

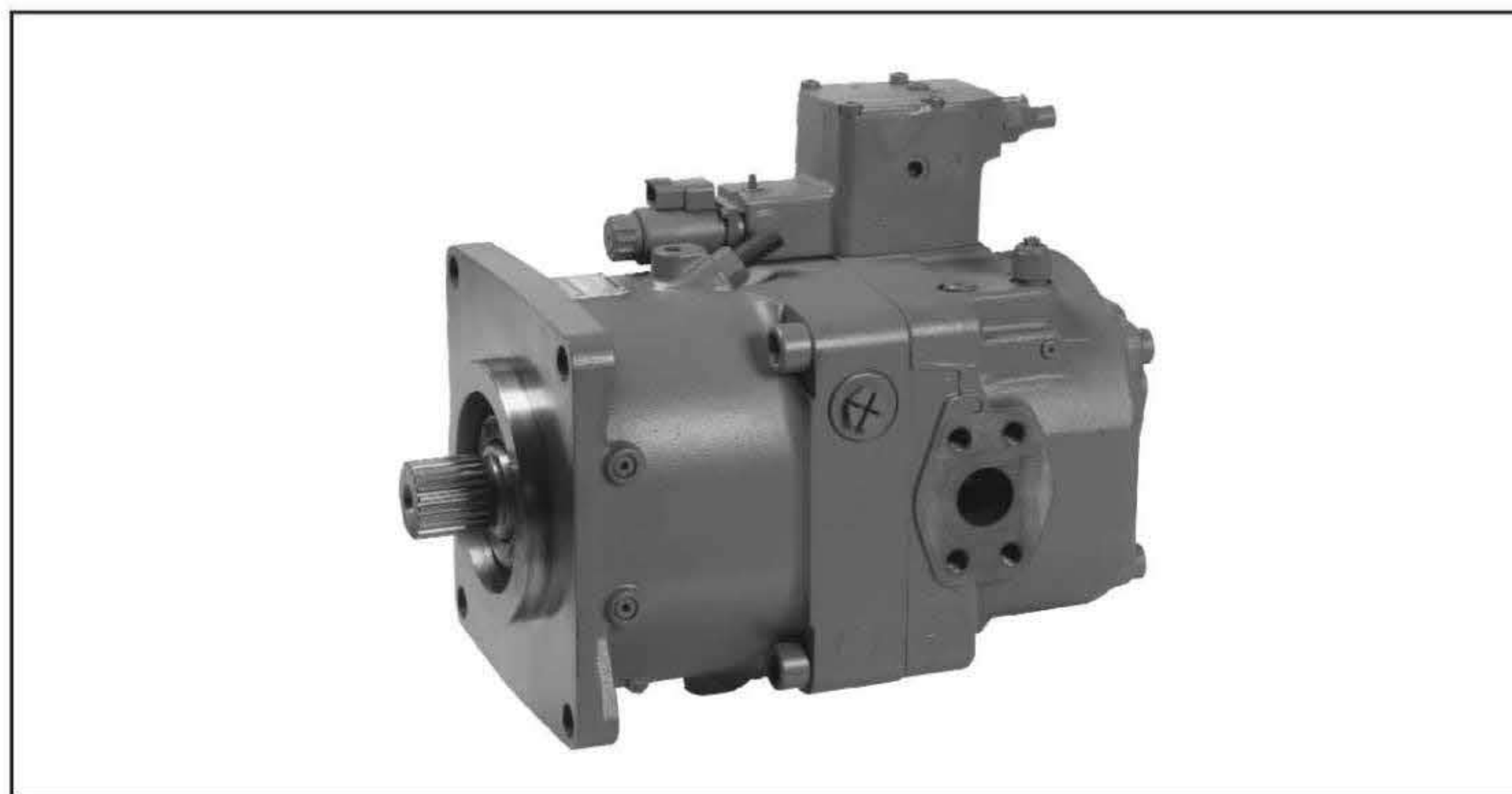
# A11VLO Series Piston

## Variable Displacement Pump

### Product show and brief introduction

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Open circuit  
Serie 190  
Size 1  
Nominal pressure 35 MPa  
Peak pressure 40 MPa



### Features

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- Variable displacement pump with axial piston drive swashplate design for hydrostatic drives in open circuits
- Designed primarily for use in mobile applications
- Pump operation either self-priming, with tank charging or charging pump
- A comprehensive range of variable units is available for different control functions
- Power can be adjusted from the outside, even when the machine is running
- The through drive is suitable for attachment of gear pumps and axial piston pumps up to the same size, i.e. 100% through drive
- The volume flow is adjustable in proportion to the drive speed and displacement and is infinitely variable from  $q_{V \max}$  to  $q_{V \min} = 0$



## Model Code

A11V	L	0	190	LRDU2	/	1	1	R	-	N	P	D	12	N00
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Axial piston unit

Variable displacement, swashplate design A11V

Charging pump (impeller)

with charging pump L

Operating mode

Pump, open circuits O

Size

Displacement  $V_{g \max}$  (mL/r) 190

Control devices

Power control with pressure cut-off and stroke limiter	
positive control	U=12V LRDU1
positive control	U=24V LRDU2

Series

1

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1

Direction of rotation

Viewed on shaft end	Clockwise	R
	Anti-clockwise	L

Seals

NBR (nitrile rubber), shaft seal FKM (fluoride rubber) N

Shaft end

Splined shaft DIN 5480 for individual pumps and pump combinations	Z
Cylindrical shaft with key DIN 6885	P
Splined shaft ANSI B92.1a-1976	standard for single pump S
	standard for combination pump T

Mounting flange

SAE J744 - 4 hole D

Connection for service lines

Pressure port and suction port SAE side ports (metric threads) 12

Through drive

Flange SAE J744 <sup>1)</sup>	Splined shaft hub	
—	—	N00
82-2(A)	5/8in 9T 16/32DP <sup>2)</sup>	K01
	3/4in 11T 16/32DP <sup>2)</sup>	K52
101-2(B)	7/8in 13T 16/32DP <sup>2)</sup>	K02
	1in 15T 16/32DP <sup>2)</sup>	K04
	W35 2 × 30 × 16 × 9g <sup>3)</sup>	K79
127-2(C)	1 1/4in 14T 12/24DP <sup>2)</sup>	K07
	1 1/2in 17T 12/24DP <sup>2)</sup>	K24
	W30 2 × 30 × 14 × 9g <sup>3)</sup>	K80
	W35 2 × 30 × 16 × 9g <sup>3)</sup>	K61
152-4(D)	1 1/4in 14T 12/24DP <sup>2)</sup>	K86
	1 3/4in 13T 8/16DP <sup>2)</sup>	K17
	W40 2 × 30 × 18 × 9g <sup>3)</sup>	K81
	W45 2 × 30 × 21 × 9g <sup>3)</sup>	K82
	W50 2 × 30 × 24 × 9g <sup>3)</sup>	K83
165-4(E)	1 3/4in 13T 8/16DP <sup>2)</sup>	K72
	W50 2 × 30 × 24 × 9g <sup>3)</sup>	K84

1) 2 = ^ 2 hole; 4 = ^ 4 hole

2) Splined shaft hub to ANSI B92.1a-1976 (splined shaft allocation to SAE J744, see pages)

3) Splined shaft hub to DIN 5480



Technical Data

Size				190
Displacement		$V_{g \max}$	mL/r	192.7
		$V_{g \min}$	mL/r	0
Max. Speed	at $V_{g \max}^{1)}$	$n_{o \max}$	rpm	2500
	at $V_g \leq V_{g \max}$	$n_{o \max}$	rpm	2500
Flow <sup>3)</sup>	at $n_{o \max}$ and $V_{g \max}$	$q_{vo \max}$	L/min	467
Power	at $q_v \max$ and $\Delta P = 35 \text{ MPa}$	$P_{o \max}$	kW	281
Torque	at $V_{g \max}$ and $\Delta P = 35 \text{ MPa}$	$T_{\max}$	Nm	1073
Weight (approx.)		m	kg	22

- 1) The values are quoted for an absolute pressure ( $P_{abs}$ ) of at least 0.08 MPa at suction port S and mineral operating fluid.  
2) The values are quoted for  $V_g \leq V_{g \max}$  or increase of the input pressure  $P_{abs}$  at suction port S.  
3) Allows for 3% displacement loss.

LRD Power Control with Pressure Cut-off

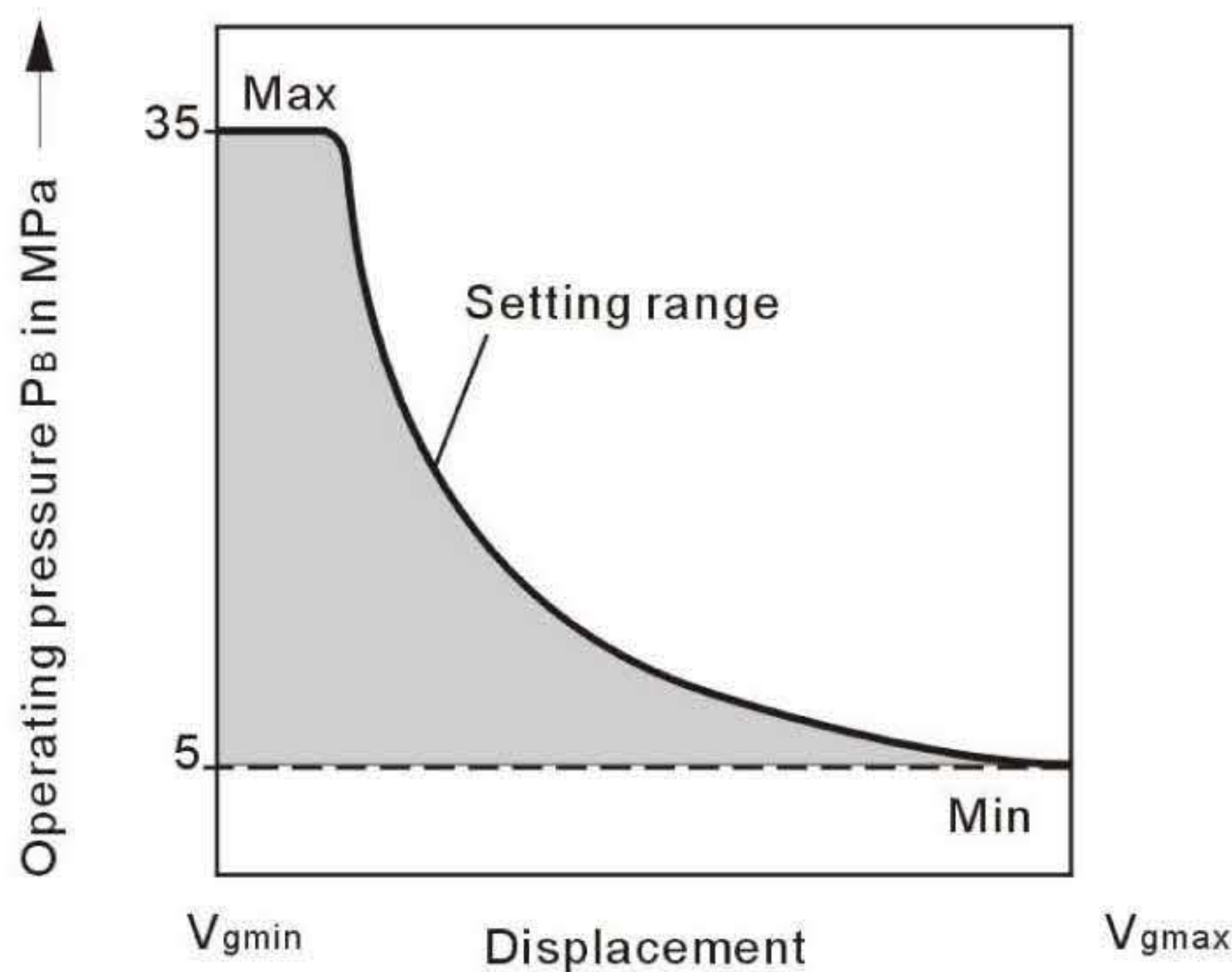
Pressure cut-off corresponds to a pressure control which adjusts the pump displacement back to  $V_{g \min}$  when the set pressure signal value is reached.

This function overrides power control, i.e. below the pressure signal value, the power control function is performed.

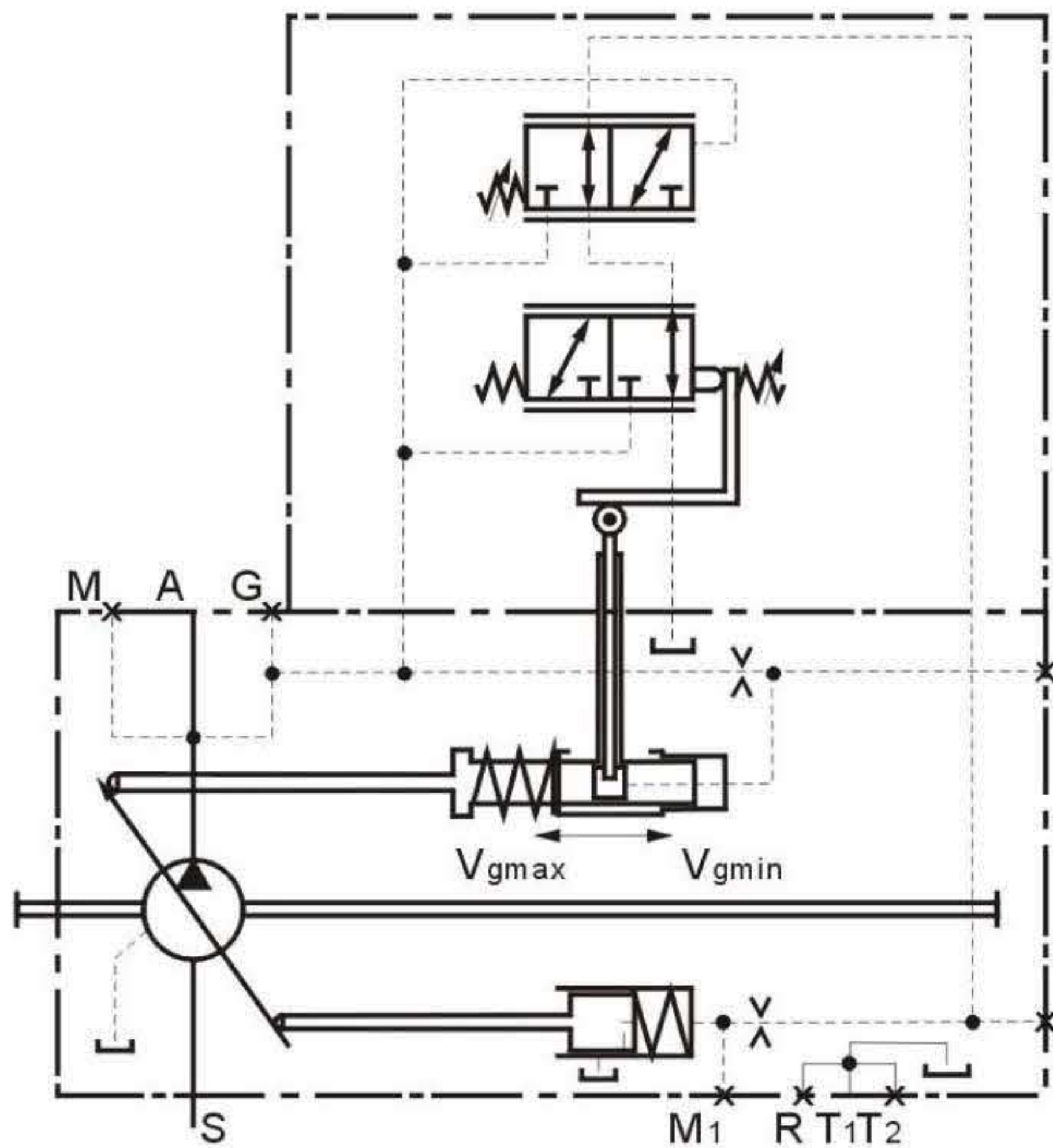
The valve is integrated into the control housing and is permanently set to a pressure signal value at the factory.

Setting range 5 to 35 Mpa.

● Characteristic



● Circuit diagram





### ● LR... Power control with stroke limiter

The stroke limiter enables the pump displacement to be infinitely varied or limited across the whole setting range. The displacement is set once proportionally by the pilot current applied at the proportional solenoid or the pilot pressure ...applied at port Y (max. 4 MPa). Direct current at 12V (U1) or 24V (U2) respectively is required to trigger the proportional solenoid (insulation IP 54).

The stroke limiter is overridden by the power control, i.e. below the power control characteristic (hyperbolic characteristic) the displacement is set according to the pilot current or pilot pressure. If the power control characteristic is exceeded by the flow set or the operating pressure, the power control overrides and readjusts the displacement according to the hyperbolic characteristic.

To swivel the pump out of its initial position  $V_{g\max}$  towards  $V_{g\min}$ , a positioning pressure of 3 MPa is needed with the electric stroke limiter LRU1/2 . The necessary positioning oil is taken from the high pressure or from the external positioning pressure available at port G ( $\geq 3$  MPa).

If the operating pressure is  $\geq 3$  MPa and  $V_{g\min} > 0$ , no external positioning pressure is required. In this case the change-over valve should be removed from the pump before commissioning and port G should be closed.

### ● LRU1/2 Power control with electric stroke limiter (positive control)

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

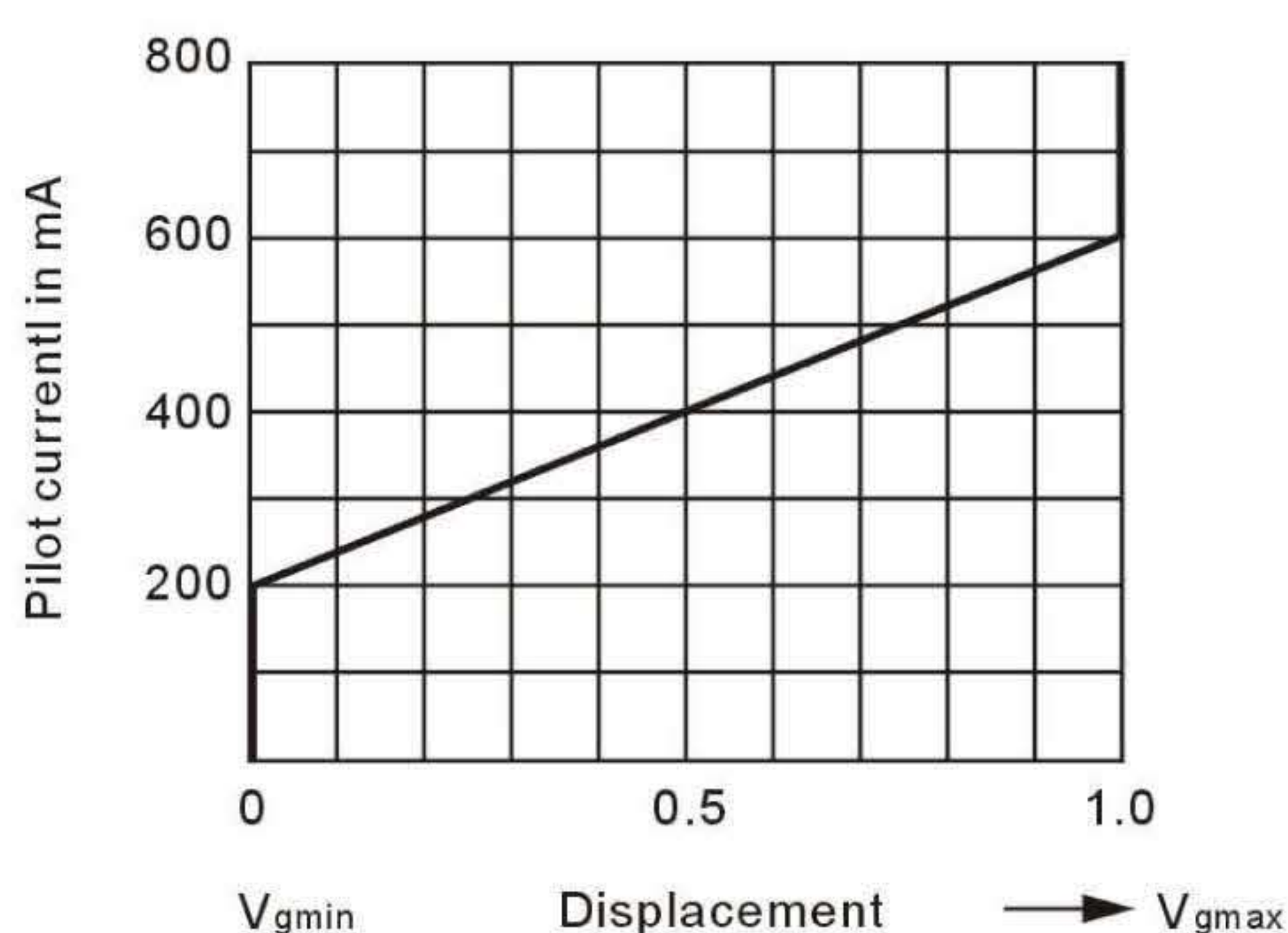
As the pilot current increases, the pump swivels to a higher displacement.

Start of control at approx.: 400 mA (12 V)    200 mA (24 V)  
End of control at approx.: 1200 mA (12 V)    600 mA (24 V)

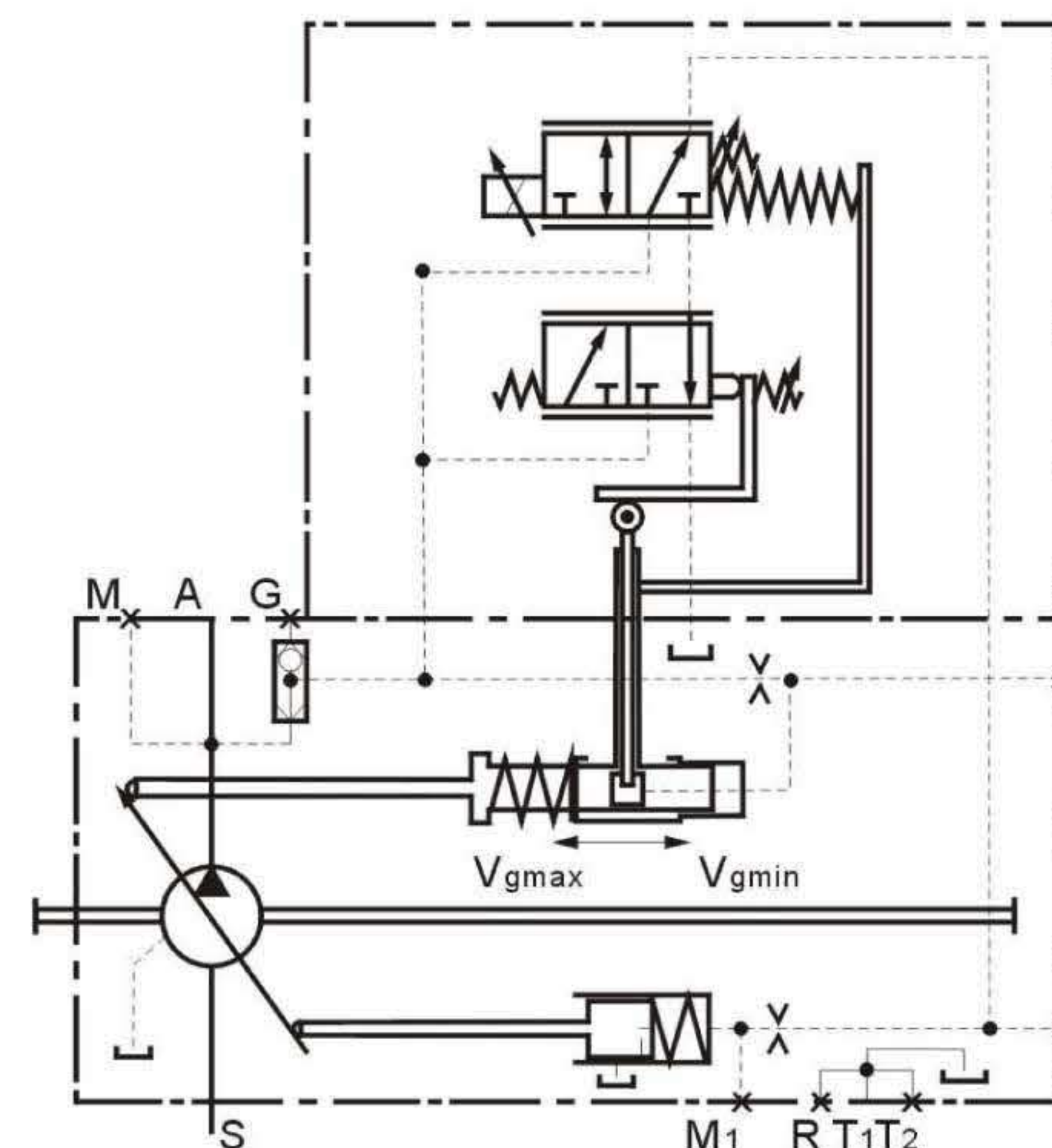
Starting position in unpressurised state:  $V_{g\max}$

At operating pressure  $> 3$  MPa the pump swivels from  $V_{g\max}$  towards  $V_{g\min}$  (pilot current  $<$  start of control)

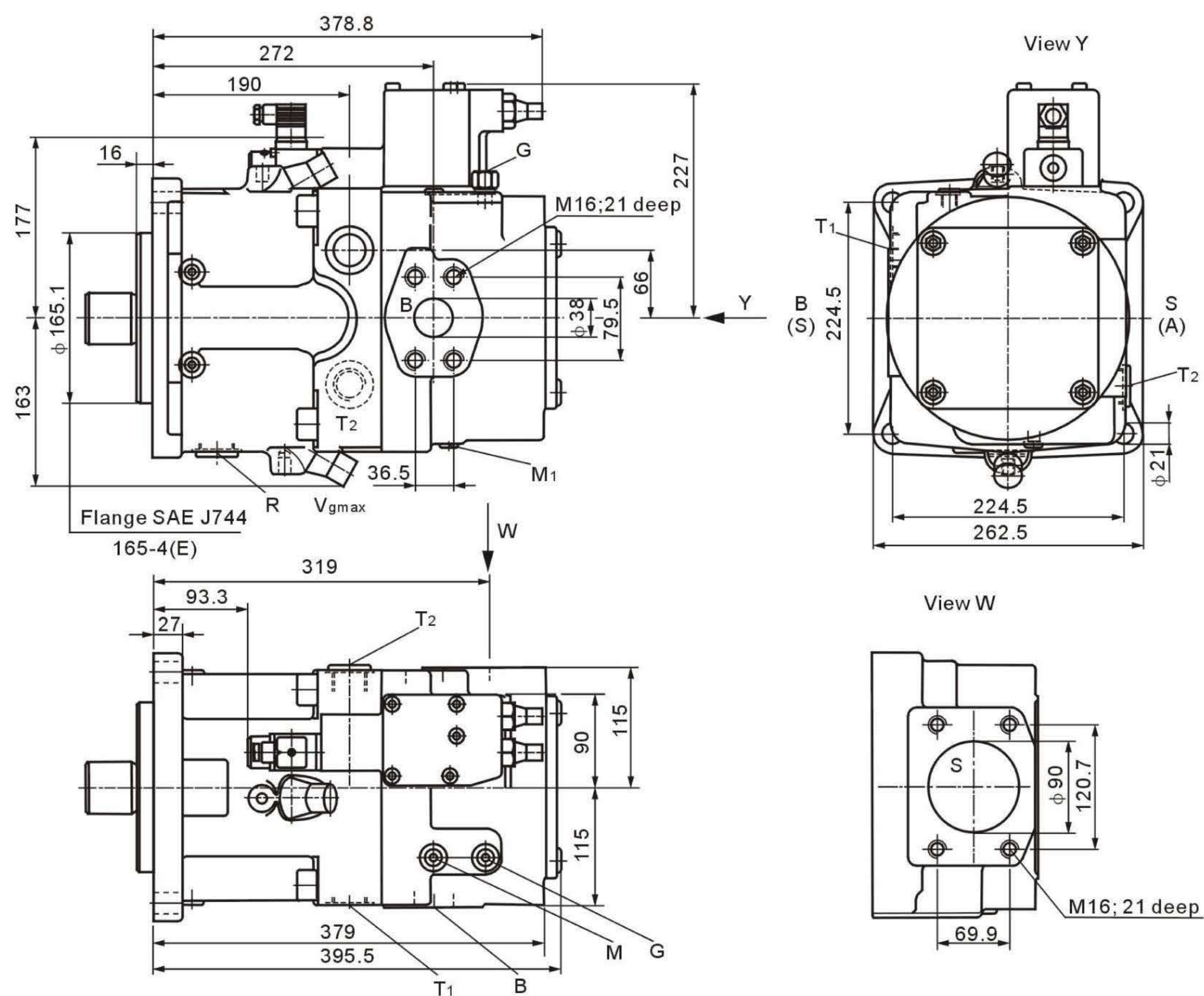
### ● Characteristic: LRU2



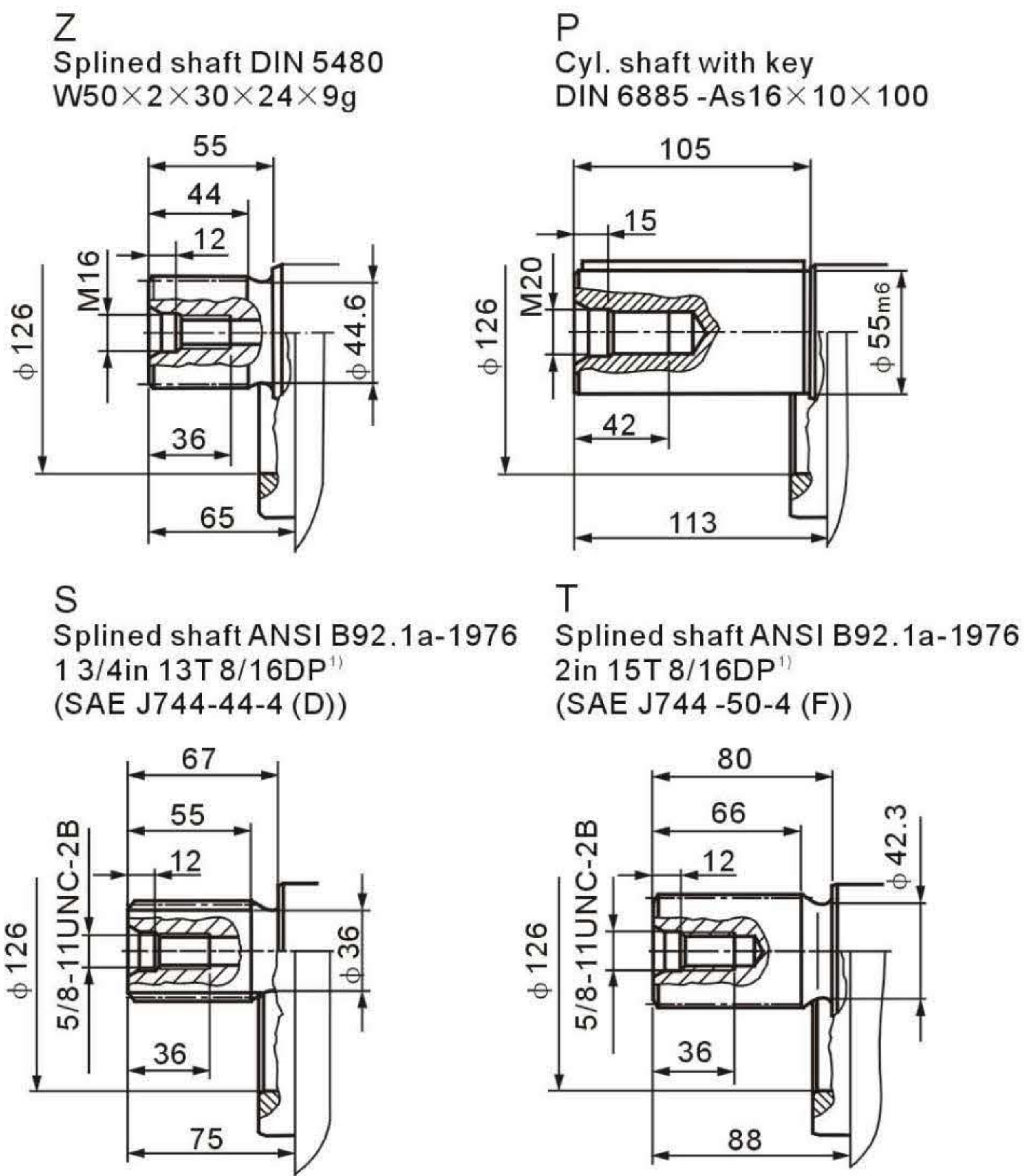
### ● Circuit diagram







● Shaft ends



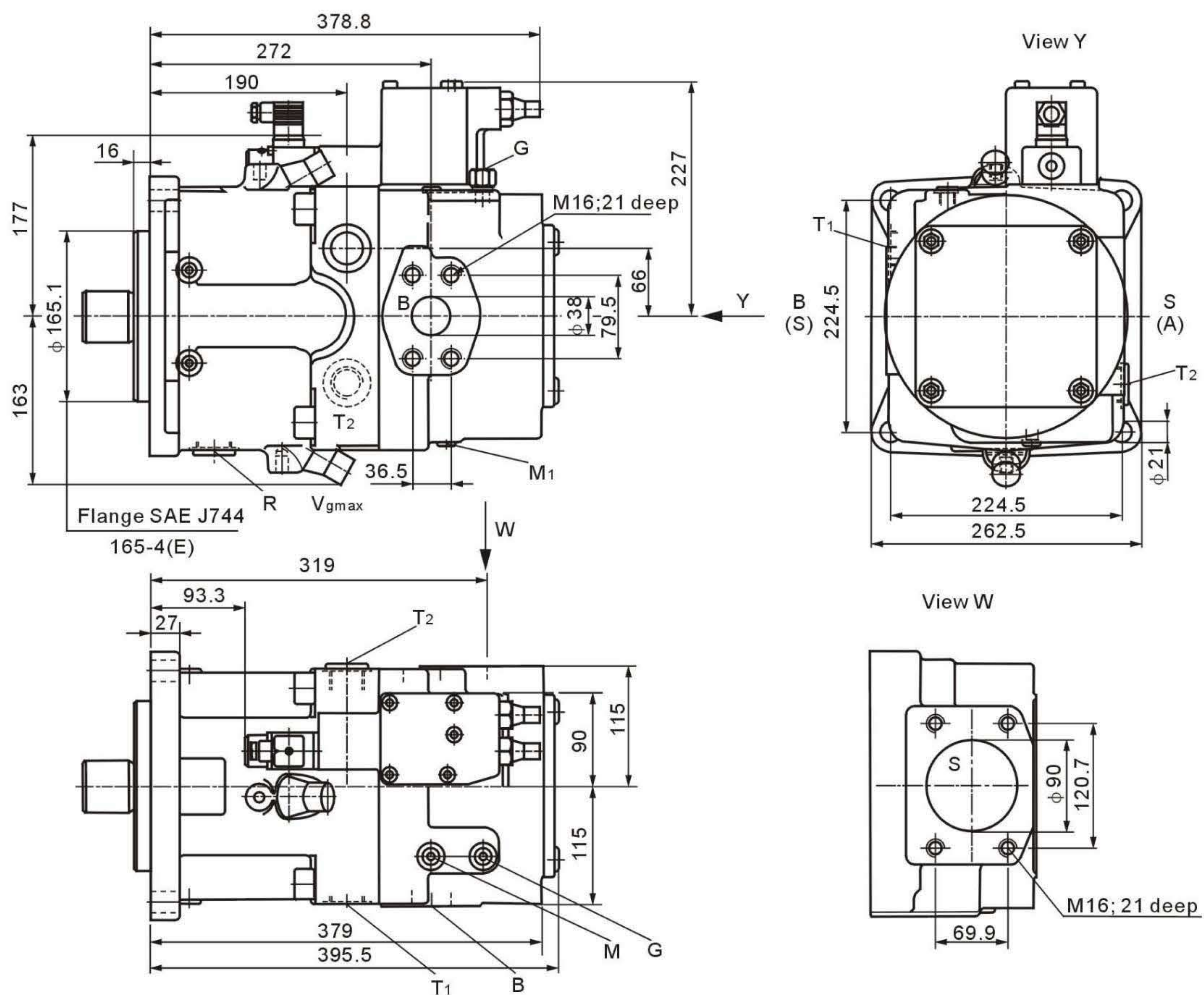
Ports

A, B	Service port	SAE 1 1/2; 42MPa High pressure series
S	Suction port	SAE 3 1/2; 3.5MPa Standard series
T1, T2	Air bleed, tank	M33×2; 16 deep
R	Air bleed, oil drain	M33×2; 16 deep
M1	Measuring point, regulating chamber	M12×1,5; 12 deep
M	Measuring point, service port	M12×1,5; 12 deep
G	Port for positioning pressure (controller) for version with stroke limiter (U2)	M14×1,5; 12 deep

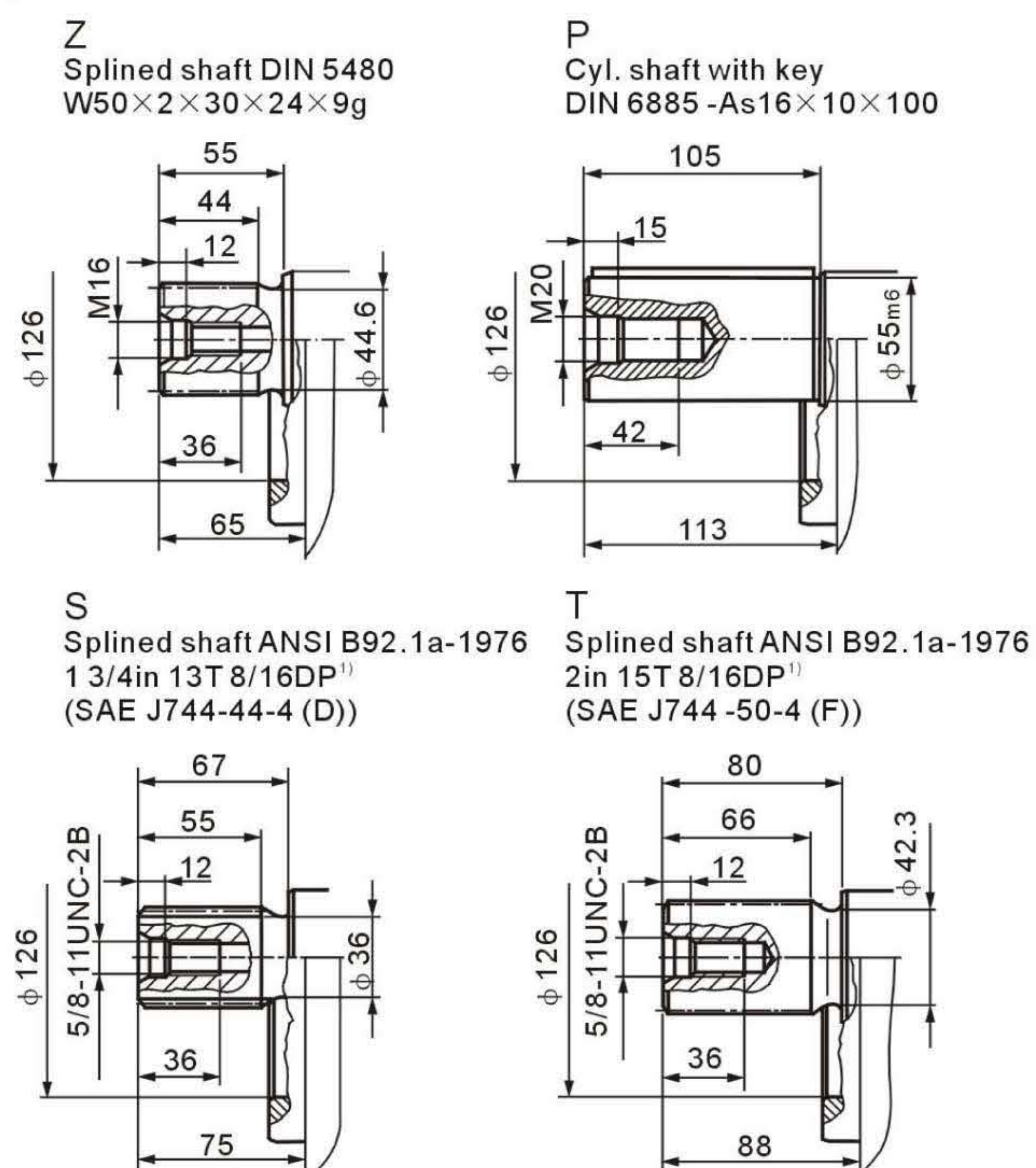
1)30° pressure angle, flat root, side fit, tolerance class 5.



## Installation Dimensions



### ● Shaft ends



### Ports

A, B	Service port	SAE 1 1/2; 42MPa High pressure series
S	Suction port	SAE 3 1/2; 3.5MPa Standard series
T <sub>1</sub> , T <sub>2</sub>	Air bleed, tank	M33×2; 16 deep
R	Air bleed, oil drain	M33×2; 16 deep
M <sub>1</sub>	Measuring point, regulating chamber	M12×1,5; 12 deep
M	Measuring point, service port	M12×1,5; 12 deep
G	Port for positioning pressure (controller) for version with stroke limiter (U2)	M14×1,5; 12 deep

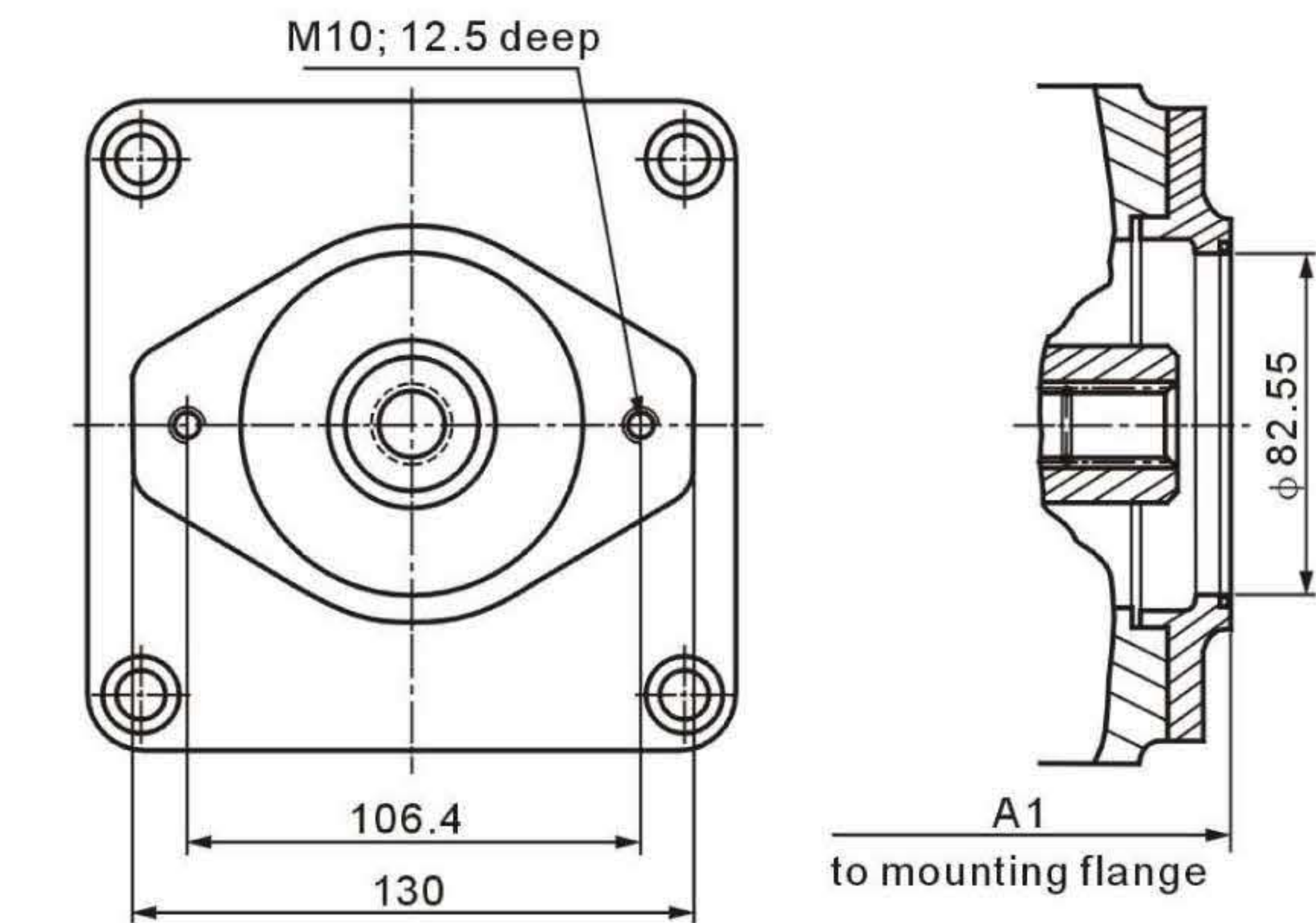
1)30° pressure angle, flat root, side fit, tolerance class 5.



Through Drive Installation Dimensions

Flange SAE J744 -82-2 (A) Hub for splined shaft to ANSI B92.1a-1976

5/8" 9T 16/32DP<sup>1)</sup> (SAE J744-16-4 (A)) K01  
3/4" 11T 16/32DP<sup>1)</sup> (SAE J744-19-4 (A-B)) K52

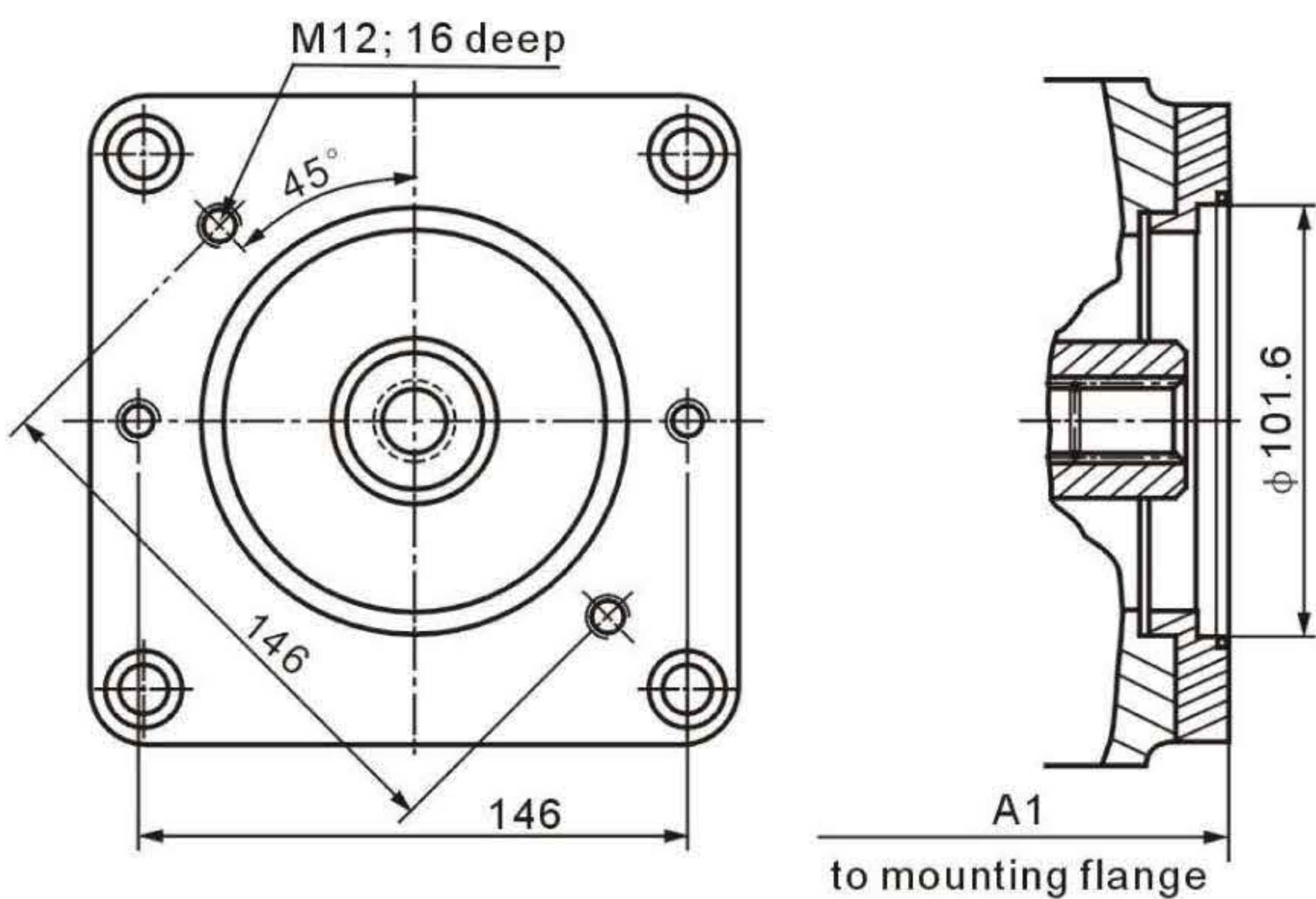


Size	A1	
	K01	K52
190	394	394

Note:The mounting flange can also be turned 90° . If required, please state in clear text.

Flange SAE J744 -101-2 (B) Hub for splined shaft to ANSI B92.1a-1976  
Hub for splined shaft to DIN 5480

7/8" 13T 16/32DP<sup>1)</sup> (SAE J744 -22-4 (B)) K02  
1" 15T 16/32DP<sup>1)</sup> (SAE J744 -25-4 (B-B)) K04  
W35x2x30x16x9g K79

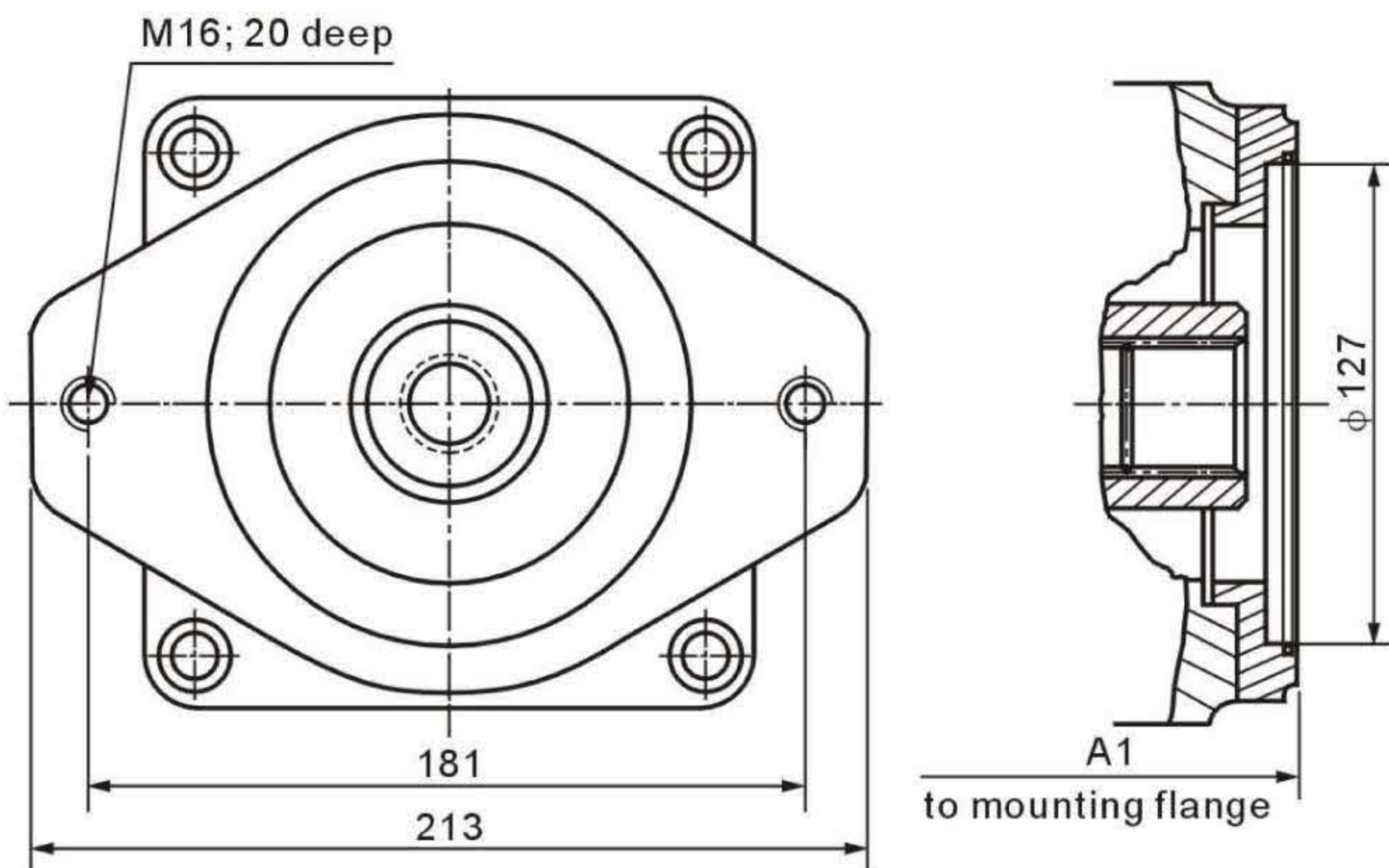


Size	A1		
	K02	K52	K79
190	404	404	394

Note:The mounting flange can also be turned 90° . If required, please state in clear text.

Flange SAE J744 -127-2 (C) Hub for splined shaft to ANSI B92.1a-1976  
Hub for splined shaft to DIN 5480

1 1/4" 14T 12/24DP<sup>1)</sup> (SAE J744 -32-4 (C)) K07  
1 1/2" 17T 12/24 DP<sup>1)</sup> (SAE J744 -38-4 (C-C)) K24  
W30x2x30x14x9g K80  
W35x2x30x16x9g K61



Size	A1			
	K07	K24	K80	K61
190	400	400	400	400

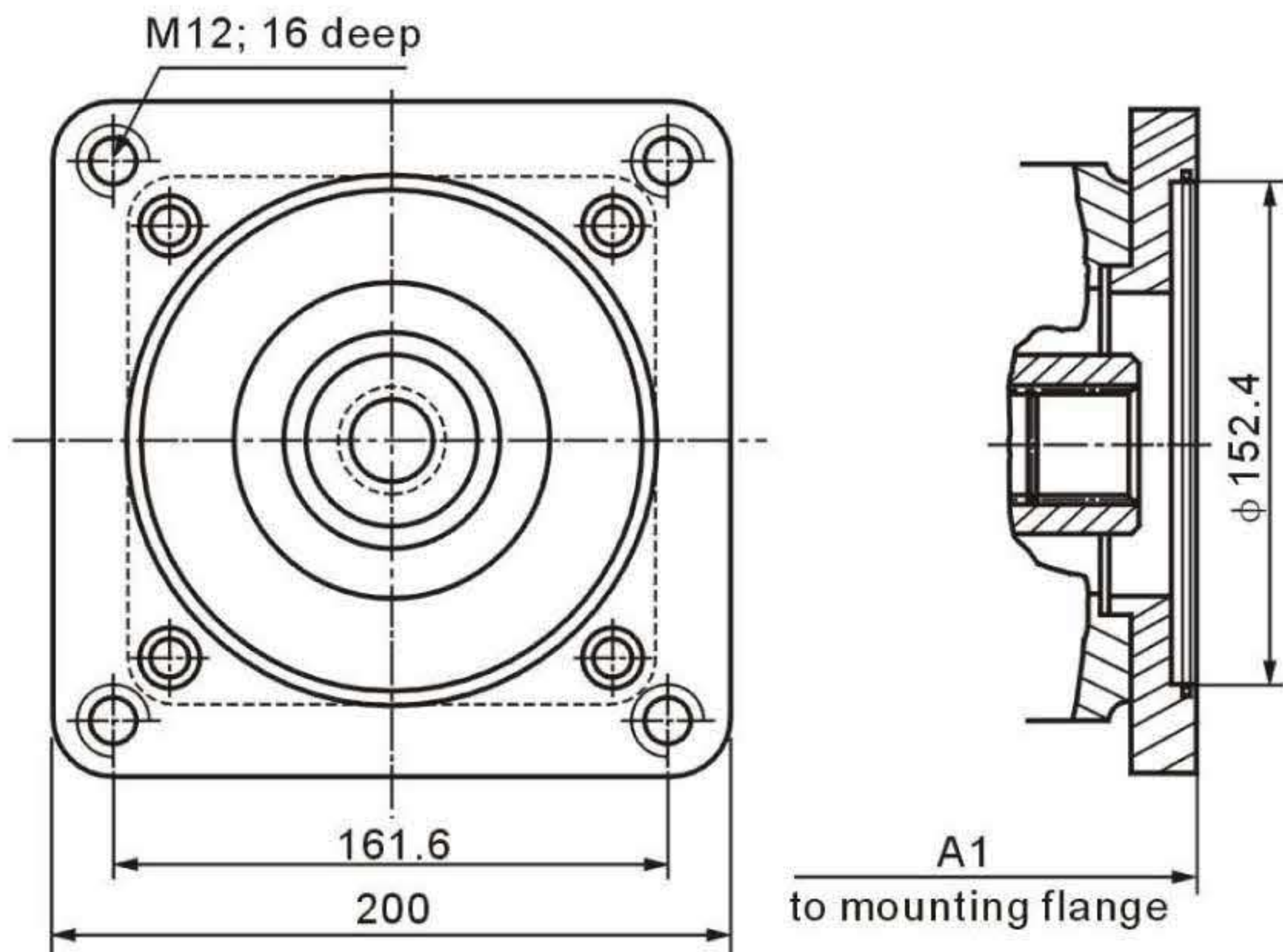
Note:The mounting flange can also be turned 90° . If required, please state in clear text.

1)30° pressure angle, flat root, side fit, tolerance class 5.



# Through Drive Installation Dimensions

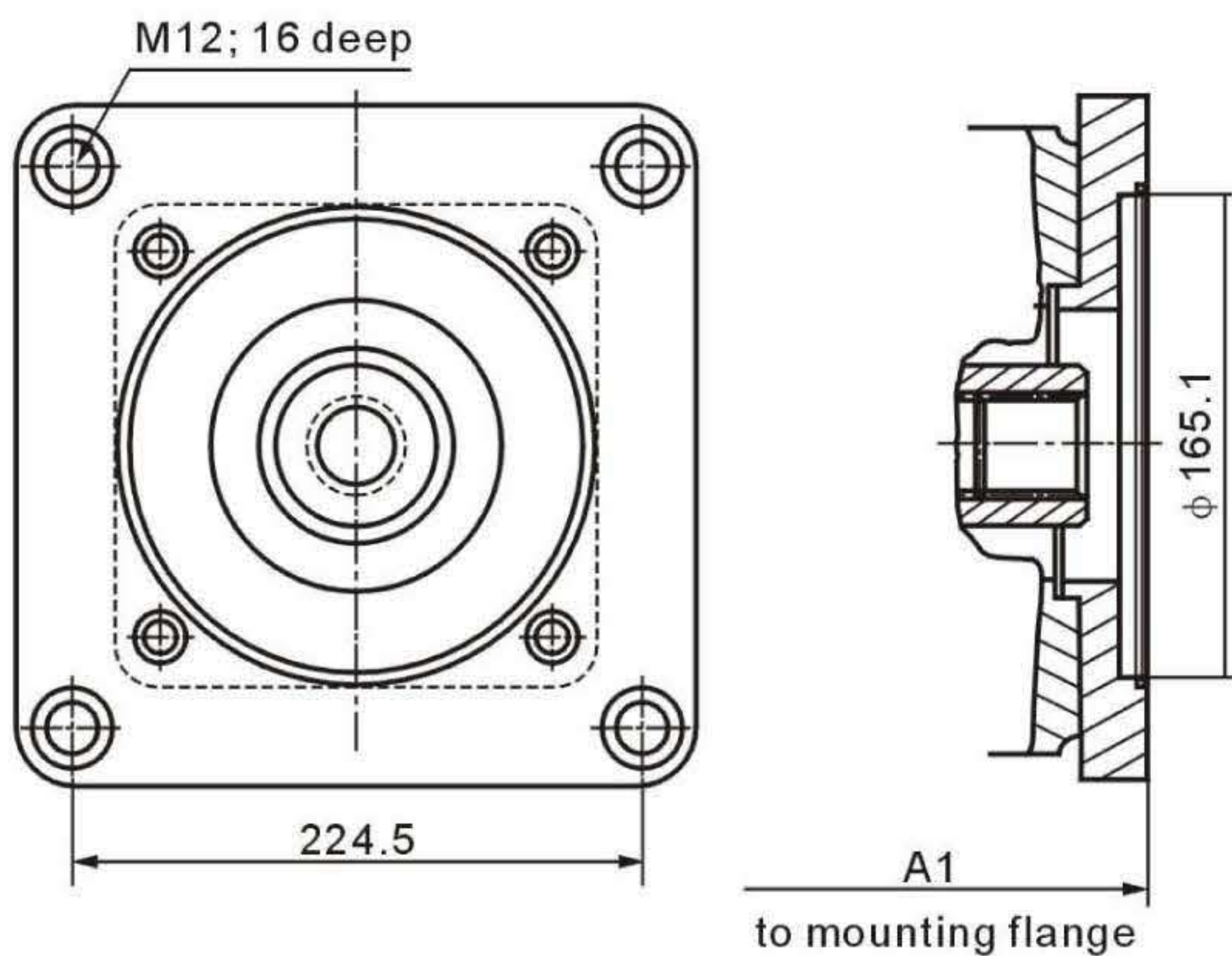
Flange SAE J744 -152-4 (D) Hub for splined shaft to ANSI B92.1a-1976  
Hub for splined shaft to DIN 5480



1 1/4 " 14T 12/24DP<sup>1)</sup> (SAE J744 -32-4 (C)) K86  
1 3/4 " 13T 8/16DP<sup>1)</sup> (SAE J744 -44-4 (D)) K17  
W40x2x30x18x9g K81  
W45x2x30x21x9g K82  
W50x2x30x24x9g K83

Size	A1				
	K86	K17	K81	K82	K83
190	424	424	424	424	424

Flange SAE J744 -165-4 (E) Hub for splined shaft to ANSI B92.1a-1976  
Hub for splined shaft to DIN 5480



1 3/4 " 13T 8/16DP<sup>1)</sup> (SAE J744 -2-4 (C)) K72  
W50x2x30x24x9g K84

Size	A1	
	K72	K84
190	409	409