



# SIL

## Functional Safety Certificate

**No. 3J240731.YICQC20**

Test Report / Technical Construction File no. CTICAJ338242131072615AR

**Certificate's Holder:** Yueqing Instrument Complete Co., Ltd.  
No. 3 SongHu Road, Songhu Industrial Zone, YueChen Town, YueQing City, ZheJiang Province, China.

**Product:** Pneumatic Ball valve  
**Model(s):** (see the following annex)

**Standard:** Has been assessed per the relevant requirements of:  
IEC 61508:2010 Parts 1-7

And meets requirements providing a level of integrity to:  
Systematic Capability: SC 3(SIL 3 Capable)  
Random Capability: Type A Element  
SIL 2 @ HFT=0, SIL 3 @ HFT=1; Route 2H  
PFD<sub>AVG</sub> and Architecture Constraints must be verified each application

\*Safety function:

When the liquid level in the container is raised and lowered, the float in the main tube also rises and falls, and the permanent magnet steel in the float passes through the magnetic coupling to the field indicator.

\* Is suitable to be safety function according to the description and the configuration defined in Annex I

**Verification Mark:**



The Verification Mark can be affixed on the product. It is NOT permitted to alter the Verification Mark in any way

**Remark:** This SIL Verification of Compliance has been issued on a voluntary basis. ECM confirms that a Test Report is existent for the above listed product(s) and found to meet the requirements of above standards for application in safety related system up to Safety Level of **SIL 3**. The unit must be properly designed into a Safety Instrument Function as per the requirements in the Safety Manual. The Verification Mark shown above can be affixed on the product. It is NOT permitted to alter the Verification Mark in any way. In addition the Verification's Holder is NOT allowed to transfer the Verification to third parties. This certificate can be checked for validity at [www.entecerma.it](http://www.entecerma.it)

**Date of issue 01 August 2024**

**Expiry date 30 July 2029**

**For online check:**



**Approver**  
Ente Certificazione Macchine  
Legal Representative  
Luca Bedonni



**Ente Certificazione Macchine**

Via Cà Bella, 243 - 40053 Valsamoggia Loc. Castello di Serravalle (Bo) Italy  
☎ +39.0516705141 📠 +39.0516705156 ✉ info@entecerma.it 🌐 www.entecerma.it



# Annex I

## No. 3J240731.YICQC20

Test Report / Technical Construction File no. CTICAJ338242131072615AR

- The use of the product [Series Puhvisi valves] must obey the required rules to conservation of SIL3 properties, these rules are recalled in the §6 of the Assessment Report reference: [SIL Capability assessment report].
- The product version of hardware components used for validation and type tests are the following:

<b>Product:</b>	Pneumatic Ball valve
<b>Model(s):</b>	ZSHR-25C, DN50, DN80, DN100, DN150, DN200, DN250, DN300, DN350, DN400, DN450, DN500, DN600, DN700, DN800, DN850, DN900, DN1000, ZSHR-64C DN50, DN80, DN100, DN150, DN200, DN250, DN300, DN350, DN400, DN450, DN500, DN600, DN700, DN800, DN900, DN1000, ZSHRy-16 DN25 DN50, DN80, DN100, DN150, DN200, DN250, DN300, DN350, DN400, DN450, DN500, DN600, DN700, DN800, DN900, DN1000, ZSHRy-100 DN25 DN50, DN80, DN100, DN150, DN200, DN250, DN300, DN350, DN400, DN450, DN500, DN600, DN700, DN800, DN900, DN1000, ZSHVy-16 DN25 DN50, DN80, DN100, DN150, DN200, DN250, DN300, DN350, DN400, DN450, DN500, ZSHVy-64 DN25 DN50, DN80, DN100, DN150, DN200, DN250, DN300, DN350, DN400, DN450, DN500, ZSHE-16 DN25 DN50, DN80, DN100, DN150, DN200, DN250, DN300, DN350, DN400, DN450, DN500, DN600, DN700, DN800, DN900, DN1000, ZSHE-64 DN25 DN50, DN80, DN100, DN150, DN200, DN250, DN300, DN350, DN400, DN450, DN500, DN600, DN700, DN800, DN900, DN1000, ZSHR-150LB 2", 3", 4", 5", 6", 8", 10", 12", 14", 16", 18", 20", 24", 28", 30", 32", ZSHR-2500LB 2", 3", 4", 5", 6", 8", 10", 12", 14", 16", 18", 20", 24", 28", 30", 32", ZSHRy-150LB 2", 3", 4", 5", 6", 8", 10", 12", 14", 16", 18", 20", 24", 28", 30", 32", ZSHRy-2500LB 2", 3", 4", 5", 6", 8", 10", 12", 14", 16", 18", 20", 24", 28", 30", 32", ZSHVy-150LB 2", 3", 4", 5", 6", 8", 10", 12", 14", 16", ZSHVy-600LB 2", 3", 4", 5", 6", 8", 10", 12", 14", 16", ZSHE-150LB 2", 3", 4", 5", 6", 8", 10", 12", 14", 16", 18", 20", 24", 28", 30", ZSHE-2500LB 2", 3", 4", 5", 6", 8", 10", 12", 14", 16", 18", 20", 24", 28", 30"

- Acceptable environmental constraints for the system are recalled in the safety Manual (Ref: [SIL-SM-02]). These elements must be checked for each integration operation of the product.
- The SIL 3 capable certified safety instrumented function of the product is the following:
  - SF1: To Close on demand.
  - SF2: To Open on demand.
- Hypothesis used for calculations are presented here under:
  - The mode of operation is Low demand, which means less than 1 trip demand each year;

Component architecture	SIL Capability	Demand frequency	PFD
1oo1 configuration	SIL2	Low	6.94E-03
1oo2 configuration	SIL3	Low	1.83E-04

Safety function	Failure rate	Undetected dangerous failure rate	Tests intervals	MTTR
SF1	8.75E-07	3.61E-07	12months	24h
SF2	4.77E-07	1.21E-07	12months	24h

- The safety integrated level of the safety function using the product shall be calculated taking into account the characteristics of the whole system.