



***Pars Jam Control***

***E.P.C Contractor of Industrial Utilities***

***Company Overview***



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**Machine Sazi Arak**

**C. Machine Sazi Arak**



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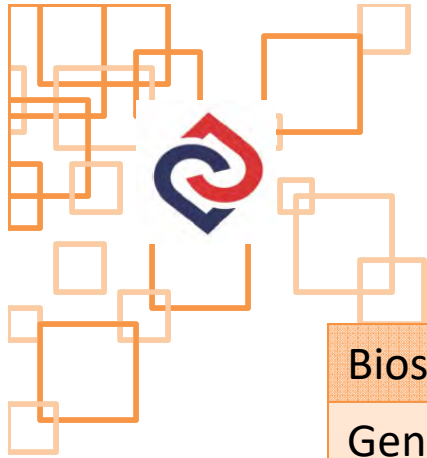
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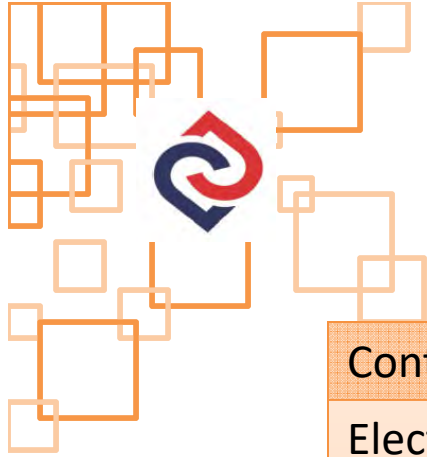
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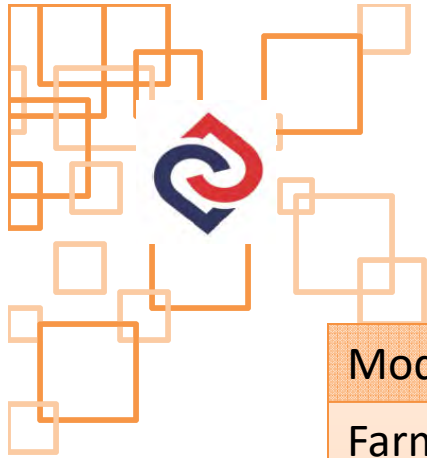
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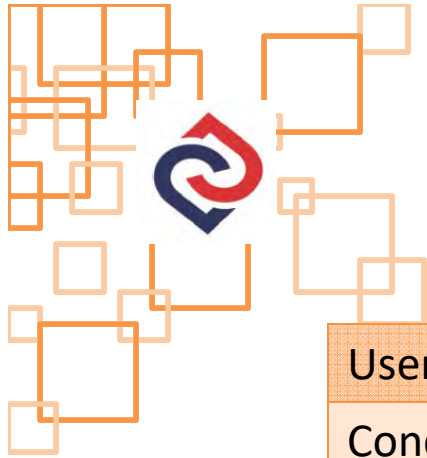
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# COMPANY OVER VIEW

Coming through years of experience, ***Pars Jam Control (PJC)***, known nationally as a leading E.P.C company, is extremely specialized in mechanical utility systems with remarkable expertise in steam systems.

The main services we can provide are:

- ✓ **Engineering Design, Consultation & Supervision**
- ✓ **Procurement**
- ✓ **Installation & Commissioning**
- ✓ **Energy Saving & Audits for Plant Optimization**
- ✓ **Training**
- ✓ **Publication**





# RELEVANT INDUSTRIES

**These are just some samples  
of application and industries we are dealing with.**

- ✓ Petrochemicals
- ✓ Refineries
- ✓ Power Plants
- ✓ Textiles & Natural Fibers
- ✓ Dairy
- ✓ Electronics
- ✓ Automotive
- ✓ Rubber & Tires
- ✓ Hospitals
- ✓ Pharmaceutical
- ✓ Sugar Refining
- ✓ Fine Chemicals
- ✓ Food & Beverage
- ✓ Heating, Venting & Air Conditioning (HVAC)
- ✓ Other Industries





# Resume



## Steam Boilers Resume

- MAPNA Generator and Wind Turbin Engineering and manufacturing Co.(PARS)
  - Pardis Technology Park
  - Iran University of Medical Sciences
  - Army Family Hospital
  - 502 Artesh Hospital
  - Shahid Dr. Chamran Hospital
  - Haft-e-Tir Hospital
  - Fayaz Bakhsh Hospital
  - Torfeh Hospital
  - Mihan Dairy & Ice Cream
  - Farmand Chocolate
  - Protein Gostar Sina
- Shohadaye Pakdasht Damavand Combined Cycle Power Plant
- RAMPCO Group
- Solomon Carpet
- Mahram food industry complex
- Rana Food
- Etkā food industry complex
- Zarnam Farhikhtegan Company
- Pasteur Institute of Iran
- Razi Vaccine and Serum Research Institute
- Khazar Economic Development Group
- National Oil Construction Engineering (Sari Moghanak Project)
- Khatoonabad copper refinery





- Shahed University
- Islamic Azad University Science and Research Branch
- Islamic Azad University South Tehran Branch
- Pars Emad Darman Pharmaceutical Company
- Modava Pharmaceutical Company
- Karen Pharmaceutical Company
- Shafa pharmaceutical and hygienic co
- Neshatdarou Saveh
- Soha Pharma Company
- Rouzdarou co
- Vitane Pharmed co
- Alhavi Pharma
- Tejarat Akhavan Farsi Company
- Ideal Sanat Pouya co
- Tabiatsabz
- Shirin Shahd Parsian
- Payasazeh Pasargad(saba project)

- SHANA Food Industries
- Debsh tea
- Sehat Industrial and Commercial Co.
- Pakdis Co
- Mehdi Clinic (Imam Khomeini Hospital)
- Iranborgeh
- MVMCO Modiran Khodro
- Lavan Refinery
- Shahid Arefi Industrial Group
- Tiam Gostar Arian
- Tohid Company
- Homa Hotel Bandar abbas
- Tehran International Tower
- Farco Chemical Manufacturing Industries (Tage)
- Padideh Shimi Gharn Company(Active)
- Padideh Shimi Jam
- Roopak Kimia Company

## Engineering Resume



- Hedayat Hospital
- Arian kimia tak Company
- Roopak Kimia Company
- Medical University Tehran
- Shariati Girls College
- Tabriz Pegah pasteurized milk Company
- Zanzan Pegah pasteurized milk Company
- Urmia Pegah pasteurized milk Company
- Pak pasteurized milk Company
- Golestan Pegah pasteurized milk Company
- Damdaran Dairy Industries Company
- Yasa Iran Rubber Company
- Sangsalar production Company
- Firouzkoh sugar Company
- Sadr Precast Concrete Parts Company
- Pars Animal Feed Company
- Gostaresh Catalyst Iranian
- Rouzbeh Chocolate Company
- Ghaflankoh Chocolate Company
- Reza Industries Development Company
- Oghab halva Company
- Halvae Shahrud Company
- Tejarat Akhavan Farsi Company
- Pakdis Urmia Company
- Tala Sefid Company
- Tsgco Company(ISTAK)
- Aviation accessories and systems industry
- Isfahan Airport
- Astan Quds Razavi affiliated industries
- Central facility of Imam Reza Holy Shrine



- Biosan Pharmed pharmaceutical company
- Vitane Pharmed
- Karen Pharmaceutical Company
- Biology fermentation Company (zisttakhmir)
- Tehran chemie pharmaceutical Company
- Tehrandarou Co
- Pars Emad Darman Pharmaceutical Company
- Nik Saman Daru Pharmaceutical Company
- Modava Pharmaceutical Company
- Tehran Neal Pharmaceutical Company
- Rayhaneh Pharmaceutical Company
- ATRA Pharmaco
- Pasteur Institute of Iran
- Razi Vaccine and Serum Research Institute
- Parand Chocolate Company (Farmand)
- Khazar Economic Development Group
- Zarnam Research Center
- MVMCO Modiran Khodro
- Rampco Company
- Mahram Food Industries
- Rana Food Company

- Tabiatfood
- Bandar Imam Petrochemical Company
- Jam Petrochemical Compan
- Regal Petrochemical Company
- Polynar Petrochemical Company
- Yazd Solar Power Station
- Shirvan Combine Cycle Power Plant
- Shohadaye Pakdasht Damavand Combined Cycle Power Plant
- Hamedan Power Plant
- Montazer Ghaem Power Plant
- Shahid Salimi Power Plant
- Moghanak oil balance terminal
- Mahak Hospital
- Rasht Qa'em Hospital
- 501 Artesh Hospital
- Birjand 96-bed Hospital
- Tehran Azad University Hospital
- Mashhad Razavi Hospital
- Kerman Shahid Bahonar Hospital
- Khatam Al-Anbia Hospital, Abarkoh, Yazd
- Kian Hospital



## EPC Resume

- Rampco Company
  - Farco Chemical Manufacturing Industries (Tage)
  - Pasteur Institute of Iran
  - Razi Vaccine and Serum Research Institute
  - Khazar Economic Development Group
  - Biosan Pharmed pharmaceutical company
  - Tehrandarou Co
  - Nik Saman Daru Pharmaceutical Company
  - Pars Emad Darman Pharmaceutical Company
- 
- Rana Food Company
  - Tehran Neal Pharmaceutical Company
  - Karen Pharmaceutical Company
  - Tolid Darou Pharmaceutical Complex
  - Moheb Roopak Kimia Company
  - Modava Pharmaceutical Company
  - Kerman Motor Co
  - Makran project
  - MVMCO Modiran Khodro

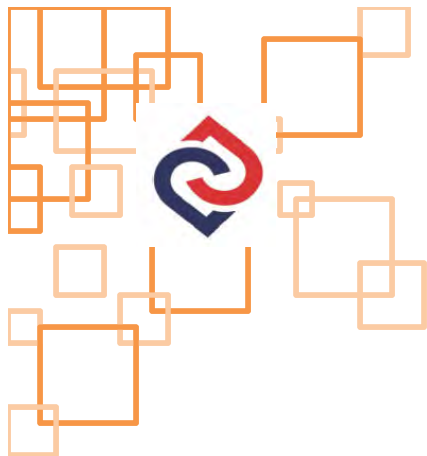


- Rayhaneh Pharmaceutical Company
- Vitan Pharmed pharmaceutical company
- Arian kimia tak company
- Zarnam Research Center
- Petropak Eastern Petrochemical Industries
- Oghab halva Company
- Parand Chocolate Company (Farmand)
- Shirvan Combined Cycle Power Plant
- Yazd solar-thermal power plant
- Moghanak oil balance tanks
- Persian Gulf Sahand Industries Co
- Khatoonabad Copper Refining Company
- Sadr Precast Concrete Parts Company
- Padideh Shimi Gharb Company
- Mahram Food Industries
- Firouzkoh sugar Company
- Sangsalar production Company
- Zoghaljain Company
- Tabriz Pegah pasteurized milk Company
- Medical University Tehran
- Atra Pharmaceutical Company
- Factor VIII Pharmaceutical Company - Saman Daroo
- Ideal Sanat Pouya Delijan Food Factory
- Gostaresh Catalyst Iranian
- Tejarat Akhvan Farsi Company
- 501 Artesh Hospital
- Army Family Hospital
- Aghajari Omidiyeh Hospital
- Shariati Girls College
- Urmia Pegah pasteurized milk Company





# Company Certificates



سازمان مدیریت و برنامه ریزی کشور  
سازمان مدیریت و برنامه ریزی استان تهران

شماره ۹۵،۳۲۴۶۲  
تاریخ ۱۳۹۵، ۲، ۱

# گواهینامه صلاحیت پیمانکاری

مدیرعامل محترم شرکت پارس جم کنترل

شماره ثبت ۳۳۷۳۳۲

با استناد به مصوبه شماره ۴۸۱۳/ت ۲۳۳۵۱ مورخ ۱۳۸۱/۱۲/۱۱ هیات محترم وزیران و با توجه به ابراز شرایط لازم و تأیید صلاحیت آن شرکت در سامانه جامع تشخیص صلاحیت عوامل نظام فنی اجرایی، بر این وسیله صلاحیت آن شرکت برای انجام امور پیمانکاری از تاریخ صدور این گواهینامه تا پایان دوره ارزشیابی و حداکثر تا تاریخ ۱۳۹۹/۱۰/۲۹ اعلام می گردد.

شناسه ملی شرکت : ۱۰۱۰۴۷۳۳۰۳۷

خواهشمند است برای مشاهده جزئیات گواهینامه صادره به پایگاه

<http://sajar.mporg.ir> مراجعه فرمایید.

رعایت مفاد قانون برگزاری مناقصات موضوع بلاغیه شماره ۱۳۰۸۱۰ مورخ ۱۳۸۴/۱۱/۱۷ رییس مجلس شورای اسلامی آیین نامه فنی اجرایی مربوطه و فریفت کاری مجاز در زمان ارجاع کلا توسط آن شرکت ضروری است.

نصرت الوترکی  
رییس سازمان

- هرگونه تغییر در ارکان و سهام شرکت و اطلاعات اعتبارآوران (مدیرعامل، هیات مدیره و کارکنان اعتبارآور)، باید حداکثر ظرف مدت سه ماه در سامانه ساجات (<http://sajar.mporg.ir>) ثبت و ارسال گردد.
- هر قرارداد جدید حداکثر ظرف مدت سه ماه پس از انعقاد قرارداد و صورت وضعیت های جدید پس از تأیید کارفرما باید در سامانه ساجات ثبت شود. تا اعتبار آنها هنگام تشخیص صلاحیت دوره بعد و آزاد سازی ظرفیت منظور شود.
- در صورت مغایرت مطالب این گواهینامه با اطلاعات موجود در پایگاه <http://sajar.mporg.ir> اطلاعات پایگاه اصالت دارد. به مندرجات پشت صفحه این گواهینامه توجه فرمایید.



**کواهینامه نمایندگی**

بسمه تعالی

**ماشین سازی اراک**  
Machine Sazi Arak

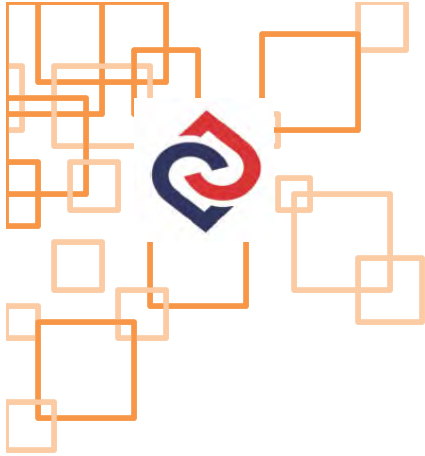
شماره: ۰۱/۹۳۱۱/FD1866  
تاریخ: ۱۴۰۲/۰۴/۰۱

با تقدیر از زحمات بی شائبه و تلاش مجدانه در راستای اهداف متعالی شرکت ماشین سازی اراک به موجب قرار داد شماره ۴۰/۱۴۰۲/۴۰/۰۷۷ مورخ ۱۴۰۲/۰۳/۳۱ شرکت پارس جم کنترل ثبت شده به شماره ۳۳۷۳۳۲ مورخ ۱۳۸۷/۰۸/۰۶ با مدیریت جناب آقای سعید صفی زاده امزاجردی مجاز می باشد از تاریخ صدور گواهینامه به عنوان نماینده مجاز فروش دیگ های بخار و آبگرم شرکت ماشین سازی اراک در سراسر کشور و خدمات پس از فروش در استان های تهران و البرز فعالیت نماید.

مدت اعتبار این گواهینامه تا تاریخ ۱۴۰۳ / ۰۴ / ۰۱ بوده و در صورت تمدید گواهینامه جدید صادر می گردد.

|  |  |  |
|--|--|--|
| رضا سرائی<br>مدیر عامل<br>و نایب رئیس هیات مدیره | مریم قدیری زاده<br>معاونت امور پروژه ها<br>و توسعه کسب و کار | سیدرحیم عظیمی<br>مدیر بازاریابی و فروش<br>گروه تولیدی دیگ های بخار |
|--|--|--|

Scanned with CamScanner



  
**RQS**  
Registrar of Quality Systems  
Certification

# CERTIFICATE

This certificate has been awarded to  
**Pars Jam Control Co.**

Unit 13,5th Floor ,no.11,Azadegan Alley ,Ghaem Magham Farahani St. ,Tehran ,Iran

**Quality management system**

An audit ,documented in a report ,has verified that this certified management  
System fulfills the requirements of following standard :

**ISO 9001:2008**

The scope of activities covered by this certificate is defined below

**Design ,Engineering , procurement ,Manufacturing ,and  
Construction of Industrial Utility (Steam System ,Valves , Boiler )**

Registration number: 17099RC058  
Date of issue : 30 Aug 2017      Expiry Ver. :15 Sep 2018  
Expiry date : 30 Aug 2020

Issued By :

  
Thorsten Wasmer  
Head of RQS Certification

Registrar of standards Ltd Global Registrar Inc .©RQS 2014  
[www.rqscert.com](http://www.rqscert.com)

**Registrar of Quality Systems**







## KEYHAN QUALITY REGISTRAR MANAGEMENT SYSTEM CERTIFICATE

Cert No.: IR-QKCU-228

This is to certify that:

**Pars Jam Control Co.**

Address: No. 11, Azadegan Alley, Ghaem Magham Farahani St., Tehran,  
IRAN

has been found to confirm the Management System Standard:

### ISO 9001:2008

This Certification is valid for the following product or service range:

**Design, Engineering, Procurement, Manufacturing and Construction of  
Industrial Utility**

Date Issued : 20/July/2013  
Registration Date : 18/July/2013  
Expiry Date : 18/July/2016

The audit has been performed  
under the supervision of:  
**Alireza Moulaei**  
Lead Auditor

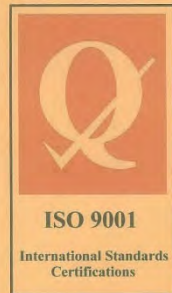


for Keyhan Quality Registrar  
**Mohammad Masoud**  
Managing Director



# ISO 9001





ISO 9001:2008

## CERTIFICATE OF REGISTRATION

THIS IS TO CERTIFY THAT THE  
QUALITY MANAGEMENT SYSTEM OF

**Pars Jam Control Co.**

No. 11, Azadegan Alley, Ghaem Magham Farahani St.

Tehran

IRAN

Has been assessed and registered as complying with the requirements of the International Standard shown above for the following Goods and Services. Further clarifications regarding the scope of this certificate and the applicability of ISO 9001:2008 requirements may be obtained by consulting the organisation.

**Design, Engineering, Procurement, Manufacturing and  
Construction of Industrial Utility**



[www.jas-anz.org/register](http://www.jas-anz.org/register)

*Ach Wilde*

Tony Wilde  
Group Chairman  
ISC Pty Ltd, A.B.N. 31 245 846 984



Registration Number: QAC/R98/0115  
Registration Date: 18/Jul/2013  
Expiry Date: 18/Jul/2016  
Amendment Date:

ISC Pty Ltd., 2/10 Gladstone Road, Castle Hill NSW 2154, Sydney, Australia.



This certificate is valid until the Expiry Date on the condition that audits are conducted and paid for as per the Certification Agreement. Should this condition not be met, cancellation procedures will be initiated and the client will be removed from the JAS-ANZ register. This Certificate remains the property of International Standards Certifications Pty Ltd and must be returned upon request. It must not be altered in any way. Intentional misuse of this certificate will result in cancellation without prior notification.



# Certificate of appreciation



NATIONAL IRANIAN OIL COMPANY

شرکت پشتیبانی ساخت و تهیه کالای نفت تهران

MANUFACTURING SUPPORT AND  
PROCUREMENT KALA NAFT CO.  
TEHRAN  
ENGINEERING & LOCAL  
MANUFACTURING SUPPORT  
DIRECTORATE

DATE: Sep-15-2013

NO: ۹۲/۴/۱۰۰/۸۹۲۸

TO: Gedik Kaynak Sanayi va Ticaret A.S  
ATT: MANAGING DIRECTOR  
FAX NO: 00902163787936

TO WHOM IT MAY CONCERN

Dear Sir ,

We hereby certify that the **Gedik Kaynak Sanayi va Ticaret A.S** has been registered as a manufacturer in our vendor list (M.S.P. kala naft).

Best Regards

  
H. Abbasian

Director Of Sourcing Dept.

ADDRESS: SEPAHBOD GHARANI AVE. P.O.BOX 15815/1775 TEHRAN- IR  
TEL: +98-21- 88912231-46 /66491336 15815/3446  
FAX: +98-21- 88802674/88916397  
E-MAIL: sourcing@kalanaft.com





تاریخ: ۹۱/۶/۲۶  
شماره: ۹۱/۳۹۹۷۰  
موضوع:



بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

جناب آقای مهندس رفیق  
مدیر محترم هماهنگی پروژه

موضوع: طرح انتقال و فرآورش نفت خام کشورهای حوزه دریای خزر

پروژه احداث مخازن تعادلی ساری اصفهانک

شیرهای کنترلی سیستم بخار

باسلام

احتراماً، عطف به نامه شماره GC-۹۱/۳۴۲۱۴ مورخ ۹۱/۰۷/۰۲ آن شرکت درخصوص

موضوع فوق، به استحضار می‌رساند صلاحیت شرکت TERMO مورد تأیید می‌باشد.

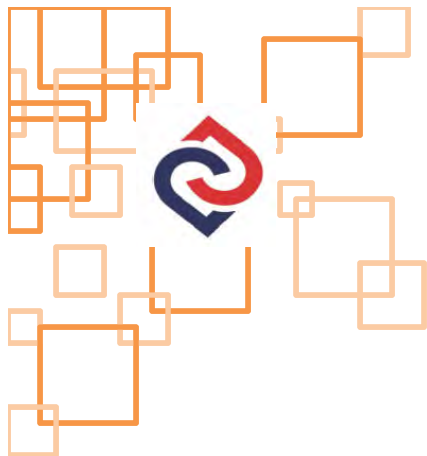
مراتب جهت اقدام مقتضی تقدیم می‌گردد.

با احترام مجدد

علی سعیدی

مجری طرح

سراش، خیابان ایلیا، خیابان طوس، شماره ۴۲، صندوق پستی ۱۳۳۸-۱۱۱۵۵، تلفن ۴۱-۸۸۹۵۴۶۱۶  
[www.nioec.org](http://www.nioec.org)



تاریخ: ۱۳۹۵/۰۷/۲۷  
شماره: ۵۸۸۴/۲۰۰/م.ا.  
پیوست: ندارد

بسمه تعالی



دانشگاه پزشکی شهید بهشتی  
بیمارستان شهدای هفتم تیر

شرکت پارس جم کنترل  
باسلام

احتراماً بدینوسیله اینمركز رضایت خود را از نحوه ارائه خدمات مهندسی و فروش مرتبط با تأسیسات مکانیکی و برقی اعلام نموده و با آرزوی پیشرفت روز افزون، ارائه خدمات تکمیلی مشابه در صنعت کشور عزیزمان را خواستاریم. ا.ق



آدرس: تهران، انتهای خیابان شهید رجایی - تلفن: ۵۵۲۲۸۵۹۲-۶ و ۵۵۲۲۸۵۷۸-۶





تاریخ ۱۳۹۳/۰۵/۱۸  
شماره ۱۱۲/ ۴۸۴۳  
دارد  
پیوست

پسته تدانی

سرپرست محترم  
جناب آقای مهندس  
مهندسین شرکت پارس کنترل  
مهندسین  
جهت اطلاع و امانت نامه

- جناب آقای مهندس کتبری
- سرپرست محترم شرکت داروسازی تاهن
- جناب آقای مهندس نزاری
- مدیرعامل محترم شرکت بنای سبک قدس رضوی
- جناب آقای مهندس اسنادی
- سرپرست محترم شرکت نان قدس رضوی
- جناب آقای مهندس انسان
- مدیرعامل محترم شرکت قند توت جیدریه
- جناب آقای مهندس قانظاران
- مدیرعامل محترم شرکت قند چناران
- جناب آقای مهندس مراهی
- سرپرست محترم شرکت فرآورده های غذایی رضوی
- جناب آقای مهندس طالبیان
- سرپرست محترم شرکت فرآورده های لبنی رضوی
- جناب آقای مهندس گل محمدی
- سرپرست محترم شرکت خمیرمایه رضوی
- جناب آقای مهندس ابویی مهریزی
- مدیرعامل محترم شرکت فخریسی و نساجی خسروی خراسان

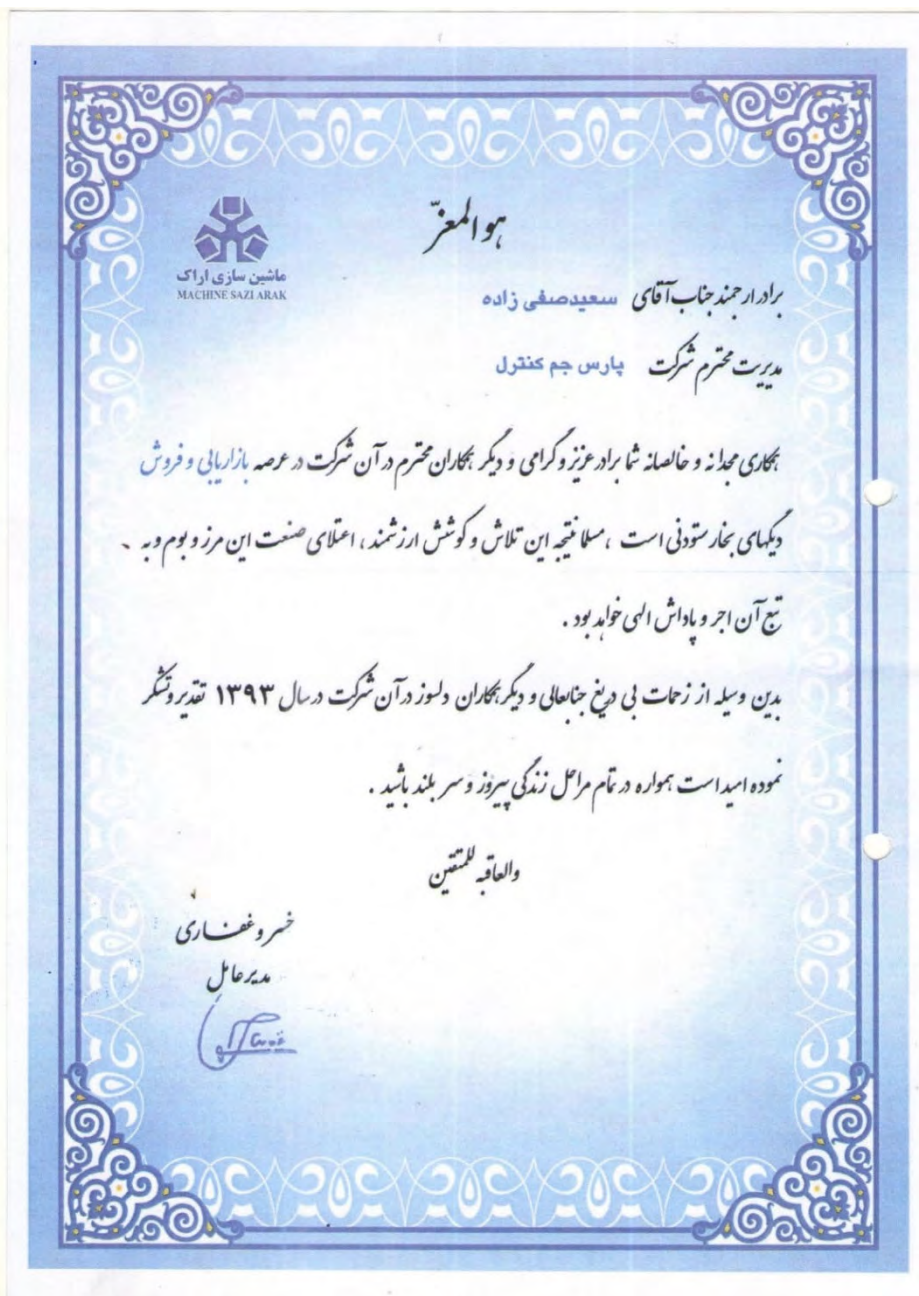
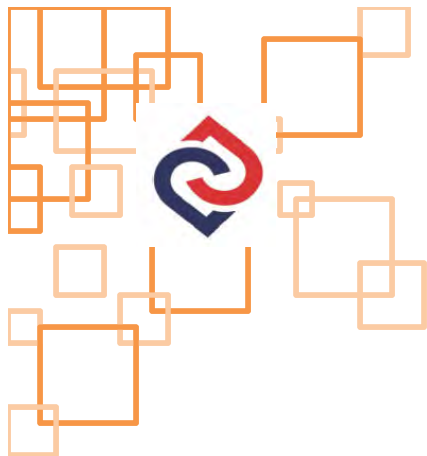
با سلام ،

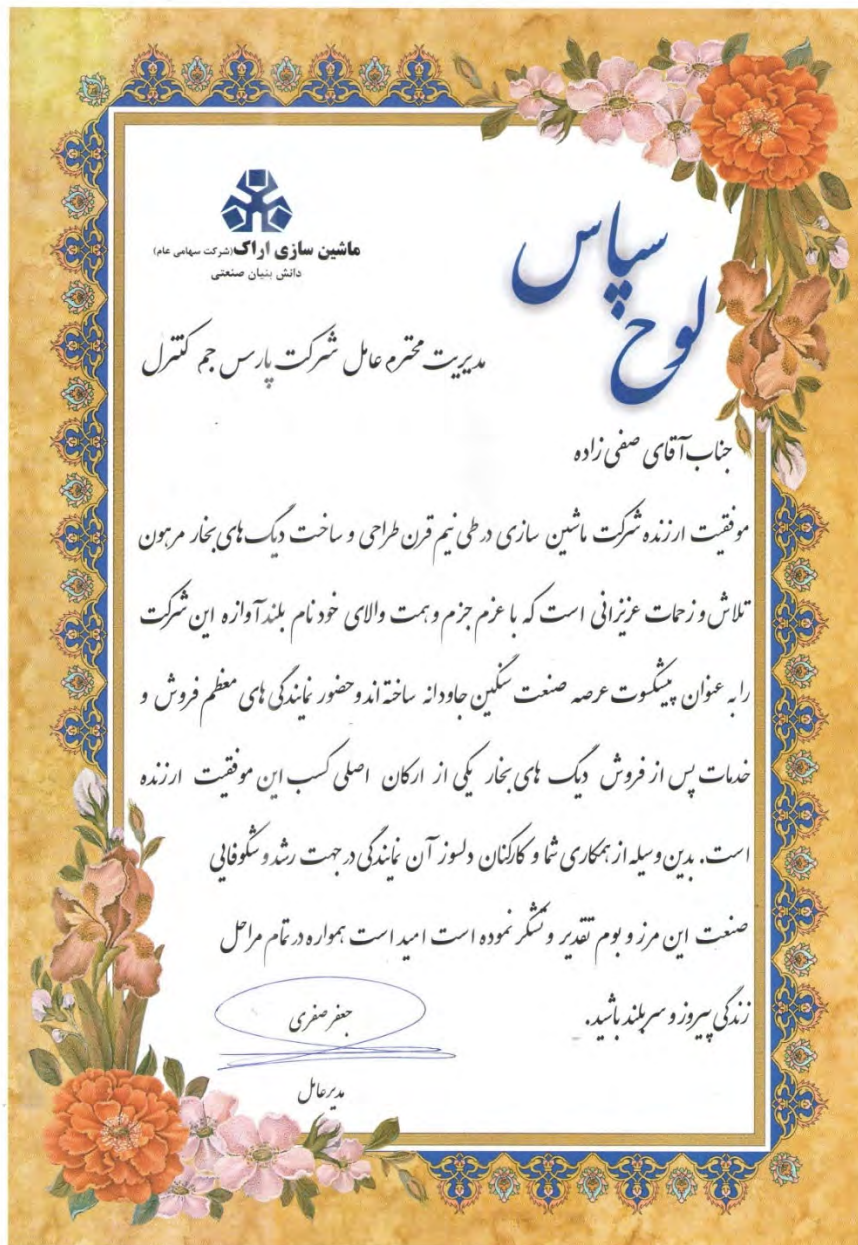
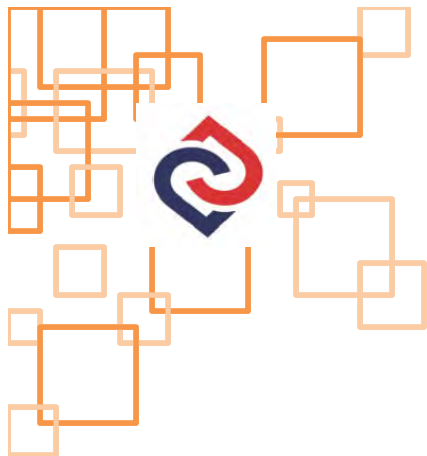
احتراماً، نظر به ارتقاء راندمان بهره برداری کارخانجات تحت پوشش این سازمان و با توجه به اینکه تأسیسات بخاریکی از پرکاربردترین و پرمصرف ترین سیستمها در صنایع میباشد بدینوسیله پیشنهاد شرکت پارس کنترل با سابق همکاری در پروژه های استان قدس رضوی، جهت امکان سنجی زمینه سازی مصرف انرژی در تأسیسات بخار آن شرکت محترم به پیوست ارسال میگردد. لذا منتضی است جهت تأمین اهداف مذکور بررسی و نتایج حاصله را به این مدیریت گزارش نمایید.

دکتر محمد مهدی زاده  
مدیر هماهنگی امور تخصصی  
شرکت پارس کنترل

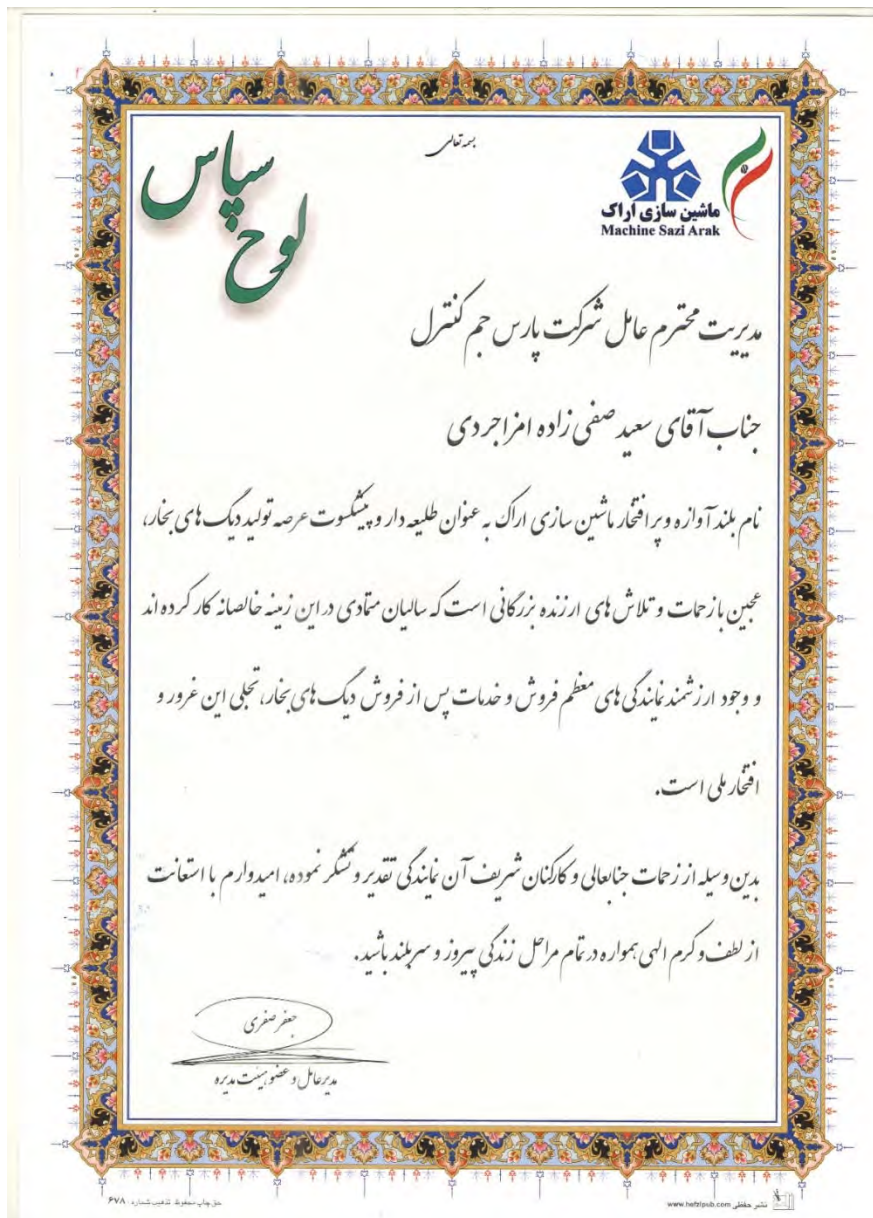
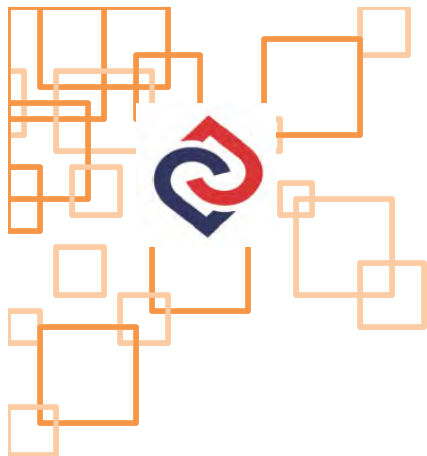
نشانی: مشهد مقدس - بلوار خیابان - بین ۲۲ و ۲۵ متعلق پستی ۹۱۷۳۵-۱۴۴۲  
تلفن: ۱۸ - ۶۱۰-۷۶۷۰۶۱۹ نمابر: ۷۶۷۰۶۱۹  
Email Address: SAZEMAN@REORAZAVI.org

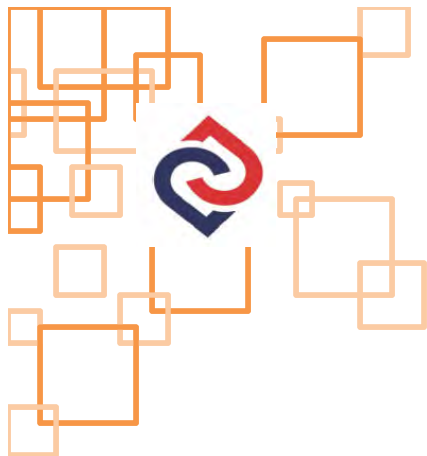












تاریخ: ۱۳۹۲/۳/۲۹  
شماره: ۹۲/۴۲۲  
پوست: —



بسمه تعالی

جناب آقای مهندس سعید صفی زاده

مدیر عامل محترم شرکت پارس جیم کنترل

طرح انتقال و فرآورش نفت خام کشورهای حوزه دریای خزر

پروژه احداث مخازن تعادلی و تاسیسات جانبی ساری / مغانک

با سلام

احتراماً، با عنایت به اجرا و راه اندازی موفقیت آمیز پکیج بویلر و سیستم بخار پروژه موضوع فوق الذکر، بدینوسیله قدردانی خود را از این همت و تلاش انجام پذیرفته در سال تولید ملی، حمایت از کار و سرمایه ایرانی توسط کارشناسان و متخصصان آن شرکت اعلام می دارد.

امید است در سایه خداوند منان، با بهره گیری از تجارب بدست آمده و تقویت بنیه فنی، شاهد حضور فعال و گسترده تر آن شرکت در طرح های صنعتی و توسعه ای کشور باشیم.

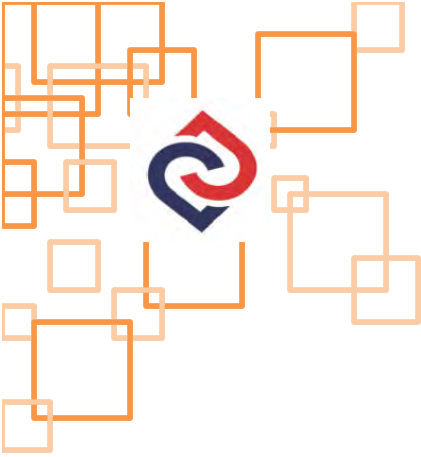
با آرزوی سربلندی و اعتلای جنابعالی و همکاران بر تالاشتان

علی محمدی  
شرکت ملی مهندسی و ساختمان نفت ایران  
دارج انتقال و فرآورش نفت خام کشورهای حوزه دریای خزر

تهران - خیابان آیتالها، خیابان موس، پلاک ۲۶، صندوق پستی ۱۱۱۵۵-۱۳۳۸  
تلفن: ۸۱۱۵۴۶۱۶-۱۱  
www.nioec.org







تاریخ: ۸/۷/۱۴۰۰  
شماره: ۹۲۸۳  
پیوست:

جناب آقای مهندس صفی زاده  
مدیر عامل محترم شرکت پارس جم کنترل

احتراماً بدینوسیله مراتب رضایت خود را از نحوه ارائه خدمات تخصصی فنی-مهندسی و فروش آن شرکت در خصوص اجرای پروژه موتورخانه (بوiler ۲۵ هزار پوندی) و نصب و راه اندازی آن در کارخانه آفرین بهگل (عضو این گروه) را ابراز می‌دارد.  
برای آن شرکت محترم آرزوی پیشرفت روزافزون در صنعت کشور عزیزمان را دارد.

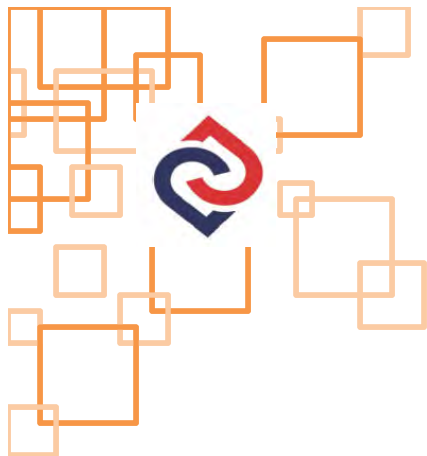
کامران متزوی

مدیر عامل



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دفتر مرکزی: تهران، خیابان مطهری، شماره ۳۳۳  
تلفن: ۰۲۱-۸۷۷۰۰۷۸ - ۱۶۶۴  
فکس: ۰۲۱-۸۸۷۶۱۱۳  
کدپستی: ۱۵۱۵۷۱۸۳۱۱





تاریخ: ۱۳۹۶/۰۵/۱۵  
شماره: ۱۰۵۱۰۳۳  
ندارد  
پست:

شرکت سامان دارویی هشتم (سهامی خاص)  
پست

با صلوات بر محمد و آل محمد (ص)

مدیریت محترم شرکت پارس جم کنترل

موضوع: تقدیر نامه

با صلوات بر محمد و آل محمد(ص)

سلام علیکم

بدینوسیله از عملکرد مثبت شرکت پارس جم کنترل در راستای ارائه خدمات تخصصی در زمینه های:

-طراحی و مهندسی

-انجام محاسبات تاسیساتی

-طراحی و مدل سازی سه بعدی 3D

-تامین و تجهیز کالا(شیر آلات - تجهیزات و مواد مصرفی)

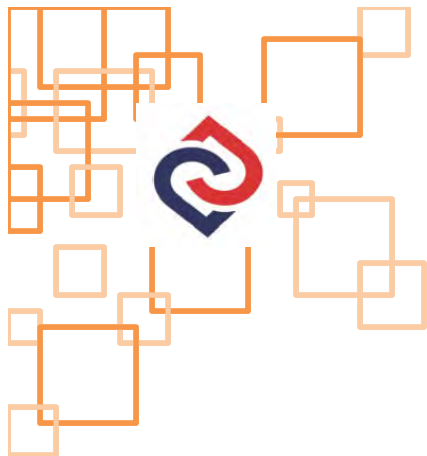
پروژه موتورخانه مرکزی شرکت داروسازی سامان داروی هشتم که با رعایت استاندارد و کیفیت بالایی انجام شده قدردانی می گردد.

پیرامی  
برهان

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مشهد: بزرگراه مشهد - قوچان، بعد از تقاطع فردوسی  
پارک علم و فناوری خراسان رضوی کدپستی: ۶۴۱۱۱-۹۱۸۵۱  
تلفن: ۰۵۱-۲۵۴۲۱۹۹۰۰۳ فکس: ۰۵۱-۲۵۴۲۱۹۹۲  
تهران: امیرآباد، بعد از تقاطع جلال آل احمد  
مرکز رشد علوم دارویی تلفن: ۰۲۱-۸۸۶۳۲۵۳



## لوح تقدیر

بهینه سازی و باز یافت انرژی سیستم بخار

### شرکت پارس جم کنترل

بدینوسیله از مجموعه فعالیت های تفصی آن شرکت در زمینه بهینه سازی سیستم بخار کارخانه شرکت توسعه صنایع رضا که موجب کاهش پشمگیر هزینه های جاری، بهره وری عمومی سیستم، افزایش کیفیت و کمیت تولید و کاهش مشکلات و فطرات بهره برداری شده است، سپاسگاری می گردد. با آرزوی توفیق و پیشرفت روزافزون جهت تیم فعال مهندسی آن شرکت، امید است که با تلاش هرچه بیشتر، سربلندی میهن عزیزمان ایران را شاهد باشیم.

شرکت توسعه صنایع رضا

مدیر عامل - علی مسیح

Reza Industries Development



شرکت توسعه صنایع رضا  
با مسئولیت محدود ثبت ۶۸۶



تاریخ: ۹۶، ع، ۲۱  
شماره: -  
پیوست: -

## پتروپاک مشرق زمین

بسمه تعالی

### تقدیر نامه

#### اجرای پروژه EPC شرکت پتروپاک مشرق زمین

سلام علیکم

بدینوسیله از عملکرد مثبت شرکت پارس جم کنترل در راستای ارائه خدمات تخصصی در زمینه طراحی و مهندسی، تامین و تجهیز کالا (شیرآلات، آهن آلات، اتصالات و ...) و عملیات اجرایی (پایبند با حجم ۶۹۰۰۰ دایا اینج، عملیات سازه ای با حجم ۳۱۲۳۰۰ کیلوگرم، نصب تجهیزات تاسیساتی و تولیدی) پروژه پتروشیمی پتروپاک مشرق زمین قدردانی می گردد.

با آرزوی توفیق روزافزون

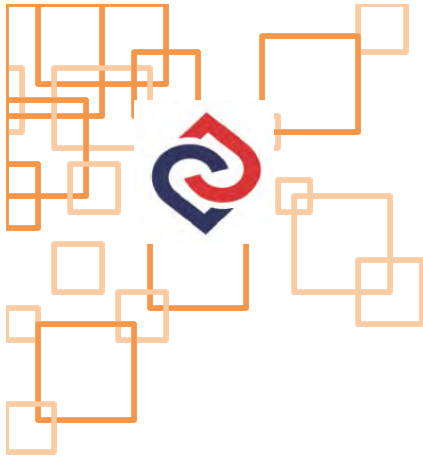
صنایع پتروشیمی پتروپاک مشرق زمین



www.petropaak.com

تهران، شهرزیبا، میدان الغدیر، خیابان منابر، خیابان رز، کوچه حامد، پلاک ۲۴ تلفن: ۴۷۱۹۹-۲۱ فکس: ۸۹۷۷۰۸۸۸-۲۱





تاریخ: 1396/05/09  
شماره: 92/47472  
پیوست: ندارد



جناب آقای مهندس صفی‌زاده  
مدیریت محترم عامل  
شرکت پارس جم کنترل

موضوع: گواهی حسن انجام آموزش

با سلام،

احتراماً، با توجه به اتمام موفقیت‌آمیز آموزش دوره طراحی سیستم‌های بخار، به مدت ۲۸ ساعت؛  
بدین وسیله از زحمات آن شرکت در اجرای دوره آموزشی قدردانی نموده و مراتب رضایت از عملکرد آن  
شرکت محترم را اعلام می‌دارم.

ناهدی فولادی  
مدیر منابع انسانی

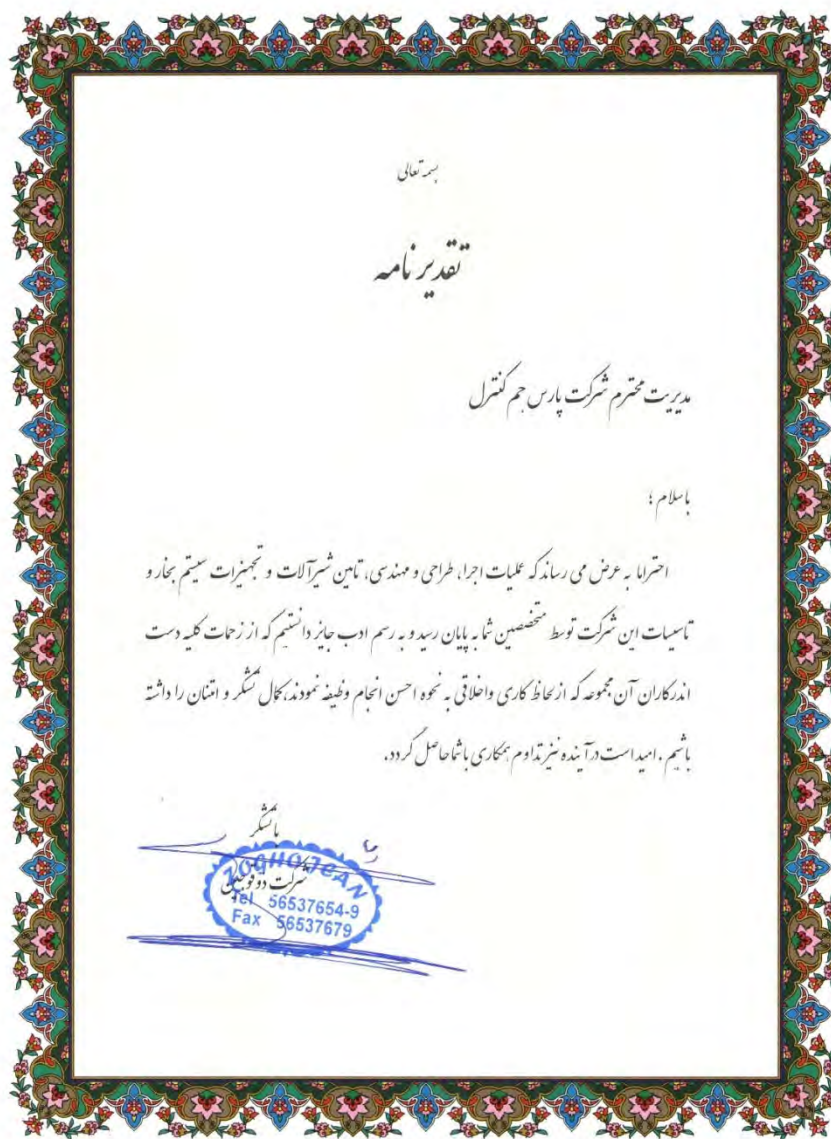
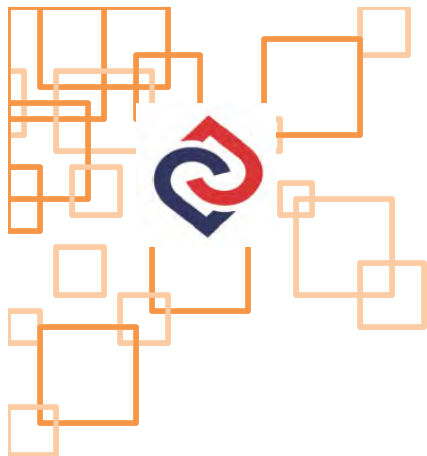
تهران، خیابان ولیعصر، پلاک ۱۲، میدان صفار پلاک ۱۲  
کد پستی: ۱۹۹۴۴۲۵۱۱  
تلفن: ۰۲۱-۸۱۹۶۱۹۰۰ (خط دورنگار: ۰۶-۸۸۷۷۱۲)  
صندوق پستی: ۱۵۸۷۵-۸۷۱۷

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تذیب خوشی - شماره ۵۲۲ - مشهد تلفن: ۰۵۱۱۷۴۷۲۳۷۷ - آدرس: خیابان جابجی - مشهد (از راست به چپ)



تاریخ: ۹۱/۰۲/۲۴  
شماره: ۱۶/۱۴۲۷  
پوست:

  
شرکت شهرستانپروزه پاکه گلستان (سهامی خاص)  
شماره ثبت: ۴۷۵۸



« سالک تولید ملی و حمایت از کار و سرمایه ایرانی »

دورنویس

**مدیر عامل محترم شرکت پارس جم کنترل**

**سلام علیکم**

احتراماً، ضمن تشکر از همکاری آن شرکت و عطف به نامه شماره ۹۱ P ۴۴۹۸ به استحضار می رساند، که در پروژه جمع آوری و برگشت کننداس بخار که توسط آن شرکت طراحی شده است پس از اجراء هیچ مشکل نداشتته و در حال بهره برداری می باشد و روزانه حدود ۴۰ متر مکعب کننداس بخار از سالن های تولید جمع آوری و به موتور خانه ارسال و در چرخه قرار می گیرد. مراتب جهت استحضار به حضور ایفاد می گردد. ۸۳۵۶۹٪

و من... التوفیق  
همکار شما سمعی  
مدیر عامل شرکت

۹۱/۲/۲۴  
۸۴۵

داره گواهینامه های: سیستم مدیریت کیفیت ISO9001:2000 سیستم مدیریت زیست محیطی ISO14001:2004 سیستم مدیریت ایمنی بهداشت OHSAS18001:2007  
یا پرده های: پاکه گلستان - زیارت - آرونا  
دریافت کننده لوح سهامی از اداره کلی استاندارد و تحقیقات صنعتی استان گلستان بعنوان واحد نمونه تولیدی  
دریافت کننده تندیس صنعت بر گرفته میز کشور از معاون رئیس جمهور و رئیس سازمان حفاظت محیط زیست  
آدرس: گرگان - میدان سیج - صندوق پستی ۵۵۵ - ۲۹۱۷۷ - تلفن: ۲۴۵۷۷۰ - ۲۴۵۰۲۷۱ - ۰۱۷۱

Email: info@pegahgolestan.com , hgolestan@randairy.ir



به نام خدا  
نقدیر نامه

مدیریت محترم شرکت پارس جم کنترل

با سلام

احتراماً بعرض می رساند که عملیات اجرا، طراحی و مهندسی، تأمین شیرآلات و تجهیزات سینم بخار و تأسیسات این شرکت توسط متخصصین شما به پایان رسید و به رسم ادب جایز دانستیم که از زحمات کلبه دست اندرکاران آن مجموعه که از لحاظ کاری و اخلاقی به نحوه احسن انجام وظیفه نمودند، کمال تشکر و امتنان را داشته باشیم. امید است که در آینده نیز تداوم همکاری با شما حاصل گردد.

پانشکر

کارون دارو

شرکت کارون دارو درخشان  
شماره ثبت ۴۵۶۴

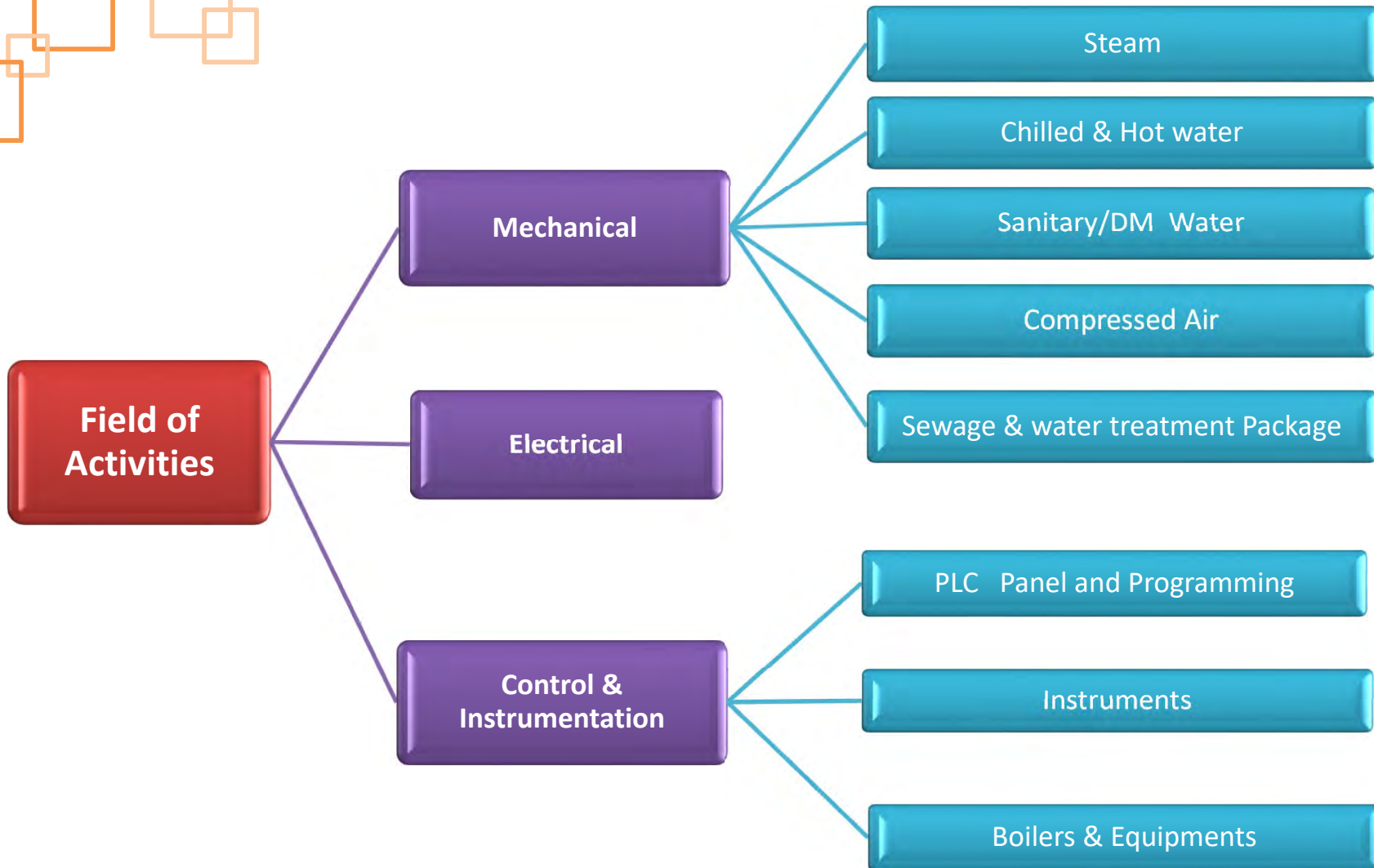
۱۴۰۳، تیرماه







# Field of Activities







# Departments

**ENGINEERING**

**PROCUREMENT**

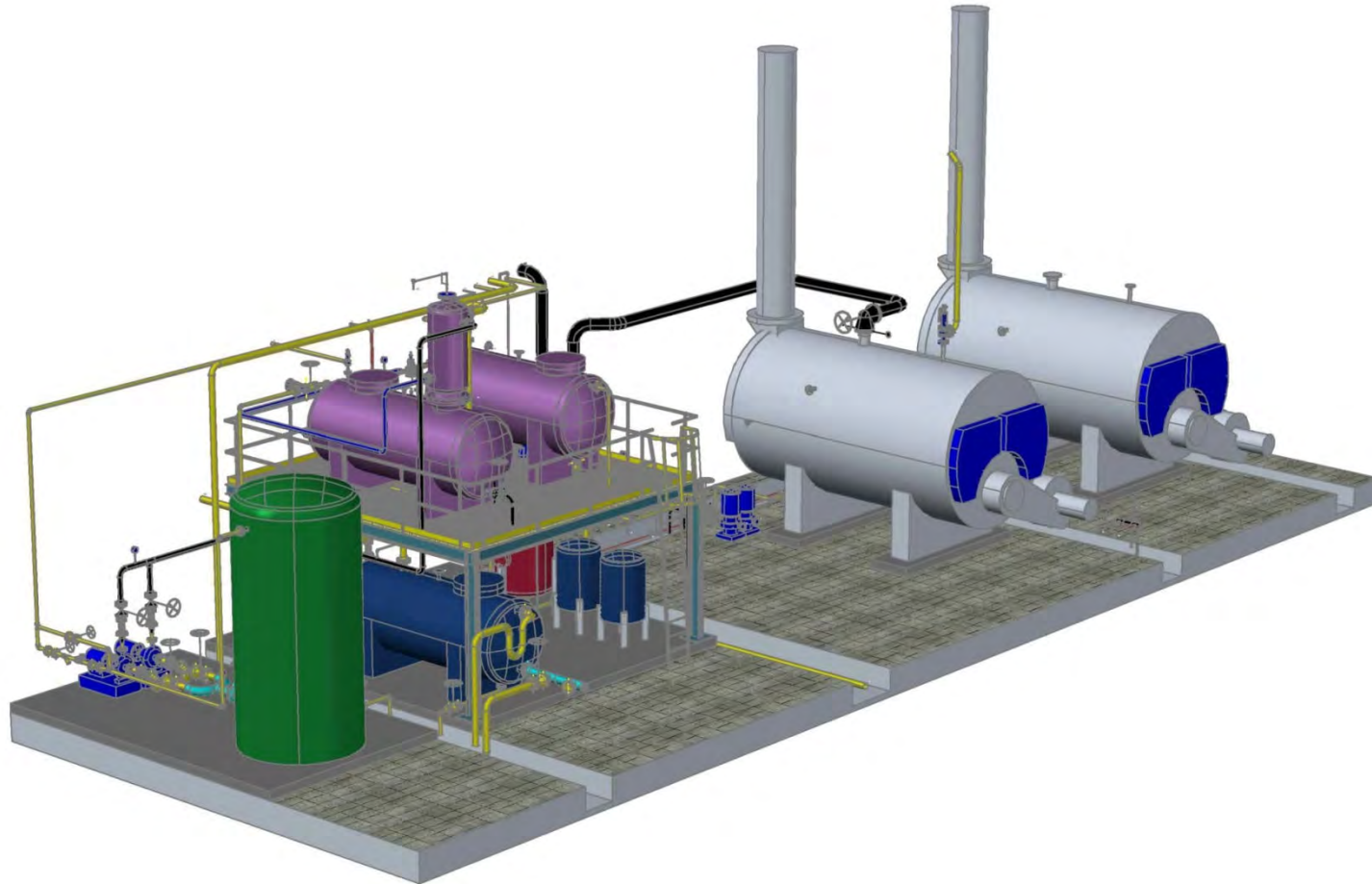
**CONSTRUCT.**

**AUDIT  
&  
ENERGY  
SAVING**

**TRAINING**



# ENGINEERING SERVICES



# RICH SOFTWARE & RESOURCES

Spirax Saco Steam Trap Management System v2.0

WorkTable.xls

File Transfer Edit View Insert Format Tools Data Help

A1 = KeyNo

Be careful not to change the order of the columns in the list. Changing the order, deleting and adding a column will cause a problem.

|   | A     | B      | C         | D          | E      | F      | G      | H              | I           | J        | K        | L              |      |
|---|-------|--------|-----------|------------|--------|--------|--------|----------------|-------------|----------|----------|----------------|------|
| 1 | KeyNo | 1.Area | 2.Trap No | 3.Location | 4.Name | 5.Type | 6.Mfr. | 7.Press. [bar] | 8.Size [mm] | 9.Flange | 10.Conn. | 11.Application | 12.C |
| 2 | 1     | ABC    | 10        |            | TB5    | T-ctrl | MIYA   | 4              | 15          |          |          |                |      |
| 3 | 2     | ABC    | 20        |            | TB5    | T-ctrl | MIYA   | 3.2            | 20          |          |          |                |      |
| 4 | 3     | ABC    | 30        |            | TB5    | T-ctrl | MIYA   | 5              | 15          |          |          |                |      |
| 5 |       |        |           |            |        |        |        |                |             |          |          |                |      |
| 6 |       |        |           |            |        |        |        |                |             |          |          |                |      |
| 7 |       |        |           |            |        |        |        |                |             |          |          |                |      |

Comparing results

Comparison: Previous list: SURVEY

Comparison Added traps Deleted traps

| Area | Trap No | Location | Name | Type | Mfr. | Press.(bar) | Size(mm) | Flange | Conn. | Set T.(°C) | Vibration | Cond. |
|------|---------|----------|------|------|------|-------------|----------|--------|-------|------------|-----------|-------|
| A    | 4       |          | S31N | Disc | MIYA | 4           | 8        |        |       |            | 0         | Good  |
| A    | 4       |          | S31N | Disc | MIYA | 4           | 8        |        |       |            |           | Leak  |
| A    | 5       |          | S31N | Disc | MIYA | 4           | 8        |        |       |            | 12        | Leak  |
| A    | 5       |          | S31N | Disc | MIYA | 4           | 8        |        |       |            | 11        | Leak  |
| A    | 6       |          | S31N | Disc | MIYA | 4           | 8        |        |       |            |           | Leak  |
| A    | 7       |          | S31N | Disc | MIYA | 4           | 8        |        |       |            | 13        | Leak  |
| A    | 7       |          | S31N | Disc | MIYA | 4           | 8        |        |       |            |           | Leak  |
| A    | 8       |          | S31N | Disc | MIYA | 4           | 8        |        |       |            | 15        | Leak  |
| A    | 8       |          | S31N | Disc | MIYA | 4           | 8        |        |       |            |           | Leak  |
| A    | 9       |          | S31N | Disc | MIYA | 4           | 8        |        |       |            | 43        | Leak  |
| A    | 9       |          | S31N | Disc | MIYA | 4           | 8        |        |       |            |           | Leak  |

Number of traps:23

PM150 ver. 1.1

Options Survey Period

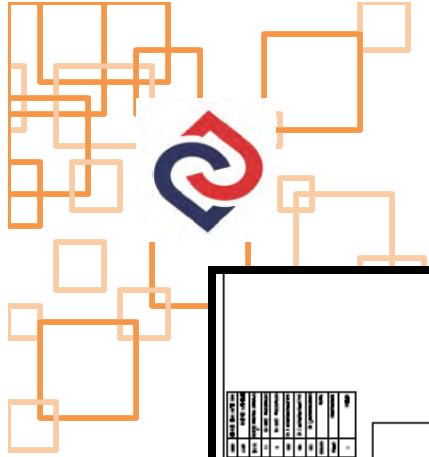
History DataPipe

Close

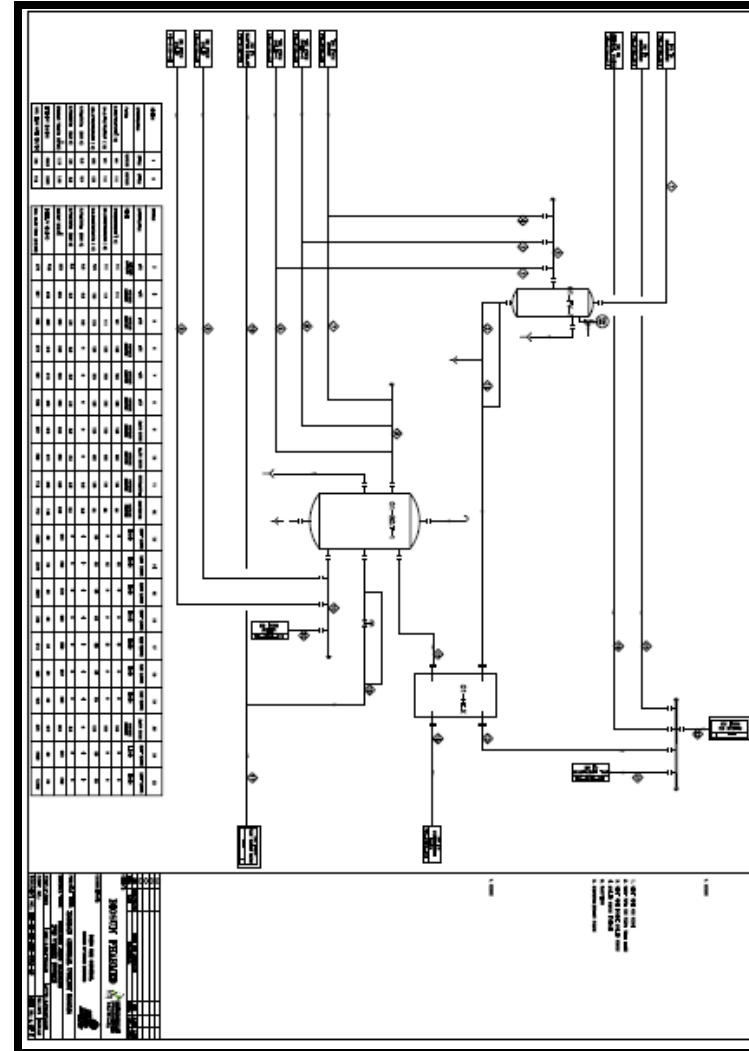
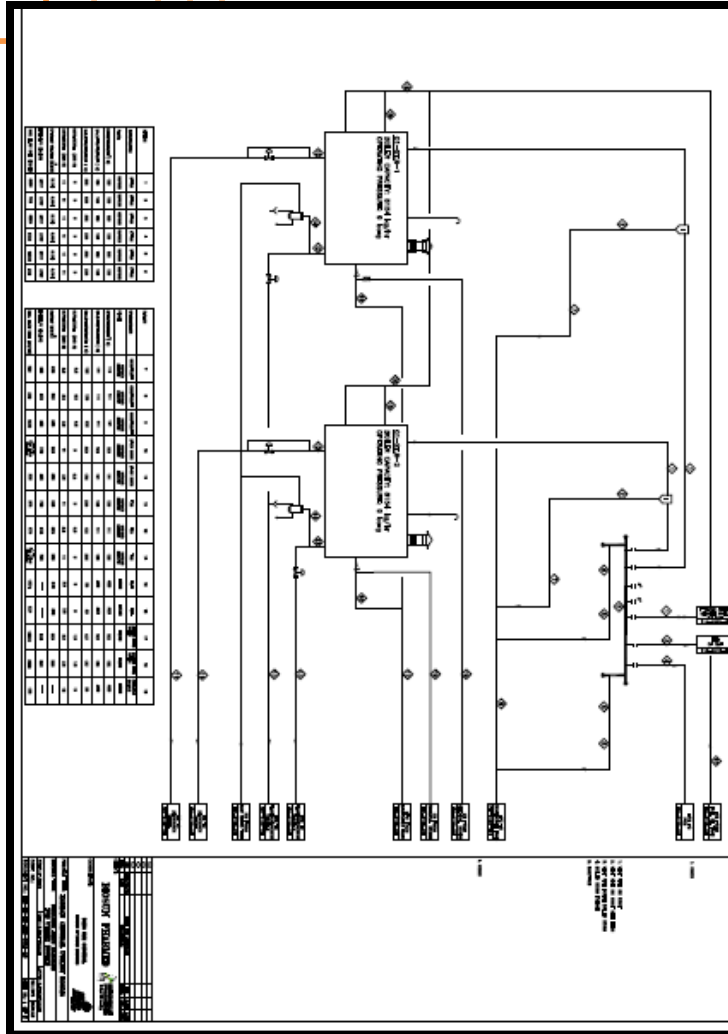
MIYAWAKI INC.





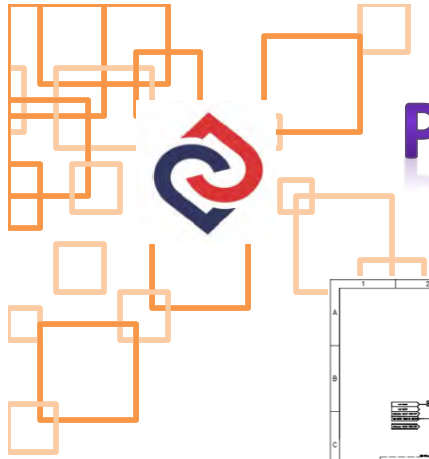


# PIPING FLOW DIAGRAM (PFD)

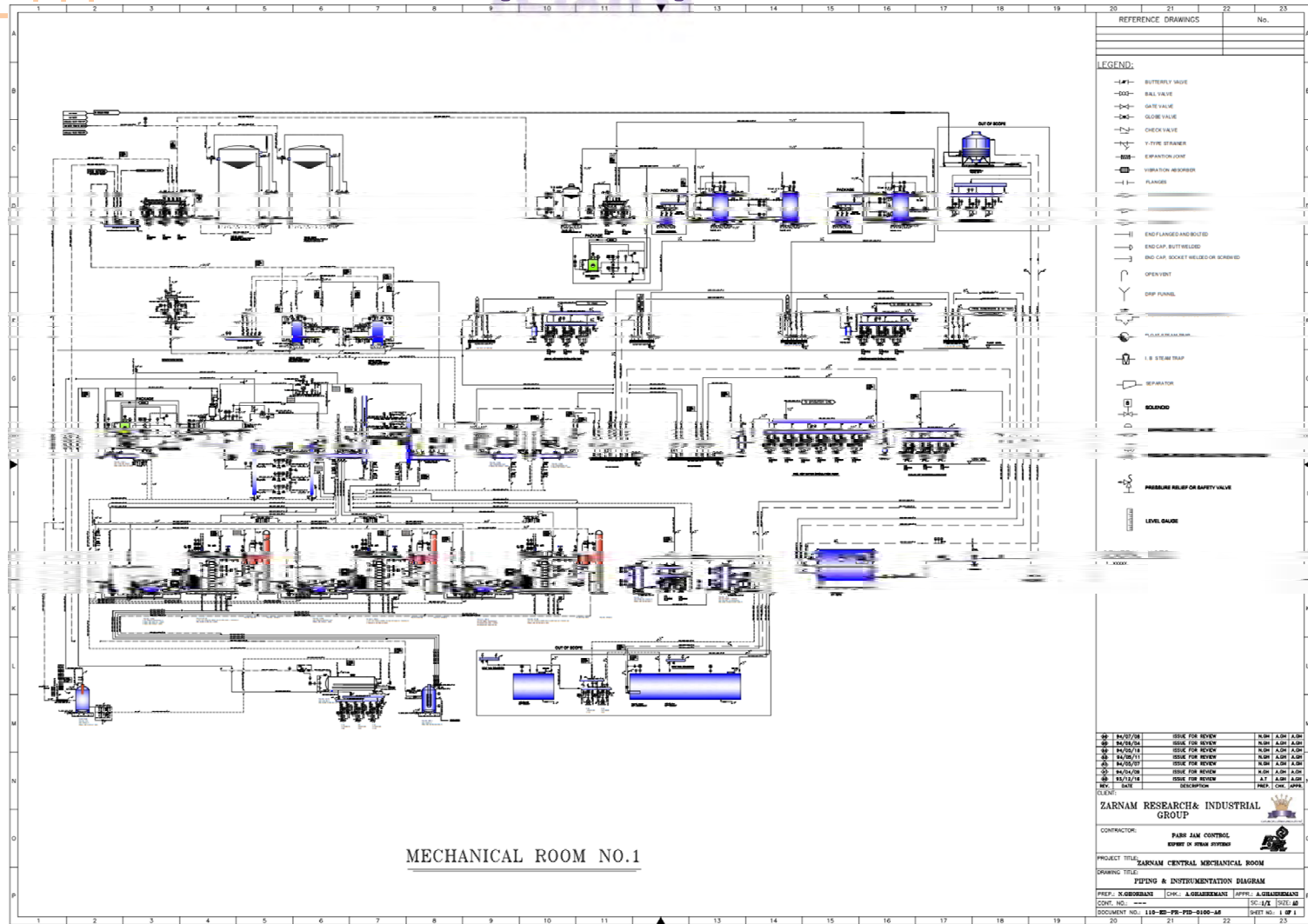






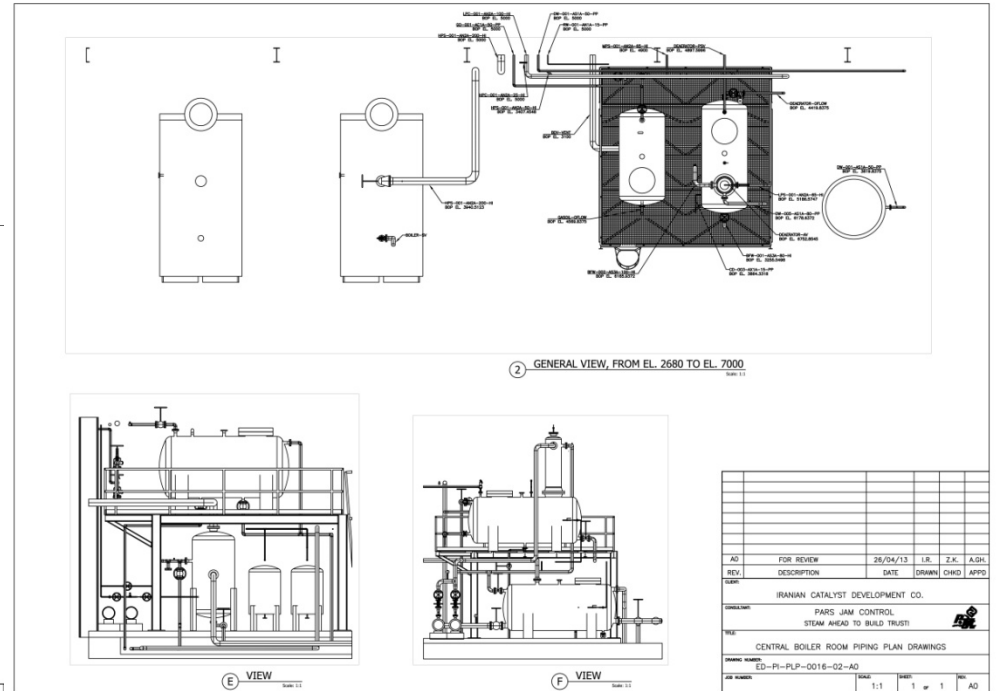
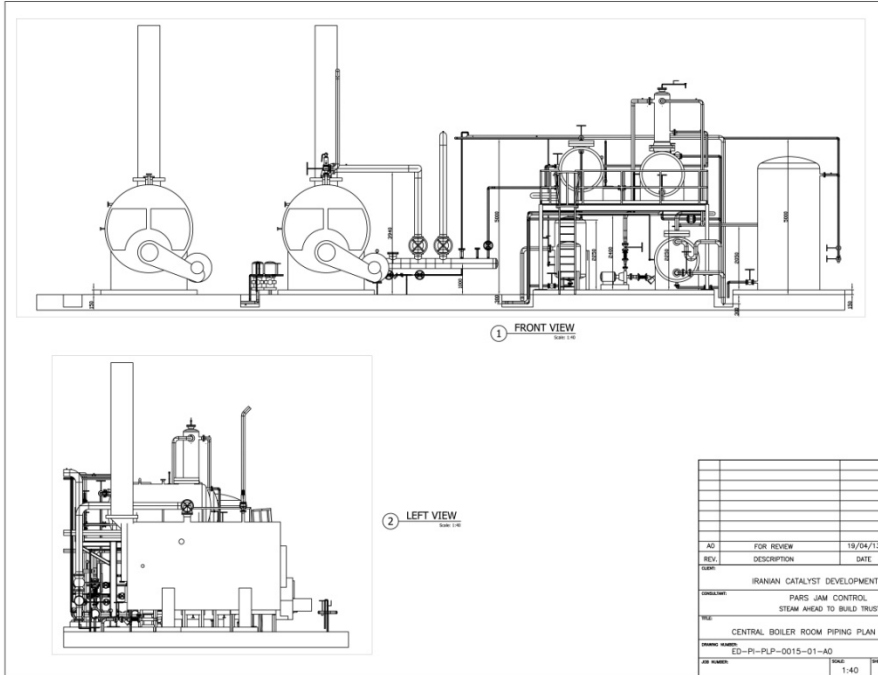


# PIPING & INSTRUMENT DIAGRAM (P&ID)





# EQUIPMENT ARRANGMENT

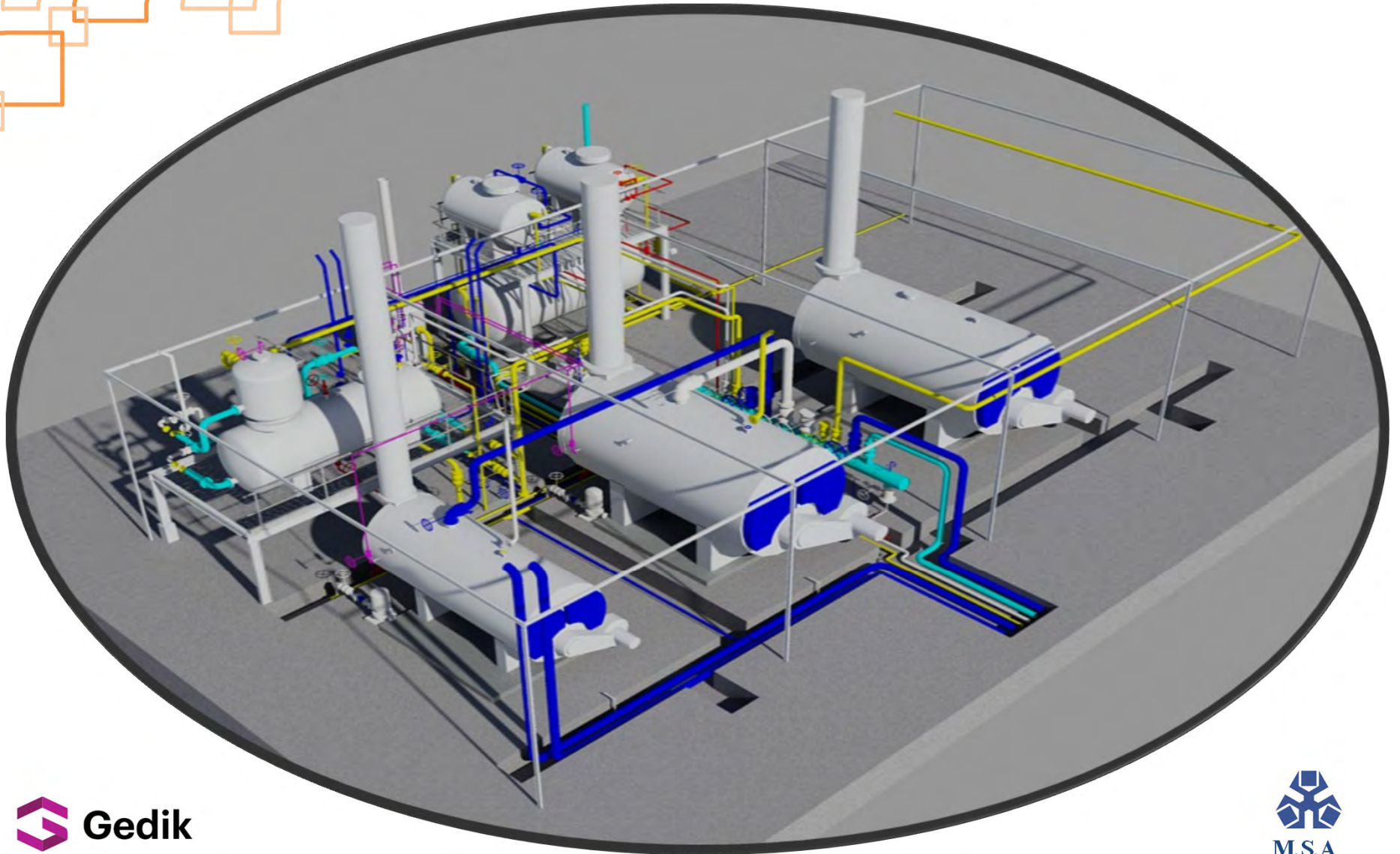








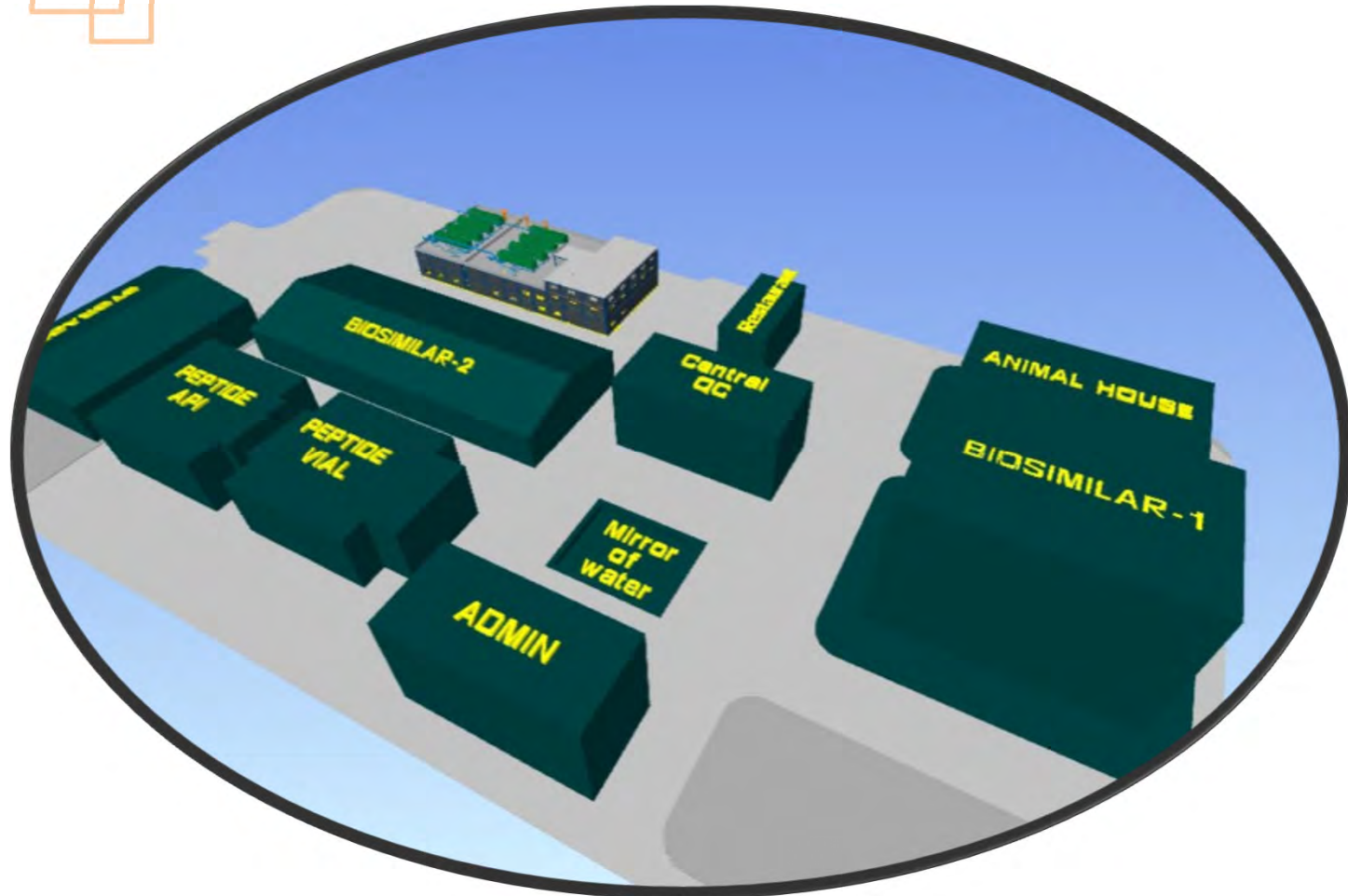
# 3D MODEL PREPARATION





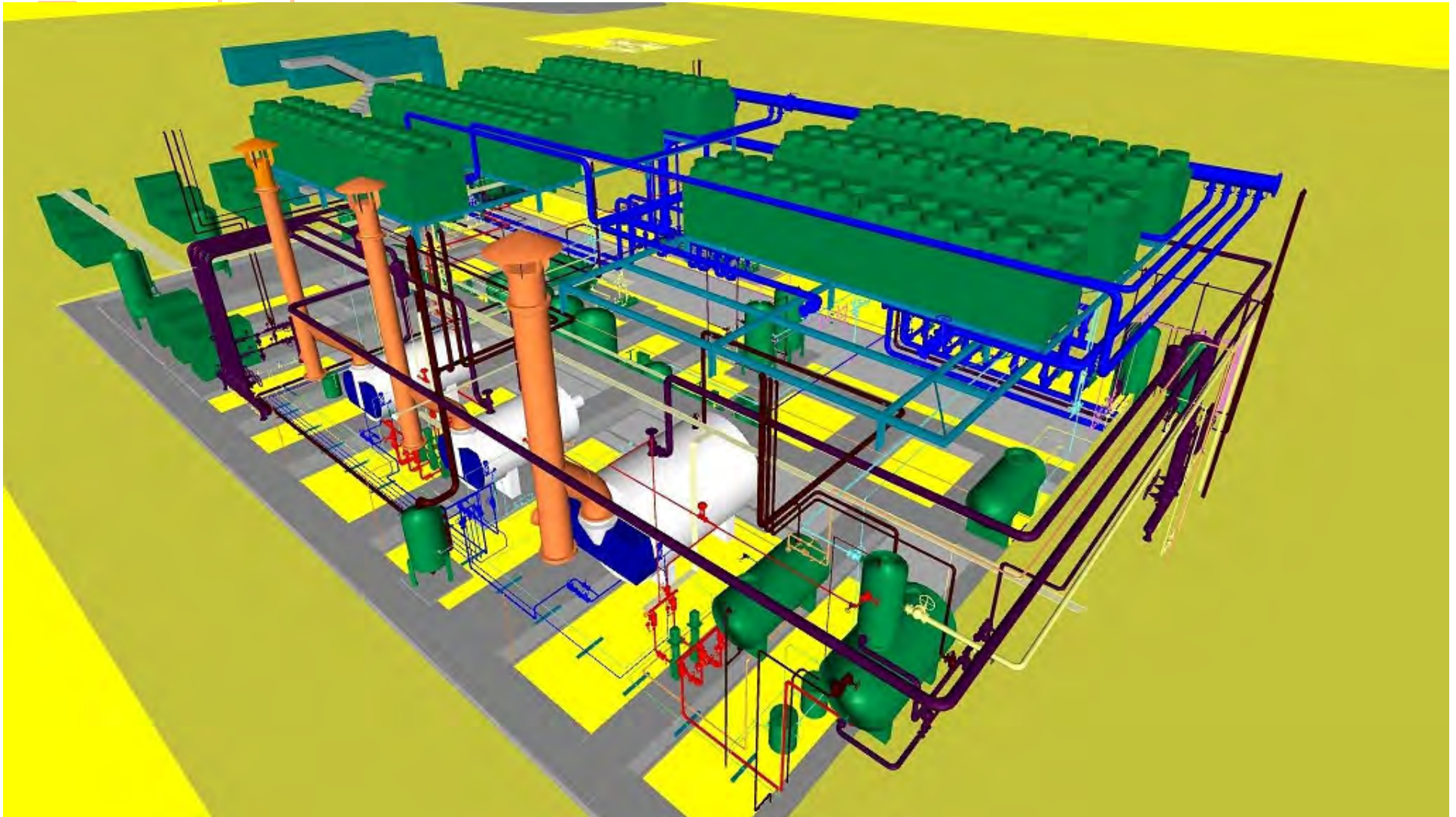


# BIOSUN PHARMED

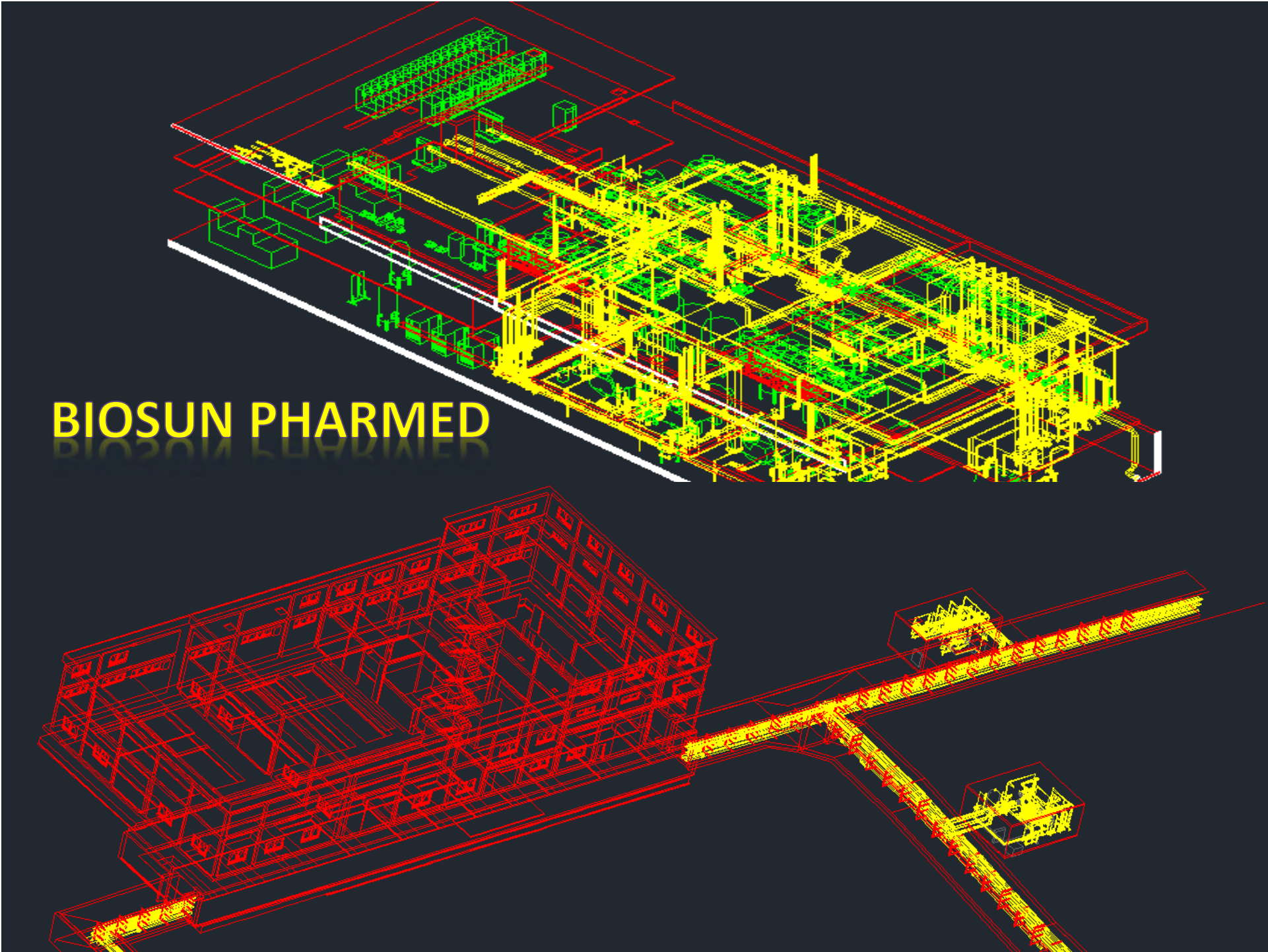




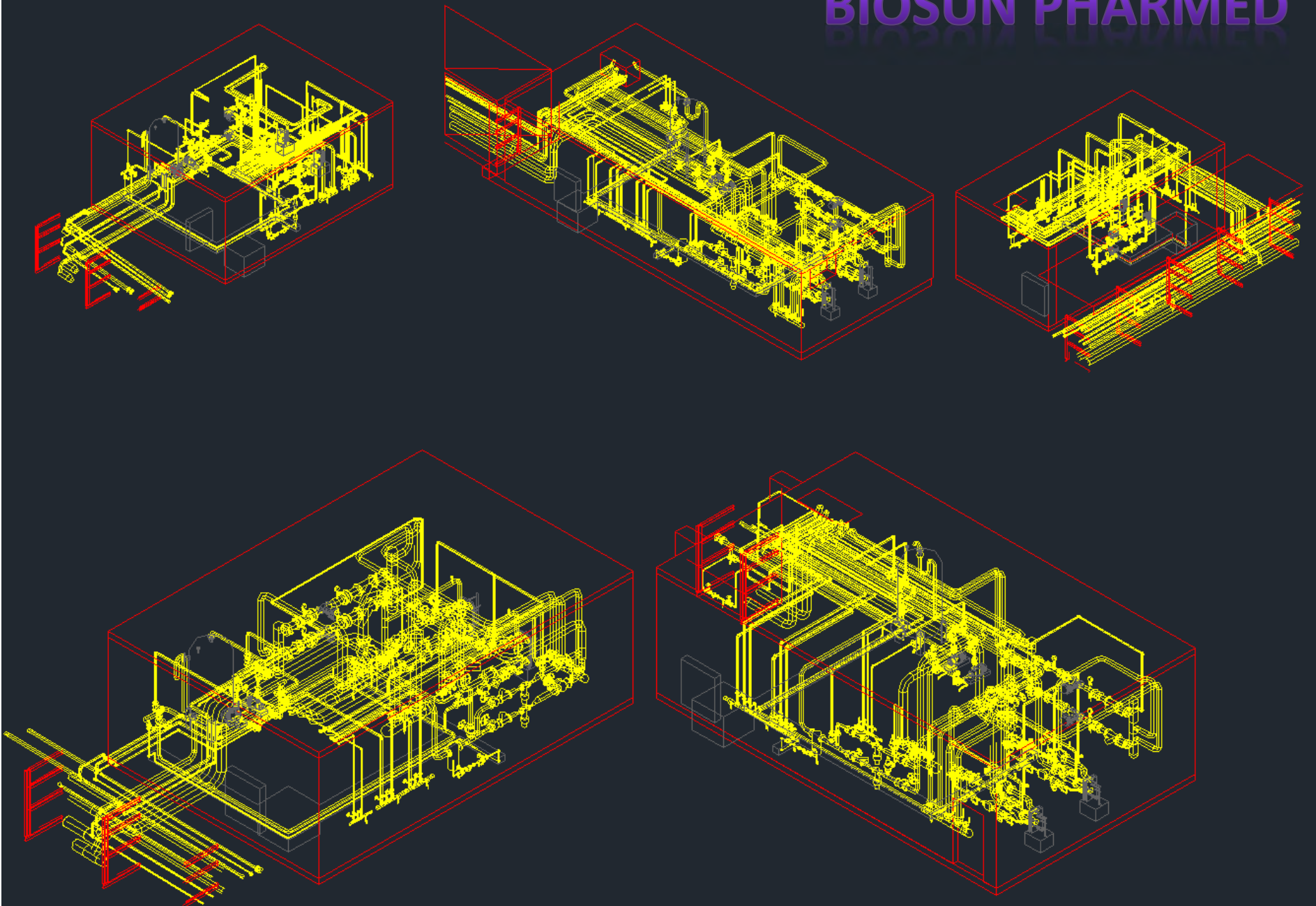
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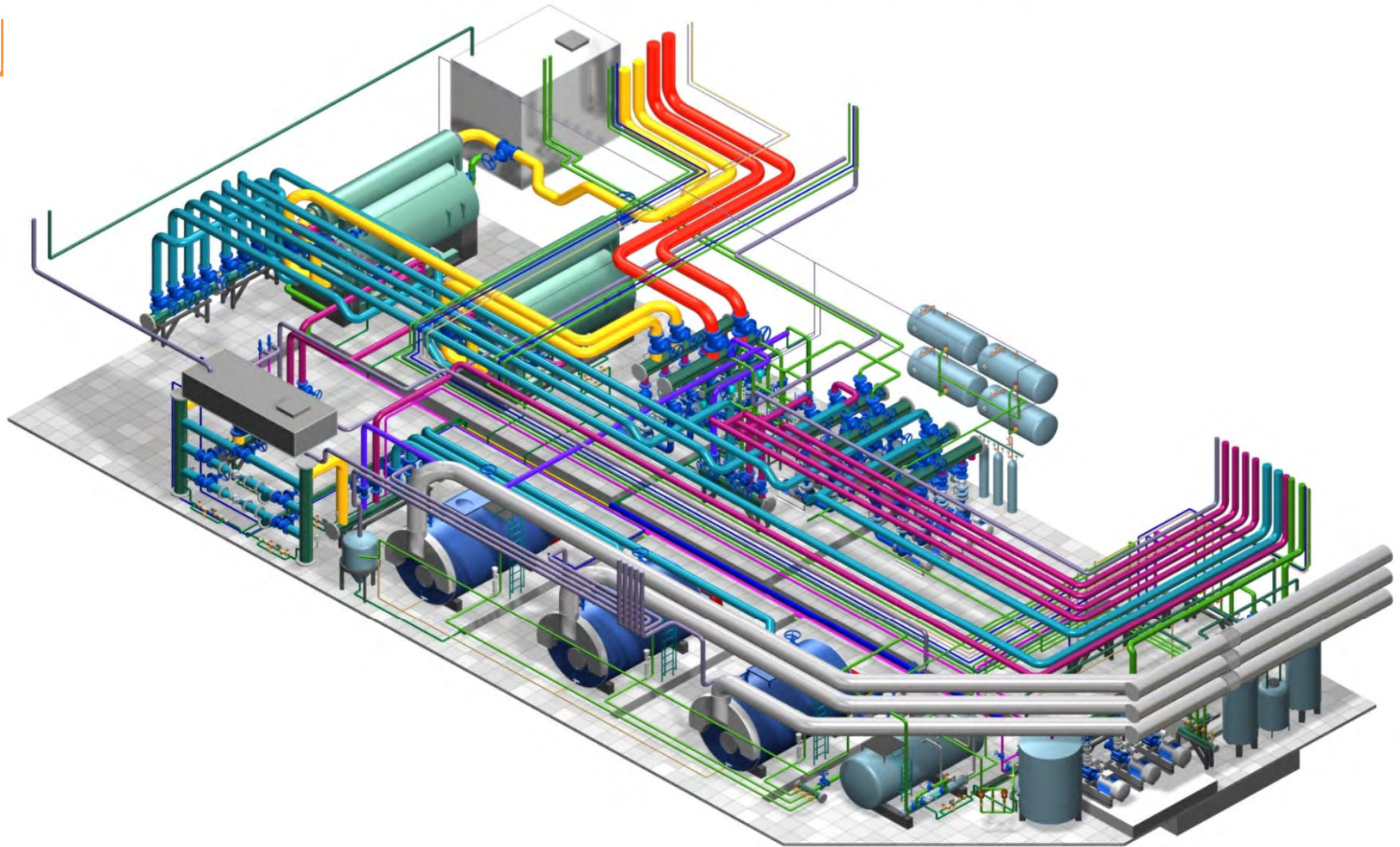
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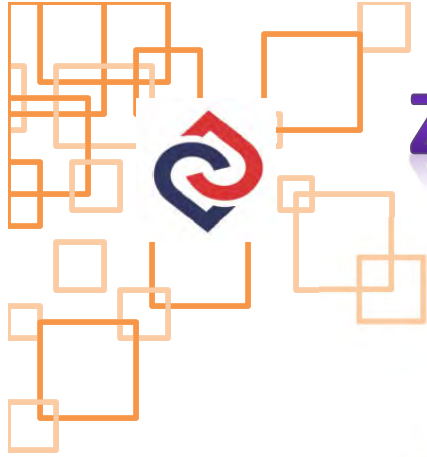




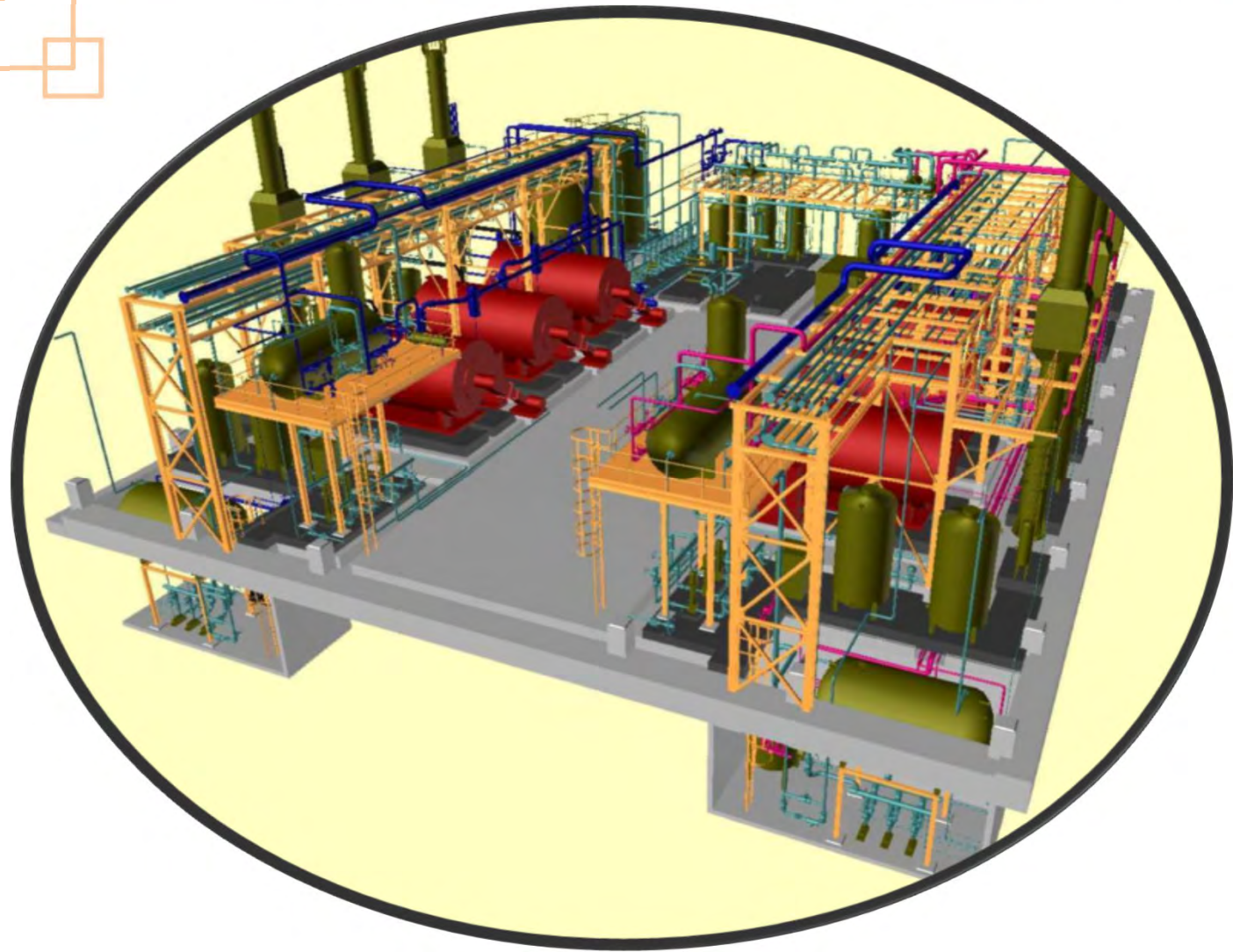
# COMMERCIAL UTILITY





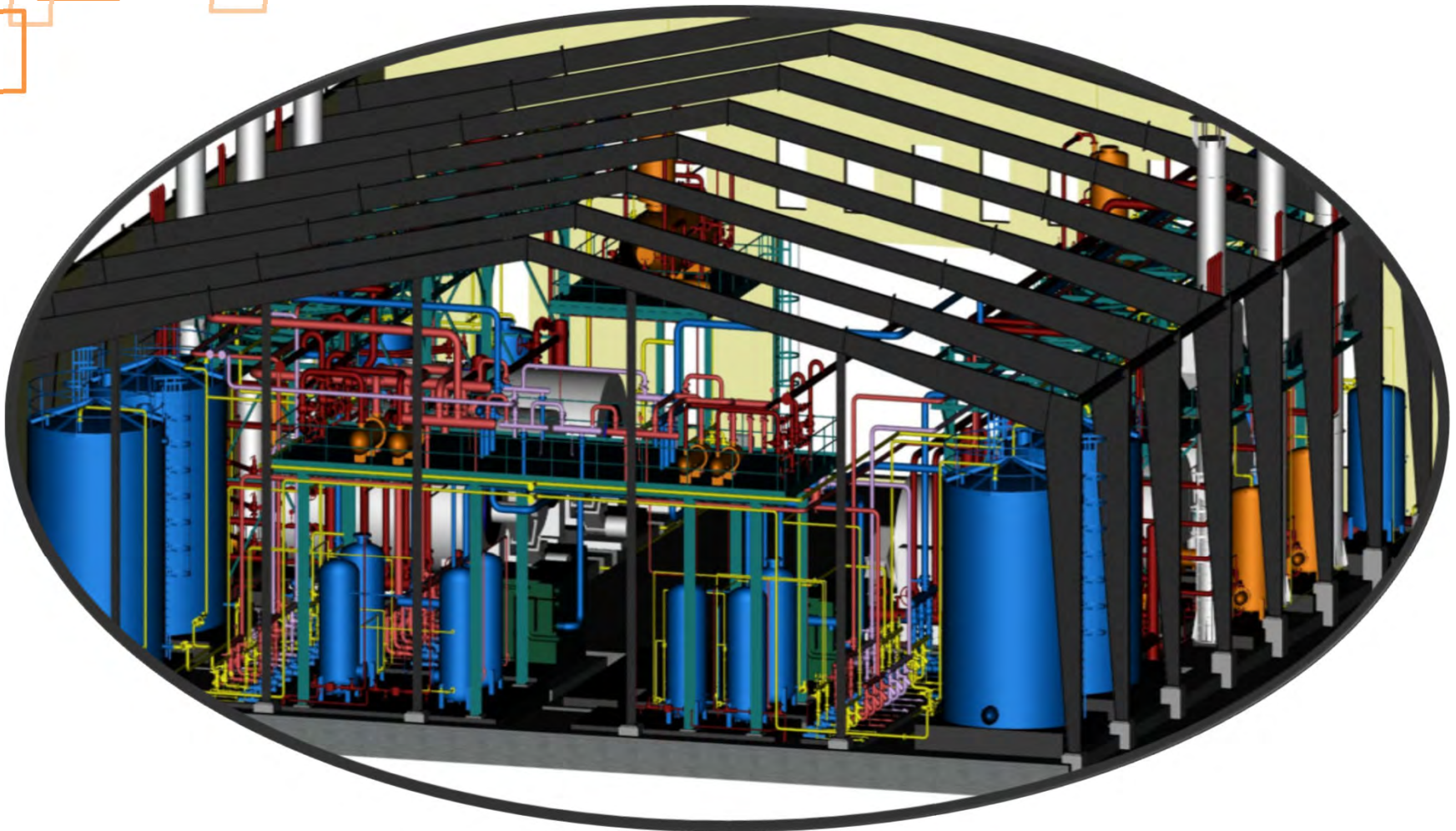


# ZAR RESEARCH & INDUSTRIAL CO.



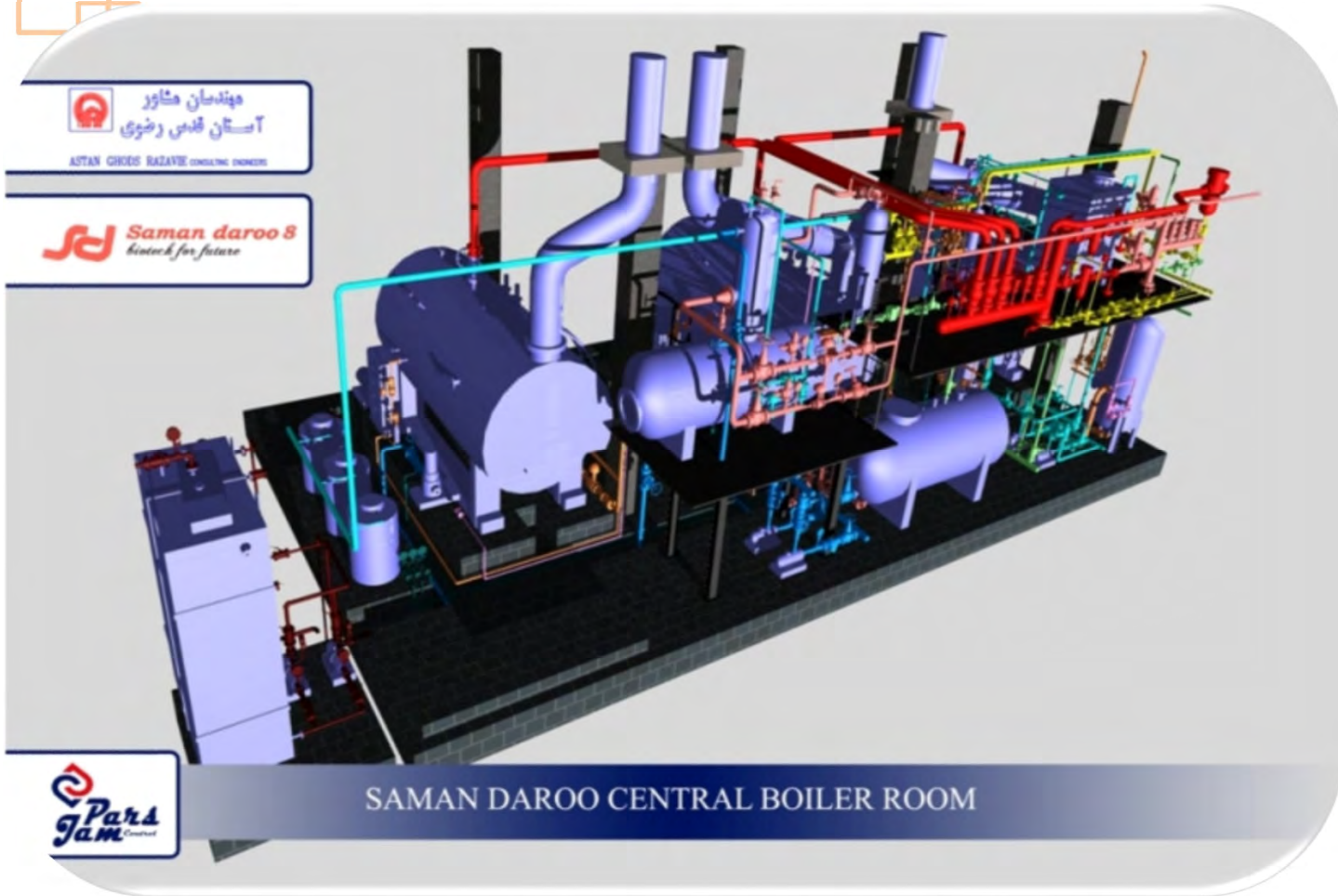


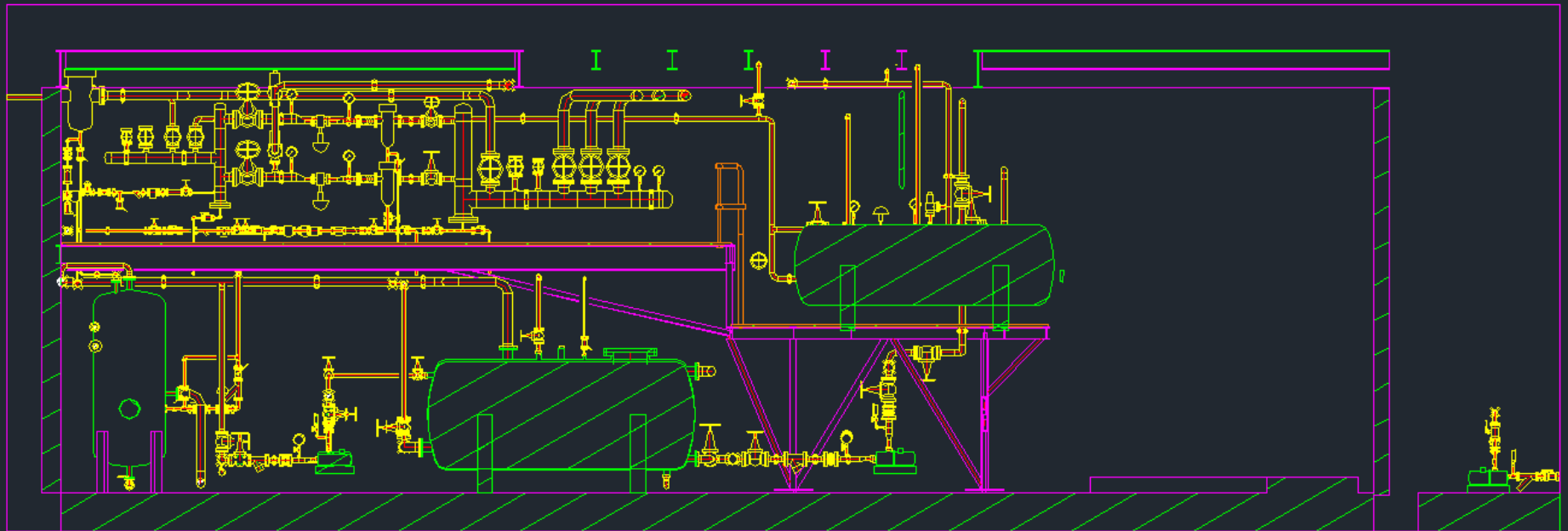
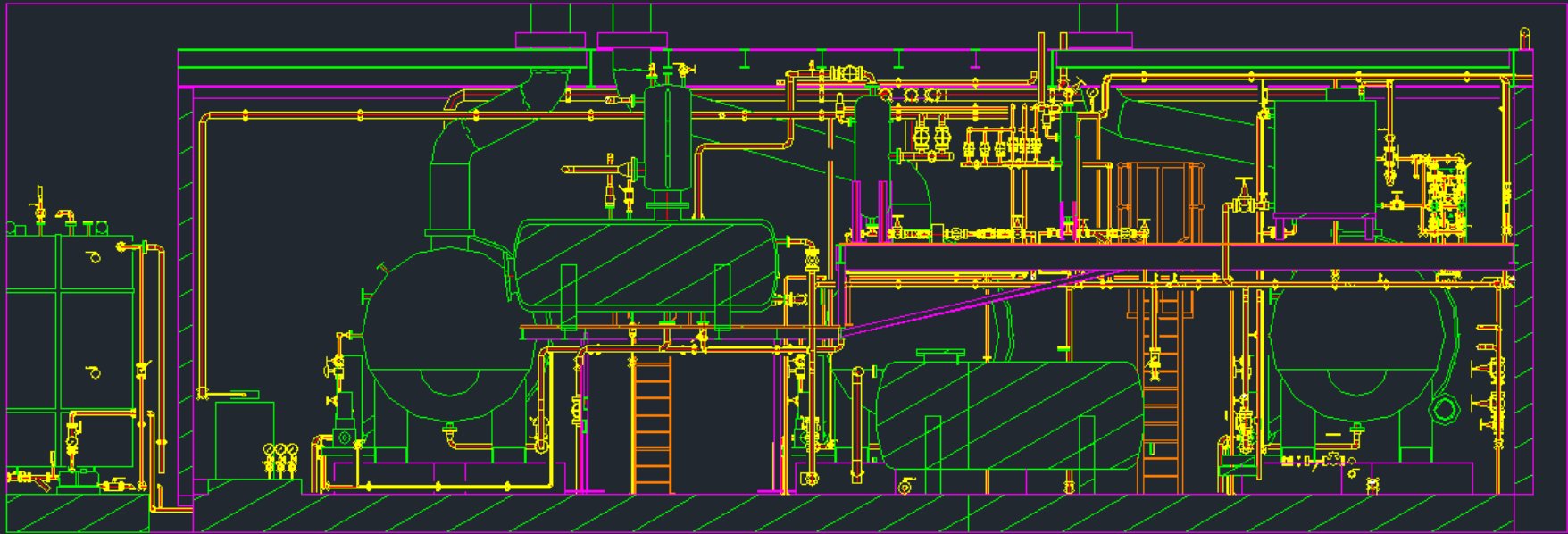
# ZAR RESEARCH & INDUSTRIAL CO.

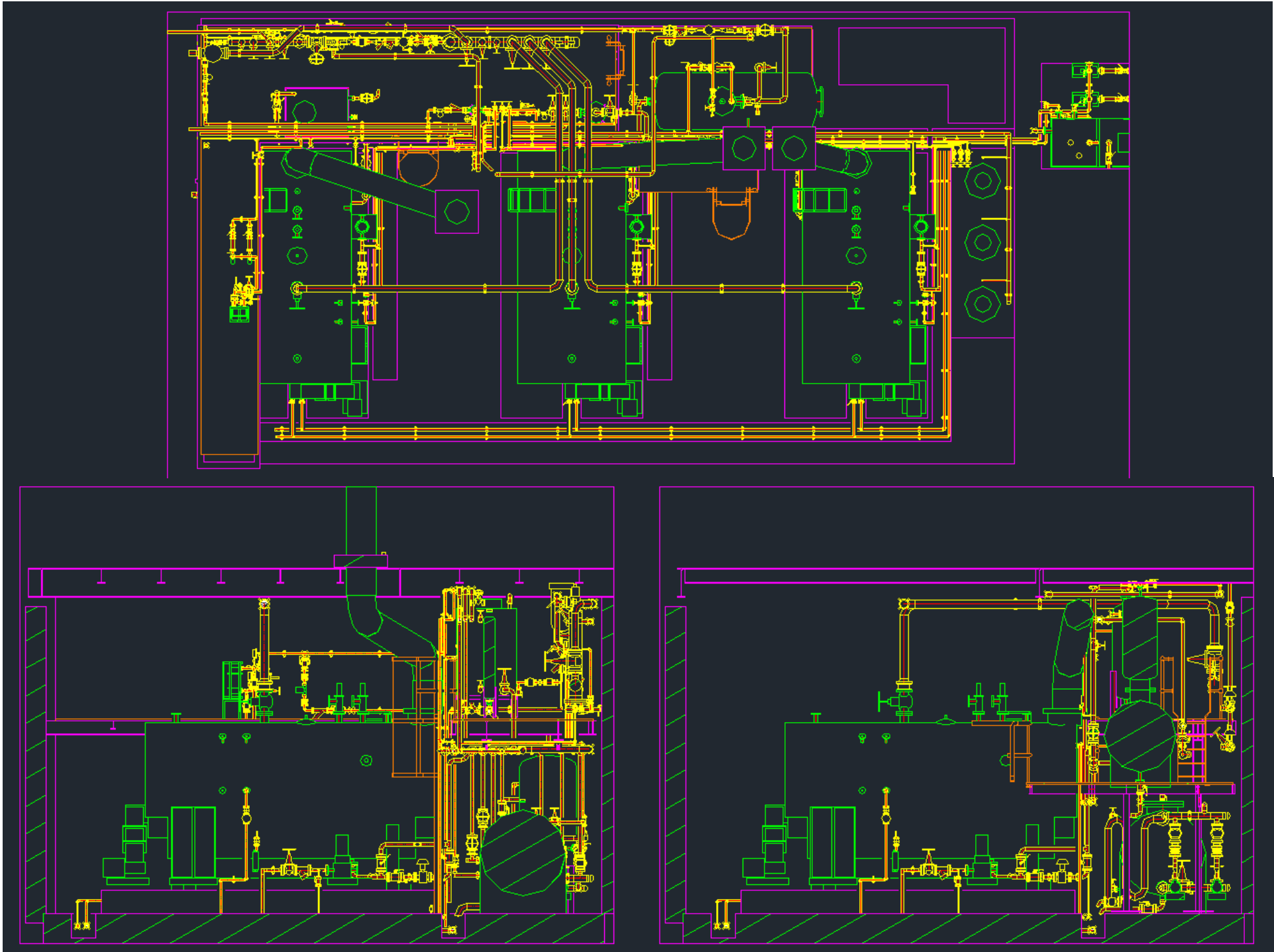




# SAMAN DAROO (FACTOR-8)



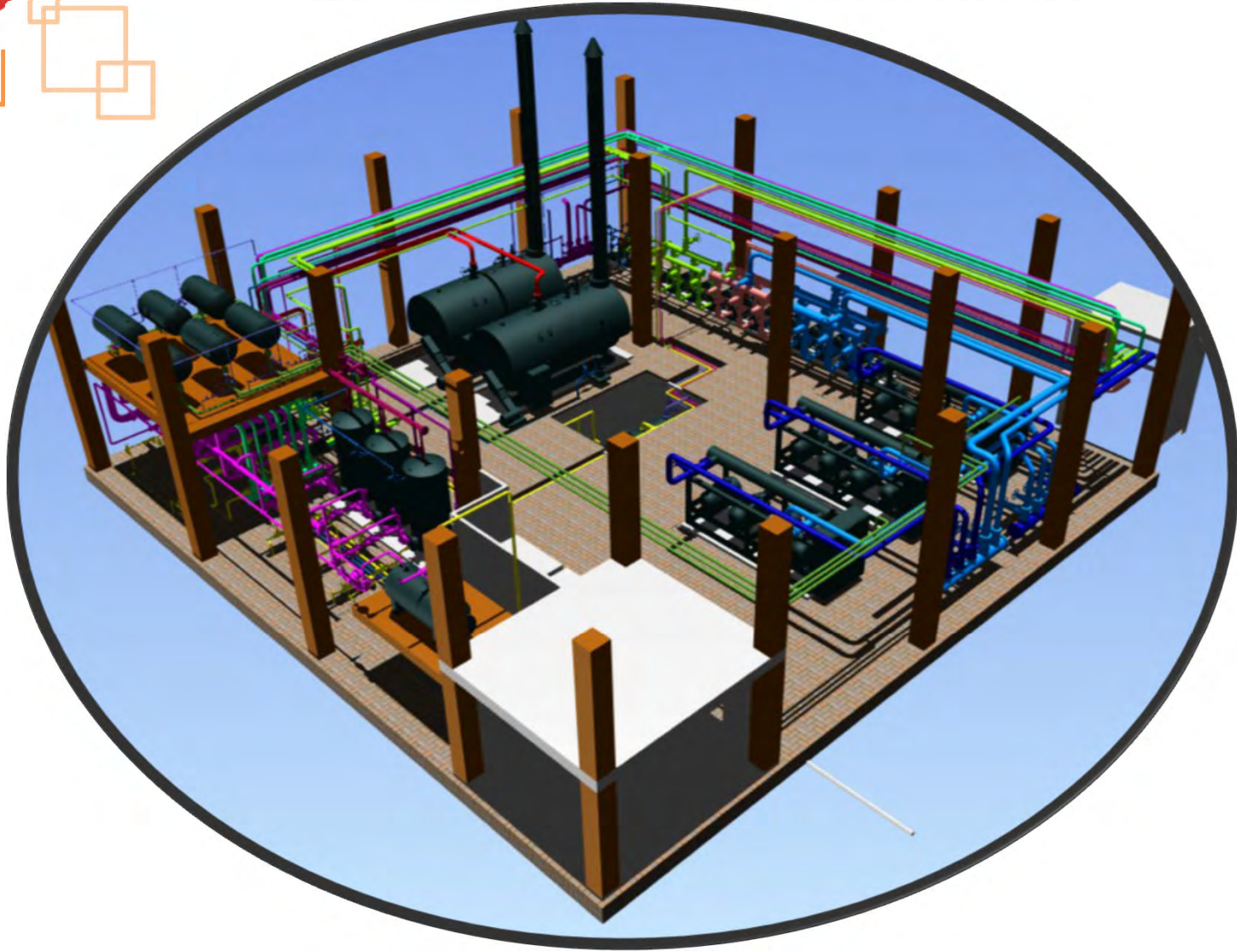


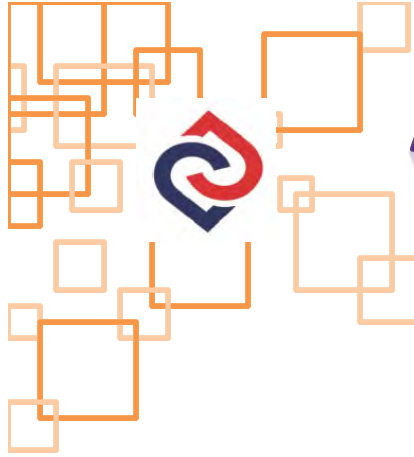




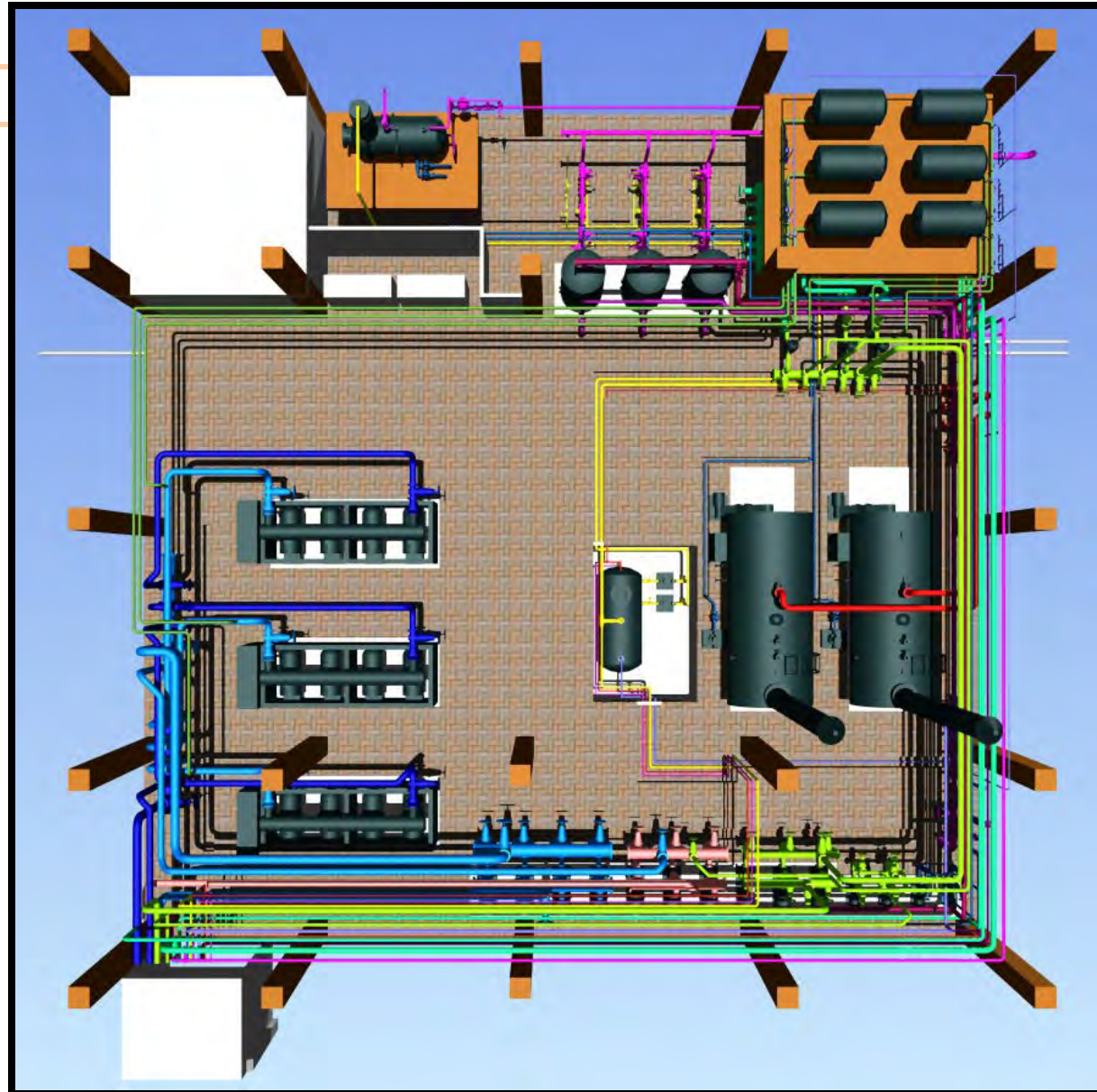


# AGHAJARI NIOC HOSPITAL





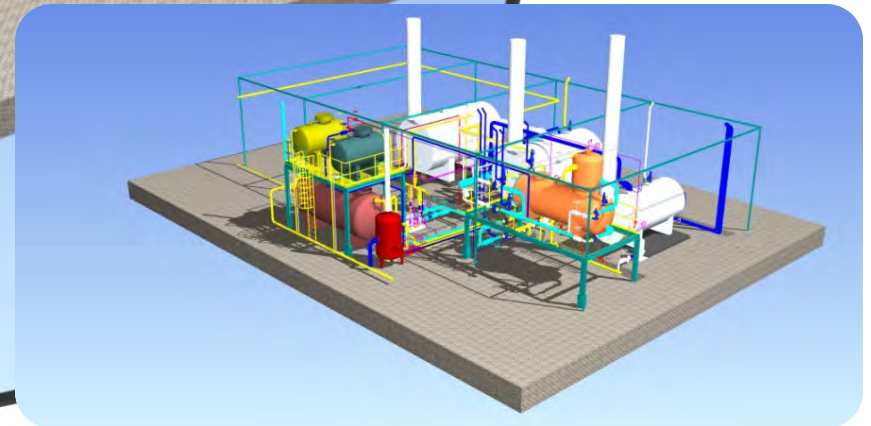
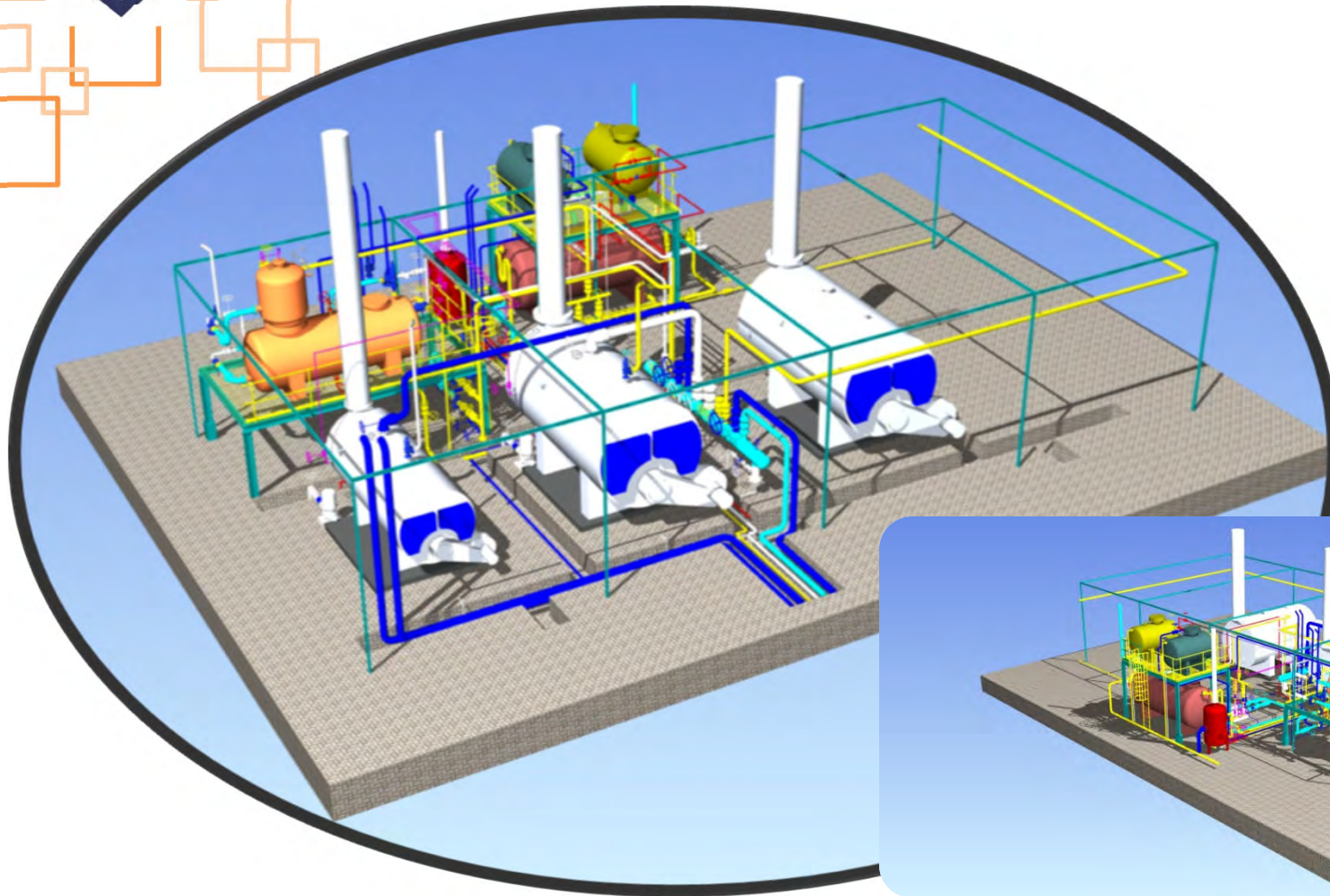
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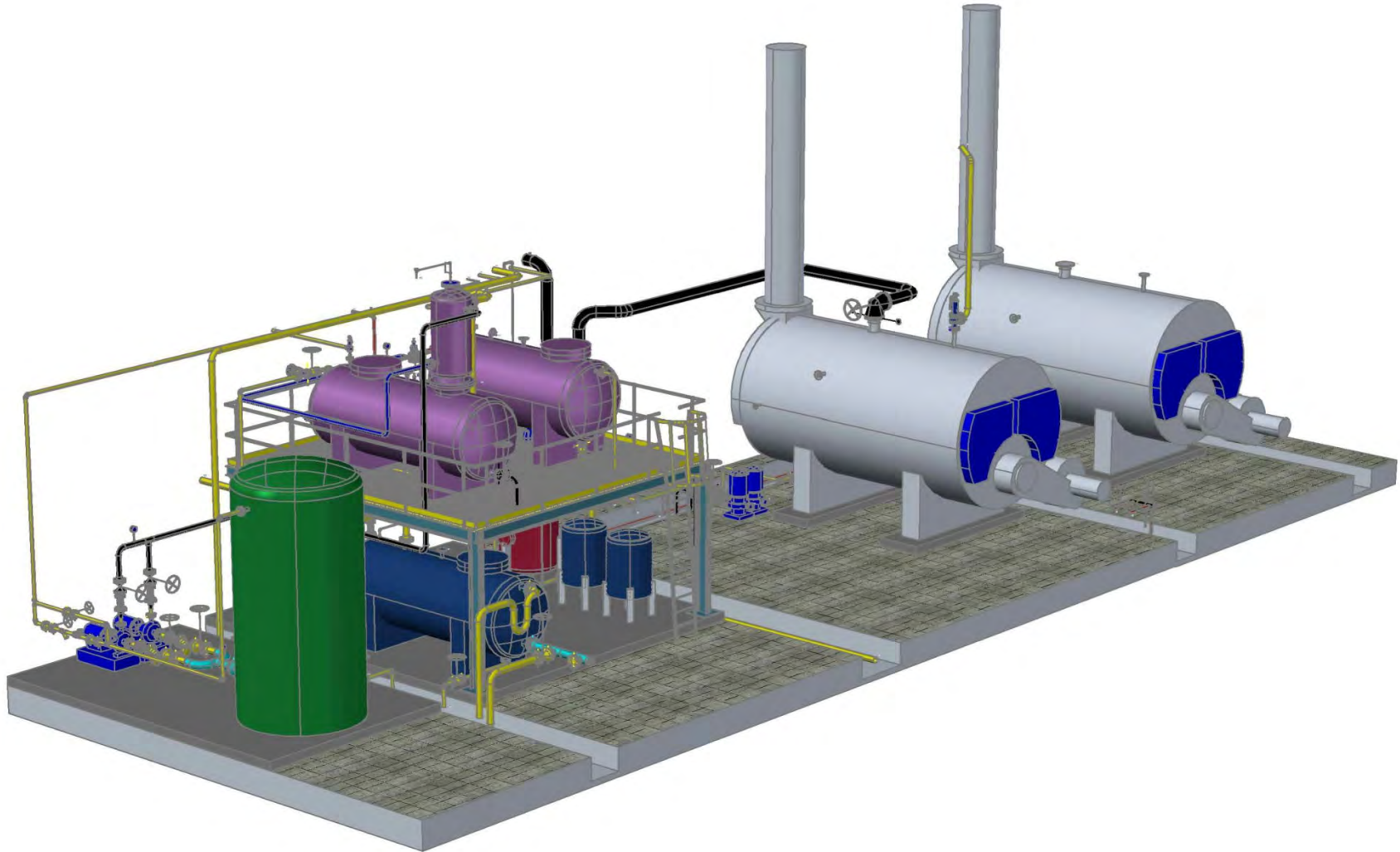


# FARMAND CHOCOLATE CO.





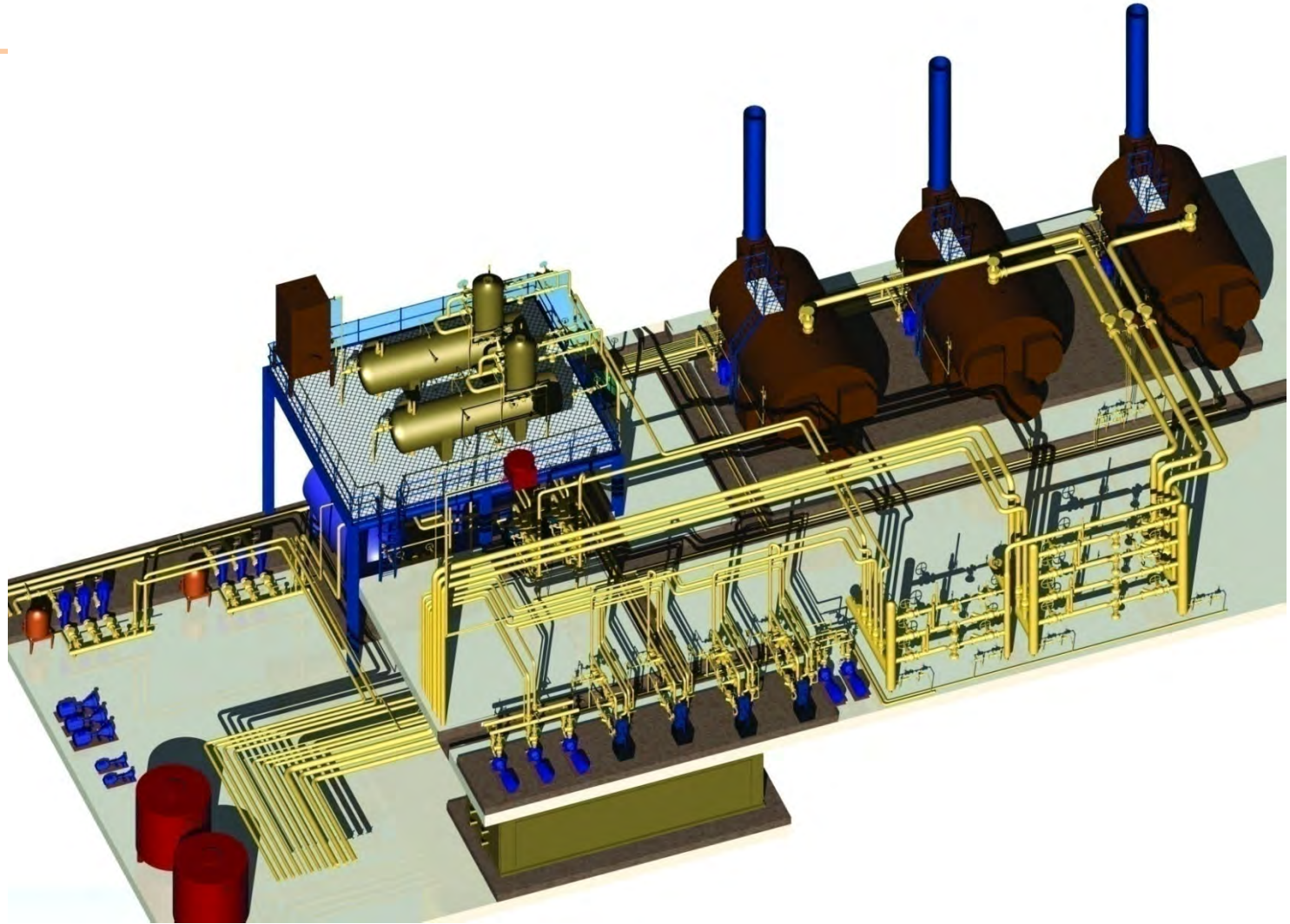
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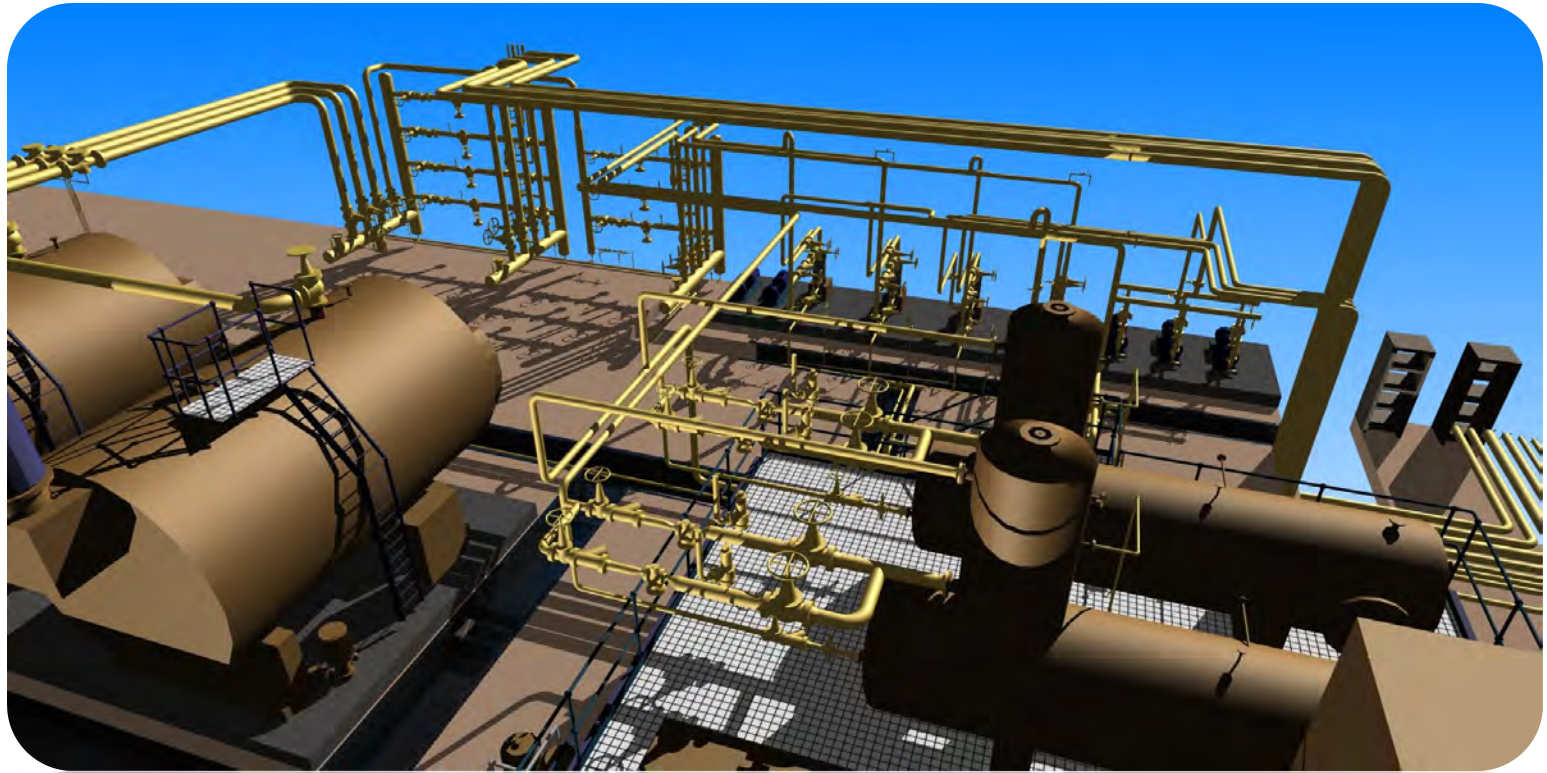
# SADR CEMENT SEGMENT CO.





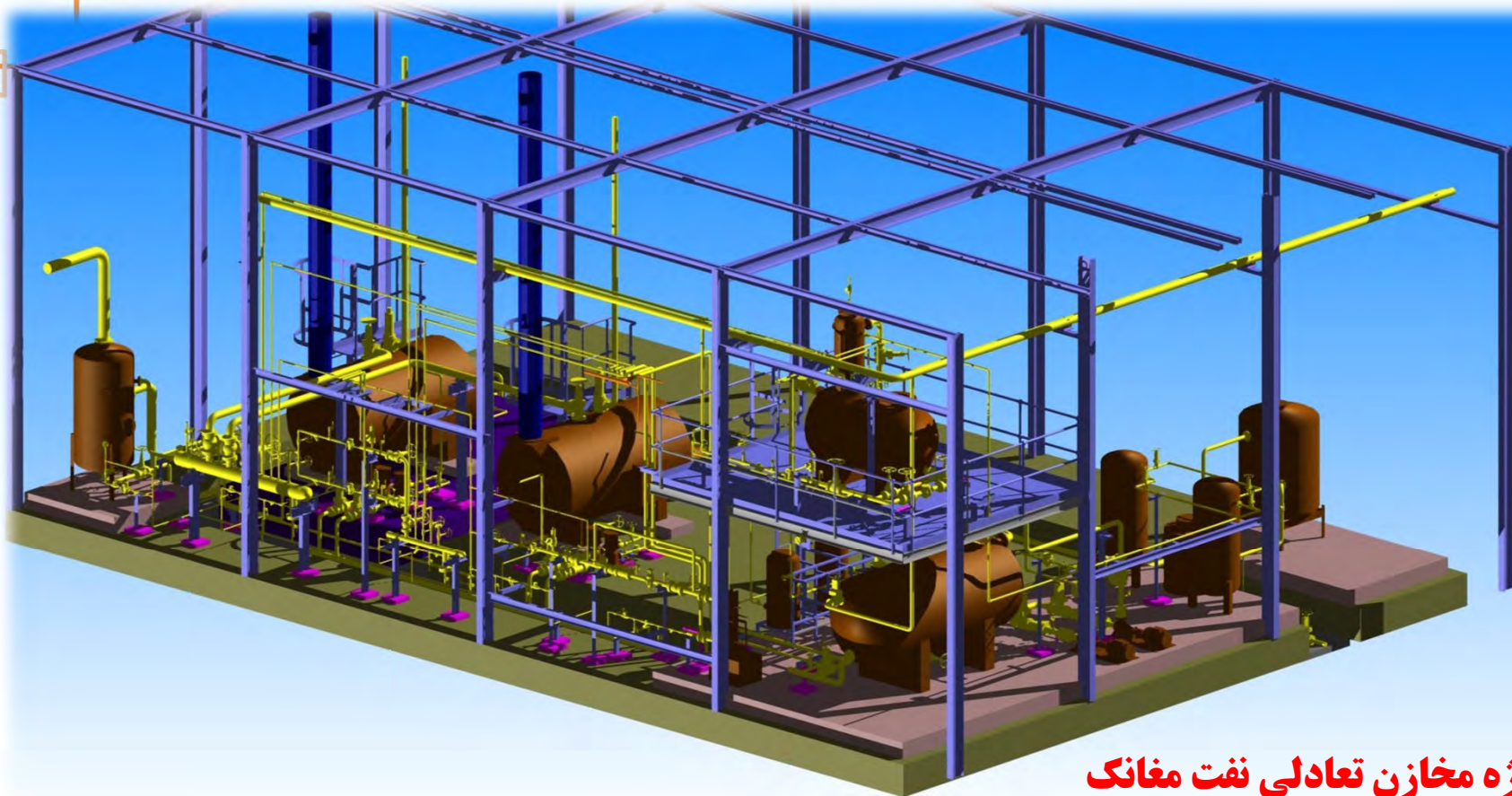


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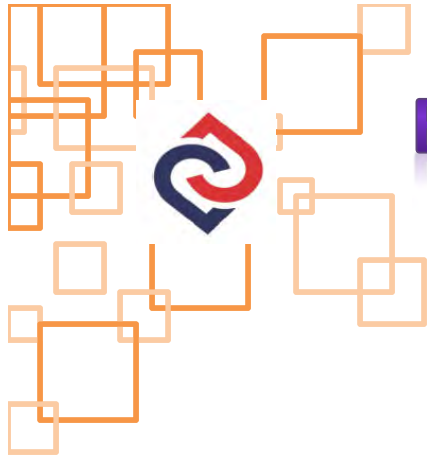


# SARY MOGHAHNAK REFINERY

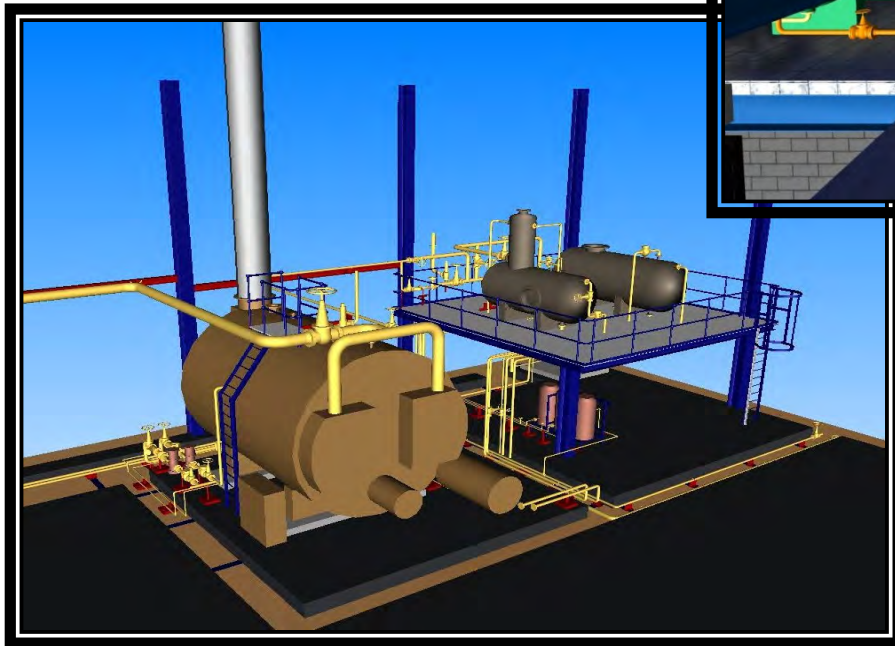
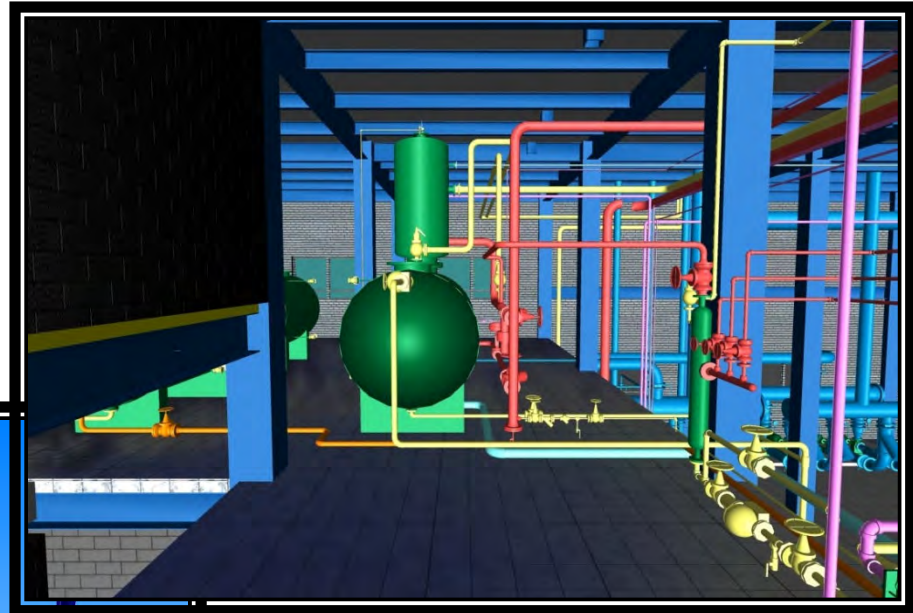


پروژه مخازن تعادلی نفت مغانک



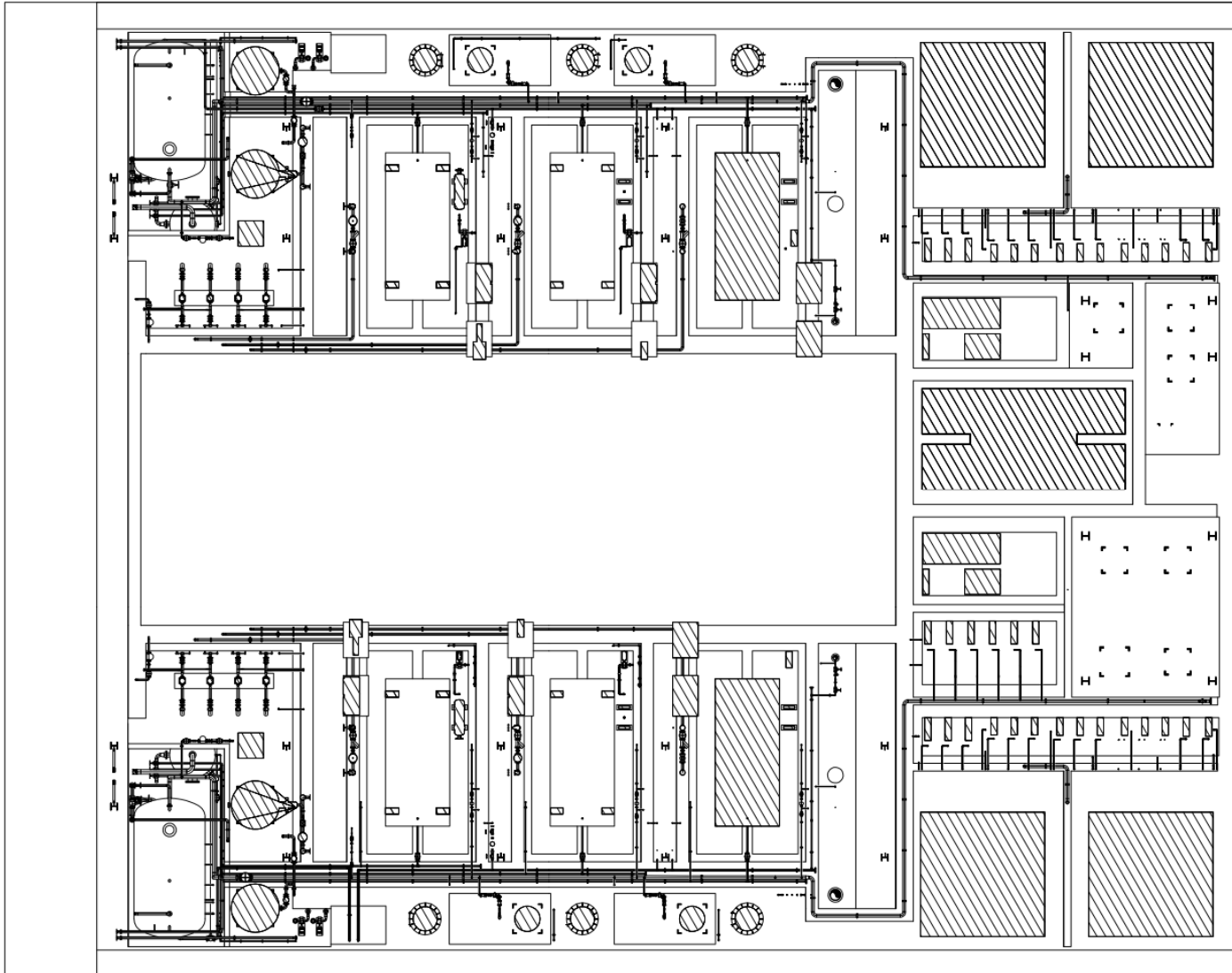


# BIOSUN PHARMACUTICAL

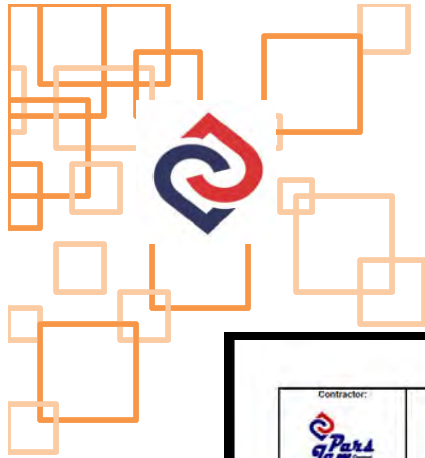




# GENERAL ARRANGEMENT







# PIPING MATERIAL SPECIFICATION (PMS)

|                  |      |                      |          |  |            |  |  |
|------------------|------|----------------------|----------|--|------------|--|--|
|                  |      |                      |          | <b>PROJECT: ZARNAM AUXILIARY BOILER ROOM</b>     |            |  |  |
| PARS JAM CONTROL |      | Client Name          |          | <b>DOC. TITLE: PIPING MATERIAL SPECIFICATION</b> |            |  |  |
|                  |      | <b>DOCUMENT CODE</b> |          | <b>PAGE 10 OF 33</b>                             |            |  |  |
| PHASE            | DISC | DOC. TYPE            | SER. No. | REV. No.   | DATE       |  |  |
| ED               | FI   | SPC                  | 5100     | A0   | 27.06.2015 |  |  |

|   |
|---|
| Class No.: AN10   |
| Base Material: Carbon Steel   |
| Rating: Class 150(PN16)   |
| Corrosion Allowance: 1 mm   |
| Service: saturated & superheated steam, Condensate Water, Boiler Feed Water, Blowdown Water |

|                |      |      |      |      |      |      |      |     |     |
|----------------|------|------|------|------|------|------|------|-----|-----|
| Temperature °C | 0    | 50   | 100  | 150  | 200  | 250  | 300  | 350 | 400 |
| Pressure Barg  | 19.6 | 19.2 | 17.6 | 15.8 | 13.9 | 12.0 | 10.2 | 8.3 | 6.5 |

**BRANCH CONNECTIONS 90 DEGREES  
BRANCH SIZE**

|          |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |
|----------|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Run Size | 15 | 20 | 25 | 32 | 40 | 50 | 65 | 80 | 100 | 125 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 600 |
| A        | C  | C  | C  | C  | C  | F  | F  | F  | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| B        | C  | C  | C  | C  | C  | F  | F  | F  | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| C        | C  | C  | C  | C  | C  | F  | F  | F  | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| D        | C  | C  | C  | C  | C  | F  | F  | F  | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| E        | C  | C  | C  | C  | C  | F  | F  | F  | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| F        | C  | C  | C  | C  | C  | F  | F  | F  | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |

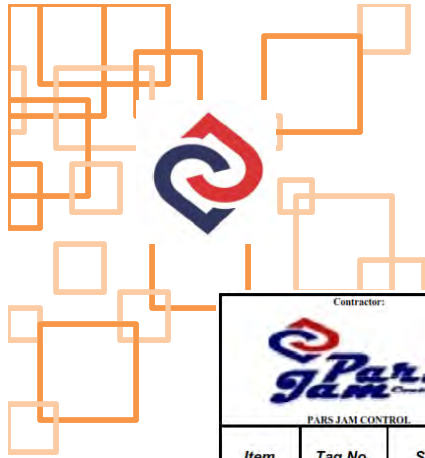
  

A Equal tee BW  
 B Reducing tee SW  
 C Sockolet  
 D Reducing Tee BW  
 E Equal tee SW  
 F Weldolet



|                  |      |                      |          |  |            |  |  |
|------------------|------|----------------------|----------|--|------------|--|--|
|                  |      |                      |          | <b>PROJECT: ZARNAM AUXILIARY BOILER ROOM</b>     |            |  |  |
| PARS JAM CONTROL |      | Client Name          |          | <b>DOC. TITLE: PIPING MATERIAL SPECIFICATION</b> |            |  |  |
|                  |      | <b>DOCUMENT CODE</b> |          | <b>PAGE 11 OF 33</b>                             |            |  |  |
| PHASE            | DISC | DOC. TYPE            | SER. No. | REV. No.   | DATE       |  |  |
| ED               | FI   | SPC                  | 5100     | A0   | 27.06.2015 |  |  |

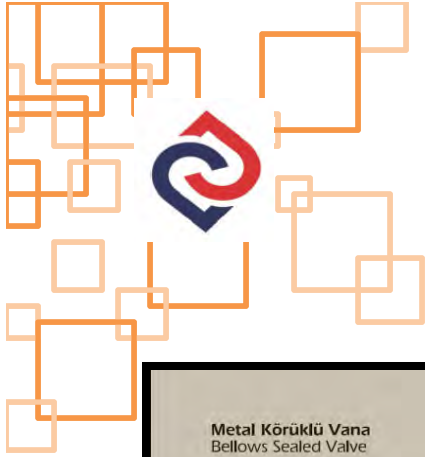
  

| Designation            | Size        | General Design Description | Material             | Standard                |
|------------------------|-------------|----------------------------|----------------------|-------------------------|
| PIPE                   | 1/2"-3/4"   | SEAMLESS, SCH 80           | API 5L Gr.B          | ANSI B36.10             |
|                        | 1"-24"      | SEAMLESS, SCH 40           | API 5L Gr.B          | ANSI B36.10             |
| ELBOW 90               | 1/2"-11/2"  | SW, LR                     | ASTM A105            | ANSI B16.11             |
|                        | 2"-24"      | BW, SCH40                  | ASTM A234 Gr.WPB     | ANSI B16.9              |
| ELBOW 45               | 1/2"-11/2"  | SW, LR                     | ASTM A105            | ANSI B16.11             |
|                        | 2"-24"      | BW, SCH40                  | ASTM A234 Gr.WPB     | ANSI B16.9              |
| EQUAL TEE              | 1/2"-11/2"  | SW                         | ASTM A105            | ANSI B16.11             |
|                        | 2"-24"      | BW, SCH40                  | ASTM A234 Gr.WPB     | ANSI B16.9              |
| RED. TEE               | 1/2"- 11/2" | SW                         | ASTM A105            | ANSI B16.11             |
|                        | 2"-24"      | BW, SCH40                  | ASTM A234 Gr.WPB     | ANSI B16.9              |
| COUPLING & UNION       | 1/2"-11/2"  | SW                         | ASTM A105            | ANSI B16.11             |
| CAP                    | 1/2"-11/2"  | SW                         | ASTM A105            | ANSI B16.11             |
|                        | 2"-24"      | BW, SCH40                  | ASTM A234 Gr.WPB     | ANSI B16.9              |
| ECC. REDUCER           | 3/4"-24"    | BW, SCH40                  | ASTM A234 Gr.WPB     | ANSI B16.9              |
| CONC. REDUCER          | 3/4"-24"    | BW, SCH40                  | ASTM A234 Gr.WPB     | ANSI B16.9              |
| FLANGE                 | 1/2"-1 1/2" | SW                         | ASTM A105            | DIN2633                 |
| WELD NECK FLANGE       | 1/2"-12"    | PN16, RF                   | ASTM A105            | DIN2633                 |
| SPECTACLE BLIND FLANGE | 1/2"-24"    | PN16, RF                   | ASTM A105            | DIN2527, 2502           |
| BLIND FLANGE           | 1/2"-24"    | PN16, RF                   | ASTM A105            | DIN2527                 |
| GASKET                 | 1/2"-24"    | PN16, 3 mm                 | Wired Graphite/ PTFE | DIN3535                 |
| NUT                    | 10-33mm     |                            | ASTM A194 Gr.2H      | ANSI B 18.2.2<br>DIN934 |



# VALVE LIST

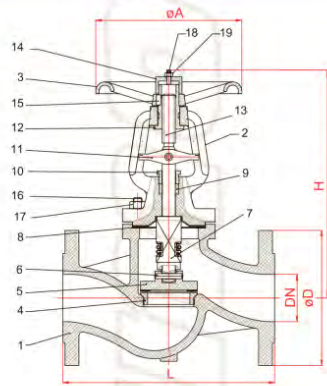
| Contractor:   |        | Client:  |                 | PROJECT: ZARNAM CENTRAL MECHANICAL ROOM          |         |         |         |      |                 |                         |                       |          |                          |                          |         |                      |        |
|---|--------|--|-----------------|--|---------|---------|---------|------|-----------------|-------------------------|-----------------------|----------|--------------------------|--------------------------|---------|----------------------|--------|
| <br>PARS JAM CONTROL |        | <br>گروه صنعتی و پژوهشی فریباشکن برآمد (پارس جام) |                 | DOC. TITLE: STEAM VALVE LIST(MECHANICAL ROOM II) |         |         |         |      |                 |                         |                       |          |                          |                          |         |                      |        |
|   |        |  |                 | DOCUMENT CODE                                    |         |         |         |      | DATE: 1394/06/4 |                         |                       |          |                          |                          |         |                      |        |
| PHASE   | DISC.  | DOC. TYPE  | SER. No.        | REV. No.   |         |         |         |      |                 |                         |                       |          |                          |                          |         |                      |        |
| ED  | ME     | LIS  | 5700            | A1   | Item    | Tag No. | Service | Type | Body Material   | Connection Type         | Rating                | Size(mm) | Working Presssure (Barg) | Working Temperature (°C) | PID No. | Line No. / Equipment | Remark |
| 1   | HV-001 | Steam  | Globe Valve(BL) | Ductile Iron                                     | Flanged | PN25    | 200     | 12   | 191.61          | 110-ED-PR-PID-0200-02A0 | HPS-0001-CN10-8"-IH   |          |                          |                          |         |                      |        |
| 2   | HV-002 | Steam  | Globe Valve(BL) | Ductile iron                                     | Flanged | PN25    | 200     | 12   | 191.61          | 110-ED-PR-PID-0200-02A0 | HPS-0002-CN10-8"-IH   |          |                          |                          |         |                      |        |
| 3   | HV-003 | Steam  | Globe Valve(BL) | Ductile Iron                                     | Flanged | PN25    | 200     | 12   | 191.61          | 110-ED-PR-PID-0200-02A0 | HPS-0003-CN10-8"-IH   |          |                          |                          |         |                      |        |
| 4   | HV-004 | Steam  | Globe Valve(BL) | Ductile Iron                                     | Flanged | PN25    | 200     | 12   | 191.61          | 110-ED-PR-PID-0200-02A0 | HPS-0007-CN10-8"-IH   |          |                          |                          |         |                      |        |
| 5   | HV-005 | Steam  | Niddle Valve    | Stainless Steel                                  | Screwed | PN25    | 15      | 12   | 191.61          | 110-ED-PR-PID-0200-02A0 | HPS-0004-CN10-16"-IH  |          |                          |                          |         |                      |        |
| 6   | HV-006 | Steam  | Ball Valve      | Stainless Steel                                  | Screwed | PN25    | 15      | 12   | 191.61          | 110-ED-PR-PID-0200-02A0 | TL-0001-CN10-1/2"-IH  |          |                          |                          |         |                      |        |
| 7   | HV-007 | Steam  | Globe Valve(BL) | Ductile iron                                     | Flanged | PN25    | 250     | 12   | 191.61          | 110-ED-PR-PID-0200-02A0 | HPS-0006-CN10-10"-IH  |          |                          |                          |         |                      |        |
| 8   | HV-008 | Steam  | Niddle Valve    | Stainless Steel                                  | Screwed | PN25    | 15      | 12   | 191.61          | 110-ED-PR-PID-0200-02A0 | HPS-0004-CN10-16"-IH  |          |                          |                          |         |                      |        |
| 9   | HV-009 | Steam  | Globe Valve(BL) | Ductile Iron                                     | Flanged | PN25    | 125     | 12   | 191.61          | 110-ED-PR-PID-0200-02A0 | HPS-0008-CN10-5"-IH   |          |                          |                          |         |                      |        |
| 10  | HV-010 | Steam  | Globe Valve(BL) | Cast Iron  | Flanged | PN16    | 200     | 3    | 143.75          | 110-ED-PR-PID-0200-02A0 | MPS-0001-AN10-8"-IH   |          |                          |                          |         |                      |        |
| 11  | HV-011 | Steam  | Globe Valve(BL) | Ductile iron                                     | Flanged | PN25    | 125     | 12   | 191.61          | 110-ED-PR-PID-0200-02A0 | HPS-0009-CN10-5"-IH   |          |                          |                          |         |                      |        |
| 12  | HV-012 | Steam  | Globe Valve(BL) | Cast Iron  | Flanged | PN16    | 200     | 3    | 143.75          | 110-ED-PR-PID-0200-02A0 | MPS-0002-AN10-8"-IH   |          |                          |                          |         |                      |        |
| 13  | HV-013 | Steam  | Globe Valve(BL) | Ductile Iron                                     | Flanged | PN25    | 125     | 12   | 191.61          | 110-ED-PR-PID-0200-02A0 | HPS-0010-CN10-5"-IH   |          |                          |                          |         |                      |        |
| 14  | HV-014 | Steam  | Globe Valve(BL) | Cast Iron  | Flanged | PN16    | 200     | 3    | 143.75          | 110-ED-PR-PID-0200-02A0 | MPS-0003-AN10-8"-IH   |          |                          |                          |         |                      |        |
| 15  | HV-015 | Steam  | Niddle Valve    | Stainless Steel                                  | Screwed | PN16    | 15      | 3    | 143.75          | 110-ED-PR-PID-0200-02A0 | MPS-0005-AN10-16"-IH  |          |                          |                          |         |                      |        |
| 16  | HV-016 | Steam  | Globe Valve(BL) | Cast Iron  | Flanged | PN16    | 150     | 3    | 143.75          | 110-ED-PR-PID-0200-02A0 | MPS-0010-AN10-6"-IH   |          |                          |                          |         |                      |        |
| 17  | HV-018 | Steam  | Niddle Valve    | Stainless Steel                                  | Screwed | PN16    | 15      | 3    | 143.75          | 110-ED-PR-PID-0200-02A0 | MPS-0005-AN10-16"-IH  |          |                          |                          |         |                      |        |
| 18  | HV-019 | Steam  | Globe Valve(BL) | Cast Iron  | Flanged | PN16    | 80      | 3    | 143.75          | 110-ED-PR-PID-0200-02A0 | MPS-0015-AN10-3"-IH   |          |                          |                          |         |                      |        |
| 19  | HV-020 | Steam  | Globe Valve(BL) | Cast Iron  | Flanged | PN16    | 200     | 3    | 143.75          | 110-ED-PR-PID-0200-02A0 | MPS-0018-AN10-8"-IH   |          |                          |                          |         |                      |        |
| 20  | HV-021 | Steam  | Globe Valve(BL) | Cast Iron  | Flanged | PN16    | 50      | 3    | 143.75          | 110-ED-PR-PID-0200-02A0 | MPS-0006-AN10-2"-IH   |          |                          |                          |         |                      |        |
| 21  | HV-022 | Condensate   | Globe Valve(BL) | Ductile Iron                                     | Flanged | PN25    | 25      | 12   | 191.61          | 110-ED-PR-PID-0200-02A0 | HPC-0001-AN10-1"-IH   |          |                          |                          |         |                      |        |
| 22  | HV-023 | Condensate   | Globe Valve(BL) | Cast Iron  | Flanged | PN16    | 25      | 0.5  | 100             | 110-ED-PR-PID-0200-02A0 | HPC-0001-AN10-1"-IH   |          |                          |                          |         |                      |        |
| 23  | HV-024 | Condensate   | Globe Valve(BL) | Ductile iron                                     | Flanged | PN25    | 25      | 12   | 191.61          | 110-ED-PR-PID-0200-02A0 | HPC-0002-AN10-1"-IH   |          |                          |                          |         |                      |        |
| 24  | HV-025 | Condensate   | Globe Valve(BL) | Cast Iron  | Flanged | PN16    | 25      | 0.5  | 100             | 110-ED-PR-PID-0200-02A0 | HPC-0002-AN10-1"-IH   |          |                          |                          |         |                      |        |
| 25  | HV-026 | Condensate   | Globe Valve(BL) | Ductile iron                                     | Flanged | PN25    | 25      | 12   | 191.61          | 110-ED-PR-PID-0200-02A0 | HPC-0003-AN10-1"-IH   |          |                          |                          |         |                      |        |
| 26  | HV-027 | Condensate   | Globe Valve(BL) | Cast Iron  | Flanged | PN16    | 25      | 0.5  | 100             | 110-ED-PR-PID-0200-02A0 | HPC-0003-AN10-1"-IH   |          |                          |                          |         |                      |        |
| 27  | HV-028 | Condensate   | Globe Valve(BL) | Ductile iron                                     | Flanged | PN25    | 20      | 12   | 191.61          | 110-ED-PR-PID-0200-02A0 | HPC-0004-AN10-3/4"-IH |          |                          |                          |         |                      |        |
| 28  | HV-029 | Condensate   | Globe Valve(BL) | Cast Iron  | Flanged | PN16    | 20      | 0.5  | 100             | 110-ED-PR-PID-0200-02A0 | HPC-0004-AN10-3/4"-IH |          |                          |                          |         |                      |        |
| 29  | HV-030 | Condensate   | Globe Valve(BL) | Ductile iron                                     | Flanged | PN25    | 20      | 12   | 191.61          | 110-ED-PR-PID-0200-02A0 | HPC-0005-AN10-3/4"-IH |          |                          |                          |         |                      |        |
| 30  | HV-031 | Condensate   | Globe Valve(BL) | Cast Iron  | Flanged | PN16    | 20      | 0.5  | 100             | 110-ED-PR-PID-0200-02A0 | HPC-0005-AN10-3/4"-IH |          |                          |                          |         |                      |        |
| 31  | HV-032 | Condensate   | Globe Valve(BL) | Cast Iron  | Flanged | PN16    | 20      | 3    | 143.75          | 110-ED-PR-PID-0200-02A0 | MPC-0001-AN10-3/4"-IH |          |                          |                          |         |                      |        |
| 32  | HV-033 | Condensate   | Globe Valve(BL) | Cast Iron  | Flanged | PN16    | 20      | 0.5  | 100             | 110-ED-PR-PID-0200-02A0 | MPC-0001-AN10-3/4"-IH |          |                          |                          |         |                      |        |
| 33  | HV-034 | Condensate   | Globe Valve(BL) | Cast Iron  | Flanged | PN16    | 15      | 3    | 143.75          | 110-ED-PR-PID-0200-02A0 | MPC-0002-AN10-1/2"-IH |          |                          |                          |         |                      |        |
| 34  | HV-035 | Condensate   | Globe Valve(BL) | Cast Iron  | Flanged | PN16    | 15      | 0.5  | 100             | 110-ED-PR-PID-0200-02A0 | MPC-0002-AN10-1/2"-IH |          |                          |                          |         |                      |        |
| 35  | HV-036 | Steam  | Globe Valve(BL) | Cast Iron  | Flanged | PN16    | 25      | 3    | 143.75          | 110-ED-PR-PID-0200-02A0 | MPS-0007-AN10-1"-IH   |          |                          |                          |         |                      |        |



# DATA SHEETS

**Metal Körüklü Vana**  
Bellows Sealed Valve

**Tip / Type**  
PN25 / TMKV - 112



**Boyutlar** **Dimensions**

| PN                    | 25   |      |     |        |        |      |        |      |     |     |     |     |      |      |  |  |
|-----------------------|------|------|-----|--------|--------|------|--------|------|-----|-----|-----|-----|------|------|--|--|
| DN / Size             | 15   | 20   | 25  | 32     | 40     | 50   | 65     | 80   | 100 | 125 | 150 | 200 | 250  | 300  |  |  |
| DN / Size             | 1/2" | 3/4" | 1"  | 1 1/4" | 1 1/2" | 2"   | 2 1/2" | 3"   | 4"  | 5"  | 6"  | 8"  | 10"  | 12"  |  |  |
| L                     | 130  | 150  | 160 | 180    | 200    | 230  | 290    | 310  | 350 | 400 | 480 | 600 | 730  | 850  |  |  |
| H                     | 230  | 230  | 248 | 248    | 268    | 268  | 312    | 366  | 400 | 463 | 488 | 559 | 701  | 714  |  |  |
| øA                    | 120  | 120  | 160 | 160    | 200    | 195  | 195    | 250  | 325 | 360 | 360 | 525 | 525  | 525  |  |  |
| øD                    | 95   | 105  | 115 | 140    | 150    | 165  | 185    | 200  | 235 | 250 | 285 | 340 | 395  | 445  |  |  |
| AĞIRLIK (kg)          | 7    | 8    | 9,2 | 13,5   | 15,6   | 22,5 | 37,8   | 48,5 | 65  | 92  | 134 | 196 | 395  | 475  |  |  |
| DN / Size             | 15   | 20   | 25  | 32     | 40     | 50   | 65     | 80   | 100 | 125 | 150 | 200 | 250  | 300  |  |  |
| Kvs m <sup>3</sup> /h | 5,4  | 9,6  | 15  | 24     | 37     | 57   | 95     | 141  | 218 | 316 | 430 | 723 | 1077 | 1575 |  |  |
| ξ                     | 4,7  | 4,6  | 4,7 | 4,6    | 4,8    | 4,7  | 4,8    | 5    | 4,9 | 4,9 | 4,9 | 5,2 | 5,4  | 5,8  |  |  |



**SIEMENS**

**4<sup>330</sup>**



**2-Port Seat Valves with Flange, PN 16**

**VVF40...**

- Grey cast iron EN-GJL-250 valve body
- DN 15...150
- $K_v$  1,9...315 m<sup>3</sup>/h
- Can be equipped with SQX... electromotoric or SKD...-, SKB...- and SKC...- electrohydraulic actuators

**Use**

For use in heating, ventilating, and air conditioning systems as a control or safety shutoff valve.

For closed circuits only (mind cavitation, refer to page 6).

CA1N4330en  
21.09.2007

Building Technologies  
HVAC Products





# STRESS ANALYSIS

## LOAD CASE DEFINITION KEY

CASE 5 (SUS) W+P1+H  
 CASE 6 (SUS) WNC+H  
 CASE 17 (OCC) L17=L12+L5  
 CASE 18 (OCC) L18=L13+L5  
 CASE 19 (OCC) L19=L14+L5  
 CASE 20 (OCC) L20=L15+L5  
 CASE 21 (OCC) L21=L16+L5  
 CASE 22 (EXP) L22=L4-L5

Piping Code: B31.3 = B31.3 -2012, Jan 10, 2013

\*\*\* CODE COMPLIANCE EVALUATION PASSED \*\*\*



Highest Stresses: (KPa )  
 Ratio (%): 49.3 @Node 4504 LOADCASE: 22 (EXP) L22=L4-L5  
 Code Stress: 164051.4 Allowable Stress: 332484.7  
 Axial Stress: 15047.0 @Node 500 LOADCASE: 17 (OCC) L17=L12+L5  
 Bending Stress: 160642.6 @Node 4504 LOADCASE: 22 (EXP) L22=L4-L5  
 Torsion Stress: 35255.8 @Node 600 LOADCASE: 22 (EXP) L22=L4-L5  
 Hoop Stress: 19641.0 @Node 30 LOADCASE: 5 (SUS) W+P1+H  
 Max Stress Intensity: 207190.5 @Node 5820 LOADCASE: 22 (EXP) L22=L4-L5

| Load Case | From Node | Code Stress KPa | Allowable Stress KPa | Ratio % | To Node | Code Stress KPa | Allowable Stress KPa | Ratio % | Piping Code |
|-----------|-----------|-----------------|----------------------|---------|---------|-----------------|----------------------|---------|-------------|
| 5(SUS)    | 10        | 9529.4          | 137357.2             | 6.9     | 30      | 9794.2          | 137357.2             | 7.1     | B31.3       |
| 6(SUS)    |           | 0.0             | 137357.2             | 0.0     |         | 264.8           | 137357.2             | 0.2     | B31.3       |
| 17(OCC)   |           | 9529.4          | 182685.1             | 5.2     |         | 9817.8          | 182685.1             | 5.4     | B31.3       |
| 18(OCC)   |           | 9529.4          | 182685.1             | 5.2     |         | 9817.8          | 182685.1             | 5.4     | B31.3       |
| 19(OCC)   |           | 9529.4          | 182685.1             | 5.2     |         | 9886.9          | 182685.1             | 5.4     | B31.3       |
| 20(OCC)   |           | 9529.4          | 182685.1             | 5.2     |         | 9886.9          | 182685.1             | 5.4     | B31.3       |
| 21(OCC)   |           | 9529.4          | 182685.1             | 5.2     |         | 9794.2          | 182685.1             | 5.4     | B31.3       |
| 22(EXP)   |           | 0.0             | 334532.1             | 0.0     |         | 0.0             | 334267.2             | 0.0     | B31.3       |
| 5(SUS)    | 30        | 9790.4          | 137357.2             | 7.1     | 50      | 11528.2         | 137357.2             | 8.4     | B31.3       |
| 6(SUS)    |           | 268.7           | 137357.2             | 0.2     |         | 2006.5          | 137357.2             | 1.5     | B31.3       |
| 17(OCC)   |           | 9826.8          | 182685.1             | 5.4     |         | 13182.8         | 182685.1             | 7.2     | B31.3       |
| 18(OCC)   |           | 9831.3          | 182685.1             | 5.4     |         | 13221.7         | 182685.1             | 7.2     | B31.3       |
| 19(OCC)   |           | 10018.7         | 182685.1             | 5.5     |         | 15095.5         | 182685.1             | 8.3     | B31.3       |
| 20(OCC)   |           | 9953.9          | 182685.1             | 5.4     |         | 13492.7         | 182685.1             | 7.4     | B31.3       |
| 21(OCC)   |           | 9791.3          | 182685.1             | 5.4     |         | 11582.8         | 182685.1             | 6.3     | B31.3       |
|           |           | 154.0           | 334271.1             | 0.0     |         | 2753.5          | 332533.3             | 0.8     | B31.3       |





# PIPE & FITTING MATERIAL TAKE OFF

| Contractor:   |        | PROJECT: ZARNAM CENTRAL MECHANICAL ROOM                        |  |               | CLIENT:   |  |
|---|--------|--|--|---------------|---|--|
|  |        | DOC. TITLE: SHORTAGE PIPE & FITTING MTO (MECHANICAL ROOM I&II) |  |               |  |  |
|   |        | DOCUMENT CODE:<br>ED-PQ-MTO-5950-A1                            |  |               |   |  |
| ITEM  | UNIT   | DESCRIPTION  |  | SIZE          | QTY   |  |
| 1   | BRANCH | ANSI B36.10 SEAMLESS SCH 40,APISL GR.B                         |  | 8"            | 24  |  |
| 2   | BRANCH | ANSI B36.10 SEAMLESS SCH 40,APISL GR.B                         |  | 6"            | 7   |  |
| 3   | BRANCH | ANSI B36.10 SEAMLESS SCH 40,APISL GR.B                         |  | 5"            | 67  |  |
| 4   | BRANCH | ANSI B36.10 SEAMLESS SCH 40,APISL GR.B                         |  | 4"            | 7   |  |
| 5   | BRANCH | ANSI B36.10 SEAMLESS SCH 40,APISL GR.B                         |  | 3"            | 19  |  |
| 6   | BRANCH | ANSI B36.10 SEAMLESS SCH 40,APISL GR.B                         |  | 2"            | 11  |  |
| 7   | BRANCH | ANSI B36.10 SEAMLESS SCH 40,APISL GR.B                         |  | 1 1/2"        | 3   |  |
| 8   | BRANCH | ANSI B36.10 SEAMLESS SCH 40,APISL GR.B                         |  | 1 1/4"        | 15  |  |
| 9   | BRANCH | ANSI B36.10 SEAMLESS SCH 40,APISL GR.B                         |  | 1"            | 7   |  |
| 10  | NO.    | ELBOW 90 ANSI B16.9 BW SCH40,ASTM A234 GR.WPB                  |  | 8"            | 10  |  |
| 11  | NO.    | ELBOW 90 ANSI B16.9 BW SCH40,ASTM A234 GR.WPB                  |  | 5"            | 30  |  |
| 12  | NO.    | ELBOW 90 ANSI B16.9 BW SCH40,ASTM A234 GR.WPB                  |  | 3"            | 45  |  |
| 13  | NO.    | ELBOW 90 ANSI B16.9 BW SCH40,ASTM A234 GR.WPB                  |  | 2 1/2"        | 3   |  |
| 14  | NO.    | ELBOW 90 ANSI B16.9 BW SCH40,ASTM A234 GR.WPB                  |  | 2"            | 23  |  |
| 15  | NO.    | ELBOW 90 ANSI B16.11 SW LR,ASTM A105                           |  | 1 1/2"        | 24  |  |
| 16  | NO.    | ELBOW 90 ANSI B16.11 SW LR,ASTM A105                           |  | 1"            | 57  |  |
| 17  | NO.    | ELBOW 90 ANSI B16.11 SW LR,ASTM A105                           |  | 1/2"          | 35  |  |
| 18  | NO.    | ELBOW 45 ANSI B16.11 THREAD,ASTM A105 Hot Dip Galvanized       |  | 2 1/2"        | 2   |  |
| 19  | NO.    | ELBOW 90 ANSI B16.11 THREAD,ASTM A105 Hot Dip Galvanized       |  | 2"            | 8   |  |
| 20  | NO.    | EQUAL TEE ANSI B16.9 BW SCH40,ASTM A234 GR.WPB                 |  | 16"x16"       | 1   |  |
| 21  | NO.    | EQUAL TEE ANSI B16.9 BW SCH40,ASTM A234 GR.WPB                 |  | 3"x3"         | 17  |  |
| 22  | NO.    | EQUAL TEE ANSI B16.9 BW SCH40,ASTM A234 GR.WPB                 |  | 2 1/2"x2 1/2" | 2   |  |
| 23  | NO.    | EQUAL TEE ANSI B16.11 SW,ASTM A105                             |  | 3/4"x3/4"     | 4   |  |
| 24  | NO.    | REDUCING TEE ANSI B16.9 BW SCH40,ASTM A234 GR.WPB              |  | 3"x2 1/2"     | 7   |  |
| 25  | NO.    | REDUCING TEE ANSI B16.9 BW SCH40,ASTM A234 GR.WPB              |  | 3"x2"         | 7   |  |
| 26  | NO.    | REDUCING TEE ANSI B16.11 SW,ASTM A105                          |  | 2"x1 1/2"     | 5   |  |
| 27  | NO.    | REDUCING TEE ANSI B16.11 SW,ASTM A105                          |  | 2"x1"         | 5   |  |
| 28  | NO.    | REDUCING TEE ANSI B16.11 SW,ASTM A105                          |  | 3/4"x1/2"     | 22  |  |
| 29  | NO.    | SOCKOLET ANSI B16.11 SW,ASTM A105                              |  | 12"x1/2"      | 1   |  |
| 30  | NO.    | SOCKOLET ANSI B16.11 SW,ASTM A105                              |  | 3"x1 1/2"     | 2   |  |
| 31  | NO.    | SOCKOLET ANSI B16.11 SW,ASTM A105                              |  | 3"x3/4"       | 14  |  |
| 32  | NO.    | SOCKOLET ANSI B16.11 SW,ASTM A105                              |  | 2"x1/2"       | 5   |  |
| 33  | NO.    | CONC. REDUCER ANSI B16.9 BW SCH40,ASTM A234 GR.WPB             |  | 5"x3"         | 1   |  |
| 34  | NO.    | CONC. REDUCER ANSI B16.9 BW SCH40,ASTM A234 GR.WPB             |  | 4"x1 1/2"     | 2   |  |
| 35  | NO.    | CONC. REDUCER ANSI B16.9 BW SCH40,ASTM A234 GR.WPB             |  | 3"x2"         | 8   |  |
| 36  | NO.    | CONC. REDUCER ANSI B16.9 BW SCH40,ASTM A234 GR.WPB             |  | 2"x1 1/2"     | 6   |  |
| 37  | NO.    | CONC. REDUCER ANSI B16.9 BW SCH40,ASTM A234 GR.WPB             |  | 2"x1"         | 12  |  |
| 38  | NO.    | CONC. REDUCER ANSI B16.9 BW SCH40,ASTM A234 GR.WPB             |  | 1 1/2"x3/4"   | 2   |  |
| 39  | NO.    | ECC. REDUCER ANSI B16.9 BW SCH40,ASTM A234 GR.WPB              |  | 1"x1/2"       | 17  |  |
| 40  | NO.    | CAP ANSI B16.9 BW SCH 40,ASTM A234 GR.WPB                      |  | 3"            | 6   |  |



# SUPPORT DETAILS



Technical drawing showing a vertical support assembly with dimensions: 2265, 594, 181, 143, and 295. Callouts 1 through 8 identify components. A coordinate system shows +Y (V), +Z (H), and +X (L). A plan view shows a circular base with a diameter of 50 mm and a height of 2 mm. A section view shows a diameter of 2 mm and a height of 2 mm. A detail view shows a diameter of 5 mm and a height of 2 mm.

| Pos.  | Designation        | Type   | [ mm ] | Qty. | [ kg ] | Material |
|-------|--------------------|--------|--------|------|--------|----------|
| 8     | Threaded rod       | 673413 | (118)  | 1    | 1.95   | S235_RG2 |
| 7     | Hexagonal nut      | 63392B | M16    | 2    | 0.06   | Gr. B    |
| 6     | Three bolt clamp   | 432219 | D219   | 1    | 5.00   | S235     |
| 5     | Eye nut            | 603912 |        | 1    | 0.20   | P250H    |
| 4     | Var. spring hanger | 213318 |        | 1    | 9.70   |          |
| 3     | Threaded stud      | 673113 | 50     | 1    | 0.07   | S235_RG2 |
| 2     | Clamp with pin     | 613912 |        | 1    | 0.40   | P250H    |
| 1     | Weld-on eye plate  | 753112 |        | 1    | 0.24   | S235_RG2 |
| 17.62 |                    |        |        |      |        |          |

| Pos.                | Designation | Type | [ mm ] | Qty. | [ kg ] | Material |
|---------------------|-------------|------|--------|------|--------|----------|
| HS10-E2-2265-109925 |             |      |        |      |        |          |
| FOD =               | 310         | kN   |        |      |        |          |
| FCD =               | 3.65        | kN   |        |      |        |          |
| FDP =               | 3.65        | kN   |        |      |        |          |
| FQly =              | 4.90        | kN   |        |      |        |          |
| late =              | 5           | mm   |        |      |        |          |
| horz =              | 2           | mm   |        |      |        |          |
| vert =              | 29          | mm   |        |      |        |          |
| Ø OD =              | 219.1       | mm   |        |      |        |          |
| Insul =             | 50          | mm   |        |      |        |          |
| Temp =              | 192         | °C   |        |      |        |          |
| Delta F =           | 15          | %    |        |      |        |          |
| Rate =              | 16.7        | N/mm |        |      |        |          |
| Tot Tvl             | 200         | mm   |        |      |        |          |
| Preset              | 119         | mm   |        |      |        |          |
| Tri Tvl =           | 29.01       | mm   |        |      |        |          |
| Tvl res dn/up       | 81/90       | mm   |        |      |        |          |

|                  |                    |          |
|------------------|--------------------|----------|
| Customer :       | LISEGA Differ N° : | 0-8-0 0  |
| Plant / System : | LICAD Dwg- N° :    | Rev      |
|                  | 10 -3-62996        | 0        |
| P.D. N° :        |                    |          |
| Addenda N° :     |                    |          |
| Processer:       | 09/10/2015         | Checked: |



# SUPPORT LIST

| Contractor:   |                        | Client:   |              | PROJECT: ZARNAM CENTRAL MECHANICAL ROOM     |  |
|---|------------------------|---|--------------|---|--|
|  |                        |  |              | DOC. TITLE: SUPPORT LIST(MECHANICAL ROOM I) |  |
|   |                        |   |              | DOCUMENT CODE<br>110-ED-ST-LIS-2400-A0      | DATE: 1394/07/19                         |
| Item  | Line No.               | Size  | Support Type | Support Tag                                 | Position                                 |
| 1   | HPS-0002-CN10-8"-IH/A  | 200   | SPS          | SPS-01                                      | E 463770.03125 N 3997837 U 102514.914062 |
| 2   | HPS-0002-CN10-8"-IH/A  | 200   | HS13         | HS13-D2-1000-103515                         | E 463770.03125 N 3997837 U 102514.914062 |
| 3   | HPS-0003-CN10-8"-IH/A  | 200   | SPS          | SPS-01                                      | E 463060.3125 N 3991337 U 102514.914062  |
| 4   | HPS-0003-CN10-8"-IH/A  | 200   | HS13         | HS13-D2-1000-103515                         | E 463060.3125 N 3991337 U 102514.914062  |
| 5   | HPS-0003-CN10-8"-IH/A  | 200   | RS17         | RS17-6"-C-400-1210-102305-90                | E 463060.3125 N 3997837 U 102514.914062  |
| 6   | HPS-0003-CN10-8"-IH/A  | 200   | S6           | S6-8"-100-300-CS                            | E 463060.3125 N 3997837 U 102514.914062  |
| 7   | HPS-0003-CN10-8"-IH/A  | 200   | GS1          | GS1-8"                                      | E 463060.3125 N 3997837 U 102514.914062  |
| 8   | HPS-0003-CN10-8"-IH/A  | 200   | REFER        | REFER TO HPS-0002-CN10-8"-IH                | E 463060.3125 N 3997837 U 102514.914062  |
| 9   | HPS-0006-CN10-10"-IH/A | 250   | S6           | S6-10"-145-300-CS                           | E 468719.75 N 4003640 U 106002.5         |
| 10  | HPS-0006-CN10-10"-IH/A | 250   | S6           | S6-10"-145-300-CS                           | E 468719.75 N 4001707 U 106002.5         |
| 11  | HPS-0006-CN10-10"-IH/A | 250   | HD1          | HD1-10" (3mm GAP)                           | E 468719.75 N 4001707 U 106002.5         |
| 12  | HPS-0006-CN10-10"-IH/A | 250   | S6           | S6-10"-145-300-CS                           | E 468719.75 N 3997841 U 106002.5         |
| 13  | HPS-0006-CN10-10"-IH/A | 250   | GS1          | GS1-10"                                     | E 468719.75 N 3997841 U 106002.5         |
| 14  | HPS-0006-CN10-10"-IH/A | 250   | DS1          | DS1-10"                                     | E 468719.75 N 3997841 U 106002.5         |
| 15  | HPS-0006-CN10-10"-IH/A | 250   | S6           | S6-10"-145-300-CS                           | E 468719.75 N 3993507 U 106002.5         |
| 16  | HPS-0006-CN10-10"-IH/A | 250   | GS1          | GS1-10"                                     | E 468719.75 N 3993507 U 106002.5         |
| 17  | HPS-0006-CN10-10"-IH/A | 250   | S6           | S6-10"-145-300-CS                           | E 468719.75 N 3991340 U 106002.5         |
| 18  | HPS-0006-CN10-10"-IH/A | 250   | S6           | S6-10"-145-300-CS                           | E 464913 N 3987114 U 106002.5            |
| 19  | HPS-0006-CN10-10"-IH/A | 250   | GS1          | GS1-10"                                     | E 464913 N 3987114 U 106002.5            |
| 20  | HPS-0006-CN10-10"-IH/A | 250   | S6           | S6-10"-145-300-CS                           | E 464913 N 3982888 U 106002.5            |
| 21  | HPS-0006-CN10-10"-IH/A | 250   | GS1          | GS1-10"                                     | E 464913 N 3982888 U 106002.5            |
| 22  | HPS-0006-CN10-10"-IH/A | 250   | S6           | S6-10"-145-300-CS                           | E 464913 N 3978354 U 106002.5            |
| 23  | HPS-0006-CN10-10"-IH/A | 250   | S6           | S6-10"-145-300-CS                           | E 464913 N 3976087 U 106002.5            |
| 24  | HPS-0006-CN10-10"-IH/A | 250   | GS1          | GS1-10"                                     | E 464913 N 3976087 U 106002.5            |
| 25  | HPS-0006-CN10-10"-IH/A | 250   | DS1          | DS1-10"                                     | E 464913 N 3976087 U 106002.5            |
| 26  | MPS-0015-AN10-3"-IH/A  | 80  | GS21         | GS21-3"-B-229-103236                        | E 470981.875 N 4005743 U 103186          |
| 27  | MPS-0015-AN10-3"-IH/A  | 80  | GS8          | GS8-3"-C-CS-103186                          | E 470981.875 N 4005743 U 103186          |
| 28  | MPS-0015-AN10-3"-IH/A  | 80  | S6           | S6-3"-150-300-CS                            | E 469353.25 N 4003640 U 105910.5         |
| 29  | MPS-0015-AN10-3"-IH/A  | 80  | HD1          | HD1-3" (3mm GAP)                            | E 469353.25 N 4003640 U 105910.5         |
| 30  | MPS-0015-AN10-3"-IH/A  | 80  | S6           | S6-3"-150-300-CS                            | E 469353.25 N 4001707 U 105910.5         |
| 31  | MPS-0015-AN10-3"-IH/A  | 80  | GS1          | GS1-3"                                      | E 469353.25 N 4001707 U 105910.5         |
| 32  | MPS-0015-AN10-3"-IH/A  | 80  | S6           | S6-3"-150-300-CS                            | E 469353.25 N 3997841 U 105910.5         |
| 33  | MPS-0015-AN10-3"-IH/A  | 80  | GS1          | GS1-3"                                      | E 469353.25 N 3997841 U 105910.5         |
| 34  | MPS-0015-AN10-3"-IH/A  | 80  | DS1          | DS1-3"                                      | E 469353.25 N 3997841 U 105910.5         |
| 35  | MPS-0015-AN10-3"-IH/A  | 80  | S6           | S6-3"-150-300-CS                            | E 469353.25 N 3995674 U 105910.5         |
| 36  | MPS-0015-AN10-3"-IH/A  | 80  | GS1          | GS1-3"                                      | E 469353.25 N 3995674 U 105910.5         |





# SUPPORT MTO

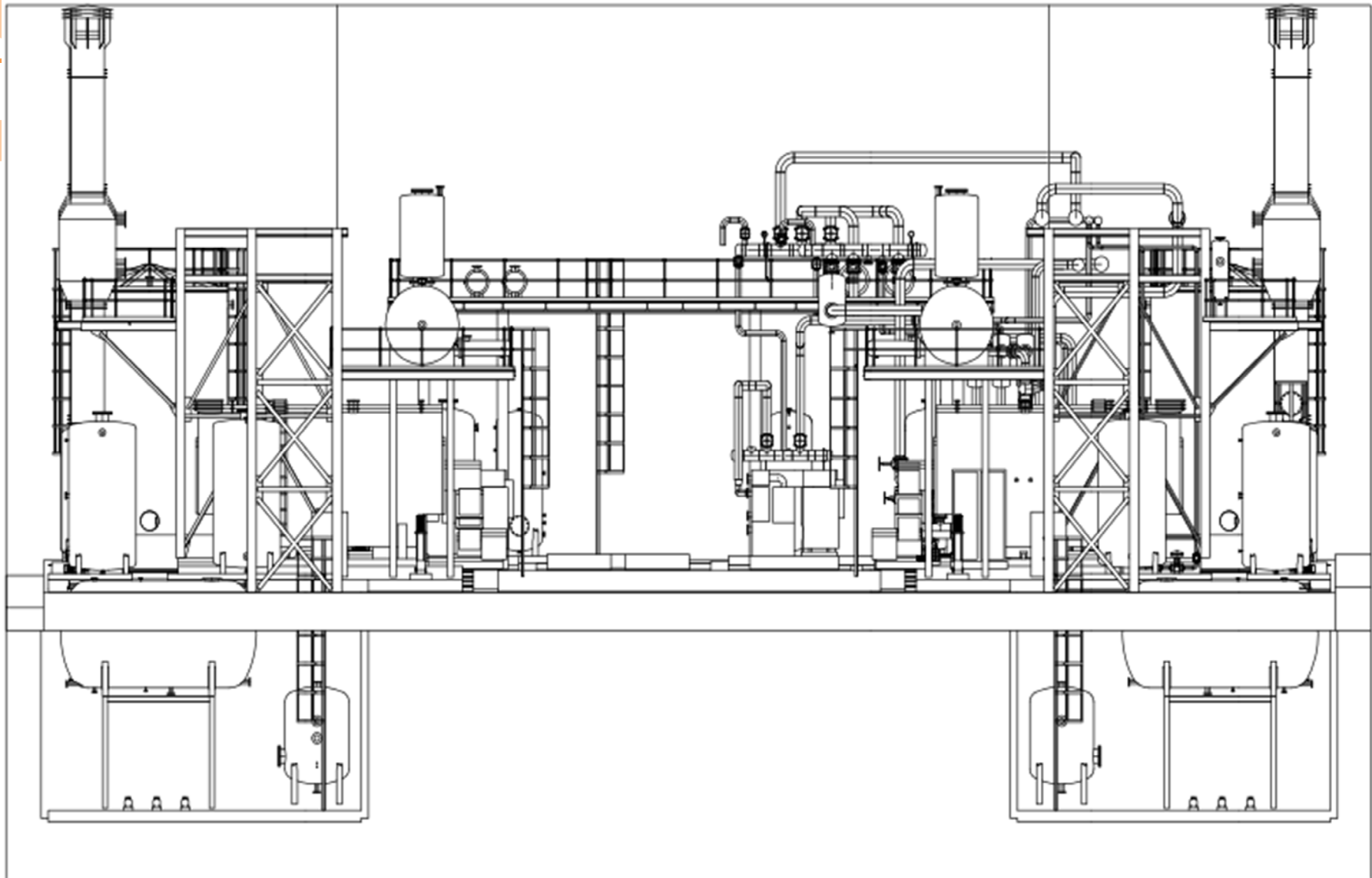
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|  |           | DOC. TITLE: SHORTAGE SUPPORT MTO<br>(MECHANICAL ROOM I&II) |                     |  |  |
|   |           | DOCUMENT CODE:   |                     |   |  |
|   |           | ED-PG-MTO-5968-A0  |                     |   |  |
| ITEM  | UNIT      | DESCRIPTION  | SIZE                | QTY   |  |
| 1   | BRANCH    | ANSI B36.10 SEAMLESS SCH 40,APISL GR.B                     | 8"                  | 1   |  |
| 2   | BRANCH    | ANSI B36.10 SEAMLESS SCH 40,APISL GR.B                     | 6"                  | 2   |  |
| 3   | BRANCH    | ANSI B36.10 SEAMLESS SCH 40,APISL GR.B                     | 4"                  | 9   |  |
| 4   | BRANCH    | ANSI B36.10 SEAMLESS SCH 40,APISL GR.B                     | 2"                  | 3   |  |
| 5   | BRANCH    | ANSI B36.10 SEAMLESS SCH 40,APISL GR.B                     | 11/2"               | 3   |  |
| 6   | 6m Length | Profile, Angle 60, ST37-2                                  | 60x60x6             | 10  |  |
| 7   | 6m Length | Profile, Angle 70, ST37-2                                  | 70x70x7             | 32  |  |
| 8   | 6m Length | Profile, Angle 80, ST37-2                                  | 80x80x8             | 30  |  |
| 9   | 6m Length | Profile, UNP 100, ST37-2                                   | 100x50x6x8.5        | 12  |  |
| 10  | 6m Length | Profile, UNP 140, ST37-2                                   | 140x60x7x10         | 28  |  |
| 11  | 6m Length | Profile, UNP 160, ST37-2                                   | 160x70x7x10         | 17  |  |
| 12  | 6m Length | Profile, HEB 120, ST37-2                                   | 120x120x6.5x11      | 40  |  |
| 13  | 6m Length | Profile, HEB 160, ST37-2                                   | 160x160x8x13        | 10  |  |
| 14  | 6m Length | Profile, HEB 200, ST37-2                                   | 200x200x9x15        | 4   |  |
| 15  | PCS       | PLATE, ST37-2  | 500mm x 500m x 6mm  | 5   |  |
| 16  | PCS       | PLATE, ST37-2  | 140mm x 140m x 6mm  | 165   |  |
| 17  | PCS       | PLATE, ST37-2  | 160mm x 160m x 6mm  | 48  |  |
| 18  | PCS       | PLATE, ST37-2  | 200mm x 200mm x10mm | 180   |  |
| 19  | PCS       | PLATE, ST37-2  | 300mm x 300mm x10mm | 90  |  |
| 20  | PCS       | PLATE, ST37-2  | 500mm x 250mm x12mm | 25  |  |
| 21  | PCS       | PLATE, ST37-2  | 350mm x350mm x15mm  | 12  |  |
| 22  | PCS       | PLATE, ST37-2  | 400mm x400mm x15mm  | 22  |  |
| 23  | PCS       | PLATE, ST37-2  | 500mm x500mm x15mm  | 10  |  |
| 24  | PCS       | PLATE, ST37-2  | 600mm x600mm x15mm  | 25  |  |
| 25  | NO.       | U-Bolt with4 Nuts  | 3"                  | 50  |  |
| 26  | NO.       | Clamp with 2 set of Bolt& Nuts                             | 1"                  | 15  |  |
| 27  | NO.       | Clamp with 2 set of Bolt& Nuts                             | 1 1/4"              | 60  |  |
| 28  | NO.       | Clamp with 2 set of Bolt& Nuts                             | 1 1/2"              | 40  |  |
| 29  | NO.       | Clamp with 2 set of Bolt& Nuts                             | 2"                  | 22  |  |
| 30  | NO.       | Clamp with 2 set of Bolt& Nuts                             | 2 1/2"              | 55  |  |
| 31  | NO.       | Clamp with 2 set of Bolt& Nuts                             | 3"                  | 25  |  |
| 32  | NO.       | Clamp with 2 set of Bolt& Nuts                             | 4"                  | 55  |  |
| 33  | NO.       | Anchor Bolt, Chemical Bolt HILTI (HVU/HAS)                 | M10 x 165           | 750   |  |



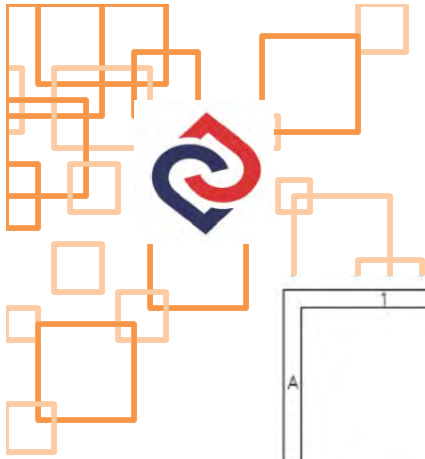




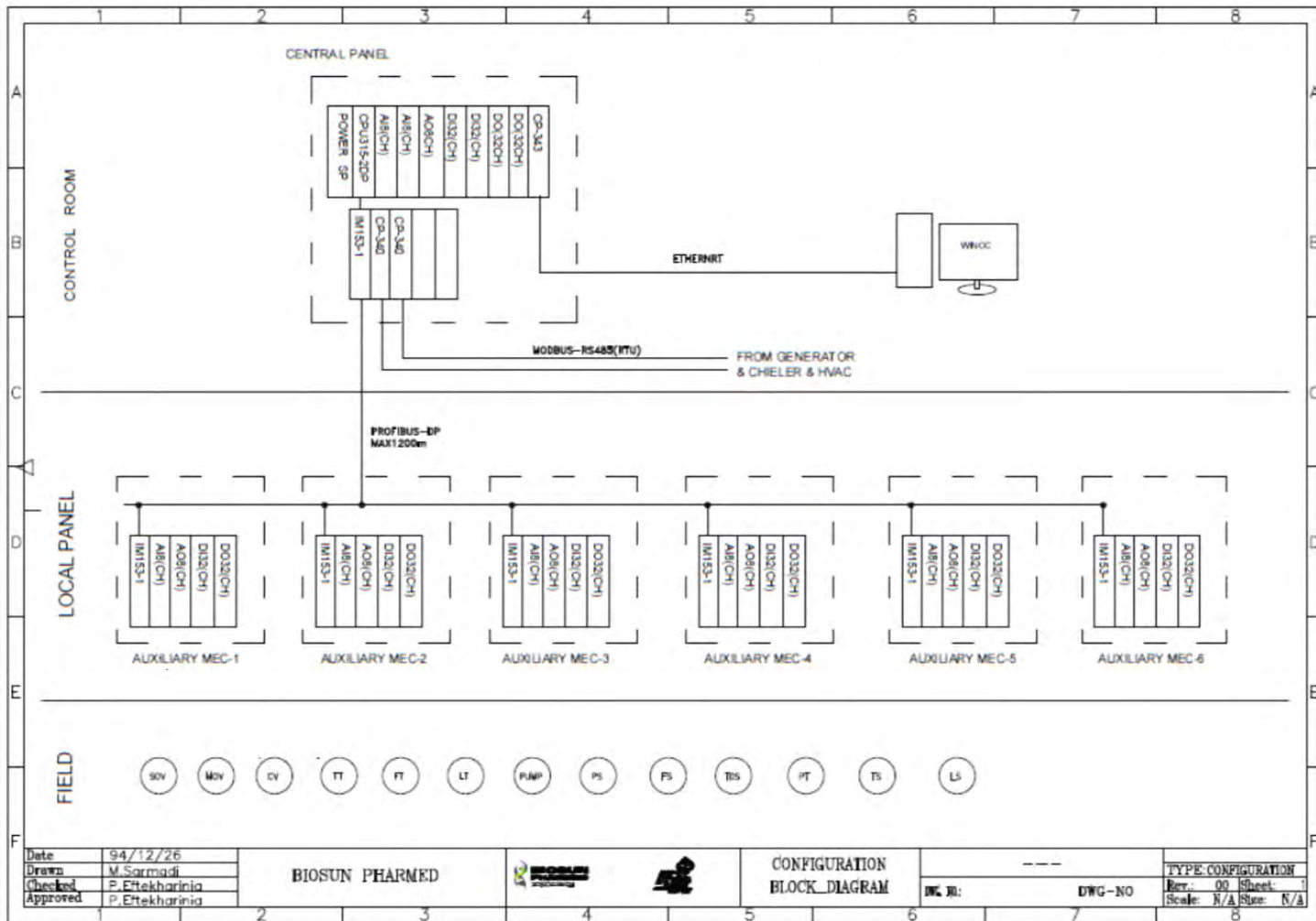
# EQUIPMENT PLAN

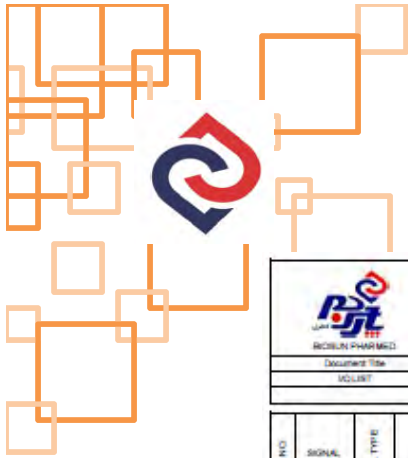






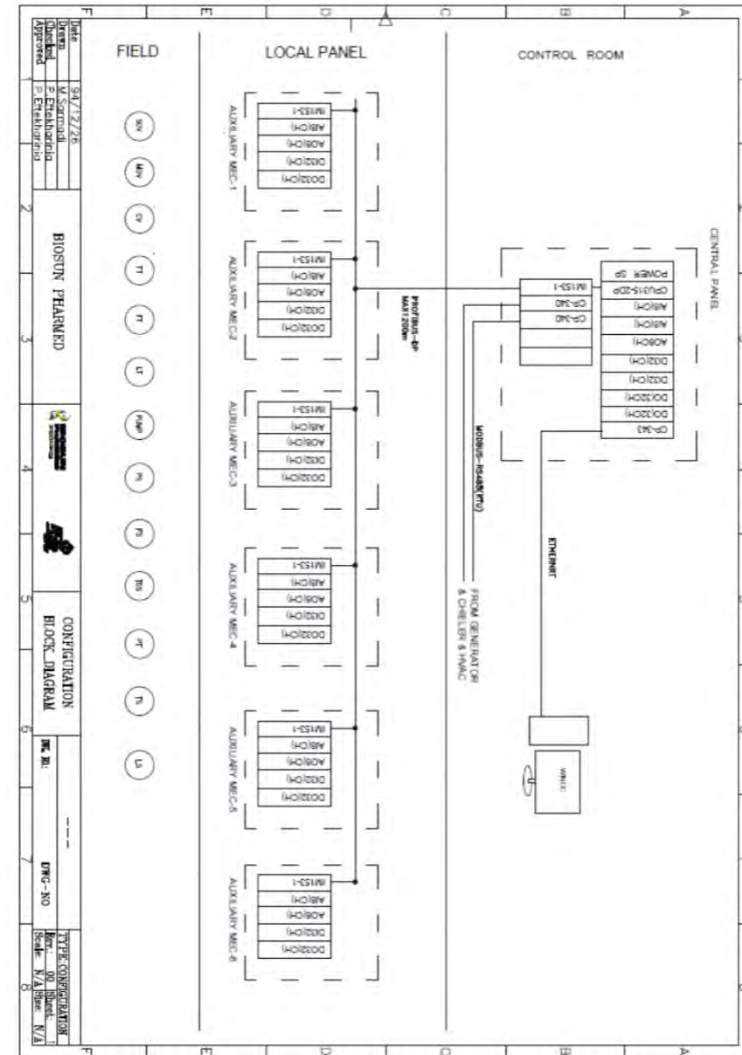
# CONTROL SYSTEM



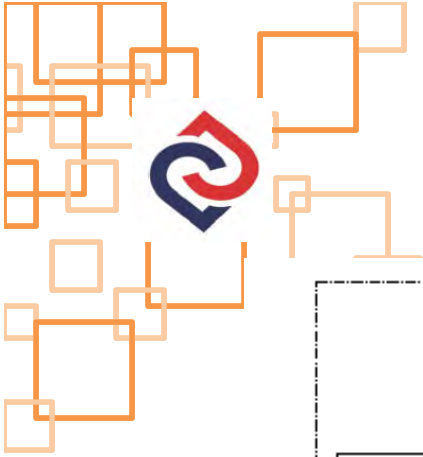


# CONTROL SYSTEM

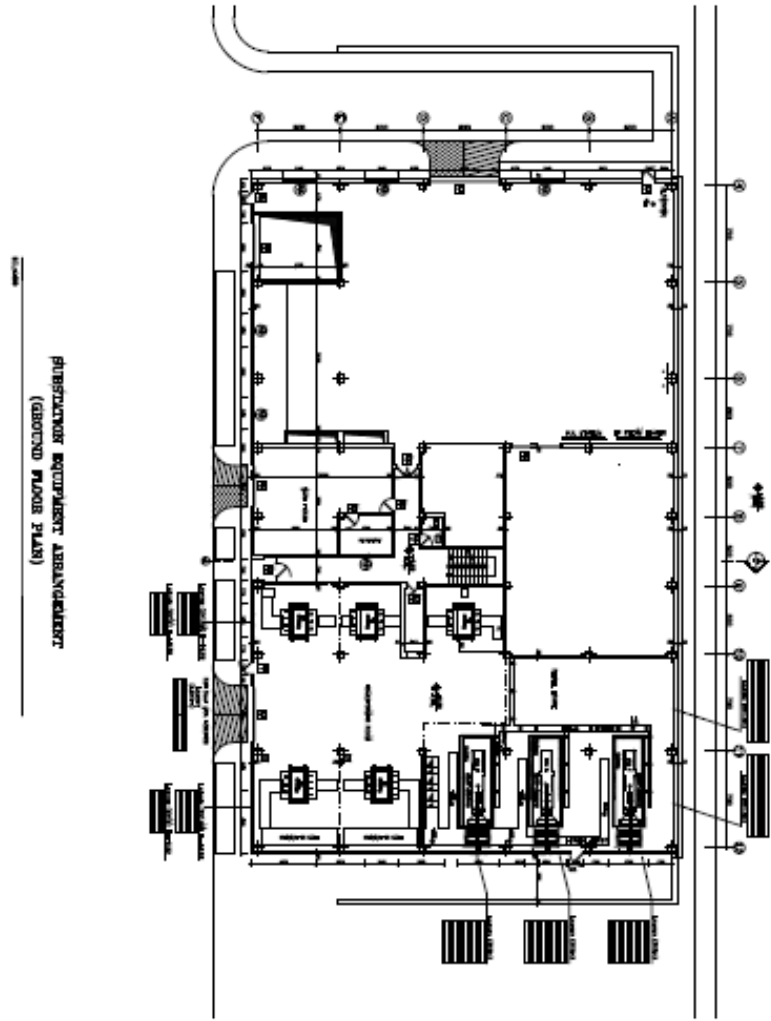
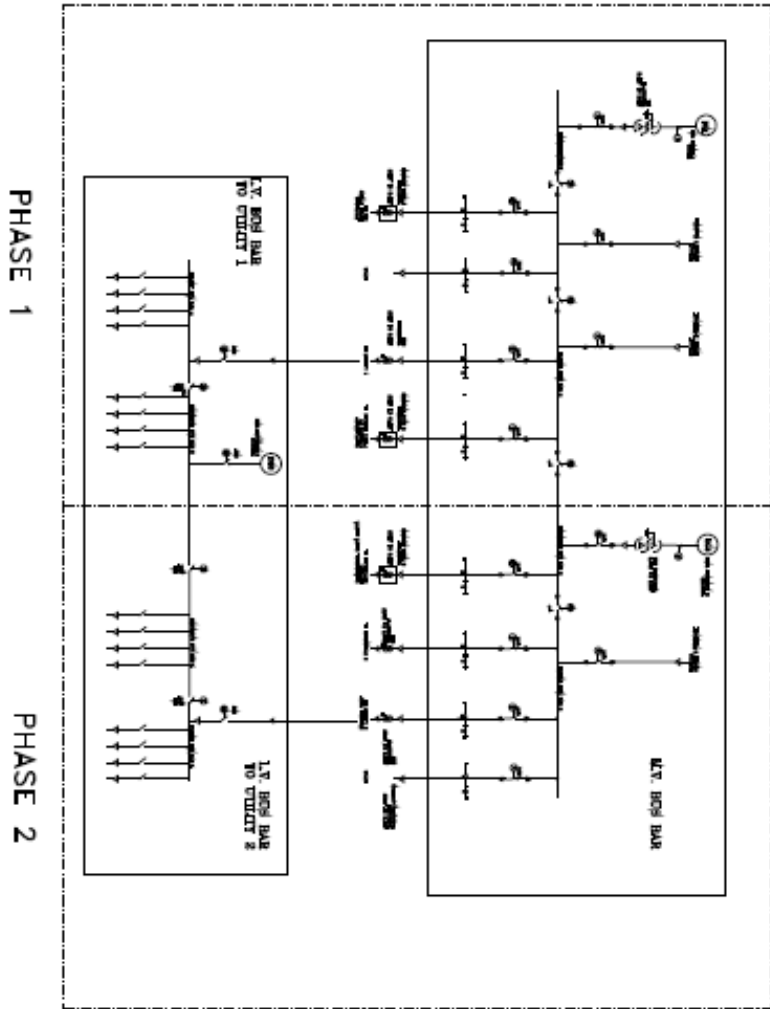
| BIOSUN PHARMED |               | KORDAN CENTRAL UTILITY ROOM(I) |                                    |                    |                                       | BIOSUN PHARMED      |              |              |               |               |         |       |      |       |       |         |      |  |
|----------------|---------------|--------------------------------|------------------------------------|--------------------|---------------------------------------|---------------------|--------------|--------------|---------------|---------------|---------|-------|------|-------|-------|---------|------|--|
| Document Title |               | SITE                           | PROJECT ID                         | DATE               | TYPE                                  | SCALE               | PAGE NUMBER  |              |               |               |         |       |      |       |       |         |      |  |
| SCLIST         |               | BP                             | PC                                 | 16                 | LS                                    | 01                  | 1 of 1       |              |               |               |         |       |      |       |       |         |      |  |
| SCLIST         |               |                                |                                    |                    |                                       |                     |              |              |               |               |         |       |      |       |       |         |      |  |
| ITEM NO        | SIGNAL TAG NO | SIGNAL TYPE                    | DEVICE                             | RED NO             | SERVICE                               | POWER               | SIGNAL CHECK | SIGNAL POINT | INTERFACE     | ACTION ON HMI |         |       |      |       |       |         |      |  |
|                |               |                                |                                    |                    |                                       |                     |              |              |               | LIMIT         | WARNING | ALARM | STOP | START | RESET | RESTART | STOP |  |
| 1              | PT 101        | AI                             | FLOW INDICATOR TRANSMITTER         | 15-80-PA-PC-2105AC | WATER SOLVENTS ET 1.1                 | 4-20MA LOOP POWERED |              | NO           | OPTO ISOLATOR | YES           |         |       |      |       |       |         |      |  |
| 2              | PT 102        | AI                             | FLOW INDICATOR TRANSMITTER         | 15-80-PA-PC-2105AC | WATER SOLVENTS ET 1.2                 | 4-20MA LOOP POWERED |              | NO           | OPTO ISOLATOR | YES           |         |       |      |       |       |         |      |  |
| 3              | PT 103        | AI                             | FLOW INDICATOR TRANSMITTER         | 15-80-PA-PC-2105AC | WATER SOLVENTS ET 1.1                 | 4-20MA LOOP POWERED |              | NO           | OPTO ISOLATOR | YES           |         |       |      |       |       |         |      |  |
| 4              | PT 104        | AI                             | FLOW INDICATOR TRANSMITTER         | 15-80-PA-PC-2105AC | WATER SOLVENTS ET 1.2                 | 4-20MA LOOP POWERED |              | NO           | OPTO ISOLATOR | YES           |         |       |      |       |       |         |      |  |
| 5              | PT 105        | AI                             | FLOW INDICATOR TRANSMITTER         | 15-80-PA-PC-2105AC | FUEL OIL SOLVENTS ET 1.1              | 4-20MA LOOP POWERED | Flow         | NO           | OPTO ISOLATOR | YES           |         |       |      |       |       |         |      |  |
| 6              | PT 106        | AI                             | FLOW INDICATOR TRANSMITTER         | 15-80-PA-PC-2105AC | FUEL OIL SOLVENTS ET 1.2              | 4-20MA LOOP POWERED | Flow         | NO           | OPTO ISOLATOR | YES           |         |       |      |       |       |         |      |  |
| 7              | PT 107        | AI                             | FLOW INDICATOR TRANSMITTER         | 15-80-PA-PC-2105AC | WATER SOLVENTS TO BACKUP              | 4-20MA LOOP POWERED | Flow         | NO           | OPTO ISOLATOR | YES           |         |       |      |       |       |         |      |  |
| 8              | PT 101        | AI                             | WATER INDICATOR TRANSMITTER        | 15-80-PA-PC-2105AC | WATER COLLECTOR                       | 4-20MA LOOP POWERED |              | NO           | OPTO ISOLATOR | YES           |         |       |      |       |       |         |      |  |
| 9              | TDR 101       | AI                             | TOTAL DISSOLVED SOLIDS TRANSMITTER | 15-80-PA-PC-2105AC | WATER ET 1.1                          | 4-20MA LOOP POWERED |              | NO           | OPTO ISOLATOR | YES           |         |       |      |       |       |         |      |  |
| 10             | TDR 102       | AI                             | TOTAL DISSOLVED SOLIDS TRANSMITTER | 15-80-PA-PC-2105AC | WATER ET 1.2                          | 4-20MA LOOP POWERED |              | NO           | OPTO ISOLATOR | YES           |         |       |      |       |       |         |      |  |
| 11             | LIT 101       | AI                             | LEVEL INDICATOR TRANSMITTER        | 15-80-PA-PC-2105AC | TANK 01 P.T. 1 ABSOLUTE FUEL OIL TANK | 4-20MA LOOP POWERED | Flow         | NO           | OPTO ISOLATOR | NO            |         |       |      |       |       |         |      |  |
| 12             | LIT 102       | AI                             | LEVEL INDICATOR TRANSMITTER        | 15-80-PA-PC-2105AC | TANK 02 P.T. 1 CONDENSATE TANK        | 4-20MA LOOP POWERED |              | NO           | OPTO ISOLATOR | NO            |         |       |      |       |       |         |      |  |
| 13             | LIT 103       | AI                             | LEVEL INDICATOR TRANSMITTER        | 15-80-PA-PC-2105AC | TANK 03 P.T. 1 DEWATER TANK           | 4-20MA LOOP POWERED |              | NO           | OPTO ISOLATOR | NO            |         |       |      |       |       |         |      |  |
| 14             | TT 101        | AI                             | TEMPERATURE TRANSMITTER            | 15-80-PA-PC-2105AC | WATER ET 1.1                          | PT 100              |              | NO           | OPTO ISOLATOR | NO            |         |       |      |       |       |         |      |  |
| 15             | TT 102        | AI                             | TEMPERATURE TRANSMITTER            | 15-80-PA-PC-2105AC | WATER ET 1.2                          | PT 100              |              | NO           | OPTO ISOLATOR | NO            |         |       |      |       |       |         |      |  |
| 16             | TT 103        | AI                             | TEMPERATURE TRANSMITTER            | 15-80-PA-PC-2105AC | TANK 01 P.T. 1 DEWATER TANK           | PT 100              |              | NO           | OPTO ISOLATOR | NO            |         |       |      |       |       |         |      |  |
| 17             | TT 104        | AI                             | TEMPERATURE TRANSMITTER            | 15-80-PA-PC-2105AC | SI 100 P.T. 1 CONDENSATE TANK         | PT 100              |              | NO           | OPTO ISOLATOR | NO            |         |       |      |       |       |         |      |  |
| 18             | TT 105        | AI                             | TEMPERATURE TRANSMITTER            | 15-80-PA-PC-2105AC | TANK 01 CHARG. 1                      | PT 100              |              | NO           | OPTO ISOLATOR | NO            |         |       |      |       |       |         |      |  |
| 19             | TT 106        | AI                             | TEMPERATURE TRANSMITTER            | 15-80-PA-PC-2105AC | TANK 01 CHARG. 2                      | PT 100              |              | NO           | OPTO ISOLATOR | NO            |         |       |      |       |       |         |      |  |
| 20             | TT 107        | AI                             | TEMPERATURE TRANSMITTER            | 15-80-PA-PC-2105AC | DI 100 P.T. 1 CONDENSATE              | PT 100              |              | NO           | OPTO ISOLATOR | NO            |         |       |      |       |       |         |      |  |







# ELECTRIC SYSTEM

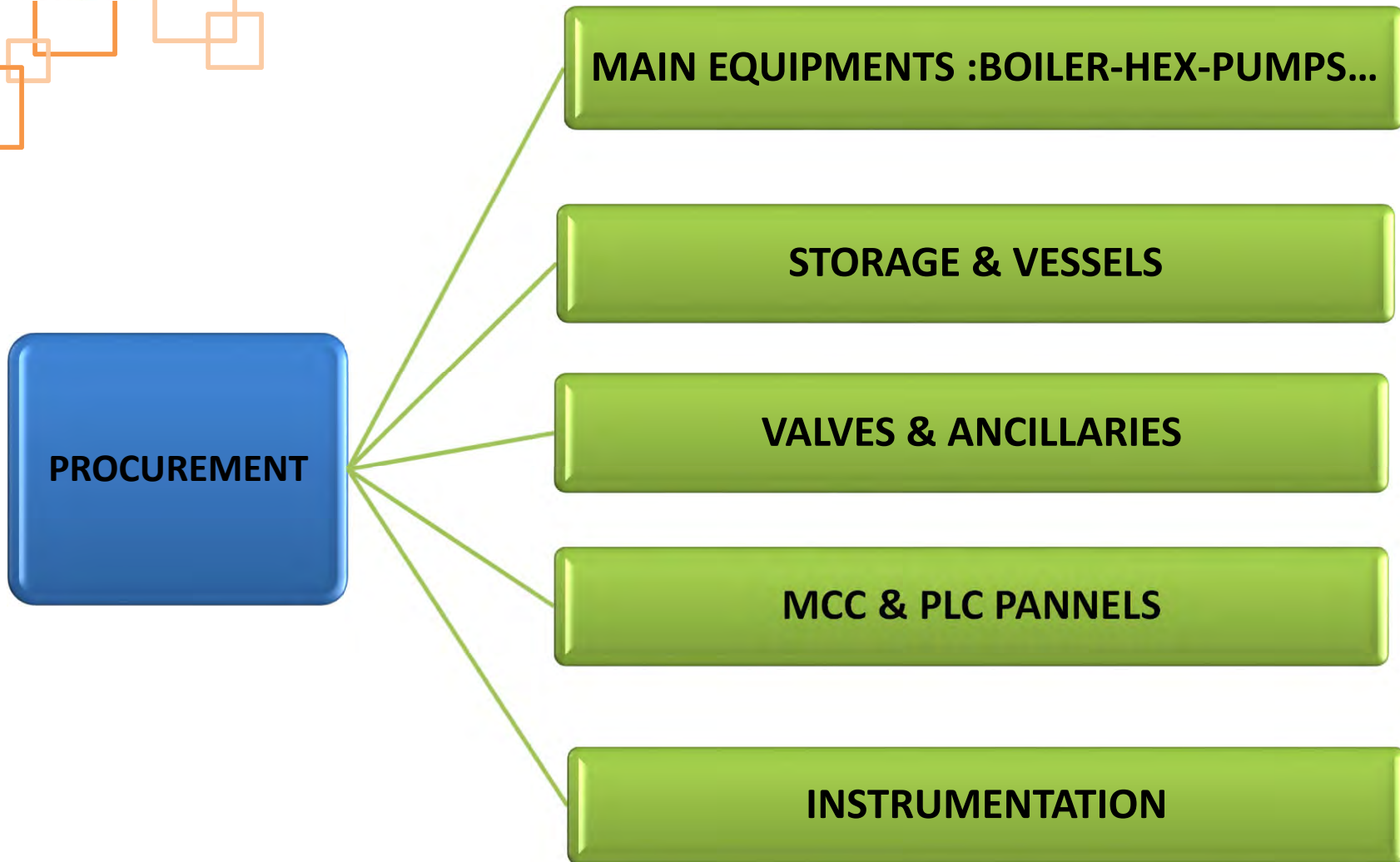




# *PROCUREMENT*



# PROCUREMENT





# STEAM & HOT WATER BOILERS



ماشین سازی اراک  
Machine Sazi Arak

- Fire tube Steam Boilers up to 32,000 kg/hr , 15 bar
- Water tube Steam boilers up to 90 ton/hr , 100 bar
- Hot Water Boilers



 **Gedik**

  
M.S.A



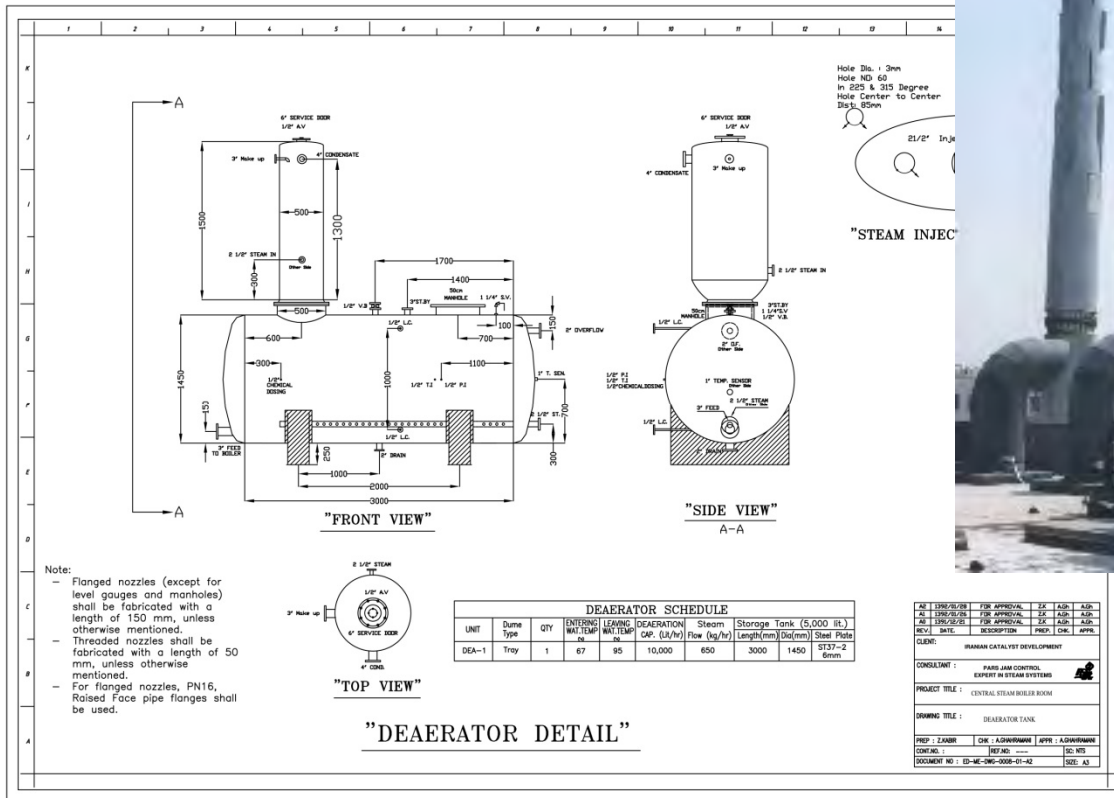


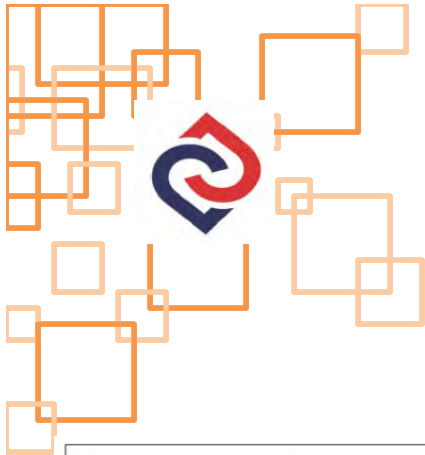
# STORAGE TANKS & VESSELS



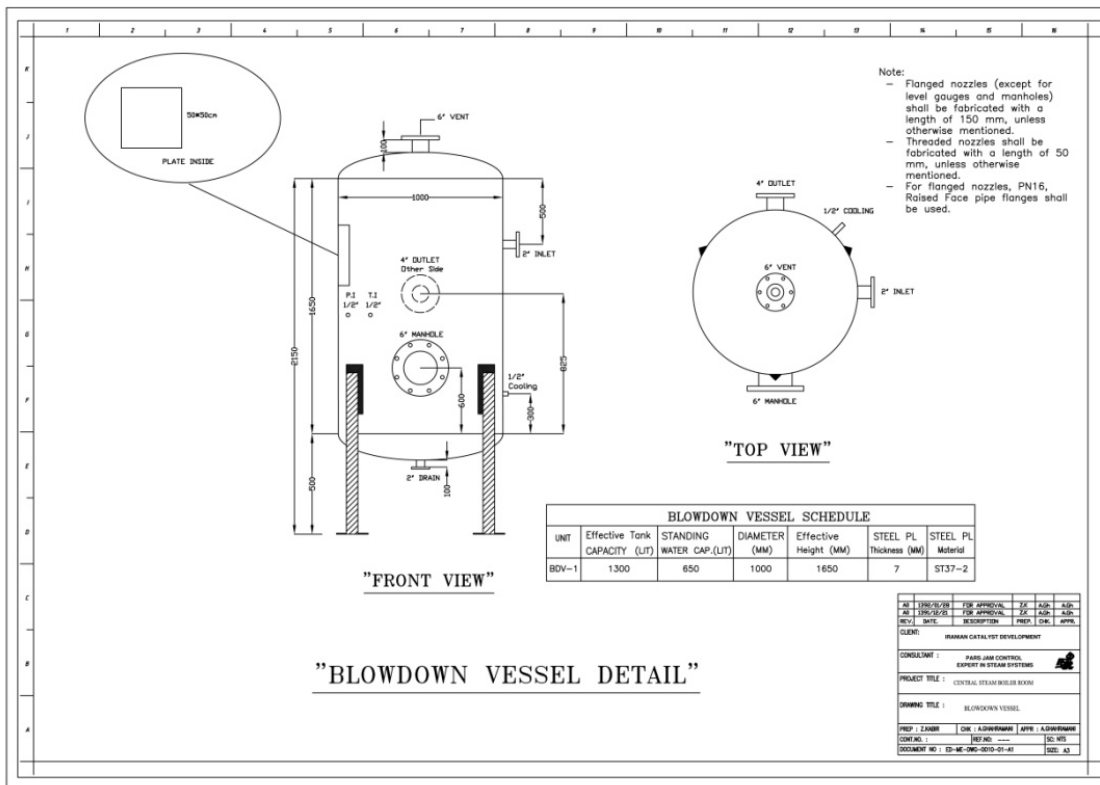


# DEAERATOR





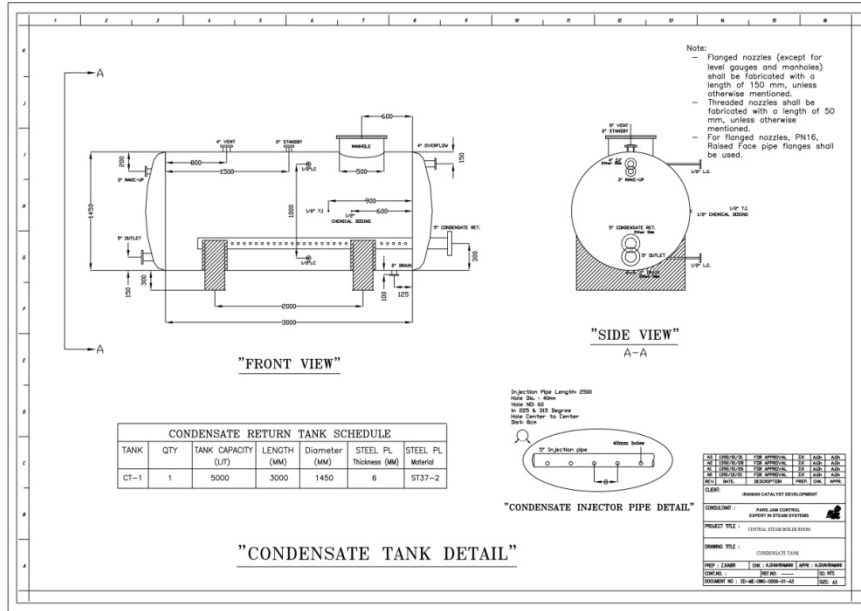
# BLOWDOWN TANK







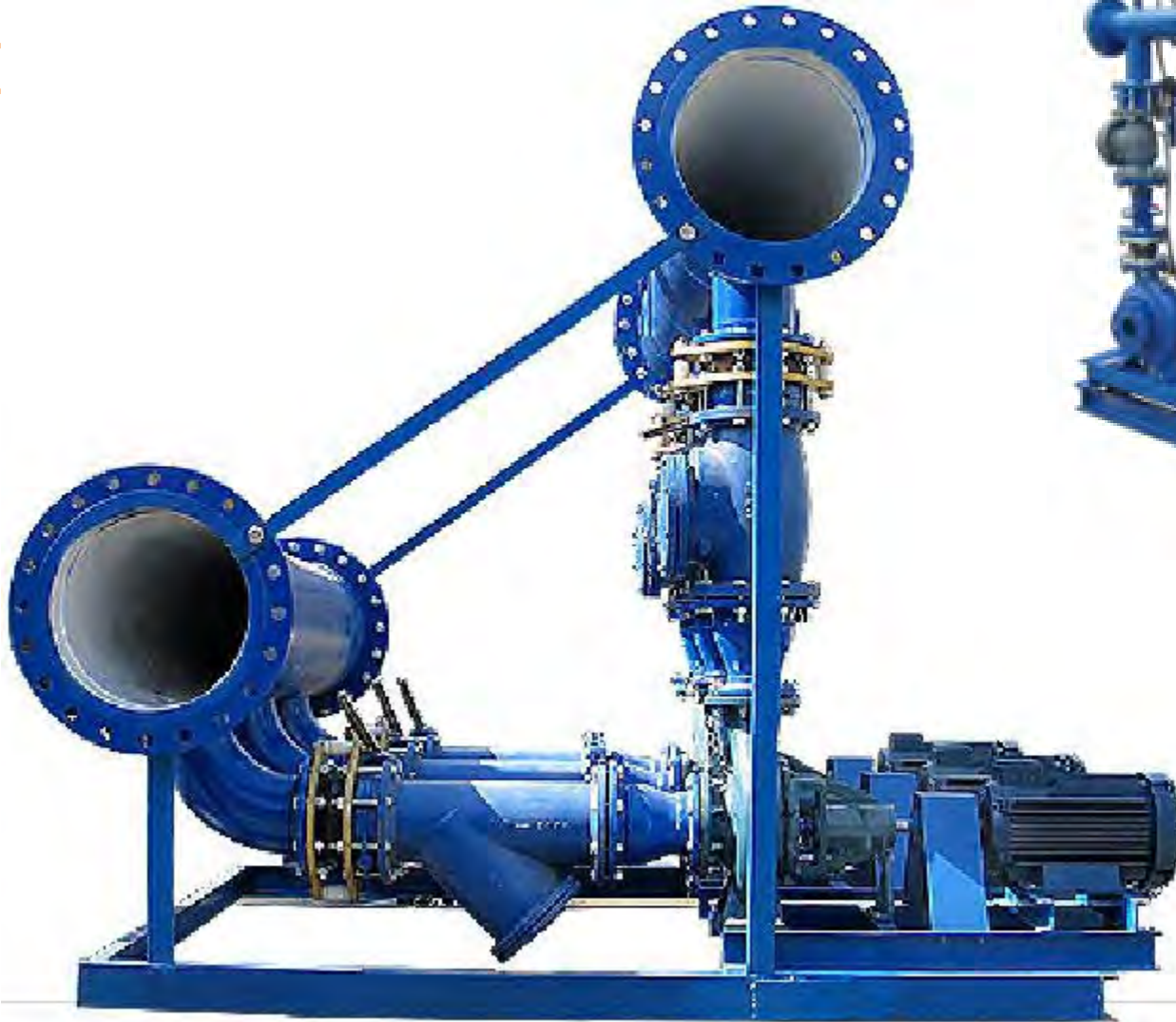
# CONDENSATE TANK

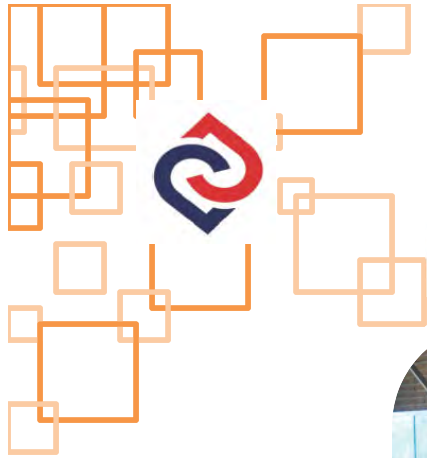






# BOOSTER PUMP SET





# CHEMICAL DOSING PACKAGE







# WATER TREATMENT





# SPECIAL PACKAGES







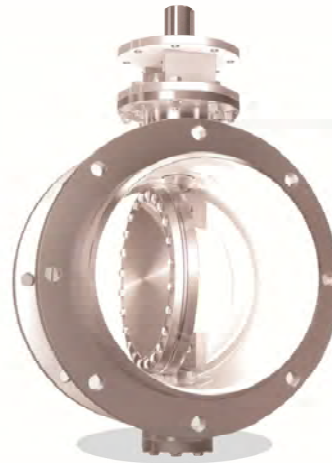
# VALVES & ARMATURES

**MANKENBERG**  
*t termo*  
For All Solutions



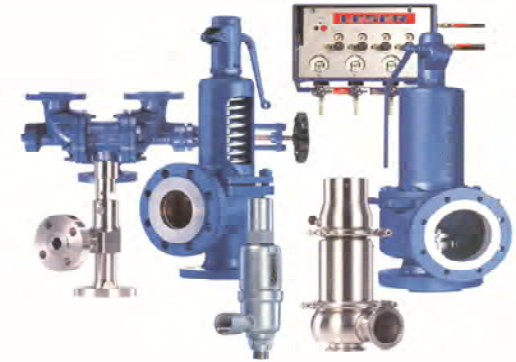
**Pressure Control Valves**

**t termo**  
*valves and armatures*  
*"For All Solutions"*



**Manual & Motorized Butterfly Valves**

**LESER**  
*t termo*  
For All Solutions



**Safety valves**

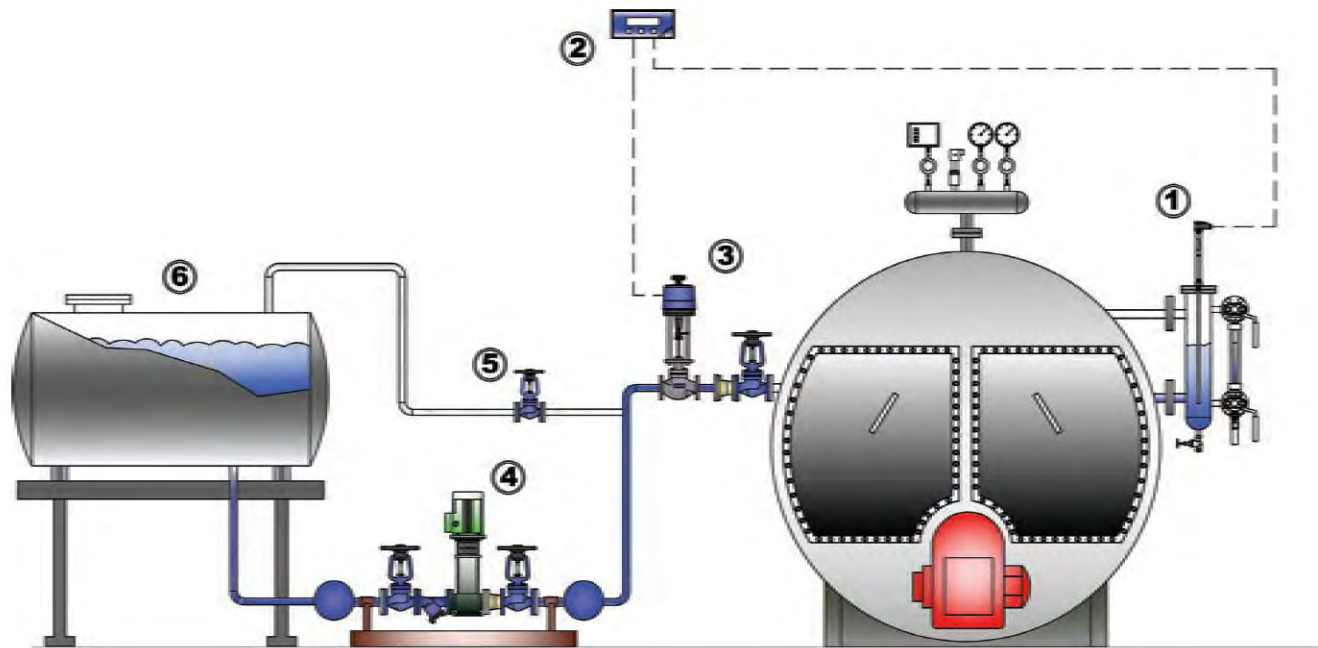


# BOILER CONTROL SYSTEM

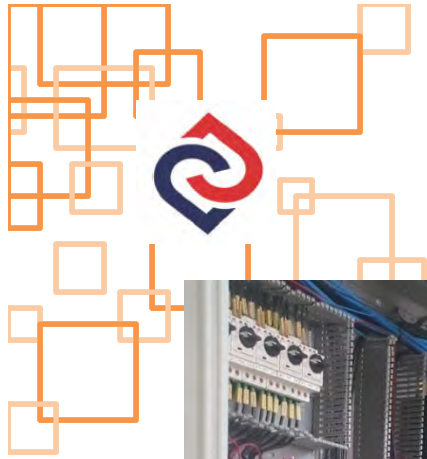




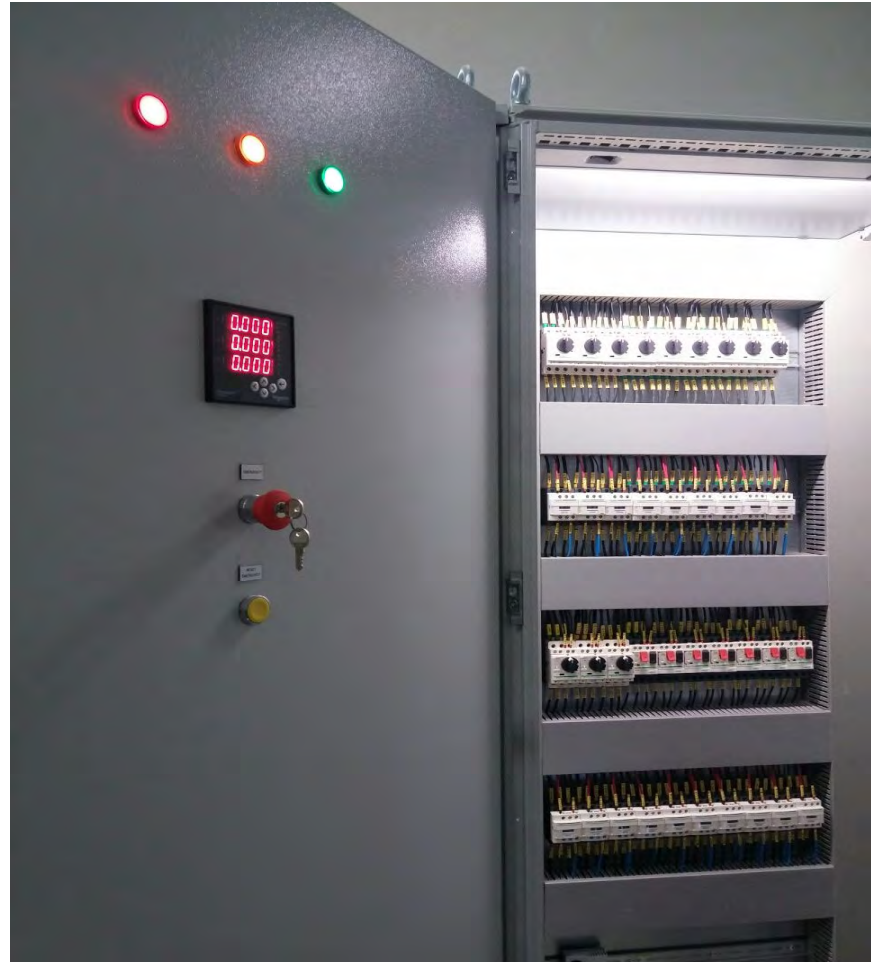
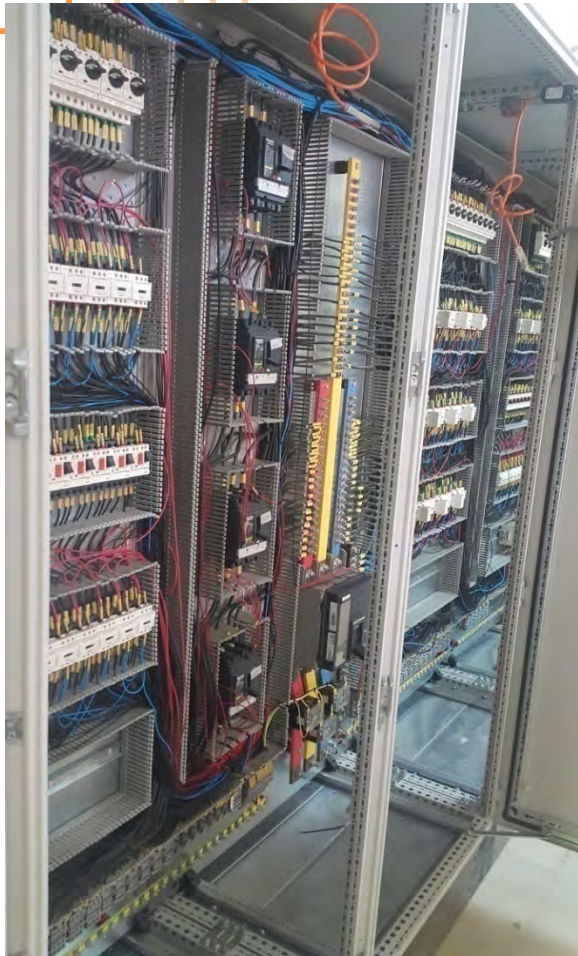
# AUTOMATIC LEVEL CONTROL SYSTEM







# ELECTRICAL PANELS







# ELECTRICAL PANELS





# BMS & CONTROL PANELS





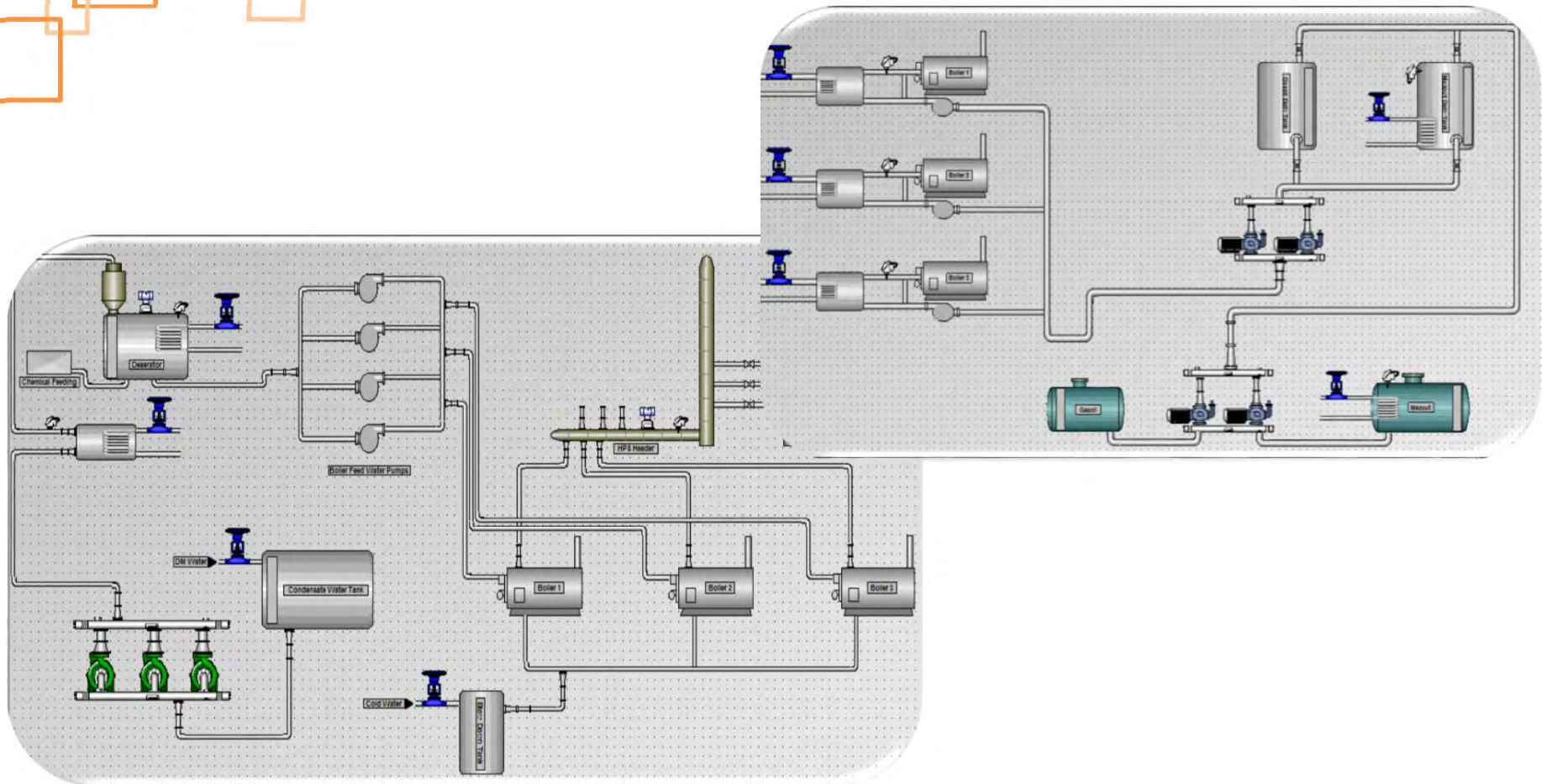


# BMS & CONTROL PANELS





# CONTROL SYSTEM PROGRAMMING







# CONSTRUCTION





# CONSTRUCTION SERVICES

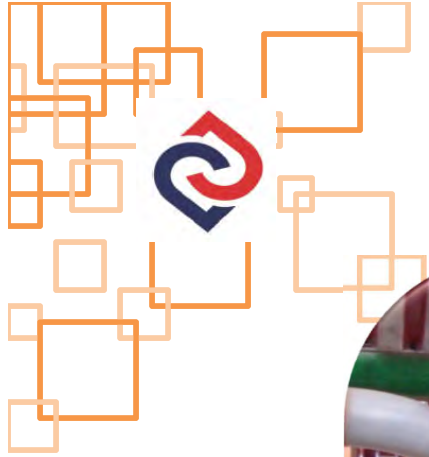






# REHIHANEH PHARMACUTICAL





# REHANEH PHARMACUTICAL

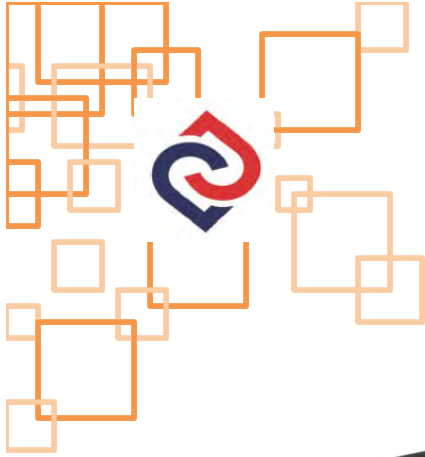






# ZAR RESEARCH GROUP





# ZAR RESEARCH GROUP







# ZAR RESEARCH GROUP







# ZAR RESEARCH GROUP





# ASTANE GHODS MEC.







# MODAVA PHARMACUTICAL







# MODAVA PHARMACUTICAL







# MODAVA PHARMACUTICAL







# FARMAND CHOCOLATE CO.







# FARMAND CHOCOLATE CO.





# YAZD POWER PLANT







# YAZD POWER PLANT







# YAZD POWER PLANT





# CONSTRUCTION SERVICES







# CONSTRUCTION SERVICES







# ARIAN KIMIA COSMETICS





# REIHANEH PHARMACEUTICAL







# ASTAN GHODS







# PEGAH TABRIZ DAIRY





# MODAVA PHARMACUETICAL







# ***PARS JAM CONTROL***

## ***in Industries***

**Saving Energy,  
Improving Productivity ,  
Health & Safety**



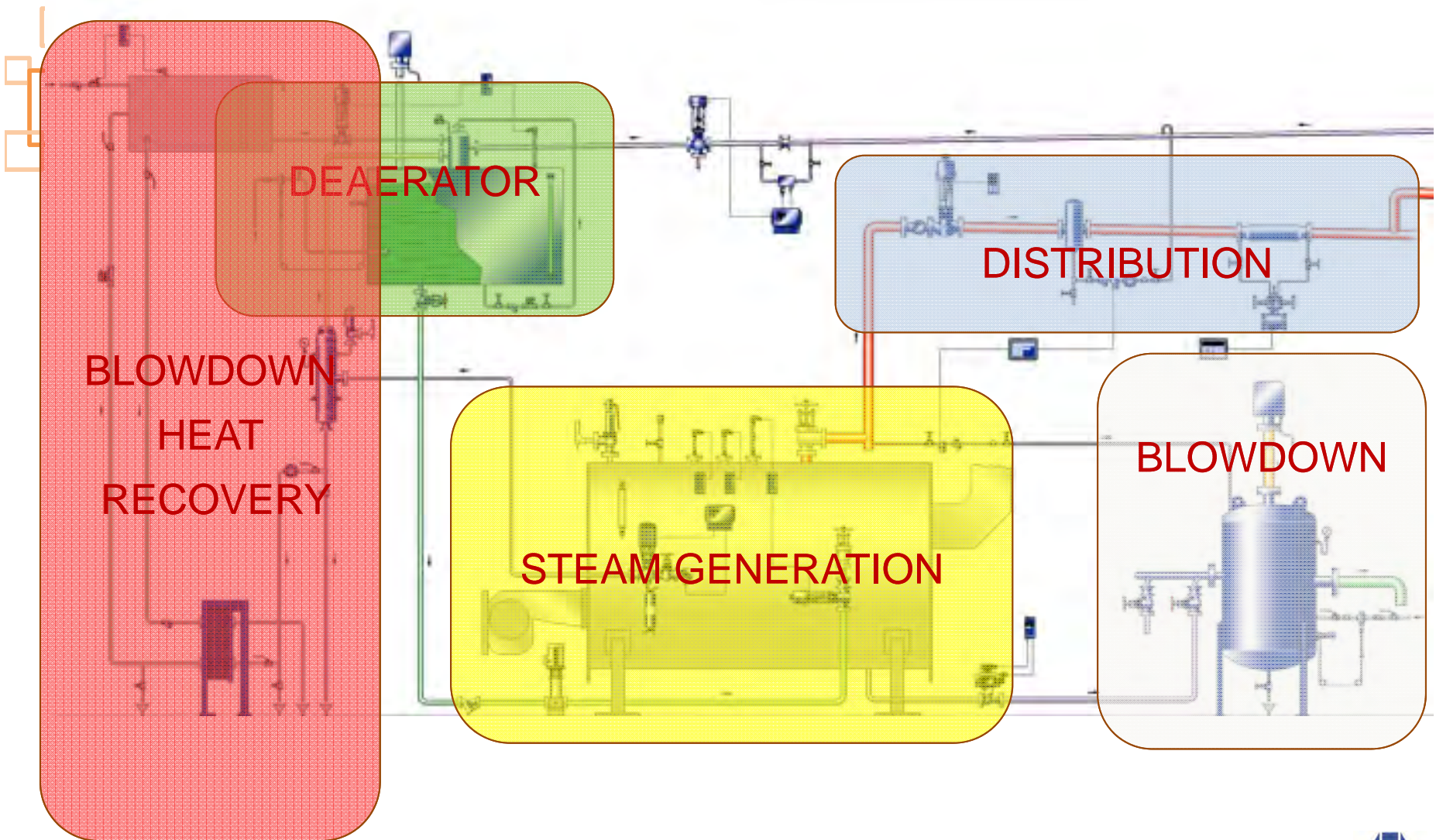


# STEAM & CONDENSATE LOOP





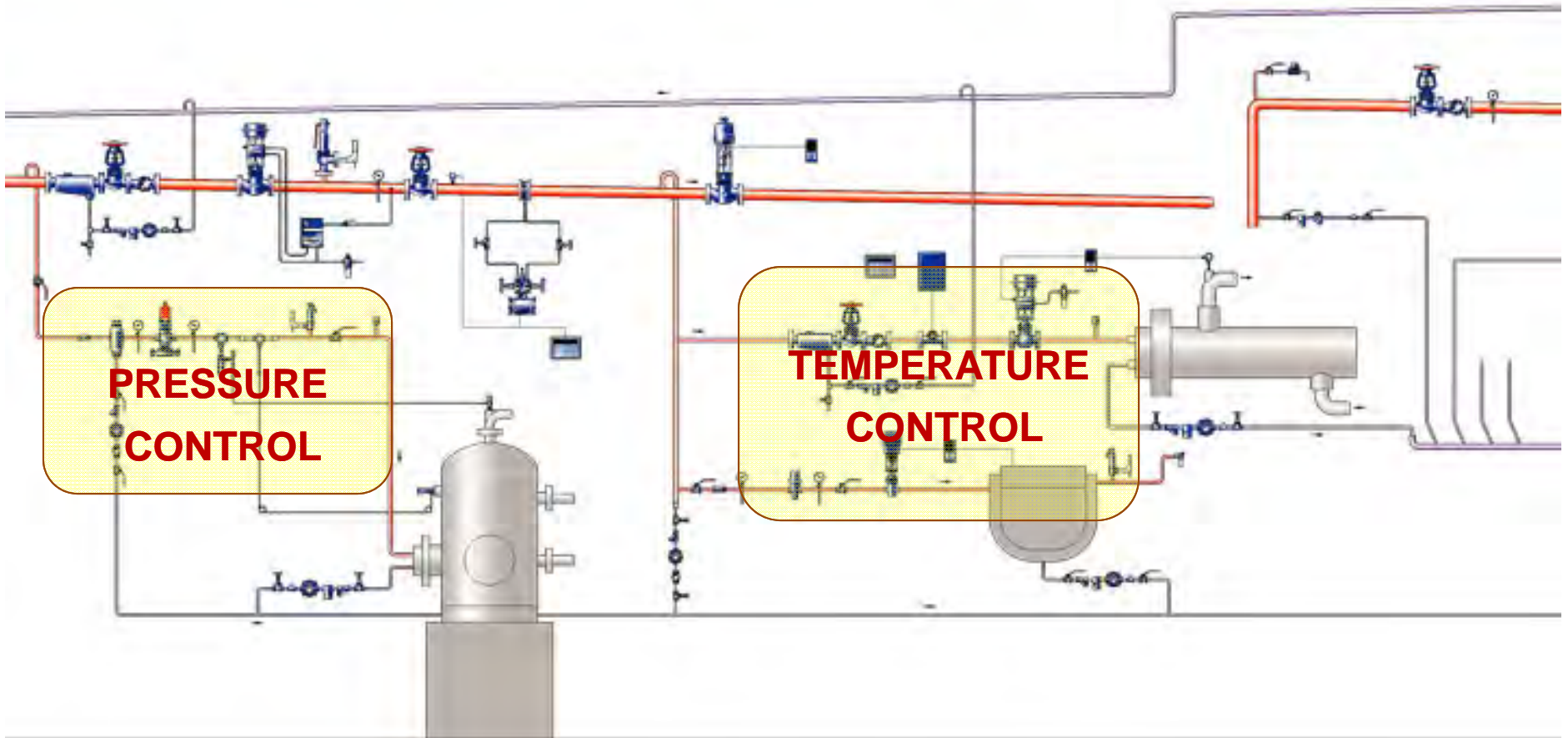
# STEAM GENERATION UTILITY



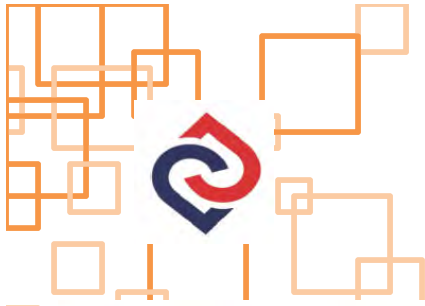




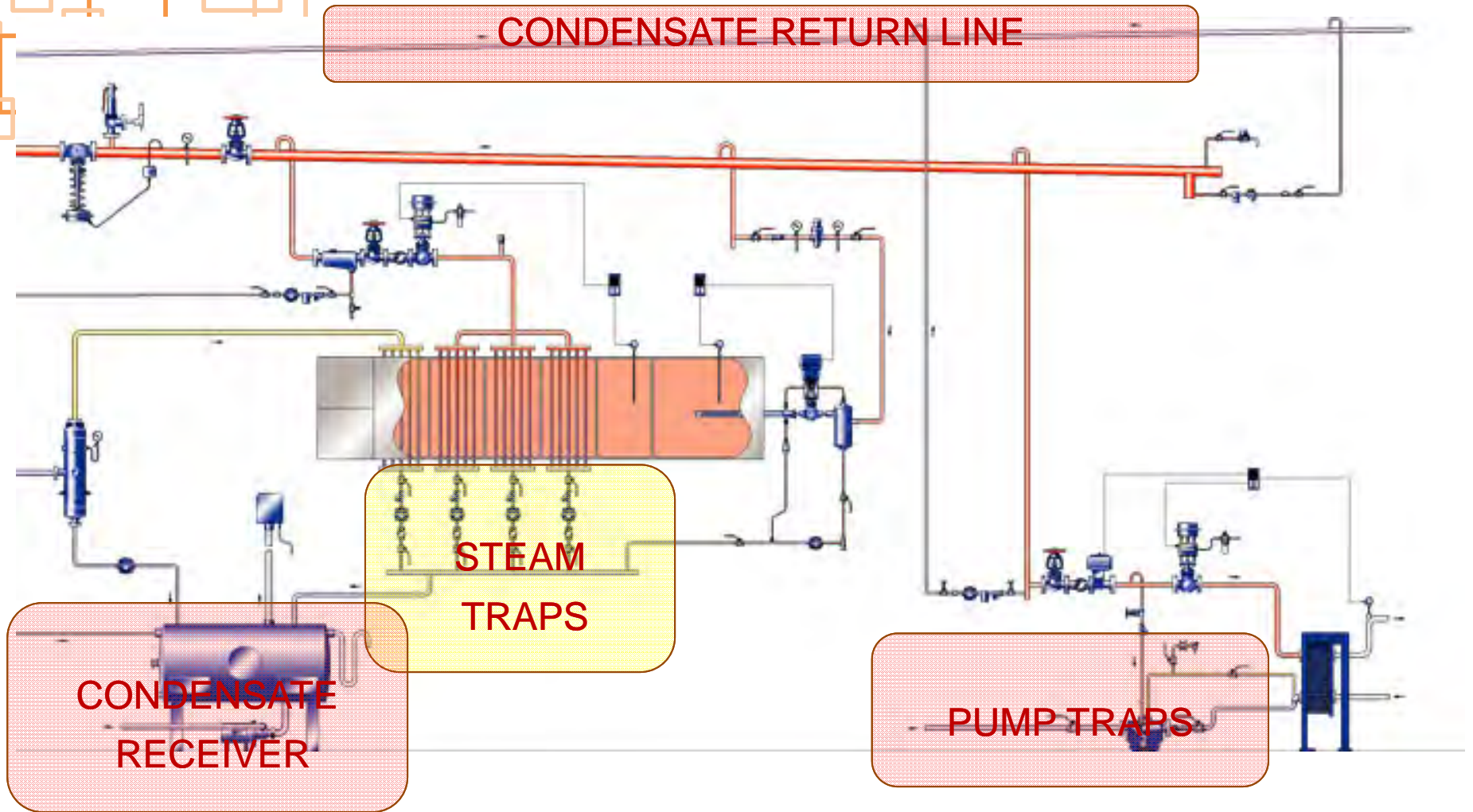
# USERS







# CONDENSATE RECOVERY





# Audits for Plant Optimization

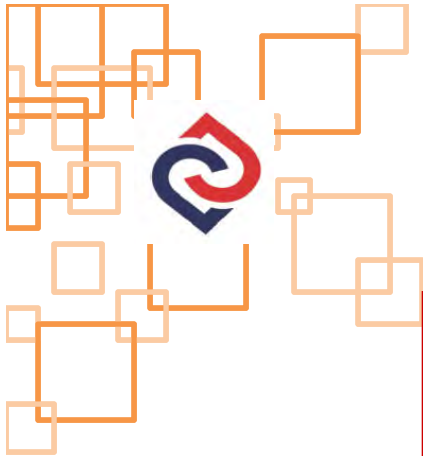




# STMS PROGRAM

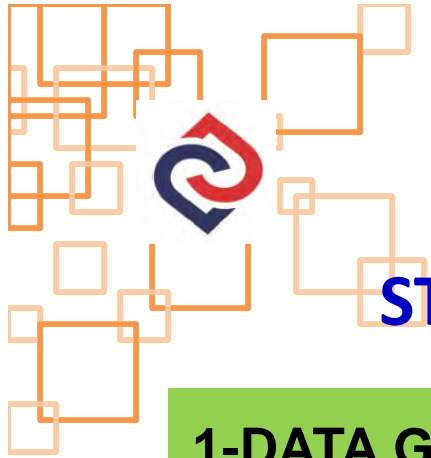






# ENERGY SAVING PROGRAMS

|   |               |
|---|---------------|
| • <b>Boilers</b>                          | <b>2-5%</b>   |
| - boiler tune-ups                         | 1-5%          |
| - heat recovery equipment                 | 2-4%          |
| - emissions monitoring and control        | 2%            |
| • <b>System Operation and Maintenance</b> | <b>10-15%</b> |
| - water treatment                         | 10-12%        |
| - load control                            | 3-5%          |
| • <b>Distribution System</b>              | <b>15-20%</b> |
| - steam leaks and traps                   | 3-5%          |
| - condensate return                       | 10-15%        |
| - insulation                              | <u>5-10%</u>  |
| • <b>Total</b>                            | <b>30-40%</b> |



# ENERGY SAVING PROGRAMS

## STEAM SYSTEM SCOPING TOOLS

1-DATA GATHERING

2-SYSTEM MODELING

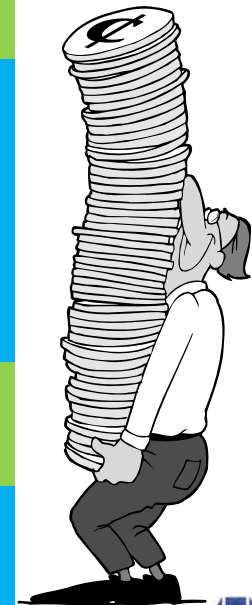
3-STEAM SYSTEM EVALUATION : **BOILER HOUSE**

4- STEAM SYSTEM EVALUATION :

**DISTRIBUTION ,CONTROL ,USERS ,CONDENSATE  
RETURN**

5- RESULTS & SUMMERIES

6- SUGGETION S TO OPTIMIZATIE THE SYSTEM



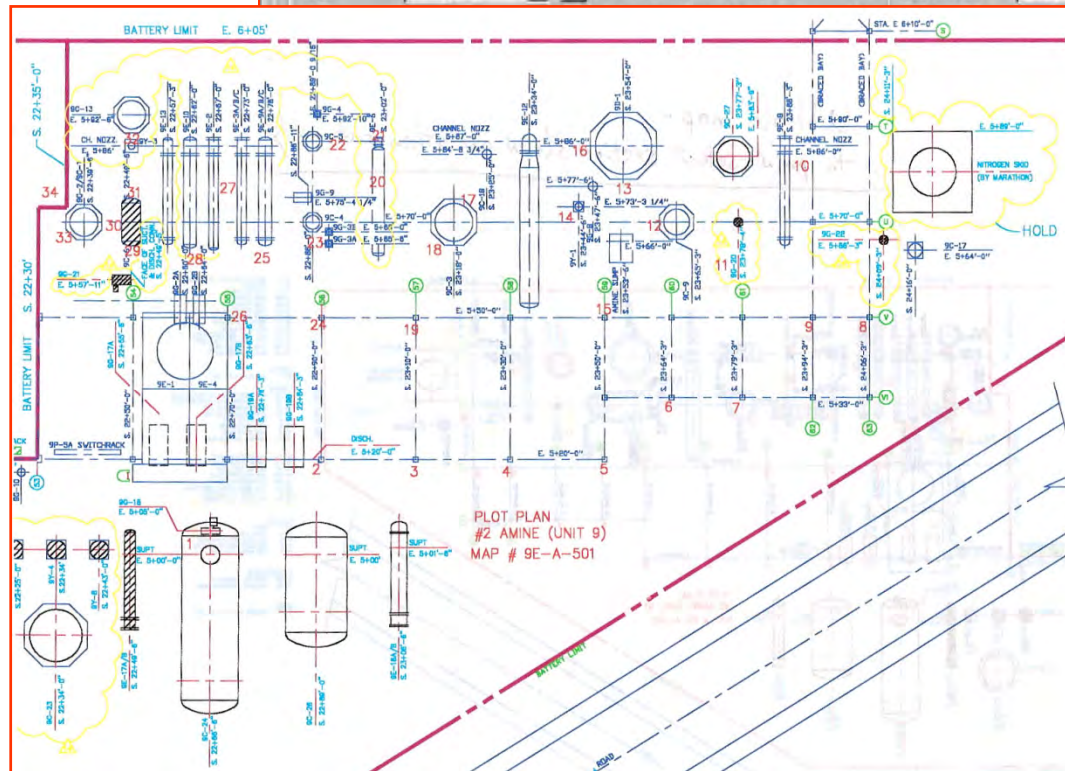


# ENERGY SAVING PROGRAMS

## ■ Steam Trap Survey

- Steam trap testing
- Steam trap tagging
- Steam trap mapping
- Database management
- Cost savings

| Current Trap Details |   | History         |               |
|----------------------|---|-----------------|---------------|
| Company              | EXAMPLE COMPANY   | Application     | Main Drainage |
| Site Name            | EXAMPLE SITE  | Pressure        | 4.20 bar g    |
| Trap Number          | 0007  | Temperature     | 153.36 deg C  |
| Location             | REAR ROLLER SHUTTER DOOR  | Suitability     | Suitable      |
| Detail               | BESIDE CLOCK IN AREA  | Survey Interval | Annually      |
| Height               | Installed 01/01/1990  | Operation       | 168hr * 33m/y |
| Size                 | 20mm (3/4")   | Test Method     | Ultrasonic    |
|                      | <input type="checkbox"/> Universal Trap <input type="checkbox"/> Diffuser |                 |               |







# ENERGY SAVING PROGRAMS



Steam trap testing



Tagged Trap



# ENERGY SAVING PROGRAMS



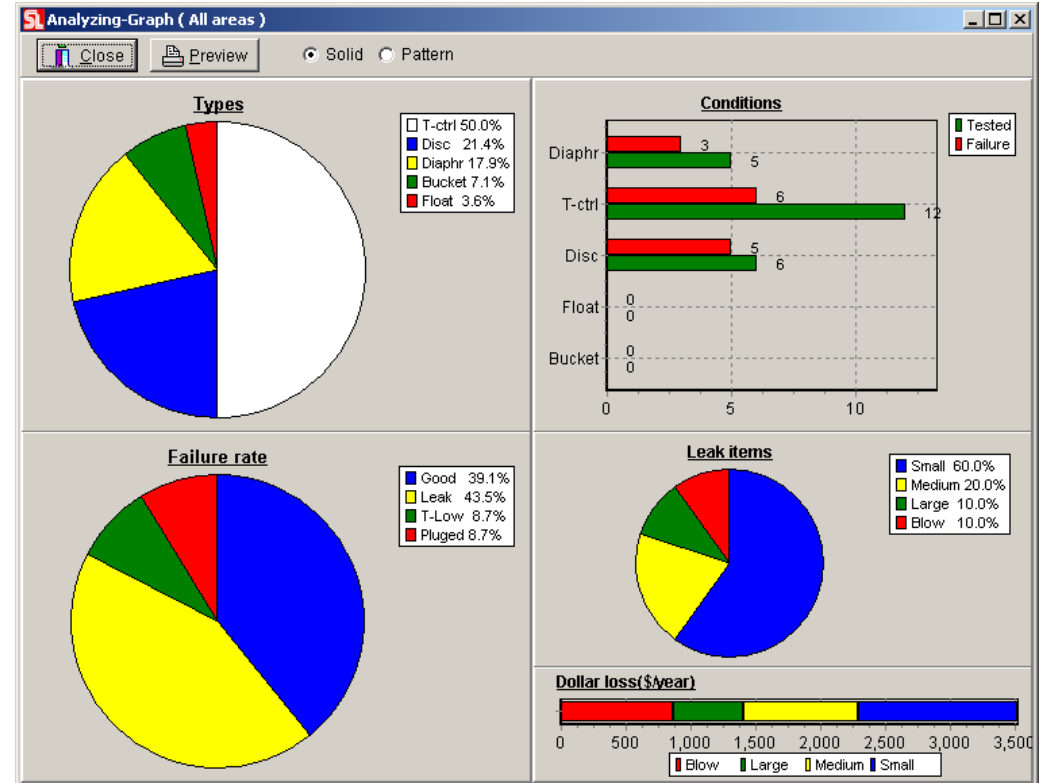
## ULTRASONIC & INFRARED TOOLS





# ENERGY SAVING PROGRAMS

| Steam Trap Check List   |  |  |
|---|--|--|
| Tag Number : PX-MD-0001   |  | DWG No: PX-41-000-01-01  |
| 1   | Survey Date: 1386/07/03<br>Complex Name: Pazvaresb | Company Name: BIPC<br>Plant Name: PX<br>Auditor: 1<br>Section: 100 |
| 2 Trap Specification :  |  |  |
| Manufacture : <input type="checkbox"/> Spirax Sarco <input type="checkbox"/> Miyawaki <input type="checkbox"/> TLV <input type="checkbox"/> Yarway <input type="checkbox"/> Plenty<br><input type="checkbox"/> Gestra <input checked="" type="checkbox"/> Douglas <input type="checkbox"/> Un Known <input type="checkbox"/> Other : -- |  |  |
| Type : <input type="checkbox"/> FT <input type="checkbox"/> TD <input type="checkbox"/> IB <input type="checkbox"/> IM <input checked="" type="checkbox"/> BI<br><input type="checkbox"/> FF <input type="checkbox"/> LE <input type="checkbox"/> TS <input type="checkbox"/> Other : ---   |  |  |
| Model: BB PM [bar]: C-13 TM [°C]: O-195 ΔPM[bar]: -- <input type="checkbox"/> Unknown   |  |  |
| Size: 3/4" Hight: <input checked="" type="checkbox"/> Low <input type="checkbox"/> Eye Level <input type="checkbox"/> High  |  |  |
| Connection Type : <input type="checkbox"/> SC <input type="checkbox"/> FL <input checked="" type="checkbox"/> SW <input type="checkbox"/> BW <input type="checkbox"/> Unknown   |  |  |
| Connection Standard : PN --- ANSI --- BS --- Other : --- <input checked="" type="checkbox"/> Unknown  |  |  |
| Orientation/Position : <input checked="" type="checkbox"/> Horizontal <input type="checkbox"/> Vertical <input type="checkbox"/> In door <input type="checkbox"/> Out door  |  |  |
| 3 Down Stream Condition :   |  |  |
| <input type="checkbox"/> No(Open Ended) <input checked="" type="checkbox"/> Yes(Recovered) <input type="checkbox"/> Yes(Not Recovered)  |  |  |
| 4 Trap Station :  |  |  |
| <input type="checkbox"/> Strainer <input type="checkbox"/> Check Valve <input type="checkbox"/> Sight Glass <input type="checkbox"/> By Pass  |  |  |
| Isolation : <input checked="" type="checkbox"/> Up <input checked="" type="checkbox"/> Down Connection Type: SW   |  |  |
| Drain Valve : <input checked="" type="checkbox"/> Up <input checked="" type="checkbox"/> Down Drain Valve Size: 3/4"  |  |  |
| 5 Application :   |  |  |
| <input type="checkbox"/> H.EX <input type="checkbox"/> Tracing <input checked="" type="checkbox"/> Drainage <input type="checkbox"/> Dryer <input type="checkbox"/> Air Handling<br><input type="checkbox"/> Tank Coil <input type="checkbox"/> Tank Jacket Others : --- Device Name : ---  |  |  |
| 6 Pocket Condition :  |  |  |
| Pocket: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Drain Valve : <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Valve Condition : ---   |  |  |
| 7 Test Method :   |  |  |
| <input checked="" type="checkbox"/> Visual <input type="checkbox"/> Ultrasonic <input type="checkbox"/> Temp-Test <input type="checkbox"/> Sight Glass  |  |  |
| 8 Fluid Condition :   |  |  |
| Operational Pressure _____ Operational Temperature _____  |  |  |



## STEAM TRAP CHECK LISITS

## TRAP POPULATION & WORKING CONDITION

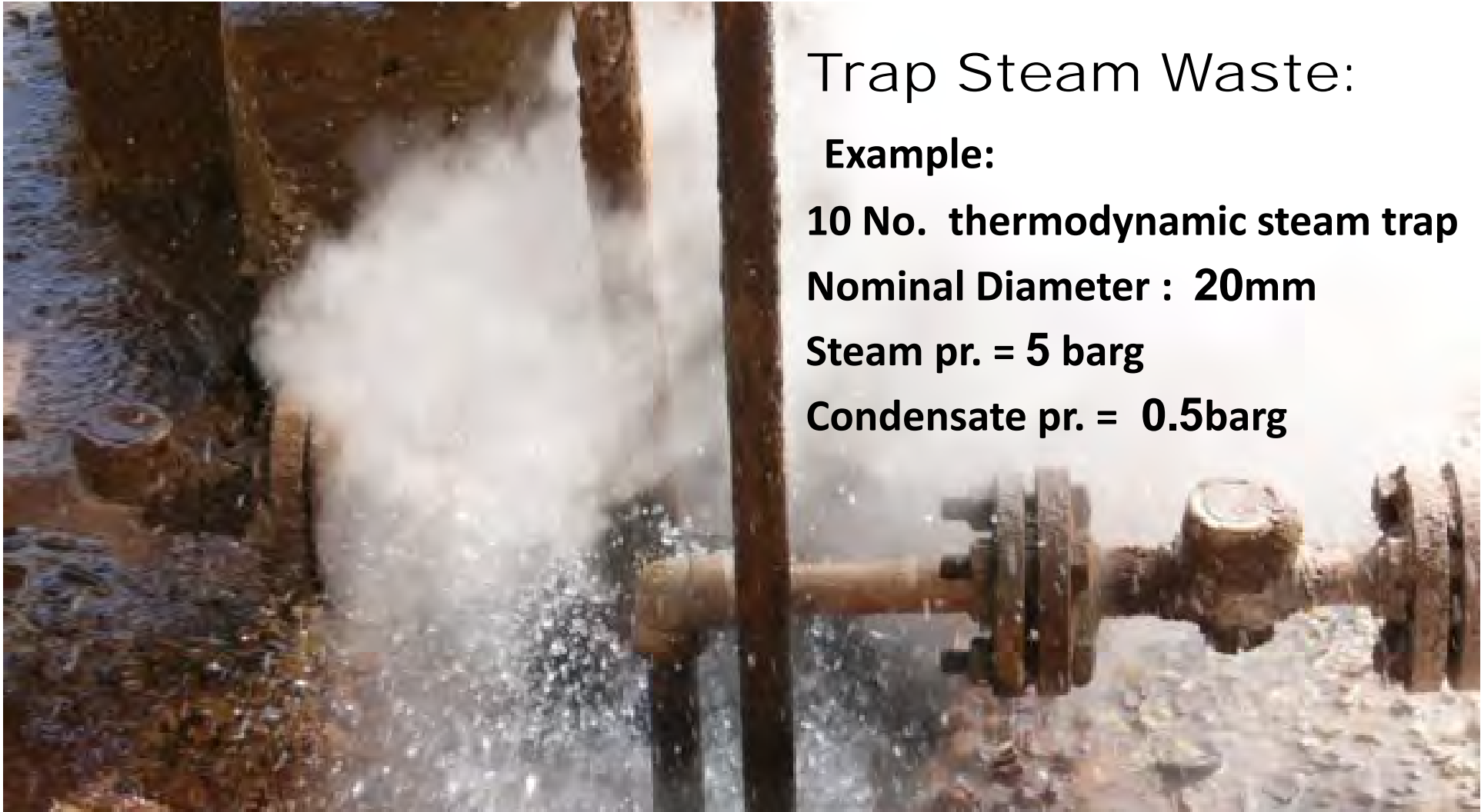






# HEAT EXCHANGERS





## Trap Steam Waste:

**Example:**

**10 No. thermodynamic steam trap**

**Nominal Diameter : 20mm**

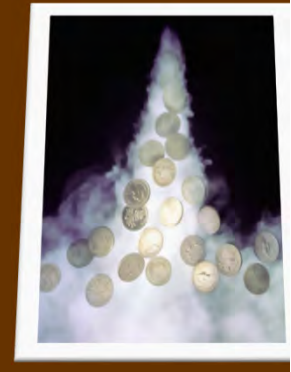
**Steam pr. = 5 barg**

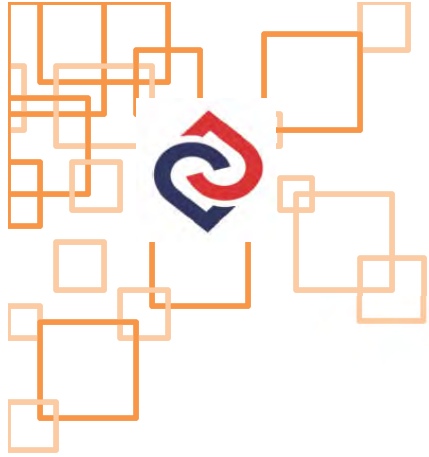
**Condensate pr. = 0.5barg**

**Steam Losses per Trap  $\approx$  15.6 kg/hr**

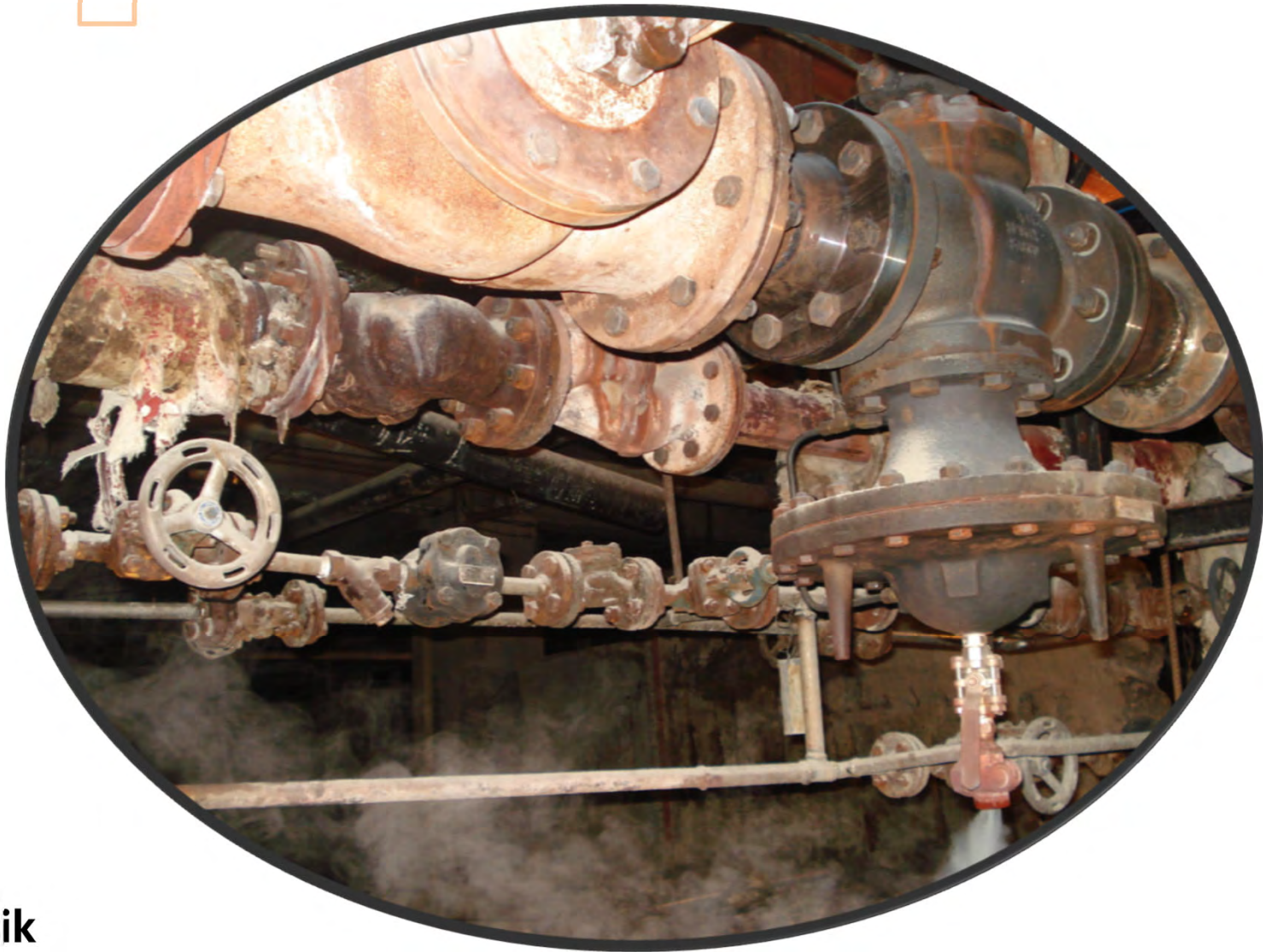
**Potential Anual Steam Leakage for 10 Traps  $\approx$  1300 Ton**

**Potential Steam Cost for 10 Traps  $\approx$  160,000,000 Rials/yr**





# Steam Distribution System Audit







# Letdown Station : Pressure Reducing Valve & Desuperheater





# Steam Line Separator







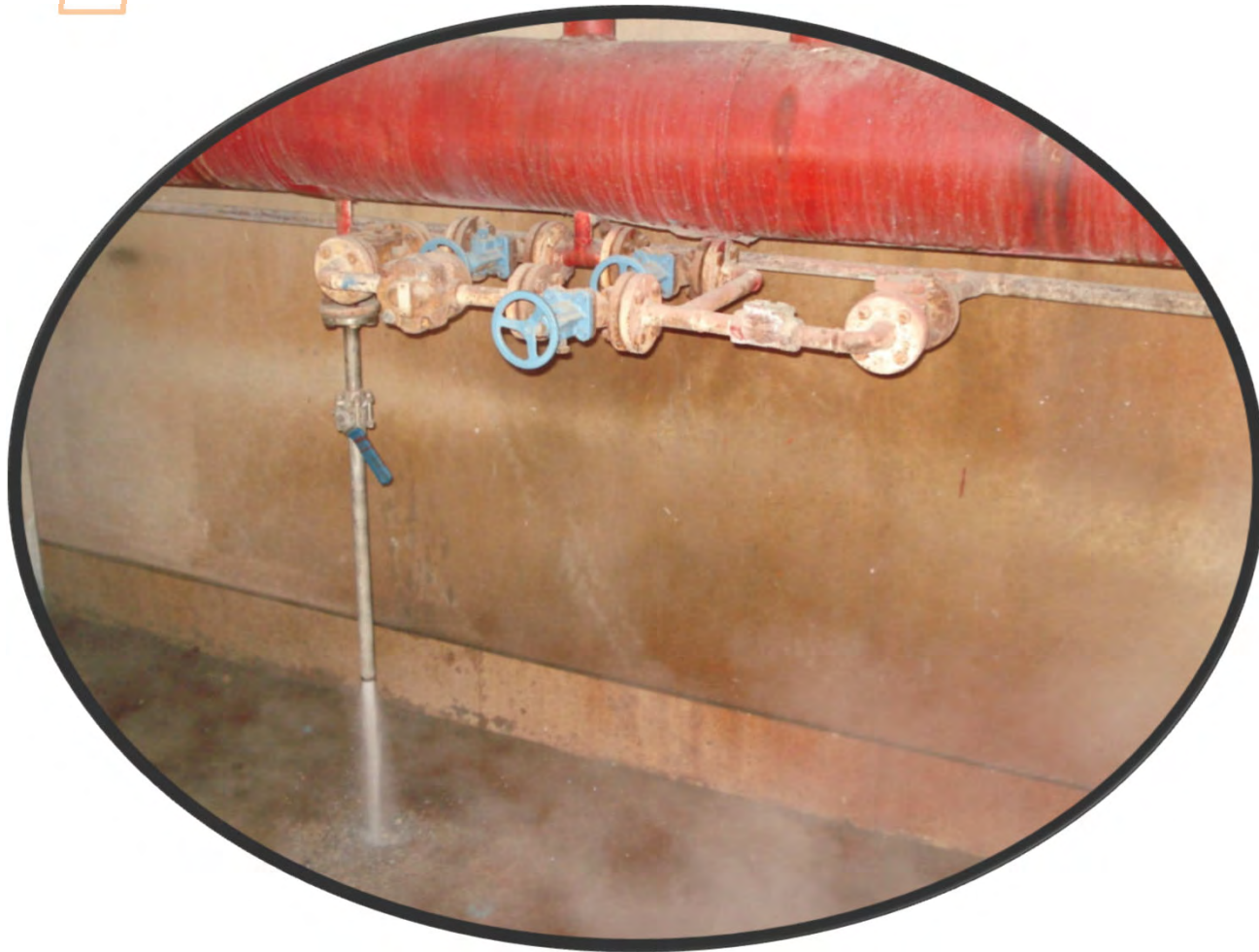
# STMS Program







## Condensate Dump In Main Header



# Steam Trap Drainage



- X نوع
- X اندازه
- X نحوه انشعاب گیری
- X نحوه نصب ( اخلاص كامل در عملكرد )
- X كیفیت شیر آلات
- X كمبود متعلقات در ایستگاه تله بخار نظیر  
( صافی ، شیر یک طرفه ، ... )
- X شیر بای پس
- X عدم تمهید تجهیز تست تله بخار



# Poor Maintenance

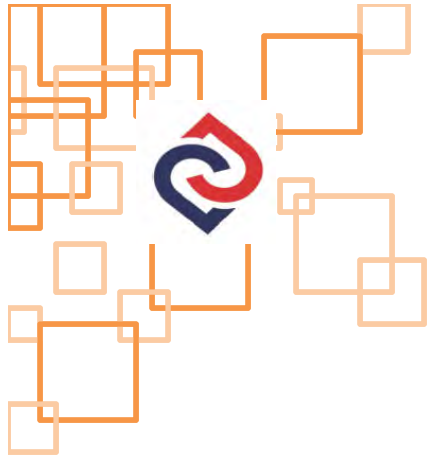






# Poor Maintenance





# Failed open steam traps





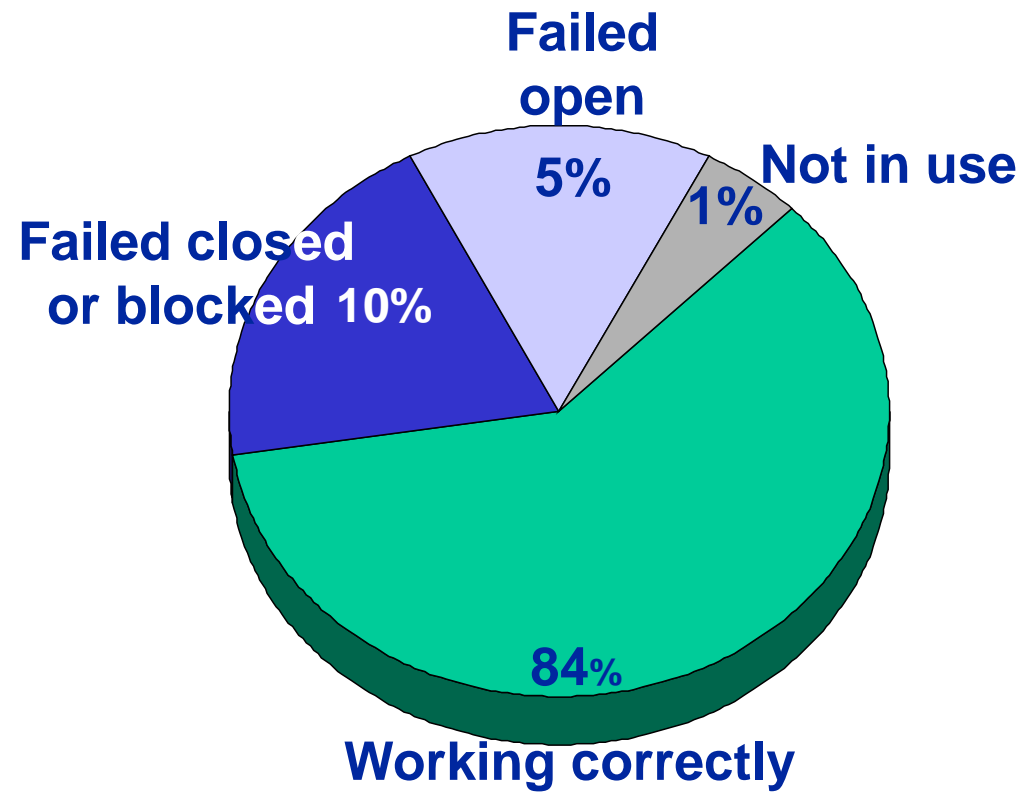
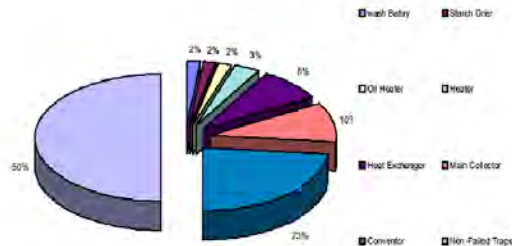
# STEAM TRAP CHECKING PROGRAMME

نحوه کارکرد تله های بخار

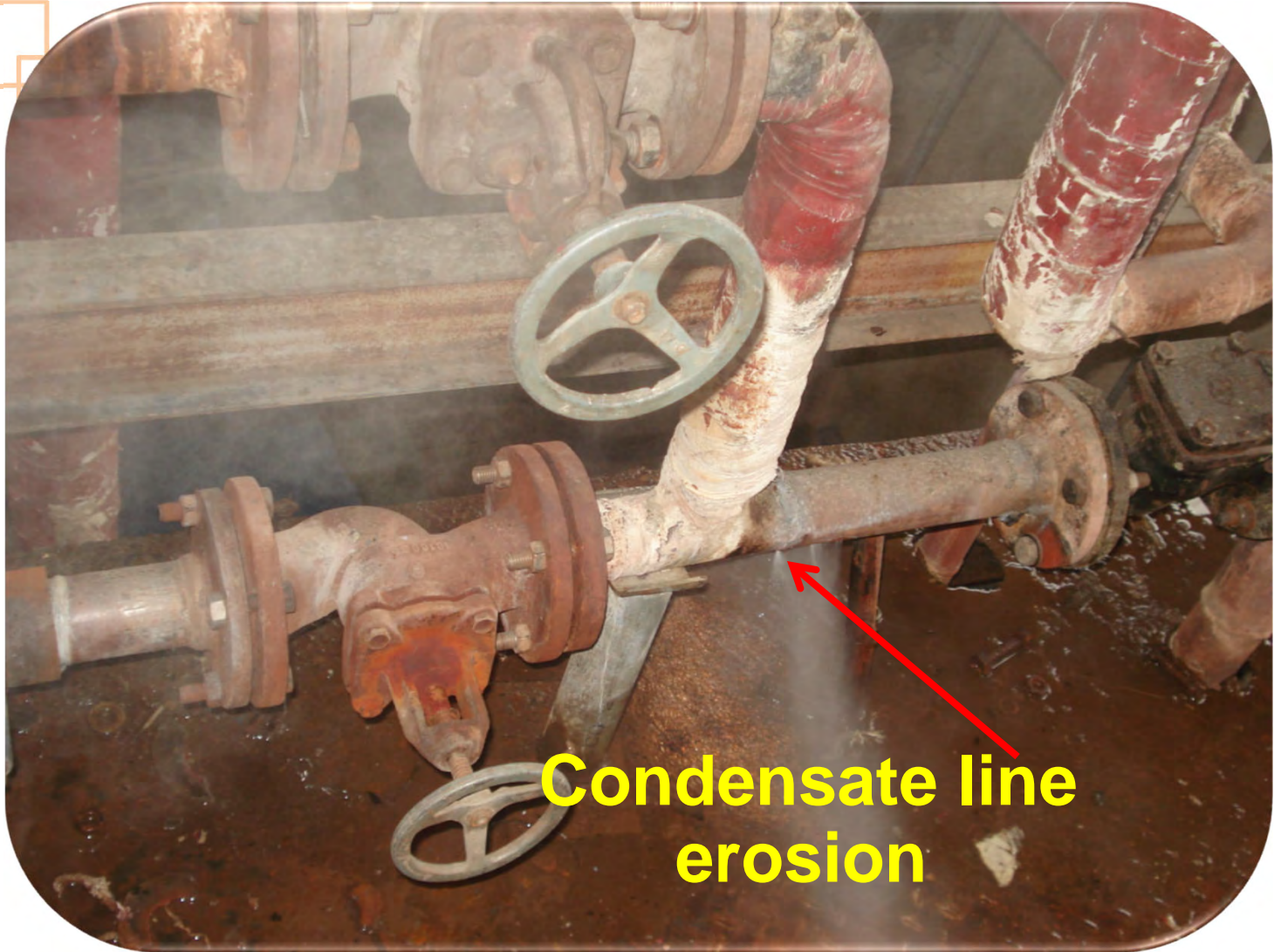


Some Sero 370 Steam Trap Management System v2.14  
Monday, March 13, 2006

Failed Traps Failures By Application  
for (Ghoush Co. - Steam)







**Condensate line  
erosion**

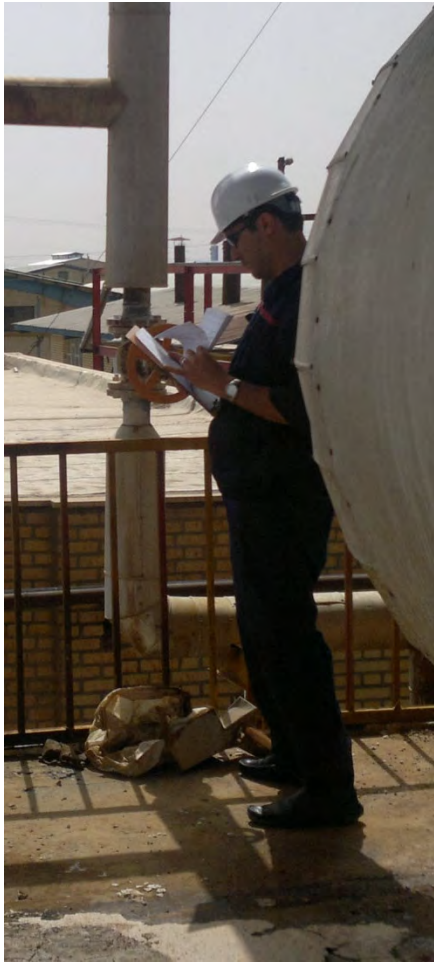
# Condensate line erosion







# Site Audit



| Steam Trap Check List  |  | HMP-06   |  |
|--|--|--|--|
| <b>Employer:</b> <input type="checkbox"/> Unit Name: <input type="checkbox"/> Light Name: <input type="checkbox"/> (کتبکو کندهاس خطه دوم برج نظار (جنب محال) پيشي پشت)   |  | <b>Trap Location:</b> <input type="checkbox"/> (که بنظر چشم از شناس) |  |
| <b>Survey Date:</b> ۹۱۱/۲/۲۴   |  | <b>Auditor/s:</b> <input type="checkbox"/> (رزمی - فرخنده)           |  |
| <b>Trap Specification:</b>   |  | <b>Description:</b>  |  |
| <b>Manufacturer:</b> <input type="checkbox"/> Spirax Sarco <input type="checkbox"/> Armstrong <input type="checkbox"/> TLV <input type="checkbox"/> Terway <input type="checkbox"/> Geastr <input type="checkbox"/> Douglas <input type="checkbox"/> Unknown <input type="checkbox"/> Other: MAW   |  |  |  |
| <b>Type:</b> <input type="checkbox"/> Float & Thermostatic <input checked="" type="checkbox"/> Thermodynamic <input type="checkbox"/> Inverted Bucket <input type="checkbox"/> Balanced Pressure & Thermostatic <input type="checkbox"/> Bimetallic <input type="checkbox"/> Free Float <input type="checkbox"/> Other   |  |  |  |
| <b>Model:</b> TD42 <input type="checkbox"/> PMA (bar): 63 <input type="checkbox"/> TMA (°C): 400 <input type="checkbox"/> ΔPmax (bar): 63 <input type="checkbox"/> Unknown   |  |  |  |
| <b>Size:</b> 3/4" <input type="checkbox"/> Installation height: <input type="checkbox"/> Low <input type="checkbox"/> Eye level <input type="checkbox"/> High  |  |  |  |
| <b>Connection type:</b> <input type="checkbox"/> Screwed <input type="checkbox"/> Flanged <input checked="" type="checkbox"/> Socket Weld <input type="checkbox"/> Butt Weld   |  |  |  |
| <b>Connection standard:</b> <input type="checkbox"/> PN <input checked="" type="checkbox"/> ANSI150 <input type="checkbox"/> BS <input type="checkbox"/> Other <input type="checkbox"/> Unknown  |  |  |  |
| <b>Orientation:</b> <input type="checkbox"/> Horizontal <input checked="" type="checkbox"/> Vertical   |  |  |  |
| <b>Position:</b> <input type="checkbox"/> Indoor <input checked="" type="checkbox"/> Outdoor   |  |  |  |
| <b>Condensate recovery:</b> <input type="checkbox"/> No (Open Ended) <input checked="" type="checkbox"/> Yes (Recovered) <input type="checkbox"/> Yes (Not Recovered)  |  |  |  |
| <b>Trap Station:</b>   |  |  |  |
| <b>Ancillaries:</b> <input type="checkbox"/> Strainer <input type="checkbox"/> Check Valve <input type="checkbox"/> Sight Glass <input checked="" type="checkbox"/> Bypass   |  |  |  |
| <b>Isolation valve:</b> <input checked="" type="checkbox"/> Up <input type="checkbox"/> Down <input type="checkbox"/> Station Size: 3/4"   |  |  |  |
| <b>Drain valve:</b> <input type="checkbox"/> Up <input type="checkbox"/> Down <input type="checkbox"/> Size: ---   |  |  |  |
| <b>Application:</b> <input type="checkbox"/> H. Ex. <input type="checkbox"/> Unit Heater <input type="checkbox"/> Dryer <input type="checkbox"/> Storage Tank <input type="checkbox"/> Tracer <input type="checkbox"/> Main Drainage <input type="checkbox"/> Collector <input checked="" type="checkbox"/> Other: Jacket  |  |  |  |
| <b>Test Method:</b> <input type="checkbox"/> Visual <input checked="" type="checkbox"/> Ultrasonic <input checked="" type="checkbox"/> Temp-Test <input type="checkbox"/> Sight Glass  |  |  |  |
| <b>Fluid Condition:</b>  |  |  |  |
| Operating Pressure: Before (bar g): 8 After (bar g): 6   |  | Operating Temperature: Before (°C): 174 After (°C): 155              |  |
| <b>Suitability:</b> <input checked="" type="checkbox"/> Suitable <input type="checkbox"/> Not suitable <input type="checkbox"/> Not preferred <input type="checkbox"/> Does not apply  |  |  |  |
| <b>Operation:</b> <input checked="" type="checkbox"/> Annually <input type="checkbox"/> Other  |  |  |  |
| <b>Steam Trap Condition:</b> <input type="checkbox"/> OK <input checked="" type="checkbox"/> Failed Open <input type="checkbox"/> Failed Closed <input type="checkbox"/> Rapid Cycle <input type="checkbox"/> Cold <input type="checkbox"/> Not in use <input type="checkbox"/> Removed <input type="checkbox"/> Disconnected <input type="checkbox"/> Wrong Installation <input type="checkbox"/> Connection Leak <input type="checkbox"/> Body Leak <input type="checkbox"/> Other       |  |  |  |
| <b>Bypass Condition:</b> <input type="checkbox"/> Bypass Valve Open <input type="checkbox"/> Bypass Valve Internal Leak <input type="checkbox"/> Bypass Valve Damaged <input type="checkbox"/> Bypass Valve External Leak  |  |  |  |
| <b>Station Problems:</b> <input type="checkbox"/> Strainer Leak <input type="checkbox"/> Check Valve Leak <input type="checkbox"/> Double Trapping <input type="checkbox"/> Group Trapping <input type="checkbox"/> Stop Valve Leak: <input type="checkbox"/> Before Trap <input type="checkbox"/> Insulation: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Station Line: <input type="checkbox"/> Leak <input type="checkbox"/> Corrosion |  |  |  |
| <b>Comment:</b>  |  | که بنظر از ناحیه صاف نشانی ندارد.                                    |  |
| <b>Offering:</b>   |  |  |  |
| <b>Registered by:</b> رزمی   |  | <b>Revised by:</b> رزمی  |  |
|  |  | <b>Project Manager:</b> رزمی   |  |







## Steam Leakage from pipe holes

Example: for

$$d = 5\text{mm}$$

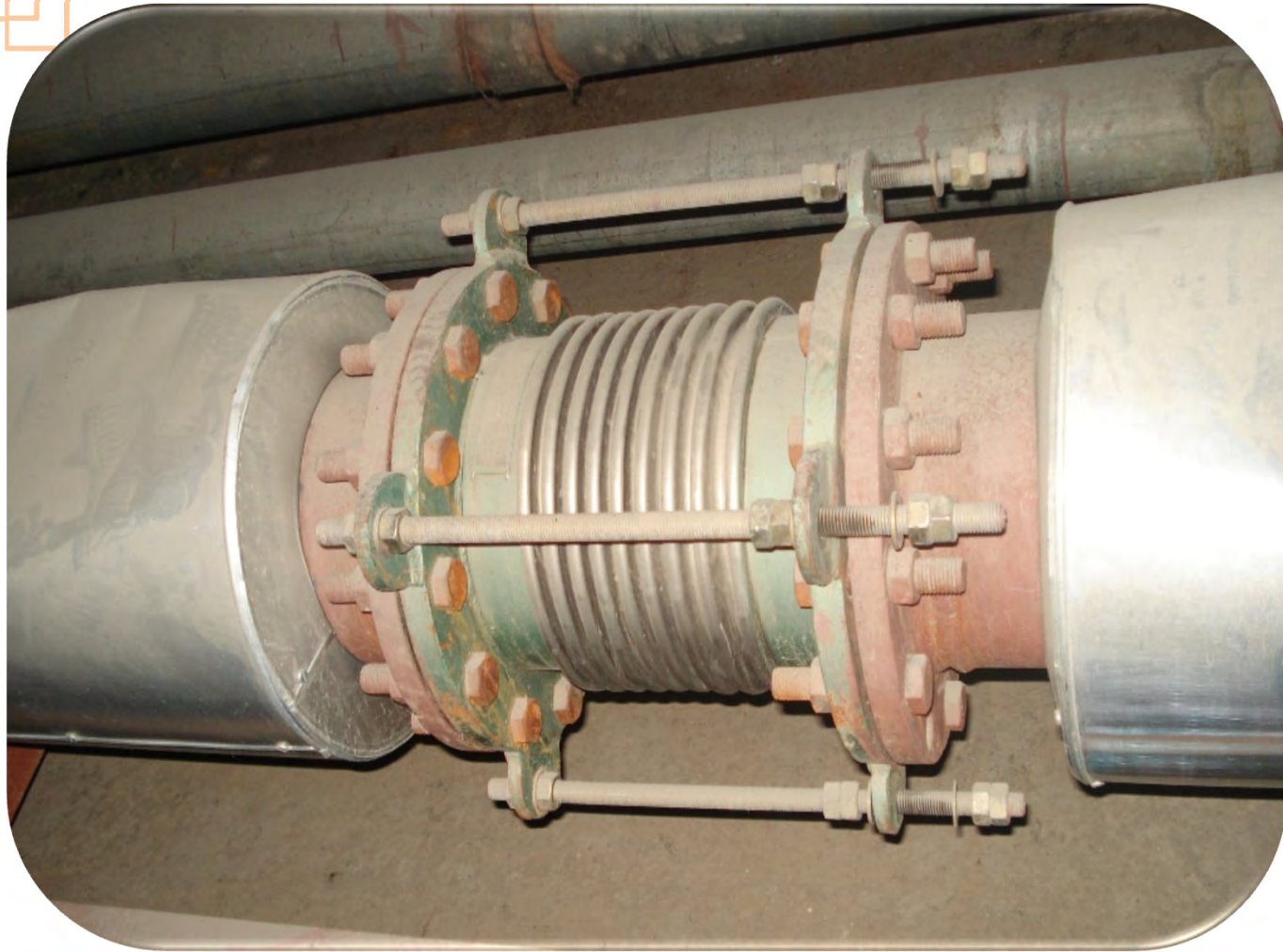
$$p = 8 \text{ barg}$$



Steam Losses = 60 kg/hr

$$\text{Losses Cost} = \frac{60 \text{ kg/hr} \times 8736 \text{ hr/yr} \times 140000 \text{ Rials/ ton}}{1000 \text{ kg/ton}} \\ \approx 74,000,000 \text{ Rials/yr}$$

# Expansion Joints





# INSULATION





# STEAM USERS





# STEAM TRAINING COURSES

**STEAM TRAINING COURSES**

**STEAM SYSTEM DESIGN**

**CONDENSATE DRAINAGE AND STEAM TRAPS**

**CONTROL SYSTEM**

**ENERGY SAVING & SYSTEM IMPROVEMENT**

**OPERATION & MAINTENANCE**

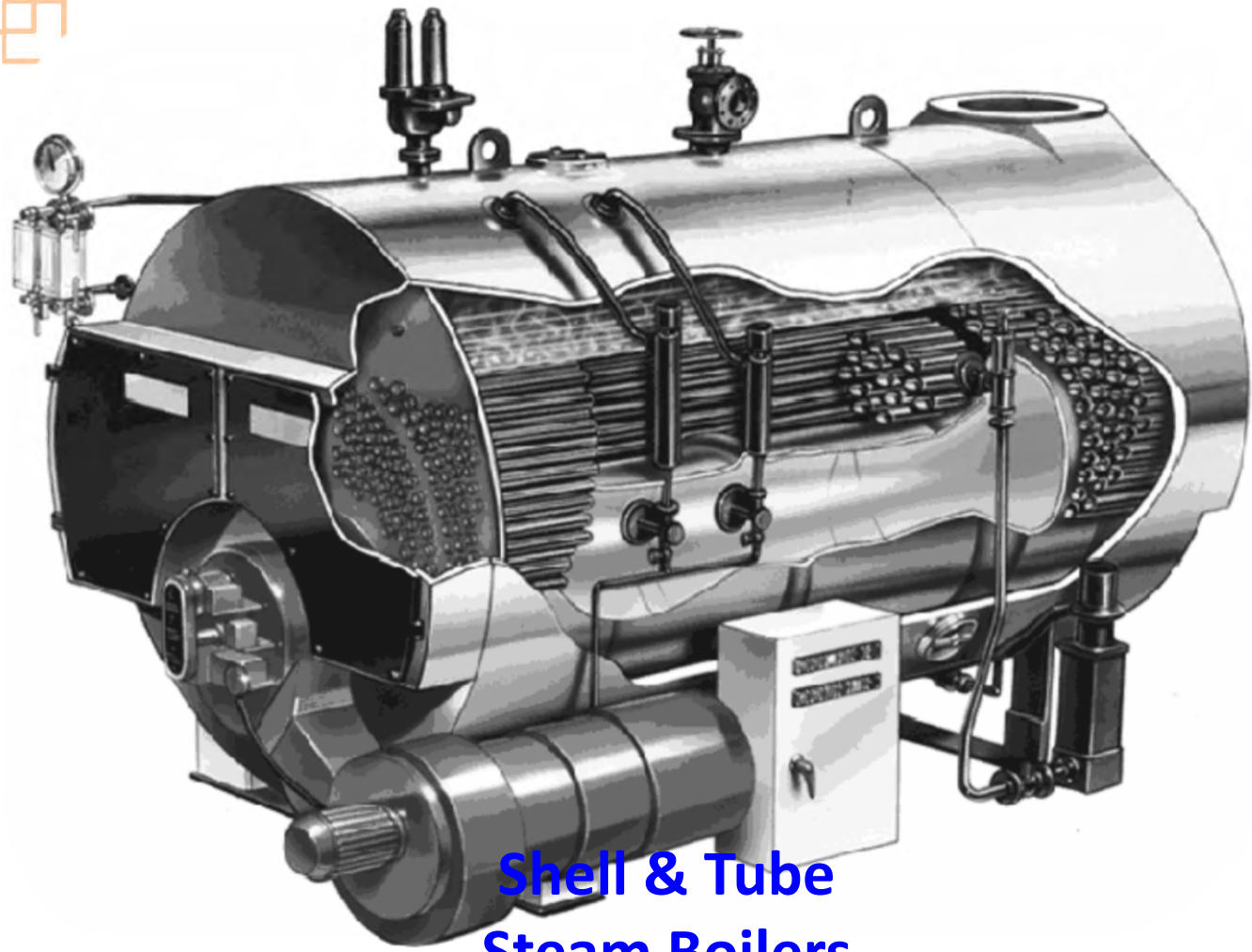
**INTENSIVE COURSE FOR INDUSTRIES**

**PUBLICATION  
& PAPERS**





# STEAM TRAINING COURSES

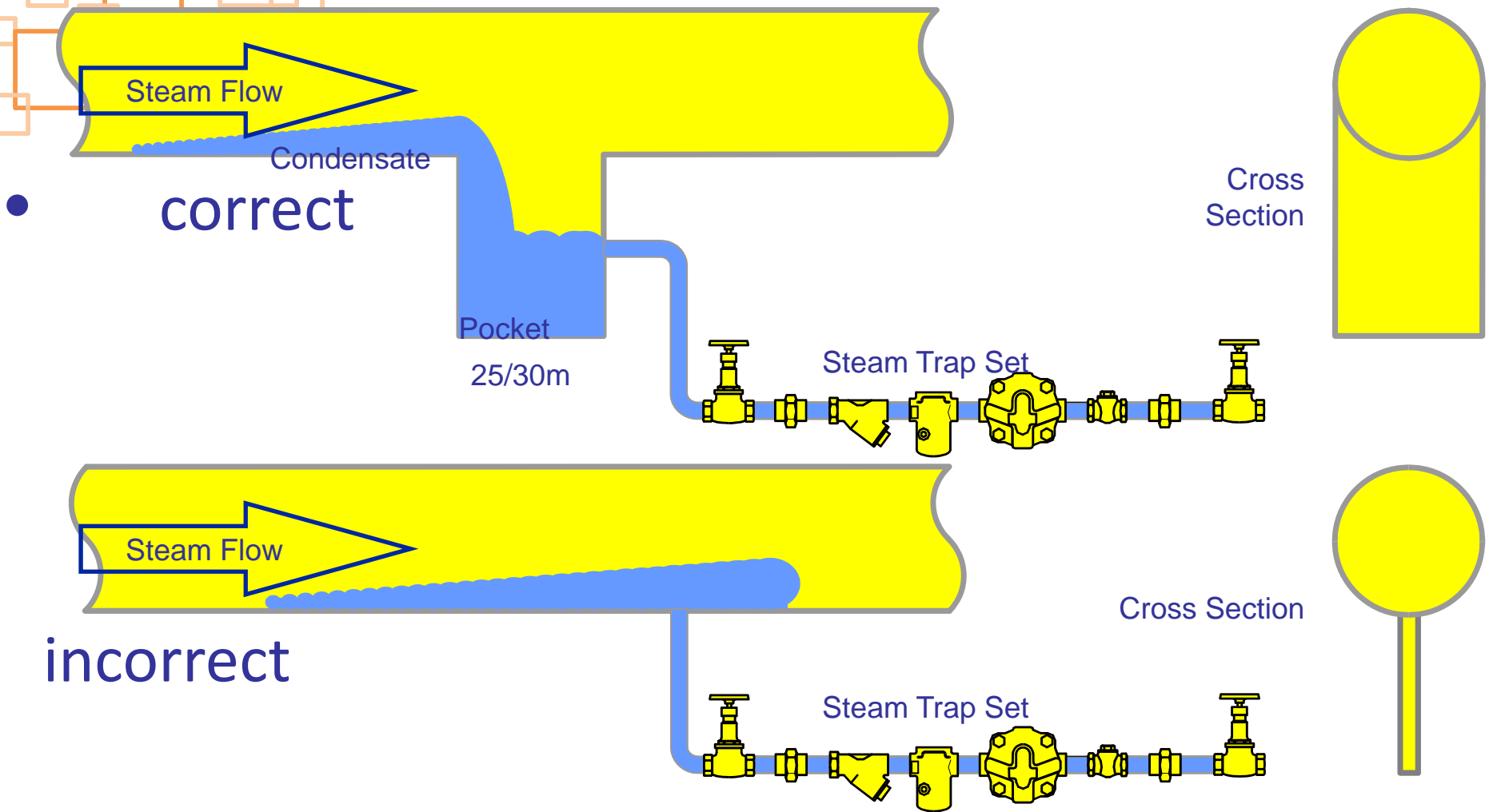


Shell & Tube  
Steam Boilers



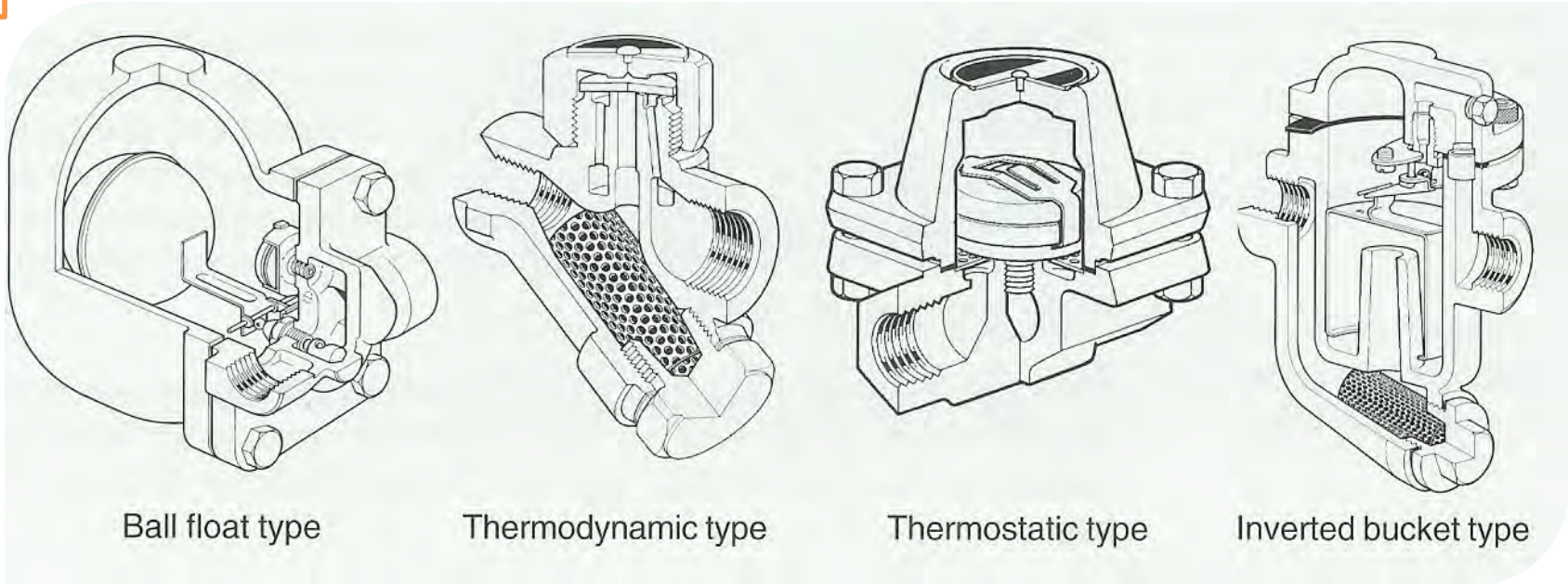


# STEAM TRAINING COURSES





# STEAM TRAINING COURSES

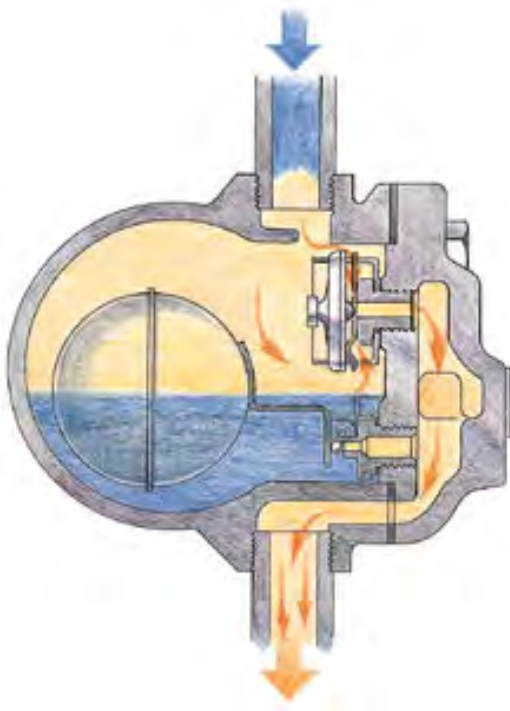


## Automatic steam traps – Selection

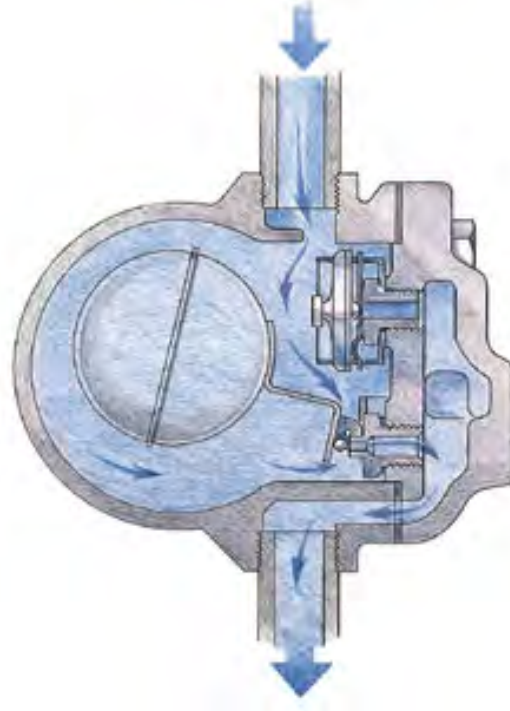


# STEAM TRAINING COURSES

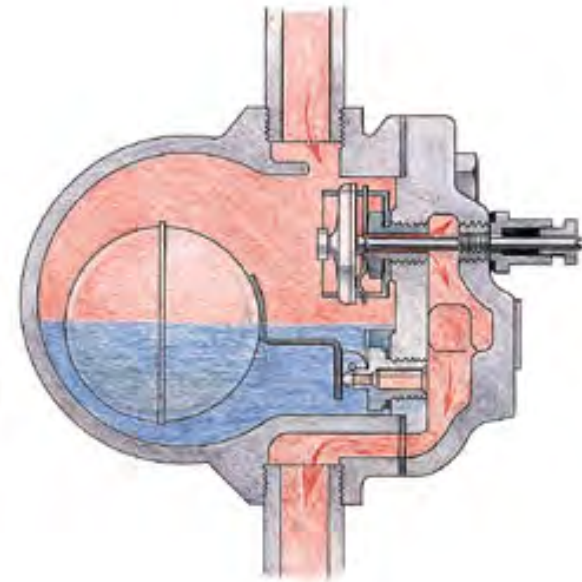
## Ball Float steam trap operation



1-Air Venting

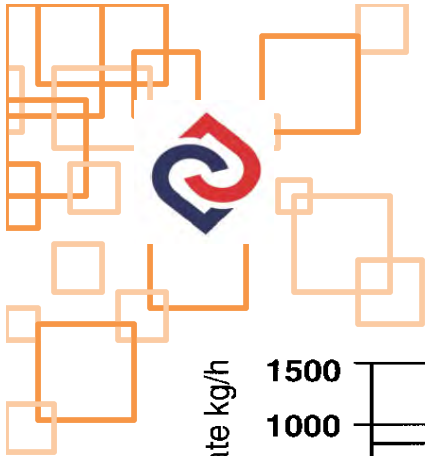


2-Condensate  
Drainage

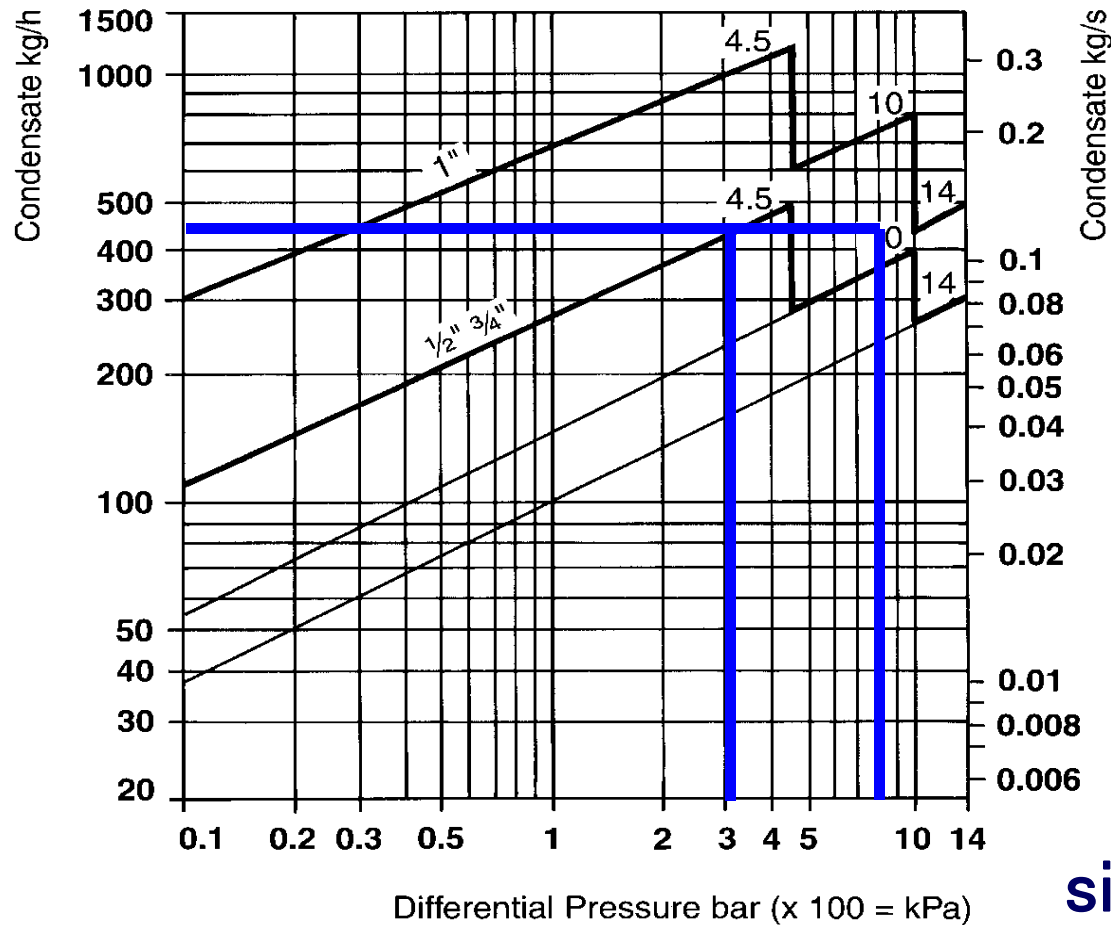


3-Steam Tarping





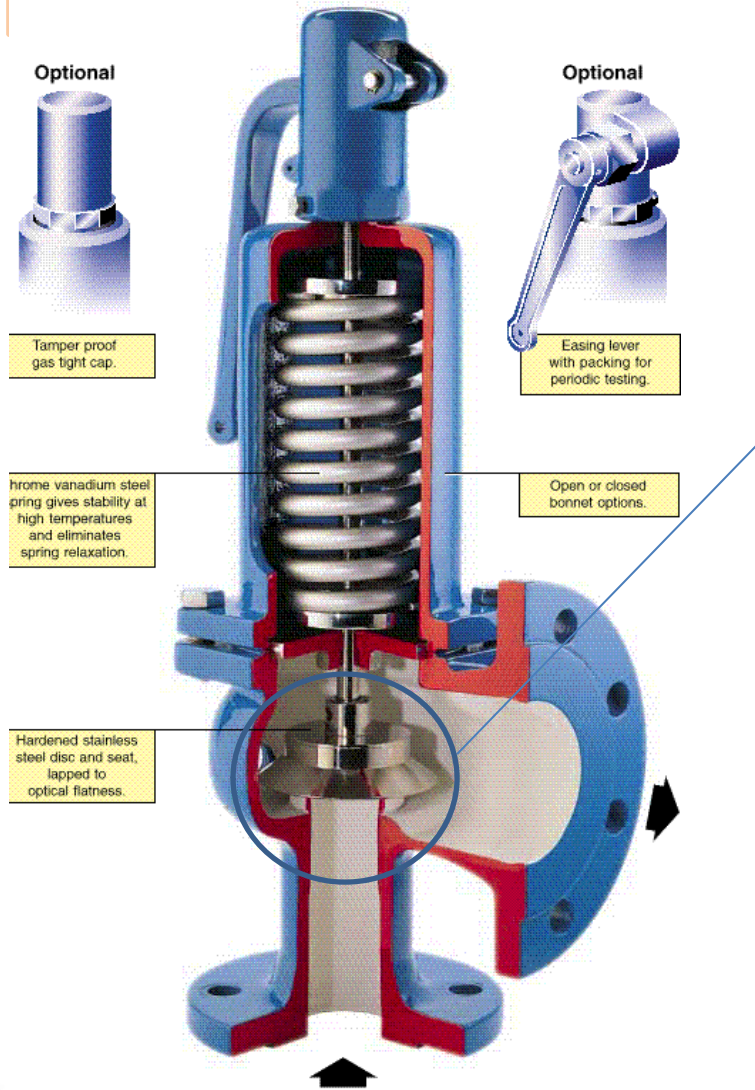
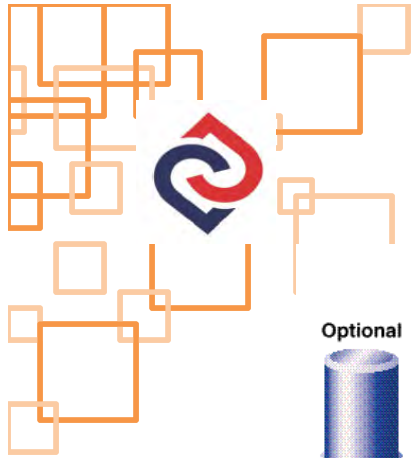
# STEAM TRAINING COURSES



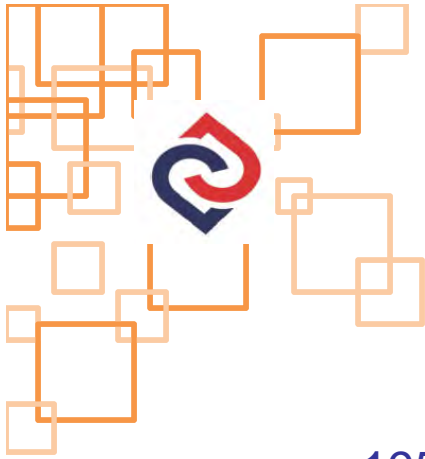
**Ball Float  
Steam trap  
sizing and selection**



# STEAM TRAINING COURSES



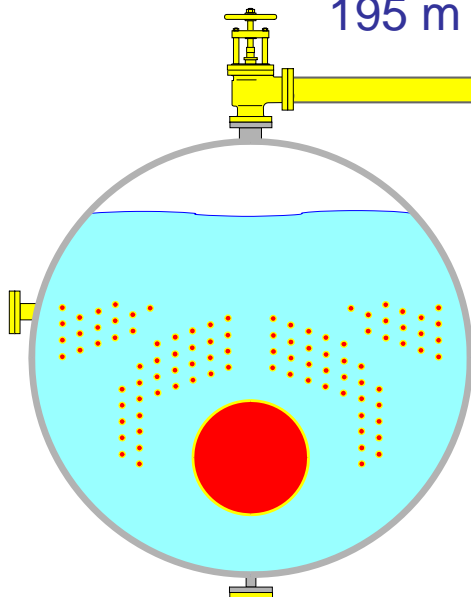
## Safety valves



# STEAM TRAINING COURSES

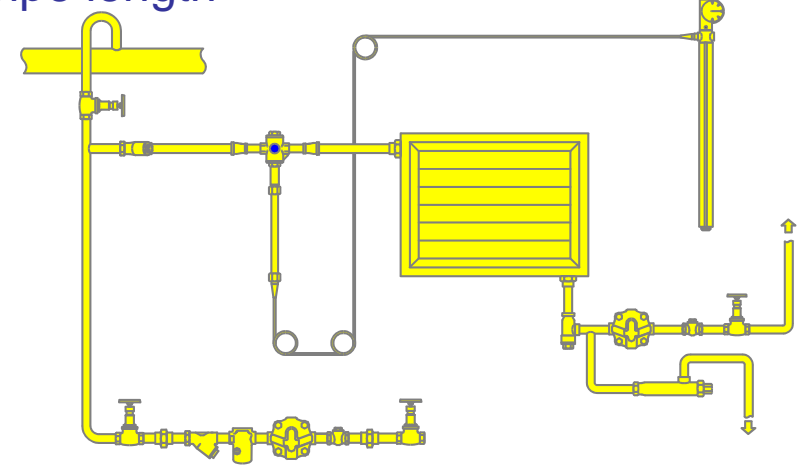
## Pipe Sizing Example

195 m + 10% = 214 m equivalent pipe length



Boiler

7 bar g 289 kg/h



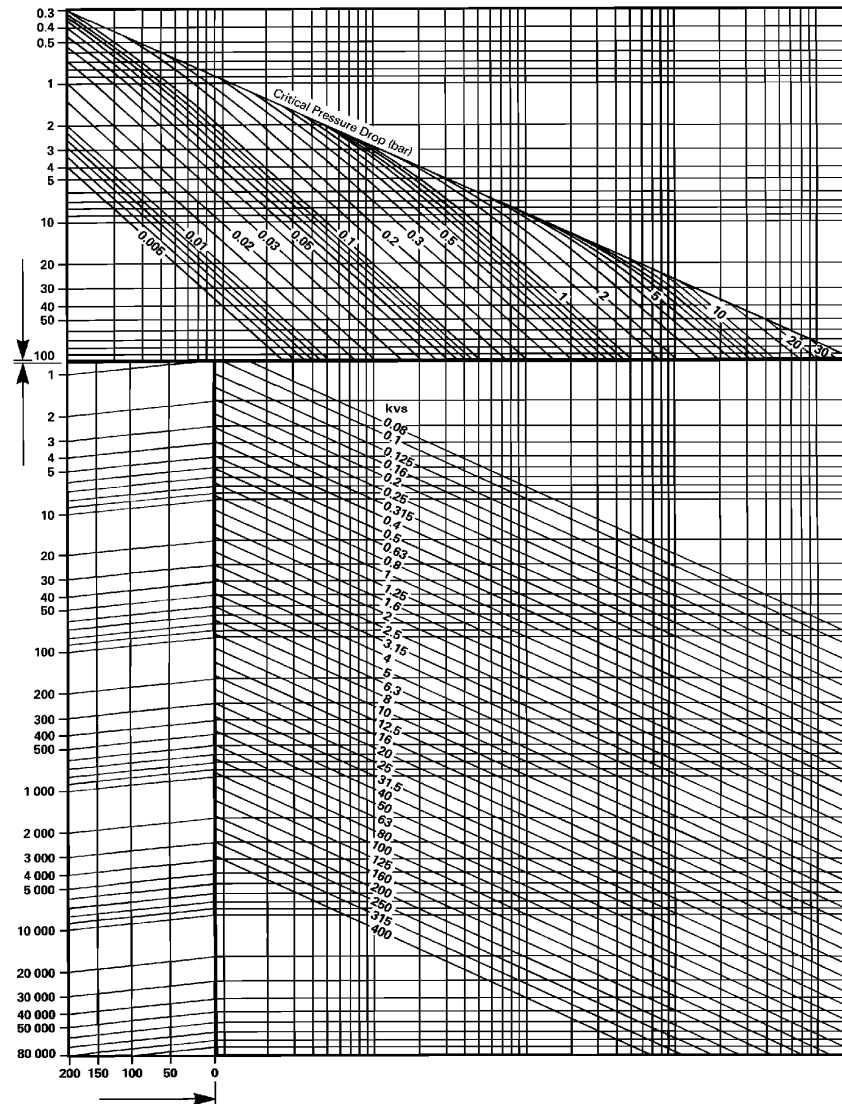
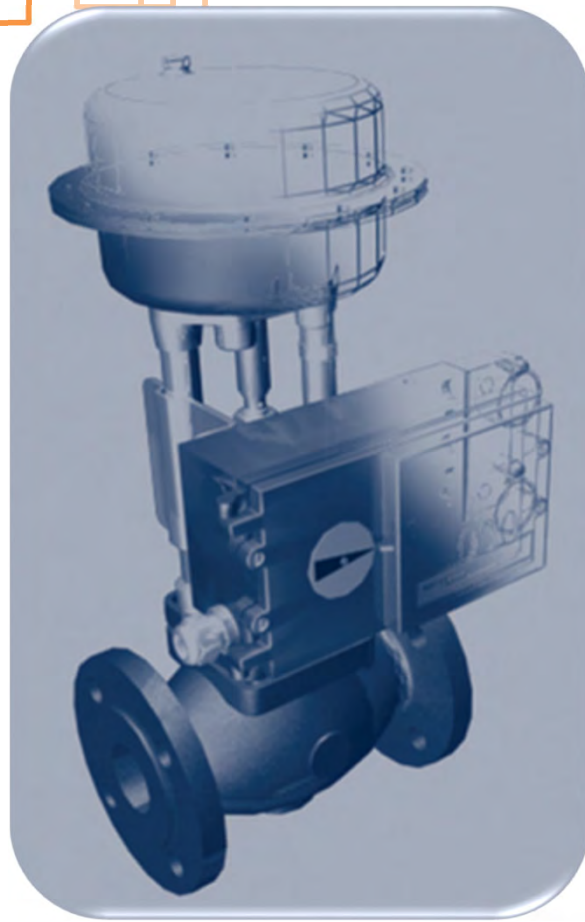
Heater Battery

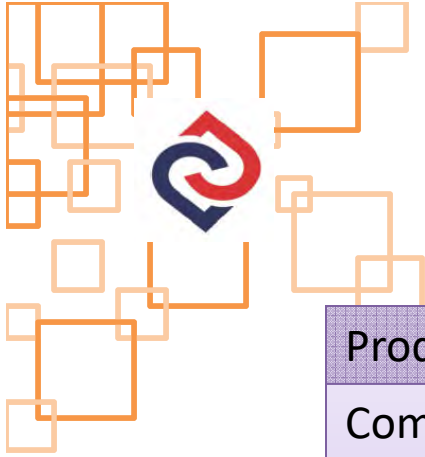
6.6 bar g 270 kg/h





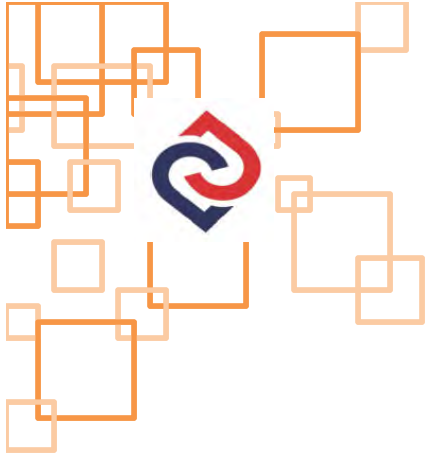
# STEAM TRAINING COURSES



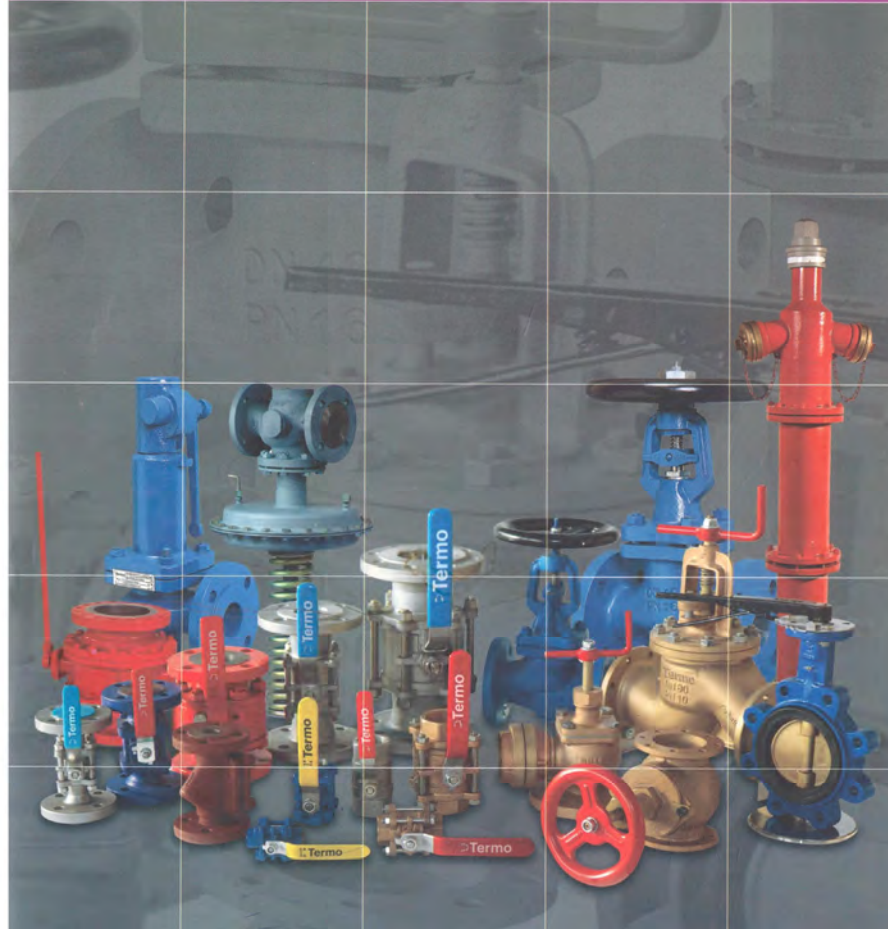


## B. Gedik

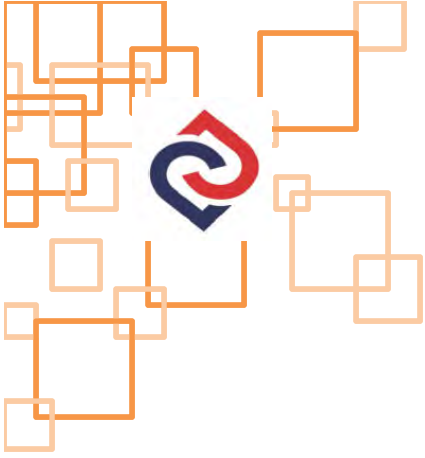
|                      |     |
|----------------------|-----|
| Product Certificates | 163 |
| Company overview     | 176 |
| Field of Activities  | 177 |
| Valves               | 179 |
| Marine Valves        | 205 |
| Gedik Casting        | 208 |
| Gedik Welding        | 211 |



VALVES and ARMATURES







# Product Certificates





 **Gedik Döküm ve Vana**

 **Termo**

ISTANBUL 19.12.2020

#### DISTRIBUTÖR

Subject to the terms and conditions agreed mutually by the parties, Gedik Casting and Valve INC hereby appoints Pars Jam Control ;corporation organized under the laws of Islamic Republic of Iran and having its principal place of business at Unit 13, No 11, Azadegan Alley , Ghaem Magham Farahani Street, Tehran; as its "distributor" to sell its products within the Territory of Islamic Republic of IRAN.

This above mentioned authorization shall become effective as of the signing date, and shall remain in full force and effect until 03 September 2023. This authorization shall be terminated automatically on 03 September 2023 without prior notice. Thereafter, the parties shall evaluate the business relation existed between each other and agree to renew the authorization .

This letter is given upon the request of PARS JAM .  
In case an exceptional case arises , the parties shall settle all disputes amicably .

Best Regards

**GEDİK DÖKÜM ve VANA  
SANAYİ ve TİCARET A.Ş.**  
Ankara Cad. No:306 - 34705 (Pendik) İstanbul / Türkiye  
Tic. Sic. No: 271630 / Mers: 08100012716300000000  
Ticari Sicil No: 271630/00000000000000000000



Dr. Mustafa KOÇAK

CEO

Gedik Döküm ve Vana San. ve Tic. A.Ş  
Ankara Caddesi No: 306 34906 Pendik - İstanbul / Türkiye  
T +90 216 367 12 62 F +90 216 367 28 68-65  
termo@gedikdokum.com.tr / dokum@gedikdokum.com.tr  
[www.gedikdokum.com.tr](http://www.gedikdokum.com.tr)

Bir Fidek Holding Kuruluşudur.

 **Gedik**

 **termo**  
vana ve armatürleri

  
**M.S.A**



Certificate No : 2209231146533938



**TÜRK LOYDU**

MANUFACTURER APPROVAL CERTIFICATE  
İMALATÇI FİRMA ONAY SERTİFİKASI

**GEDİK İLERİ DÖKÜM TEKNOLOJİLERİ SANAYİ VE  
TİCARET ANONİM ŞİRKETİ**

*is approved as manufacturer in following scope by the result of tests, audits and conformity assessment according to Türk Loydu procedures and instructions.  
Türk Loydu Prosedür ve Talimatlarına göre yapılan testler, denetimler ve uygunluk değerlendirmesi sonucunda, aşağıda belirtilen konularda imalatçı firma olarak onaylanmıştır.*

*This certificate is valid till 05.06.2025, subject to the conditions referred to at 2<sup>nd</sup> page,  
Bu sertifika, Sayfa 2'de belirtilen şartlarla 05.06.2025, tarihine kadar geçerlidir.*

|                                |   |
|--------------------------------|---|
| <b>Product Description</b>     | : Foundry Approval  |
| <b>Reference Rule</b>          | : TL Rules Part A Chapter 2 - Material (Jan. 2021),<br>TL Rules Part E Chapter 103 - Metallic Mat., Special Mat.for Naval Ships (Jan. 2022)   |
| <b>Related Standarts</b>       | : -   |
| <b>Approval Conditions</b>     | : Gray Cast Iron (EN-GJL-250) - Max. capacity: 3000 kg<br>Nodular Cst Iron (EN-GJS-400-18) - Max. capacity: 3000 kg<br>Nodular Cst Iron (EN-GJS-450-10) - Max. capacity: 3000 kg<br>Stainless Steel Cast (EN 10213 1.4308-304) - Max. capacity: 3000 kg<br>Stainless Steel Cast (EN 10213 1.4408-316) - Max. capacity: 3000 kg<br>Steel Cast (GSC25) - Max. capacity: 3000 kg<br>Bronze Cast (CuSn10) - Max. capacity: 3000 kg<br>Bronze Cast (Rg5) - Max. capacity: 3000 kg<br>Bronze Cast (Rg10) - Max. capacity: 3000 kg |
| <b>Address of Manufacturer</b> | : Sakarya 2. OSB 11 Nolu Yol, No:6 Hendek - SAKARYA   |
| <b>Approval Date</b>           | : 06.09.2022  |
| <b>Place and Date of Issue</b> | : İSTANBUL - 17.10.2022   |

**Emrah SÖĞÜTÇÜ**  
New Building Division Manager  
Yeni İnşa Bölümü Müdürü

**Caner COŞKUN** for.  
Surveyor  
Sörveyör

128537

Form No: CE 218-06/ 25th February 2022

Page 1/2







## ZERTIFIKAT Certificate

**TÜV**  
AUSTRIA

Die TÜV AUSTRIA TURK LTD. ŞTI. bescheinigt, dass die Firma  
The TÜV AUSTRIA TURK LTD. ŞTI. certifies that

**GEDİK İLERİ DÖKÜM TEKNOLOJİLERİ SAN. VE TİC. A.Ş.**  
in / of

Sakarya 2. OSB , 11 nolu yol No:6

54300 Hendek-Sakarya,Türkiye

geprüft wurden die Anforderungen nach der  
is proved and accords all necessary requirements to

**AD 2000-Merkblatt W0**

erfüllt

Die Betriebsüberprüfung erfolgte am  
Date of audit

**08.04.2022**

Der Geltungsbereich und die Einzelheiten der Prüfung sind  
Unserem Bericht zu entnehmen  
The range of validity and details of the inspection can be taken from our  
Report number:

**22-IS-0630 Rev01-TAT-22-AD2000-01**

Dieses Zertifikat gilt für folgende Anwendungsbereiche:  
This certificate is valid for the following products or service ranges:

**Industrial Armatures and Valve**

Gültigkeit bis.  
Date of expiry.

**07.04.2025**

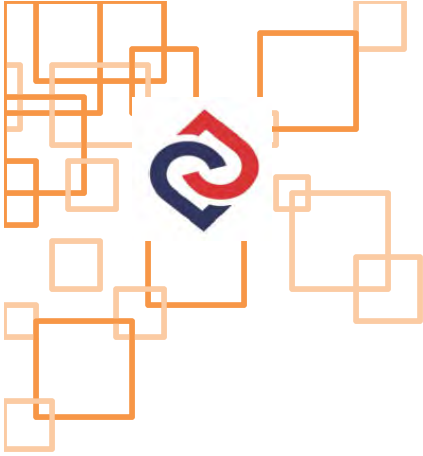
Zertifikat Nr. 22-IS-0630-TAT 22-AD2000W0-3541  
Certificate No.

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## ZERTIFIKAT Certificate

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**GEDİK TERMO VANA SAN. VE TIC. A.Ş.**

in / of

**Sakarya 2. OSB , 11 nolu yol No:6**

**54300 Hendek-Sakarya,Türkiye**

geprüft wurde und die Anforderungen nach der  
is proved and accords all necessary requirements to

**AD 2000-Merkblatt HP0**

Die Betriebsüberprüfung erfolgte am:  
Date of audit

**08.05.2022**

Der Geltungsbereich und die Einzelheiten der Prüfung sind  
Unserem Bericht zu entnehmen  
The range of validity and details of the inspection can be taken from our  
Report number:

**22-IS-0630 Rev01-TAT-22-AD2000-01**

Dieses Zertifikat gilt für folgende Anwendungsbereiche  
This certificate is valid for the following products or service ranges:

**Industrial Armatures and Valves**

Gültigkeit bis:  
Date of expiry:

**07.04.2025**

Zertifikat Nr.: 22-IS-0630-TAT-22-AD2000HP0-3542  
Certificate No:

**TÜV AUSTRIA TURK LTD. ŞTI.**  
Çamlık Mahallesi Dinc Sokak, No: 28 PK :34774 Ümraniye / İstanbul



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Marine & Offshore

Certificate number: SMS.W.II.127300/A.0

www.veristar.com

## RECOGNITION FOR BV MODE II SCHEME

**GEDIK ILERI DOKUM TEKNOLOJILERI SAN. VE TIC. A.S**  
SAKARYA - TURKEY

**Summary of the range of the recognition which is detailed in the subsequent page(s):**  
Production of Steel, Stainless Steel, Cast Iron, Ductile Cast Iron, Aluminium and Copper Alloy

*This certificate is issued to attest that Bureau Veritas Marine & Offshore has performed, at the above company's request and in compliance with the requirements of NR320, a satisfactory assessment of the manufacturing facilities and associated quality procedures related to the range of the recognition.*

**This certificate will expire on: 07 Sep 2024**

For BUREAU VERITAS,  
At BV ISTANBUL on 07 Sep 2020,  
Gurcan Yilmaz



This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the subsequent page(s) are complied with. This certificate is issued within the scope of the General Conditions of Bureau Veritas Marine & Offshore available on the internet site www.veristar.com. Any person not a party to the contract pursuant to which this document is delivered may not assert a claim against Bureau Veritas Marine & Offshore for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgement, fault or negligence committed by personnel of the Society or its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.

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BV Mod. Ad.E 697 June 2017

This certificate consists of 2 page(s)







# Sertifika

Denetim Standardı: **IATF 16949:2016**  
(1. baskı, 2016-10-01)  
Sertifika Tescil No. **01 111 2015853**  
IATF Sertifika No. **0395389**

Belge Sahibi: **GEDİK İLERİ DÖKÜM TEKNOLOJİLERİ SAN. VE TİC. A.Ş.**  
**KARGALI HANBABA MAH.2. OSB YOLU 11.NOLU YOL NO:6**  
**54300 SAKARYA**  
**Türkiye**

Kapsam: **Kum döküm yöntemiyle pig,sfero, silisyum-molibden alaşımları**  
**ve hassas döküm yöntemiyle çelik ürünlerin imalatı**

**Ürün Tasarımı Hariç**

**Yapılan bir inceleme ile IATF 16949:2016 şartlarının sağlanmış**  
**olduğu kanıtlanmıştır**

Geçerlilik: **İşbu sertifika 2021-04-20 den 2024-04-19 e kadar geçerlidir.**

Düzenlenme tarihi: **2021-04-29**



2-IAO-QMC 01003

*Kilbas*  
TÜV Rheinland Cert GmbH  
Am Grauen Stein · 51105 Köln  
Germany · NRW

1 / 1

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 **Gedik**

 **termo**  
vana ve armatürleri

  
**M.S.A**



# Sertifika

Denetim Standardı **ISO 9001:2015**

Sertifika Tescil No. **01 100 2015853**

Belge Sahibi: **GEDİK İLERİ DÖKÜM TEKNOLOJİLERİ  
SAN. VE TİC. A.Ş.  
KARGALI HANBABA MAH.2. OSB YOLU 11.NOLU YOL NO:6  
54300 SAKARYA  
Türkiye**

Kapsam: **Hassas Döküm ve Kum Döküm Yöntemleriyle Dökme Demir,  
Çelik, Paslanmaz Çelik , Sfero, Alüminyum ve Bakır Alaşımli  
Ürünlerin İmalatı**

Yapılan bir inceleme ile ISO 9001:2015 şartlarının sağlanmış  
olduğu kanıtlanmıştır

Geçerlilik: **İşbu sertifika 2021-04-25 den 2024-04-24 e kadar geçerlidir.  
İlk sertifika tarihi 2018**

2021-05-10

TÜV Rheinland Cert GmbH  
Am Grauen Stein · 51105 Köln

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Verification  
Certification

# CERTIFICATE

**GEDİK İLERİ DÖKÜM  
TEKNOLOJİLERİ SANAYİ  
VETİCARET ANONİM ŞİRKETİ**

## Scope

Manufacturing and Sales Of Cast Iron, Steel Ductile Iron, Stainless Steel, Aluminium and Copper Alloy, Products Produced By, Sand Casting and Investment Casting

## Address(es)

Kargalıhanbaba OSB Mah. Organize Sanayi 2 Sok. No:21  
Hendek/SAKARYA

## ISO 14001:2015 ENVIRONMENTAL MANAGEMENT SYSTEMS

Vericert Belgelendirme ve Gözetim Hizmetleri Ltd.Şti. has audited and registered this organization for meeting the requirements of the management system mentioned above. This certificate is valid for 3 years, only when the organization continues to comply with the requirements of "Vericert certification and audit requirements".



You can check the validity of your certificate is through 'vericert qr application', please download our application to your smartphone.

Certificate Number: VCR.TR.02.015152/R:05

Initial Certification Date: 25.11.2019

Renewal Date: 17.11.2022

Issue Date: 27.10.2023

Expiry Date: 24.11.2024

General Manager  
**Fuad Almeman**

Vericert Belgelendirme ve Gözetim Hizmetleri Ltd. Şti.  
Zümrütevler Mah. Ural Sk. No: 22 İç Kapı No: 18/Maltepe/ İstanbul  
T: +90 216 325 25 01 F: +90 216 325 73 79  
info@vericert.com.tr www.vericert.com.tr

Form 23-10.05.2022 R:04









*This certifies that*

**GEDIK TERMO VANA SAN TIC.A.S**

*has had the undermentioned product(s) examined, tested and certified as being of an appropriate quality and standard as required in the Water Supply (Water Fittings) Regulations and Scottish Water Byelaws, subject to scheme requirements being met when installed.*

*Model Numbers*

**EVA- RSGV SERIES RESILIENT SEATED GATE VALVES (PN16): DN50, DN100  
DN150, DN200, DN250, DN300, DN350, DN400, DN500, DN600**

*The certificate by itself is not evidence of a valid WRAS Approval. Confirmation of the current status of an approval must be obtained from the WRAS Approvals Directory ([www.wras.co.uk/directory](http://www.wras.co.uk/directory))*

*The product so mentioned will be valid until the end of:*

**September 2024**

*Certificate No.*

**1909111**

Ian Hughes,  
WRAS Approvals Manager





## Annex to certificate

Standard **ISO / TS 16949:2009**  
(3<sup>rd</sup> edition 2009-06-15)

Certificate-Registr-No. 01 111 1418393  
IATF-Certificate-No. 0237029

Remote Location: **GEDİK DÖKÜM VE VANA SAN. VE TİC. A.Ş.**  
SAKARYA 2.OSB 11 NO'LU YAN YOL NO.6  
TR - 54100 HENDEK-SAKARYA

Rem. Loc. Function: Human resources, policy making, sales,  
purchasing, warranty management

Certificate-Registr-No.: 01 111 1418393/01

Release date: 2016-04-27

  
TUV Rheinland Cert GmbH  
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Germany



2-IAO-QMC 01003

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# Gedik Termo Valve

## VALVES AND ARMATURES





## Gedik Casting and Valve

Gedik Casting and Valve, a subsidiary of Gedik Holding, has been manufacturing valves and armatures under TERMO brand since 1967.

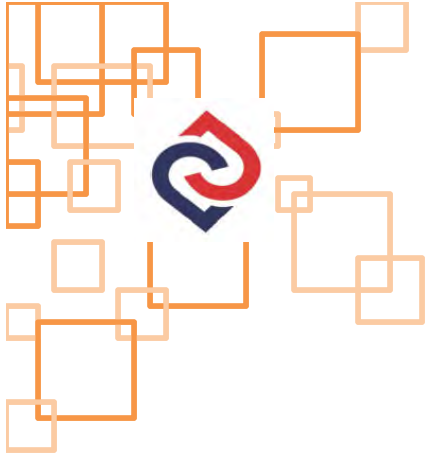
Gedik Casting and Valve, having advanced sand casting and precision casting capabilities, is the biggest integrated valve manufacturing company of Turkey with its 25,000 m<sup>2</sup> manufacturing facilities located in Hendek/Sakarya. The headquarter of the company is based in Pendik/Istanbul.

Gedik Casting and Valve, meets the demands of a wide range of sectors including industrial facilities, power plants, chemistry, petroleum, shipbuilding and construction for steam, thermal oil, hot water, natural gas, chemical fluids, seawater and HVAC applications.

"TERMO" valves and armatures having technologically and functionally advanced design features are manufactured in compliance with the national and international standards such as ISO 9001:2008, TSE, CE, PED 97/23/EC, AD 2000-W0, AD 2000-HP0, API, Bureau Veritas, Turkish Lloyd, DNV, RINA, GOST, SEPRO.

Gedik Casting and Valve is a reliable partner of its customers both in domestic and international markets, by virtue of its energy saving, cost efficient and environment-friendly products thanks to its decades of experience in wide range of sectors, know-how and high quality service approach.





**Fields of Activities**

Valve Production

Sand Casting

Investment Casting



**Certification**

"TERMO" valves and armatures are manufactured in compliance with the national and international standards such as ISO 9001:2008, TSE, CE, PED 97/23/EC, AD 2000-W0, AD 2000-HP0, API, Bureau Veritas, Turkish Lloyd, DNV, RINA, GOST, SEPRO.



ISO 9001:2008

CE 0036

AD 2000 W0

Bureau Veritas

Turkish Lloyd

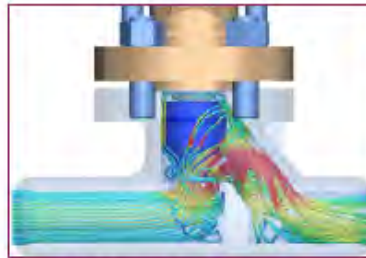
GOST





"TERMO" valves and armatures having technologically and functionally advanced design features are manufactured based on environment and user friendly principles such as high energy efficiency, improved safety and low maintenance.

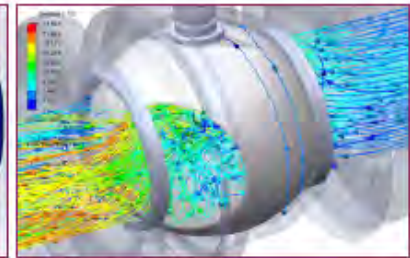
We invest in R&D to achieve desired solutions by controlling and monitoring each stage of casting process and design of valves with advanced casting and flow simulation softwares.



Globe Valve Flow Analysis



Angular Globe Valve  
Thermal and Mechanic Analysis



Ball Valve Flow Analysis



Industrial Facilities

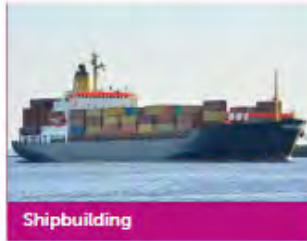


Power Plants

"TERMO" valves and armatures are used in wide range of sectors including industrial facilities, power plants, chemistry, petroleum, shipbuilding and construction.



Oil & Gas



Shipbuilding



HVAC



Chemistry





## GLOBE VALVE

| PRODUCT CODE          | TVGA120        | TVGA13F        | TVGA25F              | TVGA26F           | TVGA800        | TVGA80F        |
|-----------------------|----------------|----------------|----------------------|-------------------|----------------|----------------|
| NOMINAL PRESSURE      | PN16           | PN16           | PN25                 | PN40              | PN40           | PN40           |
| CONNECTIONS           | THREADED       | FLANGED        | FLANGED              | FLANGED           | THREADED       | FLANGED        |
| DIMENSIONS            | 1/2" - 2"      | DN15-300       | DN15-300             | DN15-300          | 1/2" - 2"      | DN15-300       |
| BODY MATERIAL         | GREY IRON GG25 | GREY IRON GG25 | DUCTILE IRON GGG40.3 | STEEL CAST GS-C25 | SS 316         | SS 316         |
| WORKING TEMP. MAX.    | 300°C (10 BAR) | 300°C (10 BAR) | 250°C (14 BAR)       | 400°C (21 BAR)    | 400°C (21 BAR) | 400°C (21 BAR) |
| WORKING PRESSURE MAX. | 16 BAR         | 16 BAR         | 25 BAR               | 40 BAR            | 40 BAR         | 40 BAR         |
| CONNECTION STANDART   | DIN 2999       | DIN 2533       | DIN 2534             | DIN 2545          | DIN 2999       | DIN 2545       |
| FACE TO FACE SIZE     | DIN 3202 - M9  | DIN 3202-F1    | DIN 3202-F1          | DIN 3202-F1       | DIN 3202 - M9  | DIN 3202-F1    |

**Option:** Soft Seal, Stellite Seat, Stellite Disc, Regulation Disc **Option:** Butt Welded



## BELLOWS SEALED GLOBE VALVE

| PRODUCT CODE          | TVGK12F           | TVGK26F                | TVGK36F             | TVGK66F           |
|-----------------------|-------------------|------------------------|---------------------|-------------------|
| NOMINAL PRESSURE      | PN16              | PN25                   | PN40                | PN40              |
| CONNECTIONS           | FLANGED           | FLANGED                | FLANGED             | FLANGED           |
| DIMENSIONS            | DN15-300          | DN15-300               | DN15-300            | DN15-300          |
| BODY MATERIAL         | GREY IRON (GG25)  | DUCTILE IRON (GGG40.3) | STEEL CAST (GS-C25) | SS 304/316        |
| BELLOWS MATERIAL      | SS 316TI (2Layer) | SS 316TI (3Layer)      | SS 316TI (3Layer)   | SS 316TI (3Layer) |
| WORKING TEMP. MAX.    | 300°C (10 BAR)    | 350°C (14 BAR)         | 400°C (21 BAR)      | 400°C (21 BAR)    |
| WORKING PRESSURE MAX. | 16 BAR            | 25 BAR                 | 40 BAR              | 40 BAR            |
| CONNECTION STANDART   | DIN 2533          | DIN 2534               | DIN 2545            | DIN 2545          |
| FACE TO FACE SIZE     | DIN 3202-F1       | DIN 3202-F1            | DIN 3202-F1         | DIN 3202-F1       |

**Option:** Soft Seal, Stellite Seat, Stellite Disc, Regulation Disc **Option:** Butt Welded





## PISTON TYPE VALVE

| PRODUCT CODE          | TVPA130         | TVPA13F         | TVPA20F         | TVPA30F         |
|-----------------------|-----------------|-----------------|-----------------|-----------------|
| NOMINAL PRESSURE      | PN16            | PN16            | PN40            | PN40            |
| CONNECTIONS           | THREADED        | FLANGED         | FLANGED         | FLANGED         |
| DIMENSIONS            | 1/2" - 2"       | DN15-200        | DN15-200        | DN15-200        |
| BODY MATERIAL         | GG25            | GG25            | GGG40.3         | GS-C25          |
| BALANCE PISTON DIM.   |                 | DN65-200        | DN65-200        | DN65-200        |
| RING MATERIAL         | CARBON GRAPHITE | CARBON GRAPHITE | CARBON GRAPHITE | CARBON GRAPHITE |
| WORKING TEMP. MAX.    | 300°C (10 BAR)  | 300°C (10 BAR)  | 350°C (21 BAR)  | 400°C (21 BAR)  |
| WORKING PRESSURE MAX. | 16 BAR          | 16 BAR          | 25 BAR          | 40 BAR          |
| CONNECTION STANDART   | DIN 2999        | DIN 2533        | DIN 2534        | DIN 2545        |
| FACE TO FACE SIZE     | DIN 3202 - M9   | DIN 3202-F1     | DIN 3202-F1     | DIN 3202-F1     |



## STRAINER-Y TYPE

| PRODUCT CODE          | TPTY130         | TPTY13F         | TPTY20F         | TPTY30F         | TPTY30F        |
|-----------------------|-----------------|-----------------|-----------------|-----------------|----------------|
| NOMINAL PRESSURE      | PN16            | PN16            | PN25            | PN40            | PN40           |
| CONNECTIONS           | THREADED        | FLANGED         | FLANGED         | FLANGED         | FLANGED        |
| DIMENSIONS            | 1/2" - 2"       | DN15-350        | DN15-300        | DN15-300        | DN15-300       |
| BODY MATERIAL         | GG25            | GG25            | GGG40.3         | GS-C25          | SS 304/316     |
| FILTER MATERIAL       | STAINLESS STEEL | STAINLESS STEEL | STAINLESS STEEL | STAINLESS STEEL | SS 304/316     |
| WORKING TEMP. MAX.    | 300°C (10 BAR)  | 300°C (10 BAR)  | 350°C (14 BAR)  | 400°C (21 BAR)  | 400°C (21 BAR) |
| WORKING PRESSURE MAX. | 16 BAR          | 16 BAR          | 25 BAR          | 40 BAR          | 40 BAR         |
| CONNECTION STANDART   | DIN 2999        | DIN 2533        | DIN 2534        | DIN 2535        | DIN 2535       |
| FACE TO FACE SIZE     | DIN 3202 - M9   | DIN 3202 - F1   | DIN 3202 - F1   | DIN 3202 - F1   | DIN 3202 - F1  |







### CHECK VALVE LIFT TYPE


| PRODUCT CODE          | TCVM150        | TCVA15F        | TCVA20F        | TCVA30F        |
|-----------------------|----------------|----------------|----------------|----------------|
| NOMINAL PRESSURE      | PN16           | PN16           | PN25           | PN40           |
| CONNECTIONS           | THREADED       | FLANGED        | FLANGED        | FLANGED        |
| DIMENSIONS            | 1/2" - 2"      | DN15-300       | DN15-300       | DN15-300       |
| BODY MATERIAL         | GG25           | GG25           | GG40.3         | GS-C25         |
| WORKING TEMP. MAX.    | 300°C (10 BAR) | 300°C (10 BAR) | 350°C (14 BAR) | 400°C (21 BAR) |
| WORKING PRESSURE MAX. | 16 BAR         | 16 BAR         | 25 BAR         | 40 BAR         |
| CONNECTION STANDART   | DIN 2998       | DIN 2533       | DIN 2534       | DIN 2535       |
| FACE TO FACE SIZE     | DIN 3202 - M8  | DIN 3202-F1    | DIN 3202-F1    | DIN 3202-F1    |



### SAFETY VALVE - SPRING LOADED

| PRODUCT CODE          | TEVM12F               | TEVM15F               |
|-----------------------|-----------------------|-----------------------|
| NOMINAL PRESSURE      | PN16                  | PN16                  |
| TYPE                  | FULL LIFT             | PROPORTIONAL          |
| CONNECTIONS           | FLANGED               | FLANGED               |
| DIMENSIONS            | DN25-100              | DN25-100              |
| BODY MATERIAL         | DUCTILE IRON (GG40.2) | DUCTILE IRON (GG40.3) |
| WORKING TEMP. MAX.    | 225 °C (10 BAR)       | 225 °C (10 BAR)       |
| WORKING PRESSURE MAX. | 16 BAR                | 16 BAR                |
| CONNECTION STANDART   | DIN 2533              | DIN 2533              |
| FACE TO FACE SIZE     | DIN 3202-F32          | DIN 3202-F32          |



 **Gedik Thermo Valve**





## FORGED STEEL GLOBE VALVE HIGH PRESSURE & TEMPERATURE

| PRODUCT CODE  | TVVA49B        | TVVA9B         | TVVA4EB         | TVVA4GB         |
|---|----------------|----------------|-----------------|-----------------|
| NOMINAL PRESSURE  | PN63/100       | PN63/100       | PN250           | PN500           |
| CONNECTIONS   | BUTT WELDED    | BUTT WELDED    | BUTT WELDED     | BUTT WELDED     |
| DIMENSIONS  | 1/2" - 2"      | 1/2" - 2"      | 1/2" - 2"       | 1/2" - 2"       |
| BODY MATERIAL   | C22.8 (A105)   | 17CrMo55       | C22.8           | C22.8           |
| WORKING TEMP. MAX.  | 450°C (21 BAR) | 550°C (21 BAR) | 400°C (110 BAR) | 400°C (264 BAR) |
| WORKING PRESSURE MAX.   | 63/100 BAR     | 63/100 BAR     | 250 BAR         | 500 BAR         |
| CONNECTION STANDART   | DIN 3239-1     | DIN 3239-1     | DIN 3239-1      | DIN 3239-1      |
| FACE TO FACE SIZE   | DIN 3202 -53   | DIN 3202 -53   | DIN 3202 -53    | DIN 3202 -53    |
| <b>Option Body Material:</b> 16Mo3 (1.5415), 13CrMo4-5 (1.7335), 17CrMo55 (1.7357)                          |                |                |                 |                 |
| <b>Option Internal Parts:</b> Stellite Seat, Stellite Disc, Regulation Disc <b>Option:</b> Actuator Adapter |                |                |                 |                 |

## STAINLESS STEEL BALL VALVE - THREADED - 2P/3P

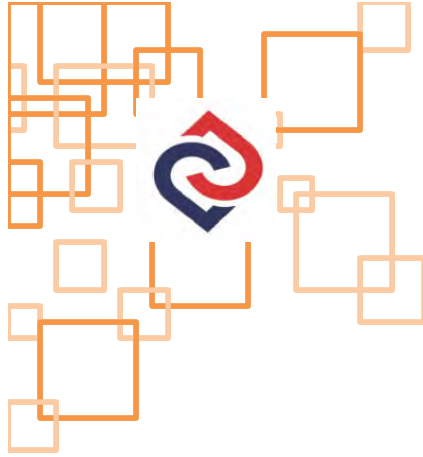


| PRODUCT CODE          | ZBVB68D       | ZBVE68D       | TBVE68B       | TBVE68C        |
|-----------------------|---------------|---------------|---------------|----------------|
| BODY DESIGN           | 2 PIECES      | 2 PIECES      | 3 PIECES      | 3 PIECES       |
| NOMINAL PRESSURE      | PN63          | PN63          | PN63          | PN63           |
| CONNECTIONS           | THREADED      | THREADED      | BUT WELDING   | SOCKET WELDING |
| DIMENSIONS            | 1/2" - 2"     | 1/2" - 2"     | 1/2" - 2"     | 1/2" - 2"      |
| BODY MATERIAL         | SS 304/316    | SS 304/316    | SS 304/316    | SS 304/316     |
| BALL MATERIAL         | SS 304/316    | SS 304/316    | SS 304/316    | SS 304/316     |
| GASKET MATERIAL       | PTFE          | PTFE          | PTFE          | PTFE           |
| WORKING TEMP. MAX.    | 180 °C        | 180 °C        | 180 °C        | 180 °C         |
| WORKING PRESSURE MAX. | 63 BAR        | 63 BAR        | 63 BAR        | 63 BAR         |
| CONNECTION STANDART   | DIN 2999      | DIN 2999      | DIN 3239-1    | DIN 3239-2     |
| FACE TO FACE SIZE     | DIN 3202 - M3 | DIN 3202 - M3 | DIN 3202 - 52 | DIN 3202 - M3  |

## STAINLESS STEEL BALL VALVE - FLANGED - 2P/3P



| PRODUCT CODE          | ZBVH63F       | ZBVE66F       |
|-----------------------|---------------|---------------|
| BODY DESIGN           | 2 PIECES      | 3 PIECES      |
| NOMINAL PRESSURE      | PN16          | PN40          |
| CONNECTIONS           | FLANGED       | FLANGED       |
| DIMENSIONS            | DN15-200      | DN15-100      |
| BODY MATERIAL         | SS 304/316    | SS 304/316    |
| BALL MATERIAL         | SS 304/316    | SS 304/316    |
| GASKET MATERIAL       | PTFE          | PTFE          |
| WORKING TEMP. MAX.    | 180 °C        | 180 °C        |
| WORKING PRESSURE MAX. | 16 BAR        | 40 BAR        |
| CONNECTION STANDART   | DIN 2533      | DIN 2535      |
| FACE TO FACE SIZE     | DIN 3202 - F4 | DIN 3202 - F1 |



## STAINLESS STEEL STRAINER

| PRODUCT CODE          | ZPTY56D       | ZPTY66D       | TPTY56F        | TPTY66F        |
|-----------------------|---------------|---------------|----------------|----------------|
| NOMINAL PRESSURE      | PN40          | PN40          | PN40           | PN40           |
| CONNECTIONS           | THREADED      | THREADED      | FLANGED        | FLANGED        |
| DIMENSIONS            | 1/2" - 2"     | 1/2" - 2"     | DN15-300       | DN15-300       |
| BODY MATERIAL         | SS 304        | SS 316        | SS 304         | SS 316         |
| FILTER MATERIAL       | SS 304        | SS 316        | SS 304         | SS 316         |
| WORKING TEMP. MAX.    | 180 °C        | 180 °C        | 400°C (21 BAR) | 400°C (21 BAR) |
| WORKING PRESSURE MAX. | 40 BAR        | 40 BAR        | 40 BAR         | 40 BAR         |
| CONNECTION STANDART   | DIN 2999      | DIN 2999      | DIN 2535       | DIN 2535       |
| FACE TO FACE SIZE     | DIN 3202 - M3 | DIN 3202 - M3 | DIN 3202 - F1  | DIN 3202 - F1  |

## STAINLESS STEEL DISC CHECK VALVE



| PRODUCT CODE          | TCVE56W        | TCVE66W        |
|-----------------------|----------------|----------------|
| NOMINAL PRESSURE      | PN40           | PN40           |
| CONNECTIONS           | WAFFER         | WAFFER         |
| DIMENSIONS            | DN15-100       | DN15-100       |
| BODY MATERIAL         | SS 304         | SS 316         |
| DISK MATERIAL         | SS 304         | SS 316         |
| WORKING TEMP. MAX.    | 400°C (21 BAR) | 400°C (21 BAR) |
| WORKING PRESSURE MAX. | 40 BAR         | 40 BAR         |
| FACE TO FACE SIZE     | DIN 3202 - K4  | DIN 3202 - K4  |

## STAINLESS STEEL SWING CHECK VALVE



| PRODUCT CODE          | ZCVC56D       | ZCVC66D       |
|-----------------------|---------------|---------------|
| NOMINAL PRESSURE      | PN40          | PN40          |
| CONNECTIONS           | THREADED      | THREADED      |
| DIMENSIONS            | 1/2" - 2"     | 1/2" - 2"     |
| BODY MATERIAL         | SS 304        | SS 316        |
| WORKING TEMP. MAX.    | 180 °C        | 180 °C        |
| WORKING PRESSURE MAX. | 40 BAR        | 40 BAR        |
| CONNECTION STANDART   | DIN 2999      | DIN 2999      |
| FACE TO FACE SIZE     | DIN 3202 - M3 | DIN 3202 - M3 |





## MONOBLOCK BALL VALVE - FIRE SAFE

| PRODUCT CODE          | TBVM36W       | TBVM66W       |
|-----------------------|---------------|---------------|
| NOMINAL PRESSURE      | PN40          | PN40          |
| CONNECTIONS           | WAFER         | WAFER         |
| DIMENSIONS            | DN15-150      | DN15-100      |
| BODY MATERIAL         | CARBON STEEL  | SS 304/316    |
| BALL MATERIAL         | SS 420        | SS 304/316    |
| GASKET MATERIAL       | PTFE          | PTFE          |
| WORKING TEMP. MAX.    | -29 / +180 °C | -29 / +180 °C |
| WORKING PRESSURE MAX. | 40 BAR        | 40 BAR        |



## COMPACT BALL VALVE - FLANGED

| PRODUCT CODE          | TBVM13P   |
|-----------------------|-----------|
| NOMINAL PRESSURE      | PN16      |
| CONNECTIONS           | FLANGED   |
| DIMENSIONS            | DN 40-200 |
| BODY MATERIAL         | GG25      |
| BALL MATERIAL         | SS 420    |
| GASKET MATERIAL       | PTFE      |
| WORKING TEMP. MAX.    | 180 °C    |
| WORKING PRESSURE MAX. | 16 BAR    |
| CONNECTION STANDART   | DIN 2533  |



## BALL VALVE- 2 PIECES - FULL BORE

| PRODUCT CODE          | TBVH13F       | TBVB13F       |
|-----------------------|---------------|---------------|
| NOMINAL PRESSURE      | PN16          | PN16          |
| CONNECTIONS           | FLANGED       | FLANGED       |
| DIMENSIONS            | DN40-125      | DN150-300     |
| BODY MATERIAL         | GG25          | GG25          |
| BODY DESIGN           | 2 PIECES - FB | 2 PIECES - FB |
| BALL MATERIAL         | SS 420        | SS 420        |
| GASKET MATERIAL       | PTFE          | PTFE          |
| WORKING TEMP. MAX.    | 180 °C        | 180 °C        |
| WORKING PRESSURE MAX. | 16 BAR        | 16 BAR        |
| CONNECTION STANDART   | DIN 2533      | DIN 2533      |
| FACE TO FACE SIZE     | DIN 3202 - F4 | DIN 3202 - F5 |



## BALL VALVE THREADED- FULL BORE

| PRODUCT CODE          | TBVE13D/TBVP13D  | TBVE36D/TBVP36D  |
|-----------------------|------------------|------------------|
| NOMINAL PRESSURE      | PN16             | PN40             |
| CONNECTIONS           | THREADED         | THREADED         |
| DIMENSIONS            | 1/2" - 2 1/2"    | 1/2" - 2 1/2"    |
| BODY MATERIAL         | GG25             | GS-C25           |
| BODY DESIGN           | 3 PIECES - FB/RB | 3 PIECES - FB/RB |
| BALL MATERIAL         | SS 420           | SS 420           |
| GASKET MATERIAL       | PTFE             | PTFE             |
| WORKING TEMP. MAX.    | 180 °C           | 180 °C           |
| WORKING PRESSURE MAX. | 16 BAR           | 40 BAR           |
| CONNECTION STANDART   | DIN 2999         | DIN 2999         |
| FACE TO FACE SIZE     | DIN 3202 - M3    | DIN 3202 - M3    |



## BALL VALVE FLANGED- FULL BORE

| PRODUCT CODE          | TBVE13F/TBVP13F  | TBVE25F/TBVP13F        | TBVE36F/TBVP36F |
|-----------------------|------------------|------------------------|-----------------|
| NOMINAL PRESSURE      | PN16             | PN25                   | PN40            |
| CONNECTIONS           | FLANGED          | FLANGED                | FLANGED         |
| DIMENSIONS            | DN15-300         | DN15-300               | DN150-300       |
| BODY MATERIAL         | GREY IRON (GG25) | DUCTILE IRON (GGG40.3) | STEEL (GS-C25)  |
| BODY DESIGN           | 3P/2P - FB/RB    | 3P/2P - FB/RB          | 3P/2P - FB/RB   |
| BALL MATERIAL         | SS 420           | SS 420                 | SS 420          |
| GASKET MATERIAL       | PTFE             | PTFE                   | PTFE            |
| WORKING TEMP. MAX.    | 180 °C           | 180 °C                 | 180 °C          |
| WORKING PRESSURE MAX. | 16 BAR           | 25 BAR                 | 40 BAR          |
| CONNECTION STANDART   | DIN 2533         | DIN 2534               | DIN 2535        |
| FACE TO FACE SIZE     | DIN 3202 - F1    | DIN 3202 - F1          | DIN 3202 - F1   |

## BALL VALVES FOR GAS - FULL BORE



| PRODUCT CODE          | TBDE36D/TBDP36D | TBDE25F/TBDP25F        | TBDE36F/TBDP36F |
|-----------------------|-----------------|------------------------|-----------------|
| NOMINAL PRESSURE      | PN40            | PN25                   | PN40            |
| CONNECTIONS           | THREADED        | FLANGED                | FLANGED         |
| DIMENSIONS            | 1/2" - 2"       | DN15-250               | DN15-250        |
| BODY MATERIAL         | STEEL (GS-C25)  | DUCTILE IRON (GGG40.3) | STEEL (GS-C25)  |
| BODY DESIGN           | 3P - FB/RB      | 3P - FB/RB             | 3P - FB/RB      |
| BALL MATERIAL         | SS 420          | SS 420                 | SS 420          |
| GASKET MATERIAL       | PTFE            | PTFE                   | PTFE            |
| WORKING TEMP. MAX.    | 180 °C          | 180 °C                 | 180 °C          |
| WORKING PRESSURE MAX. | 16 BAR          | 25 BAR                 | 40 BAR          |
| CONNECTION STANDART   | DIN 2999        | DIN 2534               | DIN 2535        |
| FACE TO FACE SIZE     | DIN 3202 - M3   | DIN 3202 - F1          | DIN 3202 - F1   |



## BALL VALVE API - ANSI (TRUNNION)

| PRODUCT CODE          | TBW34E               | TBW37E               |
|-----------------------|----------------------|----------------------|
| NOMINAL PRESSURE      | CLASS 150            | CLASS 300            |
| CONNECTIONS           | ANSI FLANGED         | ANSI FLANGED         |
| DIMENSIONS            | 2" - 12" (DN50-300)  | 2" - 12" (DN50-300)  |
| BODY MATERIAL         | STEEL (A216 WCB)     | STEEL (A216 WCB)     |
| BODY DESIGN           | FB/RB - 3 PIECES     | FB/RB - 3 PIECES     |
| BALL MATERIAL         | SS 420               | SS 420               |
| GASKET MATERIAL       | PTFE                 | PTFE                 |
| WORKING TEMP. MAX.    | 180 °C               | 180 °C               |
| WORKING PRESSURE MAX. | 20 BAR               | 50 BAR               |
| CONNECTION STANDART   | ANSI B16.5           | ANSI B16.5           |
| FACE TO FACE SIZE     | ANSI B16.10 - API 6D | ANSI B16.10 - API 6D |



## BRASS BALL VALVE

| PRODUCT CODE        | YBD893D      |
|---------------------|--------------|
| NOMINAL PRESSURE    | PN16         |
| CONNECTIONS         | THREADED     |
| DIMENSIONS          | 1/2" - 4"    |
| BODY MATERIAL       | MS58         |
| BALL MATERIAL       | MS58         |
| GASKET MATERIAL     | PTFE         |
| CONNECTION STANDART | EN ISO 228-1 |

## BRASS STRAINER



| PRODUCT CODE        | YPTY93D      |
|---------------------|--------------|
| NOMINAL PRESSURE    | PN16         |
| CONNECTIONS         | THREADED     |
| DIMENSIONS          | 1/2" - 2"    |
| BODY MATERIAL       | MS58         |
| FILTER MATERIAL     | STAINLESS    |
| CONNECTION STANDART | EN ISO 228-1 |

## BRASS CHECK VALVE



| PRODUCT CODE        | YCA93D       |
|---------------------|--------------|
| NOMINAL PRESSURE    | PN16         |
| CONNECTIONS         | THREADED     |
| DIMENSIONS          | 1/2" - 2"    |
| BODY MATERIAL       | MS58         |
| CONNECTION STANDART | EN ISO 228-1 |





## BUTTERFLY VALVE - WAFER

| PRODUCT CODE                   | TKVF23N            | TKVF23L                  |
|--------------------------------|--------------------|--------------------------|
| NOMINAL PRESSURE               | PN16               | PN16                     |
| CONNECTIONS                    | WAFER              | WAFER                    |
| DIMENSIONS                     | DN40-800           | DN40-800                 |
| BODY MATERIAL (DN40-300)       | GGG.40.3           | GGG.40.3                 |
| BODY MATERIAL (DN350-800)      | GGG40.3            | GGG40.3                  |
| DISC MATERIAL                  | GGG40.3            | SS 304 / SS 316 / CuSn10 |
| GASKET MATERIAL                | EPDM / NBR / VITON | EPDM / NBR / VITON       |
| WORKING TEMP. MAX.             | 110 °C             | 110 °C                   |
| WORKING PRESSURE MAX.          | 16 BAR             | 16 BAR                   |
| FACE TO FACE SIZE              | DIN 3202-K1        | DIN 3202-K1              |
| <b>Option:</b> Silicone Gasket |                    |                          |



## BUTTERFLY VALVE - LUG



| PRODUCT CODE                   | TKVB23N            | TKVB23L                  |
|--------------------------------|--------------------|--------------------------|
| NOMINAL PRESSURE               | PN16               | PN16                     |
| CONNECTIONS                    | LUG                | LUG                      |
| DIMENSIONS                     | DN40-800           | DN40-800                 |
| BODY MATERIAL (DN40-300)       | GGG.40.3           | GGG.40.3                 |
| BODY MATERIAL (DN350-800)      | GGG40.3            | GGG40.3                  |
| DISC MATERIAL                  | GGG40.3            | SS 304 / SS 316 / CuSn10 |
| GASKET MATERIAL                | EPDM / NBR / VITON | EPDM / NBR / VITON       |
| WORKING TEMP. MAX.             | 110 °C             | 110 °C                   |
| WORKING PRESSURE MAX.          | 16 BAR             | 16 BAR                   |
| FACE TO FACE SIZE              | DIN 3202-K1        | DIN 3202-K1              |
| <b>Option:</b> Silicone Gasket |                    |                          |





## GEAR BOX

| PRODUCT CODE                | ZAJR                |
|-----------------------------|---------------------|
| TORC RANGE                  | 300 - 2.000 Nm      |
| ADAPTER DIMENSIONS (SQUARE) | 9/11/14/17/22/27 mm |
| BODY MATERIAL               | GG25                |
| CONNECTIONS                 | ISO 5211            |



## PNEUMATIC ACTUATOR

| PRODUCT CODE   | YAKC          | YAKT          |
|--|---------------|---------------|
| TYPE   | DOUBLE ACTING | SINGLE ACTING |
| TORC   | 9 - 3.510 Nm  | 10 - 1.342 Nm |
| BODY MATERIAL  | ALUMINIUM     | ALUMINIUM     |
| CONNECTIONS  | ISO 5211      | ISO 5211      |
| Accessory: Solenoid Valve, Mechanical / Proximity Switch Box, Positioner |               |               |



## ELECTRICAL ACTUATOR

| PRODUCT CODE     | YAKE1000    | YAKE4000      |
|------------------|-------------|---------------|
| TYPE             | 24 VDC      | 220 VAC       |
| TORC             | 20 - 500 Nm | 20 - 9.000 Nm |
| PROTECTION CLASS | IP 67-68    | IP 67-68      |
| BODY MATERIAL    | ALUMINIUM   | ALUMINIUM     |
| CONNECTIONS      | ISO 5211    | ISO 5211      |



## GATE VALVE (SOFT SEAL)

| PRODUCT CODE          | ZVGA23F       |
|-----------------------|---------------|
| NOMINAL PRESSURE      | PN16          |
| CONNECTIONS           | FLANGED       |
| DIMENSIONS            | DN40-400      |
| BODY MATERIAL         | GGG40.3       |
| DISC                  | EPDM          |
| WORKING TEMP. MAX.    | 110 °C        |
| WORKING PRESSURE MAX. | 16 BAR        |
| CONNECTION STANDART   | DIN 2533      |
| FACE TO FACE SIZE     | DIN 3202 - F4 |



## GATE VALVE - STEEL

| PRODUCT CODE          | ZVHA33F       | ZVHA36F       | ZVGA38F       |
|-----------------------|---------------|---------------|---------------|
| NOMINAL PRESSURE      | PN16          | PN40          | PN63          |
| CONNECTIONS           | FLANGED       | FLANGED       | FLANGED       |
| DIMENSIONS            | DN50-200      | DN50-200      | DN50-150      |
| BODY MATERIAL         | GS-C25 (WCB)  | GS-C25 (WCB)  | GS-C25 (WCB)  |
| WORKING TEMP. MAX.    | 425 (16 BAR)  | 425 (20 BAR)  | 425 (20 BAR)  |
| WORKING PRESSURE MAX. | 16 BAR        | 40 BAR        | 63 BAR        |
| CONNECTION STANDART   | DIN 2533      | DIN 2535      | DIN 2536      |
| FACE TO FACE SIZE     | DIN 3202 - F5 | DIN 3202 - F7 | DIN 3202 - F7 |



## SWING CHECK VALVE-STEEL

| PRODUCT CODE          | ZCVC33F         | ZCVC36F         | ZCVC38F         |
|-----------------------|-----------------|-----------------|-----------------|
| NOMINAL PRESSURE      | PN16            | PN40            | PN63            |
| CONNECTIONS           | FLANGED         | FLANGED         | FLANGED         |
| DIMENSIONS            | DN50-200        | DN50-150        | DN50-150        |
| BODY MATERIAL         | GS-C25 (WCB)    | GS-C25 (WCB)    | GS-C25 (WCB)    |
| DISC MATERIAL         | STAINLESS STEEL | STAINLESS STEEL | STAINLESS STEEL |
| WORKING TEMP. MAX.    | 425 (16 BAR)    | 425 (20 BAR)    | 425 (20 BAR)    |
| WORKING PRESSURE MAX. | 16 BAR          | 40 BAR          | 63 BAR          |
| CONNECTION STANDART   | DIN 2533        | DIN 2535        | DIN 2536        |
| FACE TO FACE SIZE     | DIN 3202 - F1   | DIN 3202 - F1   | DIN 3202 - F2   |





## FIRE HYDRANT (ABOVE GROUND)

| PRODUCT CODE   | TYHC13F   | TYHC13F   | TYHC13F  |
|--|---|---|--|
| DIMENSIONS   | DN80  | DN100   | DN150  |
| HEIGHT (mm)  | 1.450   | 1.200/1.630/2.150   | 1.385/1.835  |
| NOMINAL PRESSURE   | PN16  | PN16  | PN16   |
| MATERIAL   | GG25  | GG25  | GG25   |
| evacuation capacity<br>(Vp=1bar)<br>Body Option: GGG40.3<br>design | single: 60.8 m <sup>3</sup> /h<br>double: 104.5 m <sup>3</sup> /h | single: 85 m <sup>3</sup> /h<br>double: 137 m <sup>3</sup> /h | single: 200 m <sup>3</sup> /h<br>double: 122 m <sup>3</sup> /h |

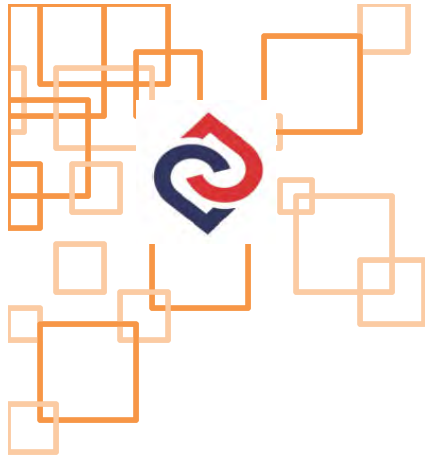


| TYHD13F | TYHD13F | TYHD13F |
|---------|---------|---------|
| DN80    | DN100   | DN150   |
| PN16    | PN16    | PN16    |
| GG25    | GG25    | GG25    |



## FIRE HYDRANT (UNDER GROUND)

| PRODUCT CODE     | TYHB13F | TYHK13 |
|------------------|---------|--------|
| DIMENSIONS       | DN80    | Cover  |
| NOMINAL PRESSURE | PN16    | PN16   |
| MATERIAL         | GG25    | GG25   |



## MANUALLY CONTROLLED BUTTERFLY VALVE

| PRODUCT CODE          |                        |
|-----------------------|------------------------|
| NOMINAL PRESSURE      | PN16/25                |
| CONNECTIONS           | FLANGED                |
| DIMENSIONS            | DN100 - DN2000         |
| BODY MATERIAL         | DUCTILE IRON (GGG40,3) |
| WORKING TEMP. MAX.    | 90°C                   |
| WORKING PRESSURE MAX. | PN16/25                |
| CONNECTION STANDART   | EN 1092-2              |
| FACE TO FACE SIZE     | TS EN 558-1            |



## DISMANTLING PART

| PRODUCT CODE          |                        |
|-----------------------|------------------------|
| NOMINAL PRESSURE      | PN16/25                |
| CONNECTIONS           | FLANGED                |
| DIMENSIONS            | DN50 - DN2000          |
| BODY MATERIAL         | DUCTILE IRON (GGG40,3) |
| WORKING TEMP. MAX.    | 90°C                   |
| WORKING PRESSURE MAX. | PN16/25                |

## TILTING CHECKVALVE



| PRODUCT CODE          |                        |
|-----------------------|------------------------|
| NOMINAL PRESSURE      | PN16/25                |
| CONNECTIONS           | FLANGED                |
| DIMENSIONS            | DN100 - DN1600         |
| BODY MATERIAL         | DUCTILE IRON (GGG40,3) |
| WORKING TEMP. MAX.    | 90°C                   |
| WORKING PRESSURE MAX. | PN16/25                |
| CONNECTION STANDART   | EN 1092-2              |
| FACE TO FACE SIZE     | TS EN 558-1            |

## KNIFE GATE VALVE



| PRODUCT CODE          |   |
|-----------------------|---|
| NOMINAL PRESSURE      | PN10/16   |
| CONNECTIONS           | WAFER   |
| DIMENSIONS            | DN50 - DN1400                                   |
| BODY MATERIAL         | DUCTILE IRON (GGG40,3) / GS-C25 / SS304 / SS316 |
| DISC MATERIAL         | AISI 304 / AISI 316                             |
| WORKING TEMP. MAX.    | 120°C   |
| WORKING PRESSURE MAX. | PN10/16   |





### IMPACT FREE DYNAMIC VACUUM LIFTER

### DOUBLE BALL VACUUM LIFTER

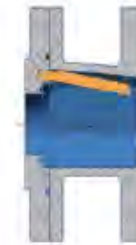
### SINGLE BALL VACUUM LIFTER

| PRODUCT CODE          |                        |                        |                        |
|-----------------------|------------------------|------------------------|------------------------|
| NOMINAL PRESSURE      | PN16/25                | PN16/25                | PN16/25                |
| CONNECTIONS           | FLANGED                | FLANGED                | FLANGED                |
| DIMENSIONS            | DN50 - DN200           | DN50 - DN250           | DN50 - DN250           |
| BODY MATERIAL         | DUCTILE IRON (GGG40.3) | DUCTILE IRON (GGG40.3) | DUCTILE IRON (GGG40.3) |
| WORKING TEMP. MAX.    | 70°C                   | 70°C                   | 70°C                   |
| WORKING PRESSURE MAX. | PN16/25                | PN16/25                | PN16/25                |
| CONNECTION STANDART   | EN 1092-2              | EN 1092-2              | EN 1092-2              |

### SWING CHECK VALVE-FLANGED



| PRODUCT CODE          |          |
|-----------------------|----------|
| NOMINAL PRESSURE      | PN16     |
| CONNECTIONS           | FLANGED  |
| DIMENSIONS            | DN15-300 |
| BODY MATERIAL         | GG25     |
| WORKING TEMP. MAX.    | 90°C     |
| WORKING PRESSURE MAX. | 16 BAR   |
| FACE TO FACE SIZE     | DIN 2533 |



### DUAL CHECK VALVE



| PRODUCT CODE          | ZCJN13W       | ZCJF13W       |
|-----------------------|---------------|---------------|
| NOMINAL PRESSURE      | PN16          | PN16          |
| CONNECTIONS           | WAFER         | WAFER         |
| DIMENSIONS            | DN50-350      | DN40-350      |
| BODY MATERIAL         | GG25          | GG25          |
| KLAPE                 | GGG40.3       | SS 316        |
| WORKING TEMP. MAX.    | 110 °C        | 110 °C        |
| WORKING PRESSURE MAX. | 16 BAR        | 16 BAR        |
| FACE TO FACE SIZE     | DIN 3202 - K4 | DIN 3202 - K4 |





## DISC CHECK VALVE

| PRODUCT CODE          | YCVE93W       | TCVE13W       |
|-----------------------|---------------|---------------|
| NOMINAL PRESSURE      | PN16          | PN16          |
| CONNECTIONS           | WAFER         | WAFER         |
| DIMENSIONS            | DN15-100      | DN125-200     |
| BODY MATERIAL         | MS58          | GG25          |
| WORKING TEMP. MAX.    | 250 °C        | 250 °C        |
| WORKING PRESSURE MAX. | 16 BAR        | 16 BAR        |
| FACE TO FACE SIZE     | DIN 3202 - K4 | DIN 3202 - K4 |



## CHECK VALVE LIFT TYPE

| PRODUCT CODE          | TCVA13D        | TCVA13F        | TCVA25F        | TCVA36F        |
|-----------------------|----------------|----------------|----------------|----------------|
| NOMINAL PRESSURE      | PN16           | PN16           | PN25           | PN40           |
| CONNECTIONS           | THREADED       | FLANGED        | FLANGED        | FLANGED        |
| DIMENSIONS            | 1/2" - 2"      | DN15-300       | DN15-300       | DN15-300       |
| BODY MATERIAL         | GG25           | GG25           | GGG40.3        | G5-C25         |
| WORKING TEMP. MAX.    | 300°C (10 BAR) | 300°C (10 BAR) | 350°C (14 BAR) | 400°C (21 BAR) |
| WORKING PRESSURE MAX. | 16 BAR         | 16 BAR         | 25 BAR         | 40 BAR         |
| CONNECTION STANDART   | DIN 2999       | DIN 2533       | DIN 2534       | DIN 2535       |
| FACE TO FACE SIZE     | DIN 3202 - M9  | DIN 3202-F1    | DIN 3202-F1    | DIN 3202-F1    |



## STOP CHECK VALVE (SDNR)

| PRODUCT CODE          | TCVA13D                     | TCVA13F                         | TCVA25F        |
|-----------------------|-----------------------------|---------------------------------|----------------|
| NOMINAL PRESSURE      | PN16                        | PN25                            | PN40           |
| CONNECTIONS           | FLANGED                     | FLANGED                         | FLANGED        |
| DIMENSIONS            | DN15-300                    | DN15-300                        | DN15-300       |
| BODY MATERIAL         | GREY IRON (GG25 EN GJL-250) | DUCTILE IRON (GGG40 EN GJS-400) | STEEL (G5-C25) |
| WORKING TEMP. MAX.    | 300°C (10 BAR)              | 350°C (14 BAR)                  | 400°C (21 BAR) |
| WORKING PRESSURE MAX. | 16 BAR                      | 25 BAR                          | 40 BAR         |
| CONNECTION STANDART   | DIN 2533                    | DIN 2534                        | DIN 2535       |
| FACE TO FACE SIZE     | DIN 3202-F1                 | DIN 3202-F1                     | DIN 3202-F1    |



## VIBRATION ABSORBERS WITH TIE - ROD

| PRODUCT CODE        |  |
|---------------------|--|
| EXPANSION           | 30 (-20/+10) mm  |
| CONNECTIONS         | FLANGED  |
| DIMENSIONS          | DN25-250   |
| BELLOWS MATERIAL    | AISI 321, STAINLESS STEEL (Optionel: AISI304/316L/316TI) |
| FLANCHED MATERIAL   | St. 37.2 CARBON STEEL (Optionel: AISI 304/316)           |
| NOMINAL PRESSURE    | PN16 (Opslyonet: PN25-.... PN64)                         |
| TEMPERATURE         | -80/+427 °C (Opslyonet: -80/+1100 °C)                    |
| CONNECTION STANDART | DIN 2533   |
| FACE TO FACE SIZE   | DIN 3202 - F4  |



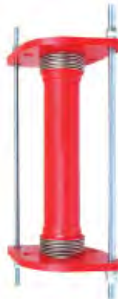
## AXIAL TYPE - LATERAL TYPE EXPANSION JOINTS

| PRODUCT CODE          | YJEB73R1   | YJEB73R5 | YJEC73R5 |
|-----------------------|--|----------|----------|
| EXPANSION             | 30 mm  |          | 60 mm    |
| LAYNER                | Without  | Without  | Without  |
| CONNECTIONS           | ROTATING FLANGED / FIXED FLANGED / BUTT WELDED           |          |          |
| DIMENSIONS            | DN25-250   |          | DN50-250 |
| BELLOWS MATERIAL      | AISI 321, STAINLESS STEEL (Optionel: AISI304/316L/316TI) |          |          |
| INNER SLEEVE MATERIAL | AISI 321, STAINLESS STEEL (Optionel: AISI304/316L/316TI) |          |          |
| FLANGE MATERIAL       | St 37.2 CARBON STEEL (Optionel: AISI 304/316)            |          |          |
| NOMINAL PRESSURE      | PN16 (Optionel: PN25 - PN64)                             |          |          |
| TEMPERATURE           | -80/+427 °C (Optionel: -80/+1100 °C)                     |          |          |



## EXTERNAL PRESSURIZED EXPANSION JOINTS

| PRODUCT CODE     | YJKB73S1   | YJKC73S1 | YJKD73S1 | YJKE73S1 |
|------------------|--|----------|----------|----------|
| CONNECTIONS      | FLANGED / BUTT WELDED                                    |          |          |          |
| EXPANSION        | 30 mm  | 60 mm    | 90 mm    | 120 mm   |
| DIMENSIONS       | DN25-250   |          |          |          |
| BELLOWS MATERIAL | AISI 321, STAINLESS STEEL (Optionel: AISI304/316L/316TI) |          |          |          |
| BODY MATERIAL    | St 37.2 CARBON STEEL (Optionel: AISI 304/316)            |          |          |          |
| FLANGE MATERIAL  | St 37.2 CARBON STEEL (Optionel: AISI 304/316)            |          |          |          |
| NOMINAL PRESSURE | PN16 (Optionel: PN25 - PN64)                             |          |          |          |
| TEMPERATURE      | -80/+427 °C (Optionel: -80/+1100 °C)                     |          |          |          |



## UNIVERSAL TYPE JOINTS WITH TIE RODS

| PRODUCT CODE         | YJMK73S1   | YJML73S1   | YJMM73S1   | YJMN73S1     |
|----------------------|--|------------|------------|--------------|
| LATERAL MOVEMENT     | -25/+25 mm   | -50/+50 mm | -75/+75 mm | -100/+100 mm |
| TOTAL AXIAL MOVEMENT | DN25-DN50 : 30 mm / DN65-300 : 60 mm                     |            |            |              |
| BELLOWS MATERIAL     | AISI 321, STAINLESS STEEL (Optionel: AISI304/316L/316TI) |            |            |              |
| BODY MATERIAL        | St. 37.2 CARBON STEEL (Optionel: AISI 304/316)           |            |            |              |
| CONNECTIONS          | FLANGED / BUTT WELDED                                    |            |            |              |
| DIMENSIONS           | DN25-250   |            |            |              |
| NOMINAL PRESSURE     | PN16 (Optionel: PN25-.... PN64)                          |            |            |              |
| TEMPERATURE          | -80/+427 °C (Optionel: -80/+1100 °C)                     |            |            |              |



## GIMBAL TYPE EXPANSION JOINTS

| PRODUCT CODE            | YJNP73S1   | YJNR73S1                               | YJNS73S1                               | YJNT73S1                               |
|-------------------------|--|--|--|--|
| EKSENEL HAREKET (X,Y,Z) | 100,100,100 mm<br>(-/+ ) 50,50,50 mm                     | 100,200,200 mm<br>(-/+ ) 50,100,100 mm | 100,300,300 mm<br>(-/+ ) 50,150,150 mm | 100,400,400 mm<br>(-/+ ) 50,200,200 mm |
| BELLOWS MATERIAL        | AISI 321, STAINLESS STEEL (Optionel: AISI304/316L/316TI) |  |  |  |
| BODY MATERIAL           | St. 37.2 CARBON STEEL (Optionel: AISI 304/316)           |  |  |  |
| CONNECTIONS             | FLANGED / BUTT WELDED                                    |  |  |  |
| DIMENSIONS              | DN25-250   |  |  |  |
| NOMINAL PRESSURE        | PN16 (Optionel: PN25-.... PN64)                          |  |  |  |
| TEMPERATURE             | -80/+427 °C (Opslyonet: -80/+1100 °C)                    |  |  |  |





## EXPANSION JOINTS ( FLEXIBLE RUBBER)

| PRODUCT CODE          | YJCBK3R                | YJCK3R     |
|-----------------------|------------------------|------------|
| CONNECTIONS           | FLANGED                | FLANGED    |
| DIMENSIONS            | DN25-300               | DN25-500   |
| BELLOWS MATERIAL      | EPDM / NBR             | EPDM / NBR |
| FLANGED MATERIAL      | DUCTILE IRON (GGG40.3) | STEEL      |
| WORKING PRESSURE MAX. | 10 BAR                 | 10 BAR     |
| WORKING TEMP. MAX.    | 90 °C                  | 90 °C      |
| CONNECTION STANDART   | DIN 2533               | DIN 2533   |



## EXPANSION JOINTS ( FLEXIBLE RUBBER) THREADED

| PRODUCT CODE          |              |
|-----------------------|--------------|
| CONNECTIONS           | THREADED     |
| DIMENSIONS            | 3/4" - 3"    |
| BELLOWS MATERIAL      | NEOPREN      |
| FLANGED MATERIAL      | GG25         |
| WORKING PRESSURE MAX. | 10 BAR       |
| WORKING TEMP. MAX.    | 90 °C        |
| CONNECTION STANDART   | EN ISO 228-1 |



## MAGNETIC TYPE LEVEL GAUGE

| PRODUCT CODE          |                             |                             |
|-----------------------|-----------------------------|-----------------------------|
| TYPE                  | BOILER TYPE                 | STANDART TYPE               |
| LENGHT                | 310 - 990 mm                | 300 - 2.000 mm              |
| BODY MATERIAL         | STAINLESS STEEL             | STAINLESS STEEL             |
| FLOAT BALL MATERIAL   | STAINLESS STEEL             | STAINLESS STEEL             |
| WORKING PRESSURE MAX. | 16 BAR                      | 16 BAR                      |
| WORKING TEMP. MAX.    | 400 °C                      | 200 °C                      |
| CONNECTIONS           | FLANGED DN20 (OPS. DN15/25) | FLANGED DN20 (OPS. DN15/25) |
| CONNECTION STANDART   | DIN 2533                    | DIN 2533                    |

\* It is possible to get the contact from the desired point by using the intitution element and control panel.



## MAGNETIC TYPE LEVEL GAUGE- PROPORTIONAL BAR

| PRODUCT CODE          |                             |
|-----------------------|-----------------------------|
| LENGHT                | 300 - 2.000 mm              |
| ANALOG OUTPUT         | 0-10 V / 4-20 mA            |
| BODY MATERIAL         | STAINLESS STEEL             |
| FLOAT BALL MATERIAL   | STAINLESS STEEL             |
| WORKING PRESSURE MAX. | 16 BAR                      |
| WORKING TEMP. MAX.    | 200 °C                      |
| CONNECTIONS           | FLANGED DN20 (OPS. DN15/25) |
| CONNECTION STANDART   | DIN 2533                    |

\* It is possible to get the contact from the desired point by using the intitution element and control panel.  
 \* Without using the digital panel; Direct 0-10 V / 4-20mA the level information can be transferred to the automation system by taking analog output, so it can be controlled via on / off controls and level-driven automation system.  
 \* With using the digital panel; 0-10 V / 4-20 mA The signal can be received and the level can be monitored on the panel. With 2 relay outputs, it is possible to receive alarms from 4 different points or contacts for start-stop operations.  
 \* RS 485 MODBUS RTU communication available.





## LEVEL SENSOR

| PRODUCT CODE          |                        |                    |                                      |
|-----------------------|------------------------|--------------------|--------------------------------------|
| INSTALLATION POSITION | Vertical               | CABLE              | 5x0,75 mm 2 Silicone Isolation       |
| PROSES CONNECTIONSSI  | G 1"                   | CABLE INPUT        | 3 PIECES Pg 11 Chrome Brass          |
| OPERATING PRESSURE    | 32 Barg / 238 °C       | FEEDING            | 220-420 Vac (Strid.)                 |
| CASING                | ALUMINIUM CASTING      | ELECTRODES AREA    | 6V Max.                              |
| CONNECTIONS MATERIAL  | 1.4571 STAINLESS STEEL | SENSITIVITY        | 1us/cm min. or 30us/cm min. Eligible |
| ELECTRODE INSULATION  | PTFE                   | OUTPUT             | Volt-free GASKETcts                  |
| ELECTRODE MATERIAL    | 1.4571 STAINLESS STEEL | RELATIONS          | Schrack RY 2110124 or equivalent     |
| SPACER MATERIAL       | PTFE                   | RELAY DELAY        | 3 sn.                                |
| INTERMEDIARY MATERIAL | STAINLESS STEEL        | ENVIRONMENTAL TEMP | 70 °C                                |
| ELECTRODE SIZE        | 500 - 1.000 - 1.500 mm | PROTECTION CLASS   | IP 65                                |
| ELECTRODE DIAMETER    | 4 mm                   | WEIGHT             | 2,9 Kg (L.1.000 mm)                  |



## REFLEX TYPE LEVEL GAUGE

| PRODUCT CODE          |              |
|-----------------------|--------------|
| DIMENSIONS            | 310 - 900 mm |
| BODY MATERIAL         | STEEL        |
| GLASS MATERIAL        | BOROSILICATE |
| WORKING TEMP. MAX.    | 250 °C       |
| WORKING PRESSURE MAX. | 16 BAR       |
| CONNECTIONS           | DN20 FLANGED |
| CONNECTION STANDART   | DIN 2533     |



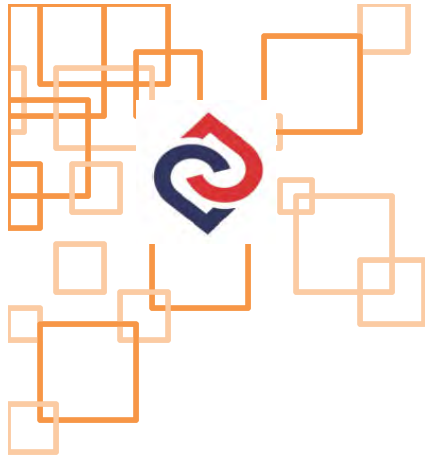
## SIGHT GLASS

| PRODUCT CODE        | YAGCL3D          | YAGCL3F                                    | YAGCL3F          |
|---------------------|------------------|--|------------------|
| WORKING TEMP. MAX.  | 150 °C           | 150 °C                                     | 250 °C           |
| NOMINAL PRESSURE    | PN16             | PN16                                       | PN16             |
| CONNECTIONS         | THREADED         | FLANGED                                    | FLANGED          |
| DIMENSIONS          | 1/2" - 2"        | DN15-150                                   | DN15-25          |
| BODY MATERIAL       | GREY IRON (GG25) | GREY IRON / DUCTILE IRON / STAINLESS STEEL | GREY IRON (GG25) |
| GLASS BODY MATERIAL | SEKURIT GLASS    | SEKURIT GLASS                              | BOROSILICATE     |
| CONNECTION STANDART | DIN 2999         | DIN 2533                                   | DIN 2533         |
| FACE TO FACE SIZE   | DIN 3202         | DIN 3202-F1                                | DIN 3202-F1      |



## LEVEL GAUGE- HS-6

| PRODUCT CODE          |                 |
|-----------------------|-----------------|
| FLOAT BALL            | STAINLESS STEEL |
| FLANGE                | STEEL (St. 37)  |
| NOMINAL PRESSURE      | PN10            |
| WORKING PRESSURE MAX. | 160 °C          |



### STEAM TRAP - INVERTED BUCKED TYPE

| PRODUCT CODE          | TSTK13D                   | TSTL13D                  | TSTL13F                  |
|-----------------------|---------------------------|--------------------------|--------------------------|
| NOMINAL PRESSURE      | PN16                      | PN16                     | PN16                     |
| TYPE                  | BOTTOM INLET - TOP OUTLET | SIDE INLET - SIDE OUTLET | SIDE INLET - SIDE OUTLET |
| CONNECTIONS           | THREADED                  | THREADED                 | FLANGED                  |
| DIMENSIONS            | 1/2" - 2"                 | 1/2" - 1"                | DN15-50                  |
| BODY MATERIAL         | GREY IRON (GG25)          | GREY IRON (GG25)         | GREY IRON (GG25)         |
| WORKING TEMP. MAX.    | 225 °C (10 BAR)           | 225 °C (10 BAR)          | 225 °C (10 BAR)          |
| WORKING PRESSURE MAX. | 16 BAR                    | 16 BAR                   | 16 BAR                   |
| CONNECTION STANDART   | DIN ISO 228-1             | DIN ISO 228-1            | DIN 2533                 |



### STEAM TRAP - TERMO & RIFOX

| PRODUCT CODE          | TSTR21D                | TSTR21F                |
|-----------------------|------------------------|------------------------|
| NOMINAL PRESSURE      | PN16                   | PN16                   |
| CONNECTIONS           | THREADED               | FLANGED                |
| DIMENSIONS            | 1/2" - 1"              | DN15-50                |
| BODY MATERIAL         | DUCTILE IRON (GGG40.3) | DUCTILE IRON (GGG40.3) |
| FLOAT BALL MATERIAL   | STAINLESS STEEL        | STAINLESS STEEL        |
| WORKING PRESSURE MAX. | 16 BAR                 | 16 BAR                 |
| WORKING TEMP. MAX.    | 350°C (11,2 BAR)       | 350°C (11,2 BAR)       |
| CONNECTION STANDART   | EN ISO 228-1           | DIN 2533               |

### STEAM TRAP - BALL FLOAT



| PRODUCT CODE          | TFTS21D                | TFTS21F                |
|-----------------------|------------------------|------------------------|
| NOMINAL PRESSURE      | PN16                   | PN16                   |
| CONNECTIONS           | THREADED               | FLANGED                |
| DIMENSIONS            | 1/2" - 1"              | DN15-50                |
| BODY MATERIAL         | DUCTILE IRON (GGG40.3) | DUCTILE IRON (GGG40.3) |
| FLOAT BALL MATERIAL   | STAINLESS STEEL        | STAINLESS STEEL        |
| WORKING PRESSURE MAX. | 16 BAR                 | 16 BAR                 |
| WORKING TEMP. MAX.    | 250 °C                 | 250 °C                 |
| CONNECTION STANDART   | EN ISO 228-1           | DIN 2533               |

### STEAM TRAP - THERMODYNAMIC



| PRODUCT CODE          | TSTT44D              | TSTT44F              |
|-----------------------|----------------------|----------------------|
| NOMINAL PRESSURE      | PN40                 | PN40                 |
| CONNECTIONS           | THREADED             | FLANGED              |
| DIMENSIONS            | 1/2" - 1"            | DN15-25              |
| BODY MATERIAL         | FORGED STEEL (C22.8) | FORGED STEEL (C22.8) |
| WORKING TEMP. MAX.    | 400°C                | 400°C (C22.8)        |
| WORKING PRESSURE MAX. | 40 BAR               | 40 BAR               |
| CONNECTION STANDART   | EN ISO 228-1         | DIN 2533             |



## STEAM TRAP - THERMOSTATIC



| PRODUCT CODE          | TSTC46D/F                | ZSRB46D/F                |
|-----------------------|--------------------------|--------------------------|
| TYPE                  | THERMOSTATIC             | BI-METALIC               |
| NOMINAL PRESSURE      | PN40                     | PN40                     |
| CONNECTIONS           | THREADED / FLANGED       | THREADED / FLANGED       |
| DIMENSIONS            | 1/2" - 1" / DN15-50      | 1/2" - 1" / DN15-50      |
| BODY MATERIAL         | FORGED STEEL (C22.8)     | FORGED STEEL (C22.8)     |
| WORKING TEMP. MAX.    | 400 °C (24 BAR)          | 350 °C (24 BAR)          |
| WORKING PRESSURE MAX. | 40 BAR                   | 40 BAR                   |
| CONNECTION STANDART   | EN ISO 228-1 / EN 1092-1 | EN ISO 228-1 / EN 1092-1 |

## LIQUID DRAINER



| PRODUCT CODE          |                 |                 |
|-----------------------|-----------------|-----------------|
| NOMINAL PRESSURE      | PN16            | PN16            |
| CONNECTIONS           | THREADED        | FLANGED         |
| DIMENSIONS            | 1/2" - 1"       | DN15-25         |
| BODY MATERIAL         | STAINLESS STEEL | STAINLESS STEEL |
| WORKING TEMP. MAX.    | 250 °C          | 250 °C          |
| WORKING PRESSURE MAX. | 45 BAR          | 45 BAR          |
| CONNECTION STANDART   | EN ISO 228-1    | DIN 2533        |

## LIQUID DRAINER



| PRODUCT CODE          |                        |                        |
|-----------------------|------------------------|------------------------|
| NOMINAL PRESSURE      | PN16                   | PN16                   |
| CONNECTIONS           | THREADED               | FLANGED                |
| DIMENSIONS            | 1/2" - 1"              | DN15-25                |
| BODY MATERIAL         | DUCTILE IRON (GGG40.3) | DUCTILE IRON (GGG40.3) |
| WORKING PRESSURE MAX. | 16 BAR                 | 16 BAR                 |
| WORKING TEMP. MAX.    | 250 °C                 | 250 °C                 |
| CONNECTION STANDART   | EN ISO 228-1           | DIN 2533               |

## LIQUID DRAINER



| PRODUCT CODE          |                        |                        |
|-----------------------|------------------------|------------------------|
| NOMINAL PRESSURE      | PN16                   | PN16                   |
| CONNECTIONS           | THREADED               | FLANGED                |
| DIMENSIONS            | 1/2" - 1"              | DN15-25                |
| BODY MATERIAL         | DUCTILE IRON (GGG40.3) | DUCTILE IRON (GGG40.3) |
| WORKING PRESSURE MAX. | 250 °C                 | 250 °C                 |
| WORKING TEMP. MAX.    | 16 BAR                 | 16 BAR                 |
| CONNECTION STANDART   | EN ISO 228-1           | DIN 2533               |





### VACUUM BREAKER

| PRODUCT CODE          | PN25            | PN16         |
|-----------------------|-----------------|--------------|
| NOMINAL PRESSURE      | PN25            | PN16         |
| CONNECTIONS           | THREADED        | THREADED     |
| DIMENSIONS            | 1/2"            | 1/2"         |
| BODY MATERIAL         | STAINLESS STEEL | MS58         |
| WORKING TEMP. MAX.    | 400 °C          | 260 °C       |
| WORKING PRESSURE MAX. | 25 BAR          | 16 BAR       |
| CONNECTION STANDART   | EN ISO 228-1    | EN ISO 228-1 |



### STEAM SEPERATOR

| PRODUCT CODE          | STEEL (St. 37.2)      | STAINLESS STEEL       |
|-----------------------|-----------------------|-----------------------|
| BODY MATERIAL         | STEEL (St. 37.2)      | STAINLESS STEEL       |
| NOMINAL PRESSURE      | PN16                  | PN16                  |
| CONNECTIONS           | FLANGED / BUTT WELDED | FLANGED / BUTT WELDED |
| DIMENSIONS            | DN15-200 / 1/2" - 2"  | DN15-200 / 1/2" - 2"  |
| WORKING TEMP. MAX.    | 300 °C (10 BAR)       | 300 °C (10 BAR)       |
| WORKING PRESSURE MAX. | 13 BAR                | 13 BAR                |
| CONNECTION STANDART   | DIN 2533              | DIN 2533              |



### CONDENSATE PUMP

| PRODUCT CODE          | ZSRV03F          |
|-----------------------|------------------|
| NOMINAL PRESSURE      | PN16             |
| CONNECTIONS           | FLANGED          |
| DIMENSIONS            | DN25-60          |
| BODY MATERIAL         | STEEL (St. 37.2) |
| WORKING TEMP. MAX.    | 250 °C (13 BAR)  |
| WORKING PRESSURE MAX. | 16 BAR           |
| CONNECTION STANDART   | DIN EN 1092-1    |

\* WORKS WITH STEAM OR AIR PRESSURE

### CHECK VALVE - DIN / ANSI

| PRODUCT CODE        | CVFFAW                            |
|---------------------|-----------------------------------|
| NOMINAL PRESSURE    | PN16                              |
| CONNECTIONS         | ANSI/DIN                          |
| DIMENSIONS          | DN50-600                          |
| BODY MATERIAL       | Rg5 / Rg10 / CuSn10 / Al-Bronzite |
| CONNECTION STANDART | DIN EN 558-1 SERIE 20             |



### DISMANTLING JOINT - DIN / ANSI

| PRODUCT CODE        |                                 |
|---------------------|---------------------------------|
| NOMINAL PRESSURE    | CLASS 125/150                   |
| CONNECTIONS         | FLANGED                         |
| DIMENSIONS          | DN50-2600                       |
| BODY MATERIAL       | ASTM A 36 STEEL / GGG40 3       |
| CONNECTION STANDART | EN1092 / AWWA C207 / ANSI B16.1 |



### DISMANTLING JOINT - DIN / ANSI

| PRODUCT CODE        |                                 |
|---------------------|---------------------------------|
| NOMINAL PRESSURE    | CLASS 125/150                   |
| CONNECTIONS         | FLANGED                         |
| DIMENSIONS          | DN50-2600                       |
| BODY MATERIAL       | ASTM A 36 STEEL / GGG40 3       |
| CONNECTION STANDART | EN1092 / AWWA C207 / ANSI B16.1 |



### GLOBE VALVE

| PRODUCT CODE        | TVGC28F         |
|---------------------|-----------------|
| NOMINAL PRESSURE    | PN10            |
| CONNECTIONS         | FLANGED         |
| DIMENSIONS          | DN32-125        |
| BODY MATERIAL       | Rg5/Rg10/CuSn10 |
| CONNECTION STANDART | DIN 86257       |
| FACE TO FACE SIZE   | DIN 86257       |



### AIR RELEASE VALVE (ARV)

| PRODUCT CODE     | TZMFI30150                      |
|------------------|---------------------------------|
| NOMINAL PRESSURE | PN10 / PN16, CLASS125,CLASS150  |
| CONNECTIONS      | FLANGED                         |
| DIMENSIONS       | DN150                           |
| BODY MATERIAL    | Rg5 / Rg10 / CuSn10 / Al-Bronze |
| DESIGN CODE      | AWWA C512                       |



### GLOBE VALVE / SDNR

| PRODUCT CODE            | TVG82G                              | TVG82G                              |
|-------------------------|-------------------------------------|-------------------------------------|
| NOMINAL PRESSURE        | PN10                                | PN10                                |
| CONNECTIONS             | FLANGED                             | FLANGED                             |
| DIMENSIONS              | DN15-32                             | DN40-200                            |
| BODY MATERIAL           | Rg5/Rg10/CuSn10                     | Rg5/Rg10/CuSn10                     |
| CONNECTION STANDART     | VG 85011-3                          | VG 85011-3                          |
| FACE TO FACE SIZE       | VG 85033-1 Form B VG 85033-1 Form D | VG 85033-2 Form B VG 85033-2 Form D |
| <b>Option:</b> DIN NORM |                                     |                                     |



### ANGLE TYPE GLOBE VALVE / SDNR

| PRODUCT CODE            | TVG82G                              | TVG82G                              |
|-------------------------|-------------------------------------|-------------------------------------|
| NOMINAL PRESSURE        | PN10                                | PN10                                |
| CONNECTIONS             | FLANGED                             | FLANGED                             |
| DIMENSIONS              | DN15-32                             | DN40-350                            |
| BODY MATERIAL           | Rg5/Rg10/CuSn10                     | Rg5/Rg10/CuSn10                     |
| CONNECTION STANDART     | VG 85011-3                          | VG 85011-3                          |
| FACE TO FACE SIZE       | VG 85034-3 Form B VG 85034-2 Form D | VG 85034-3 Form B VG 85034-2 Form D |
| <b>Option:</b> DIN NORM |                                     |                                     |



### COMBINATION AIR RELEASE VALVE (CAV)

| PN10 / PN16, CLASS125, CLASS150 | TZHRF10150                      |
|---------------------------------|---------------------------------|
| FLANGED                         | PN10 / PN16, CLASS125, CLASS150 |
| DN150                           | FLANGED                         |
| Rg5 / Rg10 / CuSn10 / Al-Bronze | DN150                           |
| AWWA C512                       | Rg5 / Rg10 / CuSn10 / Al-Bronze |
| DESIGN CODE                     | AWWA C512                       |





### BUTTERFLY VALVE - VG

| PRODUCT CODE        | TKVG82M            | TKVC82M            |
|---------------------|--------------------|--------------------|
| NOMINAL PRESSURE    | PN10               | PN10               |
| CONNECTIONS         | WAFER              | FLANGED            |
| DIMENSIONS          | DN40-200           | DN40-200           |
| BODY MATERIAL       | Rg5/Rg10/CuSn10    | Rg5/Rg10/CuSn10    |
| GASKET MATERIAL     | EPDM / NBR / VITON | EPDM / NBR / VITON |
| CONNECTION STANDART | VG 85011-3         | VG 85011-3         |
| FACE TO FACE SIZE   | VG 85053           | VG 85054           |



### BUTTERFLY VALVE - DIN

| PRODUCT CODE        | TKVB83M            |
|---------------------|--------------------|
| NOMINAL PRESSURE    | PN16               |
| CONNECTIONS         | FLANGED            |
| DIMENSIONS          | DN40-300           |
| BODY MATERIAL       | Rg5/Rg10/CuSn10    |
| GASKET MATERIAL     | EPDM / NBR / VITON |
| CONNECTION STANDART | DIN EN 1092        |
| FACE TO FACE SIZE   | DIN 3202-K1        |



### BUTTERFLY VALVE DOUBLE FLANGED - DIN / ANSI

| PRODUCT CODE        | TKDAF3U                         | TKDAF4U   | TKDAF2U | TKDAF3U |
|---------------------|---------------------------------|-----------|---------|---------|
| NOMINAL PRESSURE    | CLASS 125                       | CLASS 150 | PN10    | PN16    |
| CONNECTIONS         | FLANGED                         |           |         |         |
| DIMENSIONS          | DN50-3000                       |           |         |         |
| BODY MATERIAL       | Rg5 / Rg10 / CuSn10 / Al-Bronze |           |         |         |
| GASKET MATERIAL     | EPDM / NBR / VITON              |           |         |         |
| DESIGN CODE         | ANSI / AWWA C504 / EN 593       |           |         |         |
| CONNECTION STANDART | EN 558 BASIC SERIE 13 / 14      |           |         |         |



## BUTTERFLY VALVE DOUBLE FLANGED - DIN / ANSI

| PRODUCT CODE        | KVZ81U                          | KVZ84U    | KVZ82U | KVZ83U |
|---------------------|---------------------------------|-----------|--------|--------|
| NOMINAL PRESSURE    | CLASS 125                       | CLASS 150 | PN10   | PN16   |
| CONNECTIONS         | FLANGED                         |           |        |        |
| DIMENSIONS          | DN50-200                        |           |        |        |
| BODY MATERIAL       | Rg5 / Rg10 / CuSn10 / Al-Bronze |           |        |        |
| GASKET MATERIAL     | EPDM / NBR / VITON              |           |        |        |
| DESIGN CODE         | ANSI / AWWA C504 / EN 593       |           |        |        |
| CONNECTION STANDART | DOUBLE FLANGE TYPE SERIE 14     |           |        |        |

## BALL VALVE

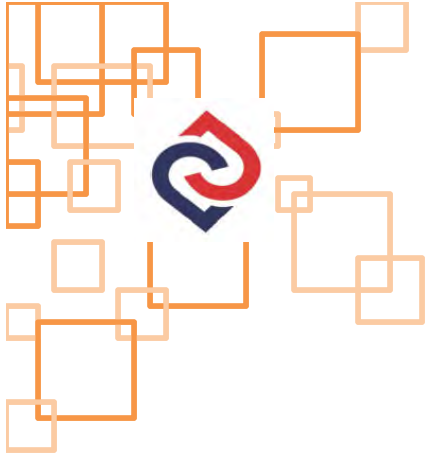


| PRODUCT CODE        | TBVER2G         | TBVER2D         |
|---------------------|-----------------|-----------------|
| NOMINAL PRESSURE    | PN16            | PN16            |
| CONNECTIONS         | FLANGED         | THREADED        |
| DIMENSIONS          | DN15-100        | 1/2" - 2"       |
| MALZEME             | Rg5/Rg10/CuSn10 | Rg5/Rg10/CuSn10 |
| CONNECTION STANDART | VG 85011-3      | DIN 2999        |
| FACE TO FACE SIZE   | DIN 3202-F1     | DIN 3202-M3     |
| Option:             | NORMA DIN       |                 |

## FIRE VALVES



| PRODUCT CODE        | TYVC82G           | TYVD82G           |
|---------------------|-------------------|-------------------|
| NOMINAL PRESSURE    | PN10              | PN10              |
| CONNECTIONS         | FLANGED / TYPE    | FLANGED / TYPE    |
| DIMENSIONS          | DN50-65           | DN50-65           |
| MALZEME             | Rg5/Rg10/CuSn10   | Rg5/Rg10/CuSn10   |
| CONNECTION STANDART | VG 85011-3        | VG 85011-3        |
| FACE TO FACE SIZE   | VG 85056-1 TYPE C | VG 85056-1 TYPE D |



### DUAL CHECK VALVE

| PRODUCT CODE        | TCV82F              |
|---------------------|---------------------|
| NOMINAL PRESSURE    | PN16                |
| CONNECTIONS         | ZwischenflanschTYPE |
| DIMENSIONS          | DN50-150            |
| MATERIAL            | Rg5/Rg10/CuSn10     |
| CONNECTION STANDART | VG 85011-3          |
| FACE TO FACE SIZE   | DIN 3202-K1         |



### FLANGED CHECK VALVE

| PRODUCT CODE        | TCV13F          |
|---------------------|-----------------|
| NOMINAL PRESSURE    | PN16            |
| CONNECTIONS         | FLANGED         |
| DIMENSIONS          | DN15-300        |
| MATERIAL            | Rg5/Rg10/CuSn10 |
| CONNECTION STANDART | DIN EN 1092     |
| FACE TO FACE SIZE   | DIN 3202-K1     |

### EJECTOR



| PRODUCT CODE        | TE2K83G         |
|---------------------|-----------------|
| NOMINAL PRESSURE    | PN10            |
| CONNECTIONS         | FLANGED         |
| DIMENSIONS          | DN65/125/150    |
| MATERIAL            | Rg5/Rg10/CuSn10 |
| CONNECTION STANDART | VG 85011-3      |
| FACE TO FACE SIZE   | DIN 3202-K1     |





### GLOBE VALVE / SDNR

| PRODUCT CODE        | TYBAG24                             | TYBAG26                             |
|---------------------|-------------------------------------|-------------------------------------|
| NOMINAL PRESSURE    | PN10                                | PN10                                |
| CONNECTIONS         | FLANGED                             | FLANGED                             |
| DIMENSIONS          | DN15-32                             | DN40-200                            |
| BODY MATERIAL       | Rg5/Rg10/CuSn10                     | Rg5/Rg10/CuSn10                     |
| CONNECTION STANDANT | VG 85011-3                          | VG 85011-3                          |
| FACE TO FACE SIZE   | VG 85023-1 Form B VG 85023-1 Form D | VG 85023-2 Form B VG 85023-2 Form D |
| Option: DIN NORM    |                                     |                                     |



### ANGLE TYPE GLOBE VALVE / SDNR

| PRODUCT CODE        | TYBAG24           | TYBAG26           |
|---------------------|-------------------|-------------------|
| NOMINAL PRESSURE    | PN10              | PN10              |
| CONNECTIONS         | FLANGED           | FLANGED           |
| DIMENSIONS          | DN15-32           | DN40-200          |
| BODY MATERIAL       | Rg5/Rg10/CuSn10   | Rg5/Rg10/CuSn10   |
| CONNECTION STANDANT | VG 85011-3        | VG 85011-3        |
| FACE TO FACE SIZE   | VG 85024-1 Form B | VG 85024-2 Form D |
| Option: DIN NORM    |                   |                   |



### AIR RELEASE VALVE (ARV)

| PRODUCT CODE     | TYBAG26150                      |
|------------------|---------------------------------|
| NOMINAL PRESSURE | PN10 / PN16, CLASS125, CLASS150 |
| CONNECTIONS      | FLANGED                         |
| DIMENSIONS       | DN150                           |
| BODY MATERIAL    | Rg5 / Rg10 / CuSn10 / Al-Bronzo |
| DESIGN CODE      | AWWA C512                       |



### COMBINATION AIR RELEASE VALVE (CAV)

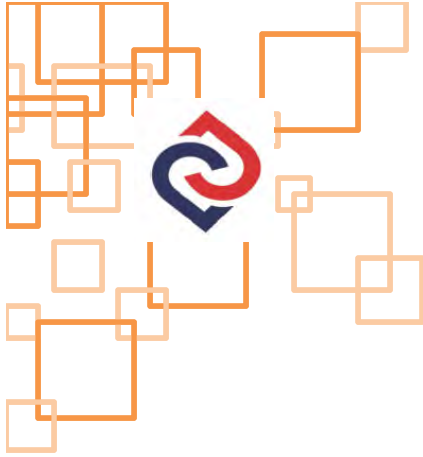
| PN10 / PN16, CLASS125, CLASS150 | TYBAG26150                      |
|---------------------------------|---------------------------------|
| FLANGED                         | PN10 / PN16, CLASS125, CLASS150 |
| DN150                           | FLANGED                         |
| Rg5 / Rg10 / CuSn10 / Al-Bronzo | DN150                           |
| AWWA C512                       | Rg5 / Rg10 / CuSn10 / Al-Bronzo |
| DESIGN CODE                     | AWWA C512                       |



### SHORT TYPE GLOBE VALVE / SHORT TYPE NON RETURN GLOBE VALVE (SDRN)

| PRODUCT CODE        | TYBAG24         | TYBAG26         |
|---------------------|-----------------|-----------------|
| NOMINAL PRESSURE    | PN10            | PN10            |
| CONNECTIONS         | FLANGED         | FLANGED         |
| DIMENSIONS          | DN20-125        | DN20-125        |
| BODY MATERIAL       | Rg5/Rg10/CuSn10 | Rg5/Rg10/CuSn10 |
| CONNECTION STANDANT | DIN 85380       | DIN 85380       |
| FACE TO FACE SIZE   | DIN 85254       | DIN 85252       |





### BUTTERFLY VALVE - VG

| PRODUCT CODE        | TR05003            | TR05004            |
|---------------------|--------------------|--------------------|
| NOMINAL PRESSURE    | PN10               | PN10               |
| CONNECTIONS         | WATER              | LUG                |
| DIMENSIONS          | DN40-200           | DN40-200           |
| BODY MATERIAL       | Rg5/Rg10/CuSn10    | Rg5/Rg10/CuSn10    |
| GASKET MATERIAL     | EPDM / NBR / VITON | EPDM / NBR / VITON |
| CONNECTION STANDARD | VG 85011-3         | VG 85011-3         |
| FACE TO FACE SIZE   | VG 85053           | VG 85054           |



### BUTTERFLY VALVE - DIN

| PRODUCT CODE        | TR05008            |
|---------------------|--------------------|
| NOMINAL PRESSURE    | PN16               |
| CONNECTIONS         | FLANGED            |
| DIMENSIONS          | DN40-300           |
| BODY MATERIAL       | Rg5/Rg10/CuSn10    |
| GASKET MATERIAL     | EPDM / NBR / VITON |
| CONNECTION STANDARD | DIN EN 1092        |
| FACE TO FACE SIZE   | DIN 3207-K1        |



### BUTTERFLY VALVE DOUBLE FLANGED - DIN / ANSI

| PRODUCT CODE        | TR04F10                         | TR04F40   | TR04F20 | TR04F30 |
|---------------------|---------------------------------|-----------|---------|---------|
| NOMINAL PRESSURE    | CLASS 125                       | CLASS 150 | PN10    | PN16    |
| CONNECTIONS         | FLANGED                         |           |         |         |
| DIMENSIONS          | DN50-2400                       |           |         |         |
| BODY MATERIAL       | Rg5 / Rg10 / CuSn10 / Al-Bronze |           |         |         |
| GASKET MATERIAL     | EPDM / NBR / VITON              |           |         |         |
| DESIGN CODE         | ANSI / APIWA C504 / EN 593      |           |         |         |
| CONNECTION STANDARD | EN 558 BASIC SERIE 13 / 14      |           |         |         |



### BUTTERFLY VALVE DOUBLE FLANGED - DIN / ANSI

| PRODUCT CODE        | TR07Z10                         | TR07Z40   | TR07Z20 | TR07Z30 |
|---------------------|---------------------------------|-----------|---------|---------|
| NOMINAL PRESSURE    | CLASS 125                       | CLASS 150 | PN10    | PN16    |
| CONNECTIONS         | FLANGED                         |           |         |         |
| DIMENSIONS          | DN50-200                        |           |         |         |
| BODY MATERIAL       | Rg5 / Rg10 / CuSn10 / Al-Bronze |           |         |         |
| GASKET MATERIAL     | EPDM / NBR / VITON              |           |         |         |
| DESIGN CODE         | ANSI / APIWA C504 / EN 593      |           |         |         |
| CONNECTION STANDARD | DOUBLE FLANGE TYPE SERIE 14     |           |         |         |





## BALL VALVE

| PRODUCT CODE        | TYV6205         | TYV6207         |
|---------------------|-----------------|-----------------|
| NOMINAL PRESSURE    | PN16            | PN16            |
| CONNECTIONS         | FLANGED         | THREADED        |
| DIMENSIONS          | DN15-100        | 1/2" - 2"       |
| MALZEME             | Rg5/Rg10/CuSn10 | Rg5/Rg10/CuSn10 |
| CONNECTION STANDARD | VG 85011-3      | DIN 2999        |
| FACE TO FACE SIZE   | DIN 5202-F1     | DIN 5202-M3     |
| Tipekod: NOKWAL10N  |                 |                 |



## DUAL CHECK VALVE

| PRODUCT CODE        | TYV6002                |
|---------------------|------------------------|
| NOMINAL PRESSURE    | PN16                   |
| CONNECTIONS         | Zweischtenflansch-TYPE |
| DIMENSIONS          | DN50-150               |
| MATERIAL            | Rg5/Rg10/CuSn10        |
| CONNECTION STANDARD | VG 85011-3             |
| FACE TO FACE SIZE   | DIN 5202-K1            |



## FLANGED CHECK VALVE

| PRODUCT CODE        | TYV6003         |
|---------------------|-----------------|
| NOMINAL PRESSURE    | PN16            |
| CONNECTIONS         | FLANGED         |
| DIMENSIONS          | DN15-300        |
| MATERIAL            | Rg5/Rg10/CuSn10 |
| CONNECTION STANDARD | DIN EN 1092     |
| FACE TO FACE SIZE   | DIN 5202-K1     |



## FIRE VALVES

| PRODUCT CODE        | TYV6004           | TYV6005           |
|---------------------|-------------------|-------------------|
| NOMINAL PRESSURE    | PN10              | PN10              |
| CONNECTIONS         | FLANGED / TYPE    | FLANGED / TYPE    |
| DIMENSIONS          | DN50-65           | DN50-65           |
| MALZEME             | Rg5/Rg10/CuSn10   | Rg5/Rg10/CuSn10   |
| CONNECTION STANDARD | VG 85011-3        | VG 85011-3        |
| FACE TO FACE SIZE   | VG 85036-1 TYPE C | VG 85036-1 TYPE D |

## EJECTOR

| PRODUCT CODE        | TEJ1000             |
|---------------------|---------------------|
| NOMINAL PRESSURE    | PN10                |
| CONNECTIONS         | FLANGED             |
| DIMENSIONS          | DN50/65/100/150/200 |
| MATERIAL            | Rg5/Rg10/CuSn10     |
| CONNECTION STANDARD | VG 85011-3          |







**Gedik** Advanced Casting Technologies





Gedik Advanced Casting Technologies provides to its customers a wide range of reliable and cost efficient solutions in cast iron, bronze, stainless steel, duplex stainless, low alloy and carbon steel casting.

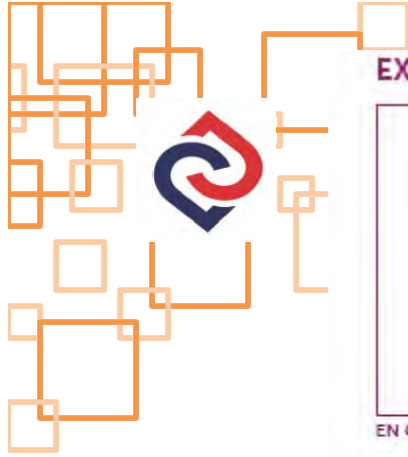
#### Features of Cast Iron Section

- 10.000 tonnes annual capacity
- Sinto FBO3 Molding Line (500 x 600 x 250/250mm) - 120 molds/hour capacity
- Sinto FBOX3 Molding Line (500 x 600 x 250/250mm) - 200 molds/hour capacity
- 2x 3 tonnes melting capacity induction furnace

#### Features of Steel, Stainless Steel and Bronze Section

- 3.000 tonnes annual capacity
- FTL Molding Line with 6 stations (1100 x 1100 x 450/450mm)
- 2x 2 tonnes melting capacity induction furnace
- 2x 1000 kg melting capacity induction furnace





## EXAMPLES OF SAND CASTING PARTS



EN GJS400-18 / 15 kg



EN GJS400-15 / 11 kg



High-Cr



1.4462 / 280 kg



Duplex Stainless Steel Pump Cover /  
1.4462 - 1200 kg



CuSn10 / 36 kg



CuSn10 / 14 kg



Al Bronze / 20 kg



CuSn10 / 125 kg





## Experts' Choice Gedik Welding

**Gedik Welding** was established in 1963 and today is one of the largest manufacturers in Europe exporting welding consumables and welding machines to more than 90 countries around the world under its internationally registered trademarks GeKa, GeKaTec and GeKaMac. The company also generates robotic solutions and welding automation equipment under the brand name ROBOWELD.





## C. Machine Sazi Arak

|                      |     |
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| Steam Boilers        | 217 |



**MACHINE SAZI ARAK**  
FIRE TUBE &  
WATER TUBE  
STEAM & HOT WATER BOILERS



## History

Machine Sazi Arak (MSA) was established in 1967 in an area of 134 hectares in the city of Arak in order to support underlying industries and meet the industrial needs of the country.

This knowledge-based company with over half a century of experience coupled with scientific and technical capabilities enjoy about 1700 highly qualified specialists, modern equipment and facilities in the form of five different production groups, three independent subsidiaries and a scientific and educational center. MSA is able to carry out major international and mega projects in form of EPC project and general contracting, able to produce a variety of metal products.

Some of the activities and products of MSA are as follows:

Engineering, procurement, construction, installation of oil, gas, petrochemical and power plant equipment including storage tanks, mobile and fixed pressure vessels, distillation towers, heat exchangers, air coolers, spherical tanks, indirect heat exchangers, mobile oil treating (MOT) units, gate valves and wellhead equipment, drilling rigs, process pumps for oil and gas industry, cranes and hydro mechanical equipment for dams, fire tube and water tube boilers as well as combination cycles boilers, bridges and heavy steel structures, production of alloy steels, pressure flanges, industrial rings, axle and railways tires, steel balls, heavy machining industrial furnaces as well as manufacturing machineries and plant equipment and industrial incinerators.







→ Steam boilers and hot water boilers as steam generators are now playing an important role in all industries including oil, gas, petrochemicals, food, textile, rubber and other industries.

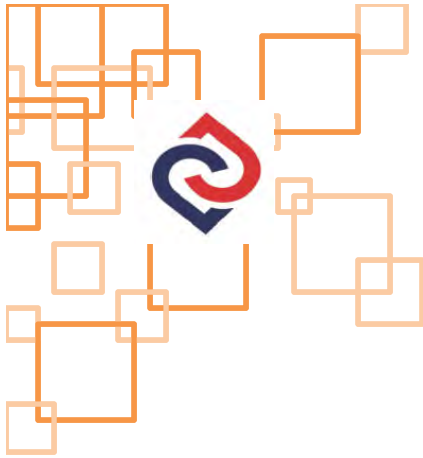
Machine Sazi Arak Co. as the first and largest manufacturer of such equipment in Iran and The Middle East under the license of John Thompson Co. (England) and now has over 50 years' experience in designing and fabrication of steam and hot water boilers and now with increasing share of the production of these equipment, has succeeded in fully integrating its technology as one of the companies owning technical know-how in the world.

Before the establishment of the Machine Sazi Arak, all the country's needs for steam boilers and even major repairs were carried out through foreign companies.

Machine Sazi Arak started manufacturing boilers with the following titles in series B and A:

- Mini Pack (Low capacity boilers series)
- Wee Chiften (Medium capacity boilers series)
- Multi Pack (High capacity boiler series)
- Cal Pack (Hot water series)

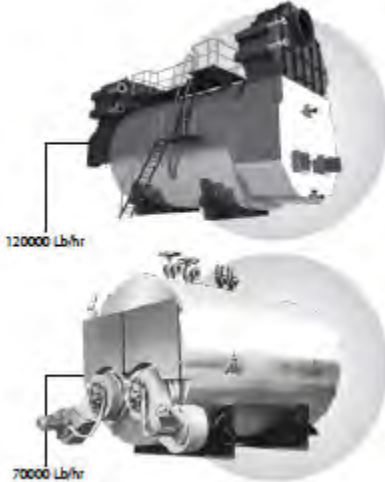




#### Company Certificates and Honors

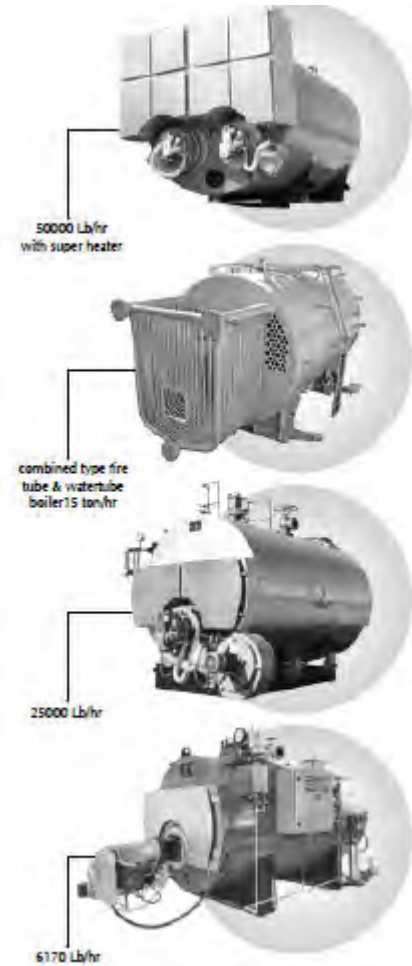
1. ISO 90001-2008 from TÜVNORD
2. Global Quality Management (GQM) from UK
3. National Standard Certificate from Iranian Institute for Standard & Industrial Research (for steam boilers)
4. Lloyd's Register Certificate for Valves
5. Organizational Excellence Certificate based on EFQM
6. Green Economy Crystal Statue (Twice)
7. Kaizen Official Citation
8. Qualification certificate of the company as a contractor awarded by Vice - Presidency for Strategic Planning and Supervision
  - Grade I for Installations & Equipment
  - Grade I for Power
  - Grade III for Industry & Mine
  - Grade I for Road & Transportation
  - Grade II for Power / Electricity
  - Grade I for Oil & Gas
9. Qualification certificate of Designing and Fabrication awarded by Vice - Presidency
  - Grade I for Road & Transportation
10. Crystal Statue for Sport, Labor and Industry
11. Total Quality Management (TQM)
12. Superior exporter of the country in 2001
13. Superior industrial unit for productivity in two consecutive years 2001 & 2002
14. Certificate awarded by Khwarizmi Festival and Ministry of Industries & Mines in 2001 and 2002
15. Superior R & D Unit for Izeh Open Spandrel Arch Bridges
16. Official Citation awarded by the Ministry of Petroleum for successful execution of South Pars Gas Field Development Project – Phases 4&5
17. Certificate awarded by the Department for Supervision over Industrial Safety of the Republic of Belarus.





### ► MSA boilers advantages

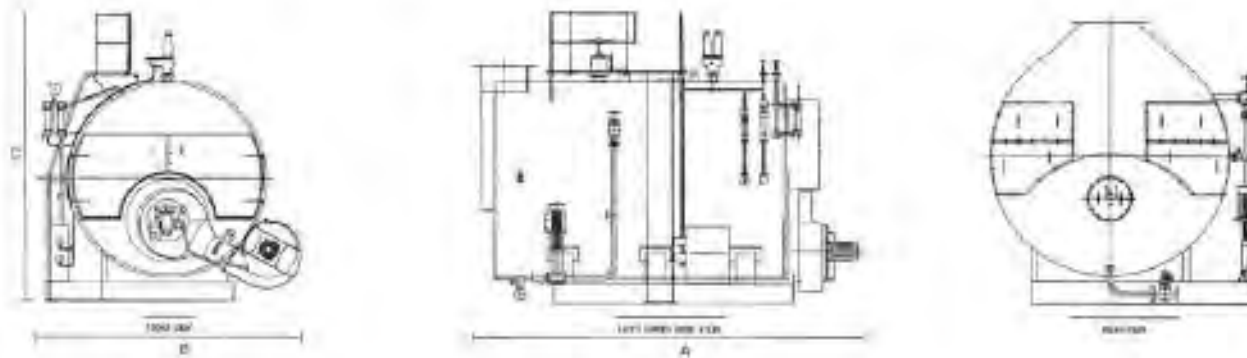
- \* Small size, high efficiency, easy installation & starting up as well as transportation.
- \* Applying the latest authentic standard in designing and materials.
- \* Quality control (QC) and quality assurance (QA) in all fabrication procedures.
- \* All process will be supervised by 3rd party insurance during manufacturing.
- \* Free operational and maintenance courses in MSA Co. training complex.
- \* Availability of spare parts and after sales services from authorized agencies.
- \* Engineering consultation in optimal selection of boilers.
- \* Equipped with safety and alarm systems.
- \* Ability of reaching to the maximum efficiency by changing the working pressure.
- \* Capability of installing superheater system for producing dry steam based on order.
- \* Ability of installing economizer to increase efficiency.
- \* Stress relieving at  $600 \pm 20 \text{ }^\circ\text{C}$
- \* Corrugated furnace
- \* Material supply from western Europe





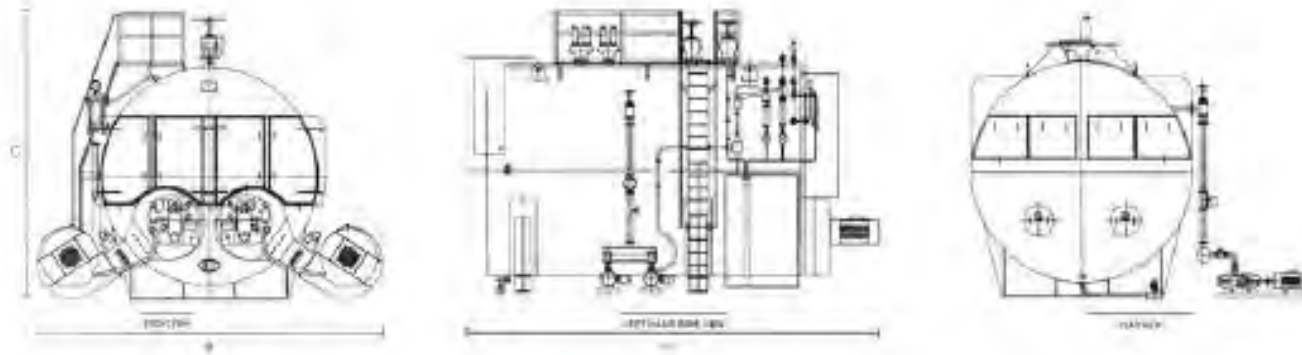


MSA fire tube boilers : A combination of technology and experience



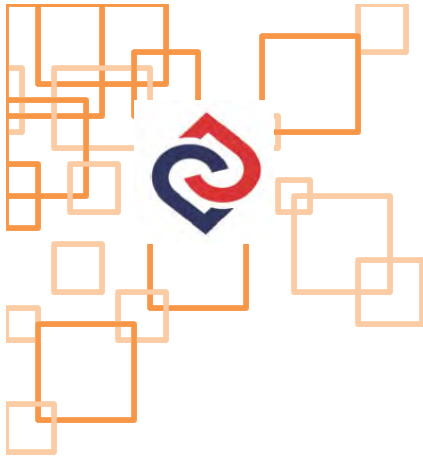
Single Burner Fire Tube Boilers in Low and Medium Capacity

| Weight (kg) |         |       | Fuel Consumption |                        | Chimney dimensions |          | Overall Dimensions(mm) |         |          | Generated Steam Temperature | Working pressure | Capacity  |      |       | Model  |     |
|-------------|---------|-------|------------------|------------------------|--------------------|----------|------------------------|---------|----------|-----------------------------|------------------|-----------|------|-------|--------|-----|
| Full        | Working | Empty | kg/Lit/hr        | kg/NM <sup>3</sup> /hr | Height             | Diameter | A Length               | B Width | C Height | °C                          | atg.             | Kcal/hr   | kW   | Kg/hr | Lbs/hr |     |
| 3276        | 3067    | 2499  | 35               | 38,5                   | 12200              | 230      | 2590                   | 1502    | 1868     | 185                         | 150              | 245,000   | 284  | 454   | 1000   | 1C  |
| 5230        | 4920    | 2670  | 83,1             | 91,4                   | 12200              | 230      | 3645                   | 2270    | 1975     | 185                         | 150              | 600,000   | 701  | 1120  | 2470   | 3C  |
| 6420        | 5948    | 4338  | 148              | 165,8                  | 12200              | 255      | 4268                   | 1886    | 2245     | 185                         | 150              | 1.100,000 | 1290 | 2000  | 4400   | 4C  |
| 9680        | 8940    | 6000  | 207              | 228,3                  | 12200              | 255      | 4354                   | 2430    | 2683     | 185                         | 150              | 1.500,000 | 1752 | 2800  | 6170   | 6C  |
| 17160       | 15460   | 10560 | 341              | 358                    | 12200              | 455      | 4385                   | 3150    | 3590     | 185                         | 150              | 2.400,000 | 2840 | 4530  | 10000  | 10C |
| 24550       | 21190   | 13550 | 496              | 520                    | 12200              | 535      | 5163                   | 3420    | 3993     | 185                         | 150              | 3.400,000 | 3976 | 6342  | 14000  | 14C |
| 35354       | 31184   | 18354 | 577              | 606                    | 12200              | 635      | 5697                   | 3616    | 4355     | 185                         | 150              | 4.400,000 | 5112 | 8154  | 18000  | 18C |
| 49466       | 45016   | 25690 | 827              | 869                    | 12200              | 710      | 6309                   | 3902    | 4629     | 185                         | 150              | 6.100,000 | 7100 | 11325 | 25000  | 25C |
| 57760       | 46824   | 29280 | 996              | 1044                   | 12200              | 813      | 7029                   | 4287    | 4940     | 185                         | 150              | 7.300,000 | 8520 | 13600 | 30000  | 30C |
| 64500       | 61500   | 34300 | 1155             | 1212                   | 12200              | 804      | 7920                   | 4500    | 5334     | 185                         | 150              | 8.500,000 | 9940 | 15855 | 35000  | 35C |



Twin Burner Boilers With High Capacity

| Weight (kg) |         |        | Fuel Consumption |                   | Chimney Dimensions |          | Overall Dimensions(mm) |         |          | Saturated Steam Temperature | Working pressure | Capacity   |       |       | Model  |      |
|-------------|---------|--------|------------------|-------------------|--------------------|----------|------------------------|---------|----------|-----------------------------|------------------|------------|-------|-------|--------|------|
| Full        | Working | Empty  | g/hr             | kJ/h <sup>2</sup> | Height             | Diameter | A Length               | B Width | E Height | °C                          | Bar              | Kcal/Hr    | Kw    | Kg/hr | Ltr/Hr |      |
| 305000      | 270000  | 55000  | 1654             | 1734              | 12193              | 3890     | 7775                   | 5580    | 6000     | 195                         | 170              | 10,210,000 | 34208 | 22700 | 50000  | 50C  |
| 150000      | 130000  | 20000  | 2175             | 2300              | 12190              | 3315     | 8330                   | 6100    | 6400     | 226                         | 302              | 13,430,000 | 35520 | 25000 | 55000  | 55C  |
| 360000      | 340000  | 80000  | 2330             | 2424              | 12193              | 3500     | 8560                   | 6700    | 6561     | 195                         | 200              | 17,090,000 | 39880 | 31000 | 70000  | 70C  |
| 155000      | 147000  | 85000  | 1990             | 2168              | 12193              | 3500     | 9000                   | 6000    | 5500     | 209                         | 261              | 19,540,000 | 22720 | 36000 | 80000  | 80C  |
| 300000      | 280000  | 90000  | 2601             | 2834              | 12190              | 2700     | 10000                  | 6300    | 7000     | 205                         | 232              | 21,980,000 | 25560 | 40000 | 90000  | 90C  |
| 250000      | 237000  | 101000 | 3196             | 3462              | 12190              | 2000     | 12000                  | 7000    | 8300     | 226                         | 362.5            | 29,300,000 | 34080 | 55000 | 120000 | 120C |



#### Mobile Steam Boilers

Output capacity : 2 tons/hr, saturated steam in 150 psi-g pressure which can be produced up to 5 tons/hr in various pressures according to customer order.

Boiler specification : Fire tube type, 3pass, design and fabrication according to BS2790-1992, The whole

package, including boiler, water, fuel tanks and electrical generator, can be transported without any road escorting.

Boiler auxiliary equipment: Water and fuel storage tanks with capacity of 2000lit and 4000lit respectively (can be increased according to customer order) equipped with level gauge valves, feed valve, steam stop valves, blow down valve, manhole, electrical diesel generator with 25kw output, for boiler electrical devices and lighting, 25tons trailer, 2axles, side walls, eight wheels, non-traffic, interconnecting-valves and piping acc. to ASME B31-3 standard

Application: steam supplying for areas that do not access to water, fuel, electricity for boiler operation, and need to steam in intermittent period, such as piping lines related to oil and gas industries, extraction of oil, road industries, mining industries, force major accidents, disaster and so on.

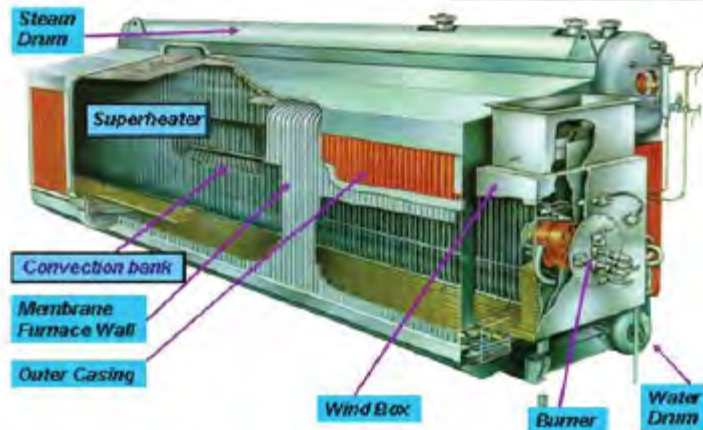






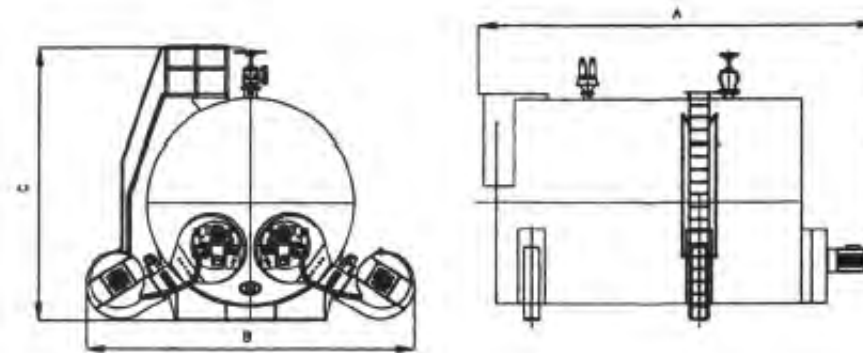
## Hot Water Boilers

| Weight (kg) |       | Fuel Consumption |                        | Chimney dimensions |          | Overall Dimensions(mm) |         |          | Max Working Pressure |       | Capacity   |                     |
|-------------|-------|------------------|------------------------|--------------------|----------|------------------------|---------|----------|----------------------|-------|------------|---------------------|
| Working     | Empty | kg/Li/HR         | kg/NM <sup>3</sup> /HR | Height             | Diameter | A Length               | B Width | C Height | Psig                 | Kw    | Kcal/Hr    | RM <sup>3</sup> /Hr |
| 3717        | 2950  | 35               | 38.5                   | 12200              | 230      | 2590                   | 1592    | 1868     | 150                  | 284   | 245,000    | 1,000,000           |
| 5230        | 3260  | 83.1             | 91.4                   | 12200              | 230      | 3645                   | 2270    | 1975     | 150                  | 701   | 600,000    | 2,400,000           |
| 6426        | 4318  | 148              | 168                    | 12200              | 255      | 4100                   | 1789    | 2345     | 150                  | 1250  | 1,075,000  | 4,000,000           |
| 9680        | 6000  | 207              | 228.3                  | 12200              | 355      | 4154                   | 2682    | 2400     | 150                  | 1752  | 1,500,000  | 6,000,000           |
| 10130       | 6450  | 298              | 303                    | 12200              | 355      | 4360                   | 1950    | 2980     | 150                  | 2390  | 2,000,000  | 8,000,000           |
| 17160       | 10560 | 341              | 358                    | 12200              | 435      | 4385                   | 3150    | 3590     | 150                  | 2840  | 2,450,000  | 10,000,000          |
| 17300       | 10700 | 410              | 430                    | 12200              | 435      | 4385                   | 3150    | 3990     | 150                  | 3408  | 2,940,000  | 12,000,000          |
| 24550       | 13550 | 495              | 520                    | 12200              | 535      | 5163                   | 3420    | 3991     | 150                  | 3976  | 3,420,000  | 14,000,000          |
| 35354       | 18354 | 577              | 606                    | 12200              | 635      | 5607                   | 3616    | 4295     | 150                  | 5112  | 4,850,000  | 18,000,000          |
| 49466       | 25600 | 827              | 869                    | 12200              | 710      | 6399                   | 3902    | 4629     | 150                  | 7100  | 6,100,000  | 24,000,000          |
| 51740       | 20280 | 096              | 1054                   | 12200              | 814      | 7020                   | 4237    | 4940     | 150                  | 8820  | 7,400,000  | 30,000,000          |
| 64500       | 34300 | 1155             | 1212                   | 12200              | 864      | 7920                   | 4500    | 5134     | 150                  | 9940  | 8,540,000  | 34,000,000          |
| 106000      | 56000 | 1654             | 1738                   | 12200              | 1080     | 7875                   | 5680    | 6000     | 150                  | 14290 | 12,400,000 | 50,000,000          |



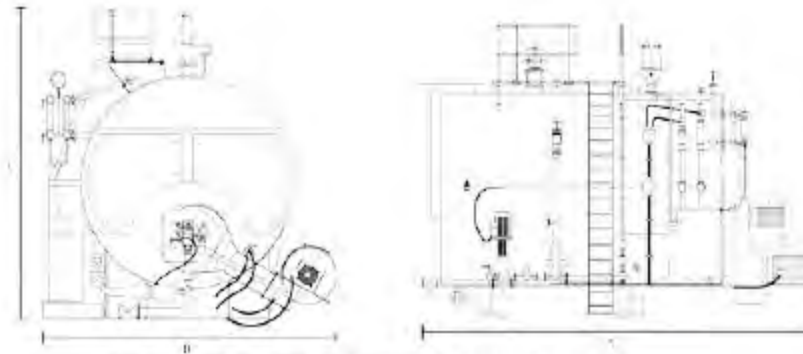
Water tube steam boiler  
 Steam capacity: 30TPH up to 90TPH  
 Working pressure: up to 100 barg  
 Steam temp. : up to 475 °C

After sales services  
 Free installation and training  
 24 months warranty after purchase or one year after starting up  
 Twice free services during the first year of starting up  
 Services presentation and providing spare parts after period  
 Agencies and after sales services offices in center of provinces  
 are ready to support the clients.



Twin burner boilers with high capacity

| Weight |         |        | Fuel consumption |       |                    |                     | Chimney dimensions (mm) |          | Overall dimensions (mm) |      |      | Working pressure | Capacity |       |        |
|--------|---------|--------|------------------|-------|--------------------|---------------------|-------------------------|----------|-------------------------|------|------|------------------|----------|-------|--------|
| Full   | Working | Empty  | Gas oil          |       | Gas                |                     | height                  | diameter | A                       | B    | C    | Pslg             | Kw       | Kg/Hr | Lbs/Hr |
|        |         |        | Kg/Hr            | Lb/Hr | M <sup>3</sup> /Hr | FT <sup>3</sup> /Hr |                         |          |                         |      |      |                  |          |       |        |
| 106000 | 97000   | 56000  | 1598             | 1654  | 1738               | 61352               | 12190                   | 1000     | 7200                    | 5680 | 6000 | 150              | 14216    | 22700 | 50000  |
| 124000 | 110000  | 63000  | 1852             | 1992  | 2090               | 73842               | 13000                   | 1000     | 7200                    | 5680 | 6000 | 360              | 15633    | 25000 | 55000  |
| 160000 | 140000  | 88000  | 2030             | 2175  | 2300               | 80500               | 12190                   | 1315     | 7230                    | 6700 | 6400 | 300              | 18744    | 30000 | 66000  |
| 165000 | 122000  | 85000  | 2088             | 2264  | 2424               | 85624               | 12000                   | 1220     | 8500                    | 6500 | 6500 | 200              | 19880    | 31818 | 70000  |
| 200000 | 187950  | 115000 | 3696             | 3982  | 4180               | 147594              | 12200                   | 1405     | 12260                   | 6000 | 8340 | 350              | 34086    | 55000 | 120000 |



Single burner boilers in low and medium capacity

| Weight |         |       | Fuel consumption |       |                    |                     | Chimney dimensions (mm) |          | Overall dimensions (mm) |      |      | Working pressure | Capacity |       |        |
|--------|---------|-------|------------------|-------|--------------------|---------------------|-------------------------|----------|-------------------------|------|------|------------------|----------|-------|--------|
| Full   | Working | Empty | Gas oil          |       | Gas                |                     | Height                  | Diameter | A                       | B    | C    | Psig             | Kw       | Kg/Hr | Lbs/Hr |
|        |         |       | Kg/Hr            | LT/Hr | M <sup>3</sup> /Hr | FT <sup>3</sup> /Hr |                         |          |                         |      |      |                  |          |       |        |
| 2533   | 2343    | 1827  | 52/8             | 56/5  | 58                 | 2048                | 12200                   | 206      | 2590                    | 1592 | 1868 | 150              | 285      | 455   | 1000   |
| 5230   | 4910    | 3260  | 77/3             | 83/1  | 91/4               | 3227                | 12200                   | 230      | 3396                    | 1625 | 1975 | 150              | 702      | 1220  | 2470   |
| 6105   | 5625    | 3971  | 110/4            | 118/7 | 130/3              | 4599                | 12200                   | 255      | 3922                    | 1905 | 2090 | 150              | 1001     | 1600  | 3520   |
| 6150   | 5670    | 4060  | 137/5            | 148   | 168/8              | 5749                | 12200                   | 255      | 3973                    | 1886 | 2345 | 150              | 1225     | 2000  | 4400   |
| 9680   | 8940    | 6000  | 192/7            | 207   | 228/3              | 8062                | 12200                   | 355      | 4154                    | 2490 | 2683 | 150              | 1755     | 2800  | 6170   |
| 12452  | 11856   | 9760  | 317              | 341   | 358                | 12641               | 12200                   | 455      | 4385                    | 3150 | 3590 | 150              | 2840     | 4530  | 10000  |
| 24200  | 21240   | 12680 | 461              | 496   | 520                | 18372               | 12200                   | 535      | 5163                    | 3420 | 3991 | 150              | 3976     | 6342  | 14000  |
| 34582  | 30533   | 17510 | 537              | 577   | 606                | 21405               | 12200                   | 635      | 5697                    | 3616 | 4295 | 150              | 4544     | 7248  | 16000  |
| 34740  | 30770   | 17740 | 537              | 577   | 606                | 21406               | 12200                   | 635      | 5697                    | 3616 | 4295 | 150              | 5112     | 8154  | 18000  |
| 34202  | 38607   | 21060 | 689              | 741   | 778                | 27474               | 12200                   | 710      | 6100                    | 4000 | 4620 | 150              | 6390     | 10192 | 22500  |
| 48100  | 43504   | 25960 | 769              | 827   | 896                | 30616               | 12200                   | 710      | 6100                    | 4000 | 4620 | 150              | 7100     | 11325 | 25000  |
| 51740  | 46724   | 29280 | 926              | 996   | 1045               | 36912               | 12200                   | 713      | 7030                    | 4240 | 4940 | 150              | 8520     | 13590 | 30000  |
| 64500  | 61500   | 34500 | 1074             | 1155  | 1212               | 42812               | 12200                   | 864      | 7100                    | 4250 | 4940 | 150              | 9940     | 15855 | 35000  |