AMVAJE ABI
ELECTRONICS INDUSTRY

Amvaje Abi 3500 Machinery Monitoring System

Amvaje Abi: A Legacy of Expertise and Commitment to Quality

Amvaje Abi Company stands at the forefront of the industry, boasting over two decades of invaluable experience in designing, manufacturing, and advancing control systems and precision tools. Specializing in various sectors, particularly oil and gas, this knowledge-based company has earned its reputation as a trailblazer in Iran.

Established in 2002 with a mission to develop electronic systems tailored to the nation's needs, Amvaje Abi has evolved significantly over the years. In 2010, facing economic sanctions and stringent restrictions, the company successfully diversified into the production of control systems and precision tools, consistently delivering top-notch products across industries like oil and gas, mining, and steel.

Amvaje Abi's journey includes remarkable milestones, such as expanding R&D units, stringent quality control measures, and efficient production in the engineering department in Shiraz. Complemented by a management and commercial branch in Tehran, the company operates with a dedicated team of over 50 experts and skilled engineers, all alums of prestigious universities in the country.

In its commitment to international standards, Amvaje Abi has earned membership in the EP and AVL list of the Ministry of Petroleum and the National Petrochemical Company. The company has also secured multiple certifications and approvals from renowned organizations like the Association of Oil and Gas Industry Equipment Manufacturers and the Industrial Automation Companies Association.

With a portfolio boasting over 200 successful products, Amvaje Abi has achieved essential certifications domestically and internationally and has also seen exclusive use in major Iranian refineries and petrochemical plants by getting an exclusive MESC Code. Notable among these are the Pars South Gas Complex, Khangiran, Parsian, Shazand Oil, and numerous other significant petrochemical complexes.

Building on its rich experiences, Amvaje Abi has ventured into international trade, exporting its high-quality products to various countries. Committed to excellence, development, support, and the incorporation of cutting-edge technologies, the company has solidified its position as a leading force in Iran's electronic and industrial control industry and is recognized as a dependable supplier.

Amvaje Abi 3500 Machinery Monitoring System

To protect machinery, the Amvaje Abi 3500 Machinery Condition Monitoring System is responsible for continuous and online condition monitoring (temperature, vibration, excessive speed, etc.). This system includes various monitoring cards and other components (rack, power cards, etc.).

Key features

- **Dual Dynamic Monitoring:**
  This system utilizes dual dynamic monitoring capabilities, simultaneously measuring absolute and relative vibrations. This dual-channel approach provides a more comprehensive view of machinery behavior and helps identify subtle changes and potential issues.

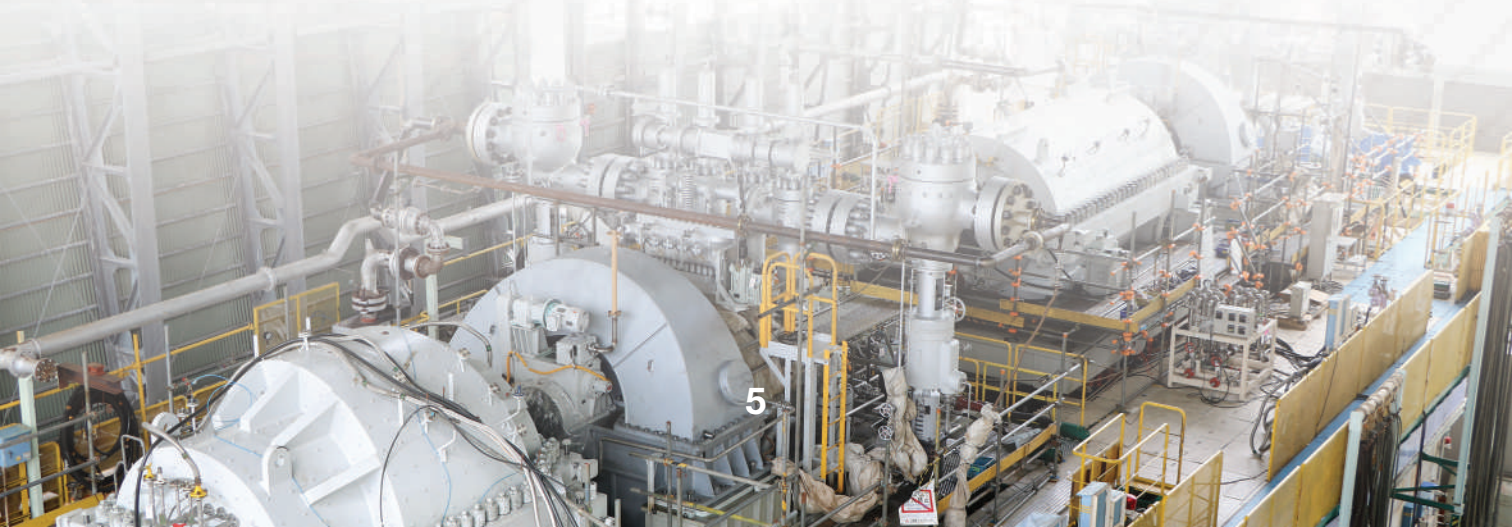
- **Advanced Trend Analysis and System Trend Identification Tools:**
  Advanced trend identification and component analysis tools in the 3500 series facilitate users in tracking historical machinery performance. Identifying and monitoring trends enable early detection of deteriorating trends and provide opportunities for proactive maintenance strategies, minimizing the risk of sudden failures.

- **High-Speed Data Acquisition and Recording:**
  With the ability to collect data at high speeds, the system quickly records and stores detailed waveform shapes. This is crucial for accurately capturing transient events and rapid changes in vibration patterns, offering precise insights into the dynamic behavior of monitored equipment.

- **Alert and Trip Settings:**
  The 3500 system offers flexible alert and trip settings, allowing users to customize thresholds based on the specific requirements of each monitored device. This adaptability ensures the system can be tuned to different operational scenarios, reducing false alarms and optimizing responses to critical conditions.

- **Secure Communication Protocols:**
  The 3500 series prioritizes security by implementing secure communication protocols, safeguarding data integrity, and preventing unauthorized access. This is particularly crucial for industries that prioritize data confidentiality and system health.

Further technical details of all available cards are comprehensively explained below.



Modules

Internal Barriers

- Intrinsically safe interfaces that provide explosion protection for transducer systems connected directly to the 3500 Machinery Protection System.
- Cost-effective solution for installing all types of transducer systems within a hazardous area.
- Standard and internal barrier monitors can reside within the same 3500 rack.
- An intrinsically safe (IS) earthing module provides the IS earth connection through the 3500 system backplane.
- The IS Earth Module requires a dedicated I/O module position and precludes the use of this monitor position for other 3500 System modules.

Available Modules:

Earthing I/O Module

Internal Barriers

AC and DC Power Supplies

- AC and DC Power Supplies are half-height modules and must be installed in designated slots on the left side of the rack.
- The 3500 rack can contain one or two power supplies with any combination of AC and DC.
- Removing or inserting either power supply module does not disrupt the operation of the rack as long as a second power supply is installed.
- Accepts a wide range of input voltages and converts them to voltages acceptable for use by other 3500 modules.
- Power supplies types:
  - High Voltage DC Power Supply
  - Low Voltage DC Power Supply

Available Modules:

Legacy Low Voltage DC Power Supply Module

AC Power Supply Module

Low Voltage AC Power Input Module

High Voltage AC Power Input Module

Legacy Low Voltage DC Power Input Module

Rack Interface Module

- Primary interface to the 3500 rack.
- Supports a proprietary protocol used to configure the rack and retrieve machinery information.
- Supports compatible Bently Nevada external communications processors such as TDXnet, TDIX, and DDIX.
- While the RIM provides certain functions common to the entire rack, the RIM is not part of the critical
- monitoring path and has no effect on the proper, normal operation of the overall monitoring system

  It must be placed in Slot 1.

Available Modules:

Datamanager I/O Module	RIM I/O Module with RS232/RS422 Interface	Standard Rack Interface Module
		

Transient Data Interface Module

- Transient Data Interface (TDI) is the interface between the 3500 monitoring system and compatible software.
- The TDI combines the function of a Rack Interface Module (RIM) with the data collection capability of a communication processor such as TDXnet.
- Interfaces with M series monitors to continuously collect steady state and transient dynamic (waveform) data and pass this data through an Ethernet link to
- the host software.
- Static data capture capability
- I/O Module Signal Common Terminal
- Data collected at selected increments of speed and time

  Alarm Data Collection

Available Module:

Transient Data Interface Module


Enhanced Keyphasor Module

- Half-height, two-channel module
- Provide Keyphasor signals to the monitor modules in a 3500 rack.
- The module receives input signals from proximity probes or magnetic pickups and converts the signals to digital Keyphasor signals that indicate when the Keyphasor mark on the shaft coincides with the Keyphasor transducer.
- Offers expanded Keyphasor signal processing capabilities.

Available Modules:

Enhanced Keyphasor Module

Keyphasor I/O Module (Internal Barriers and Internal Terminations)

Keyphasor I/O Module (Internal Terminations)

16-Channel Relay Module

- A full-height module that provides 16 relay outputs.
- Each output can be independently programmed to perform voting logic.
- Each relay of the module includes Alarm Drive Logic.
- Programming for the Alarm Drive Logic uses AND and OR logic and may use the following:
  - Alarming inputs (alert and danger statuses)
  - Not-OK
  - Individual Measured Variables from any monitor channel or any combination of monitor channels in the rack

Spare 16-Channel Relay Control Module

Spare 16-Channel Relay Output Module

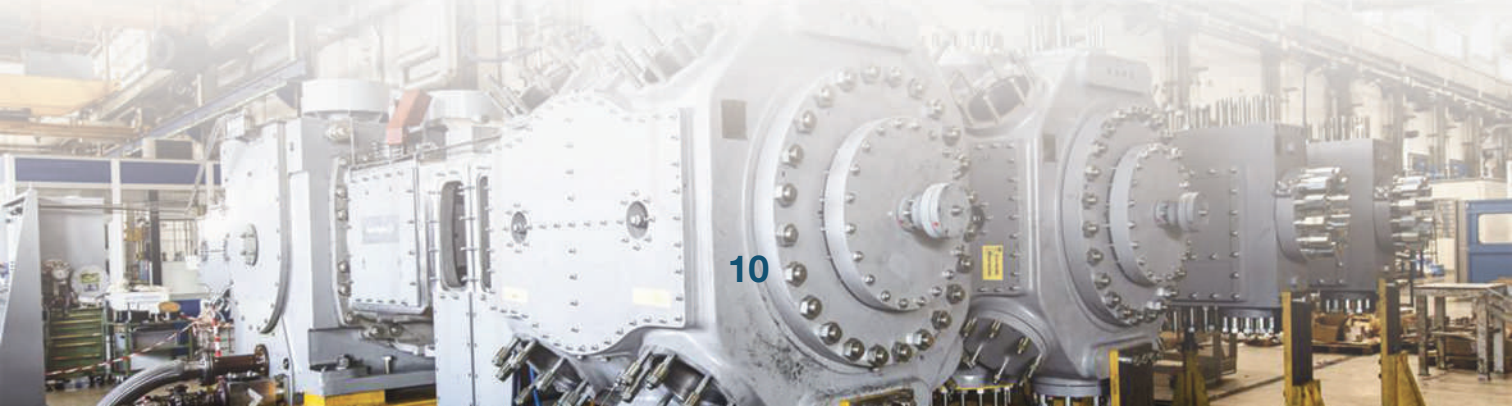
Proximitor Monitor

- Four-channel monitor that accepts input from proximity transducers and conditions the signal to provide various vibration and position measurements.
- Each channel can be programmed with the 3500 Rack Configuration Software to perform any of the following functions:
  - Radial vibration
  - Eccentricity
  - REBAM
  - Thrust position
  - Differential expansion
- Machinery protection by continuously comparing monitored parameters against configured alarm setpoints to drive alarms.
- Essential machine information for both operations and maintenance personnel
- Each channel, depending on configuration, typically conditions its input signal to generate various parameters called static values.

Available Modules:

Proximitor Monitor

Proximitor I/O Module with Internal Barriers & Internal Terminations



Proximitor Seismic Monitor

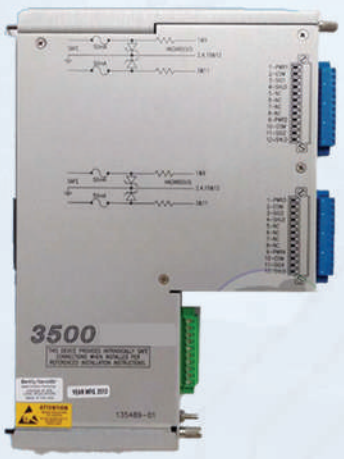
- Four-channel monitor
- Protects machinery by continuously comparing monitored parameters against configured alarm
- setpoints to drive alarms.
- Communicates essential machine information to both operations and maintenance personnel.

  Each channel can be programmed with the 3500 Rack Configuration Software to perform any of the following functions:

  - Radial vibration
  - Differential expansion
  - Shaft absolute
  - Eccentricity I REBAM
  - REBAM
  - Eccentricity
  - Thrust position
  - Acceleration
  - Velocity
  - Circular acceptance region
- Each channel, depending on configuration, typically conditions its input signal to generate various parameters called static values.

Available Modules:

Barrier Proximitor I/O Module



Proximitor/Seismic Monitor

Prox/Seismic I/O Module with internal terminations

Available Modules:

Tachometer Module

- Tow-channel module that accepts input from proximity probes or magnetic pickups to determine shaft rotative speed, rotor acceleration, or rotor direction.
- Speed Monitoring
- Setpoint Alarming
- Speed Band Alarming
- Zero Speed Notification
- Rotor Acceleration Alarming
- Reverse Rotation Notification
- It has a peak hold feature that stores the highest speed, the highest reverse speed, or the number of reverse rotations the machine has reached.

Tachometer Module

Prox/Seismic I/O Module with internal terminations

Available Modules:

Overspeed Detection Module

Overspeed Detection I/O Module

Electronic Overspeed Detection System

- Provides a highly reliable, fast response, redundant tachometer system intended for use as part of an overspeed protection system.
- Requires the use of a 3500 rack with redundant power supplies.
- The input signal range is +10.0 V to -24.0 V.
- Module will support from 1 to 255 events per revolution with a maximum full-scale range of 99,999 rpm and a maximum input frequency of 20 kHz.

Temperature Modules

- Provide six channels of temperature monitoring
- Accept both Resistance Temperature Detector (RTD) and Thermocouple (TC) temperature inputs.
- Different I/O modules are available in RTD/TC non-isolated or TC-isolated versions.
- The user can configure the RTD/TC non-isolated version to accept either TC or RTD or a mixture of TC and RTD inputs.
- Accepts from 1 to 6 RTD or TC transducer signals.

Available Modules:

Temperature Monitor

RTD/TC I/O Module with Internal Barriers and Internal Terminations (Not-Isolated)

RTD/TC non-Isolated I/O Module, Internal Terminations

Process Variable Monitor

- 6-Channel monitor for processing machine critical parameters that merit continuous monitoring, such as pressures, flows, temperatures, and levels.
- Continuously compares monitored parameters against configured alarm setpoints to drive alarms for machinery protection.
- Inputs: 20-4 mA, ±10Vdc
- It offers I/O modules for three signal input scenarios:
  - ±10 Volts DC
  - Isolated 20-4 m
  - 20 mA with Intrinsically Safe zener barriers
- The Internal Barrier I/O provides external power input terminals to provide intrinsically safe power to the 20-4 mA transducers.

Available Modules:

Process Variable Monitor

Isolated +4 to +20 mA I/O Module with internal terminations

Dynamic Pressure Monitor Module

- single slot, four-channel monitor that accepts input from high-temperature pressure transducers and uses this input to drive alarms.
- The monitor's one measured variable per channel is bandpass dynamic pressure.
- Machinery protection by continuously comparing monitored parameters against configured alarm setpoints to drive alarms.
- Essential machine information for operations and maintenance personnel.
- Each channel, depending on configuration, conditions its input signal to generate various parameters called measured variables.
- You can configure alert and danger setpoints for each active measured variable.

Dynamic Pressure Monitor Module

Process Variable Monitor

- 4-channel device used as part of the reciprocating compressor solutions package to monitor compressor crankcase and crosshead vibration.
- The monitor accepts input from seismic transducers, conditions the signal to derive vibration measurements, and compares the conditioned signals with user-programmable alarms.
- Machinery protection for reciprocating compressors by continuously comparing monitored parameters against configured alarm setpoints to drive alarms.
- Essential reciprocating compressor machine information for both operations and maintenance personnel.
- You can program each channel using the 3500 Rack Configuration Software to perform the following functions:
  - ○ Impulse Acceleration
  - ○ Acceleration 2
  - ○ Recip Velocity
  - ○ Low-Frequency Recip Velocity
- Each channel, depending on configuration, typically conditions its input signal to generate various parameters called static values.

Available Modules:

Recip Impuls/Velocity Monitor

Prox/Velom I/O Module with Internal Terminations

Recip Rod Position Monitor

- Four-channel 72/3500M Recip Rod Position Monitor accepts input from proximity transducers, conditions the signal to provide dynamic and static position measurements, and compares the conditioned signals with user-programmable alarms.
- Use the 3500 Rack Configuration Software to:
  - Configure alert setpoints for each active measured value and danger setpoints for any two of the active measured values.
  - Protect reciprocating compressors by continuously comparing monitored parameters against configured alarm setpoints to display alarms and trigger relays, if needed.
  - Monitor the condition of essential reciprocating compressor machinery.
- It measures:
  - Rod position
  - Rod drop
  - Hyper-compressor

Available Modules:

Prox/Velom I/O Module with Internal Terminations

Recip Rod Position Monitor

Communication Gateway

- Provides extensive communication capabilities of all rack-monitored values and statuses for integration with process control and other automation systems using both Ethernet TCP/IP and serial (RS232/RS422/RS485) communications capabilities.
- Supported protocols include:
  - Modicon Modbus protocol (via serial communications)
  - Modbus/TCP protocol (a variant of serial Modbus used for TCP/IP Ethernet communications)
  - Proprietary Bently Nevada protocol (for communication with 3500 Rack Configuration and Data Acquisition Software packages)
- Supports the communication interfaces, communication protocols, and other features.

Communication Gateway Module

Ethernet/RS485 ModbusI/O Module

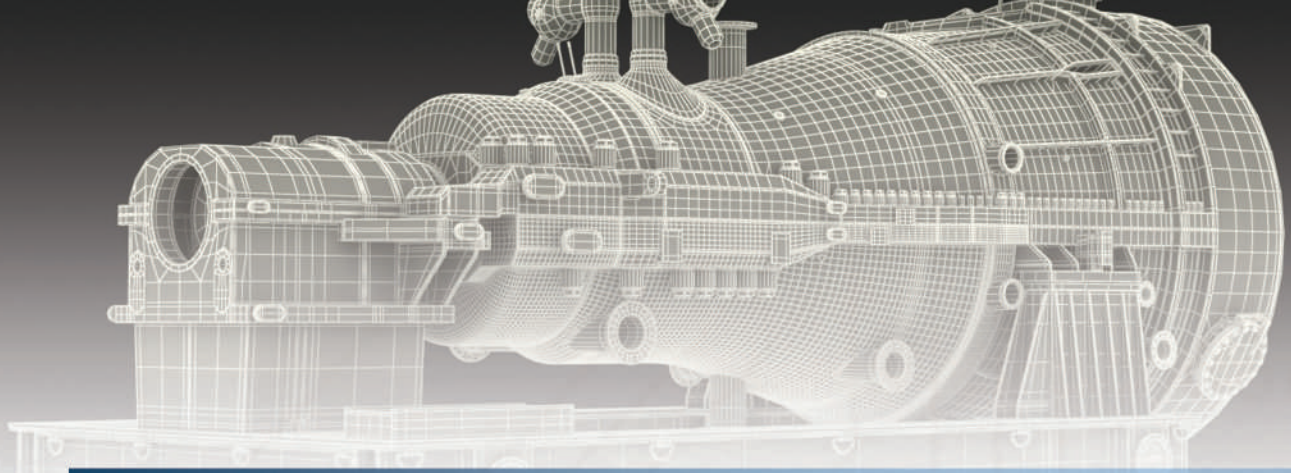
Modbus RS232/RS422 I/O Module

System Display Interface

- Remote visual indication of all 3500 Machinery Protection System information residing in the rack.
- Facilitates communication between a computer system and its display interface.
- The display interface refers to the connection and communication protocol used to transmit video signals from the computer to the display device, such as a monitor or screen.The I/O module manages the input and output operations related to the display system.
- Key functions of a System Display Interface I/O Module may include:
  - Video Signal Processing
  - Resolution and Refresh Rate Control
  - Color Management
  - Multiple Display Support
  - Input Handling
  - Driver and Firmware Support

Available Modules:

Display Interface Module	Display Interface I/O Module
	

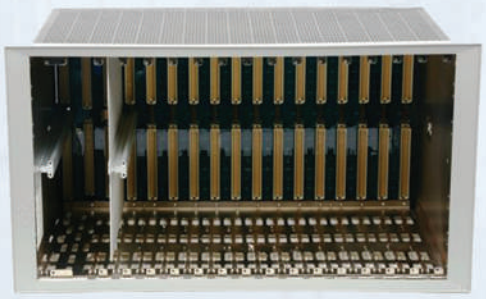


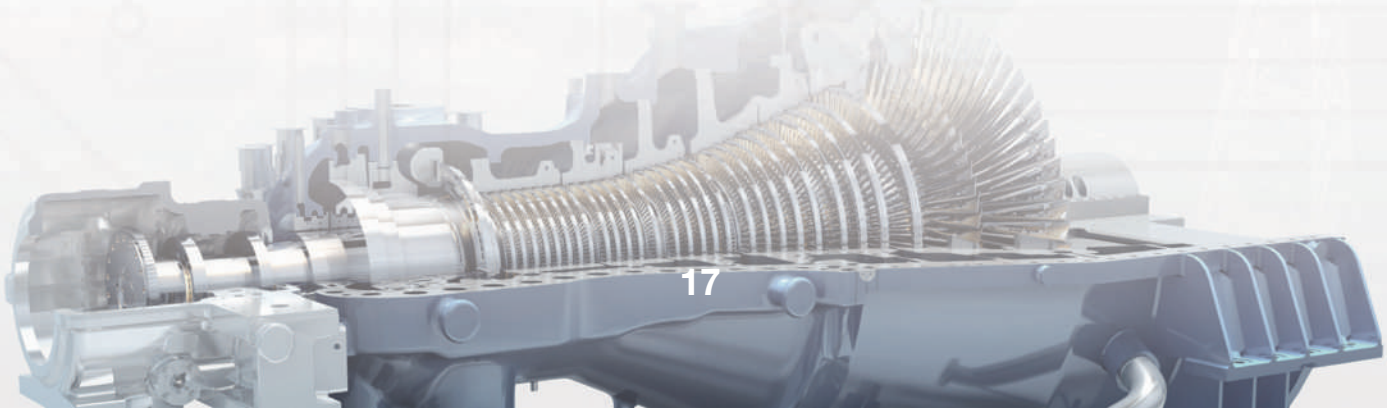
System Rack

- You can use the 3500 System rack to mount all 3500 monitor modules and power supplies.
- 3500 racks are available in two sizes:
  - Full-size rack: 19-inch EIA rack with 14 available module slots.
  - Mini-rack: 12-inch rack with seven available module slots.
- 3500 racks in three formats:
  - Panel mount
  - Rack mount
  - Bulkhead mount

Available Module:

Full-size rack 19-inch





Company's Services

- Engineering and Manufacturing Services:

- Designing various electronic and control systems.
- Reverse engineering and redesigning electronic cards and control systems.
- Electronic component assembly and mass production of various electronic and control systems.
- Testing and quality control of electronic cards.

- Specialized commercial services:

- Consultation and procurement of industrial control systems.
- Consultation and procurement of various electronic, telecommunication, and precision instruments.
- Consult and procure remote control wireless systems.

- Specialized Repairs:

- Specialized repair of electronic cards and precision instruments for refineries and petrochemical plants.

- Training and Technical Engineering Support

- Updating and Upgrading electronic and control systems

- Control Systems Integration and Commissioning

In addition to its diverse and prominent activities, Amvaje Abi Company, with its essential capabilities, is recognized as one of the active companies in the field of designing and integrating control systems and precision instruments. This includes implementation, commissioning, support, and maintenance. The Instrument and Control System Department of Amvaje Abi, with over 15 years of practical experience in industrial automation and precision instruments, has become a key player in providing suitable solutions for major industries, including oil and gas, petrochemicals, steel, etc.

The primary activities and services of the Instrument and Control System Department at Amvaje Abi:

- Consultation and Engineering
- Software design and development
- Conducting FAT processes
- Upgrading and Revamping
- Procurement of project components
- SAT
- Commissioning
- Repair and Maintenance
- Training
- Project Management
- Design of engineering documents and documentation
- Control systems Integration and precision instruments
- Cybersecurity Based On Project Requirements

Customers

شرکت ملی نفت ایران

شرکت ملی گاز ایران

شرکت ملی صنایع پتروشیمی

I.G.T.C
شرکت پالایش گاز ایلام

شرکت مجتمع گاز پارس جنوبی
SPGC

شرکت پالایش گاز شهید هاشمی نژاد
Shahid Hasheminejad Gas Refinery Company

Jahanpars
Engineering and Construction Co.

شرکت پتروشیمی امیرکبیر (سهامی خاص)

شرکت پالایش گاز پارسیان

شرکت پالایش نفت شازند اراک

شرکت صنایع پتروشیمی خلیج فارس
Persian Gulf Petrochemical Industries Co.
PGPIC
شرکت پتروشیمی پارس
(سهامی عام)
Pars Petrochemical Co.

شرکت صنایع پتروشیمی خلیج فارس
Persian Gulf Petrochemical Industries Co
PGPIC
پتروشیمی تندگویان

شرکت صنایع پتروشیمی خلیج فارس
Persian Gulf Petrochemical Industries Co.
PGPIC
شرکت گروه پتروشیمی سرمایه‌گذاری ایرانیان
شرکت پتروشیمی لردگان
(سهامی خاص)

شرکت صنایع پتروشیمی خلیج فارس
Persian Gulf Petrochemical Industries Co.
PGPIC
شرکت پتروشیمی نوری (برزویه) سهامی خاص

شرکت
مهندسی و ساختمان ماشین سازی اراک
MSA Engineering & Construction Co.

RPC
شرکت پتروشیمی رازی
RAZI PETROCHEMICAL CO.

MAPSA
Engineering Service Company

GS
فولاد خوزستان
YAZD GHADIR STEEL

شرکت ملی مناطق نفت خیز جنوب
شرکت بهره برداری نفت و گاز گچساران

PETROCHEMICAL
Regal

ABSUN ZOLAL
SUSTAINABLE & CREATIVE SOLUTIONS

MD
Mehdi Abad Mining Complex
مجتمع معدنی سرب و روی و باریت مهدی آباد

شرکت امن پژوه نوآوران فارس

Certificates and Standards

Implemented Standards

- IEC 61508-7-210
- BSI BS EN 60079-0
- BSI BS EN 60079-1
- BSI BS EN 60079-20-1
- BSI BS EN 60079-7
- IEC 61132-2 2017
- IEC-60529
- IPC 2221B
- IPC 2222A
- IPC 7351B
- IPC 7711C.7721C
- IPC A-600J
- IPC A-610F A1-2016
- ISO IEC 80079-34-2018
- ISO9001-2015

Knowledge enterprise Apporval


بسمه تعالی

کارگروه ارزیابی شرکت‌ها و موسسات دانش‌بنیان

تاییدیه شرکت‌های دانش‌بنیان

نام شرکت	صنعت الکترونیک امواج آبی	شناسه ملی	[illegible]
استان	فارس	تاریخ تایید	[illegible]
حوزه فناوری	[illegible]	نوع تایید	[illegible]

Quality Control According To ISO9001


CSP

Certificate of Registration

We hereby certify that the organization

Amvaje Abi Electronics Industry Co.

Science and Technology Park, Arian St., Dr.Hesabi Blvd., Shiraz, Iran

Has implemented and maintains a management system which complies with the following standard

ISO 9001:2015

For the following activities

Manufacturer of Distributed Control System (DCS), Instrumentation Equipment, Electronic Cards for Oil, Gas and Petrochemical Industries and Explosion Protected Electronic Ballast

A.Hesari
Managing Director of Csp Co.

IAF NACI

Certificate No: IR10-41

First issue: 25/12/2019 Current issue: 25/12/2019 Expiry date: 24/12/2022

The authenticity of this certificate can be confirmed online or by email to the CSP CO office via:

Unit 5, No. 10 Nakha Alley,Kavousifar St., Beheshti St., Tehran, Iran

www.Cspco.org info@Cspco.org

Certificates and Standards

Membership in the AVL of the Oil Ministry

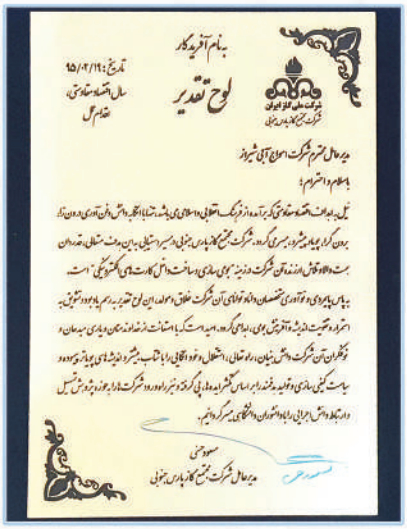
Membership Certificate Of Industrial Automation Companies Association

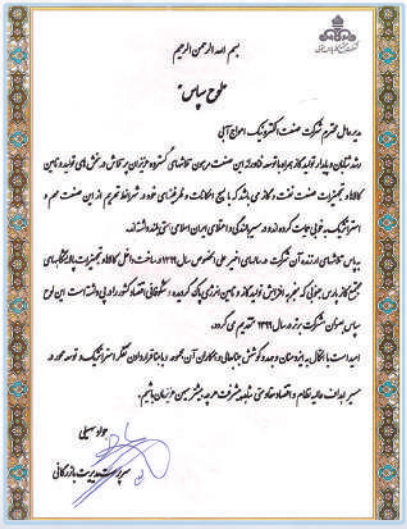
Membership Certificate Of Association of Oil and Gas Industry Equipment Manufacturers

Operation License

Technology Unit Certificate

Appreciation Letters





AMVAJE ABI
ELECTRONICS INDUSTRY

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