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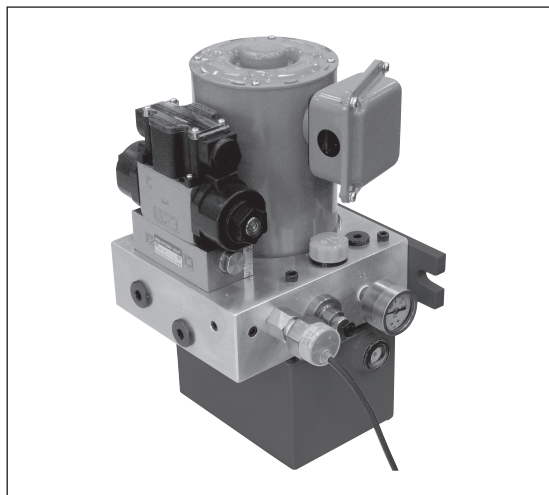
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SUPER ENERGY-SAVING SMALL UNIT – SMALLPAC (SP*A)



This compact hydraulic unit has a circuit configuration designed to stop the motor according to the clamping pressure of workpiece detected by a pressure switch.

The pressure is held by a pilot-operated check valve.

This unit is the most suitable as a jig clamp for small size machining centers.

Features

1. Drastic energy-saving effect

Power consumption of intermittent motor operations is reduced drastically.

2. Super compact size

A super compact unit so small that it can be installed next to a clamp device is realized, by reducing the size of motor, tank, etc. and integrating the pump motor and the solenoid valve by the manifold.

3. Exempted from the regulations on high efficiency motor

This unit is exempted from the regulations on high efficiency motor in many countries, thanks to the adoption of short-time rated motors. (According to our research, as of May 2016)

Description of the model designation

SP3A-ANAGAG-ABW-01

Smallpac	Model No.
No. of station of manifold 1 to 3: 1 to 3 station	3rd station pressure switch control port N: No pressure switch installed (only for Z circuit) A: A port B: B port W: A · B port
Series A: Motor 0.75 kW Pump 4 cm ³ /rev Tank 1.4 L	2nd station pressure switch control port N: No pressure switch installed (only for Z circuit) A: A port B: B port W: A · B port
* 1st station control device (In the table below)	1st station pressure switch control port N: No pressure switch installed (only for Z circuit) A: A port B: B port W: A · B port
* With/without 1st station pressure reducing valve G: With reducing valve N: No pressure reducing valve installed	* With/without 3rd station reducing valve G: With pressure reducing valve N: No pressure reducing valve installed
* 2nd station control device (In the table below)	* 3rd station control device (In the table below)
* With/without 2nd station pressure reducing valve G: With reducing valve N: No pressure reducing valve installed	* In the order of 1st, 2nd and 3rd stations from the motor side

Type of installed valve

Control device (V)	Type code	A	B	C	D	E	G	Z	Remark
Solenoid valve	HD1N-3W-BGA-025-A1 (AC100V)	○							Terminal box type
	HD1N-3W-BGA-025-A2 (AC200V)		○						Terminal box type
	HD1N-3W-BGA-025-D2 (DC24V)			○					Terminal box type
	HD1N-3W-BGA-025-D2A (DC24V)				○				4-pin connector type (right side pickup/-common)
	HD1N-3W-BGA-025-D2C (DC24V)					○			4-pin connector type (right side pickup/+common)
Pilot check valve	HK3H-W-Y2-025B	○	○	○	○	○			
Reducing valve	HG3H-P-D4-025B						○		Pilot check valve
Blank plate	HMS-CA-HD3-025							○	

* Types not listed above are available. Please consult separately.

Specifications

Motor

Motor capacity	0.75 kW, 4-pole, 3P		
Motor voltage	AC200V	AC200V	AC220V
Frequency	50Hz	60Hz	60Hz
Rated current value	4.2A	3.7A	3.6A
Rating	Short-time (S2) Continuous operation 10 sec or less		
Duty ratio	10% or less		
Legal regulations	Compliant to CE Marking		
Installation environment	Ambient temperature 5 to 35°C RH less than 95%		

* Current value at 7 MPa is approximately 120% of rated current value.

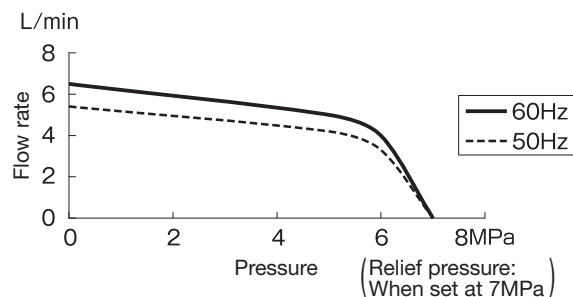
Pump

Max. operating pressure	7 MPa (For higher than 7 MPa, please consult.)
Pump displacement	4cm ³ /rev
A/B port outlet	G3/8 (O-ring seal)
Tank capacity	1.4 L (Effective fluid quantity: 0.3 L)
Recommended hydraulic fluid	R&O, wear-resistant hydraulic fluid, equivalent to ISO VG32
Fluid temperature range (Recommended viscosity)	5 to 60°C (20 to 150mm ² /s)
Fluid cleanliness	Better than NAS1683 Class 12

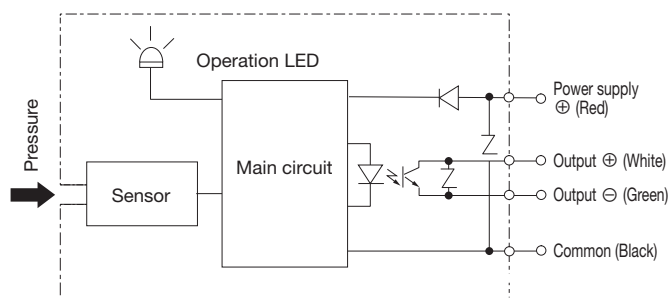
Pressure switch

Drive power supply	DC12-24V±10%
Power consumption	15mA
No. of output points	1
Output method	Open collector output, insulated by photo-coupler
Pressure adjustment range	1 to 7MPa
Hysteresis	1MPa
Switch capacity	DC35V 100mA
Model	PS86-104P-HR2 (Maker: Copal Electronics)

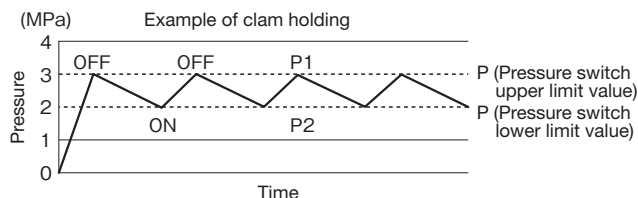
Pressure-flow rate characteristics



Pressure switch circuit



Clamping pressure varies because of the motor ON/OFF control by the pressure switch.



Precautions at starting

Please read the Operating Manual carefully to ensure correct usage.

- Control the fluid in the tank at the center of the oil level gauge when the cylinder is contracted to the end.
- Oil level in the tank drops during test run after piping work since the hydraulic oil flows into the circuit. Test run while supplying the fluid not to drop the oil level.
- Use the phases L1 (R)-U, L2 (S)-V and L3 (T)-W at the power supply side and motor side. Run and stop alternately during test run and confirm that the pressure rises on the pressure gauge provided at the discharge side. If it doesn't, check the direction of rotation of motor.
- Bleed air.
- Always ground the hydraulic power unit. Failure to ground it will cause electric shock or fire. You are recommended to install an earth leakage breaker to prevent electric shock accident and fire with certainty.
- Relief valve pressure is set at 2.0 MPa by the factory shipment.

Cautions on use

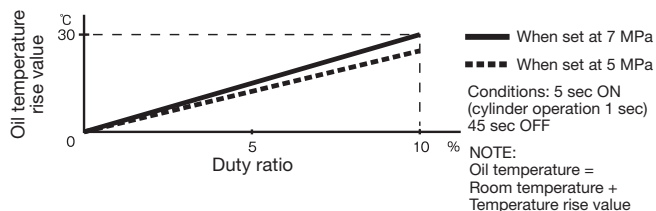
Please read the Operating Manual carefully to ensure correct usage.

- Use general mineral oil base hydraulic fluid equivalent to ISO VG32 within the specified fluid temperature range 5 to 60°C. Fire-resistant fluid cannot be used.
- Use hydraulic devices within the ambient temperature range 5 to 35°C and less than RH 95%.
- Avoid installing at vibrating or oscillating sections. Direction of installation is vertical only.
- Use operation patterns at the duty ratio 10% or less.

$$\text{Duty ratio} = \frac{\text{Operation time}}{\text{Operation time} + \text{Stop time}} \times 100\% \leq 10\%$$

* Duty ratio is the ratio of the operation time relative to the operation time and the stop time.

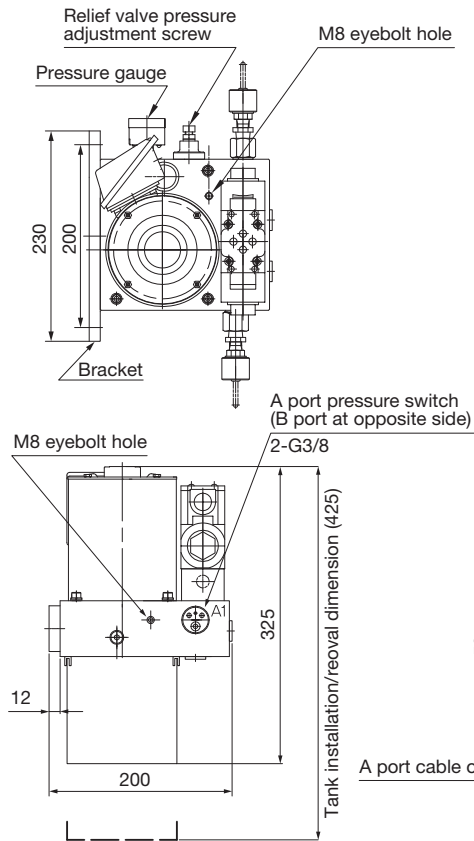
- Use in operating conditions that the oil temperature is no higher than 60°C.



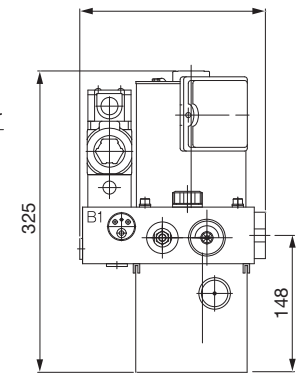
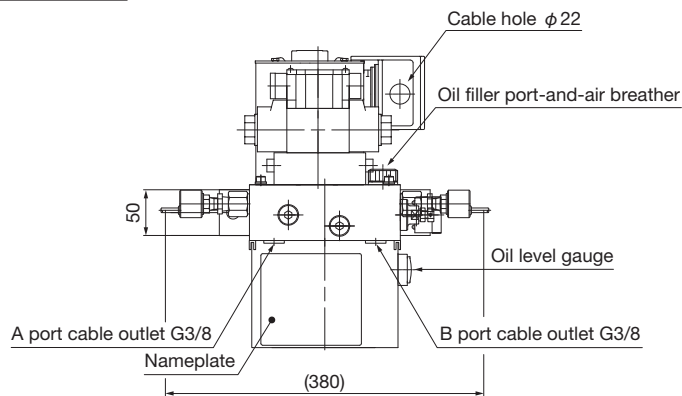
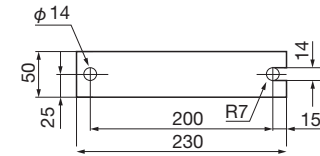
- Motor temperature must be no higher than 80°C. The temperature will rise if the duty ratio becomes 10% or higher.
- When the motor has operated for more than 10 sec, the motor must be stopped by detecting error.
- Since a thermal protector is incorporated in the motor, connect its wires. When the thermal protector trips, the machine must be stopped by detecting error. Since the thermal protector is reset automatically if the temperature drops, an electric circuit must be provided so that operation cannot be restarted unless the error detection is reset.
- You are recommended to use an electromagnetic switch of 1 rank higher. Example: Select an electromagnetic switch of 0.7 kW → 1.5 kW.
- Setting pressure of the pressure switch must be no higher than 7 MPa.
- For pressure setting methods of the pressure switch and the pressure reducing valve, refer to the instruction manual.

Outside dimensions

SP1A (1)

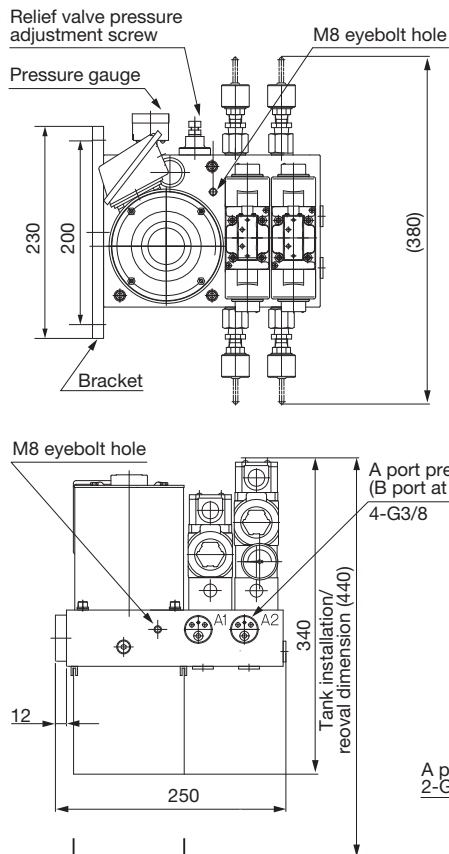


Mounting dimensions (bracket dimension)

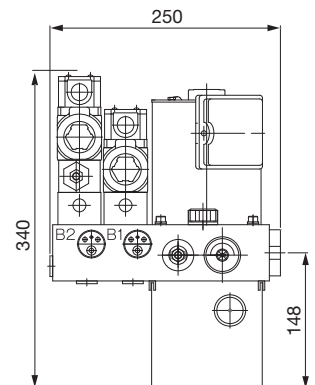
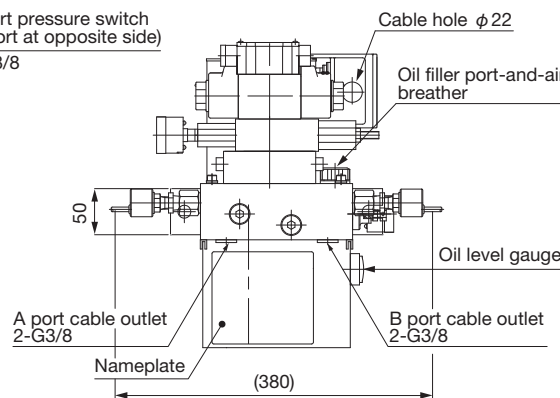
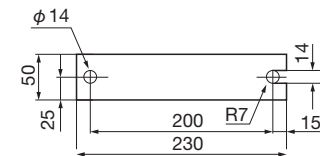


Mass: 18 kg
Conditions: No valve installed
(main unit only)

SP2A (2)



Mounting dimensions (bracket dimension)



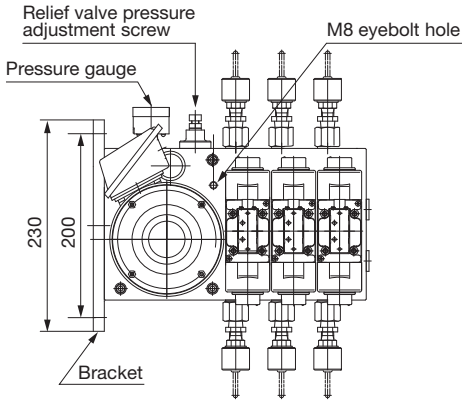
Mass: 19 kg
Conditions: No valve installed
(main unit only)

K

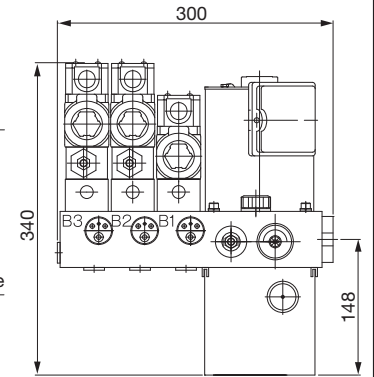
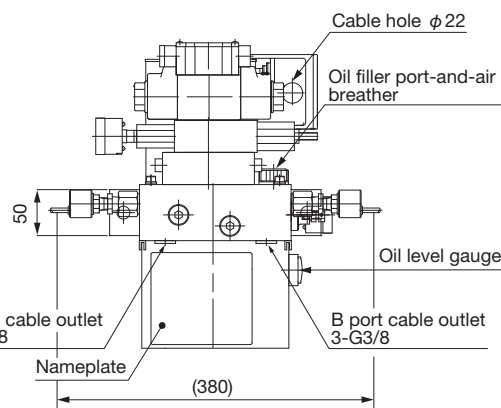
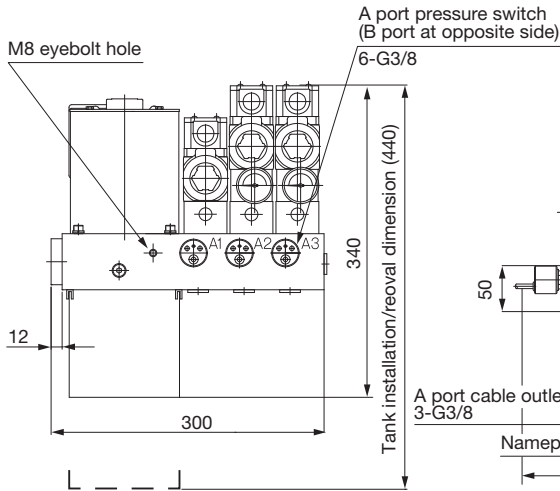
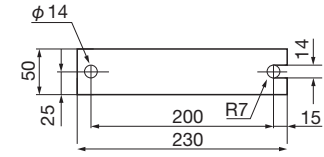
HYDRAULIC POWER UNITS

Outside dimensions

SP3A (3)



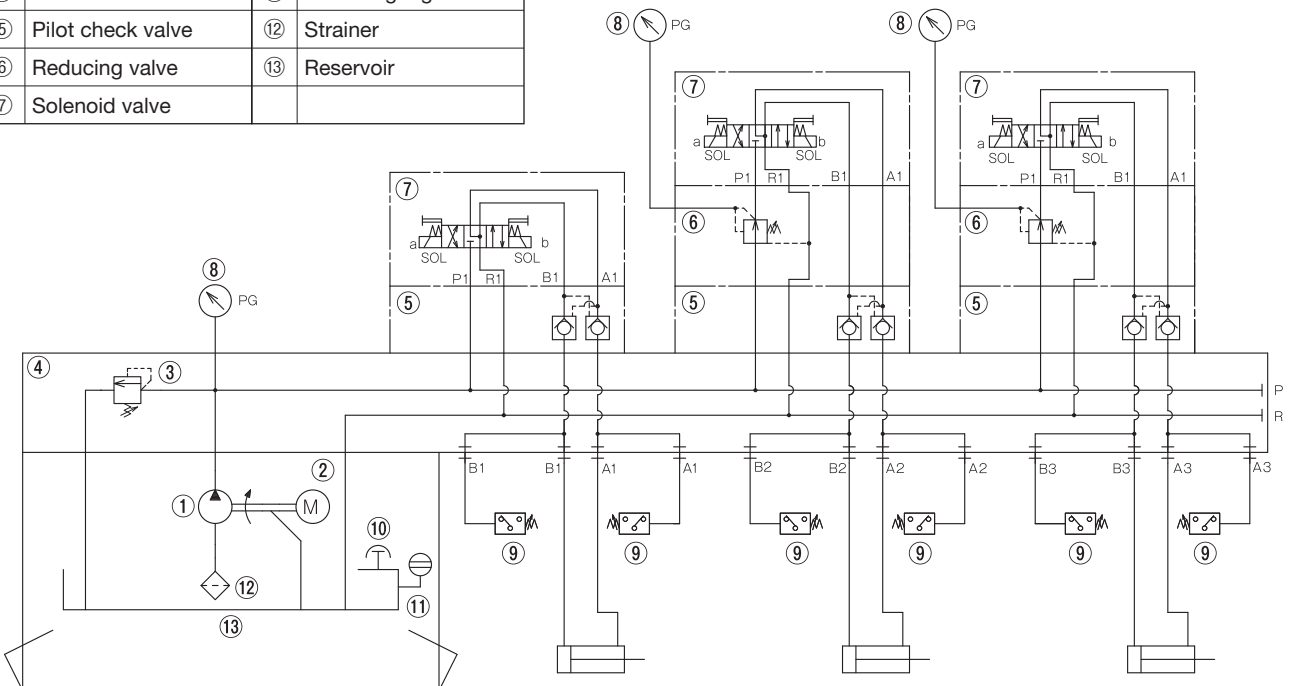
Mounting dimensions (bracket dimension)



Mass: 20 kg
Conditions: No valve installed (main unit only)

Hydraulic circuit (example)

No.	Name	No.	Name
①	Pump	⑧	Pressure gauge
②	Motor	⑨	Pressure switch
③	Relief valve	⑩	Oil filler port-and-air breather
④	Manifold	⑪	Oil level gauge
⑤	Pilot check valve	⑫	Strainer
⑥	Reducing valve	⑬	Reservoir
⑦	Solenoid valve		



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