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**NATIONAL STANDARD OF THE  
PEOPLE'S REPUBLIC OF CHINA**

**GB/T 17213.15-2017**

Replacing GB/T 17213.15-2005

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**Industrial-process control valves -- Part 8-3: Noise  
considerations -- Control valve aerodynamic noise prediction  
method**

工业过程控制阀 第8-3部分：噪声的考虑 空气动力流流经控制阀产生的噪声预测  
方法

**(English Translation)**

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## Foreword

GB/T 17213 "industrial process control valve" is divided into the following sections.

- Part 1. Control valve terms and general principles (GB/T 17213.1);
- Part 2-1. Flow capacity Calculation formula for fluid flow rate under installation conditions

(GB/T 17213.2);

Part 2-3 - Test Procedures for Flow Capability (GB/T 17213.9);

--- Part 2-4. Circulation capacity inherent flow characteristics and adjustable ratio (GB/T 17213.10);

--- Part 2-5. Circulation capacity Fluid through the interstage recovery multi-stage control valve formula (GB/T 17213.17);

--- Part 3-1. Dimensions Two-way ball-type through-flow control valve Flange end distance and two-way ball angle control valve Flange center to flange End surface spacing (GB/T 17213.3);

--- Part 3-2. Dimensionally Stroke control valve (excluding butterfly valves) End face distance (GB/T 17213.11);

--- Part 3-3. Dimension Butt welded two-way ball-type through control valve end (GB/T 17213.12);

--- Part 4. Tests and routine tests (GB/T 17213.4);

--- Part 5. Signs (GB/T 17213.5);

--- Part 6-1. Installation details of the positioner and control valve actuator connections. Mounting of the positioner on the linear actuator (GB/T 17213.6);

--- Part 6-2. Installation details of the positioner and control valve actuator connections. Mounting of the positioner on the angular travel actuator (GB/T 17213.13);

--- Part 7. Control valve data sheets (GB/T 17213.7);

--- Part 8-1. Noise considerations Noise generated by the flow of aerodynamic flow through control valves in the laboratory (GB/T 17213.8);

--- Part 8-2. Noise considerations Measurement of the noise generated by the flow of hydraulic fluid through control valves in the laboratory (GB/T 17213.14);

--- Part 8-3. Noise considerations Noise prediction methods for aerodynamic flow through control valves (GB/T 17213.15);

--- Part 8-4. Noise Considerations Noise Prediction Method for Flow of Liquid Flow Through Control Valves (GB/T 17213.16);

--- Part 9. Test procedures for step input response measurement (GB/T 17213.18).

This section GB/T 17213 Part 8-3.

This section drafted in accordance with GB/T 1.1-2009 given rules.

This Part replaces GB/T 17213.15-2005 "Industrial Process Control Valves Part 8-3.

Consideration of noise Aerodynamic flow through Control valve noise prediction method ", and GB/T 17213.15-2005 compared to the main technical changes are as follows.

- Updated some symbols and their definitions (see Chapter 4, 2005 edition Chapter 4);
- Increasing the pressure difference ratio formula [see formula (1)];
- Modify the method of calculating the pressure under the contraction section instead of calculating the pressure difference [see (3), 2005 edition (2)];
- Modify the reduced flow section critical pressure calculation method, instead of calculating the pressure ratio [see formula (4), 2005 layout (3)];
- Modify the correction coefficient  $\alpha$  expression, instead of using the pressure ratio to represent [see formula (5), 2005 layout (4)];
- Modify the calculation method of the downstream pressure at the breakpoint instead of calculating the pressure difference ratio [see formula (6), 2005 format (5)];
- Modify the calculation of the downstream pressure at the beginning of the V state instead of calculating the pressure difference [see (7), 2005 edition (6)];
- Modified to determine the criteria for each state, instead of judged by the pressure ratio (see 5.2, 2005 version 5.2);
- Increase the inlet fluid density  $\rho_1$  calculation (see 5.3.3);
- Remove the sound power ratio  $r_w$  calculation (see 2005 version 5.3.3);
- Remove the sound power ratio  $r_w$  (see 2005 version of Table 3);
- Remove the state I to state V calculation, it is integrated into Table 3 (see 2005 edition 5.4,5.5);
- Increased by the frequency of the internal sound pressure level calculation, and gives the frequency range (see 5.4.4);
- Modify the propagation loss through the pipe wall calculation formula [see 5.5, formula (20a), 2005 edition 5.6];
- Modify the frequency coefficient  $G_x$  and  $G_y$  formula (see Table 6, 2005 edition of Table 4);
- Modify the formula of weighted A-weighted sound pressure level at 1m outside the pipe wall [see 5.6, formula (25), 2005 edition 5.6];
- Modify the calculation process (see 5.7, 2005 version 5.7);
- Modify the multi-flow multi-stage valve Machining Jet Mach number formula [see 6.4, equation (32), 2005 edition 6.4];

- Modify the multi-flow multi-stage valve trim under the conditions of peak frequency formula [see 6.4, equation (33), 2005 edition 6.4];
- Removed the "valve not included in this section" clause (see 6.5 of 2005);
- Modify the 7.1 statement, made clear that the seventh chapter applies to the "expansion pipe mounted on the valve downstream of the transition point does not exceed the total angle of 30 °" Requirements (see 7.1, 2005 edition 7.1);
- Increasing the expansion tube after the conversion of the flow power calculation formula [see 7.2, equation (36)];
- Modify the calculation formula of the peak frequency in the Chapter 7 case [see 7.2, equation (37), 2005 edition 7.2];
- Modify the calculation formula of the sound effect coefficient in the seventh chapter [see 7.2, (38), 2005 edition 7.2];
- Modify the calculation formula for the internal sound pressure level in chapter 7 (see 7.2, equation (41), 2005 edition 7.2);
- Added the "experiment can determine the coefficient of sound valve" chapter (see Chapter 8);
- Added the "downstream installation of two or more fixed-area step-down parts of the noise generated when calculating" Chapter (see Chapter 9);
- Give a new calculation example (see Appendix A).

This section uses the translation method is equivalent to using IEC 60534-8-3:2010 "industrial process control valves Part 8-3. Consideration of noise Aerodynamic flow through the control valve noise prediction method. " the documents of our country that are consistent with the corresponding international documents that are normative references in this section are as follows.

- GB/T 17213 (all parts) Industrial Process Control Valves [IEC 60534 (all parts)]
- GB/T 17213.1-2015 industrial process control valves - Part 1. Control valve terms and general principles (IEC 60534-1:2005, IDT) this part is proposed by China Machinery Industry Federation.

This part of the National Industrial Process Measurement Control and Automation Standardization Technical Committee (SAC/TC124) centralized.

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