Rexroth
Bosch Group

Axial Piston Variable Double Pump A8VO

RE 93 010/06.06 **1**/40
Replaces: 10.05

Technical data sheet

Series 61 / 63
Sizes 55...200
Nominal pressure 350 bar
Peak pressure 400 bar
for open circuit

Contents

Features

- Variable double pump with two axial tapered piston rotary groups with bent axis design for open circuit hydrostatic drives
- Flow is proportional to the drive speed and the displacement and is infinitely variable between $q_{V\ max}$ and $q_{V\ min} = 0$
- The pump is suitable for direct mounting on the flywheel housing in diesel engines
- One common suction port for auxiliary pump and both circuits.
- A wide range of control instruments is available for different control and regulating functions
- Individual power control
- Integrated auxiliary pump with pressure relief valve, optionally with additional pressure reducing valve
- Power take-off for mounting axial piston and gear pumps
- Excellent power to weight ratio
- Long service life

Ordering Code / Standard Program

A8V	O			/		R	1	–	N	Z		05			
01	02	03	04		05	06	07		08	09	10	11	12	13	14

Axial piston unit

01	Bent axis design, variable	**A8V**

Operating mode

02	Double pump (parallel construction), for open circuits	**O**

Size

03	≈ Displacement $V_{g\ max}$ in cm^3, per rotary group	**55**	**80**	**107**	**140**	**200**

Control device

		55	80	107	140	200	
04	Individual power control, without power override						
	with hydraulic stroke limiter, positive control and external pilot pressure supply	●	○	●	○	○	**LA0H2**
	with load sensing	–	–	○	○	○	**LA0S**
	with hydraulic power coupling	●	●	●	○	–	**LA0K**
	and load sensing	–	○	○	●	○	**LA0KS**
	and hydraulic stroke limiter, negative control	○	○	○	○	○	**LA0KH1**
	hydraulic stroke limiter, positive control and external pilot pressure supply	●	●	●	●	●	**LA0KH2**
	hydraulic stroke limiter, negative control and external pilot pressure supply	○	○	●	●	●	**LA0KH3**
	Individual power control with power override by pilot pressure						
	with hydraulic stroke limiter, positive control and external pilot pressure supply	●	●	●	●	●	**LA1H2**
	with load sensing	–	–	●	●	●	**LA1S**
	with hydraulic power coupling	○	○	○	○	–	**LA1K**
	and load sensing	–	○	●	●	●	**LA1KS**
	and hydraulic stroke limiter, negative control	●	●	●	●	●	**LA1KH1**
	hydraulic stroke limiter, positive control and external pilot pressure supply	●	●	●	●	●	**LA1KH2**
	hydraulic stroke limiter, negative control and external pilot pressure supply	○	○	○	○	○	**LA1KH3**
	Electrical control with prop. solenoid (positive control) U = 24V	–	–	●	●	–	**EP2**

Series, Index

		55	80	107	140	200	
05	Series 6; Index 1, 3	●	–	–	–	–	**61**
		–	●	●	●	●	**63**

Direction of rotation

06	viewed on shaft end: clockwise	**R**

Gear ratio (n_{input} / $n_{rotary\ groups}$)

07	i = 1	**1**

Seals

08	NBR (nitrile-caoutchouc), shaft seal in FKM (fluor-caoutchouc)	**N**

Shaft end

09	Splined shaft, DIN 5480	**Z**

Mounting flange

		55	80	107	140	200[1]	
10	To fit flywheel housing (conforming to SAE J617) of internal combustion engine (hole diameter for mounting ø11mm)	●	●	●	●	–	**G**
		–	–	–	–	●	**N**

[1]) hole diam.11mm at new projects only (previous types with short code G and hole diam. 14mm)

Ordering Code / Standard Program

A8V	O			/		R	1	–	N	Z		05			
01	02	03	04		05	06	07		08	09	10	11	12	13	14

Service ports

11	SAE flanged ports A1 and A2 at side, opposite (metric thread) SAE flanged port S at rear (metric thread)	**05**

Auxiliary pump

			55	80	107	140	200	
12	without integrated auxiliary pump,	without power take-off (PTO)	●	●	●	●	●	**K00**
		with power take-off (PTO)	●	●	●	●	●	**K...**
	with integrated auxiliary pump,	without power take-off (PTO)	●	●	●	●	●	**F00**
		with power take-off (PTO)	●	●	●	●	●	**F...**

Power take off 1) 2)

	Flange SAE J744 3)	Hub for splined shaft 4)				55	80	107	140	200	
13	82-2 (A)	5/8in	9T	16/32DP	(A)	●	●	●	●	●	**...01**
	101-2 (B)	7/8in	13T	16/32DP	(B)	●	●	●	●	●	**...02**
		1in	15T	16/32DP	(B-B)	●	●	●	●	●	**...04**
	127-2 (C)	1 1/4in	14T	12/24DP	(C)	❍	●	●	●	●	**...07**
	152-4 (D)	1 1/4in	14T	12/24DP	(C)	–	–	–	❍	●	**...86**
		1 3/4in	13T	8/16DP	(D)	–	–	–	●	●	**...17**

Valves

		K..	F..	
14	without valves (only for model **without** auxiliary pump, K..)	●	–	**0**
	with pressure relief valve (only for model **with** auxiliary pump, F..)	–	●	**1**
	with pressure relief and pressure reducing valve, (only for model **with** auxiliary pump, F..). U = 24V	–	●	**4**

1) Note installation conditions (see page 32/33)
2) Other PTOs on request
3) 2 = 2-hole; 4 = 4-hole
4) Hub for splined shaft conforming to ANSI B92.1a-1976 (splined shaft assignment to SAE J744, see page 32/33)

● = available ❍ = available on request – = not available

Technical Data

Hydraulic fluid

Before starting project planning, please refer to our data sheets RE 90220 (mineral fluid), RE 90221 (environmentally acceptable press ure fluids) and RE 90223 (HF pressure fluids) for detailed information regarding the choice of pressure fluids and conditions of use.

The A8VO variable displacement double pump is not suitable for use with HFA. If HFB, HFC and HFD or environmentally acceptable pressure fluids are being used, the limitations regarding technical data and seals mentioned in RE 90221 and RE 90223 must be observed.

When ordering please indicate the used hydraulic fluid.

Viscosity range

We recommend that a viscosity (at operating temperature) for optimum efficiency and service life purposes of

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

be chosen, taken the tank temperature (open circuits) into account.

Limits of viscosity range

The following values apply in extreme cases:

$\nu_{min} = 5$ mm²/s
short term (t < 3 min) at max. permitted temperature
$t_{max} = +115$°C.

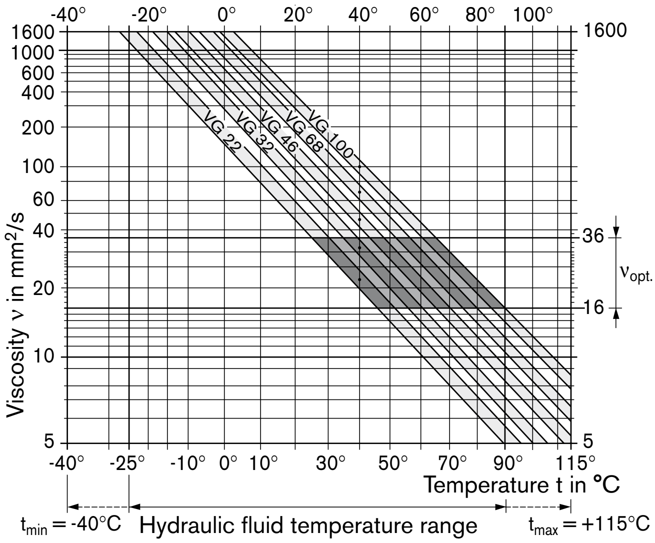
$\nu_{max} = 1600$mm²/s,
short term (t < 3 min) with cold start (p < 30 bar, n ≤ 1000 rpm, $t_{min} = -40$°C).

Note that the maximum hydraulic fluid temperature of 115°C must not be exceeded locally either (e.g. bearing area). The temperature in the bearing area is - depending on pressure and speed up to 12 K higher than the average case drain temperature.

Special measures are necessary at temperatures between -40°C and -25°C. Please contact us.

See RE 90300-03-B for detailed information about use at low temperatures.

Selection diagram



Details regarding the choice of hydraulic fluid

The correct selection of hydraulic fluid requires knowledge of the operating temperature in relation to the ambient temperature, in an open circuit the tank temperature.

The hydraulic fluid should be selected so that within the operating temperature range, the operating viscosity lies within the optimum range (ν_{opt}) (see shaded section of the selection diagram). We recommend that the highest possible viscosity range should be chosen in each case.

Example: At an ambient temperature of X° C an operating temperature of 60° C is set in the circuit. In the optimum operating viscosity range (ν_{opt}; shaded area) this corresponds to the viscosity classes VG 46 or VG 68; to be selected: VG 68.

Please note: The leakage fluid temperature, which is affected by pressure and rotational speed, is always higher than the tank temperature. At no point in the system may the temperature be higher than 115°C.

If this cannot be achieved due to unusual operating parameters. Please contact us.

Filtration

The finer the filtration, the cleaner the fluid and the longer the service life of the axial piston unit.

To ensure proper function of the axial piston unit, the Hydraulic fluid must have a cleanliness level of at least
20/18/15 according to ISO 4406.

At very high hydraulic fluid temperatures (90°C to max. 115°C), a cleanliness level of at least
19/17/14 according to ISO 4406 is required.

Please contact us if these cleanliness leveles cannot be achieved.

Technical Data

Operating pressure range

Inlet

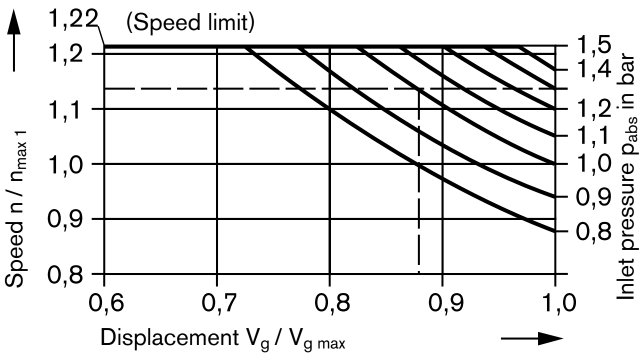
Pressure at port S
The minimum inlet pressure depends on the speed. The following limits may not be exceeded.

$p_{abs\ min}$ ________________ 0,8 bar

$p_{abs\ max}$ ________________ 1,5 bar

Minimum inlet pressure at suction port S with increased speed

In order to avoid damage of the pump a minimum inlet pressure at the suction port must be assured. The minimum inlet pressure is related to the rotational speed and the displacement of the variable pump.



Example:

Given: Size 80, input speed 2560 rpm

Required: Necessary pressure p_{abs} at suction port S

Solution: Speed ratio

$$\frac{n}{n_{max\ 1}} = \frac{2560}{2240} = 1{,}14$$

results in an inlet pressure of $p_{abs} = 1.3$ bar at full swivel angle ($V_{g\ max}$).

If a free inlet flow can only be achieved at e.g. $p_{abs} = 1$ bar, the displacement must be reduced to $0.88 \cdot V_{g\ max}$.

Note: Max. speed n_{max} (speed limit, see page 6).
Min. and max. permissible pressure at port S.

Outlet

Maximum pressure at port A_1 or A_2
(pressure specifications in according to DIN 24312)

Nominal pressure p_N ________________ 350 bar

Peak pressure p_{max} ________________ 400 bar

Case drain

The drain fluid chamber is connected to the suction and gear chambers. A drain line to the tank is not required. Note the special feature of the Size 200 for flushing fluid.

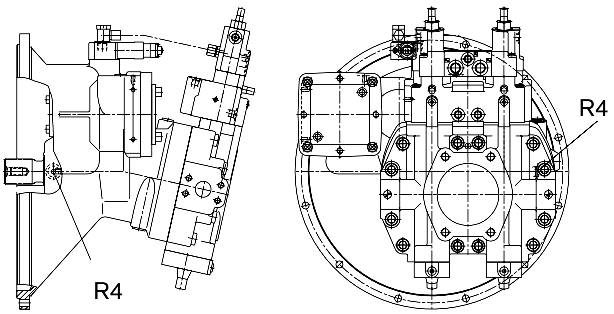
External flushing fluid connection

All A8VO variable double pumps in **size 200 always** require an external flushing fluid connection from the R4 port to the tank, to ensure cooling and lubrication of the bearing sets.

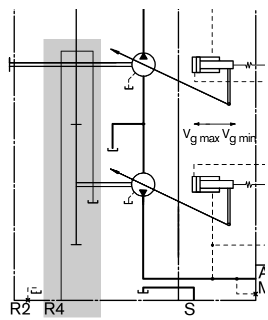
This line should have an internal diameter of ≥ 15 mm.

Note:

The tank level must be higher than the position of the R4 port (see page 37).



Circuit diagram R4 port



Temperature range of shaft seal ring

An FKM shaft seal is permissible for case temperatures of between -40°C and +115°C.

Auxiliary pump

Max. permissible pressure p_{max} ________________ 40 bar

The pressure relief valve installed to protect the integrated auxiliary pump has a fixed setting of 30 bar.

Input

Via flexible coupling.

Technical Data

Table of values (theoretical values, excluding η_{mh} and η_v: values rounded)

Size			**55**	**80**	**107**	**140**	**200**
Displacement	$V_{g\ max}$	cm^3	2 x 54,8	2 x 80	2 x 107	2 x 140	2 x 200
	$V_{g\ min}$	cm^3	0	0	0	0	0
Gear ratio $i = n_{input}/n_{rotary\ groups}$			1,0	1,0	1,0	1,0	1,0
Input speed max. at $V_{g\ max}$ [1]	$n_{max\ 1}$	rpm	2500	2240	2150	2100	1950
Input speed max. at $V_g \leq V_{g\ max}$ [2]	n_{max}	rpm	3000	2750	2450	2450	2250
Flow max. at n_{max} ($V_{g\ max}$)	$q_{v\ max}$	L/min	2 x 137	2 x 179	2 x 230	2 x 294	2 x 390
Power max.	P_{max}	kW	160	209	268	294	325
Input torque max.	T_{max}	Nm	611	891	1192	1337 [3]	1592 [3]
Mass moment of inertia	J	kgm^2	0,017	0,022	0,035	0,050	0,075
Mass approx.	m	kg	82	90	116	146	180
Variation: With integrated auxiliary pump, F00, F.. [4]							
Displacement with integrated auxiliary pump	$V_{g\ max}$	cm^3	8,6	8,6	8,6 (10,7)[4]	10,7	11 (19)[4]
Effective displacement	$V_{g\ max/eff}$	cm^3	9,7	9,7	11 (13,7)	12,7	13,4 (23,2)
Gear ratio $i = n_{input}/n_{aux.\ pump}$			0,887	0,887	0,780	0,843	0,818
Variation: With PTO, K.., F..							
Max. torque at PTO	T_{max}	Nm	250	350	380	315	400
Values valid up from 2007			280	350	380	450	650
Gear ratio $i = n_{input}/n_{PTO}$			1,0	1,0	1,0	1,0	0,818

[1]) The values shown are valid for an absolute pressure (p_{abs}) of 1 bar at the suction port S and for operation with mineral fluid (with a specific mass of 0.88kg/L).

[2]) The values shown are valid for $V_g \leq V_{g\ max}$ or for an increase in the inlet pressure p_{abs} at the suction port S (see page 5).

[3]) Observe max. permissible torque!

[4]) (...) = Available on request!

Calculation of nominal size

Flow $$q_v = \frac{V_g \bullet n \bullet \eta_v}{1000}$$ in L/min

Torque $$T = \frac{V_g \bullet \Delta p}{20 \bullet \pi \bullet \eta_{mh}}$$ in Nm

Power $$P = \frac{2\pi \bullet T \bullet n}{60\,000} = \frac{q_V \bullet \Delta p}{600 \bullet \eta_t}$$ in kW

V_g	=	Displacement per revolution	in cm^3
Δp	=	Differential pressure	in bar
n	=	Speed	in rpm
η_v	=	Volumetric efficiency	
η_{mh}	=	Mechanical-hydraulic efficiency	
η_t	=	Overall efficiency ($\eta_t = \eta_v \bullet \eta_{mh}$)	

LA0, LA1 Individual Power Control

On the variable double pump with individual power control LA0/LA1, the two rotary groups are not mechanically coupled, i.e. each rotary group is fitted with a separate power control.

The power control controls the displacement of the pump depending on the operating pressure so that a defined input power is not exceeded.

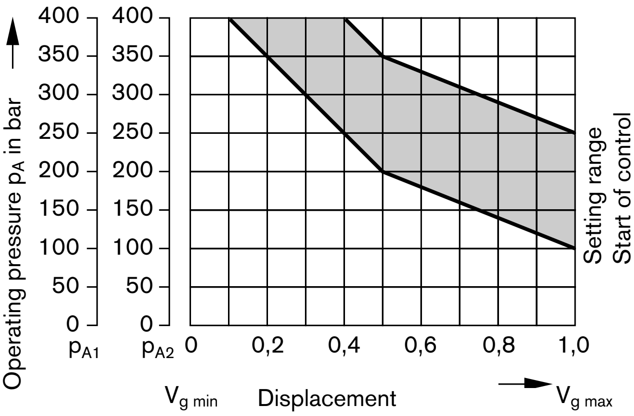
The power setting is adjusted individually for each control and can be different; each pump can be set to 100% input power.

The hyperbolic control curve is approximated using two measuring springs. The operating pressure acts on the measuring surfaces of a differential piston against the measuring springs and an externally adjustable spring force, which determines the power setting.

If the sum of the hydraulic forces exceeds the spring force, control fluid is supplied to the control piston, which swivels the pump back to reduce the flow.

When not under pressure, the pump is swiveled back to its initial position at $V_{g\ max}$ by a control spring.

Characteristic: LA0; LA1



The output power (characteristic curve) is influenced by the efficiency of the double pump.

Please state in clear text when ordering:

- Application: e.g. excavators
- Input power P (kW)
- Input speed n (rpm)
- Max. flow $q_{V\ max}$ (L/min)
- Max. operating pressure (primary pressure valve setting)

After clarifying the details a power diagram can be created by our computer.

LA0

Individual power control without override control

LA1

Individual power control with override control by pilot pressure

An external pilot pressure is applied to the third measuring surface of the differential piston (port X_3), thus enabling the set power to be reduced (negative power override).

The mechanically set basic power can be varied using different pilot pressures. This means that different power settings are possible.

If the pilot pressure signal is variably controlled by a load limiting control, the sum of the hydraulic powers is equal to the input power. The pilot pressure for the power override control is generated by an external control element or by the built-on pressure reducing valve (see page 36). The electric signal for actuation of the pressure reducing valve must be generated by an external electronic controller. The BODAS controller RC (RE 95 200) in conjunction with the LLC software (see RE 95 310) are available for this purpose.
(Further information on the Internet at www.boschrexroth.com/mobile-electronics).

Note:
If there is no power override, port X_3 to the tank should be depressurized.

LA0, LA1 Individual Power Control

LA0H; LA1H

Individual power control with hydraulic stroke limiter

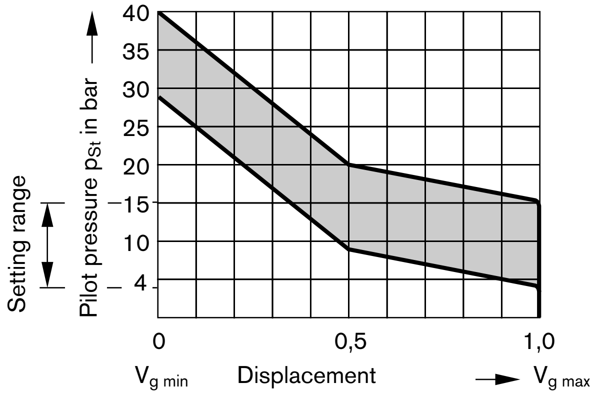
The hydraulic stroke limiter enables the displacement to be infinitely varied or limited across the entire control range of $V_{g\,max}$ to $V_{g\,min}$.

The displacement is set by the pilot pressure p_{St} applied at port X_1 (max. 40 bar).

The hydraulic stroke limiter is overridden by the power control, i.e. below the power control curve, the displacement is adjusted depending on the pilot pressure. If the set flow or the operating pressure is such that the power control curve is exceeded, the power control overrides the stroke limiter and reduces the displacement along the spring characteristic curve.

Note: The H1/H2/H3 characteristic curve is influenced by the configuration of the power control!

Characteristic: LA0H1/3; LA1H1/3
Pilot pressure increase ($V_{g\,max}$ – $V_{g\,min}$) ____ Δp = ca. 25 bar



LA0H1/3; LA1H1/3

Hydraulic stroke limiter (negative control)

Control range from $V_{g\,max}$ to $V_{g\,min}$.

With increasing pilot pressure the pump swivels to a smaller displacement.

Start of control (at $V_{g\,max}$) adjustable ______ from 4 – 15 bar

Note: The start of control depends on the power control setting.

Please specify start of control in plain text when ordering.
Initial position at zero pressure: $V_{g\,max}$

Note for H1:

A pressure of ≥ 30 bar is necessary for control. The required fluid is taken from the high-pressure line.
When using negative control directional valves, the control pressure is supplied from the negative control system via the high-pressure line.

Note for H3:

A pressure of ≥ 30 bar is necessary for control. The required control pressure is taken from the high-pressure line or the external control pressure applied at port Y_3 (≥ 30 bar).
When using standard open-center directional valves, this control must be carried out with the external control pressure supply

LA0H2; LA1H2

Hydraulic stroke limiter and external pilot pressure supply (positive control)

Control range from $V_{g\,min}$ to $V_{g\,max}$.

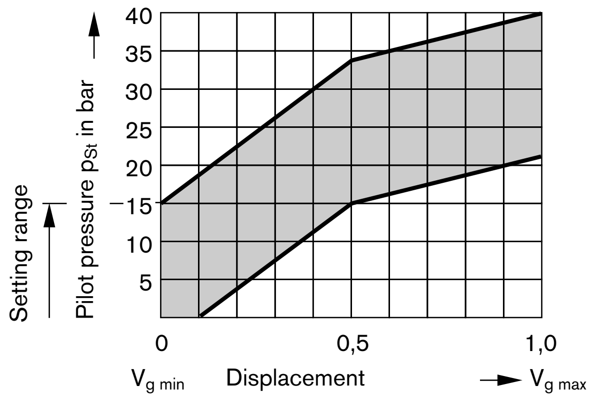
With increasing pilot pressure the pump swivels to a higher displacement.

Start of control (at $V_{g\,min}$) adjustable __________ 0 to 15 bar
Please specify start of control in plain text when ordering.

Initial position at zero pressure: $V_{g\,max}$

To control from $V_{g\,max}$ to $V_{g\,min}$ a pressure of ≥ 30 bar is required. The required fluid is taken from the high-pressure line or the external control pressure applied at port Y_3 (≥ 30 bar) (pilot pressure < start of control).

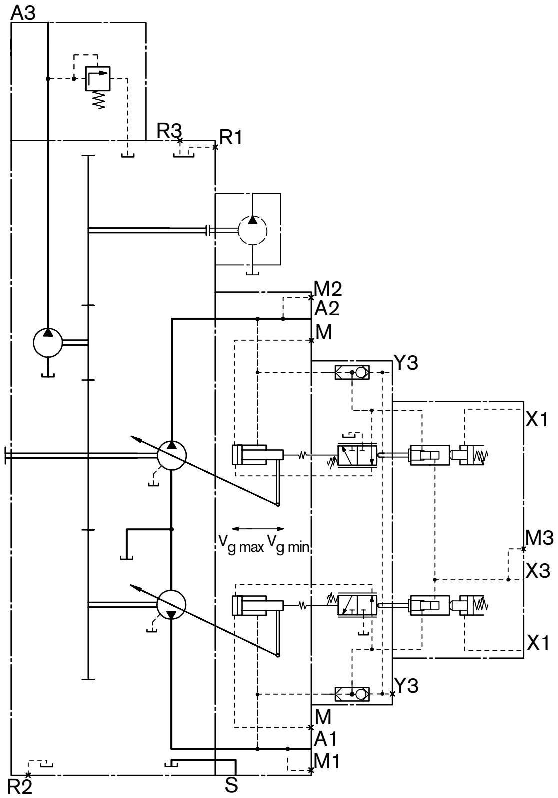
Characteristic: LA0/1H2
Pilot pressure increase ($V_{g\,min}$ – $V_{g\,max}$) ______ Δp = ca. 25 bar



Note: If port Y_3 is used (H2 + H3), it must always be connected to an external control pressure. If there is no external control pressure supply, this connection to the tank must be depressurized.

LA0, LA1 Individual Power Control

Circuit diagram: LA1H2



LA0K; LA1K

Individual power control with hydraulic coupling

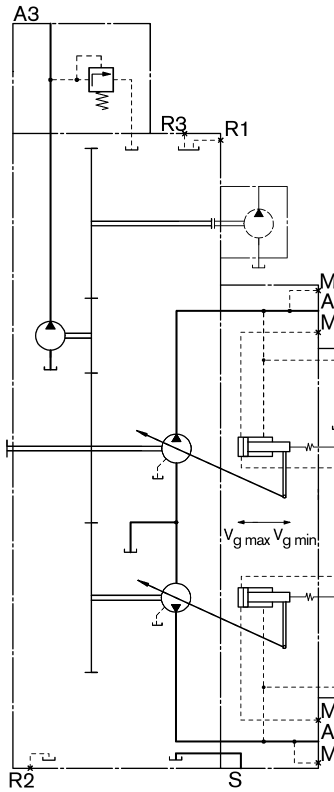
The hydraulic coupling of the two individual controls provides the function of a summation power control. However, the two rotary groups are coupled hydraulically, not mechanically.

The operating pressures of the two circuits each act on the differential pistons in the two individual controls, causing both rotary groups to swivel out and back together.

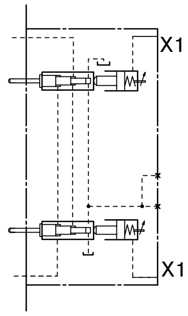
If one pump is working at less than 50% of the total input power, the remaining power can be transferred to the other pump, up to a limit of 100% of the total input power.

With the additional H1/H3 hydraulic stroke limiter function, each rotary group can be independently swiveled back to a smaller V_g than is currently specified by the power control.

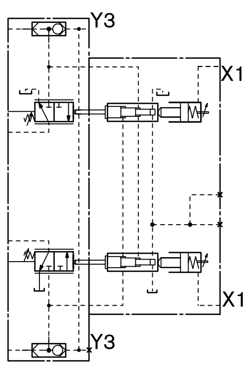
Circuit diagram: LA1KH1



Circuit diagram module for LA0KH1



Circuit diagram module for LA0KH3



LA0, LA1 Individual Power Control

LA0S; LA1S, LA0KS, LA1KS

Individual power control with load sensing

The load-sensing control is a flow control option that operates as a function of the load pressure to regulate the pump displacement to match the actuator flow requirement.

The flow depends here on the cross section of the external sensing orifice (1) fitted between the pump outlet and the actuator. The flow is independent of the load pressure below the power curve and within the control range of the pump.

The sensing orifice is usually a separately arranged load sensing directional valve. The position of the directional valve piston determines the opening cross section of the sensing orifice and thus the flow of the pump.

The load-sensing control compares pressure before and after the sensing orifice and maintains the pressure drop (differential pressure Δp) across the orifice - and therefore the pump flow - constant as a function of the orifice size.

If the differential pressure Δp on the sensing orifice increases, the pump is swivelled back towards $V_{g\,min}$ and, if the Δp decreases the pump is swivelling out towards $V_{g\,max}$ until the pressure drop across the sensing orifice in the valve is restored.

$\Delta p_{orifice} = p_{pump} - p_{actuator}$

The setting range for Δp is between 14 bar and 25 bar.

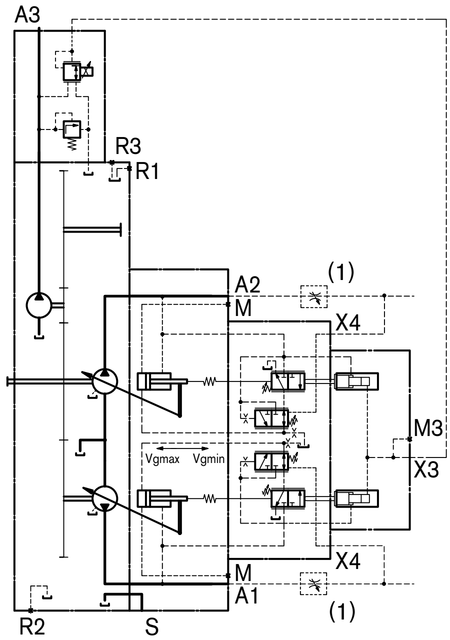
The standard differential pressure setting 18 bar. (Please state in clear text when ordering).

The stand-by pressure in zero stroke operation (sensing orifice plugged) is slightly above the Δp setting.

In a LUDV (flow sharing) system the pressure cut-off is integrated in the LUDV control block.

(1) The LS directional valve (sensing orifice) is not included with the pump.

Circuit diagram: LA1S



EP Electrical Control with Proportional Solenoid

With the electrical control with proportional solenoid, the pump displacement is adjusted proportionally to the solenoid current, resulting in a magnetic control force, acting directly onto the control spool that pilots the pump control piston.

Control from $V_{g\,min}$ to $V_{g\,max}$

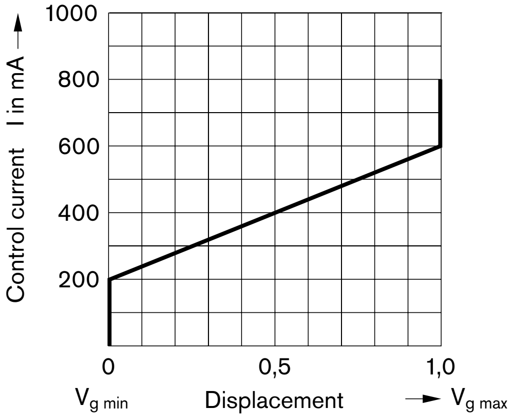
With increasing control current the pump swivels to a higher displacement.

Starting position without control signal (control current): $V_{g\,min}$

The required control pressure is taken either from the load pressure, or from the externally applied control pressure at the Y_3 port.

To ensure the control even at low operating pressure $<$ 30 bar the port Y_3 must be supplied with a external control pressure of approx. 30 bar.

Characteristic: EP2



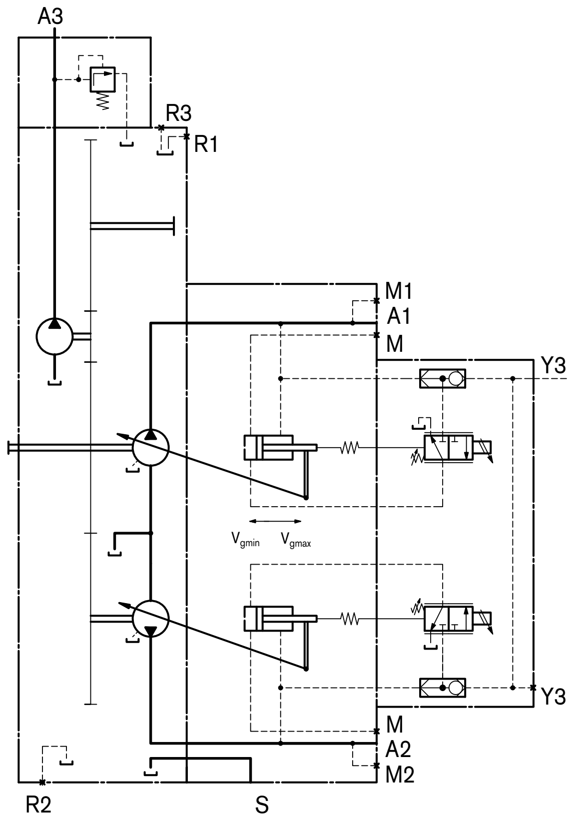
Note
for load sensing "S" and electric control "EP":
When operated at $V_{g\,min}$ ($>$ 5min) the hydraulic fluid in the housing can become heated to a non-permissible temperature. Please ask for details.

Solenoid technical data	EP2
Voltage	24 V (±20%)
Control current	
Start of control at V_g 0	200 mA
End of control at $V_{g\,max}$	600 mA
Limiting current	0.77 A
Nominal resistance (at 20°C)	22.7 Ω
Dither frequency	100 Hz
Duty cycle	100%
Type of protection according to DIN/EN 60529	IP67 and IP69K

To control the proportional solenoids the following electronic amplifiers and controller are available (also as to the internet under www.boschrexroth.com/mobile-electronics):

- BODAS controller **RC** (RE 95200) and application software
- Analog amplifier **RA** (RE95230)

Circuit diagram: EP2

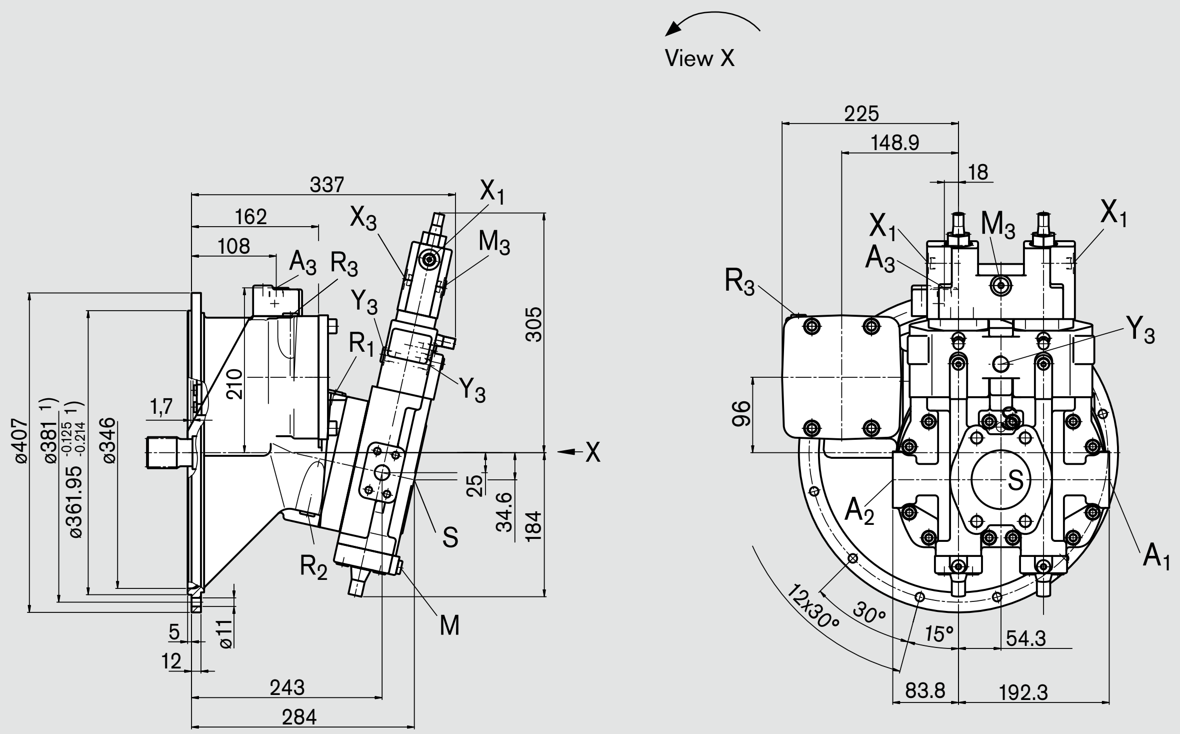


Unit Dimensions, Size 55

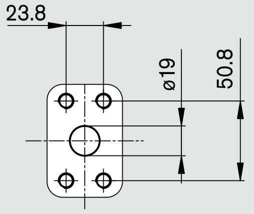
Before finalizing your design, please request a approved installation drawing. Dimensions in mm

LA0KH1/H3, LA1KH1/H3

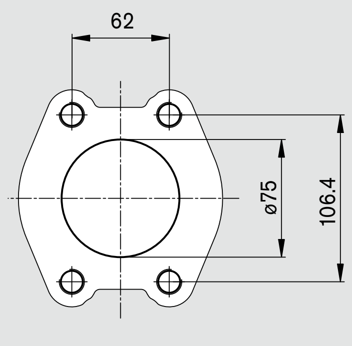
Individual power control with hydraulic coupling and hydraulic stroke limiter (negative control)



Detail of A_1, A_2
(2:1)



Detail of S
(2:1)



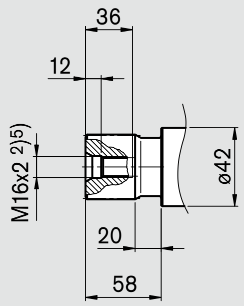
1)Dimensions conform to SAE J617-Nr. 4, for connection to flywheel housing in internal combustion engine.

Unit Dimensions, Size 55

Before finalizing your design, please request a approved installation drawing. Dimensions in mm

Shaft end

Z Splined shaft DIN 5480 W40x2x30x18x9g



Ports

A_1, A_2	Service line ports (high pressure series)	SAE J518	3/4 in	
	Fastening threads	DIN 13	M10x1,5; 17 deep [5])	
S	Suction port (standard series)	SAE J518	3 in	
	Fastening threads	DIN 13	M16x2; 21 deep [5])	
A_3	Service line port (auxiliary pump)	DIN 3852	M18x1,5; 12 deep	140 Nm [5])
R_1, R_3	Bleed port	DIN 3852	M14x1,5; 12 deep	80 Nm [5])
R_2	Fluid drain	DIN 3852	M14x1,5; 12 deep	80 Nm [5])
M	Gauge port for control pressure	DIN 3852	M12x1,5; 12 deep	50 Nm [5])
M_3	Gauge port for power override [3])	DIN 3852	M14x1,5; 12 deep	80 Nm [5])
X_1	Pilot pressure port for hydraulic stroke limiter	DIN 3852	M14x1,5; 12 deep	80 Nm [5])
X_3	Pilot pressure port for power override [3])	DIN 3852	M14x1,5; 12 deep	80 Nm [5])
Y_3	External control pressure port [4])	DIN 3852	M14x1,5; 12 deep	80 Nm [5])

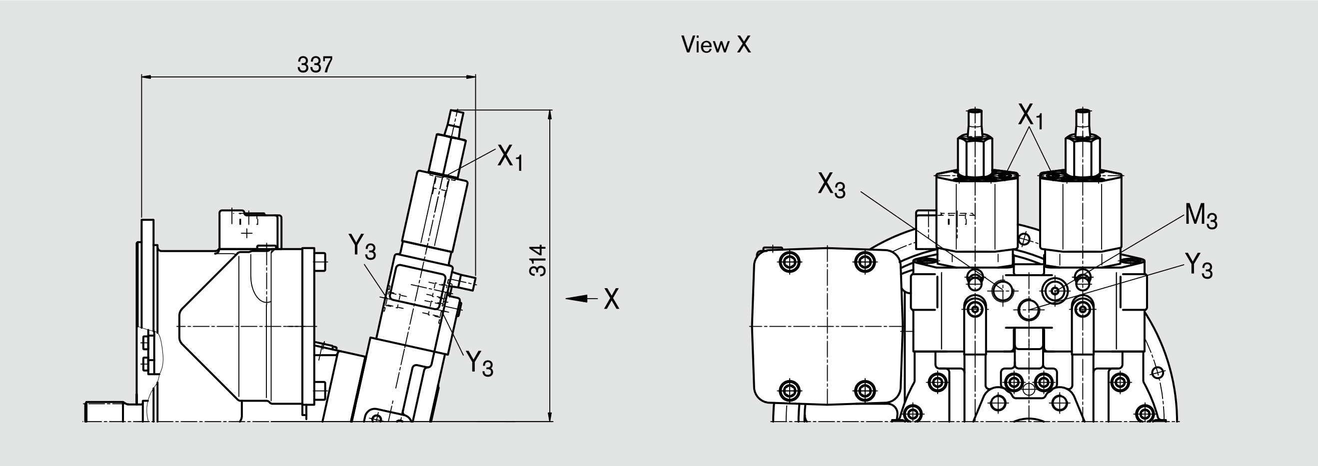
[2]) Centering bore according to DIN 332, thread according to DIN 13.
[3]) On the LA0 version, the port has no function.
[4]) Only on versions LA...H2 and LA...H3.
[5]) Please observe the general notes for the max. tightening torques on page 40.

Unit Dimensions, Size 55

Before finalizing your design, please request a approved installation drawing. Dimensions in mm

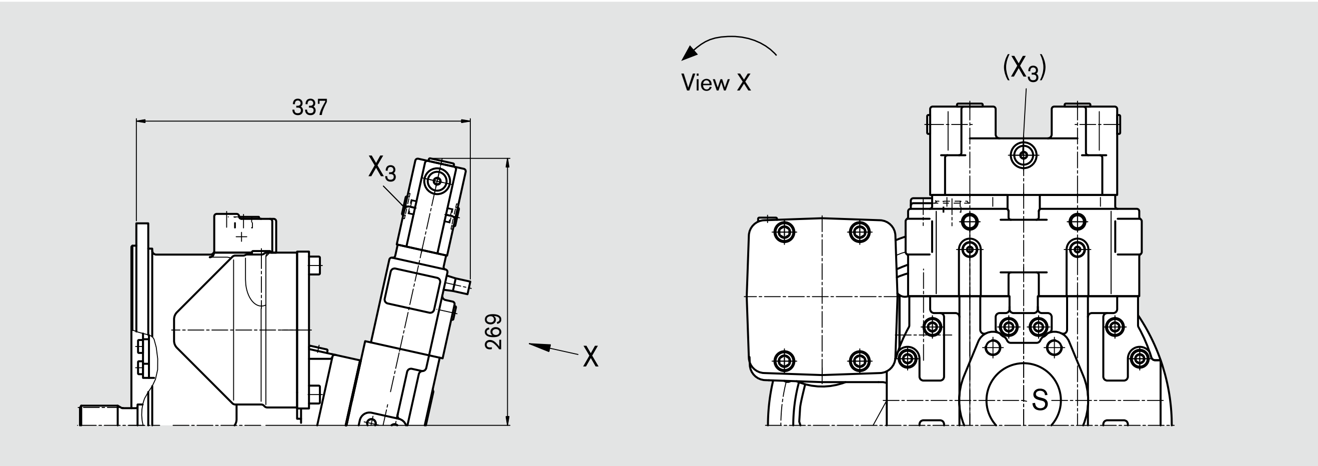
LA0H2, LA1H2

Individual power control with hydraulic stroke limiter and external pilot pressure supply (positive control)



LA0K, LA1K

Individual power control with hydraulic power coupling

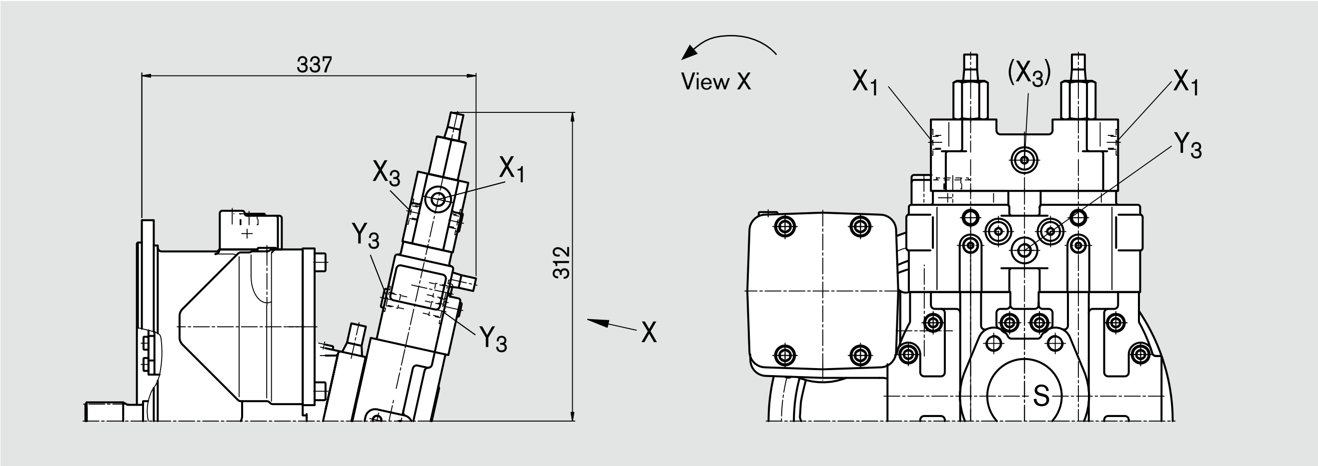


Unit Dimensions, Size 55

Before finalizing your design, please request a approved installation drawing. Dimensions in mm

LA0KH2, LA1KH2

Individual power control with hydraulic power coupling, hydraulic stroke limiter and external pilot pressure supply (positive control)

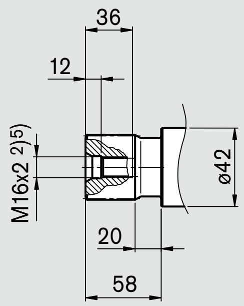


Unit Dimensions, Size 80

Before finalizing your design, please request a approved installation drawing. Dimensions in mm

Shaft end

Z Splined shaft DIN 5480
W40x2x30x18x9g



Ports

A_1, A_2	Service line ports (high pressure series)	SAE J518	1 in	
	Fastening threads	DIN 13	M12x1,75; 17 deep [5])	
S	Suction port (standard series)	SAE J518	3 in	
	Fastening threads	DIN 13	M16x2; 21 deep [5])	
A_3	Service line port (auxiliary pump)	DIN 3852	M18x1,5; 12 deep	140 Nm [5])
R_1, R_3	Bleed port	DIN 3852	M14x1,5; 12 deep	80 Nm [5])
R_2	Fluid drain	DIN 3852	M14x1,5; 12 deep	80 Nm [5])
M	Gauge port for control pressure	DIN 3852	M12x1,5; 12 deep	50 Nm [5])
M_1, M_2	Gauge ports for high pressure	ISO11926	9/16-18UNF-2B;12 deep	80 Nm [5])
M_3	Gauge port for power override [3])	DIN 3852	M14x1,5; 12 deep	80 Nm [5])
X_1	Pilot pressure port for hydraulic stroke limiter	DIN 3852	M14x1,5; 12 deep	80 Nm [5])
X_3	Pilot pressure port for power override [3])	DIN 3852	M14x1,5; 12 deep	80 Nm [5])
X_4	Pilot pressure port for load sensing	DIN 3852	M14x1,5;12 deep	80 Nm [5])
Y_3	External control pressure port [4])	DIN 3852	M14x1,5; 12 deep	80 Nm [5])

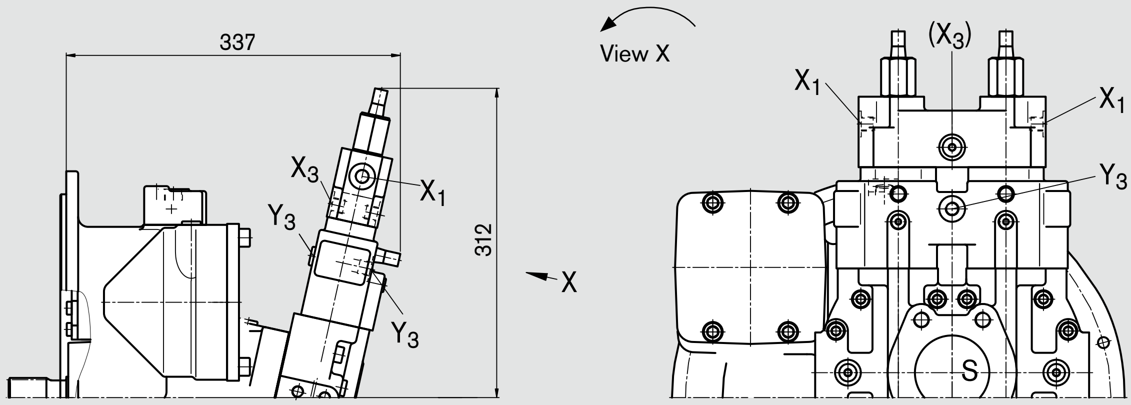
[2]) Centering bore according to DIN 332, thread according to DIN 13.
[3]) On the LA0 version, the port has no function.
[4]) Only on versions LA...H2 and LA...H3.
[5]) Please observe the general notes for the max. tightening torques on page 40.

Unit Dimensions, Size 80

Before finalizing your design, please request a approved installation drawing. Dimensions in mm

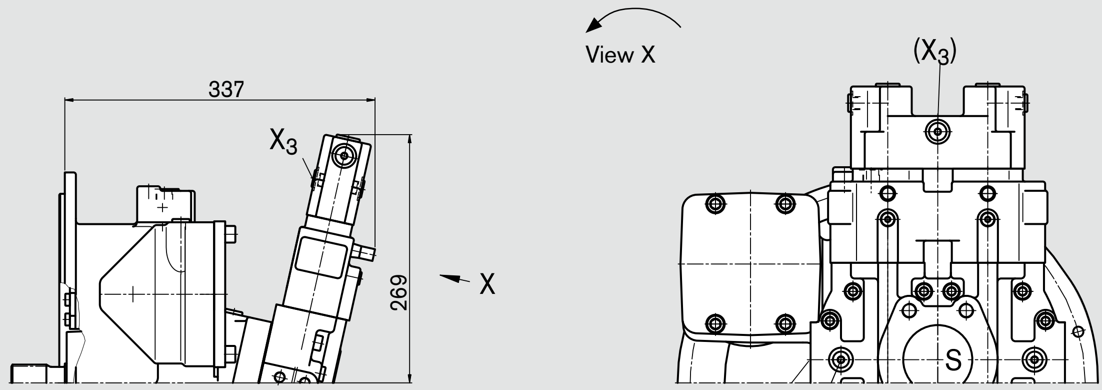
LA0H2, LA1H2

Individual power control with hydraulic stroke limiter and external pilot pressure supply (positive control)



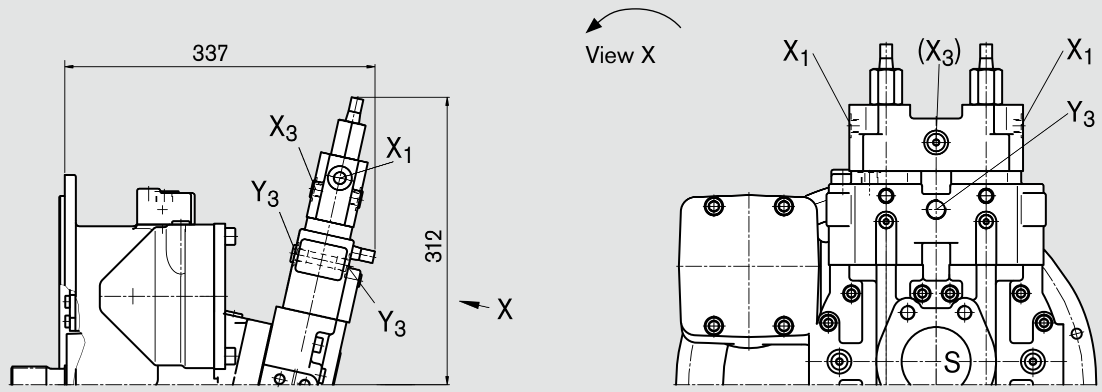
LA0K, LA1K

ndividual power control with hydraulic power coupling



LA0KH2, LA1KH2

Individual power control with hydraulic power coupling, hydraulic stroke limiter and external pilot pressure supply (positive control)

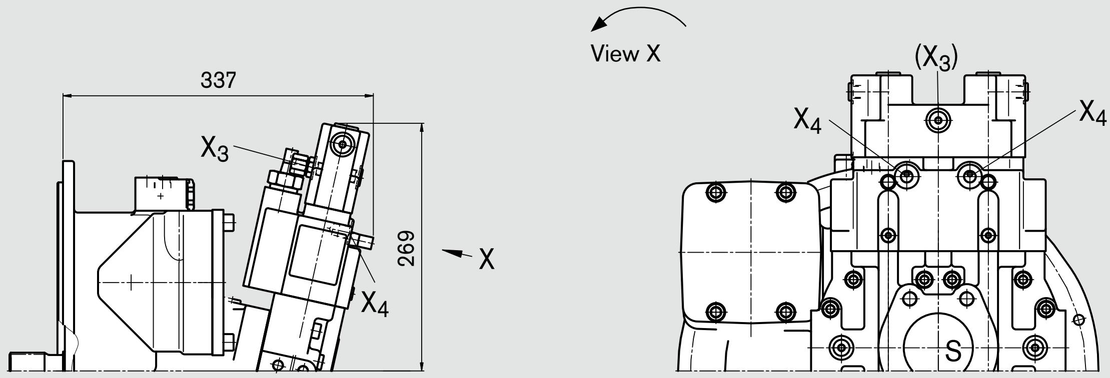


Unit Dimensions, Size 80

Before finalizing your design, please request a approved installation drawing. Dimensions in mm

LA0KS, LA1KS

Individual power control with hydraulic power coupling and load sensing

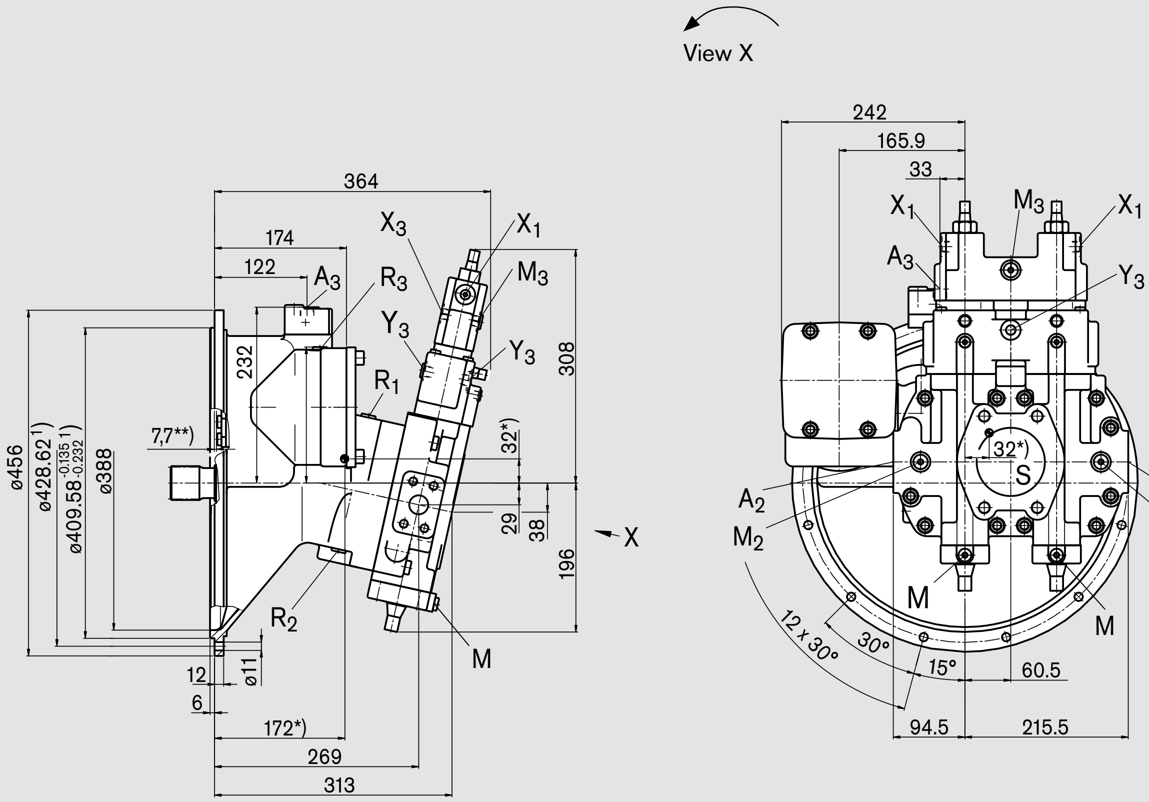


Unit Dimensions, Size 107

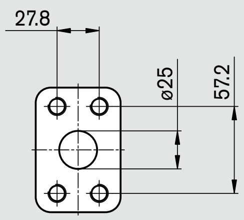
Before finalizing your design, please request a approved installation drawing. Dimensions in mm

LA0KH1/H3, LA1KH1/H3

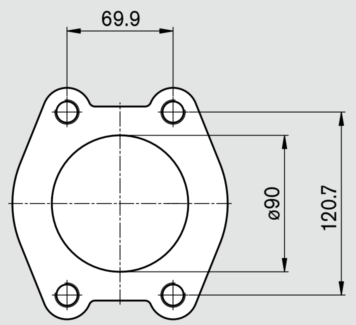
Individual power control with hydraulic coupling and hydraulic stroke limiter (negative control)



Detail of A_1, A_2
(2:1)



Detail of S
(2:1)



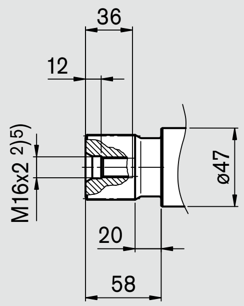
*) Center of gravity
**) at auxiliary pump 10,7 cm^3 = 4,7mm
[1]) Dimensions conform to SAE J617-No. 3, for connection to flywheel housing in internal combustion engine.

Unit Dimensions, Size 107

Before finalizing your design, please request a approved installation drawing. Dimensions in mm

Shaft end

Z Splined shaft DIN 5480 W45x2x30x21x9g



Ports

A_1, A_2	Service line ports (high pressure series)	SAE J518	1 in	
	Fastening threads	DIN 13	M12x1,75; 17 deep 5)	
S	Suction port (standard series)	SAE J518	3 1/2 in	
	Fastening threads	DIN 13	M16x2; 21 deep 5)	
A_3	Service line ports (auxiliary pump)	DIN 3852	M18x1,5; 12 deep	140 Nm 5)
R_1, R_3	Bleed port	DIN 3852	M14x1,5; 12 deep	80 Nm 5)
R_2	Fluid drain	DIN 3852	M14x1,5; 12 deep	80 Nm 5)
M	Gauge port for control pressure	DIN 3852	M12x1,5; 12 deep	50 Nm 5)
M_1, M_2	Gauge ports for high pressure	DIN 3852	M14x1,5; 12 deep	80 Nm 5)
M_3	Gauge port for power override 3)	DIN 3852	M14x1,5; 12 deep	80 Nm 5)
X_1	Pilot pressure port for hydraulic stroke limiter	DIN 3852	M14x1,5; 12 deep	80 Nm 5)
X_3	Pilot pressure port for power override 3)	DIN 3852	M14x1,5; 12 deep	80 Nm 5)
X_4	Pilot pressure port for load sensing	DIN 3852	M14x1,5;12 deep	80 Nm 5)
Y_3	External control pressure port 4)	DIN 3852	M14x1,5; 12 deep	80 Nm 5)

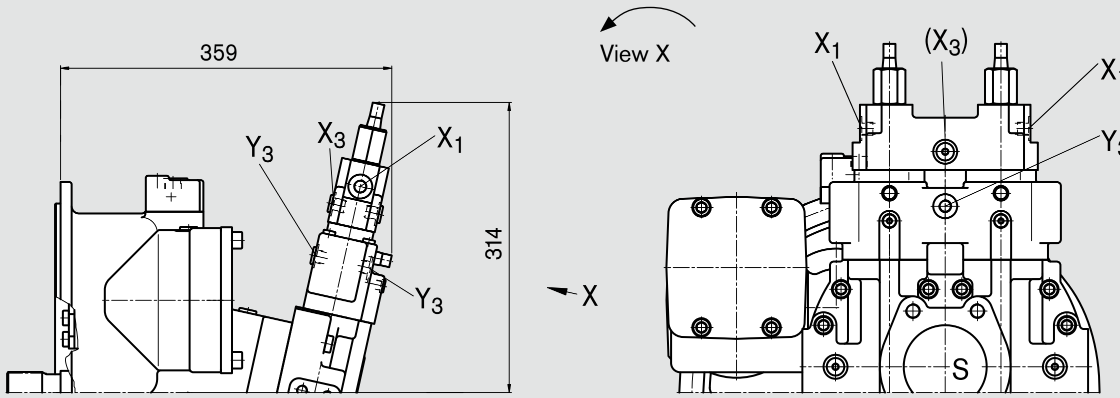
2) Centering bore according to DIN 332, thread according to DIN 13.
3) On the LA0 version, the port has no function.
4) Only on versions LA...H2 and LA...H3.
5) Please observe the general notes for the max. tightening torques on page 40.

Unit Dimensions, Size 107

Before finalizing your design, please request a approved installation drawing. Dimensions in mm

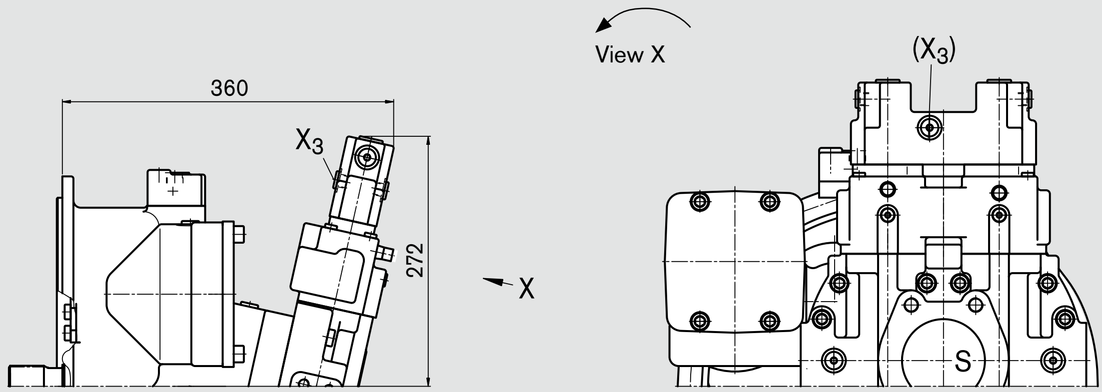
LA0H2, LA1H2

Individual power control with hydraulic stroke limiter and external pilot pressure supply (positive control)



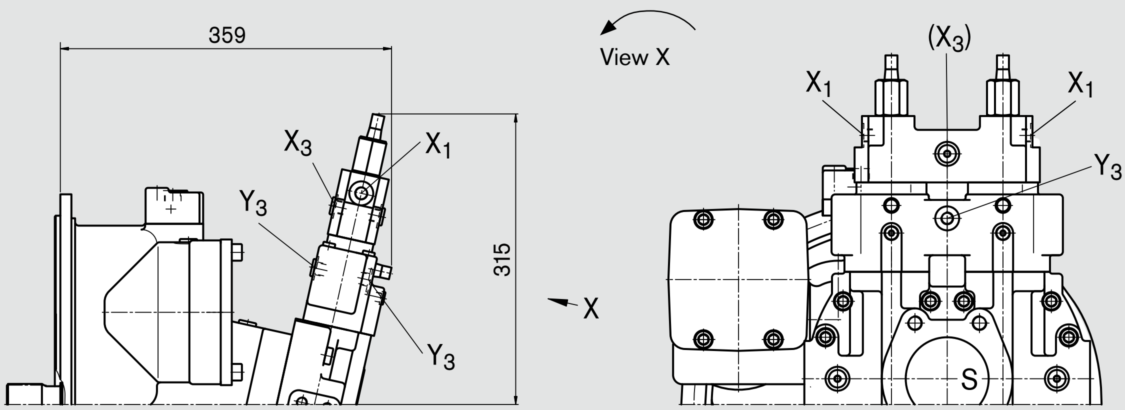
LA0K, LA1K

Individual power control with hydraulic power coupling



LA0KH2, LA1KH2

Individual power control with hydraulic power coupling, hydraulic stroke limiter and external pilot pressure supply (positive control)

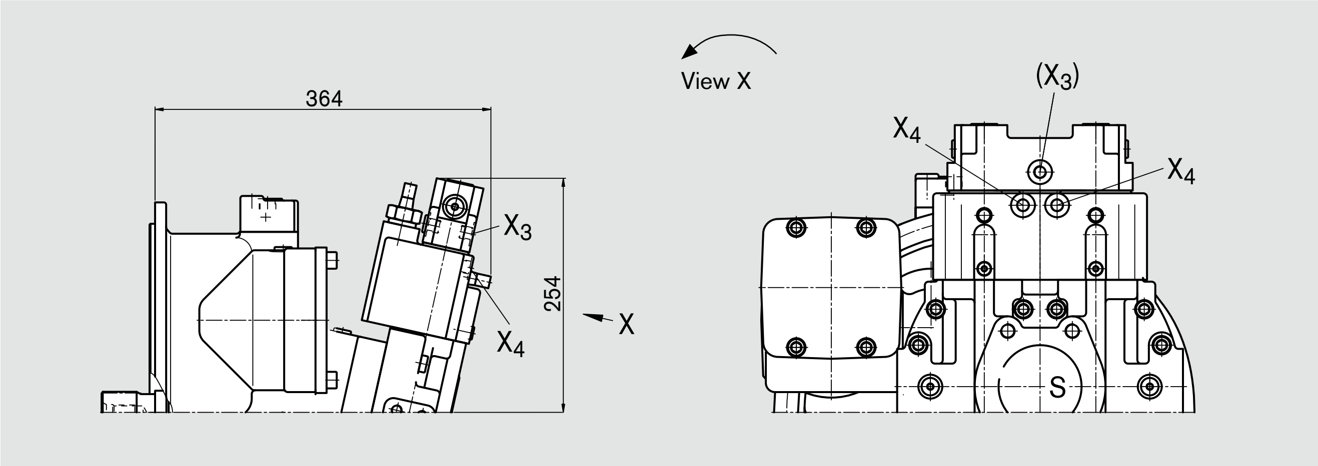


Unit Dimensions, Size 107

Before finalizing your design, please request a approved installation drawing. Dimensions in mm

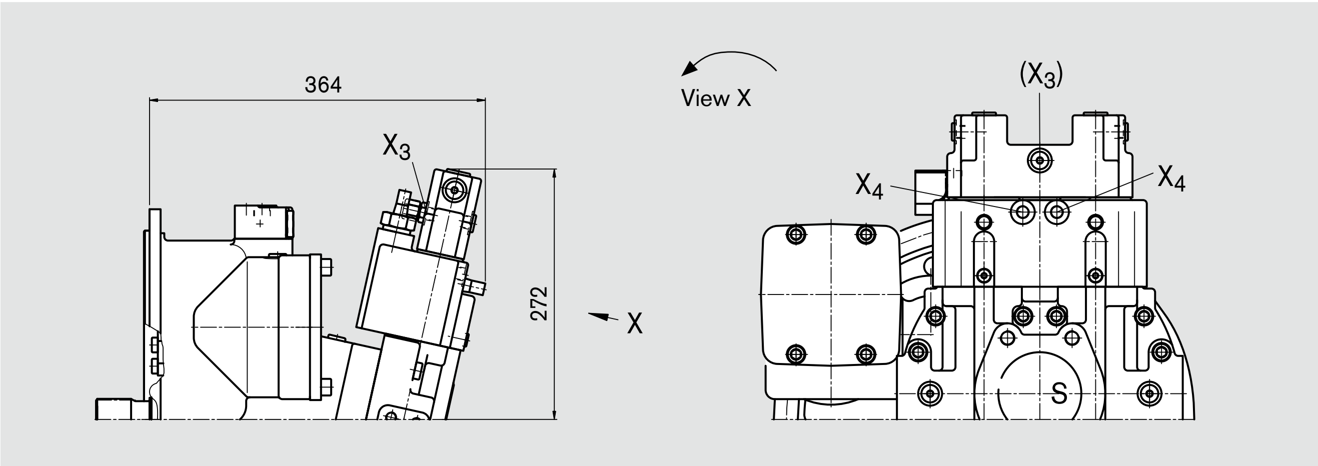
LA0S, LA1S

Individual power control with load sensing



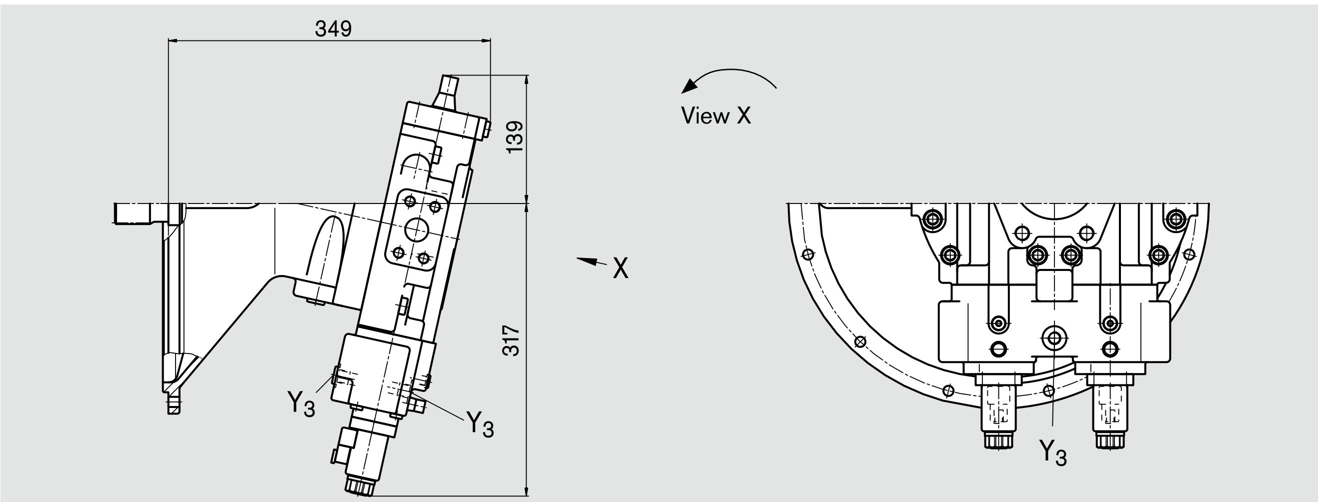
LA0KS, LA1KS

Individual power control with hydraulic power coupling and load sensing



EP2

Electrical control with proportional solenoid (positive control)

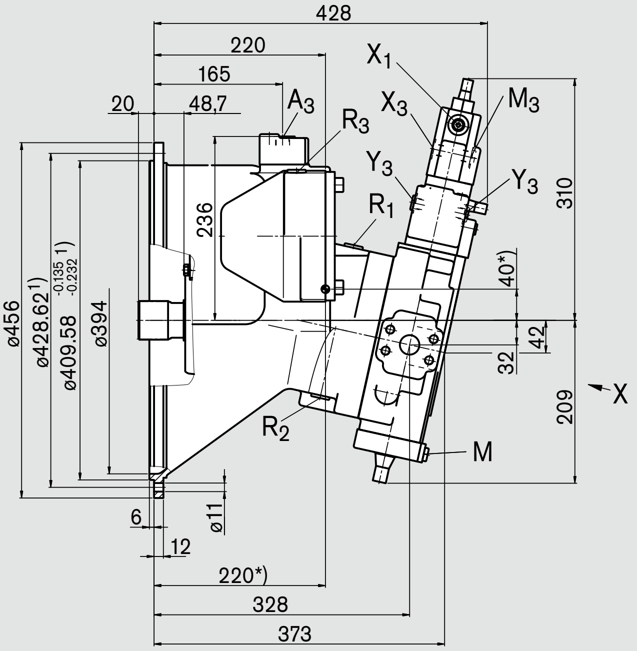


Unit Dimensions, Size 140

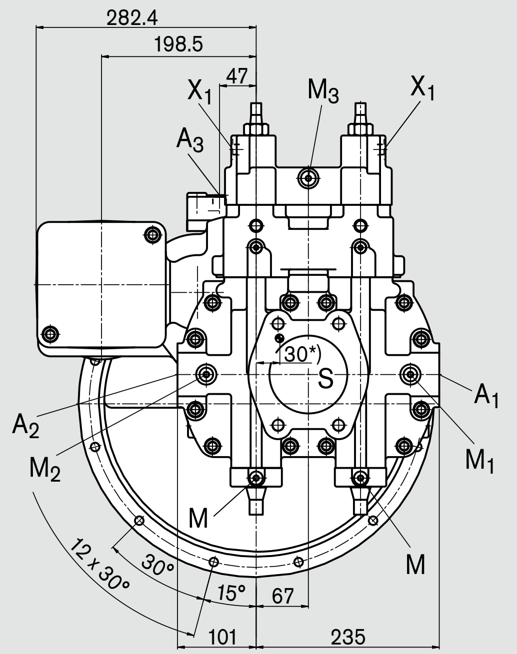
Before finalizing your design, please request a approved installation drawing. Dimensions in mm

LA0KH1/H3, LA1KH1/H3

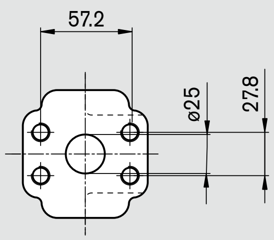
Individual power control with hydraulic coupling and hydraulic stroke limiter (negative control)



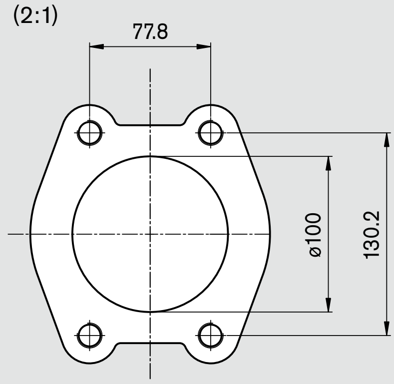
View X



Detail of A_1, A_2
(2:1)



Detail of S
(2:1)



*) Center of gravity

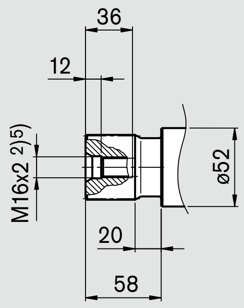
1) Dimensions conform to SAE J617-No. 3, for connection to flywheel housing in internal combustion engine.
Loch-ø11mm nur bei Neuprojekten (bisherige Typen mit Kurzbezeichnung G und Loch-ø 14mm)

Unit Dimensions, Size 140

Before finalizing your design, please request a approved installation drawing. Dimensions in mm

Shaft end

Z Splined shaft DIN 5480 W50x2x30x24x9g



Ports

A_1, A_2	Service line ports (high pressure series)	SAE J518	1 in	
	Fastening threads	DIN 13	M12x1,75; 17 deep [5])	
S	Suction port (standard series)	SAE J518	4 in	
	Fastening threads	DIN 13	M16x2; 21 deep [5])	
A_3	Service line port (auxiliary pump)	DIN 3852	M18x1,5; 12 deep	140 Nm [5])
R_1, R_3	Bleed port	DIN 3852	M18x1,5; 12 deep	140 Nm [5])
R_2	Fluid drain	DIN 3852	M18x1,5; 12 deep	140 Nm [5])
M	Gauge port for control pressure	DIN 3852	M12x1,5; 12 deep	50 Nm [5])
M_1, M_2	Gauge port for high pressure	ISO11926	9/16-18UNF-2B;12 deep	80 Nm [5])
M_3	Gauge port for power override [3])	DIN 3852	M14x1,5; 12 deep	80 Nm [5])
X_1	Pilot pressure port for hydraulic stroke limiter [3])	DIN 3852	M14x1,5; 12 deep	80 Nm [5])
X_3	Pilot pressure port for power override [3])	DIN 3852	M14x1,5; 12 deep	80 Nm [5])
X_4	Pilot pressure port for load sensing	DIN 3852	M14x1,5;12 deep	80 Nm [5])
Y_3	External control pressure port [4])	DIN 3852	M14x1,5; 12 deep	80 Nm [5])

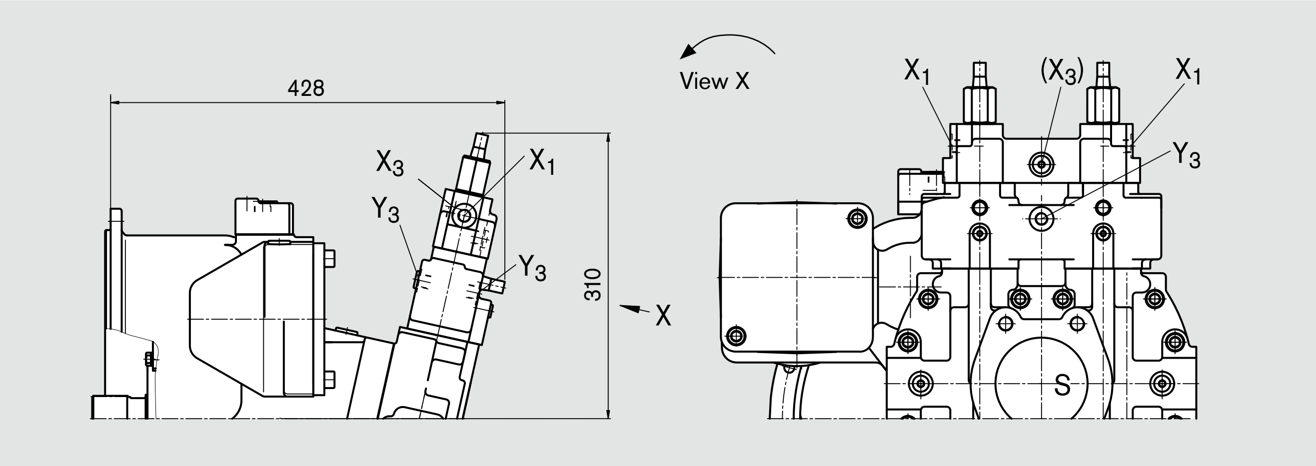
[2]) Centering bore according to DIN 332, thread according to DIN 13.
[3]) On the LA0 version, the port has no function.
[4]) Only on versions LA...H2 and LA...H3.
[5]) Please observe the general notes for the max. tightening torques on page 40.

Unit Dimensions, Size 140

Before finalizing your design, please request a approved installation drawing. Dimensions in mm

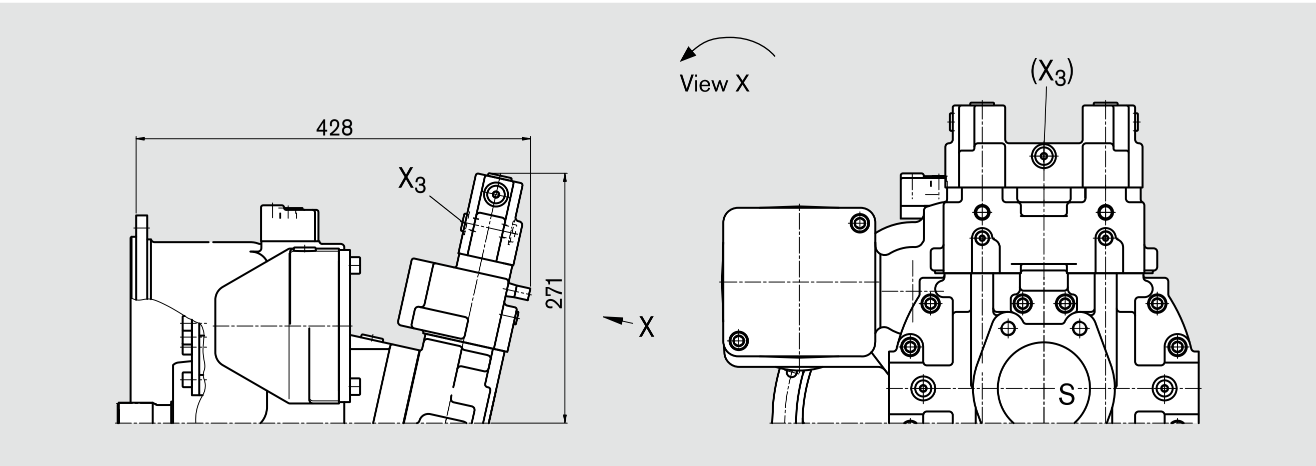
LA0H2, LA1H2

Individual power control with hydraulic stroke limiter and external pilot pressure supply (positive control)



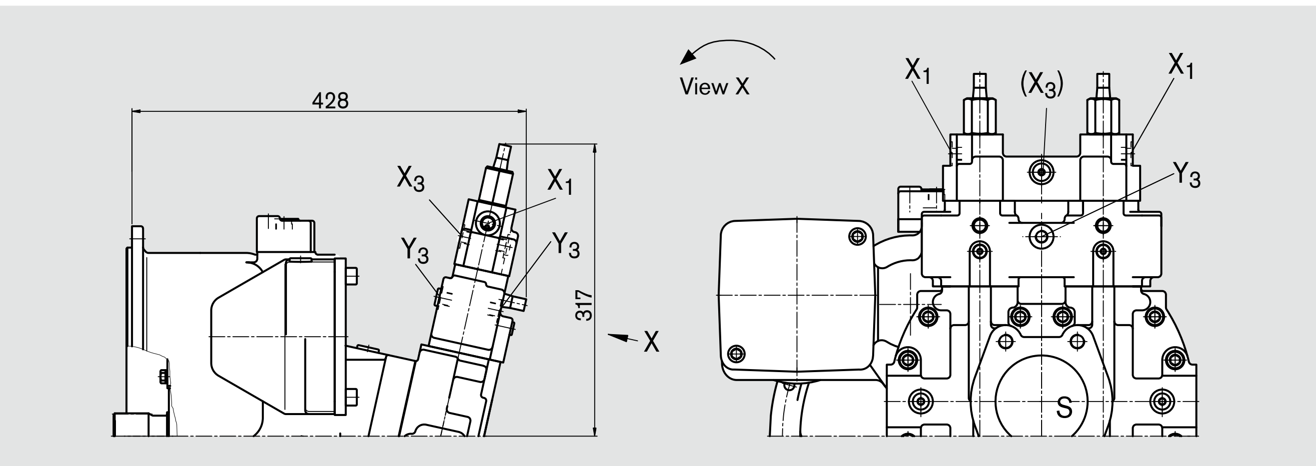
LA0K, LA1K

Individual power control with hydraulic power coupling



LA0KH2, LA1KH2

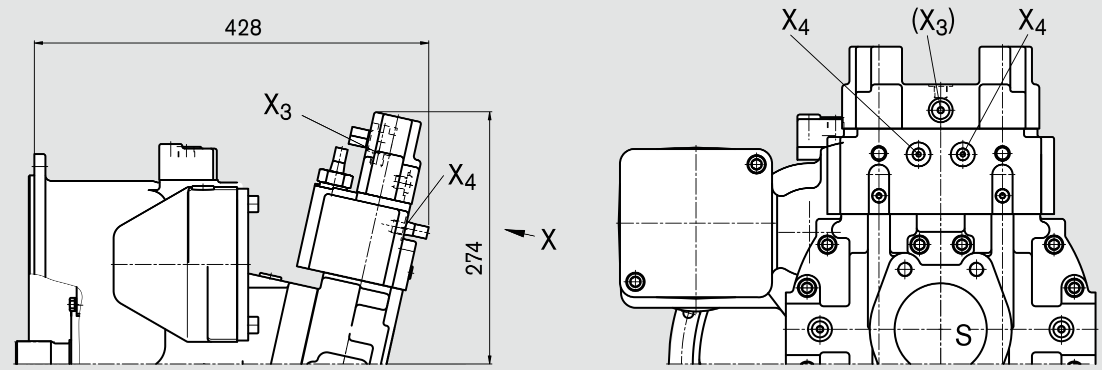
Individual power control with hydraulic power coupling, hydraulic stroke limiter and external pilot pressure supply (positive control)



Unit Dimensions, Size 140

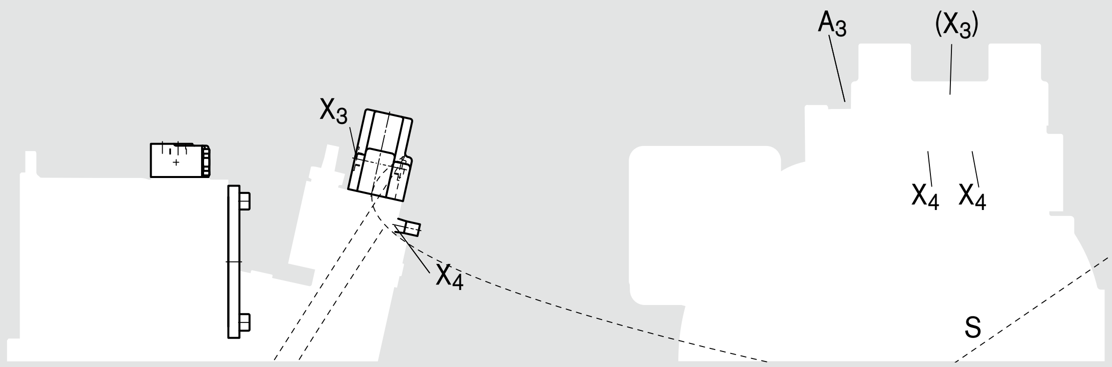
LA0S, LA1S

Individual power control with load sensing



LA0KS, LA1KS

Individual power control with hydraulic power coupling and load sensing

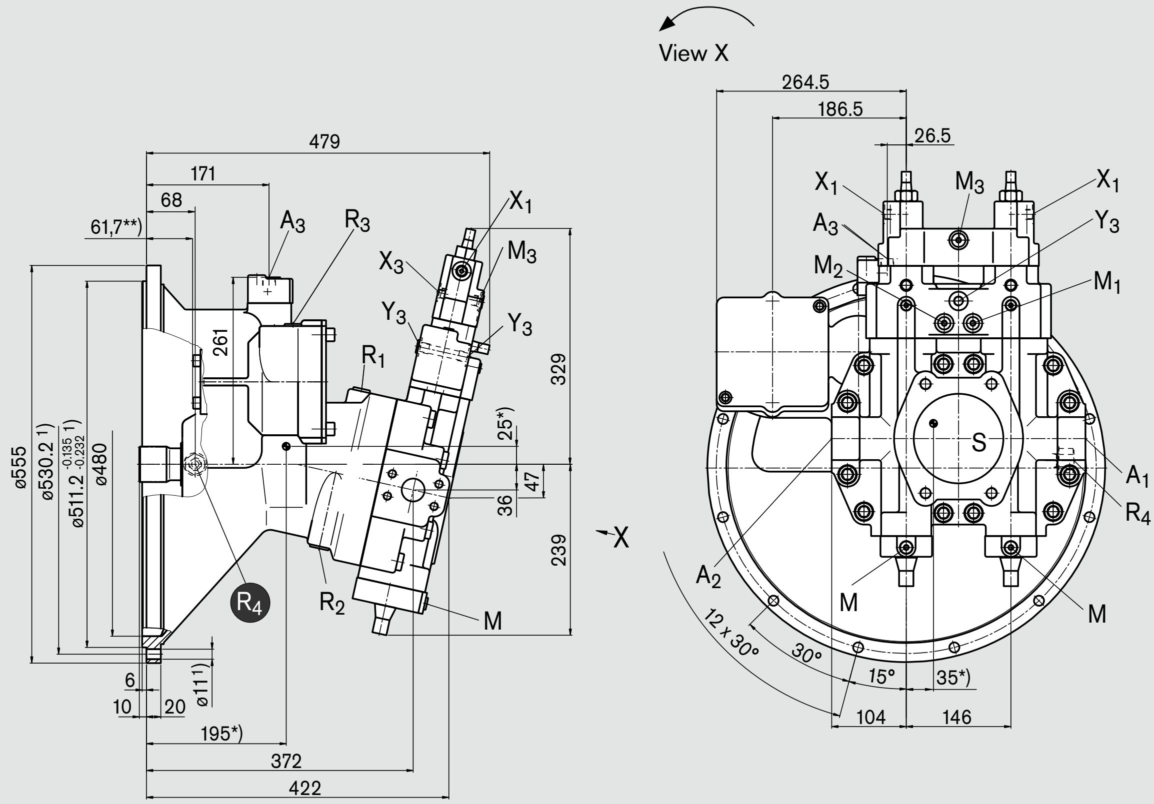


Unit Dimensions, Size 200

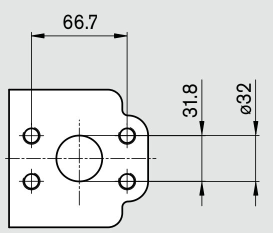
Before finalizing your design, please request a approved installation drawing. Dimensions in mm

LA0KH1/H3, LA1KH1/H3

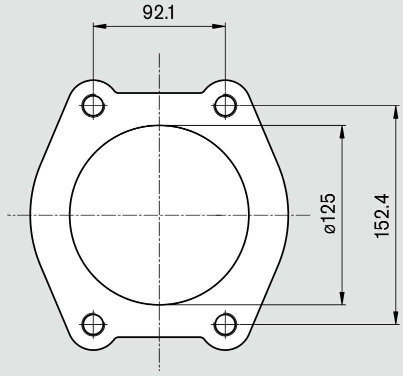
Individual power control with hydraulic coupling and hydraulic stroke limiter (negative control)



Detail of A_1, A_2
(2:1)



Detail of S
(2:1)



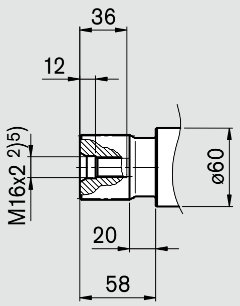
R_4 –Must be connected to tank to ensure cooling and lubrication of bearing sets.
*) Center of gravity
**) at auxiliary pump 19cm³ = 48,3
1) Dimensions conform to SAE J617-No. 1, for connection to flywheel housing in internal combustion engine, hole diam.11mm at new projects only (previous types with short code G and hole diam. 14mm)

Unit Dimensions, Size 200

Before finalizing your design, please request a approved installation drawing. Dimensions in mm

Shaft end

Z Splined shaft DIN 5480
W50x2x30x24x9g



Ports

A_1, A_2	Service line ports (high pressure series)	SAE J518	1 1/4 in	
	Fastening threads	DIN 13	M12x1,75; 19 deep 5)	
S	Suction port (standard series)	SAE J518	5 in	
	Fastening threads	DIN 13	M16x2; 23 deep 5)	
A_3	Service line port (auxiliary pump)	DIN 3852	M18x1,5; 12 deep	140 Nm 5)
R_1, R_3	Bleed port	DIN 3852	M22x1,5; 12 deep	210 Nm 5)
R_2	Fluid drain	DIN 3852	M22x1,5; 12 deep	210 Nm 5)
R_4	Flushing fluid port	DIN 3852	M18x1,5; 12 deep	140 Nm 5)
M	Gauge port for control pressure	DIN 3852	M12x1,5; 12 deep	50 Nm 5)
M_1, M_2	Gauge ports for high pressure	ISO11926	9/16-18UNF-2B;12 deep	80 Nm 5)
M_3	Gauge port for power override 3)	DIN 3852	M14x1,5; 12 deep	80 Nm 5)
X_1	Pilot pressure port for hydraulic stroke limiter	DIN 3852	M14x1,5; 12 deep	80 Nm 5)
X_3	Pilot pressure port for power override 3)	DIN 3852	M14x1,5; 12 deep	80 Nm 5)
X_4	Pilot pressure port for load sensing	DIN 3852	M14x1,5;12 deep	80 Nm 5)
Y_3	External control pressure port 4)	DIN 3852	M14x1,5; 12 deep	80 Nm 5)

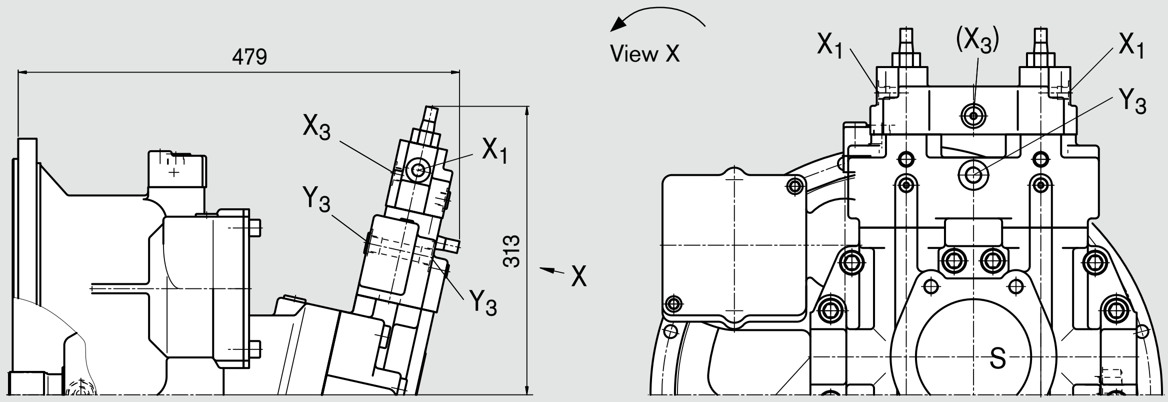
2) Centering bore according to DIN 332, thread according to DIN 13.
3) On the LA0 version, the port has no function.
4) Only on versions LA...H2 and LA...H3.
5) Please observe the general notes for the max. tightening torques on page 40.

Unit Dimensions, Size 200

Before finalizing your design, please request a approved installation drawing. Dimensions in mm

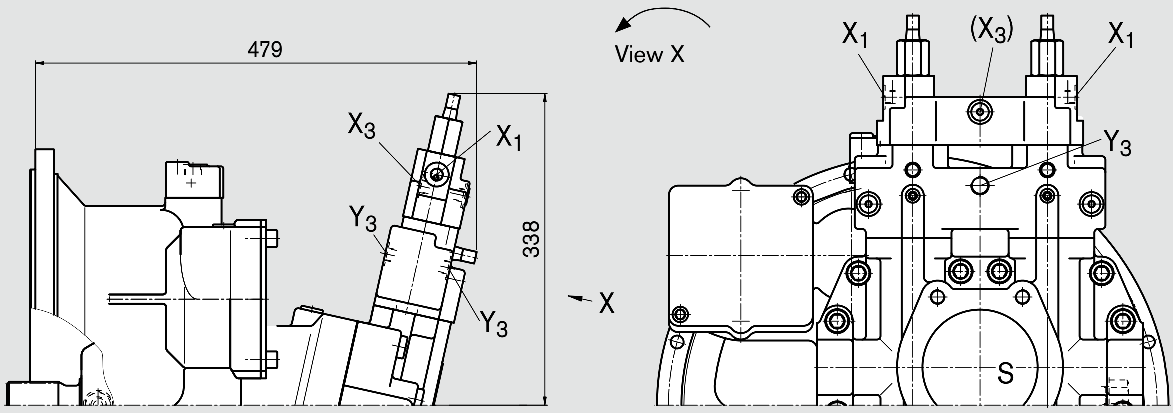
LA0H2, LA1H2

Individual power control with hydraulic stroke limiter and external pilot pressure supply (positive control)



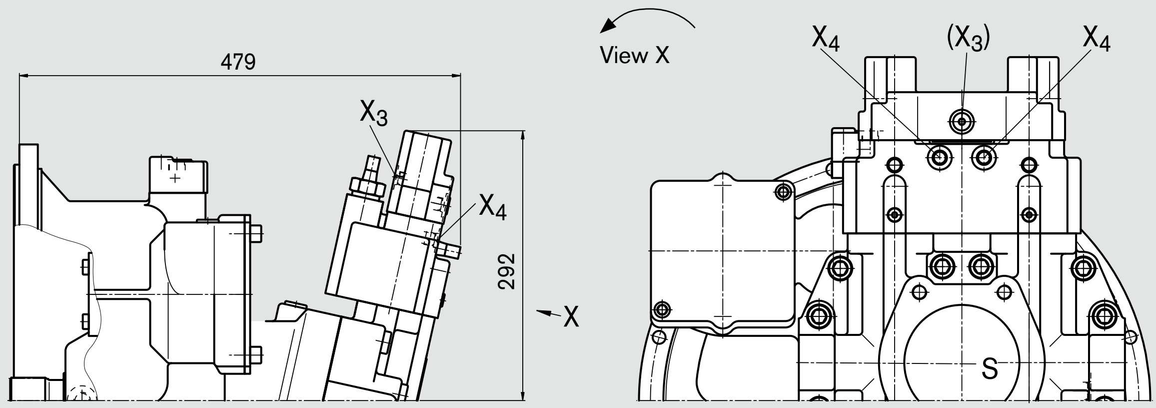
LA0KH2, LA1KH2

Individual power control with hydraulic power coupling, hydraulic stroke limiter and external pilot pressure supply (positive control)



LA0S, LA1S

Individual power control with load sensing

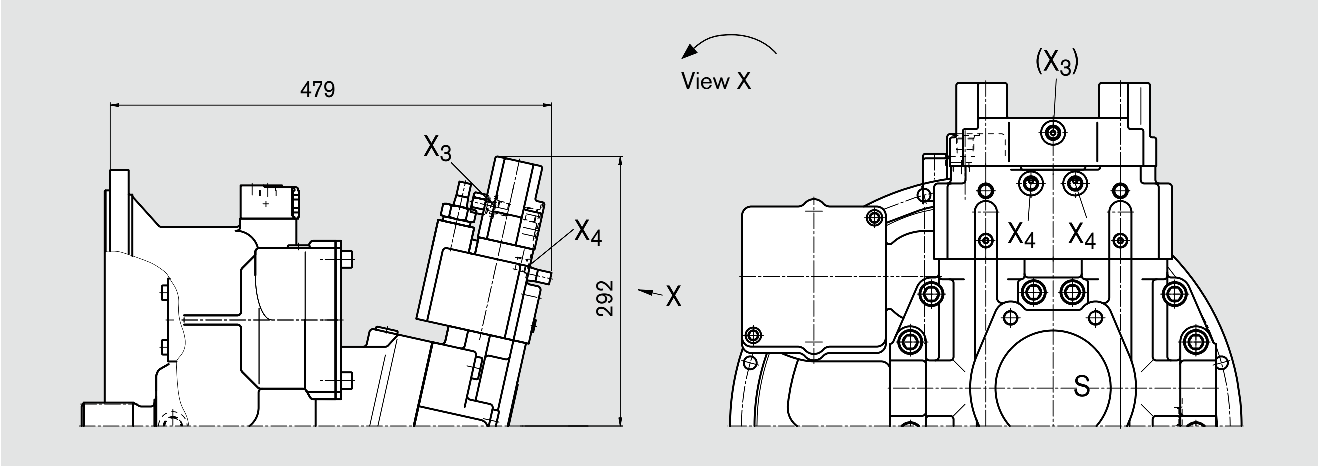


Unit Dimensions, Size 200

Before finalizing your design, please request a approved installation drawing. Dimensions in mm

LA0KS, LA1KS

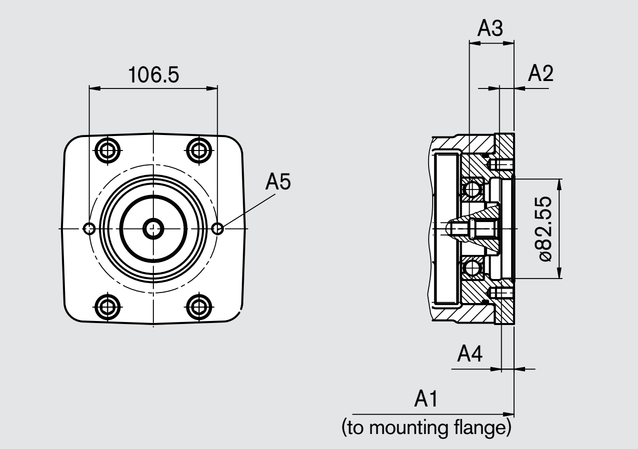
Individual power control with hydraulic power coupling and load sensing



Power Take-off Dimensions

Before finalizing your design, please request a approved installation drawing. Dimensions in mm

K01/F01 Flange SAE J744 – 82-2 (A)
Hub for splined shaft according to ANSI B92.1a-1976 5/8in 9T 16/32DP [1]) (SAE J744 – 16-4 (A))



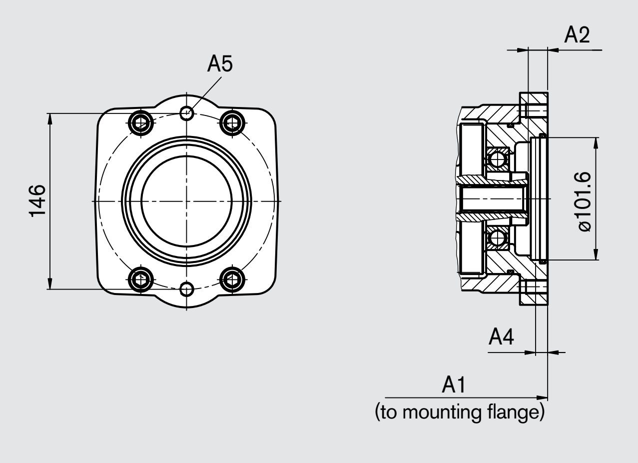
Size	A1	A2	A3	A4	A5[2])
55	178,1	10,1	35,1	10,5	M10x1,5;15 deep
80	178,1	10,1	35,1	10,5	M10x1,5;15 deep
107	190,1	12,1	37,1	10,5	M10x1,5;15 deep
140	232,1	11,1	36,1	10,1	M10x1,5;14 deep
200	260	12	37	10,2	M10x1,5;15 deep

Note related to the position of the fixing threads:

Standard position is shown. Further positions of the fixing threads available.
Please state in clear text.

K02/F02 Flange SAE J744 – 101-2 **(B)**
Hub for splined shaft according to ANSI B92.1a-1976 7/8in 13T 16/32DP [1]) (SAE J744 – 22-4 (**B**))

K04/F04 Flange SAE J744 – 101-2 **(B)**
Hub for splined shaft according to ANSI B92.1a-1976 1in 15T 16/32DP [1]) (SAE J744 – 25-4 (**B-B**))



K02/F02, K04/F04

Size	A1	A2	A4	A5[2])
55	185,1	13,1	10	M12x1,75;18 deep
80	185,1	13,1	10	M12x1,75;18 deep
107	197,1	16,1	10	M12x1,75;18 deep
140	243,1	15,1	12,1	M12x1,75;18 deep
200	262,5	14,5	10,4	M12x1,75;18 deep

Note related to the position of the fixing threads:

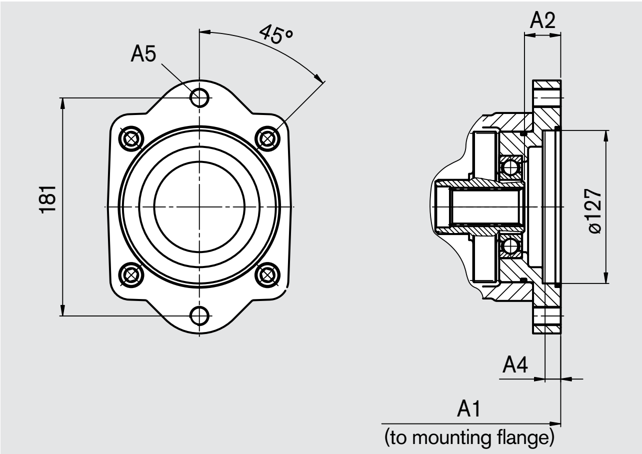
Standard position is shown. Further positions of the fixing threads available.
Please state in clear text.

[1]) 30° pressure angle, flat root, side fit, tolerance class 5
[2]) Thread according to DIN13, please observe the general notes for the max. tightening torques on page 40.

Power Take-off Dimensions

Before finalizing your design, please request a approved installation drawing. Dimensions in mm

K07/F07 Flange SAE J744 – 127-2 **(C)**
Hub for splined shaft according to ANSI B92.1a-1976 1 1/4in 14T 12/24DP [1]) (SAE J744 – 32-4 (**C**))



Size	A1	A2	A3	A4	A5[2])
55					
80	185,1	16,1	59,1[3])	13	M16x2
107	197,1	30,1	–	13	M16x2
140	243,1	15,1	–	13	M16x2
200	267,5	19,5	–	11	M16x2

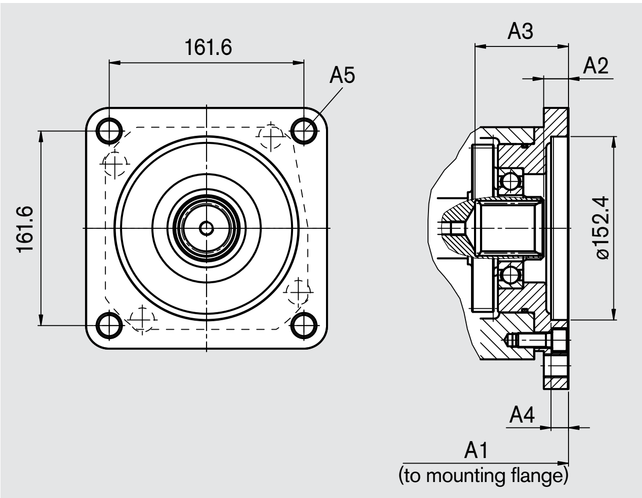
[3]) Illustration as for K01

Note related to the position of the fixing threads:

Standard position is shown. Further positions of the fixing threads available.
Please state in clear text.

K86/F86 Flange SAE J744 – 152-4 **(D)**
Hub for splined shaft according to ANSI B92.1a-1976 1 1/4in 14T 12/24DP [1]) (SAE J744 – 32-4 (**C**))

K17/F17 Flange SAE J744 – 152-4 **(D)**
Hub for splined shaft according to ANSI B92.1a-1976 1 3/4in 13T 8/16DP [1]) (SAE J744 – 44-4 (**D**))



K86/F86, K17/F17

Size	A1	A2	A3	A4	A5[2])
140	248,1	20,1	77,1	13,4	M20x2,5
200	267,5	19,5	76,5	13,4	M20x2,5

[1]) 30° pressure angle, flat root, side fit, tolerance class 5
[2]) Thread according to DIN13, please observe the general notes for the max. tightening torques on page 40.

Overview of Attachments

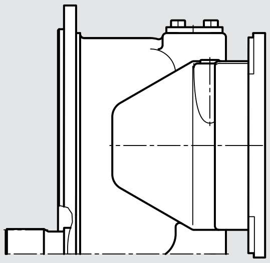
Flange	Hub for splined shaft	Short code K.../F...	Attachment for 2nd pump A4FO Size (Shaft)	A4VG Size (Shaft)	A10VG Size (Shaft)	A10VO/31 Size (Shaft)	A10VO/53 Size (Shaft)	A11VO Size (Shaft)
Power Take-off – A8VO55/80								
82-2 (A)	5/8in	**01**	–	–	–	–	–	–
101-2 (B)	7/8in	**02**	16, 22, 28 (S)	–	18 (S)	28 (S, R)	28 (S, R) 45 (U, W)	–
	1 in	**04**	–	28 (S)	28,45 (S)	–	45 (S, R) 60 (U, W)	40 (S)
127-2 (C)	1 1/4in	**07**	–	40, 56, (S)	–	–	60 (S)	60 (S) [1]
Power Take-off – A8VO107								
82-2 (A)	5/8in	**01**	–	–	–	–	–	–
101-2 (B)	7/8in	**02**	16, 22, 28 (S)	–	18 (S)	28 (S, R) 45 (U)	28 (S, R) 45 (U, W)	–
	1 in	**04**	–	28 (S)	28,45 (S)	45 (S, R)	45 (S, R) 60 (U, W)	40 (S)
127-2 (C)	1 1/4in	**07**	–	40, 56, 71 (S)	–	–	60 (S)	60 (S)
Power Take-off – A8VO140								
82-2 (A)	5/8in	**01**	–	–	–	–	–	–
101-2 (B)	7/8in	**02**	16, 22, 28 (S)	–	18 (S)	28 (S, R) 45 (U)	28 (S, R) 45 (U, W)	–
	1 in	**04**	–	28 (S)	28,45 (S)	45 (S, R)	45 (S, R) 60 (U, W)	40 (S)
127-2 (C)	1 1/4in	**07**	–	40, 56, 71 (S)	63 (S)	71 (S, R) 100 (U)	60 (S) 85 (U)	60(S)
152-4 (D)	1 1/4in	**86**	–	–	–	–	–	75 (S)
	1 3/4in	**17**	–	90 (S)	–	140 (S)	–	95 (S)
Power Take-off – A8VO200								
82-2 (A)	5/8in	**01**	–	–	–	–	–	–
101-2 (B)	7/8in	**02**	16, 22, 28 (S)	–	18 (S)	28 (S, R) 45 (U)	28 (S, R) 45 (U, W)	–
	1 in	**04**	–	28 (S)	28,45 (S)	45 (S, R)	45 (S, R) 60 (U, W)	40 (S)
127-2 (C)	1 1/4in	**07**	–	40, 56, 71 (S)	–	71 (S, R) 100 (U)	60 (S) 85 (U)	60 (S)
152-4 (D)	1 1/4in	**86**	–	–	–	–	–	75 (S)
	1 3/4in	**17**	–	90, 125 (S)	–	140 (S)	–	95, 130 (S)

[1]) For mounting the A11VO size 60, side threaded ports for A_1 and A_2 are required. Please ask for details.

Power Take-off, Auxiliary Pump and Valves

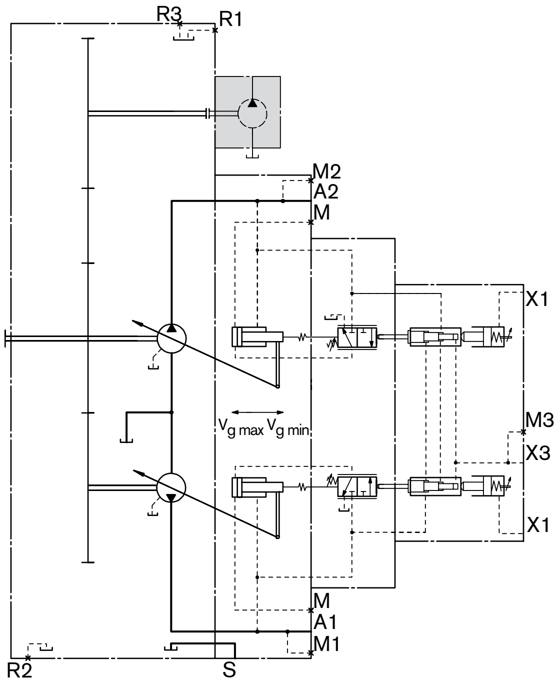
Variation:

with power take-off, without integrated auxiliary pump, K..0



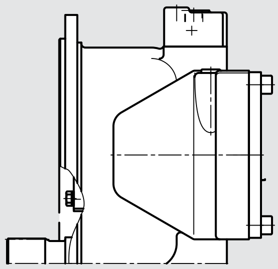
Detail of K..0

For technical data, see table of values on page 6.
For mounting on PTO:
Axial piston pumps and gear pumps



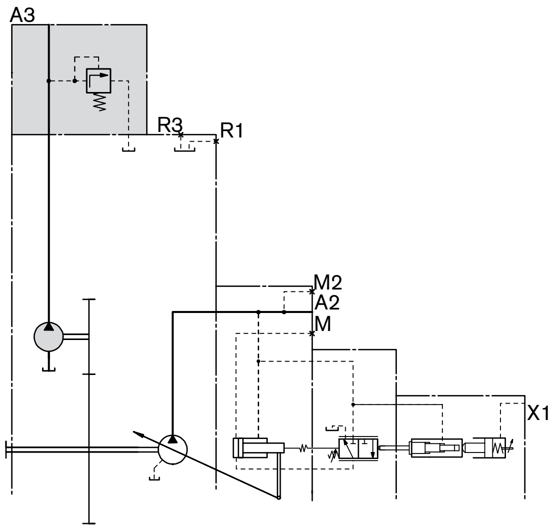
Variation:

without power take-off, with integrated auxiliary pump (pilot fluid pump) and pressure relief valve, F001



Detail of F001

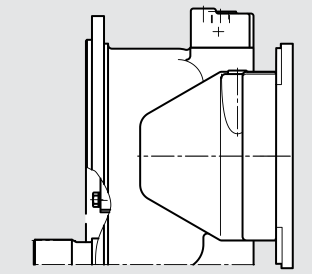
For technical data, see table of values on page 6.
The pressure relief valve installed to protect the integrated auxiliary pump has a fixed setting of 30 bar.



Power Take-off, Auxiliary Pump and Valves

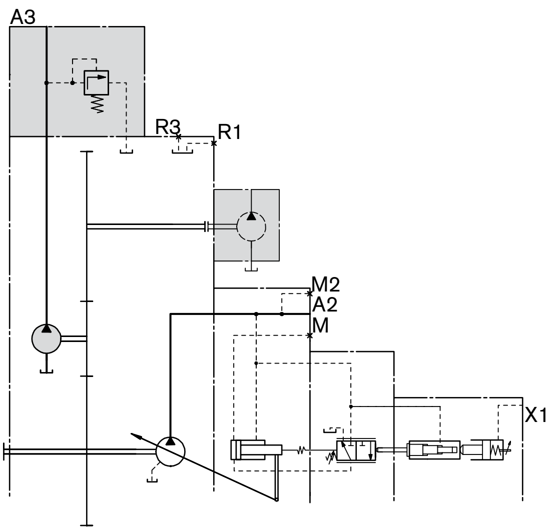
Variation:

with power take-off, with integrated auxiliary pump (pilot fluid pump) and pressure relief valve, F..1



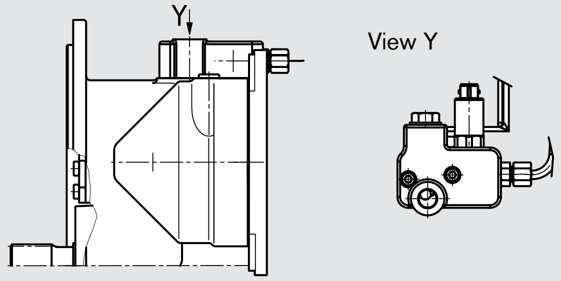
Detail for F..1

For technical data, see table of values on page 6.
The pressure relief valve installed to protect the integrated auxiliary pump has a fixed setting of 30 bar.
For mounting on PTO:
Axial piston pumps and gear pumps



Variation:

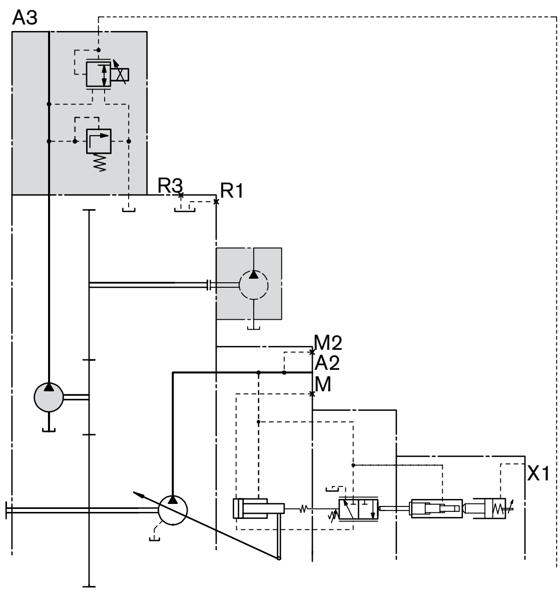
with power take-off, with integrated auxiliary pump (pilot fluid pump), with pressure relief and pressure reducing valves, F..4



Detail for F..4

For technical data, see table of values, page 6.
The pressure relief valve installed to protect the integrated auxiliary pump has a fixed setting of 30 bar. An electrically controlled pressure reducing valve can be used to override the power setting (load limiting control).

Pressure reducing valve control voltage:
F..4 24V DC
Recommended frequency >100Hz
For mounting on PTO:
Axial piston pumps and gear pumps



Installation Notes

General information

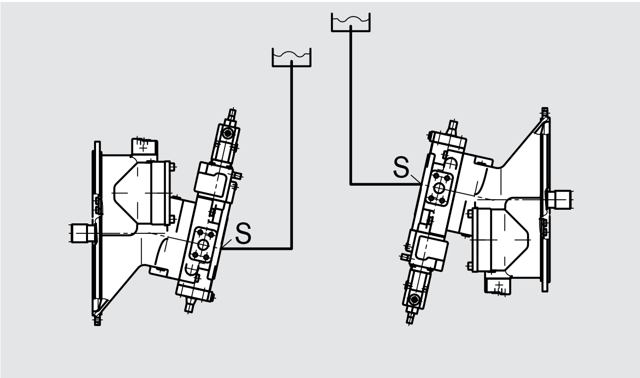
During commissioning and operation, the axial piston unit must be filled with hydraulic fluid and must be bled.
This must also be noted during long idle periods, as the system can be drained through the hydraulic lines.
The drain fluid chamber is internally connected to the suction chamber. A drain line to the tank is not required.
Note the special feature of the NG200 for flushing fluid. (Port R4)
The minimum suction pressure at port S of 0.8 bar absolute must be reached.

Installation position

Shaft vertical.

Installation below tank level

Installation below tank level is when the pump is fitted below the minimum fluid level in the tank.



Notice

Notice

General Notes

– The pump A8VO is designed to be used in open circuits.

– Project planning, assembly and startup of the pump require the invovement of trained personnel.

– The working and functional ports are only designed to accommadate hydraulic piping.

– There is a danger of burns from the pump and especially the solenoids during and shortly after operation. Suitable safety precautions, e.g. protective clothing plan.

– The characteristic curve may shift depending on the operating status (operating pressure, fluid temperature) of the pump.

– Tightening torques:
  - The tightening torques specified in this data sheet are maximum values and may not be exceeded (maximum value for screw thread). Manufacturer specifications for the max. permissible tightening torques of the used fittings must be observed!
  - For DIN 13 fastening screws we recommend checking the tightening torque individually according to VDI 2230 Edition 2003.

– The data and information contained must be adhered to.

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