INTERNATIONAL STANDARD

ISO 17613-1

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Manually operated pumps for drinking water — Selection and acceptance —

Part 1: Southeast Asia

Pompes à main pour eau potable — Sélection et acceptation —

Partie 1: Asie du Sud-Est

Reference number
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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 17613-1 was prepared by Technical Committee ISO/TC 115, *Pumps*, Subcommittee SC 1, *Dimensions and technical specifications of pumps*.

ISO 17613 consists of the following parts, under the general title *Manually operated pumps for drinking water — Guidelines for selection and acceptance*:

— *Part 1: Southeast Asia*

Other parts dealing with the needs of other specific geographic areas are in preparation.

Manually operated pumps for drinking water — Selection and acceptance —

Part 1: Southeast Asia

1 Scope

This part of 17613 specifies the selection and acceptance of manually operated pumps suitable for lifting drinking water, free of sand and/or suspended particles, from shallow and deep borewells situated in Southeast Asia.

NOTE Other parts of this International Standard will address the specific needs of other geographical areas.

This part of ISO 17613 is applicable to manually operated pumps. It does not apply to other existing types of pumps, such as foot, pedal-or crank-operated pumps.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced edition (including any amendments) applies.

ISO 630 *Structural steels — Plates, wide flats, bars, sections and profiles*

ISO 965-1, *ISO general purpose metric screw threads — Tolerances — Part 1: Principal and basic data*

ISO 965-2, *ISO general purpose metric screw threads — Tolerances — Part 2: Limits of sizes for general purpose external and internal screw threads — Medium quality*

ISO 1461, *Hot dip galvanized coating on fabricated iron and steel articles — Specifications and test methods*

ISO 2081:—[1)], *Metallic coatings — Electroplated coatings of zinc with supplementary treatments on iron or steel*

ISO 2768-1:1989, *General tolerances — Part 1: Tolerance for linear and angular dimensions without individual tolerance indications*

ISO 2859-1:1999, *Sampling procedures for inspection by attributes — Part 1: Sampling schemes indexed by Acceptance Quality Limit (AQL) for lot-by-lot inspection* (including Technical Corrigendum ISO 2859-1:1999/Cor.1:2001)

ISO 3581*, Welding consumables — Covered electrodes for manual arc welding of stainless and heat-resisting steels — Classification*

1) Under preparation (revision of ISO 2081:1986)

ISO 4042:1999, *Fasteners — Electroplated coatings*

ISO 4520:1981, *Chromate conversion coatings on electroplated zinc and cadmium coatings*

ISO 9692-1, *Welding and allied processes — Recommendations for joint preparation — Part 1: Manual metal-arc welding, gas-shielded metal-arc welding, gas welding, TIG welding and beam welding of steels*

ISO 15609-1:2004, *Specification and qualification of welding procedures for metallic materials — Welding procedure specification — Part 1: Arc welding* (including Technical Corrigendum ISO 15609-1:2004/Cor.1:2005)

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
platform
foundation for the pump and sanitary sealing for the borewell, which also facilitates drainage of surplus water to keep the area surrounding the pump clean

3.2
pump head assembly
mechanism above ground level which operates the pumping element

3.3
pumping element
element lifting water upward in each pumping cycle

3.4
connecting mechanism
linkage between the pump-head assembly and the pumping element

3.5
rising pipe
pipe to transport water from intake to discharge point.

4 Classification

4.1 Size classification

The size classification of manually operated pumps according to the depth from which water is lifted (R), with minimum recommended size of borewell/tubewell (d) is given in Table 1.

Table 1 — Recommended minimum diameter of borewell/tubewell

Borewell/tubewell size classification	Static water level (SWL) range R m	Minimum borewell/tubewell diameter d mm
Shallow	$0 < R < 6$	40
Medium	$6 \leqslant R < 15$	100
Deepwell	$15 \leqslant R < 40$	100
Extra-deepwell	$R \geqslant 40$	100

4.2 Type classification

The type classification of manually operated pumps shall be specified as follows, depending on the type of action involved:

a) reciprocating;

b) lever-operated;

c) direct-acting;

d) rotary:

   1) double acting,

   2) quadruple acting;

e) hydraulic;

f) any combination of above.

5 Construction and dimensions

The pump base (stand or pedestal) shall be constructed in a workmanlike manner and to dimensions not less than those shown in Figures A.1 to A.7.

When installed over the borehole, the pump base shall be grouted with a waterproof grout such that surface level leakage does not re-enter the bore hole.

6 Requirements

Unless otherwise specified, tolerances for linear and angular dimensions (including fillet radii and chamfer height) for all manufactured components shall conform to the tolerances as per Class m (medium) of ISO 2768-1:1989. The tolerance of metric threads shall conform to the requirements of ISO 965-1 and ISO 965-2, Class 6g for bolts and Class 6H for nuts.

The raw materials used for manufacturing pump components coming in contact with water shall not contain any material that is harmful or that can be detrimental to the quality of water being pumped. Typically, austenitic stainless steel should be used.

It is recommended to use stainless steel connecting rods where water has an ion content exceeding 1 mg/l or a pH value less than 6,5.

All the components shall be free from sharp edges/corners, burrs and other surface defects.

Welding shall conform to the requirements of ISO 9692-1 and ISO 15609-1. For stainless steel components welded by manual arc welding, suitable electrodes conforming to the requirements of ISO 3581 shall be used.

Unless otherwise specified, the minimum specified thickness of the member to be welded shall be the guiding factor for deciding the weld fillet size. The fillet shall normally be not less than the minimum specified thickness of the member to be welded.

Polytetrafluoroethylene (PTFE) tape or equivalent shall be used on the metal riser pipe threaded joints.

7 Anti-corrosive treatment

7.1 Electrogalvanizing

Electroplating, if provided for steel parts, shall conform to classification code Fe/Zn 25C of ISO 2081—1[1)] and ISO 4520:1981.

Except for high tensile bolts, all bolts, nuts and washers used in the assembly shall be electroplated and passivated to conform to classification code Fe/Zn 8C of ISO 4042:1999.

7.2 Galvanizing

Hot-dip galvanizing, if provided for steel parts or sub-assemblies, shall conform to ISO 1461.

The galvanized components shall be given a chromate conversion coating to protect them from white rust formation.

7.3 Painting

Exterior surfaces of cast iron and steel components that are not electroplated or galvanized shall be given one coat of lead-free primer and one coat of lead-free top coat paint.

Paint used on the pump components shall not be of the marine anti-fouling type.

8 Testing

8.1 Visual tests

All the pumps shall be examined for finish and visual defects.

8.2 Dimensional and other tests

Unless otherwise specified in the contract or order, the procedure given in ISO 2859-1 shall be followed for sampling inspection. For the characteristics dictated in 8.3, 8.4 and 8.5, a single sampling plan with general inspection level I and an acceptance quality level (AQL) of 1 % as given in Table I and II-A of ISO 2859-1:1999 shall be followed.

When required the manufacturer shall produce test certificates for the component raw materials.

The pumping element shall be checked for water leakage using a 0,2 MPa (2 bar) hydrostatic pressure applied for 10 min. The pressure is to be measured using a previously calibrated pressure gauge capable of reading from 0 MPa to 0,5 MPa (0 bar to 5 bar). No leakage from the pumping element shall be observed.

A sample pump shall be tested for discharge at the specified operating conditions at the manufacturers works. The discharge measured shall not be less than that guaranteed by the supplier.

8.3 Routine tests

Two complete pumps from the selected lot shall be subjected to a discharge test in addition to the tests required in 8.2.

The pump shall be primed and the test shall start only after getting continuous flow of water through the pump outlet. The water shall then be collected in a container for a number of continuous cycles as specified by the pump manufacture to be completed in one minute. The water level (lift) shall be the maximum given in Table 1 for the classification.

The discharge thus measured shall not be less than the discharge guaranteed by the supplier.

8.4 Type testing

A sample pump shall be operated for 4 000 h, with the help of some mechanical device or otherwise at the operating conditions specified by the manufacturer but with the water level (lift) at the maximum given in Table 1 for the classification.

The force exerted by the operator to operate the pump shall not exceed 150 N and the range of movement of the operating arm shall lie between 0,65 m to 0,85 m above the level of the operators feet. This test shall be repeated after the 4 000 h test.

The discharge shall be measured and recorded after every 24 h of pumping. At the conclusion of the test, the variation between the maximum and the minimum discharge reading shall not be more than 5 %.

At the end of the type test, the pump shall be opened and critical components examined for abnormal wear or other damage.

The manufacturer shall provide a list of the pump's critical components to the testing authority.

The type test shall be repeated if any major design change is carried out.

8.5 Conformity criteria

The pump lot shall be considered to conform to the requirements of the specification if the pumps tested are selected in accordance with the requirements of 8.2 and conform to the following requirements:

a) the number of pumps meeting the requirements of a characteristic inspected under 8.2 shall exceed the corresponding acceptance number as specified in ISO 2859-1;

b) the pumps selected according to 8.3 meet the requirements as given in 8.3;

c) the pump type test complies with the requirements of type test described in 8.4 and the examination shows no abnormal wear.

9 Marking

The pump head assembly shall have a nameplate with the following data as a minimum:

a) name of the manufacturer;

b) pump assembly serial number (which can be correlated with the production records);

c) maximum lift for efficient operation;

d) minimum flow rate at maximum lift.

In addition all major components shall have the manufacturer's identification mark.

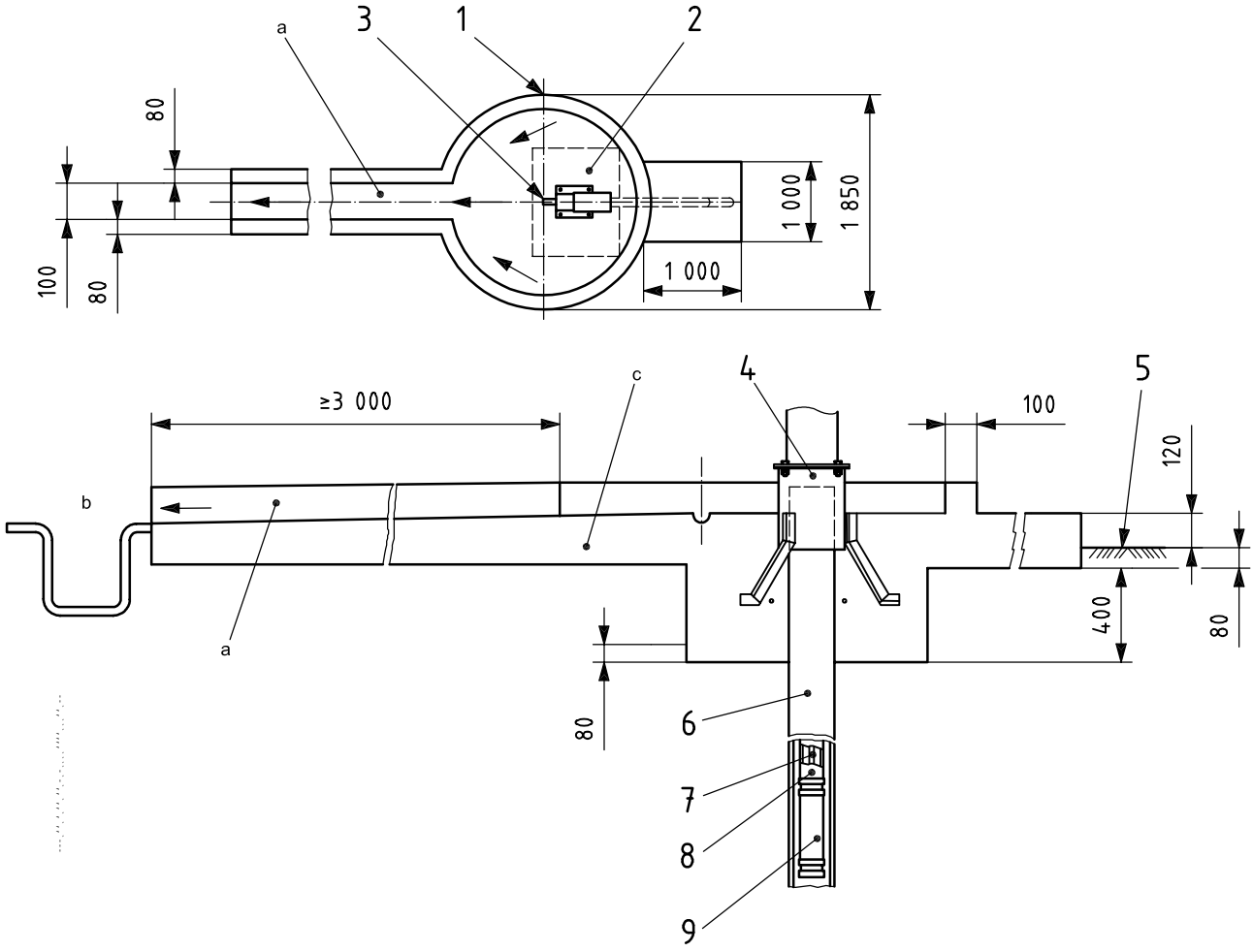
10 Packing and protection

To be specified by the purchaser.

Annex A
(informative)

Typical pump installations

Dimensions in millimetres



Key

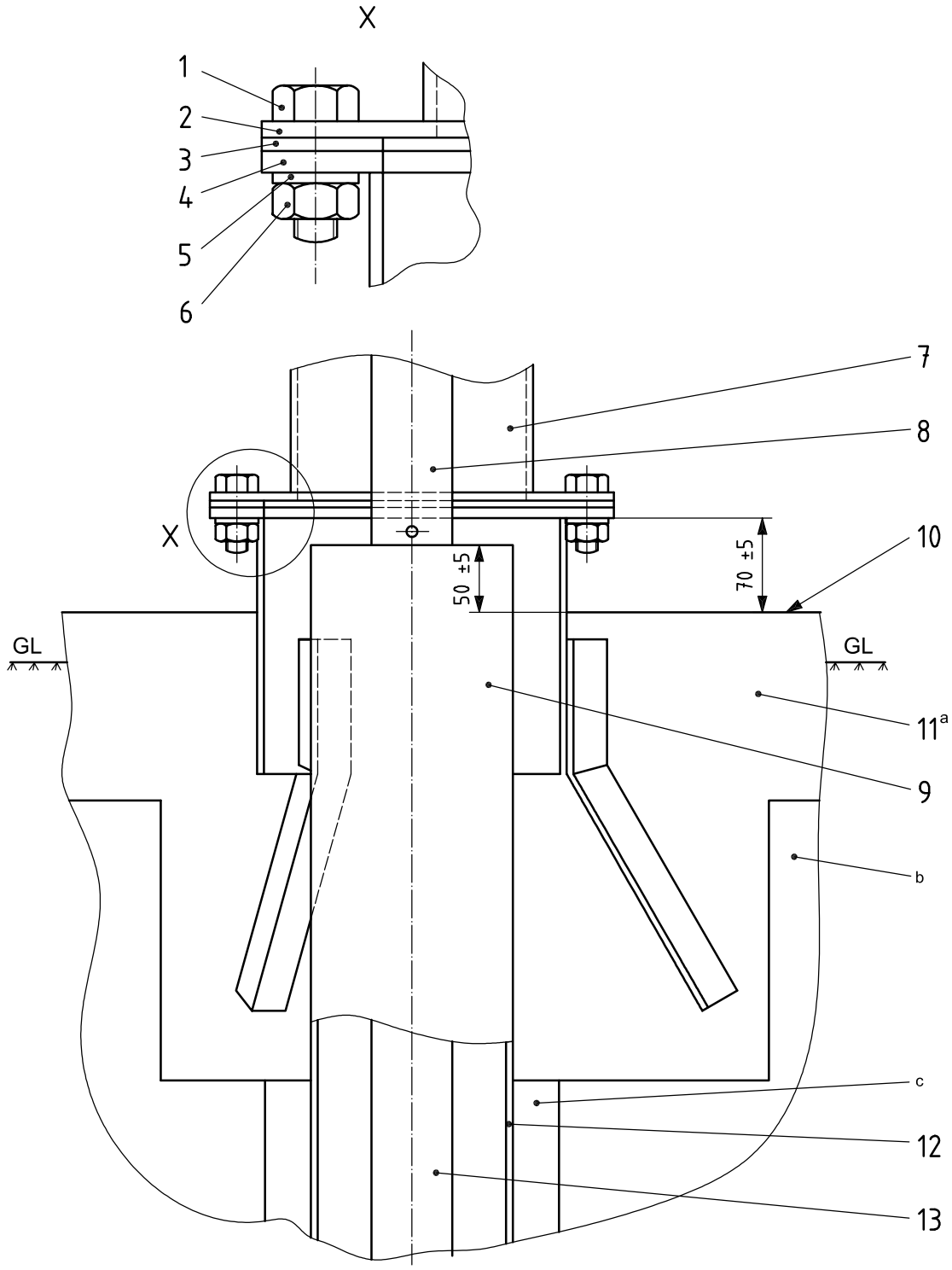
1	platform	6	casing pipe
2	foundation 760 × 760 × 400 deep	7	connecting mechanism
3	spout	8	riser pipe
4	standard pump base	9	pumping element
5	ground		

The free end of the casing pipe should be a minimum of 50 mm above the installation mark. Casing pipe is not required when the bore pipe passes through rock.

a Slope 1:50.
b To drain or soak pit.
c Cement mix: 1 part by volume fine cement, 2 parts by volume sharp sand, 4 parts by volume gravel.

Figure A.1 — Indicative set-up for a manually operated pump

Dimensions in millimetres

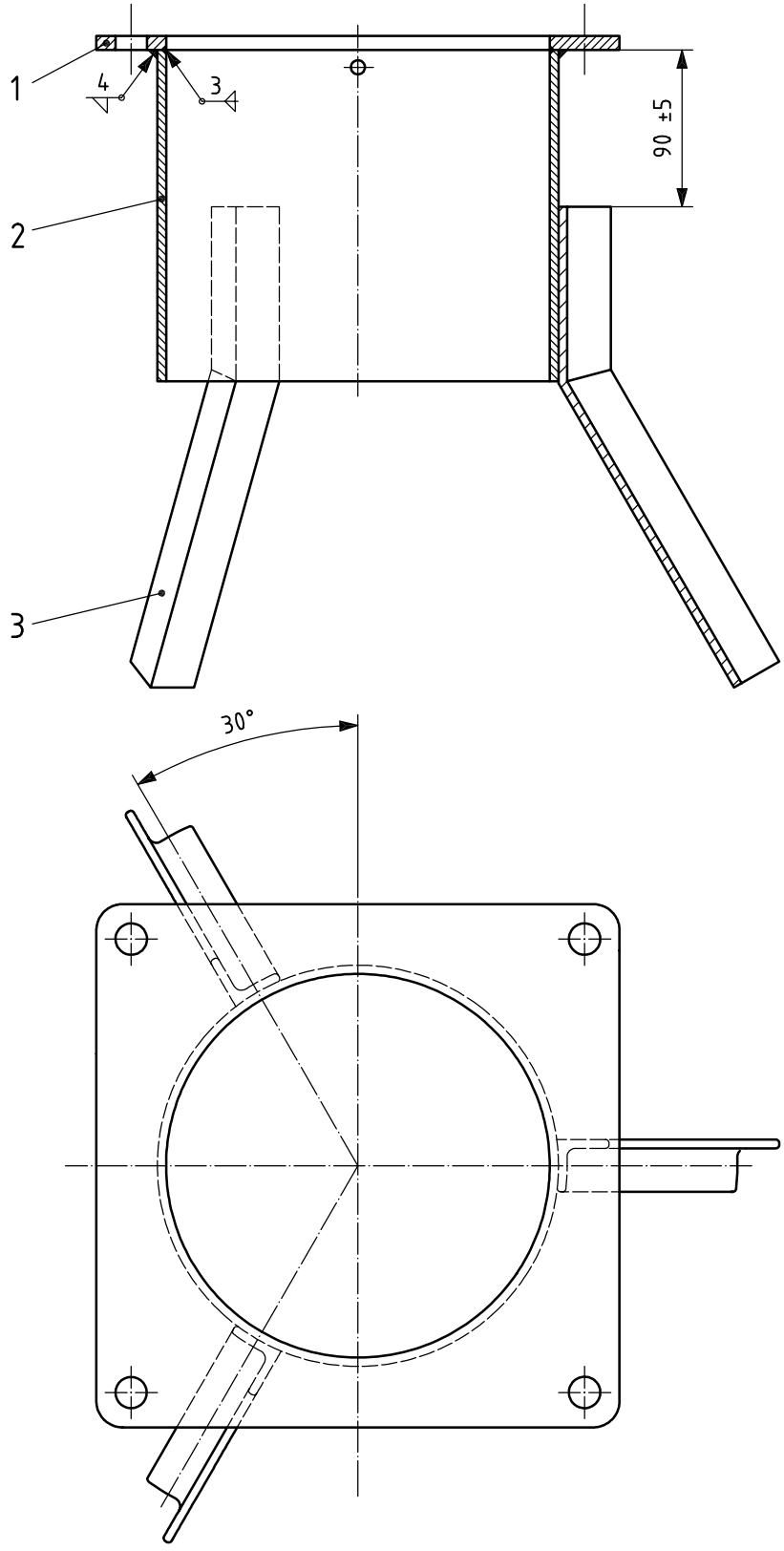


Key

1	bolt M 16	7	pump stand	13	rising main
2	base flange	8	rising pipe		
3	rubber gasket	9	well casing	a	Concrete.
4	flange	10	platform surface	b	Earth/ground.
5	washer	11	platform	c	Sand/gravel.
6	nut M 16	12	well casing (177 mm maximum diameter)		

Figure A.2 — Indicative pump base installation

Dimensions in millimetres



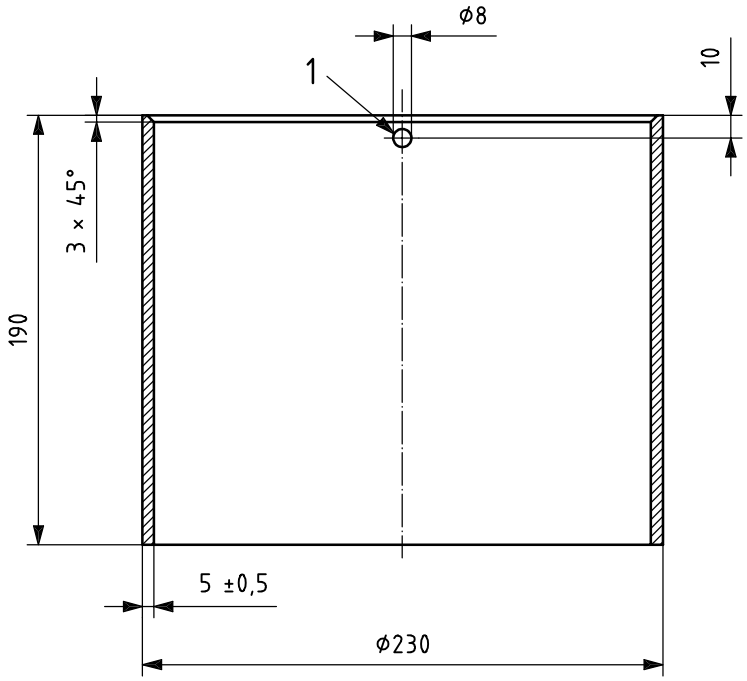
Key

1 base flange 2 base pipe 3 leg

Materials shall be in accordance with the requirements of ISO 630.

Figure A.3 — Indicative pump base

Dimensions in millimetres
General drawing tolerance is ± 1 mm unless otherwise specified



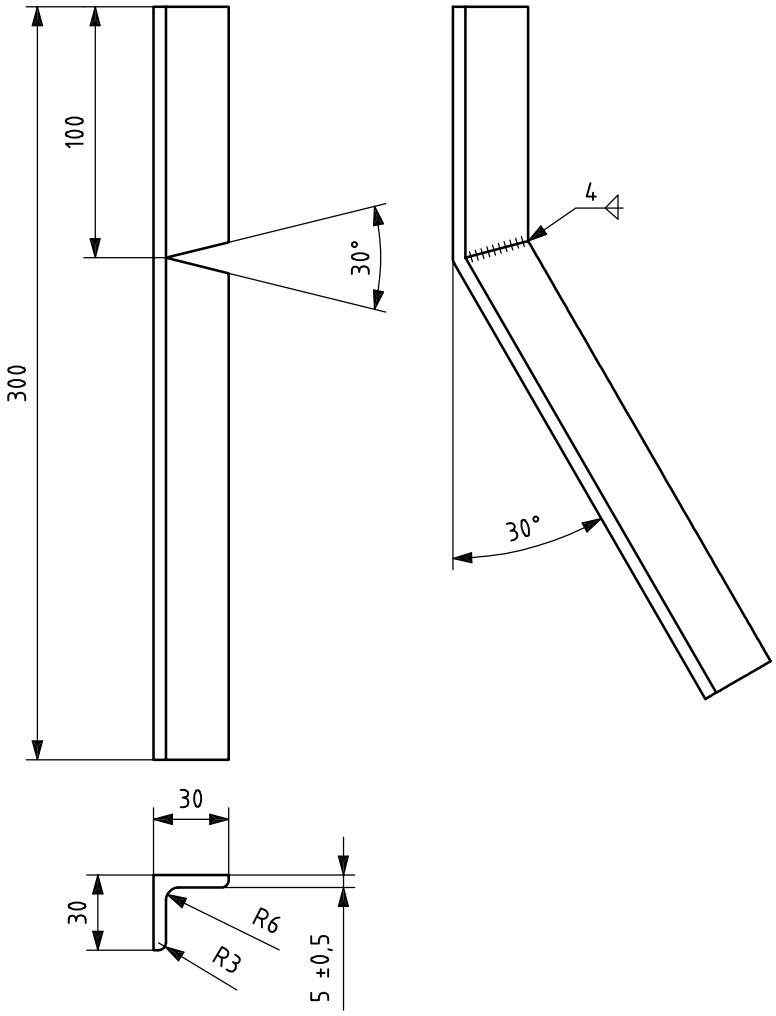
Key

1 ventilation hole

All sharp corners shall be rounded off.

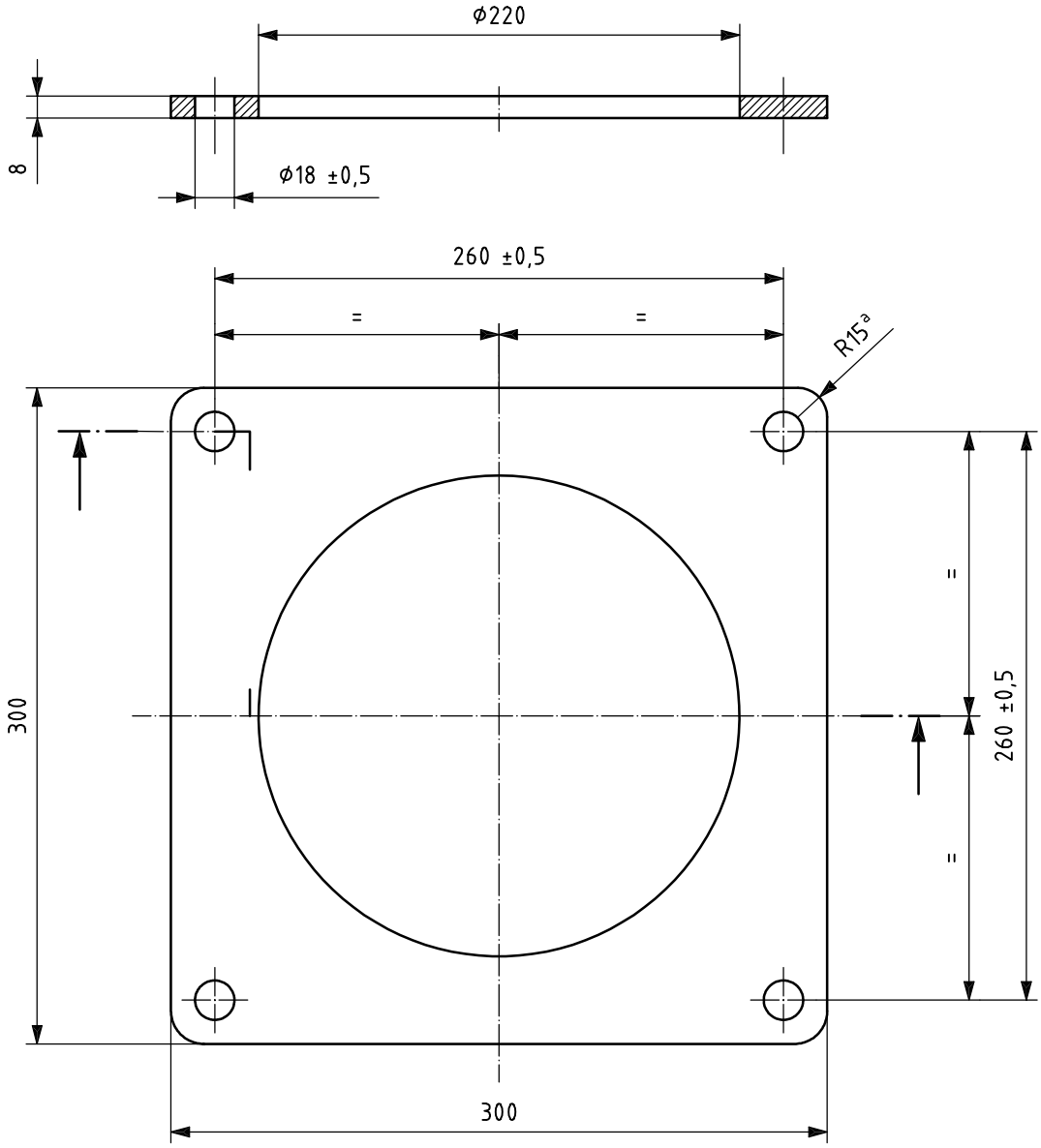
Figure A.4 — Indicative base frame

Dimensions in millimetres
General drawing tolerance is ± 1 mm unless otherwise specified



All sharp corners shall be rounded off.

Figure A.5 — Indicative Base Leg

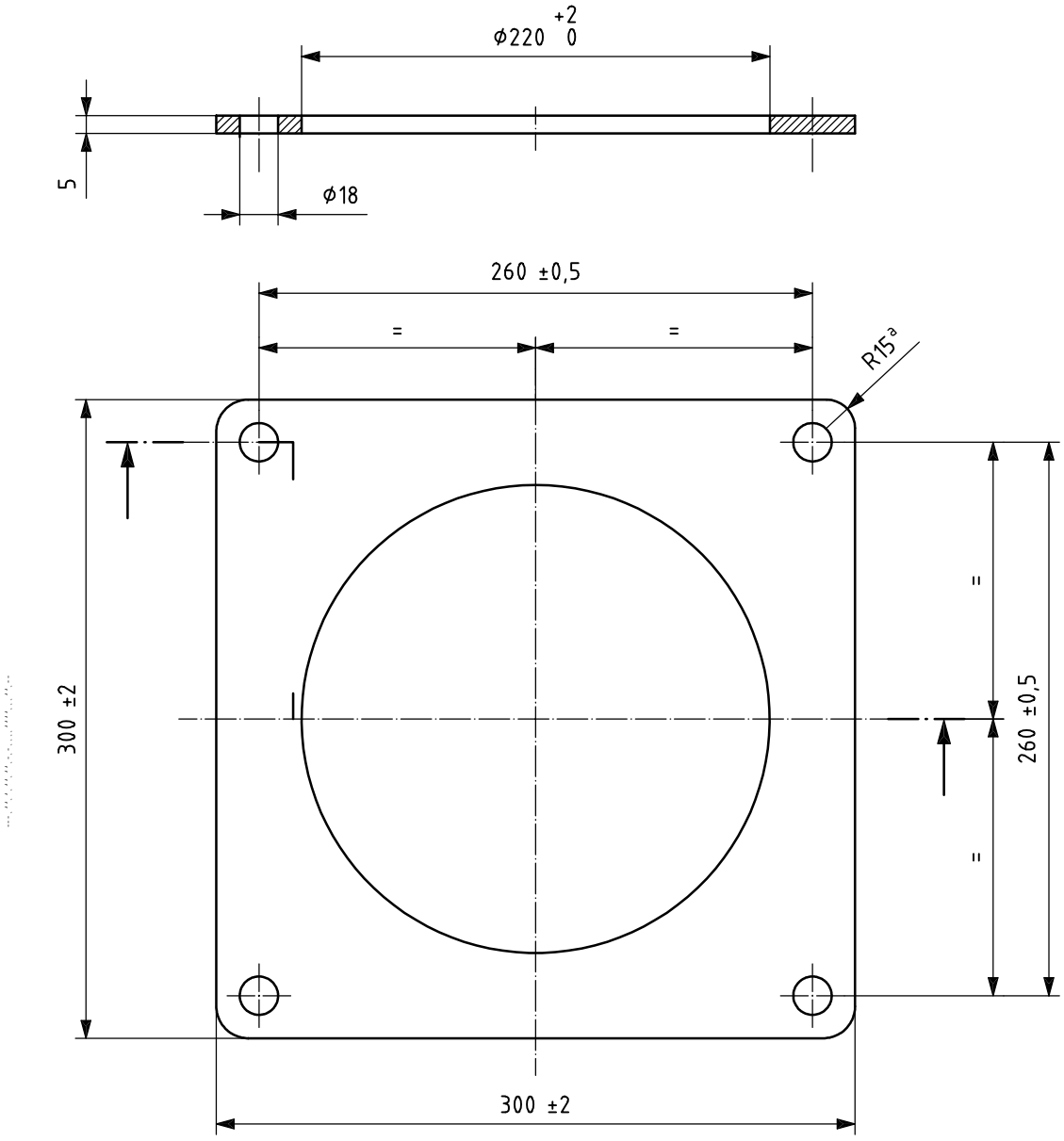


a Or chamfer of 15 × 45°

All sharp corners shall be rounded off.

Figure A.6 — Base Flange

Dimensions in millimetres
General drawing tolerance is ± 1 mm unless otherwise specified



a Or chanfer of 15 × 45°

Gasket material: Nitrile rubber (ISO 3302-1[M3]) with hardness 60 – 70 Shore A.

Figure A.7 — Indicative rubber gasket

Bibliography

[1] ISO 3302-1, *Rubber — Tolerances for products — Part 1: Dimensional tolerances*

ICS 23.080

Price based on 13 pages