iceland
India Iran Ireland Italy
Japan Luxemburg
Malaysia
Mexico
Morocco
Netherlands
New Zealand
Norway Portugal
Saudi Arabia Singapore
South Africa Spain Sweden
Switzerland Turkey USA Yugoslavia

Linde AG, Werksgruppe Flurförderzeuge und Hydraulik
Postfach 62, Schweinheimer Straße 34, D-8750 Aschaffenburg
Telefon (0 60 21) 99-0, Telex 4186 018
Telefax (0 60 21) 99-1579