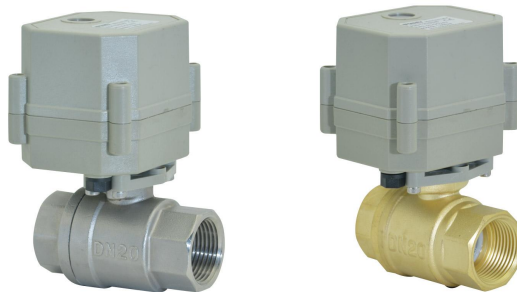


台州通禾流体控制股份有限公司

Taizhou Tonhe Flow Control Co., Ltd

Tonhe A20 M Series Proportional actuator ball valve



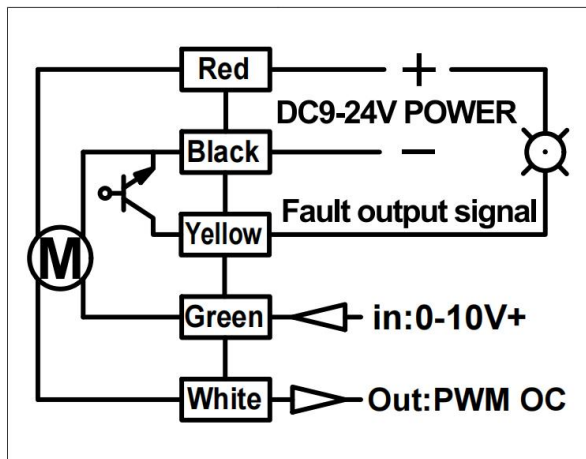
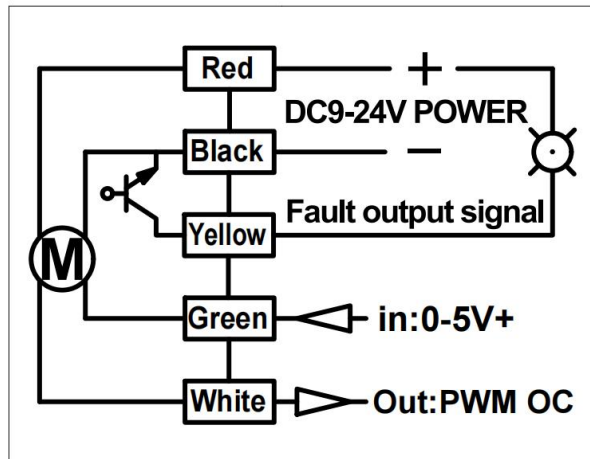
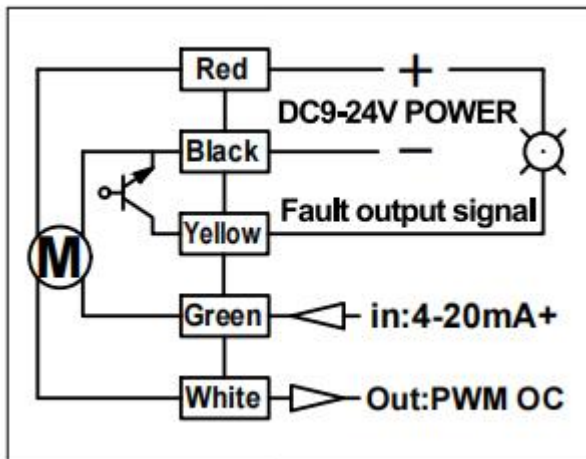
www.tonheflow.com

➤ Technical Parameters

Valve size 阀体口径	□NPT/BSP 1/4" 3/8" 1/2" 3/4" 1" (Optional)
Maximum working pressure 最大工作压力	1.0MPa
Circulation medium 介质	Fluid, air, water 液体, 空气, 水
Rated voltage 额定电压	DC9-24V, DC24V
control signal 输入信号	4-20mA、0-5V、0-10V (可选)
输出信号	PWM、4-20mA、1-5V、2-10V
Wiring diagram 接线图	5 wire control with feedback signal 5 线控制带反馈信号
Open/close time 开关时间	≤7S
Life time 工作寿命	70000 times
Valve material 阀体材质	□Brass ☒ SS304 (Optional) 黄铜、不锈钢304 可选
Actuator material 执行器材料	PPO Engineering Plastics
Sealing material 密封材质	FKM & PTFE
Actuator rotation 执行器旋转角度	90°
Max. torque force 最大扭力	3 N.M
Cable Length 电线长度	0.5m
Environment temperature 环境温度	-15℃~60℃
Liquid temperature 液体温度	2℃~90℃
Manual override 手动功能	No
Indicator 开关指示	Yes
Protection class 防护等级	IP67
Product certificate 认证	EMC, ROHS
Company system certification 公司体系认证	ISO 9001:2015
Locked-rotor Current 堵转电流	500mA

➤ 输入 4-20mA/0-5V/0-10V (可选) 、输出 PWM 接线图

Input signal 4-20mA,0-5V or 0-10V for choice, output signal PWM,see below:



- 1、Red (红线) 电源+, 接 DC9~24V 正极;
 - 2、Black (黑线) 电源-, 接 DC9~24V 负极, 4-20mA/0-5V/0-10V 负极
 - 3、Green (绿线) 位置输入+, 控制电流/电压 (4-20mA/0-5V/0-10V 可选) 正极
 - 4、Yellow (黄线) 错误输出-, 湿节点 NPN 三极管的集电极输出, 当有错误导致电机工作电流过大, 比如当阀门有杂物挡住球转不动时等, 节点闭合, 正常工作时节点断开, 只能拉低外部信号, 负载 500mA。
 - 5、White (白线) 位置反馈-, 湿节点 NPN 三极管集电极输出, OC 输出 PWM 信号, 100Hz, 5%-95%, 表示 0-90 度, 负载 500mA。
- *PWM: WT 接上拉电阻到 RD, 一般使用 1k 或 5.1k 电阻, 推荐 15v 以下供电使用 1k, 15v 以上供电使用 5.1k, 示波器夹子接电源负极, 探头接 PWM 白线
- *5%-95%表示占空比, 就是 VCC 时间占一个周期的时间的比例
- *PWM 信号是反馈位置, 错误信号要外接一个 10k 电阻到电源正, 堵转的时候, 错误信号对地电压会变低, 此时可以用示波器测信号。

- 1、RD(red wire) connects to DC9-24V positive pole;
- 2、BK(black wire) connects to DC9 ~ 24V negative pole, and it is also 4-20mA-/0-5V-/0-10V's negative pole;
- 3、GR(green wire) connects to analogy signal positive pole(e.g. 4-20mA, 0-5V, 0-10V) ;
- 4、YW(yellow wire) connects to ERROR output negative pole. Wet contact NPN triode collector output. When there is an error causing the motor to work with excessive current, such as when debris blocks the

valve and the ball cannot rotate, the contact is closed; when working normally, the contact open, it only can pull down the external signal. The load is 500mA

5、WT(white wire) connects to position feedback negative pole.

Wet contact NPN triode collector output, OC output PWM signal, 100Hz, 5%-95%, indicating 0-90 degrees. The load is 500mA.

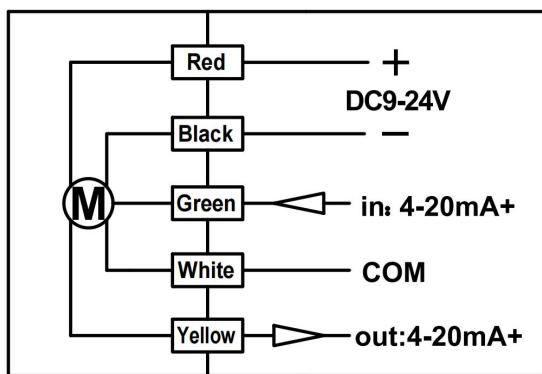
*PWM: Connecting a pull-up resistor to WT and RD, usually use a 1k or 5.1k resistor, recommend to use 1k for power supply below 15V, and 5.1k for over 15V. Oscilloscope clamp connects to power's negative pole, and oscilloscope probe connects to PWM white wire.

*5%-95% represents duty cycle, which is the ratio of VCC time to the cycle time.

*PMW signal is a signal to give position feedback, the error signal needs to be connected with a 10k resistor to power's positive pole. When blocking occurs, the error signal to the ground voltage will be lower, at this time, it is able to test signal with oscilloscope.

➤ 输入 4-20mA、输出 4-20mA 接线图

Wiring of input 4-20mA signal, output 4-20mA.



1、Red（红线）电源+，接 DC9~24V 正极

2、Black（黑线）电源-，接 DC9~24V 负极

3、Green（绿线）位置输入+，控制电流（4-20mA）正极

4、White（白线）位置输入-，位置反馈负极

5、Yellow（黄线）位置反馈+，反馈信号为输出电流 4-20mA

*4-20ma 输出，负载电阻最大为输入电源电压 $(v-2) / 0.02$ ，比如 15v 供电， $(15-2) / 0.02=650$ 欧。推荐使用 300 欧

1. RD(red wire) connects to DC9-24V positive pole;

2. BK(black wire) connects to DC9-24V negative pole;

3. GR(green wire) connects to analogy(4-20mA) signal's positive pole;

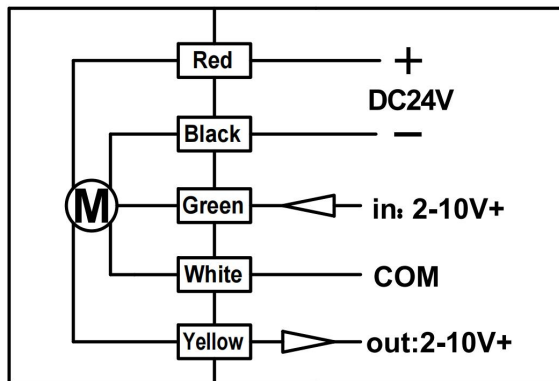
4. WT(white wire) connects to negative poles of input analogy signal and output signal

5. YW(yellow wire) connects to position feedback positive pole, output signal 4-20mA is the feedback signal.

* When output signal is 4-20mA, the maximum load resistance is the input power voltage $(v-2) / 0.02$, e.g. if

the power is 15V, then $(15-2)/0.02=650\Omega$, it is recommended to use a 300Ω load resistor.

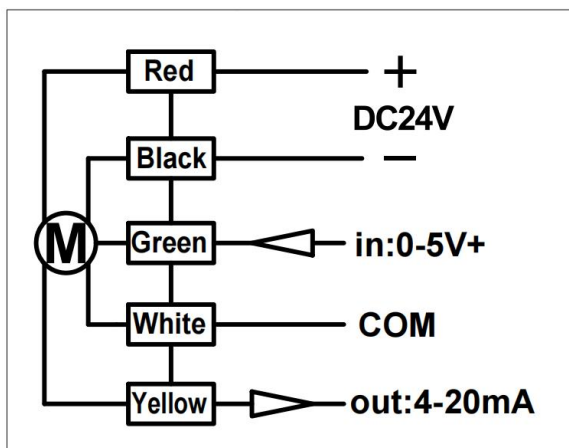
➤ **输入、输出 2-10V 接线图 Wiring of input and output signal both 2-10V**



- 1、Red（红线） 电源+，接 DC24V 正极
- 2、Black（黑线） 电源-，接 DC24V 负极
- 3、Green（绿线） 位置输入+，控制电压（2-10V）正极
- 4、White（白线） 位置输入-，位置反馈负极
- 5、Yellow（黄线） 位置反馈+，反馈信号为输出电压 2-10V

1. RD(red cable) connects DC9-24V positive pole
2. BK(black cable) connects DC9 ~ 24V negative pole
3. GR(green cable) connects position input /control current +/- control voltage 2-10V
4. WT(white cable) connects common signal
5. YW(yellow cable) connects position feedback positive,output 2-10V signal

➤ **输入 0-5V、输出 4-20mA 接线图 Wiring of input signal 0-5v,output signal 4-20mA**



- 1、Red（红线） 电源+，接 DC9~24V 正极
- 2、Black（黑线） 电源-，接 DC9~24V 负极
- 3、Green（绿线） 位置输入+，控制电压（0-5V）正极
- 4、White（白线） 位置输入-，位置反馈负极
- 5、Yellow（黄线） 位置反馈+，反馈信号为输出电流 4-20mA

*4-20ma 输出，负载电阻最大为输入电源电压 $(v-2)/0.02$ ，比如 15v 供电， $(15-2)/0.02=650$ 欧。推荐使用 300 欧

1. RD(red cable) connects DC9-24V positive pole
2. BK(black cable) connects DC9 ~ 24V-negative pole

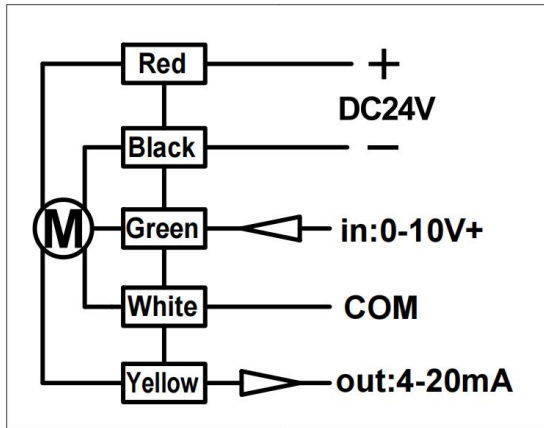
3. GR(green cable) connects position input /control current +/- control voltage 0-5V

4. WT(white cable) connects common signal

5. YW(yellow cable) connects position feedback positive,output 4-20mA signal

*When output signal is 4-20mA, the biggest input voltage of load resistance is $(v-2)/0.02$, e.x. power is 15V, $(15-2)/0.02=650\Omega$, suggest to use 300Ω

➤ **输入 0-10V、输出 4-20mA 接线图 Wiring of input signal 0-10V, output signal 4-20mA.**



1、Red（红线）电源+，接 DC9~24V 正极

2、Black（黑线）电源-，接 DC9~24V 负极

3、Green（绿线）位置输入+，控制电压（0-10V）正极

4、White（白线）位置输入-，位置反馈负极

5、Yellow（黄线）位置反馈+，反馈信号为输出电流 4-20mA

*4-20ma 输出，负载电阻最大为输入电源电压 $(v-2)/0.02$ ，比如 15v 供电， $(15-2)/0.02=650$ 欧。推荐使用 300 欧

1. RD(red cable) connects DC9-24V positive pole

2. BK(black cable) connects DC9 ~ 24V negative pole

3. GR(green cable) connects position input /control current +/- control voltage 0-10V

4. WT(white cable) connects common signal

5. YW(yellow cable) connects position feedback positive,output 4-20mA signal

*When output signal is 4-20mA, the biggest input voltage of load resistance is $(v-2)/0.02$, e.g. power is 15V, $(15-2)/0.02=650\Omega$, suggest to use 300Ω