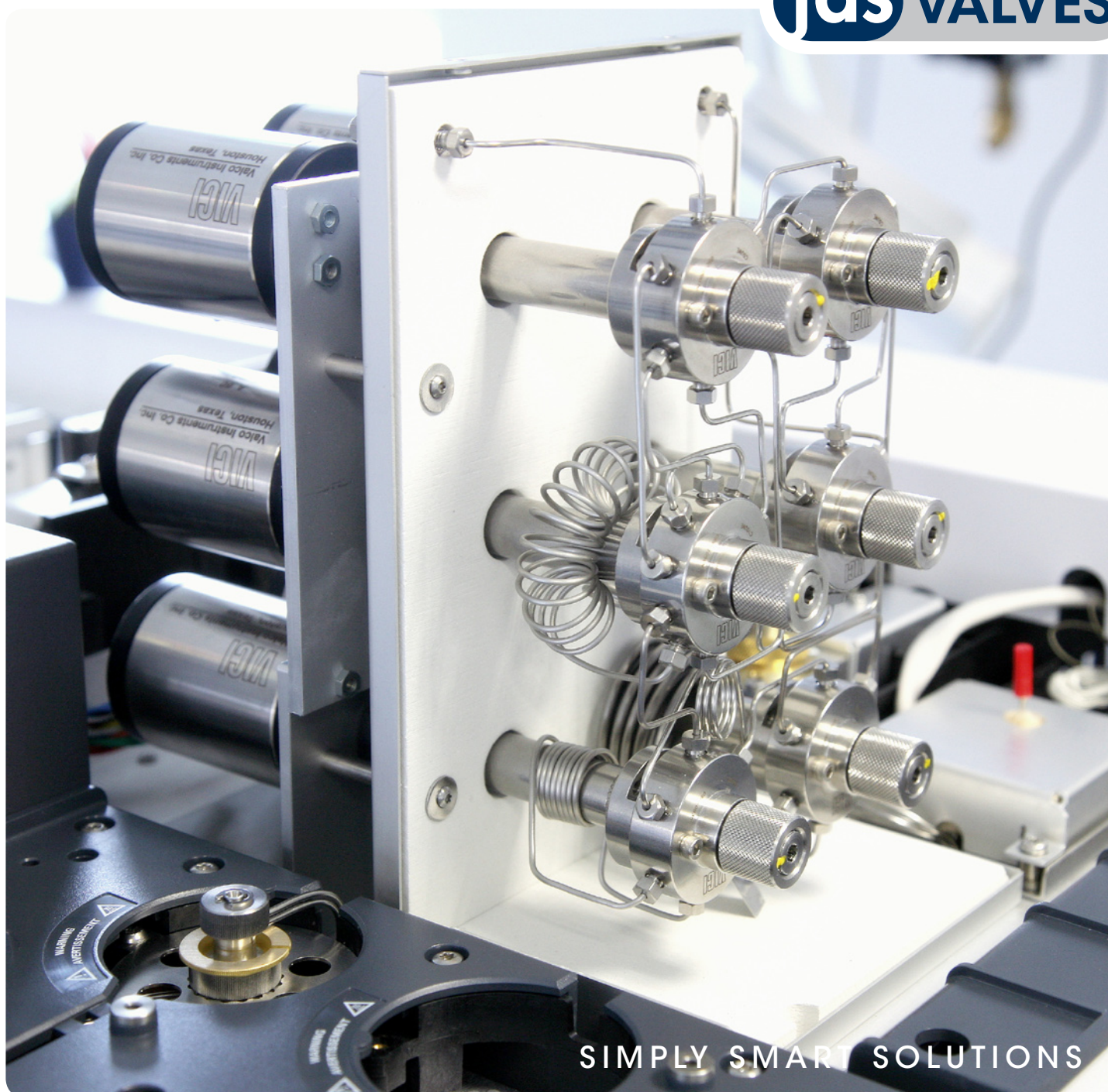


VALVE Systems

For Gas Analytics and Process Chromatography

jas VALVES



SIMPLY SMART SOLUTIONS

JAS Gas Analyzers



Overview

Based on the Agilent Technologies GC models 7890 and 6890/6850 and Valco VICI valves, joint analytical systems GmbH (JAS) offers many Simply Smart Solutions for the wide field of laboratory and online gas analytics.

JAS maintains a long standing and close business relationship with Valco Instruments Company Inc. (VICI), which is our sole provider for the high quality valves we integrate into our gas analyzers.

However, we not only offer VICI valves, but their complete product portfolio, including GC detectors, columns (e.g. HayeSep) and accessories.

Depending on the application our gas analyzers include Gas Sampling Valves (GSV), Liquid Gas Sampling Valves (LGSV) and Multi Positioning Valves (MPV) in different fitting sizes, port diameters, number of positions, pressures and temperatures to fit your specific analytical needs.

Different VICI valve actuators are available:

- Microelectric actuators for automatic valve alignment, high-speed switching, and compact size,
- Standard electric actuators at lower cost than the microelectric, dependable, and economic,
- Air actuators, useful in situations where any spark could be disastrous, where heat could compromise an electric actuator, or where electricity is not available,
- Manual actuation for simplicity and low cost are the main advantages.

The valves are installed inside a heated JAS valve box on top of the Agilent GCs for sample introduction, column switching and stream selection.

Applications

All **JAS Valve Systems** can be customized and provide application capabilities for:

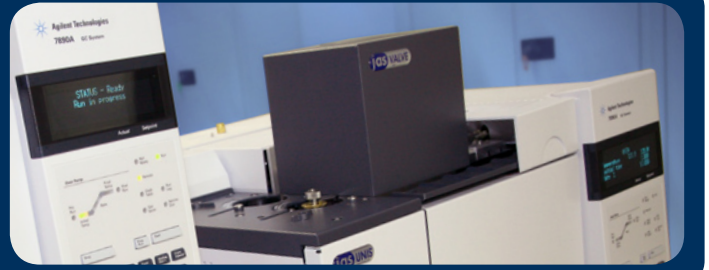
- Analysis of noble gases and permanent gases
- Natural Gas Analysis (NGA)
- Refinery Gas Analysis (RGA)
- Liquefied Petroleum Gas (LPG)
- Analysis of liquid sample streams

JAS valve GC configurations will allow you to analyze highly complex gas matrices such as:

- Permanent Gases (H_2 , O_2 , N_2 , CO , CO_2) with TCD Detector, HID Detector or NiCat / FID combinations (only for CO and CO_2)
- Hydrocarbons ($C_1 - C_6+$) with FID Detector
- Sulfur components (H_2S , COS , THT , DCS , TCS , etc.) with detectors TCD, AED, SCD, FPD, PFPD

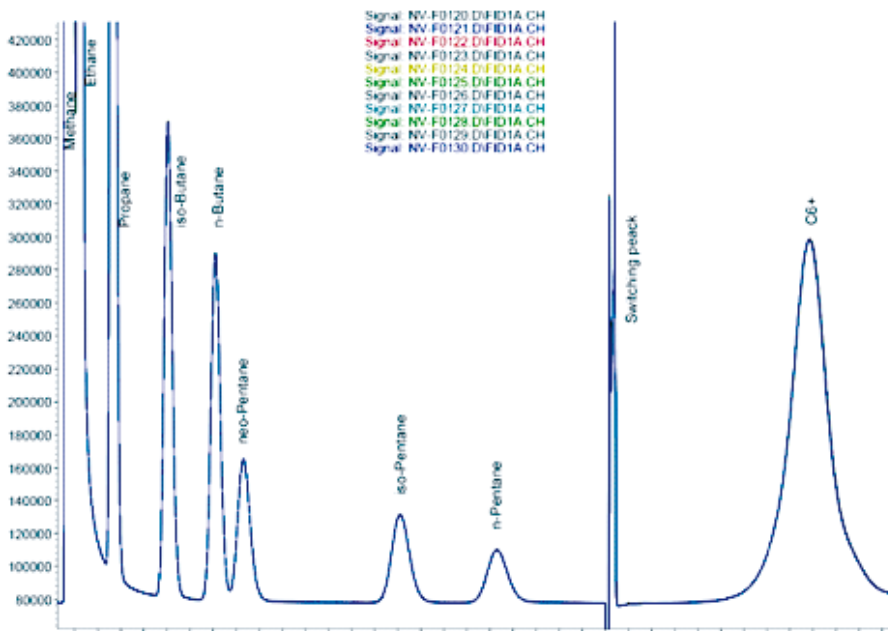


Reliability and Standard Deviation



Reliability and Standard Deviation

Our installed base of gas analyzers works reliable and gives reproducible data with remarkably low standard deviations. Below chromatogram shows an overlay of 10 consecutive C1 – C6+ analyses.



Standard Deviation	Standard Deviation in %
1303,145316	0,066636595
25,44350822	0,054342075
1,895638269	0,058265838
0,682804673	0,074911646
0,573875713	0,07340817
0,343834585	0,081066295
0,976444798	0,259920888
1,081203034	0,425118167
19,27966401	0,454536462
1340,257623	0,066591241
0,501553143	0,806874426
1,633843458	0,262781417
6,46216338	0,137003705
8,637669434	0,028226442
12,62836755	0,035076821

Table 1 shows the standard deviation per compound, per run and per detector for Natural Gas.

FID Signal

Compounds		Area 1	Area 2	Area 3	Area 4	Area 5	Area 6	Area 7	Area 8	Area 9	Area 10	Average	Standard Deviation	Standard Deviation in %
Methane	CH4	1954980,2	1954972,7	1955799,1	1954309,6	1954081	1954320,7	1956424,5	1956549,8	1957204,5	1957058,9	1955600,1	1303,145316	0,066636595
Ethane	C2H6	46806,8	46808,7	46819,3	46797,5	46792,6	46795,8	46836,9	46832,1	46856,5	46863,9	46821,01	25,44350822	0,054342075
Propane	C3H8	3255,1	3255,9	3253,5	3251,4	3250,7	3251,6	3254,5	3252,3	3255,9	3253,43		1,895638269	0,058265838
iso-Butane	C4H10	910,1	911,4	911,3	911,5	911,2	911,1	912,6	911,4	912,1	912,1	911,48	0,682804673	0,074911646
n-Butane	C4H10	781,3	781,3	782,6	781,7	781,2	780,9	782	782,1	782	782,5	781,76	0,573875713	0,07340817
Neo Pentane	C5H12	424	424	423,6	424,1	424,4	424,8	424,3	423,8	424	424,4	424,14	0,343834585	0,081066295
iso-Pentane	C5H12	374	376,5	376,3	376,4	376,5	376,5	375,6	375,9	374,5	374,5	375,67	0,976444798	0,259920888
n-Pentane	C5H12	254,2	253,2	253,6	253,4	254,1	254,9	255,7	256,5	253,4	254,3	254,33	1,081203034	0,425118167
Total C6+		4222,7	4248,3	4236,8	4221	4242,1	4240,8	4211,9	4253,3	4262,3	4273,9	4241,61	19,27966401	0,454536462
Total 1 (FID Signal)		2011708,4	2012032	2012856,1	2011326,6	2011113,8	2011360,1	2013478	2013637,2	2014322,7	2014800,4	2012693,53	1340,257623	0,066591241

TCD Signal

Carbon Dioxide	CO2	62,1	62,4	62,1	62,7	61,2	62,4	62,7	61,6	62,6	61,8	62,16	0,501553143	0,806874426
Ethane	C2H6	619,4	622,1	623,7	619,1	621,3	622,3	624,2	621,2	622,6	621,6	621,75	1,633843458	0,262781417
Nitrogen	N2	4705,6	4717,9	4713,2	4716,4	4713,8	4716,1	4728,6	4719,8	4724,3	4712,1	4716,78	6,46216338	0,137003705
Methane	CH4	30610,3	30598,5	30604	30581,8	30599,2	30603,1	30612,8	30607,2	30599,2	30597,3	30601,34	8,637669434	0,028226442
Total 2 (TCD Signal)		35897,4	36000,9	36003	35980	35985,5	36003,9	36028,3	36009,8	36008,7	35992,8	36002,03	12,62836755	0,035076821

Table 1: Standard deviation, Natural Gas

JAS Specials for Gas Analyzers



Coated system components for corrosive substances

In presence of corrosive substances, our UNIS inlet systems, the valves and their respective tubings can be offered with Hastelloy C (HC) or Siltek coatings. Additionally, valves are available for high pressures and temperatures of up to 300°C.

Depending on the individual sample matrix, JAS may recommend a valve system maintenance package to regularly exchange the stressed parts. This proactively avoids system down time.

JAS Double Filament TCDs

For certain JAS gas analyzers we may recommend the JAS Thermal Conductivity Detector (TCD) for Agilent 7890 and 6890/6850 GCs. It is a double filament detector with either NiFe Filaments for standard analysis or WRe Filaments for aggressive compounds, where single filaments can be exchanged separately. It is completely embedded into EZChrom Software, respectively communicates via the AIB Board with the Agilent GC ChemStation Software.

JAS Calorific Value Calculation (BTU) Tool

A unique feature of the JAS gas analyzers is our Calorific Value Calculation (BTU) Software Tool. It works according to DIN 51857 / ISO 6976 and is completely embedded into the Agilent GC ChemStation Software and EZChrom Software.

Calculation according to DIN 51857 / ISO 6976

25 GRD / 273,15 K; 101.325 kPa

Compound	Symbol	Mol-%	Uns. %		
Helium	He				
Carbon Dioxide	CO ₂			Calorific Value	35,983 (MJ/m ³)
Nitrogen	N ₂			Calorific Value	9,995 (kWh/m ³)
Oxygen	O ₂				
Hydrogen	H ₂			Calorific Value	32,430 (MJ/m ³)
Carbon Monoxide	CO			Calorific Value	9,008 (kWh/m ³)
Methane	CH ₄	90,0000			
Ethane	C ₂ H ₆			Molar Mass	14,5076 (kg/kmol)
Ethene	C ₂ H ₄				
Propane	C ₃ H ₈			Standard Density	0,64853 (kg/m ³)
Propene	C ₃ H ₆			Relative Density	0,5016
iso-Butane	i-C ₄ H ₁₀				
n-Butane	n-C ₄ H ₁₀			Wobbe index (top)	50,806 (MJ/m ³)
iso-Pentane	i-C ₅ H ₁₂			Wobbe index (top)	14,113 (kWh/m ³)
n-Pentan	n-C ₅ H ₁₂				
neo-Pentane	neo-C ₅			Wobbe index (bottom)	45,79 (MJ/m ³)
Total C6+	C ₆ +	0,0800			12,719 (kWh/m ³)
Total		90,0800		Real gas factor:	0,99803



JAS Process and Online Analyzers



JAS Process and Online Analyzers

JAS has a proven history of integrating Agilent Technologies standard laboratory GC instruments and other third party chromatography products into process environments. **JAS** has the technology and expertise to use the Agilent GC models 7890, 6890, 6850 and Micro GC to for example supervise impurities in your weg production processes.

As this field is characterized by a high level of customization and project management, please understand that a personal discussion of your particular needs is the best approach to convince you of our expertise.

The main advantages are:

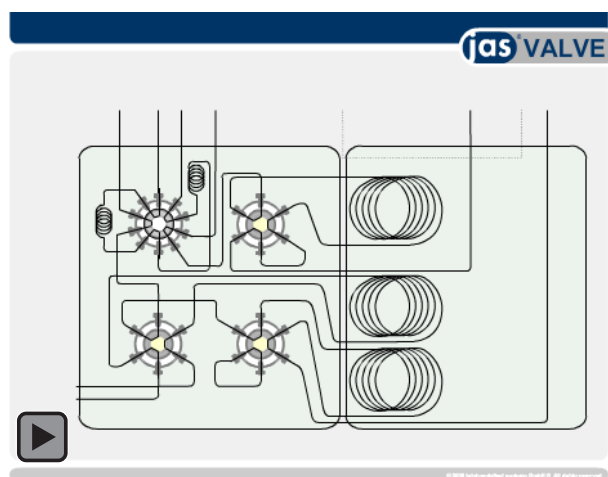
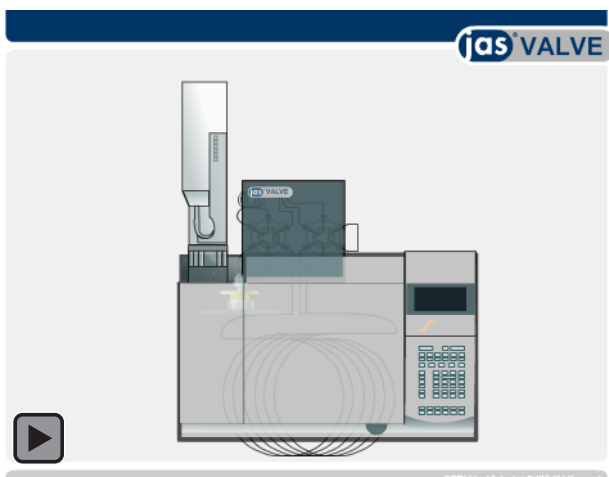
- Cost efficient equipment, when comparing to process GCs,
- Reliable instruments from Agilent Technologies,
- Easy to operate,
- Easy to maintain,
- Many different GC detectors available.

JAS Data Transfer to Process Control System (PCS)

With the ASQ12, JAS offers an analog signal transfer via 4-20mA out-put channels to guarantee a reliable data transfer of the chromatographic results to the Process Control System (PCS). Our ASQ12 can calibrate up to eight different signals in the Agilent ChemStation SW, then dedicate each signal to an upper and lower threshold and report them to the PCS. Apart from compound related signals these freely configurable output signals can be used for e.g. stream identification or alarms.

JAS VALVE Systems Animations

Please click on the below figure to run the product animation.
To enlarge, please zoom the PDF. (requires minimum Acrobat Reader 9)





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About joint analytical systems

Since 1995 JAS is a major partner and Value Added Reseller of Agilent Technologies. We are an innovative-driven organization that offers customized solutions for GC, GCxGC, μ GC, GC-AED, GC-MS, GC-QQQ, LC, LC-MS, LC-QQQ and Q-TOF LC-MS applications.

JAS serves key industries such as

- Chemical
- Environmental
- Food and Flavor
- Forensic
- Mechanical Engineering
- Petrochemical
- Pharmaceutical

JAS Products for GC

- Atomic Emission Detector
- CryoTrap
- Customized Valving System
- EzPrep - Preparative Fraction Collector
- Olfactometer
- Scotti-RFID Systems
- UNIS Inlets

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