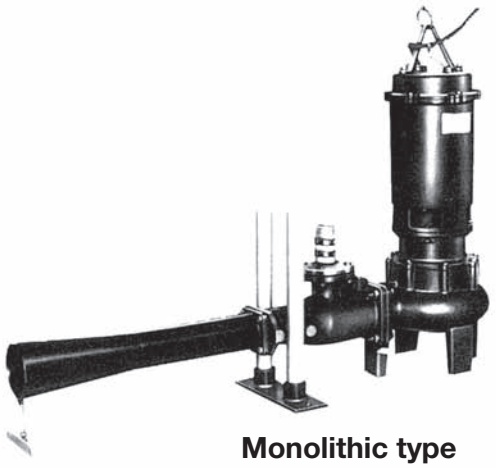
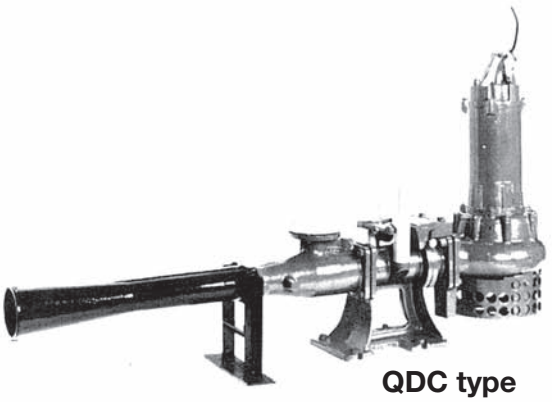
SUBMERSIBLE AERATOR – For Sewage Water & Contaminants



Monolithic type



QDC type

APPLICATIONS

- For preliminary or final aeration in sewage treatment (combined or separate treatment) plant.
- For preliminary or final aeration in industrial waste water treatment plant.
- For mixing / putrefaction prevention / scum prevention in sewage and septic vessels of all kinds.

FEATURES

- High oxygen dissolving efficiency.
- Provides super-fine air bubbles.
- High mixing power.
- Silent.
- Uses vortex pump that prevents clogged of foreign matter.
- Quick discharge connector (option) makes maintenance simple.

STANDARD SPECIFICATIONS

Aerator model			Standard	50DE	80DE		100DE	
Pump (non-auto type)		Model	Standard	50DV2	80DV		100DV	
		Motor output kW (poles)		0.75(2)	1.5(4)	2.2(4)	3.7(4)	5.5(4)
Treated liquid	Quality			Sewage containing foreign solids				
	Temperature			0 ~ 40°C				
	Max.size of foreign solids (mm)		Spherical solids dia.	20	34	42	46	50
			Fibrous material length	100 ~ 150	160 ~ 240	160 ~ 240	200 ~ 300	200 ~ 300
Max. submergence				4m				
Aerator	Construction	Method		Ejector (jet)				
		Nozzle diameter		20	34	42	46	50
		Installation	Monolithic type	Without fixture	Nil			
			QDC type	N/A	With QDC (including strainer)			
	Materials	Aerator body		FC200				
		Nozzle		SCS13				
		Diffuser		FC200				
		Installation fixture	Fixture	SS and others				
			QDC	FC200 and others (same as standard QDC)				
Pump				According to specifications of pump used (but impeller diameter is different from standard)				
Submersible motor								

* Theoretically, the diameter of foreign solids that can pass through the system is 100% of pump inlet bore, but in practice this is limited by aeration nozzle diameter.

OPTIONAL SPECIFICATIONS

Motor specifications			Voltage 50Hz400V • 60Hz400/440V • others
Modifications	Impeller		BC6 • SCS13 (except 50DE)
	Lifting and installation parts	Monolithic type	Stainless steel (SUS420, 304) parts set for : • Lifting chain (for DE) • Lifting fixture • Fixtures (base plate, foundation bolts, guide pins, guide pipe fixture for DE)
			Stainless steel (SUS420, 304) parts set for: • Lifting chain (same as standard type) • Lifting fixture • Parts for QDC (foundation bolts, guide pipe supports and guide pins)
	Guide pipe		SUS304
Others			• Extension cable (total length 20/30m) • Tar Epoxy coating (for pump) • Witnessed tests (performance test only)

STANDARD ACCESSORIES

Monolithic type

- Fixtures (not supplied with 0.75kW model) ····· 1 set
  - Set components:
    - Base plate ····· SS ····· 1
    - Foundation bolts ····· SS ····· 2
    - Guide pipe fixtures (for DE) SS ····· 2
    - Guide pins ····· SS ····· 2
    - Diffuser support plate (with bolts) SUS304 ····· 1
- Lifting chain ····· SBC (equivalent to steel) ··· 1
- Hose nipple for air pipe ····· FC200 ····· 2
- Hose band for hose nipple ····· SUS304 ····· 4
- Companion flange (with bolts) for hose nipple (not supplied with 0.75·2.2kW models) FC200 ····· 1
- Submersible cable ····· 0.75kW ····· 6 m; 1.5~5.5kW ····· 10m
- Ground surface nameplate ····· 1

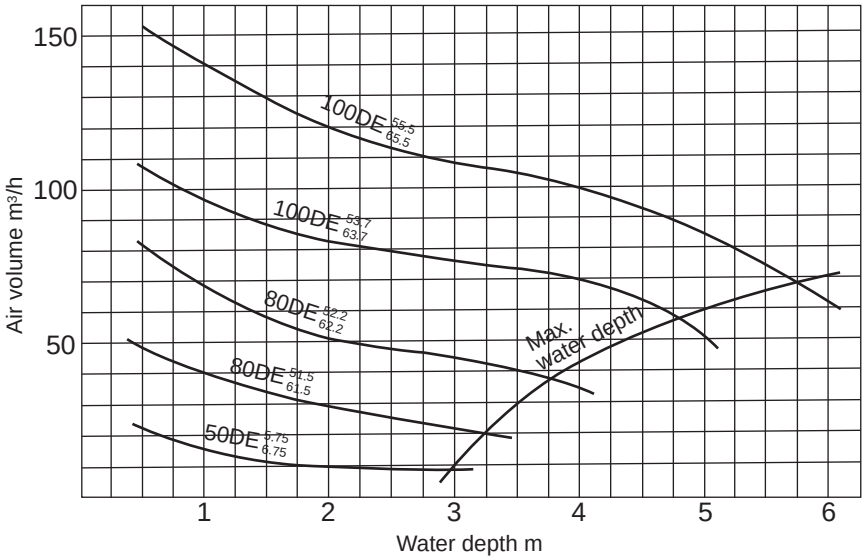
QDC type (Note : Except 0.75kW model)

- QDC ····· 1 set
  - Set components:
    - QDC body ····· FC200 ····· 1
    - Foundation bolts ····· SS ····· 4
    - Detachable flange ····· FC200 ····· 1
    - Sliding guide ····· FC200 ····· 1
    - Guide pipe support ····· SS ····· 1
    - Guide pin ····· SS ····· 4
    - Bolts ····· SUS420 ····· 1 set
    - Lifting chain ····· SBC (equivalent to steel) ··· 1
- Discharge bend (with bolts) ····· (same as standard discharge bend) 1
- Pump strainer (with bolts) ····· SS ····· 1
- Companion flange (with bolts) for air pipe (not supplied with 0.75·2.2kW models) ····· FC200 ····· 1
- Submersible cable ····· 1.5~5.5kW ····· 10m
- Ground surface nameplate ····· 1

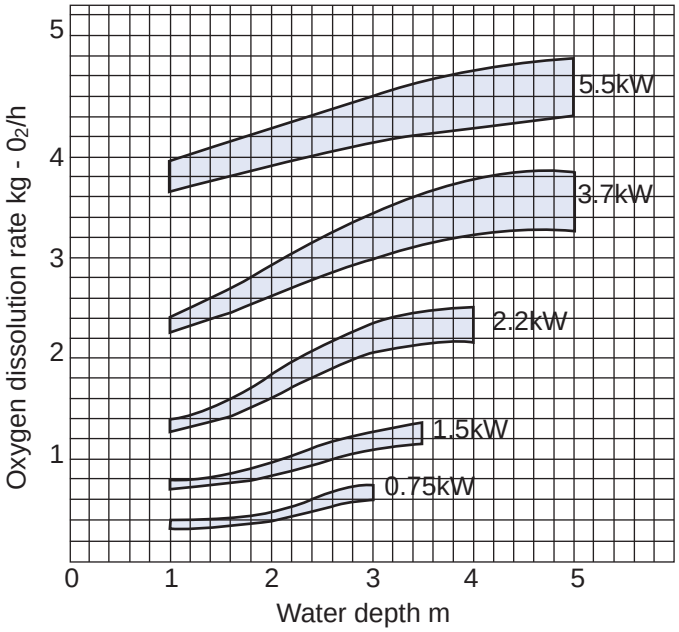
Note :
Technical standards for electrical equipment require that the pump wiring be equipped with shut-off devices and electrical leakage breakers when pump is used. Users are requested to provide such devices.

SELECTION CHART

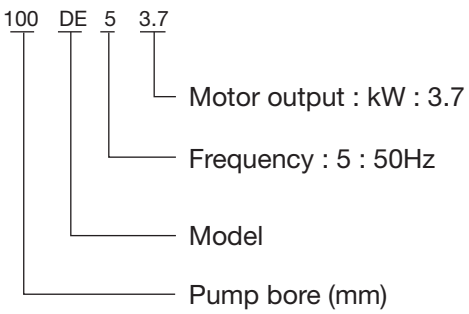
AIR FLOW RATE CHARACTERISTICS



OXYGEN DISSOLUTION RATE CHARACTERISTICS



SYMBOLS



SPECIFICATIONS TABLE

Specification / Model	Submersible motor: Output (kW)	Phase voltage	Poles	Starting method	Air flow rate(m^3/h)	Rating: Oxygen dissolution rate (kg.O2/h)	Water depth(m)	Circulation water flow rate(m^3/h)	Vesset dimensions (Max.): Length (m)	Width (m)	Water depth(m)	Effective volume(m^3)	Optimum water depth (m)
50DE 5.75 6.75	0.75	3 phase 200 / 200 / 220V	2		10	0.38~0.48	2	22	3(2)	3(2)	2.9	26(12)	1~2.5
80DE 51.5 61.5	1.5		4		25.5 / 25	0.96~1.14	2.5	46 / 45	4(3)	4(3)	3.4	54(31)	1~3.0
80DE 52.2 62.2	2.2				45 / 44	2.05~2.34	3	62 / 60	5(4)	5(4)	3.8	95(61)	1.5~3.5
100DE 53.7 63.7	3.7				74	3.12~3.64	3.5	95	6(5)	6(5)	4.8	173(120)	2~4.0
100DE 65.5 65.5	5.5				100	4.29~4.84	4	110	7(6)	7(6)	5.8	284(210)	3~3.5

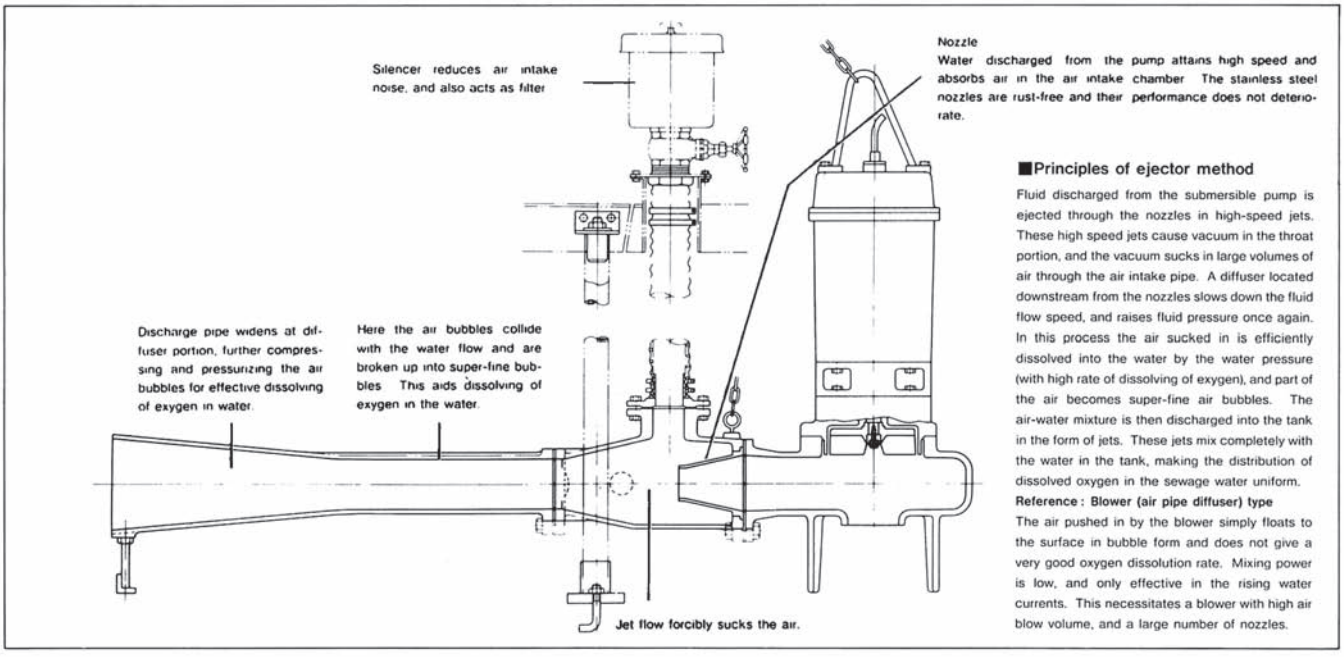
Notes :
(1) Rated specification values are based on the following conditions:
- Water temperature : 20°C
- QDC used
- Error of ± 1.5% in air flow rate
- Values in parentheses are in case of final aeration.

MOTOR CHARACTERISTICS

Frequency (Hz)	Output (kW)	Phase	Starting method	Voltage (V)	Rated current (A)	Cable size (mm^2)
50	0.75	3 phase	Direct on line	200 allowable fluctuation: ± 10%	3.7	1.25
	1.5				7.8	
	2.2				10.4	2.0
	3.7				16.6	
	5.5				22.5	5.5

Notes :
- Oxygen dissolution rate curves represent the distribution of dissolved oxygen by water depth
  Upper limit : Dissolved oxygen rate at 1/2 water depth
  Lower limiit : Dissolved oxygen rate near surface
- Measuring conditions
  Water quality : Clean water 20°C
  Vessel dimensions : 6m (length)X3m (width)X5m (depth)=90m^3
  Measuring method : Deoxidation method (sodium sulfite + cobalt chloride)
  Instrument : Dissolved Oxygen Meter DO-3 made by Electrochemical Instruments Ltd.

CONSTRUCTION



■Principles of ejector method

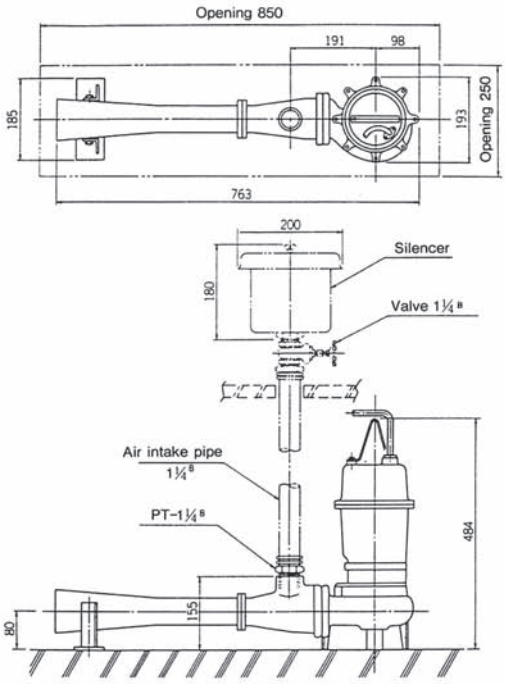
Fluid discharged from the submersible pump is ejected through the nozzles in high-speed jets. These high speed jets cause vacuum in the throat portion, and the vacuum sucks in large volumes of air through the air intake pipe. A diffuser located downstream from the nozzles slows down the fluid flow speed, and raises fluid pressure once again. In this process the air sucked in is efficiently dissolved into the water by the water pressure (with high rate of dissolving of exygen), and part of the air becomes super-fine air bubbles. The air-water mixture is then discharged into the tank in the form of jets. These jets mix completely with the water in the tank, making the distribution of dissolved oxygen in the sewage water uniform.

Reference : Blower (air pipe diffuser) type

The air pushed in by the blower simply floats to the surface in bubble form and does not give a very good oxygen dissolution rate. Mixing power is low, and only effective in the rising water currents. This necessitates a blower with high air blow volume, and a large number of nozzles.

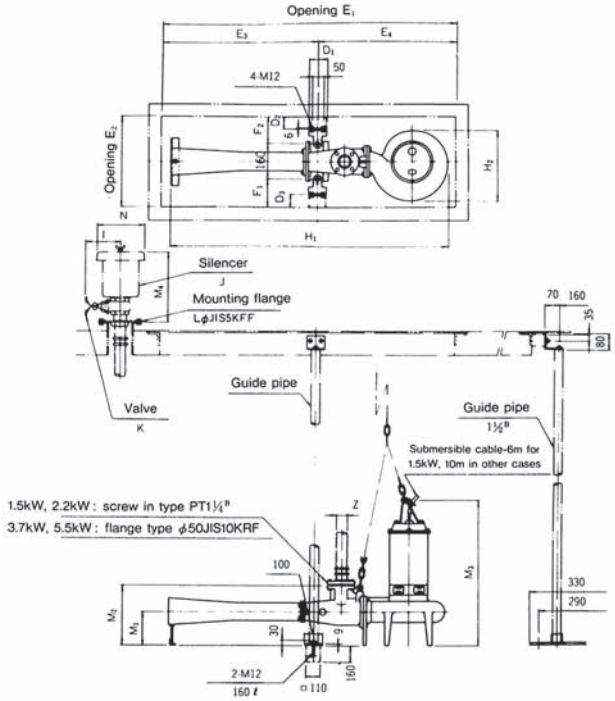
DIMENSION

•Monolithic type
(0.75kW)



Note : Parts drawn with chain double-dashed lines are optional accessories that must be ordered separately.

•Monolithic type
(1.5 - 5.5kW)



Unit : mm

Model 50 Hz	Output kW	D1	D2	D3	E1	E2	E3	E4	F1	F2	FH1	H2	I	J	K	L	M1	M2	M3	M4	Z	Weight kg
80 DE 51.5	1.5	100	50	50	1300	400	674	626	120	120	1165	250	117	1¼ᴮ	1¼ᴮ	65	144	237	718	300	1¼ᴮ	78
80 DE 52.2	2.2																		788			87
100 DE 53.7	3.7	100	75	75	1500	450	757	743	145	145	1385	308	162	2”	2”	80	180	310	845	350	2”	135
100 DE 55.5	5.5																		1003			169

Note : Please inquire outer dimensions and section drawings for QDC type