Iran-Transfo

# ITS-ME20-01

Edition 1.0 2019-07

# Dehydrating breathers

## Technical Terms of Delivery



ITS

IRAN TRANSFO STANDARD
Iran Transformer Research Institute

| Compiled: | Edited: | Approved: |
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# FOREWORD

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

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

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

http://research.iran-transfo.com

**About this standard:**

The present standard has been approved in Iran Transfo Co.'s Mechanical Equipment 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 Dehydrating breathers for oil type distribution and power transformers according to DIN EN 50216-5.

# 2 Designation Code and Dimensions

## 2.1 Designation

A dehydrating breather designated as:

**Dehydrating breather- ITS-ME20-01-Type X**

**Table 1: A dehydrating breather types**

| X | A | B | C | L |
|---|---|---|---|---|
| Distribution transformers | ✓ | ✓ | ✓ | - |
| Power transformers | - | - | - | ✓ |
| Air type<br>Cable box | - | ✓ | - | ✓ |

### 2.1.1 Type A

With angled connection oval flange and filling plug (DIN EN 50216-5 and DIN 42567 A).

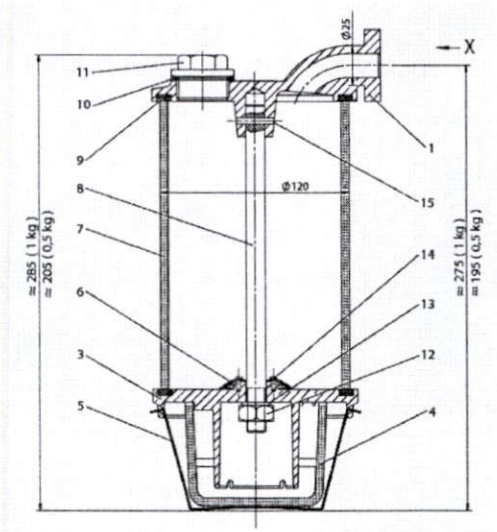


**Figure1: Dehydrating breather type A**

VIEW X

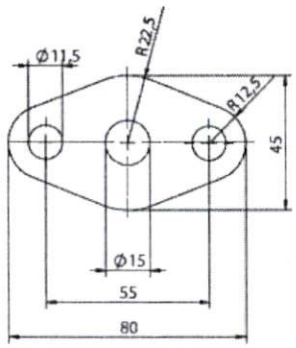


Figure2: Flange of type A

**Table 2: Part list of type A**

| Item | Quantity | Description | Standard | Remarks |
|---|---|---|---|---|
| 1 | 1 | Upper part | DIN 42567-1 | ALSi12(Cu) |
| 3 | 1 | Bottom section | DIN 42567- 3 | ALSi12(Cu) |
| 4 | 1 | Oil bowl | DIN 42567-4 | Acrylic glass |
| 5 | 1 | Holder | DIN 42567-5 | X10CrNi188 (1.4310) |
| 6 | 1 | Perforated plate | DIN 42567-6 | AL99.5 |
| 7 | 1 | Cylinder | DIN 42567-7 | Glass |
| 8 | 1 | Bolt | DIN 42567-8 | M12x25/ A2-70 |
| 9 | 2 | Gasket | DIN 42567-9 | 123x107x4/ NBR 70 |
| 10 | 1 | Gasket | DIN 7603 | 33x39x3/ Hecker centellen WS 3820 |
| 11 | 1 | Stop screw | R 1" DIN 910 | ALSi12(Cu) |
| 12 | 1 | Hex nut | M12- DIN 934- 4D | A2-70 |
| 13 | 1 | Spring washer | B12- DIN 127 | A2-70 |
| 14 | 2 | Round- head grooved pin | 2.3x5- DIN 1476 | A2-70 |
| 15 | 1 | Dowel pin | 4x24- DIN1481 | A2-70 |

### 2.1.2 Type B

With straight connection oval flange (DIN EN 50216-5 and DIN 42567 B).

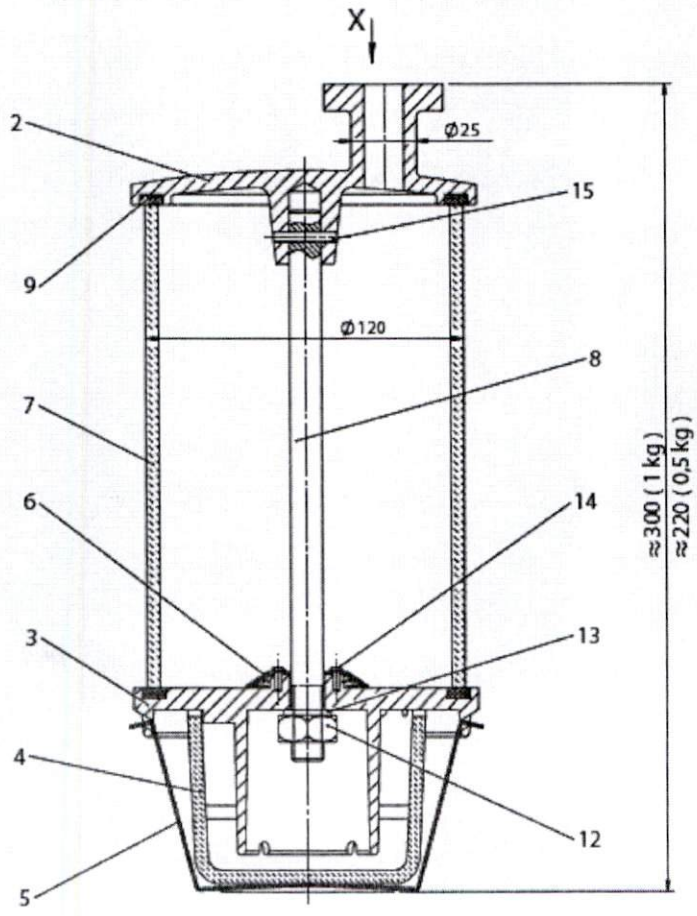


Figure3: Dehydrating breather type B

VIEW X

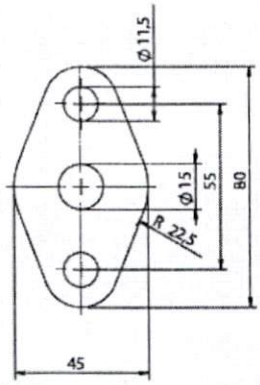


**Figure4: Flange of type B**

**Table 3: Part list of type B**

| Item | Quantity | Description | Standard | Remarks |
|---|---|---|---|---|
| 2 | 1 | Upper part | DIN 42567-2 | ALSi12(Cu) |
| 3 | 1 | Bottom section | DIN 42567-3 | ALSi12(Cu) |
| 4 | 1 | Oil bowl | DIN 42567-4 | Acrylic glass |
| 5 | 1 | Holder | DIN 42567-5 | X10CrNi188 (1.4310) |
| 6 | 1 | Perforated plate | DIN 42567-6 | AL99.5 |
| 7 | 1 | Cylinder | DIN 42567-7 | Glass |
| 8 | 1 | Bolt | DIN 42567-8 | M12x25/ A2-70 |
| 9 | 2 | Gasket | DIN 42567-9 | 123x107x4/ NBR 70 |
| 12 | 1 | Hex nut | M12- DIN 934- 4D | A2-70 |
| 13 | 1 | Spring washer | B12- DIN 127 | A2-70 |
| 14 | 2 | Round- head grooved pin | 2.3x5- DIN 1476 | A2-70 |
| 15 | 1 | Dowel pin | 4x24- DIN1481 | A2-70 |

### 2.1.3 Type C

Either With G1/2", G3/4" or G1" internal connection thread (DIN EN 50216-5).

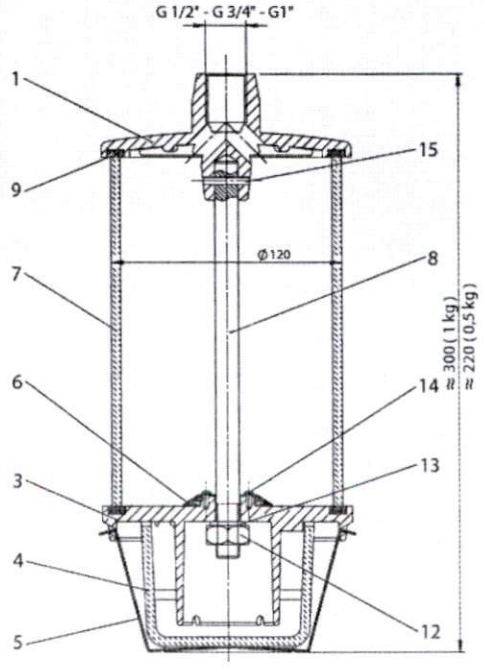


**Figure5: Dehydrating breather type C**

**Table 4: Part list of type C**

| Item | Quantity | Description | Standard | Remarks |
|---|---|---|---|---|
| 1 | 1 | Upper part | G1/2"-DIN 42567 * | ALSi12(Cu) |
| 3 | 1 | Bottom section | DIN 42567-3 | ALSi12(Cu) |
| 4 | 1 | Oil bowl | DIN 42567-4 | Acrylic glass |
| 5 | 1 | Holder | DIN 42567-5 | X10CrNi188 (1.4310) |
| 6 | 1 | Perforated plate | DIN 42567-6 | AL99.5 |
| 7 | 1 | Cylinder | DIN 42567-7 | Glass |
| 8 | 1 | Bolt | DIN 42567-8 | M12x25/ A2-70 |
| 9 | 2 | Gasket | DIN 42567-9 | 123x107x4/ NBR 70 |
| 12 | 1 | Hex nut | M12- DIN 934- 4D | A2-70 |
| 13 | 1 | Spring washer | B12- DIN 127 | A2-70 |
| 14 | 2 | Round- head grooved pin | 2.3x5- DIN 1476 | A2-70 |
| 15 | 1 | Dowel pin | 4x24- DIN1481 | A2-70 |

*- For special types G3/4" or G1"

### 2.1.4 Type L

This type of dehydrating breather is according to DIN EN 50216-5 and DIN 42562 (type SL). Four categories considered with silica gel capacity.

**Table 5: Specifications type L**

| Type | | L1 | L2 | L3 | L4 |
|---|---|---|---|---|---|
| Silica gel capacity / kg | | 1.2 | 2.4 | 3.6 | 4.8 |
| Height (h) / mm | | 340 | 487 | 634 | 781 |
| Weight (without silica gel)/ kg | | 5.5 | 7.4 | 9.3 | 11.2 |
| Assembly groups | B1 | 1 | 1 | 1 | 1 |
| | B2 | - | 1 | 2 | 3 |
| | OV | 1 | 1 | 1 | 1 |

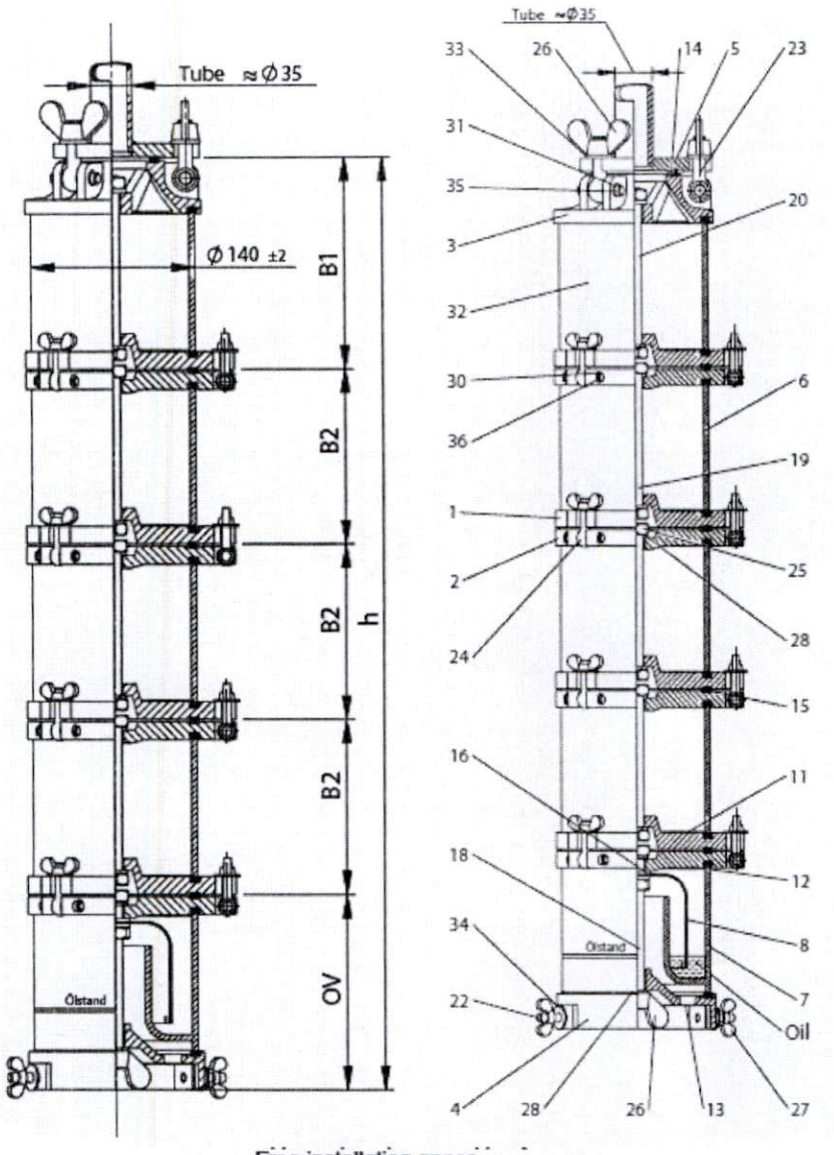


Figure6: Dehydrating breather type L with flange

Table 6: Part list of type L

| Item | Quantity | | | Description | Standard | Remarks |
|---|---|---|---|---|---|---|
| | B1 | B2 | OV | | | |
| 1 | 1 | 1 | - | Partition plate | DIN 42562-1 | ALSi12(Cu) |
| 2 | - | 1 | 1 | Partition plate | DIN 42562-2 | ALSi12(Cu) |
| 3 | 1 | - | - | Top section | DIN 42562-3 | ALSi12(Cu) |
| 4 | - | - | 1 | Bottom ring | DIN 42562-4 | ALSi12(Cu) |
| 5* | - | - | - | Flanges | DIN 42562-5 | S235JR(1.0037) |
| 6 | 1 | 1 | 1 | Cylinder | DIN 42562-6 | Glass |
| 7 | - | - | 1 | Oil container | DIN 42562-7 | Glass |
| 8 | - | - | 1 | Dome | DIN 42562-8 | X5CrNi18010(1.4301) |
| 11 | 1 | 1 | - | Perforated plate | DIN 42562-11 | AL99.5 |
| 12 | - | - | 1 | Perforated plate | DIN 42562-12 | AL99.5 |
| 13 | - | - | 1 | Perforated plate | DIN 42562-13 | AL99.5 |
| 14 | 1 | - | - | gasket | DIN 42562-14 | NBR70 / EPDM ** |
| 15 | 2 | 3 | 3 | gasket | DIN 42562-14 | NBR70 / EPDM ** |
| 16 | - | - | 2 | gasket | DIN 42530 | PA6 |
| 18 | - | - | 1 | Threated bolt | - | M12x150 / A2-70 |
| 19 | - | 1 | - | Hex screw | - | M12x130 / A2-70 |
| 20 | 1 | - | - | Hex screw | - | M12x140 / A2-70 |
| 22 | - | - | 2 | Stud bolt | DIN 939 | M8x30 / A2-70 |
| 23 | 3 | - | - | Eyebolt | DIN 444 | M12x55 / A2-70 |
| 24 | - | 3 | 3 | Eyebolt | DIN 444 | M8x40 / A2-70 |
| 25 | 1 | 1 | 2 | Hex nut | DIN 934 | M12 / A2-70 |
| 26 | 3 | - | 1 | Wing nut | DIN 315 | M12 / A2-70 |
| 27 | - | 3 | 5 | Wing nut | DIN 315 | M8 / A2-70 |
| 28 | 1 | 1 | 2 | Spring washer | DIN 125 | B12 / X12CrNi177 |
| 30 | - | 6 | 6 | Circlip | DIN 471 | 8x0.8 / X12CrNi177 |
| 31 | 6 | - | - | Circlip | DIN 471 | 10x1 / X12CrNi177 |
| 32 | - | - | - | Silica gel | ITS-MC29-02 | - |
| 33 | 3 | - | - | washer | DIN 125 | A2-70 |
| 34 | - | 3 | 5 | washer | DIN 125 | A2-70 |
| 35 | 3 | - | - | Pin | 35- DIN 42562 | A2-70 |
| 36 | - | 3 | 3 | Pin | 36- DIN 42562 | A2-70 |

*- Optional if requested
**- for low temperature application up to -40 °c

# 3 Technical Requirements

- The Dehydrating breather shall work properly from -40 to +80°C
- Aluminium name plate with serial number outside of the housing must be considered.
- One NBR gasket from each size shall be provided with Dehydrating breather as spare parts.

# 4 Painting

- Surface preparation with 25µm roughness.
- Surface cleaning Sa2 ½.
- Powder coat with polyester resin according to the ITQ-MP03-01 standard.
- RAL 7038.
- Coat thickness 80µ after dip curing.
- Stainless steel surfaces without any painting.



# 5 Checks and Tests

The purchaser reserves the right to carry out any check to ascertain dehydrating breather suitability. The check can be carried out also while dehydrating breather manufacturing.

## 5.1 Visual Check

The visual check is aimed at ascertaining the absence, in all dehydrating breather 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 and corresponding standards.

## 5.3 Tightness Test as type test

The dehydrating breather should withstand tightness test without water penetration in glass cylinder. Manufacturer shall assure tightness between glass cylinder and bottom section (types A, B, C) and partition plates and bottom ring (Type L) by decreasing Surface roughness in sealing surfaces. Test method and acceptance criteria are according to the IEC60259- IP55.

## 5.4 NBR Materials Test

# 6 Delivery

## 6.1 Packing

The unit should be delivered with proper standard packing protected from mechanical damages and water penetration inside of dehydrating breather.

## 6.2 Labelling

Each packing should be identified by following data:

- Manufacturer name and factory mark
- Purchaser code number
- Dehydrating breather type

# 7 Normative References

The following standard specifications in the current edition are valid:

**IEC60529**
Degrees of protection provided by enclosures (IP Code)

**DIN 42562**
Transformers; Silica gel breathers with fillings of 1, 2 to 4, 8 kg

**DIN EN 50216-5**
Power transformer and reactor fittings - Part 5: Liquid level, pressure and flow indicators, pressure relief devices and dehydrating breathers

**ITS-MG01-01 Ed. 1.4**
NBR-Materials for Sealing

**ITQ-MP03-01**
Evaluation of powder coating for transformer equipment