

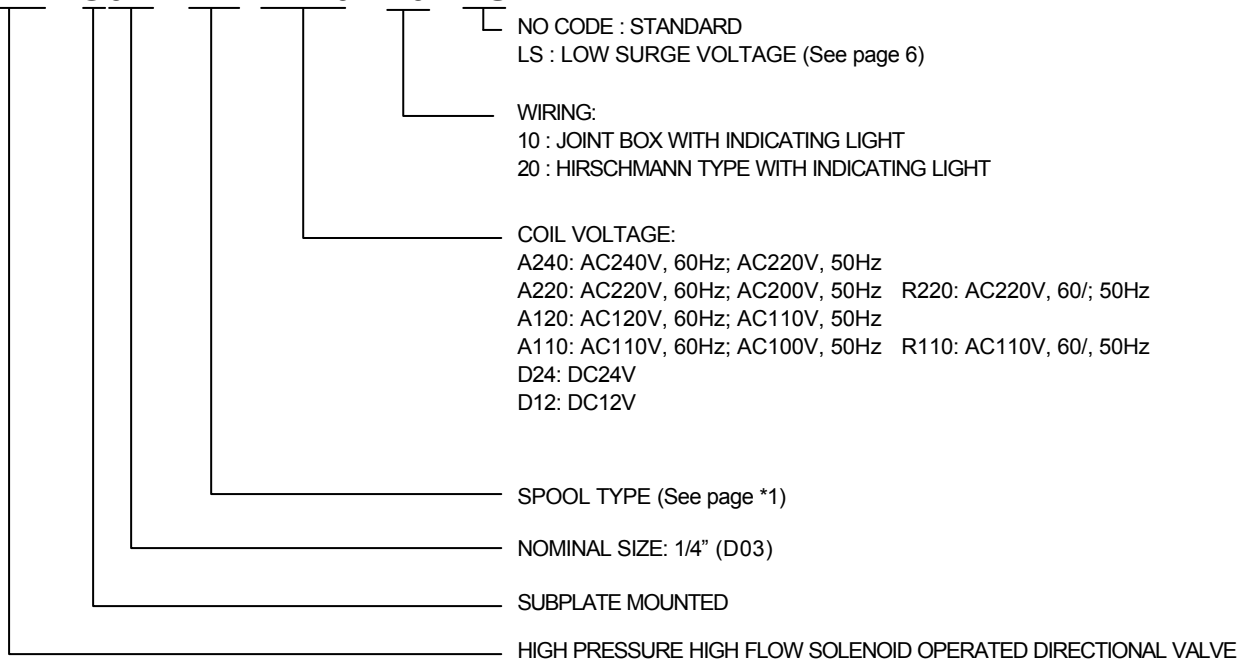


**FEATURES**

- 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.
- Indicating signal lights 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.
- Viton seal kits are available for fire-resistance fluids.

**HOW TO ORDER**

**SWH - G02 - C2 - A220 - 10 - LS**



**SPECIFICATIONS**

MAXIMUM OPERATING PRESSURE	315kgf/cm <sup>2</sup> (4500PSI)
RATED FLOW CAPACITY	63LPM(16.8GPM)
MAXIMUM TANK LINE BACK PRESSURE	140kgf/cm <sup>2</sup> (2000PSI)
MAXIMUM FREQUENCIES OF OPERATION	300CPM
FILTRATION RECOMMENDED	25Micron
HYDRAULIC FLUIDS	Mineraloil,recommendationtemperature0-55°C Max.temperature-25°C~90°C Viscosity10-400cSt

**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
A.C.	A110	AC100V	50	90-110	1.6	0.46	26
		AC110V	60	99-121	1.5	0.39	
	A120	AC110V	50	99-121	1.3	0.38	
		AC120V	60	108-132	1.2	0.27	
	A220	AC200V	50	180-220	0.80	0.23	
		AC220V	60	198-242	0.75	0.19	
	A240	AC220V	50	198-242	0.67	0.19	
		AC240V	60	216-264	0.59	0.13	
	R110	AC110V	50/60	100-120	0.3	0.3	
	R220	AC220V	50/60	198-242	0.15	0.15	
D.C.	D12	DC12V		10.8-13.2	2.2	2.2	
	D24	DC24V		21.6-26.4	1.1	1.1	

**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 M5x45L 4 pieces (#10-24 UNC x 13/4" L) for tightening torque 50-70 kgf – cm (43.3-60 lbs-in).
- O-ring AS568-0124 pieces.

**PRESSURE DROP AND PERFORMANCE CURVES**

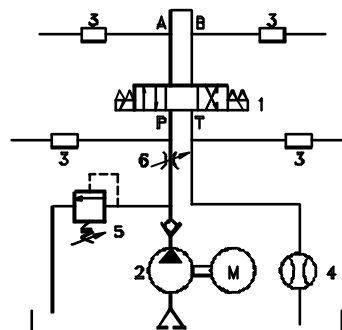
TEST SYSTEMS

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

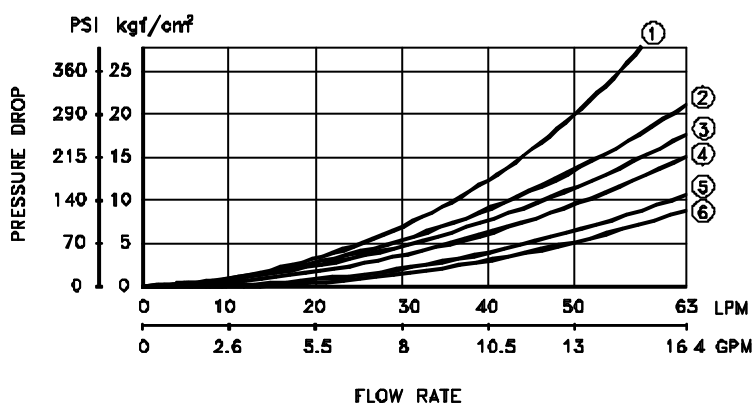
TEST CONDITIONS

Pressure: 70kgf/cm<sup>2</sup> (1000PSI)  
 Flow Rate: 63 LPM (16.8GPM)  
 Viscosity: 35 cSt

TEST CIRCUIT



PERFORMANCE CURVES



	PRESSURE DROP CURVE NUMBER				
	P A	B T	P B	A T	P T
C2	5	5	5	5	-
C3	6	6	6	6	4
C4	5	6	5	6	-
C40	5	5	5	5	-
C5	2	2	2	2	4
C6	1	1	1	1	4
C60	1	1	1	1	3
C7	6	5	6	5	-
C8	5	5	5	6	-
C9	6	5	5	5	-
D2	5	5	5	5	-
D3	5	3	5	3	-
B2	4	5	4	5	-
B3	3	3	5	5	-
B20	2	-	5	-	-
B2S	4	5	4	5	-
B3S	5	5	3	3	-
B20S	5	-	2	-	-

CONTRAST CHART BETWEEN FACTORS AND VISCOSITIES

	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 ( P' ) can be obtained from the formula  
 $P' = p(G'/0.85)$  for other specific gravity(G').

### LIST OF SPOOL FUNCTIONS

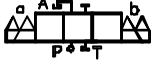
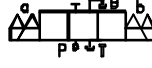
THE MAXIMUM FLOW RATE LPM(GPM) UNDER DIFFERENT PRESSURE kgf/cm <sup>2</sup> (PSI)									
SPOOL TYPE NORMAL POSITION	P A, B T P B, A T						P A		
	50kgf/cm <sup>2</sup> (735 PSI)	100 kgf/cm <sup>2</sup> (1470 PSI)	150 kgf/cm <sup>2</sup> (2200 PSI)	210 kgf/cm <sup>2</sup> (3000 PSI)	250 kgf/cm <sup>2</sup> (3675 PSI)	315 kgf/cm <sup>2</sup> (4500 PSI)	50 kgf/cm <sup>2</sup> (735 PSI)	100 kgf/cm <sup>2</sup> (1470 PSI)	
C2 	63(16.8)	63(16.8)	63(16.8)	63(16.8)	63(16.8)	63(16.8)	40(10.7) 32 (8.5)	40(10.7) 25 (6.7)	
C3 	63(16.8)	63(16.8)	63(16.8)	63(16.8)	63(16.8)	63(16.8)	63(16.8)	63(16.8)	
C4 	63(16.8)	63(16.8)	63(16.8)	63(16.8)	63(16.8)	63(16.8)	40(10.7) 32 (8.5)	40(10.7) 25 (6.7)	
C40 	63(16.8)	63(16.8)	63(16.8)	63(16.8)	63(16.8)	63(16.8)	40 (10.7) 32 (8.5)	40 (10.7) 25 (6.7)	
C5 	50(13.3)	50(13.3)	50(13.3)	50(13.3)	50(13.3)	-	50 (13.3)	50 (13.3)	
C6 	40(10.7)	40(10.7)	40(10.7)	40(10.7)	40(10.7)	-	40 (10.7)	40 (10.7)	
C7 	63(16.8)	63(16.8)	63(16.8)	63(16.8)	63(16.8)	63(16.8)	40 (10.7) 32 (8.5)	40 (10.7) 25 (6.7)	
C8 	63(16.8)	63(16.8)	63(16.8)	63(16.8)	63(16.8)	63(16.8)	40 (10.7) 32 (8.5)	40 (10.7) 25 (6.7)	
C9 	63(16.8)	63(16.8)	63(16.8)	63(16.8)	63(16.8)	63(16.8)	40 (10.7) 32 (8.5)	40 (10.7) 25 (6.7)	
B2 	63(16.8)	63(16.8)	63(16.8)	63(16.8)	63(16.8)	63(16.8)	20 (5.3)	20 (5.3)	
B3 	63(16.8)	63(16.8)	63(16.8)	63(16.8)	63(16.8)	63(16.8)	63(16.8)	63(16.8)	
B20 	-	-	-	-	-	-	35 (9.3)	32 (8.5)	
D2 	63(16.8)	63(16.8)	63(16.8)	63(16.8)	63(16.8)	63(16.8)	40 (10.7)	30 (8)	
D3 	63(16.8)	63(16.8)	63(16.8)	63(16.8)	63(16.8)	63(16.8)	40 (10.7)	30 (8)	

NOTE: 

40(10.7)
32(8.5)

1. The figures in the square shows the parameter among voltage & flow under saturated temperature and 90 % Applied voltage.

2. The upper side number in table describes the maximum flow under DC and RF. The lower side number in Table describes the maximum flow under AC.

				P B 					
150 kgf/cm <sup>2</sup> (2200 PSI)	210 kgf/cm <sup>2</sup> (3000 PSI)	250 kgf/cm <sup>2</sup> (3675 PSI)	315 kgf/cm <sup>2</sup> (4500 PSI)	50 kgf/cm <sup>2</sup> (735 PSI)	100 kgf/cm <sup>2</sup> (1470 PSI)	150 kgf/cm <sup>2</sup> (2200 PSI)	210 kgf/cm <sup>2</sup> (3000 PSI)	250 kgf/cm <sup>2</sup> (3675 PSI)	315 kgf/cm <sup>2</sup> (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)	—
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)	37 (9.9)	30 (8)	28 (7.5)
				45 (12)	45 (12)	45 (12)	45 (12)	45 (12)	45 (12)
25 (6.7)	20 (5.3)	18 (4.8)	15 (4)	63 (16.8)	50 (13.3)	45 (12)	40 (10.7)	32 (8.5)	25 (6.7)
				45 (12)	30 (8)	28 (7.5)	25 (6.7)	22 (5.9)	18 (4.8)
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)

### RESULT OF

#### TEST SYSTEMS

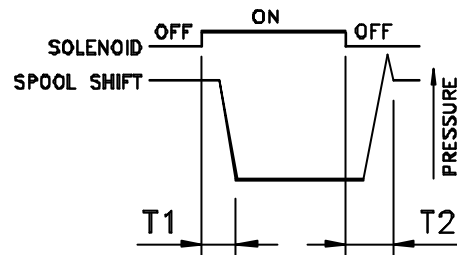
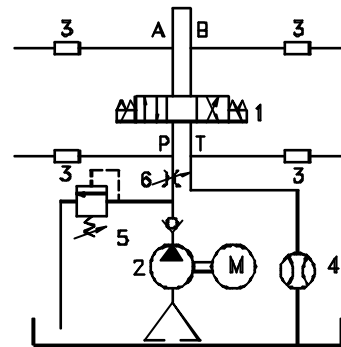
1. Testing Valve
2. Pump
3. Pressure Sensor
4. Flow Sensor
5. Relief Valve
6. Throttle Valve

#### TEST CONDITIONS

Pressure: 140 kgf/cm<sup>2</sup> (2000 PSI)  
 Flow Rate: 30 LPM (8 GPM)  
 Viscosity: 35 cSt

MODEL	SHIFT OVER TIME (SEC)	
	T1	T2
SWH-G02-AC SERIES	0.01-0.04	0.02-0.04
SWH-G02-DC SERIES	0.02-0.06	0.02-0.04
SWH-G02-RF SERIES	0.02-0.06	0.02-0.04

#### TEST CIRCUIT



### LS OPTION

Electrical Surge Control Model

LS OPTION

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

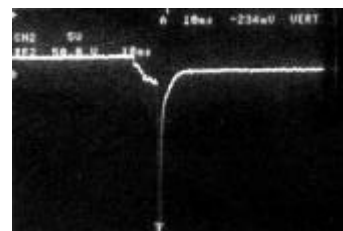
#### FEATURES

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

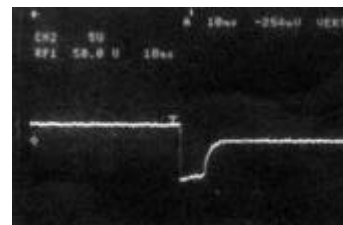
#### EFFECTS

- 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 eliminate sparks at the control relay contact. It can be directly operated with a PLC (programmable logic controller).

Electrical surge waveform standard DC



Electrical surge controlled DC solenoid





# SOLENOID OPERATED DIRECTIONAL VALVE

SWH-G02 SERIES

## INSTALLATION DIMENSIONS

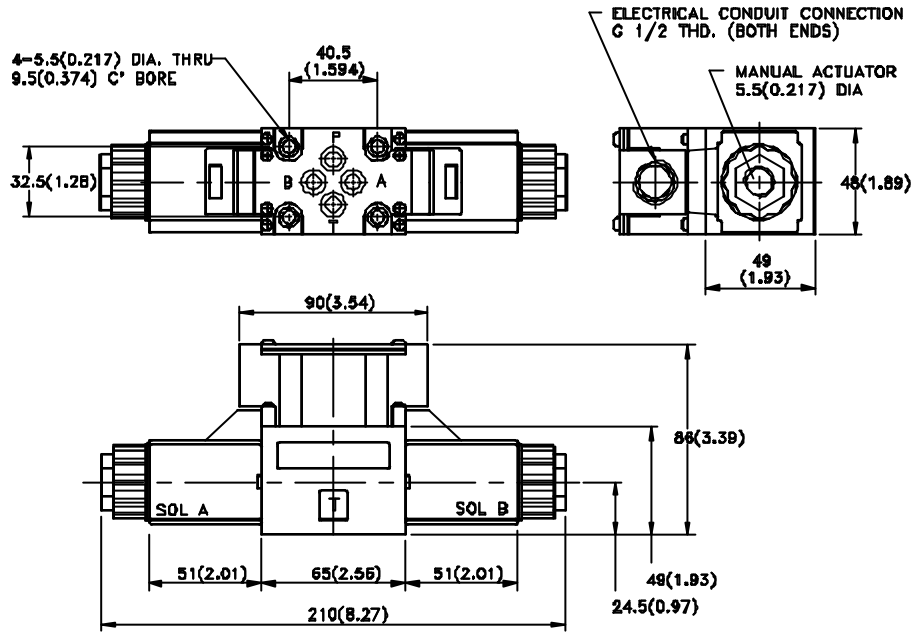
Mounting surface: ISO 4401-AB-03-4-A

UNIT: mm(inch)

WEIGHT: 2.0kgs (4.4 lbs)

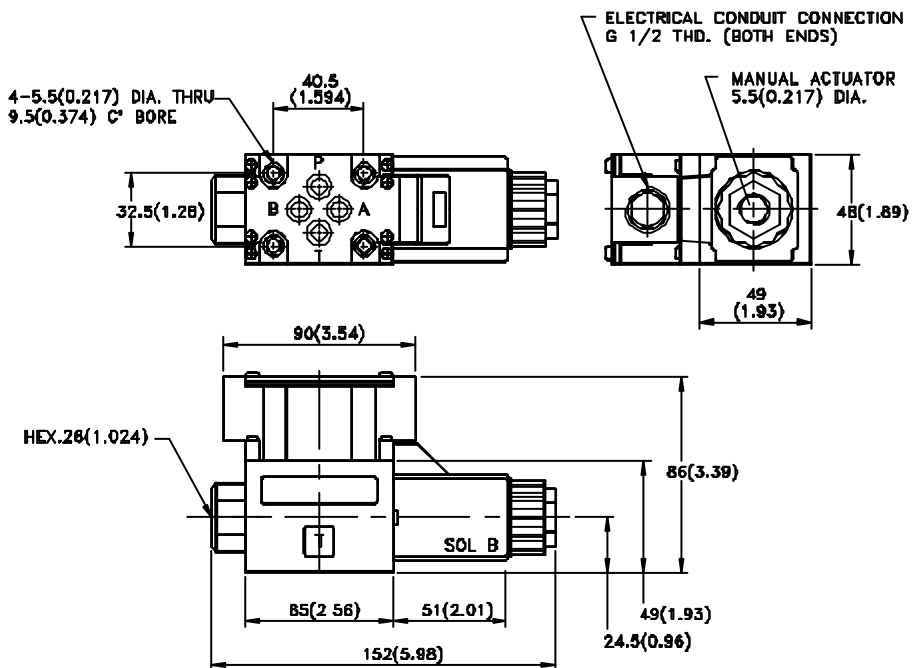
SWH-G02-C \*\* - \*\*\*\* - 10 - \*\*

Models with AC, DC, RF solenoids



SWH-G02-B \*\* - \*\*\*\* - 10 - \*\*

Models with AC, DC, RF Solenoids



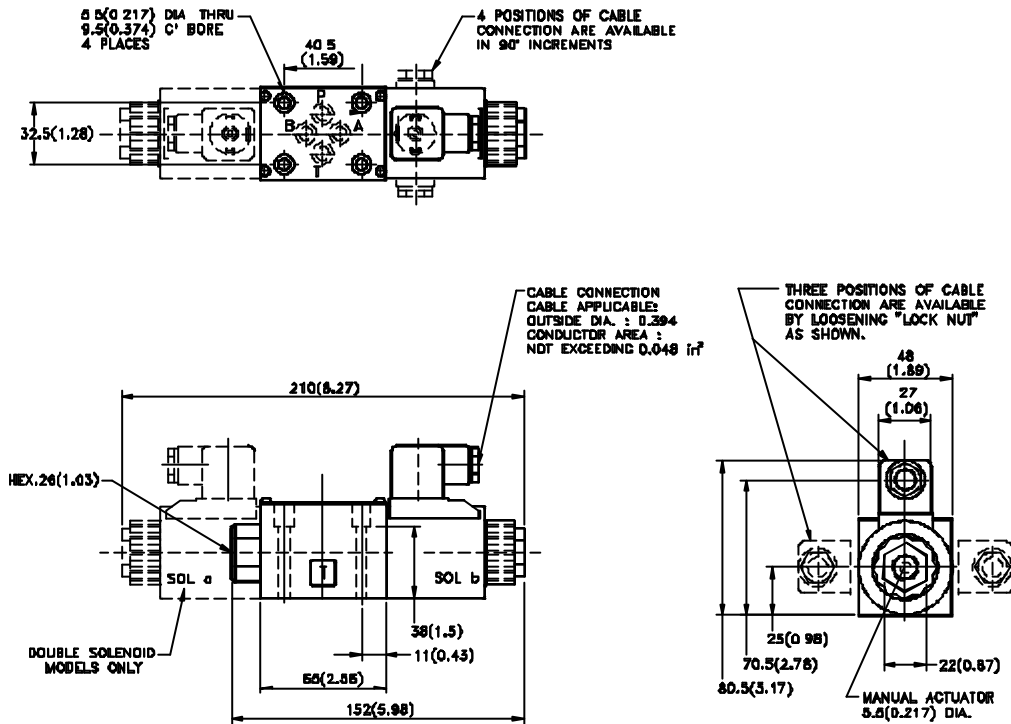
## INSTALLATION DIMENSIONS

Mounting surface: ISO 4401-AB-03-4-A

UNIT: mm(inch)

SWH-G02- \*\*\* - \*\*\*\*\* -20- \*\*

Models with AC, DC, RF solenoids



## MODEL AND WEIGHT

MODEL	WEIGHT kgs(LB)	MODEL	WEIGHT kgs(LB)
SWH-G02-C ** - A *** - 10- **	1.9(4.18)	SWH-G02-C - A *** - 20- **	1.9(4.18)
SWH-G02-B ** - A *** - 10- **	1.6(3.52)	SWH-G02-B - A *** - 20- **	1.5(3.3)
SWH-G02-C ** - D/R *** - 10- **	2.0(4.4)	SWH-G02-C - D/R *** -20- **	2.0(4.4)
SWH-G02-B ** - D/R *** - 10- **	1.6(3.52)	SWH-G02-B - D/R *** - 20- **	1.6(3.52)
SWH-G02-D ** - A *** - 10- **	1.9(4.18)	SWH-G02-D - A *** - 20- **	1.9(4.18)
SWH-G02-D ** - D/R *** - 10- **	1.9(4.18)	SWH-G02-D - D/R *** - 20- **	1.9(4.18)