

Copper Alloy Gate Valves

Technical Terms of Delivery



IRAN TRANSFO **D**ISTRIBUTION TRANSFORMERS **S**TANDARD
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FOREWORD

Iran Transfo Distribution Transformer Standard consists of a series of standards which are prepared on the basis of valid International standards, in conformity with Iran Transfo Distribution's technical requirements.

The initial draft has been prepared in Transformer Research Institute of Iran (ITRI) which is also responsible to issue the final documents approved by professional committees in the form of IDS standards. It should be mentioned that all departments of Zangan Distribution Transformer Co. are obligated to apply the issued IDS Standards.

All users must be assured that the latest edition of this standard will be used. The latest edition of IDS standards is also available on the ITRI web site:

<http://filer.irantransfo.com>

About this standard:

The present standard has been approved in Zangan Distribution Transformer Co.'s Mechanical Committee by:

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All users should ensure that they have the latest edition of this publication.

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1 Scope

These technical terms of delivery apply to copper alloy gate valves according to EN 12288, for oil filled transformer use having flanged body ends.

Flanged connection according to EN 1092-3, for oil filling, oil drainage or connection of transformer pipelines.

The range of nominal sizes is DN 25 to DN 100 and of nominal diameters is 25 mm to 100 mm

The range of pressure designations covered is PN 10; PN 16

For the applicability of each nominal size/diameter and each pressure designation to the different types of valve body end, see EN 12288 clause 4.1.

2 Designation and Dimensions

A Copper Alloy Gate valve is designated as:

Copper Alloy Gate Valves-IDS-MEO04-03-DN X

X = Nominal size of valve acc. to table 1

Overall view and dimensional parameters of copper alloy gate valve with details of the main parts are shown in the figure below:

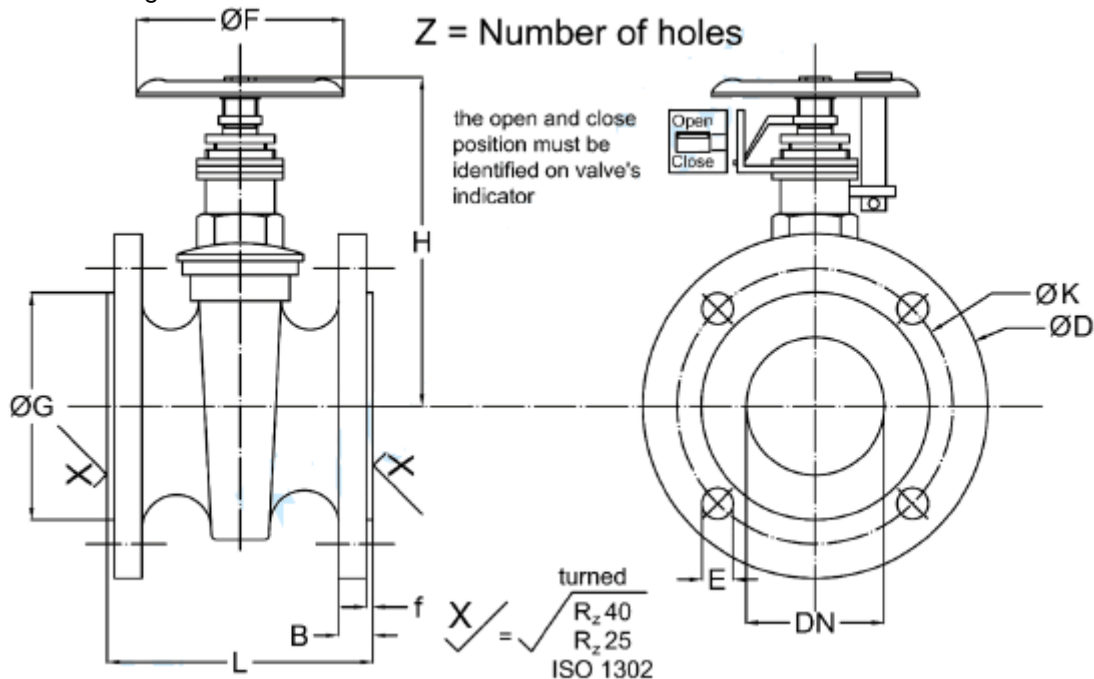


Figure 1: Overall view of copper alloy gate valve with dimensional parameters

Table 1: Dimensions (dimensions in mm)

DN	ØD	ØG	ØF	f	B	E	H _{Max}	ØK	L	screw		Lock	Pressure[bar]
										quantity	size		
25 ⁽¹⁾	115	65	70	2	12	14	145	85	80	4	M12	Capable to be sealed	10
40	150	84	160	2	14	18	185	110	100	4	M16		10
50	165	99	160	2	16	18	215	125	110	4	M16		10
80	200	132	160	2	18	18	280	160	150	8	M16		16
100	220	156	160	2	20	18	350	180	160	8	M16		16

(1) For size DN25, if the valve is a "Globe Valve", it will be approved.

2.1 Flange dimension Tolerances

Flange dimension tolerances according to EN 1092-3 table 10.

2.2 Sizing of the operating element

Size of the handwheel shall be determined in accordance with EN 12570. The handwheel shall be selected such that the valve can be operated when the line pressure is equal to the maximum allowable pressure at 20°C and can be seated or unseated against a differential pressure of not less than the maximum allowable pressure at 20°C.

3 Design

Valves shall be properly designed incorporating appropriate safety margins and taking all relevant operating factors into account in order to ensure that they will be safe throughout their intended life cycle. The construction details shall be the responsibility of the manufacturer.

3.1 Materials

The materials of construction of the valve shall be in accordance with table 2.

The materials of non-metallic seating and sealing components and the material of body end components not in contact with the service fluid are the responsibility of the manufacturer.

NOTE: the use of materials or combinations of materials which may be subject to galvanic (electrolytic) corrosion in service should be avoided.

The materials of non-metallic seating and sealing components and the material of body end or other components in contact with the transformer oil shall have no potential for mixing or corrosion with that fluid.

The materials of non-metallic seating and sealing components and the material of body end components not in contact with the service fluid are the responsibility of the manufacturer.

Table 2: material and standard

Component	Form	Standard	Alloy designation	
			Symbol	Number
Body bonnet	Casting	EN 1982	CuAl10Fe2-C	CC331G
			CuAl10Fe5Ni5-C	CC333G
			CuSn5Zn5Pb5-C	CC491K
			CuSn7Zn2Pb3-C	CC492K
			CuSn6Zn4Pb2-C	CC498K
Obturator Obturator seat ring Body seat ring	Casting	EN 1982	Alloy designation specified for body and bonnet	
	Rod	EN 12163	CuSn6	CW452K
		EN 12167	CuSn8	CW453K
	a	Nickel-copper alloys having 30% Nickel minimum		
b	Stainless steels of 13%chromium and 18/8 chromium/nickel types			
Stem Stem bushing	Casting	EN 1982	Alloy designations specified for body and bonnet	
	Forging	EN 12420	CuAl6Si2Fe	CW301G
	Rod	EN 12163 EN 12164	CuAl10Ni5Fe4	CW307G
			CuSn6	CW452K
			CuSn8	CW453K
			CuZn25Al5Fe2Mn2Pb	CW705R
			CuZn39Mn1AlPbSi	CW718R
CuZn39Sn1	CW719R			
CuZn40Mn1Pb1AlFeSn1	CW721R			
c	Stainless steels of the 13% chromium and 18/8 chromium/nickel types			
a Form not specified.				
b Not all alloy designations listed are available standard.				
c Not all alloy designations listed are available in both these standards.				

3.2 Pressure/temperature ratings

The valves should be made with copper alloy material work properly with transformer oil at 120°C temperature and 6 bar pressure in any horizontal or vertical position.

4 Technical Requirements

- The valve should work properly with 120°C transformer oil according to IEC 60296 at 10 bar pressure (for PN10 valves) and 16 bar pressure (for PN16 valves) in any mounting position (shutter axis on horizontal or on vertical or with any slant).
- The working degree of the contact surfaces between shutter and relevant seats has to allow the perfect sealing of the gate valves at the required conditions (see Checks and Tests).
- Proper gaskets, 120°C oil resistance, located in such a way to be easily replaced and provide a proper sealing between valve body, body and driving stem.
- The gaskets have to withstand the transformers thermal treatment carried out in air and/or under vacuum at 120°C for 30 days.
- The flanges should be casted with the valve body simultaneously. Welding and mechanical connection is not permitted.
- Gaskets must be set with synthetic rubber (material NBR), resistance to 120°C transformer oil and pressed not less than 30% of their thickness according to IDS-MCO09-01.
- The valves with size greater than DN80 should have shutter guide in order to keep it against dynamic pressure influences.
- Valve stem seals shall be capable of replacement in service without draining the transformer oil.
- All screws should be stainless steel and protected against corrosion.

5 Inspection and Tests

The purchaser has the right to inspect the manufacturer site to ensure the quality and operation of the valves.

All checks and tests are carried out also while valves manufacturing.

5.1 Visual Check

The visual check is aimed at ascertaining the absence, in all valve components, of any macroscopic defects such as:

Repairs or faulty manufacturing, manufacturing or casting burrs, blowholes, inclusions, indentations, foreign matters, excessive roughness and unevenness of the surfaces.

5.2 Dimensional Check

All dimensions should be checked according to clause 2.

5.3 Tightness Test

To procedure 11 and 12 of EN 12266-1 the following tests are required to the copper alloy gate valves:

5.3.1 Seat Tightness

With the obturator in closed position: 2.5 bar pressure with 90°C transformers oil for ½ hour.

The test has to be carried out by applying the required pressure by means of a pump connected to a flange mounted on one side of the valve being the other side left open.

The test has to be carried out on both sides of the gate valve.

5.3.2 Shell Tightness

With the obturator in open position: 6 bar pressure with transformers oil at 90°C for ½ hour. The test has to be carried out on both sides closed by blind flanges, the oil introduced through a joint.

5.4 Screws Test

All the screws exposed to the atmosphere shall be stainless steel or brass and should be successfully passed condensation test according to ASTM D 4585.

5.5 Sealing Gasket Materials Test

All Sealing materials should be tested according to "Zangan Distribution Transformer Co." standard IDS-MCO09-01.

6 Delivery

6.1 Packing

These valves should be placed in suitable wooden boxes with the following conditions:

- The boxes must be impact resistant during movement, transport, storage and weight of cargo.
- Each valve should preferably be packed in a bubble bag that is weather resistance.
- The box must be able to be transported by forklift.

6.2 Labelling

Each packing should be identified by attached labelling and marked with following data:

- Manufacturer name and factory mark
- Valve Size (DN)
- Order Number
- Quantity
- Gross and net weight

7 Normative References

EN 12288

Industrial valves -Copper alloy valves

EN 19

Industrial valves - marking of metallic valves

EN 558

Industrial valves Face-to-face and centre-to-face dimensions of metal valves for use in flanged pipe systems - PN and Class designated valves

EN 736-1

Valves-Terminology - Part 1: Definition of types of valves

EN 736-2

Valves - Terminology - Part 2: Definition of components of valves

EN 736-3

Valves - Terminology - Part 3: Definition of terms

EN 1057

Copper and copper alloys - Seamless round copper tubes for water and gas in sanitary and heating applications

EN 1092-3

Flanges and their joints - Circular flanges for pipes, valves, fittings and accessories, PN designated - Part 3: Copper alloy flanges

EN 1759-3

Flanges and their joints - Circular flanges for pipes, valves, fittings and accessories, Class designated - Part 3: Copper alloy flanges

EN 1982

Copper and copper alloys - Ingots and castings

EN 12163

Copper and copper alloys - Rod for general purposes

EN 12164

Copper and copper alloys - Rod for free machining purposes

EN 12167

Copper and copper alloys - Profiles and rectangular bar for general purposes

EN 12168

Copper and copper alloys - Hollow rod for free machining purposes

EN 12266-1

Industrial valves - Testing of valves - Part 1: Pressure tests, test procedures and acceptance criteria - Mandatory requirements

EN 12266-2

Industrial valves - Testing of valves - Part 2: Tests, test procedures and acceptance criteria - Supplementary requirements

EN 12420

Copper and copper alloys - Forgings"

EN 12449

Copper and copper alloys - Seamless, round tubes for general purposes

EN 12516-3

Valves — Shell design strength - Part 3: Experimental method

EN 12570

Industrial valves - Method for sizing the operating element

EN ISO 228-1

Pipe threads where pressure-tight joints are not made on the threads — Part 1: Dimensions, tolerances and designation (ISO 228-1)

EN ISO 5210

Industrial valves - Multi-turn valve actuator attachments (ISO 5210)

ISO 7-1

Pipe threads where pressure-tight joints are made on the threads - Part 1: Dimensions, tolerances and designation

ISO 1302

Geometrical Product Specifications (GPS) - Indication of surface texture in technical product documentation

ASME B1.20.1

Pipe threads, general purpose (inch)

IEC 60296 ed5.0,

Fluids for electro technical applications – mineral insulating oils for electrical equipment.