



شرکت ملی گاز ایران

مدیریت پژوهش و فناوری

امور تدوین استانداردها

IGS

Iranian Gas Standards

مشخصات فنی خرید

ترانسهای یکسو کننده سیستم حفاظت از زنگ

Transformer Rectifiers for Cathodic Protection

## IGS-EL-013(2) : 1998 Transformer Rectifiers



### 1. SCOPE

THIS SPECIFICATION OUTLINES THE MINIMUM QUALITY REQUIREMENTS OF THE HEAVY DUTY TRANSFORMER RECTIFIER UNIT FOR GAS PIPELINE CATHODIC PROTECTION THE POWER OF TR / REC AS SPECIFIED IN THE DATA SHEET ( ITEM II )

### 2. SERVICE CONDITIONS :

THE TRANSFORMER - RECTIFIER UNIT SHALL BE SUITABLE FOR OUT DOOR INSTALLATION IN HUMID , SALT LADEN , DUSTY ATMOSPHERE AND DESIGNED FOR CONTINUOUS FULL LOAD OPERATION UNDER THE FOLLOWING SERVICE CONDITIONS .

- A-      MAXIMUM AMBIENT SHADE TEMPERATURE 50°C
- MINIMUM AMBIENT SHADE TEMPERATURE -25°C

- B- METAL SURFACES DIRECTLY EXPOSED TO SUN CAN AT TIMES REACH A SURFACE TEMPERATURE OF 85°C
- C- ALTITUDE ABOVE SEA – LEVEL MAX . 2000M
- D- MAXIMUM RELATIVE HUMIDITY 95%
- E- LIGHTNING STORMS ARE AT TIMES SEVER BUT INFREQUENT APPROXIMATELY ISOCLASTIC LEVEL 60 STORM DAY / YEAR
- F- ESTIMATED DUST CONCENTRATION OF 70 TO 1400 MILLIGRAM / CU METER . IT IS THE RESPONSIBILITY OF THE MANUFACTURER OR SUPPLIER TO ENSURE THAT TRANSFORMER - RECTIFIER AND ALL AUXILIARY APPARATUS AND EQUIPMENT ARE DESIGNED AND CONSTRUCTED TO OPERATE SATISFACTORILY UNDER SPECIFIED SERVICE CONDITIONS .

### 3. APPLICABLE STANDARDS :

IN ADDITION TO THE REQUIREMENTS OF THE PARAGRAPHS CONTAINED HEREIN , THE TRANSFORMER – RECTIFIER UNIT AND ITS MAIN COMPONENTS SHALL CONFORM TO THE LATEST ISSUE OF FOLLOWING STANDARDS .

|                                      |                       |
|--------------------------------------|-----------------------|
| RECTIFICATION                        | ----- , BS 2709       |
| SEMI – CONDUCTOR RECTIFIER EQUIPMENT | IEC 146 , BS 4417     |
| POWER TRANSFORMER                    | IEC 76 , BS 171       |
| INSULATING OIL                       | IEC 296 , BS 148      |
| FUSES                                | IEC 269 , BS 88       |
| MOVING COIL METERS                   | IEC 51 , BS 89        |
| SURGE DIVERTERS ( ARRESTERS )        | IEC 99 – 1A , BS 2914 |
| SWITCHES AND SWITCH – FUSES          | IEC 408 , BS 5419     |
| CONTROL SWITCHES ( CONTROL RELAYS )  | IEC 337 -----         |
| CONDUIT AND CABLE FITTINGS           | BS 4568 & 6121 PART 1 |

THE FOLLOWING MECHANICAL FITTINGS FOR THE UNIT SHALL BE COMPLIED WITH RELEVANT STANDARDS :

- A- OIL LEVEL GAUGE
- B- THERMOMETER
- C- OIL FILLER PLUG AND DRAIN VALVE
- D- EARTH TERMINAL

- E- SILICAGEL BREATHER
- F- LIFTING LUGS
- G- SUNSHADE ( IF REQUIRED )

#### **4. ELECTRICAL DATA :**

##### **4.1 AC INPUT VOLTAGE RATINGS :**

AS SPECIFIED ON THE RELEVANT REQUISITION OR DATA SHEET , THE TR – RECT UNIT SHALL BE SUITABLE EITHER FOR 220 / 230 V , 50 HZ , SINGLE PHASE OR 380/400 V , 50 HZ , THREE PHASE AND NEUTRAL . FULL – RATED D.C. OUT – PUT SHALL BE OBTAINED WITH INPUT VOLTAGE 5% BELOW THE NOMINAL VALUE CONTINUOUS INPUT VOLTAGE 10% ABOVE NOMINAL VALUE SHALL NOT DAMAGE THE TRANSFORMER OR THE RECTIFYING ELEMENTS .

##### **4.2 DC OUTPUT RATINGS :**

THE DC OUT PUT SHALL BE AS SPECIFIED ON THE RELEVANT REQUISITION OR DATA SHEET . TR – REC . SHALL BE CAPABLE OF SUPPLYING CONTINUOUS FULL RATED OUTPUT VOLTAGE AND AMPER AT AN AMBIENT TEMPERATURE OF 50°C IN SHADE AT SUMMER TIME AND -25°C IN WINTER .

##### **4.3 VOLTAGE ADJUSTMENT :**

SUBJECT TO THE REQUIREMENT SPECIFIED ON THE RELEVANT REQUISITION AND/OR DATA SHEET , THE OUT PUT VOLTAGE SHALL BE REGULATED BY ONE OR COMBINATION OF TWO OF THE FOLLOWING METHODS .

A- THE OUTPUT SHALL BE REGULATED BY 3 TAPPIN SWITCHES :

COARS ,MEDIUM AND FINE , PROVIDING CONTROL IN 63 STEPS .

B- THE OUT PUT VOLTAGE SHALL BE ADJUSTABLE BY MEANS OF VARIABLE AUTO TRANSFORMER , LOCATED ON THE PRIMARY