

# DIN SPEC 91322:2015-09 (E)

## Bore head radar for horizontal directional drilling (HDD-radar) - Environment, conditions and limitations of use

---

Inhalt	Seite
Foreword .....	3
Introduction.....	4
1 Scope.....	6
2 Normative references.....	6
3 Terms and definitions .....	6
4 Process Description.....	10
4.1 General.....	10
4.2 Pilot drilling and obstacle avoidance.....	10
5 Equipment Requirements.....	11
5.1 General.....	11
5.2 Location.....	12
5.3 Accuracy of bore head location.....	12
5.4 Control.....	12
5.5 Buried obstructions to be detected.....	13
5.6 Size of objects to be detected.....	13
5.6.1 Linearly Shaped Objects .....	13
5.6.2 Amorphously Shaped Objects .....	13
5.6.3 Multiple Objects.....	13
5.7 Detection direction and distance.....	13
5.7.1 Distance.....	13
5.7.2 Direction .....	13
5.8 Data processing speed.....	13
5.9 Durability and compatibility requirements .....	13
5.10 Drill Rod Connectivity.....	14
6 Pre-Planning .....	14
6.1 General .....	14
6.2 Limitations depending on soil types and saturation.....	14
6.3 Utilities under Ground.....	14
6.4 Bore path planning.....	14
7 Installation.....	14
7.1 General .....	14
7.2 Practitioner training requirements .....	15
7.3 Installation records .....	15
7.3.1 As-Built records.....	15
7.3.2 Enhanced information on detected objects .....	15
Annex A (informative) Factors affecting HDD-radar performance.....	16
A.1 General .....	16
A.2 Energy absorption.....	16
A.3 Energy spreading .....	16
A.4 Energy scattering .....	16
Annex B (informative) Methods to determine the position of the bore head.....	17
B.1 General .....	17
B.2 Walkover technique.....	17
B.3 Wire Cable techniques .....	17
Bibliography.....	19