ZNC-FRC Electronic Flow Switch

Mainly applicable media: air, circulating water, cutting fluid, lubricating oil, etc.
Main application occasions: Water-cooled welding machine, laser equipment cooling system, vacuum coating machine, electric furnace, polysilicon ingot casting furnace.
Applications: Pneumatic and hydraulic systems for monitoring of circulating water, cutting fluids and lubricant cut-offs, as well as pump idling protection.

I. Overview

Flow switches are mainly installed online or inserted in water, gas, oil and other media pipelines to monitor the size of the water flow in the water system. In the water flow is higher or lower than a set point when the trigger output alarm signal to the unit, the system can make the corresponding instructions after the signal. Avoid or reduce the host "dry burning".

II. Principles of operation

Based on the thermal principle in the closed probe contains two resistors, one of which is heated as the detection resistance, the other is not heated as the reference resistance, when the medium flows, the heat on the heated resistor is taken away, the resistance value is changed, and the difference between the two resistances is used as a basis for judging the flow rate.

III. Product characteristics

- ➢ Product has no moving parts and is maintenance-free
- ➢ Multiple mounting options available (plug-in, ducted (threaded or flanged connections))
- ➢ Suitable for high temperature and high pressure, corrosive occasions, food hygiene occasions
- ➢ For water, oil, gas and other fluid media

IV. Technical parameters

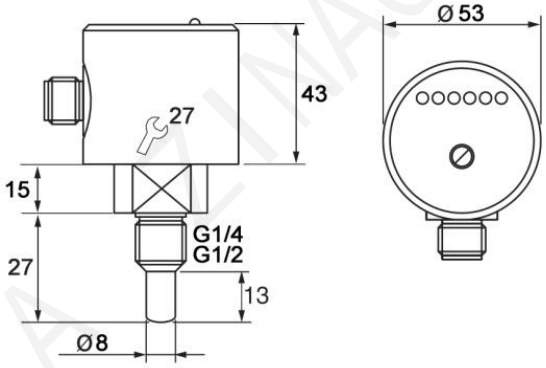
Type	parameter
Plug-in setting range	1 - 150 cm/s (water) 3 - 300 cm/s (oil), 20 - 2000 cm/s (air)
signal output	Relay, PNP, NPN
electricity supply	24V±20%DC
Turn on the power	Maximum 400mA (PNP or NPN type) Maximum 1A@48Vac/dc (relay type)
No-load current	Maximum 80mA

Setting method	Potentiometer setting, key setting
Pressure resistance range	≤10MPa (standard type), ≤30MPa (explosion-proof type)
Medium temperature change	≤4℃/s
response time	1...13s, typical 2s
Initialisation time	About 8s
Electrical protection	Inverted phase, short circuit, overload protection
protection class	IP67，IP65
Medium temperature	-20...80° C (standard), ≤280° C (explosion-proof)
material	Probe: stainless steel; Housing: stainless steel (explosion-proof cast aluminium housing)
Measurement accuracy	±2.5%

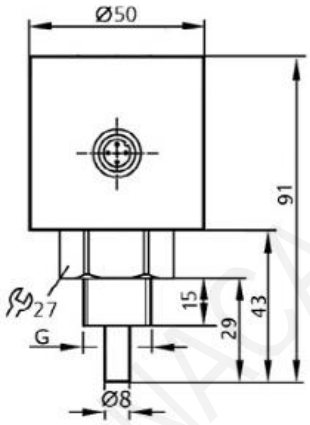
V. Instrument Selection

selection							instructions
ZNC-FRC	-□	/□	/□	/□	/□	/□	
Instrument type	A						Plug-in (six-position indicator)
	B						Display type (percentage display)
	F						Explosion-proof (relay output)
connection method		G12					Interface thread G1/2(A/B/F)
		G14					Interface thread G1/4 (A/B/F)
		T					NPT1/2 or ZG3/4 or M20×1.5 (special explosion-proof type)
		H2					flange connection
output method			P				PNP output
			N				NPN output
			C				relay output
Catch material				S1			304
				S2			316L
Power supply method					C		DC24V
Probe length						LJ	13~200

VI. External Dimensions

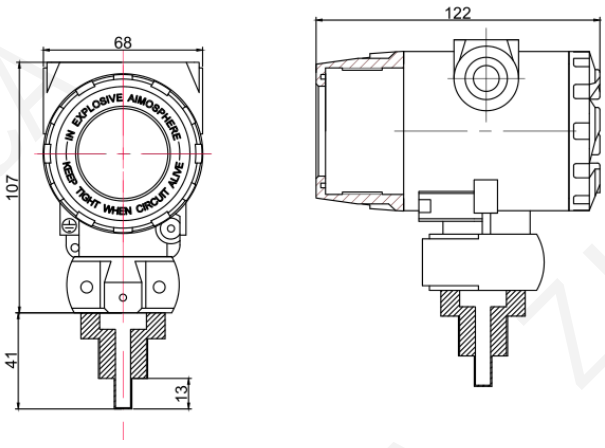


Six-digit Indicator Display Dimension Drawing

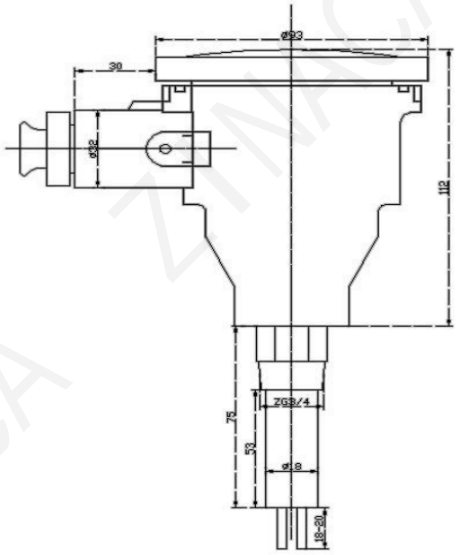


G1/2或G1/4外螺纹型

Percentage display size chart

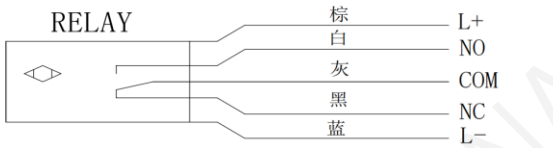


Explosion-Proof Economy Dimension Drawing

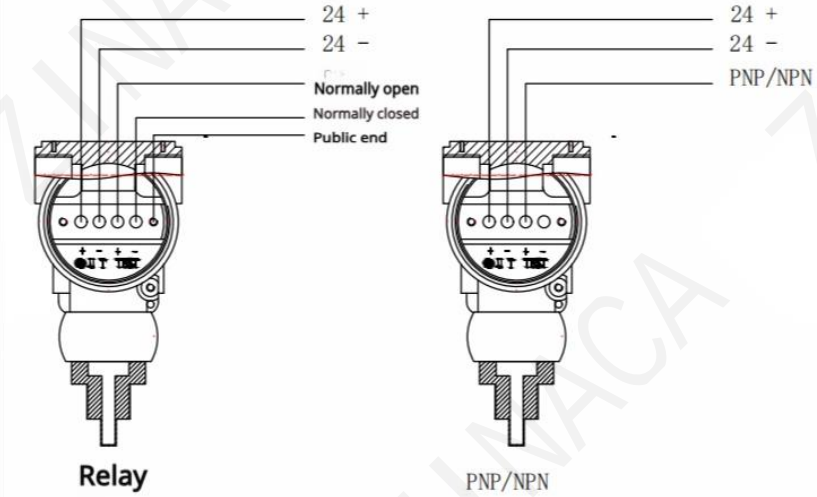


Explosion-proof Dimension Drawing

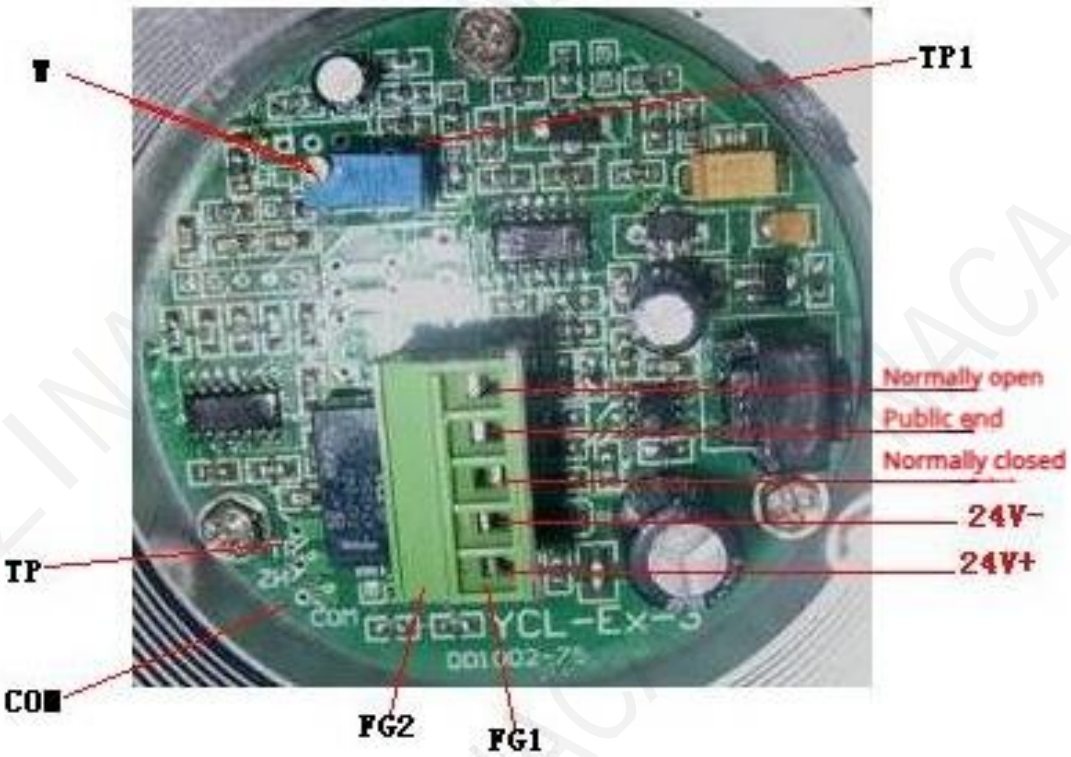
VII. Instrument Wiring



Explosion proof economy wiring diagram:



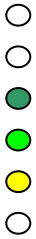
Explosion-proof wiring diagram:



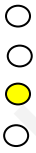
Explosion-proof wiring diagram: Terminal 1: DC24+; 2: DC24-; 3: Normally closed contact; 4: Common point; 5: Normally open contact Com is the common test point, TP is the test point corresponding to the fluid (flow) and the circuit voltage, W is the threshold voltage adjusting potentiometer, TP1 is the test point of the W potentiometer adjusting voltage, FG1 power supply indication, FG2 relay action indication.

VIII. Commissioning

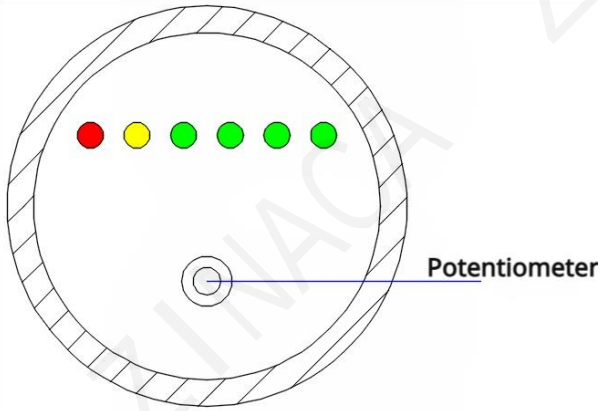
Red LED illuminated: current cut-off or flow rate below set value switch released



Yellow and green LEDs are on: the flow rate is greater than the set value, the more the green light turns on, the greater the flow rate.

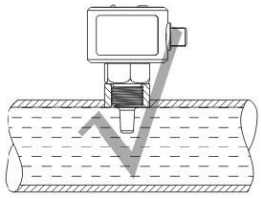
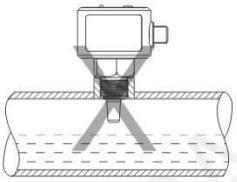
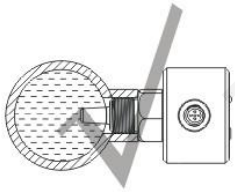
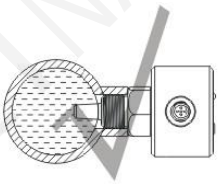
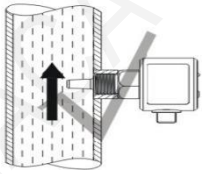
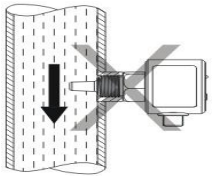
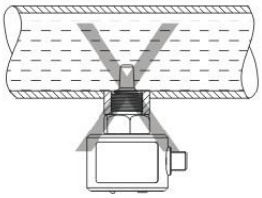
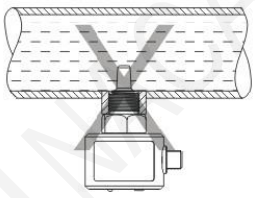


Yellow LED illuminated: Flow rate equal to set value switch activated.



When there is no flow rate in the pipeline power on to detect several LED lights on, if the green light is all on, please do not rotate clockwise, please rotate counterclockwise until the red light is on. If the red light is on, please do not rotate anti-clockwise. When the pipeline reaches the set flow rate stability, adjust the potentiometer to a green light, then rotate counterclockwise to the yellow light, then stop for about 10 seconds, then rotate counterclockwise to the red light.

IX. Instrumentation installation

1 、 horizontal installation: when the pipeline medium for the full pipe, you can use this installation, but when the pipeline liquid for the non-full pipe, you can not use this installation, because it may lead to the flow switch probe does not contact the medium, and can not work properly.		
2 、 side installation: in the pipeline medium for the full pipe or non-full pipe, can be used in this installation mode。		
3 、 Vertical installation: when the vertical pipeline installation, should be installed in the medium from the bottom to the top of the flow pipe section.		
4 、 Inverted: This installation is prohibited, this installation will be the bottom of the pipeline sediments cover the head, resulting in the flow switch can not work properly. And if the installation is not sealed tightly will lead to leakage of water for a long time soak the flow switch, resulting in damage to the flow switch, and this installation is not conducive to setting the parameters of the flow switch.		

X. Common Failure Analysis

fault phenomenon	Possible causes	Treatment
Power supply indicator does not light up	Incorrect wiring; damaged power module	Check the power supply wiring Check the power supply.
Flow rate indicator does not light up	Flow rate not reaching set value	Increase the flow rate or lower the setting
	The probe is fouled.	Cleaning dirt on the probe (probe dirt can be cleaned with solvents such as alcohol and acetone. It can be removed with metallurgical sandpaper if necessary.)
	Mechanical damage to the indicator light;	Repair
	Mechanical damage to the probe	Repair
	Abnormal power supply, circuit damage	Repair
Indicators all display normally, but the output is wrong	Incorrect wiring	Correct wiring
	Disconnection or short circuit in the wiring	Check wiring to repair breaks or shorts
	Damaged relay	Return to factory to replace relay
No response to potentiometer adjustment	Improperly adjusted tools	Replacement of suitable tools
	Mechanical damage to potentiometers	Repair