

A large blue industrial machine, the Zap-Lok tuboscope, is shown in a desert environment. The machine is used for installing tuboscope technology into wells. It features a large blue frame with red rollers and a yellow lifting arm. A large metal pipe is being processed by the machine. The background shows a dry, hilly landscape under a clear blue sky.

Zap-Lok™

Safe, Efficient, Cost-Effective
Connection Technology

Tuboscope

NOY Wellbore
Technologies
Zap-Lok® Technology

Tuboscope | **NOY** Wellbore
Technologies

Zap-Lok™ Advanced Connection Technology

Zap-Lok™ Unequaled Weld-Free Integrity at Lower Costs

For nearly 50 years, Zap-Lok's mechanical connection technology from Tuboscope has remained the global standard for safe, efficient and cost-effective pipeline installation. As testimony to the unsurpassed reliability of Zap-Lok, not a single in-service connection-related failure has been recorded since its introduction.

With Zap-Lok, your connections, bare or internally coated, deliver unmatched strength and consistency. All this, at a fraction of the time, manpower requirements, risk and costs of welded pipe connections.



Onshore, offshore, in all terrain, climatic conditions and configurations, Zap-Lok mechanical connection technology is the industry's leading solution to your most challenging applications:

- Oil and condensate takeaway
- CO₂ and water flow lines
- Corrosive transmission and disposal pipe
- High-pressure pipelines
- Sour gas service

The Zap-Lok Edge

- Produces fully-rated pipelines from 2 in to 12 in, up to Schedule 80, X-65-grade (65,000 psi)
- Delivers permanent, high-strength connections
- Minimizes in-field welding requirements
- Consistent quality of each connection reduces risk
- Exceeds production schedules
- Supports ASME B-31.4, B-31.3 and B-31.8 standards
- Slashes manpower, infrastructure requirements
- Cuts pipeline installation time, costs
- Reduces HSE footprint, welding-related risks



2.5
Hours

1.5
Hours

.16
Hours

- Sch. 80 Welded
- Sch. 40 Welded
- Zap-Lok

Man Hours Comparison

As shown on this comparison for a 10 3/4" connection, Zap-Lok reduces skilled man-hours by up to 90% with consistent connections regardless of the pipe schedule.



The Perfect Balance of Reliability, Speed and Economy

As evident in zero reported failures during operation, you never have to sacrifice fast installation time and lower costs for reliability.

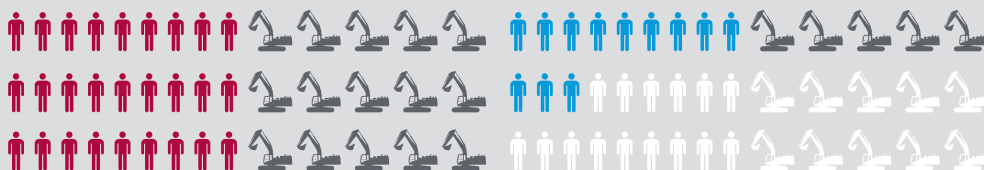
Zap-Lok helps exceed planned production schedules, and in the process, delivers a pipeline that is considerably safer than often-inconsistent welded connections. Quite simply, when it takes five days to install a line, rather than a month, the associated cost savings and reduced HSE exposure are obvious. Add in the comparatively smaller crews, as well as the reduced infrastructure and support facilities required, and the value of your asset rises appreciably, particularly in more remote locations.

The efficiencies and cost savings are especially pronounced offshore, where cutting time on location and the chartering of smaller support vessels can deliver a tremendous bounce to your bottom line. When Zap-Lok connections are externally coated before hand there is no need for a separate station dedicated for covering welded connections to protect them from the marine environment.

As an added bonus, with Zap-Lok you typically do not have to suspend operations during harsh climatic conditions, such as in areas with drought-induced burn bans.

Installation Footprint

Case History



8 inch Welded Construction	
Welding Crew	20 people
Field Joint Coating Crew	5 people
X-Ray Crew	2 people
Total Pieces of Equipment on site	15 pieces

8 inch Zap-Lok™ Construction	
Zap-Lok Installation Crew	12 people
Total Pieces of Equipment on site	5 pieces

Consistent Field Manufacturing

Case History

Pipe Diameter		Pipeline Length (ft.)
Welding	8 inch	62,178 (19 KM)
Zap-Lok	8 inch	59,800 (18.2 KM)

Construction (days)	Average Per Day (ft.)
15	4,144 (1.3 KM)
7	8,543 (2.6 KM)

Fast, Field-Proven Installations

Onshore – West Texas

The client's project consisted of an 80,000 ft, 6 in flow line, which was to be installed during one of the extremely dry West Texas seasons. With a total Zap-Lok crew of six, the line was completed and installed, incident-free, in 6 ½ days.

Speed Breakdown

Per Joint	1 min. 55 sec.
Avg. Per Joint	12,308 ft. / day
Total Time	6 ½ days



Offshore – Gulf of Mexico Shelf

The economic benefits of the Zap-Lok technology was especially illustrated in this shallow-water project, which involved a 28,518 ft, 3 in flow line. A Zap-Lok crew of five personnel completed the construction in less than four days, reducing considerably the high costs associated with offshore installation.

Speed Breakdown

Per Joint	2 min. 43 sec.
Avg. Per Joint	7,605 ft. / day
Total Time	3 ¾ days



Our Process Facilitates Safe, Consistent Connections

Welding is an art, with each pass relying on the skill and experience of the welder to maintain consistency and quality. Adjustments must be made to accommodate different pipe sizes, wall thickness and environmental conditions.

With Zap-Lok, you never have to **reinvent the weld** when moving from one connection to the next, or from one size or schedule of pipe to another. Whether you are dealing with 2 in or 12 in., Schedule 40 or Schedule 80, or X-65-grade pipe, Zap-Lok delivers consistency on every connection.

In the field, the operator simply lines up each joint of pipe in the Tuboscope provided hydraulic press. Within seconds, the two ends are hydraulically pressed together, generating metal-to-metal friction and high compressive forces from the bell-end onto the pin-end. From there, the Zap-Lok press simply

rolls to the next connection and repeats the process. With each connection requiring about 3 min to complete, Zap-Lok delivers average construction rates from 5,000 to 6,000 ft./day (1,524–1,829 m/day).

What results are permanent connections that are up to 140% stronger than the specified minimum yield strength (SMYS) of the pipe, and compatible with internal inspection, pigging and cathodic protection. Further, the high strength and flexibility of Zap-Lok connections are sustained during field bending and extended pull sections.

In keeping with our emphasis on QA, after each installation, the Tuboscope provided hydraulic press and the power unit undergo an extensive inspection and maintenance program before they are returned to the field for another pipe lay.



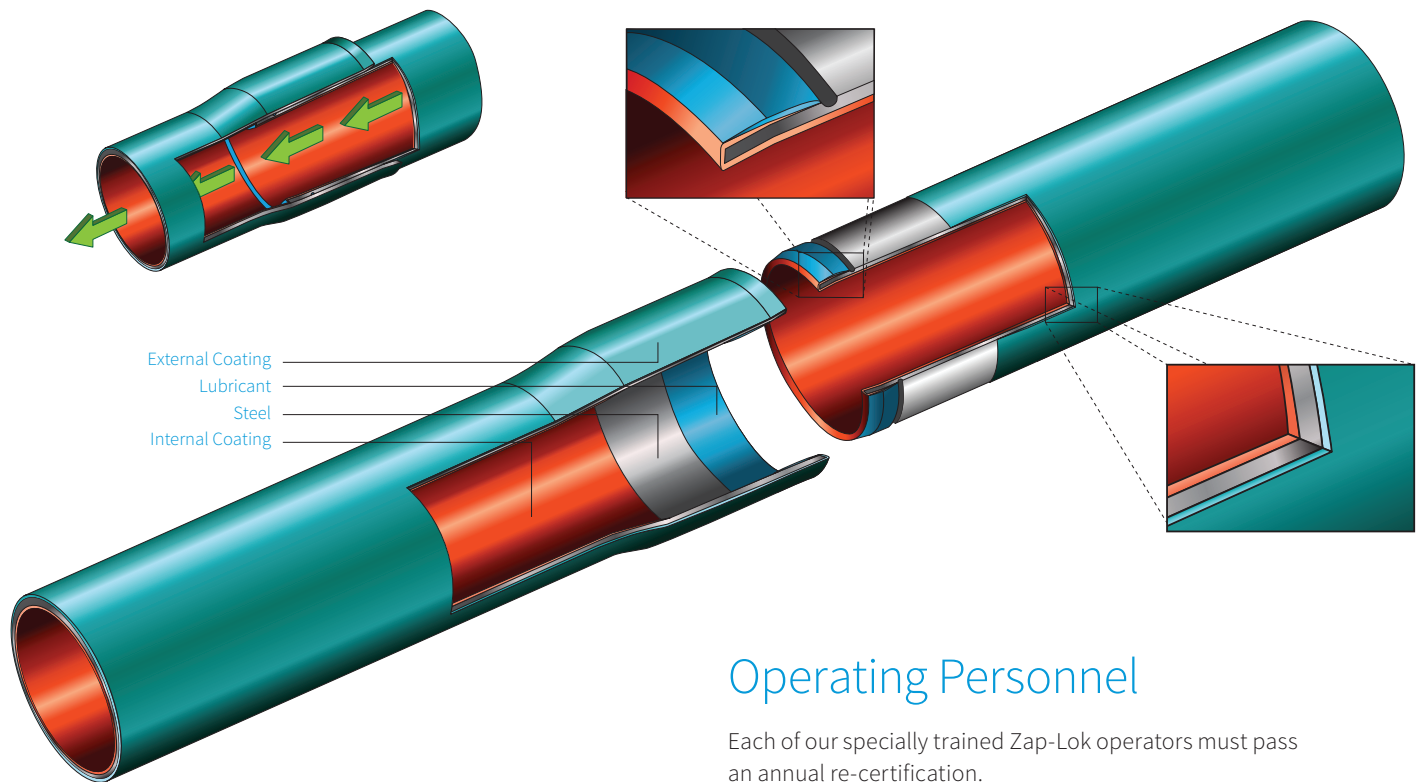
Catching Defects Before They Go to Your Location

Our in-house Quality Assurance / Quality Control program helps ensure that every joint of pipe meets the demanding Zap-Lok specifications and is ready for field installation. We perform a thorough inspection of each connection to identify material defects or potential defects before the pipe leaves our facility.

Complementing our extensive pre-job inspection program, at the clients request, Tuboscope also offers a comprehensive package of inspection services.

- Ultrasonic (UT)
- Electromagnetic (EMI)
- Wall Mapping with Laser OD (TruMap™)
- Magnetic Particle (MPI)





Zap-Lok Line Pipe Cross-Section

Operating Personnel

Each of our specially trained Zap-Lok operators must pass an annual re-certification.

Groundbreaking TK™-Coatings Provide Ultimate Protection

With our pacesetter Tube-Kote™ (TK™) line of internal coatings, Tuboscope routinely sets the industry standard for preventing corrosion, wear and improving hydraulic efficiency. Before delivery to the field, Zap-Lok connections, as well as custom-fabricated elbows, T's and other pieces, are prepped and internally coated at our facility. Since no welding is required, there are no risks of burning off the internal coating and compromising the in-service integrity. For tie-ins and other accessories, Tuboscope manufactures a custom sleeve that isolates the area during welding to protect the internal coating.

Under our TK umbrella, internal coatings are specially designed to meet all operating conditions, including downhole temperatures with high H₂S concentrations and temperatures up to 400°F (204°C). All of our powder-applied epoxy novolac TK-Coatings include phenolic-based primers to enhance the ability of the coating to maintain adhesion to the steel substrate under the most corrosive and demanding environments.

The combination of Zap-Lok and Tube-Kote coatings provide you unrivaled efficiency and protection.



The Tuboscope Difference

The Zap-Lok mechanical connection technology is but one component in the comprehensive Tuboscope toolbox. For over 75 years, Tuboscope remains the industry leader for providing a comprehensive suite of value-added solutions that consistently improve performance and maximize the lifecycle of oilfield tubulars.

To learn more about how our Zap-Lok mechanical connection technology can optimize the safety and reduce the time and costs of your pipeline installations, contact your nearest Tuboscope representative.

Zap-Lok™ Equipment

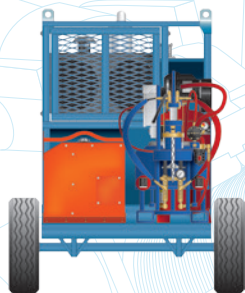
8000 All-In-One Hydraulic Power Unit (HPU)

(Includes Generator and Epoxy Mixer)

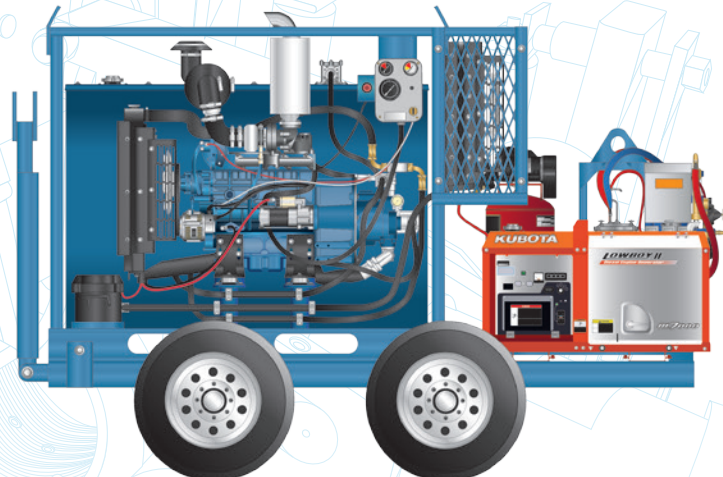
System Specifications

Weight	7,800 lbs (3.17515 kg)
Measurements	
Unit Length	135" (3.429 m)
Unit Height	85" (2.159 m)
Unit Width	33" (1.905 m)

End View



Side View



8000T All-In-One HPU

(Includes Generator and Epoxy Mixer)

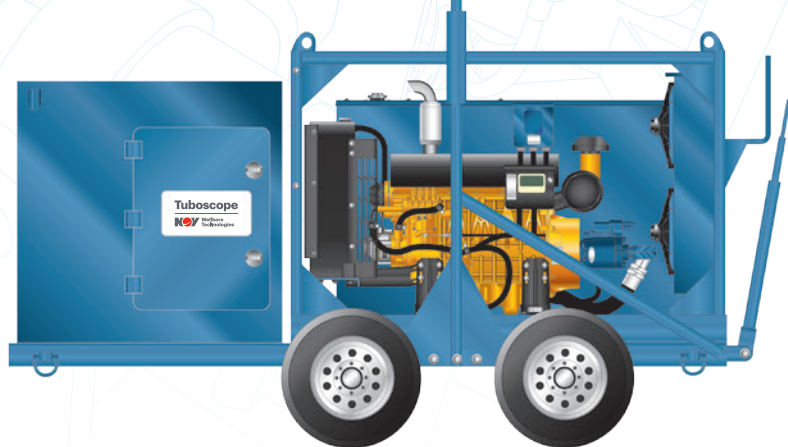
System Specifications

Weight	10,900 lbs (4,944.16 kg)
Measurements	
Unit Length	166" (4.2164 m)
Unit Height	132" (3.3528 m)
Unit Width	94" (2.3876 m)

End View



Side View



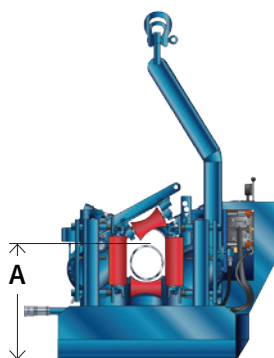
Model 5500-T

(For 2"–4" Diameter)

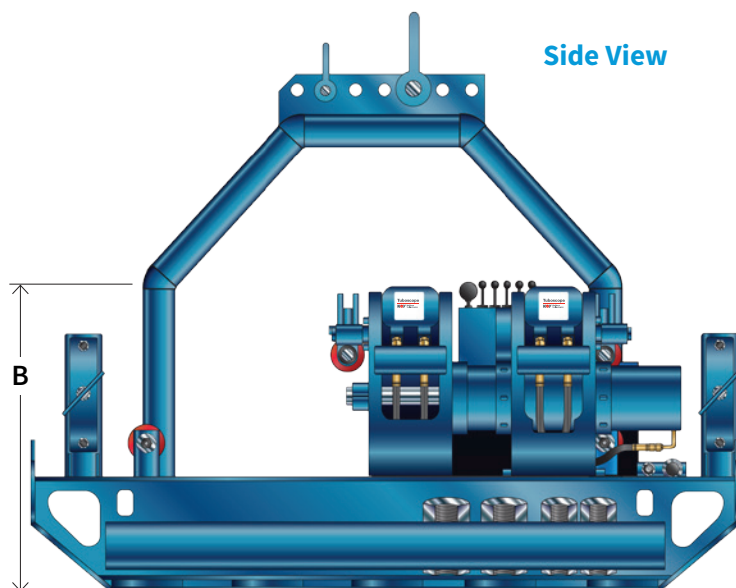
System Specifications

Weight	3,000 lbs (1.36078 kg)
Measurements — Closed Position	
Unit Length	77" (1.9558 m)
Unit Height	50" (1.2700 m)
Unit Width	64" (1.6256 m)
Unit Height (from pipe center) "A"	20" (0.508 m)
Measurements — Without Arm	
Unit Height "B"	39.25" (0.99695 m)

End View



Side View

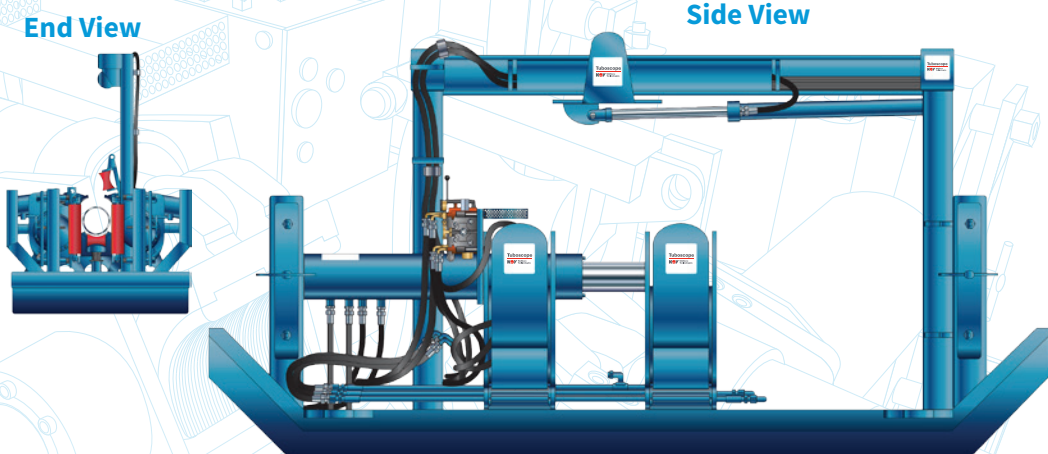


Model 8000-Z

(For 6"–8" Diameter)

System Specifications

Weight	7,800 lbs (3.17515 kg)
Measurements	
Unit Length	135" (3.429 m)
Unit Height	85" (2.159 m)
Unit Width	33" (1.905 m)

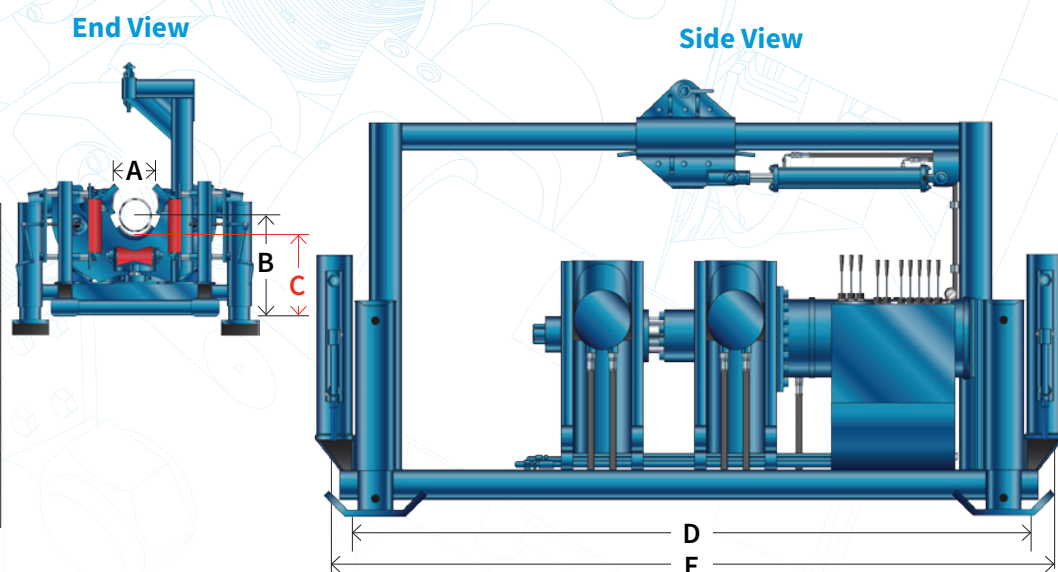


Model 8000-12 T

(For 8"–12" Diameter)

System Specifications

Weight	19,000 lbs (8.61826 kg)
Measurements	
Unit Total Length "E"	160" (4.064 m)
Unit Frame Length "D"	152" (3.8608 m)
Unit Height	85" (2.159 m)
Unit Width	78" (1.9812 m)
Pipe Slips "A"	12.75" (0.32385 m)
Height "B"	28" (0.7112 m)
Height "C"	21.625" (0.549275 m)

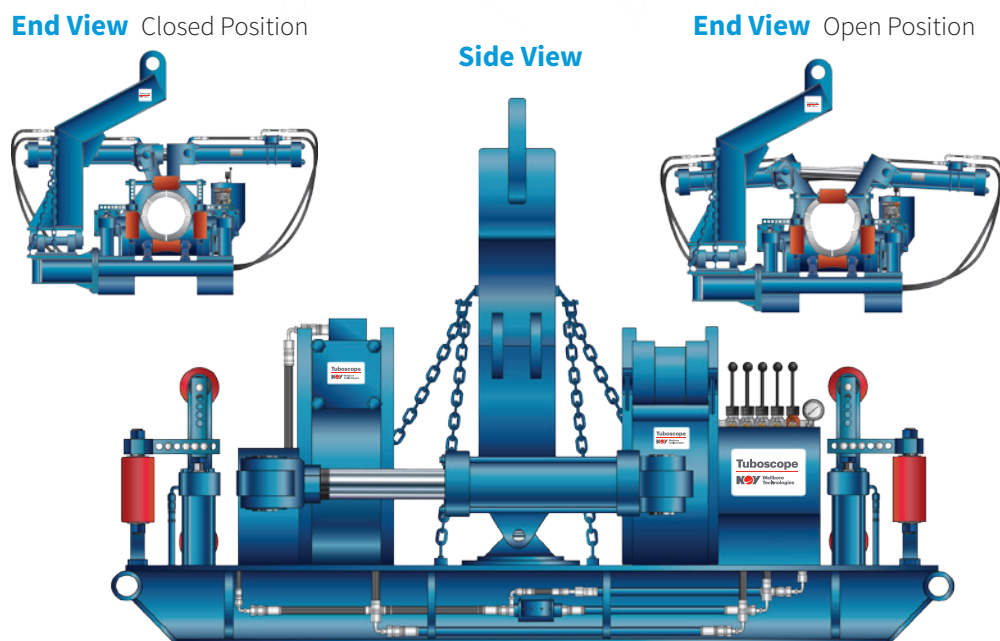


Model 8000-12 Z

(For 6"–12" Diameter)

System Specifications

Weight	10,700 lbs (4.535924 kg)
Measurements — Closed Position	
Unit Length	132" (3.3528 m)
Unit Height	93" (2.3622 m)
Unit Width	84" (2.1336 m)
Measurements — Open Position	
Unit Width	108" (2.7432 m)



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