



instrument

**2024
PRODUCT
INTRODUCTION**

Radar Level Meter

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Company Profile

Weifang AOBO Instrument Technology Development Co., Ltd., founded in 2002, with registration capital of 10 million RMB, is a "High-Tech" and "Double-Software Certification" enterprise specialized in "flow measurement and intelligent measurement & control" industry, integrating R&D, production, sales and service.

The company has a core R&D team for computer software and technology, automatic intelligent control, HVAC engineering design and flow measurement. It has the ability to provide customers with specific solutions and complete sets of products according to their different needs, based on years of practical experience. Especially in the heating industry, by the customer's recognition, has a high reputation in the industry.

The products are mainly used in the measurement and control of "steam, liquid, gas, sewage and tap water"; and especially suitable for energy monitoring and energy-saving control in many industries, such as thermal power plants, thermal companies, residential heating, petroleum, chemical industry, papermaking, food, coating, printing & dyeing and HVAC.

Since its foundation, based on self-developed and leading technology, reliable quality, high-quality service and good reputation, our company has been warmly accepted by customers, and become a designated supplier for many central enterprises and listed companies.

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I. Products Introduction

1.1 Features

The LM78xx series is FMCW radar operating at 76-81 GHz, which has a maximum measuring range of 120m and a minimum blind zone of 8cm. It supports 4-wire and 2-wire applications. Higher operating frequency and shorter wavelength make it ideal for solid applications, including those with extreme dust and high temperature to + 200°C.



The radar consists of an electronic circuit coupled to a lens antenna and flange for quick and easy positioning.

The main benefits of using 78 GHz over devices using lower frequency are:

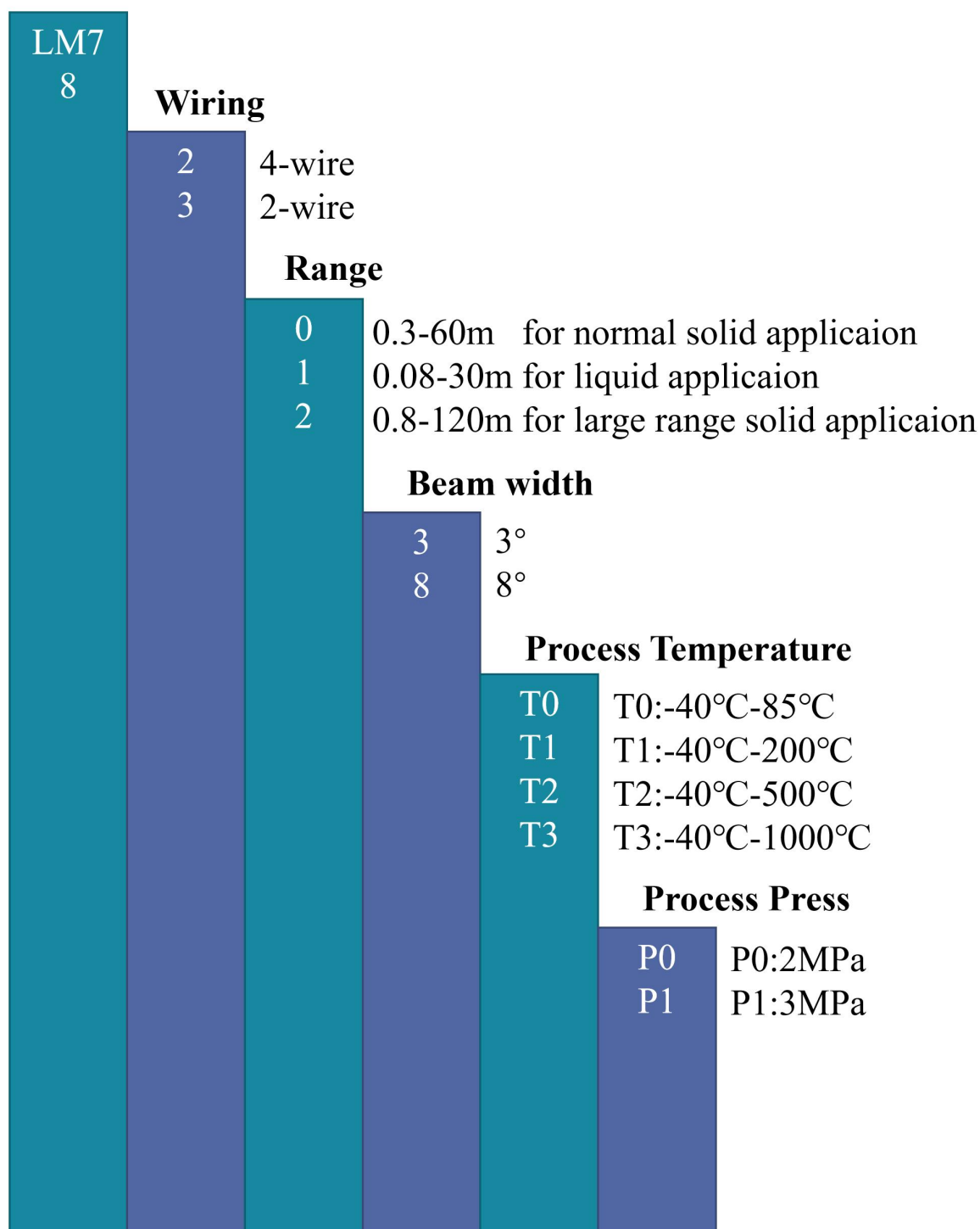
- Based on the self-developed CMOS millimeter wave RF chip, a more compact RF architecture, a higher signal-to-noise ratio, and a smaller blind zone are realized.
- 5GHz working bandwidth means higher measurement resolution and accuracy.
- 3°Antenna beam angle, so the interference in the environment has less impact on the instrument, and the installation is more convenient.
- Shorter wavelength yields good reflection properties on sloped solids, so aiming towards material angle of repose is usually not necessary.
- Support remote debugging and remote upgrading to reduce the cost of field personnel.

Communication and programming

LM78XX supports 485 bus protocol (4-wire), serial-port (2-wire) protocol, and hart (2-wire) protocol. It is very easy to install and configure via an optional graphical local display interface on PC. Or you can modify the built-in parameters either locally via the push buttons. Or you can use cell phone to control LM78xx via bluetooth.

1.2 80G Series selection guide

76-81GHz FMCW radar



1.3 ADBT-RD70 Series product Introduction

ADBT-RD71

Application : liquid, weakly corrosive liquid

Measuring range : 0-10m

Process connection : thread / flange

Antenna size : 22mm lens antenna

Accuracy : $\pm 2\text{mm}$

Protection grade : IP67

Explosion-proof grade : Exd II C T6 Gb

Frequency range : 76-81GHz

Power supply : two-wire/four-wire/six-wire(DC24V/AC220V)

Signal output : 4~20mA/HART/RS485 Modbus

Display programming : programmer with bluetooth/5G remote network debugging



ADBT-RD72

Application : weakly corrosive liquid

Measuring range : 0-120m

Process connection : 3-inch half thread/flange

Antenna size : 78mm lens antenna

Accuracy : $\pm 2\text{mm}$

Protection grade : IP67

Explosion-proof grade : Exd II C T6 Gb

Frequency range : 76-81GHz

Power supply : two-wire/four-wire/

six-wire(DC24V/AC220V)

Signal output : 4~20mA/HART/RS485 Modbus

Display programming : programmer with bluetooth/5G remote network debugging



ADBT-RD73

Application : solid powder, particles, and blocks

Measuring range : 0-120m

Process connection : flange

Antenna size : 78mm lens antenna (PTFE integral filled antenna)

Accuracy : $\pm 5\text{mm}$

Protection grade : IP67

Explosion-proof grade : Exd II C T6 Gb

Frequency range : 76-81GHz

Power supply :two-wire/four-wire/
six-wire(DC24V/AC220V)

Signal output : 4~20mA/HART/RS485 Modbus

Display programming : programmer with bluetooth/5G remote network debugging

ABDT-RD74

Application : highly corrosive liquids or liquids containing vapors

Measuring range : 0-60m

Process connection : stainless steel+PTFE flange

Antenna size : fully enclosed lens antenna

Accuracy : $\pm 2\text{mm}$

Protection grade : IP67

Explosion-proof grade : Exd II C T6 Gb

Frequency range : 76-81GHz

Power supply :two-wire/four-wire/
six-wire(DC24V/AC220V)

Signal output : 4~20mA/HART/RS485 Modbus

Display programming : programmer with bluetooth/5G remote network debugging

ABDT-RD75

Application : hygienic, liquid medicine, chemical raw materials

Measuring range : 0-20m

Process connection : Clamp connection



Antenna size : 32mm lens antenna

Accuracy : $\pm 2\text{mm}$

Protection grade : IP67

Explosion-proof grade : Exd II C T6 Gb

Frequency range : 76-81GHz

Power supply : two-wire/four-wire/
six-wire(DC24V/AC220V)

Signal output : 4~20mA/HART/RS485 Modbus

Display programming : programmer with bluetooth/5G

remote network debugging

ABDT-RD76

Application : blast furnace, molten iron, and combustion furnace material levels

Measuring range : 0-30m

Process connection : Special Steel

Antenna size : 78mm lens antenna

Accuracy : $\pm 5\text{mm}$

Protection grade : IP67

Explosion-proof grade : Exd II C T6 Gb

Frequency range : 76-81GHz

Power supply : two-wire/four-wire/
six-wire(DC24V/AC220V)

Signal output : 4~20mA/HART/RS485 Modbus

Display programming : programmer with bluetooth/5G

remote network debugging



II. Technical Specifications

Frequency	76GHz ~ 81GHz, 5GHz FMCW bandwidth
Measuring range	XXXX: 0.3 m ~ 60m (solid)

	XXXX: 0.08m~30m (liquid)
	XXXX2: 0.6m ~ 120m (solid)
Measurement accuracy	±1mm
Beam angle	3°/8°
Minimum measured dielectric constant	≥2
Power	15~28VDC
Communication	MODBUS
	HART/series
Signal output	4 ~ 20mA or RS-485
	4~20mA
Fault output	3.8mA, 4mA, 20mA, 21mA, hold
Field operation / programming	128 × 64 dot matrix display / 4 buttons
	PC software
	bluetooth
Humidity	≤95%RH
Enclosure	Aluminum alloy, stainless steel
Antenna type	Lens antenna, can be equipped with antenna cover / anti-corrosive antenna / flange isolated by quartz
Process temperature	T0:-40~85℃; T1:-40~200℃; T2:-40~500℃; T3:-40~1000℃
Process pressure	-0.1~2MPa
Product size	Ø100*270mm
Cable entry	M20*1.5
Recommended cables	AWG18 or 0.75mm ²
Protection class	IP67
Explosion-proof grade	ExdialICT6
Installation method	thread or flange
Weight	2.480Kg/2.995Kg
Packing box size	370*270*180mm

III. Installation

The main concern of installation is to aim to the material surface under test and on the other hand to avoid false echoes. Typical scenes are list below for correct installation.

■ Keep the antenna beam free of any interference such as ladders, pipes, steps, as shown in Fig.1.

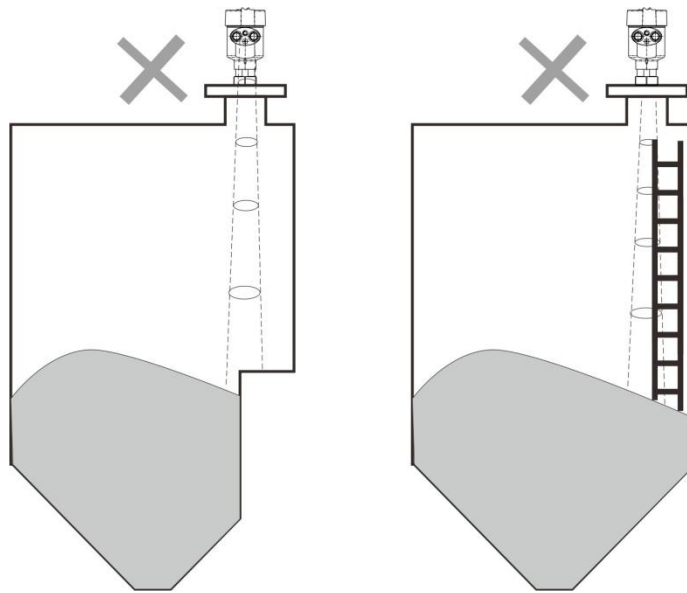


Fig.1 Example for avoiding false echo

■ Avoid the contact between antenna beam and feeding flow, as shown in Fig.2.

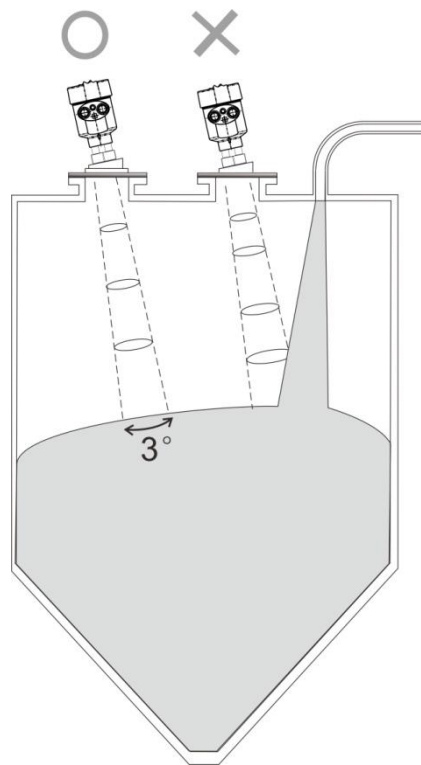


Fig.2 Example for avoiding false echoes

- At least 200mm away from the wall for avoiding false echo.

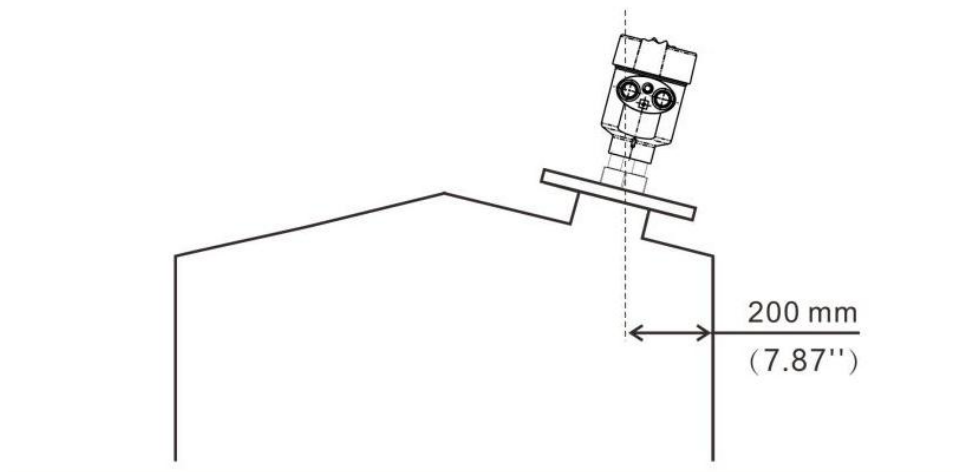


Fig.3 Example for avoiding false echo

- Aiming the antenna beam to the bottom of tapered vessel for avoiding false echo when the level is at the bottom of the tapered vessel.

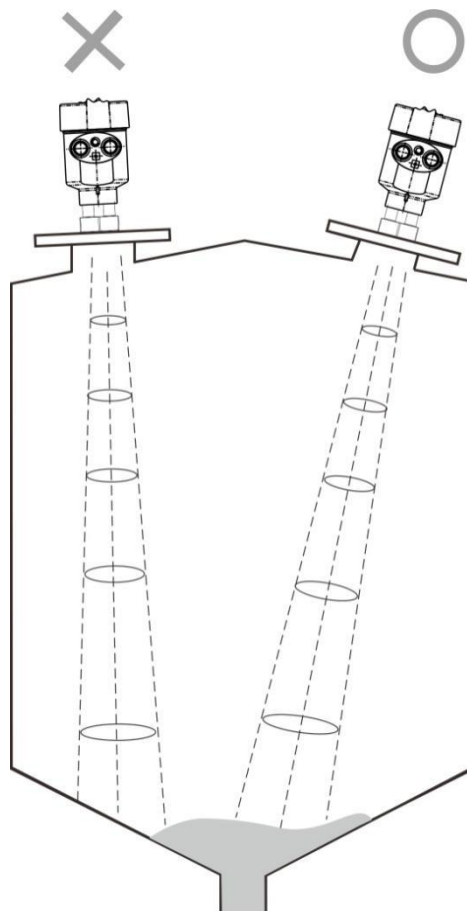
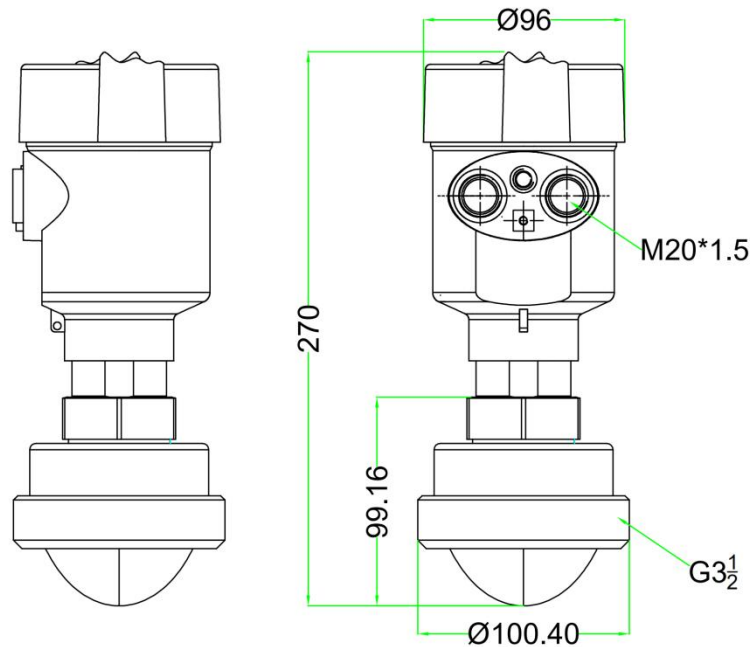


Fig.4 Example for avoiding false echo

IV. Dimensions

With 3° antenna beam width



With 8° antenna beam width

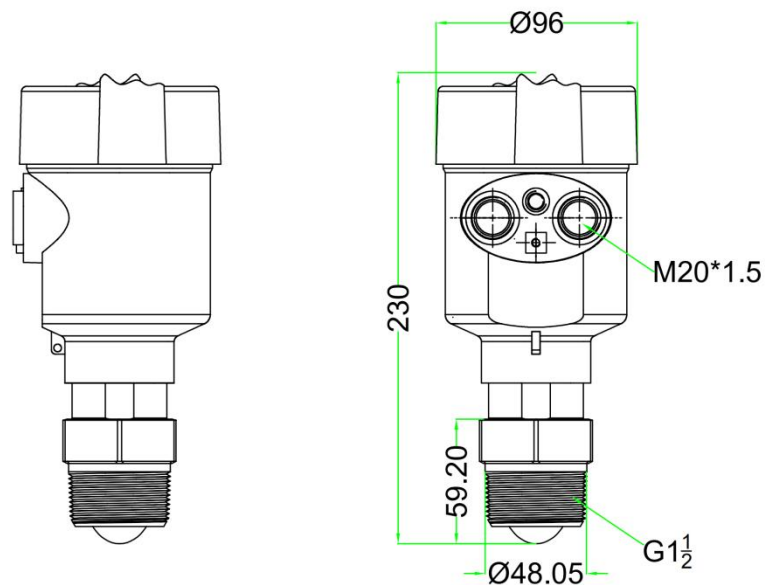
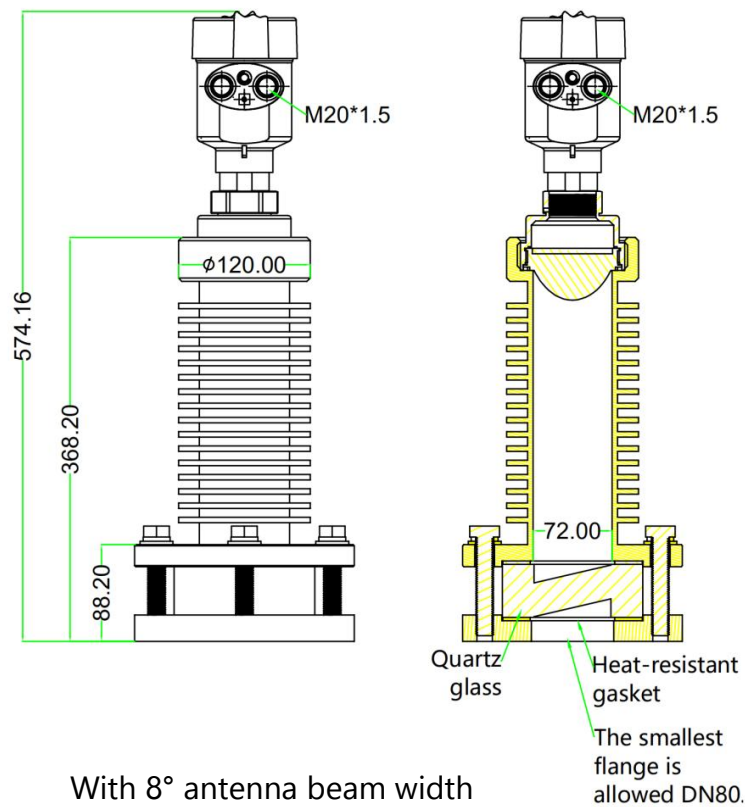


Fig.5 Dimensions for LM78xx series

With 3° antenna beam width



With 8° antenna beam width

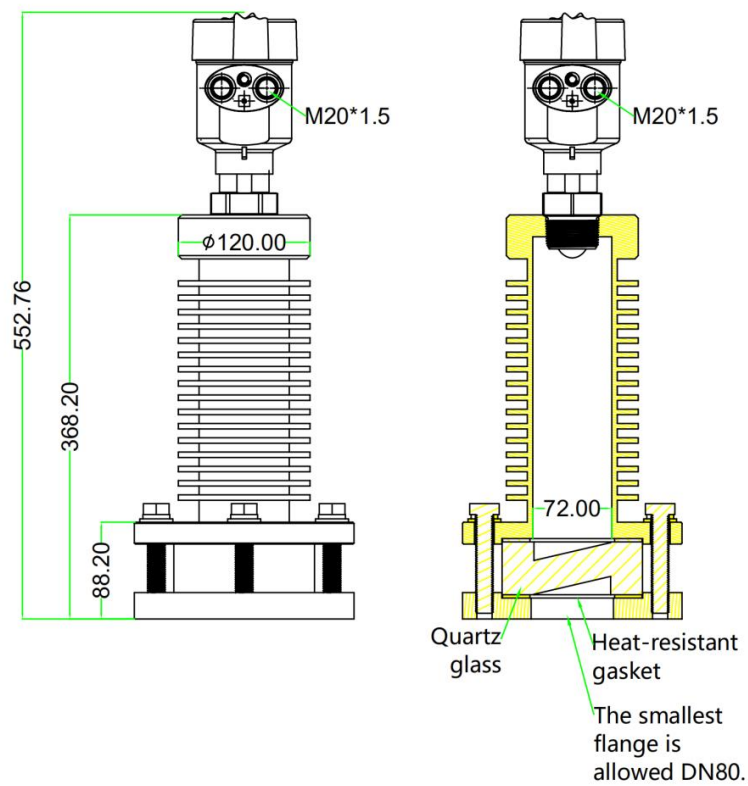


Fig.6 Diagram of high temperature resistant structure(for T2 and T3)

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