

Linde Hydraulics Media. Information.

Our media at a glance. All documents can be found in the download area of our website.

PRODUCT CATALOGUE	DATASHEETS	BROCHURES	FACT SHEETS	CAD DOWNLOADS
General technical data.	General technical data.	General technical data.	General technical data.	3D models in *.stp file.
Design characteristics & Product advantages.				
Portfolio overview.	Technical specification.	Application examples.	Application examples.	
	Functional descriptions.			

INFORMATION

www.linde-hydraulics.com



LEARN MORE MEDIA & DOWNLOADS

CONTENT

Linde Hydraulics Product Catalogue. **Content.**



OUR SERVICES		Linde Hydraulics Lifecycle.	
ELECTRONICS		Controllers & Diagnostics.	
	DIIMDS	Variable displacement.	
	T OWL 5	Self-regulating.	\bigotimes
	CONTROL VALVES	Monoblock & Modular.	
HIGH	MOTORS	Variable displacement.	
HYDRAULICS	MOTORS	Fixed displacement.	
	ACTUATORS	Shift actuator.	
	CVCTEMC	Pump/Motor - Compact unit.	Compact
	STSTEMS	Shift in Motion.	Shift in Motion
LINDE HYDRAULIC	5 WORLDWIDE	Sales & Service partners.	



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Our Services. Linde Hydraulics Lifecycle.



Inquiry & Layout

Regardless of whether you contact us in person or by other means, with us you will always find your solution as quickly as possible.

Linde Hydraulics offers you a wide range of solutions for your construction, forestry or agricultural machinery. Get an overview on our website. In the download area you will not only find layout examples for your application, but also data and fact sheets with technical details of our portfolio. In addition, 3D (step) models of our products can be used to determine the required installation space. A global network of sales partners always offers you a local contact person - together with our team of application engineers we will support and verify your layout.

→ You can find a **sales partner** close to you on our website at **www.linde-hydraulics.com/network**



Development & Application Engineering

Regardless of whether you need standard or customized solutions, our engineers will develop what brings you forward – under all operating conditions.

Benefit from our expertise and the wealth of experience of our engineers in every step of the product development process:

- Common product development
- Worldwide project support
- Pulse and endurance testing beyond the application requirements
- Customized project coaching
- System training for specific applications

Commissioning & Series Production

Regardless of being at the prototyping and commissioning stage or series production, with systems and expert knowledge, we always ensure high quality and reliability.

We are already well prepared before we come to you to commission your machine. During the development of the iCon[®] controller, for example, we use the design parameters of your machine to create a simulation model, with which a majority of the functions can already be programmed and tested by computer. During commissioning on site, we can then fully concentrate on the fine adjustment of the parameters. The so-called partial integration by means of Hardware-In-The-Loop test systems significantly shortens the development period of the controls and offers you more flexibility in designing your machine functions.

Even when our products are finally ready for series production, we do not lean back or rest on the fact that we have a very competent and experienced team. With a holistic quality concept, we ensure consistently high quality and reliability completely independent of variance or quantity.

Our Services. Linde Hydraulics Lifecycle.



Spare parts & Remanufacturing

You matter to us! We are there for you for more than one lifetime.

In case you have to hurry! With our outstanding parts availability, our global network of service partners and the accustomed Linde quality, we are there for you when you need us. It doesn't matter whether you need a single part in the event of a breakdown or whether we prepare your units for the next harvest.

\rightarrow Just visit our online-shop at shop.linde-hydraulics.com

Here you can find all spare parts tailored to your needs easily via the serial number of your unit. A defined stock of parts is available within 24 hours!

 \rightarrow For repair and remanufacturing services you can find a **service partner** close to you on our website at **www.linde-hydraulics.com/network**









Compact unit Shift in Motion





LEARN MORE

Electronics. **Controllers**. **iCon**[®].

Product advantages

- Cost-efficient configuration of manifold functions: from simple controls to complex and safety-critical systems
- Software with customer-specific adaptations
- Short development cycles
- Demand-oriented extension and simple implementation in overall vehicle network



Fields of application

Con®			
	CB 16-02	CD 88-02	CD 97-02
imple controls	\checkmark	\checkmark	\checkmark
Inderspeed control	\checkmark	\checkmark	\checkmark
pual path drive		\checkmark	\checkmark
on-road drive		\checkmark	\checkmark
complex controls			\checkmark

General technical data

Safety level

PLb

PLd

PLd

CB 16-02

CD 88-02

CD 97-02

Controller

Function

 \checkmark

 \checkmark

 \checkmark

	Conn	ector				Out	puts							Inputs				Con	nm.
	ļ	- jyco	Jut, max.	ut n groups)	ut	urrent	er supply, mA	er supply, t 250 mA	er supply,) mA	er supply, 30 mA	0-5 V	Ē	sensors /)		lup	lDown			00
Safety	60+94 pin TE	Tyco Family	HighSide C 3 A	HighSide Ol (switched i	LowSide O	LowSide ci controller	Sens. pow 5 V at 150	Sens. pow 2V - 10V a	Sens. pow 10V at 250	Sens. pow 24V at 100	Analog In,	Frequency	Inductive s (frequency	PWM In	Digital Pull	Digital Pull	Ignition	CAN	Ethernet 1
		\checkmark	0	2	0	4	2			1	8	2	0		0	0	1	1	\checkmark
\checkmark		\checkmark	6	10	2	22	2		1		19	7	1		10	12	1	3	
\checkmark	\checkmark		19	8	8	8	2	2			24	14	4	\checkmark	4	12	1	4	

Electronics. **Diagnostics**. **iDiag**[®].

Design characteristics

- Diagnostic system compatible with iCon $^{\textcircled{R}}$ Controllers
- Parameterization
- "Teach in" of components
- Harness checking
- Data logger suited for PC/laptop with Windows operating system with serial or USB interface

Product advantages

- Optimum system usage by teach-in function
- Efficient trouble shooting
- Easy usage by self-explanatory user surface
- Practical-minded partition of control elements by functional groups
- Modular set-up: individual functions can be added optionally later











Design characteristics

- Axial piston pump in swashplate design
- Clockwise or counter clockwise rotation
- Integrated high pressure relief valves with charge function
- Hydrostatic plain bearing of the swashplate

Product advantages

- Precise and load-independent
- High power density
- Long service life

General technical data

All the controls used in the Series 02 are based on a loadindependent control mechanism. No matter which control is used: identical commands always result in the same response in the machine. The sensitive and precise machine control makes work easier and increases productivity. Various customer system options for mechanical, hydraulic and electric input solutions are available. Further special regulating features like torque control and pressure cut-off are also available. The reliable control of the pump can easily be integrated into any kind of vehicle management control system.



HPV-02									
Nominal size			55	75	105	135	165	210	280
Displacement	Max. displacement	cc/rev	54.7	75.9	105	135.7	165.6	210.1	281.9
Coood	Max. operating speed	rpm	3900	3400	3200	3000	2750	2300	2400
speed	Max. speed*	rpm	4150	3600	3400	3200	2950	2500	2550
	Nominal pressure	bar	450	450	450	450	450	450	450
Pressure	Max. pressure**	bar	500	500	500	500	500	500	500
	Max. housing pressure	bar	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Torque	Torque (Δp =430 bar; charge press.=20 bar)	Nm	374	519	719	929	1133	1438	1929
Corner power (th	1еог.) (Vmax X Пmax X 🗛 430 bar)	kW	153	185	241	292	326	346	485
Weight (approx.))*** (with H1-control, without oil)	kg	46	49	66	72	113	132	164

Customer interfaces

Compac unit

Shift in Motion

LEARN MORE

Contr	ol opti	ions**	**			Ser	ISOLS				Flar	nges				Shafts****		PT	0	Р	orts	
	Proportional	3-Position	Pressure cut-off	Enable function	Torque Control	Swash angle	Pressure			2 hole	2 hole, 4 additional threads M12	2 hole, 4 additional threads M16	2 hole, additional holes (d=17,5mm)	4 hole	9-1 14) 2.1-1970	nion flange 46 Typ A	o	Power take-off			ISO 6162-2 Radial twin ports	ISO 6149-1
Electro-hydraulic	✓	✓	✓	✓	✓			S/	AE-B AE-C	✓	✓				ISO 301 ⁻ (SAE) 7 ⁻ ANSI B9	Compag SAE J 19	DIN 548			Work ports	\checkmark	
Hydraulic	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	S/	AE-D	\checkmark		\checkmark	\checkmark		,	,	,	~				
Mechanic	\checkmark			\checkmark				S	AE-E					\checkmark	\checkmark	\checkmark	\checkmark			Threaded ports		\checkmark

* highest transient speed, that can temporarily occur | ** highest transient pressure, that can temporarily occur | *** inclusive internal gear pump (size 55-135) or external gear pump (size 165-280) | **** Availability depends on nominal size

Open Circuit. Self-Regulating Pump. HPR-02.

Design characteristics



Legal emission regulations force manufacturers of mobile machinery to optimize the noise emission of their products. Since secondary measures tend to be expensive and less efficient Linde Hydraulics prefers to fight the noise where it is generated: by optimally connecting an additional volume directly next to the commutation of the HPR-02 pump, Linde Hydraulics invented the SPU silencer. The adaptive SPU reduces pressure pulsations in the regulating pump over the entire range of operation – without loss of power.

- Axial piston pump in swashplate design
- Exact controllers with and without position feedback
- Adaptive noise optimization SPU
- Hydrostatic plain bearing of the swashplate

Product advantages

- Excellent suction up to rated speed
- High power density
- Energy saving operation by 'flow on demand'-control

General techn	ical data														<u> </u>	
HPR-02																
Nominal size			55	75	95	105	135	165	210	249	280	105 D	125 D	165 D	210 D	249 D
Displacement	Max. displacement	cc/rev	55	75.9	94.7	105	135.7	163.6	210.1	249.9	281.9	210	2x125	2x165	2x210	2x249
Speed	Max. operating speed (without tank pressurization)	rpm	2700	2500	2500	2500	2350	2400	2100	2300 ²	2000	2450	2400	2100	2100	2000
Volume flow	Max. volume flow*	l/min	148.5	189.8	237.5	246.8	312.1	392.6	441.2	574.8 ²	563.8	514.5	600.0	695.5	882	1000
	Nominal pressure	bar	420	420	350	420	420	350	420	350	420	420	350	420	350	350
Pressure	Max. pressure**	bar	500	500	420	500	500	420	500	420	500	500	420	500	420	420
	Max. housing pressure	bar	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Torque	Torque	Nm	368	507	528	702	907	911	1404	1392	1884	1245	1392	1964	2339	2785
Corner power (t	heoretical)	kW	104	132.8	138	172.7	218.5	229	308.8	335.3 ²	394.7	319.4	337	431.8	514	583
Weight (approx.	.) (without oil)	kg	39	39	44.5	50	65	74	116	125	165	96	113	177	180	340

Customer interfaces

		C	ontrol option	S****					Sensors		Shafts****	
		pressure cut-off	hydraulic ApLS – override	electrical ApLS – override	electric stroke limiter and pressure cut-off	hyperbolic power limiter	hyperbolic power limiter and pressure cut-off	Swash angle	Speed sensor	ISO 3019-1 (SAEJ 744) ANSI B92.1- 1970	Compagnion flange SAE J 1946 Typ A	DIN 5480
								1		1	J	1
Load sensing		\checkmark	\checkmark	\checkmark	\checkmark	\checkmark		•		•	•	•
Electro-proportional	\checkmark						\checkmark					

* theoretical data of a single unit without efficiency effects | ** highest transient pressure, that can temporarily occur | **** Availability depends on nominal size | ²Consultation with Linde Hydraulics required

Compac unit Shift in Motion





Open Circuit. Monoblock Control Valves.

Design characteristics

- Basic block: five directional control valves of identical nominal size in one cast housing
- Designed for the Linde Synchron Control (LSC) -
- Load Sensing System
- Nominal sizes 30, 25, 22 and 18
- Flows up to 600 l/min (size 30)
- Broad dimensioned diameters and flow-optimized design of the supply channels
- Extendable with directional control valves in sandwich design, in identical or differing nominal size
- Pressure cut-off and additional functions integrated in connection plate
- Special functions via intermediate plates
- Optionally with hydraulic or electric piloting

Product advantages

- All advantages of the LSC valve technology
- Compact design
- Full-size expandability
- High efficiency achieved by flow-optimized channels even for applications with numerous actuators

Five directional control valves in a common housing form the base of the manifold valve plate in monoblock design. This results in the most compact package.

With its latest LSC generation, Linde Hydraulics combines the design characteristics of the proven LSC system with the benefits of the electric control. The powerful electronic control unit recognises the operator's command by the amplitude and the speed with which the joysticks are being moved. It then sets the pump and the valves according to the dynamic demand. Due to the overlaid, classic load-sensing control mechanism, no sensors are needed.

All components are provided by a single source and matched perfectly with each other. The operator can change the system's behaviour electronically with regard to its dynamics and fine control, as well as its dependency or independency on the load. This enables multi-purpose machines which can quickly be optimized to the specific use by the operator. With completely opened valves, the actuators can be controlled exclusively via the pump's control to achieve the maximum possible efficiency.





Compact unit

Shift in Motion



MONOBLOCK



Manifold valve plates of series VT modular are made up of individual components of a modular building block system. This is why manifold valve plates can be configured to optimally match any application with one up to eight actuators.

The directional control valves are at the core of every — manifold plate in LSC technology. Compared to other load — sensing directional control valves, LSC directional control — valves stand apart, in particular, thanks to the integrated downstream pressure compensators and pressure copiers. — This arrangement prevents the actuator from lowering when the function starts.

As a result of the compact design, the oil flow only needs to pass through the valve once and not several times. This ensures optimized flow passages in the directional control valve. Due to the high-precision production of the directional control valves, there is only minimal leakage even at high load, which is beneficial to the load holding function of the valves.

Open Circuit. Modular Control Valves.

Design characteristics

- Directional control valves available as sub plate mounted valves
- Designed for the Linde Synchron Control (LSC) Load Sensing System
- Nominal sizes 25 and 30
- Flows up to 600 l/min (size30)
- Modular design for the configuration of valve plates for 1-8 actuators
- Optionally with hydraulic, electric or combined piloting

Product advantages

- All advantages of the LSC valve technology
- Easy to configure building block system
- Adjustable to the target application
- Quick availability
- Ideal for machines with low production volume











LEARN MORE CMV

Open & Closed Circuit. Variable Displacement Motor. CMV.

Design characteristics

- Axial piston motor in bent axis design _
- Standardized interfaces ____
- Speed sensor optional _

Product advantages

- High speeds _
- High power density
- Low windage losses _

With the next generation of the bent axis motors, Linde Hydraulics expands its customer oriented portfolio of highquality components for hydraulic systems. Due to their standardized interfaces, e.g. the plug-in flange according to ISO, the CMV and CMF fit a high variety of applications, without the need of adaptors. The motors enable a more cost effective operation of the respective applications thanks to low windage losses and lighter weight.



General technical data

CMV					×			
Nominal size	minal size placement Max. displacement placement Max. operating speed at V _{max} ed Max. speed at V _{max} * Max. operating speed at V _{min} Max. speed at V _{min} * Max. speed at V _{min} * Nominal pressure Max. housing pressure Iue Output torque (Δp=430 bar and Vmax)		60	85	115	140	170	215
Displacement	Max. displacement	cc/rev	62	87.7	115.3	144.1	170	217.9
	Max. operating speed at ${\rm V}_{\rm max}$	rpm	4450	3900	3550	3250	3100	2900
Coood	Max. speed at V _{max} *	rpm			on re	quest		
speed	Max. operating speed at ${\rm V}_{\rm min}$	rpm	7200	6800	6150	5600	4900	4600
	Max. speed at V _{min} *	rpm			on re	quest		
	Nominal pressure	bar	450	450	450	450	450	450
Pressure	Max. pressure**	bar	500	500	500	500	500	500
	Max. housing pressure	bar	2.5	2.5	2.5	2.5	2.5	2.5
Torque	Output torque (Δp =430 bar and Vmax)	Nm	411	582	787	958	1163	1471
Corner power (th	eOf.) (Vmax x nmax at Vmin x ∆p 430 bar)	kW	320	427	508	578	597	718
Weight	approx. (without oil)	kg	27.7	36.3	44.8	59.2	62.1	76.4

Customer interfaces

	Contro	l option	s			Se	nsors			Flanges			Shafts****		Pc	orts****		
	Proportional	2-Position	default = Vmin (positive control)	default = Vmax (negative control)	Pressure override	Speed		150 3019-1	(SAE) 744)	ISO 3019 - 2 (metric)	Plug-in ISO 3019 – 2	ISO 3019-1 (SAE) 744) ANSI B92.1-1970	Compagnion flange SAE J 1946 Typ A	DIN 5480		ISO 6162-2 Side ports	ISO 6162-2 Twin ports (rear)	ISO 6149 – 1
Electro-hydraulic	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	/			/	/	/	/	/	/	Work ports	\checkmark	\checkmark	
Hydraulic	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	V		v		v	V	V	V	V	Threaded ports			\checkmark

* highest transient speed, that can temporarily occur | ** highest transient pressure, that can temporarily occur | **** Availability depends on nominal size

Open & Closed Circuit. Variable Displacement Motor. HMV-02.

Design characteristics

- Axial piston motor in swashplate design
- Optimized starting and low speed behaviour
- Swivelling to 0 cc/rev

Product advantages

- PTO through-drive motor
- Jerk-free low speed
- Large conversion range
- Extremely high angular acceleration possible

						- 🍊 -					General technical data
HMV-02											
Nominal size			55	75	105	135	165	210	280	105 D	165 D
Displacement	Max. displacement	cc/rev	54.7	75.9	105	135.6	165.6	210	281.9	210	331.2
	Max. operating speed at $\ensuremath{V_{max}}$	rpm	4300	3800	3700	3200	3100	2700	2400	3300	2900
Coord	Max. speed at V_{max}^{*}	rpm	4400	4100	3800	3500	3400	3000	2700	3400	3100
speed	Max. operating speed at $\ensuremath{V_{min}}$	rpm	4700	4400	4100	3700	3500	3200	2900	4100	3500
	Max. speed at V_{min}^{*}	rpm	5300	5000	4700	4000	3900	3500	3200	4400	3700
	Nominal pressure	bar	450	450	450	450	450	450	450	450	450
Pressure	Max. pressure**	bar	500	500	500	500	500	500	500	500	500
	Max. housing pressure	bar	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Torque	Output torque (Δp =430 bar and Vmax)	Nm	374	519	719	928	1133	1438	1929	1437	2267
Corner power (t	heor.) (Vmax x nmax at Vmin x ∆p 430 bar)	kW	184	239	309	360	415	482	586	677	878
Weight	approx. (without oil)	kg	28	32	42	56	76	101	146	98	149

Standard hydraulic motors at low speeds in their starting

phase cannot generate the necessary torque. Therefore,

the power of the fast spinning hydraulic motors has to be

reduced by means of several step gearboxes down to the

speed needed on the wheel. Somewhat higher windage

losses and poorer mechanical efficiency are benevolently

accepted in this context. Quite the opposite holds true for the motors by Linde Hydraulics: The motors of the Series

02 are capable of transmitting the required torque even

at low speed and make it possible to start smoothly and

sensitively.

Customer interfaces

	Cont	ral ant	ione				600		F				bafte****	:	Through drive	De	*****		
	Cont	τοι ορι	IOIIS				Sen	5015	r	langes		3	lidits		initiough drive	PL	nts		
	portional	osition	ault= Vmin	ault= Vmax	ssure override	ssure side selection	ed			2 hole	4 hole	· 3019-1 ‹EJ 744) SI B92.1-1970	mpagnion flange E J 1946 Typ A	l 5480	ly for nominal sizes 5, 135, 165, 210, 280, 50, 165D		i 6162-2 Jial	6162-2 al	6149 - 1
	Pro	2-P	def	def	Рге	Pre	Spe		SAE C	\checkmark		ISO (SA AN	Cor SAE	NIO	001 10501		ISO Rac	ISO Axi	150
lectro-hydraulic	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	1		SAE D	\checkmark		/	/	/	/	Work ports	\checkmark	\checkmark	
łydraulic	\checkmark	\checkmark		\checkmark	\checkmark		V		SAE E		\checkmark	v	v	V	v	Threaded ports			\checkmark

* highest transient speed, that can temporarily occur | ** highest transient pressure, that can temporarily occur | *** Availability depends on nominal size











Open & Closed Circuit. Variable Displacement Motor. HMV-02 D.

Design characteristics

- Axial piston double motor in swash plate design
- "Dry case" capability
- Through-drive motor

Product advantages

- High starting torque and maximum speed
- Maximum efficiency
- No gearbox required

This axial piston double motor has been developed by Linde Hydraulics to achieve maximum speeds higher than conventional swash plate designs. Additionally, a large displacement volume in a compact design means wider transmission speed ranges, normally achieved with modular transmissions, are possible. The HMV-02 D is about 30 % lighter than a motor combined with transfer gear box, and has a smaller footprint.

However, maximum efficiency is achieved with suction of the leakage from the housing. The so called "dry case" significantly reduces the windage losses and thus also the power required to drive the double motor.



General technical data

HMV-02 D				
Nominal size			105 D	165 D
Displacement	Max. displacement	cc/rev	210	331.2
	Max. operating speed at $\ensuremath{V_{max}}$	rpm	3300	2900
Coood	Max. speed at V _{max} *	rpm	3400	3100
speed	Max. operating speed at $\ensuremath{V_{min}}$	rpm	4100	3500
	Max. speed at V_{min}^{*}	rpm	4400	3700
	Nominal pressure	bar	450	450
Pressure	Max. pressure**	bar	500	500
	Max. housing pressure	bar	2.5	2.5
Torque	Output torque (Δ p=430 bar and Vmax)	Nm	1437	2267
Corner power (t	Corner power (theor.) (Vmax x nmax at Vmin x Δ p 430 bar)		677	878
Weight	approx. (without oil)	kg	98	149

Customer interfaces

	Control options							ISOFS	Fla	nges**	**		Shafts***	*	Through drive	Po	rts****		
	portional	osition	ault= Vmin	ault= Vmax	ssure override	ssure side selection	sed			2 hole	4 hole	. 3019-1 (E) 744) SI B92.1-1970	15480	npagnion flange E J 1946 Typ A	ough drive		6162-2 Jial	6162-2 al	6149 - 1
	Pro	2-P	def	def	Pre	Pre	Spe		SAE C			ISO AN	DIN	Cor SAI	Thr		ISO Rac	ISO Axi	150
Electro-hydraulic	\checkmark		\checkmark				/		SAE D		\checkmark	/		/	/	Work ports	\checkmark		
Hydraulic							V		SAE E		\checkmark	V		V	V	Threaded ports			\checkmark

* highest transient speed, that can temporarily occur | ** highest transient pressure, that can temporarily occur | **** Availability depends on nominal size





LEARN MORE

Open & Closed Circuit. Variable Displacement Motor. Dry Case.

Design characteristics

- Significant reduction of windage losses by suction of leakage from housing
- Maintaining lubrication via active bearing lubrication

Product advantages

Maximization of efficiency

Dry case

- Significantly reduced energy consumption
- Greatly improved performance
- No adverse effects on operation or service life

General technical data



Idle losses are composed of flow losses in canals and kidneys, friction losses in gaps and bearings and windage losses. The diagram above shows the comparison between the losses of two motor concepts and the great effects of "dry case" under identical conditions.

Air from tank Vent port (upper side) HMV-02 D Suction port (bottom side)

to tank

Besides the output power, the operation of machines is

also generally associated with power loss. In the case of

axial piston machines, the power loss is composed of flow,

Linde Hydraulics has now developed the ability to run the

motors without oil in the housing. The moving parts of the motor rotating in the housing are thus hardly affected

by circulating oil. This procedure significantly reduces

windage losses and considerably increases efficiency. The

active bearing lubrication ensures the supply of oil to the

relevant points, that the so called "dry case" operation is

guaranteed without any adverse effects.

friction and windage losses.

Dry case

Suction of leakage

The feed flow generates a vacuum via the venturi nozzle. Oil is sucked up on motor bottom side. Air to fill the vacuum is filled in on motor upper side.

charge pump



The oil/air mixture is returned to tank via diffuser/ filter. Oil/air mixture is calmed - air is separated out. The air for filling the motor housing is drawn from the tank above the liquid level.

Compact unit Shift in Motion

Dry case





LEARN MORE

Open & Closed Circuit. Fixed Displacement Motor. CMF.

Design characteristics

- Fixed displacement bent axis motor
- Standardized interfaces
- Plug-in flange available

Product advantages

- High power density
- High speeds
- Very small dimensions

With the next generation of the bent axis motors, Linde Hydraulics expands its customer oriented portfolio of high-quality components for hydraulic systems. The fixed displacement motor CMF is characterized by its high external load and speed capacity. Due to its standardized interfaces, e.g. the plug-in flange according to ISO, the CMF fits a high variety of applications, without the need of adaptors. Low windage losses in combination with the low weight of the motor support the cost-effective operation of the application.



General technical data

		80
	cc/rev	80
Max. operating speed	rpm	4500
Max. speed*	rpm	5000
Nominal pressure	bar	450
Max. pressure**	bar	500
Max. housing pressure	bar	2.5
(Δ p=430 bar; charge press.=20 bar)	Nm	547
1eor.) (Vmax X ∩max X ∆p 430 bar)	kW	258
Weight (approx.)*** (without oil) kg		23.0
)	Max. operating speed Max. speed* Nominal pressure Max. pressure** Max. housing pressure (Δp =430 bar, charge press.=20 bar) HeOf.) (Vmax x Imax X Δp 430 bar) **** (without oil)	cc/rev Max. operating speed rpm Max. speed* rpm Max. speed* rpm Max. speed* bar Max. pressure bar Max. housing pressure bar Max. housing pressure bar (Ap=430 bar, charge press.=20 bar) Nm Hetor.) (Vmax x nmax X Ap 430 bar) kW

Customer interfaces

Sensors			Flanges			Shafts****			Ports****						
Speed		ISO 3019-1 / SAE 744,	SAE C 4-bolt: 127-4	ISO 3019-2 metric, 140 mm, 4-bolt	Plug-in, similar to 150 3019-2, 190 mm, 2-bolt	150 3019-1 (SAEJ 744) ANSI 892.1-1970	Compagnion flange SAE J 1946 Typ A	DIN 5480		ISO 6162-2 Radial twin ports	ISO 6162-2 Side ports	ISO 6149 - 1			
			/					.(Work ports	\checkmark	\checkmark				
v			·	v	v	v	v	v	Threaded ports			\checkmark			

* highest transient speed, that can temporarily occur | ** highest transient pressure, that can temporarily occur | **** Availability depends on nominal size

Open & Closed Circuit. Fixed Displacement Motor. HMF-02/HMA-02.

Design characteristics

- Fixed displacement swashplate motor
- High pressure relief valves set fixed or variable opt.
- Robust and simple design

Product advantages

- Steady low speed
- High power density
- Reliable and easy to maintain

							(<u> </u>			General teo	chnical data
HMF-02/HMA-0)2											
Nominal size	35	55	63	75	85	105	135	165	210	280		
Displacement		cc/rev	35,6	54,7	63	75,9	85,6	105	135,6	165,6	210	281,9
Coord	Max. operating speed	rpm	4500	4100	3900	3800	3600	3500	3200	3100	2700	2400
speed	Max. speed*	rpm	4800	4400	4200	4100	3850	3800	3500	3400	3000	2700
	Nominal pressure	bar	450	450	450	450	450	450	450	450	450	450
Pressure	Max. pressure**	bar	500	500	500	500	500	500	500	500	500	500
	Max. housing pressure	bar	2,5	2,5	2,5	2,5	2,5	2,5	2,5	2,5	2,5	2,5
Torque	(Δ p=430 bar; charge press.=20 bar)	Nm	244	374	431	519	586	719	928	1133	1438	1929
Corner power (theor.) (Vmax x nmax x Δp 430 bar) kW		kW	115	161	176	207	221	263	311	368	407	485
Weight (approx.)*** (without oil) kg		16	19	24	26	33	33	39	76	101	146	



* highest transient speed, that can temporarily occur | ** highest transient pressure, that can temporarily occur | **** Availability depends on nominal size







Compact unit

Shift in Motion



LEARN MORE HMF-02 / HMA-02

Closed Circuit. Shift Actuator. Actuator.

Design characteristics

- Electro-hydraulic multi-position cylinder (3 positions)
- Prepared for mounting of clevis or spherical head
- Simple and robust design

Product advantages

Customer interfaces

- Defined and exact switching operations
- Easy implementation in conventional gearboxes
- Small space requirement and high reliability

The use of hydraulic cylinders for shifting gears requires not only fast and precise shifting processes, but also defined and electronically sensable rest positions as well as a defined behavior in case of system failure. The actuator from Linde Hydraulics combines all these properties and accommodates them in a robust and compact housing. Together with the shift rod, which is prepared to accommodate conventional connections, all requirements for easy implementation are met. More information can be found in the "Shift in Motion" section.



General tech	nical data		
Actuator			
Forco	Shifting force	Ν	1000 +/- 300
FUICE	Detent force	Ν	450 +/- 100
Stroke	Shifting stroke	mm	±9.5
Droccuro	Supply pressure	bar	25±5 (Typically, this is charge pressure of the drive system)
Plessule	Tank pressure	bar	<2
Positions			3 (1-N-2)



Compact unit

Shift in Motion



LEARN MORE

Contr	ol opti	ons			Thread of the	Thread of the shift rod				Sensors
	12 V	24 V	AMP Connector	Deutsch Connector		M 16			ISO 6149-1, M14 x 1.5	Proportional position sensor
Electro-hydraulic	\checkmark	\checkmark		\checkmark	Metric thread	\checkmark		Threaded ports	\checkmark	\checkmark

Together with the customer Linde Hydraulics defines new standards in technology. Advanced modular drive technology, realised in hydrostatic variators for variable speed transmission, form the core of power split gearboxes.

Compact units with a hollow shafts are available for mounting to conventional gearboxes in smaller machines. These compact units are used as fully hydrostatic systems with additional mechanical PTO drive. In this way, a further function can be operated independently of the travel function.

With customer-specific developments, Linde Hydraulics supports the change from power shift to continuous variable transmission technology.

Closed Circuit. Pump/Motor - Compact Unit. K-02.

Design characteristics

- HPV-02 and HMF-02 back-to-back in common unit
- Version for powersplit transmission and direct drive solutions (e.g. orchard tractors)
- Integrated high pressure relief valves with charge and purge function

Product advantages

Customer interfaces

- Precise crawling speed
- Compact design
- Low fuel consumption over entire operating range
- Mechanical throughdrive (in addition to travel drive)

					General technical data
K-02					
Nominal size			55/55	75/75	105/105
Displacement	Max. displacement	cc/rev	55/55	75/75	105/105
Coord	Max. operating speed	rpm	3900	3400	3200
speed	Max. speed*	rpm	4150	3600	3400
	Nominal pressure	bar	450	450	450
Pressure	Max. pressure**	bar	500	500	500
	Max. housing pressure	bar	2.5	2.5	2.5
Torque	Torque (Δ p=430 bar; charge press.=20 bar)	Nm	374	519	719
Corner power (theor.) (Vmax x nmax x Δp 430 bar) kW			153	185	241

	Control option								
	Proportional	3-Position	Pressure cut-off	Enable function				Swash angle	
Electro-hydraulic	√			~				~	

ors Flanges Shafts**** Ports ISO 3019-1 (SAEJ 744) ANSI B92.1-1970 flange SAE J 1946 Typ A Speed sensor Compagnion ISO 6162-2 Twin ports ISO 6162-2 Side ports ISO 6149-1 hole SAE-B Work ports SAE-C SAE-D Threaded ports SAE-E

* highest transient speed, that can temporarily occur | ** highest transient pressure, that can temporarily occur | **** Availability depends on nominal size







Closed Circuit. Hydrostatic Drive. Shift in Motion.

Design characteristics

- Hydrostatically controlled synchronization of stop to shift gearboxes
- Full utilization of the kinetic energy while changing the gears
- The system includes only two additional components compared to conventional drives

Product advantages

- Autom. and jerkless gear changes (<0.7 sec.) without standstill and the need of expensive synchromesh gear boxes
- Considerable reduction of fuel consumption and noise emission
- Minimum space requirement

Concept

Compac unit

Motior

LEARN MORE SHIFT IN MOTION Shift in Motion enables shifting procedures in a moving machine, equipped with a manual transmission that is intended to be shifted at standstill by electro-hydraulically synchronising the drivetrain. This system is particularly suitable for vehicles that often change between transport and operation, i.e. vehicles that require both high tractive effort and a high top speed above 25 kilometres per hour. The shifting procedure is load-free thanks to electrohydraulically synchronised gears and the ability to adjust the drive component's speed and torque. This makes the shifting procedures wear-free and also increases the transmission's efficiency.



Implementation



Customer interface

Shift rod with clevis or spherical head Multiple positions of rest and

analog position signal

Defined default behavior



System requirements

Stop to shift gearbox with two or more gears and defined neutral position

Admissible tractive effort interruption of <0.7 sec

Closed Circuit. Hydrostatic Drive. Shift in Motion.

Equipment

1 x HPV 105-02 E2

1 x HMV 135-02 E6

1 x iCon®

1 x Actuator

Α

В

С

D

Application examples



Equipment

1 x HPV 75-02 E2

1 x iCon®

1 x Actuator

1 x HMV 105-02 E6

Α

В

С

D







Linde Hydraulics Worldwide. Sales Partners.



In addition to the Linde Hydraulics locations, our global network of sales partners offers you competent support in the following contexts:

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- Application engineering _
- Commissioning _
- Series production —
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Coverage of sales & service partners

Linde Hydraulics Locations



Compact unit

Shift in Motion



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- Repair services
- Remanufacturing _
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- \rightarrow For repair and remanufacturing services you can find a **service partner** close to you on our website at www.linde-hydraulics.com/network

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