### PERFORMANCE SPECIFICATION

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mounting Pattern</td>
<td>ISO 03 / NFPA D03 / Cetop 03/NG 06</td>
</tr>
<tr>
<td>Maximum Operating Pressure</td>
<td>315 kgf/cm² (4500 PSI)</td>
</tr>
<tr>
<td>Maximum Tank Line Back Pressure</td>
<td>160 kgf/cm² (2300 PSI)</td>
</tr>
<tr>
<td>Current</td>
<td>2.6A (DC 12V)</td>
</tr>
<tr>
<td></td>
<td>1.3A (DC 24V)</td>
</tr>
<tr>
<td>Power Consumption</td>
<td>28.8 Watts</td>
</tr>
<tr>
<td>Insulation</td>
<td>Class H</td>
</tr>
<tr>
<td>Surge Protection</td>
<td>(Option) Built-in Diode, Surge Voltage &lt; 1 voltage</td>
</tr>
<tr>
<td>Fluid Viscosity</td>
<td>10~1000 Cst</td>
</tr>
<tr>
<td>Permissible Contamination Level</td>
<td>With NAS 1638 Class 12 (ISO 21/18)</td>
</tr>
<tr>
<td>Operation Fluid and Temperature</td>
<td>JIS D1601 Type-3 Class-D Stage-7</td>
</tr>
<tr>
<td></td>
<td>@ 0.4mm (0.016 inch) displacement @ 6.8G @ 66.7 Hz *3 Directions</td>
</tr>
<tr>
<td>Vibration Tolerance</td>
<td>JIS 0203 S2 &amp; JIS D 0203 D2 (equivalent to IP67)</td>
</tr>
<tr>
<td></td>
<td>To immerse in 30°C (86°F) water @ 100mm (3.94 inch) in 10 minutes</td>
</tr>
<tr>
<td>Waterproof Tolerance</td>
<td></td>
</tr>
<tr>
<td>Maximum Frequency of Operation</td>
<td>250 cycles/minute</td>
</tr>
<tr>
<td>Response Time</td>
<td>≤ 50 msec on</td>
</tr>
<tr>
<td></td>
<td>≤ 100 msec off</td>
</tr>
<tr>
<td>Corrosion Resistance Treatment</td>
<td>Zinc Phosphate Compound</td>
</tr>
<tr>
<td>Weight</td>
<td>Single Solenoid approx. 1.5kg (3.3Lbs.)</td>
</tr>
<tr>
<td></td>
<td>Double Solenoid approx. 2.0kg (4.4Lbs.)</td>
</tr>
</tbody>
</table>

### HOW TO ORDER

**SWH - G02 - C2 - D24 - 31 - LS**

- **LS:** Low Surge Voltage (Diode Std.)
- **WIRING:**
  - 31: LEAD WIRE (18” Lead Wire)
  - 41: DUAL SPADES TYPE
- **COIL VOLTAGE:**
  - D24: DC24V
  - D12: DC12V
- **SPOOL TYPE** (See page 2)
- **NOMINAL SIZE:** 1/4”
- **SUBPLATE MOUNTED**
- **HIGH PRESSURE HIGH FLOW SOLENOID OPERATED DIRECTIONAL VALVE**
### SPOOL TYPE

<table>
<thead>
<tr>
<th>TYPE</th>
<th>GRAPHIC SYMBOLS</th>
<th>APPLICATION TYPE</th>
<th>GRAPHIC SYMBOLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>C2</td>
<td>![C2 Symbol]</td>
<td>TWO POSITION</td>
<td>![N2 Symbol]</td>
</tr>
<tr>
<td>C3</td>
<td>![C3 Symbol]</td>
<td>WITHOUT SPRING</td>
<td>![N3 Symbol]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CENTERING</td>
<td></td>
</tr>
<tr>
<td>C4</td>
<td>![C4 Symbol]</td>
<td>TWO POSITION</td>
<td>![D2 Symbol]</td>
</tr>
<tr>
<td>C40</td>
<td>![C40 Symbol]</td>
<td>DETENT</td>
<td>![D3 Symbol]</td>
</tr>
<tr>
<td>C5</td>
<td>![C5 Symbol]</td>
<td>TWO POSITION</td>
<td>![B2 Symbol]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SPRING</td>
<td>![B3 Symbol]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFFSET</td>
<td>![B20 Symbol]</td>
</tr>
<tr>
<td>C6</td>
<td>![C6 Symbol]</td>
<td>TWO POSITION</td>
<td>![B2S Symbol]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DETENT</td>
<td>![B3S Symbol]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>WITHOUT CENTERING</td>
<td>![B20S Symbol]</td>
</tr>
<tr>
<td>C60</td>
<td>![C60 Symbol]</td>
<td>THREE POSITION</td>
<td>![B20S Symbol]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SPRING CENTERED</td>
<td></td>
</tr>
<tr>
<td>C7</td>
<td>![C7 Symbol]</td>
<td>TWO POSITION</td>
<td>![C2BS Symbol]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SPRING</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CENTERED</td>
<td></td>
</tr>
<tr>
<td>C8</td>
<td>![C8 Symbol]</td>
<td>TWO POSITION</td>
<td>![C3BS Symbol]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SPRING</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CENTERED</td>
<td></td>
</tr>
<tr>
<td>C9</td>
<td>![C9 Symbol]</td>
<td>TWO POSITION</td>
<td>![C4BS Symbol]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SPRING</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CENTERED</td>
<td></td>
</tr>
<tr>
<td>C9B</td>
<td>![C9B Symbol]</td>
<td>THREE POSITION</td>
<td>![C5BS Symbol]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SPRING CENTERED</td>
<td></td>
</tr>
<tr>
<td>C5SB</td>
<td>![C5SB Symbol]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C6SB</td>
<td>![C6SB Symbol]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C60B</td>
<td>![C60B Symbol]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C7B</td>
<td>![C7B Symbol]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C8B</td>
<td>![C8B Symbol]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C9B</td>
<td>![C9B Symbol]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C5SB</td>
<td>![C5SB Symbol]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C6SB</td>
<td>![C6SB Symbol]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C60B</td>
<td>![C60B Symbol]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C7B</td>
<td>![C7B Symbol]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C8B</td>
<td>![C8B Symbol]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C9B</td>
<td>![C9B Symbol]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PORT INTERCONNECTION:**
- WITH SOLENOID "A" ENERGIZED P → A  B → T
- WITH SOLENOID "B" ENERGIZED P → B  A → T
- BUT PORT INTERCONNECTIONS ARE REVERSED FOR C5, C6, C60 TYPE.
PRESSURE DROP AND PERFORMANCE CURVES

TEST SYSTEMS
1. Testing Valve
2. Pump
3. Pressure Sensor
4. Flow Sensor
5. Relief Valve
6. Throttle Valve

TEST CONDITIONS
Pressure: 70 kgf/cm² (1000 PSI)
Flow Rate: 63 LPM (16.8 GPM)
Viscosity: 35 CST

PERFORMANCE CURVES

CONTRAST CHART BETWEEN FACTORS AND VISCOSITIES

The pressure drop (\(\Delta P'\)) can be obtained from the formula \(\Delta P' = \Delta p(G' / 0.85)\) for other specific gravity (\(G'\)).
## LIST OF SPOOL FUNCTIONS

### THE MAXIMUM FLOW RATE LPM(GPM) UNDER DIFFERENT PRESSURE kgf/cm² (PSI)

<table>
<thead>
<tr>
<th>SPOOL TYPE</th>
<th>NORMAL POSITION</th>
<th>50kgf/cm² (735 PSI)</th>
<th>100 kgf/cm² (1470 PSI)</th>
<th>150 kgf/cm² (2200 PSI)</th>
<th>210 kgf/cm² (3000 PSI)</th>
<th>250 kgf/cm² (3675 PSI)</th>
<th>315 kgf/cm² (4500 PSI)</th>
<th>50 kgf/cm² (735 PSI)</th>
<th>100 kgf/cm² (1470 PSI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>P→A, B→T</td>
<td>P→B, A→T</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C2</td>
<td></td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>–</td>
<td>40(10.7)</td>
<td>40(10.7)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>32 (8.5)</td>
<td>25 (6.7)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>32 (8.5)</td>
<td>25 (6.7)</td>
</tr>
<tr>
<td>C3</td>
<td></td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td></td>
</tr>
<tr>
<td>C4</td>
<td></td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td></td>
</tr>
<tr>
<td>C40</td>
<td></td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
</tr>
<tr>
<td>C5</td>
<td></td>
<td>50(13.3)</td>
<td>50(13.3)</td>
<td>50(13.3)</td>
<td>50(13.3)</td>
<td>50(13.3)</td>
<td>–</td>
<td>50 (13.3)</td>
<td>50 (13.3)</td>
</tr>
<tr>
<td>C6</td>
<td></td>
<td>40(10.7)</td>
<td>40(10.7)</td>
<td>40(10.7)</td>
<td>40(10.7)</td>
<td>40(10.7)</td>
<td>–</td>
<td>40 (10.7)</td>
<td>40 (10.7)</td>
</tr>
<tr>
<td>C7</td>
<td></td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>40 (10.7)</td>
<td>40 (10.7)</td>
</tr>
<tr>
<td>C8</td>
<td></td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>32 (8.5)</td>
<td>25 (6.7)</td>
</tr>
<tr>
<td>C9</td>
<td></td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>40 (10.7)</td>
<td>40 (10.7)</td>
</tr>
<tr>
<td>B2</td>
<td></td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>20 (5.3)</td>
<td>20 (5.3)</td>
</tr>
<tr>
<td>B3</td>
<td></td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>32 (8.5)</td>
<td>32 (8.5)</td>
</tr>
<tr>
<td>B20</td>
<td></td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>35 (9.3)</td>
<td>32 (8.5)</td>
</tr>
<tr>
<td>D2</td>
<td></td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>30 (8)</td>
</tr>
<tr>
<td>D3</td>
<td></td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>63(16.8)</td>
<td>30 (8)</td>
</tr>
</tbody>
</table>

**NOTE:**
1. The figures in the square shows the parameter among voltage & flow under saturated temperature and 90 % applied voltage.
| P → B | | |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 150 kgf/cm² | 210 kgf/cm² | 250 kgf/cm² | 315 kgf/cm² | 50 kgf/cm² | 100 kgf/cm² | 150 kgf/cm² | 210 kgf/cm² | 250 kgf/cm² | 315 kgf/cm² |
| (2200 psi) | (3000 psi) | (3675 psi) | (4500 psi) | (735 psi) | (1470 psi) | (2200 psi) | (3000 psi) | (3675 psi) | (4500 psi) |
| 18 (4.8) | 14 (3.7) | 10 (2.7) | 10 (2.7) | 40 (10.7) | 40 (10.7) | 18 (4.8) | 14 (3.7) | 10 (2.7) | 10 (2.7) |
| 12 (3.2) | 9 (2.4) | 7 (1.9) | 7 (1.9) | 32 (8.5) | 25 (6.7) | 12 (3.2) | 9 (2.4) | 7 (1.9) | 7 (1.9) |
| 63 (16.8) | 63 (16.8) | 63 (16.8) | 63 (16.8) | 63 (16.8) | 63 (16.8) | 63 (16.8) | 63 (16.8) | 63 (16.8) | 63 (16.8) |
| 18 (4.8) | 14 (3.7) | 10 (2.7) | 10 (2.7) | 40 (10.7) | 40 (10.7) | 18 (4.8) | 14 (3.7) | 10 (2.7) | 10 (2.7) |
| 12 (3.2) | 9 (2.4) | 7 (1.9) | 7 (1.9) | 32 (8.5) | 25 (6.7) | 12 (3.2) | 9 (2.4) | 7 (1.9) | 7 (1.9) |
| 18 (4.8) | 14 (3.7) | 10 (2.7) | 10 (2.7) | 40 (10.7) | 40 (10.7) | 18 (4.8) | 14 (3.7) | 10 (2.7) | 10 (2.7) |
| 12 (3.2) | 9 (2.4) | 7 (1.9) | 7 (1.9) | 32 (8.5) | 25 (6.7) | 12 (3.2) | 9 (2.4) | 7 (1.9) | 7 (1.9) |
| 50 (13.3) | 50 (13.3) | 50 (13.3) | 50 (13.3) | 50 (13.3) | 50 (13.3) | 50 (13.3) | 50 (13.3) | 50 (13.3) | 50 (13.3) |
| 40 (10.7) | 40 (10.7) | 40 (10.7) | 40 (10.7) | 40 (10.7) | 40 (10.7) | 40 (10.7) | 40 (10.7) | 40 (10.7) | 40 (10.7) |
| 18 (4.8) | 14 (3.7) | 10 (2.7) | 10 (2.7) | 40 (10.7) | 40 (10.7) | 18 (4.8) | 14 (3.7) | 10 (2.7) | 10 (2.7) |
| 12 (3.2) | 9 (2.4) | 7 (1.9) | 7 (1.9) | 32 (8.5) | 25 (6.7) | 12 (3.2) | 9 (2.4) | 7 (1.9) | 7 (1.9) |
| 18 (4.8) | 14 (3.7) | 10 (2.7) | 10 (2.7) | 40 (10.7) | 40 (10.7) | 18 (4.8) | 14 (3.7) | 10 (2.7) | 10 (2.7) |
| 12 (3.2) | 9 (2.4) | 7 (1.9) | 7 (1.9) | 32 (8.5) | 25 (6.7) | 12 (3.2) | 9 (2.4) | 7 (1.9) | 7 (1.9) |
| 18 (4.8) | 14 (3.7) | 10 (2.7) | 10 (2.7) | 40 (10.7) | 40 (10.7) | 18 (4.8) | 14 (3.7) | 10 (2.7) | 10 (2.7) |
| 12 (3.2) | 9 (2.4) | 7 (1.9) | 7 (1.9) | 32 (8.5) | 25 (6.7) | 12 (3.2) | 9 (2.4) | 7 (1.9) | 7 (1.9) |
| 20 (5.3) | 20 (5.3) | 20 (5.3) | 20 (5.3) | 63 (16.8) | 63 (16.8) | 63 (16.8) | 63 (16.8) | 63 (16.8) | 63 (16.8) |
| 63 (16.8) | 63 (16.8) | 63 (16.8) | 63 (16.8) | 63 (16.8) | 63 (16.8) | 63 (16.8) | 63 (16.8) | 63 (16.8) | 63 (16.8) |
| 25 (6.7) | 20 (5.3) | 18 (4.8) | 15 (4) | 63 (16.8) | 50 (13.3) | 45 (12) | 40 (10.7) | 30 (8) | 25 (6.7) |
| 25 (6.7) | 21 (5.6) | 16 (4.3) | 13 (3.5) | 40 (10.7) | 30 (8) | 25 (6.7) | 21 (5.6) | 16 (4.3) | 13 (3.5) |
| 25 (6.7) | 21 (5.6) | 16 (4.3) | 13 (3.5) | 40 (10.7) | 30 (8) | 25 (6.7) | 21 (5.6) | 16 (4.3) | 13 (3.5) |
**INSTALLATION DIMENSIONS**

SWH-G02-C  
Models with 31:LEAD WIRE (18" Lead Wire)  
41:DUAL SPADES TYPE

Mounting surface: ISO 4401-AB-03-4-A  
UNIT: mm(inch)  
WEIGHT: 2.0kgs (4.4 lbs)

---

**DOUBLE SOLENOID DIMENSIONS**

---

SWH-G02-B  
SAE Dual Spade Option

18" Leadwire Option
RESULT OF MEASUREMENTS

TEST SYSTEMS
1. Testing Valve
2. Pump
3. Pressure Sensor
4. Flow Sensor
5. Relief Valve
6. Throttle Valve

TEST CONDITIONS
Pressure: 140 kgf/cm\(^2\) (2000 PSI)
Flow Rate: 30 LPM (8 GPM)
Viscosity: 35 CST

<table>
<thead>
<tr>
<th>MODEL</th>
<th>SHIFT OVER TIME (SEC)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>T1</td>
</tr>
<tr>
<td>SWH-G02-AC SERIES</td>
<td>0.01-0.04</td>
</tr>
<tr>
<td>SWH-G02-DC SERIES</td>
<td>0.02-0.06</td>
</tr>
<tr>
<td>SWH-G02-RF SERIES</td>
<td>0.02-0.06</td>
</tr>
</tbody>
</table>

LS OPTION

Electrical Surge Control Model

Valve model: SWH-G02-***-D ** - ** -LS

FEATURES
- Suppresses the surge voltage.
- Eliminates sparks between relay contacts.
- Extends the life of the relay contact.

EFFECTS
- Improves the reliability of the control relay.
- Extends the life of conventional relays.
- Can be operated with a miniature relay.
- The RAC rectifier built-in DC model eliminates sparks at the control relay contact. It can be directly operated with a PLC (programmable logic controller).
**SHOCKLESS TYPE**

Mobile Application: Hydraulic Directional Control Valves

**SWH-G02 Mobile application Series**

### FEATURES

- Armature operates in oil system. Impact is cushioned, noise is reduced, solenoid life is increased.
- Wet armature solenoid eliminates push pin seal, therefore no seal wear, drop or leakage for longer valve life.
- Molded coils for maximum insulating properties, which is impervious to moisture and dirt.
- Plug-in solenoid, for ease of maintenance.
- All spools and bodies are interchangeable, simplifying maintenance.
- High pressure, high flow rating, provides low pressure drop, with maximum performance.
- Specially designed, balanced spool allows proper shifting force, for maximum reliability and long life.
- Hydraulic shock caused by abrupt change in the flow condition at flow cut off is minimized by a specially machines spool.
- Specifically designed to control the shock or “bang” in hydraulic systems.
- Minimizes the effect of pressure spikes or instantaneous high flow rates common in many hydraulic systems.

### HOW TO ORDER

```
SWH-G02-C2-D24-31-M
```

- **M**: SHOCKLESS TYPE
- **WIRING**: Mobile Application
- **31**: LEAD WIRE (18” Lead Wire)
- **41**: DUAL SPADES TYPE
- **COIL VOLTAGE**:
  - D12 : DC12V
  - D24 : DC24V
- **SPOOL TYPE** (See page13)
- **NOMINAL SIZE** : 1/4”
- **SUBPLATE MOUNTED**
- **HIGH PRESSURE HIGH FLOW SOLENOID DIRECTIONAL VALVE**
### SHOCKLESS TYPE

Mobile Application: Hydraulic Directional Control Valves

**SWH-G02 Mobile application Series**

### SPECIFICATIONS

<table>
<thead>
<tr>
<th><strong>Maximum Operating Pressure</strong></th>
<th>210 kgf/cm² (3000 PSI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rated Flow Capacity</strong></td>
<td>40 LPM (10.5 GPM)</td>
</tr>
<tr>
<td><strong>Maximum Tank Line Back Pressure</strong></td>
<td>140 kgf/cm² (2000 PSI)</td>
</tr>
<tr>
<td><strong>Maximum Frequencies of Operation</strong></td>
<td>120 CPM</td>
</tr>
<tr>
<td><strong>Recommended Filtration</strong></td>
<td>25 Micron</td>
</tr>
</tbody>
</table>

### SOLENOID RATINGS

<table>
<thead>
<tr>
<th>Electric Source</th>
<th>Coil Type</th>
<th>Voltage (V)</th>
<th>Current &amp; Power at Rated Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC</td>
<td>D12 DC12V</td>
<td>10.8-13.2 Hz</td>
<td>In-Rush: 2.2 Holding: 2.2 Wattage 26</td>
</tr>
<tr>
<td></td>
<td>D24 DC24V</td>
<td>21.6-26.4 Hz</td>
<td>In-Rush: 1.1 Holding: 1.1 Wattage 26</td>
</tr>
</tbody>
</table>

**TECHNICAL DATA:**

- Solenoid can be used within -10% to +10% of the rated voltage of the coil.
- Withstand voltage 1500 v/sec.
- Insulation resistance over 100MΩ.
- A momentary signal of approx 0.1 second is required for shifting action.

**ACCESSORIES:**

- Mounting bolt kits are supplied with valve socket head cap screws M5 x 45L 4 pieces (#10-24UNC x 1 3/4") for tightening torque 50-70 kgf-cm (43.3-60.6 lbs-in)
- O-ring AS568-012 4 pieces.
PRESSURE DROP AND PERFORMANCE CURVES

TESTE SYSTEMS
1) Testing Valve
2) Pump
3) Pressure Sensor
4) Flow Sensor
5) Relief Valve
6) Throttle Valve

TEST CONDITIONS
Pressure: 70kfg/cm² (1000PSI)
Flow Rate: 63 LPM (16.8GPM)
Viscosity: 35 CST

PERFORMANCE CURVES

SPOOL TYPE

<table>
<thead>
<tr>
<th>PRESSURE DROP CURVE</th>
<th>P → A</th>
<th>B → T</th>
<th>P → B</th>
<th>A → T</th>
</tr>
</thead>
<tbody>
<tr>
<td>C2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>C4</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>B3</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

CONTRAST CHART BETWEEN FACTORS AND VIScosITIES

<table>
<thead>
<tr>
<th>VISCOSITY</th>
<th>CST</th>
<th>15</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
<th>80</th>
<th>90</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSU</td>
<td>77</td>
<td>98</td>
<td>141</td>
<td>186</td>
<td>232</td>
<td>278</td>
<td>324</td>
<td>371</td>
<td>417</td>
<td>464</td>
<td></td>
</tr>
<tr>
<td>FACTOR(G')</td>
<td>0.81</td>
<td>0.87</td>
<td>0.96</td>
<td>1.03</td>
<td>1.09</td>
<td>1.14</td>
<td>1.19</td>
<td>1.23</td>
<td>1.27</td>
<td>1.30</td>
<td></td>
</tr>
</tbody>
</table>

The pressure drop (ΔP') can be obtained from the formula
ΔP' = Δp(G'/0.85) for other specific gravity (G').
RESULT OF MEASUREMENTS

TEST SYSTEMS
1. Testing Valve
2. Pump
3. Pressure Sensor
4. Flow Sensor
5. Relief Valve
6. Throttle Valve

TEST CONDITIONS
Pressure: 140 kgf/cm² (2000 PSI)
Flow Rate: 30 LPM (8 GPM)
Viscosity: 35 CST

TEST CIRCUIT

<table>
<thead>
<tr>
<th>MODEL</th>
<th>SHIFT OVER TIME (sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SWH-G02-DC-M SERIES</td>
<td>T1</td>
</tr>
<tr>
<td></td>
<td>0.1-0.15</td>
</tr>
</tbody>
</table>

LIST OF SPOOL FUNCTION

<table>
<thead>
<tr>
<th>SPOOL TYPE</th>
<th>NORMAL POSITION</th>
<th>P→A, B→T</th>
<th>P→B, A→T</th>
<th>P→A</th>
<th>P→B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>50 (735)</td>
<td>100 (1470)</td>
<td>140 (2000)</td>
<td>210 (3000)</td>
</tr>
<tr>
<td>C2</td>
<td></td>
<td>40 (10.7)</td>
<td>40 (10.7)</td>
<td>40 (10.7)</td>
<td>30 (8)</td>
</tr>
<tr>
<td>C4</td>
<td></td>
<td>40 (10.7)</td>
<td>40 (10.7)</td>
<td>40 (10.7)</td>
<td>30 (8)</td>
</tr>
<tr>
<td>B3</td>
<td></td>
<td>40 (10.7)</td>
<td>40 (10.7)</td>
<td>40 (10.7)</td>
<td>40 (10.7)</td>
</tr>
</tbody>
</table>

THE MAXIMUM FLOW RATE LPM(GPM) UNDER DIFFERENT PRESSURE kgf/cm²(PSI)

P 11/11