



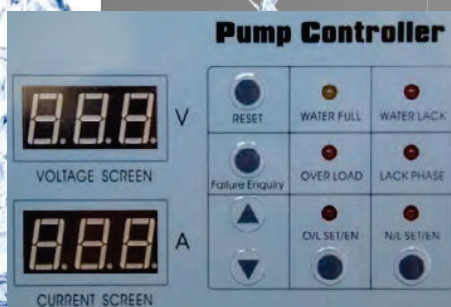
BOREHOLE PRODUCT RANGE

4SD 4" BOREHOLE PUMP

4SDM 4" BOREHOLE MOTORS

**CONTROL BOXES
- SINGLE PHASE**

**DIGITAL STARTER PROTECTOR
- THREE PHASE**



4" BOREHOLE PUMP

APPLICATIONS

For water supply from wells or reservoirs.
For domestic use for civil and industrial applications.
For garden use and irrigation.

OPERATING CONDITIONS

Maximum fluid temperature: 35°C
Maximum solid content: 3%
Maximum immersion: 120m
Minimum well diameter: 4"

MOTOR AND PUMP

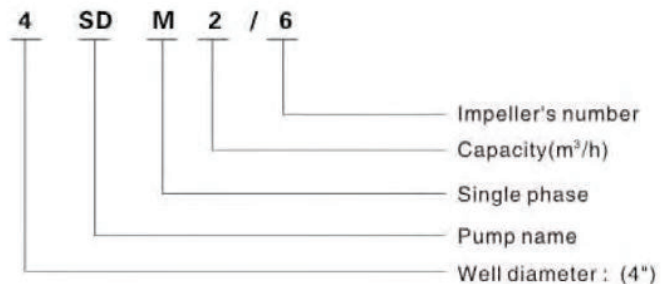
Internal diameter of outlet: 1.25" 1.5" 2"

Rewindable motor

Three-phase: 350V-415V/50Hz

Single-phase: 180V -240V/50Hz

Equipped with
start control box

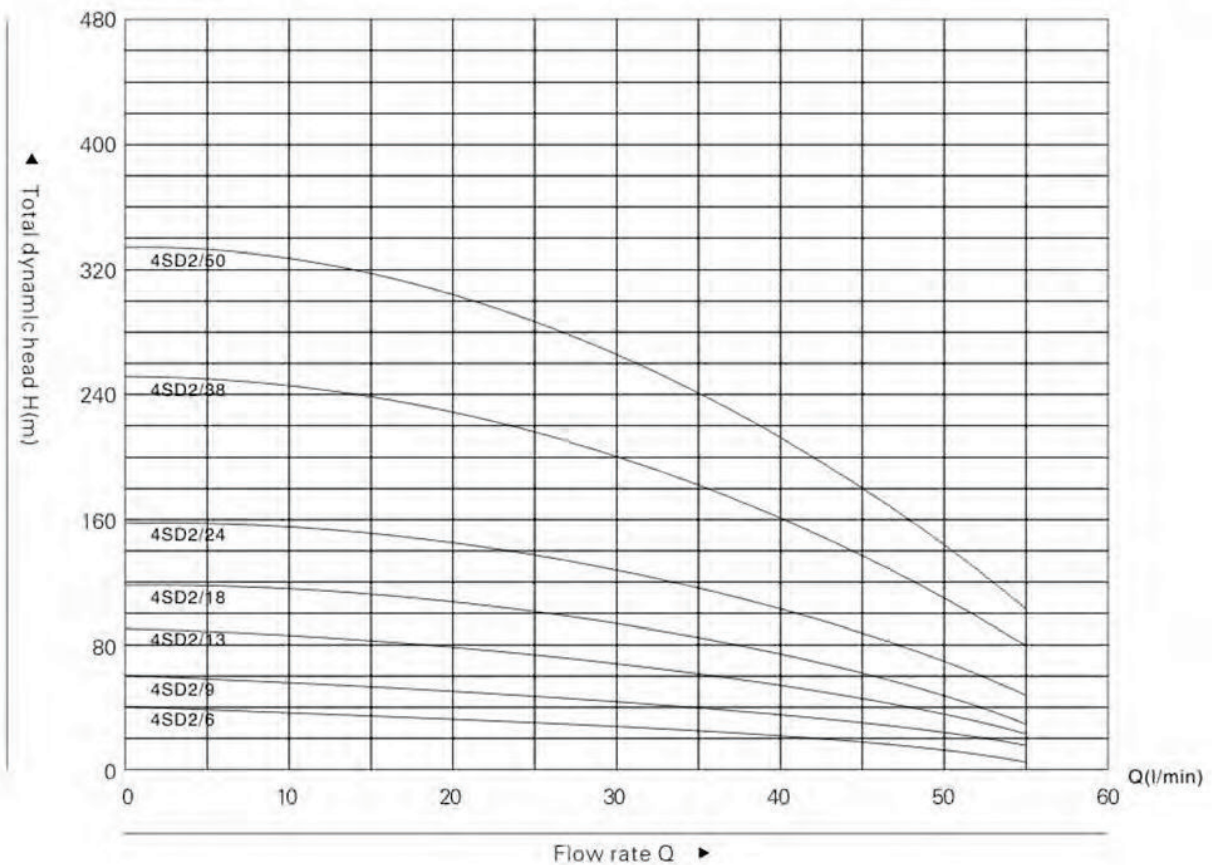


MATERIALS

COMPONENTS	MATERIAL
Delivery casing	AISI 304 SS/201SS
Strainer	AISI 304 SS/201SS
Diffuser	Polycarbonate
Impeller	POM
Shaft	AISI 304 SS/2Cr13
Shaft coupling	AISI 304 SS/201SS
Wear ring	Rubber
Motor external casing	AISI 204 SS
Mechanical seal	Special seal for deep wells (carbor-sic/tc)
Shaft	AISI 304 SS/2Cr13
Bearing	NSK etc.
Seal lubricant oil	5# White Oil

4SD2

PERFORMANCE CURVES

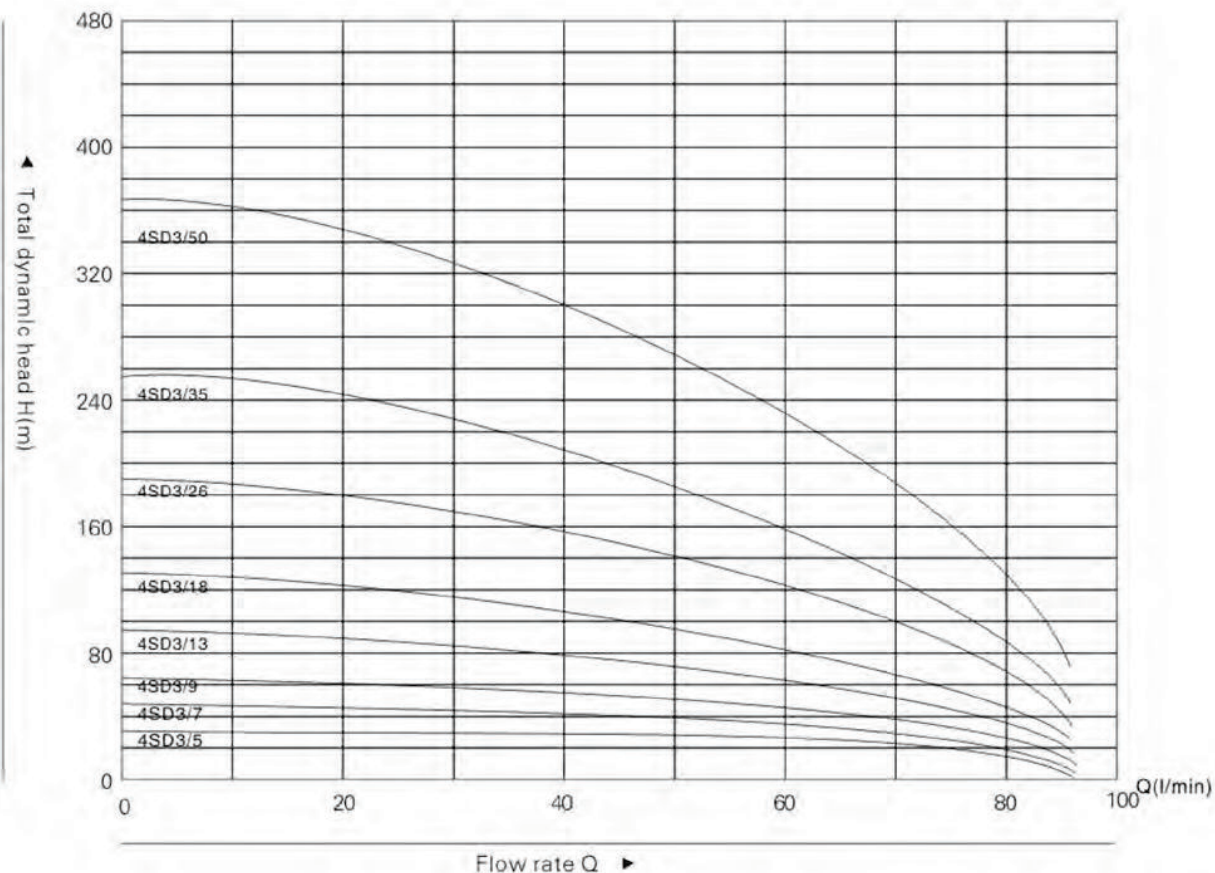


PERFORMANCE TABLE

TYPE		MOTOR POWER		DELIVERY N ~ 2850 R/MIN													
1~ 220 V/240 V	3~ 380 V/415 V			kW	HP	Q	m³/h l/min	0	0.3	0.6	0.9	1.2	1.5	1.8	2.1	2.4	2.7
										0	5	10	15	20	25	30	35
4SDm2/6	4SDm2/6	0.37	0.5	H(m)	40	39	38	37	36	34	32	29	25	21	17		
4SDm2/9	4SDm2/9	0.55	0.75		60	59	58	57	54	52	48	43	38	32	26		
4SDm2/13	4SDm2/13	0.75	1.0		86	85	84	82	79	75	69	62	55	46	37		
4SDm2/18	4SDm2/18	1.10	1.5		119	118	117	114	109	103	95	86	76	64	51		
4SDm2/24	4SDm2/24	1.5	2.0		159	157	156	152	145	138	127	114	101	85	68		
4SDm2/38	4SDm2/38	2.2	3.0		252	249	247	240	230	218	201	181	160	135	108		
	4SDm2/50	3.0	4.0		332	328	325	316	303	287	264	238	210	177	142		

4SD3

PERFORMANCE CURVES

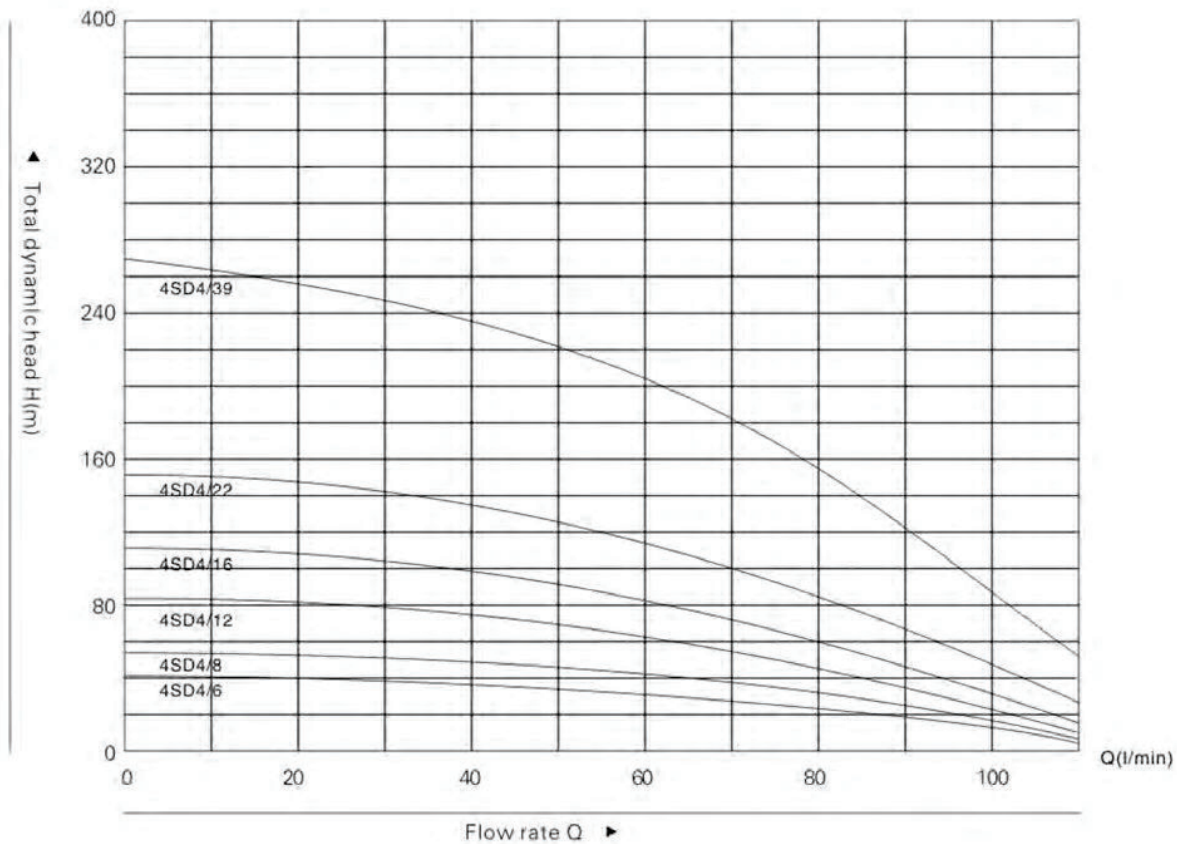


PERFORMANCE TABLE

TYPE		MOTOR POWER		DELIVERY N ~ 2850 R/MIN											
1~ 220 V/240 V	3~ 380 V/415 V			Q	m³/h l/min	0	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4
		kW	HP				0	10	20	30	40	50	60	70	80
4SDm3/5	4SDm3/5	0.37	0.5	H(m)	36	35	34	33	30	27	23	18	13	7	
4SDm3/7	4SDm3/7	0.55	0.75		51	50	48	46	42	38	32	25	18	10	
4SDm3/9	4SDm3/9	0.75	1.1		65	64	62	59	54	48	41	32	23	13	
4SDm3/13	4SDm3/13	1.1	1.5		94	93	90	85	78	70	59	46	34	19	
4SDm3/18	4SDm3/18	1.5	2.2		131	129	124	117	108	97	81	63	46	26	
4SDm3/26	4SDm3/26	2.2	3.0		189	186	179	169	156	140	117	91	67	37	
	4SDm3/35	3.0	4.0		254	250	242	228	210	188	158	123	90	50	
	4SDm3/50	4.0	5.5		363	358	345	325	300	269	225	175	129	72	

4SD4

PERFORMANCE CURVES

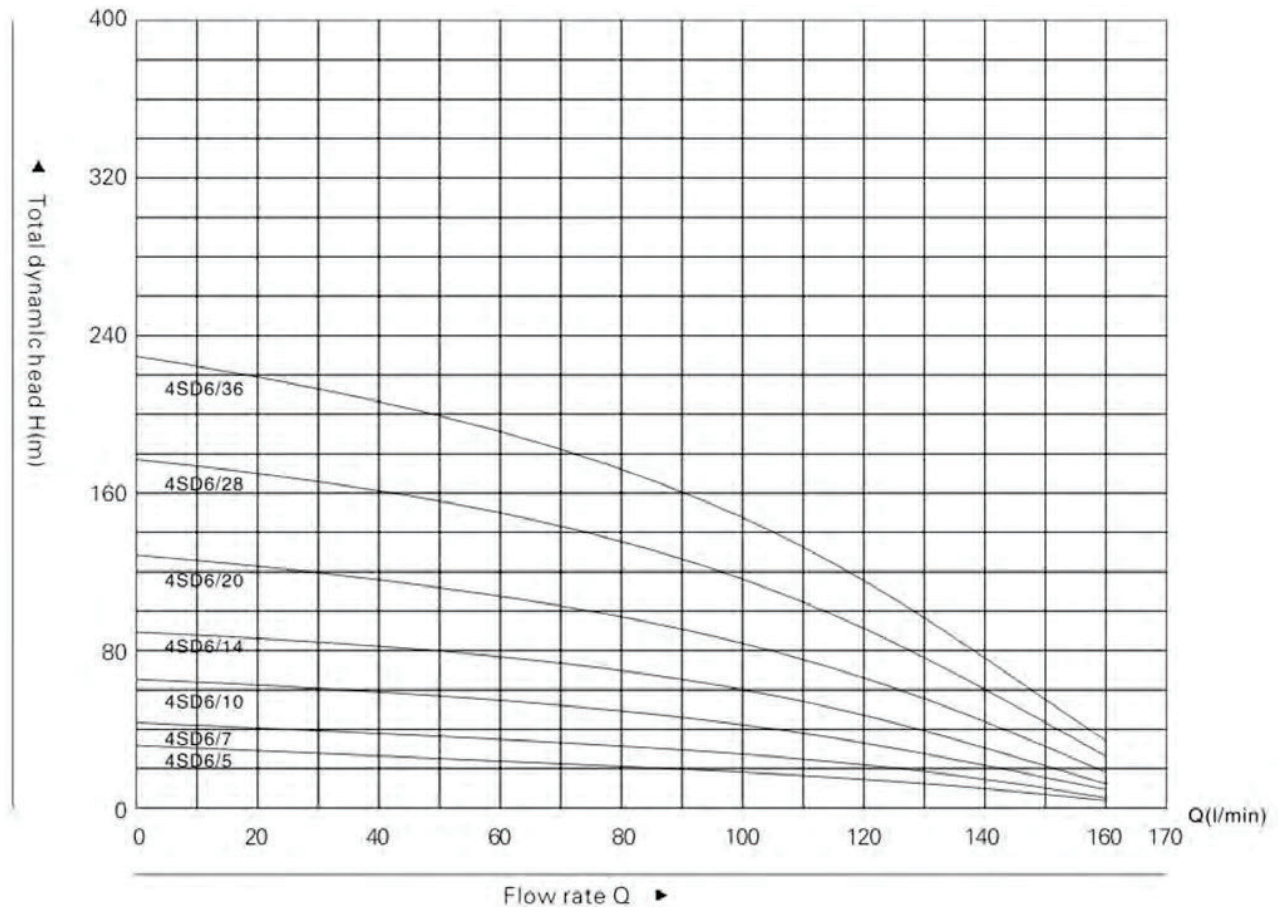


PERFORMANCE TABLE

TYPE		MOTOR POWER		DELIVERY N ~ 2850 R/MIN													
1~ 220 V/240 V	3~ 380 V/415 V			Q	m³/h	0	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4	6.0	
		kW	HP			l/min	0	10	20	30	40	50	60	70	80	90	100
4SDm4/6	4SDm4/6	0.55	0.75	H(m)		41	40	39	38	37	35	32	28	23	19	13	
4SDm4/8	4SDm4/8	0.75	1.0			55	54	52	51	49	47	43	38	31	25	18	
4SDm4/12	4SDm4/12	1.1	1.5			83	81	79	78	73	70	65	57	46	37	27	
4SDm4/16	4SDm4/16	1.5	2.0			110	109	105	104	98	93	86	76	62	49	36	
4SDm4/22	4SDm4/22	2.2	3.0			151	149	144	143	134	128	119	104	85	68	49	
	4SDm4/39	4.0	5.5			268	265	255	253	238	228	211	184	151	121	87	

4SD6

PERFORMANCE CURVES

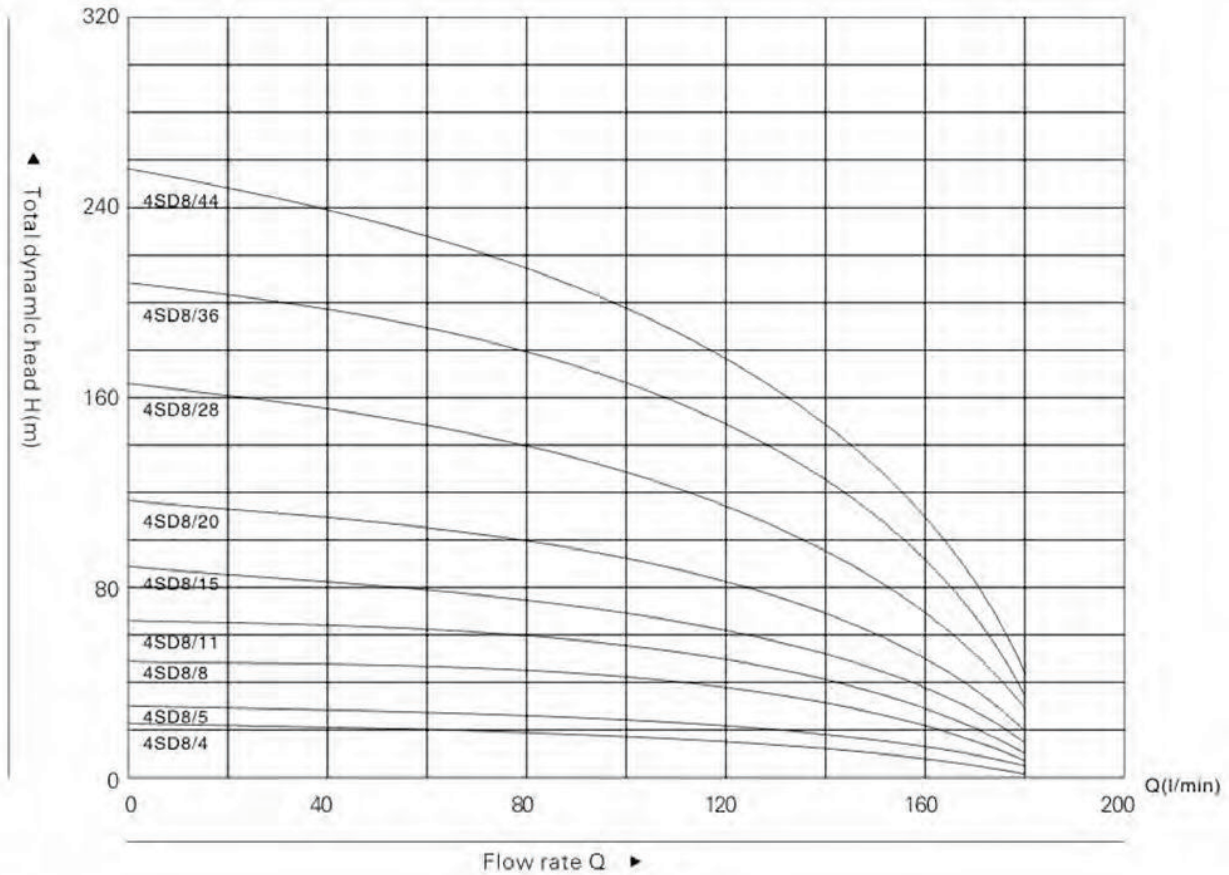


PERFORMANCE TABLE

TYPE		MOTOR POWER		DELIVERY N ~ 2850 R/MIN										
1~ 220 V/240 V	3~ 380 V/415 V			Q	m³/h	0	1.2	2.4	3.6	4.8	6.0	7.2	8.4	9.6
		kW	HP			l/min	0	20	40	60	80	100	120	140
4SDm6/5	4SDm6/5	0.55	0.75	H(m)		32	30	28	27	24	21	16	11	5
4SDm6/7	4SDm6/7	0.75	1.0			44	42	39	37	34	30	23	15	7
4SDm6/10	4SDm6/10	1.1	1.5			63	60	56	53	49	42	33	21	9
4SDm6/14	4SDm6/14	1.5	2.0			88	85	78	75	68	59	46	30	13
4SDm6/20	4SDm6/20	2.2	3.0			126	121	112	107	98	84	65	43	19
	4SDm6/28	3.0	4.0			177	169	157	150	137	118	92	60	26
	4SDm6/36	4.0	5.5			227	218	202	192	176	152	118	77	34

4SD8

PERFORMANCE CURVES

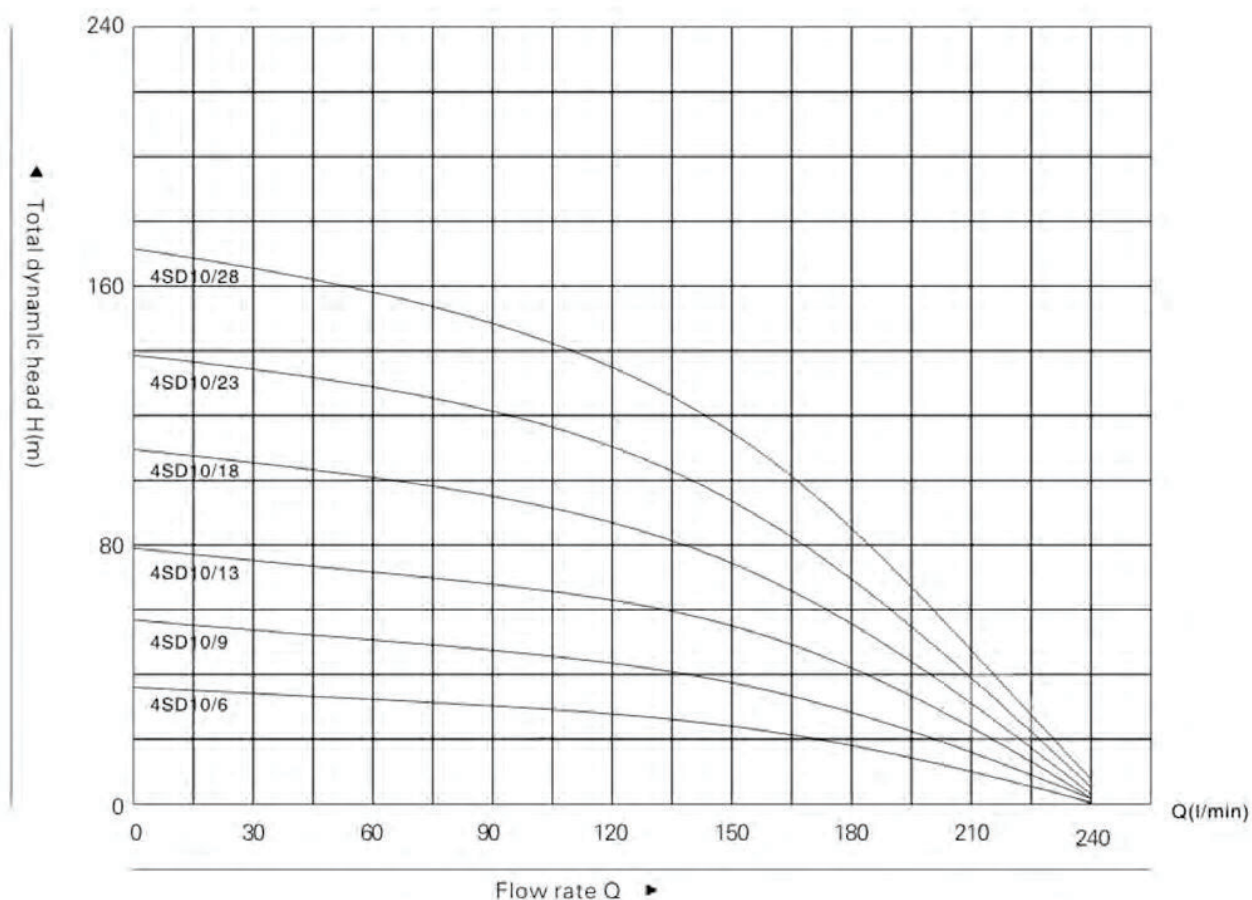


PERFORMANCE TABLE

TYPE		MOTOR POWER		DELIVERY N ~ 2850 R/MIN											
1~ 220 V/240 V	3~ 380 V/415 V			Q	m ³ /h	0	1.2	2.4	3.6	4.8	6.0	7.2	8.4	9.6	10.8
		kW	HP		l/min	0	20	40	60	80	100	120	140	160	180
4SDm8/4	4SDm8/4	0.55	0.75	H(m)		23	22	21	20	19	18	16	14	10	4
4SDm8/5	4SDm8/5	0.75	1.0			29	28	27	26	25	23	20	17	13	5
4SDm8/8	4SDm8/8	1.1	1.5			46	45	44	41	39	36	32	27	21	8
4SDm8/11	4SDm8/11	1.5	2.0			64	62	60	57	54	50	45	38	28	11
4SDm8/15	4SDm8/15	2.2	3.0			87	84	82	78	74	68	61	51	39	15
	4SDm8/20	3.0	4.0			116	113	109	103	98	91	81	69	52	20
	4SDm8/28	4.0	5.5			162	158	153	145	137	127	114	96	72	28
	4SDm8/36	5.5	7.5			209	203	196	186	177	163	146	123	93	36
	4SDm8/44	7.5	10			255	248	240	227	216	200	179	151	114	44

4SD10

PERFORMANCE CURVES

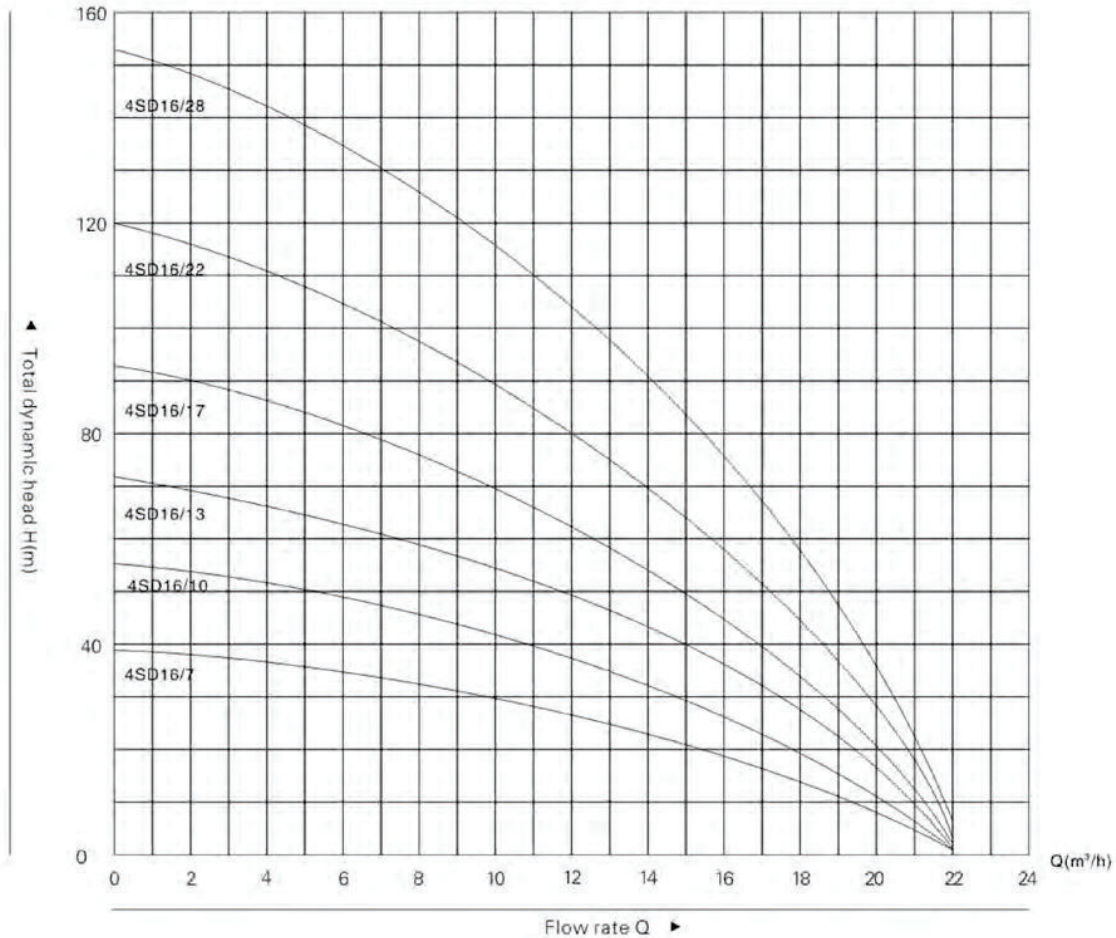


PERFORMANCE TABLE

TYPE		MOTOR POWER		DELIVERY N ~ 2850 R/MIN										
1~ 220 V/240 V	3~ 380 V/415 V			Q	m³/h	0	1.8	3.6	5.4	7.2	9.0	10.8	12.6	14.4
		kW	HP			l/min	0	30	60	90	120	150	180	210
4SDm10/6	4SDm10/6	1.1	1.5	H(m)		36	35	33	31	29	25	19	10	3
4SDm10/9	4SDm10/9	1.5	2.0			55	53	50	47	43	37	28	15	5
4SDm10/13	4SDm10/13	2.2	3.0			79	77	72	68	63	54	41	22	7
	4SDm10/18	3.0	4.0			109	107	100	94	87	75	57	31	9
	4SDm10/23	4.0	5.5			139	136	127	121	111	95	72	39	12
	4SDm10/28	5.5	7.5			170	166	155	147	135	116	88	48	14

4SD16

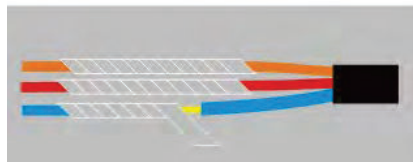
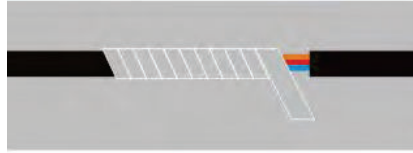
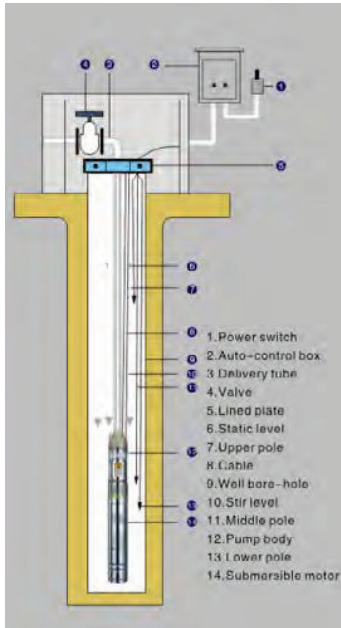
PERFORMANCE CURVES



PERFORMANCE TABLE

TYPE		MOTOR POWER		DELIVERY N ~ 2850 R/MIN											
1~ 220 V/240 V	3~ 380 V/415 V			Q	m³/h	0	6	8	10	12	14	16	18	20	21
		kW	HP			l/min	0	100	130	165	200	230	265	300	330
4SDm16/7	4SDm16/7	1.5	2.0	H(m)		38	33	30	28	25	22	18	13	8	3
4SDm16/10	4SDm16/10	2.2	3.0			55	47	44	40	36	32	26	19	11	4
	4SDm16/13	3.0	4.0			71	61	57	52	47	41	34	25	14	5
	4SDm16/17	4.0	5.5			93	80	74	68	61	54	44	32	19	7
	4SDm16/22	5.5	7.5			120	103	96	88	79	70	57	42	24	9
	4SDm16/28	7.5	10.0			153	132	122	112	100	89	73	53	31	11

INSTALLING A BOREHOLE PUMP AND MOTOR



MAXIMUM CABLE LENGTH FROM PUMP TO STARTER

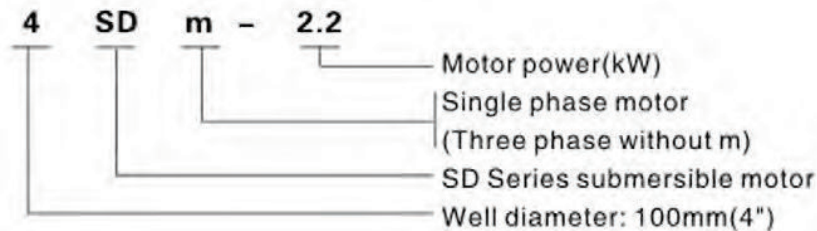
Type	7.5k W	i_n (A)	1.5 mm ²	2.5 mm ²	4 mm ²	6 mm ²	10 mm ²	16 mm ²	25 mm ²
220V~/50H	0.25	3.9	122	207					
	0.37	4.2	111	185	295				
	0.55	4.5	80	133	211	315			
	0.75	6	58	96	153	229	377		
	1.1	9	48	79	153	190	316		
	1.5	10.3	34	57	92	137	228		
	2.2	14.6		43	68	102	169		
380V~/50H	0.25								
	0.37	1.4	768						
	0.55	2.2	489	811					
	0.75	2.3	416	691					
	1.1	3.4	281	467	744				
	1.5	4.2	219	363	579	862			
	2.2	5.5	153	254	405	605	997		
	3	7.9	113	188	300	447	736		
	4	9.6	89	147	235	350	578	909	
	5.5	13.6	66	109	174	260	427	671	
	7.5	17.6	49	81	130	193	319	501	746

4" OIL FILLED MOTOR - SINGLE PHASE

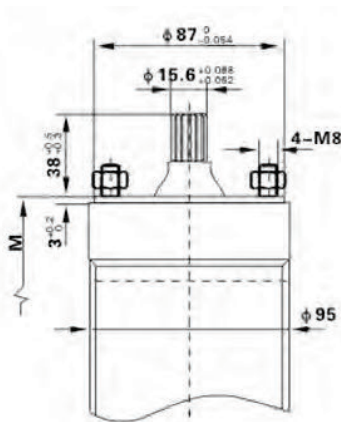


MOTOR TECHNICAL DATA

Single phase power:	0.37 to 2.2 kW
Speed:	2850rpm
Voltage:	220V/50Hz
Insulation class:	B
Protection grade:	IP 68
Highest temperature of liquid:	35oC
Maximum solid handling:	40g/m ³
Motor casing:	stainless steel
Maximum diameter:	Ø 95 mm
With sandproof cover/pressure balance membrane/mechanical seal for high performance.	
Flange and coupling according to NEMA standard.	

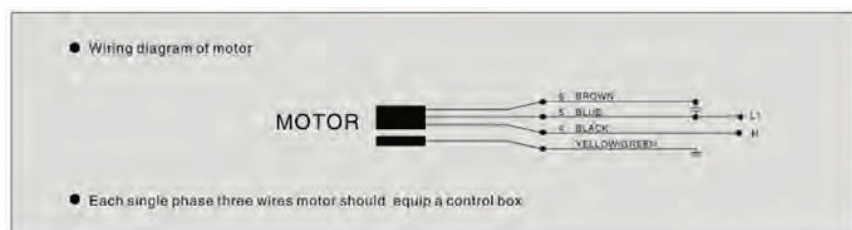
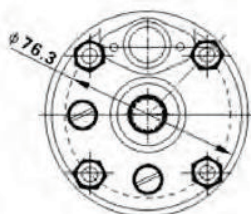


MOTOR DIMENSIONS



TYPE Single Phase 220 V~/50HZ	MOTOR POWER		DIMENSIONS	
	kW	HP	Length (mm)	Weight (kg)
4SDm-0.37	0.37	0.5	407	8.2
4SDm-0.55	0.55	0.75	437	8.6
4SDm-0.75	0.75	1.0	457	9.3
4SDm-1.1	1.1	1.5	477	10.7
4SDm-1.5	1.5	2.0	537	13
4SDm-2.2	2.2	3.0	617	17.7

MOTOR WIRING



CSR PERFORMANCE DATA: 4" OIL FILLED MOTOR, SINGLE PHASE

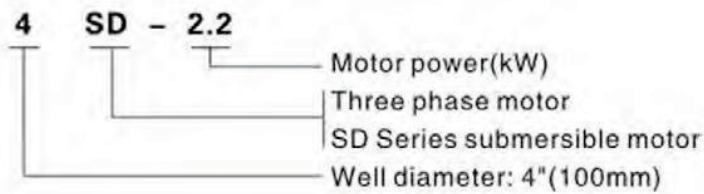
TYPE Single Phase 220 V~ /50HZ	P _N		THRUST LOAD	U _N	n _N	I _N	I _A	η (%)			COSφ			T _N	T _A
	(kW)	(HP)	(N)	(V)	(min- 1)	(A)	(A)	50	75	100	50	75	100	(Nm)	(Nm)
4SDm-0.37	0.37	0.5	1500	220	2815	3.35	10	36.2	43.3	56	0.95	0.97	0.98	1.255	1.04
4SDm-0.55	0.55	0.75	1500	220	2825	4.24	15.3	45	54.2	60.6	0.97	0.98	0.99	1.88	1.39
4SDm-0.75	0.75	1	1500	220	2824	5.34	18.8	56.3	59.1	65.5	0.99	0.99	0.99	2.536	1.78
4SDm-1.1	1.1	1.5	1500	220	2828	7.34	26.5	56	65	69	0.96	0.98	0.99	3.72	2.31
4SDm-1.5	1.5	2	2000	220	2853	10.28	43.1	53	63	69	0.87	0.92	0.96	5.03	3.62
4SDm-2.2	2.2	3	2000	220	2820	14	51.1	65	69	71.7	1	1	0.99	7.45	4.39

4" OIL FILLED MOTOR - THREE PHASE

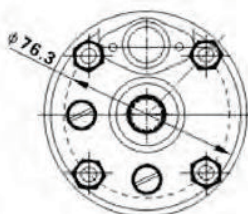
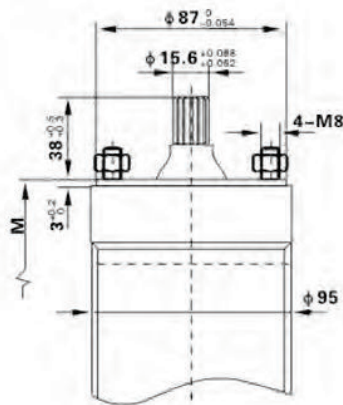


MOTOR TECHNICAL DATA

Single phase power:	0.37 to 2.2 kW
Speed:	2850rpm
Voltage:	220Vwww/50Hz
Insulation class:	B
Protection grade:	IP 68
Highest temperature of liquid:	35oC
Maximum solid handling:	40g/m ³
Motor casing:	stainless steel
Maximum diameter:	Ø 95 mm
With sandproof cover/pressure balance membrane/mechanical seal for high performance.	
Flange and coupling according to NEMA standard.	

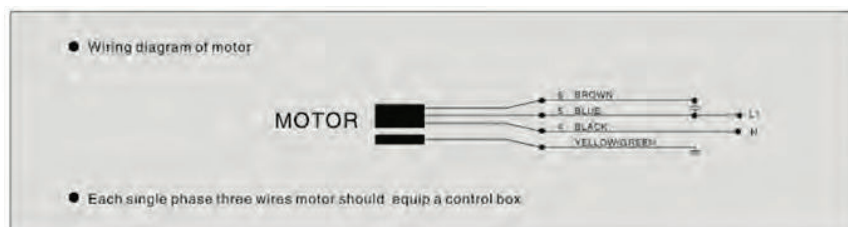


MOTOR DIMENSIONS



TYPE Three Phase 380 V~ /50HZ	MOTOR POWER		DIMENSIONS	
	kW	HP	Length (mm)	Weight (kg)
4SD - 0.37	0.37	0.5	407	8.2
4SD - 0.55	0.55	0.75	437	8.6
4SD-0.75	0.75	1.0	457	9.5
4SD-1.1	1.1	1.5	477	11.3
4SD-1.5	1.5	2.0	537	13.2
4SD - 2.2	2.2	3.0	572	16.5
4SD - 3	3.0	4.0	647	19.2
4SD- 4	4.0	5.5	697	22.0
4SD - 5.5	5.5	7.5	797	27.6
4SD - 7.5	7.5	10.0	955	39.0

MOTOR WIRING



CSR PERFORMANCE DATA: 4" OIL FILLED MOTOR, THREE PHASE

TYPE Three Phase 380 V~ /50HZ	P _N		THRUST LOAD	U _N	n _N	I _N	I _A	η (%)			COSφ			T _N	T _A
	(kW)	(HP)	(N)	(V)	(min- 1)	(A)	(A)	50	75	100	50	75	100	(Nm)	(Nm)
4SD - 0.37	0.37	0.5	1500	380	2870	1.37	7.12	49.2	58	60	0.52	0.6	0.7	1.23	3.4
4SD - 0.55	0.55	0.75	1500	380	2862	1.86	9.8	50.4	63.3	63.5	0.53	0.6	0.7	1.82	5.6
4SD-0.75	0.75	1	1500	380	2854	2.13	11.1	67.4	37	69.5	0.52	0.67	0.77	2.52	6.93
4SD-1.1	1.1	1.5	1500	380	2868	3.01	17.4	64	72	73.8	0.53	0.65	0.75	3.67	11.8
4SD-1.5	1.5	2	2000	380	2875	4.23	24.9	65	72	76	0.51	0.61	0.71	5.01	17.6
4SD - 2.2	2.2	3	2000	380	2841	5.64	30.5	69.3	74	77	0.55	0.7	0.77	7.41	22.8
4SD - 3	3	4	2500	380	2820	7.7	34.3	71	74.6	77	0.59	0.71	0.78	10.16	28.1
4SD- 4	4	5.5	2500	380	2815	9.9	44.8	72.7	75.4	76	0.77	0.88	0.9	13.57	33
4SD - 5.5	5.5	7.5	3500	380	2826	13.5	58.9	73.4	78	78	0.7	0.8	0.87	18.59	41.4
4SD - 7.5	7.5	10	4500	380	2822	17.8	71.1	75	79	81	0.68	0.77	0.82	25.38	45.9

4" WATER FILLED MOTOR - SINGLE & THREE PHASE



MOTOR TECHNICAL DATA

Rewindable motor.

Single phase: 0.37 to 2.2 kW, 220 - 230V/50Hz

Three phase: 0.37 TO 2.2kW, 380 - 415V/50Hz

Speed: 2850rpm

Voltage: 220V-240V-/50Hz

Insulation class: B

Protection grade: IP 58

Maximum oil temperature: 35°C

Maximum starts/hour: 30

Allowable voltage variation: +6% -10%

Maximum solid handling: 40g/m³

Motor shaft: stainless steel

Stator shell: stainless steel

Upper/lower bracket: cast iron with nickel coating

Maximum submergence depth: 250m

Mounting: vertical/horizontal

Motor cable length: 3m

Coolant: Clear water

Single phase motors are capacitor start and run.

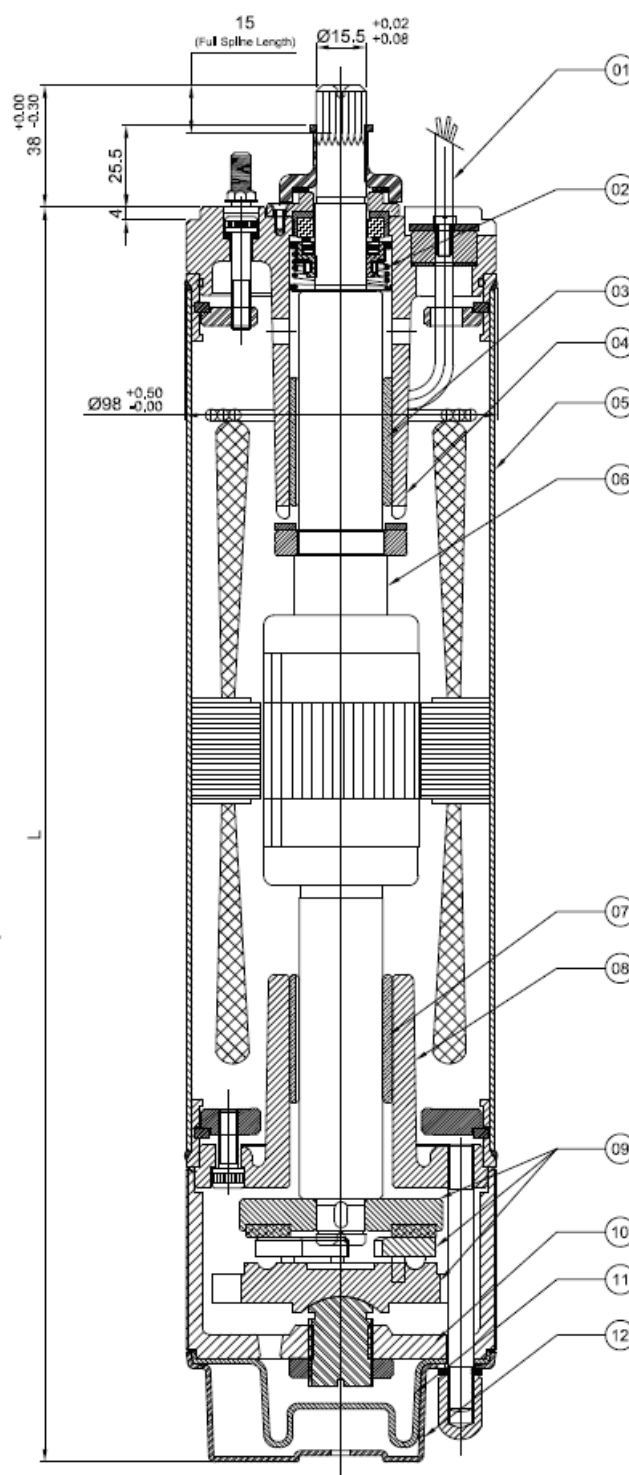
Coupling dimensions as per NEMA standard.

Winding wires are dual coated enamelled.

MOTOR DIMENSIONS

MOTOR POWER		DIMENSIONS	
kW	HP	Length (mm)	Weight (kg)
0.37	0.5	535	12.4
0.55	0.75	550	14.2
0.75	1	570	16.4
1.1	1.5	580	20.8
1.5	2	590	23.4
2.2	3	640	26.2
3	4	740	32.2
4	5.5	800	38.8
5.5	7.5	880	40.0
7.5	10	1020	45.2

SERIAL NO.	PART NAME	MATERIAL
01	Cable 3 Core/4 Core	EPR
02	Mechanical Seal	Ceramic/Carbon
03	Bearing Bush	Carbon
04	Upper Housing	CI (FG-200)/S.S.304
05	Motor Pipe	Stainless Steel
06	Rotor shaft	S.S.420
07	Bearing Bush	Carbon
08	Lower Housing	CI (FG-200)
09	Thrust Bearing set	Carbon/S.S. 420
10	Lower Part - 2	CI (FG-200)
11	Pressure Cup	N.B.R.
12	Motor Base	S.S.304
13	All Hardware	S.S.316



CSR PERFORMANCE DATA OF SINGLE PHASE MOTORS (220Volt/50Hz)

P _N		THRUST LOAD	U _N	n _N	I _N	I _A	η (%)			COSφ			T _N	T _A	CAPACITOR RUNNING
(kW)	(HP)	(N)	(V)	(min-1)	(A)	(A)	50	75	100	50	75	100	(Nm)	(Nm)	μF (U _C = 450 V)
0.37	0.5	1500	220	2855	3.21	10.6	37	49	56	0.89	0.93	0.96	1.21	0.93	72
0.55	0.75	1500	220	2845	4.19	15.38	47	58	64	0.91	0.94	0.97	1.86	1.28	72
0.75	1	1500	220	2845	5.79	20.21	45	56	61	0.95	0.98	0.99	2.45	1.99	72
1.1	1.5	3000	220	2850	8.41	30.11	47	58	64	0.91	0.95	0.98	3.70	2.81	72
1.5	2	3000	220	2805	10.59	33.91	52	62	68	0.92	0.95	0.98	4.97	3.28	72
2.2	3	4000	220	2815	16	54.1	52	60	64	0.95	0.96	0.99	7.41	4.37	108

CSR PERFORMANCE DATA OF THREE PHASE MOTORS (380Volt/50Hz)

P _N		THRUST LOAD	U _N	n _N	I _N	I _A	η (%)			COSφ			T _N	T _A
(kW)	(HP)	(N)	(V)	(min-1)	(A)	(A)	50	75	100	50	75	100	(Nm)	(Nm)
0.37	0.5	1500	380	2835	1.32	5.05	58	65	67	0.6	0.72	0.8	1.23	2.71
0.55	0.75	1500	380	2835	1.59	6.00	60	66	67	0.60	0.72	0.81	1.89	3.11
0.75	1	1500	380	2845	2.01	8.88	64	67	70	0.58	0.71	0.79	2.50	4.81
1.1	1.5	3000	380	2825	3.00	13.70	68	72	73	0.58	0.72	0.81	3.79	9.61
1.5	2	3000	380	2845	3.91	18.59	68	72	73	0.60	0.72	0.81	5.0	11.31
2.2	3	4000	380	2820	5.90	28.68	71	75	75	0.59	0.72	0.81	7.59	21.71
3	4	4000	380	2810	8.5	29.5	62	67	70	0.72	0.78	0.82	10	16
4	5.5	4000	380	2790	10.79	32.29	62	67	71	0.72	0.79	0.83	13.39	21.25
5.5	7.5	4000	380	2785	14.79	50.4	69	73	74	0.74	0.79	0.84	18.93	37.19
7.5	10	4000	380	2855	18.00	61.1	70	72	73	0.98	0.95	0.92	24.58	45.10

P_N - Rated Output
 U_N - Rated Voltage
 n_N - RPM
 I_N - Full Load Current
 I_A - Starting Current

η - Motor Efficiency
 cosφ - Power Factor
 T_N - Full Load Torque
 T_A - Starting Torque
 F_[N] - Axial Thrust Load

4" CONTROL BOX - SINGLE PHASE OIL FILLED

TECHNICAL DATA

This single phase capacitor operating motor is equipped with an external capacitor and over-load protector.

APPLICATION RANGE

Type of motor: Single phase motor
Motor power: 0.25-2.2kW
Voltage: 220V
Frequency: 50Hz



PRODUCT FUNCTIONS

Protects against short circuiting and over current.

OPERATING METHOD

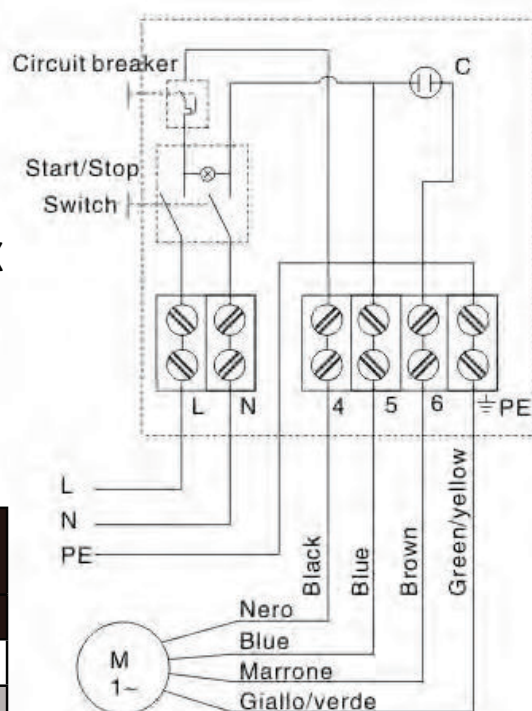
Manual control.

INSTALLATION ENVIRONMENT INDEX

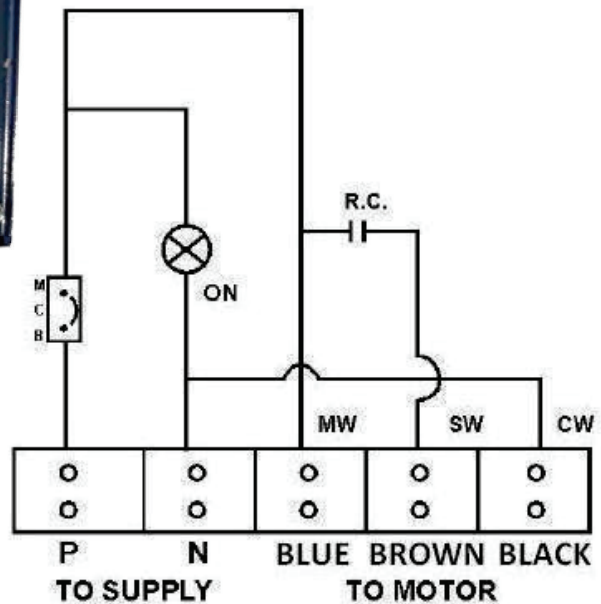
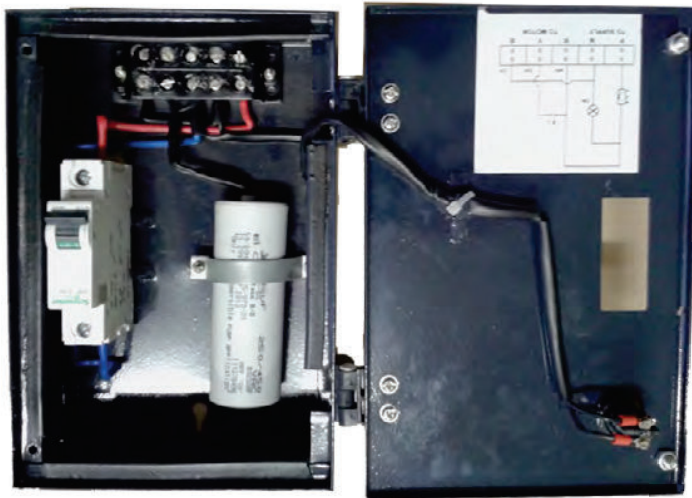
Grade protection: IP20
Environment temperature: -25°C to +55°C
Environment humidity: (20-90)%RH

PERFORMANCE DATA

POWER		RUNNING CAPACITOR	MCB
kW	HP	Microfarad (μF)	Amp
0.25	0.33	16	6
0.37	0.50	20	8
0.55	0.75	30	10
0.75	1.00	40	15
1.1	1.50	50	15
1.5	2.00	65	20
2.2	3.00	80	25

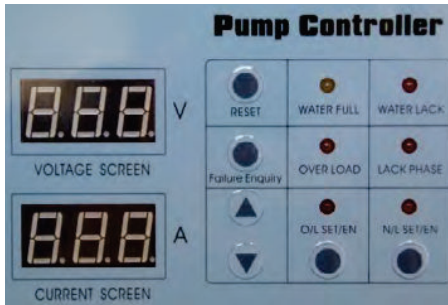


4" CONTROL BOX - SINGLE PHASE WATER FILLED



POWER		MODEL DETAIL	RUNNING CAPACITOR	MCB
kW	HP		Microfarad (μ F)	Amp
0.37	0.50	Single Phase Panel with MCB & Capacitor	36	6
0.55	0.75		36	10
0.75	1.00		36	10
1.1	1.50		36	20
1.50	2.00		72	20
2.2	3.00		72	20

4" DIGITAL STARTER PROTECTOR - THREE PHASE



GENERAL DESCRIPTION

The 3 phase pump controller is an electronic control/protector for most pump motors and its operation and installation will be explained in the following pages:

1. Over current/under voltage protection is performed automatically by switching the main supply to the pump motor off.
2. In the event of a power failure or input voltage lower than 160V, the controller will switch off the power to the pump motor in 4 seconds.
3. The unit can also determine water levels in tanks or reservoirs and control the pump according to demand.

TECHNICAL FEATURES

Rated Voltage:	380V $\pm$ 15%
Output Power:	4kW (8 amp)
Operating Temperature:	-10 to +40°C
Control Distance:	1km
Humidity:	$\leq$ 90%
Height above Sea Level:	2000m
Protection function:	Time extension feature

OVERLOAD (TIMES)	PROTECTION TIME (SECONDS)
1.3	50
1.5	30
2	15
3	6
5	1



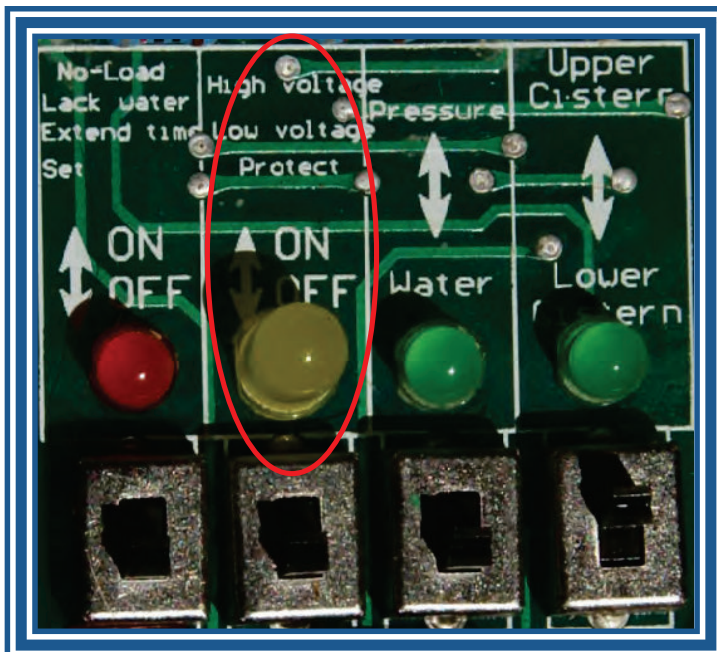
OPERATION

1. **Water level control:** one reservoir/ water tank can be controlled via the wiring connection at the bottom of the controller.

2. **over load protection:** At the loss of any one phase, the phase detection CCT will signal the power contactor to drop out and switch the power supply to the pump motor off. Should for any reason the motor draw too much (high) current (see current setting) the over current protection CCT will signal the power contactor to drop out and switch of the power to the motor. This is done automatically in the time set by the installer, see Setting and Adjustments for high current and fast switch off times (anti-time overload protection). The overload LED / light will light up (blink) in the event of a power failure. Also refer to the failure enquiry feature.

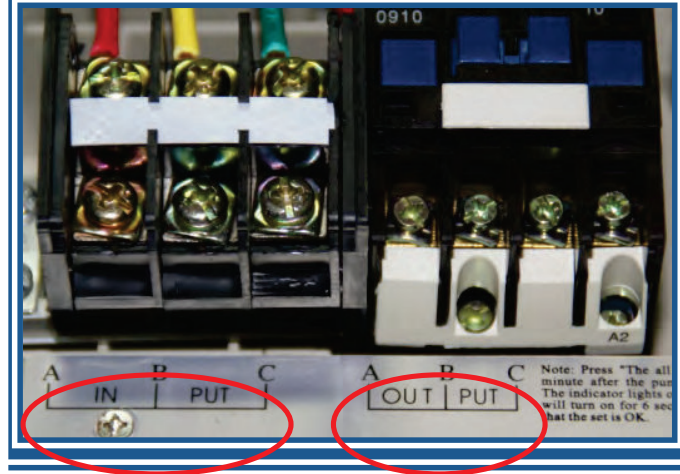
3. **Short CCT protection:** The controller will react the same as in the case of an overload, high current condition occurring and power to the pump motor will be switched off within the same time limit as set by the installer.

4. **over/under Voltage protection:** The small LED on the PCB will blink if this function is switched on. The voltage may vary as specified - 380V $\pm$ 15%. The controller will self protect within 20 seconds when the voltage drops below 280V.



INSTALLATION

1. Fit the controller vertically to the appropriate area. Avoid dust, sun light and rain.
2. Connect the input power to the 3 phase input terminal marked A,B and C.
3. Connect the pump motor cable wiring to the output terminals also marked A, B and C. They are to the right of the input connections.



4. Connect the water reservoir/tank probe cables to the terminals marked high, med and low at the right bottom of the PC board. Also note the small switch below the green LED, on far right-hand side just above the tank terminals. A selection can be made for the upper or lower tank.

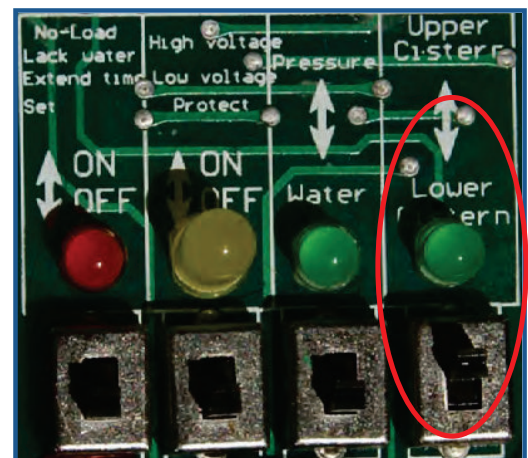


Lower tank/Cistern:

Max water level: Power on
Min water level: Power off

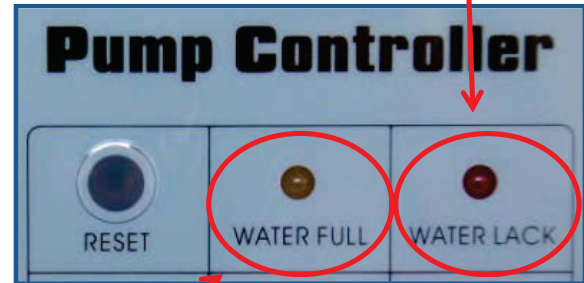
Upper tank / Cistern:

Min water level: Power on
Max water level: Power off



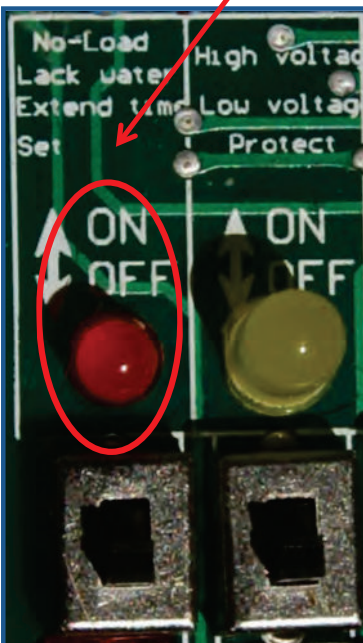
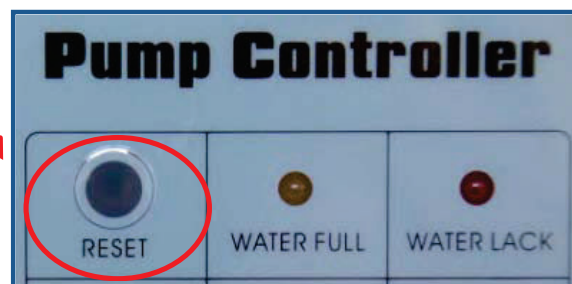
5. **Lack of water:** Switch to lower cistern. Should the lower tank lack water, whilst the pump is still running, the pump motor current will be low and the controller will sense this low current or no-load situation as there is no water in the tank and will therefore switch power to the motor off within 10 seconds.

6. Should the pump be in power-on mode but it has been switched off for a no-load fault and the tanks are now full of water, the probes in the tank will signal that the tank is full and the contactor will supply power to the motor. The unit will also do a self test every 30 minutes (adjustable), provided that no-load switch is on.



7. The **water full** LED will come on as the tank probes signal that the water is at a high level.

8. **Reset** on the front panel should only be used to get the pump's motor running again, in the event of the controller switching off, after the installation has gone through a fault finding test.



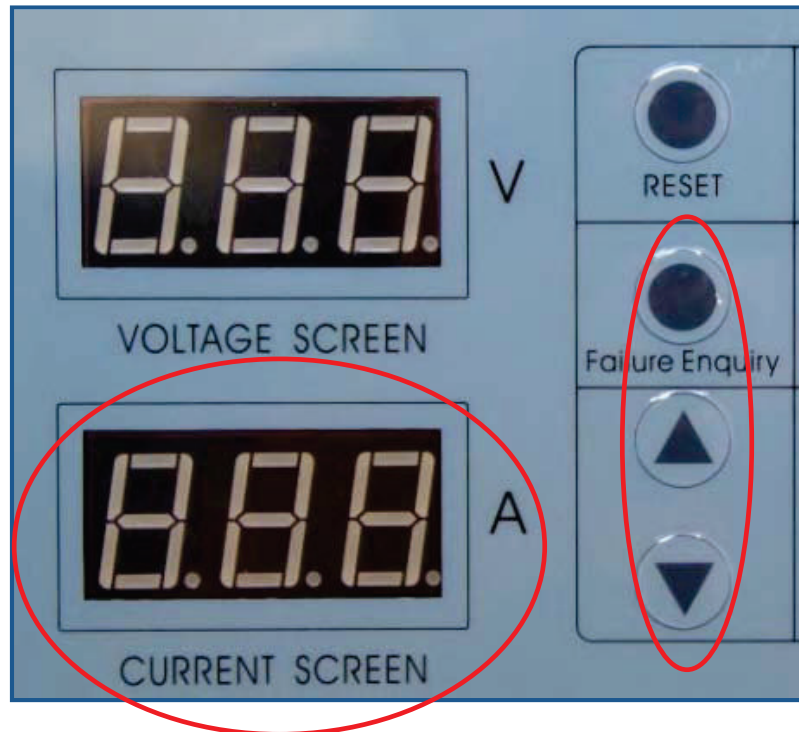
9. The user may also select water level or pressure control by switching to either function on the small PCB's second last switch, marked "pressure" and "water".

10. Switch to upper cistern, pump will not run. Lack of water will send a signal to switch on the power to pump motor.



SETTINGS AND ADJUSTMENTS

1. This unit has 10 failure data reports and by pressing the failure enquiry button on the front panel the user can select, with the arrows, any report that will be displayed on the digital current indicator A.



Should a failure light blink, pressing the failure enquiry button will result in the current indicator showing that particular fault condition. Overload will show overload current.

2. Should a phase loss be indicated on the front panel, the user will see the following on the current indicator when pressing the failure enquiry button:

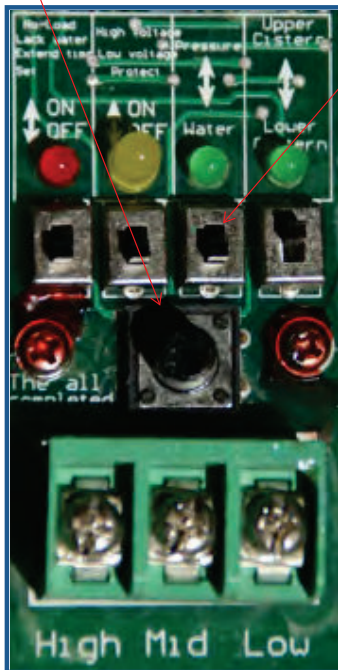
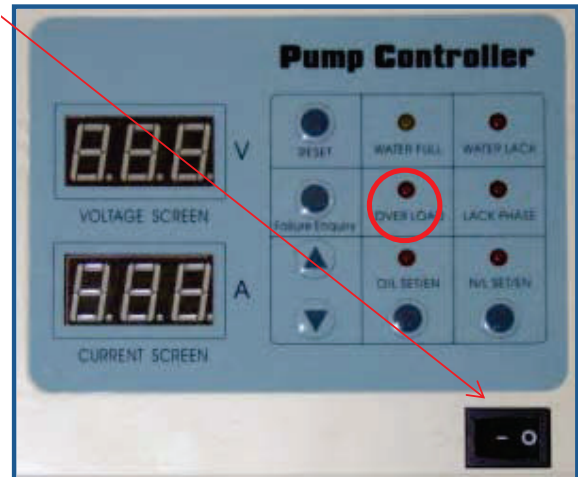
- 011 - phase A loss
- 101 - phase B loss
- 110 - phase C loss
- 111 - this code with the light on means that the input connections are not wired properly or the pressure mode senses low pressure which causes switch off condition and one has to re-set continuously until the fault has been fixed.



3. The **on/off switch** on the front panel may also be used to stop the function of the controller or switch the pump motor back on again.

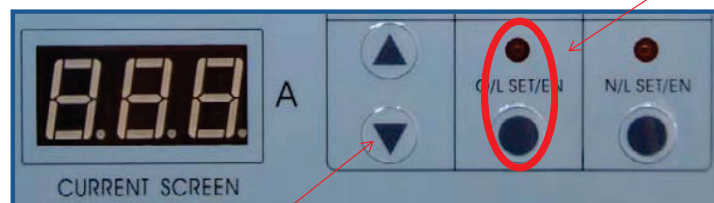
4. The **“all complete / enter” button**: after running the pump motor normally for 60 seconds the user may press the “enter” button mentioned above. This is found on the PCB above the level connectors. Note that the overload LED on the front panel will flicker for 6 seconds and then turn off.

This means that the running and overload current settings with other functions have been memorized and the controller is in the ready state.



5. By selecting “lower or upper tank/cistern”, “pressure or water” the installer/user will notice that the LED corresponding to that switch will be on if the switch is in the lower position. The LED will go off in the upper position. Also note that the factory default signal to the controller is set on the “upper cistern”.

6. **over-load setting**: Switch the controller on and take note of the running current, then press the overload set/confirm (O/L SET/EN) with the LED now ON.



Press the up/down arrow button to select or adjust the digital indicator to the value recorded and a bit more, then press the O/L SET/EN button with the LED now off.

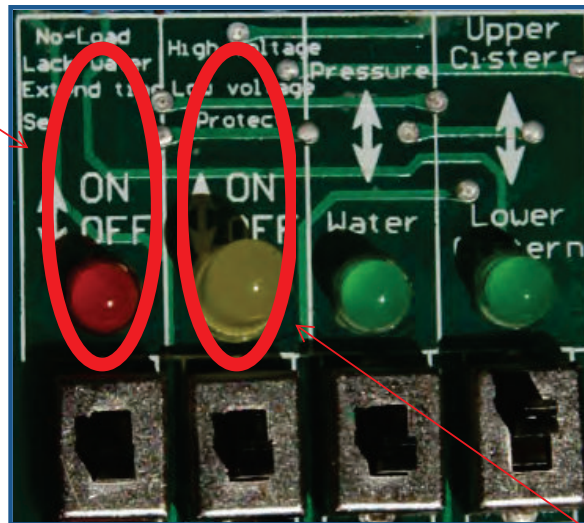
7. No-load setting. Start the pump motor and run for 60 seconds with “no load” . The current should be low. Record this value and press the set/confirm (N/L SET/EN) button on the front panel. With the LED above now “on”, select and adjust with the up/down arrow buttons the current setting as displayed on the digital display.

Press the N/L SET/EN button again with the LED off. The value has been recorded and

memorized. The no-load current can be set directly as 0.85 times that of the normal operating/running current. The factory default no-load setting is 0.1 amp.



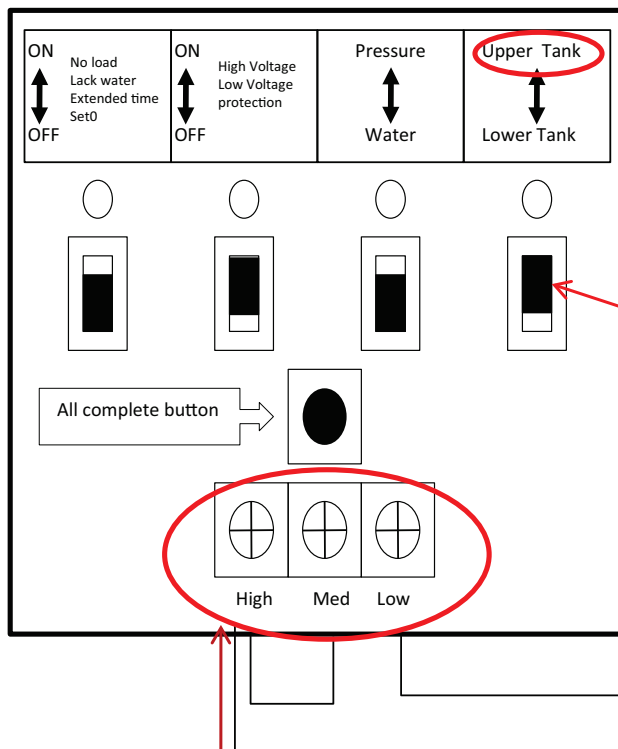
8. No-load reset time. After running the pump motor, switch the “no-load lack water extended set” switch to “on”, located below the red LED. The current digital indicator now shows the no-load reset time in minutes. By adjusting with the “up/down” arrows, select the time required. Then switch to “off”. The time has now been recorded and memorized. Suggested time is 20 minutes as the factory default time is 30 minutes.



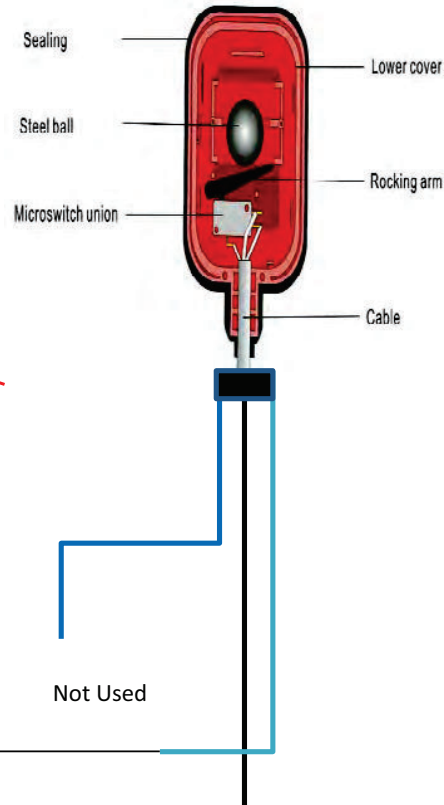
9. over/Under voltage. After running the pump motor, switch the “high/low voltage” switch to “on”. This is located under the yellow LED on the board and the light will be on. This will ensure that the high/low voltage protection function/protector is ON and will protect as per the specification of $380V \pm 15\%$.

FLOAT LEVEL CONNECTIONS

Tank Filling - upper tank connections:



Float Level FSK-1

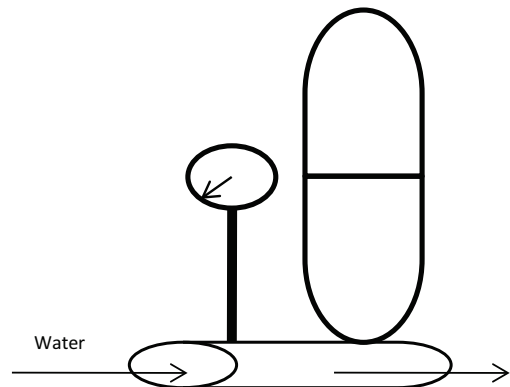
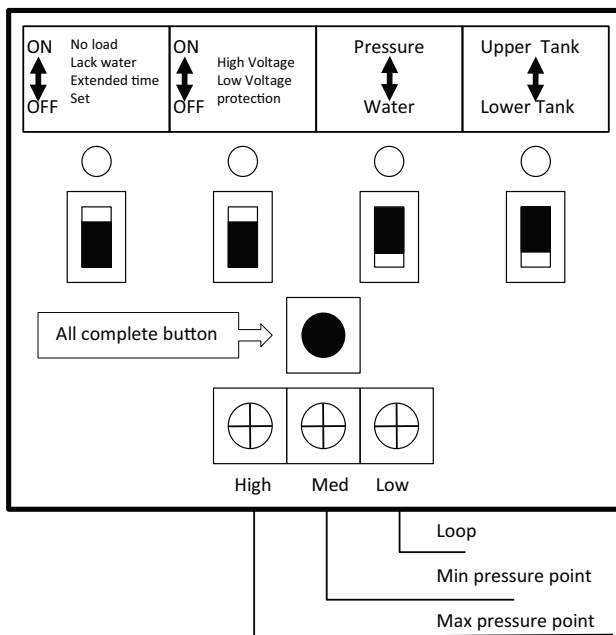


When tank is empty there should be an open circuit Low and Med-High, pump will then start.

FAULT FINDING

If the control unit is connected to the water pressure system and the pump motor does not switch on at the minimum pressure, check the following:

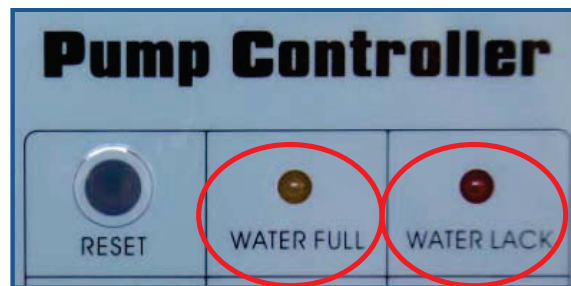
1. Ensure that the wiring is done correctly, see diagram.



2. If the wiring is correct and the system still does not operate correctly, remove the wiring and short CCT the terminals H, M and L. Start the pump motor. If the motor runs, it is an indication that the wiring to the pressure system is faulty or the probes are defective. Repeat by shorting and disconnecting to make sure the unit is fine.



3. Should the same problem occur with the water tank system, use the same test procedure described in the previous point. This will eliminate the level probes from the control unit and probe wiring.
4. Should the “full” or “lack “ LED’s on the front panel flash, proceed as follows to find the problem: Always check the wiring between the control unit and the water system first. Incorrect signals are sent to the control unit and simulator test as described above for tank/ pressure systems may be used to establish if the controller unit is faulty or not.



5. Should the pump motor always be in in “overload” protection mode, check the following:
 - Pump motor is not faulty or locked
 - The overload protection is set correctly, always make sure that the overload current is set higher than the normal running current.

FAILURE ENQUIRY

The control unit will have the last 10 failure reports. By pressing the above mentioned button, failure reports will be indicated on the digital current screen. First reports will always be the phase conditions as describe in Settings and Adjustments.

