ZANGAN DISTRIBUTION TRANSFORMER

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Copper Alloy Flanged Outlet Valves for Oil Sampling and Discharge

Technical Terms of Delivery




IDS

IRAN TRANSFO DISTRIBUTION TRANSFORMERS STANDARD
Transformer Research Institute of Iran

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FOREWORD

Iran Transfo Distribution 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 applies to Copper Alloy Flanged Outlet Valves according to DIN 42568 with the Flanged connection according to DIN EN 1092-3, used in oil filled transformers for oil sampling and discharge. The valves should be made with copper alloy material worked properly with transformer oil at 100°C and 6 bar pressure in any direction (horizontal or vertical).

2 Designation Code and Dimensions

A copper alloy outlet valve is designated as:

Copper Alloy Flanged Outlet Valves-IDS-MEO04-02-DN X

X = Nominal size of valve acc. to table 1

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

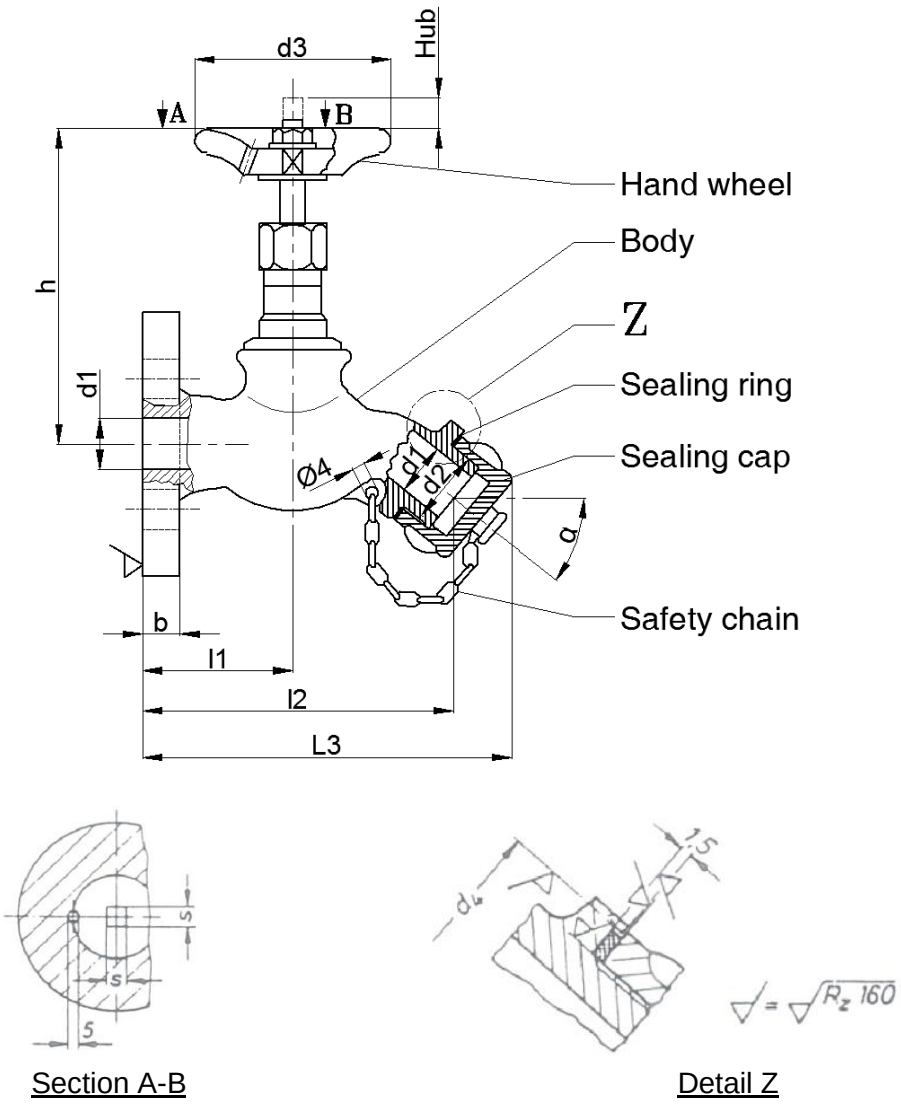

Figure 1: Overall view of copper alloy outlet valve with dimensional parameters

According to the parameters shown in figure 1 the dimensions of valves are as below table:

Table 1: Copper alloy outlet valve dimensions in mm (acc. to figure 1 parameters)

DN	*b*	d_1	d_2 *		d_3	d_4	*h*	Hub	l_1	l_2	l_3	$\alpha^{\pm 2^\circ}$	s [H11]	Flow rate at operating pressure 0.1 bar at 20° C [L/h]
			Inner thread	External thread										
15	10	15	G 3/4	G 3/4 A	50	36	95	9	44	92	110	40°	6	500
32	13	32	G 1 1/4	G 1 1/4 A	80	51	133	14	55	112	130	27°	8	3600
* Thread standard according to DIN ISO 228 (Item 1)														

The fixing flange sizes are based on nominal diameter (DN). According to size of valve, the fixing flange shape is varied. Dimensional specifications of all fixing flanges which used are shown in the following figure:

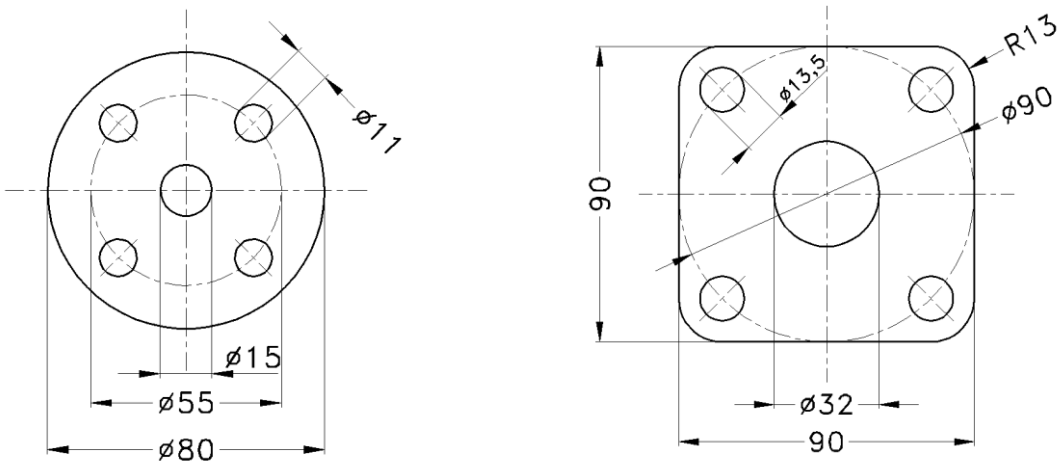

Figure 2: Round type flange interface for DN15 and Square type flange interface for DN32

3 Main Parts Materials

Valve parts material are according to table 2.

Table 2: Valve parts material

Part name	Standard
Body	Bronze (Rg5 : CuSn5ZnPb) or Brass(Ms58 : CuZn40Pb2) DIN 1705 ,DIN EN 1982 ,DIN 1709 ,DIN 17660
Disk (shutter)	
Headpiece	
Stem	Brass(Ms58 : Cu Zn40Pb2)- DIN 17672
Hand wheel	Aluminum or Aluminum alloy – red color
Sealing and gasket	PTFE or NBR or PA6

4 Technical Requirements

- The valve should be worked properly with 100°C oil at 6 bar pressure in any mounting position consist of stem axis on horizontal ,vertical and slant .
- The contact surfaces between shutter and relevant seats have to allow the perfect sealing of the outlet valves at the required conditions (see Checks and Tests).
- Proper gaskets, 100°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 100°C for 30 days.
- The flange should be casted with the valve body simultaneously. Welding and mechanical connection is not permitted.

- Unless otherwise specified in the purchase order, the flanges have to be plane (without collar and scoring) parallel and coaxial; all threads have to be according UNI metric system, coarse type
- Gaskets must be set with synthetic rubber, resistance to 100°C transformer oil and pressed not less than 30% of their thickness.
- The valve 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 or to be galvanized and protected against corrosion.

5 Surfaces

All products must be have without any crack, cavity in internal and external surfaces and other Imperfections.

6 Checks 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.

6.1 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.

6.2 Dimensional Check

All dimensions should be checked according to table 1 .manufacturer must be submit dimensional test certificate.

6.3 Tightness Test

The outlet valves should withstand, without leaks, the following tests (According to EN 12266):
The valve should operate (open & close) 50 times and then test for porosity and bore leakage test.
Seat Tightness.

6.3.1 Seat Tightness

6.3.1.1 Tests carried out by manufacturer

- The test should be carried out by transformer oil with temperature of 50 ˚C and pressure of 6 bar, as a routine test for each valve, and oil leakage from the downstream surface of the obturator is not permitted. The test duration should be 15 minutes.
- The test should be carried out by oil with 90 ˚C and 6 bar, as a type test, and oil leakage from the downstream surface of the obturator is not permitted. The test duration should be 30 minutes.
- The test should be carried out by air with 3 bar, as a routine test for each valve. The valve should be immersed in water with the upper surface of the valve not more than 50 mm below the surface of the water. A check shall be made for bubbles breaking the surface of the water. Test duration should be 1 minutes.

Meanwhile the manufacturer is obliged to provide a certification document for each of the valves. Test duration should be 1 minutes.

6.3.1.2 Witness Tests

- The test should be carried out by oil with 90 ˚C and 6 bar, oil leakage from the downstream surface of the obturator is not permitted. Test duration should be 30 minutes.

- The test should be carried out by air with 3 bar, bubbles from the downstream surface of the obturator are not permitted breaking the surface of the water. Test duration should be 1 minutes.

6.3.2 Shell tightness

The test shall confirm the leak tightness of the shell including the operating sealing against internal pressure. The obturator of isolating and control valves shall be in open position

6.3.2.1 Tests for manufacturer

- The test should be carried out by transformer oil with 50 ˚C and 6 bar, as a routine test for each valve, and the complete external surface of the shell shall be checked visually for leakage. Test duration should be 15 minutes.
- The test should be carried out by transformer oil with 90 ˚C and 6 bar, as a type test, and the complete external surface of the shell shall be checked visually for leakage. Test duration should be 30 minutes.
- The test should be carried out by air with 3 bar, as a routine test for each valve. The valve should be immersed in water with the upper surface of the valve not more than 50 mm below the surface of the water. A check shall be made for bubbles breaking the surface of the water. Test duration should be 1 minutes.

Meanwhile the manufacturer is obliged to provide a certification document for each of the valves.

6.3.2.2 Witness Tests

- The test should be carried out by transformer oil with 90 ˚C and 6 bar, as a type test, and the complete external surface of the shell shall be checked visually for leakage. Test duration should be 30 minutes.
- The test should be carried out by air with 3 bar, as a routine test for each valve. The valve should be immersed in water with the upper surface of the valve not more than 50 mm below the surface of the water. A check shall be made for bubbles breaking the surface of the water. Test duration should be 1 minutes.

6.4 Nut Test

Technical delivery condition of nuts should be according DIN EN ISO 3506-2. As a supplementary test, all nuts should be successfully passed salt spray test according to DIN EN ISO 4042, 144 hours.

6.5 NBR Materials Test

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

7 Delivery

7.1 Packing

The unit should be delivered with proper standard packing protected mechanical damages and water penetration on the inside of the valves.

7.2 Labelling

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

- Manufacturer name and factory mark
- Order Number
- Quantity
- Gross and net weight
- Date of manufacture

8 Normative References

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For undated references, the latest edition of the referenced document applies:

DIN 42568
Transformers; outlet valve DN 15 and DN 32 for sampling and discharge

DIN EN 1092-3
Flanges and their joints - Circular flanges for pipes, valves, fittings and accessories, PN designated - Part 3: Copper alloy flanges

DIN EN 1982
Copper and copper alloys - Ingots and castings

BS 2874
Specification for copper and copper alloy rods and sections (other than forging stock)

EN 12266-1
Industrial valves. Testing of metallic valves. Pressure tests, test procedures and acceptance criteria. Mandatory requirements

DIN EN ISO 3506-2
Mechanical properties of corrosion-resistant stainless steel fasteners - Part 2: Nuts

DIN EN ISO 4042
Fasteners - Electroplated coatings