

Water-Glycol Type Operating Fluid Hydraulic Devices

Water-Glycol Type Operating Fluid Hydraulic Pump Specifications

Use the following tables to select the appropriate type of pump when using a water-glycol type hydraulic operating fluid.

1. PVS, PZS Series Variable Piston Pump

W/G Pump Type	Rated Voltage MPa{kgf/cm ² }	Maximum Working Pressure MPa{kgf/cm ² }	Maximum Revolution Speed min ⁻¹	Suction Pressure MPa{kgf/cm ² }
W-PVS-0B - 8N*-30	14 {143}	14 {143}	1200	-0.01{-0.1} or larger
W-PVS-1B - 16N*-12 - 22N*-	14 {143} 10.5{107}	14 {143} 10.5{107}	1200	-0.01{-0.1} or larger
W-PVS-2B - 35N*-12 - 45N*-	14 {143} 10.5{107}	14 {143} 10.5{107}	1200	-0.01{-0.1} or larger
W-PZS-3B - 70N*-10	14 {143}	14 {143}	1200	-0.01{-0.1} or larger
W-PZS-4B -100N*-10	14 {143}	14 {143}	1200	-0.01{-0.1} or larger
W-PZS-5B -130N*-10	14 {143}	14 {143}	1200	-0.01{-0.1} or larger

Note 1) Keep oil temperature between 10 and 50°C when operating.

Note 2) We recommend periodic maintenance of the PVS, PZS Series Variable Piston Pump.

Water- or glycol-based hydraulic operating fluids lack in lubricity compared to general mineral oils, which makes the life of the pump (the life of the rolling-element bearing) short.

2. VDR22 Design Series Variable Vane Pump

W/G Pump Type	Rated Voltage MPa{kgf/cm ² }	Maximum Working Pressure MPa{kgf/cm ² }	Maximum Revolution Speed min ⁻¹	Suction Pressure MPa{kgf/cm ² }
W-VDR-1*-1A2-22 -1A3- -2A2- -2A3-	3.5{35.7} 7 {71.4} 3.5{35.7} 5 {51 }	3.5{35.7} 7 {71.4} 3.5{35.7} 5 {51 }	1800	-0.015 to +0.03 {-0.15 to +0.3}

Note) Keep oil temperature between 15 and 55°C when operating.

3. VDC Series Variable Vane Pump

W/G Pump Type	Rated Voltage MPa{kgf/cm ² }	Maximum Working Pressure MPa{kgf/cm ² }	Maximum Revolution Speed min ⁻¹	Suction Pressure MPa{kgf/cm ² }
W-VDC-1*-1A2-20 -1A3- -2A2- -2A3-	3.5{35.7} 7 {71.4} 3.5{35.7} 5 {51 }	3.5{35.7} 7 {71.4} 3.5{35.7} 5 {51 }	1800	-0.015 to +0.03 {-0.15 to +0.3}
W-VDC-2*-1A2-20 -1A3- -2A2- -2A3-	3.5{35.7} 7 {71.4} 3.5{35.7} 5 {51 }	3.5{35.7} 7 {71.4} 3.5{35.7} 5 {51 }	1800	-0.015 to +0.03 {-0.15 to +0.3}
W-VDC-3*-1A2-20 -1A3-	3.5{35.7} 7 {71.4}	3.5{35.7} 7 {71.4}	1800	-0.015 to +0.03 {-0.15 to +0.3}

Note) Keep oil temperature between 15 and 55°C when operating.

4. IPH Series IP Pump

W/G Pump Type	Rated Voltage MPa{kgf/cm ² }	Maximum Working Pressure MPa{kgf/cm ² }	Maximum Revolution Speed min ⁻¹	Suction Pressure MPa{kgf/cm ² }
W-IPH-2*-*-11	21{214}	25 {255}	1200	-0.015 to +0.03{-0.15 to +0.3}
W-IPH-3*-*-20	21{214}	25 {255}	1200	-0.015 to +0.03{-0.15 to +0.3}
W-IPH-4*-*-20	21{214}	25 {255}	1200	-0.015 to +0.03{-0.15 to +0.3}
W-IPH-5*-*-21(11)	21{214}	25 {255}	1200	-0.015 to +0.03{-0.15 to +0.3}
W-IPH-6*-*-21(11)	21{214}	25 {255}	1200	-0.015 to +0.03{-0.15 to +0.3}

Note) • Use the air bleed off valve to bleed air during test running.

CAB-T02-*-11 maximum operating pressure 25MPa (255kgf/cm²)

• Keep oil temperature between 15 and 55°C when operating.

Water-Glycol Type Operating Fluid Hydraulic Valve Specifications

Use the following tables to select the appropriate type of hydraulic valves when using a water-glycol type hydraulic operating fluid.

1. Pressure Control Valves

Name	W/G Valve Type	Specifications	
		Maximum Working Pressure	Maximum Flow Rate
Relief valve	R-⊙03-* ⁻ 12 R-⊙06-* ⁻ 20 R-⊙10-* ⁻ 20	21MPa{214kgf/cm ² }	(Note) 30(20)ℓ/min 150 340
Relief valve	RI-G03-* ⁻ 20 RI-G06-* ⁻ 20	21MPa{214kgf/cm ² }	(Note) 120(30)ℓ/min 260
Remote Control Relief Valve	RCD-T02-* ⁻ 11 RC-T02-* ⁻ 12 RC-G02-* ⁻ 21	21MPa{214kgf/cm ² }	15ℓ/min 2 2
Solenoid Controlled Relief Valve	RSA-⊙03-*** ⁻ 15 RSA-⊙06-*** ⁻ 23 RSA-⊙00-*** ⁻ 23 RSS-⊙03-*** ⁻ 15 RSS-⊙06-*** ⁻ 23 RSS-⊙10-*** ⁻ 23	21MPa{214kgf/cm ² }	30ℓ/min 150 340 30 150 340
Solenoid Controlled Relief Valve	RIS-G03-*** ⁻ 21 RIS-G06-*** ⁻ 21	21MPa{214kgf/cm ² }	120ℓ/min 260
Pressure Reducing (and Check) Valve	W-(C)G-⊙03-* ⁻ 21 W-(C)G-⊙06-* ⁻ 21 W-(C)G-⊙10-* ⁻ 21	21MPa{214kgf/cm ² }	(Note) 40(20)ℓ/min 100 250
Balancing Valve	GR-G01-A* ⁻ 20 GR-G03-A*(B)-20	14MPa{143kgf/cm ² }	20ℓ/min 40
Pressure Control (and Check) Valve	(C)Q-⊙03-*** ⁻ 21 (C)Q-⊙06-*** ⁻ 21 (C)Q-⊙10-*** ⁻ 21	21MPa{214kgf/cm ² }	40ℓ/min 100 250

Note) Flow rate values in parentheses are for when the pressure adjusting range field indicated by the asterisk (*) is A, B, or C.

2. Direction Control Valves

Name	W/G Valve Type	Specifications	
		Maximum Working Pressure	Maximum Flow Rate
Right Angle Check Valve	CA-⊙03-* ⁻ 20 CA-⊙06-* ⁻ 20 CA-⊙10-* ⁻ 20	21MPa{214kgf/cm ² }	40ℓ/min 110 320
In-line Check Valve	CN-T03-* ⁻ 11 CN-T06-* ⁻ 11 CN-T10-* ⁻ 11	21MPa{214kgf/cm ² }	30ℓ/min 75 190
Pilot Check Valve	CP-⊙03-* ⁻ 20 CP-⊙06-* ⁻ 20 CP-⊙10-* ⁻ 20	21MPa{214kgf/cm ² }	40ℓ/min 110 320
DMA Type Manual Valve	W-DMA-G01-*** ⁻ 20 W-DMA-G03-*** ⁻ 20	21MPa{214kgf/cm ² }	35ℓ/min 65
SA Wet Type Solenoid Valve	SA-G01-*** ⁻ 31 SA-G03-*** ⁻ (J)21 DSA-G04-*** ⁻ 22 DSA-G06-*** ⁻ 22	28MPa{286kgf/cm ² }	Note1) 85ℓ/min 250 500
SS Wet Type Solenoid Valve	SS-G01-*** ⁻ 31 SS-G03-*** ⁻ (J)22 DSS-G04-*** ⁻ 22 DSS-G06-*** ⁻ 22	28MPa{286kgf/cm ² }	Note1) 85ℓ/min 110 250 500
	SS-G01-*** ⁻ FR-*** ⁻ 31 SS-G03-*** ⁻ FR-*** ⁻ (J)22	21MPa{214kgf/cm ² }	Note1) 45ℓ/min 65
Fine Solenoid Valve	W-SF-G01-*** ⁻ 10	14MPa{143kgf/cm ² }	Note1) 34ℓ/min
Non-leak Type Solenoid Valve	SNH-G01-*** ⁻ 11 SNH-G03-*** ⁻ 10 SNH-G04-*** ⁻ 10 SNH-G06-*** ⁻ 10	31.5MPa{321kgf/cm ² }	Note1) 17ℓ/min 34 50 85
Gauge cock	K2-⊙02-10	21MPa{214kgf/cm ² }	—
	K2-⊙03/04-10	35MPa{357kgf/cm ² }	—

Note) 1. Maximum flow rate depends on the flow path. Use a maximum flow rate that is within 85% of the standard valve.
2. Wet type solenoid valves other than those noted above cannot be used with W/G.

3. Flow Control Valves

Name	W/G Valve Type	Specifications	
		Maximum Working Pressure	Maximum Flow Rate
Throttle (and Check) Valve	(C)FR-03-10 (C)FR-06-10 (C)FR-10-10	21MPa{214kgf/cm ² }	30ℓ/min 75 190
FT Type Flow Control (and Check) Valve	(C)FT-G02-**-22 FT-G03-**-22	21MPa{214kgf/cm ² }	(Note)
F Type Flow Control (and Check) Valve	(C)F-G06-170-20 (C)F-G10-373-20	21MPa{214kgf/cm ² }	
TN Type Flow Control (and Check) Valve	(C)TN-G02-2-11 (C)TN-G02-8-11	10.5MPa{107kgf/cm ² }	
TS Type Flow Control (and Check) Valve	(C)TS-G01-2-11	10.5MPa{107kgf/cm ² }	
TL (TLT) Type Feed Control Valve	W-TL-G03-*-11 W-TL-G04-*-11 W-TLT-G04-*-11	7MPa{71kgf/cm ² }	

Note) Due to the hydraulic fluid gravity differential, maximum flow rate is about 15% less than standard.

4. Modular Valve

Name	W/G Valve Type	Specifications	
		Maximum Working Pressure	Maximum Flow Rate
Modular Type Relief Valve	OR-G01-**-20(21) OR-G03-**(J)50	21MPa{214kgf/cm ² }	30ℓ/min 65
Brake Modulator Valve	ORO-G01-**-20 ORO-G03-**(J)50	21MPa{214kgf/cm ² }	20ℓ/min 30
Direct Relief Modular Valve	ORD-G01-**-20 ORD-G03-*(J)50	21MPa{214kgf/cm ² }	20ℓ/min 30
Pressure Reducing Modular Valve	OG-G01-P*-21 OGB-G01-P*-20 W-OG-G03-P*(J)51 W-OG-G03-PC-(J)51	21MPa{214kgf/cm ² }	30ℓ/min 30 65 45
	OGS-G01-P*C-22	21MPa{214kgf/cm ² }	30ℓ/min
Pressure Reducing (and Check) Modular Valve	OG-G01-**-21 OGB-G01-**-20 W-OG-G03-**(J)51 OG-G03-*C-(J)51	21MPa{214kgf/cm ² }	30ℓ/min 30 65 45
Sequence Modular Valve	OQ-G01-P2-20 OQ-G03-P2*(J)50	21MPa{214kgf/cm ² }	30ℓ/min 65
Counter Balance Modular Valve	OCQ-G01-*1*-20 OCQ-G03-*1*(J)50	21MPa{214kgf/cm ² }	30ℓ/min 65
Flow Regulator Modular Valve	OY-G01-*-20 OCY-G01-P-20 OCY-G03-P-(J)50 OCY-G01-*-X/Y-20 OCY-G03-*-X/Y-(J)51	21MPa{214kgf/cm ² }	30ℓ/min 30 85 30 85
Flow Control Modular Valve	OF-G01-P20-20 OF-G03-P60-J50 OCF-G01-*40-X/Y-30 OCF-G03-*60-X/Y-(J)50	21MPa{214kgf/cm ² }	(Note)
Check Modular Valve	OC-G01-**-20(21) OC-G03-**(J)50	21MPa{214kgf/cm ² }	30ℓ/min 85
Vacuum Check Modular Valve	OCV-G01-W-20 OCV-G03-W-(J)-50	21MPa{214kgf/cm ² }	30ℓ/min 65
Pilot Operated Check Modular Valve	OCP-G01-**(F)-21 OCP-G03-**(J)50	21MPa{214kgf/cm ² }	30ℓ/min 85
04 Series Relief Modular Valve	ORH-G04-P*-10	31.5MPa{321kgf/cm ² }	250ℓ/min
04 Series Direct Relief Modular Valve	ORH-G04-D*-10	31.5MPa{321kgf/cm ² }	40ℓ/min
04 Series Reducing Modular Valve	OGH-G04-**-10	31.5MPa{321kgf/cm ² }	250ℓ/min
04 Series Counter Balance Modular Valve	OQH-G04-**-10	31.5MPa{321kgf/cm ² }	250ℓ/min
04 Series Flow Regulator Modular Valve	OYH-G04-**-10	31.5MPa{321kgf/cm ² }	250ℓ/min
04 Series Flow Control Modular Valve	OFH-G04-*200-X/Y-10	31.5MPa{321kgf/cm ² }	(Note)
04 Series Check Modular Valve	OCH-G04-**-10	31.5MPa{321kgf/cm ² }	250ℓ/min
04 Series Vacuum Check Modular Valve	OVH-G04-W-10	31.5MPa{321kgf/cm ² }	250ℓ/min
04 Series Pilot Check Modular Valve	OPH-G04-**-10	31.5MPa{321kgf/cm ² }	250ℓ/min

Note) Due to the hydraulic fluid gravity differential, maximum flow rate is about 15% less than standard.

5. Electro-hydraulic Control Valves

Name	W/G Valve Type	Specifications	
		Maximum Working Pressure	Maximum Flow Rate
Pilot Relief Valve	EPR-G01-* -12	28MPa{286kgf/cm ² }	1ℓ/min
Relief Valve	ER-G03-* -21 ER-G06-* -21	25MPa{255kgf/cm ² }	120ℓ/min 260
Relief and Reducing Valve	W-EGB-G03-* -11 W-EGB-G06-* -11	25MPa{255kgf/cm ² }	40ℓ/min 80
Flow Control Valve	(C)ES-G02-* -(F)-12 ES-G03-* -(F)-12 (C)ES-G06-250-11 ES-G10-500-(F)-11	21MPa{214kgf/cm ² }	(Note)
Load Sensing Flow Control Valve	ESR-G03-125-12 ESR-G03-125R*-12 ESR-G06-250-12 ESR-G06-250R*-12 ESR-G10-500-11 ESR-G10-500R*-11	25MPa{255kgf/cm ² }	(Note)
Flow Direction Control Valve	ESD-G01-***-12 ESD-G03-***-12 ESD-G04-***-12 ESD-G06-***-13	25MPa{255kgf/cm ² }	(Note)
Modular type reducing valve	EOG-G01-P*-11	25MPa{255kgf/cm ² }	25ℓ/min
Modular Type Flow Control Valve	EOF-G01-*25-11	21MPa{214kgf/cm ² }	(Note)

Note) 1. Due to the hydraulic fluid gravity differential, maximum flow rate is about 15% less than standard.

2. The ESH series high-speed response proportional valve does not support water or glycol-based hydraulic operating fluid.