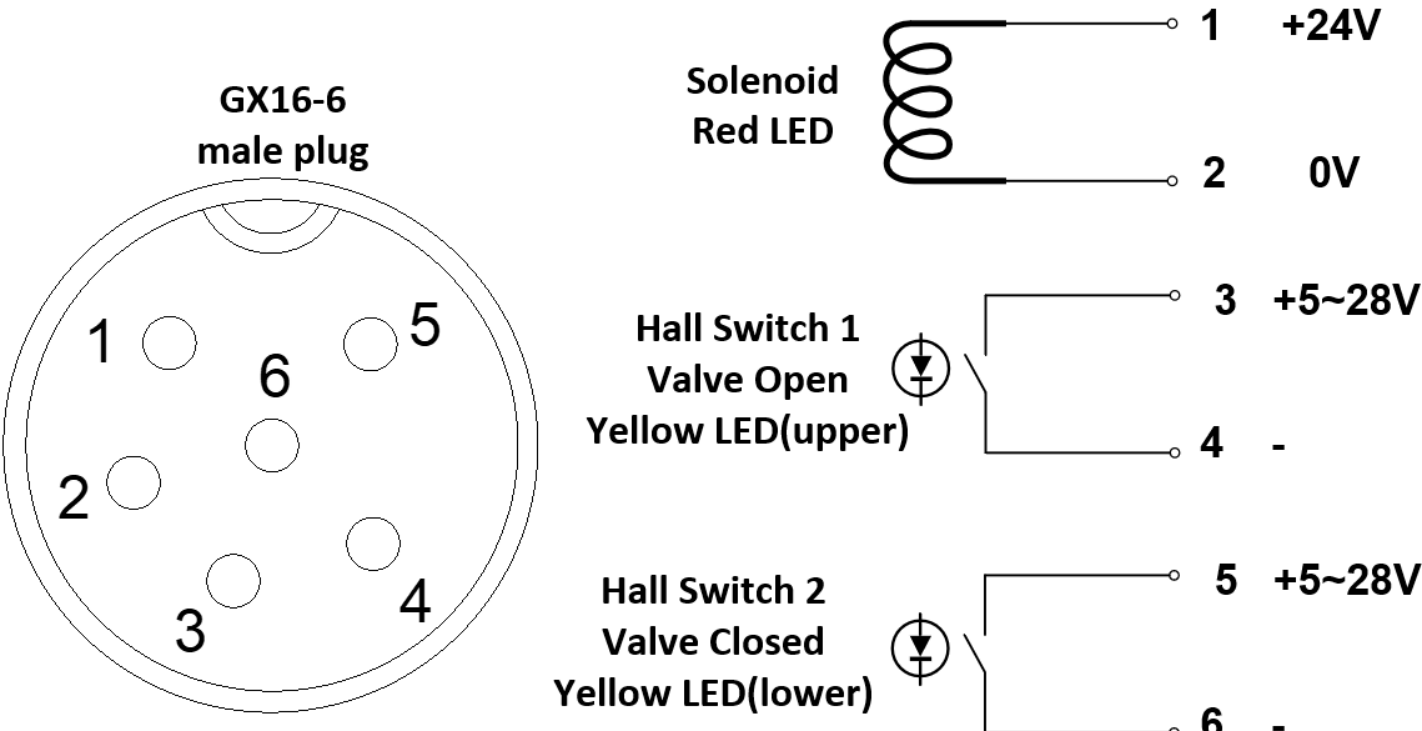


Electrical pins of GX16-6 aviation plug



Note 1: For models without electromagnetic valves, pins 1 and 2 are vacant.

Note 2: The factory wire color sequence is 1 red, 2 black, 3 white, 4 yellow, 5 green and 6 brown

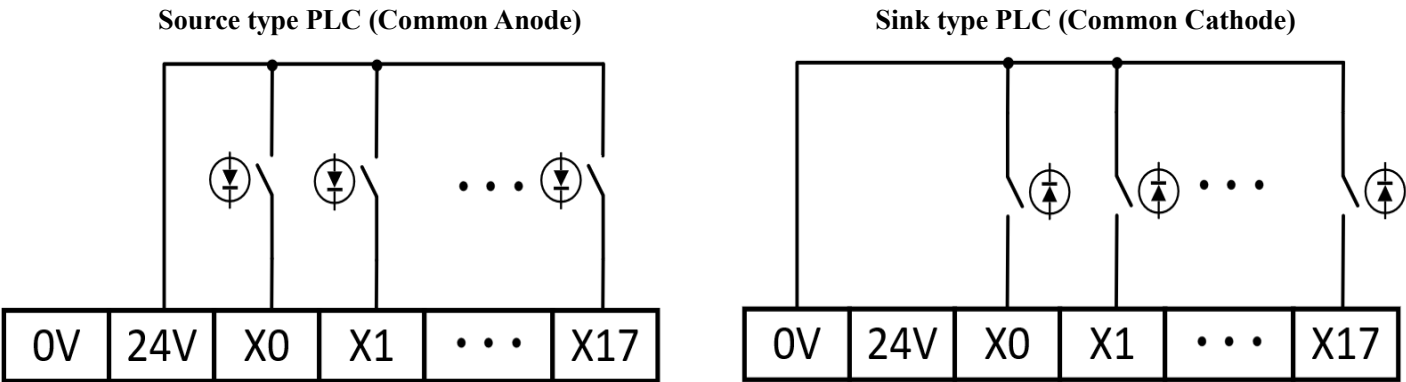
Electrical parameters of the two-wire hall magnetic switch

- Quiescent current (Leakage current): 6μA
- Voltage drop: 2.5V~3.2V (current range: .5mA~500mA)
- Max. current: 500mA (without short-circuit protection), 350mA (with short-circuit protection)
- Load voltage: 5~28V (Nominal 24V)
- Safety guaranteed: short-circuit protection, reverse polarity protection, surge protection
- Applicable load: IC(5V)/MCU(5V)/Relay/PLC

Electric circuit connection of the two-wire hall magnetic switch(single)

Hall magnetic switch is equivalent to a switch with polarity, please pay attention to the current direction when installing

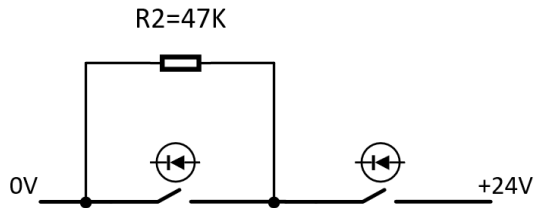
When single switch connect to DI port the leakage current is about 6μA。



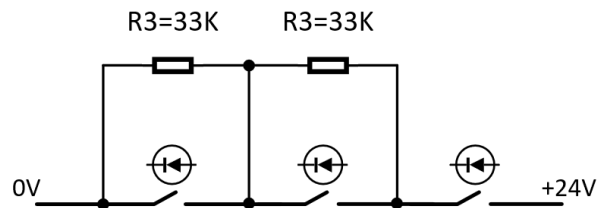
Multiple switches series connect to DI port of PLC

PLC system with anti-interference capability, when leakage current below 1mA, there will be no impact to PLC signal input

Two hall magnetic switches series connect



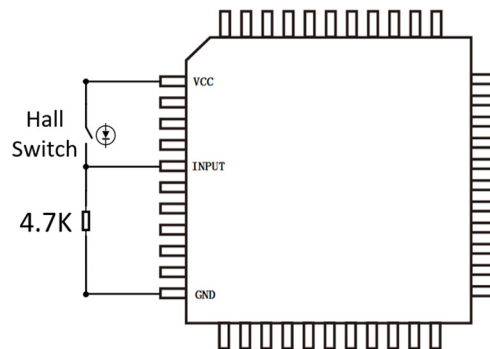
Three hall magnetic switch series connect



- 1) When series connection with 2 hall switches, either switch needs to be series connected with one resistor $R2=47K\Omega$, leakage current is $6\mu A$ or $0.4mA$
- 2) When series connection with 3 hall switches, either switch needs to be series connected with one resistor $R3=33K\Omega$, leakage current is $6\mu A$ or $0.6mA$
- 3) When series connection with 4 hall switches, either switch needs to be series connected with one resistor $R4=18K\Omega$, leakage current is $6\mu A$ or $0.8mA$

Electric circuit connect to IC/MCU(5V)

The following is an input example of a MCU(5V), the pull-down resistor is 4.7K. When the Hall magnetic switch is off, the input port is low level 0V, when the Hall magnetic switch is on, the input port is high level 3.0V. This circuit needs delay function to obtain correct output and reliability.

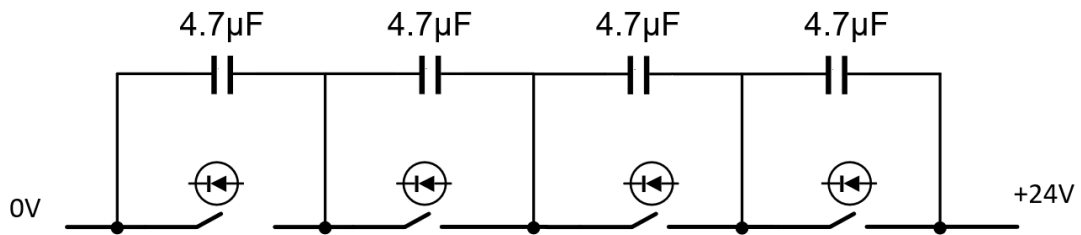


```
while (1)
{
    if(P00==1&&delay(50)&&P00==1&&delay(50)&&P00==1) //set P00 as the Input of MCU, delay(50)=50ms
    {
        //program
    }
}

int delay(unsigned int n)
{
    for (i=0; i<n; i++)
    for (j=0; j<1000; j++);
    {
    }
    return 1;
}
```

Multiple switches Series connect to DI port of PLC

The leakage current of this series circuit is about $7\mu\text{A}$, each switch with a parallel connection of $4.7\mu\text{F}$ capacitor (Max. 6 switches series connection)



GX16-6 female aviation connector (to be configured by users)

1) GX16-6 female aviation connector with cable (waterproof molding)

Optional wire: 6 core cable, $6-0.2\text{ mm}^2 \sim 6-0.3\text{ mm}^2$

Optional wire: 4 core cable, $6-0.3\text{ mm}^2 \sim 6-0.5\text{ mm}^2$ (use one switch)

2) GX16-6 female connector with cable

Optional wire: RVV 6 core cable, $6-0.3\text{ mm}^2$ (recommend)

Optional wire: RVV 4 core cable, $4-0.5\text{ mm}^2$ (use one switch)

3) GX16-6 L-type connector with cable



1)



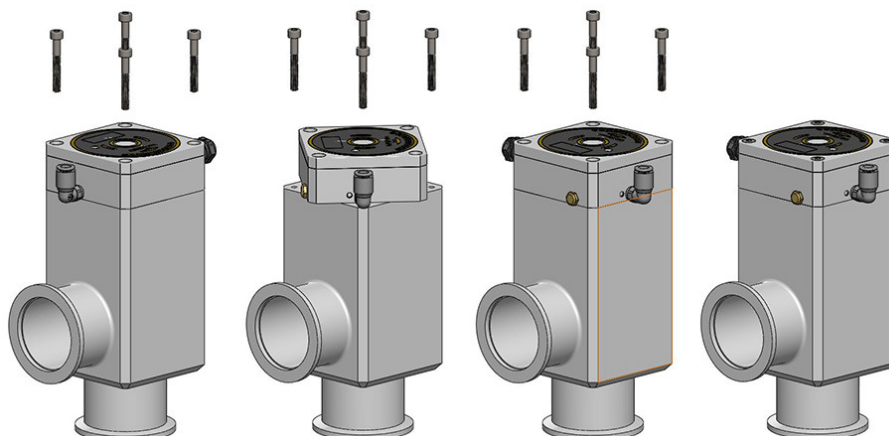
2)



3)

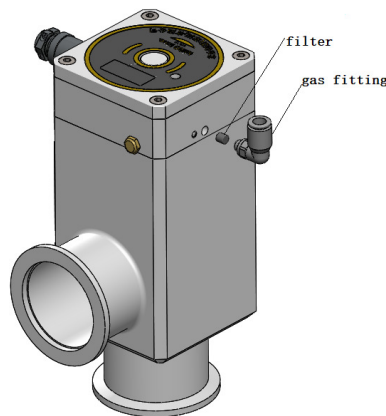
Adjust the orientation of GX16-6 aviation plug

- 1) place the valve on the work desk (protect KF flange with plastic cap to avoid damage), take out the four bolts
- 2) Rotate the electric box to adjust the direction
- 3) Fasten the four bolts



Clean dust filter

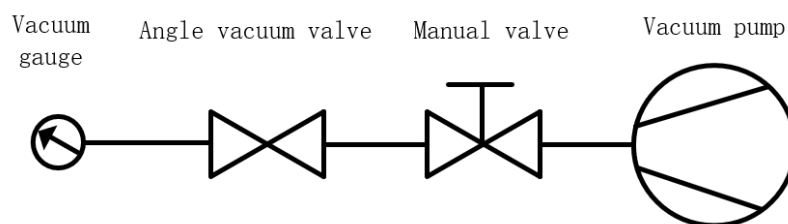
The drive gas of the valve has to be clean, in case air filter gets dirty and require clean please Un-plug the gas fitting, pull the O-ring and the filter out and clean it with ultra-sonic.



Component's life

- 1) KF40 Corrugated metal bellows ≈ 15 million, KF25\KF16 bellows ≈ 10 million, KF50 bellows > 6.5 million
- 2) Spring > 10 million
- 3) Pneumatic Cylinder > 20 million
- 4) Solenoid > 50 million
- 5) Magnetic switch > 100 million (theory life)

Life-Test setup as shown in the picture below:



1. Using Helium Leak Detector and make sure the vacuum pipeline has no leakage.
2. Power on the angle vacuum valve with 24V voltage and provide 0.6Mpa drive gas, open and close the valve with the frequency of 1.16Hz (power on the solenoid with 24V for 0.86 seconds and power off for 0.86 seconds)
3. After the angle vacuum valve starts cycling, turn on the manual valve and mechanical pump, evacuate the system for at least 4 hours and then turn off the manual valve, then turn off the vacuum pump
4. In a low vacuum environment, due to the gas venting inside the pipeline, the pressure will slowly rise, and will eventually stabilize at tens of pascals to two or three hundred pascals (depending on the cleanliness of the pipeline and the pumping time). After the bellows in the vacuum valve has any small cracks due to fatigue, the cracks will expand rapidly in a short time, causing the pressure to rise sharply to several kilopascals or even atmospheric pressure.
5. Observe vacuum gauge and account cycling days N:

$$\text{Life} = 0.1 \text{ million} * N$$

Remark1: The recommended test frequency for KF25, KF16, KF10 is 200,000 times per day, for KF40 it is 100,000 times per day, and for KF50 it is 50,000 times per day.

Remark2: Welded metal bellows are only suitable for use in a clean environment. In a dusty environment, dust accumulates at the weld seam of the welded bellows, which will cause a significant decrease in the life of the welded bellows. Therefore, our company does not recommend customers use welded bellows.

Valve Indicators

A. Mechanical indicator

Steel rod up: valve one

Steel rod down: valve off

B. Solenoid power LED (red)

Red LED on: solenoid power on

Red LED on: solenoid power off

C. Upper Magnetic switch LED (yellow)

Yellow LED on(upper): magnetic switch on, valve on and steel bar up

Yellow LED off(upper): magnetic switch off, valve closed or partially open

D. Lower Magnetic switch LED (yellow)

Yellow LED on(lower): magnetic switch on, valve closed

Yellow LED off(lower): magnetic switch off, valve open or partially open

Valve operational parameters

1. **Drive gas:** clean compressed air or inert gas (filter size below 100 μ m)
2. **Drive gas pressure range:** 3.5-7 bar
3. **Nominal Drive gas pressure:** 6 bar
4. **Drive gas tubing O.D.:** default 6 mm (4mm is optional)
5. **Max. Working gas temperature:** 250°C (valve under ambient room temperature)
6. **Gas direction:** Either direction
7. **Solenoid nominal voltage:** 24V ($\pm 5\%$)
8. **Solenoid power:** 1.3W
9. **Magnetic switch nominal voltage:** 24V(5~28V)
10. **Leakage rate:** $<1 \times 10^{-9}$ mbar•L/sec (1×10^{-10} m³•Pa/sec)
11. **Min. Working pressure:** 1×10^{-8} mbar (1×10^{-6} Pa)
12. **Max. Working pressure in Opening Direction:** 2000mbar
13. **Max. Working pressure in Closed Direction:** 1200mbar
14. **Cycling frequency:** KF16<3Hz, KF25<2Hz, KF40<1.3 Hz, KF50<0.5Hz

Remarks: under 25°C ambient temperature, when working gas temperature is 250°C, gas flow rate is 1.2m/s (atmosphere pressure), the solenoid temperature is about 85°C (Max. Working temperature is 110°C), the temperature of rubber O-ring at bellow sealing position is about 178°C~195°C

