

# Outline of the functions of electric pumps

Hydraulic Pumps

Type	Hydraulic designation	Attached operating valve	Page indicating the operating valve	Functions
MP-4		SMV-33	—	A single-acting cylinder is operated by a manual three-way valve. The pressure can be maintained at a preset pressure of the pressure switch.
MP-5, MP-6		HOV-33B	—	
MP-4C		SMV-43	—	A double-acting cylinder is operated by a manual four-way valve. The pressure can be maintained at a preset pressure of the pressure switch.
MP-5C, MP-6C, MP-12H MP-12, MP-15H, MP-17H		HOV-43	102	
MP-10		MHV-4B	135	
MP-15, MP-20H		HOV-44	102	
MP-17		BHV-46	148	
MP-20		BHV-48	148	
MP-5SL, MP-6SL MP-10SL, MP-12HSL MP-12SL, MP-15HSL			MSL-4S	
MP-15SL	SOL-R-4		107	
MP-5SW, MP-6SW MP-10SW, MP-12HSW MP-12SW, MP-15HSW		MSW-4H MCH-4	106	Equipped with a four-way three-position spool-type solenoid operated directional valve, the pump operates a double-acting cylinder. The hydraulic oil returns to the oil tank at the center valve position. The pressure can be maintained by the pilot controlled check valve. When a high-capacity cylinder is used, it is recommended to provide a bleeder circuit. The PA type is available on request. (See P. 74 for the contents of the package.)
MP-5SW-PA, MP-6SW-PA MP-10SW-PA, MP-12HSW-PA MP-12SW-PA, MP-15HSW-PA			138	
MP-5SB, MP-6SB MP-10SB, MP-12HSB MP-12SB, MP-15HSB		MSW-4B	106	Equipped with a four-way three-position spool-type solenoid operated directional valve, the pump operates a double-acting cylinder. The hydraulic oil returns to the oil tank at the center valve position. The PA type is available on request. (See P. 74 for the contents of the package.)
MP-5SB-PA, MP-6SB-PA MP-10SB-PA, MP-12HSB-PA MP-12SB-PA, MP-15HSB-PA			107	
MP-15SW, MP-17HSW MP-20HSW		SOW-R-4	107	
MP-15SW-PA		SOW-R-46	108	
MP-17SW			108	
MP-20SW			108	
MP-4D-PA, MP-5D-PA MP-6D-PA			KD-2S	
MP-10D-PA	GSL-24		105	
MP-5TK, MP-6TK, MP-12HTK MP-15HTK, MP-17HTK		TK-3	110	A pump equipped with a block having discharge and return openings. An external direction-control valve needs to be mounted before use.
MP-10TK		TK-10	110	
MP-15TK, MP-20HTK		TK-4	110	
MP-17TK		TK-17	—	
MP-20TK		TK-20	—	

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## ■ Special Package Pump for Single-Acting Cylinder MP-\*D-PA type

A two-way solenoid valve is attached to this pump, in which a push-button operating switch, pressure switch (DPS-100), and others are set, and the pressure can be maintained. Simply connect the power and it is ready to use. **(Please read the operation manual before use.)**

When the push-button operating switch is pressed, the two-way solenoid valve is powered up at the same time as the motor starts to rotate, and the oil is discharged. When the push-button switch is kept pressed during this process, the pressure reaches the point set by the pressure switch in advance, then the motor stops automatically and the pressure is maintained. When the push-button is released, the motor stops and the electricity to the two-way solenoid valve is cut; the pressure of the cylinder is then released and the pump enters the return process.

※MP-4D-PA includes a pressure switch (PCS-700).

- Includes a one-point push-button switch. Please inform us if you need a foot switch.
- Includes a 2.5-m power cable and a 5-m operating switch cord.
- The operating voltage is 200 V. (MP-4D-PA is 100 V.)

## ■ Special Package Pump for Double-Acting Cylinder MP-\*SW-PA type

A four-way three-position solenoid valve (MSW-4H) and a pilot controlled check valve (MCH-4) are attached to this pump, in which a control box, a push-button operating switch, pressure switch (DPS-100), and others are set, and the pressure can be maintained. Simply connect the power and the pump is ready to use. **(Please read the operation manual before use.)**

The motor starts to rotate by turning on the start switch which is located at the electromagnetic switch attached to the pump. The oil is discharged from port A by pressing the upper button of the push-button switch and is discharged from port B by pressing the lower button. The cylinder operates while the push-button switch is kept pressed, and stops when the switch is released. The pressure is maintained even when one push-button switch is released in the pressurized state, because a pilot controlled check valve is attached to this pump. When the other push-button switch is pressed and the pressure reaches a certain level, the pressure maintained until then is released. The pump should be used such that power is not supplied continuously to the solenoid valve of this pump for more than one minute. The switching should not exceed 20 cycles/min.

※MP-15SW-PA cannot maintain the pressure because it does not include a pilot controlled check valve. The attached four-way three-position solenoid valve is the SOW-R-4 type.

- Includes a two-point push-button switch. Please inform us if you need a foot switch.
- Includes a 2.5-m power cable and a 5-m operating switch cord.
- The operating voltage is 200 V.

## ■ Special Package Pump for Double-Acting Cylinder MP-\*SB-PA type

A four-way three-position solenoid valve (MSW-4B) is attached to this pump, in which a control box, a push-button operating switch, pressure switch (DPS-100), and others are set, and the pump should be selected if the pressure does not need to be maintained. Simply connect the power and the pump is ready to use. **(Please read the operation manual before use.)**

The motor starts to rotate by turning on the start switch which is located at the electromagnetic switch attached to the pump. The oil is discharged from port A by pressing the upper button of the push-button switch and is discharged from port B by pressing the lower button. The cylinder operates while the push-button switch is kept pressed, and stops when the switch is released. Note that this pump cannot maintain the pressure. The pump should be used such that the power is not supplied continuously to the solenoid valve of this pump for more than one minute. The frequency of the switching should not exceed 20 cycles/min.

- Includes a two-point push-button switch. Please inform us if you need a foot switch.
- Includes a 2.5-m power cable and a 5-m operating switch cord.
- The operating voltage is 200 V.

## ■ Solenoid Valves

- For the solenoids of the direction-control valve for the SW/SB types (including the PA type), one solenoid must be excited after releasing the excitation of the other. Two solenoids must not be excited simultaneously.
- Power should not be supplied continuously to the solenoids of the direction-control valve for the SL/SW/SB types (including the PA type) for more than one minute. Otherwise, the spool will stick to the solenoids by hydraulic lock, preventing switching.
- The frequency of switching the solenoids of the direction-control valve for the SL/SW/SB types (including the PA type) should not exceed 20 cycles/min. (One cycle means to turn ON/OFF the solenoids on the left/right sides respectively.)
- See P. 202 for the characteristics of the solenoid valves.