

JAPANESE
INDUSTRIAL
STANDARD

Translated and Published by
Japanese Standards Association

JIS B 2061 : 2023

(JVMA/JSA)

Faucets, ball taps and flush valves

ICS 23.060.01 ; 91.140.60

Reference number : JIS B 2061 : 2023 (E)

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B 2061 : 2023

Date of Establishment: 1950-12-15

Date of Revision: 2023-06-20

Date of Public Notice in Official Gazette: 2023-06-20

Investigated by: Japanese Industrial Standards Committee
Standards Board for ISO area

JIS B 2061 : 2023, First English edition published in 2024-01

Translated and published by: Japanese Standards Association
Mita MT Building, 3-13-12, Mita, Minato-ku, Tokyo, 108-0073 JAPAN

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Foreword

This Japanese Industrial Standard has been revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard submitted by Japan Valve Manufacturers' Association (JVMA)/Japanese Standards Association (JSA) with a draft being attached, based on the provision of Article 12, paragraph (1) of the Industrial Standardization Act applied mutatis mutandis pursuant to the provision of Article 16 of the said Act. This edition replaces the previous edition (**JIS B 2061** : 2017), which has been technically revised.

However, **JIS B 2061** : 2017 may be applied in the **JIS** mark certification based on the relevant provisions of Article 30, paragraph (1), etc. of the Industrial Standardization Act until 19 June 2024.

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Faucets, ball taps and flush valves

1 Scope

This Japanese Industrial Standard specifies the single faucets, combination faucets, stop cocks, ball taps and flush valves/flush faucets (including electrically open/close type of each category) (hereafter generically referred to as faucets) which are directly connected to water supply or which are connected to the piping downstream of the water receiving tank directly connected to water supply.

This Standard is applicable to the following faucets.

- a) Single faucets, combination faucets and stop cocks of working pressure 0.75 MPa max. for feeding water and/or hot water. The faucets exclusively used for hot water feeding apparatus utilizing solar energy are excluded.
- b) Ball taps of working pressure 0.75 MPa max. for feeding water.
- c) Flush valves/flush faucets of working pressure 0.75 MPa max.

NOTE The pressure used in this Standard refers to gauge pressure. The working pressure refers to the pressure at which the water discharge is stopped.

2 Normative references

Part or all of the provisions of the following standards, through reference in this text, constitute provisions of this Standard. For standards with the year indication, only the editions of the indicated year shall be applied and the revisions (including amendments) made thereafter shall not be applied. For those without the indication of the year, the most recent editions (including amendments) shall be applied.

JIS B 0100 *Glossary of terms for valves*

JIS B 0202 : 1999 *Parallel pipe threads*

JIS B 0203 : 1999 *Taper pipe threads*

JIS S 3200-1 *Equipment for water supply service — Test methods of hydrostatic pressure*

JIS S 3200-2 *Equipment for water supply service — Test method of low temperature resistant*

JIS S 3200-3 *Equipment for water supply service — Test method of water hammer*

JIS S 3200-4 *Equipment for water supply service — Test method of prevention from back current*

JIS S 3200-5 *Equipment for water supply service — Test methods of destruction by vacuum pressure*

JIS S 3200-7 *Equipment for water supply service — Test methods of effect to water quality*

JIS S 3201 *Testing methods for household water purifiers*

JIS S 3241 *Household water purifiers*

3 Terms and definitions

For the purpose of this Standard, the following terms and definitions, and those given in JIS B 0100 apply.

3.1

back current preventive device

device that securely prevents the back current which occurs when the inlet pressure drops below the outlet pressure

3.2

feed suspension

temporary stoppage of water discharge from a combination faucet under the condition of mixing cold and hot water

3.3

ordinary temperature

temperature of $20\text{ °C} \pm 15\text{ °C}$

3.4

vacuum pressure relief device

device which relieves negative pressure generated on inlet side

3.5

discharge volume regulation performance

function of self-stop after discharging water of preset quantity

3.6

self-closing type

construction in which water is discharged by hand or foot operation and stops automatically

3.7

hose coupling type

construction designed to connect a hose directly or through a joint

3.8

common use type

construction which enables the use in both cold and other districts

3.9

thermostatic combination faucet

combination faucet incorporating a mechanism which automatically adjusts the mixing proportion of cold and hot water amounts, and discharges mixed water at the temperature which is preset by operating the temperature adjusting handle, in the event of fluctuations in the pressure, temperature, etc. of hot and cold water

3.10

mixing combination faucet

combination faucet capable of adjusting the temperature of discharging water by a single handle operation

3.11

single-lever combination faucet

combination faucet capable of discharging and stopping water, and adjusting the water discharge flow rate and the temperature of discharging water by a single handle operation

3.12

concealed type

construction in which the mechanism part of faucet is concealed in a wall or deck

3.13

electrically open/close type

construction in which a valve is opened/closed electrically

3.14

branch connection port

screw connection part at the end of the branched flow path

3.15

branch stop cock

stop cock provided with a branch connection port on the inlet side

3.16

branch type

construction in which the flow path branched from the inlet side is provided with a water stopping mechanism and a branch connection port

3.17

with branch connection port

construction in which the flow path branched from the inlet side is provided with a branch connection port

3.18

two ports/three ports/four ports

construction in which each of the multiple flow paths branched from the common feed water port is provided with a water stopping mechanism and a spout

3.19

dividing two ports/ dividing four ports

construction in which each of the multiple flow paths branched from the common feed water port is provided with a water stopping mechanism and a spout in back-to-back orientation

3.20

main stop system

construction in which the outlet side flow path is provided with a water supply port and a water return port for a water purifier, an electric water heater, etc.

3.21

Y-type stop cock

stop cock, mainly used for indoor water feed pipes, with a spindle mounted in the oblique direction and with a union joint on the outlet side

3.22

faucet aerator

device which mixes air in the flowing water and prevents water from splashing

3.23

flow straightener

device which straightens the flow of discharging water

3.24

flow rate controller

device which automatically controls water at the predetermined flow rate in the event of pressure fluctuations

3.25

strainer, filter

device which filters foreign matters in the flowing water by a wire net, etc.

3.26

emergency water stopping device

device which automatically stops water discharge, which is used for emergency response in the event of accidental disconnection of an automatic coupling joint

3.27

automatic coupling joint type

construction in which an automatic coupling joint can be directly connected

3.28

hot water saving type

general term for such faucets as water-stop-at-hand type, small flow rate water discharge type and water-preceding-discharge type of thermostatic combination faucets, mixing combination faucets or single-lever combination faucets, all of which are capable of reducing the consumption of hot water by a flow rate regulator and a temperature regulator installed within the reach of a user

3.29

water-stop-at-hand type, A1

faucets of hot water saving type used as kitchen faucets, bathroom shower faucets or bathroom shower and bath faucets whose water discharge/stop can be operated within the reach of a user, which satisfy the construction requirements specified in 6.6

3.30

small flow rate water discharge type, B1

faucets of hot water saving type used as bathroom shower faucets or bathroom shower bath faucets, which satisfy the small flow rate water discharge performance specified in 5.16

3.31

water-preceding-discharge type, C1

faucets of hot water saving type used as kitchen faucets and washroom faucets, which are designed so as to reduce the consumption of hot water by an unintentional operation, and which satisfy the construction requirements specified in 6.7

3.32

water discharge plate

part of a spout of faucet which influences the shape, state, etc. of the water discharged

3.33

water discharge force

force of water discharged from the water discharge plate

Note 1 to entry It is measured by a water discharge force measuring device and expressed in newtons (N).

3.34

water discharge flow rate

amount of water, per unit time, discharged from the water discharge plate

Note 1 to entry It is measured by a flowmeter and expressed in litres per minute (L/min).

3.35**water receiving plate**

plate for receiving water discharged from the water discharge plate for the purpose of measuring the water discharge force

3.36**water discharge force measuring device**

device for measuring the force of water discharged from the water discharge plate

3.37**flowmeter**

device for measuring the amount of discharged water per unit time

3.38**pressure receiving face**

face of the water receiving plate which receives water discharged from the water discharge plate

3.39**water purification cartridge**

cartridge containing activated carbon as the main ingredient for the removal of residual chlorine and other dissolved substances in city water

Note 1 to entry Some cartridges are combined with other filtering materials with the aim of removing turbidity.

3.40**water purifier built-in type**

kitchen faucet with a built-in water purification cartridge, satisfying the construction requirements specified in 6.8

3.41**big flush**

flushing with high volume of water by a closet bowl with switching mechanisms for big and small flushing

3.42**small flush**

flushing with low volume of water by a closet bowl with switching mechanisms for big

and small flushing

3.43

water discharge amount of closet flush valve

amount of water discharged by one big flushing operation (movement) of a closet bowl

3.44

water discharge amount of urinal flush valve

amount of water discharged by one flushing operation (movement) of a urinal

Note 1 to entry Some automatic flush valves have a discharge volume control, so that the volume of water discharged can be varied depending on the usage conditions.

4 Classification, nominal size and sub-division

The classification (see Annex H), nominal size and sub-division of faucets shall be as given in Table 1.

Table 1 Classification, nominal size and sub-division

Division	Classification	Nominal size			Sub-division
Single faucet	Wall faucet	13	20	25	Rotary spout type, swing type, horizontal swing type, goose-neck type, hose coupling type, concealed type, two ports/three ports/four ports, branch type, shower type
	Lavatory faucet	13	20	25	
	Horizontal wash basin faucet	13	—	—	
	Vertical wash basin faucet	13	—	—	
	Wall mounted laboratory faucet	13	—	—	One port/two ports/three ports/four ports
	Deck mounted laboratory faucet	13	—	—	One port/two ports/three ports/four ports, dividing two ports/dividing four ports
	Horizontal drinking faucet	13	—	—	
	Vertical drinking faucet	13	—	—	
Combination faucet	Main stop system faucet	13	—	—	For water purifier, for electric water heater
	Wall mounted thermostatic combination faucet	13	20	25	Shower type, shower and bath type, concealed type, hose coupling type, two ports/three ports/four ports, branch type, with branch connection port, water saving type (except two-handle combination faucet)
	Deck mounted thermostatic combination faucet	13	20	25	
	Wall mounted mixing combination faucet	13	20	—	
	Deck mounted mixing combination faucet	13	—	—	
	Wall mounted single-lever combination faucet	13	20	—	
	Deck mounted single-lever combination faucet	13	20	—	

Table 1 (concluded)

Division	Classification	Nominal size			Sub-division
Combination faucet	Wall mounted two-handle combination faucet	13	20	—	For water purifier, for electric water heater Shower type, hot water saving type (except two-handle combination faucet)
	Deck mounted two-handle combination faucet	13	20	—	
	Main stop system wall mounted mixing combination faucet	13	—	—	
	Main stop system deck mounted mixing combination faucet	13	—	—	
	Main stop system wall mounted single-lever combination faucet	13	—	—	
	Main stop system deck mounted single-lever combination faucet	13	—	—	
	Main stop system wall mounted two-handle combination faucet	13	—	—	
	Main stop system deck mounted two-handle combination faucet	13	—	—	
Stop cock	Angle stop cock	13	20	—	Branch type, with branch connection port
	Straight stop cock	13	20	—	
	Concealed long shank stop cock	13	20	25	
	Y-type stop cock	13	20	—	
	Branch stop cock	13	20	—	
Ball tap	Horizontal low tank ball tap	13	—	—	
	Vertical low tank ball tap	13	—	—	Submerged spout type
	Horizontal ball tap	13	20	25	
Flush valve /flush faucet	Closet flush valve	—	—	25	With branch connection port, water saving type
	Urinal flush valve	13	—	—	Water saving type
	Urinal flush faucet	13	—	—	

5 Performance

5.1 Hydrostatic pressure resistance

The faucets, when tested in accordance with 8.1, shall be free from deformation, fracture, water leakage, seepage or other defects on the pressure retaining part.

5.2 Low temperature resistance

The faucets for cold district or for common use, when tested in accordance with 8.2, shall satisfy the following.

- a) There shall be no fracture or deformation due to freeze.
- b) The faucets shall satisfy the following performance requirements after thawing.
 - 1) Hydrostatic pressure resistance
 - 2) Water hammer
 - 3) Back current prevention
 - 4) Vacuum pressure relief

- 5) Handling
- 6) Water discharge
- 7) Water stopping
- 8) Temperature self-regulation
- 9) Insulation

5.3 Water hammer

The faucets, when tested in accordance with **8.3**, shall have a water hammer value not more than 1.5 MPa.

The water hammer value shall be the pressure which does not include the water pressure during water discharge.

5.4 Back current prevention

The back current prevention of faucets with a back current preventive device shall be as follows. The faucet of which the back current preventive device does not have a water stopping mechanism on the outflow side, and is opened in the air, may satisfy **a)** only.

- a) **By the low pressure test** When tested in accordance with **8.4 a)**, the faucet shall be free from leakage from the seat of back current preventive device or other abnormalities.
- b) **By the high pressure test** When tested in accordance with **8.4 b)**, the faucet shall be free from leakage from the seat of back current preventive device, deformation or fracture of seat or other abnormalities.

5.5 Vacuum pressure relief

The vacuum pressure relief shall be as follows.

- a) The water feeding implement having a built-in vacuum pressure relief device, when tested in accordance with **8.5**, shall satisfy the water level rising specified in Table 2.

Table 2 Permissible water level rising

Unit: mm		
Vertical distance between the position where the back current preventive function of vacuum pressure relief device is effective and the water surface ^{a)}	Vertical distance at testing (A)	Permissible water level rising (B)
40 or over to and excl. 100	40	20 max.
100 or over	100	50 max.
Note ^{a)} Distance under ordinary assembly.		

- b) For the water feeding implement provided with a spout clearance, if the clearance of the dimensions as specified in Annex A cannot be secured, the test shall be performed in accordance with **8.5** and there shall be no backflow of water into the spout.

5.6 Durability

The durability of faucets, when tested in accordance with **8.6**, shall satisfy the following requirements.

- a) Back current prevention
- b) Vacuum pressure relief
- c) Water stopping

5.7 Effect to water quality

For the effect to water quality of faucets and ball taps ¹⁾ for drinking water, the corrected values, when tested in accordance with **8.7**, shall conform to the criteria given in the relevant ministerial ordinances.

NOTE Relevant ministerial ordinances include the “Ordinance of the ministry concerning the standards for construction and materials of water feeding equipment”.

Note ¹⁾ These refer to the faucets used in kitchen or washing room for drinking water or ball taps for water receiving tank for drinking water, in usual service.

5.8 Handling

The handling of faucets, when tested in accordance with **8.8**, shall be smooth and secure.

5.9 Water discharge

5.9.1 Water discharge of faucets, ball taps and flush faucets

The water discharge of faucets, ball taps and flush faucets, when tested in accordance with **8.9.1**, shall satisfy the following requirements. The water discharge performance of the combination faucet shall be determined by the water discharge flow rate of cold water side or hot water side, whichever the flow rate is smaller. The water discharge performance of the laboratory faucets shall be determined by the water discharge flow rate of one port.

For the faucet equipped with a water saving disc holder, where no faucet with an ordinary disc holder is available as a comparative subject, the following **a)** and **c)** shall apply.

- a) To determine water discharge performance of faucets, ball taps and flush faucets, the water discharge flow rate shall be sufficient according to intended use.
- b) The water discharge of faucets equipped with a water saving disc holder shall be as follows.

- 1) When turning the handle 120°, the water discharge flow rate shall be over 20 % but not exceeding 70 % of the flow rate of faucets with an ordinary disc holder.
- 2) When turning the handle to full open, the water discharge flow rate shall be at least 70 % of the flow rate of faucets with an ordinary disc holder.
- c) The water discharge flow rate shall be at least 0.5 L/min for any use.

5.9.2 Water discharge of flush valves

The water discharge of flush valves, when tested in accordance with **8.9.2**, shall be such that the flow rate attains the maximum instantaneous flow rate (maximum flow rate during water discharge) immediately after starting discharge, then gradually decreases to stop. Tolerances on water discharge amount of a closet flush valve shall be the water discharge amount set by the manufacturer ± 1.5 L for the standard type and the set water discharge amount ± 1.0 L for the water saving type.

The maximum instantaneous flow rate and the water discharge amount shall be as given in Table 3.

Table 3 Maximum instantaneous flow rate and water discharge amount

Classifica- tion	Type ^{a)}	Maximum in- stantaneous flow rate (L/min)	Water dis- charge amount (L)
Closet flush valve	Standard	100 to 120	Over 6.5 ^{b)}
	Water saving	60 to 120	6.5 max. ^{b)}
Urinal flush valve	Standard	15 min.	Over 4
	Water saving	10 min.	4 max.
Note ^{a)} If the instrument can be adapted to either the stand- ard type or water saving type by adjustment, the wa- ter saving type shall be used.			
Note ^{b)} Water shall be discharged in the amount stated above, including tolerances, when measured by the method specified in 8.9.2 .			

5.10 Water discharge stopping

The water stopping of faucets, when tested in accordance with **8.10**, shall satisfy the following.

- a) The faucets and flush valves/flush faucets shall be free from the seat leakage.
- b) The ball taps shall automatically stop water by the buoyancy of floating ball and the like, and shall be free from the seat leakage.

5.11 Emergency water stopping

The hose coupling type faucet with an emergency water stopping device, when tested in accordance with **8.11**, shall be free from the seat leakage with the water discharge stopped in case of emergency.

5.12 Temperature self-regulation

The faucets with a thermostat, when tested in accordance with 8.12, shall satisfy the following.

- a) The temperature of discharging water when setting the temperature indicator to approximately 40 °C shall be within ± 3 °C of the set temperature.
- b) When the temperature of discharging water is set to approximately 40 °C according to intended use, and then the inlet side water feeding pressure is allowed to fluctuate, the fluctuation in temperature of discharging water shall be within ± 3 °C of the set temperature.

5.13 Insulation

For the faucets of electrically open/close type, the insulation, when tested in accordance with 8.13, shall satisfy the following.

These requirements do not apply to the battery-powered products, or d.c.-powered faucets where the electricity converted by a d.c. power supply unit outside the faucet is further passed on through a connector (only those which are easily removable) to be used as a power source, provided that it can be confirmed that the d.c. power supply unit to be used bears marking, etc. indicating the compliance with the requirements for a specified electrical appliance.

- a) **Insulation resistance** The value of resistance, when tested in accordance with 8.13 a), shall be not less than 1 M Ω .
- b) **Moisture-proof insulation resistance** The value of resistance, when tested in accordance with 8.13 b), shall be not less than 0.3 M Ω .
- c) **Withstand voltage** After the test is performed in accordance with 8.13 c), the operation shall be normal.

5.14 Power consumption

The power consumption of faucets of electrically open/close type, when tested in accordance with 8.14, shall not exceed the indicated rated power consumption.

This requirement does not apply to battery-powered products, or d.c.-powered faucets where the electricity converted by a d.c. power supply unit outside the faucet is further passed on through a connector (only those which are easily removable) to be used as a power source, provided that it can be confirmed that the d.c. power supply unit to be used bears marking, etc. indicating the compliance with the requirements for a specified electrical appliance.

5.15 Discharge volume regulation

The faucets with discharge volume regulating device, when tested in accordance with 8.15, shall satisfy the following.

$$\left| \frac{\text{Preset water discharge amount} - \text{Actual water discharge amount}}{\text{Preset water discharge amount}} \right| \leq 0.2$$

5.16 Small flow rate water discharge type (B1)

The faucets of small flow rate water discharge type, when tested in accordance with 8.16, shall conform to Table 4. The faucets capable of switching to the shower mode shall satisfy the requirements above when they are used in the main use mode. The main use mode refers to that used mainly for washing a human body and exclude the additional modes intended for e.g. massaging, warming and cleaning.

Table 4 Water discharge force of small flow rate water discharge type (B1)

Construction of bathroom shower/bathroom shower and bath faucets	Water discharge force (N)
Faucets constructed not to mix air in flowing water	0.60 min.
Faucets constructed to mix air in flowing water	0.55 min.

5.17 Water purification

The purification of faucets of water purifier built-in type, when tested in accordance with 8.17, shall satisfy the following.

- Filtration flow rate** When tested in accordance with 8.17 a), requirements for filtration flow rate specified in **JIS S 3241** shall be satisfied.
- Minimum dynamic water pressure** When tested in accordance with 8.17 b), requirements for water purifier not equipped with pump specified in **JIS 3241** shall be satisfied.
- Free residual chlorine removal** When tested in accordance with 8.17 c), requirements for removal performance of water purifying capability specified in **JIS S 3241** shall be satisfied.
- Free residual chlorine filtration capability** When tested in accordance with 8.17 d), requirements for filtration capability of water purifying capability specified in **JIS S 3241** shall be satisfied.
- Hygiene of filtered water** When tested in accordance with 8.17 e), requirements for hygiene performance of filtered water specified in **JIS S 3241** shall be satisfied.

6 Construction, shape and dimensions

6.1 Basic construction

The basic construction of faucets shall satisfy the following :

- easy and safe to handle, and free from abnormal noise;
- free from sharp edges and/or projections that may injure bare skin;
- not liable to generate water hammer;
- easy to maintain and check;
- easy to install.

6.2 Construction, shape and dimensions of faucets

The construction, shape and dimensions of faucets shall be as follows.

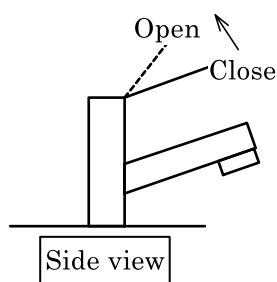
- a) The principal dimensions of faucets shall be in accordance with Annex A and Annex B. The construction, shape and dimensions may be based on the design developed by the purchaser or the manufacturer.

NOTE 1 For the widths across flats of faucet mounting nuts, see **JIS B 1002**.

NOTE 2 The principal common dimensions of disc holder type and solid type faucets are given in Annex E for reference.

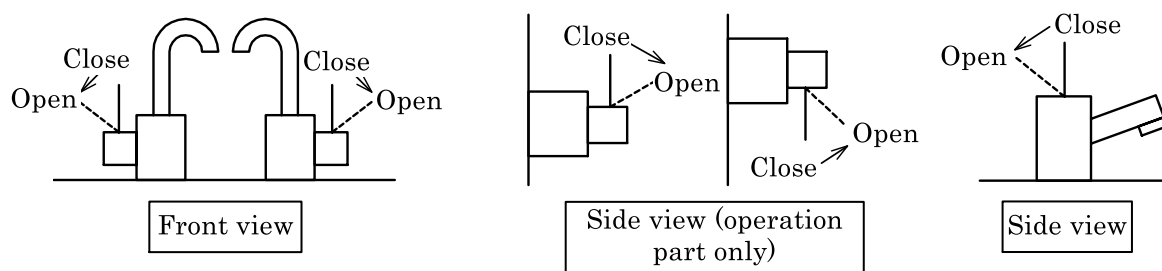
NOTE 3 The shape and dimensions of disc holder, disc packing and spindle to be used for faucets are given in Annex F for reference.

- b) The faucet shall be opened counter-clockwise and closed clockwise, except for the cases where the handle is a lever type, and where it is used on the hot water side of wall faucet (swing type), lavatory faucet (swing type), wall mounted two-handle combination faucet and deck mounted two-handle combination faucet.
- c) For the single-lever combination faucet, the water shall be stopped by lowering the lever if the lever is operated by up/down movement [see Figure 1 a)]. If the lever is not necessarily operated by up/down movement, the following lever operations in 1) to 3) may be applied [see Figure 1 b)].
- 1) When the lever is installed on the side of faucet body and when the lever is positioned to the right of the user, the lever shall be moved to the left to stop the water; if the lever is positioned to the left of the user, the lever shall be moved to the right to stop water.
 - 2) When the lever is installed on the front of faucet, the lever shall be moved toward the wall (back side) to stop water.
 - 3) When a stick type lever is installed on the top of faucet body, the lever shall be moved toward the user to stop water.



- a) Method for opening/closing of single-lever combination faucet by moving the lever up/down

Figure 1 Method for opening/closing of single-lever combination faucet



- 1) When lever is installed to the right or left of faucet body
- 2) When lever is installed on the front of faucet body
- 3) When stick type lever is installed on the top of faucet body

b) Method for opening/closing of single-lever combination faucet by moving the lever in a direction other than up/down

Figure 1 (concluded)

- d) The handles of two-handle combination faucet shall be so designed that the handle to the right of the user is for cold water and that to the left is for hot water. These handles shall each bear an easily discernible marking of “hot” or “cold”.
- e) The thermostatic combination faucet shall be provided with a safety device to prevent a high temperature water discharge.
- f) The two-handle combination faucet, thermostatic combination faucet and mixing combination faucet having the feed suspension function shall be provided with the back current preventive device on both hot and cold water sides.
- g) The water purifier built-in type faucet, hose coupling type faucet, main stop system faucet and faucet with hand shower shall be provided with the back current preventive device.
- h) The faucet may be provided with a faucet aerator, flow straightener, flow rate controller, water hammer reducer or strainer.
- i) The faucet may be of discharge volume regulating type or self-closing type.
- j) The spout of faucet may be either rotary, fixed or limited rotary.
- k) The faucet may be processed so that the attachment of a rubber plug type or pop-up type draining device is possible.
- l) The handle of faucets may be of a locking key system.
- m) The handle of faucets may be located either on the right or left.
- n) The hose coupling of faucets may be provided with an automatic coupling joint. The principal dimensions of the automatic coupling joint (external thread) for a fully automatic washing machine shall be in accordance with Annex A. Also, the automatic coupling joint may be provided with the emergency water stopping device.
- o) The spindle of stop cock may be designed so that it can be turned by a screwdriver or the like instead of a handle.

- p) The faucet may be of electrically open/close type.

6.3 Construction, shape and dimensions of ball taps

The construction, shape and dimensions of ball taps shall be as follows.

- a) The principal dimensions of ball taps shall be in accordance with Annex C. The construction, shape and dimensions may be based on the design developed by the purchaser or the manufacturer.

NOTE 1 For the widths across flats of ball tap fixing nuts, see **JIS B 1002**.

NOTE 2 The spout clearance when a ball tap is combined with a water receiver is described in Annex G for reference.

- b) If the spout of ball tap is submerged, the ball tap shall be equipped with a vacuum pressure relief device.
- c) The leverage of ball tap may be of either the single-link type or the multi-link type.
- d) The ball tap may be of electrically open/close type.

6.4 Construction, shape and dimensions of flush valves/flush faucets

The construction, shape and dimensions of flush valves/flush faucets shall be as follows.

- a) The principal dimensions of flush valves/flush faucets shall be in accordance with Annex C. The construction, shape and dimensions may be based on the design developed by the purchaser or the manufacturer.
- b) The closet flush valve shall be equipped with a vacuum pressure relief device.
- c) The flush valve/flush faucet may be of electrically open/close type.

6.5 Construction of faucet for cold district or for common use

For preventing breakage due to freeze and for retaining the functions after freeze, the construction of faucets for cold district or for common use shall be as follows.

- a) The prevention of freezing shall be carried out by draining, using built-in heater and the like.
- b) The draining should be easily operated manually, without the use of tools.
- c) The safety shall be secured at the time of both freezing and restart of water flow after thawing.
- d) The faucets for cold district or for common use may be of electrically open/close type.

6.6 Construction of water-stop-at-hand type (A1)

The construction of A1 shall be as follows for the purpose of reducing hot water consumption.

- a) Having a mechanism for discharging and stopping water independent of the discharging mode changing function, and the flow rate and temperature adjusting

functions.

- b) Capable of only discharging and stopping water by means of a switch such as a button and sensor within the user's operation range.

6.7 Construction of water-preceding-discharge type (C1)

The construction of C1 shall be one of the following for the purpose of reducing hot water consumption. The front side of the faucet shall be clearly identified by a marking on the faucet itself, in the work instructions or the like.

- a) The construction shall be such that hot water does not discharge when the lever handle for temperature control, which is integrated with the water discharge/stop operating part and which is installed on the top face of the faucet body, is on the front of the faucet.
- b) The construction shall be such that hot water does not discharge when the lever handle for temperature control, which is integrated with the water discharge/stop operating part and which is installed on the right or left side face of the faucet body with the axis of rotation for temperature control being horizontal, is at an angle of up to 45° above the horizontal.
- c) The construction shall be such that the discharge/stop operating part exclusively for cold water is provided independent of the hot water discharge/stop operating part.

6.8 Construction of water purifier built-in type

The faucets of water purifier built-in type shall be constructed so that a water purification cartridge can be fitted on the outlet side of the faucet, and pressure shall not act on the water purification cartridge when the valve is closed.

7 Materials

The materials of faucets shall be of sufficient strength to withstand normal services and installation, and shall have a performance that satisfies the requirement in 5.7. In the case of electrically open/close type, the materials shall be of sufficient performance to satisfy the requirements in 5.13 and 5.14.

8 Test methods

8.1 Hydrostatic pressure resistance test

The hydrostatic pressure resistance test shall be carried out in accordance with **JIS S 3200-1**. For the tests in the delivery inspection specified in 9.3, the pneumatic test method specified in Annex 2 or Annex 3 of **JIS S 3200-1** may be used.

- a) For stop cocks and hose coupling faucets, apply a water pressure of 1.75 MPa also to the outlet side.
- b) For the combination faucets with the feed suspension function, apply a water pressure of 1.75 MPa with the water in a suspended state.

8.2 Low temperature resistance test

The low temperature resistance test shall be carried out in accordance with **JIS S 3200-2**. After thawing the specimen, let water flow, and check whether the specimen discharges water or not, then carry out the performance tests specified in **5.2**.

The faucet of water purifier built-in type shall be tested in accordance with **JIS S 3241**.

The water pressure for the re-flowing shall be 0.1 MPa.

8.3 Water hammer test

The water hammer test shall be carried out in accordance with **JIS S 3200-3**. Discharge water under the condition given in Table 5 and measure the pressure when the seat of specimen is closed in the specified period of time. The stop cock may be excluded from the application of this test, but the test shall be applied to those stop cocks which are opened/closed in normal use, such as stop cocks fitted with a discharge pipe.

Table 5 Conditions of water hammer test

Division	Opening angle	Discharging flow rate	Seat closing time
Manual type	Approx. 120° for handle type ^{a)} , Full-opening for lever type	2 m/s ^{b)}	0.5 s
Self-closing type Discharge volume regulating type Electrically open/close type	Full-opening	2 m/s ^{b)}	In accordance with the specifications of instruments.
Note ^{a)} Full-opening for those whose full-opening angle is 120° or under. Note ^{b)} Where the discharge water pressure increases to 0.15 MPa but the flow rate does not attain 2 m/s, the discharge water pressure shall not exceed 0.15 MPa.			

8.4 Back current prevention test

The back current prevention test shall be carried out in accordance with **JIS S 3200-4**.

The test may be carried out on the back current preventive device separately.

- Low pressure test**, in accordance with the paragraph of “Case of test pressure (hydrostatic pressure) 3 kPa” given in **JIS S 3200-4**.
- High pressure test**, in accordance with the paragraph of “Case of test pressure (hydrostatic pressure) other than 3 kPa” given in **JIS S 3200-4**.

8.5 Vacuum pressure relief test

The vacuum pressure relief test shall be carried out in accordance with **JIS S 3200-5**.