

Wagner Instrumentation



Wagner Instrumentation

With more than 110 years of experience, Wagner Instrumentation has earned a reputation for supplying custom and standard instrumentation to domestic and international oilfields. Our offerings touch rigs worldwide as part of the NOV global family by supplementing the offerings of the M/D Totco™ group. Choosing Wagner Instrumentation means working with a friendly, knowledgeable sales team that is ready to assess and identify your custom needs in a timely manner. We offer a quick turnaround with hundreds of parts in stock and ready to ship, reducing downtime.

Wagner Instrumentation offers a comprehensive line of hydraulic instrumentation and systems with the built-in durability and accuracy needed to solve drilling and work over problems. Our focus on safety is an ever-present quality in our products and services. We have established adequate controls throughout the company to ensure all parts, components, and assemblies offered conform to rigid contract and design documents to ensure full compliance with customer requirements. All our programs were designed to meet the requirements of the latest revision of ISO-9001.

Table of Contents

Weight Indicators	4
Anchor Type	4
Deflection Type.....	5
Coil Tubing.....	6
Crane Weight / Crane Weight & Radius Measuring Systems.....	7
Hydraulic Tank Systems.....	8
Wire Line Systems	9
Rotary Torque Systems	10
Rotary Torque System-Chain.....	10
Electric Torque Systems.....	11
Tong Torque and Tong Line Pull Indication Systems	12
Universal Tong Line Pull Series	12
Tong Torque (Joint Torque) Series	12
Tachometer Systems	13
RPM System	13
SPM System.....	13
Proximity Sensor System.....	14
Mud Pressure Systems	15
Single and Dual Pointer	15
Standpipe Pressure Gauges.....	16
4:1 Debooster.....	17
Recorders	18
Drilling Recorder.....	18
Pressure Recorder.....	19

Weight Indicators

Anchor Type Weight Indicator



The anchor type weight indicators are designed for accurate indication of hook load and weight on bit. Our weight indicators are designed to work with all major deadline anchors using either tension or compression type loadcell. Panel mount and box mount versions are available, in either English or Metric divisions. Each system is comprised of a diaphragm type load cell, high pressure hose assembly with disconnects, 12" or 16" indicator with complete dial set and damper assembly, recharge kit consisting of hand pump, and (1) quart of instrument fluid. Heavy duty steel box or console for mounting of additional gauges is also available (optional).

FEATURES

- Models available for deadline loads from 30,000 pounds to 200,000 pounds
- Indicator includes, outer dial (vernier) for direct weight-on-bit reading and inner dial for total hook load
- Hook load and vernier dampers are designed to dampen excessive pointer movement and extreme shock during tough drilling situations
- Includes vernier bit weight indicator with 4:1 sensitivity for highest accuracy possible
- High pressure, rugged hose and disconnect set are included with each system
- Large, easy to read indicators available in 12" or 16" versions
- Panel mount or box mount versions available with optional heavy-duty steel box or console for custom configuration of your choice of hydraulic instruments and meter combinations
- Compatible with all industry-standard deadline anchors

BENEFITS

- Rugged design delivers accurate measurements even in extreme drilling and environmental conditions
- Instant, accurate indications of total load and net weight on bit enable faster, more efficient, and more economical drilling operations

To order specify:

- Panel or box mount indicator
- Single line load capacity to be used with
- Anchor to be used with
- Indicator size (12" or 16")
- English, Metric, or Decanewton divisions

Weight Indicators

Deflection (Clipper Type) Weight Indicator



The deflection (clipper) type weight indicator is ideal for use with small drilling and work over rigs. The unit comes complete with 12" indicator with complete dial set, heavy-duty steel box for mounting, 25-foot hose, and deflection type sensor with c-clamp. Unit is ready to use out of the box and can be moved from rig-to-rig with ease.

FEATURES

- Available with English or Metric dial sets
- Deflection type load cell may be used on wireline sizes from 7/8" to 1 1/4"
- Easy to read 12" indicator
- Optional box available to house (2) 6" gauges and (3) 5" meters
- 48,000-pound maximum single line load capability with 1" line
- Provided with standard 25' hose length (other lengths available upon request)
- Heavy duty, compact, steel box included with system
- Provides superior accuracy using (2) pointers, a primary pointer for hook load, and a secondary (vernier) pointer for indicating small weight changes

BENEFITS

- Unit is portable, rugged, dependable, and ready to be placed on the drill line right out of the box
- Adjustable dampers allow operator-controlled pointer sensitivity

To order specify:

- Single line load capacity needed
- Size and number of lines
- Scale needed (Pounds, Kilograms or Decanewtons)

Weight Indicators

Coil Tubing Weight Indicator System



The coil tubing weight indicator systems are designed specifically for use on coil tubing units. The system is available in either a single pointer or dual acting application depending on the needs of your coil tubing unit.

Single pointer systems are complete with 6" or 8 ½" gauge, bracket to mount gauge, hose assembly, disconnects set, load cell, and recharge kit consisting of a hand pump and (1) qt. of instrument fluid. Dual acting systems include 8 ½" gauge, bracket to mount gauge, (2) hose assemblies, (2) disconnect sets, (2) load cells, and recharge kit consisting of a hand pump and (1) quart of instrument fluid.

FEATURES

- Gauges are fluid filled to ensure proper lubrication and shock resistance
- Load cells are equipped with heavy duty diaphragm rubbers for long lasting durability
- Single pointer gauges available in 6" or 8 ½" versions
- Gauges calibrated a full 360 degrees using a ball bearing style movement to ensure accuracy to within .5 to 1 percent of full scale capacity
- Available in English or Metric divisions

BENEFITS

- Rugged design ensures years of reliable, accurate measurements
- Each system custom built to suit your application

To order specify:

- Gauge size (single pointer gauge only)
- Capacity and ratio of coil tubing unit
- Single or dual acting system
- Length of hose

Weight Indicators

Crane Weight Type Indicator System and Radius Measuring Systems



The crane weight indicator systems are reliable, easy to use hydraulic systems designed for dead line type applications. These systems are ideal for use in construction, dockside, and offshore drilling environments, as well as for salvage operations and material replenishment. These durable systems provide accurate, reliable measurements that help ensure safe lifting operations. Systems are available in standard crane weight version or crane weight and radius version.

The crane weight system consists of a gauge with bracket for mounting of gauge, load cell, whip hoses for gauge and load cell, disconnect sets for gauge and load cell, boom hose (specify length when ordering), double yoke clevis with pins, and recharge kit consisting of hand pump, and (1) quart of instrument fluid. The crane weight and radius system includes all of the above, and a radius sensor, and radius hoses with disconnect sets. The system also shows total weight of load, load radius, and safe lifting capacity, all on a single 8 1/2" gauge.

FEATURES

- System available in crane weight, or crane weight and radius versions
- Crane weight gauges available in 6", 8 1/2", or 12" versions
- Crane weight radius gauges available in 8 1/2" version only
- Available in English or Metric divisions
- Dual scales dials for multiple parts line reeving available
- Single line load capacities available up to 30,000 pounds
- Available with piston or diaphragm type load cells
- Pin sizes for load cell and clevis available from 1 1/4" to 2"

BENEFITS

- Rugged design ensures years of trouble-free, accurate operations
- Accurate measurements help ensure safe lifting operations
- Gauge can be mounted outside or inside cab for easy viewing by operator
- Easy to read dial eliminates time consuming and difficult calculations
- Accurate readings help prevent expensive crane accidents

To order crane weight system specify:

- Capacity and number of lines strung
- Pin size for load cell and clevis
- Boom length
- Type of load cell required
- Gauge size

To order crane weight and radius system specify:

- Boom manufacturer and provide load curve for specified boom
- Boom length
- Distance from king pin to heel pin
- Number of lines strung
- Pin size for load cell and clevis
- Type of load cell required

Weight Indicators

Hydraulic Tank Weight Indicator Systems



The hydraulic tank weight indicator system eliminates the guesswork when blending wet or dry material, providing extremely accurate load measurement for bulk tanks and hoppers. The system consists of gauge, bracket to mount gauge, hose assembly with disconnect set, load cell, and recharge kit consisting of hand pump, and (1) quart of instrument fluid.

FEATURES

- Hydraulic compression type load cells are friction free and ideal for weighing of drilling mud, chemicals and cement
- Available with rugged tension type load cell for hopper type applications
- Rugged and simple design provides years of reliable service
- Available in English, Metric or dual scale divisions
- Gauge is calibrated a full 360 degrees using a ball bearing movement and is accurate to within .5 to 1 percent of full scale
- Available in totalizer versions of 2, 3 or 4 cell, with readout from single gauge
- Gauge available in 6", 8 1/2", 12", or 16" versions
- Standard hose length of 15 feet with other lengths available upon request
- Operator-adjustable dial gear rotates the dial for easy tare adjustment
- Operator-adjustable damper smoothes gauge pointer sensitivity

BENEFITS

- Eliminates any guesswork when blending wet or dry material

To order specify:

- Capacity needed including tare weight
- Contents to be weighed
- Hose length needed
- Indicator size needed
- Type of tank and ratio of tank
- For totalizer system, specify number of load cells required

Weight Indicators

Wire Line Type Weight Indicator Systems



The wireline weight indicator systems are designed to provide reliable, accurate weight readings for downhole wireline operations. This system provides accurate measurement of downhole tool weights during wireline operations and heel or floor block applications. The wireline system is ideal for use by wireline service trucks and consists of a 6" liquid filled hydraulic gauge, bracket to mount gauge, hose assembly, hydraulic load cell, and recharge kit consisting of hand pump and (1) quart of instrument fluid.

FEATURES

- Available in standard capacities of 2000, 3000, 4000, 5000, and 10,000 pounds and the Metric equivalent. Other capacities available upon request.
- Wireline conversion units for 3-sheave devices available for truck mounted wireline applications. These systems come with 10:1 ratio dual pointer gauge and aluminum compression type load cells
- Systems are provided fully assembled, ready to use right out of the box, calibrated to within ½ percent accuracy
- Heavy-duty hydraulic hose available in lengths up to 100 feet
- Easy to read, 6" dial face available in pounds, kilograms, decanewtons or dual scale
- Integral damper assembly increases pointer sensitivity for accuracy even with the smallest loads
- Rugged, durable design

BENEFITS

- Precise calibration ensures reliable readings, reducing loss of valuable downhole tools
- Available in a variety of capacities giving you the flexibility to choose the right system for any job
- Rugged, durable design offers years of cost-effective, low maintenance service
- Operator can perform routine repairs
- Adjustable pointer response time and calibration controls for custom onsite adjustment

To order specify:

- Capacity of system needed
- Hose length needed
- Type of head (applies only to 3-sheave device type systems)

Rotary Torque Systems

Rotary Torque System-Chain



The rotary torque system-chain is designed to help the driller during coring, milling, and reaming operations. The system also helps avoid twist-offs and increases bit life by showing the driller when the drill string is torquing to unsafe levels.

FEATURES

- Comprised of 6" fluid-filled gauge with bracket, 2-foot and 14-foot hose assys with disconnects, and idler assy with wheel
- Models available in box and panel mount versions
- Gauge capacities measured in points and are a relative indication of torque

To order specify:

- Chain size or wheel
- 500 point or 1000 point gauge
- Panel or box mount
- Length of hoses (if other than standard lengths)

Rotary Torque Systems

Electric Torque Systems



The electric torque system is engineered to provide years of accurate, reliable measurement of rotary torque on electric rigs and is easily installed. The system includes dual output current sensor with signal conditioner with a donut style sensor and 150-foot cable with connectors. Optional E/P transducer and 5" meter are also available.

FEATURES

- Current sensor attaches easily to power cable
- Dual output provides signal both to meter and recorder (or other data acquisition devices)
- Optional meter available in either amps, foot-pounds or Metric units of measurement
- Simple design with no moving parts reduces maintenance costs

To order specify:

- Cable length (if different than what comes standard)
- Dial capacity (optional on meter)

Tong Torque and Tong Line Pull Indication Systems

Universal Tong Line Pull Series and Tong Torque Series



The tong torque and tong line pull indication systems are designed to give accurate readings for makeup and breakout torque to reduce drill collar and tool joint failure. The systems indicate the torque applied to drill pipe, drill collars, tubing, and casing while joints are made. This is important for reducing drill collar and tool joint failure resulting from improper make-up. Each System consists of a hydraulic load cell, shackles (on tension type models), hose assembly, 6" liquid filled gauge with damper assembly, bracket to mount gauge (except on panel mount versions), and recharge kit consisting of hand pump, and (1) quart of instrument fluid. Both types of Tong Systems are available in English, Metric, or dual scale capacities up to 30,000 pounds straight line pull.

There are two types of systems available, universal tong line pull and tong torque.

Universal Tong Line Pull Series:

The universal tong line pull series indicates make-up or breakout torque in pounds of line pull for tool joints, drill collars, and drill string components. This is useful in applications where the user wants to use the system with different length tong handles. To obtain the foot pounds equal to the pounds reading on the indicator, the operator simply multiplies the pounds reading of the indicator by the tong handle length (in feet) that he is using, and this will provide the foot-pounds equivalent.

Tong Torque (Joint Torque) Series:

The tong torque (joint torque) series indicates torque in foot pounds applied to each joint when using power tongs to run pipe or casing. These systems are available for specific makes and models of power tongs and come with either compression or tension type load cells.

FEATURES

- Adjustable target pointer can be set to the desired capacity, so the driller can work to a clear mark
- Models and capacities available to work with wide range of manual and power tongs
- Available in wide range of capacities and in English, Metric, or dual scale capacities
- Models available for temporary or permanent installation
- Load cells available in either tension or compression type
- Durable, rugged design

BENEFITS

- Rugged design ensures years of reliable service and minimum maintenance
- Gauge target pointer can be set to the required torque to give driller a clear target mark
- Fluid filled design of gauge reduces the need for repairs and protects your equipment investment
- Provides accurate torque indications, reducing drill collar and tool joint failure
- Multiple design configurations allow user to use every time collars are run, or only for spot checks

To order specify:

- Capacity and scale needed (English or Metric)
- Handle length or tong to be used with (tong torque systems only)
- Panel or box mount indicator
- Tension or compression type load cell (tong torque systems only)
- Hose length needed (if different than standard)

Tachometer Systems

RPM and SPM Systems



Tachometer generator systems are offered in both RPM and SPM versions. Both the RPM and SPM systems include a generator with mounting base, pulley, and v-belt with clip, cable assembly with connectors and j-box, meter assembly, and bracket to mount meter (box mount version only).

The RPM tachometer generator systems provide exceptionally accurate rotary speed measurements, enabling the driller to optimize drill speed for maximum efficiency. The SPM tachometer generator systems provide easy-to-read pump speed measurements information the mud pressure gauges do not deliver.

FEATURES

- Meters available in 5" or 6" versions
- Meters available in box mount or panel mount versions
- J-box assembly includes output for both meter and recorder (optional)
- Standard cable lengths of 50 foot (RPM) and 150 foot (SPM) included with each system (additional lengths available upon request)
- Generator available in explosion proof or non-explosion proof versions
- Standard capacities of 0 to 150/300 RPM and 0 to 200 SPM (additional capacities available upon request)
- 10-volt output from generator at 1000 RPM
- Direct connection to the pump pinion shaft by means of v-belt connection between the shaft and the generator pulley

BENEFITS

- Accurate rotary speed readings help driller optimize drill speed
- Quick pump speed readings help detect pump or hole problems
- Durable, proven design provides years of accurate, reliable measurements of RPM and SPM functions

To order specify:

- Meter size (5" or 6")
- Box or panel mount meter
- Length of cable
- Generator type (explosion proof or non-explosion proof)
- Dial capacity (if different than standard)

Tachometer Generator Systems

Proximity Detection Systems



The proximity detection system eliminates the need for belt-driven generators on RPM and SPM systems. The system uses reliable and durable proximity sensors that are permanently mounted on the mud pump for the SPM and near the rotary table for the RPM. The signal received from the sensor is processed into an output signal in the form of a pulse signal or analog signal for operation of electric meters, digital pump stroke counters, recorders, etc.

Standard configuration can supply signal for (2) SPM functions, and (1) RPM function (other configurations available). The system includes a tough NEMA 4 enclosure which houses the modules and processors, cable assemblies with connectors for (3) functions, and (3) proximity detection sensors. Output cables and meters are optional with system.

FEATURES

- Standard configuration provides output for digital pump stroke counter, (3) meters, and (3) functions on drilling recorder
- No moving parts, modules easily replaced in case repair is needed
- Modules and processors are housed in tough, durable NEMA 4 enclosure
- Provides pulse and analog type signals

BENEFITS

- Simple design of system allows for easy installation and maintenance procedures
- Eliminates the need for generators with moving parts and belt assemblies
- Output signal provided can be used to operate meters, digital stroke counters, drilling recorders, electronic circular recorder, etc.

To order specify:

- Functions to be monitored
- Cable lengths needed
- Types of measuring devices system will be used with (meters, stroke counters, etc)

Mud Pressure Systems

Single and Dual Pointer Pressure Systems



The pressure systems are designed to provide a quick, accurate check of pressure. The systems are available in both single pointer and dual pointer (compound) versions. Both types come complete with 6" liquid filled gauge, bracket to mount gauge (on box mount version only), hose assembly, sensor assembly (diaphragm protector, 1:1 piston isolator, or de booster), and recharge kit consisting of hand pump and (1) quart of instrument fluid.

The **single pointer pressure system** is available in pressure capacities up to 15,000 psi straight pressure or 20,000 psi 4:1 deboosted pressure. The single pointer gauge versions are available with coarse line increments for pump pressure applications and fine line increments for choke applications.

The **dual pointer compound pressure systems** are available in straight pressure capacities up to 16,000 psi and have a vernier pointer on the gauge with a 4:1 resolution for extreme sensitivity to even the smallest pressure changes.

FEATURES FOR SINGLE POINTER PRESSURE SYSTEMS

- 6" dial face on gauge
- Gauge is fluid filled
- Rugged durable design
- Standard capacities up to 15,000 psi straight pressure and 20,000 psi deboosted
- Available in English, Metric, or dual scale divisions
- Available in box mount version (damper attached to gauge) or panel mount version (remote mount damper)
- Accuracy rate of 1 percent of full capacity
- Standard hose length of 50 feet (other lengths available)
- Available with diaphragm protector, 1:1 piston isolator or 4:1 de booster
- Available with heavy duty 1502 or 2202 union and subs for standard service or H2S

FEATURES FOR DUAL POINTER PRESSURE SYSTEMS

- 6" dial face on gauge
- Gauge is fluid filled
- Rugged, durable design
- Standard capacities up to 16,000 psi straight pressure
- Available in English or Metric divisions
- Available in box mount version (damper attached to gauge) or panel mount version (remote mount damper)
- Vernier pointer offers 4:1 resolution for indicating even the smallest pressure changes
- Accuracy rate of 1% full capacity
- Standard hose length of 50 feet (other lengths available)
- Available with diaphragm protector or 1:1 piston isolator
- Available with heavy duty 1502 or 2202 union and subs for standard service or H2S

BENEFITS

- Large 6" dial face on gauge allows clear viewing from long distances
- Rugged design allows for years of accurate, dependable service
- Flexible mounting design allows for mounting of gauges in drillers console, weight indicator box or stand alone
- Full 360° calibration accurately indicates even the smallest pressure changes
- Operator-adjustable damper allows for more accurate readings under extreme conditions

To order specify:

- Capacity needed
- Box or panel mount version
- Application
- Straight pressure or deboosted
- English or Metric divisions
- Diaphragm protector, 1:1 piston isolator or de booster
- Hose length (if different from the standard 50 foot)
- Single pointer or dual pointer (compound) gauge

Mud Pressure Systems

Standpipe Pressure Gauges



The standpipe pressure gauges are offered with a variety of connections, including 2" male npt, hammer union type, and flanged type. These gauges integrate a 6" inverted gauge with a heavy-duty housing and include a check valve and damper assembly incorporated into housing. These gauges are ideal for use on pumps, pump trucks, standpipe, choke manifolds, and pipeline pressure applications.

FEATURES

- Replaceable diaphragm cup, check valve and damper assembly
- Standard capacities up to 15,000 psi
- Dial available in English, Metric, or dual scale divisions
- Hammer union type available in 1502 or 2202 for standard or H2S service
- Flange type available in a variety of flange sizes (contact Wagner for specifics)
- Flange type and hammer union type available with ABS certification
- Large 6" dial face is visible for up to 75 feet away

BENEFITS

- Fluid-filled case keeps internal components lubricated and reduces vibration
- Damper assembly reduces vibration and pointer oscillations
- Durable fluid filled design with built-in damper increases component life and reduces maintenance costs

To order specify:

- Capacity
- English, Metric or dual scale divisions
- Hammer union and sub size (hammer union type only)
- Flange size and pressure capacity of flange (flange type only)
- Ring groove size (flange type only)
- Standard or H2S service

Mud Pressure Systems

Pressure Deboosters



The 4:1 pressure deboosters are designed to reduce line pressure by a ratio of 4:1, exposing the operator at the panel $\frac{1}{4}$ of the actual pressure that is seen at the manifold. Gauges are calibrated at $\frac{1}{4}$ of the line pressure to reflect actual pressures.

FEATURES

- Models available for working pressures of 10,000 psi, 15,000 psi and 20,000 psi
- Available with 1502 or 2202 union and subs for standard or H2S service
- Available in stand alone versions with autoclave connections
- Highly accurate delivers an accuracy rate of 2 percent of full-scale capacity
- Provided completely with union and separator boot
- Designed for use with all standard pressure gauges that are calibrated for use with 4:1 deboosters

BENEFITS

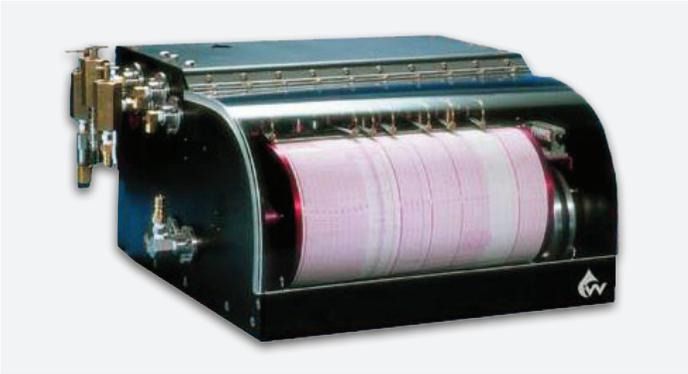
- Reduces line pressure by 75%, therefore increasing operator safety dramatically

To order specify:

- Capacity and union needed
- Size of autoclave fitting (on stand alone versions only)
- Standard or H2S service

Recorders

Drilling Recorder



The drilling recorder is a tough, reliable drill floor recorder designed to monitor up to seven different functions. The essential tool records the measurements of all crucial drilling functions, such as drill string weight, rate of penetration, pump pressure, torque, and other data. The drilling recorder comes complete with all the necessary mounting hardware and the necessary installation hardware for each function it is designed to record.

FEATURES

- Available with 12- or 24-hour clock
- Available with 12- or 24-hour charts
- Available with English, Metric, or SI Metric charts
- Available in any configuration up to 7 pens
- Recording capabilities include weight, pump pressure, rate of penetration, rotary RPM, torque, and pump rate SPM
- Completely mechanical
- Uses duplicate carbon paper
- Recorder comes complete with mounting hardware and installation hardware per function requested

BENEFITS

- Mechanical design means no electrical power is needed
- Recorder is easily operated and can be maintained and serviced by on-site personnel
- Recorder is easily hooked up through existing instrumentation and equipment supplied with recorder
- Keeps accurate records of important drilling operations

To order specify:

- Number of functions to be recorded
- What functions are to be recorded and the capacities of those functions
- English, Metric, or SI Metric

Recorders

Pressure Recorder



The pressure recorder is a rugged, 1-, 2-, and 3-pen recorder designed to record weight, torque, and pressures up to 16,000 psi.

FEATURES

- 6" fluid-filled gauges are used in the recorders which makes operation and maintenance a breeze
- Recorder tubes use a standard 6" tube assy for ease of maintenance and calibration
- Standard 12" chart paper is used along with disposable felt tip pens
- Metric equivalents are available
- Manual wind and multi-speed electric clocks available

To order specify:

- Pressure range or capacity to be recorded
- Type of clock and speed
- Wall mount or portable

National Oilwell Varco has produced this brochure for general information only, and it is not intended for design purposes. Although every effort has been made to maintain the accuracy and reliability of its contents, National Oilwell Varco in no way assumes responsibility for liability for any loss, damage or injury resulting from the use of information and data herein. All applications for the material described are at the user's risk and are the user's responsibility.

Corporate Headquarters
7909 Parkwood Circle Drive
Houston, Texas 77036
USA

Wagner Instrumentation
10586 Texas 75 North
Willis, Texas 77378
USA

Phone: 936 856 9161

© 2018 National Oilwell Varco All Rights Reserved
D8C1005381-MKT-001 Rev. 02