Oil & Gas

Oil & Gas

Control every move

- Directional Control Valves & Regulators
- Pressure Switches
- Temperature Switches
- Level Switches

Barksdale®
CONTROL PRODUCTS
CRANE
Barksdale, Inc./Barksdale GmbH
A Subsidiary of Crane Co.

Oil and Gas - The Challenge today

Oil & Gas Today

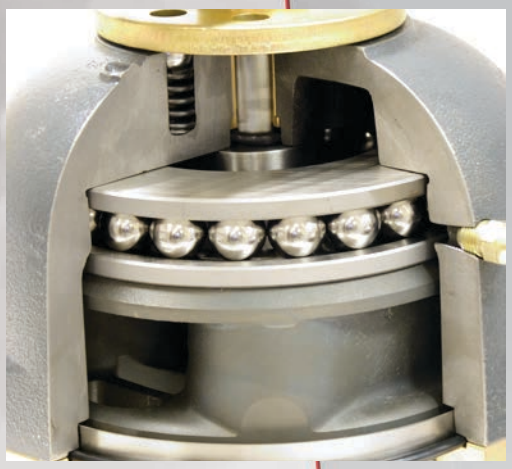
Worldwide economic growth, depletion of oil reserves, and continued investment in safety systems are driving the demand for oil and gas production equipment. This growing need is pushing producers to seek rugged and reliable control equipment.

Barksdale's control products are designed to meet this challenge. We engineer our products to deliver exceptional performance and long life even in the most demanding applications. When you choose Barksdale's control products, you can rest easy knowing that over 65 years of experience has guided that design and development. Our goal is to help you "Control Every Move"!

Barksdale - engineering the future

Since 1949, our core values of being market-focused, technology-driven, and customer-intimate have guided our product development and our culture. Today, Barksdale Control Products has grown into a leading solutions provider with facilities in North America, Europe and Asia. Our global network of technology centers, distributors and support representatives enable local support. Crane Co., our parent company, provides the financial backing to ensure we will support our customers over the long haul.

Shear-Seal®
Barksdale - The Solution



Barksdale - Proven Reliability

For over 65 years, Barksdale's revolutionary Shear-Seal® valve design has been recognized as the industry standard for demanding applications in the Oil & Gas industry. Designed to provide years of trouble-free operation and virtually zero leakage, the Shear-Seal® design uses fluid pressure to maintain a leak-free metal-to-metal seal that improves with use. The shearing action between the rotor & pressure seal continually laps the mating surfaces and prevents contaminates from lodging between the sealing surfaces. The result is a valve that doesn't wear out – but wears in over time, providing you superior control consistently through the entire life of the product.

Our customers rely on genuine Barksdale Shear-Seal® valve technology for their control systems because they know it is the only technology with a proven track record of performance in the most demanding situations. Our Shear-Seal® valve products are designed to thrive in high pressure, high flow, dirty environments where the need for zero leakage is an absolute necessity. They provide a high level of safety, quality and reliability for equipment world-wide.

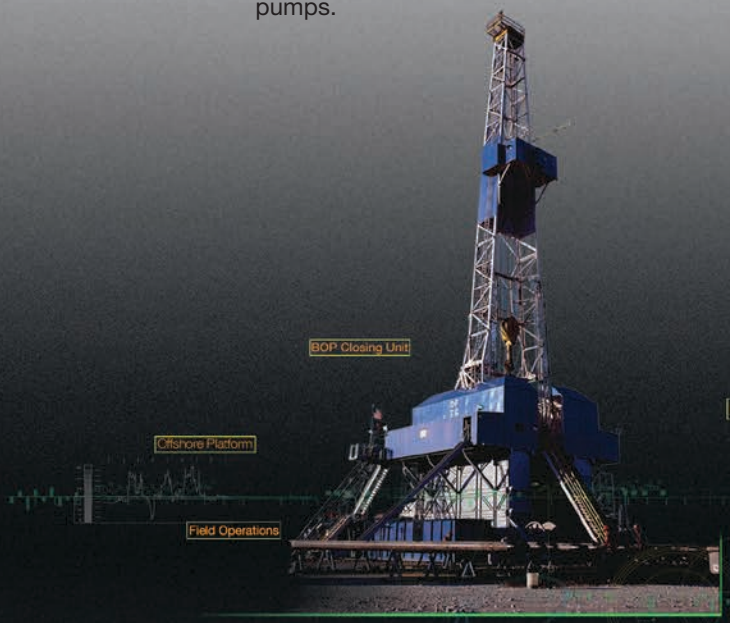
Today, Barksdale also has a complete line of pressure, level, temperature switches, pressure transducers and electronic control instrumentation to meet the most demanding equipment requirements. Combine this technical expertise with our dedication to exceptional service, and you will find that Barksdale is unmatched as a solutions provider to the industry.

Upstream

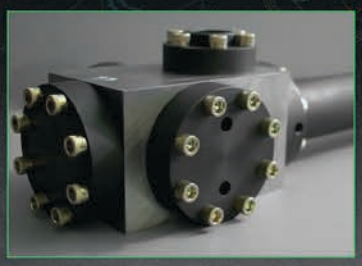
Barksdale has been a product leader providing Shear-Seal® valves and regulators to major oil & gas equipment manufacturers for over 50 years. Our products can be found in applications such as BOP closing units, offshore platforms, pipe injection machines, work-over rigs, oil separators and pumps.

Midstream

Barksdale is a main componen
original equipment manufacture
products in gas distribution ins
cutting equipment, hydraulic po
heat tracing equipment, compr



Actuated Heavy Duty Valves



Pressure Regulator

Stainless Steel High Pressure Valve

Field Development
Hydralic Power Units
Work-Over Rigs
Field Pipeline Gathering
Pipe Cutting Equipment
Heat Tracing

Long Distance Transportation

Explosion Temperatu

Engineered to Excel

Barksdale's products meet every challenge

t provider to major oil & gas
ers. You can find Barksdale
trumentation equipment, pipe
ower units, oil and gas tankers,
essor stations and more.

Downstream

Barksdale is a major component provider to the refinery and petrochemical industries. Our products are located on pump skids, reservoir tanks, hydraulic power tools, sample systems, cooling stations, safety shutdown systems and more.

Shear-Seal® Valves

Land

	Land Application Products			
	Heavy Duty Control Valve	**Heavy Duty Hydraulic Regulator**	**Hydraulic Relief Valve**	**Actuated Heavy Duty Control Valve**
Port Sizes:	1/4" – 1 1/2"	1/2" – 1 1/2"	3/4"	1"
Pressure Range:	0 – 6000 psi	300 – 3000 psi (regulated range)	0 – 5500 psi	0 – 5000 psi
Max. Flow Capacity: (@ 40 ft/s)	1/4" – 6 gpm 1/2" – 19 gpm 1" – 50 gpm 1 1/2" – 114 gpm	1/2" – 45 gpm 1" – 70 gpm 1 1/2" – 120 gpm	15 gpm	75 gpm
Features:	▸ High velocity flow ▸ Selector, Bypass & Manipulator flow patterns ▸ Tolerates contaminated media ▸ Panel mount option ▸ Sub-plate manifold option ▸ Spring return option ▸ SAE porting option	▸ Manual, Air & Hydraulic Fail-safe Motors ▸ Self adjusting ▸ Tolerates contaminated media ▸ Self venting ▸ NPT & SAE porting options	▸ High flow with Zero Leak ▸ Multiple resets ▸ Metal-to-metal seal ▸ Field adjustable or factory set ▸ Tamper-proof cap	▸ Air or Hydraulic integrated actuator ▸ 2 and 3 Positions ▸ Selector, Bypass, & Manipulator flow patterns ▸ Tolerates contaminated media ▸ Panel mounting option ▸ SAE porting option ▸ Position indication option
Standard Materials of Construction	**Body**: Bronze **Housing**: Ductile Iron **Rotor**: Stainless Steel **Shear-Seal**: Stainless Steel **Shaft**: Stainless Steel **O-rings**: Buna-N **Back-up rings**: Teflon®	**Body**: Phosphate coated carbon steel **Wetted Parts**: Stainless Steel **Tower Housing**: Phosphate coated alloy steel **Flanges**: Phosphate coated alloy steel **O-rings**: Buna-N **Back-up rings**: Teflon®	**Internals**: Stainless Steel **Housing**: powder coated ductile iron **Spring**: powder coated steel **Ball**: Tungsten Carbide **Back-up rings**: Teflon®	**Body/Housing**: Phosphate coated carbon steel **Rotor**: Stainless steel Shear-Seal: Stainless steel **Shaft**: Stainless steel **O-rings**: Buna N **Back-up rings**: Teflon®
Applicable Products:	▸ Series 140 & 200 ▸ Series 920 & 5620 ▸ Series 3760 ▸ Series 180 	▸ L20415, LF20415, LG20415 ▸ L20517, LF20517, LG20517 Other Series that can be configured for land applications: ▸ 20313, F20313, G20313 ▸ 20415, F20415, G20415 ▸ 20495, F20495, G20495 ▸ 20517, F20517, G20517 ▸ 20597, F20597, G20597 	▸ Series 8010 	▸ Series LA14 ▸ Series LH14 
Applications:	▸ Land-based safety drilling equipment ▸ Steel Mills ▸ Machinery panels ▸ Power generation facilities	▸ Land-based safety drilling controls ▸ BOP Control Units ▸ Coiled Tube Reels ▸ Oil & Gas Panels	▸ Pump system safety ▸ Accumulator systems ▸ Compressor over-pressure protection ▸ Tank protection	▸ Land-based safety drilling equipment ▸ BOP Control Units ▸ Workover rigs ▸ Mobile drilling rigs

Shear-Seal® Valves

Offshore

	Offshore Application Products			
	Actuated Heavy Duty Control Valve	**Premium Performance Hydraulic Regulator**	**High Pressure Control Valve**	**Stainless Steel Manual Valve**
Port Sizes:	1/4" – 1 1/2"	1/2" – 1 1/2"	1/4" – 1"	1/4" – 1/2"
Pressure Range:	0 – 6000 psi	300 – 3300 psi (regulated range)	0 – 15000 psi	0 – 6000 psi
Max. Flow Capacity: (@ 40 ft/s)	1/4" – 6 gpm 1/2" – 19 gpm 1" – 50 gpm 1 1/2" – 114 gpm	1/2" – 45 gpm 1" – 70 gpm 1 1/2" – 120 gpm	1/4" SAE-4 – 6 gpm 3/8" SAE-6 – 6 gpm 1/2" SAE-8 – 6 gpm 1" SAE-16 – 19 gpm	4 gpm
Features:	▸ Air or Hydraulic integrated actuator ▸ 2 and 3 Positions ▸ Selector, Bypass & Manipulator flow patterns ▸ Tolerates contaminated media ▸ Panel mount option ▸ Straight body mount option ▸ SAE porting option ▸ Position indication option	▸ Manual, Air & Hydraulic Failsafe Motors ▸ Self Adjusting ▸ Tolerates contaminated media ▸ SAE Code 62 flanges; SAE & NPT porting options ▸ Surge dampening	▸ All external Stainless Steel construction ▸ Low pressure drop ▸ High velocity flow ▸ Multiple flow patterns ▸ Low handle load ▸ Spring return option ▸ SAE porting option	▸ All stainless steel construction ▸ Low pressure drop ▸ Selector, Bypass & Manipulator flow patterns ▸ Rugged design
Standard Materials of Construction	**Body:** Bronze, Stainless Steel **Housing:** Bronze **Rotor:** Stainless Steel **Shear-Seal:** Stainless Steel **Shaft:** Stainless Steel **O-rings:** Buna-N **Back-up rings:** Teflon®	**Body:** 316 Stainless Steel **Wetted Parts:** 400 SS **Tower Housing:** 316 SS **Flanges:** 316 Stainless Steel **O-rings:** Buna-N **Back-up rings:** Teflon®	**Body:** Stainless Steel **Housing:** Stainless Steel **Rotor:** Stainless Steel **Shear-Seal:** Stainless Steel **Shaft:** Stainless Steel **O-rings:** Buna N **Back-up rings:** Teflon®	**Metal parts:** Stainless Steel **O-rings:** Buna N **Back-up rings:** Teflon®
Applicable Products:	▸ A14 & A20 ▸ H14 & H20 ▸ A92 & A562 ▸ H92 & H562 ▸ A376 & H376 ▸ A18 & H18 	▸ S20415, SF20415, SG20415 ▸ S20517, SF20517, SG20517 Other Series that can be configured for offshore applications: ▸ 20313, F20313, G20313 ▸ 20415, F20415, G20415 ▸ 20495, F20495, G20495 ▸ 20517, F20517, G20517 ▸ 20597, F20597, G20597 	▸ Series 4140 	▸ Series MAV-101 thru MAV-103 ▸ Series MAV-201 thru MAV-221 
Applications	▸ Offshore safety drilling equipment ▸ BOP Control Units ▸ Workover Rigs ▸ Chemical Processing Plants	▸ Offshore oil drilling controls ▸ BOP Control Units ▸ Pressure sensitive applications	▸ Offshore drilling equipment ▸ Gas compression systems ▸ Marine umbilical reels ▸ High pressure test stands	▸ Oil & Gas control panels ▸ Semi-submersible systems ▸ High pressure hydraulic skids

Guide
Electronic Pressure Control

	Explosion Proof Electronic Pump Control Switch	Explosion proof Transducers	Intrinsically Safe Transducers	Nonincendive Transducers
Pressure Range:	0 to 10,000 psi (689 bar)	Vacuum to 10,000 psi (689 bar)	Vacuum to 10,000 psi (689 bar)	Vacuum to 10,000 psi (689 bar)
Typical Life:	100M cycles	100M cycles	100M cycles	100M cycles
General Advantage:	Programmable dead-band Delay feature	Continuous analog output Voltage and current output	Continuous analog output Voltage and current output	Continuous analog output Voltage and current output
Hazardous Location Approvals:	▸ ATEX Certified ▸ Explosion proof housing	▸ cULus Explosion proof ▸ UL Approved ▸ Class I, Groups A, B, C & D ▸ Class II, Groups E, F & G ▸ IECEx & ATEX Certified "Ex-d" &"Ex-tb"* *425X only	▸ cULus Intrinsically Safe for Div 1 ▸ Class I, Groups A, B, C & D ▸ Class II, Groups E, F & G ▸ ATEX Certified Intrinsically safe "ia"* *445 only	▸ cULus Nonincendive for Div 2 ▸ Class I, Groups A, B, C & D ▸ Class II, Groups E, F & G
Applicable Products:	▸ UDS7-BX 	▸ 423X ▸ 425X ▸ 426X 	▸ 443 ▸ 445 ▸ 446 	▸ 433 ▸ 435 ▸ 436 
Applications	▸ Oil & gas pipelines ▸ Refineries ▸ Petrochemical plants ▸ Pulp and paper mills ▸ Coal & oil fired power plants ▸ Cement plants ▸ Gas transfers for fuel systems	▸ Oil & gas pipelines ▸ Oil patch ▸ Petrochemical plants ▸ Refineries ▸ Coal & oil fired power plants ▸ Cement plants ▸ Gas transfers for fuel systems ▸ Gas panels ▸ Gas mixing systems	▸ Oil & gas pipelines ▸ Oil patch ▸ Petrochemical plants ▸ Refineries ▸ Pulp & paper mills ▸ Coal & oil fired power plants ▸ Cement plants ▸ Gas transfers for fuel systems ▸ Gas panels ▸ Gas mixing systems	▸ Oil & gas pipelines ▸ Oil patch ▸ Petrochemical plants ▸ Refineries ▸ Pulp and paper mills ▸ Coal & oil fired power plants ▸ Cement plants ▸ Gas transfers for fuel systems ▸ Gas panels ▸ Gas mixing systems

Guide
Mechanical Pressure Switches

	Diaphragm	Bourdon Tube	Dia-Seal Piston	Piston
Pressure Range:	Vacuum to 150 psi (10 bar)	15 psi (1 bar) to 18,000 psi (1,240 bar)	Vacuum to 1,000 psi (70 bar)	10,000 psi (689 bar)
Typical Life:	1,000,000 cycles	1,000,000 cycles	1,000,000 cycles	2,500,000 cycles
General Advantage:	Lower dead-band: 2%- 7%	Stable & durable during continuous cycling	Less vulnerable to leakage (when compared to piston switches)	Fast response to pressure changes
	Typically higher accuracies	Higher operating pressures	Typically more economical	Typically longer life
Hazardous Location Approvals:	▸ UL & CSA for Div 1 Explosion proof ▸ Class I, Groups B, C & D ▸ Class II, Groups E, F & G ▸ ATEX Certified Flame proof “d” ▸ IP66	▸ UL & CSA for Div 1 Explosion proof ▸ Class I, Groups B, C & D ▸ Class II, Groups E, F & G ▸ ATEX Certified Flame proof “d”	▸ UL & CSA for Div 1 Explosion proof ▸ Class I, Groups B*, C & D ▸ Class II, Groups E, F & G ▸ Class III* ▸ IECEx & ATEX Certified Flame proof “d”* ▸ KGS* ▸ NACE* * 9671X & 9681X only	▸ UL & CSA for Div 1 Explosion proof ▸ Dual sealed for DIV 1 & DIV 2 applications ▸ Class I, Groups B, C & D ▸ Class II, Groups E, F & G ▸ Class III ▸ IECEx & ATEX Certified Flame proof “Ex-d” ▸ KGS ▸ NACE
Applicable Products:	▸ D1X/D2X 	▸ B1X/B2X 	▸ P1X ▸ 9671X ▸ 9681X 	▸ 9692X 
Applications	▸ Pump & compressor monitoring ▸ Hydraulic power units ▸ Oil & gas ▸ Food & beverage ▸ Utility & power generation ▸ Mining	▸ Power plants ▸ Water pumps ▸ Blowout preventers (BOP) ▸ Pneumatic devices ▸ General industrial applications ▸ Oil and gas applications	▸ BOP closing units ▸ Safety panels ▸ Pipelines ▸ Chemical and petrochemical plants ▸ Pulp and paper mills ▸ Pump and gas compressors ▸ Turbines ▸ Oil & gas applications	▸ BOP closing units ▸ Safety panels ▸ Pipelines ▸ Chemical and petrochemical plants ▸ Pulp and paper mills ▸ Pump and gas compressors ▸ Turbines ▸ Oil & gas applications

Guide
Mechanical Temperature Switches

	Remote Bulb & Capillary and Local Mount	Remote Bulb & Capillary and Local Mount (Heat Trace Specific)	Compact Temperature Switch
Temperature Range:	-50°F (-45°C) to 600°F (315°C)	15°F (-9°C) to 325°F (163°C)	-10°F (-23°C) to 330°F (165°C)
General Advantage:	Installed on the pipe/vessel or up to 25 feet capillary	Installed on the pipe/vessel or up to 10 feet capillary	Compact size
	Available with thermowell & armor	Available with thermowell & armor	Local and remote mount versions
Hazardous Location Approvals:	▸ UL Approved for Div 1 Explosion proof ▸ Class I, Groups B*, C & D ▸ Class II, Groups E, F & G ▸ CSA Approved for Div 1 ▸ Class III ▸ ATEX Certified Flame proof “d” * UL only	▸ UL, CSA & FM for Div 1 Explosion proof ▸ Class I, Groups B, C & D ▸ Class II, Groups E, F & G ▸ Class III ▸ ATEX Certified Flame proof “d” ▸ NEPSI (China) ▸ GOST (Russia)	▸ UL & CSA for Div 1 Explosion proof ▸ Class I, Groups A*, B, C & D ▸ ATEX & IECEx Certified Flame proof “Ex-d” ▸ NACE * UL only
Applicable Products:	▸ T1X/T2X ▸ L1X 	▸ TXR ▸ TXL 	▸ T9692X 
Applications	▸ Oil & gas ▸ Heat tracing ▸ Printing machinery ▸ Compressors ▸ Process equipment ▸ Machine tools and industrial equipment	▸ Heat tracing ▸ Hydraulic power units ▸ Combustion engines ▸ Compressors ▸ Machine tools and industrial equipment ▸ Process equipment	▸ Offshore platforms ▸ Safety panels ▸ Chemical plants & refineries ▸ Compressor skids ▸ Instrument panels ▸ Hazardous location applications

Hazardous Location Reference

General Information

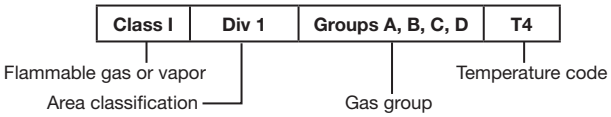
Hazardous (classified) locations, as defined in the National Electric Code (NEC), are locations where fire or explosion hazards may exist due to the presence of flammable gases, vapors or flammable liquids, combustible dusts, or ignitable fibers or flyings. Protection against explosion in hazardous locations requires that all equipment that could be exposed to the flammable or combustible atmospheres be of a type suitable for installation in such locations. The Classes and Groups for which equipment has been Listed or Classified are shown in the individual Listings and Classifications under the respective categories and are marked on the equipment itself.

Classification Definition

North American Division System	International Zone System
Division 1: Where ignitable concentrations of flammable gases, vapors or liquids can exist all of the time or some of the time under normal operating conditions.	*Zone 0:* Where ignitable concentrations of flammable gases, vapors or liquids can exist all of the time or for long periods of time under normal operating conditions.
	Zone 1: Where ignitable concentrations of flammable gases, vapors or liquids can exist some of the time under normal operating conditions.
Division 2: Where ignitable concentrations of flammable gases, vapors or liquids are not likely to exist under normal operating conditions.	*Zone 2:* Where ignitable concentrations of flammable gases, vapors, or liquids are not likely to exist under normal operating conditions.

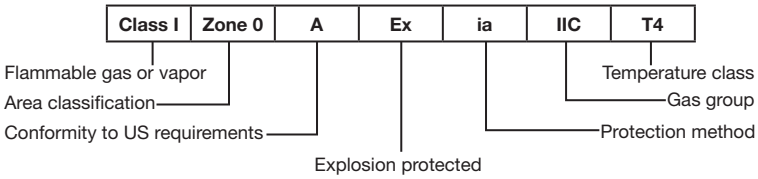
North American Marking

Division System



International Marking

Zone System



Protection Method Comparison

North American Division System		International / ATEX Zone System	
Area	Division Protection Methods	Area	Zone Protection Methods
Div. 1	Explosion proof Intrinsically safe	Zone 0 Zone 1	Intrinsically safe, 'ia'
		Zone 1	Flame proof, 'd' Any Class I or Zone 0 method Any Class I, Div. 1 method
Div. 2	Hermetically sealed Nonincendive Non-sparking	Zone 2	Hermetically sealed, 'nC' Nonincendive, 'nC' Non-sparking, 'nA'

Gas / Dust Group Comparison

Reference Gas / Dust	North American Division System	International Zone System
Acetylene	Class I, Group A	Group IIC
Hydrogen	Class I, Group B	Group IIC
Ethylene	Class I, Group C	Group IIB
Propane	Class I, Group D	Group IIA
Magnesium	Class II, Group E	-
Coal	Class II, Group F	-
Grain	Class II, Group G	-
Cotton	Class III	-
Fibers Group*	Class III	-

* No equivalent Zone classification

Marking According to ATEX Directive 94/9/EC

CE	0081	Ex	II	2	G D	Ex ia	IIC	T4	Ex	tD	A21	IP66	T85	LCIE	08	ATEX	6092	X

CE	**European Community Mark** Manufactured according to applicable EC Directives.	
0081	**Notified Body Number** For production surveillance (0081 for LCIE)	
Ex	**Marking** Specific for equipment to be used in explosive atmospheres	
II	**Equipment Group** I for Mines II different from Mines	
2	**Equipment Category**	
	Mines	Different from Mines ()
	M1 very high protection **M2** high protection	**1** very high protection **2** high protection **3** normal protection for associated apparatus
G, D	**Hazardous Atmospheres** **G** for gas, vapor, mist **D** for dust	
Ex ia	**Mark** For the specific types of protection according the applicable standard.	

IIC	**Gas Group**
T4	**Temperature Class**
Ex	**Explosion Protected**
tD	**Dust Protection by Enclosure**
A21	**Dust Zone 1**
IP66	**Enclosure Protection**
T85	**Surface Temperature Rating**
LCIE	**Notified Body** Who has released product certification
D1	**Year of Issuing** The last two digits of the year
ATEX	**ATEX Directive** 94/9/EC
E 042	**Certification Number** Progressive in the year.
X	**Supplementary Letter** **X** Particular condition of use **U** Component

Did you know? Barksdale offers a complete line of mechanical and electronic pressure, temperature, level and flow switches as well as pressure transducers, regulators, valves and Dynalco® speed instrumentation products.

Visit www.barksdale.com to see our product portfolio.

▲ Compact Pressure Switch

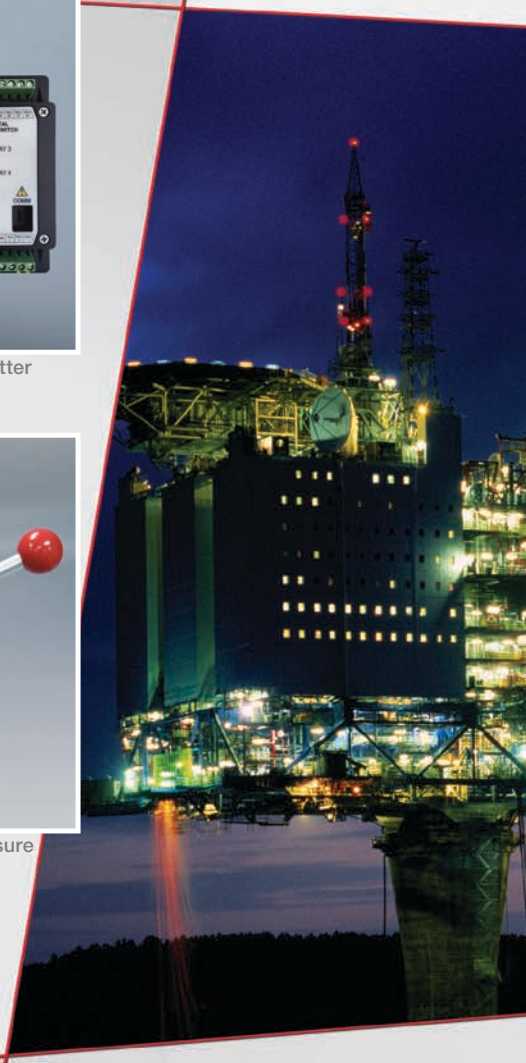
▲ General Industrial Pressure Transducer

▲ Dynalco® Digital Speed Switch & Transmitter

▲ LevelSite®

▲ Generation 3000 Electronic Pressure / Temperature / Level

▲ Shear-Seal® High Pressure OEM Valves



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