

## Handling

### ● Hydraulic oil

- Use a petroleum-based hydraulic fluid equivalent to ISO VG32 to 68.
- Operate the unit in an environment where both the following conditions are satisfied: viscosity range from 15 to 400 mm<sup>2</sup>/s {cSt} and oil temperature from -15 to 70°C.
- Contamination of the hydraulic fluid causes valve trouble and reduces the service life, so pay due attention to controlling contamination and ensure that it goes no higher than NAS contamination class 12.

### ● Ambient temperature, relative humidity

- Use the product under the following conditions. Ambient temperature: -15 to 50°C, Relative humidity: 0 to 95%

### ● Fluid temperature and ambient temperature

- When there is a large difference between the fluid and ambient temperature, take care about thermal shocks while using the products. The recommended ambient temperatures for solenoid valves are the guide for the temperature limits of electrical parts and thermal shocks are not taken into consideration.

### ● Filters

- Use a line filter with a filtration accuracy of 25 μm or better.

### ● Installation and maintenance

- No restriction applies to the installation direction. However, install the solenoid valves and solenoid pilot operated directional control valves of the no-spring type such that the spool shaft is leveled.
- Finish the face on which the valve is mounted to a surface roughness of 1.6a or better and a flatness tolerance within 0.01 mm.
- Use an O-ring with a hardness of Hs90 for the valve's gasket unless otherwise specified.
- Dip the end of the pipe connected to the valves into oil in the tank.

### ● Tank port piping

- Connect piping to the tank port such that the tank port is always filled with the fluid.
- Ensure that no surge pressures beyond the permissible back pressure are applied to the tank port.

### ● Continuous pressurization

- Avoid holding the solenoid valves and solenoid pilot operated directional control valves at the switching position over a prolonged period under high pressure. Otherwise, hydraulic locking may occur, causing operation failure.

### ● Maximum flow rate

- The maximum flow rate refers to the largest possible flow rate at each pressure at which the valve can function properly, or the largest flow rate possible with the pressure drop ignored.

### ● Energize the solenoids

- With solenoid valves or solenoid pilot operated directional control valves, be sure to energize each solenoid after demagnetizing the other. Never energize both solenoids at the same time.

### ● No-spring type (without detent)

- Energize the solenoid continuously to prevent reverse rotation of the spool.

### ● No-spring type (with detent)

- Momentary energizing (0.1 seconds minimum) is sufficient. However, continuous energizing will be necessary if reverse rotation of the spool is required without fail.
- When continuous energizing is off, the tank line piping connected to the valve should be isolated. If the tank line is connected to a common line instead of having an isolated line, the spool may switch unexpectedly due to surge pressures generated by switching of other directional control valves. This phenomenon is likely to occur especially when using the valve in a non-energized state.