



NBS4 SERIES

SUBMERSIBLE MOTORS 4" OIL-FILLED

TECHNICAL DETAILS

NBS4 PRODUCT INTRODUCTION

The NBS4 submersible motors are 4" rewindable submersible motors which are suitable for water wells which max. temperature is 30°C and which pH is between 6.5 and 8.0. The filling liquid is a non-toxic dielectric fluid, which is approved by the F.D.A. (Food and Drug Administration) as well as by other various institutes of pharmacology world-wide. The coupling dimensions and flange comply with NEMA 4" standards, as these submersible motors are designed for driving 4" borehole (deep well) submersible pumps that are in accordance with 4" NEMA standards. Usually the submersible motors are installed vertically. However, the motors may be installed horizontally provided technical approval for each specific application. The 4" submersible motors can be installed in boreholes up to 150 m deep. Rewind ability is assured by a design which enables the easy dismantling and assembly of the motors.

APPLICATION

These motors are built for dependable operation in 4" diameter or larger water wells. Oil lubricated thrust and radial bearings enable a maintenance free operation. A special diaphragm ensures pressure compensation inside the motor.

PRODUCT ADVANTAGES

- Stator refrigerated in dielectric non-toxic oil bath
- Cable material according to drinking water regulation
- Sand slinger and shaft seal for high performance in sand
- High efficiency electrical design for low operation cost
- All motors prefilled and 100% tested

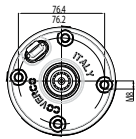
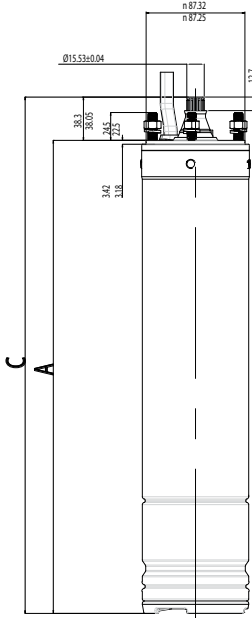
SPECIFICATION STANDARD

- 0,37 - 7,5 kW
- 4" NEMA flange
- Protection: IP 68
- Starts per hour: 30
- Installation: vertical/horizontal (approval needed)
- Standard voltage: 220-230V/50 Hz ;380-415V / 50Hz, 460V / 60Hz
- Voltage tolerance: $\pm 10\%$
- Singlephase:PSC type
- Motor protection: Select thermal overloads according to DIN 60947-4-1, trip class 10 or 10A,trip time < 10 s. at 5 x IN
- Insulation: Class F
- Rated ambient temperature: 30°C
- Cooling flow: min. 8 cm/sec
- Water pH:6.5-8
- Thrust rating:1500 N, 2500 N, 4500 N(K)



THREE-PHASE

PERFORMANCE DATA V 220-230 Hz 60



Potenza		Hz	Tensione	RIA(*)	LRC / RLC	Giri R.p.m. T.min	FLT	LRT FLT	BDT / FLT	Efficienza $\eta\%$			Fattore di potenza $\cos\phi$			S.F. Amp
KW	HP		V			Min ⁻¹	Nm			50	75	100	50	75	100	
0.37	0.50	60	220	2.6	5.1	3470	1.01	3.5	4.0	36	44	49	0.64	0.71	0.77	3.3
			230	2.6	5.2	3490	1.01	3.7	4.1	36	44	49	0.61	0.63	0.73	3.3
0.55	0.75	60	220	3.4	5.4	3480	1.51	3.3	3.9	44	52	57	0.62	0.71	0.77	4.2
			230	3.4	5.3	3500	1.50	3.4	4.1	43	51	56	0.58	0.67	0.73	4.1
0.75	1.0	60	220	4.1	5.0	3460	2.08	2.2	2.9	50	58	61	0.64	0.74	0.80	5.0
			230	4.1	5.1	3480	2.06	2.3	3.3	49	57	61	0.60	0.70	0.77	4.9
1.1	1.5	60	220	5.2	5.4	3450	3.05	2.9	5.8	62	67	70	0.62	0.73	0.80	6.3
			230	5.2	5.6	3470	3.05	3.0	5.8	60	65	70	0.59	0.70	0.77	6.1
1.5	2.0	60	220	6.9	5.3	3460	4.13	2.6	4.3	67	72	74	0.57	0.69	0.77	8.1
			230	7.0	5.9	3470	4.14	3.2	4.6	66	71	74	0.50	0.64	0.74	8.1
2.2	3.0	60	220	9.5	5.4	3440	6.10	3.3	3.7	77	79	80	0.54	0.68	0.77	10.6
			230	9.8	5.4	3460	6.20	3.6	4.2	74	78	79	0.47	0.62	0.73	10.6
3.0	4.0	60	220	14.2	6.0	3470	8.25	3.4	4.3	70	76	77	0.50	0.63	0.73	15.1
			230	15.1	6.2	3490	8.25	3.6	4.5	69	75	76	0.47	0.60	0.66	15.7
4.0	5.5	60	220	16.8	6.4	3450	11.1	3.1	3.4	76	79	80	0.58	0.71	0.79	18.5
			230	17.0	6.3	3460	11.0	3.3	3.6	73	78	80	0.51	0.64	0.75	18.6
5.5	7.5	60	220	21.0	6.4	3470	15.1	2.6	3.0	78	81	82	0.63	0.76	0.84	23.8
			230	21.1	6.4	3485	15.1	2.7	3.2	78	81	82	0.56	0.70	0.79	23.6
7.5	10	60	220	29.0	5.9	3440	20.8	2.6	2.6	78	79	80	0.64	0.78	0.85	32.6
			230	29.0	6.0	3460	20.7	2.8	2.8	76	79	80	0.58	0.72	0.81	32.0

RESISTANCE VALUES $\pm 5\%$ (25 °C) THREE-PHASE V 380-415 Hz 50

TYPE	kW	Ω
NBS4 050 T	0.37	54
NBS4 075 T	0.55	40
NBS4 100 T	0.75	26.4
NBS4 150 T	1.10	16.1
NBS4 200 T	1.50	12.3
NBS4 300 T	2.20	8.3
NBS4 400 T	3.00	5.5
NBS4 550 T	4.00	3.8
NBS4 750 T	5.50	3.0
NBS4K 1000 T	7.50	2.2

RESISTANCE VALUES $\pm 5\%$ (25 °C) SINGLE-PHASE V 220-230 Hz 50

TYPE	kW	Ω (Main)	Ω (Start)
NBS4 050 M	0.37	7.70	23.3
NBS4 075 M	0.55	5.35	18.8
NBS4 100 M	0.75	3.90	9.45
NBS4 150 M	1.10	2.65	8.25
NBS4 200 M	1.50	2.05	9.35
NBS4 300 M	2.20	1.42	3.75
NBS4K 500 M	3.70	1.15	2.35

LENGTHS AND WEIGHTS THREE-PHASE

TYPE	kW	Tot.A (mm)	Tot.C (mm)	Kg
NBS4 050 T	0.37	350	388	7.4
NBS4 075 T	0.55	364	402	8.0
NBS4 100 T	0.75	384	422	8.8
NBS4 150 T	1.10	411	449	10.1
NBS4 200 T	1.50	428	466	10.8
NBS4 300 T	2.20	467	505	12.5
NBS4 400 T	3.0	522	560	15.0
NBS4 550 T	4.0	587	625	18.3
NBS4 750 T	5.5	687	725	22.5
NBS4K 300 T	2.2	467	505	12.5
NBS4K 400 T	3.0	522	560	15.0
NBS4K 550 T	4.0	587	625	18.3
NBS4K 750 T	5.5	687	725	22.5
NBS4K 1000 T	7.5	768	806	28.3

LENGTHS AND WEIGHTS SINGLE-PHASE

TYPE	kW	Tot.A (mm)	Tot.C (mm)	Kg
NBS4 050 M	0.37	364	402	8.1
NBS4 075 M	0.55	389	427	9.2
NBS4 100 M	0.75	411	449	10.3
NBS4 150 M	1.10	434	472	11.4
NBS4 200 M	1.50	467	505	12.8
NBS4 300 M	2.20	565	603	17.4
NBS4K 300 M	2.20	565	603	17.4
NBS4K 500 M	3.70	680	718	24.1

SINGLE-PHASE

PERFORMANCE DATA V 220-230 Hz 50

Power		Hz	Voltage	RIA(*)	LRC / RLC	R.p.m.	FLT	LRT / FLT	BDT / FLT	Efficiency $\eta\%$			Power factor $\cos\phi$			Capacitor
KW	HP									50	75	100	50	75	100	
0.37	0.50	50	220	3.5	2.9	2815	1.26	1.06	2.4	33	42	49	0.93	0.96	0.98	20
			230	3.6	3.0	2830	1.25	1.17	2.6	30	40	47	0.88	0.92	0.95	
0.55	0.75	50	220	4.6	3.0	2810	1.87	0.91	2.2	39	49	55	0.95	0.97	0.99	25
			230	4.6	3.1	2830	2.86	1.02	2.5	36	47	54	0.90	0.94	0.98	
0.75	1.0	50	220	5.8	3.2	2800	2.55	0.90	2.1	44	54	60	0.94	0.97	0.98	36
			230	5.9	3.3	2820	2.54	0.99	2.3	41	52	59	0.88	0.94	0.97	
1.1	1.5	50	220	8.2	3.1	2810	3.74	0.75	2.0	48	58	64	0.82	0.90	0.95	40
			230	8.6	3.1	2825	3.74	0.82	2.2	44	54	62	0.72	0.82	0.90	
1.5	2.0	50	220	10.4	3.2	2790	5.13	0.72	2.6	53	62	68	0.86	0.93	0.97	50
			230	10.6	3.2	2810	5.09	0.80	2.6	49	60	66	0.74	0.85	0.93	
2.2	3.0	50	220	14.7	3.8	2810	7.50	0.70	2.3	54	64	69	0.93	0.97	0.99	76
			230	14.6	4.1	2820	7.51	0.77	2.5	51	62	68	0.84	0.93	0.97	
3.7	5.0	50	220	22.5	4.2	2880	12.2	0.83	2.5	62	71	75	0.96	0.98	0.99	130+
			230	22.0	4.2	2890	12.2	0.84	2.5	59	68	74	0.90	0.95	0.98	156-200

PERFORMANCE DATA V 230-240 Hz 50

Power		Hz	Voltage	RIA(*)	LRC / RLC	R.p.m.	FLT	LRT / FLT	BDT / FLT	Efficiency $\eta\%$			Power factor $\cos\phi$			Capacitor
KW	HP									50	75	100	50	75	100	
0.37	0.50	50	230	3.4	2.9	2800	1.26	1.07	2.4	32	42	49	0.93	0.96	0.98	20
			240	3.5	3.0	2815	1.26	1.15	2.6	30	39	47	0.87	0.92	0.96	
0.55	0.75	50	230	4.4	3.1	2800	1.87	0.92	2.3	39	49	56	0.96	0.98	0.99	25
			240	4.4	3.2	2815	1.86	1.02	2.4	37	47	55	0.91	0.96	0.98	
0.75	1.0	50	230	5.7	2.4	2800	2.56	0.72	2.2	43	54	60	0.96	0.98	0.99	36
			240	5.6	2.4	2820	2.54	0.78	2.4	41	51	59	0.90	0.95	0.98	
1.1	1.5	50	230	8.1	3.1	2790	3.79	0.73	1.9	47	57	63	0.82	0.91	0.96	40
			240	8.3	3.0	2810	3.75	0.79	2.2	44	54	61	0.75	0.85	0.92	
1.5	2.0	50	230	10.2	3.3	2790	5.13	0.71	2.8	51	61	67	0.83	0.91	0.96	50
			240	10.5	3.2	2800	5.10	0.76	3.1	48	59	65	0.74	0.84	0.92	
2.2	3.0	50	230	13.8	3.6	2820	7.47	0.74	2.3	55	65	71	0.91	0.97	0.98	76
			240	14.0	3.6	2830	7.41	0.82	2.5	51	61	68	0.83	0.91	0.97	
3.7	5.0	50	230	22.6	4.2	2900	12.2	0.82	2.3	56	67	73	0.93	0.97	0.99	130+
			240	22.6	4.3	2910	12.2	0.91	2.4	52	63	71	0.85	0.92	0.97	156-200

PERFORMANCE DATA V 220-230 Hz 60

Power		Hz	Voltage	RIA(*)	LRC / RLC	R.p.m.	FLT	LRT / FLT	BDT / FLT	Efficiency $\eta\%$			Power factor $\cos\phi$			Capacitor	S.F. Amp
KW	HP									50	75	100	50	75	100		
0.37	0.50	60	220	3.7	3.9	3460	1.01	1.19	3.4	32	42	48	0.89	0.93	0.95	20	4.7
			230	3.9	3.8	3470	1.02	1.34	3.6	30	40	46	0.82	0.87	0.91	20	4.7
0.55	0.75	60	220	5.0	3.9	3450	1.52	1.35	3.2	34	44	52	0.97	0.98	0.99	31.5	6.3
			230	5.1	4.0	3460	1.51	1.51	3.4	32	42	50	0.92	0.95	0.97	31.5	6.2
0.75	1.0	60	220	6.2	4.1	3460	2.06	0.96	2.8	41	51	58	0.90	0.94	0.97	31.5	7.6
			230	6.4	4.0	3470	2.06	1.06	3.2	38	48	55	0.81	0.87	0.93	31.5	7.6
1.1	1.5	60	220	8.1	3.9	3440	3.05	0.77	2.4	49	59	65	0.88	0.93	0.96	40	9.7
			230	8.3	4.0	3460	3.04	0.87	2.7	43	54	63	0.79	0.86	0.93	40	9.6
1.5	2.0	60	220	10.5	3.9	3420	4.20	0.81	3.6	51	61	67	0.96	0.98	0.99	50	12.5
			230	10.4	4.0	3440	4.20	0.90	4.3	48	58	66	0.90	0.95	0.98	50	12.3
2.2	3.0	60	220	14.9	4.5	3440	6.10	0.74	3.7	55	64	70	0.93	0.96	0.98	76	16.5
			230	15.0	4.5	3460	6.10	0.82	3.7	51	62	68	0.84	0.91	0.95	76	16.4
3.7	5.0	60	220	30.8	3.1	3480	10.1	1.12	2.1	41	52	60	0.85	0.88	0.92	150+	32.9
			230	30.3	3.3	3460	10.0	1.24	2.1	40	50	58	0.85	0.88	0.91	(156-200)	32.4

THREE-PHASE

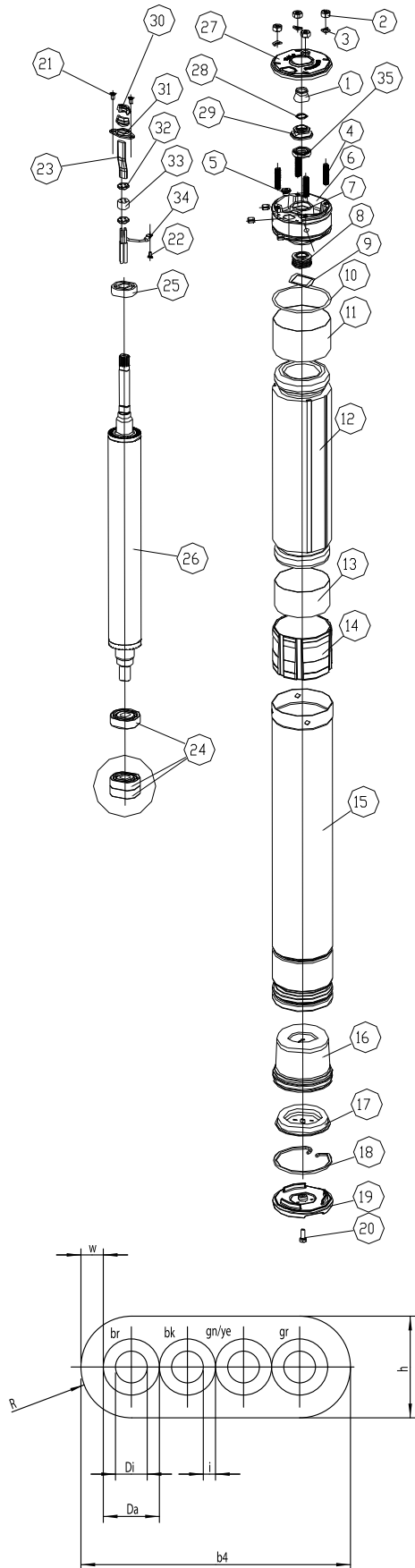
PERFORMANCE DATA V 380-415 Hz 50

Rating		Hz	Voltage	RIA(*)	LRC / RLC	R.p.m.	FLT	LRT / FLT	BDT / FLT	Efficiency $\eta\%$			Power factor $\cos\phi$		
KW	HP		V			Min ⁻¹	Nm			50	75	100	50	75	100
0.37	0.50	50	380	1.35	3.5	2790	1.26	1.7	2.5	40	47	51	0.69	0.77	0.83
			400	1.35	3.7	2820	1.25	1.9	2.7	39	47	51	0.64	0.73	0.79
			415	1.35	3.9	2835	1.25	2.0	3.1	38	46	50	0.61	0.70	0.76
0.55	0.75	50	380	1.85	3.6	2800	1.87	1.8	2.3	47	53	56	0.65	0.75	0.83
			400	1.85	3.8	2830	1.85	2.1	2.5	46	53	56	0.60	0.70	0.78
			415	1.90	3.9	2850	1.84	2.3	2.8	43	52	56	0.55	0.66	0.75
0.75	1.0	50	380	2.20	4.1	2810	2.55	2.3	2.3	54	61	63	0.64	0.75	0.82
			400	2.20	4.2	2835	2.52	2.5	2.5	54	61	63	0.58	0.70	0.78
			415	2.25	4.3	2850	2.51	2.9	2.8	52	60	63	0.54	0.65	0.74
1.1	1.5	50	380	3.00	4.6	2800	3.76	2.6	3.5	63	68	69	0.64	0.76	0.83
			400	3.00	4.7	2830	3.73	2.8	3.8	60	66	68	0.60	0.71	0.79
			415	3.00	4.7	2845	3.71	3.0	3.9	59	65	68	0.55	0.67	0.75
1.5	2.0	50	380	4.00	4.4	2800	5.10	2.6	3.2	63	69	70	0.60	0.73	0.82
			400	4.10	4.5	2825	5.07	2.9	3.5	61	67	69	0.53	0.66	0.76
			415	4.30	4.5	2840	5.05	3.1	3.8	59	66	69	0.48	0.61	0.71
2.2	3.0	50	380	5.60	4.2	2800	7.51	2.2	2.9	69	73	74	0.60	0.73	0.82
			400	5.70	4.3	2820	7.45	2.5	3.1	67	72	74	0.52	0.66	0.76
			415	6.00	4.3	2835	7.44	2.7	3.2	64	70	73	0.46	0.60	0.71
3.0	4.0	50	380	7.40	4.5	2780	10.30	2.5	2.8	73	74	75	0.59	0.73	0.83
			400	7.50	4.6	2810	10.18	2.7	3.2	69	73	74	0.51	0.66	0.78
			415	7.90	4.8	2825	10.16	3.0	3.4	66	72	73	0.47	0.60	0.72
4.0	5.5	50	380	9.60	5.1	2800	13.62	2.8	2.9	77	79	79	0.57	0.72	0.82
			400	9.80	5.1	2820	13.53	3.1	3.1	74	78	78	0.50	0.64	0.77
			415	10.3	5.1	2835	13.48	3.4	3.2	70	76	77	0.45	0.59	0.71
5.5	7.5	50	380	12.6	5.2	2825	18.60	2.5	2.7	79	80	80	0.63	0.77	0.86
			400	12.5	5.4	2845	18.44	2.7	2.8	77	80	80	0.55	0.71	0.82
			415	12.8	5.4	2860	18.37	2.9	3.0	74	79	79	0.50	0.65	0.78
7.5	10.0	50	380	16.9	5.1	2810	25.50	2.4	2.5	80	80	80	0.65	0.79	0.87
			400	16.9	5.3	2835	25.26	2.6	2.6	78	80	80	0.57	0.72	0.83
			415	17.3	5.3	2850	25.05	2.7	2.7	75	79	79	0.51	0.66	0.77

PERFORMANCE DATA V 380 Hz 60

Power		Hz	Voltage	RIA(*)	LRC / RLC	R.p.m.	FLT	LRT / FLT	BDT / FLT	Efficiency $\eta\%$			Power factor $\cos\phi$			S.F. Amp
KW	HP		V			Min ⁻¹	Nm			50	75	100	50	75	100	
0.37	0.50	60	380	1.6	5.6	3500	1.01	4.3	4.7	36	45	50	0.57	0.64	0.70	2.0
0.55	0.75	60	380	2.1	6.0	3500	1.52	4.1	4.6	44	53	59	0.57	0.65	0.72	2.5
0.75	1.0	60	380	2.5	5.1	3480	2.06	3.2	3.6	51	59	63	0.57	0.67	0.75	3.0
1.1	1.5	60	380	3.2	5.8	3470	3.03	3.3	3.2	59	66	69	0.58	0.69	0.76	3.8
1.5	2.0	60	380	4.4	5.3	3470	4.10	3.1	5.0	63	70	71	0.52	0.64	0.71	5.0
2.2	3.0	60	380	5.9	6.0	3470	6.06	3.4	4.1	71	76	77	0.61	0.64	0.74	6.4
3.0	4.0	60	380	8.2	6.0	3470	8.24	3.5	4.3	70	75	77	0.50	0.63	0.73	8.7
4.0	5.5	60	380	10.2	6.3	3450	11.0	3.5	4.0	74	78	80	0.54	0.67	0.76	11.4
5.5	7.5	60	380	13.0	6.5	3490	15.0	3.1	3.8	78	81	83	0.55	0.69	0.78	14.5
7.5	10	60	380	17.8	6.5	3480	20.6	2.9	3.3	77	80	81	0.57	0.71	0.80	19.4

MOTOR CUT-OPEN VIEW



SPARE PARTS LIST

#	PART DESCRIPTION	Q.TY	#	PART DESCRIPTION	Q.TY
1	Sand slinger	1	19	Shell protector	1
2	Nut	4	20	Lock screw for shell protector	1
3	Washer	4	21	Screw for lead clamp	2
4	Stud	4		Grounding screw + lock washer	1
5	Oil fill plug	1	23	Lead	1
6	Top end bracket	1	24	Lower ball bearing	1
7	Lock pins	4	25	Upper ball bearing	1
8	Mechanical shaft seal	1	26	Rotor with shaft	1
9	Wavy spring	1	27	Top end bell cover	1
10	O-ring gasket for top end bell	1	28	Washer	1
	Insulation Roll up (11-13)	1	29	Sand slinger base	1
12	Wound stator	1		Lead seal bushing + Lead pressure disk + Lead fix rubber	1
14	Bottom end bell	1	31	Lead Clamp	1
15	Motor outer shell	1	35	Lip seal	1
16	Pressure equalization Diaphragm	1		Parallel connectors	3
17	Cover Diaphragm	1		Filling non-toxic oil Ondina 927	Kg.
18	Snap ring	1		Instruction sticker	1
				Lead jacket g6	4

CONSTRUCTION MATERIALS

#	STANDARD WATER	#	STANDARD WATER
1	Rubber	18	304 SS
2	304 SS	19	Lurynyl
3	304 SS	20	304 SS
4	304 SS	21	304 SS
5	Brass	22	304 SS
6	Cast iron	23	Rubber/ Copper wire
7	304 SS	24	Hardened steel
8	Nitrile-Carbon and ceramic face seal	25	Hardened steel
9	Hardened steel	26	Steel/304 SS
10	NBR	27	304 SS
11	Nomex-Mylar	28	304 SS
12	Copper wire	29	Hostaform
13	Nomex-Mylar	30	Nylon
14	Aluminium	31	304 SS
15	304 SS	32	Polypropylen
16	Rubber	33	Buna N
17	304 SS	34	Copper
		35	NBR

MOTOR LEADS

Typ	Di	i	Da	w	R	b4	h
4x1.5	1.5	0.6	2.7	1.9	2.5	14.6	5.1