

DIN EN 16932-2:2018-07 (E)

Drain and sewer systems outside buildings - Pumping systems - Part 2: Positive pressure systems

Contents		Page
European foreword		4
1	Scope	5
2	Normative references	5
3	Terms and definitions	5
4	Symbols and units	7
5	General	8
6	Planning of positive pressure systems	8
6.1	Type of pumping station	8
6.1.1	Introduction	8
6.1.2	Pumping stations with submersible pumps	9
6.1.3	Pumping stations with dry installed pumps	11
6.1.4	Other types of pumping stations	11
6.2	Selection of type of pumping station	12
6.3	Route and profile of rising mains	12
7	Hydraulic design of pumping systems	13
7.1	Introduction	13
7.2	Establish inflow rates	15
7.2.1	Foul wastewater pumping stations	15
7.2.2	Surface water pumping installations	15
7.2.3	Combined sewer pumping stations	15
7.3	Select desired pump flow rates	15
7.4	Dimensioning collection tank	15
7.5	Select rising main diameter	16
7.5.1	Pumping stations	16
7.5.2	Pressure sewer systems	17
7.6	Retention period	17
7.7	Calculation of system characteristics	18
7.7.1	System head calculation	18
7.7.2	Pressure sewer systems	20
7.8	Selection of pump units and duty points	20
7.9	Check pressure transients (waterhammer)	22
8	Detailed design of pumping stations	23
8.1	General	23
8.2	Layout	23
8.3	Collection tank	24
8.4	Pump units	25
8.4.1	Pumps	25
8.4.2	Air compressor units	25
8.5	Controls and electrical equipment and instrumentation	25
9	Septicity	26
9.1	General	26
9.2	Control of septicity	27

9.2.1	General	27
9.2.2	Limiting retention period	27
9.2.3	Air flushing	27
9.2.4	Chemical treatment	28
9.2.5	Hydrogen sulphide stripping	28
9.2.6	Dilution of the septic wastewater in fresh wastewater	28
10	Testing and verification	28
10.1	Pumping stations	28
10.2	Rising mains	28
10.3	Commissioning	28
11	Operation and maintenance manual	29
	Bibliography	30