FEATURES

- Armature operates in oil system. Impact is cushioned, noise is reduced, solenoid life is increased.
- Wet armature solenoid eliminates pushpin 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.
- Indicating signal lights and bolt kits are standard.
- 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.
- A specially machined spool minimizes hydraulic shock caused by abrupt change in the flow condition at flow cut off.
- Hydraulic shock caused by abrupt change in the flow condition at flow cut off, is minimized by a specially machined 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 - G 02 - C2 - R220 -10 - M

M : HYDRAULIC SHOCKLESS TYPE

WIRING :
10 : JOINT BOX WITH INDICATING LIGHT
20 : HIRSCHMANN TYPE WITH INDICATING LIGHT (DIN TYPE)

COIL VOLTAGE :
R220: AC220V, 60Hz ; AC 200V, 50Hz
R240: AC240V, 60Hz ; AC 220V, 50Hz
R120: AC120V, 60Hz ; AC 110V, 50Hz
R110: AC110V, 60Hz ; AC 100V, 50Hz
D12: DC12V
D24: DC24V
(CONTACT NORTHMAN FOR ADDITIONAL COIL VOLTAGE.)

SPOOL TYPE: (PLEASE SEE PAGE 2)

INTERFACE 02 :NFPA D03 / ISO 4401-03 / CETOP 3/NG 06

SUBPLATE MOUNTED

HIGH PRESSURE HIGH FLOW SOLENOID DIRECTIONAL VALVE

SPECIFICATIONS

Maximum operating pressure	207 BAR (3000 PSI)
Rated flow capacity	40 LPM (10.5 GPM)
Maximum tank line back pressure	138 BAR (2000 PSI)
Maximum frequencies of operation	120 CPM
Recommended filtration	25 MICRON
Hydraulic fluids recommended oil temperature	50 ±5°C (122 ±9°F)

REMARK: Installation dimensions please see page 9 & 10

SOLENOID RATINGS

ELECTRIC SOURCE	COIL TYPE	VOLTAGE(V)			CURRENT & POWER AT RATED VOLTAGE		
		SOURCE RATED	Hz	RANGE (±10%)	IN-RUSH CURRENT (A)	HOLDING CURRENT (A)	WATTAGE
RF	R110	AC110V	50	99-121	0.15	0.15	26
		AC110V	60				
	R220	AC220V	50	198-242	0.30	0.30	
		AC220V	60				
DC	D12	DC 12V		10.8-13.2	2.20	2.20	
	D24	DC 24V		21.6-26.4	1.10	1.10	

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 pcs (#10-24UNC x 1-3/4″ 4 pcs) for tightening torque 50-70 kgf-cm (43.3-60.6 lb-in).
- O-Ring AS568-012 4 pcs..

PRESSURE DROP AND PERFORMANCE CURVES

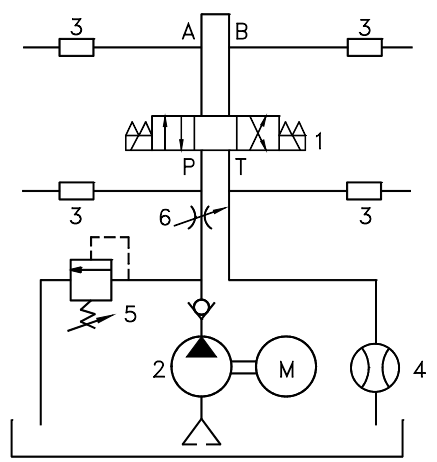
TEST SYSTEMS

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

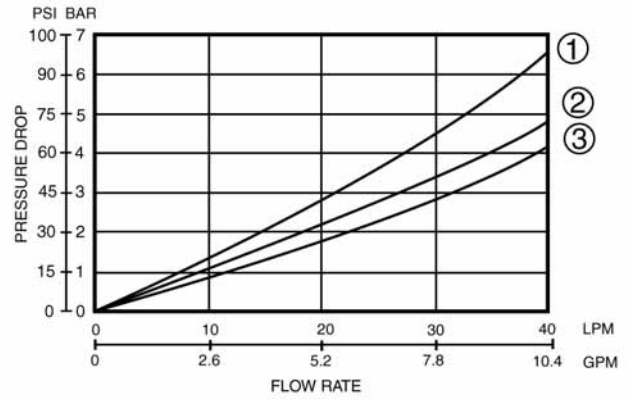
TEST CONDITIONS

Pressure: 69 BAR (1000PSI)
Flow Rate: 63 LPM (16.8GPM)
Viscosity: 35 cSt (175 SSU)

TEST CIRCUIT



PERFORMANCE CURVES



SPOOL TYPE	PRESSURE DROP CURVE			
	P → A	B → T	P → B	A → T
C2	2	2	2	2
C4	2	3	2	3
B3	1	1	2	2

CONTRAST CHART BETWEEN FACTORS AND VISCOSITIES

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

The pressure drop ($\Delta P'$) can be obtained from the formula
$\Delta P' = \Delta P (G'/0.85)$ for other specific gravity (G').

RESULT OF MEASUREMENTS

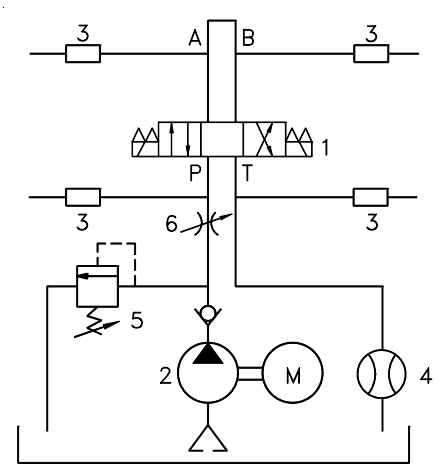
TEST SYSTEMS

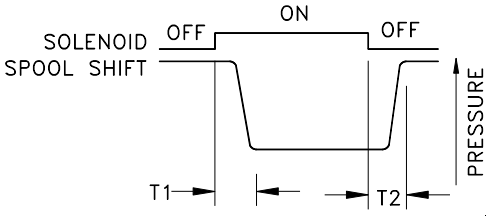
1. Testing Valve
2. Pump
3. Pressure Sensor
4. Flow Sensor
5. Relief Valve
6. Throttle Valve

TEST CONDITIONS

Pressure: 138 BAR (2000 PSI)
Flow Rate: 30 LPM (8 GPM)
Viscosity: 35 cSt (175 SSU)

TEST CIRCUIT





MODEL	CHANGE OVER TIME (SEC)	
	T1	T2
SWH-G02-RF-M SERIES	0.10-0.15	0.10-0.15
SWH-G02-DC-M SERIES	0.02-0.06	0.02-0.04

LIST OF SPOOL FUNCTION

THE MAXIMUM FLOW RATE LPM(GPM) UNDER DIFFERENT PRESSURE BAR (PSI)												
SPOOL TYPE NORMAL POSITION	P→A, B→T P→B, A→T				P→A				P→B			
	50 BAR (735 PSI)	100 BAR (1470 PSI)	140 BAR (2000 PSI)	210 BAR (3000 PSI)	50 BAR (735 PSI)	100 BAR (1470 PSI)	140 BAR (2000 PSI)	210 BAR (3000 PSI)	50 BAR (735 PSI)	100 BAR (1470 PSI)	140 BAR (2000 PSI)	210 BAR (3000 PSI)
C2	40 (10.7)	40 (10.7)	40 (10.7)	40 (10.7)	30 (8.0)	22 (5.9)	16 (4.3)	10 (2.7)	30 (8)	22 (5.9)	16 (4.3)	10 (2.7)
C4	40 (10.7)	40 (10.7)	40 (10.7)	40 (10.7)	30 (8.0)	22 (5.9)	16 (4.3)	10 (2.7)	30 (8)	22 (5.9)	16 (4.3)	10 (2.7)
B3	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)	40 (10.7)	40 (10.7)