

## PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1  
Stylesheet Version v1.2

EPAS ID: PAT2940320

<b>SUBMISSION TYPE:</b>	NEW ASSIGNMENT
<b>NATURE OF CONVEYANCE:</b>	ASSIGNMENT
<b>CONVEYING PARTY DATA</b>	
<b>Name</b>	<b>Execution Date</b>
BROOKS AUTOMATION, INC.	05/30/2014
<b>RECEIVING PARTY DATA</b>	
<b>Name:</b>	MKS INSTRUMENTS, INC.
<b>Street Address:</b>	2 TECH DRIVE, SUITE 201
<b>City:</b>	ANDOVER
<b>State/Country:</b>	MASSACHUSETTS
<b>Postal Code:</b>	01810
<b>PROPERTY NUMBERS Total: 3</b>	
<b>Property Type</b>	<b>Number</b>
<b>Application Number:</b>	14082894
<b>Patent Number:</b>	8589107
<b>Patent Number:</b>	8195418
<b>CORRESPONDENCE DATA</b>	
<b>Fax Number:</b>	(978)341-0136
<i>Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.</i>	
<b>Phone:</b>	978-341-0036
<b>Email:</b>	Sharon.Stanizzi@hbsr.com
<b>Correspondent Name:</b>	JAMES M. SMITH
<b>Address Line 1:</b>	530 VIRGINIA ROAD, P.O. BOX 9133
<b>Address Line 2:</b>	HAMILTON, BROOK, SMITH & REYNOLDS, P.C.
<b>Address Line 4:</b>	CONCORD, MASSACHUSETTS 01742-9133
<b>ATTORNEY DOCKET NUMBER:</b>	5089.0000-101
<b>NAME OF SUBMITTER:</b>	SHARON STANIZZI
<b>SIGNATURE:</b>	/SHARON STANIZZI/
<b>DATE SIGNED:</b>	07/16/2014
<b>Total Attachments: 13</b>	
source=01000000115_ASG1_Active#page1.tif	
source=01000000115_ASG1_Active#page2.tif	
source=01000000115_ASG1_Active#page3.tif	
source=01000000115_ASG1_Active#page4.tif	
<b>PATENT</b>	

source=01000000115\_ASG1\_Active#page5.tif  
source=01000000115\_ASG1\_Active#page6.tif  
source=01000000115\_ASG1\_Active#page7.tif  
source=01000000115\_ASG1\_Active#page8.tif  
source=01000000115\_ASG1\_Active#page9.tif  
source=01000000115\_ASG1\_Active#page10.tif  
source=01000000115\_ASG1\_Active#page11.tif  
source=01000000115\_ASG1\_Active#page12.tif  
source=01000000115\_ASG1\_Active#page13.tif

## PATENT ASSIGNMENT

For good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Brooks Automation, Inc. ("Assignor"), hereby assigns to MKS Instruments, Inc., a Delaware corporation having a place of business at 2 Tech Drive, Suite 201, Andover, Massachusetts 01810 ("Buyer" and herein also referred to as "Assignee"), all of Assignor's right, title and interest in and to the below-identified patents, patent registrations and patent applications ("Patent Rights"), including all rights to sue for past infringement, the same to be held and enjoyed by Buyer, its successors and assigns, in and throughout the United States of America, its territories and all foreign countries, including but not limited to Assignor's right, title and interest in and to the invention(s) described in said Patent Rights and such letters patents as may issue from patent applications included within the Patent Rights, including but not limited to non-provisionals, continuations, divisionals, reissues, reexaminations, extensions, and substitutions of said application(s) or such patents; said Patent Rights to be held and enjoyed by said Assignee for its own use and behalf and for its successors, assigns and legal representatives, to the full end of the term for which said letters patents may be granted as fully and entirely as the same would have been held by Assignor had this assignment and sale not been made. Assignor hereby conveys all of Assignor's rights arising under or pursuant to any and all United States laws and international agreements, treaties or laws relating to the protection of industrial property by the filing of any such application(s) within the Patent Rights, including but not limited to any cause(s) of action and damages accruing prior to this assignment. Assignor hereby acknowledges that this assignment, being of Assignor's entire right, title and interest in and to said invention(s), carries with it the right in Assignee to apply for and obtain from competent authorities in all countries of the world any and all letters patent by attorneys and agents of Assignee's selection and the right to procure the grant of all letters patent to Assignee in its own name as assignee of Assignor's entire right, title and interest therein;

AND, Assignor hereby further agrees for ourselves and our executors and administrators to execute upon request any other lawful documents and likewise to perform any other lawful acts which may be deemed necessary to secure fully the aforesaid invention(s) to said Assignee, its successors, assigns, and legal representatives, including the execution of non-provisional, substitution, continuation, divisional, reissue, reexamination, or corresponding foreign or international patent applications but at Assignee's own expense and charge;

AND, Assignor hereby further agrees to provide factual statements or testimony in any interference or other proceeding in which said invention(s) or any application or patent directed thereto may be involved;

AND, Assignor hereby authorizes and requests the Director of the United States Patent and Trademark Office to issue such letters patent as shall be granted upon applications included within the Patent Rights, or applications based thereon, to said Assignee, its successors, assigns, or legal representatives:

Docket No.	Country	Case Type	Application Status	Application Number	Filing Date	Publication Number	Publication Date	Patent Number	Issue Date	Title
390-012516-US(PAR)	US	ORD	Granted	11/739,986	25-Apr-07	US2008/0270046	30-Oct-08	8,195,418	5-Jun-12	Pressure measurement instrument and method
0100.2093-008	US	DIV	Granted	11/820,629	20-Jun-07	US2007/0251293	1-Nov-07	7,921,719	12-Apr-11	Method And Apparatus For Storing Vacuum Gauge Calibration Parameters And Measurement Data On A Vacuum Gauge Structure
0100.2153-003	US	DIV	Granted	12/313,778	24-Nov-08	US2009/0146665	11-Jun-09	7,847,559	7-Dec-10	Method And Apparatus For Shielding Feedthrough Pin Insulators In An Ionization Gauge Operating In Harsh Environments
0100.2143-000	US	PRI	Granted	11/827,370	11-Jul-07	US2009/0015264	15-Jan-09	7,768,267	3-Aug-10	An Ionization Gauge With A Cold Electron Source

Docket No.	Country	Case Type	Application Status	Application Number	Filing Date	Publication Number	Publication Date	Patent Number	Issue Date	Title
0100.2149-004	US	CON	Granted	12/229,271	21-Aug-08	US2008/0315887	25-Dec-08	7,656,165	2-Feb-10	Method and Apparatus for Maintaining Emission Capabilities of Hot Cathodes in Harsh Environments
0100.2149-000	US	PRI	Granted	11/488,457	18-Jul-06	US2008/0018337	24-Jan-08	7,429,863	30-Sep-08	Method and Apparatus for Maintaining Emission Capabilities of Hot Cathodes in Harsh Environments
0100.2067-001	US	CIP	Granted	11/439,875	24-May-06	US2007/0012116	18-Jan-07	7,418,869	2-Sep-08	Wide-Range Combination Vacuum Gauge
0100.2150-000	US	PRI	Granted	11/700,303	31-Jan-07			7,360,429	22-Apr-08	High-Sensitivity Pressure Actuated Switch Based On MEMS-fabricated Silicon Diaphragm And Having Electrically Adjustable Switch Point

Docket No.	Country	Case Type	Application Status	Application Number	Filing Date	Publication Number	Publication Date	Patent Number	Issue Date	Title
0100.2093-000	US	ORD	Granted	11/012,871	14-Dec-04	US2006/0123915	15-Jun-06	7,313,966	1-Jan-08	Method And Apparatus For Storing Vacuum Gauge Calibration Parameters And Measurement Data On A Vacuum Gauge Structure
0100.2050-004	US	CIP	Granted	11/354,278	14-Feb-06	US2006/0197537	7-Sep-06	7,295,015	13-Nov-07	An Ionization Gauge
0100.2082-002	US	CON	Granted	11/146,721	7-Jun-05	US2006/0021442	2-Feb-06	7,249,516	31-Jul-07	Method Of Operating A Resistive Heat-Loss Pressure Sensor
0100.2050-001	US	CIP	Granted	10/799,446	12-Mar-04	US2005/0184735	25-Aug-05	7,030,619	18-Apr-06	Ionization Gauge
0100.1019-027	US	CON	Granted	10/852,896	24-May-04	US2004/0216527	4-Nov-04	6,945,119	20-Sep-05	Apparatus And Methods For Heat Loss Pressure Measurement
0100.1019-016	US	CIP	Granted	10/273,402	16-Oct-02	US2003/0097876	29-May-03	6,938,493	6-Sep-05	Apparatus And Methods For Heat Loss Pressure Measurement
0100.1019-028	US	CON	Granted	10/853,358	24-May-04	US2004/0216528	4-Nov-04	6,865,952	15-Mar-05	Apparatus And Methods For Heat Loss Pressure Measurement

Docket No.	Country	Case Type	Application Status	Application Number	Filing Date	Publication Number	Publication Date	Patent Number	Issue Date	Title
0100.1019-018	US	CON	Granted	10/630,458	30-Jul-03	US2004/0020301	5-Feb-04	6,799,468	5-Oct-04	Apparatus And Methods For Heat Loss Pressure Measurement
0100.1019-005	US	CIP	Granted	09/583,339	31-May-00			6,658,941	9-Dec-03	Apparatus And Methods For Heat Loss Pressure Measurement
0100.1019-004b	US	CPA	Granted	09/475,392	2-Aug-00			6,227,056	8-May-01	Method Of Pressure Measurement
0100.1011-005	US	CON	Granted	09/528,472	17-Mar-00			6,198,105	6-Mar-01	Miniature Ionization Gauge Utilizing Multiple Ion Collectors
0100.1018-001	US	DIV	Granted	09/010,484	21-Jan-98			6,081,121	27-Jun-00	Ionization Gauge And Method Of Using And Calibrating Same
0100.1011-004	US	CPA	Granted	09/276,985	14-Oct-99			6,046,456	4-Apr-00	Miniature Ionization Gauge Utilizing Multiple Ion Collectors
0100.1011-000	US	ORD	Granted	08/917,932	27-Aug-97			6,025,723	15-Feb-00	Miniature Ionization Gauge Utilizing Multiple Ion Collectors
0100.1019-000	US	ORD	Granted	08/897,629	21-Jul-97			6,023,979	15-Feb-00	Apparatus And Methods For Heat Loss Pressure

Docket No.	Country	Case Type	Application Status	Application Number	Filing Date	Publication Number	Publication Date	Patent Number	Issue Date	Title
0100.1018-000	US	ORD	Granted	08/745,419	12-Nov-96			5,801,535	1-Sep-98	Ionization Gauge And Method Of Using And Calibrating Same
0100.1010-000	US	ORD	Granted	08/130,128	4-Oct-93			5,452,613	26-Sep-95	Wide Range Vacuum Gauge
0100.2156-001	US	PCT	Published	12/808,983	17-Dec-08	20110234233	29-Sep-11			Ionization Gauge Having Electron Multiplier Cold Emission Source
0100.2174-002	US	RCE	Published	12/860,050	20-Aug-10	US2011/0062961	17-Mar-11	8,648,604	11-Feb-14	Ionization Gauge With Operational Parameters And Geometry Designed For High Pressure Operation
0100.2188-002	US	RCE	Published	13/051,430	18-Mar-11	US2011/0163754	7-Jul-11			Ionization Gauge With Emission Current And Bias Potential Control
0100.2236-008	US	PCT	Published	12/514,339	13-Nov-07	US2010/0084549	8-Apr-10			Electrostatic Ion Trap
0100.2241-003	US	RCE	Allowed	13/289,142	4-Nov-11	US2012/0112056	10-May-12			Electrostatic Ion Trap
0100.2249-003	US	PCT	Published	13/508,644		US2012/0227465	13-Sep-12			Vacuum Quality Measurement



Docket No.	Country	Case Type	Application Status	Application Number	Filing Date	Publication Number	Publication Date	Patent Number	Issue Date	Title
390-010592-US(PAR)	US			475,013	7-Jun-2995			5,720,315	24-Feb-1998	System for Controlling Flow through a process region
390-012516-US(CO1)	US	CON	Granted	13/487,018	1-Jun-12	US2012/0239307	20-Sep-12	8,589,107	19-Nov-13	Measurement Instrument and Method
390-012516-US(CO2)	US	CON	Pending	14/082,894	18-Nov-13					Measurement Instrument and Method
390P010775-US(PAR)	US	ORD	Granted	09/993,111	6-Nov-01	US2002/0108652	15-Aug-02	6,688,321	10-Feb-04	Method and Apparatus for a Flow Regulator Having an Integral Hinge
0100.2367-000	US	PRO	Pending	61/884,797	30-Sep-13	N/A	N/A			Cold Cathode Ionization Vacuum Gauge

Docket No.	Country	Case Type	Application Status	Application Number	Filing Date	Publication Number	Publication Date	Patent Number	Issue Date	Title
0100.1011-001	EP	ORD	Pending	98102090.2	6-Feb-98					Miniature Ionization Gauge Utilizing Multiple Ion Collectors
0100.1011-002	JP	ORD	Granted	10199849659	2-Mar-98			2839243	16-Oct-98	Miniature Ionization Gauge Utilizing Multiple Ion Collectors
0100.1016-001	JP	ORD	To be Abnd.	4280293	19-Oct-92			3359941	11-Oct-02	Improved Ionization Gauge And Method Of Using And Calibrating Same
0100.1019-001	EP	ORD	Natl Proc	98102089.4	6-Feb-98			0893677	16-Jan-02	Apparatus And Methods For Heat Loss Pressure Measurement
0100.1019-003	JP	ORD	Granted	10199853876	5-Mar-98			2839244	16-Oct-98	Apparatus And Methods For Heat Loss Pressure Measurement
0100.1019-008	JP	ORD	To be Abnd.	2001165174	31-May-01					Apparatus And Methods For Heat Loss Pressure Measurement
0100.1019-012	FR	EPC	Granted	98102089.4	6-Feb-98			0893677	16-Jan-02	Apparatus And Methods For Heat Loss Pressure Measurement
0100.1019-013	DE	EPC	Granted	98102089.4	6-Feb-98			69803147.4-08	16-Jan-02	Apparatus And Methods For Heat Loss Pressure Measurement
0100.1019-014	GB	EPC	To be Abnd.	98102089.4	6-Feb-98			0893677	16-Jan-02	Apparatus And Methods For Heat Loss Pressure Measurement
0100.1019-025	TW	ORD	To be Abnd.	92127922	8-Oct-03					Apparatus And Methods For Heat Loss Pressure Measurement
0100.1019-030	EP	PCT	Natl Proc	03770756.9	14-Oct-03	1552265	13-Jul-05	1552265	23-Aug-06	Heat Loss Pressure Measurement

Docket No.	Country	Case Type	Application Status	Application Number	Filing Date	Publication Number	Publication Date	Patent Number	Issue Date	Title
0100.1019-032	KR	PCT	To be Abnd.	20057006598	14-Oct-03					Apparatus And Methods For Heat Loss Pressure Measurement
0100.2082-005	CN	PCT	Granted	200580025130. X	19-Jul-05	CN1993607	4-Jul-07	ZL200580025130 X	22-Apr-09	Method Of Operating A Resistive Heat-Loss Pressure Sensor
0100.2082-006	EP	PCT	Granted	05772352.0	19-Jul-05	1771711	11-Apr-07	1771711	25-Apr-12	Heat-Loss Pressure Sensor
0100.2082-007	JP	PCT	Granted	2007523626	19-Jul-05			4809837	26-Aug-11	Method Of Operating A Resistive Heat-Loss Pressure Sensor
0100.2082-009	GB	EPP	Granted	05772352.0	19-Jul-05			1771711	25-Apr-12	Method Of Operating A Resistive Heat-Loss Pressure Sensor
0100.2082-010	DE	EPP	Granted	05772352.0	19-Jul-05				25-Apr-12	Method Of Operating A Resistive Heat-Loss Pressure Sensor
0100.2082-011	CH	EPP	Granted	05772352.0	19-Jul-05			1771711	25-Apr-12	Method Of Operating A Resistive Heat-Loss Pressure Sensor
0100.2093-003	TW	ORD	Allowed	94144066	13-Dec-05					Method And Apparatus For Storing Vacuum Gauge Calibration Parameters And Measurement Data On A Vacuum Gauge Structure
0100.2093-004	CN	PCT	Granted	200580042652. 0	29-Nov-05	CN101084422A	5-Dec-07	ZL200580042652 0	9-Sep-09	Method And Apparatus For Storing Vacuum Gauge Calibration Parameters And Measurement Data On A Vacuum Gauge Structure

Docket No.	Country	Case Type	Application Status	Application Number	Filing Date	Publication Number	Publication Date	Patent Number	Issue Date	Title
0100.2093-005	EP	PCT	Allowed	05852494.3	29-Nov-05	1825241	29-Aug-07			Method And Apparatus For Storing Vacuum Gauge Calibration Parameters And Measurement Data On A Vacuum Gauge Structure
0100.2093-006	JP	PCT	Granted	2007546716	29-Nov-05	2012112981	14-Jun-12	5124283	2-Nov-12	Method And Apparatus For Storing Vacuum Gauge Calibration Parameters And Measurement Data On A Vacuum Gauge Structure
0100.2093-009	CN	DIV	Granted	200910150238. 1	29-Nov-05	CN101666697A	10-Mar-10	ZL200910150238 .1	4-Jul-12	Method And Apparatus For Storing Vacuum Gauge Calibration Parameters And Measurement Data On A Vacuum Gauge Structure
0100.2093-010	JP	DIV	Pending	2012063178	29-Nov-05					Method And Apparatus For Storing Vacuum Gauge Calibration Parameters And Measurement Data On A Vacuum Gauge Structure
0100.2149-003	TW	ORD	Allowed	96122448	22-Jun-07					Method and Apparatus for Maintaining Emission Capabilities of Hot Cathodes in Harsh Environments
0100.2149-006	JP	PCT	Granted	2009520742	18-Jun-07	2009544140	10-Dec-09	5379684	4-Oct-13	Method and Apparatus for Maintaining Emission Capabilities of Hot Cathodes in Harsh Environments
0100.2156-003	CN	PCT	To be Abnd.	200880126701. 2	17-Dec-08	CN101952703A	19-Jan-11			Ionization Gauge Having Electron Multiplier Cold Emission Source
0100.2156-004	EP	PCT	Published	08868368.5	17-Dec-08	2232224	29-Sep-10			Ionization Gauge Having Electron Multiplier Cold Emission Source

Docket No.	Country	Case Type	Application Status	Application Number	Filing Date	Publication Number	Publication Date	Patent Number	Issue Date	Title
0100.2156-005	KR	PCT	Pending	1020107016098	17-Dec-08					Ionization Gauge Having Electron Multiplier Cold Emission Source
0100.2156-006	JP	PCT	Pending	2010539468	17-Dec-08					Ionization Gauge Having Electron Multiplier Cold Emission Source
0100.2174-003	CN	PCT	Granted	2009801125552	19-Feb-09	CN101990630A	23-Mar-11	ZL2009801125552	14-Aug-13	Ionization Gauge With Operational Parameters And Geometry Designed For High Pressure Operation
0100.2174-004	EP	PCT	Published	09713559.4	19-Feb-09	2252869	24-Nov-10			Ionization Gauge With Operational Parameters And Geometry Designed For High Pressure Operation
0100.2174-005	JP	PCT	Pending	2010547736	19-Feb-09					Ionization Gauge With Operational Parameters And Geometry Designed For High Pressure Operation
0100.2188-003	CN	PCT	Published	2009801370982	11-Sep-09	CN102159929A	17-Aug-11			Ionization Gauge With Emission Current And Bias Potential Control
0100.2188-004	EP	PCT	Published	09815009.7	11-Sep-09	2326931	1-Jun-11			Ionization Gauge With Emission Current And Bias Potential Control
0100.2188-005	JP	PCT	Published	2011527884	11-Sep-09	2012503199	2-Feb-12			Ionization Gauge With Emission Current And Bias Potential Control
0100.2234-001	WO	PRI	Published	PCT/US2013/025198	7-Feb-13	WO2013119851	15-Aug-13			Ionization Gauge for High Pressure Operation
0100.2236-003	TW	ORD	Pending	96142784	12-Nov-07					Mass Spectrometer Systems And Methods
0100.2236-004	CN	PCT	Published	2007800420720	13-Nov-07	CN101578684A	11-Nov-09			Electrostatic Ion Trap

Docket No.	Country	Case Type	Application Status	Application Number	Filing Date	Publication Number	Publication Date	Patent Number	Issue Date	Title
0100.2236-005	EP	PCT	Published	07840031.4	13-Nov-07	2076917	8-Jul-09			Electrostatic Ion Trap
0100.2236-006	JP	PCT	Granted	2009536335	13-Nov-07			5324457	26-Jul-13	Electrostatic Ion Trap
0100.2236-007	KR	PCT	Pending	1020097012363	13-Nov-07					Electrostatic Ion Trap
0100.2241-004	CN	PCT	Published	201080029456.0	5-May-10	CN102648511A	22-Aug-12			Electrostatic Ion Trap
0100.2241-005	EP	PCT	Published	10772778.6	5-May-10	2430646	21-Mar-12			Electrostatic Ion Trap
0100.2241-006	KR	PCT	Published	1020117028183	5-May-10	20120060941	12-Jun-12			Electrostatic Ion Trap
0100.2241-007	JP	PCT	Pending	2012509953	5-May-10					Electrostatic Ion Trap
0100.2249-004	CN	PCT	Published	201080050648.X	8-Nov-10	102612641	25-Jul-12			Vacuum Quality Measurement System
0100.2249-005	EP	PCT	Published	10829236.8	8-Nov-10	2499476	19-Sep-12			Vacuum Quality Measurement System
0100.2249-006	JP	PCT	Published	2012538063	8-Nov-10	2013510323	21-Mar-13			Vacuum Quality Measurement System
0100.2249-007	KR	PCT	Pending	1020127014884	8-Nov-10					Vacuum Quality Measurement System
0100.2336-002	WO	PRI	Published	PCT/US2012/062599	30-Oct-12	WO2013/066881	10-May-13			Method And Apparatus For Tuning An Electrostatic Ion Trap
0100.2350-001	WO	PRI	Pending	PCT/US2013/030801	13-Mar-13					Trace Gas Concentration In ART MS Traps
390-012516-CN(PCT)	CN	ORA	Granted	CN0880021480.2	24-Apr-08	101688813	31-Mar-10	Z10880021480.2	17-Jul-13	Pressure measurement instrument and method
390-012516-EP(PCT)	EP	ORA	Published	EP08743228.2	24-Apr-08	2 140 241	6-Jan-10			Pressure measurement instrument and method
390-012516-JP(PCT)	JP	ORA	Published	JP2010506251	24-Apr-08	10-525366	22-Jul-10			Pressure measurement instrument and method
390-012516-TW(EQV)	TW	ORD	Pending	TW97115165	25-Apr-08					Pressure measurement instrument and method

Executed as of the 30<sup>th</sup> day of May, 2014.

**BROOKS AUTOMATION, INC.**

By: 

Name: Stephen S. Schwartz

Title: Chief Executive Officer

*[Signature Page to Patent Assignment]*