ELEBOR®

ELEBOR S.A.

HELLENIC GEOTECHNICAL EQUIPMENT

Edition 2025

Catalogue

Swelling-Type Friction Bolts

ELE BOLT™

Boring - Drilling - Tunnelling - Mining - Construction - Geotechnical

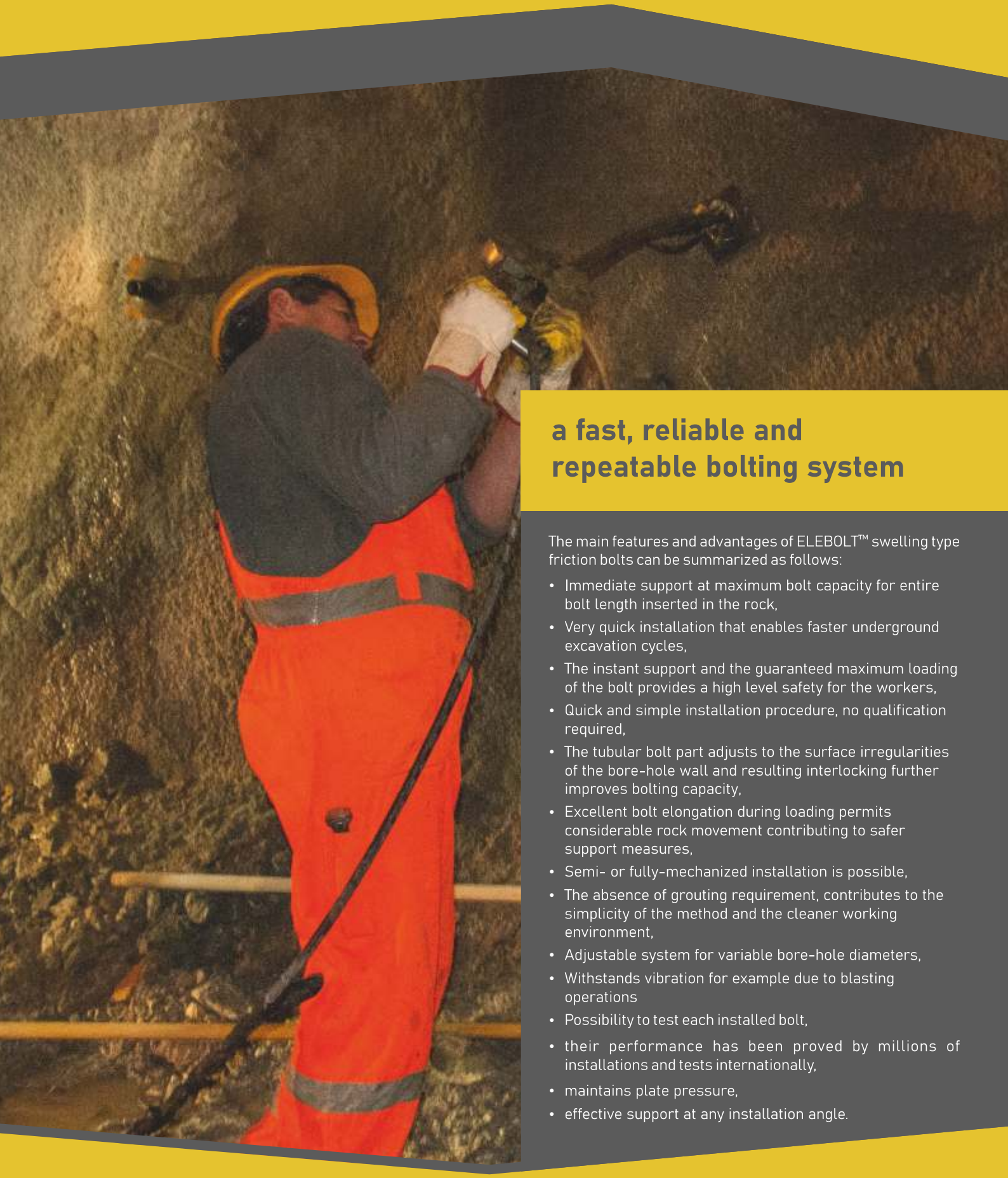
Introduction

The ELEBOLT™ friction bolts is a proven friction bolt system used for many years in mines and tunnels all over the world.

The deformed folded-tubular body is produced from premium grade steel sheet on automated production lines.

Entire process from raw material arrival to finished product despatch is monitored and controlled in respect of quality assurance and traceability.

a world-wide prooven friction bolt system



a fast, reliable and repeatable bolting system

The main features and advantages of ELEBOLT™ swelling type friction bolts can be summarized as follows:

- Immediate support at maximum bolt capacity for entire bolt length inserted in the rock,
- Very quick installation that enables faster underground excavation cycles,
- The instant support and the guaranteed maximum loading of the bolt provides a high level safety for the workers,
- Quick and simple installation procedure, no qualification required,
- The tubular bolt part adjusts to the surface irregularities of the bore-hole wall and resulting interlocking further improves bolting capacity,
- Excellent bolt elongation during loading permits considerable rock movement contributing to safer support measures,
- Semi- or fully-mechanized installation is possible,
- The absence of grouting requirement, contributes to the simplicity of the method and the cleaner working environment,
- Adjustable system for variable bore-hole diameters,
- Withstands vibration for example due to blasting operations
- Possibility to test each installed bolt,
- their performance has been proved by millions of installations and tests internationally,
- maintains plate pressure,
- effective support at any installation angle.

Applications

Tunneling

- radial and roof rock bolting,
- tunnel entrance preparation/support,
- slope stabilization,
- hanging & supporting suspended equipment (ventilation fans, ducts etc.)
- wire mesh fixing.

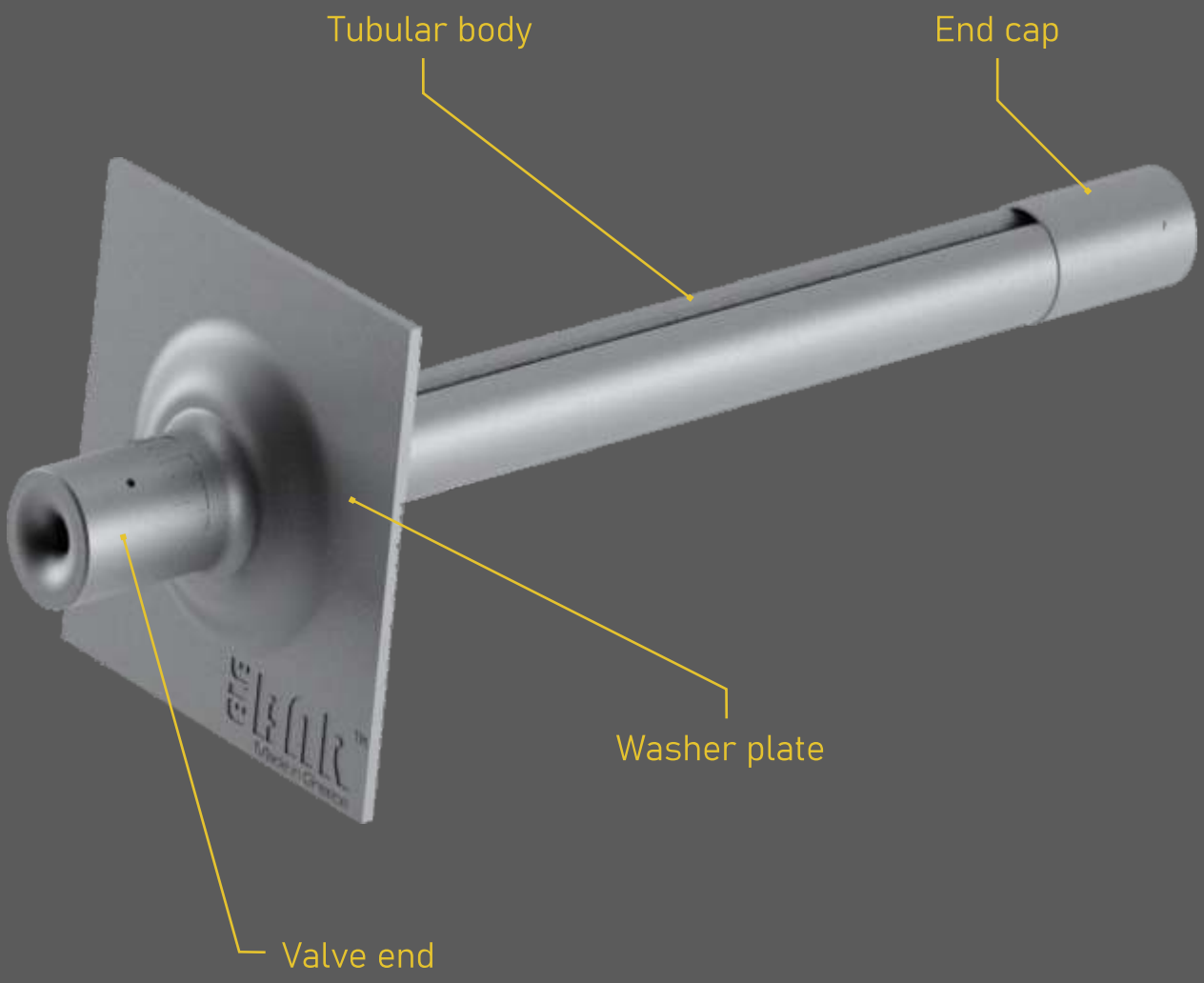
Underground & Surface Mining

- radial and roof rock bolting (immediate support),
- hanging & supporting suspended equipment (ventilation fans, ducts, conveyor belts etc.)
- wire mesh fixing.

Geotechnics

- slope/embankement stabilization,
- soil nailing,
- wire mesh fixing.

Main system components



ELEBOLT™ is a friction stabilizer that is activated by swelling its tubular steel body after the bolt has been inserted in the borehole. Swelling is achieved by injection of high pressure water in the bolt. The swelling action brings the tubular steel body in true and tight contact to the borehole walls thus exerting radial forces to the surrounding rock/strata.

ELEBOLT™ friction bolts consist of the following three (3) parts:

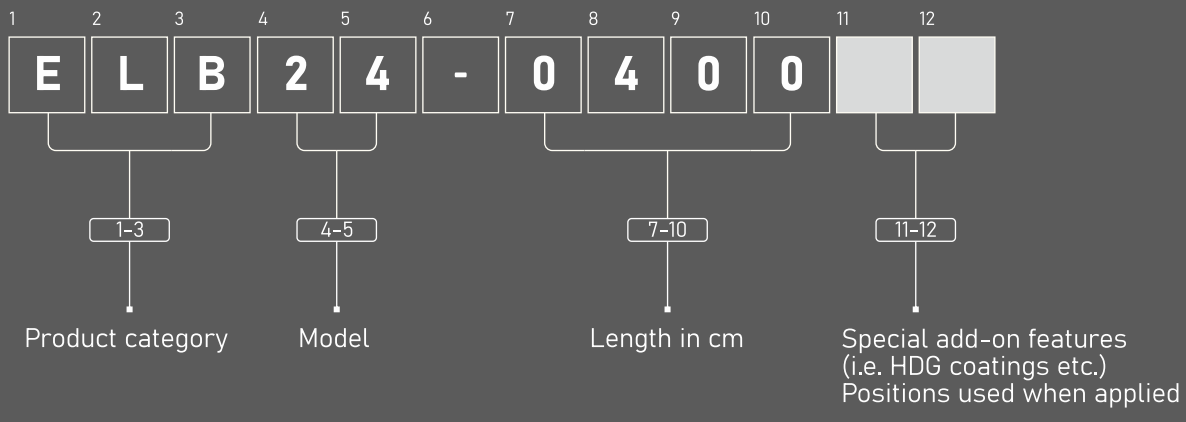
- the tubular steel body having a specially C-shaped closed-loop profile,
- the water injection valve which is welded at one extremity of the bolt end and actually comprises the bolt head, and
- the end cap, which is welded at the other extremity and is the tip of the bolt that enters the bore hole.

ELEBOLT™ friction bolts are produced in the European Union under strict ISO standards. Each batch of raw material as well as each lot of produced bolts is subjected to quality control and tests in order to certify the high quality for each manufactured bolt.

ELEBOLT™ technical specifications

		ELB12 Standard	ELB16 Midi	ELB24 Ultra
Typical fracture load in tension		120	160	240
Minimum guaranteed elongation at fracture	%	20		
Typical elongation at fracture	%	30		
Recommended bore-hole diameter	mm	32-39	45-53	45-53
Optimal bore-hole diameter	mm	35-38	45-51	45-51
Tube diameter (prior to folding)	mm	41	54	54
Tube wall thickness	mm	2	2	3
Folded tube diameter (prior to inflation)	mm	26	36	36
Bolt end-cap diameter	mm	29	38	38
Bolt head (valve) diameter	mm	30/38	41/50	41/50
Nominal weight	kg/m	2	2.8	3.8
Inflation water pressure	bar	300	240	300
Available bolt lengths	m	2-6		

guide to coding system



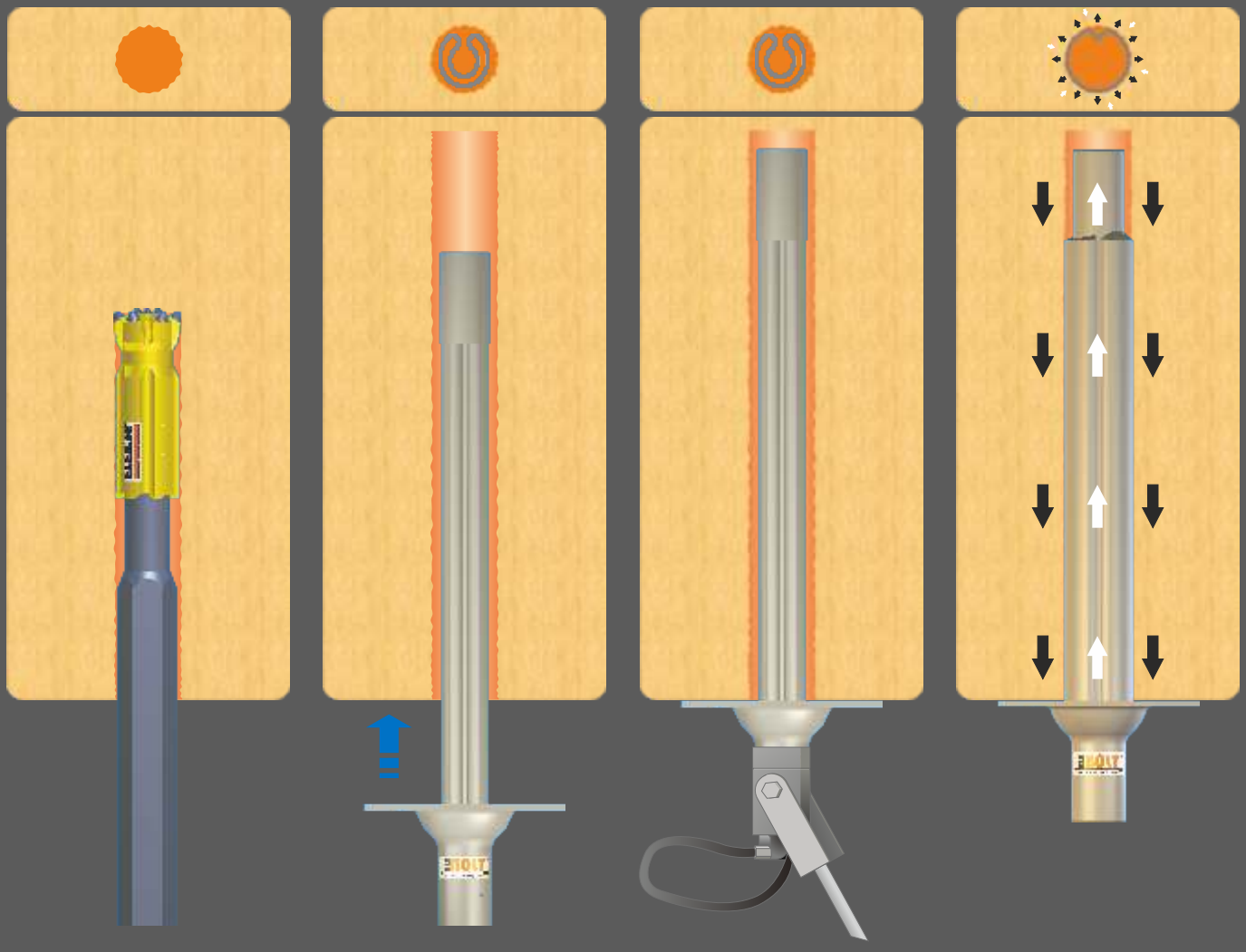
Operation of ELEBOLT™ bolting system

The ELEBOLT™ friction bolt fitted with the washer plate is inserted in a bore hole of suitably selected diameter. When entire bolt length is inserted in the bore hole and the washer plate rests on rock surface, water is injected at high pressure thought the valve bolt head to initiate expansion process which gradually swells the tubular body of the bolt. Swelling is completed when pressure in the bolt reaches 300 bar.

The tubular part of the bolt is now in full contact with the bore wall thus exerting radial forces with its entire length to the surrounding rock. The high pressure has deformed the bolt so that the steel tube has adjusted its shape according to the micro-irregularities of the surface of the bore-hole wall. This interlocking enhances friction and further improves the load bearing capacity of the system.

The key advantage of ELEBOLT™ friction bolts is that upon expansion they provide immediate support with their full capacity thus are capable of compensating instantly to any rock movements. fitted with the washer plate is inserted in a bore hole of suitably

Installation procedure is very fast. Rock support is immediate with swelling accomplishment. Anchoring is achieved instantly offering IMMEDIATE SUPPORT.



ELEBOLT™ inflation equipment

The EHP300E unit is used to inject water at high pressure to inflate the ELEBOLT™ or other equivalent swelling type friction.

The unit's frame and casing is made entirely by AISI304 stainless steel and is mounted on a set of anti-vibration rubber feet and features suitable perforations for the ventilation of the electric motor. The unit is equipped with an on-board electric panel with ON-OFF-AUTO switch, warning and operation lamp signals and adjustable operation pressure gauge.

The unit is assembled with a triplex plunger pump, bypass valve, non-return valve and rubber coupler and is equipped with inlet water filter and manometer for the inspection of the outlet pressure.

Pump type	High pressure triplex plunger
Pump output	8.8 lt/min
Max output pressure	300 bar
Required inlet water pressure	0.5 - 1.5 bar
Electric motor	5.0kW / 1450 rpm / 380V / 50 Hz

Data refer to units fitted with pump Speck NP16/9-280

Complete set of spare parts is available for both inflation chucks HP30 and HP41.

ELEBOLT™ pull-out testing equipment

Croc™ pull testing equipment

A complete range of testing apparatus is available to perform pull-out tests in all types and sizes of installed ELEBOLT™ friction bolts.

The main system components are:

- a hollow hydraulic cylinder
- a hydraulic pump (manual operated or electric driven)
- a manometer for monitoring the applied load
- a hydraulic hose with quick connection fittings
- a resting base bolted to the hydraulic cylinder providing the necessary room for rock-bolt elongation during the pull-out testing
- a set of accessories including the ELEBOLT™ Croc gripping device, an extension rod of suitable length and nuts.

Cylinder capacity	**Model Name**	Center Hole	Piston Stroke	Metric tons at 700 bar	Weight
tons		mm	mm	tons	kg
30	**RH 302**	32.9	63.5	28.8	11.6
30	**RH 306A**	32.5	149.2	28.8	9.9
30	**RH 306**	32.5	152.4	28.8	17.7

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