



# IRANIAN PETROLEUM STANDARD

# IPS

**MATERIAL AND EQUIPMENT STANDARD**

**FOR**

**POSITIVE DISPLACEMENT PUMPS**

**CONTROLLED VOLUME**

**FIRST EDITION**

**NOVEMBER 2003**

**DEPUTY MINISTER  
FOR  
ENGINEERING & TECHNOLOGY  
RESEARCH AND STANDARDS**

## FOREWORD

This Standard is intended to be used within and for Iranian Ministry of Petroleum (N.I.O.C, N.I.G.C, N.P.C., N.I.O.R.D.C. and other affiliate organizations and companies) and has been prepared on the basis of the recognized standards, scientific publications, technical documents, accumulated knowledge and experiences in petroleum industries at national and international levels.

Iranian Petroleum Standards are prepared by Iranian Petroleum Standards Organization reviewed and amended by the relevant technical standard committees to incorporate acceptable comments made by oil, gas and petrochemical experts.

Standards are finally approved by the “Standards High Council” of Iranian Ministry of Petroleum.

Iranian Petroleum Standards (IPS) are subject to amendment withdrawal, if required, thus the latest edition of IPS shall be applicable.

Any comment or recommendation submitted to the “Iranian Petroleum Standards Organization” will be evaluated in the relevant technical committee and will be considered in the next revision, upon approval.

## GENERAL DEFINITIONS:

Throughout this Standard the following definitions shall apply.

“**COMPANY**” : Refers to one of the related and/or affiliated companies of the Iranian Ministry of Petroleum such as National Iranian Oil Company, National Iranian Gas Company, National Petrochemical Company etc.

“**PURCHASER**” : Means the “Company “ Where this standard is part of direct purchaser order by the “Company”, and the “Contractor” where this Standard is a part of contract documents.

“**VENDOR**” and “**SUPPLIER**” : Refers to firm or person who will supply and/or fabricate the equipment or material.

“**WILL**” : Is normally used in connection with the action by the “Company” rather than by a contractor, supplier or vendor.

“**MAY**” : Is used where a provision is completely discretionary.

“**SHOULD**” : Is used where a provision is advisory only.

“**SHALL**” : Is used where a provision is mandatory.

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## 0. INTRODUCTION

This Standard specification gives the amendments and supplements to API Standard 675, Second Edition, October 1994, "Positive Displacement Pumps-Controlled Volume". It shall be used in conjunction with data/requisition sheets for controlled volume pump..

**Note:** This is a revised version of the standard specification for Positive Displacement Pumps-controlled volume for process services, which is issued as revision(1). Revision(0) of the said standard specification is withdrawn.

### Guidance for Use of this Standard

The amendments/supplement to API Standard 675 given in this Standard are directly related to the equivalent sections or clauses in API Standard 675. For clarity, the section and paragraph numbering of API Standard 675 has been used as far as possible. Where clauses in API are referenced within this Standard, it shall mean those clauses are amended by this Standard. Clauses in API that are not amended by this Standard shall remain valid as written.

The following annotations, as specified hereunder, have been used at the bottom right hand side of each clause or paragraph to indicate the type of change made to the equivalent clause or paragraph of API.

**Sub. (Substitution):** The clause in API shall be deleted and replaced by the new clause in this Standard.

**Del. (Deletion) :** The clause in API shall be deleted without any replacement.

**Add. (Addition) :** The new clause with the new number shall be added to the relevant section of API.

**Mod. (Modification):** Part of the clause or paragraph in API shall be modified and/or the new description and/or statement shall be added to that clause or paragraph as given in this Standard

## SECTION 1 - GENERAL

### 1.1 Scope

This Standard contains minimum requirements for positive displacement pumps-controlled volume for use in refinery services, chemical, gas and petrochemical plants, and where applicable in production and exploration.

Compliance by the pump vendor with the provisions of this Standard does not relieve him of the responsibility of furnishing pump and accessories of proper design, mechanically suited to meet guarantees at the specified service conditions.

No deviations or exceptions from this Standard shall be permitted without the written prior approval of the Company. Intended deviations shall be listed separately by the Vendor and supported by reasons thereof for purchaser's consideration. **(Mod.)**

### 1.2 Alternative Design

The International System (SI) of Units , dimension and rating in accordance with [IPS-E-GN-100](#) shall be used, Unless otherwise specified. **(Mod.)**

### 1.3 Conflicting Requirements

In case of conflict between documents relating to the inquiry or order, the following priority of documents shall apply:

**First priority:**

Purchase order and variations thereto.

**Second priority:**

Data/requisition sheets and drawings.

**Third priority:**

This Standard Specification.

All conflicting requirements shall be referred to the purchaser in writing. The purchaser will issue confirmation document if needed for clarification. **(Sub.)**

### 1.4 Definition of Terms

Simplex metering pump, is a pump having one plunger or diaphragm.

Duplex metering pump, is a pump having two plungers or diaphragms.

Triplex metering pump, is a pump having three plungers or diaphragms.

Single acting pump, is a pump in which the pumping takes place on only one and the same side of each piston.

Double acting pump, is a pump in which pumping takes place alternatively on either side of each piston. **(Mod.)**

### 1.5 Reference Publications

**1.5.1** Throughout this Standard the following dated and undated standards/codes are referred

to. These referenced documents shall, to the extent specified herein, form a part of this standard. For dated references, the edition cited applies. The applicability of changes in dated references that occur after the cited date shall be mutually agreed upon by the Company and the Vendor. For undated references, the latest edition of the referenced documents (including any supplements and amendments) applies.

**IPS (IRANIAN PETROLEUM STANDARDS)**

- [M-EL-132](#) "Induction Motors" **(Mod.)**
- [M-PM-320](#) "Lubrication, Shaft Sealing and Control Oil Systems for Special Purpose Application." **(Mod.)**
- [E-EL-110](#) "Electrical Area Classification and Extent" **(Mod.)**

**SECTION 2 - BASIC DESIGN**

**2.1 General**

- 2.1.5** Add to the end of this clause: "Including 10% Accumulation". **(Mod.)**
- 2.1.7** All electrical components and installations shall be suitable for the area classification, gas grouping and temperature classes specified by the purchaser on the data sheets, and shall meet requirements of IPS Standard [M-EL-132](#) and [E-EL-110](#). **(Sub.)**
- 2.1.9** For packed pumps, provision shall be made to permit packing adjustment and visual observation of packing performance. **(Mod.)**
- 2.1.10** Plungers shall be replaceable without disturbing stroke adjustment or removing crosshead. **(Mod.)**
- 2.1.12** Unless otherwise specified pumps and accessories shall be suitable for outdoor installation in the climatic zone specified. **(Mod.)**
- 2.1.21** For abrasive fluid services, provisions shall be made to prevent particle sedimentation within the pump head spaces. For this services mechanically operated pump valves are preferred. **(Add.)**
- 2.1.22** To meet the required rated capacity, vendor may offer at his option, two or tree cylinder arrangement (duplex or triplex) with a common driver in place of simplex arrangement. When manifolds connect such suction and discharge nozzles, fabricated out of SS 316 material shall be supplied by the vendor. Relief valve shall be designed to pass rated capacity when fully open and limiting the accumulation pressure to 110% of setting pressure. **(Add.)**
- 2.1.23** Pump with spring return on plunger not acceptable **(Add.)**

**2.2 Pressure-Containing Parts**

- 2.2.7** Complete liquid end, including suction connection shall be suitable for relief valve setting pressure which is equal to discharge flange rating. **(Add.)**

**2.3 Liquid end connections**

- 2.3.3** Threaded connections larger than DN15 (½") require Purchaser's approval. **(Mod.)**
- 2.3.5** Plugs shall have low galling tendency. Threaded plugs shall be fixed properly to prevent loosening and leakage from them. Seal welding of threaded plugs is not permitted. **(Mod.)**

**2.3.6.3** Flanges that are thicker or have a larger outside diameter than required by ANSI are acceptable but they shall be faced and drilled as specified in ANSI Standard. Non ANSI flanges may be furnished by prior approval of the Company. In this cases the vendor shall submit the mating flanges. **(Add.)**

## **2.5 Diaphragms**

**2.5.2** Unless otherwise specified, double diaphragms shall be used for viscous, abrasive and corrosive fluids. **(Mod.)**

**2.5.6** Mechanically actuated replenishing function is preferred for intended seepage. **(Add.)**

**2.5.7** For single diaphragm pumps and for service temperatures above 150°C, the diaphragm between two perforated plate construction is preferred. **(Add.)**

## **2.11 Lubrication**

**2.11.3** All gearing, cams, connecting rods, cranks, etc. required to obtain the reciprocating plunger action from the motor, shall be housed in oil tight drive units. Exposed crank shafts are not acceptable. **(Add.)**

## **2.12 Capacity Adjustment**

**2.12.2** Manual stroke adjustment with the unit in operation must be provided unless automatic capacity controls are called for, on the individual metering pump data sheet. **(Mod.)**

## **SECTION 3 - ACCESSORIES**

### **3.1 Drivers**

**3.1.8** Motor drivers shall be supplied in accordance with IPS Std. [M-EL-132](#) and [E-EL-110](#). **(Add.)**

**3.1.9** Minimum motor kW for any pump application shall be 0.37 kW. **(Add.)**

**3.1.10** Pumps shall be direct or gear driven and coupled by flexible couplings. Chain and belt driven are not acceptable. **(Add.)**

### **3.2 Couplings and Guards**

**3.2.4** Materials for the guard shall be non sparking. **(Add.)**

### **3.6 Pulsation Suppression Devices**

**3.6.1** Volume bottles without internals, shall be equipped with a fail-safe device for conditions of product loss.

Unless otherwise approved by purchaser, pump suction accumulators shall be of double-diaphragm type (separator bag) with rupture indicator/monitor. **(Mod.)**

## **SECTION 4 - INSPECTION, TESTING AND PREPARATION FOR SHIPMENT**

### **4.4 Preparation for shipment**

**4.4.1** the preparation shall be suitable for a period of 12 months of outdoor storage from the time of shipment. **(Mod.)**



**SECTION 5 - VENDOR'S DATA****5.1 General**

5.1.3 All documents shall be in English language. **(Add.)**

**5.2 Proposal****5.2.1 General**

Priced spare parts prices shall be included. **(Mod.)**

**5.3 Contract Data****5.3.3 Technical Data**

An illustrated part list shall be furnished. **(Mod.)**

## Note to Users

The IPS Standards reflect the views of the Iranian Ministry of Petroleum and are intended for use in the oil and gas production facilities, oil refineries, chemical and petrochemical plants, gas handling and processing installations and other such facilities.

IPS publications are based on internationally acceptable standards and include selections from the options stipulated in the referenced standards. They are also supplemented by additional requirements and/or modifications based on the experience acquired by the Iranian Petroleum Industry and the local market availability. The options which are not specified in the text of the standards are itemized in data sheet/s, so that, the user can select his appropriate preferences therein.

The IPS standards are therefore expected to be sufficiently flexible so that the users can adapt these standards to their requirements. However, they may not cover every requirement or diversity of conditions of each project or work.

For such cases, an addendum to IPS Standard shall be prepared by the user which elaborates the particular requirements of the user. This addendum together with the relevant IPS shall form the job specification for the specific project or work.

The users of IPS publications are therefore requested to send their views and comments, including any addendum prepared for particular cases to the Ministry of Petroleum, Standards and Research Organization. These comments and recommendations will be reviewed by the relevant technical committee and will be incorporated in the formal revision of the relevant IPS. The IPS publications are reviewed and revised approximately every five years.

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