Electric Drives and Controls | Hydraulics | Linear Motion and Assembly Technologies | Pneumatics | Service

Rexroth
Bosch Group

Axial Piston Variable Double Pump A8VO

RE 93010/03.09 1/40
Replaces: 11.07

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 of bent-axis design for hydrostatic drives in open circuits
- The flow is proportional to the input speed and to the displacement, and is infinitely variable from $q_{V\,max}$ to $q_{V\,min} = 0$
- The pump is suitable for direct mounting on the flywheel case 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 controller
- Integrated auxiliary pump with pressure-relief valve, optionally with additional pressure-reduction 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	15

Axial piston unit

01	Bent-axis design, variable	A8V

Operation mode

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

Size

03	≈ Displacement $V_{g\,max}$ in cm³, per rotary group	55	80	107	140	200	

	Control device	55	80	107	140	200	
04	Individual power controller 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 controller 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
	Electric control with prop. solenoid (positive control) U = 24V	–	–	●	●	–	EP2

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

Direction of rotation

06	viewed from shaft end: clockwise	R

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

07	i = 1	1

Seals

08	NBR (nitrile-caoutchouc), shaft seal ring 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 case (conforming to SAE J617)	●	●	●	●	–	G
	of internal combustion engine (hole diameter for fixing ø11 mm)	–	–	–	–	●	N

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

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	15

Service line port

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

Auxiliary pump		55	80	107	140	200	
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]

12 Flange SAE J744 [3]	Hub for splined shaft [4]				55	80	107	140	200	
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..	
13	Without valves (only for versions **without** auxiliary pump, K..)	●	–	**0**
	With pressure-relief valve (only for versions **with** auxiliary pump, F..)	–	●	**1**
	With pressure-relief and pressure-reduction valve, (only for versions **with** auxiliary pump, F..). U = 24V	–	●	**4**

Connector for solenoids (only for EP)		55	80	107	140	200	
14	DEUTSCH connector molded, 2-pin, without suppressor diode	–	–	●	●	–	**P**

Standard / special version

15	Standard version	(without code)	
		combined with attachment part or attachment pump	**-K**
	Special version		**-S**
		combined with attachment part or attachment pump	**-SK**

[1] Note installation conditions (see pages 32/33)
[2] Other PTOs on request
[3] 2 = 2-hole; 4 = 4-hole
[4] Hub for splined shaft according to ANSI B92.1a-1976 (splined shafts assigned according to SAE J744, see pages 32/33)

● = available ❍ = on request – = not available

Technical Data

Hydraulic fluid

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

The A8VO variable double pump is not suitable for operation with HFA. If HFB, HFC and HFD or environmentally acceptable hydraulic 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.

Operating viscosity range

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

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

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

Limits of viscosity range

The following values apply in extreme cases:

ν_{min} = 5 mm²/s
short-term (t < 3 min)
at max. perm. temperature of t_{max} = +115°C.

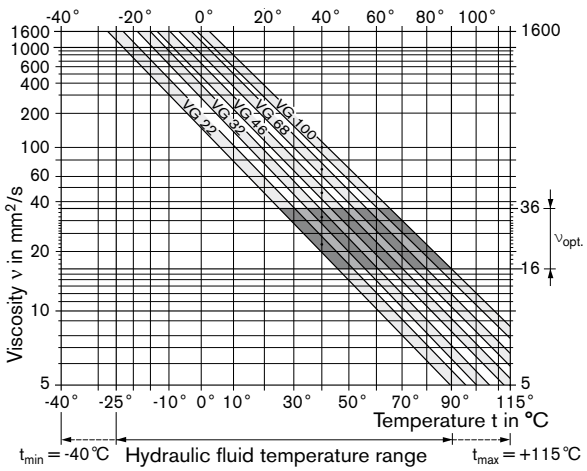
ν_{max} = 1600 mm²/s,
short-term (t < 3 min)
at cold start (p ≤ 30 bar, n ≤ 1000 rpm, t_{min} = -40°C).
Only for starting up without load. Optimum operating viscosity must be reached within approx. 15 minutes.

Note that the maximum hydraulic fluid temperature of 115°C must not be exceeded locally either (e.g. in the 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 in the temperature range from -40°C to -25°C (cold start phase); please contact us.

For detailed information about use at low temperatures, see RE 90300-03-B.

Selection diagram



Details regarding the choice of hydraulic fluid

The correct choice 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 chosen so that the operating viscosity in the operating temperature range is within the optimum range ($\nu_{opt.}$) - the shaded area of the selection diagram. We recommended that the higher viscosity class be selected in each case.

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

Note:
The case drain temperature, which is affected by pressure and speed, is always higher than the tank temperature. At no point in the system may the temperature be higher than 115°C.

If the above conditions cannot be maintained due to extreme operating parameters, please contact us.

Filtration

The finer the filtration, the higher the cleanliness level of the hydraulic fluid and the longer the service life of the axial piston unit.

To ensure functional reliability of the axial piston unit, the hydraulic fluid must have a claenliness level of at least

20/18/15 according to ISO 4406.

At very high hydraulic fluid temperatures (90°C to max. 115°C) at least cleanliness level

19/17/14 according to ISO 4406 is required.

If the above classes cannot be observed, please contact us.

Technical Data

Operating pressure range

Input

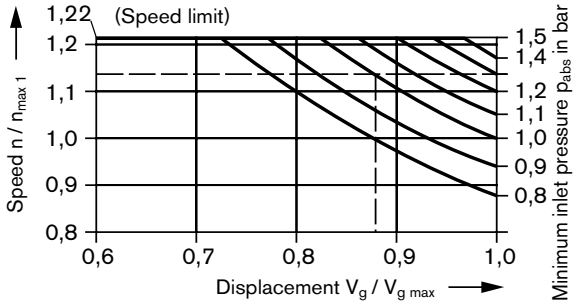
Pressure on port S
The minimum permissible inlet pressure depends on the input speed. The following limit values must not be exceeded or undercut.

$p_{abs\ min}$ _____ 0.8 bar

The max. pressure $p_{abs\ max}$ is also dependent on the speed (see following diagram).

Minimum permissible inlet pressure at suction port S with increased speed

In order to avoid damage to the pump (cavitation), a minimum inlet pressure at the suction port must be assured. The minimum inlet pressure is depends on the speed and the displacement of the variable pump.



Example:

Given: Size 80, input speed 2560 rpm

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

Solution: Speed ratio $\frac{n}{n_{max\ 1}} = \frac{2560}{2240} = 1.14$

results in a minimum 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 • $V_{g\ max}$.

Note:

– Max. speed n_{max} (speed limit, see page 6)
– Min. and max. permissible pressure at port S.
– Permissible values for the shaft seal ring

Output

Pressure on port A_1 or A_2
(pressure data according to DIN 24312)

Nominal pressure p_N _____ 350 bar

Peak pressure p_{max} _____ 400 bar

Nominal pressure: Max. design pressure at which fatigue strength is ensured.

Peak pressure: Max. operating pressure which is permissible for short-term (t < 1 s).

Case drain fluid

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

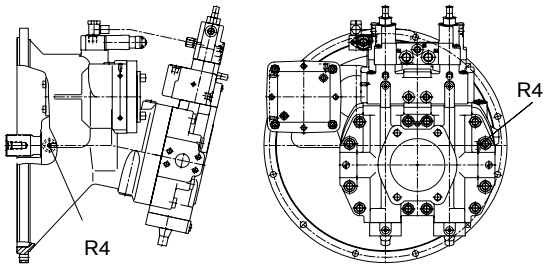
External flushing fluid connection

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.

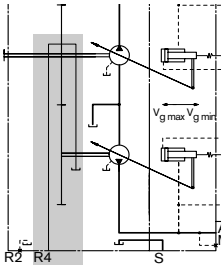
This line should have an internal diameter ≥ 15 mm.

Note:

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



Circuit diagram with R4 port



Temperature range of shaft seal ring

The FKM shaft seal ring is permissible for case drain temperatures of -40°C to +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, without efficiencies and tolerances; 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	at $V_{g\,max}$ [1]	$n_{max\,1}$	rpm	2500	2240	2150	2100	1950
	at $V_g \leq V_{g\,max}$ [2]	n_{max}	rpm	3000	2750	2450	2450	2250
Flow	at n_{max} and $V_{g\,max}$	$q_{v\,max}$	L/min	2 x 137	2 x 179	2 x 230	2 x 294	2 x 390
Power								
at n_{max}, V_{gmax} and Δp=350 bar		P_{max}	kW	160	209	268	294 [3]	325 [3]
Input torque								
at $V_{g\,max}$ and Δp=350 bar		T_{max}	Nm	611	891	1192	1337 [3]	1592 [3]
Rotary stiffness (single rotary group) [5]								
$V_{g\,max}$ to 0,5•$V_{g\,max}$		c_{TW}	Nm/rad	11213	17985	25565	41408	39505
0,5•$V_{g\,max}$ to 0 (interpolated)		c_{TW}	Nm/rad	41442	67666	89381	146677	156876
Moment of inertia for rotary group								
with power take-off, without attachment pump		J_{TW}	kgm^2	0.0161	0.0209	0.0345	0.0581	0.0849
without power take-off (PTO)		J_{TW}	kgm^2	0.0126	0.0173	0.0288	0.0500	0.0750
Angular acceleration (single rotary group) [5]		α	rad/s^2	25800	21800	17100	7500	11000
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	13.6 (23.6)
Gear ratio $i = n_{input}/n_{aux.\ pump}$				0.887	0.887	0.780	0.843	0.804
Variation: with power take-offs, K.., F..								
Max. torque at PTO		T_{max}	Nm	250	350	380	450	650
Gear ratio $i = n_{input}/n_{PTO}$				1.0	1.0	1.0	1.0	0.804

[1] The values shown are valid for absolute pressure (p_{abs}) of 1 bar at suction port S and for operation with mineral fluids 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!

[5] **Caution:** Exceeding the permissible limit values may result in a loss of function, a reduction in service life or in the destruction of the axial piston unit.
Other permissible limit values with respect to speed variation, reduced angular acceleration as a function of the frequency and the permissible startup angular acceleration (lower than the maximum angular acceleration) can be found in data sheet RE 90261.

Calculation of nominal size

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

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

Power $P = \dfrac{2\pi \bullet T \bullet n}{60\,000} = \dfrac{q_v \bullet \Delta p}{600 \bullet \eta_t}$ 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 Controller

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

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

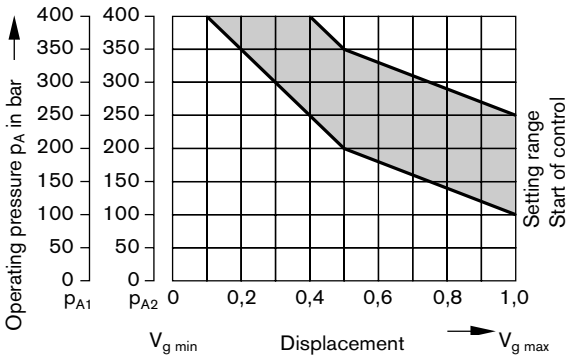
The power setting is adjusted individually for each control and can be different; each pump can be set to 100% input power.

The hyperbolic power characteristic 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 forces, 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 return spring.

Characteristic: LA0; LA1



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

Please state in clear text when ordering:

– Application: e.g. excavator

– Input power P in kW

– Input speed n in rpm

– Max. flow $q_{V\,max}$ in 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 controller without power override

LA1

Individual power controller with power override 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 is generated by an external control element or by the mounted pressure-reduction valve (see page 36).
The electric signal for controlling the pressure-reduction valve must be generated by an external electronic controller. The BODAS controllers 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):

– BODAS controller RC

Series 20	RE 95200
Series 21	RE 95201
Series 22	RE 95202
Series 30	RE 95203

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

LA0, LA1 - Individual Power Controller

LA0H; LA1H

Individual power controller 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 controller, i.e. below the power controller characteristic, the displacement is adjusted depending on the pilot pressure. If the set flow or the operating pressure is such that the power controller characteristic is exceeded, the power controller overrides the stroke limiter and reduces the displacement along the spring characteristic.

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

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 controller setting.

Please specify start of control in clear text when ordering.
Initial position in depressurized state: $V_{g\,max}$

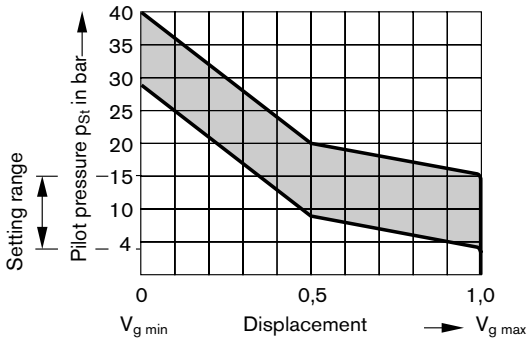
Note for H1:

A pressure ≥ 30 bar is necessary for control. The required control 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 ≥ 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.

Characteristic: LA0H1/3; LA1H1/3
pilot pressure increase ($V_{g\,max} - V_{g\,min}$)—— Δp = approx. 25 bar



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 larger displacement.

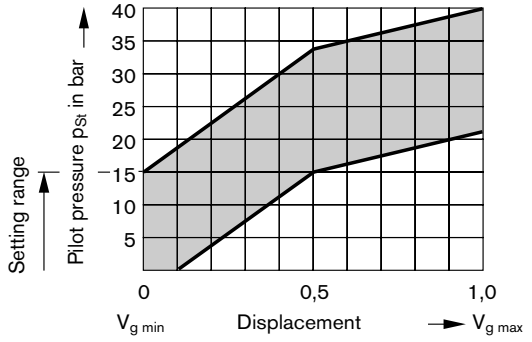
Start of control (at $V_{g\,min}$) adjustable———— 0 to 15 bar
Please specify start of control in clear text when ordering.

Initial position in depressurized state: $V_{g\,max}$

To control from $V_{g\,max}$ to $V_{g\,min}$ a pressure ≥ 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

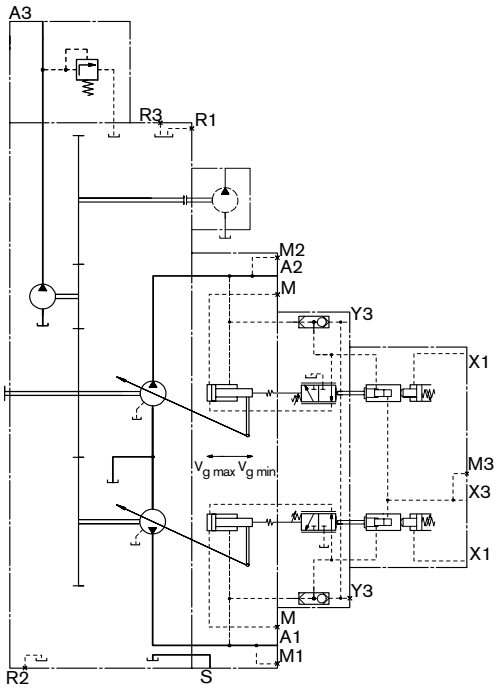
Pilot pressure increase ($V_{g\,min} - V_{g\,max}$) —— Δp = approx. 25 bar



Note: If port Y_3 is present (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 Controller

Circuit diagram: LA1H2



LA0K; LA1K

Individual power controller with hydraulic coupling

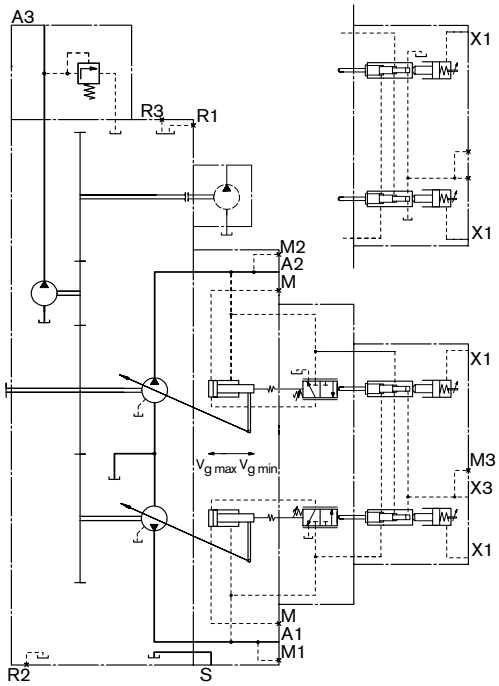
The hydraulic coupling of the two individual controller provides the function of a summation power control. However, the two rotary groups are coupled hydraulically, not mechanically.

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.

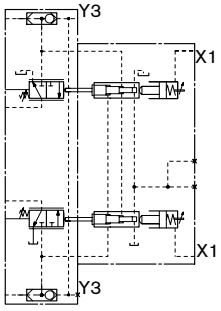
With the additional H1/H3 hydraulic stroke limiter function, each rotary group can be independently swiveled back to a smaller V_g than is currently specified by the power control.

Circuit diagram: LA1KH1



Circuit diagram module for LA0KH1

Circuit diagram module for LA0KH3



LA0, LA1 - Individual Power Controller

LA0S; LA1S, LA0KS, LA1KS

Individual power controller with load sensing

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

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

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

The load-sensing controller compares pressure before and after the measuring orifice and maintains the pressure drop (differential pressure Δp) and thus the flow constant.

If the differential pressure Δp on the measuring orifice increases, the pump is swiveled back towards $V_{g\,min}$ and, if the Δp decreases, the pump is swiveled out towards $V_{g\,max}$ until equilibrium in the valve is restored.

$\Delta p_{measuring\ orifice} = p_{pump} - p_{consumer}$

Setting range for Δp _____ 14 - 25 bar

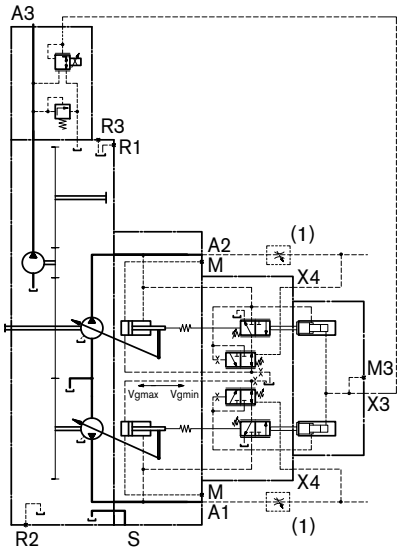
Standard setting _____ 18 bar
(please state in clear text).

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

In an LUDV (flow sharing) system, the pressure cut-off is integrated in the LUDV valve block.

(1) The measuring orifice (control block) is not included in supply.

Circuit diagram: LA1S



EP Electric Control with Proportional Solenoids

With the electric control with proportional solenoid, the pump displacement is adjusted proportionally and steplessly to the current by means of the magnetic force.

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

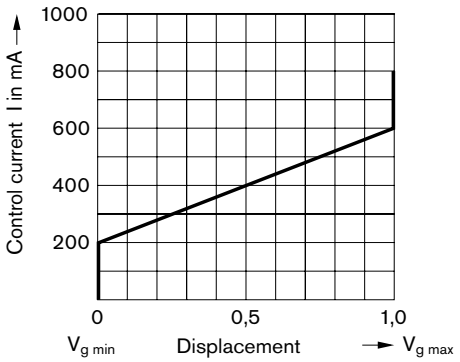
With increasing control current the pump swivels to a larger displacement.

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

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

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

Characteristic: EP2



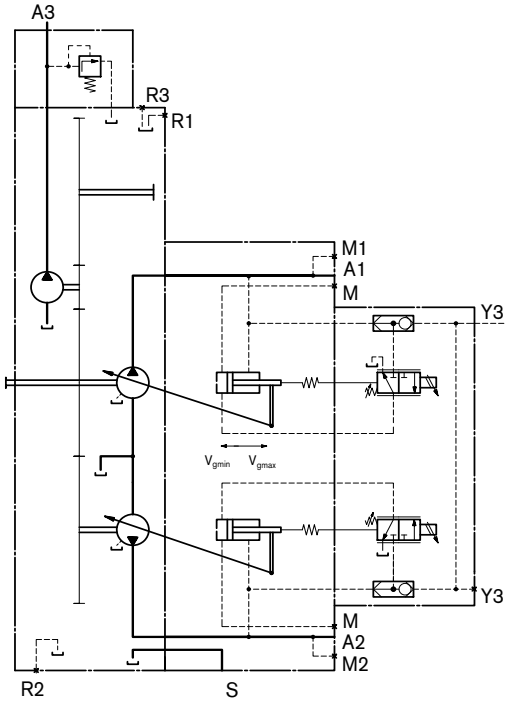
Note on load sensing "S" and electric control "EP":
When operated at $V_{g\,min}$ (> 5min), the hydraulic fluid in the case can become heated to an impermissible temperature. Please contact us.

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
Actuated time	100%
Type of protection according to DIN/EN 60529	IP67 and IP69K

The following electronic controllers and amplifiers are available for controlling the proportional solenoids (information is also available on the Internet at www.boschrexroth.com/mobile-electronics):

- BODAS controller RC
  - Series 20 ____ RE 95200
  - Series 21 ____ RE 95201
  - Series 22 ____ RE 95202
  - Series 30 ____ RE 95203
  - and application software
- Analog amplifier RA ____ RE 95230

Circuit diagram: EP2

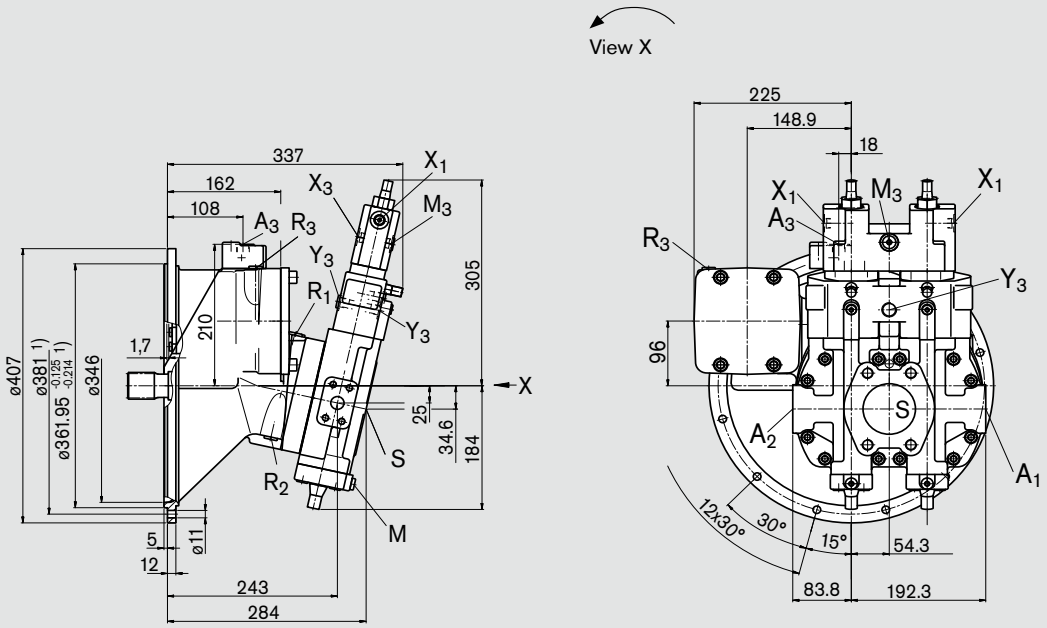


Unit Dimensions, Size 55

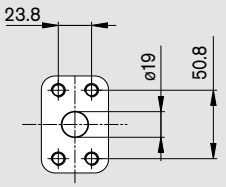
Before finalizing your design, please request a binding installation drawing. Dimensions in mm

LA0KH1/H3, LA1KH1/H3

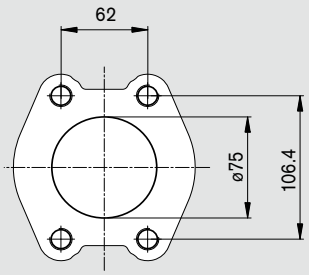
Individual power controller with hydraulic coupling and hydraulic stroke limiter (negative control)



Detail of A_1, A_2
(2:1)



Detail of S
(2:1)

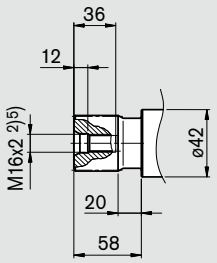


1) Dimensions according to SAE J617-No. 4, for connection to flywheel case in internal combustion engine.

Unit Dimensions, Size 55

Shaft end

Z Splined shaft DIN 5480
W40x2x30x18x9g



Ports

A_1, A_2	Service line ports (high-pressure series)	SAE J518	3/4in	
	Fixing thread	DIN 13	M10x1.5; 17 deep [5]	
S	Suction port (standard series)	SAE J518	3in	
	Fixing thread	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	Air bleed port [6]	DIN 3852	M14x1.5; 12 deep	80 Nm [5]
R_2	Fluid drain [6]	DIN 3852	M14x1.5; 12 deep	80 Nm [5]
M	Gauge port for control pressure [6]	DIN 3852	M12x1.5; 12 deep	50 Nm [5]
M_3	Gauge port for power override [3] [6]	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] [7]	DIN 3852	M14x1.5; 12 deep	80 Nm [5]

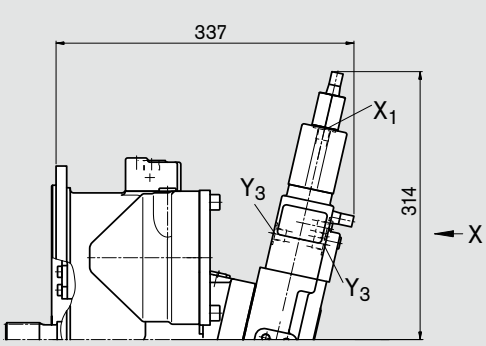
[2] Center bore according to DIN 332 (thread according to DIN 13)
[3] On the LA0 version, the port has no function
[4] Only for versions LA...H2 and LA...H3
[5] Please observe the general notes for the max. tightening torques on page 40.
[6] Plugged
[7] 1x plugged, 1x open

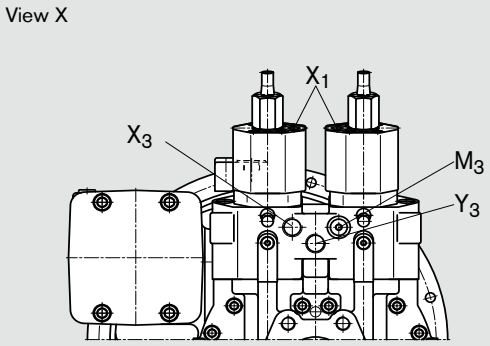
Unit Dimensions, Size 55

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

LA0H2, LA1H2

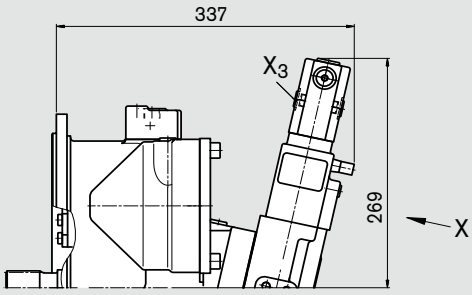
Individual power controller with hydraulic stroke limiter and external pilot pressure supply (positive control)

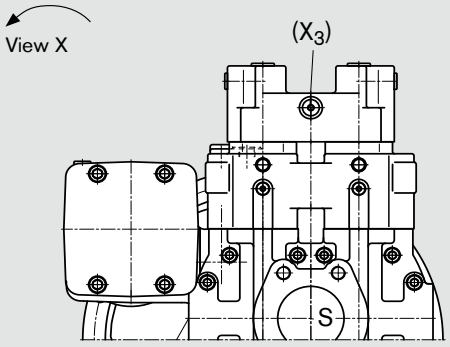




LA0K, LA1K

Individual power controller with hydraulic power coupling

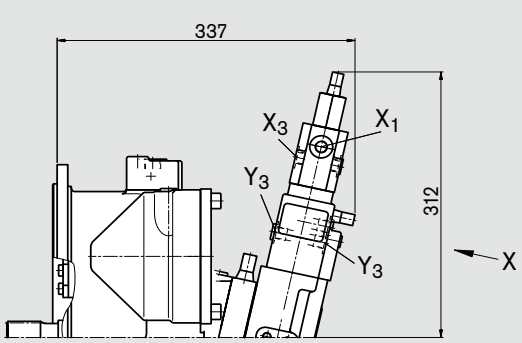


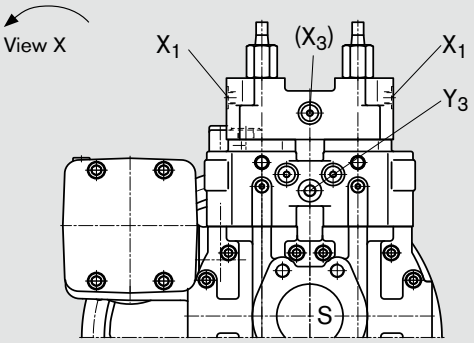


Unit Dimensions, Size 55

LA0KH2, LA1KH2

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



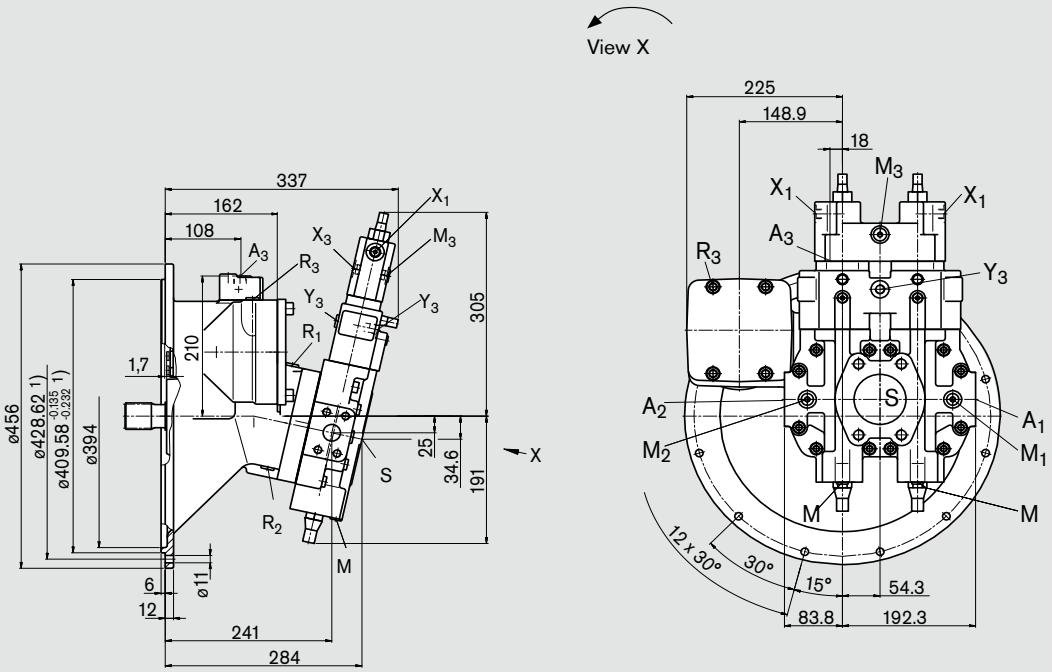


Unit Dimensions, Size 80

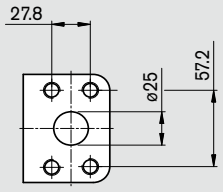
Before finalizing your design, please request a binding installation drawing. Dimensions in mm

LA0KH1/H3, LA1KH1/H3

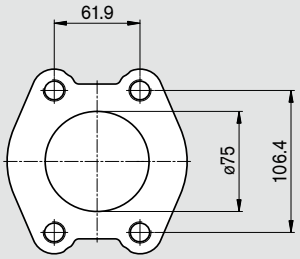
Individual power controller with hydraulic coupling and hydraulic stroke limiter (negative control)



Detail of A_1, A_2 (2:1)



Detail of S (2:1)

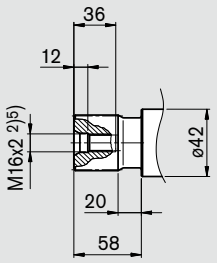


[1]) Dimensions according to SAE J617-No. 3, for connection to flywheel case in internal combustion engine.

Unit Dimensions, Size 80

Shaft end

Z Splined shaft DIN 5480
W40x2x30x18x9g



Ports

A_1, A_2	Service line ports (high-pressure series)	SAE J518	1in	
	Fixing thread	DIN 13	M12x1.75; 17 deep [5]	
S	Suction port (standard series)	SAE J518	3in	
	Fixing thread	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	Air bleed port [6]	DIN 3852	M14x1.5; 12 deep	80 Nm [5]
R_2	Fluid drain [6]	DIN 3852	M14x1.5; 12 deep	80 Nm [5]
M	Gauge port for control pressure [6]	DIN 3852	M12x1.5; 12 deep	50 Nm [5]
M_1, M_2	Gauge port for high-pressure [6]	ISO11926	9/16-18UNF-2B;12 deep	80 Nm [5]
M_3	Gauge port for power override [3] [6]	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] [7]	DIN 3852	M14x1.5; 12 deep	80 Nm [5]

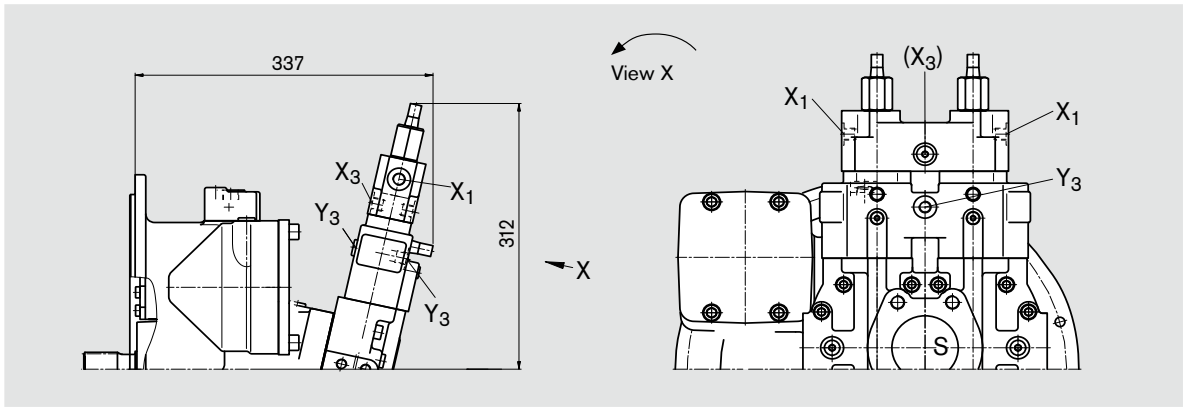
[2]) Center bore according to DIN 332 (thread according to DIN 13)
[3]) On the LA0 version, the port has no function
[4]) Only for versions LA...H2 and LA...H3
[5]) Please observe the general notes for the max. tightening torques on page 40.
[6]) Plugged
[7]) 1x plugged, 1x open

Unit Dimensions, Size 80

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

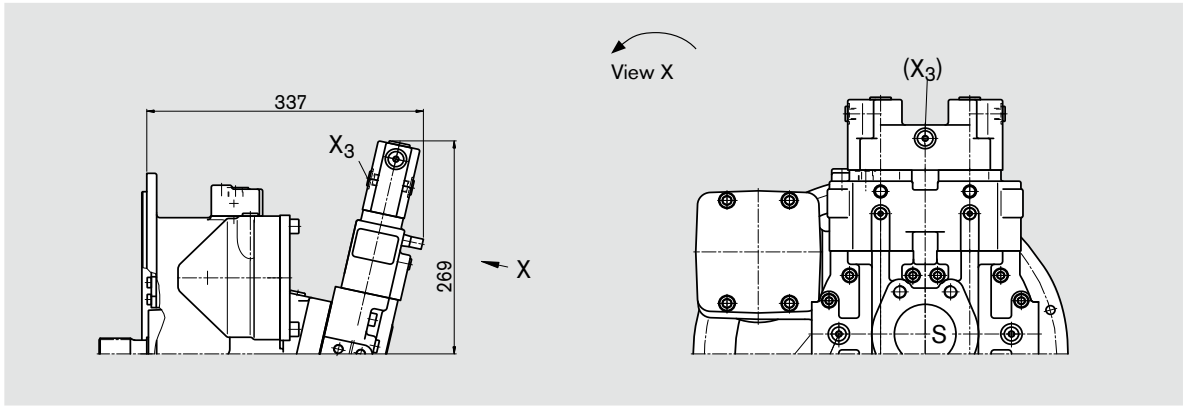
LA0H2, LA1H2

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



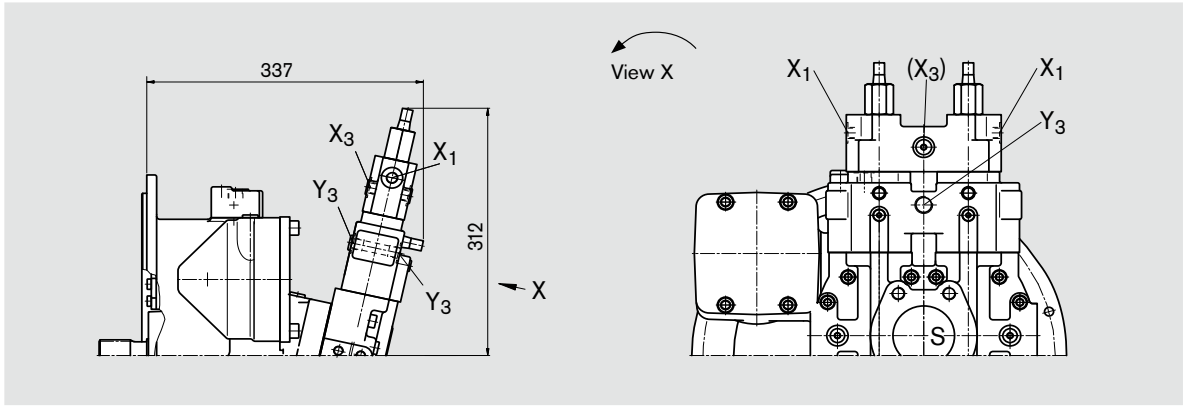
LA0K, LA1K

Individual power controller with hydraulic power coupling



LA0KH2, LA1KH2

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

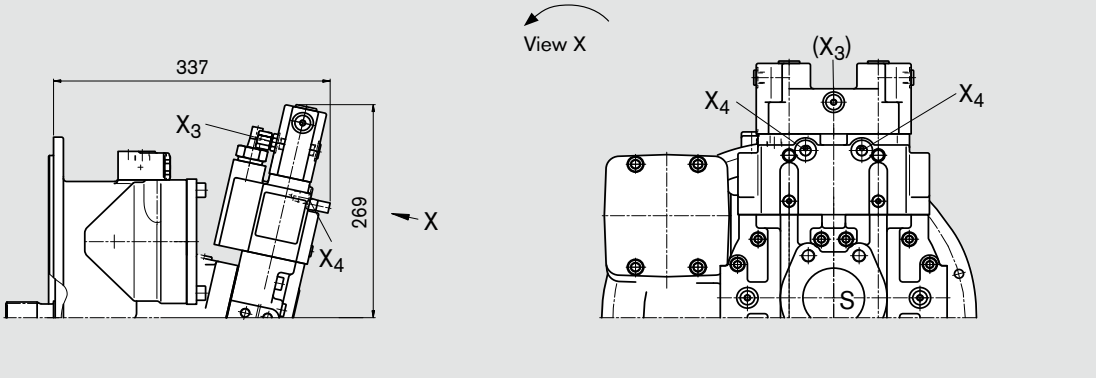


Unit Dimensions, Size 80

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

LA0KS, LA1KS

Individual power controller with hydraulic power coupling and load sensing

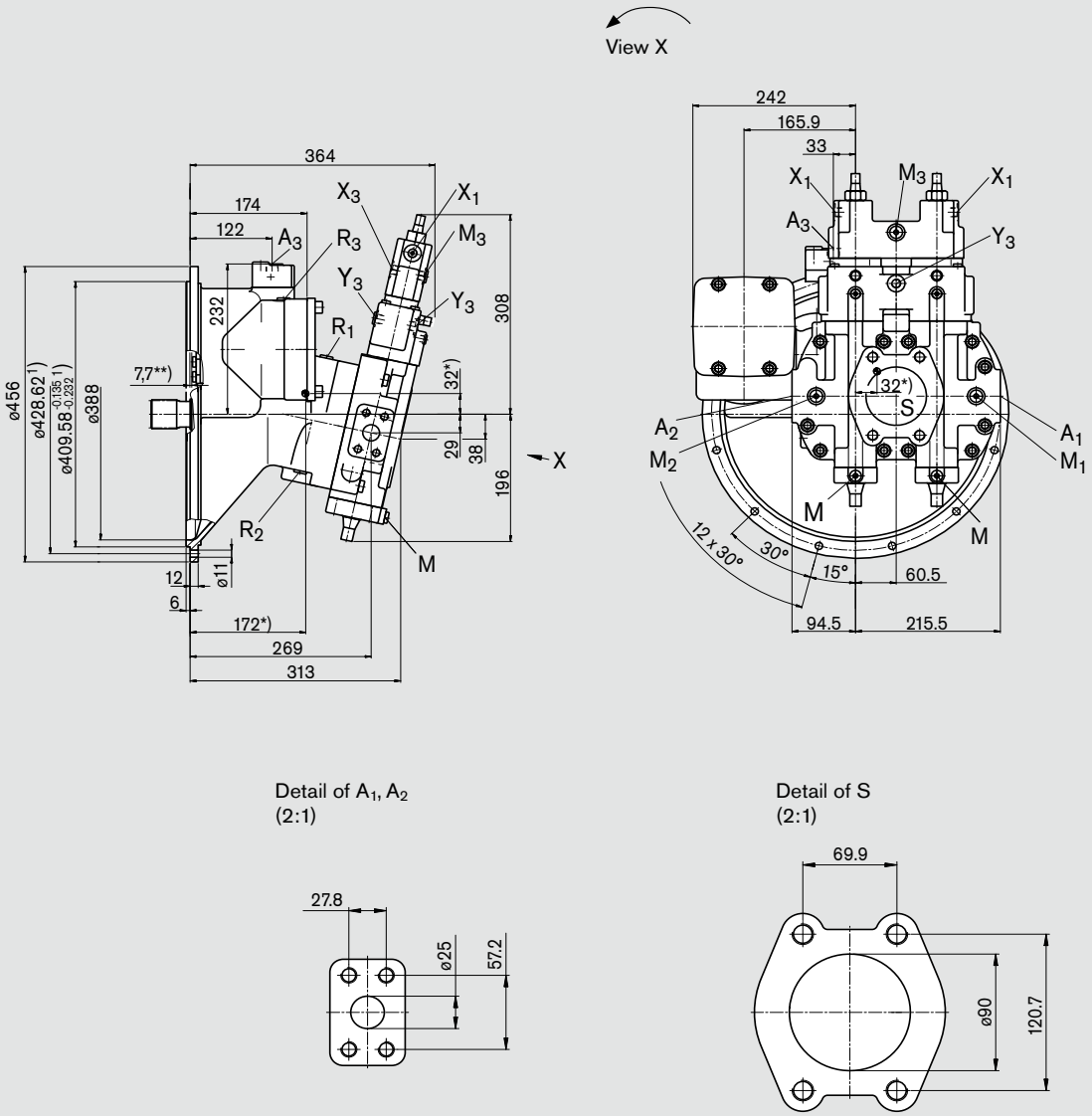


Unit Dimensions, Size 107

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

LA0KH1/H3, LA1KH1/H3

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



Detail of A_1, A_2
(2:1)

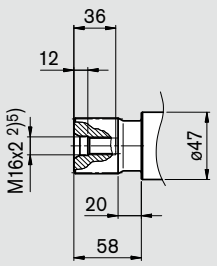
Detail of S
(2:1)

*) Center of gravity
**) with auxiliary pump 10.7 cm³ = 4.7 mm
1) Dimensions according to SAE J617-No. 3, for connection to flywheel case in internal combustion engine.

Unit Dimensions, Size 107

Shaft end

Z Splined shaft DIN 5480
W45x2x30x21x9g



Ports

A_1, A_2	Service line ports (high-pressure series)	SAE J518	1in	
	Fixing thread	DIN 13	M12x1.75; 17 deep [5]	
S	Suction port (standard series)	SAE J518	3 1/2in	
	Fixing thread	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	Air bleed port [6]	DIN 3852	M14x1.5; 12 deep	80 Nm [5]
R_2	Fluid drain [6]	DIN 3852	M14x1.5; 12 deep	80 Nm [5]
M	Gauge port for control pressure [6]	DIN 3852	M12x1.5; 12 deep	50 Nm [5]
M_1, M_2	Gauge ports for high-pressure [6]	DIN 3852	M14x1.5; 12 deep	80 Nm [5]
M_3	Gauge port for power override [3] [6]	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] [7]	DIN 3852	M14x1.5; 12 deep	80 Nm [5]

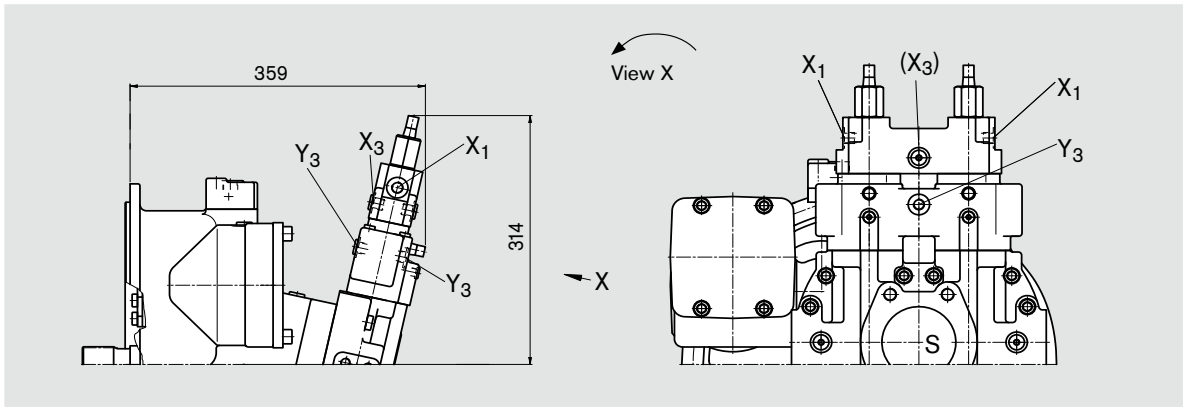
[2]) Center bore according to DIN 332 (thread according to DIN 13)
[3]) On the LA0 version, the port has no function
[4]) Only for versions LA...H2 and LA...H3
[5]) Please observe the general notes for the max. tightening torques on page 40.
[6]) Plugged
[7]) 1x plugged, 1x open

Unit Dimensions, Size 107

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

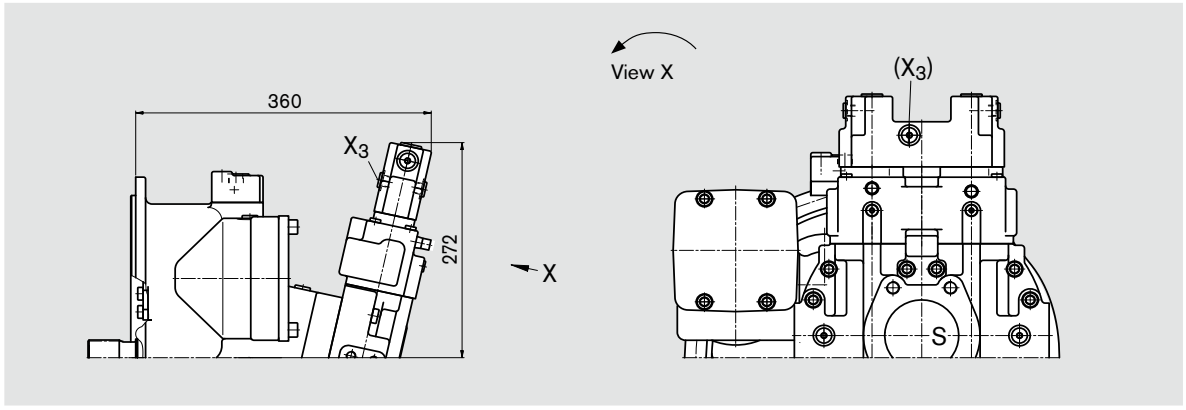
LA0H2, LA1H2

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



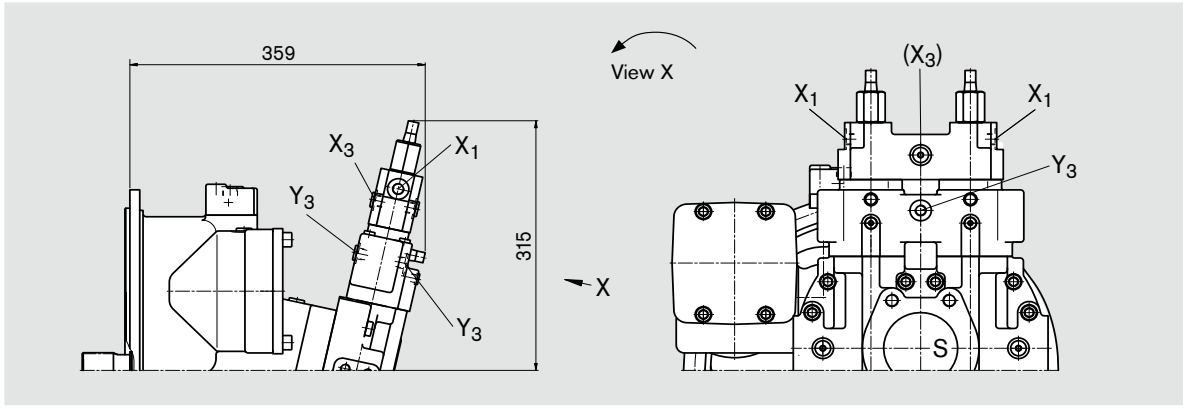
LA0K, LA1K

Individual power controller with hydraulic power coupling



LA0KH2, LA1KH2

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

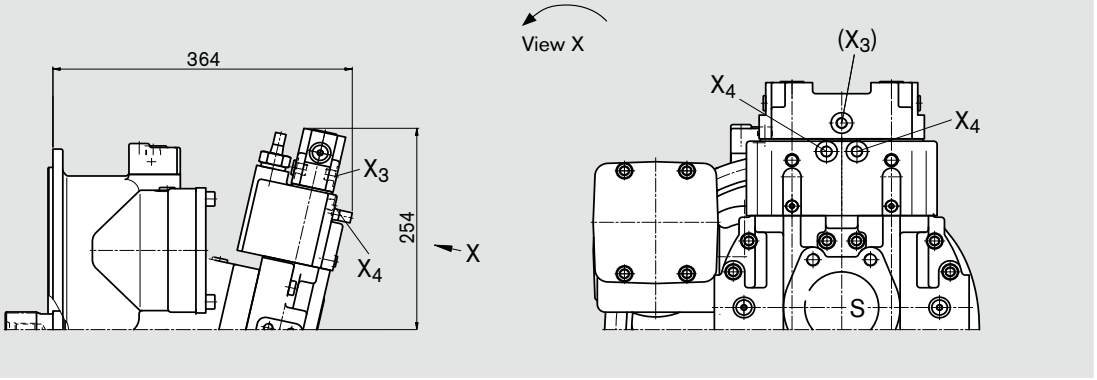


Unit Dimensions, Size 107

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

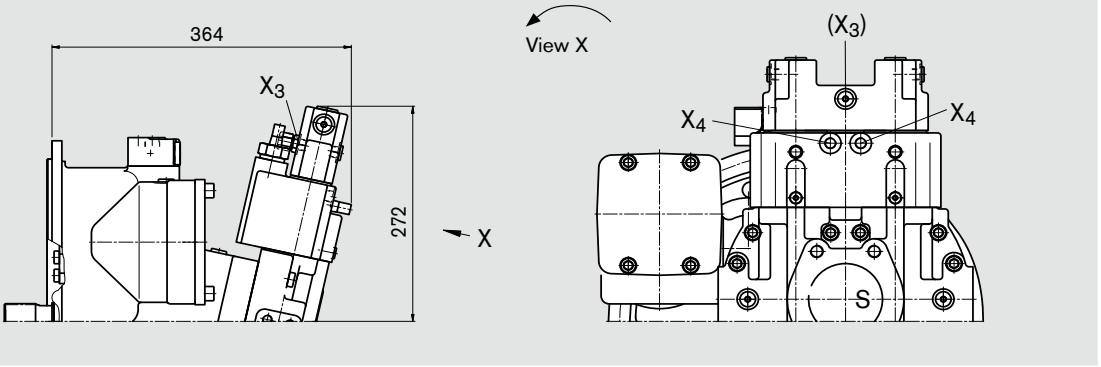
LA0S, LA1S

Individual power controller with load sensing



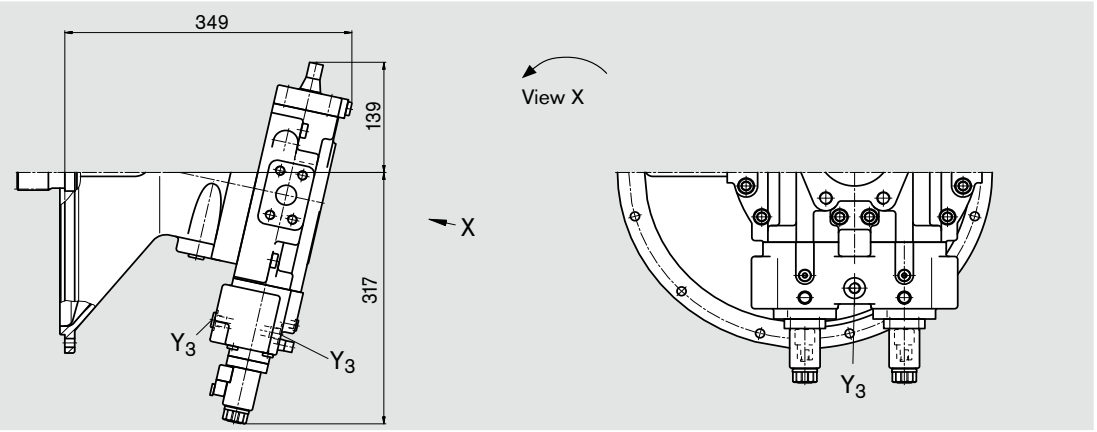
LA0KS, LA1KS

Individual power controller with hydraulic power coupling and load sensing



EP2

Electric control with proportional solenoid (positive control)

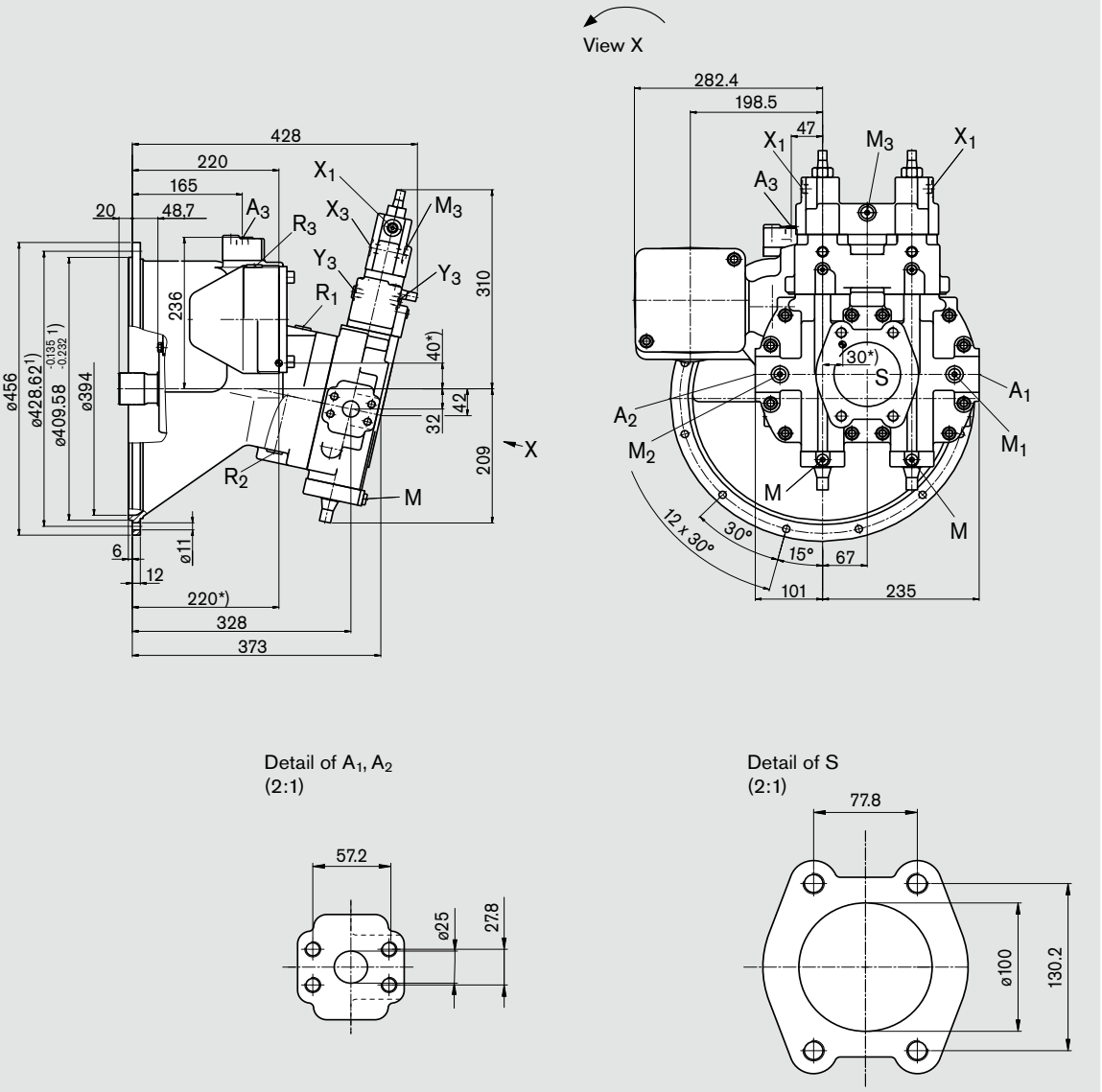


Unit Dimensions, Size 140

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

LA0KH1/H3, LA1KH1/H3

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



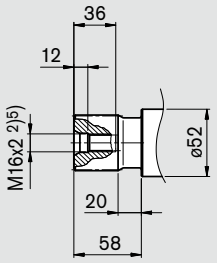
*) Center of gravity

1) Dimensions according to SAE J617-No. 3, for connection to flywheel case in internal combustion engine.

Unit Dimensions, Size 140

Shaft end

Z Splined shaft DIN 5480
W50x2x30x24x9g



Ports

A_1, A_2	Service line ports (high-pressure series)	SAE J518	1in	
	Fixing thread	DIN 13	M12x1,75; 17 deep [5]	
S	Suction port (standard series)	SAE J518	4in	
	Fixing thread	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	Air bleed port [6]	DIN 3852	M18x1.5; 12 deep	140 Nm [5]
R_2	Fluid drain [6]	DIN 3852	M18x1.5; 12 deep	140 Nm [5]
M	Gauge port for control pressure [6]	DIN 3852	M12x1.5; 12 deep	50 Nm [5]
M_1, M_2	Gauge port for high-pressure [6]	ISO11926	9/16-18UNF-2B;12 deep	80 Nm [5]
M_3	Gauge port for power override [3] [6]	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] [7]	DIN 3852	M14x1.5; 12 deep	80 Nm [5]

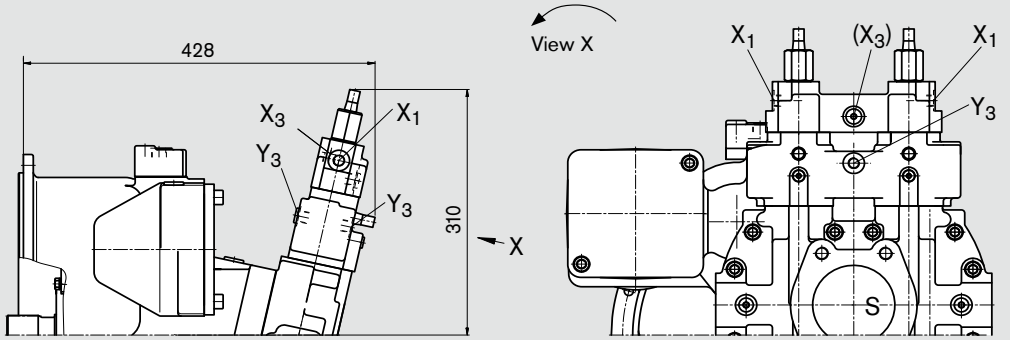
[2]) Center bore according to DIN 332 (thread according to DIN 13)
[3]) On the LA0 version, the port has no function
[4]) Only for versions LA...H2 and LA...H3
[5]) Please observe the general notes for the max. tightening torques on page 40.
[6]) Plugged
[7]) 1x plugged, 1x open

Unit Dimensions, Size 140

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

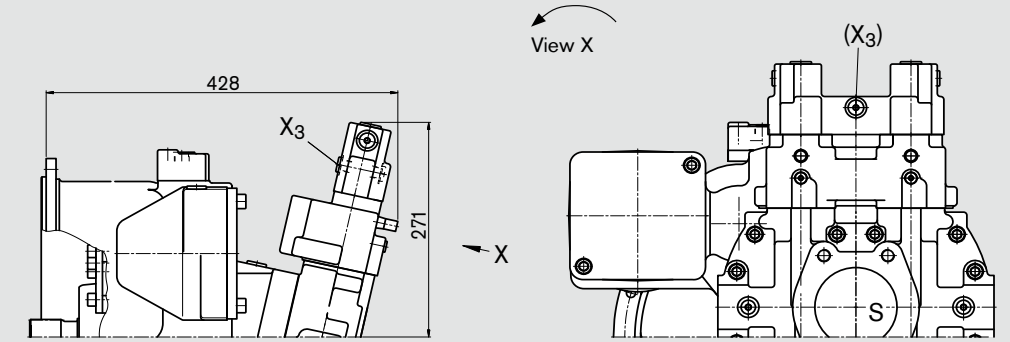
LA0H2, LA1H2

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



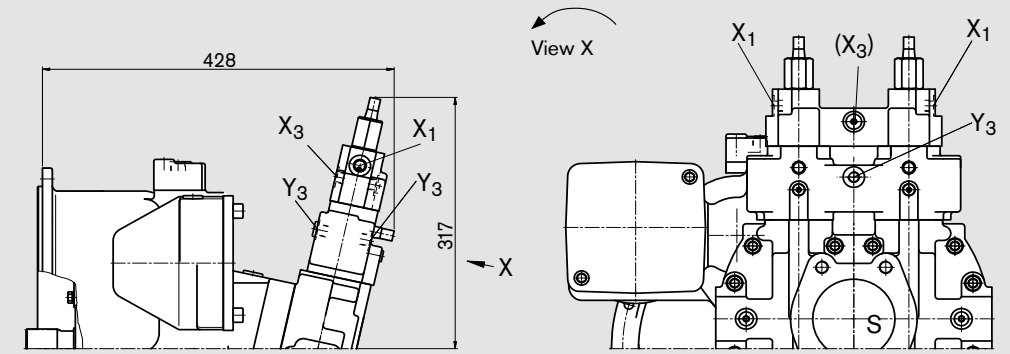
LA0K, LA1K

Individual power controller with hydraulic power coupling



LA0KH2, LA1KH2

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

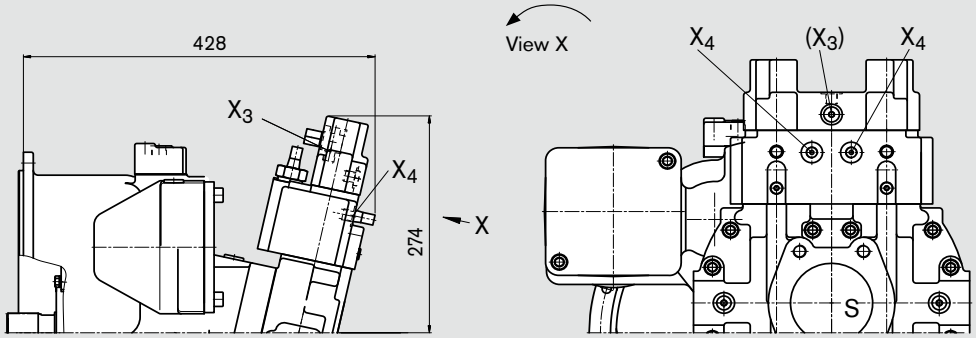


Unit Dimensions, Size 140

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

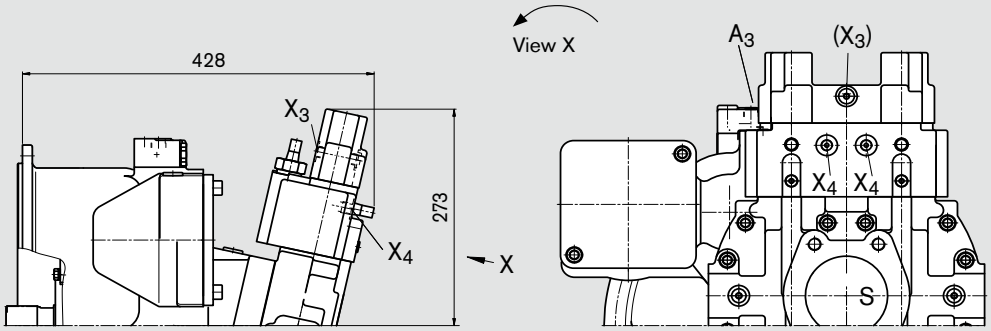
LA0S, LA1S

Individual power controller with load sensing



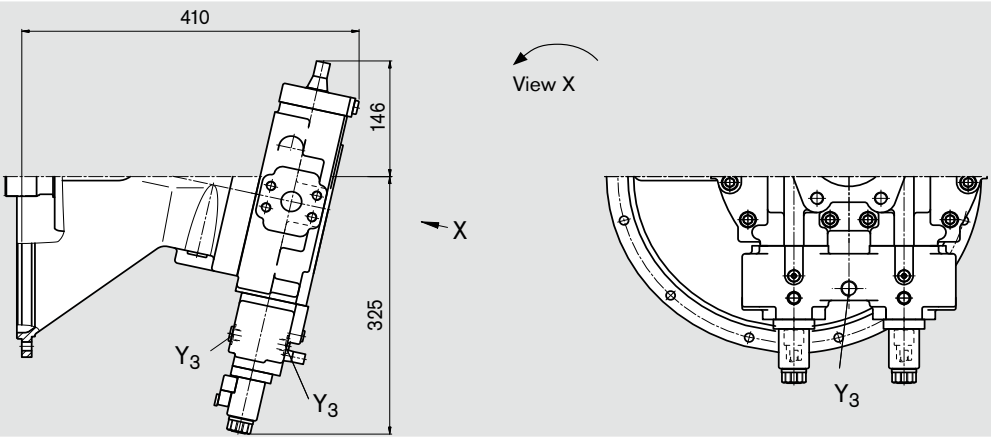
LA0KS, LA1KS

Individual power controller with hydraulic power coupling and load sensing



EP2

Electric control with proportional solenoid (positive control)

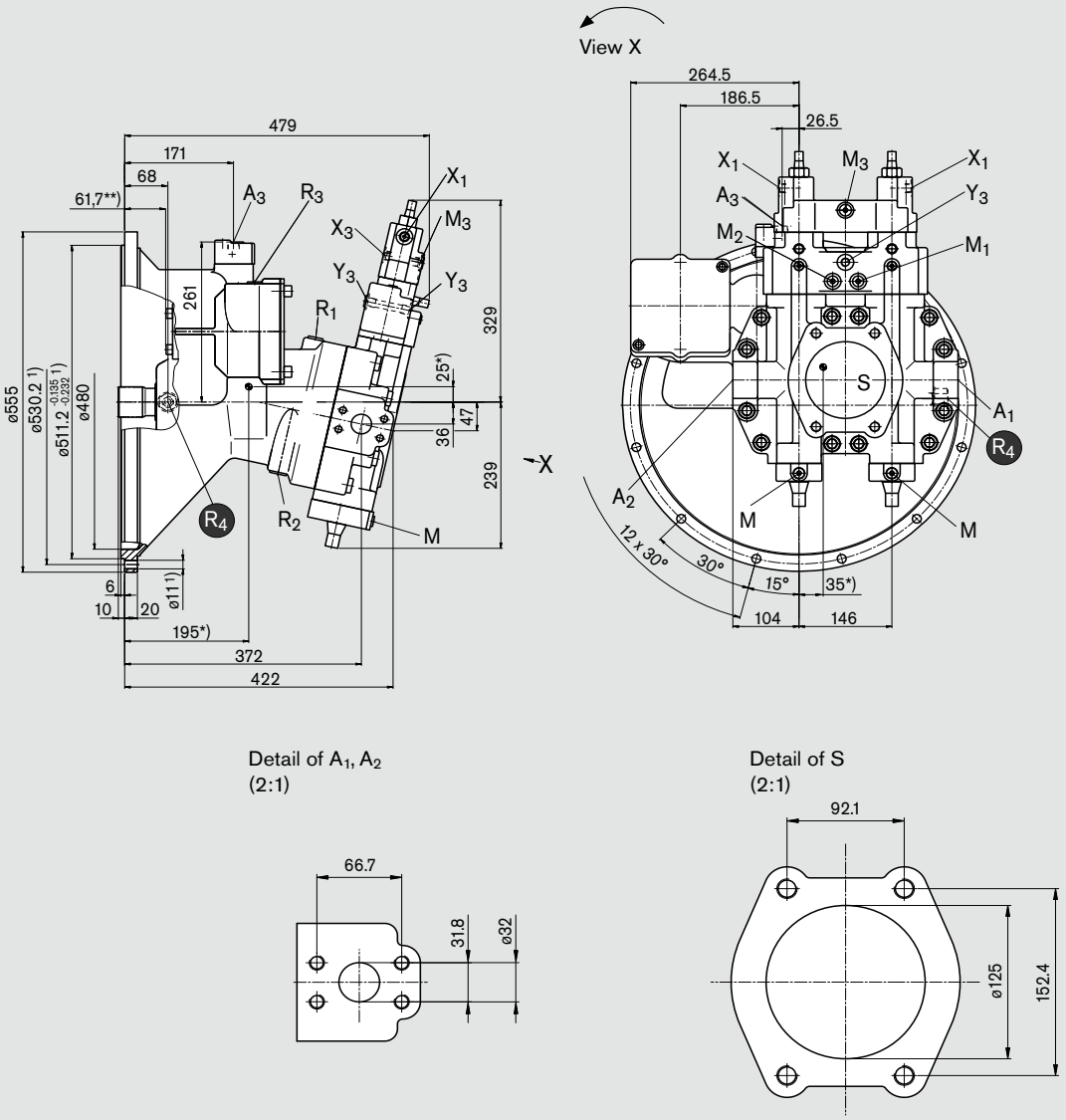


Unit Dimensions, Size 200

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

LA0KH1/H3, LA1KH1/H3

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



Detail of A_1, A_2
(2:1)

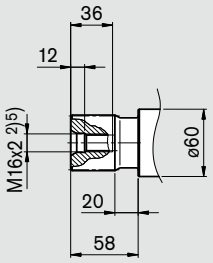
Detail of S
(2:1)

R4 –Must be connected to tank to ensure cooling and lubrication of bearing sets.
*) Center of gravity
**) with auxiliary pump 19 cm^3 = 48.3
1) Dimensions according to SAE J617-No. 1, for connection to flywheel case in internal combustion engine, hole diam. 11 mm for new projects only (previous types with short code G and hole diam. 14 mm)

Unit Dimensions, Size 200

Shaft end

Z Splined shaft DIN 5480
W50x2x30x24x9g



Ports

A_1, A_2	Service line ports (high-pressure series)	SAE J518	1 1/4in	
	Fixing thread	DIN 13	M12x1.75; 19 deep [5]	
S	Suction port (standard series)	SAE J518	5in	
	Fixing thread	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	Air bleed port [6]	DIN 3852	M22x1.5; 12 deep	210 Nm [5]
R_2	Fluid drain [6]	DIN 3852	M22x1.5; 12 deep	210 Nm [5]
R_4	Flushing fluid port [6]	DIN 3852	M18x1.5; 12 deep	140 Nm [5]
M	Gauge port for control pressure [6]	DIN 3852	M12x1.5; 12 deep	50 Nm [5]
M_1, M_2	Gauge port for high-pressure [6]	ISO11926	9/16-18UNF-2B;12 deep	80 Nm [5]
M_3	Gauge port for power override [3] [6]	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] [7]	DIN 3852	M14x1.5; 12 deep	80 Nm [5]

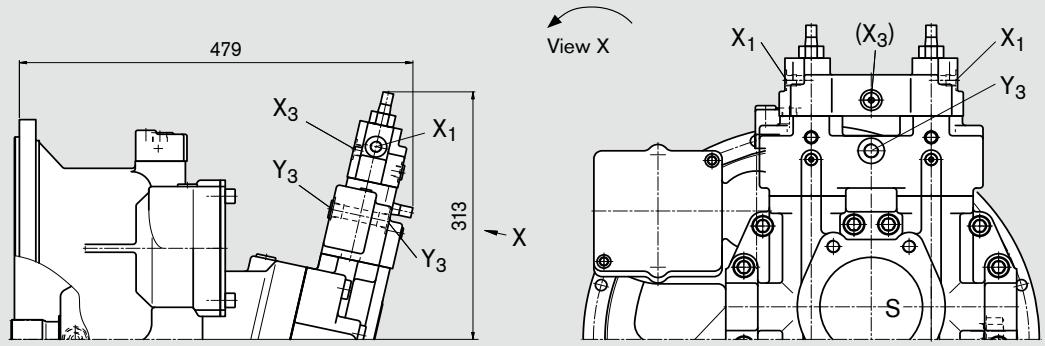
[2] Center bore according to DIN 332 (thread according to DIN 13)
[3] On the LA0 version, the port has no function
[4] Only for versions LA...H2 and LA...H3
[5] Please observe the general notes for the max. tightening torques on page 40.
[6] Plugged
[7] 1x plugged, 1x open

Unit Dimensions, Size 200

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

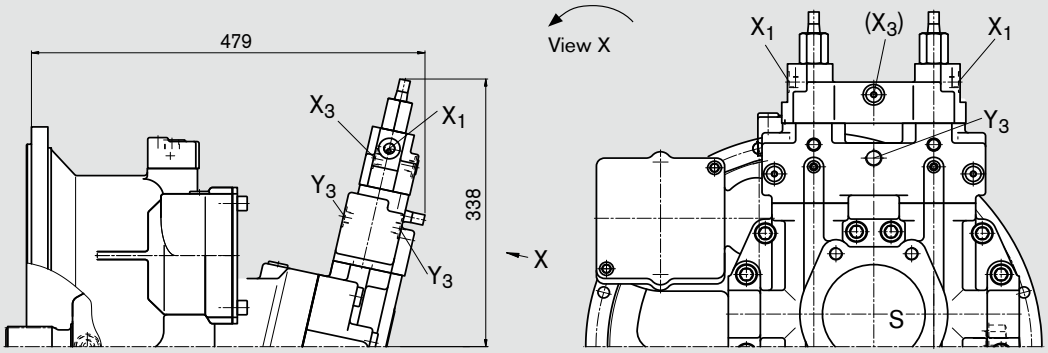
LA0H2, LA1H2

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



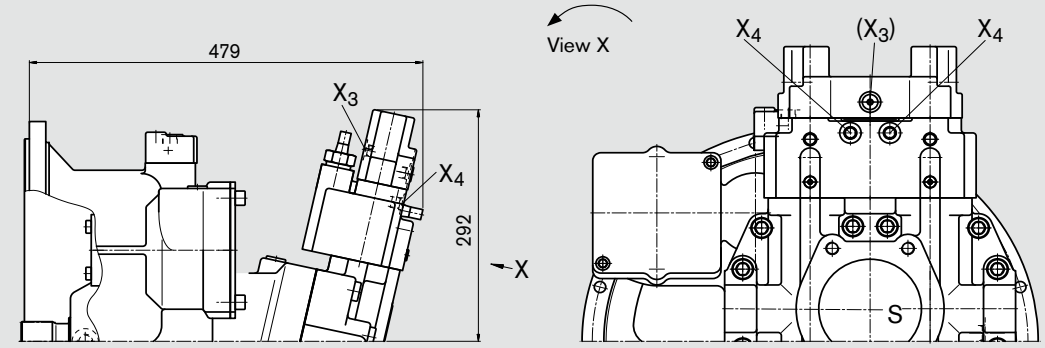
LA0KH2, LA1KH2

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



LA0S, LA1S

Individual power controller with load sensing

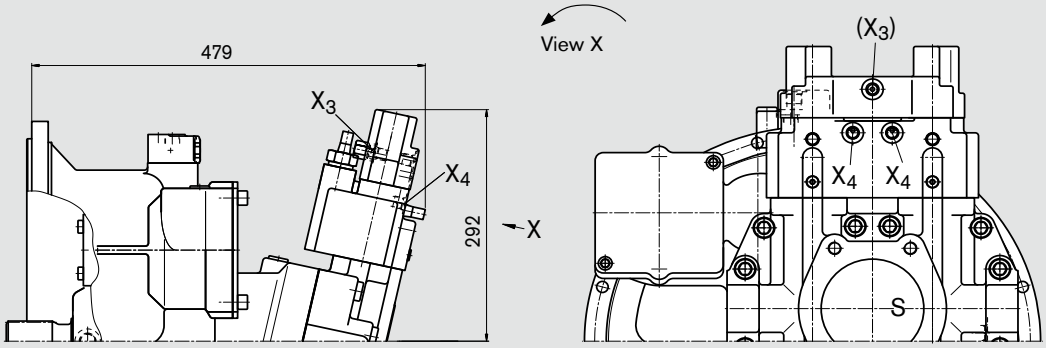


Unit Dimensions, Size 200

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

LA0KS, LA1KS

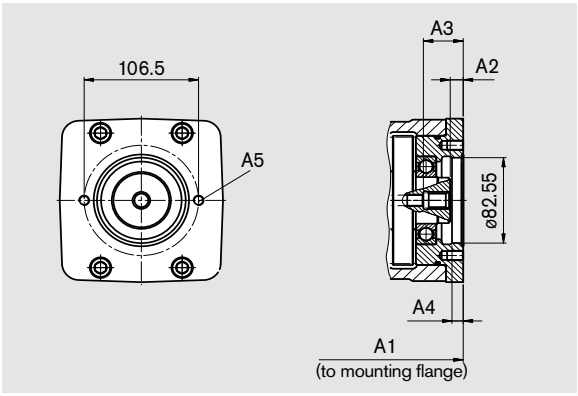
Individual power controller with hydraulic power coupling and load sensing



Power Take-off Dimensions

Before finalizing your design, please request a binding 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))



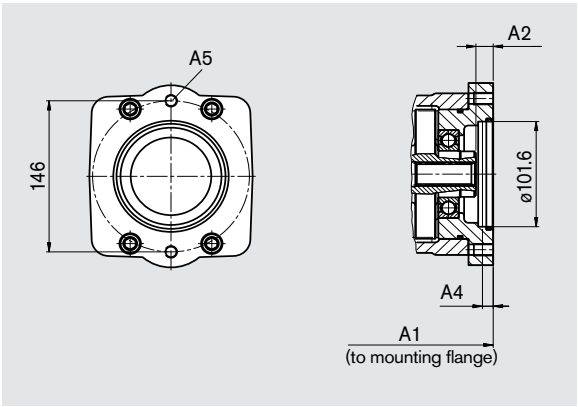
Size	A1	A2	A3	A4	A5 [2]
55	178	10.1	35.1	10.5	M10x1.5;15 deep
80	178	10.1	35.1	10.5	M10x1.5;15 deep
107	190	12.1	37.1	10.5	M10x1.5;15 deep
140	232	11.1	36.1	10.1	M10x1.5;14 deep
200	260	12	37	10.2	M10x1.5;15 deep

Note related to the position of the fixing threads:

Standard position is shown. Further positions of the fixing threads available on request.
Please specify 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	13.1	10	M12x1.75;18 deep
80	185	13.1	10	M12x1.75;18 deep
107	197	16.1	10	M12x1.75;18 deep
140	243	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:

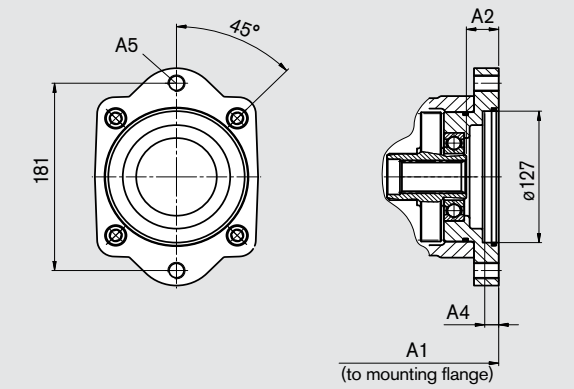
Standard position is shown. Further positions of the fixing threads available on request.
Please specify in clear text.

[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 binding 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	16.1	59.1 [3]	13	M16x2
107	197	30.1	–	13	M16x2
140	243	15.1	–	13	M16x2
200	267.5	19.5	–	11	M16x2

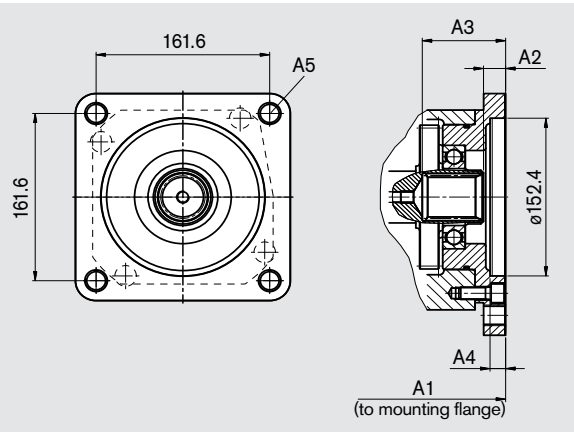
[3]) Illustration as for K01

Note related to the position of the fixing threads:

Standard position is shown. Further positions of the fixing threads available on request.
Please specify 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	248.5	20.6	77.6	14.5	M20x2.5
200	267.5	19.5	76.5	14.5	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

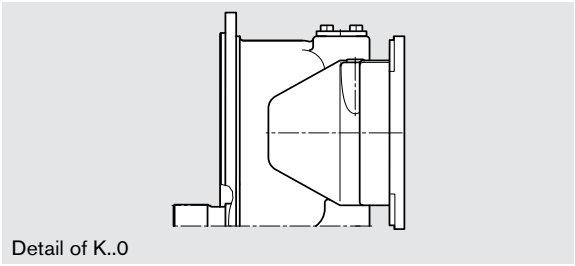
Flange	Hub for splined shaft	Short code K.../F...	Attachment for 2nd pump A4FO Size (Shaft)	A4VG Size (Shaft)	A10VG Size (Shaft)	A10VO/31 Size (Shaft)	A10VO/53 Size (Shaft)	A11VO Size (Shaft)	External gear pump
Power take-off – A8VO55/80									
82-2 (A)	5/8in	**01**	–	–	–	–	–	–	Size F Sizes 4-22 [1]
101-2 (B)	7/8in	**02**	16, 22, 28 (S)	–	18 (S)	28 (S, R)	28 (S, R) 45 (U, W)	–	Size N Sizes 20-32 [1] Size G Sizes 38-45 [1]
	1in	**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) [2]	–
Power take-off – A8VO107									
82-2 (A)	5/8in	**01**	–	–	–	–	–	–	Size F Sizes 4-22 [1]
101-2 (B)	7/8in	**02**	16, 22, 28 (S)	–	18 (S)	28 (S, R) 45 (U)	28 (S, R) 45 (U, W)	–	Size N Sizes 20-32 [1] Size G Sizes 38-45 [1]
	1in	**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**	–	–	–	–	–	–	Size F Sizes 4-22 [1]
101-2 (B)	7/8in	**02**	16, 22, 28 (S)	–	18 (S)	28 (S, R) 45 (U)	28 (S, R) 45 (U, W)	–	Size N Sizes 20-32 [1] Size G Sizes 38-45 [1]
	1in	**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**	–	–	–	–	–	–	Size F Sizes 4-22 [1]
101-2 (B)	7/8in	**02**	16, 22, 28 (S)	–	18 (S)	28 (S, R) 45 (U)	28 (S, R) 45 (U, W)	–	Size N Sizes 20-32 [1] Size G Sizes 38-45 [1]
	1in	**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] Rexroth recommends special gear pump versions. Please contact us.

[2] For mounting the A11VO size 60, side threaded ports for A_1 and A_2 are required. Please contact us.

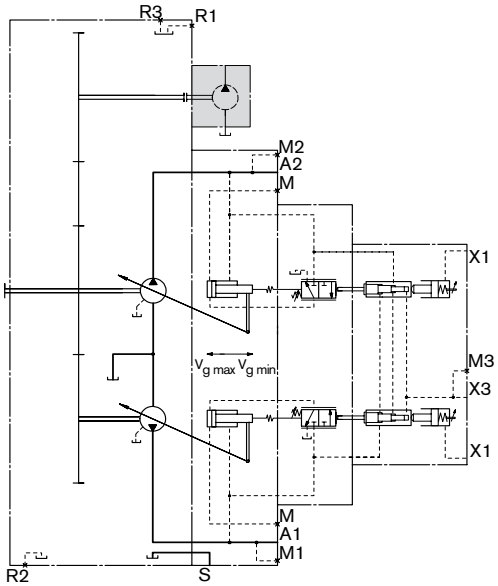
Power Take-off, Auxiliary Pump and Valves

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

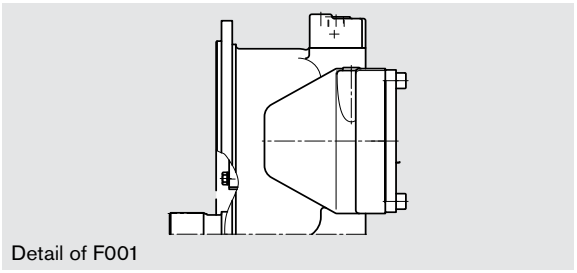


Detail of K..0

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

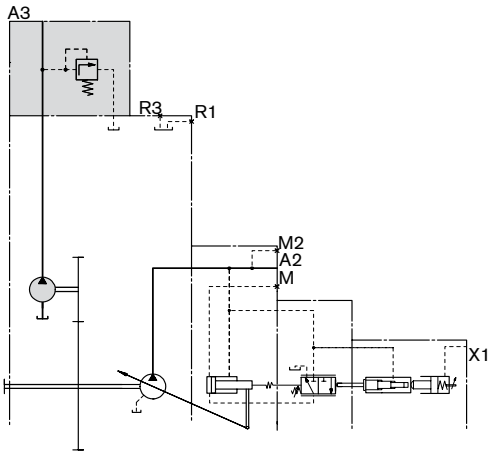


Variation:
without power take-off, with integrated auxiliary pump (pilot fluid pump) and pressure-relief valve, F001



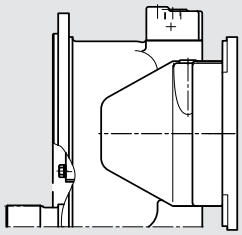
Detail of F001

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.



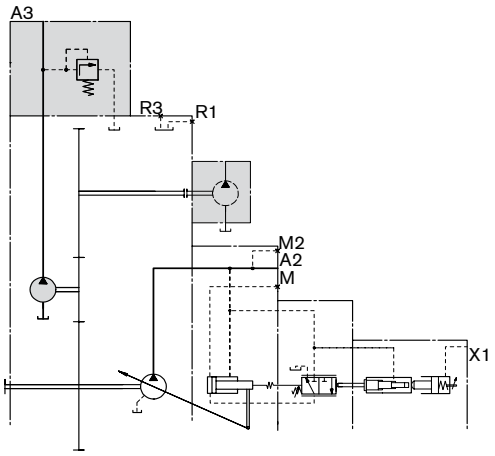
Power Take-off, Auxiliary Pump and Valves

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

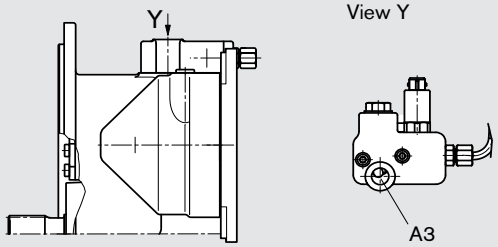


Detail for F..1

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



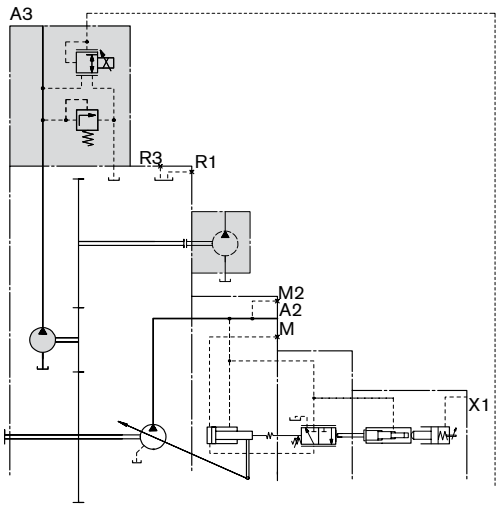
Variation:
with power take-off, with integrated auxiliary pump (pilot fluid pump), with pressure-relief and pressure-reduction valves, F..4



Detail for F..4

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. An electrically controlled pressure-reduction valve can be used to override the power setting (load-limiting control).

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



Connector for Solenoids (only for EP)

DEUTSCH DT04-2P-EP04, 2-pin

Molded, without bi-directional suppressor diode (standard) _____ **P**

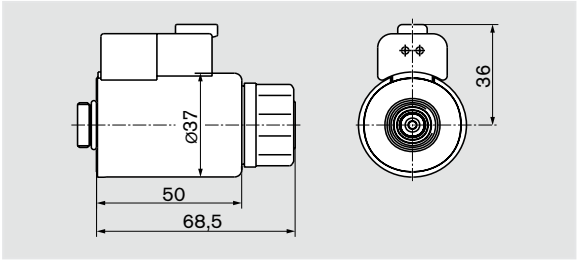
Type of protection according to DIN/EN 60529: IP67 and IP69K

Mating connector

DEUTSCH DT06-2S-EP04
Rexroth Mat. No. R902601804

consisting of:	DT designation
– 1 case	DT06-2S-EP04
– 1 wedge	W2S
– 2 sockets	0462-201-16141

The mating connector is not included in supply.
This can be supplied by Rexroth on request.



Note for round solenoids:

The position of the connector can be changed by turning the solenoid body.

The following procedure is to be observed:

1. Loosen the fixing nut (1)
2. Turn the solenoid body (2) to the desired position
3. Tighten the fixing nut
   Tightening torque of fixing nut: 5^{+1} Nm
   (width across flats WAF26, 12-sided DIN 3124)

Installation Notes

General

During commissioning and operation, the axial piston unit must be filled with hydraulic fluid and air bled. This is also to be observed following a relatively long standstill as the system may empty via the hydraulic lines.

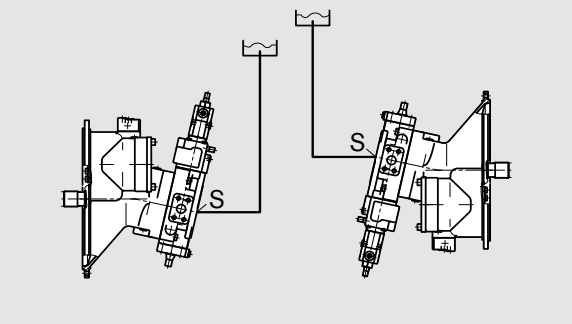
The case drain chamber is internally connected to the suction chamber. A case drain line to the tank is not required.
Note the special feature of size 200 for flushing fluid. (Port R4)
In all operational states, the suction line must flow into the tank below the minimum fluid level.
The minimum suction pressure at port S must not fall below of 0.8 bar absolute.

Installation position

Shaft horizontal.

Below-tank installation

Below-tank installation is when the pump is fitted below the minimum fluid level in the tank.



Notice

General Notes

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

– Project planning, assembly and commissioning of the pump require the involvement of qualified personnel.

– The service line ports and function ports are only designed for mounting hydraulic lines.

– During and shortly after operation, there is a risk of burns on the pump and especially on the solenoids. Take suitable safety precautions, e.g. wear protective clothing.

– There may be shifts in the characteristic depending on the operating state of the pump (operating pressure, fluid temperature).

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

– The data and information contained herein must be adhered to.