

## PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1  
Stylesheet Version v1.2

EPAS ID: PAT4779620

<b>SUBMISSION TYPE:</b>	NEW ASSIGNMENT
<b>NATURE OF CONVEYANCE:</b>	ASSIGNMENT
<b>CONVEYING PARTY DATA</b>	
<b>Name</b>	<b>Execution Date</b>
THORATEC LLC	11/16/2015
<b>RECEIVING PARTY DATA</b>	
<b>Name:</b>	TC1 LLC
<b>Street Address:</b>	ONE ST. JUDE MEDICAL DRIVE
<b>City:</b>	ST. PAUL
<b>State/Country:</b>	MINNESOTA
<b>Postal Code:</b>	55117
<b>PROPERTY NUMBERS Total: 1</b>	
<b>Property Type</b>	<b>Number</b>
<b>Application Number:</b>	15198342
<b>CORRESPONDENCE DATA</b>	
<b>Fax Number:</b>	(314)612-2307
<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>	314-621-5070
<b>Email:</b>	uspatents@armstrongteasdale.com
<b>Correspondent Name:</b>	PATENT DOCKET DEPARTMENT
<b>Address Line 1:</b>	ARMSTRONG TEASDALE LLP
<b>Address Line 2:</b>	7700 FORSYTH BLVD., SUITE 1800
<b>Address Line 4:</b>	ST. LOUIS, MISSOURI 63105
<b>ATTORNEY DOCKET NUMBER:</b>	P04012D
<b>NAME OF SUBMITTER:</b>	CHRISTOPHER M. GOFF
<b>SIGNATURE:</b>	/Christopher M. Goff/
<b>DATE SIGNED:</b>	01/17/2018
<b>Total Attachments: 25</b>	
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## CONFIRMATORY ASSIGNMENT

WHEREAS, Thoratec Corporation was converted to Thoratec LLC pursuant to the Articles of Organization – Conversion, filed on November 12, 2015.

WHEREAS, Thoratec LLC, a Limited Liability Company of California, having its principal place of business at 6035 Stoneridge Drive, Pleasanton, California 94588 (“Assignor”), has heretofore sold, transferred, and conveyed to TC1 LLC, a Limited Liability Company having a principal place of business at 6035 Stoneridge Drive, Pleasanton, California 94588 (“Assignee”), all of its right, title, and interest, in and to certain inventions, patents, and patent applications as set forth in Exhibit A attached hereto, as part of an assignment agreement dated November 16, 2015 and attached as Exhibit A.

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which is acknowledged, Assignor hereby confirms that Assignor did sell, transfer, and convey unto Assignee all right, title, and interest in and to the following:

- (a) all intellectual property (including, without limitation, any innovation, information, invention, discovery, product, process, work or design) disclosed, embodied, shown, or claimed in the below-referenced patent applications in Exhibit A, implicitly or explicitly;
- (b) the below-referenced patent applications in Exhibit A, the right to claim priority to the below-referenced patent applications in Exhibit A, all applications based in whole or in part upon the below-referenced patent applications in Exhibit A, including, without limitation, all applications that are a provisional, non-provisional, design, divisional, continuation, continuation-in-part, registration, utility model, industrial design, reissue, renewal, substitute, extension, reexamination, post-grant review, inter partes review, supplemental examination or non-U.S. patent applications or application for other rights based in whole or in part on the below-referenced patent applications in Exhibit A;
- (c) all patents (including, without limitation, all U.S. and non-U.S. patents, registrations, utility models, industrial designs, design patents, counterparts, continuations, continuations-in-part, divisionals, reissues, renewals, substitutes, extensions, reexaminations, post-grant reviews, inter partes reviews and supplemental examinations) that are granted or issued upon, or that claim priority to, any and all applications described in (b) of this paragraph or that disclose or claim intellectual property described in (a) of this paragraph, in whole or in part; and
- (d) all claims for damages by reason of past infringement of any rights under the applications or patents described in (a), (b) or (c) of this paragraph (including provisional rights to reasonable royalties pursuant to 35 U.S.C. §154(d)) and the right to sue for and collect such damages and royalties for Assignee’s own use.

Assignor hereby authorizes and requests the U.S. Patent and Trademark Office or any other U.S. or non-U.S. agency to issue to the Assignee any and all patent(s), or other rights or documents, resulting from the intellectual property, patent application(s) and patents described in this Confirmatory Assignment.

Assignor hereby agrees to sign all papers and documents, including without limitation, applications, declarations, oaths and petitions, and, at the Assignee’s expense, perform any other acts that are necessary in connection with prosecution of patent application(s) or intellectual property described in

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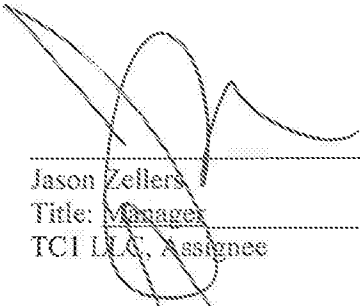
this Confirmatory Assignment and the enforcement of patent(s) or other rights resulting from such patent application(s) or intellectual property.

Assignor hereby agrees that the terms, covenants, and conditions of this Confirmatory Assignment shall be binding upon and inure to the benefit of the Assignee, its successors, assigns and other legal representative.

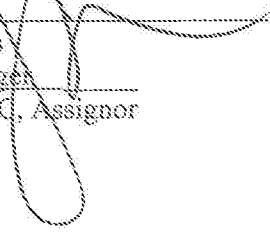
Assignor hereby promises and affirms that Assignor has not entered, and will not enter, into any assignment, contract, or understanding that conflicts with this Confirmatory Assignment.

In Witness Whereof, Assignor and Assignee have executed this Confirmatory Assignment on the dates indicated below.

Dated: Nov 28, 2014

  
\_\_\_\_\_  
Jason Zellers  
Title: Manager  
TCI LLC, Assignee

Dated: Nov 28, 2014

  
\_\_\_\_\_  
Jason Zellers  
Title: Manager  
Thoratec LLC, Assignor

## Exhibit A

Knobbe Ref.	Thoratec Ref.	Country	Title of Invention	Appl. No.	Filing Date	Status
THOR.001PCA	P02000X4CA1	CA	IMPLANTABLE HEART ASSIST SYSTEM	2480467	2/14/2003	Issued
THOR.001PCAD1	P02000X4CA2	CA	IMPLANTABLE HEART ASSIST SYSTEM AND METHOD OF APPLYING SAME	2785934	8/7/2012	Abandoned
THOR.001PPC	P02000X4WO	WO	IMPLANTABLE HEART ASSIST SYSTEM	PCT/US2003/04853	2/14/2003	Abandoned
THOR.007VREP	P02002EP2	EP	CANNULAE HAVING A REDIRECTING TIP	8010438.3	11/10/2004	Abandoned
THOR.014A	P02007	US	IMPLANTABLE HEART ASSIST SYSTEM AND METHOD OF APPLYING SAME	10/686040	10/15/2003	Abandoned
THOR.033A	P04000	US	EXPANDABLE IMPELLER PUMP	11/227277	9/15/2005	Issued
THOR.033C1	P04000C1	US	EXPANDABLE IMPELLER PUMP	12/157267	6/9/2008	Issued
THOR.033C1C1	P04000C2	US	EXPANDABLE IMPELLER PUMP	13/072624	3/25/2011	Issued
THOR.033C3	P04000C3	US	EXPANDABLE IMPELLER PUMP	13/740042	1/11/2013	Issued
THOR.033C4	P04000C4	US	EXPANDABLE IMPELLER PUMP	14/622339	2/13/2015	Published
THOR.033PR	P04000A	US	LEFT VENTRICULAR ASSIST DEVICE (LVAD) WITH EXPANDABLE CATHETER/IMPELLER PUMP	60/610938	9/17/2004	Closed
THOR.033VAU	P04000AU1	AU	EXPANDABLE IMPELLER PUMP	2005286914	9/16/2005	Issued
THOR.033VAUD1	P04000AU2	AU	EXPANDABLE IMPELLER PUMP	2012203159	9/16/2005	Issued
THOR.033VCA	P04000CA	CA	EXPANDABLE IMPELLER PUMP	2580452	9/16/2005	Issued
THOR.033VCN	P04000CN	CN	EXPANDABLE IMPELLER PUMP	200580031227.1	9/16/2005	Issued
THOR.033VEP	P04000EP	EP	EXPANDABLE IMPELLER PUMP	5799883.3	9/16/2005	Published
THOR.033VEPD1	P04000EP2	EP	EXPANDABLE IMPELLER PUMP	13167651	5/14/2013	Published

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Knobbe Ref.	Thoratec Ref.	Country	Title of Invention	Appl. No.	Filing Date	Status
THOR.033VHK	P04000HK	HK	EXPANDABLE IMPELLER PUMP	7106935.8	9/16/2005	Published
THOR.033VJP	P04000JP1	JP	EXPANDABLE IMPELLER PUMP	2007-532569	9/16/2005	Issued
THOR.033VJPD1	P04000JP2	JP	EXPANDABLE IMPELLER PUMP	2011-000620	9/16/2005	Issued
THOR.033VPC	P04000WO	WO	EXPANDABLE IMPELLER PUMP	PCT/US2005/033416	9/16/2005	Closed
THOR.034A	P04001	US	HEART ASSIST DEVICE WITH EXPANDABLE IMPELLER PUMP	11/728051	3/23/2007	Issued
THOR.034C1	P04001C1	US	HEART ASSIST DEVICE WITH EXPANDABLE IMPELLER PUMP	12/945594	11/12/2010	Issued
THOR.034C2	P04001C2	US	HEART ASSIST DEVICE WITH EXPANDABLE IMPELLER PUMP	13/618071	9/14/2012	Issued
THOR.034C3	P04001C3	US	HEART ASSIST DEVICE WITH EXPANDABLE IMPELLER PUMP	15/176620	6/8/2016	Pending
THOR.034PR1	P04001A	US	EXPANDABLE IMPELLER PUMP	60/785299	3/23/2006	Closed
THOR.034PR2	P04002A	US	HEART ASSIST DEVICE WITH EXPANDABLE IMPELLER PUMP	60/785531	3/23/2006	Closed
THOR.034VAU	P04001AU	AU	HEART ASSIST DEVICE WITH EXPANDABLE IMPELLER PUMP	2007230945	3/23/2007	Issued
THOR.034VCA	P04001CA	CA	HEART ASSIST DEVICE WITH EXPANDABLE IMPELLER PUMP	2646277	3/23/2007	Issued
THOR.034VCN	P04001CN1	CN	HEART ASSIST DEVICE WITH EXPANDABLE IMPELLER PUMP	200780018603.2	3/23/2007	Issued
THOR.034VCND1	P04001CN2	CN	HEART ASSIST DEVICE WITH EXPANDABLE IMPELLER PUMP	201110240259.X	3/23/2007	Abandoned
THOR.034VEP	P04001EP	EP	HEART ASSIST DEVICE WITH EXPANDABLE IMPELLER PUMP	7753903.9	3/23/2007	Issued

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Knobbe Ref.	Thoratec Ref.	Country	Title of Invention	Appl. No.	Filing Date	Status
THOR.034VEP	P04001DE	DE	HEART ASSIST DEVICE WITH EXPANDABLE IMPELLER PUMP	7753903.9	3/23/2007	Issued
THOR.034VEP	P04001GB	GB	HEART ASSIST DEVICE WITH EXPANDABLE IMPELLER PUMP	7753903.9	3/23/2007	Issued
THOR.034VEP	P04001NL	NL	HEART ASSIST DEVICE WITH EXPANDABLE IMPELLER PUMP	7753903.9	3/23/2007	Issued
THOR.034VEP	P04001FR	FR	HEART ASSIST DEVICE WITH EXPANDABLE IMPELLER PUMP	7753903.9	3/23/2007	Issued
THOR.034VEPD1	THOR-P04001EP2	EP	HEART ASSIST DEVICE WITH EXPANDABLE IMPELLER PUMP	16169053	5/10/2016	Pending
THOR.034VHK	P04001HK	HK	HEART ASSIST DEVICE WITH EXPANDABLE IMPELLER PUMP	9100058	3/23/2007	ABA Intent
THOR.034VJP	P04001JP1	JP	HEART ASSIST DEVICE WITH EXPANDABLE IMPELLER PUMP	2009-501590	3/23/2007	Abandoned
THOR.034VJPD1	P04001JP2	JP	HEART ASSIST DEVICE WITH EXPANDABLE IMPELLER PUMP	2011-102836	3/23/2007	Abandoned
THOR.034VJPD2	P04001JP3	JP	HEART ASSIST DEVICE WITH EXPANDABLE IMPELLER PUMP	2012-083873	3/23/2007	Issued
THOR.034VPC	P04001WO	WO	HEART ASSIST DEVICE WITH EXPANDABLE IMPELLER PUMP	PCT/US07/073 13	3/23/2007	Closed
THOR.039A	P04003	US	BLOOD PUMP WITH EXPANDABLE CANNULA	12/829359	7/1/2010	Issued
THOR.039AU	P04003AU	AU	BLOOD PUMP WITH EXPANDABLE CANNULA	2010266166	7/1/2010	Issued
THOR.039C1	P04003C	US	BLOOD PUMP WITH EXPANDABLE CANNULA	13/968161	8/15/2013	Issued
THOR.039CA	P04003CA	CA	BLOOD PUMP WITH EXPANDABLE CANNULA	2769631	7/1/2010	Pending

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Knobbe Ref.	Thoratec Ref.	Country	Title of Invention	Appl. No.	Filing Date	Status
THOR.039CN	P04003CN	CN	BLOOD PUMP WITH EXPANDABLE CANNULA	201080038684.4	7/1/2010	Abandoned
THOR.039EP	P04003EP	EP	BLOOD PUMP WITH EXPANDABLE CANNULA	10730681	7/1/2010	Published
THOR.039JP	P04003JP1	JP	BLOOD PUMP WITH EXPANDABLE CANNULA	2012-518617	7/1/2010	Issued
THOR.039JPD1	P04003JP2	JP	BLOOD PUMP WITH EXPANDABLE CANNULA	2015-186444	9/24/2015	Pending
THOR.039PR	P04003A	US	BLOOD PUMP WITH EXPANDABLE CANNULA	61/222236	7/1/2009	Expired
THOR.039VPC	P04003WO	WO	BLOOD PUMP WITH EXPANDABLE CANNULA	PCT/US2010/040847	7/1/2010	Expired
THOR.045A	P04008	US	PERCUTANEOUS HEART PUMP	13/345597	1/6/2012	Issued
THOR.045C1	P04008C	US	PERCUTANEOUS HEART PUMP	14/858354	9/18/2015	Published
THOR.045PR	P04008A	US	PERCUTANEOUS HEART PUMP	61/430537	1/6/2011	Expired
THOR.045WO	P04008WO	WO	PERCUTANEOUS HEART PUMP	PCT/US2012/020553	1/6/2012	Expired
THOR.046A	P04009	US	CATHETER PUMP	13/343618	1/4/2012	Issued
THOR.046CA	P04009CA	CA	PERCUTANEOUS HEART PUMP	2823951	7/4/2013	Pending
THOR.046EP	P04009EP	EP	PERCUTANEOUS HEART PUMP	12731913	8/5/2013	Published
THOR.046PR	P04009A	US	PERCUTANEOUS HEART PUMP	61/430129	1/5/2011	Expired
THOR.046TW	P04009TW	TW	HEART PUMP AND CATHETER ASSEMBLY THEREFOR	101100509	1/5/2012	Issued
THOR.046WO	P04009WO	WO	PERCUTANEOUS HEART PUMP	PCT/US2012/020382	1/5/2012	Expired
THOR.047A	P04010	US	IMPELLER HOUSING FOR PERCUTANEOUS HEART PUMP	13/343617	1/4/2012	Issued
THOR.047AU	P04010AU	AU	IMPELLER HOUSING FOR PERCUTANEOUS HEART PUMP	2012204321	7/2/2013	Pending
THOR.047CA	P04010CA	CA	IMPELLER HOUSING FOR PERCUTANEOUS HEART PUMP	2823950	7/4/2013	Pending



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Knobbe Ref.	Thoratec Ref.	Country	Title of Invention	Appl. No.	Filing Date	Status
THOR.047EP	P04010EP	EP	IMPELLER HOUSING FOR PERCUTANEOUS HEART PUMP	12732507	8/5/2013	Published
THOR.047PR	P04010A	US	IMPELLER HOUSING FOR PERCUTANEOUS HEART PUMP	61/430146	1/5/2011	Expired
THOR.047TW	P04010TW	TW	IMPELLER HOUSING FOR PERCUTANEOUS HEART PUMP	101100510	1/5/2012	Abandoned
THOR.047WO	P04010WO	WO	IMPELLER HOUSING FOR PERCUTANEOUS HEART PUMP	PCT/US2012/020369	1/5/2012	Expired
THOR.048A	P04011	US	CATHETER PUMP	13/344544	1/5/2012	Issued
THOR.048PR	P04011A1	US	PERCUTANEOUS HEART PUMP	61/430171	1/6/2011	Expired
THOR.048PR2	P04011A2	US	PERCUTANEOUS HEART PUMP	61/430517	1/6/2011	Expired
THOR.048WO	P04011WO	WO	PERCUTANEOUS HEART PUMP	PCT/US2012/020383	1/5/2012	Expired
THOR.072A	P04013	US	DISTAL BEARING SUPPORT	13/802556	3/13/2013	Issued
THOR.072C1	P04013C	US	DISTAL BEARING SUPPORT	15/266864	9/15/2016	Pending
THOR.072DE	P04013DE	DE	DISTAL BEARING SUPPORT	102013008158	5/13/2013	Published
THOR.072EP	P04013EP	EP	DISTAL BEARING SUPPORT	13791119	11/12/2014	Published
THOR.072GB	P04013GB1	GB	DISTAL BEARING SUPPORT	1308544.4	5/13/2013	Issued
THOR.072GBD1	P04013GB2	GB	DISTAL BEARING SUPPORT	1414709.4	8/19/2014	Abandoned
THOR.072JP	P04013JP	JP	DISTAL BEARING SUPPORT	2015-512724	11/13/2014	Pending
THOR.072PR	P04013A	US	DISTAL BEARING SUPPORT	61/646755	5/14/2012	Expired
THOR.072WO	P04013WO	WO	DISTAL BEARING SUPPORT	PCT/US2013/040798	5/13/2013	Expired
THOR.084A	P04012	US	FLUID HANDLING SYSTEM	14/203978	3/11/2014	Issued
THOR.084D1	P04012D	US	FLUID HANDLING SYSTEM	15/198342	6/30/2016	Published
THOR.084DA1	D04018	US	CATHETER PUMP CONSOLE INTERFACE	29/449306	3/14/2013	Issued
THOR.084DA2	D04020	US	CATHETER PUMP CONSOLE	29/449287	3/14/2013	Issued

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Knobbe Ref.	Thoratec Ref.	Country	Title of Invention	Appl. No.	Filing Date	Status
THOR.084EP	P04012EP	EP	FLUID HANDLING SYSTEM	14779928	9/9/2015	Published
THOR.084JP	P04012JP	JP	FLUID HANDLING SYSTEM	2016-500668	9/11/2015	Pending
THOR.084PR	P04012A1	US	FLUID HANDLING SYSTEM	61/646861	5/14/2012	Abandoned
THOR.084PR2	P04012A2	US	FLUID HANDLING SYSTEM	61/780656	3/13/2013	Expired
THOR.084WO	P04012WO	WO	FLUID HANDLING SYSTEM	PCT/US2014/020790	3/5/2014	Expired
THOR.084XAU1	D04018AU	AU	CATHETER PUMP CONSOLE INTERFACE	14455/2013	9/9/2013	Issued
THOR.084XAU2	D04020AU1	AU	CATHETER PUMP CONSOLE	14456/2013	9/9/2013	Issued
THOR.084XAU3	D04020AU2	AU	CATHETER PUMP CONSOLE	14457/2013	9/9/2013	Issued
THOR.084XCA1	D04018CA	CA	CATHETER PUMP CONSOLE INTERFACE	152903	9/9/2013	Issued
THOR.084XCA2	D04020CA	CA	CATHETER PUMP CONSOLE	152904	9/9/2013	Issued
THOR.084XCA2D1	D04020CA2	CA	CATHETER PUMP CONSOLE	157980	7/31/2014	Issued
THOR.084XEU1	D04018EP	EM	CATHETER PUMP CONSOLE INTERFACE	001383715-0001	9/10/2013	Issued
THOR.084XEU2	D04020EP	EM	CATHETER PUMP CONSOLE	001383624-0001-0002	9/10/2013	Issued
THOR.084XJP1	D04018JP	JP	CATHETER PUMP CONSOLE INTERFACE	2013-021388	9/17/2013	Issued
THOR.084XJP2	D04020JP	JP	CATHETER PUMP CONSOLE	2013-021389	9/17/2013	Issued
THOR.089A	P04014	US	SHEATH SYSTEM FOR CATHETER PUMP	13/801833	3/13/2013	Published
THOR.089DE	P04014DE	DE	SHEATH SYSTEM FOR CATHETER PUMP	102013008159.9	5/13/2013	Published
THOR.089EP	P04014EP	EP	SHEATH SYSTEM FOR CATHETER PUMP	13790890	11/21/2014	Published
THOR.089GB	P04014GB	GB	SHEATH SYSTEM FOR CATHETER PUMP	1308566.7	5/13/2013	Issued
THOR.089PR	P04014A	US	SHEATH SYSTEM FOR CATHETER PUMP	61/646789	5/14/2012	Expired

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Knobbe Ref.	Thoratec Ref.	Country	Title of Invention	Appl. No.	Filing Date	Status
THOR.089WO	P04014WO	WO	SHEATH SYSTEM FOR CATHETER PUMP	PCT/US2013/040799	5/13/2013	Expired
THOR.090A	P04015	US	IMPELLER FOR CATHETER PUMP	13/802570	3/13/2013	Issued
THOR.090C1	-P04015C	US	IMPELLER FOR CATHETER PUMP	15/142522	4/29/2016	Published
THOR.090DE	P04015DE	DE	IMPELLER FOR CATHETER PUMP	102013008168.8	5/13/2013	Published
THOR.090EP	P04015EP	EP	IMPELLER FOR CATHETER PUMP	13790364	11/21/2014	Published
THOR.090GB	P04015GB	GB	IMPELLER FOR CATHETER PUMP	1308563.4	5/13/2013	Abandoned
THOR.090NP	P04015US	US	IMPELLER FOR CATHETER PUMP	14/401096	11/13/2014	Issued
THOR.090PR	P04015A1	US	BLADES FOR CATHETER PUMP	61/646827	5/14/2012	Expired
THOR.090PR2	P04015A2	US	BLADES FOR CATHETER PUMP	61/667875	7/3/2012	Expired
THOR.090WO	P04015WO	WO	IMPELLER FOR CATHETER PUMP	PCT/US2013/040809	5/13/2013	Expired
THOR.092A	P04016	US	CATHETER PUMP	13/801528	3/13/2013	Issued
THOR.092D1	P04016D	US	CATHETER PUMP	15/172664	6/3/2016	Published
THOR.092EP	P04016EP	EP	CATHETER PUMP	13813867	12/23/2014	Published
THOR.092PR	P04016A	US	CATHETER PUMP	61/667903	7/3/2012	Expired
THOR.092WO	P04016WO	WO	CATHETER PUMP	PCT/US2013/048343	6/27/2013	Expired
THOR.093A	P04017	US	MOTOR ASSEMBLY FOR CATHETER PUMP	13/802468	3/13/2013	Issued
THOR.093C1	P04017C	US	MOTOR ASSEMBLY FOR CATHETER PUMP	14/719816	5/22/2015	Abandoned
THOR.093C2	P04017C2	US	MOTOR ASSEMBLY FOR CATHETER PUMP	15/242024	8/19/2016	Pending
THOR.093DE	P04017DE	DE	MOTOR ASSEMBLY FOR CATHETER PUMP	102013011042.4	7/2/2013	Published
THOR.093EP	P04017EP	EP	MOTOR ASSEMBLY FOR CATHETER PUMP	13813687	12/23/2014	Published
THOR.093GB	P04017GB	GB	MOTOR ASSEMBLY FOR CATHETER PUMP	1311685	6/28/2013	Abandoned
THOR.093PR	P04017A	US	CATHETER PUMP	61/667869	7/3/2012	Expired
THOR.093WO	P04017WO	WO	MOTOR ASSEMBLY FOR CATHETER PUMP	PCT/US2013/048332	6/27/2013	Expired

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Knobbe Ref.	Thoratec Ref.	Country	Title of Invention	Appl. No.	Filing Date	Status
THOR.097A	P04019	US	CATHETER PUMP ASSEMBLY INCLUDING A STATOR	14/209889	3/13/2014	Issued
THOR.097C1	P04019C	US	CATHETER PUMP ASSEMBLY INCLUDING A STATOR	15/065573	3/9/2016	Published
THOR.097EP	P04019EP	EP	CATHETER PUMP ASSEMBLY INCLUDING A STATOR	14764393	10/7/2015	Published
THOR.097NP	P04019US	US	CATHETER PUMP ASSEMBLY INCLUDING A STATOR	14/775501	9/11/2015	Published
THOR.097PR	P04019A1	US	CATHETER PUMP ASSEMBLY INCLUDING A STATOR	61/798590	3/15/2013	Expired
THOR.097PR2	P04019A2	US	CATHETER PUMP ASSEMBLY INCLUDING A STATOR	61/903282	11/12/2013	Expired
THOR.097WO	P04019WO	WO	CATHETER PUMP ASSEMBLY INCLUDING A STATOR	PCT/US2014/020878	3/5/2014	Expired
THOR.102A	P04022	US	SENSORS FOR CATHETER PUMPS	14/687493	4/15/2015	Published
THOR.102EP	P04022EP	EP	SENSORS FOR CATHETER PUMPS	15780622	10/28/2016	Pending
THOR.102PR	P04022A	US	SENSORS FOR CATHETER PUMPS	61/979920	4/15/2014	Expired
THOR.102WO	P04022WO	WO	SENSORS FOR CATHETER PUMPS	PCT/US2015/025960	4/15/2015	Published
THOR.103NP	P04024US	US	CATHETER PUMP WITH OFF-SET MOTOR POSITION	15/303711	10/12/2016	Pending
THOR.103PR	P04024A	US	CATHETER PUMP WITH OFF-SET MOTOR POSITION	61/979876	4/15/2014	Expired
THOR.103WO	P04024WO	WO	CATHETER PUMP WITH OFF-SET MOTOR POSITION	PCT/US2015/025959	4/15/2015	Expired
THOR.104NP	P04026	US	HEART PUMP PROVIDING ADJUSTABLE OUTFLOW	15/303698	10/12/2016	Pending

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Knobbe Ref.	Thoratec Ref.	Country	Title of Invention	Appl. No.	Filing Date	Status
THOR.104PR	P04026A	US	HEART PUMP PROVIDING ADJUSTABLE OUTFLOW	61/979925	4/15/2014	Expired
THOR.104WO	P04026WO	WO	HEART PUMP PROVIDING ADJUSTABLE OUTFLOW	PCT/US2015/026014	4/15/2015	Expired
THOR.105A	P04021	US	CATHETER PUMP WITH POSITIONING BRACE	15/130170	4/15/2016	Published
THOR.105PR	P04021A1	US	CATHETER PUMP WITH POSITIONING BRACE	61/979974	4/15/2014	Expired
THOR.105PR2	P04021A2	US	CATHETER PUMP WITH POSITIONING BRACE	62/148420	4/16/2015	Expired
THOR.106A	P04027	US	CATHETER PUMP WITH ACCESS PORTS	14/687382	4/15/2015	Published
THOR.106EP	P04027EP	EP	CATHETER PUMP WITH ACCESS PORTS	15780293	10/28/2016	Pending
THOR.106PR	P04027A	US	CATHETER PUMP WITH ACCESS PORTS	61/979952	4/15/2014	Expired
THOR.106WO	P04027WO	WO	CATHETER PUMP WITH ACCESS PORTS	PCT/US2015/026013	4/15/2015	Expired
THOR.107EP	P04023EP	EP	CATHETER PUMP INTRODUCER SYSTEMS AND METHODS	15779336	10/28/2016	Pending
THOR.107NP	P04023US	US	CATHETER PUMP INTRODUCER SYSTEMS AND METHODS	15/303709	10/12/2016	Pending
THOR.107PR	P04023A	US	CATHETER PUMP INTRODUCER SYSTEMS AND METHODS	61/979937	4/15/2014	Expired
THOR.107WO	P04023WO	WO	CATHETER PUMP INTRODUCER SYSTEMS AND METHODS	PCT/US2015/026025	4/15/2015	Expired
THOR.108PR	P04025A	US	GUIDE FEATURES FOR PERCUTANEOUS CATHETER PUMP	62/038678	8/18/2014	Expired

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Knobbe Ref.	Thoratec Ref.	Country	Title of Invention	Appl. No.	Filing Date	Status
THOR.108WO	P04025WO	WO	GUIDE FEATURES FOR PERCUTANEOUS CATHETER PUMP	PCT/US2015/045370	8/14/2015	Published
THOR.127A	P04028	US	REDUCED ROTATIONAL MASS MOTOR ASSEMBLY FOR CATHETER PUMP	15/003576	1/21/2016	Published
THOR.127PR	P04028A	US	REDUCED ROTATIONAL MASS MOTOR ASSEMBLY FOR CATHETER PUMP	62/106670	1/22/2015	Expired
THOR.127WO	P04028WO	WO	REDUCED ROTATIONAL MASS MOTOR ASSEMBLY FOR CATHETER PUMP	PCT/US2016/014371	1/21/2016	Published
THOR.128A	P04029	US	MOTOR ASSEMBLY WITH HEAT EXCHANGER FOR CATHETER PUMP	15/003682	1/21/2016	Published
THOR.128PR	P04029A	US	MOTOR ASSEMBLY WITH HEAT EXCHANGER FOR CATHETER PUMP	62/106675	1/22/2015	Expired
THOR.128WO	P04029WO	WO	MOTOR ASSEMBLY WITH HEAT EXCHANGER FOR CATHETER PUMP	PCT/US2016/014379	1/21/2016	Published
THOR.130A	P04030	US	ATTACHMENT MECHANISMS FOR MOTOR OF CATHETER PUMP	15/003696	1/21/2016	Published
THOR.130PR	P04030A	US	ATTACHMENT MECHANISMS FOR MOTOR OF CATHETER PUMP	62/106673	1/22/2015	Expired
THOR.130WO	P04030WO	WO	ATTACHMENT MECHANISMS FOR MOTOR OF CATHETER PUMP	PCT/US2016/014391	1/21/2016	Published
THOR.1CP6C5C2	P02000X6C5C1	US	IMPLANTABLE HEART ASSIST SYSTEM AND METHOD OF APPLYING SAME	12/565651	9/23/2009	Issued
THORCV.001A	P02000	US	IMPLANTABLE HEART ASSIST SYSTEM	09/166005	10/2/1998	Issued

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Knobbe Ref.	Thoratec Ref.	Country	Title of Invention	Appl. No.	Filing Date	Status
THORCV.001C1	P02000C1	US	IMPLANTABLE HEART ASSIST SYSTEM	09/558445	4/25/2000	Issued
THORCV.001CP1	P02000X1	US	IMPLANTABLE HEART ASSIST SYSTEM	09/289231	4/9/1999	Issued
THORCV.001CP2	P02000X2	US	IMPLANTABLE HEART ASSIST SYSTEM AND METHOD OF APPLYING SAME	09/470841	12/23/1999	Issued
THORCV.001CP3	P02000X3	US	IMPLANTABLE HEART ASSIST SYSTEM AND METHOD OF APPLYING SAME	09/552979	4/21/2000	Issued
THORCV.001CP4	P02000X4	US	IMPLANTABLE HEART ASSIST SYSTEM AND METHOD OF APPLYING SAME	10/078260	2/15/2002	Issued
THORCV.001CP5	P02000X5	US	IMPLANTABLE HEART ASSIST SYSTEM AND METHOD OF APPLYING SAME	10/171023	6/11/2002	Issued
THORCV.001CP6	P02000X6	US	IMPLANTABLE HEART ASSIST SYSTEM AND METHOD OF APPLYING SAME	10/289467	11/6/2002	Issued
THORCV.001GCH	P02000X6CH	CH	IMPLANTABLE HEART ASSIST SYSTEM AND METHOD OF APPLYING SAME	3778067.3	10/28/2003	Issued
THORCV.001GDE	P02000X6DE	DE	IMPLANTABLE HEART ASSIST SYSTEM AND METHOD OF APPLYING SAME	3778067.3	10/28/2003	Issued
THORCV.001GEP	P02000X6EP	EP	IMPLANTABLE HEART ASSIST SYSTEM	3778067.3	10/28/2003	Issued
THORCV.001GES	P02000X6ES	ES	IMPLANTABLE HEART ASSIST SYSTEM AND METHOD OF APPLYING SAME	3778067.3	10/28/2003	Issued

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Knobbe Ref.	Thoratec Ref.	Country	Title of Invention	Appl. No.	Filing Date	Status
THORCV.001GFR	P02000X6FR	FR	IMPLANTABLE HEART ASSIST SYSTEM AND METHOD OF APPLYING SAME	3778067.3	10/28/2003	Issued
THORCV.001GG B	P02000X6GB	GB	IMPLANTABLE HEART ASSIST SYSTEM AND METHOD OF APPLYING SAME	3778067.3	10/28/2003	Issued
THORCV.001GIT	P02000X6IT	IT	IMPLANTABLE HEART ASSIST SYSTEM AND METHOD OF APPLYING SAME	3778067.3	10/28/2003	Issued
THORCV.001GLI	P02000X6LI	LI	IMPLANTABLE HEART ASSIST SYSTEM AND METHOD OF APPLYING SAME	3778067.3	10/28/2003	Issued
THORCV.001GN L	P02000X6NL	NL	IMPLANTABLE HEART ASSIST SYSTEM AND METHOD OF APPLYING SAME	3778067.3	10/28/2003	Issued
THORCV.001GPC	P02000X6WO	WO	IMPLANTABLE HEART ASSIST SYSTEM AND METHOD OF APPLYING SAME	PCT/US2003/0 34869	10/28/2003	Closed
THORCV.001GSE	P02000X6SE	SE	IMPLANTABLE HEART ASSIST SYSTEM AND METHOD OF APPLYING SAME	3778067.3	10/28/2003	Issued
THORCV.001HA U	P02000X2AU	AU	HEART ASSIST SYSTEM	38844/00	3/15/2000	Abandoned
THORCV.001HC A	P02000X2CA1	CA	HEART ASSIST SYSTEM	2367469	3/15/2000	Abandoned
THORCV.001HC H	P02000X2CH	CH	HEART ASSIST SYSTEM	917948.2	3/15/2000	Issued
THORCV.001HD E	P02000X2DE	DE	HEART ASSIST SYSTEM	917948.2	3/15/2000	Issued
THORCV.001HEP	P02000X2EP	EP	HEART ASSIST SYSTEM	917948.2	3/15/2000	Issued
THORCV.001HES	P02000X2ES	ES	HEART ASSIST SYSTEM	917948.2	3/15/2000	Issued
THORCV.001HFR	P02000X2FR	FR	HEART ASSIST SYSTEM	917948.2	3/15/2000	Issued
THORCV.001HG B	P02000X2GB	GB	HEART ASSIST SYSTEM	917948.2	3/15/2000	Issued



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Knobbe Ref.	Thoratec Ref.	Country	Title of Invention	Appl. No.	Filing Date	Status
THORCV.001HIT	P02000X2IT	IT	HEART ASSIST SYSTEM	917948.2	3/15/2000	Issued
THORCV.001HLI	P02000X2LI	LI	HEART ASSIST SYSTEM	917948.2	3/15/2000	Issued
THORCV.001HNL	P02000X2NL	NL	HEART ASSIST SYSTEM	917948.2	3/15/2000	Issued
THORCV.001HPC	P02000X2WO	WO	HEART ASSIST SYSTEM (AMEND PER PCT SEARCH REPT)	PCTUS00/06749	3/15/2000	Closed
THORCV.001HSE	P02000X2SE	SE	HEART ASSIST SYSTEM	917948.2	3/15/2000	Abandoned
THORCV.001HTW	P02000X2TW	TW	IMPLANTABLE HEART ASSIST SYSTEM AND METHOD OF APPLYING SAME	89105156	3/21/2000	Abandoned
THORCV.001PAU	P02000X4AU	AU	IMPLANTABLE HEART ASSIST SYSTEM AND METHOD OF APPLYING SAME	2003215293	2/14/2003	Abandoned
THORCV.001PR	P02000A	US	IMPLANTABLE HEART ASSIST DEVICE	60/061434	10/9/1997	Closed
THORCV.001VAU	P02000AU	AU	IMPLANTABLE HEART ASSIST SYSTEM	97976/98	10/9/1998	Issued
THORCV.001VBR	P02000BR	BR	IMPLANTABLE HEART ASSIST SYSTEM	PI9814060-4	10/9/1998	Abandoned
THORCV.001VCA	P02000CA	CA	IMPLANTABLE HEART ASSIST SYSTEM	2305443	10/9/1998	Issued
THORCV.001VCH	P02000CH	CH	IMPLANTABLE HEART ASSIST SYSTEM	98952226	10/9/1998	Issued
THORCV.001VCN	P02000CN	CN	IMPLANTABLE HEART ASSIST SYSTEM	98809992	10/9/1998	Abandoned
THORCV.001VCZ	P02000CZ	CZ	IMPLANTABLE HEART ASSIST SYSTEM	PV2000-1173	10/9/1998	Issued
THORCV.001VDE	P02000DE	DE	IMPLANTABLE HEART ASSIST SYSTEM	98952226	10/9/1998	Issued
THORCV.001VEP	P02000EP	EP	IMPLANTABLE HEART ASSIST SYSTEM	98952226	10/9/1998	Issued

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Knobbe Ref.	Thoratec Ref.	Country	Title of Invention	Appl. No.	Filing Date	Status
THORCV.001VES	P02000ES	ES	IMPLANTABLE HEART ASSIST SYSTEM	98952226	10/9/1998	Issued
THORCV.001VFR	P02000FR	FR	IMPLANTABLE HEART ASSIST SYSTEM	98952226	10/9/1998	Issued
THORCV.001VGB	P02000GB	GB	IMPLANTABLE HEART ASSIST SYSTEM	98952226	10/9/1998	Issued
THORCV.001VHK	P02000HK	HK	IMPLANTABLE HEART ASSIST SYSTEM	106798.1	10/9/1998	Abandoned
THORCV.001VIL	P02000IL	IL	IMPLANTABLE HEART ASSIST SYSTEM	135209	10/9/1998	Issued
THORCV.001VIT	P02000IT	IT	IMPLANTABLE HEART ASSIST SYSTEM	98952226	10/9/1998	Issued
THORCV.001VJP	P02000JP1	JP	IMPLANTABLE HEART ASSIST SYSTEM	2000-515640	10/9/1998	Issued
THORCV.001VJP D2	P02000JP3	JP	IMPLANTABLE HEART ASSIST SYSTEM	2010-037404	10/9/1998	Issued
THORCV.001VK R	P02000KR	KR	IMPLANTABLE HEART ASSIST SYSTEM	10-2000- 7003855	10/9/1998	Issued
THORCV.001VM X	P02000MX	MX	IMPLANTABLE HEART ASSIST SYSTEM	PA/a/2000/003 173	10/9/1998	Issued
THORCV.001VNL	P02000NL	NL	IMPLANTABLE HEART ASSIST SYSTEM	98952226	10/9/1998	Issued
THORCV.001VPC	P02000WO	WO	IMPLANTABLE HEART ASSIST SYSTEM	PCTUS98/214 24	10/9/1998	Closed
THORCV.001VRJ P	P02000JP2	JP	IMPLANTABLE HEART ASSIST SYSTEM	2004-372152	10/9/1998	Issued
THORCV.001VR U	P02000RU	RU	IMPLANTABLE HEART ASSIST SYSTEM	200107816	10/9/1998	Issued
THORCV.001VSE	P02000SE	SE	IMPLANTABLE HEART ASSIST SYSTEM	98952226	10/9/1998	Issued
THORCV.001VSG	P02000SG	SG	IMPLANTABLE HEART ASSIST SYSTEM	200001547-9	10/9/1998	Issued
THORCV.001VT W	P02000TW	TW	IMPLANTABLE HEART ASSIST SYSTEM	87116785	1/28/1999	Abandoned

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Knobbe Ref.	Thoratec Ref.	Country	Title of Invention	Appl. No.	Filing Date	Status
THORCV.001VUA	P02000UA	UA	IMPLANTABLE HEART ASSIST SYSTEM	2000041978	10/9/1998	Issued
THORCV.006A	P02001	US	EXTRA-CORPOREAL VASCULAR CONDUIT	09/780083	2/9/2001	Issued
THORCV.006VPC	P02001WO	WO	EXTRA-CORPOREAL VASCULAR CONDUIT	PCTUS01/29542	9/20/2001	Closed
THORCV.007VCA	P02002CA	CA	CANNULAE HAVING A REDIRECTING TIP	2545838	11/10/2004	Abandoned
THORCV.007VCH	P02002CH	CH	CANNULAE HAVING A REDIRECTING TIP	4810735.3	11/10/2004	Abandoned
THORCV.007VDE	P02002DE	DE	CANNULAE HAVING A REDIRECTING TIP	4810735.3	11/10/2004	Abandoned
THORCV.007VEP1	P02002EP1	EP	CANNULAE HAVING A REDIRECTING TIP	4810735.3	11/10/2004	Abandoned
THORCV.007VEPD2	P02002EP3	EP	CANNULAE HAVING A REDIRECTING TIP	10185579.9	11/10/2004	Abandoned
THORCV.007VES	P02002ES	ES	CANNULAE HAVING A REDIRECTING TIP	4810735.3	11/10/2004	Abandoned
THORCV.007VFR	P02002FR	FR	CANNULAE HAVING A REDIRECTING TIP	4810735.3	11/10/2004	Abandoned
THORCV.007VGB	P02002GB	GB	CANNULAE HAVING A REDIRECTING TIP	4810735.3	11/10/2004	Abandoned
THORCV.007VHKD2	P02002HK	HK	CANNULAE HAVING A REDIRECTING TIP	11105622	11/10/2004	Abandoned
THORCV.007VIT	P02002IT	IT	CANNULAE HAVING A REDIRECTING TIP	4810735.3	11/10/2004	Abandoned
THORCV.007VNL	P02002NL	NL	CANNULAE HAVING A REDIRECTING TIP	4810735.3	11/10/2004	Abandoned
THORCV.007VSE	P02002SE	SE	CANNULAE HAVING A REDIRECTING TIP	4810735.3	11/10/2004	Abandoned
THORCV.008A	P02003	US	MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	09/876281	6/6/2001	Issued
THORCV.008CP1	P02003X1	US	MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	10/078283	2/14/2002	Abandoned

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Knobbe Ref.	Thoratec Ref.	Country	Title of Invention	Appl. No.	Filing Date	Status
THORCV.008DV1	P02003D1	US	A MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	10/743841	12/22/2003	Abandoned
THORCV.008DV3	P02003D3	US	MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	11/417509	5/3/2006	Abandoned
THORCV.008DV4	P02003D4	US	A MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	11/418499	5/3/2006	Abandoned
THORCV.008QAU	P02003X1AU1	AU	A MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	2003211034	2/13/2003	Abandoned
THORCV.008QAUD2	P02003X1AU3	AU	A MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	2011202758	2/13/2003	Abandoned
THORCV.008QCA	P02003X1CA	CA	A MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	2480465	2/13/2003	Abandoned
THORCV.008QCH	P02003X1CH	CH	MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	3739796.5	2/13/2003	Issued
THORCV.008QDE	P02003X1DE	DE	MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	3739796.5	2/13/2003	Issued
THORCV.008QEP	P02003X1EP	EP	A MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	3739796.5	2/13/2003	Issued
THORCV.008QES	P02003X1ES	ES	MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	3739796.5	2/13/2003	Abandoned
THORCV.008QFR	P02003X1FR	FR	MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	3739796.5	2/13/2003	Issued
THORCV.008QGB	P02003X1GB	GB	MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	3739796.5	2/13/2003	Issued
THORCV.008QIT	P02003X1IT	IT	MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	3739796.5	2/13/2003	Issued

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Knobbe Ref.	Thoratec Ref.	Country	Title of Invention	Appl. No.	Filing Date	Status
THORCV.008QJP	P02003X1JP1	JP	A MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	2003-567483	2/13/2003	Issued
THORCV.008QJP D1	P02003X1JP2	JP	A MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	2010-059190	2/13/2003	Issued
THORCV.008QLI	P02003X1LI	LI	MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	3739796.5	2/13/2003	Issued
THORCV.008QNL	P02003X1NL	NL	MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	3739796.5	2/13/2003	Issued
THORCV.008QPC	P02003X1WO	WO	A MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	PCT/US2003/04401	2/13/2003	Abandoned
THORCV.008QRAU	P02003X1AU2	AU	A MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	2008200502	2/13/2003	Abandoned
THORCV.008QSE	P02003X1SE	SE	MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	3739796.5	2/13/2003	Issued
THORCV.008VAU	P02003AU	AU	A MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	2002214653	10/15/2001	Abandoned
THORCV.008VCA	P02003CA	CA	A MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	2449689	10/15/2001	Abandoned
THORCV.008VCH	P02003CH	CH	A MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	1983207	10/15/2001	Abandoned
THORCV.008VDE	P02003DE	DE	A MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	1983207	10/15/2001	Abandoned
THORCV.008VEP	P02003EP	EP	A MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	1983207	10/15/2001	Issued
THORCV.008VES	P02003ES	ES	A MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	1983207	10/15/2001	Abandoned

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Knobbe Ref.	Thoratec Ref.	Country	Title of Invention	Appl. No.	Filing Date	Status
THORCV.008VFR	P02003FR	FR	A MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	1983207	10/15/2001	Abandoned
THORCV.008VGB	P02003GB	GB	A MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	1983207	10/15/2001	Abandoned
THORCV.008VIT	P02003IT	IT	A MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	1983207	10/15/2001	Abandoned
THORCV.008VJP	P02003JP	JP	A MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	2003-501535	10/15/2001	Abandoned
THORCV.008VNL	P02003NL	NL	A MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	1983207	10/15/2001	Abandoned
THORCV.008VPC	P02003WO	WO	A MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	PCTUS01/427 74	10/15/2001	Closed
THORCV.008VSE	P02003SE	SE	A MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	1983207	10/15/2001	Issued
THORCV.009A	P02004	US	PERCUTANEOUS CATHETER ASSEMBLY	09/741695	12/19/2000	Issued
THORCV.009C1	P02004C	US	PERCUTANEOUS CATHETER ASSEMBLY	10/308235	12/2/2002	Issued
THORCV.021A	P02011	US	CANNULAE HAVING REDUCED FLOW RESISTANCE	10/866535	6/10/2004	Issued
THORCV.027A	P02012	US	QUICK PRIMING CONNECTORS FOR BLOOD CIRCUIT	11/370225	3/6/2006	Issued
THORCV.027C1	P02012C	US	QUICK PRIMING CONNECTORS FOR BLOOD CIRCUIT	12/254746	10/20/2008	Issued
THORCV.027CN	P02012CN	CN	QUICK PRIMING CONNECTORS FOR BLOOD CIRCUIT	200780013366	3/6/2007	Abandoned
THORCV.027VEP	P02012EP	EP	QUICK PRIMING CONNECTORS FOR BLOOD CIRCUIT	7752420.5	3/6/2007	Abandoned
THORCV.031A	P02013	US	BLOOD CONDUIT CONNECTOR	11/371208	3/8/2006	Abandoned

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Knobbe Ref.	Thoratec Ref.	Country	Title of Invention	Appl. No.	Filing Date	Status
THORCV.059AU	P02018AU	AU	IMPLANTABLE HEART ASSIST SYSTEM	2009285537	8/28/2009	Abandoned
THORCV.059CA	P02018CA	CA	IMPLANTABLE HEART ASSIST SYSTEM	2771158	8/28/2009	Abandoned
THORCV.059EP	P02018EP	EP	IMPLANTABLE HEART ASSIST SYSTEM	9810687.5	8/28/2009	Abandoned
THORCV.059JP	P02018JP	JP	IMPLANTABLE HEART ASSIST SYSTEM	2011-525254	8/28/2009	Abandoned
THORCV.059NP	P02018US	US	IMPLANTABLE HEART ASSIST SYSTEM	13/061086	2/25/2011	Abandoned
THORCV.059WO	P02018WO	WO	IMPLANTABLE HEART ASSIST SYSTEM	PCT/US2009/055431	8/28/2009	Expired
THORCV.105A	P01060	US	MULTI-LUMEN CANNULA	12/469328	5/20/2009	Issued
THORCV.105AU	P01060AU1	AU	MULTI-LUMEN CANNULA	2010249562	11/22/2011	Abandoned
THORCV.105AU D1	P01060AU2	AU	MULTI-LUMEN CANNULA	2013203979	4/11/2013	Abandoned
THORCV.105C1	P01060C	US	MULTI-LUMEN CANNULA	13/561197	7/30/2012	Issued
THORCV.105CA	P01060CA	CA	MULTI-LUMEN CANNULA	2762569	11/18/2011	Issued
THORCV.105CN	P01060CN	CN	MULTI-LUMEN CANNULA	201080028684.6	12/27/2011	Abandoned
THORCV.105EP	P01060DE	EP	MULTI-LUMEN CANNULA	10721065	12/14/2011	Issued
THORCV.105HK	P01060HK	HK	MULTI-LUMEN CANNULA	12104748	5/15/2012	Abandoned
THORCV.105JP	P01060JP	JP	MULTI-LUMEN CANNULA	2012-511994	11/18/2011	Issued
THORCV.105WO	P01060WO	WO	MULTI-LUMEN CANNULA	PCT/US2010/035424	5/19/2010	Closed
THORCV.1CP4C1	P02000X4C1	US	IMPLANTABLE HEART ASSIST SYSTEM AND METHOD OF APPLYING SAME	10/408926	4/7/2003	Issued
THORCV.1CP4C1 C	P02000X4C1C	US	IMPLANTABLE HEART ASSIST SYSTEM AND METHOD OF APPLYING SAME	10/878592	6/28/2004	Issued

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Knobbe Ref.	Thoratec Ref.	Country	Title of Invention	Appl. No.	Filing Date	Status
THORCV.1CP4C2	P02000X4C2	US	IMPLANTABLE HEART ASSIST SYSTEM AND METHOD OF APPLYING SAME	11/418490	5/3/2006	Abandoned
THORCV.1CP4C3	P02000X4C3	US	IMPLANTABLE HEART ASSIST SYSTEM AND METHOD OF APPLYING SAME	11/418502	5/3/2006	Abandoned
THORCV.1CP4C4	P02000X4C4	US	IMPLANTABLE HEART ASSIST SYSTEM AND METHOD OF APPLYING SAME	11/417917	5/3/2006	Abandoned
THORCV.1CP6C1	P02000X6C1	US	IMPLANTABLE HEART ASSIST SYSTEM AND METHOD OF APPLYING SAME	10/729026	12/5/2003	Issued
THORCV.1CP6C2	P02000X6C2	US	IMPLANTABLE HEART ASSIST SYSTEM AND METHOD OF APPLYING SAME	10/878591	6/28/2004	Issued
THORCV.1CP6C3	P02000X6C3	US	IMPLANTABLE HEART ASSIST SYSTEM AND METHOD OF APPLYING SAME	11/121352	5/3/2005	Issued
THORCV.1CP6C4	P02000X6C4	US	IMPLANTABLE HEART ASSIST SYSTEM AND METHOD OF APPLYING SAME	11/418393	5/3/2006	Abandoned
THORCV.1CP6C5	P02000X6C5	US	IMPLANTABLE HEART ASSIST SYSTEM AND METHOD OF APPLYING SAME	11/417905	5/3/2006	Issued
THORCV.1CP6C5 C	P02000X6C5C2	US	IMPLANTABLE HEART ASSIST SYSTEM AND METHOD OF APPLYING SAME	12/616087	11/10/2009	Issued
THORCV.1CP6C5 C3	P02000X6C5C3	US	IMPLANTABLE HEART ASSIST SYSTEM AND METHOD OF APPLYING SAME	13/175735	7/1/2011	Issued



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THORCV.1CP6C6	P02000X6C6	US	IMPLANTABLE HEART ASSIST SYSTEM AND METHOD OF APPLYING SAME	11/417889	5/3/2006	Issued
THORCV.1CP6C7	P02000X6C7	US	IMPLANTABLE HEART ASSIST SYSTEM AND METHOD OF APPLYING SAME	11/417677	5/3/2006	Issued
THORCV.1HR1C A	P02000X2CA2	CA	HEART ASSIST SYSTEM	2466577	3/15/2000	Abandoned
THORCV.8CP1D V1	P02003X1D1	US	MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	11/417652	5/3/2006	Abandoned
THORCV.8CP1D V2	P02003X1D2	US	MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	11/417662	5/3/2006	Abandoned
THORCV.8CP1D V3	P02003X1D3	US	MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	11/417918	5/3/2006	Abandoned
THORCV.8CP1D V4	P02003X1D4	US	MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	11/418377	5/3/2006	Abandoned
THORCV.8CP1D V5	P02003X1D5	US	MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	11/417647	5/3/2006	Issued
THORCV.8CP1D V6	P02003X1D6	US	MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	11/417937	5/3/2006	Abandoned
THORCV.8CP1D V7	P02003X1D7	US	MULTILUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	11/417487	5/3/2006	Abandoned
THORCV.8CP1D V8	P02003X1D8	US	MULTI-LUMEN CATHETER FOR MINIMIZING LIMB ISCHEMIA	11/418489	5/3/2006	Abandoned
FORFLOW.001PE P	P02000X4EP	EP	IMPLANTABLE HEART ASSIST SYSTEM AND METHOD OF APPLYING SAME	3711112.7	2/14/2003	Abandoned
FORFLOW.001PJ P	P02000X4JP	JP	IMPLANTABLE HEART ASSIST SYSTEM	2003-569252	2/14/2003	Abandoned

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Knobbe Ref.	Thoratec Ref.	Country	Title of Invention	Appl. No.	Filing Date	Status
FORFLOW.006V AU	P02001AU	AU	EXTRA-CORPOREAL VASCULAR CONDUIT	2001292901	9/20/2001	Abandoned
FORFLOW.006V CA	P02001CA	CA	EXTRA-CORPOREAL VASCULAR CONDUIT	2437796	9/20/2001	Abandoned
FORFLOW.006VE P	P02001EP	EP	EXTRA-CORPOREAL VASCULAR CONDUIT	1973308.8	9/20/2001	Abandoned
FORFLOW.009VP C	P02004WO	WO	IMPROVED PERCUTANEOUS CATHETER ASSEMBLY	PCTUS01/427 73	10/15/2001	Abandoned
ORQIS.007A	P02002	US	CANNULAE HAVING A REDIRECTING TIP	10/706346	11/12/2003	Abandoned
ORQIS.007C1	P02002C1	US	CANNULAE HAVING A REDIRECTING TIP	11/417916	5/3/2006	Abandoned
ORQIS.007C2	P02002C2	US	CANNULAE HAVING A REDIRECTING TIP	11/417510	5/3/2006	Abandoned
ORQIS.007C3	P02002C3	US	CANNULAE HAVING A REDIRECTING TIP	11/417528	5/3/2006	Abandoned
ORQIS.007C4	P02002C4	US	CANNULAE HAVING A REDIRECTING TIP	11/417877	5/3/2006	Abandoned
ORQIS.007C5	P02002C5	US	CANNULAE HAVING A REDIRECTING TIP	11/417678	5/3/2006	Abandoned
ORQIS.007VAU	P02002AU	AU	CANNULAE HAVING A REDIRECTING TIP	2004289319	11/10/2004	Abandoned
ORQIS.007VJP	P02002JP	JP	CANNULAE HAVING A REDIRECTING TIP	2006-539854	11/10/2004	Abandoned
ORQIS.007VPC	P02002WO	WO	CANNULAE HAVING A REDIRECTING TIP	PCT/US2004/0 37636	11/10/2004	Closed
ORQIS.010A	P02005	US	SYSTEM INCLUDING A CANNULA HAVING REDUCED FLOW RESISTANCE	10/865045	6/10/2004	Abandoned
ORQIS.013A	P02006	US	METHODS FOR MINIMALLY INVASIVE VASCULAR ACCESS	11/083042	3/17/2005	Abandoned
ORQIS.014VPC	P02007WO	WO	IMPLANTABLE HEART ASSIST SYSTEM AND METHOD OF APPLYING SAME	PCT/US2004/0 33575	10/12/2004	Abandoned

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ORQIS.015A	P02008	US	METHODS FOR REDUCING BLEEDING FROM A CANNULATION SITE	11/057692	2/14/2005	Abandoned
ORQIS.015VPC	P02008WO	WO	APPARATUS AND METHODS FOR REDUCING BLEEDING FROM A CANNULATION SITE	PCT/US2006/005038	2/13/2006	Closed
ORQIS.018A	P02009	US	CANNULAE FOR SELECTIVELY ENHANCING BLOOD FLOW	10/735413	12/12/2003	Abandoned
ORQIS.019A	P02010	US	CANNULA HAVING REDUCED FLOW RESISTANCE	10/866649	6/10/2004	Abandoned
ORQIS.021VEP	P02011EP	EP	CANNULAE AND SYSTEM HAVING REDUCED FLOW RESISTANCE	5757823.9	6/10/2005	Abandoned
ORQIS.021VPC	P02011WO	WO	CANNULAE AND SYSTEM HAVING REDUCED FLOW RESISTANCE	PCT/US2005/020663	6/10/2005	Closed
ORQIS.027VPC	P02012WO	WO	QUICK PRIMING CONNECTORS FOR BLOOD CIRCUIT	PCT/US2007/005719	3/6/2007	Closed
ORQIS.031VPC	P02013WO	WO	BLOOD CONDUIT CONNECTOR	PCT/US2007/005875	3/7/2007	Abandoned
ORQIS.037PR	P02018A	US	IMPLANTABLE HEART ASSIST SYSTEM	61/092714	8/28/2008	Closed

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