UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-K

x **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the fiscal year ended December 31, 2018
OR

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from to .
Commission File Number 001-14962

CIRCOR INTERNATIONAL, INC.
(Exact name of registrant as specified in its charter)

Delaware	**04-3477276**
(State or Other Jurisdiction of Incorporation or Organization)	**(I.R.S. Employer Identification No.)**
c/o CIRCOR, Inc.	
30 Corporate Drive, Suite 200, Burlington, MA	**01803-4238**
(Address of principal executive offices)	**(Zip Code)**

(781) 270-1200
(Registrant's telephone number, including area code)

Securities registered pursuant to Section 12 (b) of the Act:
Common Stock, par value $0.01 per share (registered on the New York Stock Exchange)
Securities registered pursuant to Section 12 (g) of the Act: None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☐ No x

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Exchange Act. Yes ☐ No x

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes x No ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes x No ☐

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§ 229.405 of this chapter) is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. x

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer", "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer	x	Accelerated filer	o	Emerging growth company	o
Non-accelerated filer	o	Smaller reporting company	o		

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. Yes ☐ No ☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ☐ No x

The aggregate market value of voting stock held by non-affiliates of the registrant as of June 30, 2018 was $712,250,764. The registrant does not have any non-voting common equity.

As of February 22, 2019, there were 19,857,359 shares of the registrant's Common Stock outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Part III incorporates by reference certain portions of the information from the registrant's definitive Proxy Statement for the 2019 Annual Meeting of Stockholders to be held on May 9, 2019. The definitive Proxy Statement will be filed with the Securities and Exchange Commission within 120 days of the close of the registrant's year ended December 31, 2018.

Table of Contents

Part I

Item 1. Business

This Annual Report on Form 10-K contains certain statements that are “forward-looking statements” as that term is defined under the Private Securities Litigation Reform Act of 1995 (the “Act”). The words “may,” “hope,” “should,” “expect,” “plan,” “anticipate,” “intend,” “believe,” “estimate,” “predict,” “potential,” “continue,” and other expressions which are predictions of or indicate future events and trends and which do not relate to historical matters, identify forward-looking statements. We believe that it is important to communicate our future expectations to our stockholders, and we, therefore, make forward-looking statements in reliance upon the safe harbor provisions of the Act. However, there may be events in the future that we are not able to accurately predict or control and our actual results may differ materially from the expectations we describe in our forward-looking statements. Forward-looking statements, including statements about our future performance, including realization of cost reductions of cost reductions from restructuring activities and expected synergies, involve known and unknown risks, uncertainties and other factors, which may cause our actual results, performance or achievements to differ materially from anticipated future results, performance or achievements expressed or implied by such forward-looking statements. Factors that could cause or contribute to such differences include, but are not limited to, changes in the price of and demand for oil and gas in both domestic and international markets, our ability to successfully integrate acquired businesses, as contemplated, the possibility that expected benefits related to the FH acquisition may not materialize as expected, any adverse changes in governmental policies, variability of raw material and component pricing, changes in our suppliers’ performance, fluctuations in foreign currency exchange rates, changes in tariffs or other taxes related to doing business internationally, our ability to hire and retain key personnel, our ability to operate our manufacturing facilities at efficient levels including our ability to prevent cost overruns and reduce costs, our ability to generate increased cash by reducing our working capital, our prevention of the accumulation of excess inventory, our ability to successfully implement our restructuring or simplification strategies, fluctuations in interest rates, our ability to successfully defend product liability actions, as well as the uncertainty associated with the current worldwide economic conditions and the continuing impact on economic and financial conditions in the United States and around the world, including as a result of natural disasters, terrorist attacks, current Middle Eastern conflicts and related matters. For a discussion of these risks, uncertainties and other factors, see Item 1A, "Risk Factors". We undertake no obligation to publicly update or revise any forward-looking statement, whether as a result of new information, future events or otherwise.

Overview

CIRCOR International, Inc. was incorporated under the laws of Delaware on July 1, 1999. As used in this report, the terms “we,” “us,” “our,” the “Company” and “CIRCOR” mean CIRCOR International, Inc. and its subsidiaries (unless the context indicates another meaning). The term “common stock” means our common stock, par value $0.01 per share.

We design, manufacture and market differentiated technology products and sub-systems for markets including industrial, oil & gas, aerospace and defense, and commercial marine. CIRCOR has a diversified flow and motion control product portfolio with recognized, market-leading brands that fulfill its customers’ mission critical needs. The Company’s strategy is to grow organically and through complementary acquisitions; simplify CIRCOR’s operations; achieve world class operational excellence; and attract and retain top industry talent. We have a global presence and operate 28 major manufacturing facilities that are located in North America, Western Europe, Morocco, and India. The Company has the following reportable business segments: Industrial (“Industrial segment”), Energy ("Energy segment" or "Energy"), and Aerospace & Defense (“Aerospace & Defense segment”) . We sell our products through distributors, representatives, Engineering, Procurement and Construction ("EPC") companies, as well as directly to end-user customers and original equipment manufacturers (“OEMs”).

Strategies

Our objective is to enhance shareholder value by focusing on growth, margin expansion, strong free cash flow, and disciplined capital deployment. We have a four-point strategy to achieve these objectives.

1) *Grow Organically and Through Acquisitions*. We leverage the power of our global design capabilities to develop innovative products that solve our customers’ most challenging and critical problems. New products will be an increasingly important part of our growth strategy going forward. In addition, we are positioning ourselves to grow in parts of our end markets where our products are under-represented. This could include establishing a presence in higher growth geographies where we have a limited presence today. It also could include taking products established in one end-market and selling those solutions into other relevant end markets.

In addition to organic growth, we expect to acquire businesses over time. We are primarily focused on companies with differentiated technologies in complementary markets that we already understand and where we expect substantial growth. In addition to strategic fit and differentiated technology, the main criterion for an acquisition is return on invested capital.

2) *Simplify CIRCOR*. In 2013, we embarked on a long-term journey to simplify CIRCOR. We have a large number of facilities relative to our size and believe that simplifying this structure will not only expand our margins by reducing cost, but will help us improve our customer service, operations, and controls. We obtain an in depth understanding of our customer needs and competitor capabilities in our end markets, and continue to simplify our product portfolio and the number of unique products we offer in the marketplace through active product management.

3) *Achieve World Class Operational Excellence*. Our Global Operations and Supply Chain organization is fully committed to achieving operational excellence in support of our customers’ expectations of perfect quality, on-time delivery and market competitiveness. We follow the CIRCOR Operating System ("COS") which creates a disciplined culture of continuous improvement for driving operational excellence including a sales and inventory operations plan that provides for world-class quality and delivery while maintaining an optimal level of working capital. COS is comprised of ten business process attributes designed to engage and empower our employees to recognize and eliminate waste, work real-time problem solving as part of their everyday job experience, and enhance our performance both in operations and business office processes. Under COS our employees participate in a regimented training program and receive regular prescriptive assessments / action plans to drive process maturity. Quantitative performance metrics define site certification levels to help attain and sustain a level of quality, productivity, inventory management and market competitiveness that delights our customers, shareholders, and employees.

4) *Build the Best Team*. Finally, we have a fundamental belief at CIRCOR that the best team wins. We are committed to attracting the most talented people in our industry and we are committed to investing, engaging, challenging and developing our employees. We believe the best people combined with robust process, appropriate metrics, and individual accountability will deliver extraordinary results.

Business Segments

Energy

Effective January 1, 2018, we realigned our business segments in order to simplify the business. The current and prior periods are reported under the new segment structure.

The Energy segment remained unchanged from the 2017 reporting structure except for the addition of the Reliability Services business ("Reliability Services"). We acquired the Reliability Services business as part of the Fluid Handling acquisition that took place in 2017 and subsequently sold the business in January 2019 Refer to Note 19, "Subsequent Event," of the consolidated financial statements included in this Annual report for additional information regarding this disposition.

Energy is a global provider of highly engineered integrated flow control solutions, valves and services for the Oil & Gas and Process Instrumentation markets.

We are focused on satisfying our customers’ mission-critical application needs by utilizing advanced technologies. Our flow control solutions can withstand extreme temperatures and pressures, and as such are used in the most critical and severe service applications. Our installations include land-based, topside, and sub-sea oil and gas production, refining and petrochemical process control, oil sand processing, critical pressure control and cryogenic applications.

We plan to grow Energy by expanding our capabilities in Oil & Gas both organically and inorganically across the Oil & Gas and Petrochemical markets.

Energy is headquartered in Houston, Texas and has manufacturing facilities in North America, the United Kingdom, Italy, and the Netherlands.

Markets and Applications

Energy serves an increasing range of energy-focused global markets. Key to our business strategy is targeting additional markets that can benefit from our innovative products and system solutions. Markets served today include Oil & Gas: upstream (on-shore and off-shore), mid-stream and downstream, as well as petrochemical processing. The upstream and mid-stream markets are primarily served by our large international project and North American short-cycle businesses, and downstream and petrochemical markets are served primarily by our refinery valves, instrumentation and sampling businesses, and until its sale in January 2019, the Reliability Services business.

- Upstream Oil & Gas: These markets commonly include all the equipment between the outlet on the wellhead to the mainline transmission pipeline and it also incorporates all the activities associated with the installation of this equipment. Our diverse portfolio covers all facets of oil and gas production, both topside and sub-sea, and includes short cycle standard valve products and custom engineered valves.

- Mid-stream Oil & Gas: This market begins at the mainline transmission pipeline and extends to the fence around the refinery or petrochemical plant. It includes certain ancillary equipment, as well as the gas processing plants that prepare and purify raw natural gas for entry into the major pipeline systems and Liquid Natural Gas (LNG) liquefaction and transport processes. Our valves are used for flow control in the main transmission lines, gathering systems, and storage facilities. We also provide inspection and cleaning products and services to insure the integrity of transmission pipelines.

- Downstream Oil & Gas: The downstream market includes the refining, distillation, stripping, degassing, dehydrating, desulphurizing, and purifying of the crude oil to its constituent components. In addition to flow control applications for feedstocks and process control across each downstream process unit, our refinery valves business provides highly specialized engineered solutions for coking and catalytic cracking that improve the safety and efficiency of operations within the refinery.

- Petrochemical Processing: The petrochemical processing market includes the refining and manufacture of chemicals derived from oil and gas, such as polyethylene. This market requires specific instrumentation and ancillary equipment to monitor the quality and efficiency of production. Our instrumentation and sampling business provides products that are used to facilitate these activities with the highest degree of precision.

Brands

Energy provides its flow control solutions and services through the following significant brands:

Circle Seal Controls, CIRCOR Tech, CIRCOR Reliability Services, Contromatics, COT-Puritech, DeltaValve, Dopak Sampling, GO Regulators, Hoke-Gyrolok, Hydroseal, KF Valves, LSC, Mallard Control, Pibiviesse, Pipeline Engineering, SICELUB, TapcoEnpro, and Texas Sampling.

Products

Energy offers a range of flow control solutions (distributed and highly engineered) and services, including:

- Valves (from 1/8 inch to 64 inches in diameter)
    - Engineered Trunion and Floating Ball Valves
    - Gate, Globe and Check Valves
    - Butterfly Valves
- Instrumentation Fittings and Sampling Systems, including Sight Glasses & Gauge Valves
- Liquid Level Controllers, Liquid Level Switches, Plugs & Probes Pressure Controllers, Pressure Regulators
- Pipeline pigs, quick opening closure, pig signalers
- Delayed coking unheading devices and fluid catalytic converter and isolation valves
- Oil mist systems and preventative lubrication services

For our manufactured valve products, we are subject to applicable federal, state and local regulations. In addition, many of our customers require us to comply with certain industrial standards, including those issued by the American Petroleum Institute, International Organization for Standardization, Underwriters' Laboratory, American National Standards Institute, American Society of Mechanical Engineers, and the European Pressure Equipment Directive. We also need to meet standards that qualify us to be on authorized supplier lists with various global end users. We are fully qualified and licensed for the API 6D, API 6DSS and API 6A PSL4.

Customers

Energy’s products and services are sold to end-user customers, such as major oil companies, EPC companies, and distributors, through sales channels that include direct sales, sales representatives, and agents.

Revenue and Backlog

Energy accounted for $451.2 million, $339.6 million, and $305.9 million, or 38%, 51%, and 52% of our net revenues for the years ended December 31, 2018, 2017 and 2016, respectively. Energy’s backlog as of January 31, 2019 was $166.8 million compared with $190.1 million as of January 31, 2018. Energy backlog represents backlog orders we believe to be firm.

Aerospace & Defense

The Aerospace & Defense segment includes the Aerospace & Defense business from the 2017 Advanced Flow Solutions ("AFS") segment, along with the Pumps and Valves Defense business acquired as part of the FH acquisition.

Aerospace & Defense is a diversified flow control technology platform. Our primary product focus areas are valves, pumps, actuation, motors, switches, and high pressure pneumatic systems.

Aerospace & Defense products are mainly used in aerospace, defense, and general industrial markets.

We plan to grow Aerospace & Defense by increasing market share in existing and new markets through exceptional sales and customer service enabled by innovative, reliable and high quality solutions. Product portfolio expansion through acquisitions of differentiated technologies in current and adjacent applications is also a key part of our growth strategy.

We have Aerospace & Defense facilities in North America, the United Kingdom, France, Morocco, and India. Our Aerospace & Defense headquarters is in Corona, California.

Markets and Applications

Aerospace & Defense serves the aerospace and defense markets.

- The commercial aerospace market that we serve includes systems and components on airliners and business jets, such as hydraulic, pneumatic, fuel and ground support equipment including maintenance, repair and overhaul (MRO). In addition, we serve the defense aerospace market, including military and naval applications where controls or motion switches are mission critical. We support fixed wing aircraft, rotorcraft, missile systems, ground vehicles, submarines, weapon systems and weapon launch systems, ordinance, fire control, fuel systems, pneumatic controls, and hydraulic and dockside support equipment including MRO.

- The non-aerospace defense market that we serve is primarily focused on naval vessels, with our pumps and valves used across most naval platforms in a wide variety of onboard applications. We are a trusted supplier to many countries' navies, leveraging our engineering and manufacturing capabilities to work directly with our customers in developing targeted solutions for mission critical applications including very low acoustic signature pumps for submarines.

Brands

Aerospace & Defense manufactures and markets control valves, automatic recirculation valves, regulators, fluid controls, actuation systems, landing gear components, pneumatic controls, electro-mechanical controls, and other flow control products and systems. Aerospace & Defense provides actuation and fluid control systems and services through the following brands: CIRCOR Aerospace, Aerodyne Controls, CIRCOR Bodet, CIRCOR Industria, CIRCOR Motors, Hale Hamilton, Leslie Controls, Portland Valve, and Warren Pumps.

Products

Aerospace & Defense offers a range of solutions, including:

- Specialty Centrifugal, 2-Screw, and Propeller Pumps
- Specialized control valves
- MIL-Spec butterfly valves and actuators
- Electromechanical, pneumatic and hydraulic, fluid and motion control systems
- Actuation components and sub-systems

In the manufacture of our products, we must comply with certain certification standards, such as AS9100C, ISO 9001:2008, National Aerospace & Defense Contractors Accreditation Program, Federal Aviation Administration Certification and European Aviation Safety Agency as well as other customer qualification standards. Currently all of our manufacturing facilities comply with the applicable standards.

Customers

Aerospace & Defense products and services are used by a range of customers, including those in the military and defense, commercial aerospace, business and general aviation, and general industrial markets. Our customers include aircraft manufacturers (OEMs) and Tier 1 suppliers to these customers.

Revenue and Backlog

Aerospace & Defense accounted for $237.0 million, $183.0 million and $166.1 million, or 20%, 28% and 28% of our net revenues for the years ended December 31, 2018, 2017 and 2016, respectively. Aerospace & Defense backlog as of January 31, 2019 was $183.3 million compared with $142.0 million as of January 31, 2018.

Aerospace & Defense backlog represents orders we believe to be firm, including future customer demand requirements on long-term aerospace product platforms where we are the sole source provider. We determine the amount of orders to include in our backlog for such aircraft platforms based on 12 months demand published by our customers.

Industrial

The Industrial segment includes the businesses acquired as part of the FH acquisition (except for the businesses noted above that were moved to the Energy and Aerospace & Defense segments) as well as the Industrial Solutions and Power and Process businesses that were part of the Advance Flow Solutions segment in 2017.

Industrial is a global portfolio of highly engineered and differentiated fluid handling products and flow control products. Our primary products are positive displacement pumps, specialty centrifugal pumps, automatic recirculating valves, control valves, and harsh environment flow control products for steam and cryogenic applications.

Our technology is focused on moving the most difficult fluids with extremely high efficiency for critical applications in the general industrial, power, process, oil & gas, and commercial marine end markets.

We plan to grow the Industrial segment by expanding our share in existing markets with innovative solutions and new product offerings through our strong sales and service network, and leveraging our brand and commercial position.

Industrial is headquartered in Radolfzell, Germany, with primary manufacturing centers in North America, Germany, India, and China.

Markets and Applications

Industrial serves the industrial, commercial marine, oil & gas, and power and process markets.

- The general industrial market includes a broad range of manufacturing operations for flow and energy control. Our products are used to handle viscous and critical fluids, automate and control plant utilities, increase energy efficiency in buildings and campuses, and safely regulate critical fluids such as industrial gases and cryogenic fluids used in manufacturing processes.

- The power and process market is comprised of electric utilities, industrial power producers, and OEM power generating equipment providers. Our products and services are used across this segment in lubrication management for turbines and generators, as well as fuel delivery, heat transfer, and emissions reduction applications. We serve power generation facilities and processes fueled by natural gas, oil, hydro, solar, nuclear, and coal.

- The Oil & Gas market is divided into three sub-segments: upstream, midstream, and downstream. In upstream, our products and services are used to manage equipment and fluids critical to the drilling of new wells, and also maximize, control, and maintain oil production from both new and existing wells. In midstream, our products are used in the transfer of oils and refined products via pipelines, ship vessels, railcars, and trucks. Our products and services are also used to manage and maintain storage terminals. In downstream, our products are used to support critical refining processes, both directly in the process and as part of integrated equipment supplied by OEMs.

- The commercial marine market includes shipbuilders, OEM suppliers of onboard equipment, and shipping fleet operators. Our products and services are designed specifically to support all aspects of fluid systems, including propulsion, ballast handling, cooling water, bilge, fuel, power generation, and mechanical hydraulics.

- In all of the markets we serve, we provide aftermarket components and, in limited applications, aftermarket services.

Brands

Industrial manufactures and markets products and services through the following brands:

Allweiler, Houttuin, IMO Pump, IMO AB, Nicholson Steam Trap, Rockwood Swendemann, Rosscor, RTK, Schroedahl, SES, Spence Engineering, Tushaco, and Zenith.

Products

Industrial offers a range of fluid handling products and services, including:

- 3 Screw Pumps
- 2 Screw Pumps
- Progressing Cavity Pumps
- Specialty Centrifugal Pumps
- Gear Metering Pumps
- Multiphase Pump Systems
- Automatic Recircultaing Valves
- Severe Service and General Service Control Valves

Our products must comply with certification standards applicable to many of our end markets. These standards include but are not limited to ISO 9001:2008, ANSI/ASQC Q 9001, API 676, and Mil-I-45208.

Customers

Industrial's products and services are sold directly to end-users, OEMs that supply specialized systems in their respective end markets, and EPC companies through a global network of direct and indirect sales channels.

Revenue and Backlog

Industrial accounted for $487.6 million, $139.1 million and $118.2 million or 41%, 21% and 20% of our net revenues for the years ended December 31, 2018, 2017 and 2016. Industrial backlog as of January 31, 2019 was $168.2 million.

CIRCOR Consolidated

Competition

The domestic and international markets for our products are highly competitive. Some of our competitors have substantially greater financial, marketing, personnel and other resources than us. We consider product brand, quality, performance, on-time delivery, customer service, price, distribution capabilities and breadth of product offerings to be the primary competitive factors in these markets. We believe that new product development and product engineering also are important to our success and that our position in the industry is attributable, in significant part, to our ability to develop innovative products and to adapt existing products to specific customer applications.

The primary competitors of our Energy segment include: Balon Corporation, Crane Co., Emerson Electric Company, Flowserve Corporation, IMI plc, P.e.r.a.r S.p.A, PetrolValves S.p.A, Cameron division of Schlumberger Limited, SPX Flow, Inc., and Valvitalia S.p.A.

The primary competitors of our Aerospace & Defense segment include: Crane Co., Curtiss-Wright Corporation, Marrotta Controls, Moog, Inc., Parker Hannifin Corp., and Woodward Inc.

The primary competitors of our Industrial segment include: Leistritz AG, Curtiss-Wright Corporation, Netzsch GmbH, ITT Corporation, Seepex GmbH, and Naniwa Ltd.

New Product Development

Our engineering differentiation comes from our ability to offer products, solutions and services that address high pressure, high temperature, and caustic flow. Our solutions offer high standards of reliability, safety and durability in applications requiring precision movement and zero leakage.

We continue to develop new and innovative products to enhance our market positions. Our product development capabilities include designing and manufacturing custom applications to meet high tolerance or close precision requirements. For example, our Energy segment operation can meet the tolerance requirements of sub-sea, cryogenic environments as well as critical service steam applications. Our Aerospace & Defense segment continues to expand its integrated systems design and testing capability to support bundled sub-systems for aeronautics applications, as well as acoustically superior motors for marine applications. These testing and manufacturing capabilities enable us to develop customer-specified applications. In many cases, the unique characteristics of our customer-specified technologies have been subsequently used in broader product offerings. The Industrial segment provides unique fluid handling products for viscous and critical fluids with specific design and engineering capabilities, as well as highly differentiated smart technology for specific applications.

We maintain a Global Engineering Center of Excellence in India with a capable technology and engineering team that complements the engineering resources in a business unit.

Customers

For the years ended December 31, 2018, 2017, and 2016, we had no customers from which we derive revenues that exceed 10% of the Company’s consolidated revenues. Our businesses sell into both long-term capital projects as well as short-cycle demand. As a result, we tend to experience fluctuations in orders, revenues and operating results at various points across economic and business cycles. Our Energy businesses can be cyclical in nature due to the fluctuation of the worldwide price, supply and demand for oil and gas. When the worldwide demand for oil and gas is depressed, the demand for our products used in those markets decreases as our customers with higher production costs will cut back investment and reduce purchases from us. The number of active rigs and wells drilled in North American short-cycle Oil & Gas market is a strong indicator of demand especially for our distributed valves products. In addition, the level of capital expenditures by national oil companies or the oil majors in exploration and production activities drive demand for our long cycle, engineered valves products. Maintenance expenditures during refinery turnarounds drive demand for our refinery valve products. Similarly, although not to the same extent as the Oil & Gas markets, the aerospace, military and maritime markets have historically experienced cyclical fluctuations in demand.

Selling and Distribution

Across our businesses we utilize a variety of channels to market our products and solutions. Those channels include direct sales, distributors, commissioned representatives, and our service centers. Our distribution and representative networks typically offer technically trained sales forces with strong relationships in key markets.

We believe that our well-established sales and distribution channels constitute a competitive strength. We believe that we have good relationships with our representatives and distributors. We continue to implement marketing programs to enhance these relationships. Our ongoing distribution-enhancement programs include reducing lead times, introducing new products, and offering competitive pricing, application design, technical training, and service.

Intellectual Property

We own patents that are scheduled to expire between 2019 and 2030 and trademarks that can be renewed as long as we continue to use them. We do not believe the vitality and competitiveness of any of our business segments as a whole depends on any one or more patents or trademarks. We own certain licenses such as software licenses, but we do not believe that our business as a whole depends on any one or more licenses.

Raw Materials

The raw materials used most often in our production processes are castings, forgings and bar stock of various materials, including stainless steel, carbon steel, bronze, copper, brass, titanium and aluminum. These materials are subject to price fluctuations that may adversely affect our results of operations. We purchase these materials from numerous suppliers and at times experience constraints on the supply of certain raw material as well as the inability of certain suppliers to respond to our needs. Historically, increases in the prices of raw materials have been partially offset by higher sales prices, active materials management, project engineering programs and the diversity of materials used in our production processes.

Employees and Labor Relations

As of January 31, 2019, our worldwide operations directly employed approximately 4,400 people. We have 96 employees in North America who are covered by two collective bargaining agreements. We also have the following employees covered by governmental regulations or workers' councils:

- Germany - 1107 employees
- France - 150 employees
- Mexico - 108 employees
- Italy - 85 employees
- UK - 40 employees
- Norway - 33 employees
- Sweden - 10 employees

We believe that our employee relations are good at this time.

Available Information

We file reports on Form 10-Q with the Securities and Exchange Commission ("SEC") on a quarterly basis, additional reports on Form 8-K from time to time, and an annual report on Form 10-K on an annual basis. These and other reports filed by us, or furnished by us, to the SEC in accordance with section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended, are available free of charge from the SEC on its website at http://www.sec.gov. Additionally, our Form 10-Q, Form 8-K, Form 10-K and amendments to those reports are available without charge, as soon as reasonably practicable after they have been filed with, or furnished to, the SEC, on our Investor Relations website at http://investors.CIRCOR.com. The information on our website is not part of, or incorporated by reference in, this Annual Report.

Item 1A. Risk Factors

Set forth below are certain risk factors that we believe are material to our stockholders. If any of the following risks occur, our business, financial condition, cash flows, results of operations and reputation could be harmed. You should also consider these risk factors when you read "forward-looking statements" elsewhere in this report. You can identify forward-looking statements by terms such as "may," "hope," "should," "expect," "plan," "anticipate," "intend," "believe," "estimate," "predict," "potential" or "continue," the negative of those terms or other comparable terminology. Forward-looking statements are only predictions and can be adversely affected if any of the following risks occur:

Some of our end-markets are cyclical, which cause us to experience fluctuations in revenues or operating results.

We have experienced, and expect to continue to experience, fluctuations in revenues and operating results due to economic and business cycles. Results of operations for any particular period are not necessarily indicative of the results of the operations for any future period. We sell our products principally to aerospace, military, commercial aircraft, Oil & Gas exploration, transmission and refining, power generation, chemical processing and maritime markets. Although we serve a variety of markets to reduce dependency on any one, a significant downturn in any one of these markets could cause a material reduction in our revenues that could be difficult to offset. In addition, decreased market demand typically results in excess manufacturing capacity among our competitors which, in turn, results in pricing pressure. As a consequence, a significant downturn in our markets can result in lower revenues and profit margins.

In particular, our Energy businesses are cyclical in nature as the worldwide demand for oil and gas fluctuates. Energy sector activity can fluctuate significantly in a short period of time, particularly in the United States, North Sea, the Middle East, Brazil and Australia, amongst other regions. When worldwide demand for oil and gas is depressed, the demand for our products used in maintenance and repair of existing oil and gas applications, as well as exploration or new oil and gas project applications, is reduced. A decline in oil price will have a similar impact on the demand for our products, particularly in markets, such as North America, where the cost of oil production is relatively higher. Demand for our products and services depends on a number of factors, including the number of oil & gas wells being drilled, the maintenance and condition of industry assets, the volume of exploration and production activities and the capital expenditures of asset owners and maintenance companies. The willingness of asset owners and operators to make capital expenditures to produce and explore for sources of energy will continue to be influenced by numerous factors over which we have no control, including:

- the current and anticipated future prices for energy sources, including oil and natural gas, solar, wind and nuclear;
- level of excess production capacity;
- cost of exploring for and producing energy sources;
- worldwide economic activity and associated demand for energy sources;
- availability and access to potential hydrocarbon resources;
- national government political priorities;
- development of alternate energy sources; and
- environmental regulations.

As a result, we historically have generated lower revenues and profits in periods of declining demand or prices for crude oil and natural gas. Any future downward pricing pressure on crude oil could have a material adverse effect on our business, financial condition, cash flows, or results of operations.

We face significant competition and, if we are not able to respond, our revenues may decrease.

We face significant competition from a variety of competitors in each of our markets. Some of our competitors have substantially greater financial, marketing, personnel and other resources than we do. New competitors also could enter our markets. We consider product quality, performance, customer service, on-time delivery, price, distribution capabilities and breadth of product offerings to be the primary competitive factors in our markets. Our competitors may be able to offer more attractive pricing, duplicate our strategies, or develop enhancements to products that could offer performance features that are superior to our products. Competitive pressures, including those described above, and other factors could adversely affect our competitive position, resulting in a loss of market share or decreases in prices, either of which could have a material adverse effect on our business, financial condition, cash flows or results of operations. In addition, some of our competitors are based in foreign countries and have cost structures and prices based on foreign currencies.

The majority of our transactions are denominated in either U.S. dollar or Euro currency. Accordingly, currency fluctuations could cause our U.S. dollar and/or Euro priced products to be less competitive than our competitors' products that are priced in other currencies.

If we cannot continue operating our manufacturing facilities at current or higher levels, our results of operations could be adversely affected.

We operate a number of manufacturing facilities for the production of our products. The equipment and management systems necessary for such operations may break down, perform poorly or fail, resulting in fluctuations in manufacturing efficiencies. Such fluctuations may affect our ability to deliver products to our customers on a timely basis, which could have a material adverse effect on our business, financial condition, cash flows or results of operations. We have continuously enhanced and improved Lean manufacturing techniques as part of the CIRCOR Operating System. We believe that this process produces meaningful reductions in manufacturing costs. However, continuous improvement of these techniques may cause short-term inefficiencies in production. If we ultimately are unable to continuously improve our processes, our results of operations may suffer.

Our acquisition of the fluid handling business of Colfax Corporation (FH) and the integration of its business, operations and employees with our own may be more difficult, costly or time consuming than expected, and the anticipated benefits and cost savings of the acquisition may not be fully realized, which could adversely impact our business, financial condition, cash flows and results of operations.

We completed the acquisition of FH on December 11, 2017. The success of the acquisition, including the achievement of anticipated benefits and cost savings of the acquisition, is subject to a number of uncertainties and will depend, in part, on our ability to successfully combine and integrate FH's business into our business in an efficient and effective manner. Potential difficulties that we may encounter in the integration process include the following:

- the inability to successfully integrate FH's business into our own in a manner that permits us to achieve the cost savings and operating synergies anticipated to result from the acquisition, which could result in the anticipated benefits of the acquisition not being realized partly or wholly in the time frame currently anticipated or at all;
- loss of key management and technical personnel;
- integrating personnel, IT systems and corporate, finance and administrative infrastructures of FH into our company while maintaining focus on providing consistent, high quality products and services;
- coordinating and integrating our internal operations, compensation programs, policies and procedures, and corporate structures;
- potential unknown liabilities and unforeseen or increased costs and expenses;
- the possibility of faulty assumptions underlying expectations regarding potential synergies and the integration process;
- incurring significant acquisition-related costs and expenses;
- performance shortfalls as a result of the diversion of management's attention caused by integrating operations; and
- servicing the substantial debt that we have incurred in connection with the acquisition.

Any of these factors could result in us failing to realize the anticipated benefits of the acquisition, on the expected timeline or at all, and could adversely impact our business, financial condition, cash flows and results of operations.

Implementation of our acquisition strategy may not be successful, which could affect our ability to increase our revenues or could reduce our profitability.

One of our strategies is to increase our revenues and expand our markets through acquisitions that will provide us with complementary products and access to additional geographic markets. We expect to spend significant time and effort expanding our existing businesses and identifying, completing and integrating acquisitions. We expect to face competition for acquisition candidates that may limit the number of acquisition opportunities available to us and may result in higher acquisition prices. We cannot be certain that we will be able to identify, acquire or profitably manage additional companies or successfully integrate such additional companies without substantial costs, delays or other problems. Also, there can be no assurance that companies we acquire ultimately will achieve the revenues, profitability or cash flows, or generate the synergies upon which we justify our investment in them; as a result, any such under-performing acquisitions could result in impairment charges which would adversely affect our results of operations. In addition, acquisitions may involve a number of special risks, including: adverse effects on our reported operating results; use of cash; diversion of management's attention; loss of key personnel at acquired companies; or unanticipated management or operational problems or legal liabilities.

Implementation of our divestiture, restructuring, or simplification strategies may not be successful, which could affect our ability to increase our revenues or could reduce our profitability.

We continually review our current business and products to attempt to maximize our performance. We may in the future deem it appropriate to pursue the divestiture of additional product lines or businesses as conditions dictate. Any divestiture may result in a dilutive impact to our future earnings if we are unable to offset the dilutive impacts from the loss of revenue associated with the divested assets or businesses, as well as significant write-offs, including those related to goodwill and other intangible assets, which could have a material adverse effect on our results of operations and financial condition. A successful divestiture depends on various factors, including our ability to effectively transfer liabilities, contracts, facilities and employees to any purchaser, identify and separate the intellectual property to be divested from the intellectual property that we wish to retain, reduce fixed costs previously associated with the divested assets or business, and collect the proceeds from any divestitures. In addition, if customers of the divested business do not receive the same level of service from the new owners, this may adversely affect our other businesses to the extent that these customers also purchase other products offered by us. All of these efforts require varying levels of management resources, which may divert our attention from other business operations.

A focus of our Company is to simplify the way we are organized and the number of facilities we manage. We believe that such focus will reduce overhead structure, enhance operational synergies, and result in improved operating margins and customer service. Nevertheless, we may not achieve expected cost savings from restructuring and simplification activities and actual charges, costs and adjustments due to such activities may vary materially from our estimates. Our ability to realize anticipated cost savings, synergies, margin improvement, and revenue enhancements may be affected by a number of factors, including the following: our ability to effectively eliminate duplicative overhead, rationalize manufacturing capacity, synchronize information technology systems, consolidate warehousing and distribution facilities and shift production to more economical facilities; significant cash and non-cash integration and implementation costs or charges in order to achieve those cost savings, which could offset any such savings; and our ability to avoid labor disruption in connection with integration efforts or divestitures.

If we do not realize the expected benefits or synergies of any divestiture, restructuring, or simplification activities, our business, financial condition, cash flows and results of operations could be negatively impacted.

If we are unable to continue operating successfully overseas or to successfully expand into new international markets, our revenues may decrease.

We derive a significant portion of our revenue from sales outside the United States. In addition, one of our key growth strategies is to sell our products in international markets not significantly served by us in portions of Europe, Latin America and Asia. We market our products and services outside of the United States through direct sales, distributors, and technically trained commissioned representatives. We may not succeed in our efforts to further penetrate these markets. Moreover, conducting business outside the United States is subject to additional risks, including currency exchange rate fluctuations; changes in regional, political or economic conditions, trade protection measures such as tariffs or import or export restrictions; and complex, varying and changing government regulations and legal standards and requirements, particularly with respect to price protection, competition practices, export control regulations and restrictions, customs and tax requirements, immigration, anti-boycott regulations, data privacy, intellectual property, anti-corruption and environmental compliance, including U.S. customs and export regulations and restrictions and the Foreign Corrupt Practices Act, and the occurrence of any of these factors could materially and adversely affect our operations.

If we cannot pass on higher raw material or manufacturing costs to our customers, we may become less profitable.

One of the ways we attempt to manage the risk of higher raw material and manufacturing costs is to increase selling prices to our customers. The markets we serve are extremely competitive and customers may not accept price increases or may look to alternative suppliers, which may negatively impact our profitability and revenues.

If our suppliers cannot provide us with adequate quantities of materials to meet our customers' demands on a timely basis or if the quality of the materials provided does not meet our standards, we may lose customers or experience lower profitability.

Some of our customer contracts require us to compensate those customers if we do not meet specified delivery obligations. We rely on numerous suppliers to provide us with our required materials and in many instances these materials must meet certain specifications. In addition, we continue to increase our dependence on lower cost foreign sources of raw materials, components, and, in some cases, completed products. Managing a geographically diverse supply base inherently poses significant logistical challenges. While we believe that we also have improved our ability to effectively manage a global supply base, a risk nevertheless exists that we could experience diminished supplier performance resulting in longer than expected lead times and/or product quality issues. The occurrence of such factors could have a negative impact on our ability to deliver products to customers within our committed time frames and could adversely impact our results of operations, financial conditions and cash flows.

Our international activities expose us to fluctuations in currency exchange rates that could adversely affect our results of operations and cash flows.

Our international manufacturing and sales activities expose us to changes in foreign currency exchange rates. Our major foreign currency exposures involve the markets in Western Europe and Canada. Fluctuations in foreign currency exchange rates could result in our (i) paying higher prices for certain imported goods and services, (ii) realizing lower prices for any sales denominated in currencies other than U.S. dollars, (iii) realizing lower net income, on a U.S. dollar basis, from our international operations due to the effects of translation from weakened functional currencies, and (iv) realizing higher costs to settle transactions denominated in other currencies. Any of these risks could adversely affect our results of operations and cash flows. Our major foreign currency exposures involve the markets in Western Europe and Canada.

We may use forward contracts to help manage the currency risk related to certain business transactions denominated in foreign currencies. We primarily utilize forward exchange contracts with maturities of less than eighteen months. To the extent these transactions are completed, the contracts minimize our risk from exchange rate fluctuations because they offset gains and losses on the related foreign currency denominated transactions. However, there can be no assurances that we will be able to effectively utilize these forward exchange contracts in the future to offset significant risk related to fluctuations in currency exchange rates. In addition, there can be no assurances that counterparties to such contracts will perform their contractual obligations to us to realize the anticipated benefits of the contracts.

If we experience delays in introducing new products or if our existing or new products do not achieve or maintain market acceptance, our revenues may decrease.

Our industries are characterized by: intense competition; changes in end-user requirements; technically complex products; and evolving product offerings and introductions.

We believe our future success depends, in part, on our ability to anticipate or adapt to these factors and to offer, on a timely basis, products that meet customer demands. Failure to develop new and innovative products or to custom design existing products could result in the loss of existing customers to competitors or the inability to attract new business, either of which may adversely affect our revenues. The development of new or enhanced products is a complex and uncertain process requiring the anticipation of technological and market trends. We may experience design, manufacturing, marketing or other difficulties, such as an inability to attract a sufficient number of qualified engineers, which could delay or prevent our development, introduction or marketing of new products or enhancements and result in unexpected expenses.

If we fail to manufacture and deliver high quality products in accordance with industry standards, we may lose customers.

Product quality and performance are a priority for our customers since many of our product applications involve caustic or volatile chemicals and, in many cases, involve processes that require precise control of fluids. Our products are used in the aerospace, military, commercial aircraft, analytical equipment, Oil & Gas exploration, transmission and refining, power generation, chemical processing and maritime industries. These industries require products that meet stringent performance and safety standards, such as the standards of the American Petroleum Institute, International Organization for Standardization, Underwriters' Laboratory, American National Standards Institute, American Society of Mechanical Engineers and the European Pressure Equipment Directive. If we fail to maintain and enforce quality control and testing procedures, our products will not meet these stringent performance and safety standards which are required by many of our customers. Non-compliance with the standards could result in a loss of current customers and damage our ability to attract new customers, which could have a material adverse effect on our business, financial condition, cash flows or results of operations.

We depend on our key personnel and the loss of their services may adversely affect our business.

We believe that our success depends on our ability to hire new talent and the continued employment of our senior management team and other key personnel. If one or more members of our senior management team or other key personnel were unable or unwilling to continue in their present positions, our business could be seriously harmed. In addition, if any of our key personnel joins a competitor or forms a competing company, some of our customers might choose to use the services of that competitor or those of a new company instead of our own. Other companies seeking to develop capabilities and products similar to ours may hire away some of our key personnel. If we are unable to maintain our key personnel and attract new employees, the execution of our business strategy may be hindered and our growth limited.

We face risks from product liability lawsuits that may adversely affect our business.

We, like other manufacturers, face an inherent risk of exposure to product liability claims in the event that the use of our products results in personal injury, property damage or business interruption to our customers. We may be subjected to various product liability claims, including, among others, that our products include inadequate or improper instructions for use or installation, or inadequate warnings concerning the effects of the failure of our products. Although we maintain quality controls and procedures, including the testing of raw materials and safety testing of selected finished products, we cannot be certain that our products will be free from defect. In addition, in certain cases, we rely on third-party manufacturers for our products or components of our products. Although we have liability insurance coverage, we cannot be certain that this insurance coverage will continue to be available to us at a reasonable cost or, if available, will be adequate to cover any such liabilities. For example, liability insurance typically does not afford coverage for a design or manufacturing defect unless such defect results in injury to person or property. We generally attempt to contractually limit liability to our customers to risks that are insurable but are not always successful in doing so. Similarly, we generally seek to obtain contractual indemnification from our third-party suppliers, and for us to be added as an additional insured party under such parties' insurance policies. Any such indemnification or insurance is limited by its terms and, as a practical matter, is limited to the credit worthiness of the indemnifying or insuring party. In the event that we do not have adequate insurance or contractual indemnification, product liabilities could have a material adverse effect on our business, financial condition, cash flows or results of operations.

We rely on information technology in our operations, and any material failure, inadequacy, interruption or security failure of that technology could harm our business, financial condition, cash flows and results of operations.

We rely on information technology networks and systems, including the Internet, to process, transmit and store electronic information, and manage or support a variety of business processes, including operational and financial transactions and records, personal identifying information, payroll data and workforce scheduling information. We purchase some of our information technology from vendors, on whom our systems depend. We rely on commercially available systems, software, tools and monitoring to provide security for the processing, transmission and storage of company and customer information. Although we have taken steps to protect the security of our information systems and the data maintained in those systems, no such measures can eliminate the possibility of the systems' improper functioning or the improper access or disclosure of confidential or personally identifiable information such as in the event of cyber-attacks. Security breaches, whether through physical or electronic break-ins, computer viruses, ransomware, impersonation of authorized users, attacks by hackers or other means, can create system disruptions or shutdowns or the unauthorized disclosure of confidential information. Additionally, outside parties frequently attempt to fraudulently induce employees, suppliers or customers to disclose sensitive information or take other actions, including making fraudulent payments or downloading malware, by using "spoofing" and "phishing" emails or other types of attacks. Our employees have been and likely will continue to be targeted by such fraudulent activities. Outside parties may also subject us to distributed denial of services attacks or introduce viruses or other malware through "trojan horse" programs to our users' computers in order to gain access to our systems and the data stored therein. Because the techniques used to obtain unauthorized access, disable or degrade service, or sabotage systems change frequently and continuously become more sophisticated, often are not recognized until launched against a target and may be difficult to detect for a long time, we may be unable to anticipate these techniques or to implement adequate preventive or detective measures.

If company, personal or otherwise protected information is improperly accessed, tampered with or distributed, we may face significant financial exposure, including incurring significant costs to remediate possible injury to the affected parties. We may also be subject to sanctions and civil or criminal penalties if we are found to be in violation of the privacy or security rules under federal, state, or international laws protecting confidential information. Any failure to maintain proper functionality and security of our information systems could interrupt our operations, damage our reputation, subject us to liability claims or regulatory penalties and could have a material adverse effect on our business, financial condition, cash flows and results of operations.

The trading price of our common stock continues to be volatile and investors in our common stock may experience substantial losses.

The trading price of our common stock may be, and, in the past, has been volatile. Our common stock could decline or fluctuate in response to a variety of factors, including, but not limited to: our failure to meet our performance estimates or performance estimates of securities analysts; changes in financial estimates of our revenues and operating results or buy/sell recommendations by securities analysts; the timing of announcements by us or our competitors concerning significant product line developments, contracts or acquisitions or publicity regarding actual or potential results or performance; fluctuation in our quarterly operating results caused by fluctuations in revenue and expenses; substantial sales of our common stock by our existing shareholders; general stock market conditions; and fluctuations in oil and gas prices or other economic or external factors. While we attempt in our public disclosures to provide forward-looking information in order to enable investors to anticipate our future performance, such information by its nature represents our good-faith forecasting efforts. In recent years, the unprecedented nature of oil prices, credit and financial crises and economic recessions, together with the uncertain depth and duration of these crises, has rendered such forecasting more difficult. As a result, our actual results have differed materially, and going forward could differ materially, from our forecasts, which could cause further volatility in the value of our common stock.

In recent years the stock market as a whole experienced dramatic price and volume fluctuations. In the past, securities class action litigation has often been instituted against companies following periods of volatility in the market price of their securities. This type of litigation could result in substantial costs and a diversion of management attention and resources.

The costs of complying with existing or future governmental regulations on importing and exporting practices and of curing any violations of these regulations, could increase our expenses, reduce our revenues or reduce our profitability.

We are subject to a variety of laws and international trade practices, including regulations issued by the United States Bureau of Industry and Security, the Department of Homeland Security, the Department of State and the Department of Treasury. We cannot predict the nature, scope or effect of future regulatory requirements to which our international trading practices might be subject or the manner in which existing laws might be administered or interpreted. Future regulations could limit the countries into which certain of our products may be sold or could restrict our access to, and increase the cost of obtaining products from, foreign sources. In addition, actual or alleged violations of such regulations could result in enforcement actions and/or financial penalties that could result in substantial costs.

If we incur higher costs as a result of trade policies, treaties, government regulations or tariffs, we may become less profitable.

There is currently significant uncertainty about the future relationship between the United States and China, including with respect to trade policies, treaties, government regulations and tariffs. The current U.S. administration has called for substantial changes to U.S. foreign trade policy and has implemented greater restrictions on international trade and significant increases in tariffs on goods imported into the U.S. Under the current status, we expect that tariff increases will primarily impact [our] Distributed Valves product lines. We are unable to predict whether or when additional tariffs will be imposed or the impact of any such future tariff increases.

If we are unable to generate sufficient cash flow, we may not be able to service our debt obligations, including making payments on our outstanding term loan.

Our ability to make payments of principal and interest on our indebtedness when due, including the significant indebtedness that we incurred in connection with the acquisition of FH, depends upon our future performance, which will be subject to general economic conditions, industry cycles and financial, business and other factors affecting our consolidated operations, many of which are beyond our control. If we are unable to generate sufficient cash flow from operations in the future to service our outstanding debt, we may be required to, among other things:

- seek additional financing in the debt or equity markets;
- refinance or restructure all or a portion of our indebtedness;
- divert funds that would otherwise be invested in our operations;
- sell selected assets; or
- reduce or delay planned capital expenditures or operating expenditures.

Such measures might not be sufficient to enable us to service our debt, which could negatively impact our financial results. In addition, we may not be able to obtain any such financing, refinancing or complete a sale of assets on economically favorable terms. In the case of financing or refinancing, favorable interest rates will be dependent on the health of the debt capital markets.

Our significant existing indebtedness could also have the effect, among other things, of reducing our flexibility to respond to changing business and economic conditions, reducing funds available for working capital, capital expenditures, acquisitions and other general corporate purposes or creating competitive disadvantages relative to other companies with lower debt levels.

Our credit agreement requires that we maintain certain ratios and limits our ability to make acquisitions, incur debt, pay dividends, make investments, sell assets or merge.

Our credit agreement, dated December 11, 2017, governs our indebtedness. This agreement includes provisions which place limitations on certain activities, including our ability to: issue; incur additional indebtedness; create any liens or encumbrances on our assets or make any guarantees; make certain investments; pay cash dividends above certain limits; or dispose of or sell assets or enter into a merger or a similar transaction. These restrictions may limit our ability to operate our business and may prohibit or limit our ability to execute our business strategy, compete, enhance our operations, take advantage of potential business opportunities as they arise or meet our capital needs. Furthermore, future debt instruments or other contracts could contain more restrictive financial or other covenants. The breach of any of these covenants by us or the failure by us to meet any of these conditions or requirements could result in a default under any or all of our indebtedness. If we are unable to service our indebtedness, our business, financial condition, cash flows and results of operations would be materially adversely affected.

Various restrictions and agreements could hinder a takeover of us which is not supported by our board of directors or which is leveraged.

Our amended and restated certificate of incorporation and amended and restated by-laws, as well as the Delaware General Corporation Law, contain provisions that could delay or prevent a change in control in a transaction that is not approved by our board of directors or that is on a leveraged basis or otherwise. These include provisions creating a staggered board, limiting the shareholders' powers to remove directors, and prohibiting shareholders from calling a special meeting or taking action by written consent in lieu of a shareholders' meeting. In addition, our board of directors has the authority, without further action by the shareholders, to set the terms of and to issue preferred stock. Issuing preferred stock could adversely affect the voting power of the owners of our common stock, including the loss of voting control to others.

Delaying or preventing a takeover could result in our shareholders ultimately receiving less for their shares by deterring potential bidders for our stock or assets.

A change in international governmental policies or restrictions could result in decreased availability and increased costs for certain components and finished products that we purchase from sources in foreign countries, which could adversely affect our profitability.

Like most manufacturers of flow control products, we attempt, where appropriate, to reduce costs by seeking lower cost sources of certain components and finished products. Many such sources are located in developing countries such as India and China, where a change in governmental approach toward U.S. trade could restrict the availability to us of such sources. In addition, periods of war or other international tension could interfere with international freight operations and hinder our ability to purchase such components and products. A decrease in the availability of these items could hinder our ability to timely meet our customers' orders. We attempt, when possible, to mitigate this risk by maintaining alternate sources for these components and products and by maintaining the capability to produce such items in our own manufacturing facilities. However, even when we are able to mitigate this risk, the cost of obtaining such items from alternate sources or producing them ourselves is often considerably greater, and a shift toward such higher cost production could therefore adversely affect our profitability.

We, along with our customers and vendors, face the uncertainty in the public and private credit markets and in general economic conditions in the United States and around the world.

In recent years there has been at times disruption and general slowdown of the public and private capital and credit markets in the United States and around the world. Such conditions can adversely affect our revenue, results of operations and overall financial growth. Our business can be affected by a number of factors that are beyond our control such as general geopolitical, economic and business conditions and conditions in the financial services market, which each could materially impact our business, financial condition, cash flows and results of operations. Additionally, many lenders and institutional investors, at times, have reduced funding to borrowers, including other financial institutions. A constriction on future lending by banks or investors could result in higher interest rates on future debt obligations or could restrict our ability to obtain sufficient financing to meet our long-term operational and capital needs or could limit our ability in the future to consummate strategic acquisitions. Any uncertainty in the credit markets could also negatively impact the ability of our customers and vendors to finance their operations which, in turn, could result in a decline in our sales and in our ability to obtain necessary raw materials and components, thus potentially having an adverse effect on our business, financial condition, cash flows or results of operations.

Terrorist activity and/or political instability around the world could cause economic conditions to deteriorate and adversely impact our businesses.

In the past, terrorist attacks have negatively impacted general economic, market and political conditions. Terrorist acts, acts of war or political instability (wherever located around the world) could cause damage or disruption to our business, our facilities or our employees which could significantly impact our business, financial condition or results of operations. The potential for future terrorist attacks, the national and international responses to terrorist attacks, political instability, and other acts of war or hostility, including the recent and current conflicts in Iraq, Afghanistan and the Middle East, have created many economic and political uncertainties, which could adversely affect our business and results of operations in ways that cannot presently be predicted. In addition, with manufacturing facilities located worldwide, including facilities located in North America, Western Europe, Morocco, and India, we may be impacted by terrorist actions not only against the United States but in other parts of the world as well. In some cases, we are not insured for losses and interruptions caused by terrorist acts and acts of war.

The costs of complying with existing or future environmental regulations and curing any violations of these regulations could increase our expenses or reduce our profitability.

We are subject to a variety of environmental laws relating to the storage, discharge, handling, emission, generation, use and disposal of chemicals, solid and hazardous waste and other toxic and hazardous materials used to manufacture, or resulting from the process of manufacturing, our products. We cannot predict the nature, scope or effect of future regulatory requirements to which our operations might be subject or the manner in which existing or future laws will be administered or interpreted. Future regulations could be applied to materials, products or activities that have not been subject to regulation previously. The costs of complying with new or more stringent regulations, or with more vigorous enforcement of these or existing regulations could be significant.

Environmental laws require us to maintain and comply with a number of permits, authorizations and approvals and to maintain and update training programs and safety data regarding materials used in our processes. Violations of these requirements could result in financial penalties and other enforcement actions. We also could be required to halt one or more portions of our operations until a violation is cured. Although we attempt to operate in compliance with these environmental laws, we may not succeed in this effort at all times. The costs of curing violations or resolving enforcement actions that might be initiated by government authorities could be substantial.

Regulations related to “conflict minerals” may cause us to incur additional expenses and could limit the supply and increase the cost of certain metals used in manufacturing our products.

Under the conflict minerals rule, public companies must disclose whether specified minerals, known as conflict minerals, are necessary to the functionality or production of products manufactured or contracted to be manufactured. The rule requires a disclosure report to be filed by May 31st of each year and requires companies to perform due diligence and disclose and report whether or not such minerals originate from the Democratic Republic of Congo or an adjoining country. The conflicts mineral rule could affect sourcing at competitive prices and availability in sufficient quantities of certain minerals used in the manufacture of our products, including tantalum, tin, gold and tungsten. The number of suppliers who provide conflict-free minerals may be limited. In addition, there may be material costs associated with complying with the disclosure requirements, such as costs related to determining the source of certain minerals used in our products, as well as costs of possible changes to products, processes, or sources of supply as a consequence of such verification activities. As our supply chain is complex, we may not be able to sufficiently verify the origins of the relevant minerals used in our products through the due diligence procedures that we implement, which may harm our reputation. In addition, we may encounter challenges to satisfy those customers who require that all of the components of our products be certified as conflict-free, which could place us at a competitive disadvantage if we are unable to do so.

We may be adversely affected by comprehensive tax reform

On December 22, 2017, the Tax Cuts and Jobs Act ("Tax Act") was signed into law. The Tax Act contains significant changes to corporate taxation, including reduction of the corporate tax rate from 35% to 21%, additional limitations on the tax deductibility of interest, substantial changes to the taxation of foreign earnings, immediate deductions for certain new investments instead of deductions for depreciation expense over time, and modification or repeal of many business deductions and credits. Notwithstanding the reduction in the corporate income tax rate, the overall impact of the Tax Act remains uncertain, and our results of operations, cash flows or financial condition, as well as the trading price of our Common Stock, could be adversely affected. In addition, it is uncertain how various states will respond to the Tax Act.

Item 1B. Unresolved Staff Comments

None.

Item 2. Properties

We maintain 28 major manufacturing facilities worldwide, including operations located in North America, Western Europe, Morocco and India. We also maintain sales offices or warehouses from which we ship finished goods to customers, distributors and commissioned representative organizations. Our executive office is located in Burlington, Massachusetts and is leased.

Our Energy segment has major manufacturing facilities located in North America, Italy, United Kingdom, and the Netherlands. Properties in Nerviano, Italy and Spartanburg, South Carolina are leased. Our Aerospace & Defense segment has major manufacturing facilities located in North America, United Kingdom, Germany, France, India and Morocco. Properties in Hauppauge, New York and Corona, California are leased. Our Industrial segment has major facilities located in North America and Netherlands. Properties in Germany and India are leased.

Segment	Leased	Owned	Total
Energy	7	5	12
Aerospace & Defense	1	4	5
Industrial	4	7	11
Total	12	16	28

In general, we believe that our properties, including machinery, tools and equipment, are in good condition, are well maintained, and are adequate and suitable for their intended uses. Our manufacturing facilities generally operate five days per week on one or two shifts. We believe our manufacturing capacity could be increased by working additional shifts and weekends and by successful implementation of our CIRCOR Operating System. We also have low-cost sources for manufacturing in Mexico, India, and Morocco which have capacity to fulfill our manufacturing needs. We believe that our current facilities will meet our near-term production requirements without the need for additional facilities.

Item 3. Legal Proceedings

For information regarding our legal proceedings refer to the first three paragraphs of Note 15, “Contingencies, Commitments and Guarantees”, to the consolidated financial statements included in this Annual Report, which disclosure is incorporated herein by reference.

Item 4. Mine Safety Disclosures

Not applicable.

Part II

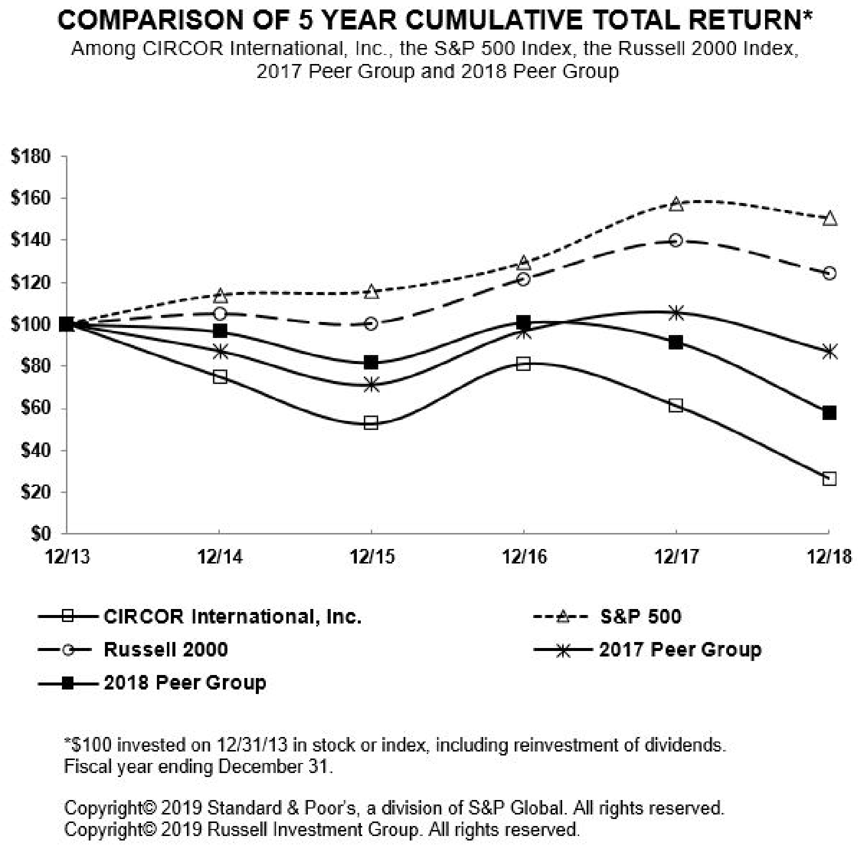
Item 5. Market for Registrant’s Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities

Our common stock is traded on the New York Stock Exchange (“NYSE”) under the symbol “CIR.”

Our Board of Directors is responsible for determining our dividend policy. The timing and level of any dividends will necessarily depend on our Board of Directors’ assessments of earnings, financial condition, capital requirements and other factors, including restrictions, if any, imposed by our lenders. On February 28, 2018, we announced the suspension of our nominal dividend, as part of our capital deployment strategy.

As of February 22, 2019, there were 19,857,359 shares of our common stock outstanding and we had 57 holders of record of our common stock. We believe the number of beneficial owners of our common stock was substantially greater on that date.

The graph below compares the cumulative 5-Year total return provided shareholders on CIRCOR International, Inc.'s common stock relative to the cumulative total returns of the S&P 500 index, the Russell 2000 index, our previous peer group (“2017 Peer Group”) and our updated peer group (“2018 Peer Group”). The companies included in the 2017 Peer Group and the 2018 Peer Group are listed in footnotes 1 and 2 below, respectively. We revised our peer group to incorporate peers relevant to the businesses we acquired in the Fluid Handling acquisition. An investment of $100 (with reinvestment of all dividends) is assumed to have been made in our common stock, in each index and in each of the peer groups on 12/31/2013 and its relative performance is tracked through 12/31/2018.



	12/13	12/14	12/15	12/16	12/17	12/18
CIRCOR International, Inc.	**100.00**	**74.77**	**52.44**	**80.96**	**60.91**	**26.65**
S&P 500	**100.00**	**113.69**	**115.26**	**129.05**	**157.22**	**150.33**
Russell 2000	**100.00**	**104.89**	**100.26**	**121.63**	**139.44**	**124.09**
2017 Peer Group	**100.00**	**87.21**	**71.19**	**96.87**	**105.44**	**86.94**
2018 Peer Group	**100.00**	**96.22**	**81.62**	**100.76**	**91.40**	**57.87**

- **2017 Peer Group**: There are six companies included in the company's 2017 Peer Group which are: Crane Co, Curtiss-Wright Corp, Flowserve Corp, Forum Energy Technologies Inc., SPX Flow Inc. and Woodward Inc.
- **2018 Peer Group**: The three companies included in the company's 2018 Peer Group are: Dover Corp, IDEX Corp and Schlumberger NV.

Item 6. Selected Financial Data

The following table presents certain selected financial data that has been derived from our audited consolidated financial statements and related notes and should be read along with the section entitled "Management's Discussion and Analysis of Financial Condition and Results of Operations" and our audited consolidated financial statements and notes included in this Annual Report.

The consolidated statements of (loss) income and consolidated statements of cash flows data for the years ended December 31, 2018, 2017 and 2016, and the consolidated balance sheet data as of December 31, 2018 and 2017 are derived from, and should be read in conjunction with, our audited consolidated financial statements and the related notes included in this Annual Report. The consolidated statements of income and consolidated statements of cash flows data for the years ended December 31, 2015 and 2014, and the consolidated balance sheet data as of December 31, 2016, 2015 and 2014, are derived from our consolidated financial statements not included in this Annual Report.

Selected Financial Data
(in thousands, except per share data)

	Years Ended December 31,				
	2018 (3)	2017	2016	2015	2014
Statement of (Loss) Income Data (1):					
Net revenues	$ 1,175,825	$ 661,710	$ 590,259	$ 656,267	$ 841,446
Gross profit	341,650	200,820	183,115	199,332	257,020
Operating income	9,384	20,568	10,918	26,174	64,757
(Loss) Income before income taxes	(36,094)	6,113	9,680	22,428	63,261
Net (loss) income	$ (39,384)	$ 11,789	$ 10,101	$ 9,863	$ 50,386
Balance Sheet Data:					
Total assets	$ 1,791,612	$ 1,906,799	$ 820,756	$ 669,915	$ 724,722
Total debt	786,037	795,208	251,200	90,500	13,684
Shareholders' equity	528,993	601,974	404,410	400,777	494,093
Total capitalization	$ 1,315,030	$ 1,397,182	$ 655,610	$ 491,277	$ 507,777
Other Financial Data:					
Cash flow provided by (used in):					
Operating activities	$ 53,994	$ 9,637	$ 59,399	$ 27,142	$ 70,826
Investing activities	(16,877)	(502,124)	(210,481)	(87,726)	(1,842)
Financing activities	(74,073)	535,568	158,764	2,251	(37,724)
Interest expense, net	52,913	10,777	3,310	2,844	2,652
Capital expenditures	23,588	14,541	14,692	12,711	12,810
Diluted earnings per common share	$ (1.99)	$ 0.70	$ 0.61	$ 0.58	$ 2.84
Diluted weighted average common shares outstanding	19,834	16,849	16,536	16,913	17,768
Cash dividends declared per common share	$ —	$ 0.15	$ 0.15	$ 0.15	$ 0.15

(1) See Note 5, "Special and Restructuring charges, net," of the consolidated financial statements included in this Annual Report, for additional details on charges included in the twelve months ended December 31, 2018, December 31, 2017, and December 31, 2016 operating income above. The statement of income data for the year ended December 31, 2015 includes special and restructuring charges, net of $14.4 million. The statement of income data for the year ended December 31, 2014 includes special and restructuring charges, net of $12.7 million.

(2) On December 11, 2017 we acquired FH, on October 12, 2016 we acquired Critical Flow Solutions, and on April 15, 2015 we acquired Schroedahl.

(3) On January 1, 2018 the Company adopted ASU 2014-09, Revenue from Contracts, which had a material impact on revenues during FY'18. The Company discloses the impact of this change on revenue in Note 2, Summary of Significant Accounting Policies. On January 1, 2018 we adopted the FASB issued ASU 2017-07, Compensation—Retirement Benefits (Topic 715), which had a material impact in the current year. Refer to Note 14, Retirement Plans

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations

See Item 1, Business, for additional detail on forward looking statements.

Company Overview

We design, manufacture and market differentiated technology products and sub-systems for markets including industrial, oil & gas, aerospace and defense, and commercial marine. CIRCOR has a diversified flow and motion control product portfolio with recognized, market-leading brands that fulfill its customers' mission critical needs. See Part 1, Item 1, Business, for additional information regarding the description of our business.

We expect the trend in lower capital expenditures, as well as deferred maintenance spending, by many national oil companies, oil majors and refineries to continue in 2019 and impact our project businesses in engineered valves. However, we expect to see modest growth in other markets that we serve, including the short-cycle on-shore North American distributed valves market and petrochemical processing market. We received a number of large orders in 2018 for refinery valves, however, it is uncertain whether this trend will continue in 2019. Capital expenditures in the industrial end markets that we serve is expected to grow modestly, although there are some signs of a slowdown in Europe. We expect to experience lower demand for our products that serve the power generation markets. Aerospace and defense end markets are expected to grow as demand for commercial air travel continues to increase and funding on military programs in the U.S. improves in 2019. We do not expect an improvement in the commercial marine sector as global shipbuilding continues to be constrained.

We continue to implement actions to mitigate the impact on our earnings with the lower demand and increasingly competitive environment. In addition, we are investing in products and technologies designed to help solve our customers' most difficult problems. We expect to further simplify CIRCOR by standardizing technology, reducing facilities, consolidating suppliers and achieving world class operational excellence, including working capital management. We believe our cash flow from operations and financing capacity is adequate to support these activities. Finally, continuing to attract and retain talented personnel, including the enhancement of our global sales, operations, product management and engineering organizations, remains an important part of our strategy during 2019.

Basis of Presentation

All significant intercompany balances and transactions have been eliminated in consolidation. Effective January 1, 2018 we reorganized our segments by end market: Energy, Aerospace & Defense and Industrial. Prior year financial statements have been adjusted to reflect this new organization basis beginning in the first quarter of 2018.

We operate and report financial information using a 52-week fiscal year ending December 31. The data periods contained within our Quarterly Reports on Form 10-Q reflect the results of operations for the 13-week, 26-week and 39-week periods which generally end on the Sunday nearest the calendar quarter-end date.

Critical Accounting Policies

The Company's discussion and analysis of its financial condition and results of operations is based upon its financial statements, which have been prepared in accordance with accounting principles generally accepted in the United States of America. The preparation of these financial statements requires management to make estimates and assumptions that affect the reported amounts of assets, liabilities, revenue and expenses and related disclosure of contingent liabilities. On an on-going basis, management evaluates its significant estimates, including those related to contracts accounted for under the percentage of completion method, bad debts, inventories, intangible assets and goodwill, purchase accounting, delivery penalties, income taxes, and contingencies including litigation. Management believes the most complex and sensitive judgments, because of their significance to the consolidated financial statements, result primarily from the need to make estimates about the effects of matters that are inherently uncertain. Management bases its estimates on historical experience, current market and economic conditions and other assumptions that management believes are reasonable. The results of these estimates form the basis for judgments about the carrying value of assets and liabilities where the values are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions.

There have been no significant changes from the methodology applied by management for critical accounting estimates previously disclosed in our Annual Report on Form 10-K for the fiscal year ended December 31, 2017. For information regarding our critical accounting policies, refer to Note 2, "Summary of Significant Accounting Policies," to the consolidated financial statements included in this Annual Report, which disclosure is incorporated by reference herein.

For goodwill, we perform an impairment assessment at the reporting unit level on an annual basis as of our October month end or more frequently if circumstances warrant. In October 2018 when we performed our impairment assessment, the fair value of each of our reporting units exceeded the respective carrying amount, and no goodwill impairments were recorded. The fair values utilized for our 2018 goodwill assessment exceeded the carrying amounts by more than 20% for our Energy, Aerospace & Defense, and Industrial reporting units, respectively. The growth rate assumptions utilized were consistent with growth rates within the markets that we serve. If our results significantly vary from our estimates, related projections, or business assumptions in the future due to change in industry or market conditions, we may be required to record impairment charges.

Results of Operations

2018 Compared With 2017

Consolidated Operations

(in thousands)	2018	2017	Total Change	Acquisitions	Operations	Foreign Exchange
Net Revenues						
Energy	$ 451,232	$ 339,617	$ 111,615	$ 57,290	$ 51,918	$ 2,407
Aerospace & Defense	237,017	182,983	54,034	46,929	4,669	2,436
Industrial	487,576	139,110	348,466	344,456	1,911	2,099
Consolidated Net Revenues	$ 1,175,825	$ 661,710	$ 514,115	$ 448,675	$ 58,498	$ 6,942

Net revenues in 2018 were $1.2 billion, an increase of $514.1 million from 2017 primarily driven by our December 2017 acquisition of the fluid handling business of Colfax Corporation ("FH") $448.7 million, along with operations increase of $58.5 million and favorable foreign exchange increase of $6.9 million.

Segment Results

The Chief Operating Decision Maker ("CODM") is the function that allocates the resources of the enterprise and assesses the performance of the Company's reportable operating segments. CIRCOR has determined that the CODM is solely comprised of its Chief Executive Officer ("CEO"), as the CEO has the ultimate responsibility for CIRCOR strategic decision-making and resource allocation.

Our CODM evaluates segment operating performance using segment operating income. Segment operating income is defined as generally accepted accounting principles ("GAAP") operating income excluding intangible amortization and amortization of fair value step-ups of inventory and fixed assets from acquisitions completed subsequent to December 31, 2011, the impact of restructuring related inventory write-offs, impairment charges and special charges or gains. The Company also refers to this measure as adjusted operating income. The Company uses this measure because it helps management understand and evaluate the segments’ core operating results and facilitates a comparison of performance for determining incentive compensation achievement.

For information regarding our segment determination refer to Note 18, “Business Segment and Geographical Information," of the consolidated financial statements included in this Annual Report.

(in thousands)	2018	2017	Change
Net Revenues			
Energy	$ 451,232	$ 339,617	$ 111,615
Aerospace and Defense	237,017	182,983	54,034
Industrial	487,576	139,110	348,466
Consolidated Net Revenues	$ 1,175,825	$ 661,710	$ 514,115
Operating Income			
Energy - Segment Operating Income	$ 33,496	$ 30,131	$ 3,365
A&D - Segment Operating Income	36,047	23,375	12,672
Industrial - Segment Operating Income	57,340	19,932	37,408
Corporate expenses	(30,299)	(21,744)	(8,555)
Subtotal	96,584	51,694	44,890
Restructuring charges, net	12,752	6,062	6,690
Special charges, net	11,087	7,989	3,098
Special and restructuring charges, net (1)	23,839	14,051	9,788
Restructuring related inventory charges (1)	2,402	—	2,402
Amortization of inventory step-up	6,600	4,300	2,300
Acquisition amortization	47,310	12,542	34,768
Acquisition depreciation	7,049	233	6,816
Restructuring and other costs	63,361	17,075	46,286
Consolidated Operating Income	$ 9,384	$ 20,568	$ (11,184)
Consolidated Operating Margin	0.8%	3.1%	

(1) See Note 5 "Special and Restructuring charges, net" of the consolidated financial statements included in this Annual Report, for additional details.

Energy Segment

(in thousands)	2018	2017	Change
Orders	$ 451,910	$ 376,039	$ 75,871
Net Revenues	$ 451,232	$ 339,617	$ 111,615
Segment Operating Income	33,496	30,131	3,365
Segment Operating Margin	7.4%	8.9%	

Energy segment orders increased $75.9 million, or 20%, to $451.9 million for 2018 compared to $376.0 million in 2017, primarily due to primarily driven by capital project and maintenance, repair, and overhaul orders within the Reliability Services business (+18%), Refinery Valves business (+16%) and Engineered Valves business (+3%), partially offset by declines in our Distributed Valves business (-17%).

Energy segment net revenues increased $111.6 million, or 33%, in 2018 compared to 2017. The increase was primarily driven by the addition of the Reliability Services business acquired with the FH acquisition (+17%), our Refinery Valves business (+11%), our North American Distributed Valves business (+3%), our Pipeline business (+2%) and our Instrumentation & Sampling business (+1%).

Segment operating income increased $3.4 million, or 11%, to $33.5 million for 2018 compared to $30.1 million in 2017. The increase in segment operating income was primarily due to operational improvements within our Refinery Valves business (+32%), and the acquisition of Reliability Services business (+17%), partially offset by operational losses within our North American Distributed Valves business (-24%) and Engineered Valves business (-14%).

QUARTERLY ENERGY SEGMENT INFORMATION

(in thousands, except percentages)

(unaudited)

	2017					2018				
	1ST QTR	2ND QTR	3RD QTR	4TH QTR	TOTAL	1ST QTR	2ND QTR	3RD QTR	4TH QTR	TOTAL
Orders	100,012	73,140	84,857	118,030	376,039	129,762	113,171	110,987	97,990	451,910
Net Revenues	76,210	78,276	88,570	96,561	339,617	99,972	112,804	121,023	117,433	451,232
Operating Income	6,407	8,170	6,936	8,618	30,131	5,696	9,242	9,163	9,396	33,497
Operating Margin	8.4%	10.4%	7.8%	8.9%	8.9%	5.7%	8.2%	7.6%	8.0%	7.4%
Backlog (1)	142,752	140,102	138,811	182,999	182,999	224,139	217,666	205,924	183,467	183,467

(1) at end of period.

Aerospace & Defense Segment

(in thousands)	2018	2017	Change
Orders	$ 277,469	$ 193,535	$ 83,934
Net Revenues	$ 237,017	$ 182,983	$ 54,034
Segment Operating Income	36,047	23,375	12,672
Segment Operating Margin	15.2%	12.8%	

Aerospace & Defense segment orders increased $84.0 million, or 43%, to $277.5 million for 2018 compared to $193.5 million in 2017, primarily due to our Pumps Defense business (+36%) and our U.S. fluid control and actuation business (+7%).

Aerospace & Defense segment net revenues increased by $54.0 million, or 30%, in 2018 compared to 2017. The increase was primarily driven by the defense related business ("Pumps Defense") we acquired in the FH acquisition (+26%), price and volume increases in our United States ("U.S.") fluid control business (+5%) and our United Kingdom ("U.K.") defense business (+2%), partially offset by decreased revenues in our actuation business (-2%) and French business (-2%). The increase in our Pumps Defense business is attributed to the timing of orders received for the Joint Strike Fighter program.

Segment operating income increased $12.7 million, or 54%, to $36.0 million for 2018 compared to $23.4 million for 2017. The increase in operating income was primarily driven by our Pumps Defense business (+43%), lower headquarter costs (+23%), our U.S. fluid control business (+11%), and our U.K. defense business (+1%), partially offset by declines in our U.S. actuation business (-21%) and our French business (-4%).

QUARTERLY A&D SEGMENT INFORMATION

(in thousands, except percentages)

(unaudited)

	2017					2018				
	1ST QTR	2ND QTR	3RD QTR	4TH QTR	TOTAL	1ST QTR	2ND QTR	3RD QTR	4TH QTR	TOTAL
Orders	56,416	39,902	45,939	51,278	193,535	59,793	59,441	81,533	76,702	277,469
Net Revenues	41,601	43,304	41,117	56,961	182,983	58,477	57,500	57,757	63,283	237,017
Operating Income	3,784	4,374	4,333	10,884	23,375	8,931	6,992	8,709	11,415	36,047
Operating Margin	9.1%	10.1%	10.5%	19.1%	12.8%	15.3%	12.2%	15.1%	18.0%	15.2%
Backlog (1)	106,178	105,741	108,157	163,694	163,694	165,841	152,081	172,986	179,639	179,639

(1) At end of period.

Industrial Segment

(in thousands, except percentages)	**2018**	**2017**		**Change**
Orders	$ 510,115	$ 131,993		$ 378,122
Net Revenues	$ 487,576	$ 139,110	348,466	$ 348,466
Segment Operating Income	57,340	19,932		37,408
Segment Operating Margin	11.8%	14.3%		

Industrial segment orders increased $378.1 million, or 286%, to $510.1 million for 2018 compared to $132.0 million in 2017, primarily due to the FH acquisition. The Pumps Businesses saw a significant increase in orders in the general industrial sector in Europe. Demand in North America was largely driven by the timing of certain Navy orders, bookings in Oil & Gas end markets, and strength in general industrial sectors.

Industrial segment net revenues increased $348.5 million, or 250%, in 2018 compared to 2017. The increase was primarily driven by the European and North American Pumps businesses ("Pumps Businesses") we acquired in the FH acquisition (+248%), along with increases in the Valves EMEA business(+3%).

Segment operating income increased $37.4 million, or 187.6%, to 57.3 million for 2018 compared to $19.9 million primarily driven by the Pumps Businesses (+166%) and Valves businesses (+21%). The decrease in segment operating margin from 14.3% to 11.8% was driven by the addition of relatively lower margin acquired businesses.

QUARTERLY INDUSTRIAL SEGMENT INFORMATION

(in thousands, except percentages)

(unaudited)

	2017					**2018**				
	1ST QTR	**2ND QTR**	**3RD QTR**	**4TH QTR**	**TOTAL**	**1ST QTR**	**2ND QTR**	**3RD QTR**	**4TH QTR**	**TOTAL**
Orders	27,654	29,889	27,296	47,154	131,993	136,607	136,746	114,876	121,886	510,115
Net Revenues	27,397	29,651	30,006	52,056	139,110	117,131	131,064	118,734	120,647	487,576
Operating Income	4,384	4,901	5,675	4,972	19,932	12,948	15,037	14,609	14,746	57,340
Operating Margin	16.0%	16.5%	18.9%	9.6%	14.3%	11.1%	11.5%	12.3%	12.2%	11.8%
Backlog (1)	32,878	33,751	31,286	155,786	155,786	170,568	167,325	178,044	163,801	163,801

(1) At end of period.

Corporate Expenses

Corporate expenses increased $8.6 million to $30.3 million for 2018. This increase was primarily driven by higher variable compensation costs, professional fees and integration costs.

Special and Restructuring charges, net

During 2018, the Company recorded a total of $23.8 million of Special and restructuring charges. In our statement of operations, these charges are recorded in Special and restructuring charges, net. These costs are primarily related to our simplification and restructuring efforts. These restructuring charges and other special charges are described in further detail in Note 5, "Special and Restructuring charges, net," of the consolidated financial statements included in this Annual Report.

Restructuring and other costs

During 2018, the Company recorded a total of $63.4 million of Restructuring and other costs. These charges represent plant, property, and equipment depreciation related to the step-up in fair value as part of our FH acquisition, intangible amortization in connection with acquisitions subsequent to December 31, 2011, and step-up in fair value of inventory acquired as part of our FH acquisition. These charges are recorded in either selling, general, and administrative expenses or cost of revenues based upon the nature of the underlying asset.

Interest Expense, Net

Interest expense increased $42.1 million to $52.9 million for 2018. The change in interest expense was primarily due to higher outstanding debt balances as a result of our acquisition of FH during the fourth quarter of 2017.

Other Expense (Income), Net

Other expense, net, was $7.4 million for 2018 compared to other income, net of $3.7 million in 2017. The difference of $11.1 million primarily relates to net pension income for the retirement plans we acquired as part of the FH acquisition. Effective January 1, 2018 all pension gains and losses are to be recorded in the Other (Income) Expense, net caption on our condensed consolidated statement of (loss) income. In addition, we had gains related to changes in foreign currency in 2018 whereas in 2017 we had losses associated with foreign currency.

Comprehensive (Loss) Income

Comprehensive income decreased $123.7 million, from a comprehensive income position of $51.3 million for the year-ended December 31, 2017 to a comprehensive loss position of $72.4 million for the year-ended December 31, 2018, primarily driven by $21.9 million in unfavorable foreign currency balance sheet remeasurements. These unfavorable foreign currency balance sheet remeasurements were driven by the Euro ($12.7 million).

As of December 31, 2018, we had a cumulative currency translation adjustment of $18.1 million regarding our Brazil entity. If we were to cease to have a controlling financial interest in the Brazil entity, we would incur a non-cash charge of $18.1 million, which would be included as a special charge within the results of operations.

(Benefit from) Provision for Income Taxes

On December 22, 2017, the U.S. government enacted the Tax Cuts and Jobs Act (the “Tax Act”). The Tax Act includes significant changes to the U.S. corporate income tax system including: a federal corporate rate reduction from 35% to 21%; limitations on the deductibility of interest expense and executive compensation; creation of the base erosion anti-abuse tax (“BEAT”), a new minimum tax; global intangible low-taxed income ("GILTI"); and the transition of U.S. international taxation from a worldwide tax system to a modified territorial tax system . The change to a modified territorial tax system resulted in a one-time U.S. tax liability on those earnings which have not previously been repatriated to the U.S. (the “Transition Tax”), with future distributions not subject to U.S. federal income tax when repatriated. A majority of the provisions in the Tax Act are effective January 1, 2018 and have been reflected in our financial statements. With respect to GILTI, the company has adopted a policy to account for this provision as a period cost.

In response to the Tax Act, the SEC staff issued guidance on accounting for the tax effects of the Tax Act. The guidance provided a one-year measurement period for companies to complete the accounting.

In connection with our initial analysis of the impact of the Tax Act, we had recorded a provisional estimate of $0.5 million net tax benefit for the period ended December 31, 2017. This benefit consists of provisional estimates of zero net expense for the Transition Tax liability, and $0.5 million benefit from the remeasurement of our deferred tax assets/liabilities due to the corporate rate reduction. On a provisional basis, the Company did not expect to owe the one-time Transition Tax liability, based on foreign tax pools that are in excess of U.S. tax rates. We have now finalized our accounting and these estimates did not change. The impact of the Tax Act resulted in a valuation allowance on a portion of our U.S. foreign tax credit carryforwards (deferred tax asset), in the amount of a $10.9 million expense, which was recorded in 2018.

The table below outlines the change in effective tax rate for 2018 and 2017 (in thousands, except percentages).

	2018	2017	Change
Income/ (Loss) Before Tax	$(36,094)	$6,113	$(42,207)
US tax rate	21.0%	35.0%	(14.0)%
State taxes	3.1%	0.3%	2.9%
US permanent differences	0.9%	2.5%	(1.6)%
Foreign tax rate differential	(3.7)%	(30.0)%	26.3%
Unbenefited foreign losses	(3.6)%	2.8%	(6.4)%
GILTI impact	(5.5)%	—%	(5.5)%
Intercompany financing	8.4%	(10.7)%	19.1%
Non-taxable CFS purchase consideration	$—	(69.3)%	69.3%
Foreign tax credit writeoff	(30.8)%	—	(30.8)%
Tax reserve	0.8%	(16.2)%	17.0%
Other	0.1%	(7.3)%	6.7%
Total	(9.1)%	(92.9)%	83.1%

Restructuring Actions

During 2018 and 2017, we initiated certain restructuring actions (the "2018 Actions" and "the 2017 Actions"), respectively. Under these restructurings, we reduced costs, primarily through reductions in workforce and closing a number of smaller facilities. In the fourth quarter of 2018, the Company announced the closure and discontinuance of manufacturing operations at the Energy Group's Oklahoma City site ("OKC Closure"), as manufacturing will move primarily to Monterrey, Mexico.

The table below (in millions) outlines the cumulative effects on past and future earnings resulting from our announced restructuring plans.

	Cumulative Planned Savings	Cumulative Projected Savings	Expected Periods of Savings Realization
OKC Closure (Note 1)	$ 1.0	$ 1.0	Q4 2018 - Q4 2019
2018 Actions	8.2	8.2	Q2 2018 - Q3 2019
2017 Actions	6.9	6.9	Q2 2017 - Q4 2018
Total Savings	$ 16.1	$ 16.1	

Note 1 - Savings figures above represent only the structural savings as a result of the closure and exit of the manufacturing facility at the Energy Group's Oklahoma City site. As part of this action, we expect margin expansion within our Energy Group primarily due to the lower labor rates in Mexico as we deliver on the volume. The savings amounts above do not include the benefit from the anticipated margin expansion.

As shown in the table above, our projected cumulative restructuring savings are aligned with our cumulative planned savings amounts. The expected periods of realization of the restructuring savings are fairly consistent with our original plans. Our restructuring actions are funded by cash generated by operations.

We expect to incur restructuring related special charges between $0.1 million and $0.2 million to complete the 2018 Actions during the first quarter of 2019. We expect to incur net restructuring related charges between $1.0 million and $1.5 million to complete the OKC Closure ending by the first half of 2019. The OKC Closure net restructuring charge projection does not contemplate the potential benefit of selling the facility. The 2017 Actions were finalized during the fourth quarter of 2017.

Results of Operations

2017 Compared With 2016

Consolidated Operations

(in thousands)	2017	2016	Total Change	Acquisitions	Operations	Foreign Exchange
Net Revenues						
Energy	$ 339,617	$ 305,939	$ 33,678	$ 51,381	$ (19,074)	$ 1,371
Aerospace & Defense	182,983	166,127	16,856	2,689	14,638	(471)
Industrial	$ 139,110	$ 118,193	20,917	$ 25,482	$ (5,625)	$ 1,060
Consolidated Net Revenues	$ 661,710	$ 590,259	$ 71,451	$ 79,552	$ (10,061)	$ 1,960

Net revenues in 2017 were $661.7 million, an increase of $71.5 million from 2016. The increase in net revenue was primarily driven through our acquisitions of Critical Flow Solutions ("CFS") in October 2016 ($43.1 million), our December 2017 acquisition of Fluid Handling ($36.5M), along with favorable F/X gains for $2.0 million, partially offset by operating losses of $(10.1 million) in aggregate.

Segment Results

The Company uses this measure because it helps management understand and evaluate the segments’ core operating results and facilitates a comparison of performance for determining incentive compensation achievement.

(in thousands)	2017	2016	Change
Net Revenues			
Energy	$ 339,617	$ 305,939	$ 33,678
Aerospace & Defense	182,983	166,127	16,856
Industrial	$ 139,110	$ 118,193	20,917
Consolidated Net Revenues	$ 661,710	$ 590,259	$ 71,451
			$ —
Operating Income			—
Energy - Segment Operating Income	30,131	$ 32,651	$ (2,520)
A&D - Segment Operating Income	23,375	15,368	8,007
Industrial - Segment Operating Income	19,932	20,056	(124)
Corporate expenses	(21,744)	(25,672)	3,928
Subtotal	51,694	42,403	9,291
Restructuring charges, net	6,062	8,975	(2,913)
Special charges, net	7,989	8,196	(207)
Special and restructuring charges, net (1)	14,051	17,171	(3,120)
Restructuring related inventory charges (1)	—	2,846	(2,846)
Amortization of inventory step-up	4,300	1,366	2,934
Impairment charges	—	208	(208)
Acquisition amortization	12,542	9,901	2,641
Acquisition depreciation	233	—	233
Brazil restatement impact	—	—	—
Restructuring and other cost, net	17,075	14,321	2,754
Consolidated Operating Income	$ 20,568	$ 10,911	$ 9,657
Consolidated Operating Margin	3.1%	1.8%	

(1) See Note 5 "Special and Restructuring charges, net" of the consolidated financial statements, for additional details.

Energy Segment

(in thousands)	2017	2016	Change
Net Revenues	$ 339,617	$ 305,939	$ 33,678
Segment Operating Income	30,131	32,651	(2,520)
Segment Operating Margin	8.9%	10.7%	

Energy segment net revenues increased $33.7 million, or 11%, in 2017 compared to 2016. The increase was primarily driven by our Refinery Valves business (+21%), our North American short-cycle business (+12%) and the Reliability Services business (3%), partially offset by declines in our large international projects business (-20%) and other oil & gas business (-4%).

Segment operating income decreased $(2.5) million, or 7.7%, from 2016 to 2017 to $30.1 million for 2017 compared to $32.7 million. The decrease in segment operating income was primarily due to the significant revenue decline in the large international projects business (-62%), along with revenue decline in our instrumentation & sampling (-17%), and our other oil & gas business (-11%) partially offset by increased shipment volumes within our North American short-cycle business (+30%), our Refinery Valves business (+25%), the Reliability Services business (+5%) and our Pipeline business (+5%).

Energy segment orders increased $121.3 million, or 48%, to $376.0 million for 2017 compared to $254.8 million in 2016, primarily due to CFS, along with increased orders in our North American short-cycle business due to improved demand and higher production activity in the U.S. shale plays, partially offset by lower orders in our large international projects business due to a significant reduction in capital expenditures for exploration and production by the major oil companies resulting in fewer projects.

QUARTERLY ENERGY SEGMENT INFORMATION

(in thousands, except percentages)

(unaudited)

	2016					2017				
	1ST QTR	**2ND QTR**	**3RD QTR**	**4TH QTR**	**TOTAL**	**1ST QTR**	**2ND QTR**	**3RD QTR**	**4TH QTR**	**TOTAL**
Orders	67,221	54,506	51,508	81,511	254,746	100,012	73,140	84,857	118,030	376,039
Net Revenues	79,509	76,418	65,073	84,939	305,939	76,210	78,276	88,570	96,561	339,617
Operating Income	8,756	8,794	6,392	8,716	32,658	6,407	8,170	6,936	8,618	30,131
Operating Margin	11.0%	11.5%	9.8%	10.3%	10.7%	8.4%	10.4%	7.8%	8.9%	8.9%
Backlog (1)	118,508	93,894	80,613	119,551	119,551	142,752	140,102	138,811	182,999	182,999

(1) at end of period.

Aerospace & Defense Segment

(in thousands)	**2017**	**2016**	**Change**
Net Revenues	$ 182,983	$ 166,127	$ 16,856
Segment Operating Income	23,375	15,368	8,007
Segment Operating Margin	12.8%	9.3%	

Aerospace & Defense segment net revenues increased by $16.9 million, or 10 %, in 2017 compared to 2016. The increase was primarily driven by increases in our U.S. Fluid Control businesses (+5%), our U.K. defense business (+3%) and our U.S. defense business (+2%). The increase in net revenues is due to higher production rates on a number of large platforms, and improved pricing on certain programs.

Segment operating income increased $8.0 million, or 52%, to $23.4 million for 2017 compared to $15.4 million for 2016. The increase in operating income was primarily as a result of improved pricing and operational efficiencies within our fluid and actuation businesses (+54%), our U.K. defense business (+20%), and our French business (6%), partially offset by declines due to operational inefficiencies in our Aerospace & Defense headquarters (-28%).

Aerospace & Defense segment orders increased $28.8 million, or 17%, to $193.6 million for 2017 compared to $164.7 million in 2016, primarily due to our aerospace and defense businesses.

QUARTERLY A&D SEGMENT INFORMATION

(in thousands, except percentages)

(unaudited)

	2016					2017				
	1ST QTR	**2ND QTR**	**3RD QTR**	**4TH QTR**	**TOTAL**	**1ST QTR**	**2ND QTR**	**3RD QTR**	**4TH QTR**	**TOTAL**
Orders	41,144	51,518	36,402	35,663	164,727	56,416	39,902	45,939	51,278	193,535
Net Revenues	42,078	40,033	38,863	45,153	166,127	41,601	43,304	41,117	56,961	182,983
Operating Income	3,703	3,242	3,499	4,925	15,369	3,784	4,374	4,333	10,884	23,375
Operating Margin	8.8%	8.1%	9.0%	10.9%	9.3%	9.1%	10.1%	10.5%	19.1%	12.8%
Backlog (1)	96,559	106,207	103,259	90,477	90,477	106,178	105,741	108,157	163,694	163,694

(1) At end of period.

Industrial Segment

(in thousands)	2017	2016	Change
Net Revenues	$ 139,110	$ 118,193	$ 20,917
Segment Operating Income	19,932	20,056	(124)
Segment Operating Margin	14.3%	17.0%	

Industrial segment net revenues increased by $20.9 million, or 18 %, in 2017 compared to 2016. The increase was primarily driven by increases in the Pumps Businesses that we acquired in the FH acquisition (+22%), partially offset by decreases in our Valves North America business (-5%).

Segment operating income remained stagnant, with a decrease of $0.1 million, or 1%, to $19.9 million for 2017 compared to $20.1 million for 2016. The decrease in operating income was primarily driven by our Valves EMEA business (-31%), partially offset by increases in the Pumps Businesses (+19%), and our Valves North America business (+12%).

Industrial segment orders increased $25.7 million, or 24%, to $132.0 million for 2017 compared to $106.3 million in 2016. The change in segment orders is primarily attributed to the Pumps Businesses acquired in the FH acquisition during 2017.

QUARTERLY INDUSTRIAL SEGMENT INFORMATION

(in thousands, except percentages)

(unaudited)

	2016					2017				
	1ST QTR	2ND QTR	3RD QTR	4TH QTR	TOTAL	1ST QTR	2ND QTR	3RD QTR	4TH QTR	TOTAL
Orders	28,418	29,293	23,408	25,143	106,262	27,654	29,889	27,296	47,154	131,993
Net Revenues	29,211	29,941	30,897	28,144	118,193	27,397	29,651	30,006	52,056	139,110
Operating Income	5,289	5,321	4,871	4,574	20,055	4,384	4,901	5,675	4,972	19,932
Operating Margin	18.1%	17.8%	15.8%	16.3%	17.0%	16.0%	16.5%	18.9%	9.6%	14.3%
Backlog (1)	44,996	43,948	36,384	32,366	32,366	32,878	33,751	31,286	155,786	155,786

(1) at end of period.

Corporate Expenses

Corporate expenses decreased $3.9 million to $21.7 million for 2017. This decrease was primarily driven by lower variable compensation costs and reduced professional fees.

Special and Restructuring charges, net and other charges

During 2017, the Company recorded a total of $14.1 million of Special and restructuring charges. In our statement of operations, these charges are recorded in Special and restructuring charges, net. These costs are primarily related to our simplification and restructuring efforts. These restructuring charges and other special charges are described in further detail in Note 5, "Special and Restructuring charges, net", of the consolidated financial statements included in this Annual Report.

Interest Expense, Net

Interest expense increased $7.5 million to $10.8 million for 2017. This change in interest expense was primarily due to higher outstanding debt balances during the period as a result of the FH acquisition.

Other (Income) Expense, Net

Other expense, net, was $3.7 million for 2017 compared to other income, net of $2.1 million in 2016. The difference of $5.8 million was primarily due to the impact of foreign currency fluctuations.

Comprehensive (Loss) Income

Comprehensive income increased $51.5 million, from a comprehensive loss of $0.2 million for the year-ended December 31, 2016 to comprehensive income of $51.3 million for the year-ended December 31, 2017, primarily driven by an increase of $47.6 million in favorable foreign currency balance sheet remeasurement. These favorable foreign currency balance sheet remeasurement were driven by the Euro ($40.6 million).

(Benefit from) Provision for Income Taxes

On December 22, 2017, the U.S. government enacted the Tax Cuts and Jobs Act (the “Tax Act”). A majority of the provisions in the Tax Act are effective January 1, 2018.

In response to the Tax Act, the SEC staff issued guidance on accounting for the tax effects of the Tax Act. The guidance provides a one-year measurement period for companies to complete the accounting. We reflected the income tax effects of those aspects of the Tax Act for which the accounting is complete. To the extent our accounting for certain income tax effects of the Tax Act is incomplete but we are able to determine a reasonable estimate, we recorded a provisional estimate in the financial statements. For items that we could not determine a provisional estimate to be included in the financial statements, we continued to apply the provisions of the tax laws that were in effect immediately before the enactment of the Tax Act.

In connection with our initial analysis of the impact of the Tax Act, we recorded a provisional estimate of $0.5 million net tax benefit for the period ended December 31, 2017. This benefit consists of provisional estimates of zero net expense for the Transition Tax liability, and $0.5 million benefit from the remeasurement of our deferred tax assets/liabilities due to the corporate rate reduction. On a provisional basis, the Company did not expect to owe the one-time Transition Tax liability, based on foreign tax pools that are in excess of U.S. tax rates. We were in process of determining the impact of the Tax Act on our U.S. foreign tax credit carryforwards (deferred tax asset), and were unable to record a provisional estimate at December 31, 2017.

We have not completed our accounting for the income tax effects of certain elements of the Tax Act. The Tax Act creates a new requirement that certain income, such as Global Intangible Low-Taxed Income (“GILTI”), earned by a controlled foreign corporation must be included in the gross income of its U.S. shareholder. Because of the complexity of the new GILTI and BEAT tax rules, we are continuing to evaluate the impact of these provisions and whether taxes due on future U.S. inclusions related to GILTI or BEAT should be recorded as a current period expense when incurred, or factored into the measurement of deferred taxes. As a result, we have not included an estimate of the tax expense or benefit related to these items for the period ended December 31, 2017.

The effective tax rate was -93% for 2017 compared to -4% for 2016. The primary drivers for the lower tax rate in 2017 included non-taxable income from reduction of an acquisition-related earnout (-69%), the establishment of a valuation allowance in 2016 for certain state net operating loss carryforwards (-19%), change in tax reserves (-15%), reduced foreign losses in 2017 with no tax benefit (-12%), provisional revaluation of certain U.S. deferred tax assets and liabilities under the Tax Act (-8%), as described in more detail in Note 8, "Income Taxes", of the consolidated financial statements included in this Annual Report, and mix of lower taxed foreign earnings to U.S. earnings (-5%). This was partially offset by the tax benefit associated with the repatriation of foreign earnings which we completed in 2016 (+27%), state income taxes (+5%), and nondeductible transaction costs (+5%).

Liquidity and Capital Resources

Our liquidity needs arise primarily from capital investment in machinery, equipment and the improvement of facilities, funding working capital requirements to support business growth initiatives, acquisitions, and debt service costs. We have historically generated cash from operations and remain in a strong financial position, with resources available for reinvestment in existing businesses, strategic acquisitions and managing our capital structure on a short and long-term basis.

We completed the acquisition of FH on December 11, 2017. The total consideration paid to acquire FH consisted of $542 million in cash, 3,283,424 unregistered shares of our common stock and the assumption of net pension and post-retirement liabilities of FH. We financed the cash consideration through a combination of committed debt financing and cash on hand. Refer to Note 4, “Business Acquisitions,” of the consolidated financial statements included in this Annual Report, for details. As a result of the transaction we incurred significant debt, including secured indebtedness, as described below.

The following table summarizes our cash flow activities for the year-ended indicated (in thousands):

	2018	2017	2016
Cash flow provided by (used in):			
Operating activities	$ 53,994	$ 9,637	$ 59,399
Investing activities	$ (16,877)	$ (502,124)	$ (210,481)
Financing activities	(74,073)	535,568	158,764
Effect of exchange rate changes on cash and cash equivalents	(5,812)	8,996	(3,944)
Increase (decrease) in cash and cash equivalents (1)	$ (42,768)	$ 52,077	$ 3,738

(1) Pursuant to the terms of the FH purchase agreement, $64.5 million of the cash balance as of December 31, 2017 was due back to Colfax Corporation (“Colfax”), which has been reflected as a current liability within the December 31, 2017, balance sheet. Amounts were fully settled during 2018.

Cash Flow Activities for the Year Ended December 31, 2018 Compared to the Year Ended December 31, 2017

During the year ended December 31, 2018, we generated $54.0 million in cash flow from operating activities compared to $9.6 million during the year ended December 31, 2017. The $44.4 million increase in operating cash was primarily driven by $26.9 million of working capital changes primarily due to improved management of inventory and cash collection on outstanding trade receivables and higher cash related earnings of $17.5 million.

During the year ended December 31, 2018, we used $16.9 million for investing activities as compared to $502.1 million during the year ended December 31, 2017. The $485.2 million year over year decrease in cash used was primarily driven by our purchase of the FH business in December of 2017.

During the year ended December 31, 2018, we used $74.1 million from financing activities as compared to cash generated of $535.6 million during the year ended December 31, 2017. The $609.6 million year over year decrease in cash generated from financing activities was primarily related to our purchase of the FH business. On December 11, 2017, we borrowed $785.0 million under a new term loan and entered into a new $150.0 million revolving line of credit on which we drew $40.0 million. Proceeds from these borrowings were used to fund the acquisition of FH and repay $97.5 million and $176.0 million of outstanding debt under our previous term loan and revolving line of credit, respectively.

As of December 31, 2018, total debt (including current portion) was $786.0 million compared to $795.2 million at December 31, 2017. Total debt is net of unamortized term loan debt issuance costs of $21.0 million and $23.7 million at December 31, 2018 and 2017, respectively. Total debt as a percentage of total shareholders’ equity was 149% as of December 31, 2018 compared to 132% as of December 31, 2017. As of December 31, 2018, we had available capacity to borrow an additional $84.5 million under our revolving credit facility.

As a result of a significant portion of our cash balances being denominated in Euros, the strengthening of the U.S. Dollar resulted in a $5.8 million increase in reported cash balances.

We entered into a secured Credit Agreement, dated as of December 11, 2017 (" Credit Agreement"), which provides for a $150.0 million revolving line of credit with a five year maturity and a $785.0 million term loan with a seven year maturity which was funded at closing of the FH acquisition in full. We entered into the Credit Agreement to fund acquisitions, such as the acquisition of FH, to support our operational growth initiatives and working capital needs, and for general corporate purposes. As of December 31, 2018, we had borrowings of $786.0 million outstanding under our credit facility and $70.7 million outstanding under letters of credit.

The Credit Agreement contains covenants that require, among other items, maintenance of certain financial ratios and also limits our ability to: enter into secured and unsecured borrowing arrangements; issue dividends to shareholders; acquire and dispose of businesses; invest in capital equipment; transfer assets among domestic and international entities; participate in certain higher yielding long-term investment vehicles; and issue additional shares of our stock which limits our ability to borrow under the credit facility. The primary financial covenant is first lien net leverage, a ratio of total secured debt (less cash and cash equivalents) to total earnings before interest expense, taxes, depreciation, and amortization based on the 12 months ended at the testing period. We were in compliance with all financial covenants related to our existing debt obligations at December 31, 2018 and we believe it is likely that we will continue to meet such covenants for at least the next twelve months from date of issuance of the financial statements.

The ratio of current assets to current liabilities was 2.3:1 at December 31, 2018 compared to 2.0:1 at December 31, 2017. As of December 31, 2018, cash and cash equivalents totaled $68.5 million and was substantially all held in foreign bank accounts. This compares to $110.4 million of cash and cash equivalents as of December 31, 2017, of which $65.3 million was payable to Colfax Corporation with balances all substantially held in foreign bank accounts. The cash and cash equivalents located at our foreign subsidiaries may not be repatriated to the United States or other jurisdictions without significant tax implications. On a provisional basis, the Company does not expect to owe the one-time Transition Tax liability, based on foreign tax pools that are in excess of U.S. tax rates. We believe that our U.S. based subsidiaries, in the aggregate, will generate positive operating cash flows and in addition we may utilize our Credit Agreement for U.S. based cash needs.

In 2019, we expect to generate positive cash flow from operating activities sufficient to support our capital expenditures and service our debt. Based on our expected cash flows from operations and contractually available borrowings under our credit facility, we expect to have sufficient liquidity to fund working capital needs and future growth over at least the next twelve months from date of filing the 2018 financial statements. In February 2018, we announced the suspension of our nominal dividend, as part of our overall capital deployment strategy.

Cash Flow Activities for the Year Ended December 31, 2017 Compared to the Year Ended December 31, 2016

During the year ended December 31, 2017, we generated $9.6 million in cash flow from operating activities compared to $59.4 million during the year ended December 31, 2016. The $49.8 million decrease in operating cash was primarily driven by working capital changes including increased inventory purchases of $55.6 million primarily related to the demand ramp-up in our North American distributed valves business, partially offset by operating cash increases of $8.4 million due to the timing of vendor payments.

During the year ended December 31, 2017, we used $502.1 million for investing activities as compared to $210.5 million during the year ended December 31, 2016. The $291.6 million year over year increase in cash used was primarily driven by our purchase of the FH business in December 2017.

During the year ended December 31, 2017, we generated $535.6 million from financing activities as compared to cash generated of $158.8 million during the year ended December 31, 2016. The $376.8 million year over year increase in cash generated from financing activities was primarily related to our purchase of the FH business in December 2017. On December 11, 2017, we borrowed $785.0 million under a new term loan and entered into a new $150.0 million revolving line of credit on which we drew $40.0 million. Proceeds from these borrowings were used to fund the acquisition of FH and repay $97.5 million and $176.0 million of outstanding debt under our previous term loan and revolving line of credit, respectively.

As of December 31, 2017, total debt (including current portion) was $795.2 million compared to $251.2 million at December 31, 2016 due to borrowings from the Credit Agreement related to the acquisition of Fluid Handling. Total debt as a percentage of total shareholders’ equity was 131% as of December 31, 2017 compared to 62% as of December 31, 2016. As of December 31, 2017, we had available capacity to borrow an additional $86.1 million under our revolving credit facility.

As a result of a significant portion of our cash balances being denominated in Euros and Canadian Dollars, the strengthening of the U.S. Dollar resulted in a $9.0 million increase in reported cash balances.

As of December 31, 2017, we had borrowings of $795.2 million outstanding under our credit facility and $77.7 million outstanding under letters of credit. We were in compliance with all financial covenants related to our existing debt obligations at December 31, 2017.

The ratio of current assets to current liabilities was 2.0:1 at December 31, 2017 compared to 3.1:1 at December 31, 2016. As of December 31, 2017, cash and cash equivalents totaled $110.4 million, of which $65.3 million was payable back to Colfax Corporation. These cash and cash equivalent balances were substantially all held in foreign bank accounts. This compares to $58.3 million of cash and cash equivalents as of December 31, 2016 substantially all of which was also held in foreign bank accounts.

Significant Contractual Obligations and Commercial Commitments

The following table summarizes our significant contractual obligations and commercial commitments at December 31, 2018 that affect our liquidity:

	Payments due by Period				
	Total (1)	Less Than 1 Year	1 – 3 Years	3 – 5 Years	More than 5 years
Contractual Cash Obligations:	(in thousands)				
Long-term debt, less current portion	$ 807,050	$ 7,850	$ —	$ 29,900	$ 769,300
Interest payments on debt	227,434	49,928	85,983	66,082	25,441
Operating leases	32,274	9,481	10,875	5,886	6,032
Total contractual cash obligations	$ 1,066,758	$ 67,259	$ 96,858	$ 101,868	$ 800,773
Commercial Commitments:					
U.S. standby letters of credit	$ 35,621	$ 26,064	$ 8,612	$ 945	$ —
International standby letters of credit	35,047	22,676	8,541	2,320	1,510
Commercial contract commitments	127,566	119,179	6,230	1,907	250
Total commercial commitments	$ 198,234	$ 167,919	$ 23,383	$ 5,172	$ 1,760

In the table above total operating leases exclude $3.5 million related to the Reliability Services Business which the company divested in January 2019. Refer to Note 19, Subsequent Event, for further details of the divestiture.

In accordance with the authoritative guidance for accounting for uncertainty in income taxes, as of December 31, 2018, we had unrecognized tax benefits of $0.6 million, including $0.0 million of accrued interest. The Company does not expect the unrecognized tax benefits to change over the next 12 months.

Our commercial contract commitments primarily relate to open purchase orders of $118.3 million, $2.7 million of which extend to 2019 and beyond.

In 2018, 2017, and 2016, we contributed $0.0 million, $0.8 million, and $1.0 million to our qualified defined benefit U.S. pension plan, respectively. In addition, we made $0.4 million in payments to our nonqualified supplemental plan for 2018, 2017 and 2016 and we made $0.2 million in payments to our non-U.S. plans in 2017. In connection with a lump sum cash payout option to terminated and vested pension plan participants, during the fourth quarter of 2016 we incurred a $4.5 million pension settlement charge included in net periodic benefit cost which has been recorded within the Special and restructuring charges, net line item. In addition, we made $1.8 million, $2.0 million, $1.5 million in payments to our 401(k) savings plan for 2018, 2017 and 2016, respectively.

In 2019, we expect to make defined benefit plan contributions based on the minimum required funding in accordance with statutory requirements. The estimates for plan funding for future periods may change as a result of the uncertainties concerning the return on plan assets, the number of plan participants, and other changes in actuarial assumptions. We anticipate fulfilling these commitments through our generation of cash flow from operations.

Off-Balance Sheet Arrangements

Through December 31, 2018, we have not entered into any off-balance sheet arrangements or material transactions with unconsolidated entities or other persons that have, or are reasonably likely to have, a current or future effect on our financial condition, changes in financial condition, revenues or expenses, results of operations, liquidity, capital expenditures, or capital resources that is material to investors.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk

Market Risk

Business performance in the Oil & Gas refining sector is largely tied to refining margins, which are also driven by the market price of crude oil and gasoline demand. Seasonal factors such as hurricanes and peak gasoline demand in the summer months may also drive high crack spread margins. During periods when high crack spread margins exist, refineries prefer to operate continuously at full capacity. Refiners may decide to delay planned maintenance (commonly called “unit turnarounds”) during these periods to maximize their returns. Refining crack spread margins moderated in 2018, which resulted in unit turnarounds. As a result, the timing of major capital projects in our severe service refinery valves business were impacted. While planned maintenance and unit turnarounds are necessary for safe and efficient operation of the refineries, project timing driven by these factors may continue to create fluctuations in our performance.

The commercial marine market experienced a historically unprecedented decade-long increase in new ship builds beginning in 2004 to meet the increase in global trade demand. This created an over-supply of capacity that resulted in a slowdown of new ship contracts between 2015 to 2018. The pumps that we supply to the commercial marine market are first supplied during commissioning of a new vessel, with aftermarket business over the lifetime of that vessel. While we have experienced increased aftermarket business during the past decade as the global shipping fleet has expanded, the downturn in new ship builds starting in 2015 has negatively impacted our new equipment commercial marine business. Any extended downturn in the commercial marine market could have a material adverse effect on our business.

Foreign Currency Exchange Risk

The Company is exposed to certain risks relating to its ongoing business operations including foreign currency exchange rate risk and interest rate risk. For additional information regarding our foreign currency exchange risk refer to Note 16, "Fair Value", of the consolidated financial statements included in this Annual Report.

We performed a sensitivity analysis as of December 31, 2018 based on scenarios in which market spot rates are hypothetically changed in order to produce a potential net exposure loss. The hypothetical change was based on a 10 percent strengthening or weakening in the U.S. dollar, whereby all other variables are held constant. The sensitivity analysis indicates that a hypothetical 10 percent adverse movement in foreign currency exchange rates would result in a foreign exchange gain of approximately $0.5 million at December 31, 2018.

Interest Rate Risk

Loans under our credit facility bear interest at variable rates which reset every 30 to 180 days depending on the rate and period selected by the Company. These loans are subject to interest rate risk as interest rates will be adjusted at each rollover date to the extent such amounts are not repaid. As of December 31, 2018, the annual rates on the revolving loans were 5.9%. If there was a hypothetical 100 basis point change in interest rates, the annual net impact to earnings and cash flows would be $8.1 million. This hypothetical change in cash flows and earnings has been calculated based on the borrowings outstanding at December 31, 2018 and a 100 basis point per annum change in interest rate applied over a one-year period. We are evaluating entering into a potential fixed rate interest swap arrangement which would result in an increase in interest costs. The Company entered into a hedging agreement to mitigate the inherent rate risk associated with our outstanding debt. Refer to Note 17, "Fair Value", of the consolidated financial statements included in this Annual Report.

Item 8. Financial Statements and Supplementary Data

Our consolidated financial statements and the related notes thereto are listed in Item 15(a)(1) on the Index to Consolidated Financial Statements.

Item 9. Changes In and Disagreements With Accountants on Accounting and Financial Disclosure

None.

Item 9A. Controls and Procedures

Evaluation of Disclosure Controls and Procedures

Our management, with the participation of our Chief Executive Officer ("CEO") and Chief Financial Officer ("CFO") (our principal executive officer and principal financial officer, respectively), has evaluated the effectiveness of our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) of the Securities Exchange Act of 1934) as of the end of the period covered by this Annual Report on Form 10-K. Management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving their objectives and management necessarily applies its judgment in evaluating the cost-benefit relationship of possible controls and procedures. Based on that evaluation, our CEO and CFO concluded that, as of December 31, 2018, the Company’s disclosure controls and procedures were effective to provide reasonable assurance that information we disclose in reports that we file or submit under the Securities Exchange Act of 1934 is accumulated and communicated to management, including our principal executive and financial officers, to allow timely decisions regarding disclosure and that such information is recorded, processed, summarized and reported, within the time periods specified in the Securities and Exchange Commission’s rules and forms.

Management’s Report on Internal Control over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting, as defined in the Exchange Act Rules 13a-15(f) and 15d-15(f). Under the supervision and with the participation of our management, including our principal executive officer and principal financial officer, we conducted an evaluation of the effectiveness of our internal control over financial reporting based on the framework titled "Internal Control - Integrated Framework" issued by the Committee of Sponsoring Organizations of the Treadway Commission in 2013. Based on our evaluation under this framework, our management concluded that our internal control over financial reporting was effective as of December 31, 2018.

Our internal control over financial reporting as of December 31, 2018 has been audited by PricewaterhouseCoopers LLP, an independent registered public accounting firm, as stated in their report which is included herein.

Changes in Internal Control over Financial Reporting

There were no changes in our internal control over financial reporting that occurred during the quarter ended December 31, 2018 that could materially affect, or are reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. Other Information

None.

Item 10. Directors, Executive Officers and Corporate Governance

The information required under this item is incorporated by reference to the Company’s definitive proxy statement pursuant to Regulation 14A, which proxy statement will be filed with the Securities and Exchange Commission no later than 120 days after the close of the Company’s fiscal year ended December 31, 2018.

Code of Ethics

The Company has implemented and regularly monitors compliance with a comprehensive Code of Conduct & Business Ethics (the "Code of Conduct"), which applies uniformly to all directors, executive officers, and employees. Among other things, the Code of Conduct addresses conflicts of interest, confidentially, fair dealing, protection and proper use of Company assets, compliance with applicable law (including insider trading and anti-bribery laws), and reporting of illegal or unethical behavior. The Code of Conduct is available on the Company's website at www.CIRCOR.com under the "Investors" sub link and hardcopy will be provided by the Company to any stockholder who requests it by writing to the Company's Secretary at the Company's headquarters. In addition, we intend to post on our website all disclosures that are required by SEC regulations or NYSE listing standards with respect to amendments to, or waivers from, any provision of the Code of Conduct.

Item 11. Executive Compensation

The information required under this item is incorporated by reference to the Company’s definitive proxy statement pursuant to Regulation 14A, which proxy statement will be filed with the Securities and Exchange Commission no later than 120 days after the close of the Company’s fiscal year ended December 31, 2018.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters

Except for the information required by Section 201(d) of Regulation S-K which is set forth below, the information required under this item is incorporated by reference to the Company’s definitive proxy statement pursuant to Regulation 14A, which proxy statement will be filed with the Securities and Exchange Commission no later than 120 days after the close of the Company’s fiscal year ended December 31, 2018.

EQUITY COMPENSATION PLAN INFORMATION

Plan category	Number of securities to be issued upon exercise of outstanding options, warrants and rights		Weighted-average exercise price of outstanding options, warrants and rights		Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in column (a))
	(a)		(b)		(c)
Equity compensation plans approved by security holders	891,454	(1)	$ 41.95	(3)	493,811
Equity compensation plans not approved by security holders	150,000	(2)	8.32	(3)	N/A
Total	1,041,454		$ 35.15		493,811

(1) Reflects 40,249 stock options and 1,050 restricted stock units granted under the Company’s Amended and Restated 1999 Stock Option and Incentive Plan and 552,409 stock options and 297,746 restricted stock units granted under the Company's 2014 Stock Option and Incentive Plan.

(2) Reflects stock options issued as an inducement equity award to our President and CEO on April 9, 2013. This award was granted pursuant to the inducement award exemption under Section 303A.08 of the NYSE Listed Company Manual. Details of this grant, including vesting terms, are set forth in Note 11, "Share-Based Compensation", of the consolidated financial statements included in this Annual Report.

(3) The weighted-average exercise price does not take into account the shares issuable upon vesting of outstanding restricted stock units, which have no exercise price.

Item 13. Certain Relationships and Related Transactions, and Director Independence

The information required under this item is incorporated by reference to the Company’s definitive proxy statement pursuant to Regulation 14A, which proxy statement will be filed with the Securities and Exchange Commission no later than 120 days after the close of the Company’s fiscal year ended December 31, 2018.

Item 14. Principal Accounting Fees and Services

The information required under this item is incorporated by reference to the Company’s definitive proxy statement pursuant to Regulation 14A, which proxy statement will be filed with the Securities and Exchange Commission no later than 120 days after the close of the Company’s fiscal year ended December 31, 2018.

Part IV

Item 15. Exhibits, Financial Statement Schedules

(a)(1) Financial Statements

Report of PricewaterhouseCoopers LLP dated March 1, 2019 on the Company’s financial statements filed as a part hereof for the fiscal year ended December 31, 2018 and on the Company’s internal control over financial reporting as of December 31, 2018 is included in this Annual Report on Form 10-K. The independent registered public accounting firm’s consent with respect to this report appears in Exhibit 23.1 of this Annual Report on Form 10-K.

(a)(2) Financial Statement Schedules

Other than our Allowance for Doubtful Accounts Rollforward included in Schedule II Valuation and Qualifying Accounts, all other schedules are omitted because they are not applicable or not required, or because the required information is included either in the consolidated financial statements or in the notes thereto.

(a)(3) Exhibits

Unless otherwise indicated, references to exhibits in the table below being incorporated by reference are made in each case with respect to filings of the Company, SEC File No. 001-14962.

Exhibit No.	Description and Location
2.1*	Share Purchase Agreement, dated April 15, 2015, between the Company and affiliates and Schroedahl-ARAPP Spezialarmaturen GmbH & Co. KG and affiliates, incorporated herein by reference to Exhibit 2.1 to the Company’s Form 8-K filed with the SEC on April 15, 2015
2.2*	Agreement and Plan of Merger dated October 12, 2016 by and among the Company, Downstream Holding, LLC, Downstream Acquisition LLC, and Sun Downstream, LP., incorporated herein by reference to Exhibit 2.1 to the Company’s Form 8-K filed with the SEC on October 14, 2016

2.3*	Purchase Agreement, dated as of September 24, 2017, by and between Colfax Corporation and the Company, incorporated herein by reference to Exhibit 2.1 to the Company's Form 8-K filed with the SEC on September 25, 2017
3	Articles of Incorporation and By-Laws:
3.1	Amended and Restated Certificate of Incorporation of the Company, incorporated herein by reference to Exhibit 3.1 to the Company’s Form 10-Q, filed with the SEC on October 29, 2009
3.2	Amended and Restated By-Laws, as amended, of the Company, incorporated herein by reference to Exhibit 3.1 to the Company’s Form 10-Q, filed with the SEC on October 31, 2013
10.1	Material Contracts:
10.2	Credit Agreement, dated as of December 11, 2017, by and among the Company, as borrower, certain subsidiaries of the Company, as guarantors, the lenders from time to time party thereto, Deutsche Bank AG New York Branch, as term loan administrative agent and collateral agent, SunTrust Bank, as revolver administrative agent, swing line lender and a letter of credit issuer, Deutsche Bank Securities Inc. and SunTrust Robinson Humphrey, Inc., as joint-lead arrangers and joint-bookrunners, and Citizens Bank, N.A. and HSBC Securities (USA) Inc. as co-managers incorporated herein by reference to Exhibit 10.2 to the Company's Form 8-K, filed with the SEC on December 12, 2017
10.3§	CIRCOR International, Inc. Amended and Restated 1999 Stock Option and Incentive Plan (as amended, the “1999 Stock Option and Incentive Plan ”), incorporated herein by reference to Exhibit 4.4 to the Company’s Form S-8, File No. 333-125237, filed with the SEC on May 25, 2005
10.4§	First Amendment to the 1999 Stock Option and Incentive Plan, dated as of December 1, 2005, incorporated herein by reference to Exhibit 10.1 to the Company’s Form 8-K, filed with the SEC on December 7, 2005
10.5§	Second Amendment to the 1999 Stock Option and Incentive Plan, dated as of February 12, 2014, incorporated herein by reference to Exhibit 10.6 to the Company's Form 10-K, filed with the SEC on March, 1 2018
10.6§	Form of Non-Qualified Stock Option Agreement for Employees (Three Year Cliff Vesting) under the 1999 Stock Option and Incentive Plan , incorporated herein by reference to Exhibit 10.1 to the Company’s Form 10-Q, filed with the SEC on May 10, 2010
10.7§	CIRCOR International, Inc. Amended and Restated Management Stock Purchase Plan dated as of January 1, 2017, incorporated hereinby reference to Exhibit 10.8 to the Company's Form 10-K, filed with the SEC on March1, 2018
10.8§	Form of Indemnification Agreement entered into by the Company and its directors and certain of its officers incorporated herein by reference to Exhibit 10.12 to the Company’s Form 10-K, filed with the SEC on March 12, 2003
10.9§	Executive Change of Control Agreement between CIRCOR, Inc. and Arjun Sharma, dated September 1, 2009, incorporated herein by reference to Exhibit 10.2 to the Company’s Form 10-Q, filed with the SEC on October 29, 2009
10.10§	Amendment to Executive Change of Control Agreement between CIRCOR, Inc. and Arjun Sharma, dated November 4, 2010, incorporated by reference to Exhibit 10.8 to the Company’s Form 8-K, filed with the SEC on November 5, 2010
10.11§	Restricted Stock Unit Agreement, dated as of April 9, 2013, between the Company and Scott A Buckhout incorporated herein by reference to Exhibit 10.1 to the Company’s Form 8-K, filed with the SEC on April 15, 2013
10.12§	Performance-Based Restricted Stock Unit Agreement, dated as of April 9, 2013, between the Company and Scott A Buckhout, incorporated herein by reference to Exhibit 10.2 to the Company’s Form 8-K, filed with the SEC on April 15, 2013
10.13§	Stock Option Inducement Award Agreement, dated as of April 9, 2013, between the Company and Scott A Buckhout, incorporated herein by reference to Exhibit 10.3 to the Company’s Form 8-K, filed with the SEC on April 15, 2013
10.14§	Severance Agreement, dated as of April 9, 2013, between the Company and Scott A Buckhout, incorporated herein by reference to Exhibit 10.4 to the Company’s Form 8-K, filed with the SEC on April 15, 2013
10.15§	Amended Performance-Based Restricted Stock Unit Agreement, dated as of April 9, 2013, between the Company and Scott A. Buckhout, incorporated by reference to Exhibit 10.1 to the Company’s Form 10-Q, filed with the SEC on April 28, 2015
10.16§	Executive Change of Control Agreement, dated as of April 9, 2013, between the Company and Scott A Buckhout, incorporated herein by reference to Exhibit 10.5 to the Company’s Form 8-K, filed with the SEC on April 15, 2013
10.17§	Performance-Based Stock Option Award Agreement, dated as of March 5, 2014, between the Company and Scott A. Buckhout, incorporated herein by reference to Exhibit 10.1 to the Company’s Form 8-K, filed with the SEC on March 11, 2014

10.18§	CIRCOR International, Inc. 2014 Stock Option and Incentive Plan 201 (the "2014 Stock Option and Incentive Plan") incorporated herein by reference to Exhibit A to the Company's Definitive Proxy Statement, filed with the SEC on March 21
10.19§	First Amendment to 2014 Stock Option and Incentive Plan, dated February 12, 2014, incorporated herein by reference to Exhibit 10.36 to the Company's Form 10-K, filed with the SEC on February 18, 2015
10.20§	Executive Change of Control Agreement, dated as of March 5, 2015, between the Company and Erik Wiik, incorporated by reference to Exhibit 10.2 to the Company's Form 10-Q, filed with the SEC on April 28, 2015
10.21§	Executive Change of Control Agreement, dated as of June 10, 2015, between the Company and Andrew Farnsworth, incorporated herein by reference to Exhibit 10.1 to the Company's Form 10-Q filed with the SEC on July 29, 2015
10.22§	Executive Change of Control Agreement, dated as of January 8, 2016, between the Company and David Mullen, incorporated herein by reference to Exhibit 10.29 the Company's Form 10-K filed with the SEC on February 23, 2016
10.23§	Inducement Restricted Stock Unit Agreement, dated as of December 2, 2013, between the Company and Rajeev Bhalla, incorporated herein by reference to Exhibit 10.35 to the Company's Form 10-K, filed with the SEC on February 27, 2014
10.24§	Stock Option Inducement Award Agreement, dated as of December 2, 2013, between the Company and Rajeev Bhalla, incorporated herein by reference to Exhibit 10.36 to the Company's Form 10-K, filed with the SEC on February 27, 2014
10.25§	Severance Agreement, dated as of December 2, 2013, between the Company and Rajeev Bhalla, incorporated herein by reference to Exhibit 10.37 to the Company's Form 10-K, filed with the SEC on February 27, 2014
10.26§	Executive Change of Control Agreement, dated as of December 2, 2013, between the Company and Rajeev Bhalla, incorporated herein by reference to Exhibit 10.38 to the Company's Form 10-K, filed with the SEC on February 27, 2014
10.27§	Form of Performance-Based Restricted Stock Unit Agreement For Employees and Directors under the 1999 Stock Option and Incentive Plan, incorporated herein by reference to Exhibit 10.29 of the Company's Form 10-K, filed with the SEC on February 21, 2017
10.28§	Form of Restricted Stock Unit Agreement For Employees and Directors under the 1999 Stock Option and Incentive Plan, incorporate herein by reference to Exhibit 10.30 of the Company's Form 10-K, filed with the SEC on February 21, 2017
10.29§	Form of Restricted Stock Unit Agreement For Directors under the 2014 Stock Option and Incentive Plan, incorporated herein by reference to Exhibit 10.31 of the Company's Form 10-K, filed with the SEC on February 21, 2017
10.30§	Form of Performance-Based Restricted Stock Unit Agreement For Employees and Directors under the 2014 Stock Option and Incentive Plan, incorporated herein by reference to Exhibit 10.32 of the Company's Form 10-K, filed with the SEC on February 21, 2017
10.31§	Form of Management Stock Purchase Plan Restricted Stock Unit Agreement For Employees and Directors under the 2014 Stock Option and Incentive Plan, incorporated herein by reference to Exhibit 10.33 of the Company's Form 10-K, filed with the SEC on February 21, 2017
10.32§	Form of Non-Qualified Stock Option Agreement for Employees under the 2014 Stock Option and Incentive Plan, incorporated herein by reference to Exhibit 10.34 of the Company's Form 10-K, filed with the SEC on February 21, 2017
10.33§	Form of Restricted Stock Unit Agreement For Employees under the 2014 Stock Option and Incentive Plan, incorporated herein by reference to Exhibit 10.35 of the Company's Form 10-K, filed with the SEC on February 21, 2017
10.34§	Executive Change of Control Agreement, dated as of 2016, between the Company and Sumit Mehrotra, incorporated herein by reference to Exhibit 10.37 of the Company's Form 10-K, filed with the SEC on February 21, 2017
10.35§	Severance Agreement, dated as of December 9, 2016, between the Company and Sumit Mehrotra, incorporated herein by reference to Exhibit 10.39 of the Company's Form 10-K, filed with the SEC on February 21, 2017
10.36§	Stockholders Agreement, dated December 11, 2017, between the Company and Colfax Corporation, incorporated herein by reference to Exhibit 10.1 to the Company's Form 8-K, filed with the SEC on December 12, 2017
10.37§	Severance Agreement, dated as of April 21, 2017, between the Company and Arjun Sharma, incorporated herein by reference to Exhibit 10.1 to the Company's Form 10-Q, filed with the SEC on April 28, 2017
10.38§	Severance Agreement, dated as of April 25, 2017, between the Company and Erik Wiik, incorporated herein by reference to Exhibit 10.2 to the Company's Form 10-Q, filed with the SEC on April 28, 2017
10.39§**	Executive Change of Control Agreement between CIRCOR, International Inc. and Chadi Chahine, dated January 7, 2019.

10.40§**	Severance Agreement, dated January 7, 2019, between the Company and Chadi Chahine.
10.41§**	Executive Change of Control Agreement between CIRCOR, Inc. and Lane Walker, dated October 10, 2018.
10.42§**	Severance Agreement, dated October 10, 2018, between the Company and Lane Walker.
21**	Schedule of Subsidiaries of CIRCOR International, Inc.
23.1**	Consent of PricewaterhouseCoopers LLP, Independent Registered Public Accounting Firm
31.1**	Certification of Chief Executive Officer Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002
31.2**	Certification of Chief Financial Officer Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002
32.1***	Certification of Chief Executive Officer and Chief Financial Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
101	The following financial statements from CIRCOR International, Inc.'s Annual Report on Form 10-K for the year ended December 31, 2018, as filed with the SEC on March 1, 2019, formatted in XBRL (eXtensible Business Reporting Language), as follows:
(i)	Consolidated Balance Sheets as of December 31, 2018 and 2017
(ii)	Consolidated Statements of Income for the years ended December 31, 2018, 2017 and 2016
(iii)	Consolidated Statements of Comprehensive (Loss) Income for the years ended December 31, 2018, 2017 and 2016
(iv)	Consolidated Statements of Cash Flows for the years ended December 31, 2018, 2017 and 2016
(v)	Consolidated Statements of Shareholders' Equity for the years ended December 31, 2018, 2017 and 2016
(vi)	Notes to the Consolidated Financial Statements

* The Company hereby agrees to provide the Commission, upon request, copies of any omitted exhibits or schedules to this exhibit required by Item 601(b)(2) of Regulation S-K.
** Filed with this report.
*** Furnished with this report.
§ Indicates management contract or compensatory plan or arrangement.

Item 16. Form 10-K Summary

Not applicable.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

CIRCOR INTERNATIONAL, INC.

By: /s/ Scott A. Buckhout
Scott A. Buckhout
President and Chief Executive Officer

Date: March 1, 2019

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

Signature	Title	Date
/s/ Scott A. Buckhout Scott A. Buckhout	President and Chief Executive Officer (Principal Executive Officer)	March 1, 2019
/s/ Chadi Chahine Chadi Chahine	Senior Vice President, Chief Financial Officer (Principal Financial Officer)	March 1, 2019
/s/ David F. Mullen David F. Mullen	Senior Vice President and Corporate Controller (Principal Accounting Officer)	March 1, 2019
/s/ David F. Dietz David F. Dietz	Chairman of the Board of Directors	March 1, 2019
/s/ Tina M. Donikowski Tina M. Donikowski	Director	March 1, 2019
/s/ Helmuth Ludwig Helmuth Ludwig	Director	March 1, 2019
/s/ Samuel Chapin Samuel Chapin	Director	March 1, 2019
/s/ John A. O'Donnell John A. O’Donnell	Director	March 1, 2019
/s/ Peter M. Wilver Peter M. Wilver	Director	March 1, 2019

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Shareholders of CIRCOR International, Inc.

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of CIRCOR International, Inc. and its subsidiaries (the "Company") as of December 31, 2018 and 2017, and the related consolidated statements of (loss) income, comprehensive (loss) income, shareholders' equity and cash flows for the each of the three years in the period ended December 31, 2018, including the related notes and financial statement schedule listed in the index appearing under Item 15(a)(2) (collectively referred to as the "consolidated financial statements"). We also have audited the Company's internal control over financial reporting as of December 31, 2018, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2018 and 2017**,** and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2018 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2018, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the COSO.

Change in Accounting Principle

As discussed in Note 2 to the consolidated financial statements, the Company changed the manner in which it accounts for revenue from contracts with customers in 2018.

Basis for Opinions

The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in Management's Report on Internal Control over Financial Reporting appearing under Item 9A. Our responsibility is to express opinions on the Company's consolidated financial statements and on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ PricewaterhouseCoopers LLP
Boston, Massachusetts
March 1, 2019

We have served as the Company's auditor since 2015.

CIRCOR INTERNATIONAL, INC.
Consolidated Balance Sheets
(in thousands, except share and per share data)

	December 31, 2018	December 31, 2017
ASSETS		
CURRENT ASSETS:		
Cash and cash equivalents	$ 68,517	$ 110,356
Trade accounts receivable, less allowance for doubtful accounts of $6,735 and $4,791, respectively	183,552	223,922
Inventories	217,378	244,896
Prepaid expenses and other current assets	90,659	59,219
Assets held for sale	87,940	—
Total Current Assets	648,046	638,393
PROPERTY, PLANT AND EQUIPMENT, NET	201,799	217,539
OTHER ASSETS:		
Goodwill	459,205	505,762
Intangibles, net	441,302	513,364
Deferred income taxes	28,462	22,334
Other assets	12,798	9,407
TOTAL ASSETS	$ 1,791,612	$ 1,906,799
LIABILITIES AND SHAREHOLDERS' EQUITY		
CURRENT LIABILITIES:		
Accounts payable	$ 123,881	$ 117,329
Accrued expenses and other current liabilities	107,312	162,589
Accrued compensation and benefits	33,878	34,734
Liabilities held for sale	11,141	—
Notes payable and current portion of long-term debt	7,850	7,865
Total Current Liabilities	284,062	322,517
LONG-TERM DEBT	778,187	787,343
DEFERRED INCOME TAXES	33,932	26,122
PENSION LIABILITY, NET	150,623	150,719
OTHER NON-CURRENT LIABILITIES	15,815	18,124
COMMITMENTS AND CONTINGENCIES (NOTE 15)		
SHAREHOLDERS' EQUITY:		
Preferred stock, $0.01 par value; 1,000,000 shares authorized; no shares issued and outstanding	—	—
Common stock, $0.01 par value; 29,000,000 shares authorized; 19,845,205 and 19,785,298 shares issued and outstanding at December 31, 2018 and 2017, respectively	212	212
Additional paid-in capital	440,890	438,721
Retained earnings	232,102	274,243
Common treasury stock, at cost (1,372,488 shares at December 31, 2018 and 2017)	(74,472)	(74,472)
Accumulated other comprehensive loss	(69,739)	(36,730)
Total Shareholders' Equity	528,993	601,974
TOTAL LIABILITIES AND SHAREHOLDERS' EQUITY	$ 1,791,612	$ 1,906,799

The accompanying notes are an integral part of these consolidated financial statements.

CIRCOR INTERNATIONAL, INC.
Consolidated Statements of (Loss) Income
(in thousands, except per share data)

	Year Ended December 31,		
	2018	2017	2016
Net revenues	$ 1,175,825	$ 661,710	$ 590,259
Cost of revenues	834,175	460,890	407,144
GROSS PROFIT	341,650	200,820	183,115
Selling, general and administrative expenses	308,427	166,201	154,818
Impairment charges	—	—	208
Special and restructuring charges, net	23,839	14,051	17,171
OPERATING INCOME	9,384	20,568	10,918
Other expense (income):			
Interest expense, net	52,913	10,777	3,310
Other (income) expense, net	(7,435)	3,678	(2,072)
TOTAL OTHER EXPENSE, NET	45,478	14,455	1,238
(LOSS) INCOME BEFORE INCOME TAXES	(36,094)	6,113	9,680
Provision for (Benefit from) income taxes	3,290	(5,676)	(421)
NET (LOSS) INCOME	$ (39,384)	$ 11,789	$ 10,101
(Loss) Earnings per common share:			
Basic	$ (1.99)	$ 0.71	$ 0.62
Diluted	$ (1.99)	$ 0.70	$ 0.61
Weighted average common shares outstanding:			
Basic	19,834	16,674	16,418
Diluted	19,834	16,849	16,536

The accompanying notes are an integral part of these consolidated financial statements.

CIRCOR INTERNATIONAL, INC.
Consolidated Statements of Comprehensive (Loss) Income
(in thousands)

	Year Ended December 31,		
	2018	**2017**	**2016**
Net (loss) income	$ (39,384)	$ 11,789	$ 10,101
Other comprehensive (loss) income:			
Foreign currency translation adjustments	(20,523)	34,119	(14,866)
Interest rate swap adjustments (1)	(1,516)	—	—
Other net changes in post-retirement liabilities and assets - recognized actuarial (loss) gains (2)	(11,087)	4,877	1,441
Net periodic pension costs amortization (3)	117	535	3,152
Other comprehensive (loss) income	(33,009)	39,531	(10,273)
COMPREHENSIVE (LOSS) INCOME	$ (72,393)	$ 51,320	$ (172)

(1) Net of an income tax effect of ($0.5 million) for the year ended December 31, 2018.
(2) Net of an income tax effect of ($3.3 million), $1.8 million, and $0.8 million for the years ended December 31, 2018, 2017 and 2016, respectively.
(3) Net of an income tax effect of $0.0 million, $0.5 million, and $0.2 million for the years ended December 31, 2018, 2017 and 2016, respectively.

The accompanying notes are an integral part of these consolidated financial statements.

CIRCOR INTERNATIONAL, INC.
Consolidated Statements of Cash Flows

(in thousands)	Year Ended December 31,		
	2018	2017	2016
OPERATING ACTIVITIES			
Net income	$ (39,384)	$ 11,789	$ 10,101
Adjustments to reconcile net income to net cash provided by operating activities:			
Depreciation	28,754	15,290	13,304
Amortization	49,255	14,747	12,316
Provision for bad debt expense	1,107	810	2,330
Loss on write down of inventory and amortization of fair value step-up	11,499	7,337	9,297
Impairment charges	—	—	208
Compensation expense of share-based plans	4,971	3,807	5,545
Debt extinguishment	—	1,810	—
Change in fair value of contingent consideration	—	(12,200)	—
Amortization of debt issuance costs	3,937	759	—
Tax effect of share-based plan compensation	—	—	145
Pension settlement charge		—	4,457
Deferred income tax expense (benefit)	(4,498)	(8,434)	(10,737)
Loss on disposal of property, plant and equipment	1,316	360	3,708
Loss (Gain) on sale of businesses	1,882	5,300	—
Changes in operating assets and liabilities, net of effects of acquisitions and divestitures:			
Trade accounts receivable	11,602	(5,734)	18,536
Inventories	8,272	(19,494)	36,092
Prepaid expenses and other assets	(45,041)	(8,578)	2,454
Accounts payable, accrued expenses and other liabilities	20,322	2,068	(48,357)
Net cash provided by operating activities	53,994	9,637	59,399
INVESTING ACTIVITIES			
Purchases of property, plant and equipment	(23,588)	(14,541)	(14,692)
Proceeds from the sale of property, plant and equipment	231	934	1,700
Proceeds from divestitures	2,753	—	—
Business acquisitions, net of cash acquired	3,727	(488,517)	(197,489)
Net cash used in investing activities	(16,877)	(502,124)	(210,481)
FINANCING ACTIVITIES			
Proceeds from long-term debt	248,300	1,090,883	323,200
Payments of short-term and long-term debt	(260,146)	(523,183)	(162,540)
Debt issuance costs	—	(30,366)	—
Dividends paid	—	(2,506)	(2,497)
Proceeds from the exercise of stock options	690	740	246
Return of cash to seller	(62,917)	—	—
Tax effect of share-based plan compensation	—	—	(145)
Sales (purchases) of treasury stock	—	—	500
Net cash (used in) provided by financing activities	(74,073)	535,568	158,764
Effect of exchange rate changes on cash and cash equivalents	(5,812)	8,996	(3,944)
(DECREASE) INCREASE IN CASH AND CASH EQUIVALENTS	(42,768)	52,077	3,738
Cash and cash equivalents at beginning of year	112,293	58,279	54,541
CASH AND CASH EQUIVALENTS AT END OF YEAR	$ 69,525	$ 110,356	$ 58,279
Cash paid during the year for:			
Income taxes	$ 633	$ 9,984	$ 10,650
Interest	$ 50,326	$ 6,778	$ 2,908
Non-cash supplemental information:			
Share issuance for business acquisition	$ —	$ 143,767	$ —
Accrued purchase price	$ —	$ 4,824	$ —
Payable to seller related to cash balances	$ —	$ 65,314	$ —
Change in fair value for shares issued in acquisition	$ (3,783)		
Accrued purchase price settled	$ (2,299)	$ —	$ —

The accompanying notes are an integral part of these consolidated financial statements.

CIRCOR INTERNATIONAL, INC.
Consolidated Statements of Shareholders' Equity
(in thousands)

	Common Stock		Additional Paid-in Capital	Retained Earnings	Accumulated Other Comprehensive (Loss) Income	Treasury Stock	Total Shareholders' Equity
	Shares	Amount					
BALANCE AT DECEMBER 31, 2015	16,364	$ 177	$ 283,621	$ 257,939	$ (65,988)	$ (74,972)	$ 400,777
Net income				10,101			10,101
Other comprehensive loss, net of tax					(10,273)		(10,273)
Common stock dividends declared				(2,497)			(2,497)
Stock options exercised	6	—	245				245
Tax effect of share-based plan compensation			(145)				(145)
Conversion of restricted stock units	66	1	156				157
Share-based plan compensation			5,545				5,545
Sales of common stock	9					500	500
BALANCE AT DECEMBER 31, 2016	16,445	$ 178	$ 289,422	$ 265,543	$ (76,261)	$ (74,472)	$ 404,410
Net income				11,789			11,789
Cumulative effect adjustment related to the adoption of share-based compensation standard (ASU 2016-09)			755	(582)			173
Other comprehensive loss, net of tax					39,531		39,531
Common stock dividends declared				(2,507)			(2,507)
Stock options exercised	18		707				707
Conversion of restricted stock units	39	1	296				297
Share-based plan compensation			3,807				3,807
Issuance of common stock to acquire business	3,283	33	143,734				143,767
BALANCE AT DECEMBER 31, 2017	19,785	$ 212	$ 438,721	$ 274,243	$ (36,730)	$ (74,472)	$ 601,974
Net income				(39,384)			(39,384)
Cumulative effect adjustment related to the adoption of revenue recognition standard (ASC 606)				(2,757)			(2,757)
Other comprehensive income, net of tax					(33,009)		(33,009)
Stock options exercised	18		690				690
Conversion of restricted stock units	42	—	291				291
Share-based plan compensation			4,971				4,971
Measurement period change in fair value of common stock to acquire a business			(3,783)			—	(3,783)
BALANCE AT DECEMBER 31, 2018	19,845	$ 212	$ 440,890	$ 232,102	$ (69,739)	$ (74,472)	$ 528,993

The accompanying notes are an integral part of these consolidated financial statements.

(1) Description of Business

CIRCOR International, Inc. (“CIRCOR” or the “Company” or “we”) designs, manufactures and distributes a broad array of flow and motion control products and certain services to a variety of end-markets for use in a wide range of applications to optimize the efficiency and/or ensure the safety of flow control systems. We have a global presence and operate major manufacturing facilities in North America, Western Europe, Morocco, and India.

As of December 31, 2018, we organized our business segment reporting structure into three segments: CIRCOR Energy ("Energy"), CIRCOR Aerospace and Defense ("Aerospace and Defense") and CIRCOR Industrial ("Industrial"). Refer to Note 18, Business Segment and Geographical Information, for further information about our segments.

(2) Summary of Significant Accounting Policies

Principles of Consolidation and Basis of Presentation

The consolidated financial statements include the accounts of CIRCOR and its subsidiaries. The results of companies acquired are included in the consolidated financial statements from the date of acquisition. All significant intercompany balances and transactions have been eliminated in consolidation. Certain reclassifications have been made to prior period amounts to conform to the current period financial statement presentation. These reclassifications have no effect on the previously reported net income.

Use of Estimates

The preparation of these financial statements in conformity with generally accepted accounting principles ("GAAP") requires management to make estimates and assumptions that affect the amounts reported in the consolidated financial statements and accompanying disclosures. Some of the more significant estimates relate to acquisition accounting, estimated total costs for ongoing long-term contracts accounted for under the percentage of completion method, inventory valuation, share-based compensation, amortization and impairment of long-lived assets, pension benefits obligations, income taxes, penalty accruals for late shipments, asset valuations, and product warranties. While management believes that the estimates and assumptions used in the preparation of the financial statements are appropriate, actual results could differ materially from those estimates.

Revenue Recognition

Revenues disclosed for 2017 and 2016 were accounted for in accordance with ASC 605. Under this standard, revenue was primarily recognized when title and risk of loss have passed to the customer, persuasive evidence of an arrangement exists, no significant post delivery obligations remain, the price to the buyers is fixed or determinable and collection of the resulting receivable is reasonably assured. Revenues and costs on certain long-term capital contracts are recognized on the percentage-of-completion method measured on the basis of costs incurred to estimated total costs for each contract. This method is used because management considers it to be the best available measure of progress towards completion on these contracts. Revenues and costs on contracts are subject to change in estimate throughout the duration of the contracts, and any required adjustments are made in the period in which a change in estimate becomes known. Estimated losses on contracts in progress are recognized in the period in which a loss becomes known. Unbilled receivables for net revenues recognized in excess of the amounts billed for active projects are recognized within other current assets on the balance sheet.

The Company provides for the estimated costs to fulfill customer warranty obligations upon the recognition of the related revenue. Shipping and handling costs invoiced to customers are recorded as components of revenues and the associated costs are recorded as cost of revenues. We recognize revenue net of sales returns, rebates, penalties, and discounts. Accounts receivable allowances include sales returns and bad debt allowances. The Company monitors and tracks the amount of product returns and reduces revenue at the time of shipment for the estimated amount of such future returns, based on historical experience. The Company makes estimates evaluating its allowance for doubtful accounts. The Company continuously monitors collections and payments from its customers and maintains a provision for estimated credit losses based upon its historical experience and any specific customer collection issues that it has identified. Account balances are charged off against the allowance when the company believes it is probable the receivable will not be recovered.

Refer to Note 3, Revenue Recognition for CIRCOR's revenue recognition policy for 2018 in accordance with ASC 606.

Cost of Revenue

Cost of revenue primarily reflects the costs of manufacturing and preparing products for sale and, to a much lesser extent, the costs of performing services. Cost of revenue is primarily comprised of the cost of materials, outside processing, inbound freight, production, direct labor and overhead including indirect labor, which are expenses that directly result from the level of production activity at the manufacturing plant. Additional expenses that directly result from the level of production activity at the manufacturing plant include: purchasing and receiving costs, inspection costs, warehousing costs, internal transfer costs, utility expenses, property taxes, amortization of inventory step-up from revaluation at the date of acquisition, depreciation of production building and equipment assets, warranty costs, salaries and benefits paid to plant manufacturing management and maintenance supplies.

Inventories

Inventories are stated at net realizable value. Cost is generally determined on the first-in, first-out ("FIFO") basis. Where appropriate, standard cost systems are utilized for purposes of determining cost; the standards are adjusted as necessary to ensure they approximate actual cost. We typically analyze our inventory aging and projected future usage on a quarterly basis to assess the adequacy of our inventory allowance, which primarily consist of obsolescence and net realizable value estimates. These estimates are measured either on an item-by-item basis or higher-level inventory grouping and determined based on the difference between the cost of the inventory and estimated market value. The provision for inventory allowance is a component of our cost of revenues. Assumptions about future demand are among the primary factors utilized to estimate market value. At the point of the loss recognition, a new, lower-cost basis for that inventory is established, and subsequent changes in facts and circumstances do not result in the restoration or increase in that newly established cost basis. Only subsequent inventory transaction via sale or disposal would then release the established inventory reserve.

If there were to be a sudden and significant decrease in demand for our products, significant price reductions, or if there were a higher incidence of inventory obsolescence for any reason, including a change in technology or customer requirements, we could be required to increase our inventory allowances and our gross profit could be adversely affected.

Business Acquisitions

The definition of a business introduces a "screen test" that is a quantitative threshold for defining asset acquisitions. If substantially all of the acquisition is made up of one asset or several similar assets, then the acquisition is an asset acquisition. "Substantially all" is commonly considered to be approximately 90%. While it is not a bright line, if it meets or exceeds the threshold it's an asset acquisition. Otherwise, the analysis must continue through the "full model." This means that the structure of the transaction will be important in determining the accounting result.

We account for business combinations under the acquisition method, and accordingly, the assets and liabilities of the acquired businesses are recorded at their estimated fair value on the acquisition date with the excess of the purchase price over their estimated fair value recorded as goodwill. We determine acquisition related asset and liability fair values through established valuation techniques for industrial manufacturing companies and utilize third party valuation firms to assist in the valuation of certain tangible and intangible assets.

The consideration for our acquisitions may include future payments that are contingent upon the occurrence of a particular event. For acquisitions that qualify as business combinations, we record an obligation for such contingent payments at fair value on the acquisition date. We estimate the fair value of contingent consideration obligations through valuation models that incorporate probability adjusted assumptions related to the achievement of the milestones and thus likelihood of making related payments or by using a Monte Carlo simulation model. We revalue these contingent consideration obligations each reporting period. Changes in the fair value of our contingent consideration obligations are recognized within general and administrative expense in our consolidated statements of income.

Accounting Standards Codification ("ASC") Topic 805, Business Combinations, provides guidance regarding business combinations and requires acquisition-date fair value measurement of identifiable assets acquired, liabilities assumed, and non-controlling interests in the acquiree. For additional information, refer to Note 4, Business Acquisitions.

Legal Contingencies

We are currently involved in various legal claims and legal proceedings, some of which may involve substantial dollar amounts. Periodically, we review the status of each significant matter and assess our potential financial exposure. If the potential loss from any claim or legal proceeding is considered probable and the amount can be estimated, we accrue a liability for the estimated loss. The determination of probability and the determination as to whether an exposure can be reasonably estimated requires management estimates. Because of uncertainties related to these matters, accruals are based on the best information available at the time. As additional information becomes available, we reassess the potential liability related to our pending claims and litigation and may revise our estimates. Such revisions in the estimates of the potential liabilities could have a material adverse effect on our business, results of operations and financial position.

For more information related to our outstanding legal proceedings, see Note 15, Contingencies, Commitments and Guarantees.

Goodwill

Goodwill is measured as the excess of the cost of acquisition over the sum of the amounts assigned to identifiable tangible and intangible assets acquired less liabilities assumed. For goodwill, we perform an impairment assessment at the reporting unit level on an annual basis as of the end of our October month end or more frequently if circumstances warrant. Our annual impairment assessment requires a comparison of the fair value of each of our reporting units to the respective carrying value. If the fair value of a reporting unit exceeds its carrying amount, goodwill of the reporting unit is considered not impaired. If the carrying value of a reporting unit is greater than its fair value, an impairment loss will be recognized in an amount equal to that excess, limited to the total amount of goodwill allocated to that reporting unit. Additionally, we will consider the income tax effect from any tax deductible goodwill on the carrying amount of the reporting unit when measuring the goodwill impairment loss.

Determining the fair value of a reporting unit is subjective and requires the use of significant estimates and assumptions. With the assistance of an independent third-party appraisal firm, we estimate the fair value of our reporting units using an income approach based on the present value of future cash flows. We believe this approach yields the most appropriate evidence of fair value. We also utilize the comparable company multiples method and market transaction fair value method to validate the fair value amount we obtain using the income approach. The key assumptions utilized in our discounted cash flow model include our estimates of future cash flows from operating activities, including those used in the estimated terminal value as well as the discount rate based on a weighted average cost of capital. Any unfavorable material changes to these key assumptions could potentially impact our fair value determinations. As such, we may experience fluctuations in revenues and operating results resulting in the non-achievement of our estimated growth rates, operating performance and working capital estimates utilized in our discounted cash flow models.

For more information related to our Goodwill, see Note 8, Goodwill and Other Intangible Assets.

Indefinite-Lived Intangible Assets

For intangible assets with indefinite lives, we perform an impairment assessment at the asset level on an annual basis as of the October month end or more frequently if circumstances warrant. Indefinite-lived intangible assets, such as trade names, are generally recorded and valued in connection with a business acquisition. These assets are reviewed at least annually for impairment, or more frequently if facts and circumstances warrant. We also utilized a fair value calculation to evaluate these intangibles. Determining the fair value is subjective and requires the use of significant estimates and assumptions. With the assistance of an independent third-party appraisal firm, we estimate the fair value using an income approach based on the present value of future cash flows. We note the fair value of each individual indefinite-lived asset exceeded the respective carrying amount, and no intangible impairments were recorded.

For more information related to our Intangible Assets, see Note 8, Goodwill and Other Intangible Assets.

Other Long-Lived Assets

In accordance with ASC 360, Plant, Property, and Equipment, we perform impairment analyses of our long-lived assets group whenever events and circumstances indicate that they may be impaired. When the undiscounted future cash flows are expected to be less than the carrying value of identified asset groups being reviewed for impairment, the asset groups are written down to fair value.

See Note 7, Property, Plant and Equipment, for further information on impairment of other long-lived assets.

Post Retirement Benefits

Pensions and other post-retirement benefits obligations and net periodic benefit costs are actuarially determined and are affected by several assumptions including the discount rate, mortality, and the expected long-term return on plan assets. Changes in the assumptions and differences from actual results will affect the amounts of net periodic benefit cost recognized in future periods. These assumptions may also have an effect on the amount and timing of future cash contributions.

As required in the recognition and disclosure provisions of ASC Topic 715, Compensation - Retirement Benefits, the Company recognizes the over-funded or under-funded status of defined benefit post-retirement plans in its balance sheet, measured as the difference between the fair value of plan assets and the benefit obligations (the projected benefit obligation for pension plans and the accumulated post-retirement benefit obligation for other post-retirement plans). The change in the funded status is the net of the recognized net periodic benefit cost, cash contributions to the trust/benefits paid directly by CIRCOR and recognized changes in other comprehensive income. Other comprehensive income changes are due to new actuarial gains and losses and new plan amendments and the amortizations of amounts in the net periodic benefit cost.

Unrecognized actuarial gains and losses in excess of the 10% corridor (defined as the threshold above which gains or losses need to be amortized) are being recognized for all plans over the weighted average expected remaining service period of the employee group unless substantially all participants are inactive in which case the average remaining lifetime of covered participants is used. Unrecognized actuarial gains and losses arise from several factors including changes in the benefit obligations from actuarial experience and assumption changes and from the difference between expected returns and actual returns on plan assets.

Income Taxes

Income taxes are accounted for under the asset and liability method. Deferred tax assets and liabilities are recognized for the future tax consequences attributable to differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax bases and operating loss and tax credit carry-forwards. Deferred tax assets and liabilities are measured using enacted tax rates expected to apply to taxable income in the years in which those temporary differences are expected to be recovered or settled. The effect on deferred tax assets and liabilities of a change in tax rates is recognized in income in the period that includes the enactment date. A valuation allowance is recognized if we anticipate that it is more likely than not that we may not realize some or all of a deferred tax asset.

In accordance with the provisions of ASC Topic 740, Income Taxes, the Company initially recognizes the financial statement effect of a tax position when, based solely on its technical merits, it is more likely than not (a likelihood of greater than fifty percent) that the position will be sustained upon examination by the relevant taxing authority. Those tax positions failing to qualify for initial recognition are recognized in the first interim period in which they meet the more likely than not standard, are resolved through negotiation or litigation with the taxing authority, or upon expiration of the statute of limitations. De-recognition of a tax position that was previously recognized occurs when an entity subsequently determines that a tax position no longer meets the more likely than not threshold of being sustained.

If future results of operations exceed our current expectations, our existing tax valuation allowances may be adjusted, resulting in future tax benefits. Alternatively, if future results of operations are less than expected, future assessments may result in a determination that some or all of the deferred tax assets are not realizable. Consequently, we may need to establish additional tax valuation allowances for a portion or all of the gross deferred tax assets, which may have a material adverse effect on our results of operations.

Under ASC Topic 740, only the portion of the liability that is expected to be paid within one year is classified as a current liability. As a result, liabilities expected to be resolved without the payment of cash (e.g., due to the expiration of the statute of limitations) or are not expected to be paid within one year are classified as non-current. It is the Company’s policy to record estimated interest and penalties as income tax expense and tax credits as a reduction in income tax expense.

With respect to GILTI, the company has adopted a policy to account for this provision as a period cost. Also, the Company has adopted the impact of ASU 2018-05 in our financial statements.

For more information related to our Income Taxes, see Note 9, Income Taxes.

Share-Based Compensation

Share-based compensation costs are based on the grant date fair value estimated in accordance with the provisions of ASC 718, Accounting for Share Based Payments, and these costs are recognized over the requisite vesting period. The Black-Scholes option pricing model is used to estimate the fair value of each stock option at the date of grant excluding the 2013 and 2014 CEO stock option awards which are valued using the Monte Carlo option pricing model as these are market condition awards. Black-Scholes utilizes assumptions related to volatility, the risk-free interest rate, the dividend yield and employee exercise behavior. Expected volatilities utilized in the model are based on the historic volatility of the Company's stock price. The risk-free interest rate is derived from the U.S. Treasury Yield curve in effect at the time of the grant. The model incorporates exercise and post-vesting forfeiture assumptions based on an analysis of historical data.

Market condition stock option awards include both a service period and a market performance vesting condition. The stock options vest if certain stock price targets are met based on the stock price closing at or above the target for 60 consecutive trading days. Vested options may be exercised 25% at the time of vesting, 50% one year from the date of vesting and 100% two years from the date of vesting. These market condition stock option awards are being expensed utilizing a graded method and are subject to forfeiture in the event of employment termination (whether voluntary or involuntary) prior to vesting. To the extent that the market conditions above (stock price targets) are not met, those options will not vest and will forfeit 5 years from grant date. The Company used a Monte Carlo simulation option pricing model to value these option awards.

See Note 12, Share-Based Compensation, for further information on share-based compensation.

Environmental Compliance and Remediation

Environmental expenditures that relate to current operations are expensed or capitalized as appropriate. Expenditures that relate to existing conditions caused by past operations, which do not contribute to current or future revenue generation, are expensed. Expenditures that meet the criteria of "Regulated Operations" are capitalized. Liabilities are recorded when environmental assessments and/or remedial efforts are probable and the costs can be reasonably estimated. In accordance with ASC 450, Contingencies, estimated costs are based upon current laws and regulations, existing technology and the most probable method of remediation.

Foreign Currency

Our international subsidiaries operate and report their financial results using local functional currencies. Accordingly, all assets, liabilities, revenues and costs of these subsidiaries are translated into United States dollars using exchange rates in effect at the end of the relevant periods. The resulting translation adjustments are presented as a separate component of other comprehensive income. We do not provide for U.S. income taxes on foreign currency translation adjustments since we do not provide for such taxes on undistributed earnings of foreign subsidiaries.

Our net foreign exchange losses / (gains) recorded for the years ended December 31, 2018, 2017 and 2016 were ($1.8) million, $2.1 million, and $2.1 million, respectively and are included in other (income) expense in the consolidated statements of income. See Note 17, Fair Value, for additional information on foreign currency exchange risk.

Earnings Per Common Share

Basic earnings per common share are calculated by dividing net income by the number of weighted average common shares outstanding. Diluted earnings per common share is calculated by dividing net income by the weighted average common shares outstanding and assumes the conversion of all dilutive securities when the effects of such conversion would not be anti-dilutive.

Earnings per common share and the weighted average number of shares used to compute net earnings per common share, basic and assuming full dilution, are reconciled below (in thousands, except per share data):

	Year Ended December 31,								
	2018			2017			2016		
	Net Income	Shares	Per Share Amount	Net Income	Shares	Per Share Amount	Net Income	Shares	Per Share Amount
Basic EPS	$ (39,384)	19,834	$ (1.99)	$ 11,789	16,674	$ 0.71	$ 10,101	16,418	$ 0.62
Dilutive securities, principally common stock options		—	0.00		175	(0.01)		118	(0.01)
Diluted EPS	$ (39,384)	19,834	$ (1.99)	$ 11,789	16,849	$ 0.70	$ 10,101	16,536	$ 0.61

Certain stock options to purchase common shares and restricted stock units ("RSUs") were anti-dilutive. There were 1,041,454 anti-dilutive stock options, RSUs, and RSU MSPs for the year ended December 31, 2018 with exercise prices ranging from $26.06 to $71.56. There were 252,001 anti-dilutive stock options and RSUs for the year ended December 31, 2017 with exercise prices ranging from $51.84 to $71.56. There were 36,281 anti-dilutive stock options and RSUs for the year ended December 31, 2016 with exercise prices ranging from $70.42 to $79.33.

As of December 31, 2018, there were 13,029 outstanding RSUs that contain rights to nonforfeitable dividend equivalents and are considered participating securities that are included in our computation of basic and fully diluted earnings per share.

Cash and Cash Equivalents

Our cash equivalents are invested in time deposits of financial institutions. We have established guidelines relative to credit ratings, diversification and maturities that are intended to maintain safety and liquidity. Cash equivalents include highly liquid investments with maturity periods of three months or less when purchased.

Other Assets

Other assets in the accompanying consolidated balance sheets include deferred debt issuance costs associated with our revolving credit facility, tax receivable and other certain assets.

Fair Value

ASC Topic 820, Fair Value Measurement, defines fair value and includes a framework for measuring fair value and disclosing fair value measurements in financial statements. Fair value is a market-based measurement rather than an entity-specific measurement. The fair value hierarchy makes a distinction between assumptions developed based on market data obtained from independent sources (observable inputs) and the reporting entity’s own assumptions (unobservable inputs). This fair value hierarchy gives the highest priority to quoted prices in active markets for identical assets or liabilities (Level 1) and the lowest priority to unobservable inputs (Level 3). We utilize fair value measurements for forward currency contracts, guarantee and indemnification obligations, certain pension plan assets, and certain intangible assets. Certain pension plan asset investments are measured at fair value using the net asset value per share (or its equivalent) practical expedient (the “NAV”).

See Note 17, Fair Value, for additional information on fair value.

Derivative Financial Instruments

The Company is exposed to certain risks relating to its ongoing business operations including foreign currency exchange rate risk and interest rate risk. The Company currently uses derivative instruments to manage foreign currency risk on certain business transactions denominated in foreign currencies. To the extent the underlying transactions hedged are completed, these forward contracts do not subject us to significant risk from exchange rate movements because they offset gains and losses on the related foreign currency denominated transactions. These forward contracts do not qualify as hedging instruments and, therefore, do not qualify for fair value or cash flow hedge treatment. GAAP requires all derivatives, whether designated in a hedging relationship or not, to be recorded on the balance sheet at fair value. Any unrealized gains and losses on our contracts are recognized as a component of other expense in our consolidated statements of income.

See Note 17, Fair Value, for additional information on derivative financial instruments.

Property, Plant and Equipment

Property, plant and equipment are recorded at cost. Depreciation is generally provided on a straight-line basis over the estimated useful lives of the assets, which typically range from 3 to 40 years for buildings and improvements, 3 to 10 years for manufacturing machinery and equipment, computer equipment and software, and furniture and fixtures. Motor vehicles are depreciated over a range of 2 to 6 years. Leasehold improvements are amortized on a straight-line basis over the shorter of the lease term or estimated useful life of the asset. Repairs and maintenance costs are expensed as incurred.

The Company reports depreciation of property, plant and equipment in cost of revenue and selling, general and administrative expenses based on the nature of the underlying assets. Depreciation primarily related to equipment used in the production of inventory is recorded in cost of revenue. Depreciation related to selling and administrative functions is reported in selling, general and administrative expenses.

See Note 7, Property, Plant and Equipment for additional information.

Research and Development

Research and development expenditures, including certain engineering costs, are expensed when incurred and are included in selling, general and administrative expenses. Our research and development expenditures for the years ended December 31, 2018, 2017 and 2016 were $8.8 million, $5.5 million and $5.9 million, respectively.

New Accounting Standards

Adopted

On January 1, 2018, we adopted the Financial Accounting Standards Board ("FASB") issued Accounting Standard Update ("ASU") 2017-01, Business Combinations (Topic 805): Clarifying the Definition of a Business. ASU 2017-01 provides further clarification of the definition of a business with the objective to assist entities with evaluating whether transactions should be accounted for as acquisitions (or disposals) of assets versus businesses. The amendments in ASU 2017-01 provide criteria to determine when a set of assets and activities is not a business. ASU 2017-01 is effective for fiscal years, and interim periods within those fiscal years, beginning after December 15, 2017. The adoption of ASU 2017-01 has not had a material impact on our condensed consolidated financial statements.

On January 1, 2018, we adopted the FASB issued ASU 2017-09, Compensation—Stock Compensation (Topic 718): Scope of Modification Accounting, which clarifies when to account for a change to the terms or conditions of a share-based payment award as a modification. Under this guidance, modification accounting is required only if the fair value, the vesting conditions, or the classification of the award changes as a result of the change in terms or conditions. The amendments in this ASU also clarify that no new measurement date will be required if an award is not probable of vesting at the time a change is made and there is no change to the fair value, vesting conditions, and classification. The amendments in this ASU are effective for public business entities for annual periods beginning after December 15, 2017, including interim periods within those annual periods. The adoption of ASU 2017-09 has not had a material impact on our condensed consolidated financial statements.

On January 1, 2018, we adopted the FASB issued ASU 2016-18, Statement of Cash Flows (Topic 230), which requires that statement of cash flows explain the change during the period in the total of cash, cash equivalents, and amounts generally described as restricted cash or restricted cash equivalents. Therefore, amounts generally described as restricted cash and restricted cash equivalents should be included with cash and cash equivalents when reconciling the beginning-of-period and end-of-period total amounts shown on the statement of cash flows. The amendments in this update do not provide a definition of restricted cash or restricted cash equivalents. The amendments in this update are effective for public business entities for fiscal years beginning after December 15, 2017, and interim periods within those fiscal years. The adoption of ASU 2016-18 has not had a material impact on our condensed consolidated financial statements.

On January 1, 2018, we adopted the FASB issued ASU 2017-07, Compensation—Retirement Benefits (Topic 715), which improves the consistency, transparency, and usefulness of the service cost and net benefit cost financial information components. The amendments in this ASU amend presentation requirements of service cost and other components of net benefit cost in the income statement. In addition, the ASU allows only the service cost component of net benefit cost to be eligible for capitalization. The amendments in this ASU are effective for public business entities for annual periods beginning after December 15, 2017, including interim periods within those annual periods. The amendments in this ASU are applied retrospectively for the presentation of the service cost component and the other components of net periodic pension cost and net periodic post-retirement benefit cost in the income statement and prospectively, on and after the effective date, for the capitalization of the service cost component of net periodic pension cost and net periodic post-retirement benefit in assets. We have elected to use the practical expedient that permits us to use the amounts disclosed in our pension and other post-retirement benefit plan note for the prior comparative periods as the estimation basis for applying the retrospective presentation requirements. For prospective and retroactive reclassification, service costs are recorded within the selling, general, and administrative caption of our consolidated income statement, while the other components of net benefit cost are recorded in the other expense (income), net caption of our consolidated income statement. The adoption of ASU 2017-17 did not have a material impact on our prior period condensed consolidated financial statements, however, the impact of this adoption was material in the fiscal year ended December 31, 2018 given the benefit plans acquired in connection with the acquisition of the fluid handling business from Colfax Corporation. Refer to Note 14, Retirement Plans, for detail of 2018 service costs and other components of net benefit costs.

On January 1, 2018, we adopted the FASB issued ASU 2016-15, Classification of Certain Cash Receipts and Cash Payments, which reduces the existing diversity in practice in how certain cash receipts and cash payments are presented and classified in the statement of cash flows under Topic 230, Statement of Cash Flows, and other Topics. This ASU addresses eight specific cash flow issues with the objective of enhancing consistency in presentation and classification. The amendments in this ASU are effective for fiscal years beginning after December 15, 2017, and interim periods within those fiscal years. The adoption of ASU 2016-15 has not had a material impact on our condensed consolidated financial statements.

On April 1, 2018, we adopted the FASB issued ASU 2017-12, Derivatives and Hedging: Targeted Improvements to Accounting for Hedging Activities, which improves the financial reporting of hedging relationships to better portray economic results of the entity's risk management activities. The amendments in this ASU are effective for fiscal years beginning after December 15, 2018, and interim periods within those fiscal years. The adoption of ASU 2017-12 has not had a material impact on our condensed consolidated financial statements.

On January 1, 2018, we adopted ASU 2014-09, Revenue from Contracts with Customers and all the related amendments (“ASC 606” or the “new revenue standard”) using the modified retrospective transition approach. The new revenue standard provides for a single comprehensive model to use in accounting for revenue arising from contracts with customers and replaces most existing revenue recognition guidance in GAAP. We recognized the cumulative effect of adopting the new revenue standard as an adjustment to the opening balance of retained earnings as of January 1, 2018. The comparative periods presented have not been restated and continue to be reported under the accounting standards in effect for those periods.

The Company recognizes revenue to depict the transfer of control to the Company’s customers in an amount reflecting the consideration the Company expects to be entitled to in exchange for performance obligations. In order to apply this revenue recognition principle, the Company applies the following five step approach: (1) identify the contract with a customer, (2) identify the performance obligations in the contract, (3) determine the transaction price, (4) allocate the transaction price to the performance obligations in the contract, and (5) recognize revenue when, or as, a performance obligation is satisfied. See Note 3, Revenue Recognition for further information.

The cumulative effect of the changes made to our consolidated January 1, 2018 balance sheet for the adoption of the new revenue standard were as follows (in thousands):

	As of December 31, 2017	ASC 606 Adjustments	As of January 1, 2018
Assets			
Contract assets (1)	15,019	(2,995)	12,024
Inventories	244,896	540	245,436
Deferred income taxes	22,334	1,123	23,457
Liabilities			
Contract liabilities (2)	(36,113)	(1,517)	(37,630)
Deferred income taxes	(26,122)	92	(26,030)
Equity			
Retained earnings	(274,243)	2,757	(271,486)

(1) Recorded within prepaid expenses and other current assets. Debit balances are presented as a positive and credit balances are presented as a negative herein.

(2) Recorded within accrued expenses and other current liabilities. Debit balances are presented as a positive and credit balances are presented as a negative herein.

The net impact on retained earnings under the new revenue standard is the result of offsetting amounts attributed to contracts that converted from point in time to over time recognition of $2.5 million and contracts that converted from over time to point in time recognition of $5.3 million.

For contracts that were modified before the effective date, we reflected the aggregate effect of all modifications when identifying performance obligations and allocating transaction price in accordance with the practical expedient method under the new revenue standard, which did not have a material effect on the adjustment to retained earnings.

The tables below illustrate the differences in our condensed consolidated statement of (loss) income and balance sheet due to the change in revenue recognition standard (in thousands):

	For the twelve months ended December 31, 2018		
	As Reported	Balances Without Adoption of ASC 606	Effective Change
Net revenues	1,175,825	1,118,765	57,060
Cost of revenues	834,175	797,612	36,563
Benefit from income taxes	3,290	(1,353)	4,643
Net (Loss) Income	(39,384)	(55,239)	15,855

	As of December 31, 2018		
	As Reported	Balances Without Adoption of ASC 606	Effective Change
Assets			
Contract assets (1)	61,618	11,966	49,652
Inventories	217,378	264,694	(47,316)
Deferred income taxes	28,462	32,800	(4,338)
Liabilities			
Contract liabilities (2) (3)	49,725	69,286	(19,561)
Deferred income taxes	33,932	33,627	305
Retained earnings	232,102	214,848	17,254

(1) Recorded within prepaid expenses and other current assets.

(2) Recorded within accrued expenses and other current liabilities.

(3) Contract Liabilities balance includes $1.4M associated with Reliability Services ("RS") which is classified within Liabilities Held for Sale on the Balance Sheet. Refer to Note 19 for additional information.

For the twelve months ended December 31, 2018, we realized changes to our net (loss) income and in the working capital accounts as described above, with no impact on our net cash flows from operating activities.

For the twelve months ended December 31, 2018, the only impact to comprehensive income as a result of the changes between the balances with ASC 606 and without ASC 606 related to the adjustments to net (loss) income shown in the table above.

Not yet Adopted

In March 2016, the FASB issued ASU 2016-02, Leases. ASU 2016-02 outlines a model for lessees by recognizing all lease-related assets and liabilities on the balance sheet. The amendments in this ASU are effective for fiscal years beginning after December 15, 2018 and interim periods within those fiscal years. Early application is permitted for all entities. ASU 2016-02 requires a modified retrospective approach for all leases existing at, or entered into after, the date of initial application, with an option to elect to use certain transition relief.

We established a cross-functional implementation team including representatives from operations, legal, and finance. We identified potential changes to our business processes and controls to support recognition and disclosure under the new standard. We made progress toward completing our evaluation of the potential changes from adopting the new standard on our financial reporting and disclosures. Activities performed during the third quarter included collecting and reviewing our lease agreements and training our finance professionals on the new standard. We continue to gather and analyze our lease agreements to determine proper classification and accounting treatment, as well as working with finance and legal advisors on specific interpretative issues.

During the fourth quarter we continued our previous implementation activities, while also focusing on finalizing debt discount rates to be used under the new standard. We determined that ASU 2016-02 will have a material impact on our consolidated balance sheets, due to the recognition of an additional right-of-use assets and lease liabilities for operating leases. We currently estimate that the lease liabilities and right-of-use assets to be greater than $20M at January 1, 2019, the date of initial application.

(3) Revenue Recognition

Our revenue is derived from a variety of contracts. A significant portion of our revenues are from contracts associated with the design, development, manufacture or modification of highly engineered, complex and severe environment products with customers who are either in or service the energy, aerospace, defense and industrial markets. Our contracts within the defense markets are primarily with U.S. military customers. Our contracts with the U.S. military customers typically are subject to the Federal Acquisition Regulations (FAR). We account for a contract when it has approval and commitment from both parties, the rights of the parties are identified, payment terms are identified, the contract has commercial substance and collectability of consideration is probable. Contracts may be modified to account for changes in contract specifications and requirements. Contract modifications exist when the modification either creates new, or changes the existing, enforceable rights and obligations. Contract modifications for goods or services that are not distinct from the existing contract are accounted for as if they were part of that existing contract. In these cases, the effect of the contract modification on the transaction price and the measure of progress for the performance obligation to which it relates, is recognized as an adjustment to revenue (either as an increase in or a reduction of revenue) on a cumulative catch-up basis, except when such modifications relate to a performance obligation which is a series of substantially the same distinct goods or services. If the modification relates to a performance obligation for a series of substantially the same distinct goods or services, the modifications are treated prospectively. Contract modifications for goods or services that are considered distinct from the existing contract are accounted for as separate contracts.

Performance Obligations. A performance obligation is a promise in a contract to transfer a distinct good or service to the customer, and is the unit of account in ASC 606. A contract's transaction price is allocated to each distinct performance obligation and recognized as revenue when, or as, control is transferred to the customer. Consistent with historical practice, we exclude from the transaction price amounts collected on behalf of third parties (e.g. taxes). Our performance obligations are typically satisfied at a point in time upon delivery and shipping and handling costs are treated as fulfillment costs. To determine the proper revenue recognition method for contracts for highly engineered, complex and severe environment products with right of payment, which meet over-time revenue recognition criteria, we evaluate whether two or more contracts should be combined and accounted for as one single contract and whether the combined or single contract should be accounted for as more than one performance obligation. This evaluation requires significant judgment and the decision to combine a group of contracts or separate the combined or single contract into multiple performance obligations could change the amount of revenue and profit recorded in a given period. In certain instances, we accounted for contracts using the portfolio approach when the effect of accounting for a group of contracts or group of performance obligations would not differ materially from considering each contract or performance obligation separately. This determination requires the use of estimates and assumptions that reflect the size and composition of the portfolio. For most of our over-time revenue recognition contracts, the customer contracts with us to provide custom products which serve a single project or capability (even if that single project results in the delivery of multiple products) with right of payment. In circumstances where each distinct product in the contract transfers to the customer over time and the same method would be used to measure the entity's progress toward complete satisfaction of the performance obligation to transfer each unit to the customer, we would then apply the series guidance to account for the multiple products as a single performance obligation. Hence, the entire contract is accounted for as one performance obligation. An example of these performance obligations include refinery valves or actuation components and sub-systems. Less commonly, however, we may promise to provide distinct goods or services within the over-time revenue recognition contract, in which case we separate the contract into more than one performance obligation. For all contracts with multiple performance obligations, we allocate the contract's transaction price to each performance obligation using our best estimate of the standalone selling price of each distinct good or service in the contract. Generally, the contractually stated price is the primary method used to estimate standalone selling price as the good or service is sold separately in similar circumstances and to similar customers for a similar price and discounts are allocated proportionally to each performance obligation. The Company will not adjust the promised amount of consideration for the effects of a significant financing component as we expect, at contract inception, that the period between when the transfer of control to our customers and when the customer fully pays for the related performance obligations will be less than a year.

The majority of our revenue recognized over-time is related to our Refinery Valves business within our Energy segment and certain other businesses that sell customized products to customers that serve the U.S. Department of Defense within our Aerospace & Defense segment and have contract provisions guaranteeing us costs and profit upon customer cancellation. Revenue is recognized over-time using an input measure (e.g., costs incurred to date relative to total estimated costs at completion, known as the “cost-to-cost” method) to measure progress. We generally use the cost-to-cost measure of progress for our contracts because it best depicts the transfer of control to the customer which occurs as we incur costs on our contracts. Under the cost-to-cost measure of progress, revenues are recorded proportionally as costs are incurred. Contract costs include labor, materials and subcontractors’ costs, other direct costs and an allocation of overhead, as appropriate.

On December 31, 2018 , we had $526.9 million of revenue related to remaining performance obligations. We expect to recognize approximately 85 percent of our remaining performance obligations as revenue during 2019 and 15 percent in 2020 and thereafter.

Contract Balances. The timing of revenue recognition, billings and cash collections results in billed accounts receivable, unbilled receivables (contract assets), and customer advances and deposits (contract liabilities) on the consolidated balance sheet. Contract assets include unbilled amounts typically resulting from over-time contracts when the cost-to-cost method of revenue recognition is utilized and revenue recognized exceeds the amount billed to the customer, and right to payment is not just subject to the passage of time. Amounts may not exceed their net realizable value. Contract assets are generally classified as current. Generally, payment terms are based on shipment and billing occurs subsequent to revenue recognition, resulting in contract assets for over-time revenue recognition products. However, we sometimes receive advances or deposits from our customers, before revenue is recognized, resulting in contract liabilities. Contract liabilities are generally classified as current. These assets and liabilities are reported net on the consolidated balance sheet on a contract-by-contract basis at the end of each reporting period. Consistent with historical practice, we elected to expense the incremental costs of obtaining a contract when the amortization period for such contracts would have been one year or less.

In order to determine revenue recognized in the period from contract liabilities, we first allocate revenue to the individual contract liabilities balances outstanding at the beginning of the period until the revenue exceeds that balance. If additional advances are received on those contracts in subsequent periods, we assume all revenue recognized in the reporting period first applies to the beginning contract liabilities as opposed to a portion applying to the new advances for the period.

The opening and closing balances of the Company’s contract assets and contract liabilities balances as of January 1, 2018 and December 31, 2018, respectively, are as follows (in thousands):

	December 31, 2018	January 1, 2018	Increase/(Decrease)
Trade accounts receivables, net	183,552	223,922	(40,370)
Contract assets (1)	61,618	12,024	49,594
Contract liabilities (2)	49,725	37,630	12,095

(1) Recorded within prepaid expenses and other current assets.

(2) Recorded within accrued expenses and other current liabilities

The difference in the opening and closing balances of the contract assets and contract liabilities primarily result from the timing difference between the Company’s performance and the customer’s payment.

Trade account receivables, net decreased $40.4 million, or 18%, to $183.6 million as of December 31, 2018, primarily driven by cash collections during the twelve months ended December 31, 2018.

Contract assets increased $49.6 million, or 412%, to 61.6 million as of December 31, 2018, primarily related to unbilled revenue recognized during the twelve months ended December 31, 2018 within our Engineered Valves business (+122%), Refinery Valves business (+96%), Fluid Control business (+29%), North American Valves business (+26%), and U.S. Defense business (+19%).

Contract liabilities increased $12.1 million, or 32%, to $49.7 million as of December 31, 2018, primarily driven by revenue recognized over time during the twelve months ended December 31, 2018 within our U.S. Defense Business (+19%), Fluid Control business (+9%), and Refinery Valves business (+8%).

Contract Estimates. Accounting for over-time contracts requires reliable estimates in order to estimate total contract revenue and costs. For these contracts, we have a Company-wide standard and disciplined quarterly Estimate at Completion

("EAC") process in which management reviews the progress and execution of our performance obligations. As part of this process, management reviews information including, but not limited to, any outstanding key contract matters, progress towards completion and the related program schedule, identified risks and opportunities and the related changes in estimates of revenues and costs. The risks and opportunities include management's judgment about the ability and cost to achieve the delivery schedule (e.g., the timing of shipments), technical requirements (e.g., a highly engineered product requiring sub-contractors) and other contract requirements. Management must make assumptions and estimates regarding labor productivity and availability, the complexity of the work to be performed, the availability of materials, the length of time to complete the performance obligation (e.g. to estimate increases in wages and prices for materials and related support cost allocations), execution by our subcontractors, the availability and timing of funding from our customer and overhead cost rates, among other variables. Based on all of these factors, we estimate the profit on a contract as the difference between the total estimated revenue and EAC costs and recognize the resultant profit over the life of the contract, using the cost-to-cost EAC input method to measure progress.

The nature of our contracts gives rise to several types of variable consideration, including penalties. We include in our contract estimates a reduction to revenue for customer agreements, primarily in our large projects business, which contain late shipment penalty clauses whereby we are contractually obligated to pay consideration to our customers if we do not meet specified shipment dates. We generally estimate the variable consideration at the most likely amount to which the customer expects to be entitled. We include estimated amounts in the transaction price to the extent it is probable that a significant reversal of cumulative revenue recognized will not occur when the uncertainty associated with the variable consideration is resolved. The variable consideration for estimated penalties is based on several factors including historical customer settlement experience, contractual penalty percentages, and facts surrounding the late shipment. Accruals related to these potential late shipment penalties as of December 31, 2018 and 2017 were $3.5 million and $2.4 million, respectively.

A change in one or more of these estimates could affect the profitability of our contracts. We review and update our contract-related estimates regularly. We recognize adjustments in estimated profit on contracts under the cumulative catch-up method. Under this method, the impact of the adjustment on profit recorded to date is recognized in the period the adjustment is identified. Revenue and profit in future periods of contract performance is recognized using the adjusted estimate. If at any time the estimate of contract profitability indicates an anticipated loss on the contract, we recognize the total loss in the quarter it is identified.

The impact of adjustments in contract estimates on our operating earnings can be reflected in either operating expenses or revenue. There were no significant changes in estimates in the three months ended December 31, 2018.

Disaggregation of Revenue. The following tables presents our revenue disaggregated by major product line and geographical market (in millions):

	December 31, 2018 Twelve Months Ended
Energy Segment	
Oil & Gas - Upstream, Midstream & Other	$ 230.1
Oil & Gas - Downstream	221.1
Total	451.2
Aerospace & Defense Segment	
Commercial Aerospace & Other	105.9
Defense	131.1
Total	237.0
Industrial Segment	
Valves	117.5
Pumps	370.1
Total	487.6
Net Revenue	$ 1,175.8

		December 31, 2018
		Twelve Months Ended
Energy Segment		
EMEA	$	115.0
North America		271.0
Other		65.3
Total		451.3
Aerospace & Defense Segment		
EMEA	$	65.6
North America		149.0
Other		22.4
Total		237.0
Industrial Segment		
EMEA	$	238.2
North America		151.0
Other		98.3
Total		487.5
Net Revenue	$	1,175.8

(4) Business Acquisitions

Fluid Handling

On September 24, 2017, CIRCOR entered into a Purchase Agreement (the "Purchase Agreement") with Colfax Corporation ("Colfax"). Pursuant to the Purchase Agreement, on December 11, 2017, the Company acquired the fluid handling business of Colfax ("FH") for consideration consisting of $542.0 million in cash, 3,283,424 unregistered shares of the Company's common stock, with a fair value of approximately $140.0 million at closing, and the assumption of net pension and post-retirement liabilities of FH. The Company financed the cash consideration through a combination of committed debt financing and cash on hand. During the second quarter of 2018, the shares were registered and sold with all proceeds going to Colfax.

FH is a leader in the engineering, development, manufacturing, distribution, service and support of fluid handling systems. With a history dating back to 1860, FH is a leading supplier of screw pumps for high demand, severe service applications across a range of markets including general industry, commercial marine, defense, and oil & gas. FH leverages differentiated technology, and provides critical aftermarket customer support, to maintain leading positions in high demand niche markets.

Effective January 1, 2018, the operating results of FH have been split between each of our operating segments, Energy, Aerospace & Defense, and Industrial based upon the end markets of the sub-businesses within FH.

The purchase price allocation is based upon a valuation of assets and liabilities that was prepared with assistance from a third party valuation specialist. The purchase accounting was finalized in the fourth quarter of 2018.

During 2018, the Company paid Colfax approximately $2.6 million pursuant to a transition services agreement which facilitated the orderly separation of the Fluid Handling business from Colfax. Colfax was a significant shareholder of the Company during the first six months of 2018.

The following table summarizes the preliminary fair value of the assets acquired and the liabilities assumed, as of December 31, 2017 and the final valuation as of December 31, 2018:

(in thousands)	December 31, 2017		December 31, 2018
	Twelve Months Ended	Measurement Period Adjustment	Twelve Months Ended
Cash and cash equivalents (a)	$ 63,403	$ —	$ 63,403
Restricted cash (a)	1,911	—	1,911
Accounts receivable	77,970	(2,128)	75,842
Inventory	79,329	(402)	78,927
Prepaid expenses and other current assets	16,937	(1,348)	15,589
Property, plant and equipment	115,891	5,033	120,924
Identifiable intangible assets	388,000	(3,000)	385,000
Other assets	338	586	924
Accounts payable	(46,045)	20	(46,025)
Cash payable to seller (a)	(65,314)	—	(65,314)
Accrued and other expenses	(63,115)	(9,273)	(72,388)
Long-term post-retirement liabilities	(143,067)	2,600	(140,467)
Other long-term liabilities	(11,215)	—	(11,215)
Deferred tax liabilities	(4,479)	(10,366)	(14,845)
Total identifiable net assets	$ 410,544	$ (18,278)	$ 392,266
Goodwill	293,344	8,195	301,539
Total purchase price	$ 703,888	$ (10,083)	$ 693,805
Consideration			
Base purchase price	542,000	—	542,000
Net working capital and other purchase accounting adjustments	18,121	(6,300)	11,821
Common Stock	143,767	(3,783)	139,984
Total	$ 703,888	$ (10,083)	$ 693,805

(a) Cash acquired and returned to seller by the second quarter of 2018, net of fx impact of $2.3 million and cash withheld to pay Colfax obligations to foreign taxing authorities of $1.8 million.

As illustrated in the table above, during the measurement period we identified certain uncollectible account receivable balances, unsubstantiated prepaid and other assets, certain existence or valuation adjustments to inventory amounts, revised valuation of property, plant, and equipment from our third party specialists, revised valuation of intangibles from our third party specialists, and accrual adjustments primarily relating to a loss contract for which we needed to establish a liability in purchase accounting. Additionally, we settled customary working capital adjustments ($11.8 million) with Colfax.

The excess of purchase price paid over the fair value of FH's net assets was recorded to goodwill, which is primarily attributable to projected future profitable growth, market penetration, as well as an expanded customer base for the acquired businesses. As of December 31, 2018, approximately 65.5% of goodwill is projected to be deductible for income tax purposes.

The FH acquisition resulted in the preliminary identification of the following identifiable intangible assets (in thousands):

	Original Estimate	Measurement Period Adjustment	Fair Value	Weighted average amortization period (in years)
Customer relationships	$ 215,000	$ —	$ 215,000	19
Acquired technologies	107,000	6,000	113,000	20
Trade names	44,000	(3,000)	41,000	Indefinite-life
Backlog	22,000	(6,000)	16,000	4
Total intangible assets	$ 388,000	$ (3,000)	$ 385,000	

During the measurement period, with the help of third party specialists, we adjusted the fair value of the acquired FH intangibles based upon better information regarding discount rates, royalty rates, and more detailed business unit forecasts that was determinable at the time of acquisition. The revised fair value of acquired FH intangibles have been recorded against our FH opening balance sheet during 2018.

The fair value of the intangible assets was based on variations of the income approach, which estimates fair value based on the present value of cash flows that the assets are expected to generate. These approaches included the relief-from-royalty method and multi-period excess earnings method, depending on the intangible asset being valued. Customer relationships, backlog, and existing technology are amortized on a cash flow basis which reflects the economic benefit consumed. The trade name was assigned an indefinite life based on the Company's intention to keep the trade names for an indefinite period of time. Refer to Note 8, Goodwill and Intangibles, net for future expected amortization to be recorded.

The results of operations of FH have been included in our consolidated financial statements beginning on the acquisition date and reported within the Fluid Handling segment, with the exception of the U.S. Defense business which is reported in the Aerospace & Defense segment and Reliability Services business which is reported in the Energy segment. The consolidated results for the year ended December 31, 2018 include $484.8 million of net revenue and $6.1 million operating loss. The results for the year ended December 31, 2017 include $36.5 million of net revenue and a $1.1 million operating loss.

The following unaudited pro forma information presents the combined results of operations as if the acquisition had been completed on January 1, 2016, the beginning of the comparable prior annual reporting period. The unaudited pro forma results include: (i) amortization associated with preliminary estimates for the acquired intangible assets; (ii) interest expense on borrowings in connection with the acquisition; (iii) the associated tax impact on these unaudited pro forma adjustments; and the transaction costs presented in the earliest period (2016).

The unaudited pro forma results do not reflect any cost saving synergies from operating efficiencies or the effect of the incremental costs incurred in integrating the two companies. Accordingly, these unaudited pro forma results are presented for informational purposes only and are not necessarily indicative of what the actual results of operations of the combined company would have been if the acquisition had occurred at the beginning of the period presented, nor are they indicative of future results of operations (in thousands):

(Unaudited)	Year ended December 31, 2017	Year ended December 31, 2016
Net Revenues	$ 1,098,978	$ 1,052,277
Net Income	$ (6,475)	$ (51,288)

CFS Acquisition

On October 12, 2016, the Company entered into an Agreement and Plan of Merger (the "Merger Agreement") by and among the Company, Downstream Holding, LLC, a Delaware limited liability company which does business as Critical Flow Solutions ("Downstream" or "CFS"), Downstream Acquisition LLC, a Delaware limited liability company and subsidiary of the Company, and Sun Downstream, LP, a Delaware limited partnership, to acquire all of the outstanding units of Downstream.

The consideration payable by the Company pursuant to the terms of the Merger Agreement was $195.0 million, subject to (i) up to an additional $15.0 million payable pursuant to an earn-out relating to achievement of a specified order bookings target by the acquired business in the twelve month period ending September 30, 2017, (ii) increase or decrease based on deviation, subject to certain limitations, from a working capital target, (iii) decrease for indebtedness and certain transaction expenses of

CFS, (iv) increase for the amount of CFS cash as of the closing, and (v) a potential increase for certain transaction related tax benefits, net of certain adjustments, if and when realized by the Company. The total consideration paid at closing on October 13, 2016 was approximately $198.0 million in cash, net of cash acquired and including amounts paid at closing for estimated adjustments for CFS working capital, the repayment of CFS outstanding indebtedness and payment of certain transaction expenses. The Company funded the purchase price and payments at closing from borrowings under the Company's existing credit agreement.

The estimated fair value of the earn-out, using the Monte Carlo simulation model, was $12.2 million as of the acquisition date and December 31, 2016. The Monte Carlo model calculates the probability of satisfying the target conditions stipulated in the earn-out. Based on actual performance through the earn-out period ending September 30, 2017, the specified order bookings target in the specified timeframe was not achieved, as project bookings shifted out to the future. Accordingly, the actual achievement resulted in an earn-out of zero as of October 1, 2017. The fair value of the earn-out decreased $12.2 million during the year ended December 31, 2017 and was recorded within Special and restructuring charges (recoveries), net as a gain.

The Company received $1.5 million as settlement for working capital adjustments during 2017. This reduction of purchase price was recorded as a reduction of goodwill.

The operating results of CFS have been included in our consolidated financial statements from the date of acquisition and reported within the Energy segment.

The purchase price allocation is based upon a valuation of assets and liabilities that was prepared with assistance from a third party valuation specialist. The assets and liabilities include the valuation of acquired intangible assets, certain operating liabilities, and the evaluation of deferred income taxes. The purchase accounting was finalized during the third quarter of 2017.

The following table summarizes the fair value of the assets acquired and the liabilities assumed, at the date of acquisition:

(in thousands)		
Cash and cash equivalents	$	6,603
Accounts receivable		28,128
Unbilled receivable		10,786
Inventory		18,701
Prepaid and other current assets		5,671
Property, plant and equipment		21,214
Identifiable intangible assets		101,600
Accounts payable		(11,655)
Accrued and other expenses		(8,866)
Deferred revenue		(3,997)
Deferred income taxes		(40,645)
Long term income tax payable		(556)
Total identifiable net assets	$	126,984
Goodwill		89,473
Total purchase price	$	216,457

The fair value of accounts receivable acquired approximates the contractual value of $28.1 million. The excess of purchase price paid over the fair value of CFS' net assets was recorded to goodwill, which is primarily attributable to projected future profitable growth, market penetration, as well as an expanded customer base for the Energy segment. Goodwill is not deductible for income tax purposes.

The CFS acquisition resulted in the identification of the following identifiable intangible assets:

	Intangible assets acquired (in thousands)	Weighted average amortization period (in years)
Customer relationships	$ 49,600	14
Existing technologies	25,800	10
Trade names	24,100	Indefinite
Backlog	2,100	1
Total intangible assets	$ 101,600	

The fair value of the intangible assets was based on variations of the income approach, which estimates fair value based on the present value of cash flows that the assets are expected to generate. These approaches included the relief-from-royalty method, incremental cash flow method, multi-period excess earnings method and direct cash flow method, depending on the intangible asset being valued. Customer relationships, aftermarket backlog, and existing technology are amortized on a cash flow basis which reflects the economic benefit consumed. The trade name was assigned an indefinite life based on the Company's intention to keep the DeltaValve and TapcoEnpro names for an indefinite period of time. Refer to Note 8, Goodwill and Other Intangible Assets, for future expected amortization to be recorded.

(5) Special and Restructuring charges, net

Special and Restructuring Charges, net

Special and restructuring charges, net consist of restructuring costs (including costs to exit a product line or program) as well as certain special charges such as significant litigation settlements and other transactions (charges or recoveries) that are described below. All items described below are recorded in Special and restructuring charges, net on our consolidated statements of income. Certain other special and restructuring charges such as inventory related items may be recorded in cost of revenues given the nature of the item.

The table below (in thousands) summarizes the amounts recorded within the special and restructuring charges, net line item on the consolidated statements of income for the periods ending December 31, 2018, 2017, and 2016:

	Special & Restructuring Charges, net		
	For the year ended December 31,		
	2018	2017	2016
Special charges, net	$ 11,087	$ 7,989	$ 8,196
Restructuring charges, net	12,752	6,062	8,975
Total special and restructuring charges, net	$ 23,839	$ 14,051	$ 17,171

Special Charges, net

The table below (in thousands) outlines the special charges, net recorded for the year ending December 31, 2018:

	Special Charges, net				
	For the year ended December 31, 2018				
	Energy	Aerospace & Defense	Industrial	Corporate	Total
Brazil closure	$ 921	$ —	$ —	$ —	$ 921
R.S. Divestiture related charges	—	—	—	2,165	2,165
Rosscor Divestiture related charges	—	—	1,888	—	1,888
Acquisition related charges	—	—	—	6,113	6,113
Total special charges, net	$ 921	$ —	$ 1,888	$ 8,278	$ 11,087

Brazil Closure: On November 3, 2015, our Board of Directors approved the closure and exit of our Brazil manufacturing operations due to the economic realities in Brazil and the ongoing challenges with our only significant end customer, Petrobras.
CIRCOR Brazil reported substantial operating losses every year since it was acquired in 2011 while the underlying market

conditions and outlook deteriorated. In connection with the closure, we recorded $0.9 million of charges within the Energy segment during the twelve months ended December 31, 2018, respectively, which relates to losses incurred subsequent to our closure of manufacturing operations during the first quarter of 2016.

Reliability Services Divestiture: In January 2019, the Company announced the sale of its Reliability Services ("RS") business. In connection with the divestiture, we incurred $2.2 million of transaction costs that were accrued during the fourth quarter of 2018. Refer to Note 19, "Subsequent Event" for additional disclosure.

Rosscor Divestiture: On November 6, 2018, we announced the divestiture of our Rosscor B.V. and SES International B.V. subsidiaries (the “Delden Business”) for a nominal amount. The Delden Business was our Netherlands-based fluid handling skids and systems business, primarily for the Oil and Gas end market. We maintain a 19.9% interest in the Delden Business, which is not material to our financial statements, as well as the intellectual property rights to our two-screw pump product line. In addition, we entered into a supply agreement allowing us to continue to supply two-screw pumps on a contract-by-contract basis. The Delden Business was reported as part of the Industrial segment. During the fourth quarter of 2018 we recorded a $1.9 million loss on the Rosscor divestiture.

Acquisition related charges: On December 11, 2017, we acquired FH. In connection with our acquisition, we recorded $6.1 million during the twelve months ended December 31, 2018, related to internal costs and external professional fees to separate the FH business from Colfax and integrate the FH business into our legacy structure.

The table below (in thousands) outlines the special charges, net recorded for the year ending December 31, 2017:

	Special Charges, net For the year ended December 31, 2017			
	Energy	**Aerospace & Defense**	**Corporate**	**Total**
Acquisition related charges	54	12	12,995	13,061
Brazil closure	879	—	—	879
Divestitures	—	3,748	101	3,849
Contingent consideration revaluation	(12,200)	—	—	(12,200)
California Legal Settlement	—	2,400	—	2,400
Total special charges, net	$ (11,267)	$ 6,160	$ 13,096	$ 7,989

Acquisition related charges:

- On December 11, 2017, we acquired FH. In connection with our acquisition, we recorded $13.0 million of acquisition related professional fees and debt extinguishment fees during the twelve months ended December 31, 2017.
- On October 12, 2016, we acquired CFS. In connection with our acquisition, we recorded $0.1 million of acquisition related professional fees during the twelve months ended December 31, 2017.

Brazil Closure: In connection with the closure, we recorded $0.9 million of charges within the Energy segment during the year ended December 31, 2017, which relates to losses incurred subsequent to our closure of manufacturing operations during the first quarter of 2016.

Divestiture: On July 7, 2017, we divested our French non-core aerospace build-to-print business within our Advanced Flow Solutions segment as part of our simplification strategy. We considered this business as non-core because the products or services did not fit our strategy and the long-term profitable growth prospects were below our expectations. Divestiture of this non-core business enables us to focus resources on businesses where there is greater opportunity to achieve sales growth, higher margins, and market leadership. We measured the disposal group at its fair value less cost to sell, which was lower than its carrying value, and recorded a $3.8 million charge during the second quarter of 2017. Also, in connection with this disposition we recorded a $1.5 million of severance included as a restructuring charge.

Contingent Consideration Revaluation: The fair value of the earn-out decreased $12.2 million related to the CFS acquisition during the twelve months ended December 31, 2017. The change in fair value during the year ended December 31, 2017 was recorded as a recovery within the special and restructuring charges (recoveries) line on our condensed consolidated statement of income. The actual achievement of the earn-out was zero and the earn-out period expired on September 30, 2017.

California Legal Settlement: We recorded a special charge of $2.4 million during the fourth quarter of 2017 related to settlement of a wage and hour claim in our California Aerospace business. The claim was settled on February 21, 2018. Refer to Note 15, " Contingencies, Commitments and Guarantees" for additional disclosure.

The table below (in thousands) outlines the special charges, net recorded for the year ending December 31, 2016:

	Special Charges, net For the year ended December 31, 2016			
	Energy	Aerospace & Defense	Corporate	Total
Acquisition related charges	—	(161)	978	817
Brazil closure	2,920	—	2	2,922
Pension settlement	—	—	4,457	4,457
Total special charges, net	$ 2,920	$ (161)	$ 5,437	$ 8,196

Acquisition related charges (recoveries) are described below:

- On October 12, 2016, we acquired CFS. In connection with our acquisition, we recorded $1.0 million of acquisition related professional fees for the year ended December 31, 2016.
- On April 15, 2015, we acquired Germany-based Schroedahl. In connection with our acquisition of Schroedahl, we recorded a $0.2 million acquisition related professional fees adjusted for the year ended December 31, 2016.

Brazil Closure: In connection with the closure, we recorded $2.9 million of charges within the Energy segment during the twelve months ended December 31, 2016, which primarily related to employee termination costs and losses incurred subsequent to our closure of manufacturing operations during the first quarter of 2016.

Pension Settlement: During the third quarter of 2016, management offered a lump sum cash payout option to terminated and vested pension plan participants. In connection with this action, the window for participants who opted to avail themselves of this program closed in the fourth quarter of 2016. During the fourth quarter of 2016, we incurred a settlement charge of $4.5 million recorded within the special and restructuring charges, net line item.

Restructuring Charges, net

The tables below (in thousands) outline the charges (or any recoveries) associated with restructuring actions recorded for the year ending December 31, 2018, 2017, and 2016. A description of the restructuring actions is provided in the section titled "Restructuring Programs Summary" below.

	Restructuring Charges / (Recoveries) As of and for the year ended December 31, 2018			
	Energy	Aerospace & Defense	Industrial	Total
Facility related expenses	$ 2,827	$ 190	$ —	$ 3,017
Employee related expenses	7,738	436	1,561	9,735
Total restructuring charges, net	$ 10,565	$ 626	$ 1,561	$ 12,752

Accrued restructuring charges as of December 31, 2017	$ 1,586
Total year to date charges, net (shown above)	12,752
Charges paid / settled, net	(13,356)
Accrued restructuring charges as of December 31, 2018	$ 982

We expect to make payment or settle the majority of the restructuring charges accrued as of December 31, 2018 during the first half of 2019.

	Restructuring Charges / (Recoveries) As of and for the year ended December 31, 2017					
	Energy		Aerospace & Defense		Total	
Facility related expenses	$	2,523	$	443	$	2,966
Employee related expenses		1,035		2,062		3,097
Total restructuring charges, net	$	3,558	$	2,505	$	6,063

Accrued restructuring charges as of December 31, 2016		$	1,618
Total year to date charges, net (shown above)			6,063
Charges paid / settled, net			(6,095)
Accrued restructuring charges as of December 31, 2017	1,586	$	1,586

	Restructuring Charges / (Recoveries) As of and for the year ended December 31, 2016							
	Energy		Aerospace & Defense		Corporate		Total	
Facility related expenses	$	792	$	3,701	$	—	$	4,493
Employee related expenses		2,393		2,089		—		4,482
Total restructuring charges, net	$	3,185	$	5,790	$	—	$	8,975

Accrued restructuring charges as of December 31, 2015	$	663
Total year to date charges, net (shown above)		8,975
Charges paid / settled, net		(8,020)
Accrued restructuring charges as of December 31, 2016	$	1,618

Restructuring Programs Summary

As specific restructuring programs are announced, the amounts associated with that particular action may be recorded in periods other than when announced to comply with the applicable accounting rules. For example, total cost associated with 2017 Actions (as discussed below) were recorded in 2017 and 2018. The amounts shown below reflect the total cost for that restructuring program.

During 2018, 2017, and 2016 we initiated certain restructuring activities, under which we continued to simplify our business ("2018 Actions", "2017 Actions", "2016 Actions", respectively). Under these restructurings, we reduced expenses, primarily through reductions in force and closing a number of smaller facilities. Charges associated with the 2018 Actions were recorded during 2018. Charges associated with the 2017 Actions and 2016 Actions were finalized in 2017.

	2018 Actions Restructuring Charges, net as of December 31, 2018							
	Energy		Aerospace & Defense		Industrial		Total	
Facility related expenses - incurred to date	$	2,187	$	—	$	—	$	2,187
Employee related expenses - incurred to date		7,631		382		1,536		9,549
Total restructuring related special charges - incurred to date	$	9,818	$	382	$	1,536	$	11,736

$1.0 million of the 2018 actions has not yet been paid as of December 31, 2018. We expect to finalize the 2018 actions during the first quarter of 2019.

	2017 Actions Restructuring Charges (Recoveries), net as of December 31, 2018		
	Energy	Aerospace & Defense	Total
Facility related expenses - incurred to date	$ —	$ 366	$ 366
Employee related expenses - incurred to date	598	1,892	2,490
Total restructuring related special charges - incurred to date	$ 598	$ 2,258	$ 2,856

The 2017 action was finalized during 2017. No remaining cash payments for these actions.

	2016 Actions Restructuring Charges / (Recoveries), net as of December 31, 2018		
	Energy	Aerospace & Defense	Total
Facility related expenses - incurred to date	$ 708	$ 94	$ 802
Employee related expenses - incurred to date	2,476	1,181	3,657
Total restructuring related special charges - incurred to date	$ 3,184	$ 1,275	$ 4,459

In July 2015, we announced the closure of one of the two Corona, California manufacturing facilities ("California Restructuring"). Under this restructuring, we are reducing certain general, manufacturing and facility related expenses. Charges with this action were finalized in the fourth quarter of 2016. No remaining cash payments for these actions.

	California Restructuring Charges, net as of December 31, 2017
	Aerospace & Defense
Facility related expenses - incurred to date	$ 3,700
Employee related expenses - incurred to date	800
Total restructuring related special charges - incurred to date	$ 4,500

Additional Restructuring Charges

In conjunction with the restructuring actions noted above, we incur certain costs, primarily related to inventory, that are recorded in cost of revenues instead of special and restructuring charges. These types of inventory restructuring costs typically relate to the discontinuance of a product line or manufacturing inefficiencies directly related to the restructuring action. Such restructuring-related amounts totaled $2.4 million, $0.0 million, and $2.8 million, for the years ending December 31, 2018, 2017 and 2016, respectively, and are described further below.

During the twelve months ended December 31, 2018, we recorded $2.4 million of inventory related restructuring charges within our Energy segment for restructuring actions with our Reliability Services, Engineered Valves, and Distributed Valves businesses.

During the first and fourth quarters of 2016, in connection with the restructuring of certain structural landing gear product lines, we recorded inventory related charges of less than $0.1 million, and $0.8 million respectively, within the Aerospace & Defense segment.

During the first and second quarters of 2016, we recorded restructuring related inventory of $1.9 million and $0.1 million respectively, associated with the closure of manufacturing operations and the exit of the gate, globe and check valves product line in Brazil. As of December 31, 2017, no inventory amounts remain on our balance sheet for the gate, globe, and check valves product line.

(6) Inventories

Inventories consisted of the following (in thousands):

	December 31, 2018	December 31, 2017
Raw materials	$ 69,910	$ 82,372
Work in process	116,088	121,709
Finished goods	31,380	40,815
Inventories	$ 217,378	$ 244,896

We regularly review inventory quantities on hand and record a provision to write-down excess and obsolete inventory to its estimated net realizable value, if less than cost, based primarily on our estimated forecast of product demand. Once our inventory value is written-down a new cost basis has been established. For 2018, 2017 and 2016, our charges for acquisition inventory step-up amortization, excess and obsolete inventory and net realizable value reserves totaled $11.5 million, $7.3 million and $9.3 million respectively.

(7) Property, Plant and Equipment

Property, plant and equipment consisted of the following (in thousands):

	December 31, 2018	December 31, 2017
Land	$ 32,849	$ 33,428
Buildings and improvements	96,241	101,016
Manufacturing machinery and equipment	176,167	196,939
Computer equipment and software	38,500	31,204
Furniture and fixtures	28,846	12,526
Vehicles	467	1,118
Construction in progress	21,323	18,787
Property, plant and equipment, at cost	394,393	395,018
Less: Accumulated depreciation	(192,594)	(177,479)
Property, plant and equipment, at cost, net	$ 201,799	$ 217,539

Depreciation expense for the years ended December 31, 2018 (including $1.0 million related to assets held for sale), 2017, and 2016 was $28.8 million, $15.3 million, and $13.3 million, respectively. The December 31, 2018 net balance excludes $5.6 million related to Reliability Services held for sale assets and $0.9 million related to the divestiture of the Rosscor business.

The Company recorded additions to property, plant and equipment of $1.5 million in each of the years ended December 31, 2018 and December 31, 2017, for which cash payments had not yet been made.

(8) Goodwill and Other Intangible Assets

The following table shows goodwill by segment as of December 31, 2018 and 2017 (in thousands):

	Energy	Aerospace & Defense	Industrial	Consolidated Total
Goodwill as of December 31, 2017	$ 154,058	$ 62,548	$ 289,156	$ 505,762
Measurement period adjustments related to acquisition	(4,742)	(5,046)	17,984	8,196
Business divestiture	—	—	(3,394)	(3,394)
Held for sale	(40,372)	—	—	(40,372)
Currency translation adjustments	(4,072)	(84)	(6,831)	(10,987)
Goodwill as of December 31, 2018	$ 104,872	$ 57,418	$ 296,915	$ 459,205

In January 2019, the Company announced the sale of its Reliability Services business. The RS business is collapsed as "held for sale" with the current assets and current liabilities section of our balance sheet. Refer to Note 19, Subsequent Events, for further details.

	Energy	Aerospace & Defense	Industrial	Consolidated Total
Goodwill as of December 31, 2016	$ 144,405	$ 18,459	$ 43,795	$ 206,659
Business acquisition (1)	6,944	43,900	238,744	289,588
Currency translation adjustments	2,709	189	6,617	9,515
Goodwill as of December 31, 2017	$ 154,058	$ 62,548	$ 289,156	$ 505,762

(1) The activity in the Energy segment relates to settlement of escrow amounts and tax amounts.

No goodwill impairments were recorded during the twelve months ended December 31, 2018 or 2017. Historical accumulated goodwill impairments were immaterial.

The tables below present gross intangible assets and the related accumulated amortization (in thousands):

	December 31, 2018		
	Gross Carrying Amount	Accumulated Amortization	Net Carrying Value
Patents	$ 5,399	$ (5,399)	$ —
Customer relationships	307,593	(57,822)	249,771
Order backlog	23,354	(18,746)	4,608
Acquired technology	133,246	(23,882)	109,364
Other	5,065	(4,661)	404
Total Amortized Assets	$ 474,657	$ (110,510)	$ 364,147
Non-amortized intangibles (primarily trademarks and trade names)	$ 77,155	$ —	$ 77,155
Total Non-Amortized Intangibles	$ 77,155	$ —	$ 77,155
Net Carrying Value of Intangible assets	$ 441,302		

	December 31, 2017		
	Gross Carrying Amount	Accumulated Amortization	Net Carrying Value
Patents	$ 5,399	$ (5,399)	$ —
Customer relationships	320,015	(41,471)	278,544
Order backlog	29,650	(8,850)	20,800
Acquired technology	135,360	(5,687)	129,673
Other	5,372	(4,897)	475
Total Amortized Assets	$ 495,796	$ (66,304)	$ 429,492
Non-amortized intangibles (primarily trademarks and trade names)	$ 83,872	$ —	$ 83,872
Total Non-Amortized Intangibles	$ 83,872	$ —	$ 83,872
Net Carrying Value of Intangible assets	$ 513,364		

The table below presents estimated future amortization expense for intangible assets recorded as of December 31, 2018 (in thousands):

	2019	2020	2021	2022	2023	After 2024
Estimated amortization expense	$ 47,564	$ 43,889	$ 42,136	$ 37,069	$ 32,495	$ 160,994

The annual impairment testing of our non-amortized intangible assets was completed as of October 28, 2018 and consisted of a comparison of the fair value of the intangible assets with carrying amounts. No impairments of our non-amortized intangible assets were recorded for the year ended December 31, 2018.

(9) Income Taxes

The significant components of our deferred income tax liabilities and assets were as follows (in thousands):

	December 31,	
	2018	2017
Deferred income tax (liabilities):		
Excess tax over book depreciation	$ (6,201)	$ (17,505)
Other	—	(8,507)
Intangible assets	(73,926)	(57,968)
Total deferred income tax liabilities	(80,127)	(83,980)
Deferred income tax assets:		
Accrued expenses	15,752	6,956
Equity compensation	4,760	4,622
Inventories	5,843	8,405
Net operating loss and state credit carry-forward	14,342	16,698
Foreign tax credit carryforward	16,750	16,602
Pension benefit obligation	29,400	46,030
Other	5,372	2,946
Total deferred income tax assets	92,219	102,259
Valuation allowance	(17,562)	(22,067)
Deferred income tax asset, net of valuation allowance	74,657	80,192
Deferred income tax (liability)/asset, net	$ (5,470)	$ (3,788)

The deferred income taxes by classification were as follows:

	December 31,	
	2018	2017
Long-term deferred income tax asset, net	$ 28,462	$ 22,334
Long-term deferred income tax liability, net	(33,932)	(26,122)
Deferred income tax (liability)/asset, net	$ (5,470)	$ (3,788)

The (benefit from) provision for income taxes is based on the following pre-tax income (in thousands):

	Year Ended December 31,		
	2018	2017	2016
Domestic	$ (66,330)	$ 4,946	$ (16,766)
Foreign	30,236	1,167	26,446
Income before income taxes	$ (36,094)	$ 6,113	$ 9,680

The provision for income taxes consisted of the following (in thousands):

	Year Ended December 31,		
	2018	2017	2016
Current provision:			
Federal - U.S.	$ —	$ (447)	$ (232)
Foreign	7,553	2,762	10,823
State -U.S.	235	442	(275)
Total current	$ 7,788	$ 2,757	$ 10,316
Deferred provision (benefit):			
Federal - U.S.	$ (1,510)	$ (3,406)	$ (8,992)
Foreign	(1,323)	(4,640)	(3,328)
State -U.S.	(1,665)	(388)	1,583
Total (benefit) deferred	$ (4,498)	$ (8,434)	$ (10,737)
Total (benefit) provision for income taxes	$ 3,290	$ (5,676)	$ (421)

Actual income taxes reported from operations were different from those that would have been computed by applying the federal statutory tax rate to income before income taxes. The expense for income taxes differed from the U.S. statutory rate due to the following:

	Year Ended December 31,		
	2018	2017	2016
Expected federal income tax rate	21.0 %	35.0 %	35.0 %
State income taxes, net of federal tax benefit	3.1	0.3	(4.8)
Change in valuation allowance on state net operating losses	—	—	18.9
Foreign tax rate differential	4.7	(38.9)	(38.4)
Unbenefited foreign losses	(4.7)	2.9	14.7
Foreign tax credits	—	—	(26.6)
Manufacturing deduction	—	(2.8)	—
GILTI	(5.5)	—	—
Research and development credit	3.3	(8.4)	(6.6)
Transaction costs	1.4	8.5	3.1
Release of contingent consideration	—	(69.9)	—
Provisional Impact of Tax Cuts and Jobs Act	(30.2)	(8.2)	—
Change in tax reserves	1.8	(16.3)	(0.5)
Equity Compensation	(2.8)	(1.6)	—
Other, net	(1.2)	6.5	0.8
Effective tax rate	(9.1)%	(92.9)%	(4.4)%

As of December 31, 2018 and 2017, the Company maintained a total valuation allowance of $17.6 million and $22.1 million, respectively, which relates to foreign, federal, and state deferred tax assets as of December 31, 2018 and foreign and state deferred tax assets as December 31, 2017. The valuation allowance is based on estimates of taxable income in each of the jurisdictions in which we operate and the period over which our deferred tax assets will be recoverable. The movement in the valuation allowance is primarily due to the increase in the valuation allowance on foreign tax credit carryforwards, offset by the finalization of purchase accounting and its impact on the valuation allowance related to certain deferred tax assets in relation to the FH acquisition.

The following table provides a summary of the changes in the deferred tax valuation allowance for the years ended December 31, 2018, 2017, and 2016 (in thousands):

	December 31,		
	2018	2017	2016
Deferred tax valuation allowance at January 1	$ 22,067	$ 3,028	$ 892
Additions	10,960	712	2,257
Acquired	(15,431)	18,494	—
Deductions	(34)	(167)	(121)
Translation adjustments		—	—
Deferred tax valuation allowance at December 31	$ 17,562	$ 22,067	$ 3,028

The Company files income tax returns in the U.S. federal, state and local jurisdictions and in foreign jurisdictions. The Company is no longer subject to examination by the Internal Revenue Service ("IRS") for years prior to 2015 and is no longer subject to examination by the tax authorities in foreign and state jurisdictions prior to 2006, with the exception of net operating loss carryforwards. The Company is currently under examination for income tax filings in various foreign jurisdictions.

As of December 31, 2018, the Company had foreign tax credits of $16.7 million, foreign net operating losses of $37.3 million, federal net operating losses of $3.0 million, state net operating losses of $70.0 million and state tax credits of $2.4 million. As of December 31, 2017, the Company had foreign tax credits of $16.4 million, foreign net operating losses of $45.6 million, state net operating losses of $56.3 million and state tax credits of $2.2 million. The foreign tax credits, if not utilized, will expire in 2026. A portion of the foreign net operating losses ($20.2 million) expire at various dates through 2025; the remainder have an unlimited carryforward period. The federal net operating losses have an unlimited carryforward period. The state net operating losses and state tax credits, if not utilized, will expire at various dates through 2038.

The Company repatriated $32 million of foreign earnings to the U.S. during the fourth quarter of 2016, resulting in a tax benefit of $2.6 million in the year ended December 31, 2016. The tax benefit is a result of foreign tax credits associated with the repatriation, in excess of the U.S. corporate tax rate.

During 2016, the Company recorded a valuation allowance and additional tax expense of $1.8 million on certain state net operating loss carryforwards, due to the uncertainty of the Company's ability to utilize these losses within the foreseeable future. The amount of net operating losses considered realizable, however, could be adjusted if objective evidence in the form of cumulative losses is no longer present and additional weight may be given to subjective evidence such as the Company’s projections for growth.

On December 22, 2017, the U.S. government enacted the Tax Cuts and Jobs Act (the “Tax Act”). The Tax Act includes significant changes to the U.S. corporate income tax system including: a federal corporate rate reduction from 35% to 21%; limitations on the deductibility of interest expense and executive compensation; creation of the base erosion anti-abuse tax (“BEAT”), a new minimum tax; global intangible low-taxed income ("GILTI"); and the transition of U.S. international taxation from a worldwide tax system to a modified territorial tax system. The change to a modified territorial tax system resulted in a one-time U.S. tax liability on those earnings which have not previously been repatriated to the U.S. (the “Transition Tax”), with future distributions not subject to U.S. federal income tax when repatriated. A majority of the provisions in the Tax Act are effective January 1, 2018 and have been reflected in our financial statements. With respect to GILTI, the company has adopted a policy to account for this provision as a period cost.

In response to the Tax Act, the SEC staff issued guidance on accounting for the tax effects of the Tax Act (ASU 2018-05). The guidance provided a one-year measurement period for companies to complete the accounting. The Company has adopted the impact of ASU 2018-05 in our financial statements.

In connection with our initial analysis of the impact of the Tax Act, we had recorded a provisional estimate of $0.5 million net tax benefit for the period ended December 31, 2017. This benefit consists of provisional estimates of zero net expense for the Transition Tax liability, and $0.5 million benefit from the remeasurement of our deferred tax assets/liabilities due to the corporate rate reduction. On a provisional basis, the Company did not expect to owe the one-time Transition Tax liability, based on foreign tax pools that are in excess of U.S. tax rates. We have now finalized our accounting and these estimates did not change. The impact of the Tax Act resulted in a valuation allowance on a portion of our U.S. foreign tax credit carryforwards (deferred tax asset), in the amount of $10.9 million expense which was recorded in 2018.

As of December 31, 2018, the liability for uncertain income tax positions was approximately $0.6 million. Approximately $0.5 million as of December 31, 2018 represents the amount that if recognized would affect the Company's effective income tax rate in future periods. The Company does not expect the unrecognized tax benefits to change over the next 12 months. The table below does not include interest and penalties of $0.0 million and $0.4 million as of December 31, 2018 and 2017, respectively. The following is a reconciliation of the Company's liability for uncertain income tax positions for the years ended December 31, 2018 and 2017 (in thousands).

	December 31,		
	2018	2017	2016
Balance beginning January 1	$ 3,014	$ 3,000	$ 2,937
Additions/(reductions) for tax positions of prior years	(460)	(7)	(102)
Additions/(reductions) based on tax positions related to current year	(340)	(65)	483
Acquired uncertain tax position balance	(512)	1,221	—
Settlements	(1,103)	(338)	—
Lapse of statute of limitations	(6)	(978)	(328)
Currency movement	—	181	10
Balance ending December 31	$ 593	$ 3,014	$ 3,000

Undistributed earnings of our foreign subsidiaries amounted to $259.9 million at December 31, 2018 and $221.3 million at December 31, 2017. The undistributed earnings of our foreign subsidiaries are considered to be indefinitely reinvested and accordingly, no provision for U.S. federal and state income taxes has been recorded. Determination of the amount of unrecognized deferred tax liability on these undistributed earnings is not practicable because of the complexity of laws and regulations, the varying tax treatment of alternative repatriation scenarios, and the variation due to multiple potential assumptions relating to the timing of any future repatriation.

(10) Accrued Expenses and Other Current Liabilities

Accrued expenses and other current liabilities consisted of the following (in thousands):

	December 31,	
	2018	2017
Customer deposits and obligations	$ 31,625	$ 17,661
Commissions payable and sales incentive	7,929	8,891
Penalty accruals	3,455	2,395
Warranty reserve	4,050	4,623
Professional fees	2,992	3,498
Taxes other than income tax	3,405	4,059
Cash due to FH seller	—	64,561
Other Contract Liabilities	14,646	16,057
Income tax payable	3,359	1,785
Other	35,851	39,059
Total accrued expenses and other current liabilities	$ 107,312	$ 162,589

(11) Financing Arrangements

Long-term debt consisted of the following (in thousands):

	December 31, 2018	December 31, 2017
Term Loan at interest rates ranging from 4.93%-5.92% in 2018 and 4.93% in 2017	$ 777,150	$ 785,000
Line of Credit at interest rates ranging from 4.93%-8.00% in 2018 and 4.93% in 2017	29,900	33,900
Total Principal Debt Outstanding	$ 807,050	$ 818,900
Less: Term Loan Debt Issuance Costs	21,013	23,707
Less: Current Portion	7,850	7,865
Total Long-Term Debt, net	$ 778,187	$ 787,343

	2019		2020	2021	2022	2023	Thereafter
Minimum principal payments	$ 7,850	7,850	$ 7,850	$ 7,850	$ 7,850	$ 7,850	$ 737,900

On December 11, 2017, we entered into a secured Credit Agreement (the "Credit Agreement"), which provides for a $150.0 million revolving line of credit with a five year maturity and a $785.0 million term loan with a seven year maturity which was funded at closing of the FH acquisition in full. The Credit Agreement replaced and terminated the Company's prior Credit Agreement, dated as of May 11, 2017 (the "Prior Credit Agreement"). The Prior Credit Agreement, under which we had borrowings of $273.5 million outstanding, was terminated on December 11, 2017 and replaced by the Credit Agreement.

The term loan requires quarterly principal payments of 0.25% of initial aggregate principal amount beginning March 29, 2018 with the balance due at maturity. The Company has mandatory debt repayment obligations of $7.9 million per year ($2.0 million per quarter) until 2024 under the Credit Agreement. Additional loans of up to $150.0 million (plus the amount of certain voluntary prepayments) and an unlimited amount subject to compliance with a first lien net leverage ratio of 4.50 to 1.00 may be made available under the Credit Agreement upon request of the Company subject to specified terms and conditions. The Company may repay any borrowings under the Credit Agreement at any time, subject to certain limited and customary restrictions stated in the Credit Agreement; provided, however, that if the Company prepays all or any portion of the term loan in connection with a repricing transaction on or prior to the 6-month anniversary of the origination date, the Company must pay a prepayment premium of 1.0% of the aggregate principal amount of the term loan so prepaid.

The Company incurred $23.9 million of debt issuance costs associated with the term loan which have been recorded as a debt discount within long-term debt and $5.2 million of fees associated with the revolver were recorded as other assets. In connection with the Prior Credit Agreement, a portion of the term debt was extinguished and $0.2 million of deferred financing costs was written off as a debt extinguishment (included in special charges on the consolidated statements of income) and a portion was tested as a modification ($0.1 million) and rolled into the new debt discount. In connection with the Prior Credit Agreement revolving facility, $1.6 million of deferred financing fees was written off as debt extinguishment and $0.6 million was rolled into the Credit Agreement (included in other assets) based on the borrowing capacity of the underlying banks.
As of December 31, 2018, we had borrowings of $807.1 million outstanding under the Credit Agreement and $35.6 million in letters of credit issued under the Credit Agreement. The Company recorded non-cash interest expense of $3.9 million, $0.8 million, and $0.4 million for December 31, 2018, 2017, and 2016, respectively, related to the amortization of its deferred financing costs described above. The Credit Agreement revolving line of credit facility matures on December 11, 2022 whereas the term loan facility matures on December 11, 2024.

The outstanding principal amounts bear interest at a fluctuating rate (generally the 30 day LIBOR rate) per annum plus an applicable margin of 3.50% with respect to LIBOR loans and 2.50% with respect to base rate loans. As of December 31, 2018 and December 31, 2017, the outstanding balance of the Company's debt approximated its fair value based on current rates available to the Company for debt of the same maturity and is a Level 2 financial instrument. The Company entered into a hedging agreement to mitigate the inherent rate risk associated with the variable rate debt, which is accounted for as cash flow hedge. Any gain or loss is recorded within accumulated other comprehensive income. Refer to Note 17, Fair Value, for additional detail on the hedge.

(12) Share-Based Compensation

We have two share-based compensation plans as of December 31, 2018: (1) the 2014 Stock Option and Incentive Plan (the "2014 Plan") and (2) the Amended and Restated 1999 Stock Option and Incentive Plan (the "1999 Plan"). The 2014 Plan was adopted by our Board of Directors on February 12, 2014 and approved by our shareholders at the Company's annual meeting held on April 30, 2014. As of April 30, 2014, no new awards will be granted under the 1999 Plan. As a result, any shares subject to outstanding awards under the 1999 Plan that expire, are canceled or otherwise terminate, or are withheld to satisfy tax withholding obligations, will not be available for award grant purposes under the 2014 Plan. Both plans permit the grant of the following types of awards to our officers, other employees and non-employee directors: incentive stock options; nonqualified stock options; deferred stock awards; restricted stock awards; unrestricted stock awards; performance share awards; cash-based awards; stock appreciation rights ("SARs") and dividend equivalent rights. The 2014 Plan provides for the issuance of up to 1,700,000 shares of common stock (subject to adjustment for stock splits and similar events). Under the 2014 Plan, shares issued for awards other than stock options or SARs count against the aggregate share limit as 1.9 shares for every share actually issued. New stock options granted under the 2014 Plan could have varying vesting provisions and exercise periods. All stock options and RSUs granted under the 1999 Plan are either 100% vested or have been terminated. RSUs granted under the 2014 Plan generally vest within three years. RSUs will be settled in shares of our common stock. As of December 31, 2018, there were 493,811 shares available for grant under the 2014 Plan.

As of December 31, 2018, there were 742,658 stock options (including the CEO stock option award noted below) and 298,796 RSUs outstanding. As of December 31, 2018, there were 13,029 RSUs outstanding that contain rights to nonforfeitable dividend equivalents and are considered participating securities that are included in our computation of basic and fully diluted earnings per share. There is no difference in the earnings per share amounts between the two class method and the treasury stock method, which is why we continue to use the treasury stock method.

During the year ended December 31, 2018, we granted stock option awards for the purchase of 127,704 shares of our common stock, compared with 142,428 in 2017 and 210,633 in 2016.

On April 9, 2013, we granted a stock option to purchase 200,000 shares of common stock to our President and Chief Executive Officer at an exercise price of $41.17 per share ("2013 CEO Option Award"). This award included a service period and a market performance vesting condition. In 2014, certain of these targets were achieved and 150,000 shares vested and remain exercisable. The remaining 50,000 shares were cancelled in 2018 due to lack of performance achievement.

On December 2, 2013, we granted a stock option to purchase 100,000 shares of common stock to our then newly appointed Executive Vice President and Chief Financial Officer at an exercise price of $79.33 per share. This award included a service period and a market performance vesting condition which were not met and all 100,000 shares were cancelled in the year ended December 31, 2018.

On March 5, 2014, we granted a stock option to purchase 100,000 shares of common stock to our President and Chief Executive Officer at an exercise price of $70.42 per share ("2014 CEO Option Award"). This option award includes a service period and a market performance vesting condition. The stock option will vest if the following stock price targets are met based on the stock price closing at or above these targets for 60 consecutive trading days. During the year ended December 31, 2018, the 2014 CEO Option Award is outstanding as follows:

2014 CEO Option Award:

Stock Price Target	Cumulative Vested Portion of Stock Options (in Shares)
$87.50	25,000
$100.00	50,000
$112.50	75,000
$125.00	100,000

As the CEO Option Awards vest, they may be exercised 25% at the time of vesting, 50% one year from the date of vesting and 100% two years from the date of vesting. As of December 31, 2018, none of the options awarded in connection with the 2014 CEO Option Award have vested. These stock option awards are being expensed utilizing a graded method and are subject to forfeiture in the event of employment termination (whether voluntary or involuntary) prior to vesting. These option awards have a 10 year term but to the extent that the market conditions above (Stock Price Targets) are not met within 5 years, these options will not vest and will forfeit 5 years from grant date. The Company used a Monte Carlo simulation option pricing model to value these option awards.

The average fair value of stock options granted during the year ended December 31, 2018, 2017, and 2016 of $14.68, $19.36, and $17.88, respectively, was estimated using the following weighted-average assumptions:

	Year Ended December 31,		
	2018	2017	2016
Risk-free interest rate	2.5%	1.7%	1.2%
Expected life (years)	4.4	4.5	4.5
Expected stock volatility	37.2%	35.1%	36.2%
Expected dividend yield	—%	0.2%	0.4%

We account for Restricted Stock Unit Awards ("RSU Awards") by expensing the weighted average fair value to selling, general and administrative expenses ratably over vesting periods generally ranging up to three years. During the years ended December 31, 2018 and December 31, 2017 we granted 167,480 and 90,725 RSUs, respectively, with approximate fair values of $42.87 and $55.28 per RSU Award, respectively. During 2018 and 2017, the Company granted performance-based RSUs as part of the overall mix of RSU Awards. These performance-based RSUs include metrics for achieving Return on Invested Capital and Adjusted Operating Margin with target payouts ranging from 0% to 200%. Of the 167,480 RSUs granted during 2018, 48,080 are performance-based RSU awards. This compares to 31,369 performance-based RSU awards granted in 2017.

The CIRCOR Management Stock Purchase Plan, which is a component of both the 2014 Plan and the 1999 Plan, provides that eligible employees may elect to receive RSUs in lieu of all or a portion of their pre-tax annual incentive bonus and, in some cases, make after-tax contributions in exchange for RSUs ("RSU MSPs"). In addition, non-employee directors may elect to receive RSUs in lieu of all or a portion of their annual directors' retainer fees. Each RSU MSP represents a right to receive one share of our common stock after a three-year vesting period. RSU MSPs are granted at a discount of 33% from the fair market value of the shares of common stock on the date of grant. This discount is amortized as compensation expense, to selling, general and administrative expenses, over a four-year period. RSU MSPs totaling 34,937 and 26,726 with per unit discount amounts representing fair values of $14.06 and $20.13, respectively, were granted under the CIRCOR Management Stock Purchase Plan during the years ended December 31, 2018 and December 31, 2017, respectively.

Compensation expense related to our share-based plans for the year ended December 31, 2018, 2017, and 2016 was $5.0 million, $3.8 million, and $5.5 million respectively. The decrease in expenses from 2017 related to non-Share-based compensation expense is recorded as selling, general, and administrative expense. As of December 31, 2018, there was $7.6 million of total unrecognized compensation costs related to our outstanding share-based compensation arrangements. That cost is expected to be recognized over a weighted average period of 2.0 years. This compares to $6.8 million for 2017 and $7.8 million for 2016, respectively.

A summary of the status of all stock options granted to employees and non-employee directors as of December 31, 2018, 2017, and 2016 and changes during the years are presented in the table below:

	December 31,					
	2018		2017		2016	
	Options	Weighted Average Exercise Price	Options	Weighted Average Exercise Price	Options	Weighted Average Exercise Price
Options outstanding at beginning of period	848,427	$ 53.99	736,319	$ 52.30	570,737	$ 56.86
Granted	127,704	42.62	142,428	60.99	210,633	38.89
Exercised	(18,304)	37.70	(17,708)	39.91	(5,982)	41.05
Forfeited	(204,702)	61.89	(10,136)	51.99	(33,014)	45.25
Expired	(10,467)	54.18	(2,476)	61.38	(6,055)	65.34
Options outstanding at end of period	742,658	$ 50.26	848,427	$ 53.99	736,319	$ 52.30
Options exercisable at end of period	415,873	$ 46.90	309,824	$ 45.66	226,386	$ 45.20

The weighted average contractual term for stock options outstanding and exercisable as of December 31, 2018 was 4.3 years and 3.4 years, respectively. The aggregate intrinsic value of stock options exercised during the years ended December 31, 2018, 2017 and 2016 was $0.2 million, $0.4 million and $0.1 million, respectively. The aggregate fair value of stock-options vested during the years ended December 31, 2018, 2017 and 2016 was $2.1 million, $1.6 million and $1.7 million, respectively. The aggregate intrinsic value of stock options outstanding and exercisable as of December 31, 2018 was $0.0 million and $0.0 million, respectively. As of December 31, 2018, there was $2.0 million of total unrecognized compensation costs related to stock options that is expected to be recognized over a weighted average period of 1.7 years.

The following table summarizes information about stock options outstanding at December 31, 2018:

	Options Outstanding			Options Exercisable	
Range of Exercise Prices	**Options**	**Weighted Average Remaining Contractual Life (Years)**	**Weighted Average Exercise Price**	**Options**	**Weighted Average Exercise Price**
$32.76 - $40.09	160,571	3.6	$ 38.79	115,067	$ 38.74
40.10 - 41.90	150,000	4.3	41.17	150,000	41.17
41.91 - 56.42	186,730	4.6	46.35	75,481	51.84
56.43 - 71.56	245,357	4.5	66.31	75,325	65.79
$32.76 - $71.56	742,658	4.3	$ 50.26	415,873	$ 46.90

A summary of the status of all RSU Awards granted to employees and non-employee directors as of December 31, 2018, 2017, and 2016 and changes during the year are presented in the table below:

	December 31,					
	2018		2017		2016	
	RSUs	**Weighted Average Price**	**RSUs**	**Weighted Average Price**	**RSUs**	**Weighted Average Price**
RSU Awards outstanding at beginning of period	186,905	$ 49.76	138,761	$ 46.60	109,281	$ 52.90
Granted	167,480	42.87	90,725	55.28	98,942	41.09
Settled	(27,503)	52.70	(29,803)	46.15	(54,034)	48.50
Canceled	(100,199)	46.71	(12,778)	62.92	(22,527)	46.86
Added by Performance Factor	—	—	—	—	7,099	41.55
RSU Awards outstanding at end of period	226,683	$ 45.66	186,905	$ 49.76	138,761	46.60
RSU Awards exercisable at end of period	5,057	$ 52.44	2,876	$ 59.17	3,040	$ 60.92

The aggregate intrinsic value of RSU Awards settled during the 12 months ended December 31, 2018, 2017 and 2016 was $1.2 million, $1.7 million, and $2.5 million, respectively. The aggregate fair value of RSU Awards vested during the 12 months ended December 31, 2018, 2017 and 2016 was $1.5 million, $1.4 million and $2.7 million, respectively.

The aggregate intrinsic value of RSU Awards outstanding and exercisable as of December 31, 2018 was $4.8 million and $0.1 million, respectively. As of December 31, 2018, there was $5.1 million of total unrecognized compensation costs related to RSU awards that is expected to be recognized over a weighted average period of 1.4 years.

The following table summarizes information about RSU Awards outstanding at December 31, 2018:

	RSU Awards Outstanding		
Fair Values at Grant Date	**RSUs**	**Weighted Average Remaining Contractual Life (Years)**	**Weighted Average Fair Value**
$32.25 - $42.99	149,561	1.6	$ 41.51
43.00 - 51.99	35,714	2.1	47.00
52.00 - 71.56	41,408	0.2	59.51
$32.25 - $71.56	226,683	1.4	$ 45.67

A summary of the status of all RSU MSPs granted to employees and non-employee directors as of December 31, 2018, 2017, and 2016 and changes during the year are presented in the table below:

	December 31,					
	2018		2017		2016	
	RSUs	Weighted Average Exercise Price	RSUs	Weighted Average Exercise Price	RSUs	Weighted Average Exercise Price
RSU MSPs outstanding at beginning of period	72,452	$ 35.01	67,924	$ 36.50	78,732	$ 37.46
Granted	34,937	28.56	26,726	40.86	20,130	26.06
Settled	(29,232)	48.87	(19,843)	42.28	(27,375)	29.94
Canceled	(6,044)	32.33	(2,355)	37.48	(3,563)	35.35
RSU MSPs outstanding at end of period	72,113	$ 32.25	72,452	$ 35.01	67,924	$ 36.50
MSP Awards exercisable at end of period	7,972	$ 31.97	—	—	—	—

There were 7,972 RSU MSPs exercisable as of December 31, 2018 compared to none exercisable for the same date in 2017, and 2016. The aggregate intrinsic value of RSU MSPs settled during the years ended December 31, 2018, 2017, and 2016 was $0.4 million, $0.3 million and $0.4 million, respectively. The aggregate fair value of RSU MSPs vested during the years ended December 31, 2018, 2017, and 2016 was $0.6 million, $0.5 million and $0.4 million, respectively. The aggregate intrinsic value of RSU MSPs outstanding as of December 31, 2018 was $0.0 million. As of December 31, 2018, there was $0.5 million of total unrecognized compensation costs related to RSU MSPs that is expected to be recognized over a weighted average period of 1.4 years.

The following table summarizes information about RSU MSPs outstanding at December 31, 2018:

	RSU MSPs Outstanding		
Range of Grant Prices	RSUs	Weighted Average Remaining Contractual Life (Years)	Weighted Average Exercise Price
$26.06 - 33.99	46,536	1.5	$ 27.74
34.00 - 39.99	1,728	0.0	34.73
40.00 - 40.86	23,849	1.2	40.86
$26.06 - $40.86	72,113	1.4	$ 32.25

We also grant Cash Settled Stock Unit Awards to our international employee participants. In prior years, these Cash Settled Stock Unit Awards would typically cliff-vest in three years. During 2018, the vesting schedule was updated so that new Cash Settled Stock Unit Awards granted vest ratably over a three year period. All of these awards are settled in cash based on the closing price of our common stock at the time of vesting. As of December 31, 2018, there were 50,907 Cash Settled Stock Unit Awards outstanding compared with 40,469 Cash Settled Stock Unit Awards outstanding as of December 31, 2017. During 2018, the aggregate cash used to settle Cash Settled Stock Unit Awards was $0.3 million. As of December 31, 2018, the Company had $0.6 million in accrued expenses classified as current liabilities for Cash Settled Stock Unit Awards compared with $0.9 million as of December 31, 2017. Cash Settled Stock Unit Award related compensation costs for the twelve month periods ended December 31, 2018, 2017, and 2016 totaled $0.0 million, $0.2 million, and $0.9 million, respectively and was recorded as selling, general and administrative expense. The decrease in compensation costs in 2018 and 2017 vs. 2016 is due primarily to a lower ending stock price.

(13) Concentrations of Risk

Financial instruments that potentially subject us to concentrations of credit risk consist primarily of cash, cash equivalents, short-term investments and trade receivables. A significant portion of our revenue and receivables are from customers who are either in or service the energy, aerospace, defense and industrial markets. We perform ongoing credit evaluations of our customers and maintain allowances for potential credit losses. For the years ended December 31, 2018, 2017 and 2016, we had no customers from which we derive revenues that exceed the threshold of 10% of the Company’s consolidated revenues.

(14) Retirement Plans

US Contribution Plan

We offer a savings plan to eligible U.S. employees. The plan is intended to qualify under Section 401(k) of the Internal Revenue Code. Substantially all of our U.S. employees are eligible to participate in the 401(k) savings plan. Participating employees may defer a portion of their pre-tax compensation, as defined, but not more than statutory limits. Under this plan, we match a specified percentage of employee contributions, and are able to make a discretionary core contribution, subject to certain limitations. For the first part of 2018, we contributed 50% of the amount contributed by the employee, up to a maximum of 5% of the employee’s earnings. Our matching contributions vest at a rate of 20% per year of service, with full vesting after 5 years of service. Effective August 28, 2018, the Company had a 401(k) benefit update, wherein the Company contributed 100% of the amount contributed by the employee, up to a maximum of 4% of the employee's earnings. Matching contributions under the updated 401K benefit plan vest 0% after year 1, 50% after year 2, and 100% after year 3 in the matching contribution.

The cost of our 401K plan is outlined below:

	Year Ended December 31,		
	2018	**2017**	**2016**
Cost of 401(k) plan	$ 1,847	$ 1,978	$ 1,509

Pension & Other Post-Retirement Benefit Obligations

The Company also sponsors various defined benefit plans, and other post-retirement benefits plans, including health and life insurance, for former employees of an acquired business. These plans include significant benefit obligations which are calculated based on actuarial valuations. Key assumptions are made in determining these obligations and related net periodic benefit costs, including discount rates, mortality, and expected long-term return on plan assets.

On December 11, 2017, the Company acquired FH. The acquisition included all of the pension obligations outside of the U.S., and a significant portion of the post-retirement obligations in the U.S. In the U.S., the company maintains a qualified noncontributory defined benefit pension plan, a nonqualified, noncontributory defined benefit supplemental pension plan, and other post-retirement benefit plans, including health and life insurance. Our plans and FH plans are frozen. To date, the supplemental and the other post-retirement benefits plans remain unfunded.

Outside of the U.S., the company sponsors various funded and unfunded defined benefit plans as a result of the 2017 acquisition of the FH business. The obligations are primarily attributed to partially funded plans in Germany and the U.K.

During fiscal year 2018, we did not make any cash contributions to our qualified defined benefit pension plan, but made $0.4 million in payments for our nonqualified plan. In 2019, we expect to make defined benefit plan contributions based on the minimum required funding in accordance with statutory requirements (approximately $1.1 million in the U.S. and approximately $4.3 million for our foreign plans). The estimates for plan funding for future periods may change as a result of the uncertainties concerning the return on plan assets, the number of plan participants, and other changes in actuarial assumptions. We anticipate fulfilling these commitments through our generation of cash flow from operations.

The components of net periodic benefit cost for the postretirement plans were as follows (in thousands):

	Pension Benefits			Other Post-retirement Benefits (1)	Other Post-retirement Benefits (1)
	Year Ended December 31,			Year Ended December 31,	Year Ended December 31,
	2018	2017	2016	2018	2017
Components of net periodic benefit cost:					
Service cost	$ 2,993	$ 181	$ —	$ 1	$ —
Interest cost	$ 9,164	$ 2,158	$ 2,185	$ 336	$ 20
Expected return on assets	(15,418)	(2,994)	(2,562)	—	—
Net periodic benefit cost	(3,261)	(655)	(377)	337	20
Net (gain) loss amortization	153	735	893	—	—
Prior service cost amortization	—	—	—	—	—
Total amortization	153	735	893	—	—
Pension settlement charge	—	—	4,457		—
Net periodic benefit cost	$ (3,108)	$ 80	$ 4,973	$ 337	$ 20
Net periodic benefit cost	$ (3,108)	$ 80	$ 9,430	$ 337	$ 20

(1) No Other Post-retirement Benefits in 2016

The weighted average assumptions used in determining the net periodic benefit cost and benefit obligations for the post-retirement plans are shown below:

	Pension Benefits			Other Post-retirement Benefits	Other Post-retirement Benefits
	Year Ended December 31,			Year Ended December 31,	Year Ended December 31,
	2018	2017	2016	2018	2017
Net periodic benefit cost (1):					
Discount rate – U.S.	3.27%	3.86%	4.11%	3.48%	3.63%
Discount rate – Foreign	1.97%	N/A	N/A	N/A	N/A
Expected return on plan assets - U.S. (2)	7.00%	7.25%	6.75%	N/A	N/A
Expected return on plan assets - Foreign	3.53%	N/A	N/A	N/A	N/A
Rate of compensation increase - U.S.	N/A	NA	N/A	N/A	N/A
Rate of compensation increase - Foreign	3.11%	N/A	N/A	N/A	N/A
Benefit obligations:					N/A
Discount rate – U.S.	3.93%	3.27%	3.86%	4.10%	3.48%
Discount rate – Foreign	2.00%	1.97%	N/A	N/A	N/A
Rate of compensation increase - U.S.	N/A	N/A	N/A	N/A	N/A
Rate of compensation increase - Foreign	3.14%	3.11%	N/A	N/A	N/A

(1) 2017 Assumption excludes those that would have been applicable for 21 days of CIRCOR's ownership of FH.

(2) 2017 excludes estimate of return on assets still held in the prior plan which had an expected long-term return on plan assets for the time since acquisition of 6.25% for 2017 for which CIRCOR is entitled to their portion of the return.

The amounts reported for net periodic benefit cost and the respective benefit obligation amounts are dependent upon the actuarial assumptions used. The Company reviews historical trends, future expectations, current market conditions, and external data to determine the assumptions. The actuarial assumptions used to determine the net periodic pension cost are based upon the prior year's assumptions used to determine the benefit obligation.

Effective with fiscal year 2018, the Company changed the method used to estimate the service and interest cost components of the net periodic benefit costs for all of its plans in the U.S., U.K., and Germany. The new method uses the spot yield curve approach to estimate the service and interest costs by applying the specific spot rates along the yield curve used to determine the benefit obligations to relevant projected cash outflows. The Company changed to the new method to provide a more precise measure of interest and service costs by more closely correlating the application of the discrete spot yield curve rates with the projected benefit cash flows. Prior to fiscal year 2018, the service and interest costs were determined using a single weighted-average discount rate used to measure the benefit obligation at the measurement date.

Assumed health care cost trend rates pre-65 trend at December 31, 2018 and 2017 were 7.0% and 5.9%, respectively. Rate to which the cost trend rate is assumed to decline (the ultimate trend rate) for December 31, 2018 and 2017 were 5.0% and 5.0%, and the year that the rate reaches the ultimate trend rate were 2027 and 2023, respectively. Assumed health care cost trend rates post-65 trend at December 31, 2018 and 2017 were 7.0% and 5.5%, respectively. Rate to which the cost trend rate is assumed to decline (the ultimate trend rate) for December 31, 2018 and 2017 were 5.0% and 5.25%, and the year that the rate reaches the ultimate trend rate were 2027 and 2021, respectively.

Assumed health care cost trend rates have a significant effect on the amounts reported for the health care plan. A one-percentage point change in assumed health care cost trend rates would have the following pre-tax effects:

	1% Increase	1% Decrease
Effect on total service and interest cost components for the year ended December 31, 2018	54	(43)
Effect on post-retirement benefit obligation at December 31, 2018	$ 1,353	$ (1,096)

In selecting the expected long-term return on assets for the qualified and foreign plans, we considered the average rate of earnings expected on the funds invested or to be invested to provide for the benefits of these plans. We, with input from the plans' professional investment managers and actuaries, also considered the average rate of earnings expected on the funds invested or to be invested to provide plan benefits. This process included determining expected returns for the various asset classes that comprise the plans' target asset allocation. This basis for selecting the long-term return on assets is consistent with the prior year. Using generally accepted diversification techniques, the plans' assets, in aggregate and at the individual portfolio level, are invested so that the total portfolio risk exposure and risk-adjusted returns best meet the plans' long-term benefit obligations to employees. Plan asset allocations are reviewed periodically and rebalanced to achieve target allocation among the asset categories when necessary. This included considering the pension asset allocation and the expected returns likely to be earned over the life of the plans.

The funded status of the defined benefit post-retirement plans and amounts recognized in the consolidated balance sheets, measured as of December 31, 2018 and December 31, 2017 were as follows (in thousands):

	Pension Benefits		Other Post-retirement Benefits	
	December 31,		December 31,	
	2018	2017	2018	2017
Change in projected benefit obligation:				
Balance at beginning of year	$ 399,638	$ 45,300	$ 11,685	$ —
Service cost	2,993	181	1	—
Interest cost	9,164	2,158	336	20
Amendments	341	—	—	—
Actuarial loss (gain)	(16,081)	413	(1,166)	263
Exchange rate (gain) / loss	(9,661)	5,759	—	—
Acquisitions	—	348,542	—	11,445
Benefits paid	(23,060)	(2,715)	(580)	(43)
Settlement payments	—	—	—	—
Balance at end of year	$ 363,334	$ 399,638	$ 10,276	$ 11,685
Change in fair value of plan assets:				
Balance at beginning of year	$ 247,583	$ 31,776	$ —	$ —
Actual return on assets (1)	(15,183)	10,374	(580)	—
Exchange rate (gain) / loss	(2,430)	1,256		—
Acquisitions - Transferred	—	28,903		—
Acquisitions - Plan receivable from Colfax	—	176,572		—
Benefits paid	(23,060)	(2,715)		(43)
Settlement payments	—	—		—
Employer contributions	4,083	1,417	580	43
Fair value of plan assets at end of year (2)	$ 210,993	$ 247,583	$ —	$ —
Funded status:				
Excess of benefit obligation over the fair value of plan assets	$ (152,341)	$ (152,055)	$ (10,276)	$ (11,685)
Pension plan accumulated benefit obligation (“ABO”)	$ 363,334	$ 399,638	N/A	N/A

(1) 2017 includes $2.3 million of plan assets still held in the prior plan at Colfax.

(2) Refer to Note 17, Fair Value for further disclosure regarding our fair value hierarchy assessment.

The following information is presented as of December 31, 2018 and 2017 (in thousands):

	Pension Benefits		Other Post-retirement Benefits	
	2018	2017	2018	2017
Funded status, end of year:				
Fair value of plan assets	$ 210,993	$ 247,583	$ —	$ —
Projected Benefit obligation	$ (363,334)	(399,638)	(10,276)	—
Net pension liability	$ (152,341)	$ (152,055)	$ (10,276)	$ —
Post-retirement amounts recognized in the balance sheet consists of:				
Non-current asset	$ 1,776	$ 1,517	$ —	$ —
Current liability	$ (3,494)	(2,853)	(701)	(746)
Non-current liability	$ (150,623)	(150,719)	(9,575)	(10,939)
Total	$ (152,341)	$ (152,055)	$ (10,276)	$ (11,685)
Amounts recognized in accumulated other comprehensive income consist of:				
Net losses	$ 28,497	$ 13,937	$ (902)	$ 263
Prior service cost (gain)	325	—	—	—
Total	28,822	13,937	(902)	263

Estimated future benefit expense to be recognized in other comprehensive income (loss):	2019
Amortization of net losses	$ 521
Prior service cost	15
Total	$ 536

As of December 31, 2018, the benefit payments expected to be paid in each of the next five years and the aggregate for the five fiscal years thereafter were as follows (in thousands):

	2019	2020	2021	2022	2023	2024-2028
Pension Benefits - All Plans	$ 23,249	$ 23,093	$ 22,912	$ 22,656	$ 22,402	$ 105,518
Other Post-retirement Benefits	701	668	662	636	622	2,854
Expected benefit payments	$ 23,950	$ 23,761	$ 23,574	$ 23,292	$ 23,024	$ 108,372

(15) Contingencies, Commitments and Guarantees

Legal Proceedings

We are subject to various legal proceedings and claims pertaining to matters such as product liability or contract disputes, including issues that may arise under certain customer contracts with aerospace and defense customers. We are also subject to other proceedings and governmental inquiries, inspections, audits or investigations pertaining to issues such as tax matters, patents and trademarks, pricing, business practices, governmental regulations, employment and other matters. Although the results of litigation and claims cannot be predicted with certainty, we believe that the ultimate disposition of these matters, to the extent not previously provided for, will not have a material adverse effect, individually or in the aggregate, on our business, financial condition, results of operations or liquidity.

On February 21, 2018, the Company entered into a mediated settlement regarding a wage and hour action in California by a former employee. In October 2016, the plaintiff alleged non-compliance with California State labor law, including missed or late meal breaks, for hourly employees of CIRCOR Aerospace, Inc. in Corona, California. The total settlement amount of $2.4 million was initially recorded as a liability as of December 31, 2017. This settlement resolves all wage/hour claims by all potentially affected employees through the settlement date and was approved by the California Superior Court during 2018. The Company expects to make payment during the second quarter of 2019.

Asbestos-related product liability claims continue to be filed against two of our subsidiaries: Spence Engineering Company, Inc. (“Spence”), the stock of which we acquired in 1984; and CIRCOR Instrumentation Technologies, Inc. (f/k/a Hoke, Inc.)

(“Hoke”), the stock of which we acquired in 1998. Due to the nature of the products supplied by these entities, the markets they serve and our historical experience in resolving these claims, we do not expect that these asbestos-related claims will have a material adverse effect on the financial condition, results of operations or liquidity of the Company.

Standby Letters of Credit

We execute standby letters of credit, which include bank guarantees, bid bonds and performance bonds, in the normal course of business to ensure our performance or payments to third parties. The aggregate notional value of these instruments was $70.7 million at December 31, 2018 of which $35.6 million were syndicated under the Credit Agreement. Our historical experience with these types of instruments has been good and no claims have been paid in the current or past several fiscal years. We believe that the likelihood of demand for payments relating to the outstanding instruments is remote. These instruments generally have expiration dates ranging from less than 1 month to 5 years from December 31, 2018.

The following table contains information related to standby letters of credit instruments outstanding as of December 31, 2018 (in thousands):

Term Remaining	Maximum Potential Future Payments
0–12 months	$ 48,740
Greater than 12 months	21,928
Total	$ 70,668

Operating Lease Commitments

Rental expense under operating lease commitments amounted to $9.5 million, $6.4 million and $5.6 million for the years ended December 31, 2018, 2017 and 2016, respectively. Minimum rental commitments due under non-cancelable operating leases, primarily for office and warehouse facilities, were as follows at December 31, 2018 (in thousands):

	2019	2020	2021	2022	2023	Thereafter
Minimum lease commitments	$ 9,481	$ 6,303	$ 4,573	$ 3,345	$ 2,540	$ 6,032

Commercial Contract Commitment

As of December 31, 2018, we had approximately $118.3 million of commercial contract commitments related to open purchase orders.

Insurance

We maintain insurance coverage of a type and with such limits as we believe are customary and reasonable for the risks we face and in the industries in which we operate. While many of our policies do contain a deductible, the amount of such deductible is typically not material. Our accruals for insured liabilities are not discounted and take into account these deductibles and are based on claims filed and reported as well as estimates of claims incurred but not yet reported.

(16) Guarantees and Indemnification obligations

As permitted under Delaware law, we have agreements whereby we indemnify certain of our officers and directors for certain events or occurrences while the officer or director is, or was, serving at our request in such capacity. The term of the indemnification period is for the officer’s or director’s lifetime. The maximum potential amount of future payments we could be required to make under these indemnification agreements is unlimited. However, we have directors and officers’ liability insurance policies that limit our exposure for events covered under the policies and should enable us to recover a portion of any future amounts paid. As a result of the coverage under these insurance policies, we believe the estimated fair value of these indemnification agreements is minimal and, therefore, have no liabilities recorded from those agreements as of December 31, 2018.

We record provisions for the estimated cost of product warranties, primarily from historical information, at the time product revenue is recognized. While we engage in extensive product quality programs and processes, our warranty obligation is affected by product failure rates, utilization levels, material usage, service delivery costs incurred in correcting a product failure, and supplier warranties on parts delivered to us. Should actual product failure rates, utilization levels, material usage, service delivery costs or supplier warranties on parts differ from our estimates, revisions to the estimated warranty liability would be required. Our warranty liabilities are included in accrued expenses and other current liabilities on our consolidated balance sheets.

The following table sets forth information related to our product warranty reserves for the years ended December 31, 2018 and 2017 (in thousands):

	December 31,	
	2018	2017
Balance beginning January 1	$ 4,623	$ 4,559
Provisions	2,854	2,590
Claims settled	(2,946)	(4,508)
Acquired reserves/other	(347)	1,759
Currency translation adjustment	(134)	223
Balance ending December 31	$ 4,050	$ 4,623

Warranty obligations of $4.1 million for the year ended December 31, 2018 decreased $0.5 million from $4.6 million for the year ended December 31, 2017. Decreases in warranty obligations were primarily driven by claims settled within certain Industrial businesses.

(17) Fair Value

Financial Instruments

The company utilizes fair value measurement guidance prescribed by accounting standards to value its financial instruments. The guidance establishes a fair value hierarchy based on the inputs used to measure fair value. This hierarchy prioritizes the inputs into three broad levels as follows:

Level One: Inputs to the valuation methodology are unadjusted quoted prices for identical assets or liabilities in active markets.
Level Two: Inputs to the valuation methodology include quoted prices for similar assets and liabilities in active markets, quoted prices for identical or similar assets or liabilities in inactive markets, and inputs that are observable for the asset or liability, either directly or indirectly, for substantially the full term of the financial instrument.
Level Three: Inputs to the valuation methodology are unobservable and significant to the fair value measurement.

A financial instrument’s level within the fair value hierarchy is based on the lowest level of any input that is significant to the fair value measurement.

The fair values of the Company’s pension plan assets as of December 31, 2018 and 2017, utilizing the fair value hierarchy were as follows (in thousands):

	December 31, 2018				December 31, 2017			
	Measured at Net Asset Value (1, 3)	Level 1	Level 2	Total	Measured at Net Asset Value (1, 2)	Level 1	Level 2	Total
U.S. Plans:								
Cash Equivalents:								
Money Market Funds	$ 3,831	$ —	$ —	$ 3,831		$ 237		$ 237
Mutual Funds:								
Bond Funds	—	—	—	—	—	—	—	—
Large Cap Funds	—	—	—	—	—	—	—	—
International Funds	20,295	—	—	20,295	4,838	—	—	4,838
Small Cap Funds	—	—	—	—	—	—	—	—
Blended Funds	—	—	—	—	—	—	—	—
Mid Cap Funds	—	—	—	—	—	—	—	—
Comingled Pools:								
Opportunistic	15,461	—	—	15,461	3,106	—	—	3,106
Investment Grade	51,340	—	—	51,340	10,664	—	—	10,664
Non-U.S. Equity	17,432	—	—	17,432	4,730	—	—	4,730
U.S. Equity	70,059	—	—	70,059	14,773	—	—	14,773
Global Low Volatility	$ 5,400	$ —	—	5,400	—	—	—	—
Foreign Plans:								
Cash		22	—	22	—	518	—	518
Equity	8,623		—	8,623	10,499	—	184	10,683
Non-U.S. government and corporate bonds	13,569		—	13,569	15,146	—	669	15,815
Insurance Contracts	240		3,542	3,782	306	—	2,932	3,238
Other			368	368	—	38	—	38
Total Fair Value	$ 206,250	$ 22	$ 3,910	$ 210,182	$ 64,062	$ 793	$ 3,785	$ 68,640

(1) Certain investments that are measured at fair value using the net asset value per share (or its equivalent) practical expedient (the “NAV”) have not been classified in the fair value hierarchy. These investments, consisting of common/collective trusts, are valued using the NAV provided by the Trustee. The NAV is based on the underlying investments held by the fund, that are traded in an active market, less its liabilities. These investments are able to be redeemed in the near-term.

(2) $179 million of pension plan asset receivable was excluded from the December 31, 2017 leveling table above as CIRCOR did not yet control the assets. The fair value was determined based on CIRCOR's percent of Colfax U.S. pension plan assets which were valued by Colfax using NAV as described in (1).

(3) $0.8 million of pension plan asset receivable was excluded from the FY'18 leveling table above as CIRCOR did not yet control the assets.

The fair value of the Company’s assets which are to be reimbursed to Colfax for 2018 pension benefits paid, expenses and investment return on those payments were as follows (in thousands):

	December 31, 2018			
	Measured at Net Asset Value (1)	Level 1	Level 2	Total
Investments owed to Colfax:				
Cash Equivalents:				
Money Market Funds	$ 2,852	$ —	$ —	$ 2,852

The fair value measurements of the Company's financial instruments as of December 31, 2018 are summarized in the table below:

	Significant Other Observable Inputs
	Level 2
Derivatives	$ (1,969)

The carrying amounts of cash and cash equivalents, trade receivables and trade payables approximate fair value because of the short maturity of these financial instruments. Cash equivalents are carried at cost which approximates fair value at the balance sheet date and is a Level 1 financial instrument. The Company's outstanding debt balances are characterized as Level 2 financial instruments. As of December 31, 2018, the fair value of our gross term loan debt (before netting debt issuance costs) was $735.7 million, or $41.4M below our carrying cost of $777.1 million. As of December 31, 2017, the outstanding balance of the Company’s debt approximated fair value based on current rates available to the Company for debt of the same maturity.

Effective April 12, 2018, the Company entered into an interest rate swap pursuant to an International Swaps and Derivatives Association ("ISDA") Master Agreement with Citizens Bank, National Association ("interest rate swap"). The four-year interest rate swap has a fixed notional value of $400.0 million with a 1% LIBOR floor and a maturity date of April 12, 2022. The fixed rate of interest paid by the Company is comprised of our current credit spread of 350 basis points plus 2.6475% for a total interest rate of 6.1475%. The ISDA Master Agreement, together with its related schedules, contain customary representations, warranties and covenants. This hedging agreement was entered into to mitigate the interest rate risk inherent in the Company’s variable rate debt and is not for speculative trading purposes.

The Company has designated the interest rate swap as a qualifying hedging instrument and is treating it as a cash flow hedge for accounting purposes pursuant to ASC 815, *Derivatives and Hedging*. The net fair value of the interest rate swap was $(2.0) million and is recorded in Accrued Expenses and Other Current Liabilities of $0.5 million and Other Non-Current Liabilities of $1.5 million on our condensed consolidated balance sheet as of December 31, 2018. The unrealized loss recognized in other comprehensive loss was $2.0 million for the twelve months ended December 31, 2018. The realized loss of $1.6 million was reclassified from other comprehensive loss to interest expense as interest expense was accrued on the swap during the twelve months ended December 31, 2018. Amounts expected to be reclassified from other comprehensive income into interest expense in the coming 12 months is a loss of $0.6 million. Interest expense (including the effects of the cash flow hedges) related to the portion of the Company's term loan subject to the aforementioned interest-rate swap agreement was $23.8 million for twelve months ended December 31, 2018.

Foreign Currency Contracts

The Company is exposed to certain risks relating to its ongoing business operations including foreign currency exchange rate risk and interest rate risk. The Company currently uses derivative instruments to manage foreign currency risk on certain business transactions denominated in foreign currencies. To the extent the underlying transactions hedged are completed, these forward contracts do not subject us to significant risk from exchange rate movements because they offset gains and losses on the related foreign currency denominated transactions. These forward contracts do not qualify as hedging instruments and, therefore, do not qualify for fair value or cash flow hedge treatment. Any gains and losses on our contracts are recognized as a component of other expense in our consolidated statements of income.

As of December 31, 2018 and December 31, 2017, we had no forward contracts. Our foreign currency forward contracts fall within Level 2 of the fair value hierarchy, in accordance with ASC Topic 820. The foreign exchange (gains)/losses for the year ended December 31, 2018, 2017 and 2016 were $0.0 million, $0.1 million, and $(0.6) million, respectively, and are included in other (income) expense in our consolidated statements of income.

(18) Business Segment and Geographical Information

Our reportable segments have been identified in accordance with ASC 280-10-50 through our evaluation of how the Company engages in business activities to earn revenues and incur expenses, which operating results are regularly reviewed by our chief operating decision maker ("CODM") to assess performance and make decisions about resources to be allocated, and the availability of discrete financial information. CIRCOR's reportable segments are generally organized based upon the end markets we sell our product and services into. No individual operating segments have been aggregated for purposes of determining our reportable segments.

Effective January 1, 2018, we realigned our businesses with end markets to simplify the business, clarify customer and channel relationships and help us exploit growth synergy opportunities across the organization. Our reporting segments are Energy, Aerospace & Defense and Industrial. The Energy segment remains unchanged except for the addition of Reliability Services, a business from the FH acquisition. The Aerospace & Defense segment includes the Aerospace business out of our previous Advanced Flow Solutions segment, as well as the Pumps Defense business of Fluid Handling. The Industrial segment includes the remaining portion of Fluid Handling as well as the industrial solutions and power and process businesses (mainly control valves) that were part of Advanced Flow Solutions. In addition, a number of smaller product lines were realigned as part of this change to better manage and serve our customers. The current and prior periods are reported under the new segment structure.

Each reporting segment is individually managed, as each requires different technology and marketing strategies, and has separate financial results that are reviewed by our CODM. Our CODM evaluates segment performance and determines how to allocate resources utilizing, among other data, segment operating income. Segment operating income excludes special and restructuring charges, net. In addition, certain administrative expenses incurred at the corporate level for the benefit of the reporting segments are allocated to the segments based upon specific identification of costs, employment related information or net revenues. Each segment contains related products and services particular to that segment.

Corporate is reported on a net "after allocations" basis. Inter-segment intercompany transactions affecting net operating profit have been eliminated within the respective reportable segments.

The amounts reported in the Corporate expenses line item in the following table consists primarily of the following: compensation and fringe benefit costs for executive management and other corporate staff; Board of Director compensation; corporate development costs (relating to mergers and acquisitions); human resource development and benefit plan administration expenses; legal, accounting and other professional and consulting costs; facilities, equipment and maintenance costs; and travel and various other administrative costs related to our corporate office and respective functions. The above costs are incurred in the course of furthering the business prospects of the Company and relate to activities such as: implementing strategic business growth opportunities; corporate governance; risk management; tax; treasury; investor relations and shareholder services; regulatory compliance; strategic tax planning; and stock transfer agent costs.

Our CODM evaluates segment operating performance using segment operating income. Segment operating income is defined as GAAP operating income excluding intangible amortization and amortization of fair value step-ups of inventory and fixed assets from acquisitions completed subsequent to December 31, 2011, the impact of restructuring related inventory write-offs, impairment charges and special charges or gains. The Company also refers to this measure as adjusted operating income. The Company uses this measure because it helps management understand and evaluate the segments' core operating results and facilitate comparison of performance for determining incentive compensation achievement.

The following table presents certain reportable segment information (in thousands):

	2018	2017	2016
Net revenues			
Energy	$ 451,232	$ 339,617	$ 305,939
Aerospace & Defense	237,017	182,983	166,127
Industrial	487,576	139,110	118,193
Consolidated revenues	$ 1,175,825	$ 661,710	$ 590,259

Segment income			
Energy - Segment Operating Income	$ 33,496	$ 30,131	$ 32,651
Aerospace & Defense - Segment Operating Income	36,047	23,375	15,368
Industrial - Segment Operating Income	57,340	19,932	20,056
Corporate expenses	(30,299)	(21,744)	(25,672)
Subtotal	96,584	51,694	42,403
Special restructuring charges, net	12,752	6,062	8,975
Special other charges, net	11,087	7,989	8,196
Special and restructuring charges, net	23,839	14,051	17,171
Restructuring related inventory charges	2,402	—	2,846
Amortization of inventory step-up	6,600	4,300	1,365
Impairment charges	—	—	202
Acquisition amortization	47,310	12,542	9,901
Acquisition depreciation	7,049	233	—
Brazil restatement impact	—	—	—
Restructuring and other cost, net	63,361	17,075	14,314
Consolidated Operating Income	9,384	20,568	10,918
Interest Expense, net (a)	52,913	10,777	3,310
Other Expense (Income), net (a)	(7,435)	3,678	(2,072)
Income from continuing operations before income taxes	$ (36,094)	$ 6,113	$ 9,680
Identifiable assets			
Energy	$ 882,630	$ 837,492	$ 463,359
Aerospace & Defense	399,102	375,094	486,369
Industrial	1,279,048	1,408,217	—
Corporate	$ (769,168)	(714,004)	(279,813)
Consolidated Identifiable assets	$ 1,791,612	$ 1,906,799	$ 669,915
Capital expenditures			
Energy	$ 7,448	$ 3,840	$ 3,902
Aerospace & Defense	4,739	3,400	4,441
Industrial	9,813	5,928	4,094
Corporate	1,787	1,378	1,775
Consolidated Capital expenditures	$ 23,787	$ 14,546	$ 14,212
Depreciation and amortization			
Energy	$ 16,482	$ 12,518	$ 7,102
Aerospace & Defense	10,937	4,325	15,624
Industrial	49,939	11,881	—
Corporate	750	1,313	1,209
Consolidated Depreciation and amortization	$ 78,108	$ 30,037	$ 23,935

The total assets for each reportable segment have been reported as the Identifiable Assets for that segment, including inter-segment intercompany receivables, payables and investments in other CIRCOR companies. Identifiable assets reported in Corporate include both corporate assets, such as cash, deferred taxes, prepaid and other assets, fixed assets, as well as the elimination of all inter-segment intercompany assets. The elimination of intercompany assets results in negative amounts reported in Corporate for Identifiable Assets. Corporate Identifiable Assets after elimination of intercompany assets were $23.8 million, $15.6 million, and $50.5 million as of December 31, 2018, 2017 and 2016, respectively.

The following tables present net revenue and long-lived assets by geographic area. The net revenue amounts are based on shipments to each of the respective areas.

Net revenues by geographic area (in thousands)	Year Ended December 31, 2018	2017	2016
United States	$ 535,008	$ 324,204	$ 232,650
France	48,346	41,584	42,908
Germany	97,771	32,480	26,451
Canada	45,919	28,703	32,750
Saudi Arabia	10,037	28,626	68,693
United Kingdom	37,154	26,872	27,579
China	35,735	16,875	11,157
Norway	29,523	13,462	21,668
Rest of Europe	106,105	56,638	32,460
Rest of Asia-Pacific	102,131	55,265	39,808
Other	128,096	37,001	54,135
Total net revenues	$ 1,175,825	$ 661,710	$ 590,259

Long-lived assets by geographic area (in thousands)	December 31, 2018	2017
United States	$ 129,527	$ 130,587
Germany	41,852	42,651
UK	11,330	12,592
India	8,535	7,618
Italy	3,999	5,213
Mexico	3,689	2,853
France	3,271	3,851
Netherlands	2,291	2,823
Other	5,325	9,351
Total long-lived assets	$ 209,819	$ 217,539

(19) Subsequent Event

In January 2019, the Company announced the sale of its Reliability Services ("RS") business to an affiliate of RelaDyne LLC, a leading provider of lubricants and industrial reliability services, for approximately $85 million in cash, on a cash-free, debt-free basis. The RS business provides critical lubrication and flushing services, and oil misting equipment to customers in the Oil & Gas, Petrochemical, Power Generation, Industrial and Navy markets. The RS business was acquired as part of the December 2017 fluid handing acquisition and was previously reported within the Energy segment As of December 31, 2018,the RS business is collapsed as "held for sale" with the current assets and current liabilities section of our balance sheet. We anticipate recording a special gain on the RS sale during the first quarter of 2019 in the range of $4.0 million to $8.0 million.

The divestiture is in line with CIRCOR's strategy to focus on its core mission-critical flow control platform and underscores its commitment to strengthening its balance sheet. The Company expects to use the net proceeds from the sale to pay down outstanding debt.

(20) Other (Income) Expense, Net

The following table outlines other (income) expense, net (in thousands):

	December 31,	
	2018	2017
Pension - Interest cost	$ 9,164	$ —
Pension - Expected return on assets	(15,418)	—
Foreign Currency Translations	(1,840)	2,136
Other	659	1,542
Other (income) expense, net	$ (7,435)	$ 3,678

On January 1, 2018, we adopted the FASB issued ASU 2017-07, Compensation—Retirement Benefits (Topic 715), which amends the presentation requirements of service cost and other components of net benefit cost in the income statement. Service costs are recorded within the selling, general, and administrative caption of our consolidated income statement, while the other components of net benefit cost are recorded in the other expense (income), net caption of our consolidated income statement. Refer to Note 2, Summary of Significant Accounting Policies, for further details of adopting ASU 2017-07.

(21) Quarterly Financial Information

Summary Quarterly Data — Unaudited

(in thousands, except per share information)

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
Year Ended December 31, 2018				
Net revenues	$ 275,580	$ 301,368	$ 297,514	$ 301,363
Gross profit	76,304	88,251	85,078	92,018
Net income (loss)	(17,441)	5,902	(6,841)	(21,005)
Earnings (loss) per common share:				
Basic	$ (0.88)	$ 0.30	$ (0.34)	$ (1.06)
Diluted	(0.88)	0.30	(0.34)	(1.06)
Dividends per common share	—	—	—	—
Year Ended December 31, 2017				
Net revenues	$ 145,208	$ 151,231	$ 159,693	$ 205,578
Gross profit	46,633	47,668	47,303	59,216
Net income (loss)	4,773	8,970	3,617	(5,571)
Earnings per common share:				
Basic	$ 0.29	$ 0.54	$ 0.22	$ (0.32)
Diluted	0.29	0.54	0.22	(0.32)
Dividends per common share	0.0375	0.0375	0.0375	0.0375

Schedule II — Valuation and Qualifying Accounts

CIRCOR INTERNATIONAL, INC.

Allowance for Doubtful Accounts

Description	Balance at Beginning of Period	Additions (Reductions) Charged to Costs and Expenses	Additions (Reductions) Charged to Other Accounts	Deductions (1)	Balance at End of Period
	(in thousands)				
Year ended					
December 31, 2018					
Deducted from asset account:					
Allowance for doubtful accounts	$ 4,791	$ 1,107	$ 1,075	$ (238)	$ 6,735
Year ended					
December 31, 2017					
Deducted from asset account:					
Allowance for doubtful accounts (2)	$ 5,056	$ (87)	$ 378	$ (556)	$ 4,791
Year ended					
December 31, 2016					
Deducted from asset account:					
Allowance for doubtful accounts	$ 8,290	$ 613	$ 425	$ (4,272)	$ 5,056

(1) Uncollectible accounts written off, net of recoveries.
(2) Balance at end of period excludes the engineered valves accounts receivable allowances of $2.4 million, which are classified as long-term as of December 31, 2015.

EXECUTIVE CHANGE OF CONTROL AGREEMENT

This EXECUTIVE CHANGE OF CONTROL AGREEMENT (“Agreement”) is made as of the 7th of January 2019, between CIRCOR International, Inc., a Delaware corporation (the “Company”), and Chadi Chahine (“Executive”).

WHEREAS, the Company presently employs the Executive in which capacity the Executive serves as an officer of the Company; and

WHEREAS, the Board of Directors of the Company (the “Board”) recognizes the valuable services rendered to the Company and its respective affiliates by the Executive; and

WHEREAS, the Board has determined that it is in the best interests of the Company and its affiliates to encourage in advance the continued loyalty of the Executive as well as the Executive’s continued attention to his assigned duties and objectivity in the event of a threatened or possible change in control of the Company;

NOW, THEREFORE, in consideration of the mutual covenants and agreements herein contained and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties agree as follows:

1. ***Definitions***. For purposes of this Agreement, the following terms shall have the following meanings:

“**Cause**” shall mean: (a) conduct by Executive constituting a material act of willful misconduct in connection with the performance of his duties, including, without limitation, misappropriation of funds or property of the Company or any of its affiliates other than the occasional, customary and de minimus use of Company property for personal purposes; (b) criminal or civil conviction of Executive, a plea of nolo contendere by Executive or conduct by Executive that would reasonably be expected to result in material injury to the reputation of the Company if he were retained in his position with the Company, including, without limitation, conviction of a felony involving moral turpitude; (c) continued, willful and deliberate non-performance by Executive of his duties hereunder (other than by reason of Executive’s physical or mental illness, incapacity or disability) which has continued for more than thirty (30) days following written notice of such non-performance from the Chairman of the Board; or (d) a violation by Executive of the Company’s employment policies which has continued following written notice of such violation from the Chairman of the Board.

“**Change in Control**” shall mean any of the following:

(a) Any “person,” as such term is used in Sections 13(d) and 14(d) of the Securities Exchange Act of 1934, as amended (the “Act”) (other than the Company, any of its subsidiaries, or any trustee, fiduciary or other person or entity holding securities under any employee benefit plan or trust of the Company or any of its subsidiaries), together with all “affiliates” and “associates” (as such terms are defined in Rule 12b-2 under the Act) of such person, shall become the “beneficial owner” (as such term is defined in Rule 13d-3 under the Act), directly or indirectly, of securities of the Company representing twenty-five percent (25%) or more of either (A) the combined voting power of the Company’s then outstanding securities having the right to voice in an election of the Company’s Board (“Voting Securities”) or (B) the then outstanding shares of Company’s common stock, par value $0.01 per share (“Common Stock”) (other than as a result of an acquisition of securities directly from the Company); or

(b) Incumbent Directors (as defined below) cease for any reason, including, without limitation, as a result of a tender offer, proxy contest, merger or similar transaction, to constitute at least a majority of the Board; or

(c) The stockholders of the Company shall approve (A) any consolidation or merger of the Company where the stockholders of the Company, immediately prior to the consolidation or merger, would not, immediately after the consolidation or merger, beneficially own (as such term is defined in Rule 13d-3 under the Act), directly or indirectly, shares representing in the aggregate fifty percent (50%) or more of the voting shares of the Company or other party issuing cash or securities in the consolidation or merger (or of its ultimate parent corporation, if any), (B) any sale, lease, exchange or other transfer (in one transaction or a series of transactions contemplated or arranged by any party as a single plan) of all or substantially all of the assets of the Company or (C) any plan or proposal for the liquidation or dissolution of the Company.

Notwithstanding the foregoing, a “Change of Control” shall not be deemed to have occurred for purposes of the foregoing clause (a) solely as the result of an acquisition of securities by the Company which, by reducing the number of shares of Common Stock or other Voting Securities outstanding, increases the proportionate number of shares beneficially owned by any person to twenty-five percent (25%) or more of either (A) the combined voting power of all of the then outstanding Voting Securities or (B) Common Stock; provided, however, that if any person referred to in this sentence shall thereafter become the beneficial owner of any additional shares of Voting Securities or Common Stock (other than pursuant to a stock split, stock dividend, or similar transaction or as a result of an acquisition of securities directly from the Company) and immediately thereafter beneficially owns twenty-five percent (25%) or more of either (A) the combined voting power of all of the then outstanding Voting Securities or (B) Common Stock, then a “Change of Control” shall be deemed to have occurred for purposes of the foregoing clause (a).

“**Good Reason**” shall mean that Executive has complied with the “Good Reason Process” (hereinafter defined) following the occurrence of any of the following events: (a) a material diminution in the Executive’s responsibilities, authority or duties; (b) a material diminution in the Executive’s Base Salary except for across-the-board salary reductions based on the Company’s financial performance similarly affecting all or substantially all senior management employees of the Company, (c) a material change in the geographic location at which the Executive provides services to the Company, provided that such change shall be more than thirty (30) miles from such location; or (d) the material breach of this Agreement by the Company. “Good Reason Process” shall mean that (i) Executive reasonably determines in good faith that a "Good Reason" event has occurred; (ii) Executive notifies the Company in writing of the occurrence of the Good Reason event within sixty (60) days of the occurrence of such event; (iii) Executive cooperates in good faith with the Company's efforts, for a period not less than ninety (90) days following such notice, to modify Executive's employment situation in a manner acceptable to Executive and Company; and (iv) notwithstanding such efforts, one or more of the Good Reason events continues to exist and has not been modified in a manner acceptable to Executive. If the Company cures the Good Reason event in a manner acceptable to Executive during the ninety (90) day period, Good Reason shall be deemed not to have occurred.

"**Incumbent Directors**" shall mean persons who, as of the Commencement Date, constitute the Board; provided that any person becoming a director of the Company subsequent to the Commencement Date shall be considered an Incumbent Director if such person's election was approved by or such person was nominated for election by a vote of at least a majority of the Incumbent Directors; but provided further, that any such person whose initial assumption of office is in connection with an actual or threatened election contest relating to the election of members of the Board or other actual or threatened solicitation of proxies or consents by or on behalf of a person other than the Board, including by reason of agreement intended to avoid or settle any such actual or threatened contest or solicitation, shall not be considered an Incumbent Director.

2. ***Term***. The term of this Agreement shall extend from the date hereof (the "Commencement Date") until the first anniversary of the Commencement Date; provided, however, that the term of this Agreement shall automatically be extended for one additional year on the first anniversary of the Commencement Date and each anniversary thereafter unless, not less than 90 days prior to each such date, either party shall have given notice to the other that it does not wish to extend this Agreement; provided, further, that if a Change in Control occurs during the original or extended term of this Agreement, the term of this Agreement shall continue in effect for a period of not less than twelve (12) months beyond the month in which the Change in Control occurred.

3. ***Change in Control Payment***.

(a) The provisions of this Paragraph 3 set forth certain terms of an agreement reached between Executive and the Company regarding Executive's rights and obligations in connection with a Change in Control. These provisions are intended to assure and encourage in advance Executive's continued attention and dedication to his assigned duties and his objectivity during the pendency and after the occurrence of any such event.

(b) If within twelve (12) months after the occurrence of the first event constituting a Change in Control, Executive's employment is terminated by the Company without Cause or Executive terminates his employment for Good Reason (each, a "Qualifying Termination"), then the Company shall pay Executive a lump sum in cash in an amount equal to two (2) times the sum of (A) Executive's current Base Salary plus (B) Executive's current target annual incentive compensation under the Company's Executive Bonus Incentive Plan ('Target

Bonus Opportunity”). Such lump sum cash payment shall be paid to Executive within thirty (30) days following the date of termination of Executive’s employment.

(c) The vesting of the Executive’s Equity Awards shall be governed by this Paragraph 3(c). The term “Equity Award” shall mean stock options, stock appreciation rights, restricted stock, restricted stock units, performance shares or any other form of award that is measured with reference to the Company’s common stock.

(i) The vesting of the Executive’s Equity Awards that vest solely on the basis of continued employment with the Company or any of its subsidiaries or affiliates shall be accelerated solely by reason of a Change in Control only if the surviving corporation or acquiring corporation following a Change in Control refuses to assume or continue the Executive’s Equity Awards or to substitute similar Equity Awards for those outstanding immediately prior to the Change in Control. If such Executive’s Equity Awards are so continued, assumed or substituted and at any time after the Change in Control the Executive incurs a Qualifying Termination, then the vesting and exercisability of all such unvested Equity Awards held by the Executive shall be accelerated in full and any reacquisition rights held by the Company with respect to an Equity Award shall lapse in full, in each case, upon such termination.

(ii) The vesting of the Executive’s Equity Awards that vest, in whole or in part, based upon achieving Performance Criteria (collectively, “Performance Shares”) shall be determined as set forth below.

(A) In the event of a Change in Control that does not also constitute a “change in the ownership or effective control of a corporation, or a change in the ownership of a substantial portion of the assets of a corporation” under Treas. Reg. § 1.409A-3(i)(5), then (i) the Performance Shares subject to this Agreement shall remain outstanding and (ii) the Performance Shares shall continue to be subject to the terms of this Agreement.

(B) In the event of a Change in Control that is also a “change in the effective control of a corporation” under Treas. Reg. § 1.409A-3(i)(5)(vi), then (i) the Performance Shares subject to this Agreement shall remain outstanding, (ii) such Performance Shares shall continue to be subject to the terms of this Agreement, (iii) all requirements to remain employed until the end of the applicable performance period shall be waived, and (iv) such Performance Shares shall be paid out on a pro-rata basis based upon the actual level of performance for the applicable performance period, with such Performance Shares to be delivered at the same time as if the Executive had remained employed with the Company.

(C) In the event of a Change in Control that is also a “change in the ownership of a corporation” under Treas. Reg. § 1.409A-3(i)(5)(v) or a “change in the ownership of a substantial portion of a corporation’s assets” under Treas. Reg. § 1.409A-3(i)(5)(vii) (a “Special CIC”), the Performance Shares shall immediately vest and the Participant shall receive, within 10 days of such Special CIC, the consideration (including all stock, other securities or assets, including cash) payable in respect of the Target Number of Performance Shares (or, if greater, the number of Performance Shares based on actual performance from the beginning of the Performance Period until the Special CIC, as reasonably determined by the Committee based on available information) as if they were vested, issued and outstanding at the time of such Special CIC [on a pro rata basis]; provided, however, that with respect to Performance Shares that are otherwise subject to a “substantial risk of forfeiture” under Treas. Reg. § 1.409A-1(d) and to the extent permitted by Treas. Reg. § 1.409-3, the Committee may arrange for the substitution for the Performance Shares with the grant of a replacement award (the “Replacement Award”) to Participant of shares of restricted stock of the surviving or successor entity (or the ultimate parent thereof) in such Change in Control, but only if all of the following criteria are met:

a. Such Replacement Award shall consist of securities listed for trading following such Change in Control on a national securities exchange;

b. Such Replacement Award shall have a value as of the date of such Change in Control equal to the value of the Target Number of Performance Shares (or, if greater, the number of Performance Shares based on actual performance from the beginning of the Performance Period until the Special CIC, as reasonably determined by the Committee based on available information), calculated as if the Performance Shares were exchanged for the consideration (including all stock, other securities or assets, including cash) payable for shares of Common Stock in such Change in Control transaction;

c. Such Replacement Award shall become vested and the securities underlying the Replacement Award shall be issued to the Participant on the 2nd anniversary of the Change in Control, if such Change in Control occurs within the first 12 months of the applicable performance period, or the 1st anniversary of the Change in Control if such Change in Control occurs after the first 12 months of the applicable performance period, in either case subject to Participant’s continued employment with the surviving or successor entity (or a direct or indirect subsidiary thereof) through such date, provided, however, that such Replacement Award will vest immediately upon and the securities underlying the Replacement Award shall be issued within 60 days after the date that (i) Participant’s employment is terminated by the surviving or successor entity without Cause, (ii) Participant’s employment is terminated for Good Reason, (iii) Participant’s death or (iv) Participant’s medically diagnosed permanent physical or mental inability to perform his or her job duties;

d. Notwithstanding clause c. above, such Replacement Award shall vest immediately prior to and the securities underlying the Replacement Award shall be issued to Participant upon (A) any transaction with respect to the surviving or successor entity (or parent or subsidiary company thereof) of substantially similar character to a Change in Control, or (B) the securities constituting such Replacement Award ceasing to be listed on a national securities exchange, in each case so long as Participant remains continuously employed until such time; and

e. The Replacement Award or the right to such Replacement Award does not cause the Performance Shares to become subject to tax under Section 409A of the Code.

f. Upon such substitution the Performance Shares shall terminate and be of no further force and effect.

For purposes of this Paragraph 3(c)(ii)(C), “Performance Criteria” means any business criteria that apply to the Executive a business unit, division, subsidiary, affiliate, the Company or any combination of the foregoing.

(d) The Company shall, for a period of two (2) years commencing on the date of a Qualifying Termination, pay such health insurance premiums as may be necessary to allow Executive, Executive’s spouse and dependents to continue to receive health insurance coverage substantially similar to the coverage they received prior to the date of termination of Executive’s employment.

(e) **Additional Limitation**.

(i) Anything in this Agreement to the contrary notwithstanding, in the event that any compensation, payment or distribution by the Company to or for the benefit of Executive, whether paid or payable or distributed or distributable pursuant to the terms of this Agreement or otherwise (the “Severance Payments”), would be subject to the excise tax imposed by Section 4999 of the Internal Revenue Code of 1986, as amended (the “Code”), the following provisions shall apply:

(A) If the Severance Payments, reduced by the sum of (1) the Excise Tax and (2) the total of the Federal, state and local income and employment taxes payable by Executive on the amount of the Severance Payments which are in excess of the Threshold Amount, are greater than or equal to the Threshold Amount, Executive shall be entitled to the full benefits payable under this Agreement.

(B) If the Threshold Amount is less than (x) the Severance Payments, but greater than (y) the Severance Payments reduced by the sum of (1) the Excise Tax and (2) the total of the Federal, state, and local income and employment taxes on the amount of the Severance Payments which are in excess of the Threshold Amount, then the benefits payable under this Agreement shall be reduced (but not below zero) to the extent necessary so that the maximum Severance Payments shall not exceed the Threshold Amount. To the extent that there is more than one method of reducing the payments to bring them within the Threshold Amount, the Severance Payments shall be reduced in the following order: (i) cash payments not subject to Section 409A of the Internal Revenue Code of 1986, as amended (the “Code”); (ii) cash payments subject to Section 409A of the Code; (iii) equity-based payments; and (iv) non-cash form of benefits. To the extent any payment is to be made over time (e.g., in installments), then the payments shall be reduced in reverse chronological order.

For the purposes of this Paragraph 3, “Threshold Amount” shall mean three times Executive’s “base amount” within the meaning of Section 280G(b)(3) of the Code and the regulations promulgated thereunder less one dollar ($1.00); and “Excise Tax” shall mean the excise tax imposed by Section 4999 of the Code, and any interest or penalties incurred by Executive with respect to such excise tax.

(ii) The determination as to which of the alternative provisions of Paragraph 3(b)(i) shall apply to Executive shall be made by KPMG LLP or any other nationally recognized accounting firm selected by the Company (the “Accounting Firm”), which shall provide detailed supporting calculations both to the Company and Executive within 15 business days of the date of termination of Executive’s employment, if applicable, or at such earlier time as is reasonably requested by the Company or Executive. For purposes of determining which of the alternative provisions of Paragraph 3(b)(i) shall apply, Executive shall be deemed to pay federal income taxes at the highest marginal rate of federal income taxation applicable to individuals for the calendar year in which the determination is to be made, and state and local income taxes at the highest marginal rates of individual taxation in the state and locality of Executive’s residence on the date of termination of Executive’s employment, net of the maximum reduction in federal income taxes which could be obtained from deduction of such state and local taxes. Any determination by the Accounting Firm shall be binding upon the Company and Executive.

4. ***Unauthorized Disclosures***. Executive acknowledges that in the course of his employment with the Company (and, if applicable, its predecessors), he has been allowed to become, and will continue to be allowed to become, acquainted with the Company’s and the Company’s business affairs, information, trade secrets, and other matters which are of a proprietary or confidential nature, including but not limited to the Company’s and its affiliates’ and predecessors’ operations, business opportunities, price and cost information, finance, customer information, business plans, various sales techniques, manuals, letters, notebooks, procedures, reports, products, processes, services, and other confidential information and knowledge (collectively the “Confidential Information”) concerning the Company’s and its affiliates’ and predecessors’ business. The Company agrees to provide on an ongoing basis such Confidential Information as the Company deems necessary or desirable to aid Executive in the performance of his duties. Executive understands and acknowledges that such Confidential Information is confidential, and he agrees not to disclose such Confidential Information to anyone outside the Company except to the extent that (i) Executive deems such disclosure or use reasonably necessary or appropriate in connection with performing his duties on behalf of the Company, (ii) Executive is required by order of a court of competent jurisdiction (by subpoena or similar process) to disclose or discuss any Confidential Information, provided that in such case, Executive shall promptly inform the Company of such event, shall cooperate with the Company, as appropriate, in attempting to obtain a protective order or to otherwise restrict such disclosure, and shall only disclose Confidential Information to the minimum extent necessary to comply with any such court order; (iii) such Confidential Information becomes generally known to and available for use in the Company’s industry (the “Fluid-Control Industry”), other than as a result of any action or inaction by Executive; or (iv) such information has been rightfully received by a member of the Fluid-Control Industry or has been published in a form generally available to the Fluid-Control Industry prior to the date Executive proposes to disclose or use such information. Executive further agrees that he will not during employment and/or at any time thereafter use such Confidential Information in competing, directly or indirectly, with the Company. At such time as Executive shall cease to be employed by the Company, he will immediately turn over to the Company all Confidential Information, including papers, documents, writings, electronically stored information, other property, and all copies of them provided to or created by him during the course of his employment with the Company.

5. ***Covenant Not to Compete***. In consideration of the benefits afforded the Executive under the terms provided in this Agreement and as a means to aid in the performance and enforcement of the terms of the provisions of Paragraph 4, Executive agrees that

(a) during the term of Executive's employment with the Company and for a period of twelve (12) months thereafter, regardless of the reason for termination of employment, Executive will not, directly or indirectly, as an owner, director, principal, agent, officer, employee, partner, consultant, servant, or otherwise, carry on, operate, manage, control, or become involved in any manner with any business, operation, corporation, partnership, association, agency, or other person or entity which is engaged in a business that is competitive with any of the Company or its affiliate's businesses or products as of the date of Executive's termination of employment with the Company, in any area or territory in which the Company or any affiliate of the Company conducts operations; provided, however, that the foregoing shall not prohibit Executive from owning up to one percent (1%) of the outstanding stock of a publicly held company engaged in the Fluid-Control Industry; and

(b) during the term of Executive's employment with the Company and for a period of twelve (12) months thereafter, regardless of the reason for termination of employment, Executive will not directly or indirectly solicit or induce any present or future employee of the Company or any affiliate of the Company to accept employment with Executive or with any business, operation, corporation, partnership, association; agency, or other person or entity with which Executive may be associated, and Executive will not employ or cause any business, operation, corporation, partnership, association, agency, or other person or entity with which Executive may be associated to employ any present or future employee of the Company or affiliate of the Company without providing the Company or the affiliate, as appropriate, with ten (10) days' prior written notice of such proposed employment.

Should Executive violate any of the provisions of this Paragraph, then in addition to all other rights and remedies available to the Company at law or in equity, the duration of this covenant shall automatically be extended for the period of time from which Executive began such violation until he permanently ceases such violation.

6. ***Notice***. For purposes of this Agreement, notices and all other communications provided for in the Agreement shall be in writing and shall be deemed to have been duly given when delivered or mailed by United States certified mail, return receipt requested, postage prepaid, addressed as follows:

If to the Executive:

At his home address as shown in the Company's personnel records;

If to the Company:

CIRCOR International, Inc.
30 Corporate Drive, Suite 200
Burlington, MA 01803
Attention: Chief Human Resources Officer

or to such other address as either party may have furnished to the other in writing in accordance herewith, except that notices of change of address shall be effective only upon receipt.

7. ***Not an Employment Contract***. This Agreement is intended only to provide those benefits for the Executive as set forth in Paragraph 3 in connection with a Change of Control. As such, this Agreement is not intended to and does not in any way constitute an employment agreement or other contract which would cause the employee to be considered anything other than an employee at will or to in any way be entitled to any specific payments or benefits from the Company in the event of a termination of employment not subject to Paragraph 3 of this Agreement.

8. ***Miscellaneous***. No provisions of this Agreement may be modified, waived, or discharged unless such waiver, modification, or discharge is agreed to in writing and signed by Executive and such officer of the Company as may be specifically designated by the Board. No waiver by either party hereto of or compliance with, any condition or provision of this Agreement to be performed by such other party shall be deemed a waiver of similar or dissimilar provisions or conditions at the same or at any prior or subsequent time. The respective rights and obligations of the parties under this Agreement will survive any termination of Executive's employment or termination of this Agreement to the extent necessary to the intended preservation of such rights and obligations. No agreements or representations, oral or otherwise, express or implied, unless specifically referred to herein, with respect to the subject matter hereof have been made by either party which are not set forth expressly in this Agreement. The validity, interpretation, construction, and performance of this Agreement shall be governed by the laws of the Commonwealth of Massachusetts (without regard to principles of conflicts of laws).

9. ***Validity***. The invalidity or unenforceability of any provision or provisions of this Agreement shall not affect the validity or enforceability of any other provision of this Agreement, which shall remain in full force and effect. The invalid portion of this Agreement, if any, shall be modified by any court having jurisdiction to the extent necessary to render such portion enforceable.

10. ***Counterparts***. This Agreement may be **executed in counterparts, each of** which shall be deemed to be an original but all of which together will constitute one and the same instrument.

11. ***Arbitration; Other Disputes***. In the event of any dispute or controversy arising under or in connection with this Agreement, the parties shall first promptly try in good faith to settle such dispute or controversy by mediation under the applicable rules of the American Arbitration Association before resorting to arbitration. In the event such dispute or controversy remains unresolved in whole or in part for a period of thirty (30) days after it arises, the parties will settle any remaining dispute or controversy exclusively by arbitration in Boston, Massachusetts, in accordance with the rules of the American Arbitration Association then in effect. Judgment may be entered on the arbitrator's award in any court having jurisdiction. Notwithstanding the above, the Company shall be entitled to seek a restraining order or injunction in any court of competent jurisdiction to prevent any continuation of any violation of Paragraph 4 or 5 hereof.

12. *Litigation and Regulatory Cooperation*. During and after Executive's employment, Executive shall reasonably cooperate with the Company in the defense or prosecution of any claims or actions now in existence or which may be brought in the future against or on behalf of the Company and/or any affiliate of the Company which relate to events or occurrences that transpired while Executive was employed by the Company; provided, however, that such cooperation shall not materially and adversely affect Executive or expose Executive to an increased probability of civil or criminal litigation. Executive's cooperation in connection with such claims or actions shall include, but not be limited to, being available to meet with counsel to prepare for discovery or trial and to act as a witness on behalf of the Company and/or the Company at mutually convenient times. During and after Executive's employment, Executive also shall cooperate fully with the Company in connection with any investigation or review of any federal, state or local regulatory authority as any such investigation or review relates to events or occurrences that transpired while Executive was employed by the Company. The Company shall also provide Executive with compensation on an hourly basis (to be derived from the sum of his Base Compensation and Target Bonus Opportunity) for requested litigation and regulatory cooperation that occurs after his termination of employment and reimburse Executive for all costs and expenses incurred in connection with his performance under this Paragraph 12, including, but not limited to, reasonable attorneys' fees and costs.

13. ***Gender Neutral***. Wherever used herein, a pronoun in the masculine gender shall be considered as including the feminine gender unless the context clearly indicates otherwise.

14. ***Section 409A***.

(a) Anything in this Agreement to the contrary notwithstanding, if at the time of the Executive's separation from service within the meaning of Section 409A of the Code, the Company determines that the Executive is a "specified employee" within the meaning of Section 409A(a)(2)(B)(i) of the Code, then to the extent any payment or benefit that the Executive becomes entitled to under this Agreement on account of the Executive's separation from service would be considered deferred compensation subject to the 20 percent additional tax imposed pursuant to Section 409A(a) of the Code as a result of the application of Section 409A(a)(2)(B)(i) of the Code, such payment shall not be payable and such benefit shall not be provided until the date that is the earlier of (A) six months and one day after the Executive's separation from service, or (B) the Executive's death.

(b) The parties intend that this Agreement will be administered in accordance with Section 409A of the Code. To the extent that any provision of this Agreement is ambiguous as to its compliance with Section 409A of the Code, the provision shall be read in such a manner so that all payments hereunder comply with Section 409A of the Code. The parties agree that this Agreement may be amended, as reasonably requested by either party, and as may be necessary to fully comply with Section 409A of the Code and all related rules and regulations in order to preserve the payments and benefits provided hereunder without additional cost to either party.

(c) The determination of whether and when a separation from service has occurred shall be made in accordance with the presumptions set forth in Treasury Regulation Section 1.409A-1(h).

(d) The Company makes no representation or warranty and shall have no liability to the Executive or any other person if any provisions of this Agreement are determined to constitute deferred compensation subject to Section 409A of the Code but do not satisfy an exemption from, or the conditions of, such Section.

(e) All in-kind benefits provided and expenses eligible for reimbursement under this Agreement shall be provided by the Company or incurred by the Executive during the time periods set forth in this Agreement. All reimbursements shall be paid as soon as administratively practicable, but in no event shall any reimbursement be paid after the last day of the taxable year following the taxable year in which the expense was incurred. The amount of in-kind benefits provided or reimbursable expenses incurred in one taxable year shall not affect the in-kind benefits to be provided or the expenses eligible for reimbursement in any other taxable year. Such right to reimbursement or in-kind benefits is not subject to liquidation or exchange for another benefit.

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IN WITNESS WHEREOF, the parties have executed this Agreement effective on the date and year first above written.

CIRCOR International

By: ________________________________

Scott A. Buckhout

President & CEO

EXECUTIVE

Chadi Chahine, CFO

____

SEVERANCE AGREEMENT

This Severance Agreement (the "Agreement") is made and entered into as of January 7, 2019, by and between CIRCOR International, Inc. ("CIRCOR" or "Company") and Chadi Chahine (the "Executive").

WHEREAS, CIRCOR presently employs the Executive in which capacity the Executive serves as Chief Financial Officer and as an officer and/or director of other direct and indirect subsidiaries of the Company; and

WHEREAS, the Company desires to provide severance compensation to the Executive upon the occurrence of certain events; and

WHEREAS, in exchange for the severance compensation provided for under this Agreement, Executive agrees to certain non-competition and non-solicitation covenants as set forth herein,

NOW, THEREFORE, in consideration of the foregoing and the mutual promises of the parties herein contained, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Company and the Executive hereby covenant and agree with each other as follows:

1. Definitions. For purposes of the Agreement, the following terms shall have the following meanings:

(a) "Accrued Benefits" shall mean (i) all accrued but unpaid Base Salary through the Date of Termination of Executive's employment (including any accrued vacation) at the rate in effect at the time Notice of Termination is given, (ii) any unpaid or unreimbursed expenses incurred in accordance with Company policies, (iii) accrued but unused vacation days through the Date of Termination of Executive's employment determined as per the Company's vacation policy, and (iv) any amounts that are accrued and vested under any Company plan or policy as of the Date of Termination.

(b) "Base Salary" shall mean the Executive's annual base salary.

(c) "Disability" shall mean, as a result of Executive's incapacity due to physical or mental illness, Executive shall have been absent from his duties with the Company on a full-time basis for 180 calendar days in the aggregate in any twelve-month period.

(d) "For Cause" shall mean: (i) conduct by Executive constituting a material act of willful misconduct in connection with the performance of his duties, including, without limitation, misappropriation of funds or property of the Company or any of its affiliates
other than the occasional, customary and de minimis use of Company property for personal purposes; (ii) criminal or civil conviction of Executive, a plea of nolo contendere by Executive or

conduct by Executive that would reasonably be expected to result in material injury to the reputation of the Company if he was retained in his position with the Company,

including, without limitation, conviction of a felony involving moral turpitude; (iii) continued, willful and deliberate non-performance by Executive of his duties hereunder (other than by reason of Executive's physical or mental illness, incapacity or disability) which has continued for more than thirty (30) days following written notice of such non performance from the Board of Directors of the Company (the "Board"); or (iv) a violation by Executive of the Company's employment policies which has continued following written notice of such violation from the Board.

(e) "Good Reason" shall mean that Executive has complied with the "Good Reason Process" (hereinafter defined) following the occurrence of any of the following events: (a) a material diminution or other material adverse change, not consented to by Executive, in the nature or scope of Executive's responsibilities, authorities, powers, functions or duties; (b) an involuntary material reduction in Executive's Base Salary except for across-the-board reductions similarly affecting all or substantially all management employees; (c) a material breach of this Agreement by the Company; or (d) a material change in the geographic location at which the Executive provides services to the Company.

"Good Reason Process" shall mean that (i) Executive reasonably determines in good faith that a "Good Reason" event has occurred; (ii) Executive notifies the Company in writing of the occurrence of the Good Reason event within 60 days of such occurrence; (iii) Executive reasonably cooperates in good faith with the Company's efforts following such notice (the "Cure Period"), to promptly remedy the condition; (iv) notwithstanding such efforts, the Good Reason event continues to exist; and (v) the Executive terminates his employment within 60 days after the end of the Cure Period. If the Company cures the Good Reason event during the Cure Period, Good Reason shall be deemed not to have occurred.

(f) "Severance Benefits" shall mean the payments described in Section 2(c) of this Agreement.

2. Post Termination Payments.

(a) Termination by the Company for Cause, Death or Disability. Upon termination of the Executive's employment by the Company for Cause, death, or Disability, the Company shall, through the Date of Termination (hereinafter defined), pay Executive the Accrued Benefits. Thereafter, the Company shall have no further obligations to Executive except as otherwise expressly provided under this Agreement or as required by law.

(b) Termination by the Executive other than for Good Reason. If Executive's employment is terminated by the Executive other than for Good Reason, then the Company shall, through the Date of Termination, pay Executive the Accrued Benefits. Thereafter, the Company shall have no further obligations to Executive except as otherwise expressly provided under this Agreement.

(c) Termination by the Company Other Than for Cause, Death or Disability or by the Executive for Good Reason. If Executive's employment is terminated (i) by the Company other than For Cause or Executive's death or Disability or (ii) by the Executive for Good Reason, then the Company shall, through the Date of Termination, pay Executive the Accrued Benefits. Subject to Section 2(d) and Section 18 below, the Executive shall also receive the following Severance Benefits:

(i) a lump sum payment equal to the Executive's current Base Salary in effect during the fiscal year in which such termination occurs payable in a single lump sum payment as soon as administratively practicable (but not later than sixty (60) days) following such Date of Termination;

(ii) a lump sum payment equal to the product of (A) the amount of the annual short-term bonus that would have been payable to the Executive if the Executive was still employed as of December 3 I st of the then current fiscal year in respect of the fiscal year in which employment termination occurs based on actual performance as compared to performance goals, and (B) the ratio of (x) the number of days elapsed during the fiscal year during which such termination of employment occurs on or prior to the date of such termination to (y) 365, payable as of the same time as annual short-term bonuses are paid to other senior executives and

(iii) subject to the Executive's election of COBRA rights, monthly payment of an amount equal to the employer's cost coverage in accordance with its contribution percentage toward medical and dental coverage for active employees immediately prior to the Date of Termination for twelve (12) months after such termination; provided, however, that the installment payments under this Section 2(c)(iii) shall cease on the first day of the month immediately following the month that the Executive no longer qualifies for continued COBRA coverage for any reason, including but not limited to the Executive's failure to pay the Executive's portion of the COBRA cost or the Executive becoming eligible for medical/dental insurance under another group health insurance plan (as defined by COBRA). Notwithstanding the foregoing, if the Company determines, in its sole discretion, that it cannot pay the foregoing installment payments without a substantial risk of violating applicable law (including, without limitation, Section 2716 of the Public Health Service Act), the Company shall be entitled to amend this Section 2(c)(iii) in order to preserve the value of such installment payments to the Executive without additional cost to either party.

(d) Required Release. The payment of the Severance Benefits shall be conditioned upon the Executive's execution, delivery to the Company, and non revocation of the release of claims, in a form reasonably acceptable to the Company (and the expiration of any revocation period contained in such release of claims) within sixty (60) days following the date of Executive's termination of employment hereunder. If the Executive fails to execute the release of claims in such a timely manner so as to permit any revocation period to expire prior to the end of such sixty (60) day period, or timely revokes the Executive's execution of such release following its execution, the Executive shall not be entitled to any of the Severance Benefits. Further, to the extent that any of the Severance Benefits constitutes '"nonqualified deferred compensation" for purposes of Section 409A of the Code, any payment of any amount or provision of any benefit otherwise scheduled to occur prior to the sixtieth (60th) day following termination of the Executive's employment hereunder, but for the condition on executing the release of claims as set forth herein, shall not be made until the first (1st) regularly scheduled payroll date following such sixtieth (60th) day, after which any remaining Severance Benefits shall thereafter be provided to Executive according to the applicable schedule set forth herein (and the first payment shall include any portion of the

Severance Benefits, and any such other payments or benefits, that would have been paid during such sixty (60) day period).

(e) Termination Covered Under Executive Change of Control Agreement. If Executive's employment is terminated under circumstances that would afford Executive certain rights under the Executive Change of Control Agreement currently in effect between the Company and Executive (or any successor agreement), the provisions of the Executive Change of Control Agreement shall govern and this Agreement shall have no force and effect, it being intended that the Executive Change of Control Agreement shall govern the rights and obligations of the parties in the event of a termination covered under the Executive Change of Control Agreement and this Agreement shall govern the rights and obligations of the parties in the event of any other termination.

3. Notice of Termination. Any termination of Executive's employment by the Company or any such termination by Executive shall be communicated by written Notice of Termination to the other party hereto. For purposes of this Agreement, a "Notice of Termination" shall mean a notice that indicates the specific termination provision in this Agreement relied upon.

4. Date of Termination. The "Date of Termination" shall be the date on which Notice of Termination is provided by either party or such later date as may be specified in such Notice of Termination.

5. Withholding. All payments made to the Executive under this Agreement shall be net of any tax or other amounts required to be withheld by the Company under applicable law.

6. No Mitigation. The Company agrees that, if the Executive's employment by the Company is terminated during the term of this Agreement, the Executive is not required to seek other employment or to attempt in any way to reduce any amounts payable to the Executive by the Company pursuant to any provision of this Agreement, including any payment under Section 2. Further, except as otherwise provided herein, the amount of any payment provided for in this Agreement shall not be reduced by any compensation earned by the Executive as the result of employment by another employer, by retirement benefits, by offset against any amount claimed to be owed by the Executive to the Company or otherwise.

7. Non-Competition and Non-Solicitation Covenants; Confidentiality. In consideration of the benefits afforded the Executive under the terms provided in this Agreement, Executive agrees that

(a) during the term of Executive's employment with the Company and for a period of twelve (12) months thereafter, regardless of the reason for termination of employment, Executive will not, directly or indirectly, as an owner, director, principal, agent, officer, employee, partner, consultant, servant, or otherwise, carry on, operate, manage, control, or become involved in any manner with any business, operation, corporation, partnership, association, agency, or other person or entity which is engaged in a business that is competitive with any of the Company's or its affiliates' products which are produced by the Company or its affiliates as of the date of Executive's termination of employment with the Company, in any area or territory in which the Company or any affiliate conducts operations; provided, however, that the foregoing shall not prohibit Executive from owning up to one percent (1%) of the outstanding stock of a publicly held company engaged in the Fluid-Control Industry; and

(b) during the term of Executive's employment with the Company and for a period of twelve (12) months thereafter, regardless of the reason for termination of employment, Executive will not directly or indirectly solicit or induce any present or future employee of the Company or any affiliate to accept employment with Executive or with any business, operation, corporation, partnership, association, agency, or other person or entity with which Executive may be associated, and Executive will not employ or cause any business, operation, corporation, partnership, association, agency, or other person or entity with which Executive may be associated to employ any present or future employee of the Company or its affiliates without providing the Company with ten (10) days' prior written notice of such proposed employment.

(c) in the course of Executive's employment with the Company (and, if applicable, its predecessors), Executive has been allowed to become, and will continue to be allowed to become, acquainted with the Company's business affairs, information, trade secrets, and
other matters which are of a proprietary or confidential nature, including but not limited to the Company's and its affiliates' and predecessors' operations, business opportunities, price and cost information, finance, customer information, business plans, various sales techniques, manuals, letters, notebooks, procedures, reports, products, processes, services, and other confidential information and knowledge (collectively the "Confidential Information") concerning the Company's and its affiliates' and predecessors' business. The Company agrees to provide on an ongoing basis such Confidential Information as the Company deems necessary or desirable to aid Executive in the performance of his duties. Executive understands and acknowledges that such Confidential Information is confidential, and he agrees not to disclose such Confidential Information to anyone outside the Company except to the extent that (i) Executive deems such disclosure or use reasonably necessary or appropriate in connection with performing his duties on behalf of the Company, (ii) Executive is required by order of a court of competent jurisdiction (by subpoena or similar process) to disclose or discuss any Confidential Information, provided that in such case, Executive shall promptly inform the Company, as appropriate, of such event, shall cooperate with the Company, as appropriate, in attempting to obtain a protective order or to otherwise restrict such disclosure, and shall only disclose Confidential Information to the minimum extent necessary to comply with any such court order; (iii) such Confidential Information becomes generally known to and available for use in the Company's industry (the "Fluid Control Industry"), other than as a result of any action or inaction by Executive; or (iv) such information has been rightfully received by a member of the Fluid-Control Industry or has been published in a form generally available to the Fluid-Control Industry prior to the date Executive proposes to disclose or use such information. Executive further agrees that he will not during employment and/or at any time thereafter use such Confidential Information in competing, directly or indirectly, with the Company. At such time as Executive shall cease to be employed by the Company, he will immediately turn over to the Company, all Confidential Information, including papers, documents, writings, electronically stored information, other property, and all copies of them provided to or created by him during the course of his employment with the Company. The provisions of this Paragraph 7(c) shall survive termination of this Agreement for any reason.

Should Executive violate any of the provisions of paragraphs 7(a) or (b), then in addition to all other rights and remedies available to the Company at law or in equity, the duration of this covenant shall automatically be extended for the period of time from which Executive began such violation until he permanently ceases such violation, the Severance Benefits shall cease and the Company shall be entitled to recovery previously paid Severance Benefits.

8. Notice. For purposes of this Agreement, notices and all other communications provided for in the Agreement shall be in writing and shall be deemed to have been duly given when delivered or mailed by United States certified mail, return receipt requested, postage prepaid, addressed as follows:

If to the Executive:

At Executive's home address as shown in the Company's personnel records; If to the Company:

CIRCOR International, Inc.
30 Corporate Drive, Suite 200
Burlington, MA 01803
Attn: Senior Vice President & General Counsel
Attn: Senior Vice President-Human Resources

or to such other address as either party may have furnished to the other in writing in accordance herewith, except that notices of change of address shall be effective only upon receipt.

9. Successor to Company. The Company shall require any successor (whether direct or indirect, by purchase, merger, consolidation or otherwise) to all or substantially all of the business or assets of the Company expressly to assume and agree to perform this Agreement to the same extent that the Company would be required to perform it if no succession had taken place. Failure of the Company to obtain an assumption of this Agreement at or prior to the effectiveness of any succession shall be a breach of this Agreement and shall constitute
Good Reason if the Executive elects to terminate employment.

10. Amendment; Other Agreements. No provisions of this Agreement may be amended, modified, or discharged unless such amendment, modification, or discharge is agreed to in writing and signed by Executive and such officer of the Company as may be specifically designated by the Board. No agreements or representations, oral or otherwise, express or implied, unless specifically referred to herein, with respect to the subject matter hereof have been made by either party which are not set forth expressly in this Agreement.

11. Governing Law. The validity, interpretation, construction, and performance of this Agreement shall be governed by the laws of the Commonwealth of Massachusetts (without regard to principles of conflicts of laws).

12. Counterparts. This agreement may be executed in several counterparts, each of which shall be deemed to be an original but all of which together will constitute one and the same instrument.

13. Arbitration; Other Disputes. In the event of any dispute or controversy arising under or in connection with this Agreement, the parties shall first promptly try in good faith to settle such dispute or controversy by mediation under the applicable rules of the American Arbitration Association before resorting to arbitration. In the event such dispute or controversy remains unresolved in whole or in part for a period of 30 days after it arises, the parties will settle any remaining dispute or controversy exclusively by arbitration in Boston, Massachusetts, in accordance with the rules of the American Arbitration Association then in effect. Judgment may be entered on the arbitrator's award in any court having jurisdiction. Notwithstanding the above, the Company shall be entitled to seek a restraining order or injunction in any court of competent jurisdiction to prevent any continuation of any violation of Section 7 of this Agreement. Furthermore, should a dispute occur concerning Executive's mental or physical capacity as described in Subparagraph l(b) or 2(a), a doctor selected by Executive and a doctor selected by the Company shall be entitled to examine Executive. If the opinion of the Company's doctor and Executive's doctor conflict, the Company's doctor and Executive's doctor shall together agree upon a third doctor, whose opinion shall be binding.

14. Assignment. Neither the Company nor the Executive may make any assignment of this Agreement or any interest herein, by operation of law or otherwise, without the prior written consent of the other party, and without such consent any attempted transfer shall be null and void and of no effect. This Agreement shall inure to the benefit of and be binding upon the Company and the Executive, their respective successors, executors, administrators, heirs and permitted assigns. In the event of the Executive's death prior to the completion by the Company of all payments due him under this Agreement, the Company shall continue such payments to the Executive's beneficiary designated in writing to the Company prior to his death (or to his estate, if the Executive fails to make such designation).

15. Litigation and Regulatory Cooperation. During and after Executive's employment, Executive shall reasonably cooperate with the Company in the defense or prosecution of any claims or actions now in existence or which may be brought in the future against or on behalf of the Company which relate to events or occurrences that transpired while Executive was employed by the Company; provided, however, that such cooperation shall not materially and adversely affect Executive or expose Executive to an increased probability of civil or criminal litigation. Executive's cooperation in connection with such claims or actions shall include, but not be limited to, being available to meet with counsel to prepare for discovery or trial and to act as a witness on behalf of the Company at mutually convenient times. During and after Executive's employment, Executive also shall cooperate fully with the Company in connection with any investigation or review of any federal, state or local regulatory authority as any such investigation or review relates to events or occurrences that transpired while Executive was employed by the Company. The Company shall also provide Executive with compensation on an hourly basis (to be derived from the sum of his Base Salary) for requested litigation and regulatory cooperation that occurs after his termination of employment and reimburse Executive for all costs and expenses incurred in connection with his performance under this Paragraph 15, including, but not limited to, reasonable attorneys' fees and costs.

16. Enforceability. If any portion or provision of this Agreement shall to any extent be declared illegal or unenforceable by a court of competent jurisdiction, then the remainder of this Agreement, or the application of such portion or provision in circumstances other than those as to which it is so-declared illegal or unenforceable, shall not be affected thereby, and each portion and provision of this Agreement shall be valid and enforceable to the fullest extent permitted by law.

17. Waiver. No waiver of any provision hereof shall be effective unless made in writing and signed by the waiving party. The failure of any party to require the performance of any term or obligation of this Agreement, or the waiver by any party of any breach of this Agreement, shall not prevent any subsequent enforcement of such term or obligation or be deemed a waiver of any subsequent breach.

18. Section 409A.

(a) It is intended that any compensation or benefits under this Agreement satisfy, to the greatest extent possible, the exemptions from the application of Section 409A of the Internal Revenue Code of 1986, as amended ("Section 409A") provided under Treasury Regulations Sections 1.409A-l(b)(4), and 1.409A-I(b)(9), and this Agreement will be construed to the greatest extent possible as consistent with those provisions, and to the extent not so exempt, this Agreement (and any definitions hereunder) will be construed in a manner that complies with Section 409A. For purposes of Section 409A (including, without limitation, for purposes of Treasury Regulations Section 1.409A-2(b)(2)(iii)), the Executive's right to receive any installment payments under this Agreement (whether Severance Benefits or otherwise) shall be treated as a right to receive a series of separate payments and, accordingly, each installment payment hereunder shall at all times be considered a separate and distinct payment. Severance Benefits shall not commence until the Executive has a "separation from service" (as defined under Treasury Regulation Section 1.409A-l(h), without regard to any alternative definition thereunder, a "separation from service").

(b) Notwithstanding any provision to the contrary in this Agreement, if the Executive is deemed by the Company at the time of termination to be a "specified employee" for purposes of Section 409A(a)(2)(B)(i), and if any of the payments set forth herein are deemed to be "deferred compensation," then to the extent delayed commencement of any portion of such payments is required in order to avoid a prohibited distribution under Section 409A(a)(2)(B)(i) and the related adverse taxation under Section 409A, such payments shall not be provided prior to the earliest of (i) the expiration of the six-month period measured from the Executive's employment termination, (ii) the date of Executive's death or (iii) such earlier date as permitted under Section 409A without the imposition of adverse taxation. Upon the first business day following the expiration of such period, all payments deferred pursuant to this paragraph shall be paid in a lump sum, and any remaining payments due shall be paid as otherwise provided herein. No interest shall be due on any amounts so deferred.

(c) To the extent that any right to reimbursement of expenses or payment of any benefit in-kind under this Agreement constitutes nonqualified deferred compensation (within the meaning of Section 409A of the Code), (i)any such expense reimbursement shall be made by the Company no later than the last day of the taxable year following the taxable year in which such expense was incurred by Executive, (ii) the right to reimbursement or in-kind benefits shall not be subject to liquidation or exchange for another benefit, and (iii) the amount of expenses eligible for reimbursement or in-kind benefits provided during any taxable year shall not affect the expenses eligible for reimbursement or in-kind benefits to be provided in any other taxable year; provided, that the foregoing clause shall not be violated with regard to expenses reimbursed under any arrangement covered by Section I 05(b) of the Code solely because such expenses are subject to a limit related to the period the arrangement is in effect.

(d) The parties agree that this Agreement may be amended, as reasonably requested by either party, and as may be necessary to fully comply with Section 409A of the Code and all related rules and regulations in order to preserve the payments and benefits provided hereunder without additional cost to either party.

(e) While the payments and benefits provided hereunder are intended to be structured in a manner to avoid the implication of any taxes or related liability under Section 409A of the Code, the Company makes no representation or warranty and shall have no liability to the Executive or any other person if any provisions of this Agreement are determined to constitute deferred compensation subject to Section 409A of the Code but do not satisfy an exemption from, or the conditions of, such Section.

IN WITNESS WHEREOF, the parties have executed this Agreement effective on the date and year first above written.

CIRCOR.INTERNATIONAL, INC.

/s/ Scott Buchout

Scott Buckhout
President and CEO

/s/ Chadi Chanine

Chadi Chahine
CFO

Exhibit 10.41

EXECUTIVE CHANGE OF CONTROL AGREEMENT

This EXECUTIVE CHANGE OF CONTROL AGREEMENT (“Agreement”) is made as of the 10th of October 2018, between CIRCOR International, Inc., a Delaware corporation (the “Company”), and Lane Walker (“Executive”).

WHEREAS, the Company presently employs the Executive in which capacity the Executive serves as an officer of the Company; and

WHEREAS, the Board of Directors of the Company (the “Board”) recognizes the valuable services rendered to the Company and its respective affiliates by the Executive; and

WHEREAS, the Board has determined that it is in the best interests of the Company and its affiliates to encourage in advance the continued loyalty of the Executive as well as the Executive’s continued attention to his assigned duties and objectivity in the event of a threatened or possible change in control of the Company;

NOW, THEREFORE, in consideration of the mutual covenants and agreements herein contained and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties agree as follows:

1. ***Definitions***. For purposes of this Agreement, the following terms shall have the following meanings:

“Base Salary” shall mean the Executive's annual base salary.

“**Cause**” shall mean: (a) conduct by Executive constituting a material act of willful misconduct in connection with the performance of his duties, including, without limitation, misappropriation of funds or property of the Company or any of its affiliates other than the occasional, customary and de minimus use of Company property for personal purposes; (b) criminal or civil conviction of Executive, a plea of nolo contendere by Executive or conduct by Executive that would reasonably be expected to result in material injury to the reputation of the Company if he were retained in his position with the Company, including, without limitation, conviction of a felony involving moral turpitude; (c) continued, willful and deliberate non-performance by Executive of his duties hereunder (other than by reason of Executive’s physical or mental illness, incapacity or disability) which has continued for more than thirty (30) days following written notice of such non-performance from the Chairman of the Board; or (d) a material violation by Executive of the Company’s employment policies which has continued following written notice “of such violation from the Chairman of the Board.

“**Change in Control**” shall mean any of the following:

(a) Any “person,” as such term is used in Sections 13(d) and 14(d) of the Securities Exchange Act of 1934, as amended (the “Act”) (other than the Company, any of its subsidiaries, or any trustee, fiduciary or other person or entity holding securities under any employee benefit plan or trust of the Company or any of its subsidiaries), together with all “affiliates” and “associates” (as such terms are defined in Rule 12b-2 under the Act) of such person, shall become the “beneficial owner” (as such term is defined in Rule 13d-3 under the Act), directly or indirectly, of securities of the Company representing twenty-five percent (25%) or more of either (A) the combined voting power of the Company’s then outstanding securities having the right to voice in an election of the Company’s Board (“Voting Securities”) or (B) the then outstanding shares of Company’s common stock, par value $0.01 per share (“Common Stock”) (other than as a result of an acquisition of securities directly from the Company); or

(b) Incumbent Directors (as defined below) cease for any reason, including, without limitation, as a result of a tender offer, proxy contest, merger or similar transaction, to constitute at least a majority of the Board; or

(c) The stockholders of the Company shall approve (A) any consolidation or merger of the Company where the stockholders of the Company, immediately prior to the consolidation or merger, would not, immediately after the consolidation or merger, beneficially own (as such term is defined in Rule 13d-3 under the Act), directly or indirectly, shares representing in the aggregate fifty percent (50%) or more of the voting shares of the Company or other party issuing cash or securities in the consolidation or merger (or of its ultimate parent corporation, if any), (B) any sale, lease, exchange or other transfer (in one transaction or a series of transactions contemplated or arranged by any party as a single plan) of all or substantially all of the assets of the Company or (C) any plan or proposal for the liquidation or dissolution of the Company.

Notwithstanding the foregoing, a “Change of Control” shall not be deemed to have occurred for purposes of the foregoing clause (a) solely as the result of an acquisition of securities by the Company which, by reducing the number of shares of Common Stock or other Voting Securities outstanding, increases the proportionate number of shares beneficially owned by any person to twenty-five percent (25%) or more of either (A) the combined voting power of all of the then outstanding Voting Securities or (B) Common Stock; provided, however, that if any person referred to in this sentence shall thereafter become the beneficial owner of any additional shares of Voting Securities or Common Stock (other than pursuant to a stock split, stock dividend, or similar transaction or as a result of an acquisition of securities directly from the Company) and immediately thereafter beneficially owns twenty-five percent (25%) or more of either (A) the combined voting power of all of the then outstanding Voting Securities or (B) Common Stock, then a “Change of Control” shall be deemed to have occurred for purposes of the foregoing clause (a).

“**Good Reason**” shall mean that Executive has complied with the “Good Reason Process” (hereinafter defined) following the occurrence of any of the following events: (a) a material diminution in the Executive’s responsibilities, authority or duties; (b) a material diminution in the Executive’s Base Salary except for across-the-board salary reductions based on the Company’s financial performance similarly affecting all or substantially all senior management employees of the Company, (c) a material change in the geographic location at which the Executive provides services to the Company, provided that such change shall be more than thirty (30) miles from such location; or (d) the material breach of this Agreement by the

Company. “Good Reason Process” shall mean that (i) Executive reasonably determines in good faith that a “Good Reason” event has occurred; (ii) Executive notifies the Company in writing of the occurrence of the Good Reason event within sixty (60) days of the occurrence of such event; (iii) Executive cooperates in good faith with the Company’s efforts, for a period not less than ninety (90) days following such notice, to modify Executive’s employment situation in a manner acceptable to Executive and Company; and (iv) notwithstanding such efforts, one or more of the Good Reason events continues to exist and has not been modified in a manner acceptable to Executive. If the Company cures the Good Reason event in a manner acceptable to Executive during the ninety (90) day period, Good Reason shall be deemed not to have occurred.

“**Incumbent Directors**” shall mean persons who, as of the Commencement Date, constitute the Board; provided that any person becoming a director of the Company subsequent to the Commencement Date shall be considered an Incumbent Director if such person’s election was approved by or such person was nominated for election by a vote of at least a majority of the Incumbent Directors; but provided further, that any such person whose initial assumption of office is in connection with an actual or threatened election contest relating to the election of members of the Board or other actual or threatened solicitation of proxies or consents by or on behalf of a person other than the Board, including by reason of agreement intended to avoid or settle any such actual or threatened contest or solicitation, shall not be considered an Incumbent Director.

2. ***Term***. The term of this Agreement shall extend from the date hereof (the “Commencement Date”) until the first anniversary of the Commencement Date; provided, however, that the term of this Agreement shall automatically be extended for one additional year on the first anniversary of the Commencement Date and each anniversary thereafter unless, not less than 90 days prior to each such date, either party shall have given notice to the other that it does not wish to extend this Agreement; provided, further, that if a Change in Control occurs during the original or extended term of this Agreement, the term of this Agreement shall continue in effect for a period of not less than twelve (12) months beyond the month in which the Change in Control occurred.

3. ***Change in Control Payment***.

(a) The provisions of this Paragraph 3 set forth certain terms of an agreement reached between Executive and the Company regarding Executive’s rights and obligations in connection with a Change in Control. These provisions are intended to assure and encourage in advance Executive’s continued attention and dedication to his assigned duties and his objectivity during the pendency and after the occurrence of any such event.

(b) If within twelve (12) months after the occurrence of the first event constituting a Change in Control, Executive’s employment is terminated by the Company without Cause or Executive terminates his employment for Good Reason (each, a “Qualifying Termination”), then the Company shall pay Executive a lump sum in cash in an amount equal to two (2) times the sum of (A) Executive’s current Base Salary plus (B) Executive’s current target annual incentive compensation under the Company’s Executive Bonus Incentive Plan (‘Target

Bonus Opportunity”). Such lump sum cash payment shall be paid to Executive within thirty (30) days following the date of termination of Executive’s employment.

(c) The vesting of the Executive’s Equity Awards shall be governed by this Paragraph 3(c). The term “Equity Award” shall mean stock options, stock appreciation rights, restricted stock, restricted stock units, performance shares or any other form of award that is measured with reference to the Company’s common stock.

(i) The vesting of the Executive’s Equity Awards that vest solely on the basis of continued employment with the Company or any of its subsidiaries or affiliates shall be accelerated solely by reason of a Change in Control only if the surviving corporation or acquiring corporation following a Change in Control refuses to assume or continue the Executive’s Equity Awards or to substitute similar Equity Awards for those outstanding immediately prior to the Change in Control. If such Executive’s Equity Awards are so continued, assumed or substituted and at any time after the Change in Control the Executive incurs a Qualifying Termination, then the vesting and exercisability of all such unvested Equity Awards held by the Executive shall be accelerated in full and any reacquisition rights held by the Company with respect to an Equity Award shall lapse in full, in each case, upon such termination.

(ii) The vesting of the Executive’s Equity Awards that vest, in whole or in part, based upon achieving Performance Criteria (collectively, “Performance Shares”) shall be determined as set forth below.

(A) In the event of a Change in Control that does not also constitute a “change in the ownership or effective control of a corporation, or a change in the ownership of a substantial portion of the assets of a corporation” under Treas. Reg. § 1.409A-3(i)(5), then (i) the Performance Shares subject to this Agreement shall remain outstanding and (ii) the Performance Shares shall continue to be subject to the terms of this Agreement.

(B) In the event of a Change in Control that is also a “change in the effective control of a corporation” under Treas. Reg. § 1.409A-3(i)(5)(vi), then (i) the Performance Shares subject to this Agreement shall remain outstanding, (ii) such Performance Shares shall continue to be subject to the terms of this Agreement, (iii) all requirements to remain employed until the end of the applicable performance period shall be waived, and (iv) such Performance Shares shall be paid out on a pro-rata basis based upon the actual level of performance for the applicable performance period, with such Performance Shares to be delivered at the same time as if the Executive had remained employed with the Company.

(C) In the event of a Change in Control that is also a “change in the ownership of a corporation” under Treas. Reg. § 1.409A-3(i)(5)(v) or a “change in the ownership of a substantial portion of a corporation’s assets” under Treas. Reg. § 1.409A-3(i)(5)(vii) (a “Special CIC”), the Performance Shares shall immediately vest and the Participant shall receive, within 10 days of such Special CIC, the consideration (including all stock, other securities or assets, including cash) payable in respect of the Target Number of Performance Shares (or, if greater, the number of Performance Shares based on actual performance from the beginning of the Performance Period until the Special CIC, as reasonably determined by the Committee based on available information) as if they were vested, issued and outstanding at the time of such Special CIC on a pro rata basis; provided, however, that with respect to Performance Shares that are otherwise subject to a "substantial risk of forfeiture" under Treas. Reg. § 1.409A-1(d) and to the extent permitted by Treas. Reg. § 1.409-3, the Committee may arrange for the substitution for the Performance Shares with the grant of a replacement award (the "Replacement Award") to Participant of shares of restricted stock of the surviving or successor entity (or the ultimate parent thereof) in such Change in Control, but only if all of the following criteria are met:

a. Such Replacement Award shall consist of securities listed for trading following such Change in Control on a national securities exchange;

b. Such Replacement Award shall have a value as of the date of such Change in Control equal to the value of the Target Number of Performance Shares (or, if greater, the number of Performance Shares based on actual performance from the beginning of the Performance Period until the Special CIC, as reasonably determined by the Committee based on available information), calculated as if the Performance Shares were exchanged for the consideration (including all stock, other securities or assets, including cash) payable for shares of Common Stock in such Change in Control transaction;

c. Such Replacement Award shall become vested and the securities underlying the Replacement Award shall be issued to the Participant on the 2nd anniversary of the Change in Control, if such Change in Control occurs within the first 12 months of the applicable performance period, or the 1st anniversary of the Change in Control if such Change in Control occurs after the first 12 months of the applicable performance period, in either case subject to Participant's continued employment with the surviving or successor entity (or a direct or indirect subsidiary thereof) through such date, provided, however, that such Replacement Award will vest immediately upon and the securities underlying the Replacement Award shall be issued within 60 days after the date that (i) Participant's employment is terminated by the surviving or successor entity without Cause, (ii) Participant's employment is terminated for

Good Reason, (iii) Participant's death or (iv) Participant's medically diagnosed permanent physical or mental inability to perform his or her job duties;

d. Notwithstanding clause c. above, such Replacement Award shall vest immediately prior to and the securities underlying the Replacement Award shall be issued to Participant upon (A) any transaction with respect to the surviving or successor entity (or parent or subsidiary company thereof) of substantially similar character to a Change in Control, or (B) the securities constituting such Replacement Award ceasing to be listed on a national securities exchange, in each case so long as Participant remains continuously employed until such time; and

e. The Replacement Award or the right to such Replacement Award does not cause the Performance Shares to become subject to tax under Section 409A of the Code.

f. Upon such substitution the Performance Shares shall terminate and be of no further force and effect.

For purposes of this Paragraph 3(c)(ii)(C), "Performance Criteria" means any business criteria that apply to the Executive a business unit, division, subsidiary, affiliate, the Company or any combination of the foregoing.

(d) The Company shall, for a period of two (2) years commencing on the date of a Qualifying Termination, pay such health insurance premiums as may be necessary to allow Executive, Executive's spouse and dependents to continue to receive health insurance coverage substantially similar to the coverage they received prior to the date of termination of Executive's employment.

(e) **Additional Limitation**.

(i) Anything in this Agreement to the contrary notwithstanding, in the event that any compensation, payment or distribution by the Company to or for the benefit of Executive, whether paid or payable or distributed or distributable pursuant to the terms of this Agreement or otherwise (the "Severance Payments"), would be subject to the excise tax imposed by Section 4999 of the Internal Revenue Code of 1986, as amended (the "Code"), the following provisions shall apply:

(A) If the Severance Payments, reduced by the sum of (1) the Excise Tax and (2) the total of the Federal, state and local income and employment taxes payable by Executive on the amount of the Severance Payments which are in excess of the Threshold Amount, are greater than or equal to the Threshold Amount, Executive shall be entitled to the full benefits payable under this Agreement.

(B) If the Threshold Amount is less than (x) the Severance Payments, but greater than (y) the Severance Payments reduced by the sum of (1) the Excise Tax and (2) the total of the Federal, state, and local income and employment taxes on the amount of the Severance Payments which are in excess of the Threshold Amount, then the benefits payable under this Agreement shall be reduced (but not below zero) to the extent necessary so that the maximum Severance Payments shall not exceed the Threshold Amount. To the extent that there is more than one method of reducing the payments to bring them within the Threshold Amount, the Severance Payments shall be reduced in the following order: (i) cash payments not subject to Section 409A of the Internal Revenue Code of 1986, as amended (the "Code"); (ii) cash payments subject to Section 409A of the Code; (iii) equity-based payments; and (iv) non-cash form of benefits. To the extent any payment is to be made over time (e.g., in installments), then the payments shall be reduced in reverse chronological order.

For the purposes of this Paragraph 3, "Threshold Amount" shall mean three times Executive's "base amount" within the meaning of Section 280G(b)(3) of the Code and the regulations promulgated thereunder less one dollar ($1.00); and "Excise Tax" shall mean the excise tax imposed by Section 4999 of the Code, and any interest or penalties incurred by Executive with respect to such excise tax.

(ii) The determination as to which of the alternative provisions of Paragraph 3(b)(i) shall apply to Executive shall be made by KPMG LLP or any other nationally recognized accounting firm selected by the Company (the "Accounting Firm"), which shall provide detailed supporting calculations both to the Company and Executive within 15 business days of the date of termination of Executive's employment, if applicable, or at such earlier time as is reasonably requested by the Company or Executive. For purposes of determining which of the alternative provisions of Paragraph 3(b)(i) shall apply, Executive shall be deemed to pay federal income taxes at the highest marginal rate of federal income taxation applicable to individuals for the calendar year in which the determination is to be made, and state and local income taxes at the highest marginal rates of individual taxation in the state and locality of Executive's residence on the date of termination of Executive's employment, net of the maximum reduction in federal income taxes which could be obtained from deduction of such state and local taxes. Any determination by the Accounting Firm shall be binding upon the Company and Executive.

4. ***Unauthorized Disclosures***. Executive acknowledges that in the course of his employment with the Company (and, if applicable, its predecessors), he has been allowed to become, and will continue to be allowed to become, acquainted with the Company's and the Company's business affairs, information, trade secrets, and other matters which are of a proprietary or confidential nature, including but not limited to the Company's and its affiliates' and predecessors' operations, business opportunities, price and cost information, finance, customer information, business plans, various sales techniques, manuals, letters, notebooks, procedures, reports, products, processes, services, and other confidential information and knowledge (collectively the "Confidential Information") concerning the Company's and its

affiliates' and predecessors' business. The Company agrees to provide on an ongoing basis such Confidential Information as the Company deems necessary or desirable to aid Executive in the performance of his duties. Executive understands and acknowledges that such Confidential Information is confidential, and he agrees not to disclose such Confidential Information to anyone outside the Company except to the extent that (i) Executive deems such disclosure or use reasonably necessary or appropriate in connection with performing his duties on behalf of the Company, (ii) Executive is required by order of a court of competent jurisdiction (by subpoena or similar process) to disclose or discuss any Confidential Information, provided that in such case, Executive shall promptly inform the Company of such event, shall cooperate with the Company, as appropriate, in attempting to obtain a protective order or to otherwise restrict such disclosure, and shall only disclose Confidential Information to the minimum extent necessary to comply with any such court order; (iii) such Confidential Information becomes generally known to and available for use in the Company's industry (the "Fluid-Control Industry), other than as a result of any action or inaction by Executive; or (iv) such information has been rightfully received by a member of the Fluid-Control Industry or has been published in a form generally available to the fluid-Control Industry prior to the date Executive proposes to disclose or use such information. Executive further agrees that he will not during employment and/or at any time thereafter use such Confidential Information in competing, directly or indirectly, with the Company. At such time as Executive shall cease to be employed by the Company, he will immediately turn over to the Company all Confidential Information, including papers, documents, writings, electronically stored information, other property, and all copies of them provided to or created by him during the course of his employment with the Company.

5. ***Covenant Not to Compete***. In consideration of the benefits afforded the Executive under the terms provided in this Agreement and as a means to aid in the performance and enforcement of the terms of the provisions of Paragraph 4, Executive agrees that

(a) during the term of Executive's employment with the Company and for a period of twelve (12) months thereafter, regardless of the reason for termination of employment, Executive will not, directly or indirectly, as an owner, director, principal, agent, officer, employee, partner, consultant, servant, or otherwise, carry on, operate, manage, control, or become involved in any manner with any business, operation, corporation, partnership, association, agency, or other person or entity which is engaged in a business that is competitive with any of the Company or its affiliate's businesses or products as of the date of Executive's termination of employment with the Company, in any area or territory in which the Company or any affiliate of the Company conducts operations; provided, however, that the foregoing shall not prohibit Executive from owning up to one percent (1%) of the outstanding stock of a publicly held company engaged in the Fluid-Control Industry; and

(b) during the term of Executive's employment with the Company and for a period of twelve (12) months thereafter, regardless of the reason for termination of employment, Executive will not directly or indirectly solicit or induce any present or future employee of the Company or any affiliate of the Company to accept employment with Executive or with any business, operation, corporation, partnership, association; agency, or other person or entity with which Executive may be associated, and Executive will not employ or cause any business, operation, corporation, partnership, association, agency, or other person or entity with which Executive may be associated to employ any present or future employee of the Company or affiliate of the Company without providing the Company or the affiliate, as appropriate, with ten (10) days' prior written notice of such proposed employment.

Should Executive violate any of the provisions of this Paragraph, then in addition to all other rights and remedies available to the Company at law or in equity, the duration of this covenant shall automatically be extended for the period of time from which Executive began such violation until he permanently ceases such violation.

6. ***Notice***. For purposes of this Agreement, notices and all other communications provided for in the Agreement shall be in writing and shall be deemed to have been duly given when delivered or mailed by United States certified mail, return receipt requested, postage prepaid, addressed as follows:

If to the Executive:

At his home address as shown in the Company's personnel records;

If to the Company:

CIRCOR International, Inc.
30 Corporate Drive, Suite 200
Burlington, MA 01803
Attention: Chief Human Resources Officer

or to such other address as either party may have furnished to the other in writing in accordance herewith, except that notices of change of address shall be effective only upon receipt.

7. ***Not an Employment Contract***. This Agreement is intended only to provide those benefits for the Executive as set forth in Paragraph 3 in connection with a Change of Control. As such, this Agreement is not intended to and does not in any way constitute an employment agreement or other contract which would cause the employee to be considered anything other than an employee at will or to in any way be entitled to any specific payments or benefits from the Company in the event of a termination of employment not subject to Paragraph 3 of this Agreement.

8. ***Miscellaneous***. No provisions of this Agreement may be modified, waived, or discharged unless such waiver, modification, or discharge is agreed to in writing and signed by Executive and such officer of the Company as may be specifically designated by the Board. No waiver by either party hereto of or compliance with, any condition or provision of this Agreement to be performed by such other party shall be deemed a waiver of similar or dissimilar provisions or conditions at the same or at any prior or subsequent time. The respective rights and obligations of the parties under this Agreement will survive any termination of Executive's employment or termination of this Agreement to the extent necessary to the intended

preservation of such rights and obligations. No agreements or representations, oral or otherwise, express or implied, unless specifically referred to herein, with respect to the subject matter hereof have been made by either party which are not set forth expressly in this Agreement. The validity, interpretation, construction, and performance of this Agreement shall be governed by the laws of the Commonwealth of Massachusetts (without regard to principles of conflicts of laws).

9. ***Validity***. The invalidity or unenforceability of any provision or provisions of this Agreement shall not affect the validity or enforceability of any other provision of this Agreement, which shall remain in full force and effect. The invalid portion of this Agreement, if any, shall be modified by any court having jurisdiction to the extent necessary to render such portion enforceable.

10. ***Counterparts***. This Agreement may be **executed in several counterparts, each of** which shall be deemed to be an original but all of which together will constitute one and the same instrument.

11. ***Arbitration; Other Disputes***. In the event of any dispute or controversy arising under or in connection with this Agreement, the parties shall first promptly try in good faith to settle such dispute or controversy by mediation under the applicable rules of the American Arbitration Association before resorting to arbitration. In the event such dispute or controversy remains unresolved in whole or in part for a period of thirty (30) days after it arises, the parties will settle any remaining dispute or controversy exclusively by arbitration in Houston, Texas, in accordance with the rules of the American Arbitration Association then in effect. Judgment may be entered on the arbitrator’s award in any court having jurisdiction. Notwithstanding the above, the Company shall be entitled to seek a restraining order or injunction in any court of competent jurisdiction to prevent any continuation of any violation of Paragraph 4 or 5 hereof.

12. ***Litigation and Regulatory Cooperation***. During and after Executive’s employment, Executive shall reasonably cooperate with the Company in the defense or prosecution of any claims or actions now in existence or which may be brought in the future against or on behalf of the Company and/or any affiliate of the Company which relate to events or occurrences that transpired while Executive was employed by the Company; provided, however, that such cooperation shall not materially and adversely affect Executive or expose Executive to an increased probability of civil or criminal litigation. Executive’s cooperation in connection with such claims or actions shall include, but not be limited to, being available to meet with counsel to prepare for discovery or trial **and to act as a witness** on behalf of the Company and/or the Company at mutually convenient times. During and after Executive’s employment, Executive also shall cooperate fully with the Company in connection with any investigation or review of any federal, state or local regulatory authority as any such investigation or review relates to events or occurrences that transpired while Executive was employed by the Company. The Company shall also provide Executive with compensation on an hourly basis (to be derived from the sum of his Base Compensation and Target Bonus Opportunity) for requested litigation and regulatory cooperation that occurs after his termination of employment, and reimburse Executive for all costs and expenses incurred in connection with

his performance under this Paragraph 12, including, **but not limited to, reasonable attorneys' fees** and costs.

13. ***Gender Neutral***. Wherever used herein, a pronoun in the masculine gender shall be considered as including the feminine gender unless the context clearly indicates otherwise.

14. ***Section 409A***.

(a) Anything in this Agreement to the contrary notwithstanding, if at the time of the Executive's separation from service within the meaning of Section 409A of the Code, the Company determines that the Executive is a "specified employee" within the meaning of Section 409A(a)(2)(B)(i) of the Code, then to the extent any payment or benefit that the Executive becomes entitled to under this Agreement on account of the Executive's separation from service would be considered deferred compensation subject to the 20 percent additional tax imposed pursuant to Section 409A(a) of the Code as a result of the application of Section 409A(a)(2)(B)(i) of the Code, such payment shall not be payable and such benefit shall not be provided until the date that is the earlier of (A) six months and one day after the Executive's separation from service, or (B) the Executive's death.

(b) The parties intend that this Agreement will be administered in accordance with Section 409A of the Code. To the extent that any provision of this Agreement is ambiguous as to its compliance with Section 409A of the Code, the provision shall be read in such a manner so that all payments hereunder comply with Section 409A of the Code. The parties agree that this Agreement may be amended, as reasonably requested by either party, and as may be necessary to fully comply with Section 409A of the Code and all related rules and regulations in order to preserve the payments and benefits provided hereunder without additional cost to either party.

(c) The determination of whether and when a separation from service has occurred shall be made in accordance with the presumptions set forth in Treasury Regulation Section 1.409A-1(h).

(d) The Company makes no representation or warranty and shall have no liability to the Executive or any other person if any provisions of this Agreement are determined to constitute deferred compensation subject to Section 409A of the Code but do not satisfy an exemption from, or the conditions of, such Section.

(e) All in-kind benefits provided and expenses eligible for reimbursement under this Agreement shall be provided by the Company or incurred by the Executive during the time periods set forth in this Agreement. All reimbursements shall be paid as soon as administratively practicable, but in no event shall any reimbursement be paid after the last day of the taxable year following the taxable year in which the expense was incurred. The amount of in-kind benefits provided or reimbursable expenses incurred in one taxable year shall not affect the in-kind benefits to be provided or the expenses eligible for reimbursement in any other taxable year. Such right to reimbursement or in-kind benefits is not subject to liquidation or exchange for another benefit.

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IN WITNESS WHEREOF, the parties have executed this Agreement effective on the date and year first above written.

CIRCOR International

By: ______________________________
Scott A. Buckhout
President & CEO

EXECUTIVE

____

Exhibit 10.42

SEVERANCE AGREEMENT

This Severance Agreement (the "Agreement") is made and entered into as of October 10, 2018, by and between CIRCOR International, Inc. ("CIRCOR" or "Company") and Lane Walker (the "Executive").

WHEREAS, CIRCOR presently employs the Executive in which capacity the Executive serves as Group President, Energy and as an officer and/or director of other direct and indirect subsidiaries of the Company; and

WHEREAS, the Company desires to provide severance compensation to the Executive upon the occurrence of certain events; and

WHEREAS, in exchange for the severance compensation provided for under this Agreement, Executive agrees to certain non-competition and non-solicitation covenants as set forth herein,

NOW, THEREFORE, in consideration of the foregoing and the mutual promises of the parties herein contained, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Company and the Executive hereby covenant and agree with each other as follows:

I. Definitions. For purposes of the Agreement, the following terms shall have the following meanings:

(a) "Accrued Benefits" shall mean (i) all accrued but unpaid Base Salary through the Date of Termination of Executive's employment (including any accrued vacation) at the rate in effect at the time Notice of Termination is given, (ii) any unpaid or unreimbursed expenses incurred in accordance with Company policies, (iii) accrued but m1used vacation days through the Date of Termination of Executive's employment determined as per the Company's vacation policy, and (iv) any amounts that are accrued and vested under any Company plan or policy as of the Date of Termination.

(b) "Base Salary" shall mean the Executive's annual base salary.

(c) "Disability" shall mean, as a result of Executive's incapacity due to physical or mental illness, Executive shall have been absent from his duties with the Company on a full-time basis for 180 calendar days in the aggregate in any twelve-month period.

(d) "For Cause" shall mean: (i) conduct by Executive constituting a material act of willful misconduct in connection with the performance of his duties, including, without limitation, misappropriation of funds or property of the Company or any of its affiliates other than the occasional, customary and de minim.is use of Company property for personal purposes;
(ii) criminal or civil conviction of Executive, a plea of nolo contendere by Executive or conduct by Executive that would reasonably be expected to result in material injury to the reputation of the Company if they were retained in his position with the Company, including, without limitation,

conviction of a felony involving moral turpitude; (iii) continued, willful and deliberate nonperformance by Executive of his duties here under (other than by reason of Executive its physical

or mental illness, incapacity or disability) which has continued for more than thirty (30) days following written notice of such non-performance from the Board of Directors of the Company (the "Board"); or (iv) a violation by Executive of the Company's employment policies which has continued following written notice of such violation from the Board.

(e) "Good Reason" shall mean that Executive has complied with the "Good Reason Process" (hereinafter defined) following the occurrence of any of the following events: (a) a material diminution or other material adverse change, not consented to by Executive, in the nature or scope of Executive's responsibilities, authorities, powers, functions or duties; (b) an involuntary material reduction in Executive's Base Salary except for across-the-board reductions similarly affecting all or substantially all management employees; (c) a material breach of this Agreement by the Company; or (d) a material change in the geographic location at which the Executive provides services to the Company.

"Good Reason Process" shall mean that (i) Executive reasonably determines in good faith that a "Good Reason" event has occurred; (ii) Executive notifies the Company in writing of the occurrence of the Good Reason event within 60 days of such occurrence; (iii) Executive reasonably cooperates in good faith with the Company's efforts following such notice (the "Cure Period"), to promptly remedy the condition; (iv) notwithstanding such efforts, the Good Reason event continues to exist; and (v) the Executive terminates his employment within 60 days after the end of the Cure Period. If the Company cures the Good Reason event during the Cure Period, Good Reason shall be deemed not to have occurred.

(f) "Severance Benefits" shall mean the payments described in Section 2(c) of this Agreement.

2. Post Termination Payments.

(a) Termination by the Company For Cause. Death or Disability. Upon termination of the Executive's employment by the Company for Cause, death, or Disability, the Company shall, through the Date of Termination (hereinafter defined), pay Executive the Accrued Benefits. Thereafter, the Company shall have no further obligations to Executive except as otherwise expressly provided under this Agreement or as required by law.

(b) Termination by the Executive other than for Good Reason. If Executive's employment is terminated by the Executive other than for Good Reason, then the Company shall, through the Date of Termination, pay Executive the Accrued Benefits. Thereafter, the Company shall have no further obligations to Executive except as otherwise expressly provided under this Agreement.

(c) Termination by the Company Other Than for Cause. Death or Disability or by the Executive for Good Reason. If Executive's employment is terminated (i) by the Company other than For Cause or Executive's death or Disability or (ii) by the Executive for Good Reason, then the Company shall, through the Date of Termination, pay Executive the Accrued Benefits. Subject to Section 2(d) and Section 18 below, the Executive shall also receive the following Severance Benefits:

(i) a lump sum payment equal to the Executive's current Base Salary in effect during the fiscal year in which such termination occurs payable in a single lump sum payment as soon as administratively practicable (but not later than sixty (60) days) following such Date of Termination;

(ii) a lump sum payment equal to the product of (A) the amount of the annual short-term bonus that would have been payable to the Executive if the Executive was still employed as of December 31st of the then current fiscal year in respect of the fiscal year in which employment termination occurs based on actual performance as compared to performance goals, and (B) the ratio of (x) the number of days elapsed during the fiscal year during which such termination of employment occurs on or prior to the date of such termination to (y) 365, payable as of the same time as annual short-term bonuses are paid to other senior executives; and

(iii) subject to the Executive's election of COBRA rights, monthly payment of an amount equal to the employer's cost coverage in accordance with its contribution percentage toward medical and dental coverage for active employees immediately prior to the Date of Termination for twelve (12) months after such termination; provided, however, that the installment payments under this Section 2(c)(iii) shall cease on the first day of the month immediately following the month that the Executive no longer qualifies for continued COBRA coverage for any reason, including but not limited to the Executive's failure to pay the Executive's portion of the COBRA cost or the Executive becoming eligible for medical/dental insurance under another group health insurance plan (as defined by COBRA). Notwithstanding the foregoing, if the Company determines, in its sole discretion, that it cannot pay the foregoing installment payments without a substantial risk of violating applicable law (including, without limitation, Section 2716 of the Public Health Service Act), the Company shall be entitled to amend this Section 2(c)(iii) in order to preserve the value of such installment payments to the Executive without additional cost to either party.

(d) <u>Required Release.</u> The payment of the Severance Benefits shall be conditioned upon the Executive's execution, delivery to the Company, and non-revocation of the release of claims, in a form reasonably acceptable to the Company (and the expiration of any revocation period contained in such release of claims) within sixty (60) days following the date of Executive's termination of employment hereunder. If the Executive fails to execute the release of claims in such a timely manner so as to permit any revocation period to expire prior to the end of such sixty (60) day period, or timely revokes the Executive's execution of such release following its execution, the Executive shall not be entitled to any of the Severance Benefits. Further, to the extent that any of the Severance Benefits constitutes "nonqualified deferred compensation" for purposes of Section 409A of the Code, any payment of any amount or provision of any benefit otherwise scheduled to occur prior to the sixtieth (60th) day following termination of the Executive's employment hereunder, but for the condition on executing the release of claims as set forth herein, shall not be made until the first (1st) regularly scheduled payroll date following such sixtieth (60th) day, after which any remaining Severance Benefits shall thereafter be provided to Executive according to the applicable schedule set forth herein (and the first payment shall include any portion of the Severance Benefits, and any such other payments or benefits, that would have been paid during such sixty (60) day period).

(e) Termination Covered Under Executive Change of Control Agreement. If Executive's employment is terminated under circumstances that would afford Executive certain rights under the Executive Change of Control Agreement currently in effect between the Company and Executive (or any successor agreement), the provisions of the Executive Change of Control Agreement shall govern and this Agreement shall have no force and effect, it being intended that the Executive Change of Control Agreement shall govern the rights and obligations of the parties in the event of a termination covered under the Executive Change of Control Agreement and this Agreement shall govern the rights and obligations of the parties in the event of any other termination.

3. Notice of Termination. Any termination of Executive's employment by the Company or any such termination by Executive shall be communicated by written Notice of Termination to the other party hereto. For purposes of this Agreement, a ••Notice of Termination" shall mean a notice that indicates the specific termination provision in this Agreement relied upon.

4. Date of Termination. The '"Date of Termination" shall be the date on which Notice of Termination is provided by either party or such later date as may be specified in such Notice of Termination.

5. Withholding. All payments made to the Executive under this Agreement shall be net of any tax or other amounts required to be withheld by the Company under applicable law.

6. No Mitigation. The Company agrees that, if the Executive's employment by the Company is terminated during the term of this Agreement, the Executive is not required to seek other employment or to attempt in any way to reduce any amounts payable to the Executive by the Company pursuant to any provision of this Agreement, including any payment under Section
2. Further, except as otherwise provided herein, the amount of any payment provided for in this Agreement shall not be reduced by any compensation earned by the Executive as the result of employment by another employer, by retirement benefits, by offset against any amount claimed to be owed by the Executive to the Company or otherwise.

7. Non-Competition and Non-Solicitation Covenants; Confidentiality. In consideration of the benefits afforded the Executive under the terms provided in this Agreement, Executive agrees that

(a) during the term of Executive's employment with the Company and for a period of twelve (12) months thereafter, regardless of the reason for termination of employment, Executive will not, directly or indirectly, as an owner, director, principal, agent, officer, employee, partner, consultant, servant, or otherwise, carry on, operate, manage, control, or become involved in any manner with any business, operation, corporation, partnership, association, agency, or other person or entity which is engaged in a business that is competitive with any of the Company's or its affiliates' products which are produced by the Company or its affiliates as of the date of Executive's termination of employment with the Company, in any area or territory in which the Company or any affiliate conducts operations; provided, however, that the foregoing shall not prohibit Executive from owning up to one percent (1%) of the outstanding stock of a publicly held company engaged in the Fluid-Control Industry; and

(b) during the term of Executive's employment with the Company and for a period of twelve (12) months thereafter, regardless of the reason for termination of employment, Executive will not directly or indirectly solicit or induce any present or future employee of the Company or any affiliate to accept employment with Executive or with any business, operation, corporation, partnership, association, agency, or other person or entity with which Executive may be associated, and Executive will not employ or cause any business, operation, corporation, partnership, association, agency, or other person or entity with which Executive may be associated to employ any present or future employee of the Company or its affiliates without providing the Company with ten (10) days' prior written notice of such proposed employment.

(c) in the course of Executive's employment with the Company (and, if applicable, its predecessors), Executive has been allowed to become, and will continue to be allowed to become, acquainted with the Company's business affairs, information, trade secrets, and other matters which are of a proprietary or confidential nature, including but not limited to the Company's and its affiliates' and predecessors' operations, business opportunities, price and cost information, finance, customer information, business plans, various sales techniques, manuals, letters, notebooks, procedures, reports, products, processes, services, and other confidential information and knowledge (collectively the "Confidential Information") concerning the Company's and its affiliates' and predecessors' business. The Company agrees to provide on an ongoing basis such Confidential Information as the Company deems necessary or desirable to aid Executive in the performance of his duties. Executive understands and acknowledges that such Confidential Information is confidential, and he agrees not to disclose such Confidential Information to anyone outside the Company except to the extent that (i) Executive deems such disclosure or use reasonably necessary or appropriate in connection with performing his duties on behalf of the Company, (ii) Executive is required by order of a court of competent jurisdiction (by subpoena or similar process) to disclose or discuss any Confidential Information, provided that in such case, Executive shall promptly inform the Company, as appropriate, of such event, shall cooperate with the Company, as appropriate, in attempting to obtain a protective order or to otherwise restrict such disclosure, and shall only disclose Confidential Information to the minimum extent necessary to comply with any such court order; (iii) such Confidential Information becomes generally known to and available for use in the Company's industry (the "Fluid-Control Industry"), other than as a result of any action or inaction by Executive; or (iv) such information has been rightfully received by a member of the Fluid-Control Industry or has been published in a form generally available to the Fluid-Control Industry prior to the date Executive proposes to disclose or use such information. Executive further agrees that he will not during employment and/or at any time thereafter use such Confidential Information in competing, directly or indirectly, with the Company. At such time as Executive shall cease to be employed by the Company, he will immediately tum over to the Company, all Confidential Information, including papers, documents, writings, electronically stored information, other property, and all copies of them provided to or created by him during the course of his employment with the Company. The provisions of this Paragraph 7(c) shall survive termination of this Agreement for any reason.

Should Executive violate any of the provisions of paragraphs 7(a) or (b), then in addition to all other rights and remedies available to the Company at law or in equity, the duration of this covenant shall automatically be extended for the period of time from which Executive began such violation until he permanently ceases such violation, the Severance Benefits shall cease and the Company shall be entitled to recovery previously paid Severance Benefits.

8. Notice. For purposes of this Agreement, notices and all other communications provided for in the Agreement shall be in writing and shall be deemed to have been duly given when delivered or mailed by United States certified mail, return receipt requested, postage prepaid, addressed as follows:

If to the Executive:

At Executive' s home address as shown in the Company's personnel records;

If to the Company:

CIRCOR International, Inc. 30 Corporate Drive, Suite 200
Burlington, MA 01803
Attn: Senior Vice President & General Counsel
Attn: Senior Vice President-Human Resources

or to such other address as either party may have furnished to the other in writing in accordance herewith, except that notices of change of address shall be effective only upon receipt.

9. Successor to Company. The Company shall require any successor (whether direct or indirect, by purchase, merger, consolidation or otherwise) to all or substantially all of the business or assets of the Company expressly to assume and agree to perform this Agreement to the same extent that the Company would be required to perform it if no succession had taken place. Failure of the Company to obtain an assumption of this Agreement at or prior to the effectiveness of any succession shall be a breach of this Agreement and shall constitute Good Reason if the Executive elects to terminate employment.

10. Amendment; Other Agreements. No provisions of this Agreement may be amended, modified, or discharged unless such amendment, modification, or discharge is agreed to in writing and signed by Executive and such officer of the Company as may be specifically designated by the Board. No agreements or representations, oral or otherwise, express or implied, unless specifically referred to herein, with respect to the subject matter hereof have been made by either party which are not set forth expressly in this Agreement.

I I. Governing Law. The validity, interpretation, construction, and performance of this Agreement shall be governed by the laws of the Commonwealth of Massachusetts (without regard to principles of conflicts of laws).

12. Counterparts. 1bis Agreement may be executed in several counterparts, each of which shall be deemed to be an original but all of which together will constitute one and the same instrument.

13. Arbitration; Other Disputes. In the event of any dispute or controversy arising under or in connection with this Agreement, the parties shall first promptly try in good faith to settle such

dispute or controversy by mediation under the applicable rules of the American Arbitration Association before resorting to arbitration. In the event such dispute or controversy remains unresolved in whole or in part for a period of30 days after it arises, the parties will settle any remaining dispute or controversy exclusively by arbitration in Boston, Massachusetts, in accordance with the rules of the American Arbitration Association then in effect. Judgment may be entered on the arbitrator's award in any court having jurisdiction. Notwithstanding the above, the Company shall be entitled to seek a restraining order or injunction in any court of competent jurisdiction to prevent any continuation of any violation of Section 7 of this Agreement. Furthermore, should a dispute occur concerning Executive's mental or physical capacity as described in Subparagraph l(b) or 2(a), a doctor selected by Executive and a doctor selected by the Company shall be entitled to examine Executive. If the opinion of the Company's doctor and Executive's doctor conflict, the Company's doctor and Executive's doctor shall together agree upon a third doctor, whose opinion shall be binding.

14. Assignment. Neither the Company nor the Executive may make any assignment of this Agreement or any interest herein, by operation of law or otherwise, without the prior written consent of the other party, and without such consent any attempted transfer shall be null and void and of no effect. This Agreement shall inure to the benefit of and be binding upon the Company and the Executive, their respective successors, executors, administrators, heirs and permitted assigns. In the event of the Executive's death prior to the completion by the Company of all payments due him under this Agreement, the Company shall continue such payments to the Executive's beneficiary designated in writing to the Company prior to his death (or to his estate, if the Executive fails to make such designation).

15. Litigation and Regulatory Cooperation. During and after Executive's employment, Executive shall reasonably cooperate with the Company in the defense or prosecution of any claims or actions now in existence or which may be brought in the future against or on behalf of the Company which relate to events or occurrences that transpired while Executive was employed by the Company; provided, however, that such cooperation shall not materially and adversely affect Executive or expose Executive to an increased probability of civil or criminal litigation. Executive's cooperation in connection with such claims or actions shall include, but not be limited to, being available to meet with counsel to prepare for discovery or trial and to act as a witness on behalf of the Company at mutually convenient times. During and after Executive's employment, Executive also shall cooperate fully with the Company in connection with any investigation or review of any federal, state or local regulatory authority as any such investigation or review relates to events or occurrences that transpired while Executive was employed by the Company. The Company shall also provide Executive with compensation on an hourly basis (to be derived from the sum of his Base Salary) for requested litigation and regulatory cooperation that occurs after his termination of employment, and reimburse Executive for all costs and expenses incurred in connection with his performance under this Paragraph 15, including, but not limited to, reasonable attorneys' fees and costs.

16. Enforceability. If any portion or provision of this Agreement shall to any extent be declared illegal or unenforceable by a court of competent jurisdiction, then the remainder of this Agreement, or the application of such portion or provision in circumstances other than those as to which it is so-declared illegal or unenforceable, shall not be affected thereby, and each portion and provision of this Agreement shall be valid and enforceable to the fullest extent permitted by law.

17. Waiver. No waiver of any provision hereof shall be effective unless made in writing and signed by the waiving party. The failure of any party to require the performance of any term or obligation of this

Agreement, or the waiver by any party of any breach of this Agreement, shall not prevent any subsequent enforcement of such term or obligation or be deemed a waiver of any subsequent breach.

18. Section 409A.

(a) It is intended that any compensation or benefits under this Agreement satisfy, to the greatest extent possible, the exemptions from the application of Section 409A of the Internal Revenue Code of 1986, as amended ("Section 409A") provided under Treasury Regulations Sections l.409A-l(b)(4), and 1.409A-l(b)(9), and this Agreement will be construed to the greatest extent possible as consistent with those provisions, and to the extent not so exempt, this Agreement (and any definitions hereunder) will be construed in a manner that complies with Section 409A. For purposes of Section 409A (including, without limitation, for purposes of Treasury Regulations Section l.409A-2(b)(2)(iii)), the Executive's right to receive any installment payments under this Agreement (whether Severance Benefits or otherwise) shall be treated as a right to receive a series of separate payments and, accordingly, each installment payment hereunder shall at all times be considered a separate and distinct payment. Severance Benefits shall not commence until the Executive has a "separation from service" (as defined under Treasury Regulation Section 1.409A-l(h), without regard to any alternative definition thereunder, a "separation from service").

(b) Notwithstanding any provision to the contrary in this Agreement, if the Executive is deemed by the Company at the time of termination to be a "specified employee" for purposes of Section 409A(a)(2)(B)(i), and if any of the payments set forth herein are deemed to be "deferred compensation," then to the extent delayed commencement of any portion of such payments is required in order to avoid a prohibited distribution under Section 409A(a)(2)(B)(i) and the related adverse taxation under Section 409A, such payments shall not be provided prior to the earliest of (i) the expiration of the six-month period measured from the Executive's employment termination, (ii) the date of Executive's death or (iii) such earlier date as permitted under Section 409A without the imposition of adverse taxation. Upon the first business day following the expiration of such period, all payments deferred pursuant to this paragraph shall be paid in a lump sum, and any remaining payments due shall be paid as otherwise provided herein. No interest shall be due on any amounts so deferred.

(c) To the extent that any right to reimbursement of expenses or payment of any benefit in-kind under this Agreement constitutes nonqualified deferred compensation (within the meaning of Section 409A of the Code), (i) any such expense reimbursement shall be made by the Company no later than the last day of the taxable year following the taxable year in which such expense was incurred by Executive, (ii) the right to reimbursement or in-kind benefits shall not be subject to liquidation or exchange for another benefit, and (iii) the amount of expenses eligible for reimbursement or in-kind benefits provided during any taxable year shall not affect the expenses eligible for reimbursement or in-kind benefits to be provided in any other taxable year; provided, that the foregoing clause shall not be violated with regard to expenses reimbursed under any arrangement covered by Section I05(b) of the Code solely because such expenses are subject to a limit related to the period the arrangement is in effect.

(d) While the payments and benefits provided here under are intended to be structured in a manner to avoid the implication of any taxes or related liability under Section 409A of the Code. The parties agree that this Agreement may be amended, as reasonably requested by either party, and as may be necessary to fully comply with Section 409A of the Code and all related rules and regulations in order to preserve the payments and benefits provided hereunder without additional cost to either party.

(e) The Company makes no representation or warranty and shall have no liability to the Executive or any other person if any provisions of this Agreement are determined to constitute deferred compensation subject to Section 409A of the Code but do not satisfy an exemption from, or the conditions of, such Section.

IN WITNESS WHEREOF, the parties have executed this Agreement effective on the date and year first above written.

CIRCOR INTERNATIONAL, INC.

/s/ Scott Buckhout

Scott Buckhout
President and CEO

/s/ Lane Walker

Lane Walker
Energy President

EXHIBIT 21

SCHEDULE OF SUBSIDIARIES

I. Subsidiaries of CIRCOR International, Inc.:

1. CIRCOR (Jersey) Ltd., a Jersey Company (83% ownership)
2. CIRCOR Aerospace, Inc., a Delaware Corporation
3. CIRCOR Energy Products, Inc., an Oklahoma Corporation
4. CIRCOR Luxembourg Holdings Sarl, a Luxembourg Limited Liability Company (44.55%)
5. CIRCOR France SAS, a French Entity
6. Leslie Controls, Inc., a Delaware Corporation
7. Spence Engineering Company, Inc., a Delaware Corporation
8. CIRCOR German Holdings Management GmbH, a German Closed Entity
1. Downstream Holding, LLC, a Delaware Limited Liability Company
2. CIRCOR Naval Solutions, LLC, a Delaware Limited Liability Company
3. CIRCOR Precision Metering, LLC, a Delaware Limited Liability Company
4. CIRCOR Pumps North America, LLC, a Delaware Limited Liability Company
5. CIRCOR Holdings, Inc., a Delaware Corporation
6. CIRCOR Dovianus Holdings B.V., a Netherlands Limited Liability Company

II. Subsidiaries of CIRCOR Aerospace, Inc.:

1. CIRCOR IP Holdings Co., a Delaware Corporation
2. CIRCOR Instrumentation Technologies, Inc., a New York Corporation
3. CIRCOR Luxembourg Holdings Sarl, a Luxembourg Limited Liability Company (<1%)

III. Subsidiaries of CIRCOR Instrumentation Technologies, Inc.:

1. CIRCOR (Jersey) Ltd., a Jersey Company (17% ownership)
2. Dopak Inc., a Texas Corporation
3. CIRCOR Mexico, S.A. de C.V., a Mexico Entity (99%)
4. CIRCOR Empleados de Mexico S.A. de C.V., a Mexico Entity (99%)

IV. Subsidiaries of CIRCOR Energy Products, Inc.:

1. CIRCOR Luxembourg Holdings Sarl., a Luxembourg Limited Liability Company (approx. 45.34%)
2. CIRCOR LLC, a Massachusetts Limited Liability Company
3. CIRCOR Mexico, S.A. de C.V., a Mexico Entity (1%)
4. CIRCOR Empleados de Mexico S.A. de C.V., a Mexico Entity (1%)
5. CIRCOR Pipeline Engineering, LLC, a Delaware Limited Limited Liability Company

V. Subsidiaries of CIRCOR (Jersey), Ltd.:

1. CIRCOR German Holdings, LLC, a Delaware Limited Liability Company
2. CIRCOR Singapore Pte Ltd, a Singapore Private Limited Company

VI. Subsidiaries of CIRCOR German Holdings, LLC:

1. CIRCOR German Holdings GmbH & Co. KG, a German Private Company

VII. Subsidiaries of CIRCOR German Holdings GmbH & Co. KG:

1. Regeltechnik Kornwestheim GmbH, a German Entity
2. SCHROEDAHL-ARAPP Spezialarmaturen GmbH & Co. KG, a German Entity
3. Allweiler GmbH, a Germany Entity
4. IMO AB, a Sweden Entity

VIII. Subsidiaries of CIRCOR Luxembourg Holdings, Sarl.:

1. CEP Holdings Sarl, a Luxembourg Limited Liability Company (6% ownership)
2. CIRCOR Energy Products (Canada) ULC, an Alberta Unlimited Liability Entity
3. Howitzer Acquisition Limited, a United Kingdom Entity
4. CIRCOR India Holdings BV, a Netherlands Entity
5. CIRCOR Middle East FZE, a United Arab Emirates Entity
6. CIRCOR do Brasil Particpações LTDA, a Brazilian Entity (>99%)
7. CIRCOR (Barbados) Holdings SARL, a Barbados Entity

IX. Subsidiaries of CIRCOR Do Brasil Particpações LTDA.:

1. CIRCOR do Brasil Industria e Comercio LTDA, a wholly owned subsidiary of CIRCOR do Brasil Participacoes LTDA

X. Subsidiaries of CIRCOR Energy Products (Canada) ULC, an Alberta Unlimited Liability Company:

1. CEP Holdings Sarl, a Luxembourg Limited Liability Entity (94% ownership)
2. Imo Industries (Canada) Inc., a Canadian Entity

XI. Subsidiaries of CEP Holdings, Sarl. :

1. Pibiviesse Srl., an Italian Entity
2. CIRCOR do Brasil Particpações LTDA, a Brazilian Entity (1%)

XII. Subsidiaries of Pibiviesse, Srl:

1. Suzhou CIRCOR Valve Company, Ltd., a Chinese Foreign Owned Enterprise

XIII. Subsidiaries of Howitzer Acquisition Limited, a United Kingdom Corporation:

1. Hale Hamilton (Valves) Limited, a United Kingdom Entity
2. Pipeline Engineering & Supply Co., Limited, a United Kingdom Entity
3. TapcoEnpro UK Limited, a United Kingdom Entity

XIV. Subsidiaries of CIRCOR India Holdings BV, a Netherlands Corporation:

1. CIRCOR India LLC, a Delaware Limited Liability Company
2. CIRCOR Flow Technologies India Private Ltd, an Indian Private Entity

XV. Subsidiaries of CIRCOR France, a French Corporation

1. CIRCOR Bodet SAS, a French Entity
2. CIRCOR Maroc SARL A.U., a Moroccan Entity
3. CIRCOR Industria SAS, a French Entity

XVI. Subsidiaries of Downstream Holding, LLC, a Delaware Limited Liability Company:

1. Downstream Aggregator, LLC, a Delaware Limited Liability Company

XVII. Subsidiaries of Downstream Aggregator, LLC, a Delaware Limited Liability Company

1. TapcoEnpro, LLC, a Delaware Limited Liability Company
2. DeltaValve, LLC, a Delaware Limited Liability Company
3. CIRCOR Luxembourg Holdings Sarl, a Luxembourg Limited Liability Entity (10.03%)

XVIII. Subsidiaries of CIRCOR Holdings, Inc.:

1. CIRCOR Netherlands Holdings B.V., a Netherlands Limited Liability Entity

XIX. Subsidiaries of CIRCOR Dovianus Holdings B.V.

1. Dovianus B.V., a Netherlands Limited Liability Entity

XX. Subsidiaries of Dovianus B.V.:

1. CIRCOR Malaysia Sdn. Bhd., a Malaysia Limited Entity
2. Allweiler India Private Limited (formerly known as Tushaco Pumps Private Limited) (99.999%), an Indian Private Entity
3. CIRCOR Netherlands II Holdings BV, a Netherlands Entity
4. Colfax Fluid Handling Middle East Ltd., an England/Wales Entity
5. CIRCOR Pump (Weihai) Company Ltd., a Chinese Foreign Owned Enterprise

XXI. Subsidiaries of Allweiler GmbH

1. Allweiler A/S, a Norway Entity
2. Allweiler AlFarid Pumps Co. (28%), a United Arab Emirates Entity
3. Allweiler Finland Oy AB, a Finland Entity
4. CIRCOR Europe Finance Ltd, a England / Wales Entity
5. CIRCOR Allweiler Imo SpA, a Italian Entity
6. CIRCOR Imo Allweiler, a France Entity
7. PD-Technik Ingenieurbüro GmbH, a German Entity
8. Rapid Allweiler Pumps & Engineering Company (Pty) Ltd. (35%), a South African Private Entity

XXII. Subsidiaries of CIRCOR Sub Holding, LLC

1. CIRCOR Sub Ltd., a England / Wales Entity

2. Portland Valve LLC, a Delaware Limited Liability Company

XXIII. Subsidiaries of CIRCOR Netherlands II Holding BV:

1. Houttuin BV, a Netherlands Entity
2. SES-Rosscor Holding B.V., a Netherlands Entity (19.9%)

XXIV. Subsidiaries of CIRCOR Naval Solutions, LLC

1. CIRCOR Sub Holding, LLC, a Delaware Limited Liability Company

Exhibit 23.1

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We hereby consent to the incorporation by reference in the Registration Statements on Form S-3 (No. 333-223958) and Form S-8 (Nos. 333-91229, 333-125237, 333-190295 and 333-197754) of CIRCOR International, Inc. of our report dated March 1, 2019 relating to the financial statements and financial statement schedule and the effectiveness of internal control over financial reporting, which appears in this Form 10-K.

/s/ PricewaterhouseCoopers LLP
Boston, Massachusetts
March 1, 2019

Exhibit 31.1

CERTIFICATION PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Scott A. Buckhout, certify that:

1. I have reviewed this annual report on Form 10-K of CIRCOR International, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 1, 2019

Signature: /s/ Scott A. Buckhout

Scott A. Buckhout

President and Chief Executive Officer

Exhibit 31.2

CERTIFICATION PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Chadi Chahine, certify that:

1. I have reviewed this annual report on Form 10-K of CIRCOR International, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 1, 2019 Signature: /s/ Chadi Chahine

Chadi Chahine

Executive Vice President, Chief Financial Officer

Exhibit 32.1

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

The undersigned officers, who are the President and Chief Executive Officer and Executive Vice President and Chief Financial Officer of CIRCOR International, Inc. (the “Company”), each hereby certifies to the best of his knowledge, that the Company’s annual report on Form 10-K to which this certification is attached (the “Report”), as filed with the Securities and Exchange Commission on the date hereof, fully complies with the requirements of Section 13(a) or 15(d), as applicable, of the Securities Exchange Act of 1934, as amended, and that the information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the issuer.

/s/ Scott A. Buckhout	/s/ Chadi Chahine
Scott A. Buckhout	**Chadi Chahine**
President and Chief Executive Officer	**Executive Vice President, Chief Financial Officer**
Principal Executive Officer	***Principal Financial Officer***
March 1, 2019	March 1, 2019