PRODUCT CATALOGUE

3 & 4” BOREHOLE PUMPS

2020

KELi PUMPS

INDEX

KELi PUMPS

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3 SDM BOREHOLE RANGE

3”

3 SDM BOREHOLE RANGE

3”

APPLICATIONS

For water supply from boreholes, wells or reservoirs
Continuous duty rated products for use in domestic, farming and irrigation applications.

OPERATING CONDITIONS

Maximum fluid temperature up to	+ 35 ° C
Maximum sand content:	0.25%
Minimum well diameter:	3”

MOTOR AND PUMP

Replaceable Pump and Motor.
Single-Phase: 220 - 240V/50Hz
Equipped with start control box or digital auto-control box.
Curve tolerance according to ISO 9906

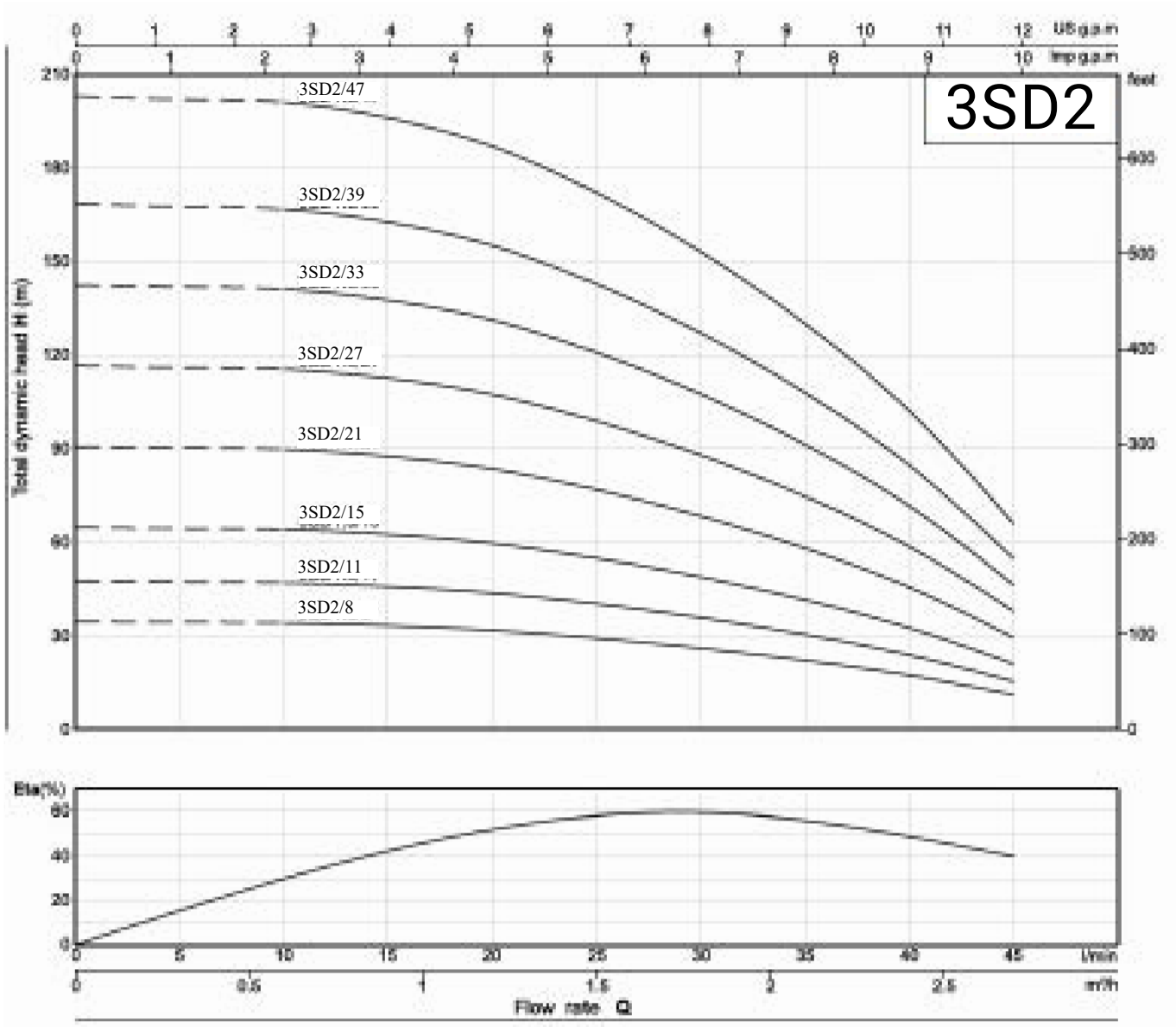
Warranty: 1 year
(according to our general sales conditions)

Components	Material
Pump external casing	AISI 304 SS
Delivery casing	Cast-Cu ASTM C85500
Suction lantern	Cast-Cu ASTM C85500
Diffuser	Plastic.PC
Impeller	Plastic.POM
Shaft	AISI 304 SS
Shaft coupling	AISI 304 SS
Wear ring	AISI 304 SS
Motor external casing	AISI 304 SS
Top chock	①Cast-Cu ASTM C85500
	②Cast-iron ASTM NO.30
Bottom support	AISI 304 SS
Mechanical seal	Special seal for deep well(Graphite-Ceramic/TC)
Shaft	AISI 304 SS-ASTM 5140
Bearing	NSK
Seal lubricant oil	Oil for food machinery and pharmaceutic use.

3SD(M) 2 / 8(N)

- built-in capacitor (outboard capacitor with no N marked)
- impeller's number
- capacity (m^3/h)
- single phase (three phase with no M marked)
- pump name
- well Ø 3"

3 SDM 1.8



PERFORMANCE DATA 50 HZ

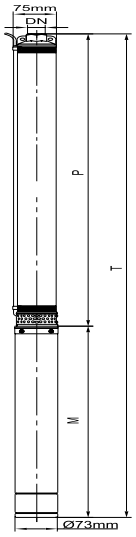
VERSION		MODEL	P2		CAP µf	DELIVERY									
1*	2**	3 ~ 380-415V	kW	HP		m3/h	0	0.3	0.6	0.9	1.2	1.5	1.8	2.1	2.4	2.7
						l/min	0	5	10	15	20	25	30	35	40	45
√	√	3SDM2/8	0.18	0.25	16	Head (m)	35	34	34	33	32	29	26	22	17	11
√	√	3SDM2/11	0.25	0.39	16		48	47	47	46	44	40	36	30	24	15
√	√	3SDM2/15	0.37	0.5	20		65	64	64	63	60	55	49	41	33	21
√	√	3SDM2/21	0.55	0.75	25		91	90	90	88	84	77	68	58	46	29
√	√	3SDM2/27	0.75	1	35		117	116	115	113	107	99	88	75	59	38
√		3SDM2/33	1.1	1.5	45		143	142	141	138	131	121	107	91	72	46
√		3SDM2/39	1.1	1.5	45		168	168	167	163	155	143	127	108	85	55
√		3SDM2/47	1.5	2	55		203	202	201	196	187	172	153	130	102	66

* Version 1 Pump, Motor & Control Box
** Version 2 Pump, Motor, Control Box, Base plate, Cable (lenght - refer pricelist), Jiont & Rope.
Note: Unit c/w maximum 1.5mm 4 core cable.
However, it is not recommended for use for lengths longer than 60m.
For applications where longer distances are required it is advised to purchase the Version 1 kit. Refer to the 3" & 4" Borehole Catalogue (p.7) for the cable length chart to ensure correct cable size is purchased.

TECHNICAL DATA

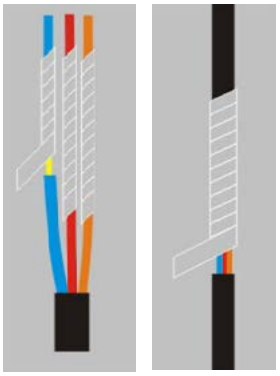
DIMENSIONS AND WEIGHTS

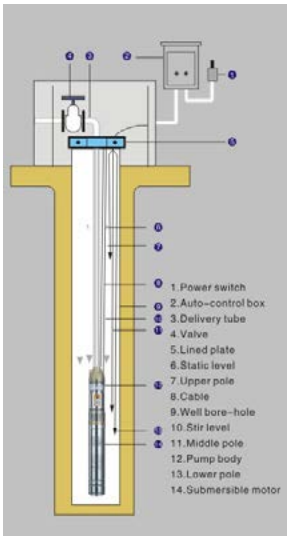
MODEL	DN	DIMENSIONS(mm)			WEIGHTS (kg)		
1 ~220-240		P	M	T	P	M	T
3 SDM 2/ 8	1 ¼"	377	288	665	1.8	4.0	5.8
3 SDM 2 / 11	1 ¼"	444	308	752	2.1	4.8	6.9
3 SDM 2 / 15	1 ¼"	535	338	873	2.4	5.6	8.0
3 SDM 2 / 21	1 ¼"	694	368	1062	3.2	6.4	9.6
3 SDM 2 / 27	1 ¼"	830	408	1238	3.5	7.5	11.0
3 SDM 2 / 33	1 ¼"	966	448	1414	4.3	8.7	13.0
3 SDM 2 / 39	1 ¼"	1101	493	1594	4.9	10.0	14.9
3 SDM 2 / 47	1 ¼"	1306	543	1849	5.8	11.3	17.1



INSTALLING A BOREHOLE PUMP AND MOTOR

SINGLE PHASE 3" OIL FILLED BOREHOLE MOTOR CAPACITOR RATINGS		
kW	Capacitor (mF)	Running Amps
0.18	12	2.2
0.25	16	3.9
0.37	20	4.2
0.55	25	4.5
0.75	35	6
1.1	45	9
1.5	55	10.3
2.2	75	14.6





MAXIMUM CABLE LENGTH FROM PUMP TO STARTER

TYPE	kW	i_n(A)	1.5 mm²	2.5 mm²	4 mm²	6 mm²	10 mm²
220V~/50H	0.18	2.2	171	290			
	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

Note: Unit c/w maximum 1.5mm 4 core cable.
However, it is not recommended for use for lengths longer than 60m.
For applications where longer distances are required it is advised to purchase the Version 1 kit.
Refer to the 3" & 4" Borehole Catalogue (p.7) for the cable length chart to ensure correct cable size is purchased.

PUMP CONTROLLER

MA CONTROL BOX SINGLE PHASE

TECHNICAL DATA

This single phase control box is equipped with a capacitor and thermal over-load protector.

APPLICATION RANGE

Type of motor:	Single phase motor
Motor power:	0.18-1.5kW
Voltage:	220V ~240V
Frequency:	50Hz

PRODUCT FUNCTIONS

Provides basic protection against short circuiting and over current.

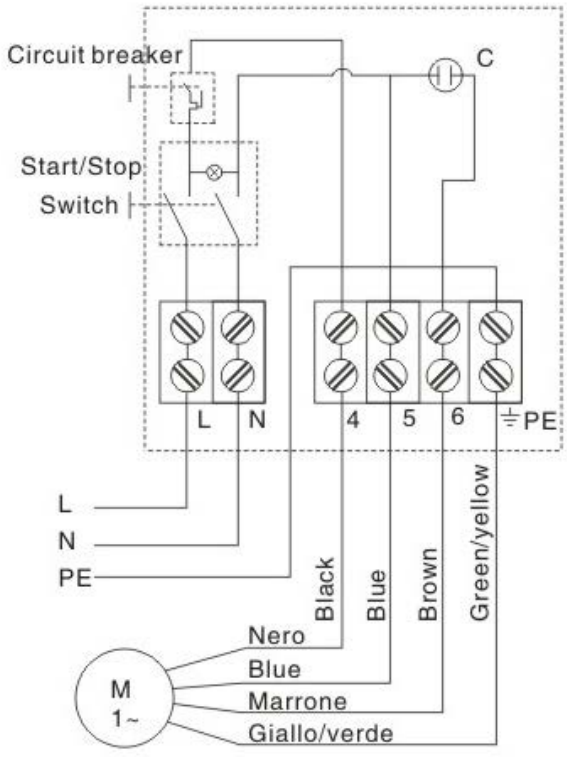
OPERATING METHOD

Manual control.

INSTALLATION ENVIRONMENT INDEX

Grade protection:	IP44
Environment temperature:	-25oC to 55oC
Environment humidity:	(20-90)%RH

POWER		RUNNING CAPACITOR	MCB
kW	HP	Microfarad (μF)	Amp
0.18	0.25	12	8
0.25	0.39	16	8
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



DIGITAL CONTROL BOX

220V DIGITAL VERSION 1

CHARACTERISTIC

Rated Operating Voltage:	AC 230V/50Hz
Rated Output Power:	0.37-2.2KW (0.5-3.0Hp)

Adopt the Digital chip control, integrate in upper/lower water level control and pressure control automatically.

Both “One Key Automatic Setting” and “Manual Setting” for set the overload and under load.

Have overload, under load (dry running), over/under voltage protection.

Under load restart time 1 - 60 minute adjustable.

Domestic original memory function, and easily check the last 10 failure data.

Humanization design, small volume, and convenient installation.

6 stages of processing inspection, 120 hours of dynamic trouble simulation fully aging.

MAIN TECHNICAL SPECIFICATIONS

Locked-rotor Actuating Time:	≤1.5 seconds
Actuating Time for Dry-running Protection:	≤20 seconds.
Local Power Loss: Static Power:	3.5W, Dynamic Power:4.5W.
Over-current Actuating Time:	1 seconds - 1 minute (inverse time lag characteristic - the higher current for the shorter time).

Liquid Level Control Mode: use the pulse electrode probe to detect and its transmission distance is less than or equal to 1000 meters.

Pressure Control Mode: electro connecting pressure gauge, normal open and close type pressure switch, and floating ball liquid level switch.

APPLICATION

Products are widely used in deep well pump, diving pump, dredge pump, pipeline pump, pressure pump, multi-level pump, etc. and used in life supply water, underground drainage, building supply water, etc.

M521 DIGITAL CONTROL BOX SINGLE PHASE

PRODUCT FUNCTIONS

Liquid level control for supply (borehole) and delivery (storage).

Enabled for operation, utilising floating level switch / liquid level probe / pressure switch.

Over / under voltage protection with adjustable parameters.

Auto / Manual operation.

Dynamic and interactive LCD display.

Push Button Calibration

Pump Accumulative Running Time Display

Pump Last Five Fault condition Recording

Controller enabled for operation with single phase motor fitted with internal or external capacitor from 0.37 to 1.5kw.

Capacitor to be retro fitted for borehole motor use.

Refer to capacitor size requirement as per table below.

APPLICATION RANGE

Type of motor:	phase motor
Motor power:	0.37 - 1.5kW
Voltage:	220V
Frequency:	50Hz

INSTALLATION ENVIRONMENT INDEX

Grade protection:	IP22
Environment temperature:	-25°C to 55°C
Environment humidity:	(20-90)%RH

SINGLE PHASE 3" / 4" OIL FILLED BOREHOLE MOTOR CAPACITOR RATINGS	
kW	Capacitor (mF)
0.37	20
0.55	25
0.75	35
1.1	45
1.5	55

TECHNICAL DATA	
RATED OUTPUT POWER	0.18kW - 1.5kW
RATED INPUT VOLTAGE	AC220V/50Hz Single Phase
TRIP RESPONSE TIME OF OVER LOAD	5sec - 5min
TRIP RESPONSE TIME OF SHORT CIRCUIT	0.1sec
TRIP RESPONSE TIME OF UNDER / OVER VOLTAGE	5sec
TRIP RESPONSE TIME OF DRY RUN	6sec
RECOVERY TIME OF OVER LOAD	30min
RECOVERY TIME OF UNDER / OVER VOLTAGE	5min
RECOVERY TIME OF DRY RUN	30min
TRIP VOLTAGE OF OVER VOLTAGE	110% of rated input voltage
TRIP VOLTAGE OF UNDER VOLTAGE	80 of rated input volgage

PROTECTION FUNCTIONS

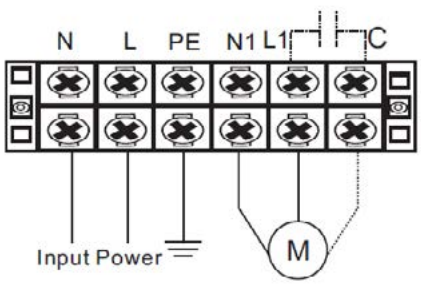
- Dry run
- Over load
- Transient surge
- Under voltage
- Over voltage
- Pump stalled
- Short circuit

MEANING OF THE ICONS SHOWN ON THE LCD

Icon	Meaning/Description
	pump parameter configuration icon, when this icon appears, pump control box is in parameter adjusting manual;
	time displaying icon, when this icon appears, it means pump control box is displaying some parameter of time, eg: pump accumulative running time (unit: hour); counting down etc
	pump fault icon, when this icon appears, it means pump control box is displaying some fault information;
	network connection error icon, when this icon appears, it means there is no network connections or network connection error between pump control box and SC(slave controller) or computer;
	network normal connection icon, when this icon appears, it means the network connection between pump control box and SC (slave controller) or computer is normal;
V	voltage
M	minute
S	second
H	hour
%	percent
A	ampere
	pump running
	pump stops running
	low pressure or lack of pressure in the pipeline or pressure tank
	high pressure or full of pressure in the pipeline or pressure tank

INSTALLATION

ELECTRICAL CONNECTION TO THE POWER SUPPLY:



4 ST BOREHOLE RANGE 4”

LOW FLOW - HIGH PRESSURE

This Slimline submersible borehole pump is suitable for 4" or larger boreholes, wells or reservoirs. Manufactured from corrosion & abrasion resistant materials. This range is manufactured to NEMA standard for submersible motors. Designed for flow rates up to 1.5m³/h and heads of up to 325 meters.

APPLICATION

Groundwater supply to reservoirs.

Irrigation in horticulture and agriculture.

Groundwater Lowering.

Pressure boosting.
Solar applications.

SPECIFICATION

Capacity:	0.5m³/h to 1.5m³/h at 2850rpm, 50Hz
Head:	up to 325m at 2850rpm, 50Hz
Power:	0.37kW to 1.5kW
Power Supply:	Single-phase 220 ~ 240V Three-phase 380 ~ 415V Solar 220v -3phase
Water Temp:	up to 35°C
Solid Handeling:	less than 0.02%
Water PH:	6.5-8.0

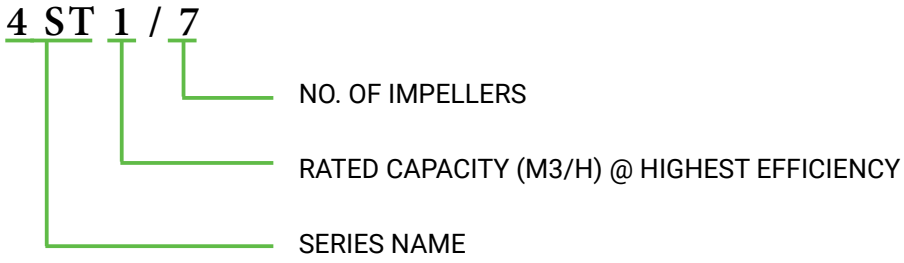
CONSTRUCTION CHARACTERISTICS

Abrasion-resistant construction. The front wear plate, combined with the floating impellers, ensure optimum resistance to abrasion.

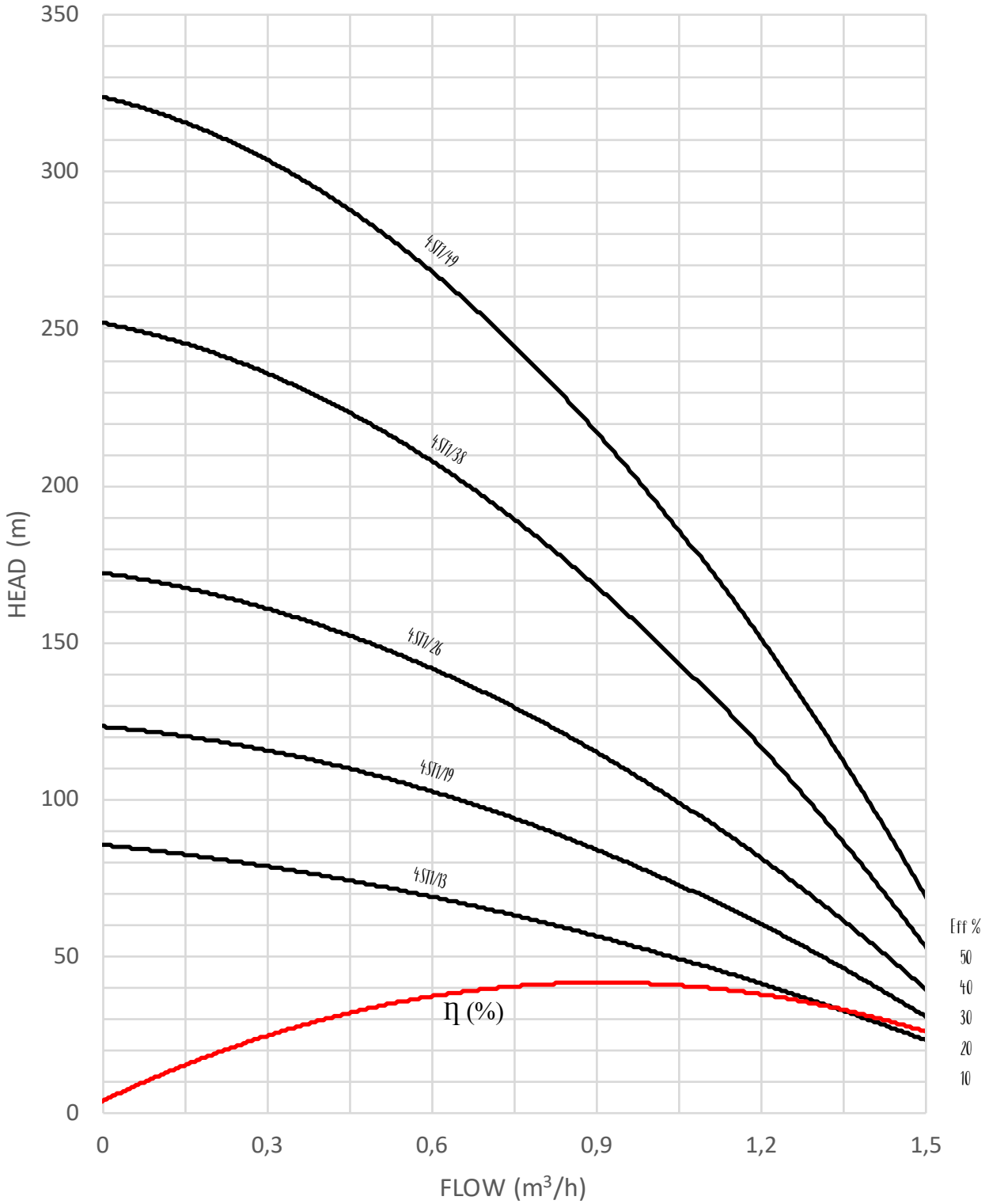
The upper and lower support brackets are cast 304 SS and offer a sturdy platform for connection to motor and discharge pipe. Offers resistance to corrosion and abrasion.

The hexagonal pump shaft guarantees effective impeller rotation.

A Stainless Steel non-return valve is fitted in the discharge and prevents back flow of water.



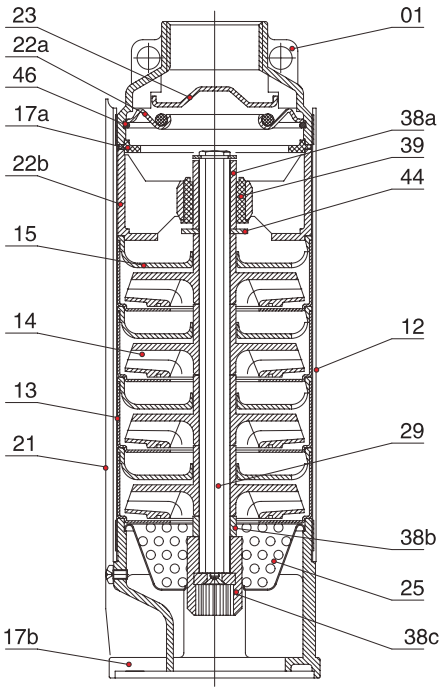
PERFORMANCE DATA



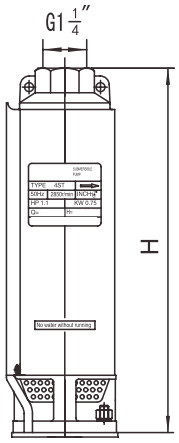
MODEL (50Hz)	P2		Delivery						
			m³/h	0	0.3	0.6	0.9	1.2	1.5
	kW	HP	l/min	0	5	10	15	20	25
4ST1/13	0.37	0.5	HEAD (m)	86	78	70	56	42	23
4ST1/19	0.55	0.75		126	110	105	86	60	30
4ST1/26	0.75	1		173	160	141	117	81	39
4ST1/38	1.1	1.5		253	234	208	169	117	52
4ST1/49	1.5	2		325	302	268	219	151	68

TECHNICAL DATA

ITEM No.	PART NAME	MATERIAL
1	Discharge head	AISI304SS
12	Outer Casing	AISI304SS
13	Bowl	AISI304SS
14	Impeller	PPO
15	Diffuser	PC
17a	Coupling ring	PC
17b	Motor adapter	AISI304SS
21	Cable tube	AISI304SS
22a	Valve seat	AISI304SS
22b	Seat assembly	PC
23	Valve	AISI304SS
25	Strainer	AISI304SS
29	Shaft	AISI304SS
38a	Shaft sleeve	AISI304SS
38b	Coupling spline	AISI304SS
39	Bush bearing	PU
44a	Washer	AISI304SS
44b	Adjusting washer	AISI304SS



MODEL (50Hz)	MOTOR POWER		DIMENSIONS & WIGHTS	
	kW	HP	LENGTH (mm)	N.W kg
4ST1/13	**0.37**	**0.5**	382	3.7
4ST1/19	**0.55**	**0.75**	481	4.7
4ST1/26	**0.75**	**1**	596	5.8
4ST1/38	**1.1**	**1.5**	832	8.1
4ST1/49	**1.5**	**2**	1052	10.45



4 SD BOREHOLE RANGE (4”)

4 SD BOREHOLE RANGE (4”)

APPLICATIONS

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

OPERATING CONDITIONS

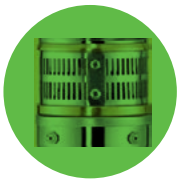
Maximum fluid temperature:	up to 35 ° C
Maximum sand content:	0.25%
Minimum well diameter:	4”

MOTOR AND PUMP

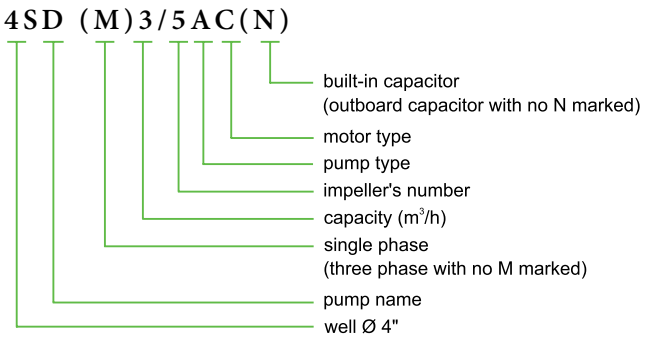
Single-phase:	220 ~240V/50Hz
Three-phase:	380 ~415V/50Hz
Solar:	220v-3phase

Equipped with start control box or digital auto-control box
NEMA dimension standards
Curve tolerance according to ISO 9906
WARRANTY: 1YEAR

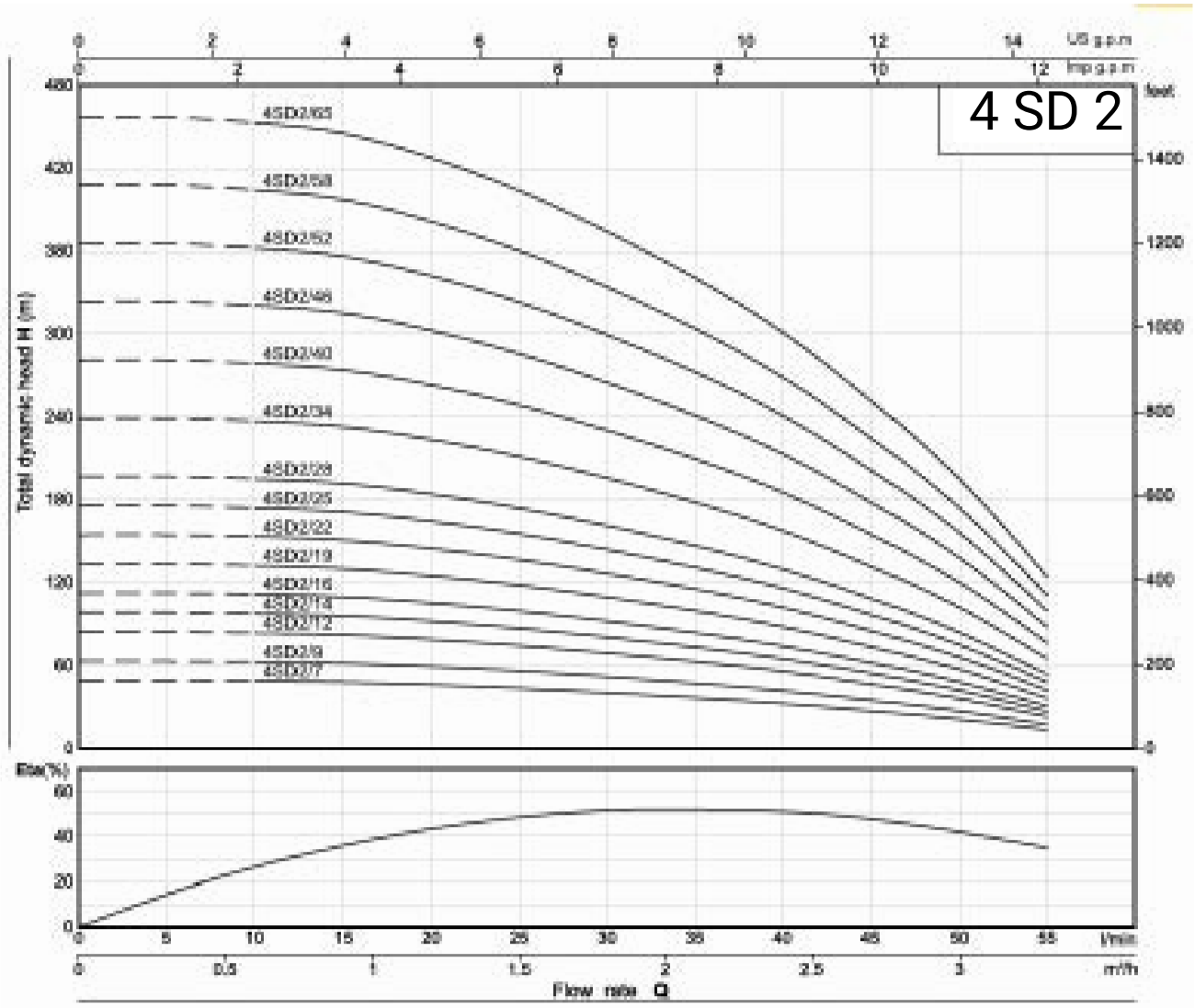
(according to our general sales conditions).



Components	Material
Pump external casing	AISI 304 SS
Delivery casing	Cast-Cu ASTM C85500
Suction lantern	Cast-Cu ASTM C85500
Diffuser	Plastic.PC
Impeller	Plastic.POM
Shaft	AISI 304 SS
Shaft coupling	AISI 304 SS
Wear ring	AISI 304 SS
Motor external casing	AISI 304 SS
Top chock	①Cast-Cu ASTM C85500 ②AISI 420 SS
	③Cast-iron ASTM NO.30
Bottom support	AISI 304 SS
Mechanical seal	Special seal for deep well(Graphite-Ceramic)
Shaft	AISI 304 SS-ASTM 5140
Bearing	NSK
Seal lubricant oil	Oil for food machinery and pharmaceutic use.



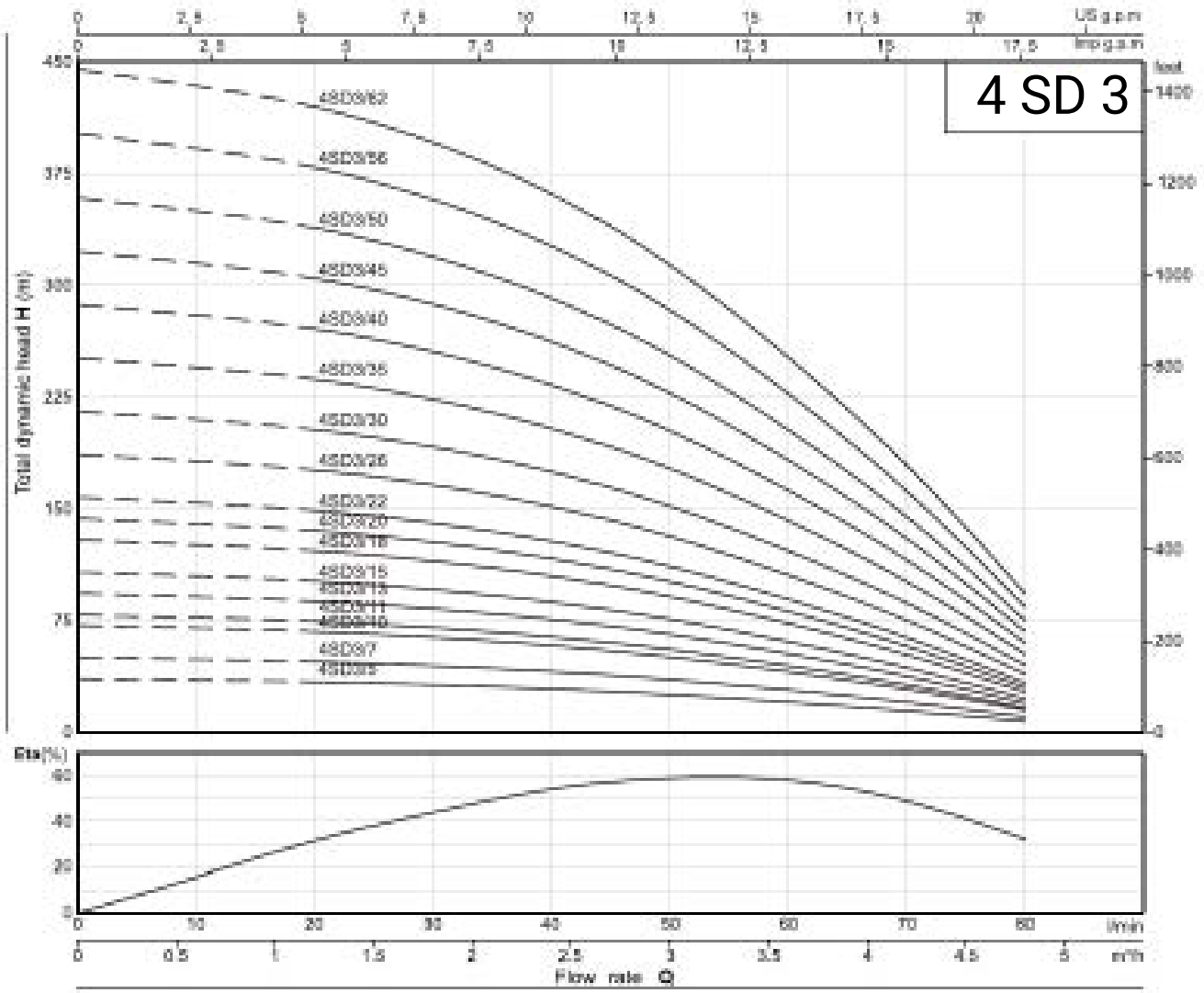
4 SD 2



PERFORMANCE DATA 50HZ

MODEL (50Hz)		P2		Delivery	n≈2850 1/min											
				m³/h	0	0.3	0.6	0.9	1.2	1.5	1.8	2.1	2.4	2.7	3.0	3.3
1 - 220-240V	3 - 380 - 415V	kW	HP	l/min	0	5	10	15	20	25	30	35	40	45	50	55
4SDM2/9	**4SD2/9**	**0.37**	**0.5**	HEAD (m)	63	63	63	62	59	56	52	47	42	35	27	17
4SDM2/12	**4SD2/12**	**0.55**	**0.75**		84	84	84	82	79	75	69	63	56	47	36	23
4SDM2/14	**4SD2/14**	**0.75**	**1**		98	98	98	96	92	87	81	73	65	54	42	27
4SDM2/16	**4SD2/16**	**0.75**	**1**		112	112	112	110	105	99	92	84	74	62	48	31
4SDM2/19	**4SD2/19**	**1.1**	**1.5**		134	134	132	130	125	118	109	100	88	74	57	36
4SDM2/22	**4SD2/22**	**1.1**	**1.5**		155	155	153	151	145	137	127	115	102	85	66	42
4SDM2/25	**4SD2/25**	**1.5**	**2**		176	176	174	171	164	155	144	131	116	97	75	48
4SDM2/28	**4SD2/28**	**1.5**	**2**		197	197	195	192	184	174	161	147	130	109	84	53
4SDM2/34	**4SD2/34**	**2.2**	**3**		239	239	237	233	223	211	196	178	157	132	102	65
4SDM2/40	**4SD2/40**	**2.2**	**3**		281	281	279	274	263	249	230	210	185	155	120	76
-	**4SD2/46**	**3**	**4**		323	323	321	315	302	286	265	241	213	178	138	88
-	**4SD2/52**	**3**	**4**		366	366	362	356	342	323	299	273	241	202	156	99
-	**4SD2/58**	**4**	**5.5**		408	408	404	397	381	360	334	304	269	225	174	111
-	**4SD2/65**	**4**	**5.5**		457	457	453	445	427	404	374	341	301	252	195	124

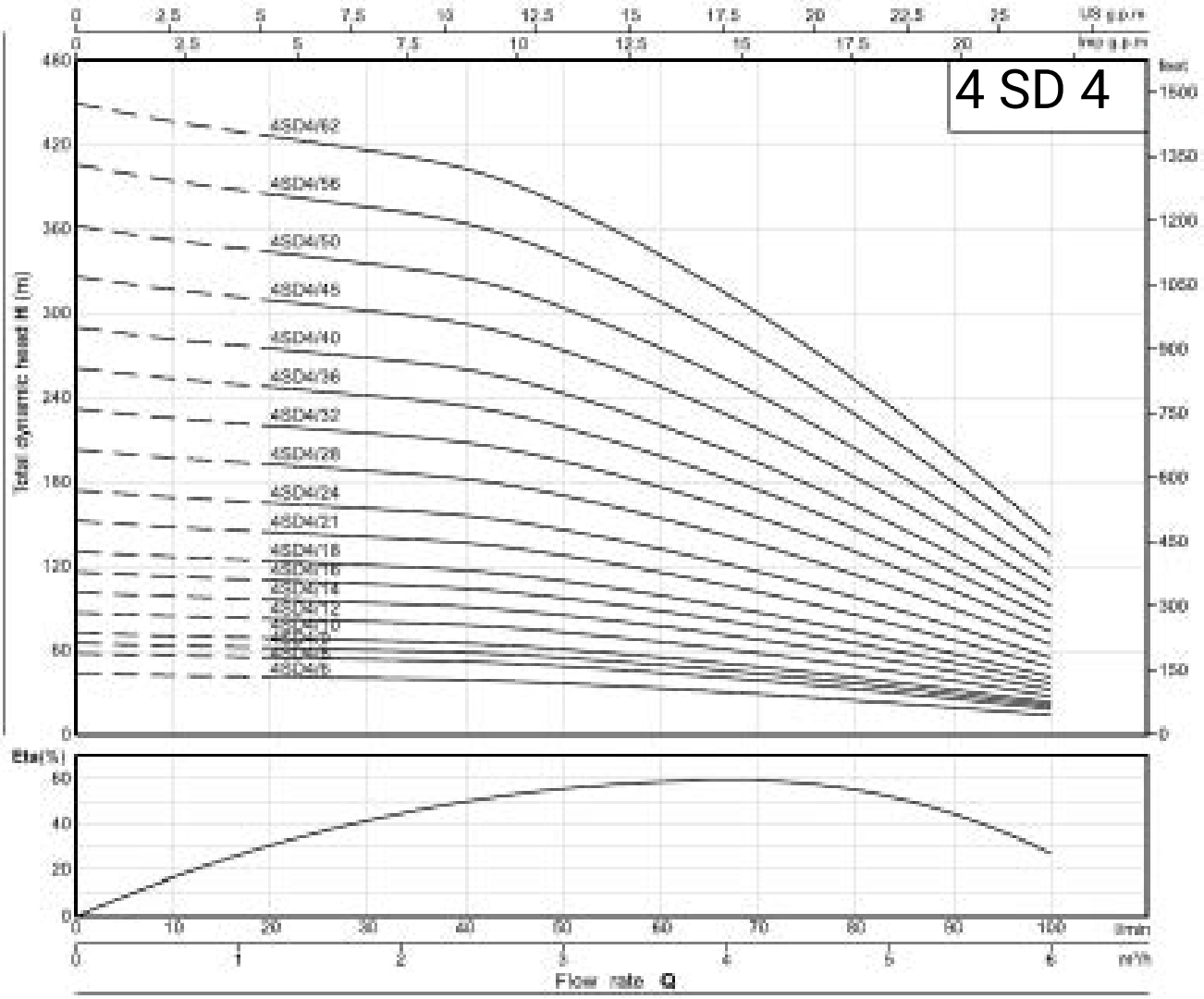
4 SD 3



PERFORMANCE DATA 50HZ

MODEL (50Hz)		P2		Delivery	n≈2850 1/min								
				m³/h	0	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8
1 - 220-240V	3 - 380 - 415V	kW	HP	l/min	0	10	20	30	40	50	60	70	80
4SDM3/7	4SD3/7	0.37	0.5	HEAD (m)	50	49	47	45	41	35	28	20	10
4SDM3/10	4SD3/10	0.55	0.75		72	70	68	64	58	50	40	29	15
4SDM3/11	4SD3/11	0.75	1		79	77	75	70	64	56	45	32	16
4SDM3/13	4SD3/13	0.75	1		93	91	88	83	76	66	53	38	19
4SDM3/15	4SD3/15	1.1	1.5		108	105	102	96	88	76	61	43	22
4SDM3/18	4SD3/18	1.1	1.5		129	126	122	115	105	91	73	52	27
4SDM3/20	4SD3/20	1.5	2		144	140	135	128	117	101	81	58	30
4SDM3/22	4SD3/22	1.5	2		158	154	149	141	128	111	89	64	33
4SDM3/26	4SD3/26	2.2	3		187	182	176	166	152	131	105	75	39
4SDM3/30	4SD3/30	2.2	3		215	210	203	192	175	151	121	87	45
-	4SD3/35	3	4		251	245	237	224	204	177	142	101	52
-	4SD3/40	3	4		287	280	271	255	234	202	162	115	60
-	4SD3/45	4	5.5		323	315	305	287	263	227	182	130	67
-	4SD3/50	4	5.5		359	350	339	319	292	252	202	144	75
-	4SD3/56	5.5	7.5		402	392	379	358	327	283	227	162	84
-	4SD3/62	5.5	7.5		445	434	420	396	362	313	251	179	93

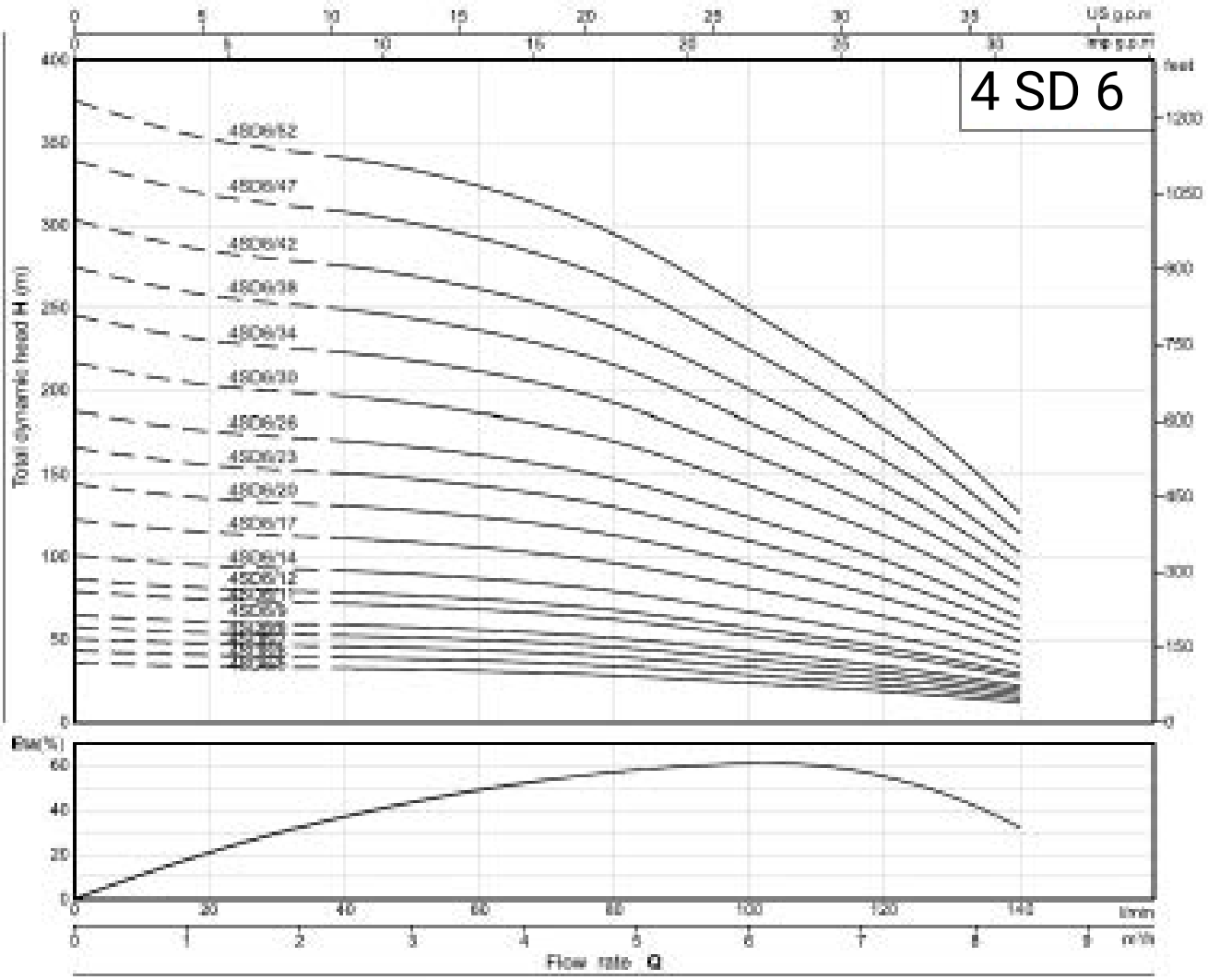
4 SD 4



PERFORMANCE DATA 50HZ

MODEL (50Hz)		P2		Delivery	n≈2850 1/min										
				m³/h	0	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4	6.0
1 - 220-240V	3 - 380 - 415V	kW	HP	l/min	0	10	20	30	40	50	60	70	80	90	100
4SDM4/6	4SD4/6	0.37	0.5	HEAD (m)	44	42	41	40	39	36	33	29	24	19	14
4SDM4/8	4SD4/8	0.55	0.75		58	56	55	54	52	49	44	39	33	26	18
4SDM4/9	4SD4/9	0.75	1		65	63	62	60	58	55	49	44	37	29	21
4SDM4/10	4SD4/10	0.75	1		73	70	69	67	65	61	55	48	41	32	23
4SDM4/12	4SD4/12	1.1	1.5		87	84	82	81	78	73	66	58	49	39	27
4SDM4/14	4SD4/14	1.1	1.5		102	98	96	94	91	85	77	68	57	45	32
4SDM4/16	4SD4/16	1.5	2		116	113	110	107	104	97	88	77	65	51	37
4SDM4/18	4SD4/18	1.5	2		131	127	124	121	117	109	99	87	73	58	41
4SDM4/21	4SD4/21	2.2	3		152	148	144	141	136	128	115	102	85	67	48
4SDM4/24	4SD4/24	2.2	3		174	169	165	161	156	146	132	116	98	77	55
-	4SD4/28	3	4		203	197	192	188	182	170	154	135	114	90	64
-	4SD4/32	3	4		232	225	220	215	208	195	176	155	130	103	73
-	4SD4/36	4	5.5		261	253	247	242	234	219	198	174	146	116	82
-	4SD4/40	4	5.5		290	281	275	268	260	243	220	194	163	128	92
-	4SD4/45	5.5	7.5		327	316	309	302	293	274	248	218	183	144	103
-	4SD4/50	5.5	7.5		363	352	344	335	325	304	275	242	203	160	115
-	4SD4/56	7.5	10		406	394	385	376	364	341	308	271	228	180	128
-	4SD4/62	7.5	10		450	436	426	416	403	377	341	300	252	199	142

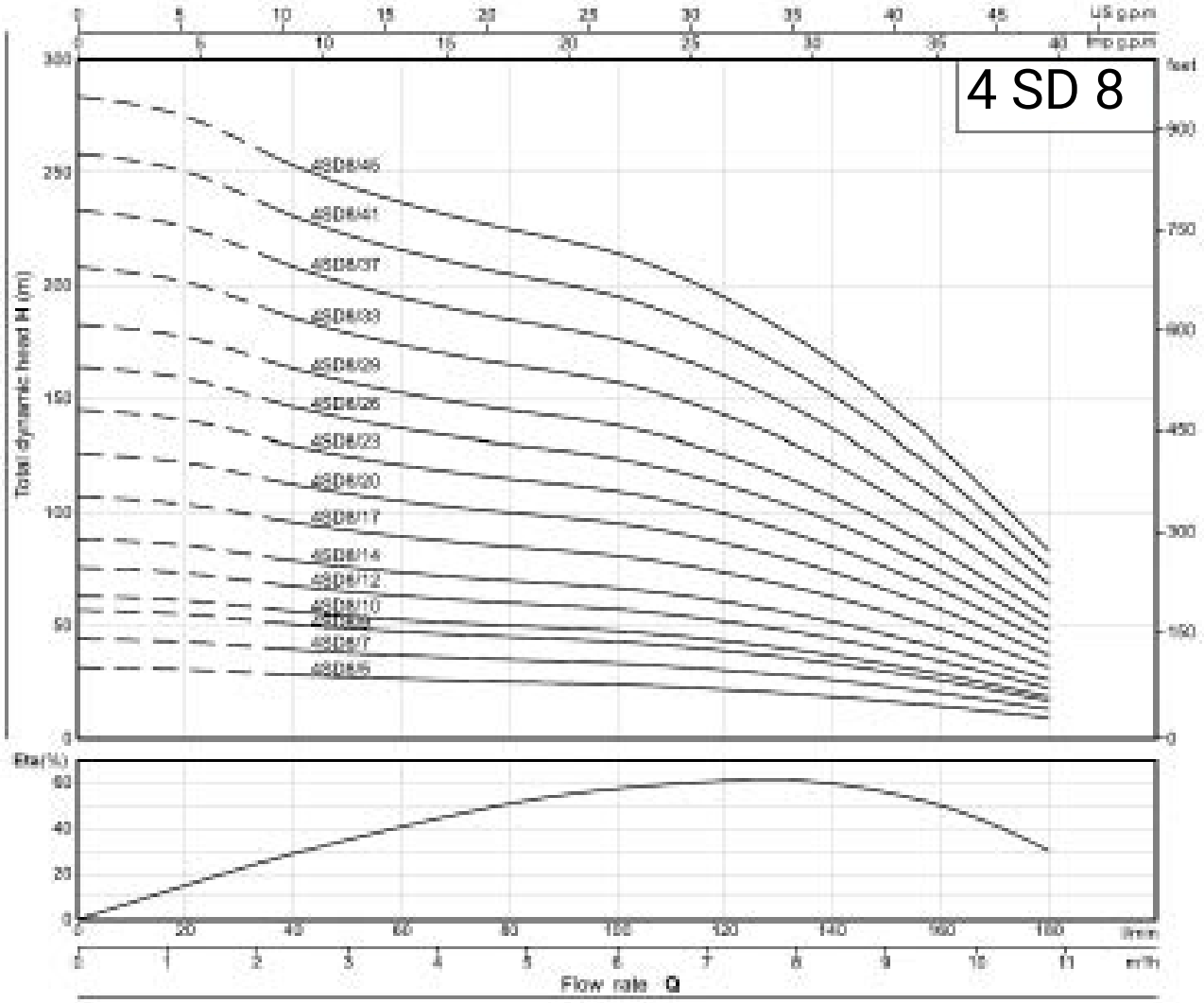
4 SD 6



PERFORMANCE DATA 50HZ

MODEL (50Hz)		P2		Delivery	n≈2850 1/min							
				m³/h	0	1.2	2.4	3.6	4.8	6.0	7.2	8.4
1 - 220-240V	3 - 380 - 415V	kW	HP	l/min	0	20	40	60	80	100	120	140
4SDM6/5	4SD6/5	0.37	0.5	HEAD (m)	36	34	33	31	28	24	19	12
4SDM6/6	4SD6/6	0.55	0.75		43	41	39	37	34	29	23	15
4SDM6/7	4SD6/7	0.75	1		51	47	46	44	40	33	26	17
4SDM6/8	4SD6/8	0.75	1		58	54	52	50	45	38	30	20
4SDM6/9	4SD6/9	1.1	1.5		65	61	59	56	51	43	34	22
4SDM6/11	4SD6/11	1.1	1.5		80	74	72	69	62	52	41	27
4SDM6/12	4SD6/12	1.5	2		87	81	79	75	68	57	45	29
4SDM6/14	4SD6/12	1.5	2		101	95	92	87	79	67	53	34
4SDM6/17	4SD6/17	2.2	3		123	115	111	106	96	81	64	42
4SDM6/20	4SD6/20	2.2	3		145	135	131	125	113	95	75	49
-	4SD6/23	3	4		166	156	151	143	130	110	87	56
-	4SD6/26	3	4		188	176	171	162	147	124	98	63
-	4SD6/30	4	5.5		217	203	197	187	170	143	113	73
-	4SD6/34	4	5.5		246	230	223	212	193	162	128	83
-	4SD6/38	5.5	7.5		275	257	249	237	216	181	143	93
-	4SD6/42	5.5	7.5		304	284	275	262	238	200	158	103
-	4SD6/47	7.5	10		340	318	308	293	267	224	177	115
-	4SD6/52	7.5	10		376	352	341	324	295	248	196	127

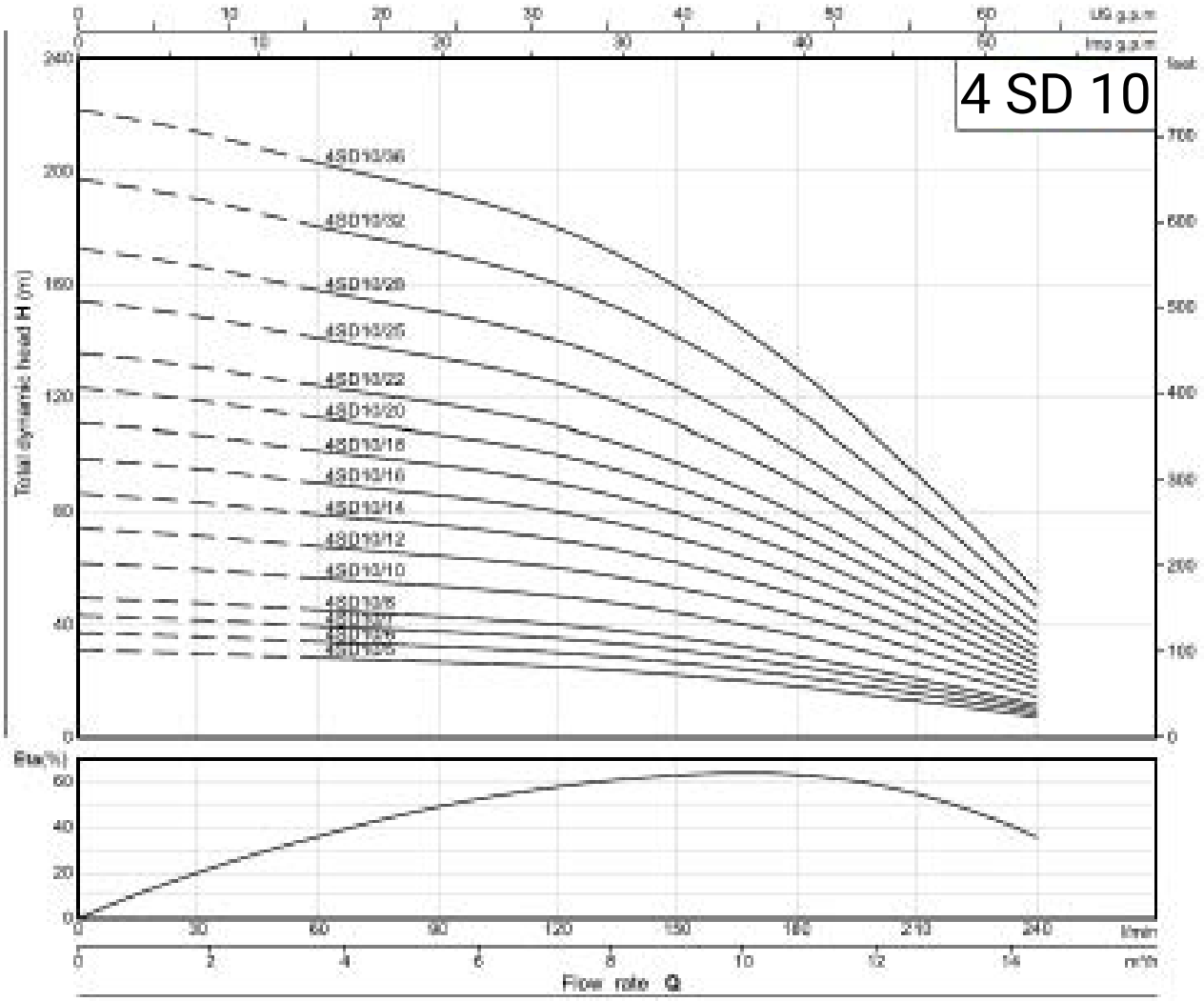
4 SD 8



PERFORMANCE DATA 50HZ

MODEL (50Hz)		P2		Delivery	n≈2850 1/min									
				m³/h	0	1.2	2.4	3.6	4.8	6.0	7.2	8.4	9.6	10.8
1 - 220-240V	3 - 380 - 415V	kW	HP	l/min	0	20	40	60	80	100	120	140	160	180
4SDM8/5	4SD8/5	0.55	0.75	HEAD (m)	32	31	28	26	25	24	22	18	14	9
4SDM8/6	4SD8/6	0.75	1		38	37	34	32	30	29	26	22	17	11
4SDM8/7	4SD8/7	0.75	1		44	43	39	37	35	33	30	26	20	13
4SDM8/8	4SD8/8	1.1	1.5		50	49	45	42	40	38	35	30	23	15
4SDM8/9	4SD8/9	1.1	1.5		57	55	51	47	45	43	39	33	26	17
4SDM8/10	4SDS8/10	1.5	2		63	61	56	53	50	48	43	37	28	18
4SDM8/12	4SD8/12	1.5	2		76	73	67	63	60	57	52	44	34	22
4SDM8/14	4SD8/14	2.2	3		88	86	79	74	70	67	61	52	40	26
4SDM8/17	4SD8/17	2.2	3		107	104	96	90	85	81	74	63	48	31
4SDM8/20	4SD8/20	3	4		126	122	112	105	100	95	87	74	57	37
-	4SD8/23	3	4		145	141	129	121	115	109	100	85	65	42
-	4SD8/26	4	5.5		164	159	146	137	130	124	113	96	74	48
-	4SD8/29	4	5.5		183	177	163	153	145	138	126	107	82	53
-	4SD8/33	5.5	7.5		208	202	186	174	165	157	143	122	94	61
-	4SD8/37	5.5	7.5		234	226	208	195	185	176	160	136	105	68
-	4SD8/41	7.5	10		259	251	231	216	205	195	178	151	117	76
-	4SD8/45	7.5	10		284	275	253	237	225	214	195	166	128	83

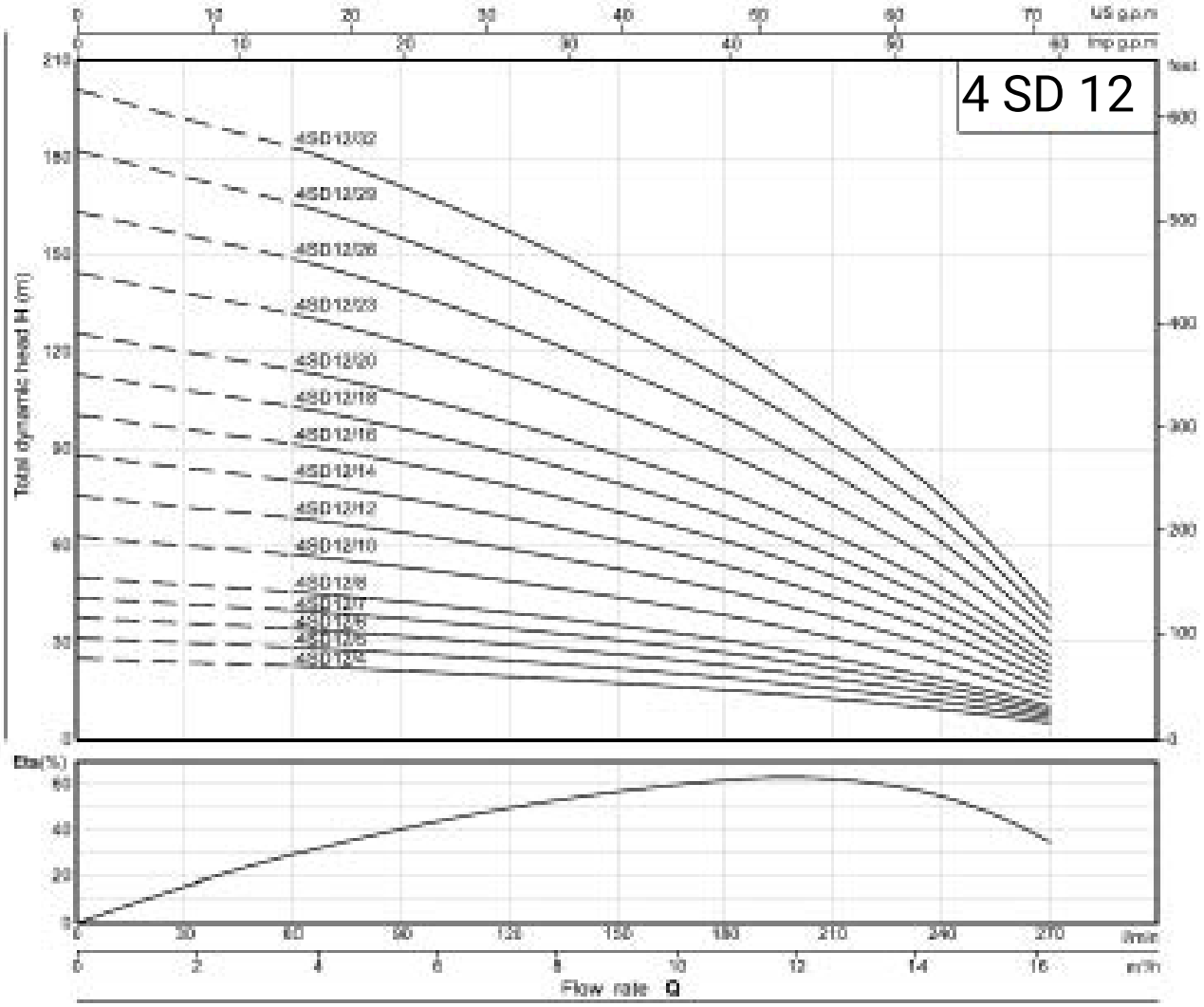
4 SD 10



PERFORMANCE DATA 50HZ

MODEL (50Hz)		P2		Delivery	n≈2850 1/min								
				m³/h	0	1.8	3.6	5.4	7.2	9.0	10.8	12.6	14.4
1 - 220-240V	3 - 380 - 415V	kW	HP	l/min	0	30	60	90	120	150	180	210	240
4SDM10/5	4SD10/5	0.75	1	HEAD (m)	31	30	28	27	25	22	18	13	7
4SDM10/6	4SD10/6	1.1	1.5		37	36	34	32	30	26	22	15	9
4SDM10/7	4SDM10/7	1.1	1.5		43	42	39	38	35	31	25	18	10
4SDM10/8	4SD10/8	1.5	2		49	48	45	43	40	35	29	21	12
4SDM10/10	4SD10/10	1.5	2		62	59	56	54	50	44	36	26	14
4SDM10/12	4SD10/12	2.2	3		74	71	68	64	60	53	43	31	17
4SDM10/14	4SD10/14	2.2	3		86	83	79	75	70	62	51	36	20
-	4SD10/16	3	4		99	95	90	86	80	71	58	41	23
-	4SD10/18	3	4		111	107	101	96	90	79	65	46	26
-	4SD10/20	4	5.5		123	119	113	107	100	88	72	52	29
-	4SD10/22	4	5.5		136	131	124	118	110	97	79	57	32
-	4SD10/25	5.5	7.5		154	149	141	134	125	110	90	65	36
-	4SD10/28	5.5	7.5		176	166	158	150	140	124	101	72	40
-	4SD10/32	7.5	10		197	190	180	172	160	141	116	83	46
-	4SD10/36	7.5	10		222	214	203	193	180	159	130	93	52

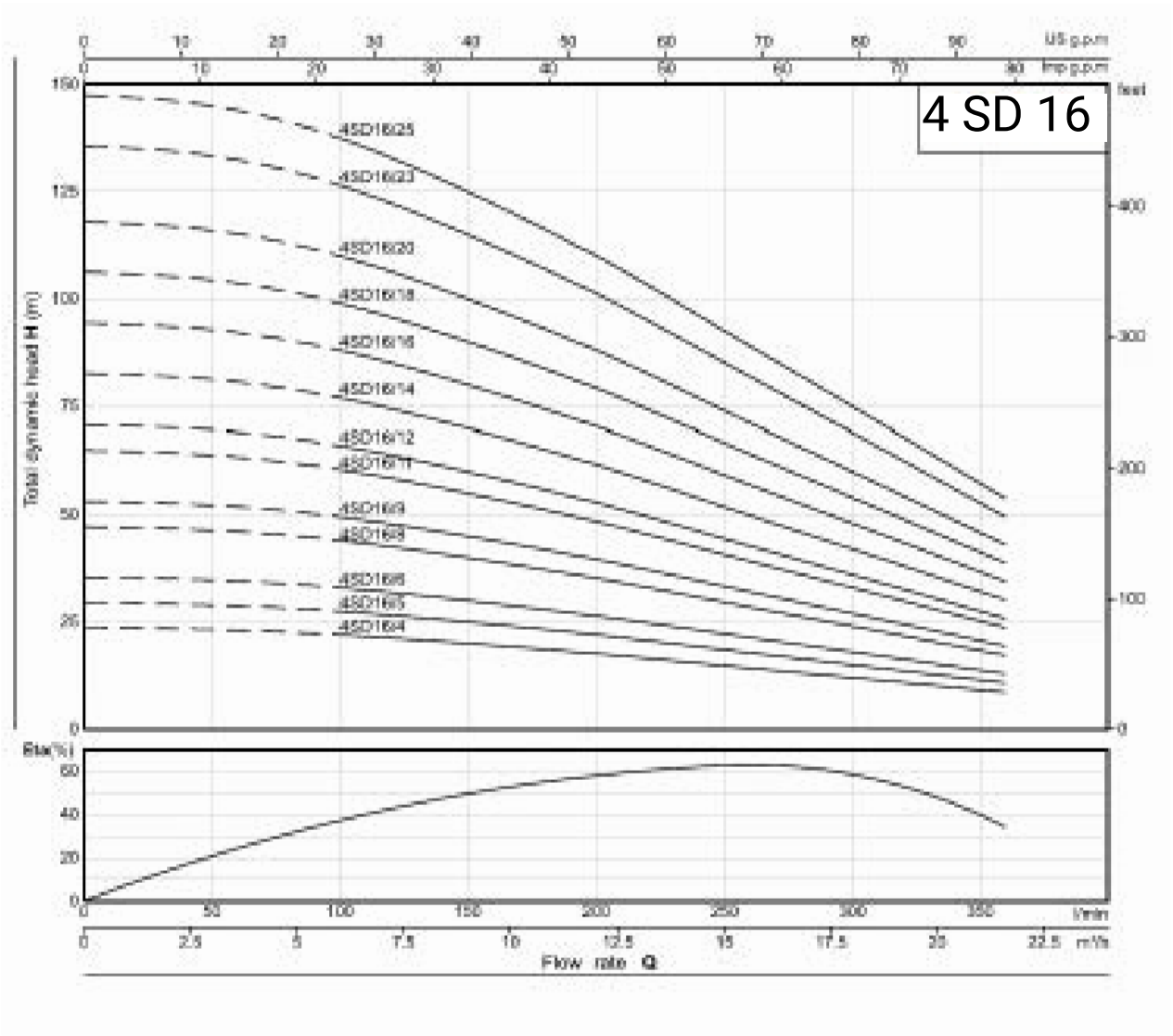
4 SD 12



PERFORMANCE DATA 50HZ

MODEL (50Hz)		P2		Delivery					n≈2850 1/min				
				m³/h	0	1.8	3.6	5.4	7.2	9.0	10.8	12.6	14.4	16.2
1 - 220-240V	3 - 380 - 415V	kW	HP	l/min	0	30	60	90	120	150	180	210	240	270
4SDM12/4	4SD12/4	0.75	1	HEAD (m)	25	24	23	21	20	18	15	13	9	5
4SDM12/5	4SD12/5	1.1	1.5		31	30	29	27	25	22	19	16	12	6
4SDM12/6	4SD12/6	1.1	1.5		38	36	34	32	29	26	23	19	14	8
4SDM12/7	4SD12/7	1.5	2		44	42	40	37	34	31	27	22	16	9
4SDM12/8	4SDM12/8	1.5	2		50	48	46	43	39	35	31	25	19	10
4SDM12/10	4SD12/10	2.2	3		63	60	57	53	49	44	38	32	23	13
4SDM12/12	4SD12/12	2.2	3		75	72	69	64	59	53	46	38	28	15
-	4SD12/14	3	4		88	84	80	75	69	62	54	44	33	18
-	4SD12/16	3	4		101	96	92	86	79	71	62	51	38	21
-	4SD12/18	4	5.5		113	108	103	96	88	79	69	57	42	23
-	4SD12/20	4	5.5		126	120	114	107	98	88	77	63	47	26
-	4SD12/23	5.5	7.5		144	138	132	123	113	101	88	73	54	29
-	4SD12/26	5.5	7.5		163	156	149	139	128	115	100	82	61	33
-	4SD12/29	7.5	10		182	174	166	155	142	128	111	92	68	37
-	4SD12/32	7.5	10		201	192	183	171	157	141	123	101	75	41

4 SD 16

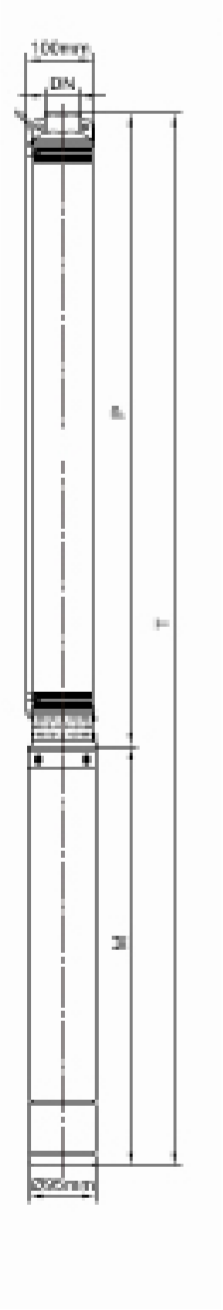


PERFORMANCE DATA 50HZ

MODEL (50Hz)		P2		Delivery	n≈2850 1/min							
				m³/h	0	3	6	9	12	15	18	21
1 - 220-240V	3 - 380 - 415V	kW	HP	l/min	0	50	100	150	200	250	300	350
4SDM16/4	4SD16/4	1.1	1.5	HEAD (m)	24	23	22	20	18	15	12	9
4SDM16/5	4SD16/5	1.5	2		30	29	28	25	22	19	15	11
4SDM16/6	4SD16/6	1.5	2		36	35	33	30	26	22	18	13
4SDM16/8	4SD16/8	2.2	3		47	46	44	40	35	30	24	17
4SDM19/9	4SD19/9	2.2	3		53	52	50	45	40	33	27	19
-	4SD16/11	3	4		65	64	61	55	48	41	33	24
-	4SD16/12	3	4		71	70	66	60	53	45	36	26
-	4SD16/14	4	5.5		83	81	77	70	62	52	42	30
-	4SD16/16	4	5.5		95	93	88	80	70	60	48	35
-	4SD16/18	5.5	7.5		107	104	99	90	79	67	54	39
-	4SD16/20	5.5	7.5		118	116	110	100	88	74	60	43
-	4SD16/23	7.5	10		136	133	127	115	101	86	69	50
-	4SD16/25	7.5	10		148	145	138	125	110	93	75	54

DIMENSIONS AND WEIGHTS

MODEL		DN	DIMENSIONS (mm)					WEIGHTS (kg)				
1 - 220-240V	3 - 380 - 415V		P	M(S)	M(T)	T(S)	T(T)	P	M(S)	M(T)	T(S)	T(T)
4SDM2/7	4SD2/7	1¼"	392	299	299	691	691	3.3	5.5	5.8	8.8	9.1
4SDM2/9	4SD2/9	1¼"	440	314	314	754	754	3.8	6.7	6.7	10.5	10.5
4SDM2/12	4SD2/12	1¼"	514	329	329	843	843	4.6	7.3	7.3	11.9	11.9
4SDM2/14	4SD2/14	1¼"	562	344	344	906	906	5.0	8.0	8.0	13.0	13.0
4SDM2/16	4SD2/16	1¼"	611	359	344	970	955	5.5	8.7	8.0	14.2	13.5
4SDM2/19	4SD2/19	1¼"	684	379	379	1063	1063	6.2	9.8	9.8	16.0	16.0
4SDM2/22	4SD2/22	1¼"	789	399	379	1188	1168	7.0	10.6	9.8	17.6	16.8
4SDM2/25	4SD2/25	1¼"	862	424	424	1286	1286	7.7	11.7	11.7	19.4	19.4
4SDM2/28	4SD2/28	1¼"	936	449	424	1385	1360	8.4	12.9	11.7	21.3	20.1
4SDM2/34	4SD2/34	1¼"	1082	502	514	1584	1596	9.7	15.7	15.7	25.4	25.4
4SDM2/40	4SD2/40	1¼"	1228	542	514	1770	1742	10.9	17.7	15.7	28.6	26.6
4SDM2/46	4SD2/46	1¼"	1406	594	554	2000	1960	12.4	19.8	17.7	32.2	30.1
-	4SD2/52	1¼"	1553	-	594	-	2147	13.9	-	19.8	-	33.7
-	4SD2/58	1¼"	1699	-	658	-	2357	15.8	-	21.4	-	37.2
-	4SD2/65	1¼"	1901	-	698	-	2599	17.5	-	23.7	-	41.2
4SDM3/5	4SD3/5	1¼"	355	299	299	654	654	2.8	5.5	5.8	8.3	8.6
4SDM3/7	4SD3/7	1¼"	409	314	314	723	723	3.4	6.7	6.7	10.1	10.1
4SDM3/10	4SD3/10	1¼"	490	329	329	814	819	4.1	7.3	7.3	11.4	11.4
4SDM3/11	4SD3/11	1¼"	517	344	344	861	861	4.4	8.0	8.0	12.4	12.4
4SDM3/13	4SD3/13	1¼"	571	359	344	930	915	4.9	8.7	8.0	13.6	12.9
4SDM3/15	4SD3/15	1¼"	624	379	379	1003	1003	5.4	9.8	9.8	15.2	15.2
4SDM3/18	4SD3/18	1¼"	737	399	379	1136	1116	6.2	10.6	9.8	16.8	16.0
4SDM3/20	4SD3/20	1¼"	790	424	424	1214	1214	6.7	11.7	11.7	18.4	18.4
4SDM3/22	4SD3/22	1¼"	844	449	424	1293	1268	7.3	12.9	11.7	20.2	19.0
4SDM3/26	4SD3/26	1¼"	952	502	514	1454	1466	8.3	15.7	15.7	24.0	24.0
4SDM3/30	4SD3/30	1¼"	1059	542	514	1601	1573	9.3	17.7	15.7	27.0	25.0
4SDM3/35	4SD3/34	1¼"	1194	594	554	1664	1748	10.6	19.8	17.7	30.4	28.3
-	4SD3/40	1¼"	1360	-	594	-	1954	11.9	-	19.8	-	31.7
-	4SD3/45	1¼"	1494	-	658	-	2152	13.2	-	21.4	-	34.6
-	4SD3/50	1¼"	1629	-	698	-	2327	14.5	-	23.7	-	38.2
-	4SD3/56	1¼"	1790	-	738	-	2528	16.1	-	25.5	-	41.6
-	4SD3/62	1¼"	1983	-	788	-	2771	17.6	-	28.0	-	45.6
4SDM4/6	4SD4/6	1¼"	396	314	314	710	710	3.2	6.7	6.7	9.9	9.9
4SDM4/8	4SD4/8	1¼"	454	329	329	783	783	3.7	7.3	7.3	11.0	11.0
4SDM4/9	4SD4/9	1¼"	484	344	344	828	828	4.0	8.0	8.0	12.0	12.0
4SDM4/10	4SD4/10	1¼"	513	359	344	872	857	4.3	8.7	8.0	13.0	12.3
4SDM4/12	4SD4/12	1¼"	571	379	379	950	950	4.8	9.8	9.8	14.6	14.6
4SDM4/14	4SD4/14	1¼"	630	399	379	1029	1009	5.3	10.6	9.8	15.9	15.1
4SDM4/16	4SD4/16	1¼"	688	424	424	1112	1112	5.9	11.7	11.7	17.6	17.6
4SDM4/18	4SD4/18	1¼"	778	449	424	1227	1202	6.4	12.9	11.7	19.3	18.1
4SDM4/21	4SD4/21	1¼"	866	502	514	1368	1380	7.2	15.7	15.7	22.9	22.9
4SDM4/24	4SD4/24	1¼"	953	542	514	1495	1467	8.1	17.7	15.7	25.8	23.8
4SDM4/28	4SD4/28	1¼"	1070	594	554	1664	1624	9.1	19.8	17.7	28.9	25.8
-	4SD4/32	1¼"	1167	-	594	-	1781	10.2	-	19.8	-	30.0
-	4SD4/36	1¼"	1335	-	658	-	1993	11.3	-	21.4	-	32.7
-	4SD4/40	1¼"	1452	-	698	-	2150	12.4	-	23.7	-	36.1
-	4SD4/45	1¼"	1598	-	738	-	2336	13.7	-	25.5	-	39.2
-	4SD4/50	1¼"	1744	-	788	-	2532	15.1	-	26.0	-	43.1
-	4SD4/56	1¼"	1951	-	848	-	2799	16.7	-	30.0	-	46.7
-	4SD4/62	1¼"	2126	-	908	-	3034	18.4	-	34.0	-	52.4

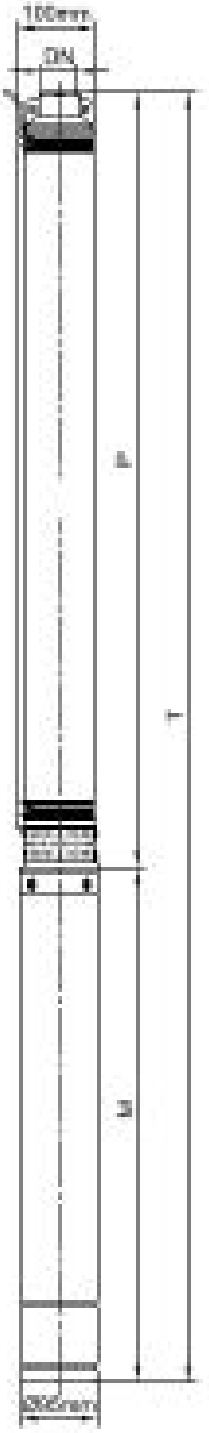


* M(S) is single phase motor, M(T) is three phase motor.
* T(S) is single phase motor, T(T) is three phase motor.

DIMENSIONS AND WEIGHTS

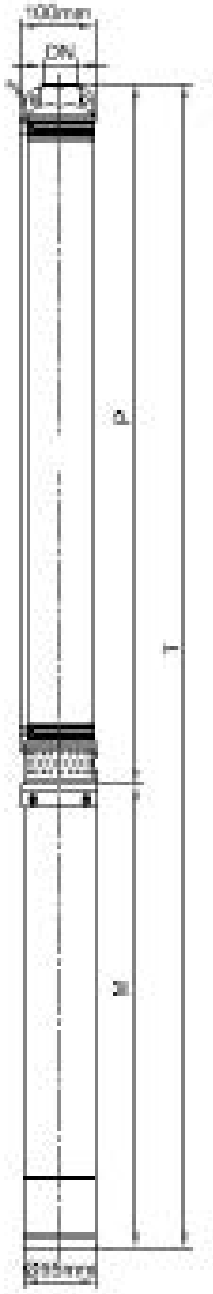
MODEL		DN	DIMENSIONS (mm)					WEIGHTS (kg)				
1 - 220-240V	3 - 380 - 415V		P	M(S)	M(T)	T(S)	T(T)	P	M(S)	M(T)	T(S)	T(T)
4SDM6/5	4SD6/5	1¼"	400	314	314	714	714	3.0	6.7	6.7	9.7	9.7
4SDM6/6	4SD6/6	1¼"	435	329	329	764	764	3.3	7.3	7.3	10.6	10.6
4SDM6/7	4SD6/7	1¼"	469	344	344	813	813	3.6	8.0	8.0	11.6	11.6
4SDM6/8	4SDM6/8	1¼"	504	359	344	863	848	3.8	8.7	8.0	12.5	11.8
4SDM6/9	4SD6/9	1¼"	538	379	379	917	917	4.1	9.8	9.8	13.9	13.9
4SDM6/11	4SD6/11	1¼"	607	399	379	1006	986	4.7	10.6	9.8	15.3	14.5
4SDM6/12	4SD6/12	1¼"	642	424	424	1066	1066	5.0	11.7	11.7	16.7	16.7
4SDM6/14	4SD6/14	1¼"	742	449	424	1191	1166	5.6	12.9	11.7	18.5	17.3
4SDM6/17	4SD6/7	1¼"	846	502	514	1348	1360	6.4	15.7	15.7	22.1	22.1
4SDM6/20	4SD6/20	1¼"	949	542	514	1491	1463	7.3	17.7	15.7	25.0	23.0
4SDM6/23	4SD6/23	1¼"	1053	594	554	1647	1607	8.1	19.8	17.7	27.9	25.8
-	4SD6/26	1¼"	1156	-	594	-	1750	9.0	-	19.8	-	28.8
-	4SD6/30	1¼"	1326	-	658	-	1984	1.01	-	21.4	-	31.5
-	4SD6/34	1¼"	1464	-	698	-	2162	11.3	-	23.7	-	35.0
-	4SD6/38	1¼"	1602	-	738	-	2340	12.4	-	25.5	-	37.9
-	4SD6/42	1¼"	1740	-	788	-	2528	13.6	-	28.0	-	41.6
-	4SD6/47	1¼"	1944	-	848	-	2792	15.0	-	30.0	-	45
-	4SD6/52	1¼"	2116	-	908	-	3024	16.4	-	34.0	-	50.4
4SDM8/5	4SD8/5	1½"	418	329	329	747	747	3.0	7.3	7.3	10.3	10.3
4SDM8/6	4SD8/6	1½"	456	344	344	800	800	3.2	8.0	8.0	11.2	11.2
4SDM8/7	4SD8/7	1½"	494	359	344	853	838	3.6	8.7	8.0	12.3	11.6
4SDM8/8	4SD8/8	1½"	532	379	379	911	911	3.9	9.8	9.8	13.7	13.7
4SDM8/9	4SD8/9	1½"	570	399	379	969	949	4.2	10.6	9.8	14.8	14.0
4SDM8/10	4SD8/10	1½"	609	424	424	1033	1033	4.5	11.7	11.7	16.2	16.2
4SDM8/12	4SD8/12	1½"	717	449	424	1165	1141	5.1	12.9	11.7	18.0	16.8
4SDM8/14	4SD8/14	1½"	793	502	514	1295	1307	5.7	15.7	15.7	21.4	21.4
4SDM8/17	4SD8/17	1½"	907	542	514	1449	1421	6.6	17.7	15.7	24.3	22.3
4SDM8/20	4SD8/20	1½"	1021	594	554	1615	1575	7.5	19.8	17.7	27.3	25.2
-	4SD8/23	1½"	1136	-	594	-	1730	8.4	-	19.8	-	28.2
-	4SD8/26	1½"	1250	-	658	-	1908	9.2	-	21.4	-	30.6
-	4SD8/29	1½"	1396	-	698	-	2094	10.1	-	23.7	-	33.8
-	4SD8/33	1½"	1548	-	738	-	2286	11.3	-	25.5	-	36.8
-	4SD8/37	1½"	1701	-	788	-	2489	12.5	-	28.0	-	40.5
-	4SD8/41	1½"	1884	-	848	-	2732	13.7	-	30.0	-	43.7
-	4SD8/45	1½"	2037	-	908	-	2945	14.9	-	34.0	-	48.9

* M(S) is single phase motor, M(T) is three phase motor.
* T(S) is single phase motor, T(T) is three phase motor.



DIMENSIONS AND WEIGHTS

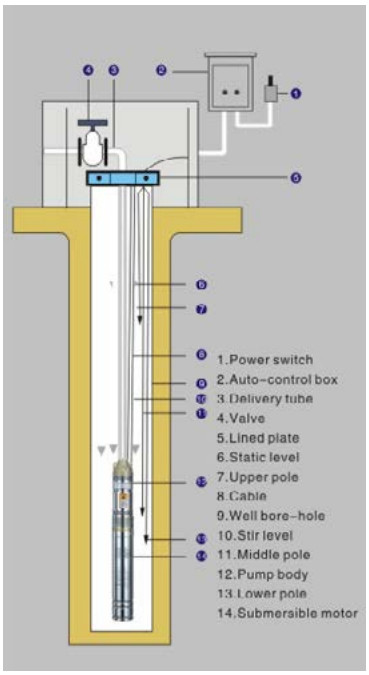
MODEL		DN	DIMENSIONS (mm)					WEIGHTS (kg)				
1 - 220-240V	3 - 380 - 415V		P	M(S)	M(T)	T(S)	T(T)	P	M(S)	M(T)	T(S)	T(T)
4SDM10/5	4SD10/5	2"	418	359	344	777	762	3.0	8.7	8.0	11.7	11.0
4SDM10/6	4SD10/6	2"	456	379	379	835	835	3.3	9.8	9.8	13.1	13.1
4SDM10/7	4SD10/7	2"	494	399	379	893	873	3.6	10.6	9.8	14.2	13.4
4SDM10/8	4SD10/8	2"	532	424	424	956	956	3.9	11.7	11.7	15.6	15.6
4SDM10/10	4SD10/10	2"	609	449	424	1058	1033	4.5	12.9	11.7	17.4	16.2
4SDM10/12	4SD10/12	2"	716	502	514	1218	1231	5.1	15.7	15.7	20.8	20.8
4SDM10/14	4SD10/14	2"	793	542	514	1335	1307	5.7	17.7	15.7	23.4	21.4
4SDM10/16	4SD10/16	2"	869	594	554	1463	1423	6.3	19.8	17.7	26.1	24.0
-	4SD10/18	2"	945	-	594	-	1539	6.9	-	19.8	-	26.7
-	4SD10/20	2"	1021	-	658	-	1679	7.5	-	21.4	-	28.9
-	4SD10/22	2"	1097	-	698	-	1796	8.1	-	23.7	-	31.8
-	4SD10/25	2"	1212	-	738	-	1950	9.0	-	25.5	-	34.5
-	4SD10/28	2"	1357	-	788	-	2146	9.8	-	28.0	-	37.8
-	4SD10/32	2"	1510	-	848	-	2358	11.0	-	30.0	-	41.0
-	4SD10/36	2"	1662	-	908	-	2570	12.2	-	34.0	-	46.2
4SDM12/4	4SD12/4	2"	452	359	344	811	796	3.1	8.7	8.0	11.8	11.1
4SDM12/5	4SD12/5	2"	508	379	379	887	887	3.5	9.8	9.8	13.3	13.3
4SDM12/6	4SD12/6	2"	564	399	379	963	943	3.8	10.6	9.8	14.4	13.6
4SDM12/7	4SD12/7	2"	620	424	424	1044	1044	4.2	11.7	11.7	15.9	15.9
4SDM12/8	4SD12/8	2"	676	449	424	1125	1100	4.6	12.9	11.7	17.5	16.3
4SDM12/10	4SD12/10	2"	819	502	514	1321	1334	5.4	15.7	15.7	21.1	21.1
4SDM12/12	4SD12/12	2"	931	542	514	1473	1445	6.1	17.7	15.7	23.8	21.8
4SDM12/14	4SD12/14	2"	1043	594	554	1637	1597	6.9	19.8	17.7	26.7	24.6
-	4SD12/16	2"	1155	-	594	-	1749	7.6	-	19.8	-	27.4
-	4SD12/18	2"	1298	-	658	-	1956	8.4	-	21.4	-	29.8
-	4SD12/20	2"	1410	-	698	-	2108	9.2	-	23.7	-	32.9
-	4SD12/23	2"	1578	-	738	-	2316	10.3	-	25.5	-	35.8
-	4SD12/26	2"	1745	-	788	-	2533	11.4	-	28.0	-	39.4
-	4SD12/29	2"	1944	-	848	-	2793	12.6	-	30.0	-	42.6
-	4SD12/32	2"	2143	-	908	-	3020	13.7	-	34.0	-	47.7
4SDM16/4	4SD16/4	2"	502	399	379	907	881	3.4	10.6	9.8	14.0	13.2
4SDM16/5	4SD16/5	2"	570	424	424	994	995	3.8	11.7	11.7	15.5	15.5
4SDM16/6	4SD16/6	2"	639	449	424	1088	1063	4.3	12.9	11.7	17.2	16.0
4SDM16/8	4SD16/8	2"	807	502	514	1309	1322	5.2	15.7	15.7	20.9	20.9
4SDM16/9	4SDM169	2"	876	542	514	1418	1390	5.6	17.7	15.7	23.3	21.3
4SDM16/11	4SD16/11	2"	1013	594	554	1607	1567	6.5	19.8	17.7	26.3	24.2
-	4SD16/12	2"	1081	-	594	-	1675	7.0	-	19.8	-	26.8
-	4SD16/14	2"	1218	-	658	-	1876	7.9	-	21.4	-	29.3
-	4SD16/16	2"	1386	-	698	-	2084	8.8	-	23.7	-	32.5
-	4SD16/18	2"	1523	-	738	-	2261	9.7	-	25.5	-	35.2
-	4SD16/20	2"	1660	-	788	-	2448	10.6	-	28.0	-	38.6
-	4SD16/23	2"	1897	-	848	-	2745	11.9	-	30.0	-	41.9
-	4SD16/25	2"	2034	-	908	-	2942	12.8	-	34.0	-	46.8

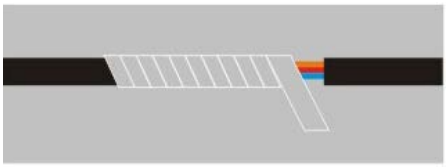


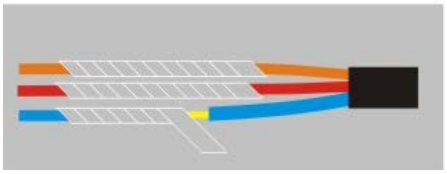
* M(S) is single phase motor, M(T) is three phase motor.
* T(S) is single phase motor, T(T) is three phase motor.

TECHNICAL DATA

INSTALLING A BOREHOLE PUMP AND MOTOR







MAXIMUM CABLE LENGTH FROM PUMP TO STARTER

Type	kW	i_n(A)	1.5 mm²	2.5 mm²	4 mm²	6 mm²	10 mm²	16 mm²	25 mm²
220V~/50H	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	0.37	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

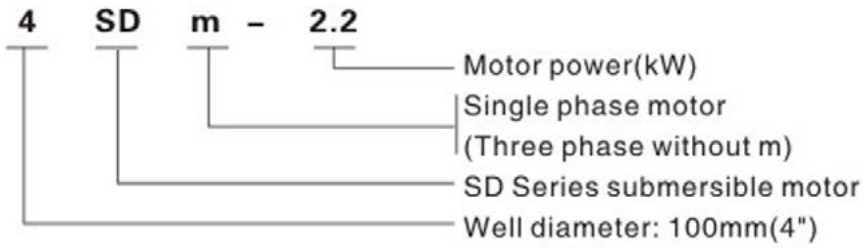
20 BAR SINGLE PHASE

MOTOR TECHNICAL DATA

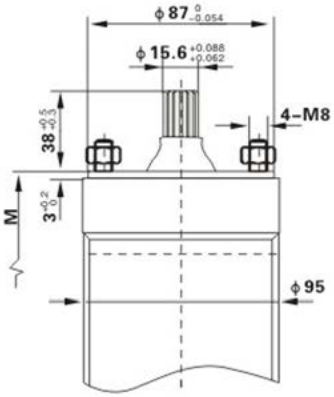
Single phase power:	0.37 to 2.2 kW
Speed:	2850rpm
Voltage:	220 ~ 240V/50Hz
Insulation class:	B
Protection grade:	IP 68
Highest temperature of liquid:	35oC
Maximum solid handling:	40g/m3
Motor casing:	stainless steel
Maximum diameter:	Φ 95 mm

With sandproof cover/pressure balance membrane/mechanical seal for high performance.

Flange and coupling according to NEMA standard.

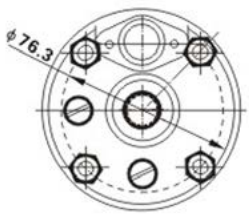


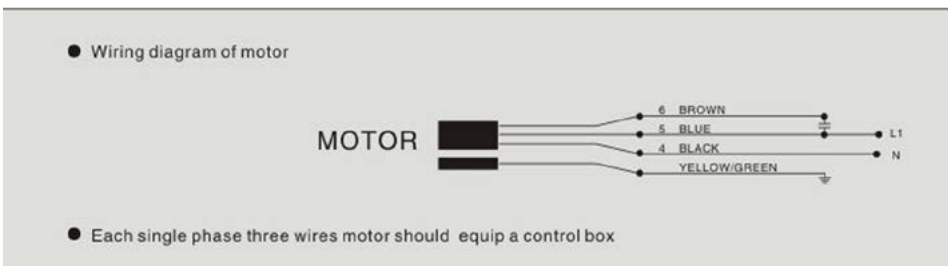
MOTOR DIMENSIONS



TYPE	MOTOR POWER		CAP	RUNNING	DIMENSIONS	
Single Phase 220V~/50HZ	kW	HP	μf	Amps	Length (mm)	Weight (kg)
4SDm-0.37	0.37	0.5	20	3.7	314	6.7
4SDm-0.55	0.55	0.75	25	4.7	329	7.3
4SDm-0.75	0.75	1.0	35	6.2	344	8.0
4SDm-l.l	1.1	1.5	45	8.0	399	10.6
4SDm-l.5	1.5	2.0	55	10.5	424	11.7
4SDm-2.2	2.2	3.0	60	15	502	15.7

MOTOR WIRING





PUMP CONTROLLER

MA ANALOGUE CONTROL BOX SINGLE PHASE

TECHNICAL DATA

This single phase control box is equipped with a capacitor and thermal over-load protector.

APPLICATION RANGE

Type of motor:	Single phase motor
Motor power:	0.37-2.2kW
Voltage:	220V ~ 240V
Frequency:	50Hz

PRODUCT FUNCTIONS

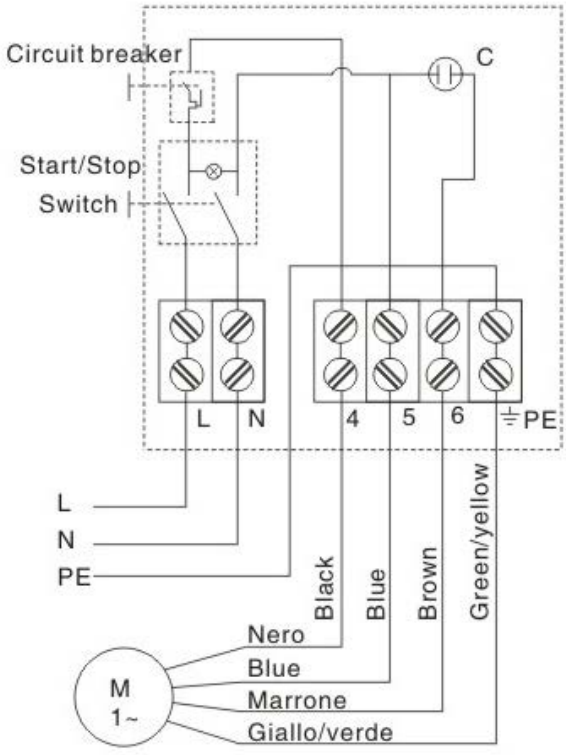
Provides basic protection against short circuiting and over current.

OPERATING METHOD

Manual control.

INSTALLATION ENVIRONMENT INDEX

Grade protection:	IP44
Environment temperature:	-25°C to +55°C
Environment humidity:	(20-90)%RH



POWER		RUNNING CAPACITOR	MCB
kW	HP	Microfarad (μF)	Amp
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

DIGITAL CONTROL BOX

220V DIGITAL VERSION 1

CHARACTERISTIC

Rated Operating Voltage:	AC 230V/50Hz
Rated Output Power:	0.37-2.2KW (0.5-3.0Hp)

Adopt the Digital chip control, integrate in upper/lower water level control and pressure control automatically.

Both “One Key Automatic Setting” and “Manual Setting” for set the overload and under load.

Have overload, under load (dry running), over/under voltage protection.

Under load restart time 1 - 60 minute adjustable.

Domestic original memory function, and easily check the last 10 failure data.

Humanization design, small volume, and convenient installation.

6 stages of processing inspection, 120 hours of dynamic trouble simulation fully aging.

MAIN TECHNICAL SPECIFICATIONS

Locked-rotor Actuating Time:	≤1.5 seconds
Actuating Time for Dry-running Protection:	≤20 seconds.
Local Power Loss: Static Power:	3.5W, Dynamic Power:4.5W.
Over-current Actuating Time:	1 seconds - 1 minute (inverse time lag characteristic - the higher current for the shorter time).

Liquid Level Control Mode: use the pulse electrode probe to detect and its transmission distance is less than or equal to 1000 meters.

Pressure Control Mode: electro connecting pressure gauge, normal open and close type pressure switch, and floating ball liquid level switch.

APPLICATION

Products are widely used in deep well pump, diving pump, dredge pump, pipeline pump, pressure pump, multi-level pump, etc. and used in life supply water, underground drainage,building supply water, etc.

PUMP CONTROLLER

M521 DIGITAL CONTROL BOX SINGLE PHASE

PRODUCT FUNCTIONS

Liquid level control for supply (borehole) and delivery (storage).

Enabled for operation, utilising floating level switch / liquid level probe / pressure switch.

Over / under voltage protection with adjustable parameters.

Auto / Manual operation.

Dynamic and interactive LCD display.

Push Button Calibration

Pump Accumulative Running Time Display

Pump Last Five Fault condition Recording

Controller enabled for operation with single phase motor fitted with internal or external capacitor from 0.18 to 2.2kw

Capacitor to be retro fitted for borehole motor use.
Refer to capacitor size requirement as per table below.

APPLICATION RANGE

Type of motor:	Single phase motor
Motor power:	0.37-2.2kW
Voltage:	220V
Frequency:	50Hz

INSTALLATION ENVIRONMENT INDEX

Grade protection:	IP22
Environment temperature:	-25°C to 55°C
Environment humidity:	(20-90)%RH

SINGLE PHASE 3" / 4" OIL FILLED BOREHOLE MOTOR CAPASITOR RATINGS	
kW	Capacitor (mF)
0.37	20
0.55	25
0.75	35
1.1	45
1.5	55
2.2	75

TECHNICAL DATA	
RATED OUTPUT POWER	0.37kW - 2.2kW
RATED INPUT VOLTAGE	AC220V/50Hz Single Phase
TRIP RESPONSE TIME OF OVER LOAD	5sec - 5min
TRIP RESPONSE TIME OF SHORT CIRCUIT	0.1sec
TRIP RESPONSE TIME OF UNDER / OVER VOLTAGE	5sec
TRIP RESPONSE TIME OF DRY RUN	6sec
RECOVERY TIME OF OVER LOAD	30min
RECOVERY TIME OF UNDER / OVER VOLTAGE	5min
RECOVERY TIME OF DRY RUN	30min
TRIP VOLTAGE OF OVER VOLTAGE	110% of rated input voltage
TRIP VOLTAGE OF UNDER VOLTAGE	80 of rated input volgage

PROTECTION FUNCTIONS

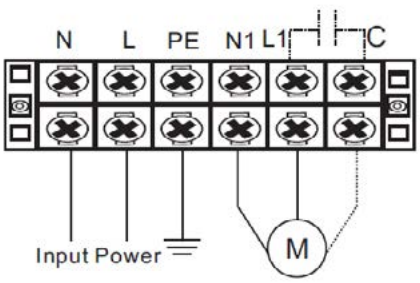
- Dry run
- Over load
- Transient surge
- Under voltage
- Over voltage
- Pump stalled
- Short circuit

MEANING OF THE ICONS SHOWN ON THE LCD

Icon	Meaning/Description
	pump parameter configuration icon, when this icon appears, pump control box is in parameter adjusting manual;
	time displaying icon, when this icon appears, it means pump control box is displaying some parameter of time, eg: pump accumulative running time (unit: hour); counting down etc
	pump fault icon, when this icon appears, it means pump control box is displaying some fault information;
 ON LINE	network connection error icon, when this icon appears, it means there is no network connections or network connection error between pump control box and SC(slave controller) or computer;
 ON LINE	network normal connection icon, when this icon appears, it means the network connection between pump control box and SC (slave controller) or computer is normal;
V	voltage
M	minute
S	second
H	hour
%	percent
A	ampere
	pump running
	pump stops running
	low pressure or lack of pressure in the pipeline or pressure tank
	high pressure or full of pressure in the pipeline or pressure tank

INSTALLATION

ELECTRICAL CONNECTION TO THE POWER SUPPLY:



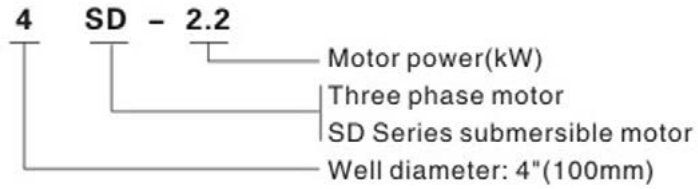
4” OIL FILLED MOTOR
THREE PHASE

MOTOR TECHNICAL DATA

Three phase power:	0.37 to 7.5kW
Speed:	2850rpm
Voltage:	380 ~ 415V/50Hz
Insulation class:	B
Protection grade:	IP 68
Highest temperature of liquid:	35oC
Maximum solid handling:	40g/m3
Motor casing:	stainless steel
Maximum diameter:	Φ 95 mm

With sandproof cover/pressure balance membrane/mechanical seal for high performance.

Flange and coupling according to NEMA standard.



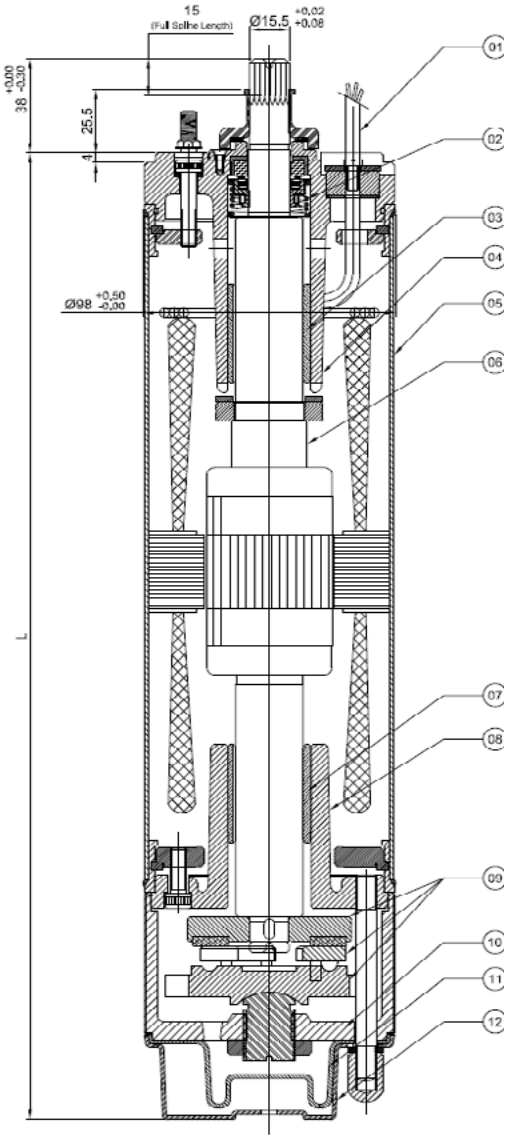
MOTOR DIMENSIONS

TYPE Three Phase 380V~/50HZ	MOTOR POWER			DIMENSIONS	
	kW	HP	RUNNING AMPS	Length (mm)	Weight (kg)
4SD - 0.37	0.37	0.5	1.5	314	6.7
4SD - 0.55	0.55	0.75	1.8	329	7.3
4SD - 0.75	0.75	1.0	2.5	344	8
4SD - 1.1	1.1	1.5	3.2	379	9.8
4SD - 1.5	1.5	2.0	4.3	424	11.7
4SD - 2.2	2.2	3.0	6.0	514	15.7
4SD - 3	3.0	4.0	8.0	594	19.8
4SD- 4	4.0	5.5	10.0	698	23.7
4SD - 5.5	5.5	7.5	13.0	788	28
4SD - 7.5	7.5	10.0	17.0	908	34

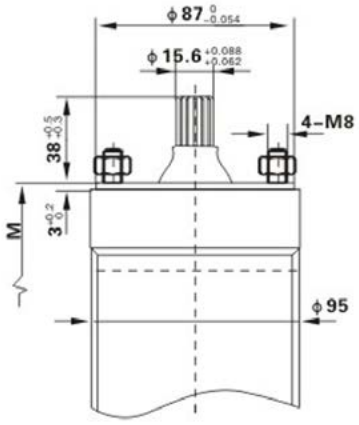
TECHNICAL DATA

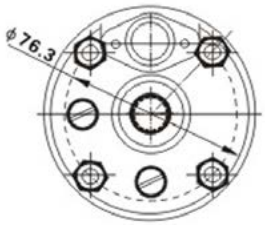
MOTOR PARTS

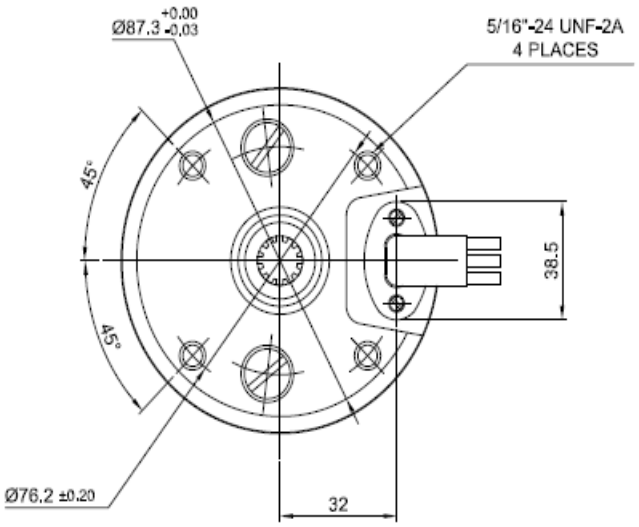
SERIAL NO.	PART NAME	MATERIAL
01	Cable 3 Core/ 4 Core	EPR
02	Mechanical Seal	Ceramic/Carbon
03	Bearing Bush	Carbon
04	Upper Housing	CI (FG-200)/S.S.304
05	Motor Pipe	Stainless Steel
06	Rotor shaft	S.S.420
07	Bearing Bush	Carbon
08	Lower Housing	CI (FG-200)
09	Thrust Bearing set	Carbon/S.S. 420
10	Lower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



DIMENSIONAL DRAWINGS







TECHNICAL DATA

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)
0.55	0.75	1500	380	2830	1.60	6.00	61	67	67	0.59	0.72	0.80	1.90	3.10
0.75	1	1500	380	2850	2.10	8.90	63	68	70	0.57	0.70	0.79	2.50	4.80
1.1	1.5	3000	380	2820	3.00	13.80	69	72	72	0.59	0.73	0.81	3.80	9.60
1.5	2	3000	380	2840	3.90	18.60	69	72	73	0.59	0.72	0.81	5.00	11.30
2.2	3	4000	380	2815	5.80	28.70	72	75	75	0.58	0.72	0.81	7.60	21.70
3	4	4000	380	2795	8.80	30.60	69	72	70	0.59	0.72	0.83	10.50	21.44
4	5.5	4000	380	2785	10.80	32.30	63	67	70	0.73	0.79	0.83	13.40	21.24
5.5	7.5	4000	380	2785	14.80	50.50	70	73	74	0.75	0.79	0.84	18.93	37.18
7.5	10	4000	380	2850	18.00	61.00	71	72	73	0.99	0.95	0.91	24.60	45.00

PN - Rated Output

UN - Rated Voltage

nN - RPM

IN - Full Load Current

IA - Starting Current

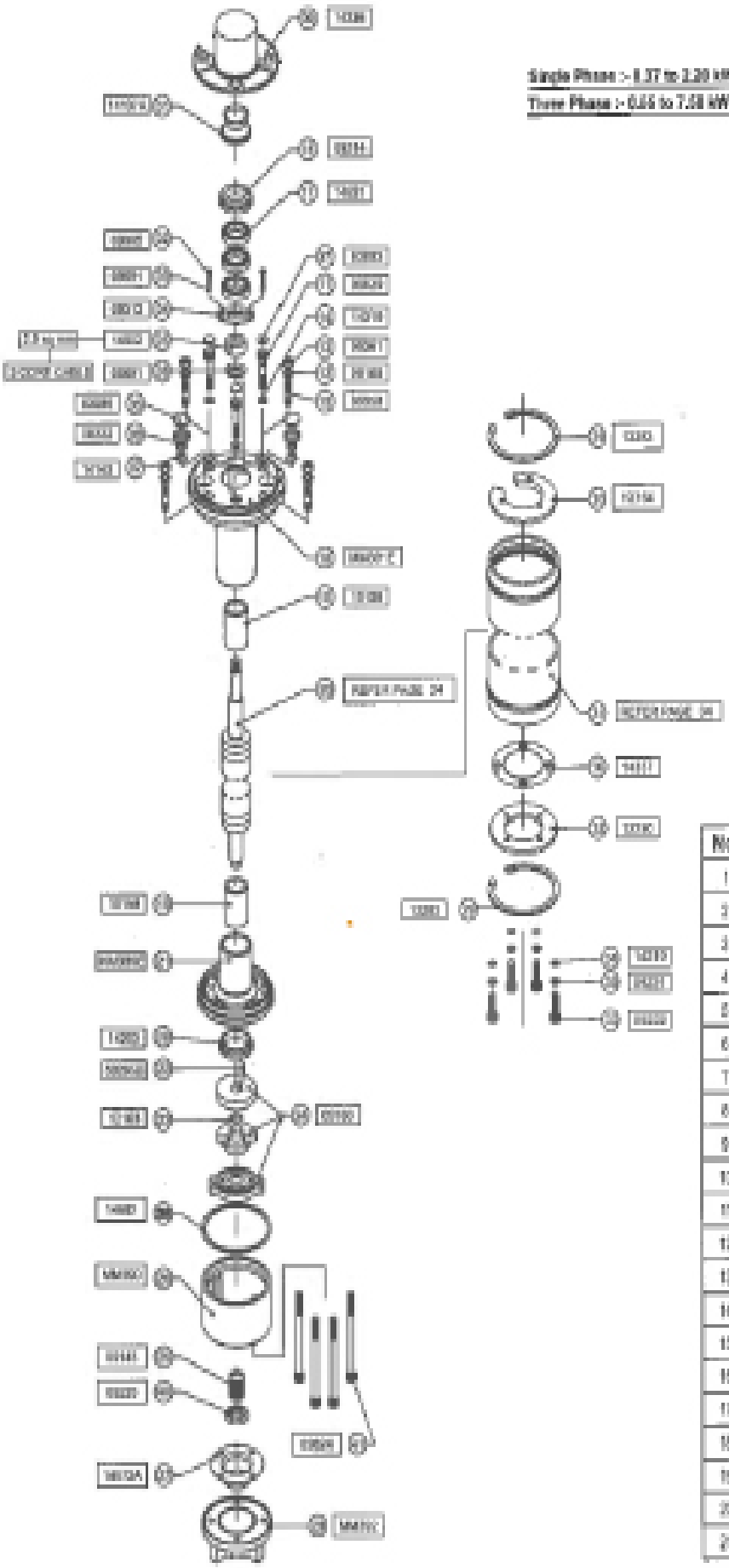
η - Motor Efficiency

cos - Power Factor

TN - Full Load Torque

TA - Starting Torque

F[N[- Axial Thrust Load



Single Phase :- 0.37 to 2.20 kW
Three Phase :- 0.55 to 7.50 kW

No.	PART'S NAME
1	SAND GUARD
2	CABLE CLIP SCREW
3	CABLE WASHER
4	CABLE CLIP
5	CABLE GROMMET
6	DRAIN PLUG
7	DRAIN PLUG "O" RING
8	CABLE WASHER
9	COUPLE CAP
10	WINDING CAP
11	ALLEN BOLT
12	HEX NUT
13	SPRING WASHER
14	ALLEN BOLT "O" RING
15	UPPER STUD
16	OIL SEAL COLLAR
17	OIL SEAL
18	UPPER HOUSING
19	BEARING BUSH
20	ROTOR SHAFT
21	LOWER HOUSING

No.	PART'S NAME
32	KEY
33	CIRCLIP (EXTERNAL)
34	THRUST BEARING PAD SET
35	ROCKER
36	LOWER HOUSING PART-2
37	PRESSURE CUP
38	MOTOR BASE
39	CIRCLIP (INTERNAL)
30	UPPER FLANGE
31	RNISH STATOR BODY
32	LOWER FLANGE
33	ALLEN BOLT
34	STUD "O" RING
35	STUD WASHER
36	DRAIN PLUG CAP
37	ALLEN BOLT CAP
38	C. T. BEARING
39	LOWER GASKET
40	ROCKER PIN
41	ALLEN BOLT

PUMP CONTROLLER

DIGITAL STARTER PROTECTOR - 1 PHASE, 230V / 3 PHASE, 380V

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 ± 15%
Output Power:		4kW (8 amp)
Operating Temperature:	-	10 to 40°C
Control Distance:		1km
Humidity:		≤ 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

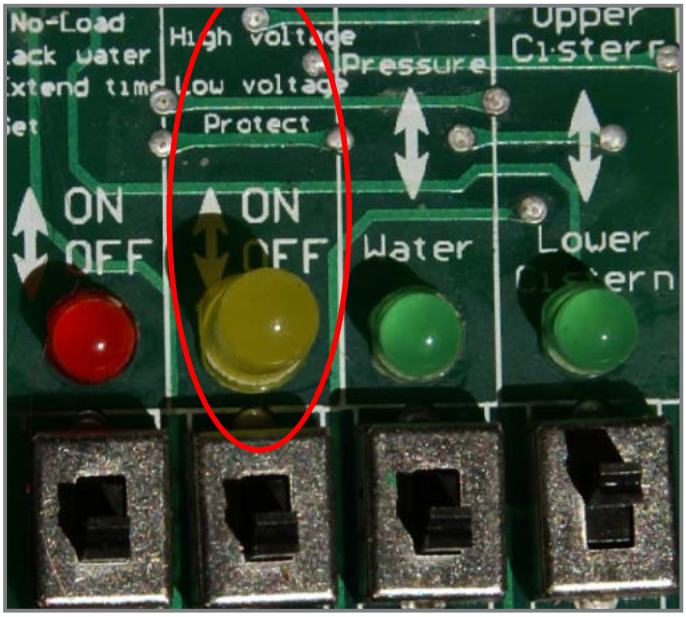
OPERATION

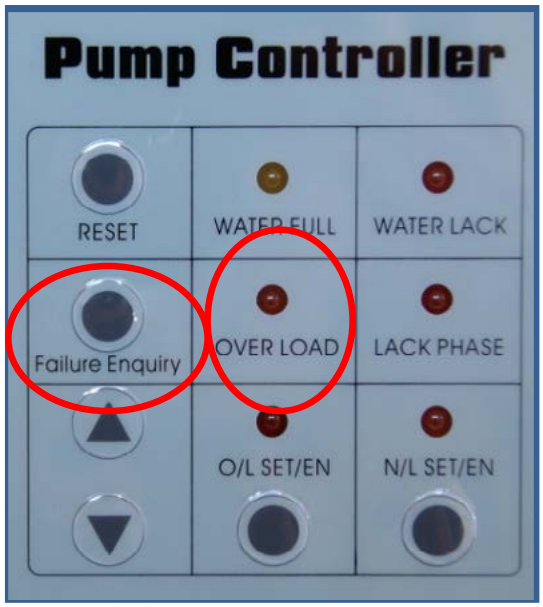
1. **WATER LEVEL CONTROL:**
   one reservoir/ water tank can be controlled via the wiring connection at the bottom of the controller.

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 occuring and power to the pump motor will be switched off within the same time limit as set by the installer.

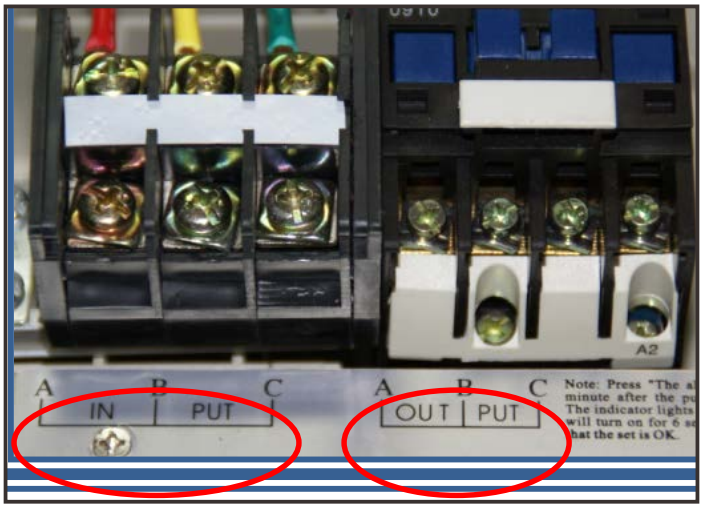
4. **OVER/UNDER VOLTAGE PROTECTION**:
   The small LED on the PCB will blink if this function is switched on. The voltage may vary as specified - 380V ± 15%. The controller will self protect within 20 seconds when the voltage drops below 280V.





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 market 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:

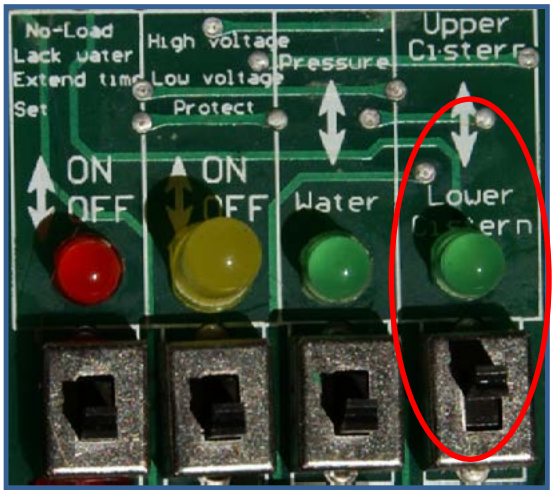
Max water level: Power on

Min water level: Power off

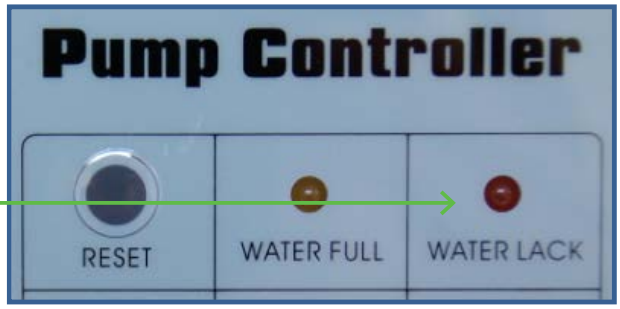
UPPER TANK / CISTERN:

Min water level: Power on

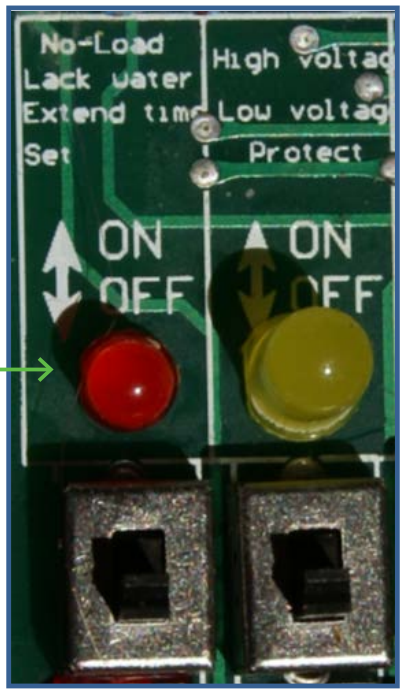
Max water level: Power off



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.



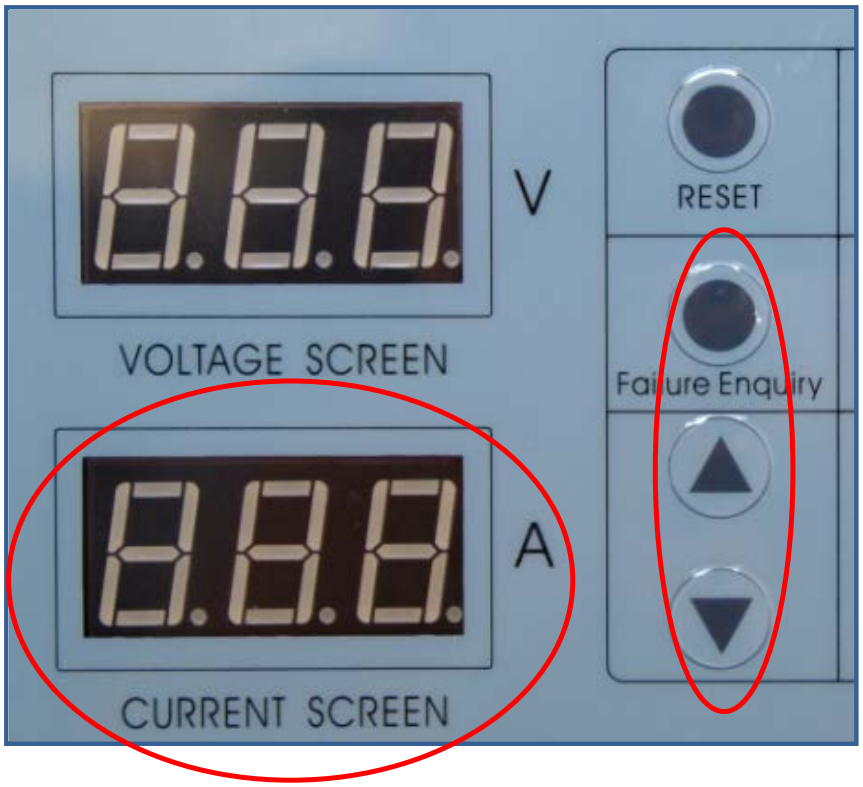
6. Should the pump be in power-on mode but it has been switched off for a no-load fault and the tanks are now full of water, the probes in the tank will signal that the tank is full and the contactor will supply power to the motor. The unit will also do a self test every 30 minutes (adjustable),provided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

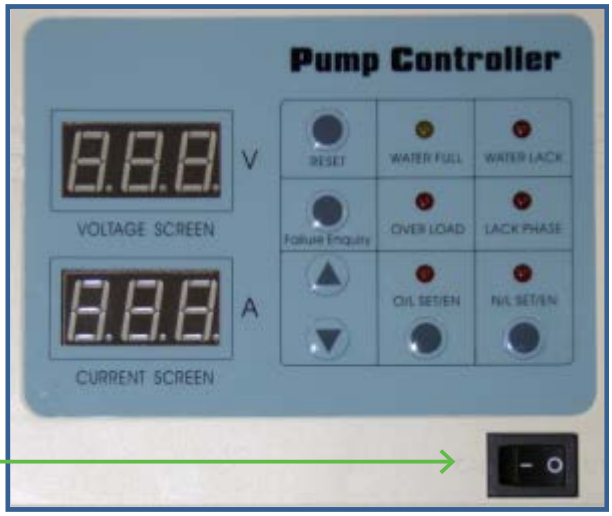
1. This unit has 10 failure data reports and by pressing the failure enquiry button on the front panel the user can select, with the arrows, any report that will be displayed on the digital current indicator A.

   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.



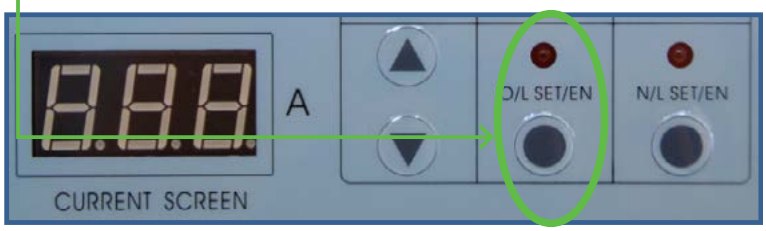
4. The “all complete / enter” button: after running the pump motor normally for 60 seconds the user may press the “enter” button mentioned above. This is found on the PCB above the level connectors. Note that the overload LED on the front panel will flicker for 6 seconds and the turn off.

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

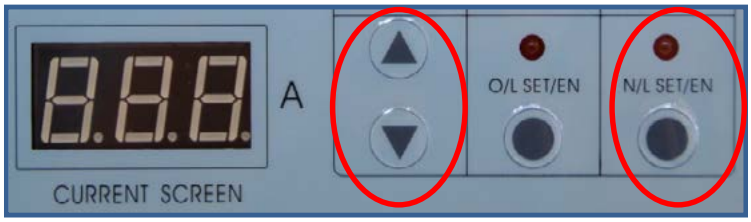
5. By selecting “lower or upper tank/cistern”, “pressure or water” the installer/user user will notice that the LED corresponding to that switch will be on if the switch is in the lower position. The LED will go off in the upper position. Also note that the factory default signal to the controller is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



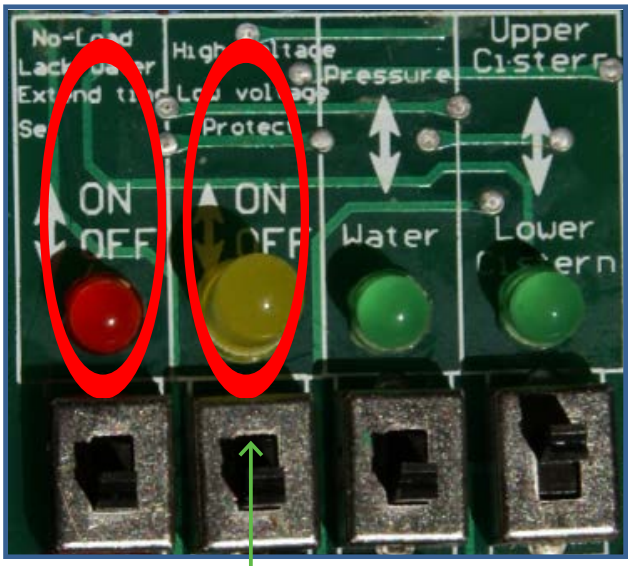
7. No-load setting. Start the pump motor and run for 60 seconds with “no load” . The current should be low. Record this value and press the set/confirm (N/L SET/EN) button on the front panel. With the LED above now “on”, select and adjust with the up/down arrow buttons the current setting as displayed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

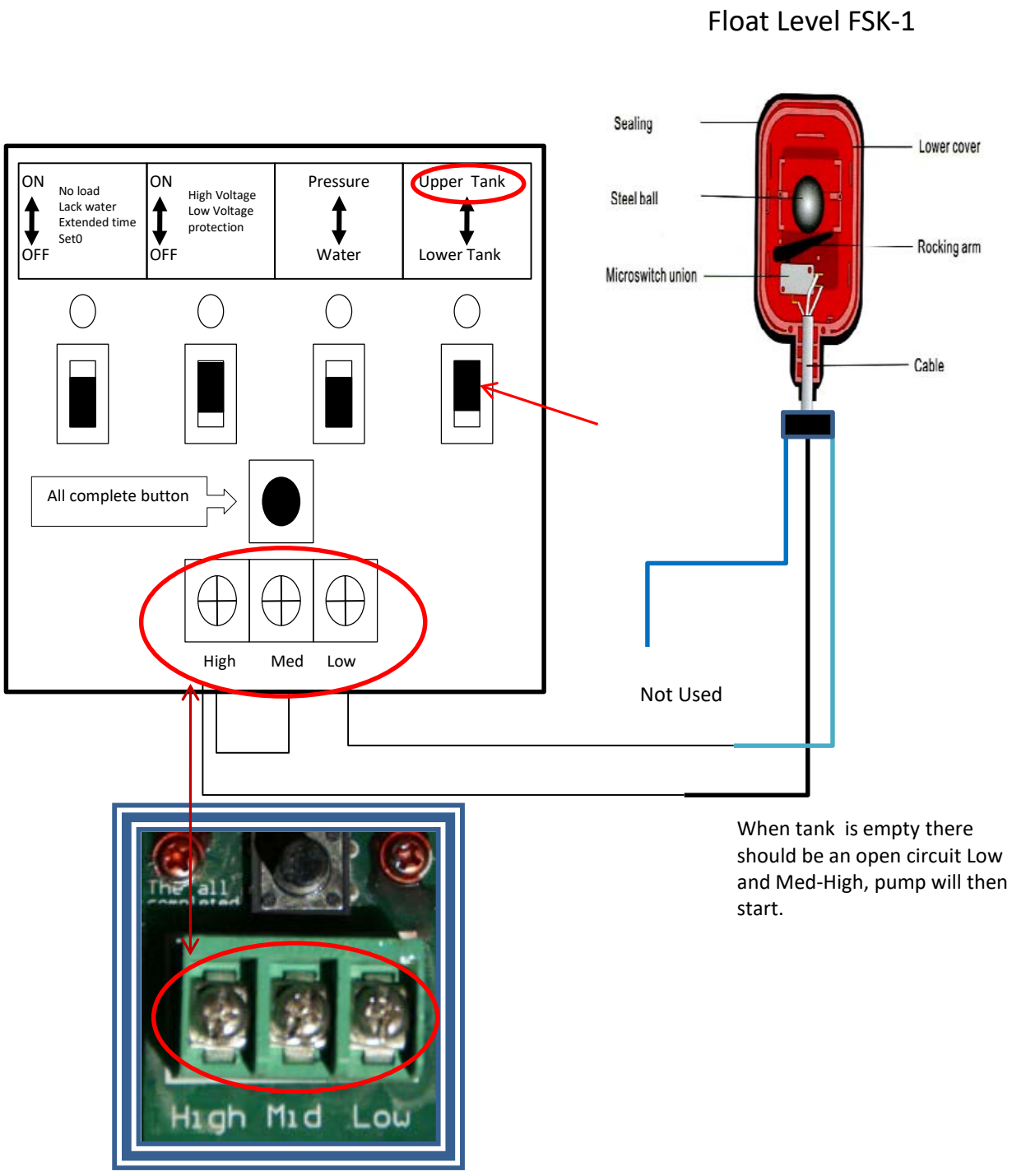
8. No-load reset time. After running the pump motor, switch the “no-load lack water extended set to “on”, located below the red LED. The current digital indicator now shows the no-load reset time in minutes. By adjusting with the “up/down” arrows, select the time required. Then switch to “off”. The time 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 ± 15%.



FLOAT LEVEL CONNECTIONS

Tank Filling - upper tank connections:

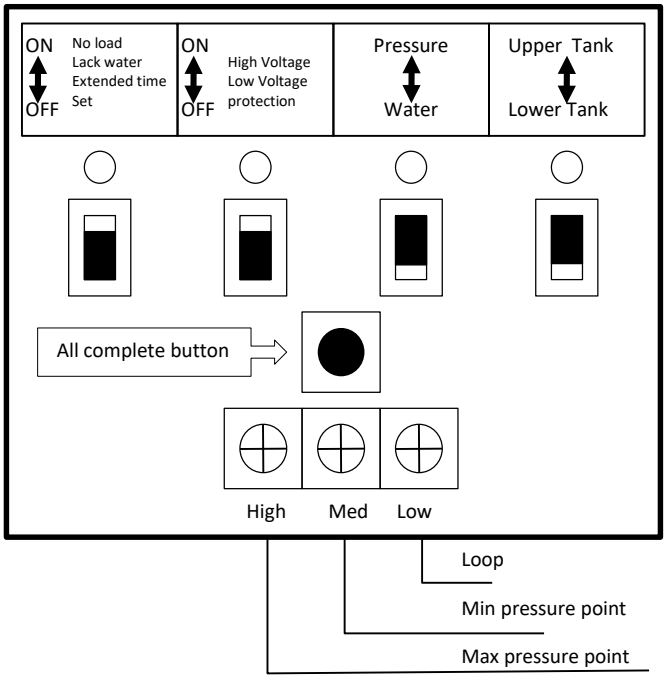


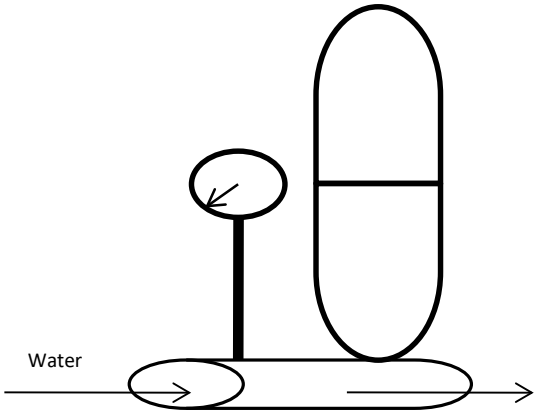
When tank is empty there should be an open circuit Low and Med-High, pump will then start.

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. 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.

PUMP CONTROLLER

DIGITAL STARTER PROTECTOR - 3 PHASE, 380V GENERATION 2

PUMP CONTROLLER

DIGITAL STARTER PROTECTOR - 3 PHASE, 380V GENERATION 2

RESPONSIBILITY

The manufacturer is not liable for malfunctioning if the product has not correctly been installed, damaged, modified, and /or run outside the recommended work range or run outside the recommended work range or in contrast with other indications given in this manual. The manufacturer declines all responsibility for possible errors in this operation manual, if due to misprints or errors in copying. The manufacturer reserves the right to make any modifications to products that it may consider necessary or useful, without affecting the essential characteristics.

INTRODUCTION

Model L931 is useful in all cases we need to control and protect single pump managing its turn-on and turn off by different electric installations.

Typical usage scenarios include:

- Houses
- Flats
- Holidays houses
- Farms
- Water supply from wells
- Irrigations of greenhouses, gardens, agriculture
- Rain water reuse
- Industrial plants
- Waste water tank / Sewage sink

TECHNICAL PARAMETER & FEATURES

Main features:

- Built In function switch
  applied for water supply by liquid level control through float switch or liquid probe;
  applied for water supply by pressure control through pressure switch and pressure tank;
  applied for drainage by liquid level control through float switch or liquid probe.
- Automatic stops the pump in the case of water shortage, protecting it from dry running without installing float switch or liquid probe in the well.
- Auto / Manual switch.
- Dynamic LCD displaying pump running state.
- Push Button Calibration.
- Pump Accumulative Running Time Displaying.
- Pump Last Five Fault Record Displaying.
- RS485 Communication.
- Starts and stops the pump in accordance with the different liquid level or pressure setting.
- Protect the pump against many faults.

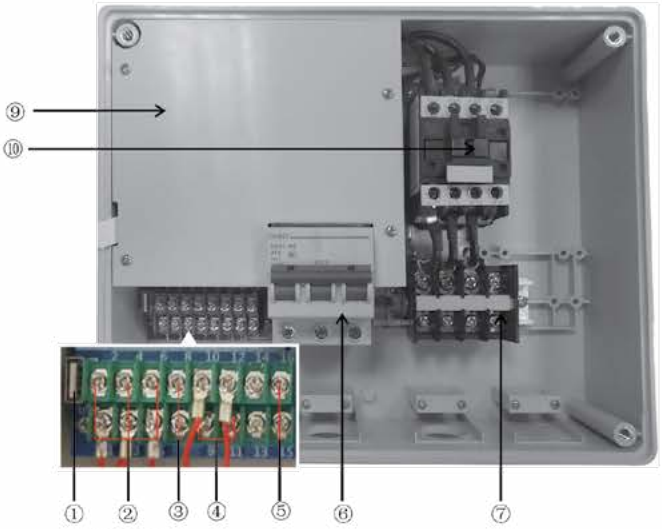
Model L931 has many operation modes by adopting different electric installations. An important feature that makes the difference between Model L931 and common On/Off pump control box is the probe / sensor free in the well. Our special design makes it a very reliable and sensitive protection against pumpdry run without installation probe / sensor in the well.

TECHNICAL PARAMETERS

MAIN TECHNICAL CHARACTERISTIC	
Control characteristic	Double liquid level control
	Pressure control
Control method	Manual / Auto
Liquid level control characteristic	Pulse electrode probe & float switch
Pressure control characteristic	Pressure switch (n/c) & pressure tank
MAIN TECHNICAL DATA	
Rated output power	0.75-4kW (1HP-5.5HP) 5.5-11kW (7.5HP-15HP) 15kW (20HP)
Rated input voltage	Refer to the nameplate
Trip response time of over load	5sec-5min
Trip response time of open phase	< 2 sec
Trip response time of short circuit	< 0.1sec
Trip response time of under / over voltage	< 5sec
Trip response time of dry run	6sec
Recovery time of over load	30min
Recovery time of under / over voltage	5min
Recovery time of dry run	30min
Trip voltage of over voltage	115% of the rated input voltage
Trip voltage of under voltage	80% of the rated input voltage
Liquid level transfer distance	≤1000m
Protection function	Dry run Over load Transient surge Under voltage Over voltage Open phase Pump stalled Short circuit Over temp Three phase unbalance Phase reversal Repeated start
MAIN INSTALLATION DATA	
Working temperature	-25℃ -- +55℃
Working humidity	20% - 90%RH, no drips concreted
Degree of protection	IP54
Install position	Vertical
Unit dimensions (L x W x H)	30.2 x 24 x 12 cm
Unit weight (net)	2.3kg
RS485 TECHNICAL DATA	
Physics Interface	RS485 Bus Interface: asynchronism semiduplex
Baud rate	1200 bps, 2400 bps, 4800 bps, 9600bps Default: 9600bps
Protocol type	MODBUS Protocol (RTU)

CONTROLLER COMPONENTS

1.3 Controller components



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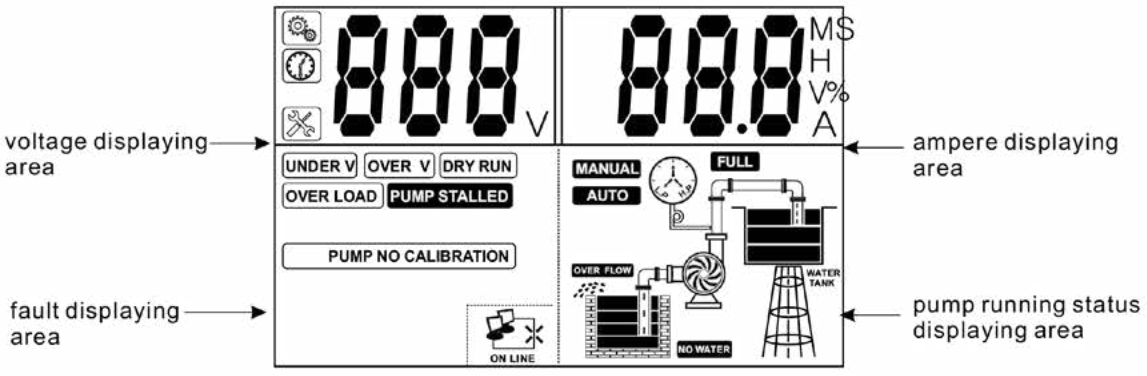
1.USB port
2.Control terminals for electrical connection to float switch/probe pressure switch
3.RS 485 terminals for communication link (remote monitor)
4. Terminals for temperature probe
5.Passive dry contacting point
6.MCB for electrical connection to the power supply
7.Terminals to electrical pump
8.Displaying board
9.Main board+Transformer board
10.AC contactor
11.Remote monitor
12.Adaptor+cable for remote monitor(SC1)
13.Wall-mounting spares+ waterproof tape for the cable



ICON DESCRIPTIONS

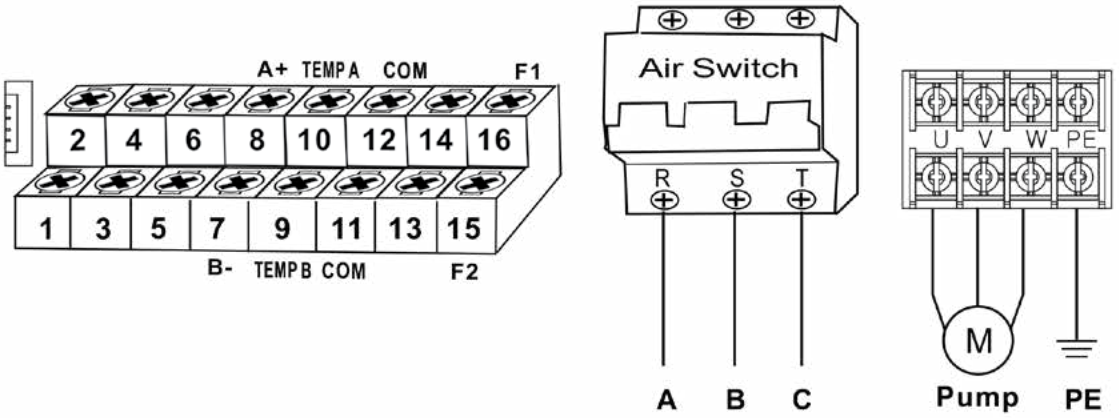
Meaning of the icons shown on the LCD

Icon	Meaning/Description
	pump parameter configuration icon, when this icon appears, pump control box is in parameter adjusting manual;
	time displaying icon, when this icon appears, it means pump control box is displaying some parameter of time, eg: pump accumulative running time (unit: hour); counting down etc
	pump fault icon, when this icon appears, it means pump control box is displaying some fault information;
 ON LINE	network connection error icon, when this icon appears, it means there is no network connections or network connection error between pump control box and SC(slave controller) or computer;
 ON LINE	network normal connection icon, when this icon appears, it means the network connection between pump control box and SC (slave controller) or computer is normal;
V	voltage
M	minute
S	second
H	hour
%	percent
A	ampere
	pump running
	pump stops running
	low pressure or lack of pressure in the pipeline or pressure tank
	high pressure or full of pressure in the pipeline or pressure tank

ELECTRICAL CONNECTION TO THE POWER SUPPLY LINE AND ELECTRICAL PUMP

2 INSTALLATION

2.1 Electrical connection to the power supply line and electrical pump



DANGER - Electric shock risk

Before carrying out any installation or maintenance operation, the M531 should be disconnected from the power supply and one should wait at least 2 minutes before opening the appliance.

Never connect AC power to output UV W terminals.

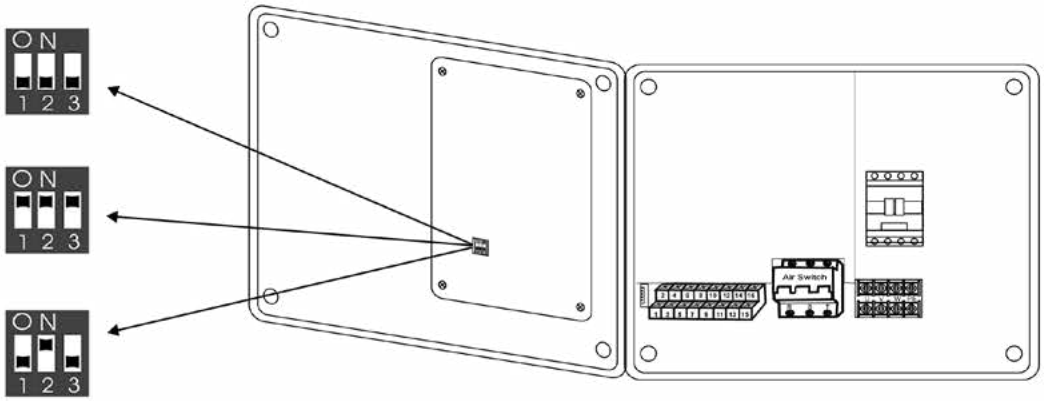
Don’t put wire, metal bar filaments etc into the controller.

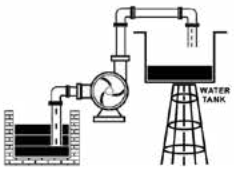
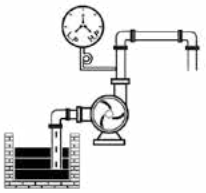
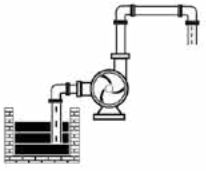
Ensure the motor, controller and power specifications matching.

The electrical and hydraulic connections must be carried out by competent, skilled, qualified personnel.

FUNCTION SWITCH SETTING

Pump users can set the function switch to meet different application requirement, before setting the function switch, the L931 should be disconnected from the power supply, after complete the setting, apply power to L931 and observe the application sign displayed on the LCD conforming to the following list.



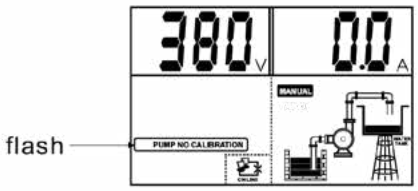
Item	Swith position	Messages & Graphic	Application
1			Applied for water supply or drainage by liquid level control through float switch or liquid sensor
2			Applied for water supply by pressure control through pressure switch & pressure tank
3			Applied for drainage by liquid level control through float switch & liquid probe

PARAMETER CALIBRATION SETTING & ERASING

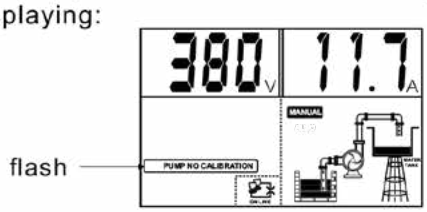
To achieve best level of protection of the pump, it is essential that parameter calibration must be done immediately after successful pump installation or pump maintenance.

SETTING THE PARAMETER CALIBRATION

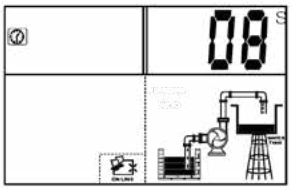
- Press the MODE key to switch to manual state, make sure the pump not running and LCD screen displaying:



- Press the START key to run pump, confirm the pump and all pipe network in normal working state (including voltage, running ampere et); LCD screen displaying:

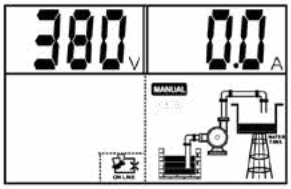


- Press the STORE key; The L931 makes a "Di" sound and starts countdown, LCD screen displaying:



- Pump stops running and parameter calibration completed, LCD screen displaying:

  L931 is ready for running.

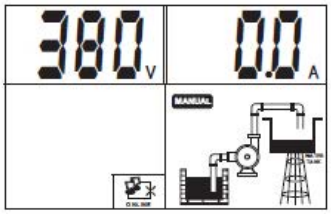


ERASING FORMER PARAMETER CALIBRATION

When pump is reinstalled after maintenance or new pump is installed, user must erase the former parameter calibration and a new calibration must be done.

ERASING THE PARAMETER CALIBRATION

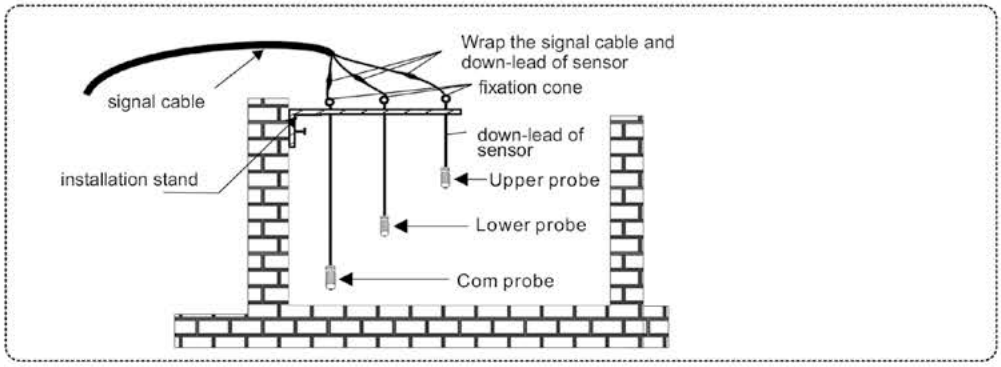
- Press the MODE key to switch to manual state, make sure the pump not running and LCD screen displaying:



- Press the STOP key and release till L931 makes a "Di" sound, L931 recover the default factory setting and LCD screen displaying:

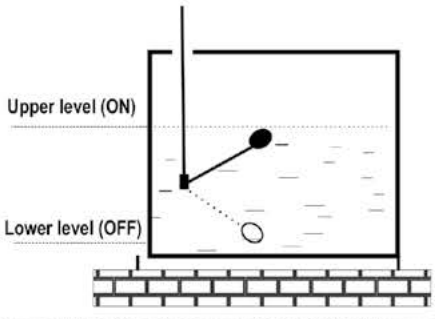
INSTALLING LIQUID PROBE & FLOAT SWITCH

Liquid probe installation



⚠ In event of high risk of electric storms (lightning) or when liquid medium in well or tank or sump is very dirty it is recommended float switch is used.

Float switch installation



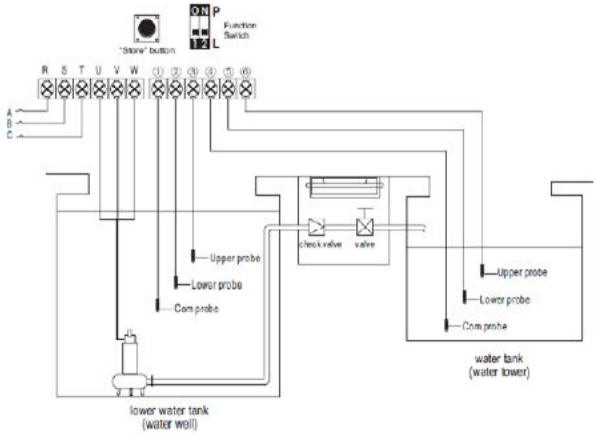
⚠ If the float switch is equipped with three wires use the BLACK and BROWN wires. In event of different colors use a multimeter to identify correct connections as follows:

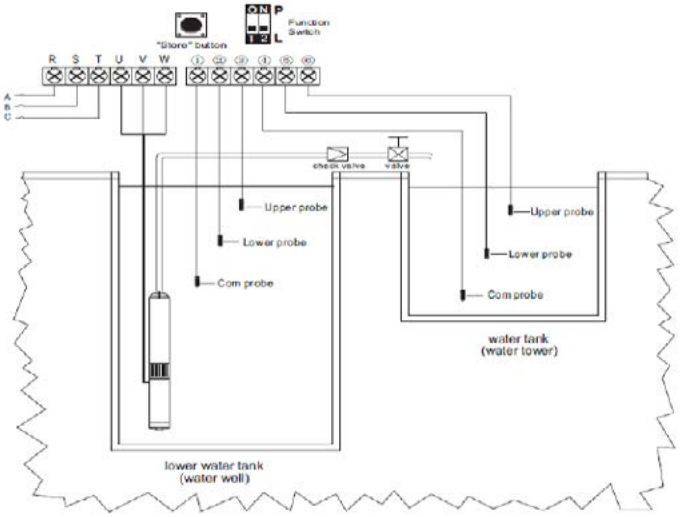
Lower level no reading OFF
Upper level-positive reading-ON

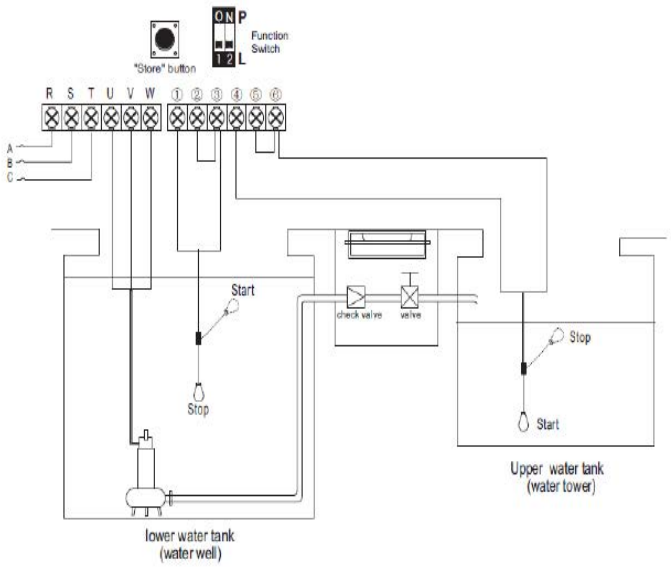
⚠ **DO NOT ENCASE SENSOR LEADS, FLOAT SWITCH WIRE OR SIGNAL CABLES IN METAL PIPES. USE PVC OR PE TUBING.**

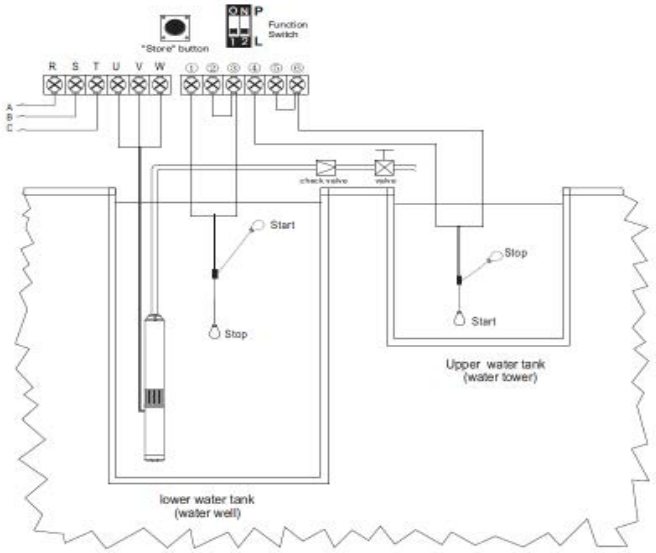
3.2 Electrical connection for different application

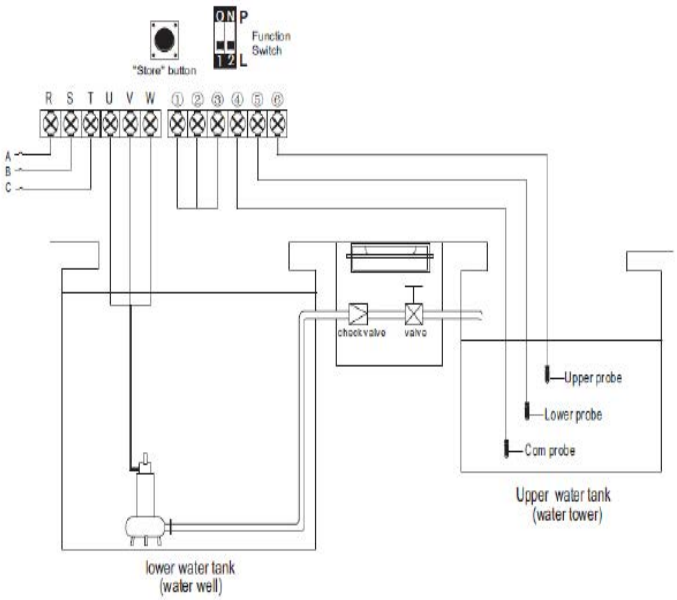
3.2.1 Water supply by liquid level control through float switch or liquid probe

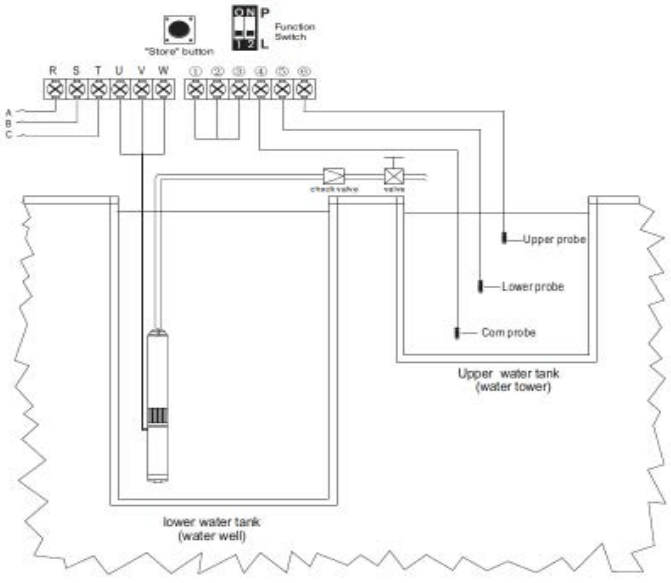


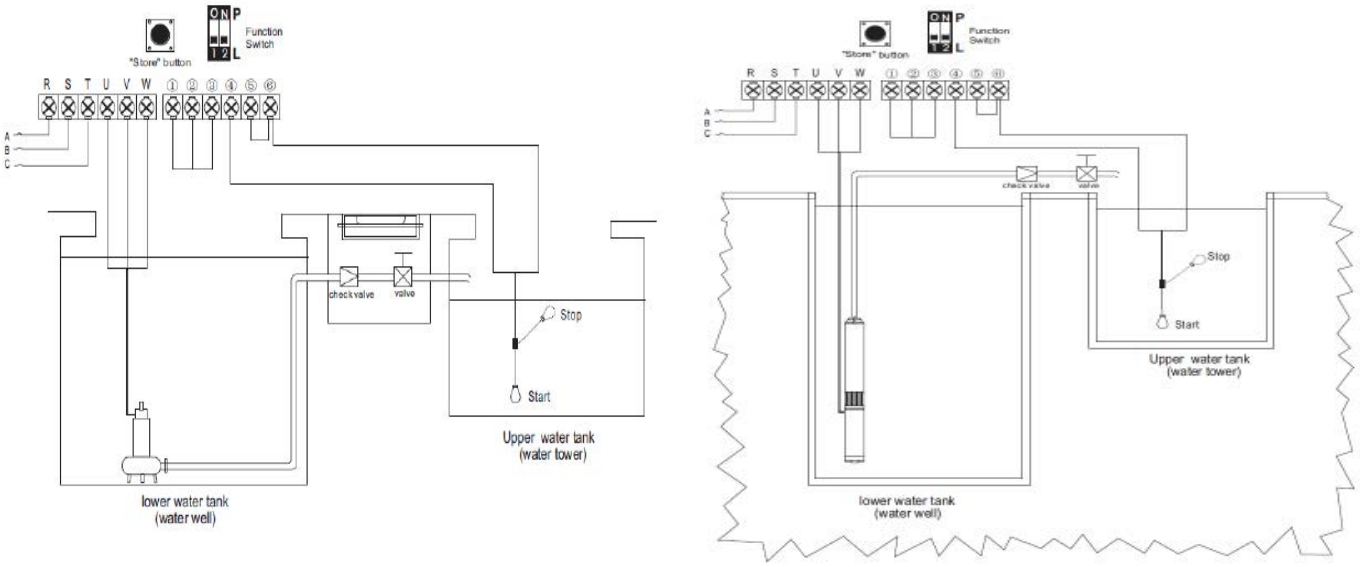












1). STARTING CONDITION

liquid level in the water tank is below Lower probe (float switch: Down level) and liquid level in the water well is above Lower probe (float switch: Up level), the L931 will run pump;

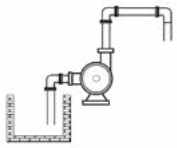
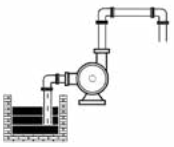
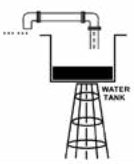
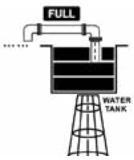
2). STOP CONDITION

liquid level in the water tank reaches Upper probe (float switch: Up level) or liquid level in the waterwell is below Lower probe (float switch: Down level); the L931 will stop pump running;

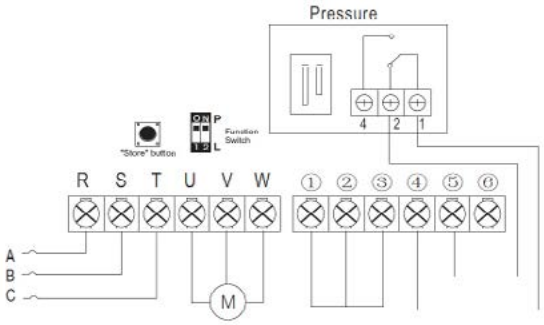
3). THE PROBE / SENSOR FREE IN THE WATER WELL

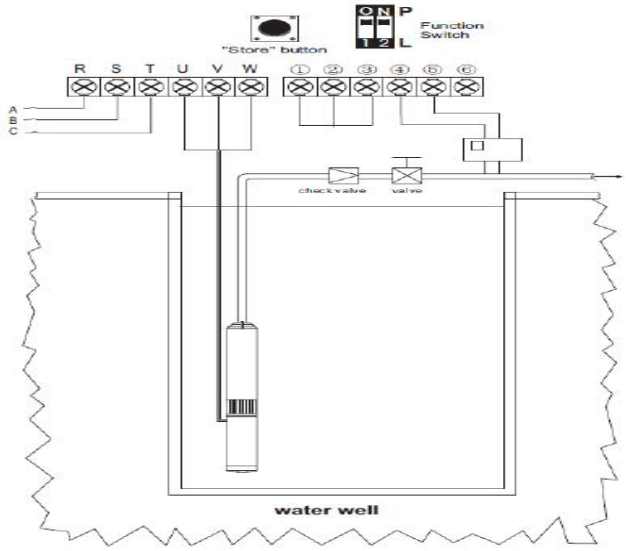
as the L931 has reliable and automatic stop function against pump dry-run (dewatering), if it is used in submersible pump for deep well, pipeline pump or other situations when it is inconvenient to install lower liquid probe in the well, pump users can put terminals 1, 2, 3 in short circuit, which minimize the troubles and costs.

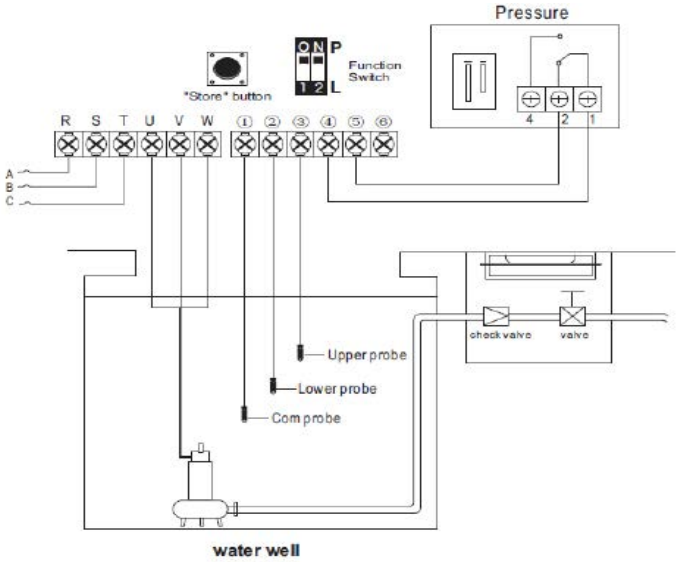
4). MEANING OF THE MESSAGES & GRAPHIC SHOWN ON THE LCD SCREEN

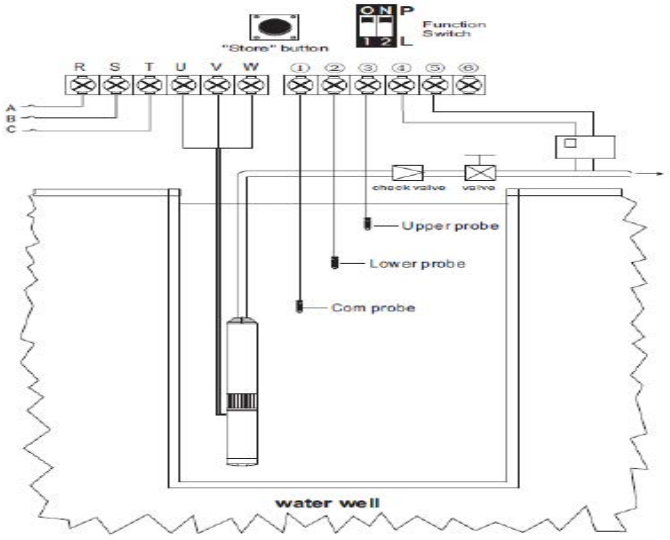
Messages & Graphic	Description
	Lack of water in water well
	Full of water in water well
	Lack of water in water tank
	Full of water in water tank

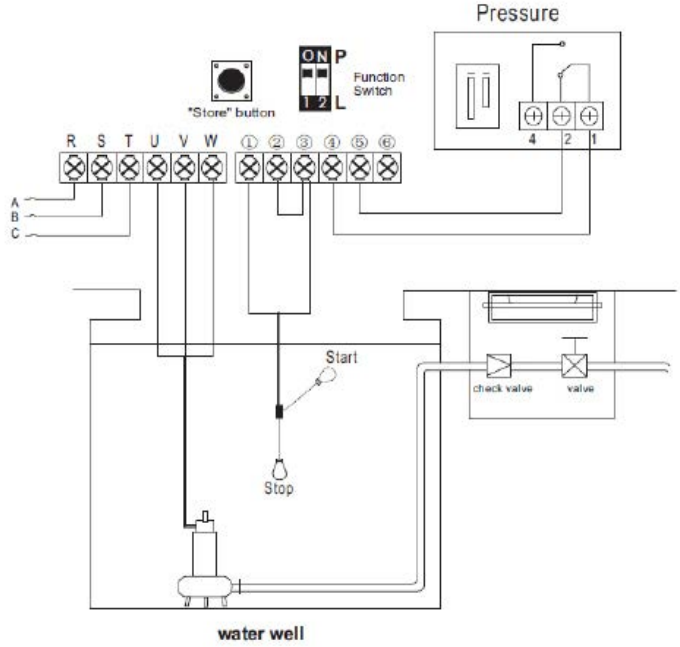
3.2.2 Water supply by pressure control through pressure switch & pressure tank

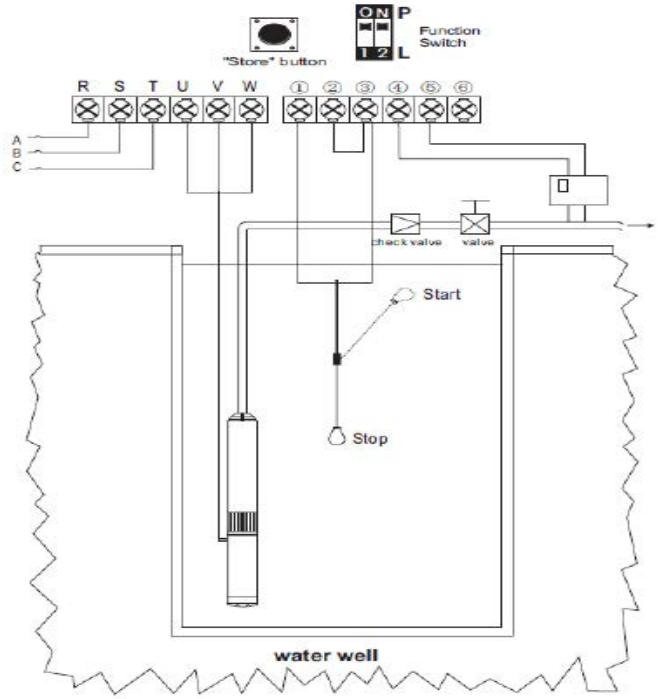












1). STARTING CONDITION

there is no pressure in the pipeline or pressure tank, contacting point of pressure switch is ON and liquid level in the water well is above Lower probe (float switch: Up level), the L931 will run pump;

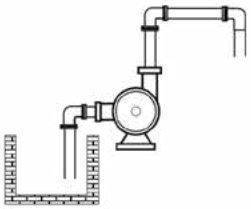
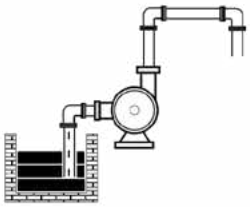
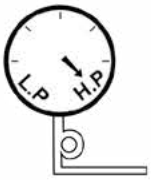
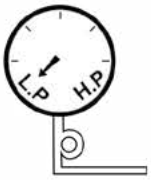
2). STOP CONDITION

there is full pressure in the pipeline or pressure tank, contacting point of pressure switch is OFF, the L931 will stop pump running; Note: pressure switch with N/C (normal close) contacting point: no pressure, contacting point is ON; meet the pressure setting, contacting point is OFF

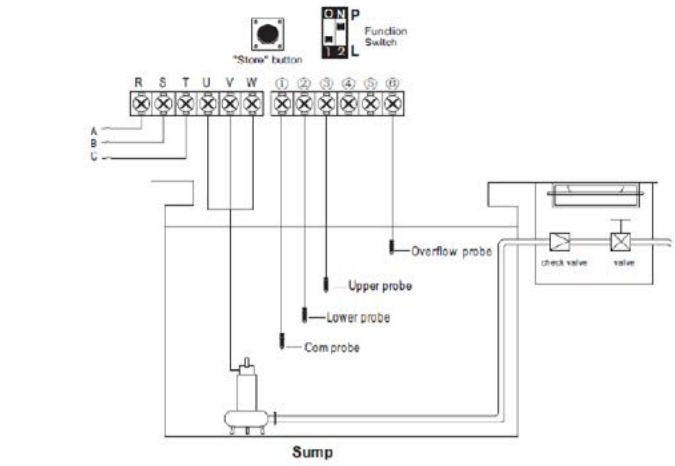
3). THE PROBE / SENSOR FREE IN THE WATER WELL

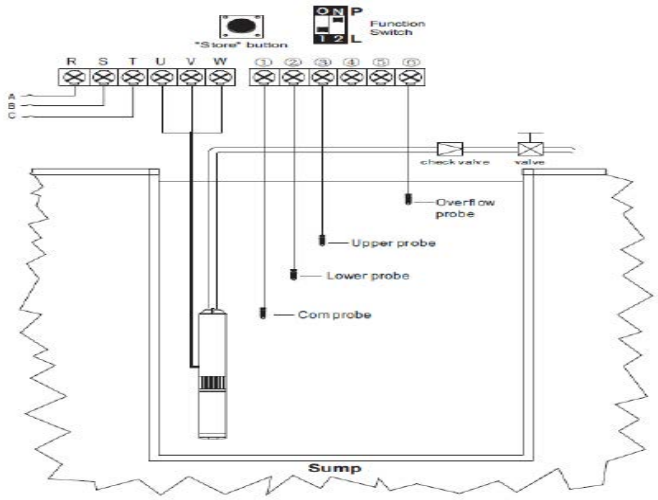
as the L931 has reliable and automatic stop function against pump dry-run (dewatering), if it is used in submersible pump for deep well, pipeline pump or other situations when it is inconvenient to install lower liquid probe in the well, pump users can put terminals 1, 2, 3 in short circuit, which minimize the troubles and costs.

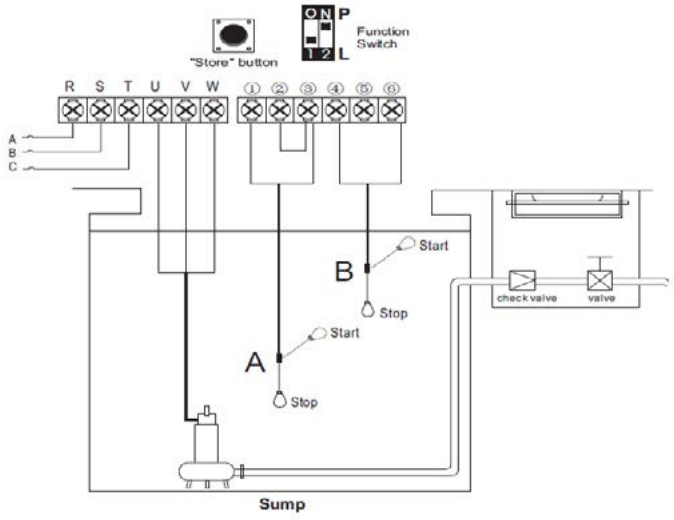
4). MEANING OF THE MESSAGES & GRAPHIC SHOWN ON THE LCD SCREEN

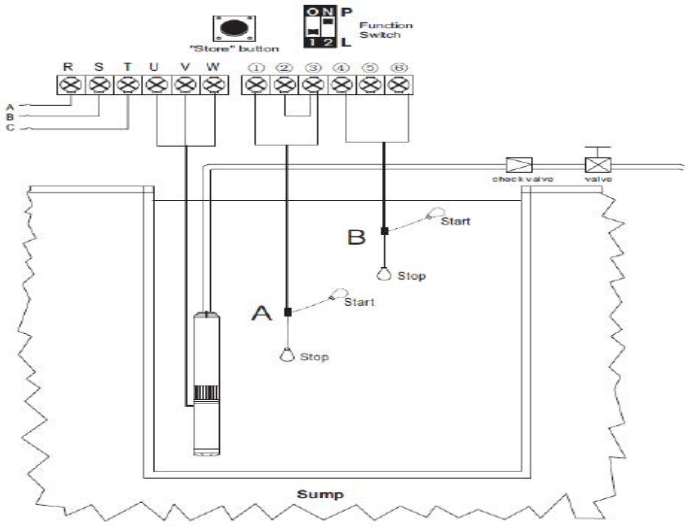
Messages & Graphic	Description
	Lack of water in water well
	Full of water in water well
	Full of pressure in pipeline or pressure tank
	Lack of pressure in pipeline or pressure tank

3.2.3 Drainage by liquid level control through float switch & liquid probe









1). STARTING CONDITION

liquid level in the sump reaches Upper probe (float switch A: Up level), the L931 will run pump;

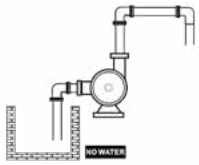
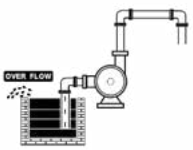
2). STOP CONDITION

liquid level in the sump is below Lower probe (float switch A: Down level), the L931 will stop pump running;

3). OVER FLOW ALARM

when pump is draining water, liquid level in the sump is still rising to Overflow probe (float switch B: Up level), the L931 will sound the overflow alarm to warn pump user to take further action.

4). MEANING OF THE MESSAGES & GRAPHIC SHOWN ON THE LCD SCREEN

Messages & Graphic	Description
	Lack of water in sump
	Overflow in sump

BASIC OPERATION

4.1) SWITCHING TO MANUAL MODE

Press the MODE key to switch to manual state, L931 is under the manual control state;under manual state, press the START key to run pump; press the STOP key to stop pump running;

Note: under manual state, the L931 can not receive the signal from liquid level probe or pressure switch.

4.2) SWITCHING TO AUTO MODE

Press the MODE key to switch to auto state, L931 is under the auto control state;under auto state, L931 will run or stop the pump according to the signal from liquid level probe or pressure switch.

Note: under auto state, if the pump is running and pump user wants to stop pump running compulsory, press the MODE key to switch to manual state and pump stops running;

Note: under auto state, if the input power being cut off and recovery power again, the L931 will enter operation state after 10seconds countdown;

Note: no matter the L931 is under auto or manual state, if the input power being cut off and recovery power again, the L931 will resume its operation state as the operation state before power being cut off;

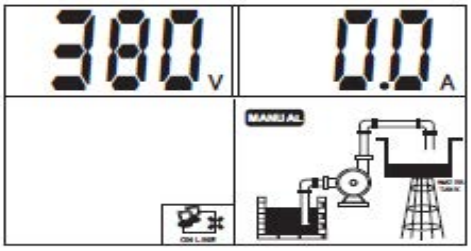
4.3 PUMP PROTECTION

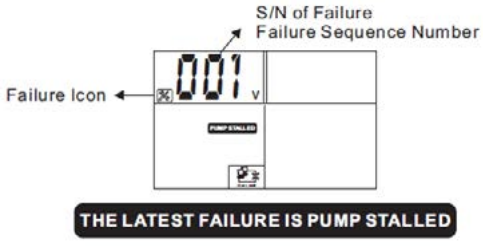
During pump running, if dry run, over load, under voltage, over voltage etc failures happened, the L931will immediately shut down the pump running and automatically execute a check for restarting conditions after a built in time delay has elapsed. The L931 will not recover automatically until all the abnormal situation(s) have been cleared. If pump stalled, open phase etc serious failures happened, pump user must check the pump and motor immediately and repair the pump.

4.4 PUMP LAST FIVE FAILURE RECORD DISPLAYING

The L931 can memorize the last five failures of pump, so it is very convenient for the pump users to analyse the pump running conditions. Displaying the pump last five failure record

- Press the MODE key to switch to manual state, make sure the pump not running and LCD screen displaying:





- Hold pressing STOP key and press MODE key, the panel makes a “Di” sound, the panel displays pump failure record.

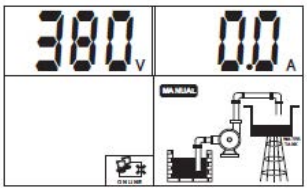
- Press STOP key to quit the failure record displaying;

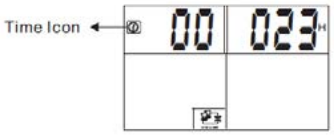
4.5 PUMP ACCUMULATIVE RUNNING TIME DISPLAYING

The panel1 can memorize how many hours of pump running, so it is very convenient for the pump users to analyse the pump running conditions and do maintenance

Displaying the pump accumulative running time

- Press the MODE key to switch to manual state, make sure the pump not running and LCD screen displaying:





THE PUMP HAS RUN FOR 23 HOURS

- Hold pressing 

button and press STOP key, the panel makes a “Di” sound, the panel displays pump failure record.
- Press STOP key to quit the accumulative running time displaying.

TROUBLE SHOOTING GUIDE

Fault Message	Possible Cause	Solutions
flashing of UNDER V	the real running voltage is lower than the calibrated voltage, pump is in under voltage protection state	report low line voltage to the power supply company
		L931 will attempt to restart the pump every 5minutes until line voltage is restored to normal
flashing of OVER V	the real running voltage is higher than the calibrated voltage, pump is in over voltage protection state	report high line voltage to the power supply company
		L931 will attempt to restart the pump every 5minutes until line voltage is restored to normal
flashing of OVER LOAD	the real running ampere is higher than the calibrated running ampere, pump is in over load protection state	L931 will attempt to restart the pump every 30minutes until running ampere is restored to normal
	pump impeller is jammed / pump motor dragging / pump bearing broken	check pump impeller or bearing
flashing of OPEN PHASE	power supply lose phase	report to the power supply company
	controller inlet wire or pumpcable broken	repair inlet wire or pump cable
flashing of PUMP NO CALIBRATION	parameter calibration not completed	refer to parameter calibration setting
flashing of DRY RUN	liquid level in the well / sump is below the pump intake, pump stops running	L931 will attempt to restart the pump every 30minutes until liquid level above the pump intake

4” OIL FILLED MOTOR 220V

3 PHASE - SOLAR APPLICATION

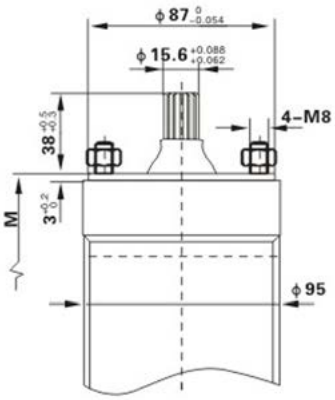
MOTOR TECHNICAL DATA

Single phase power:	0.75 to 5.5 kW
Speed:	2850rpm
Voltage:	220 3 phase
Insulation class:	B
Protection grade:	IP 68
Highest temperature of liquid:	35oC
Maximum solid handling:	40g/m3
Motor casing:	stainless steel
Maximum diameter:	Φ 95 mm

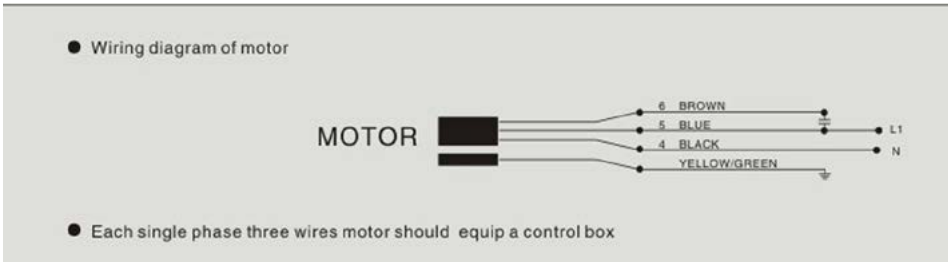
With sandproof cover/pressure balance membrane/ mechanical seal for high performance.
Flange and coupling according to NEMA standard.

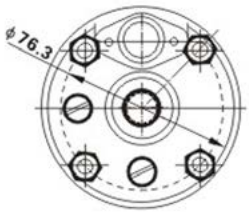
MOTOR DIMENSIONS

TYPE	MOTOR POWER		RUNNING	DIMENSIONS	
Single Phase 220V~/50HZ	kW	HP	Amps	Length (mm)	Weight (kg)
4SD-0.75	0.75	1.0	4.0	344	8.0
4SD-1.5	1.5	2.0	8.6	424	11.7
4SD-2.2	2.2	3.0	11.3	344	8.0
4SD-4.0	4	5.5	18.0	698	23.7
4SD-5.5	5.5	7.5	24.0	788	28



MOTOR WIRING





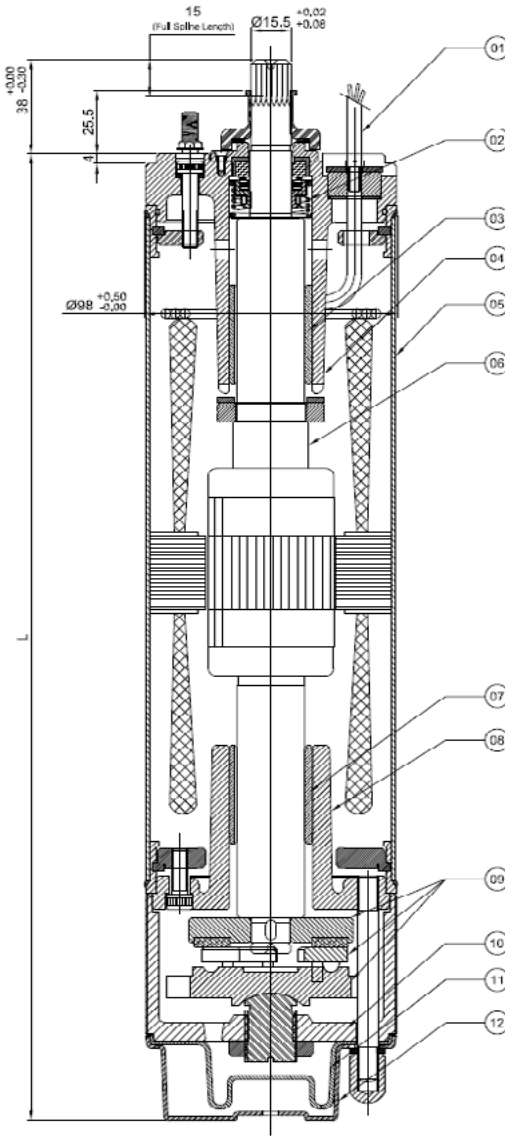
Note: These motors make use of our AC-DC inverters

For more information go to the Solar Inverter AC-DC Catalogue (Solar Products)

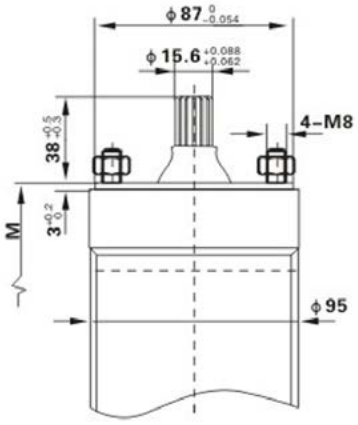
TECHNICAL DATA

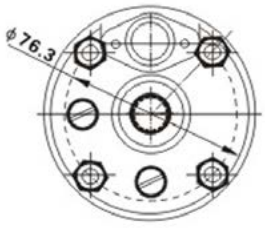
MOTOR PARTS

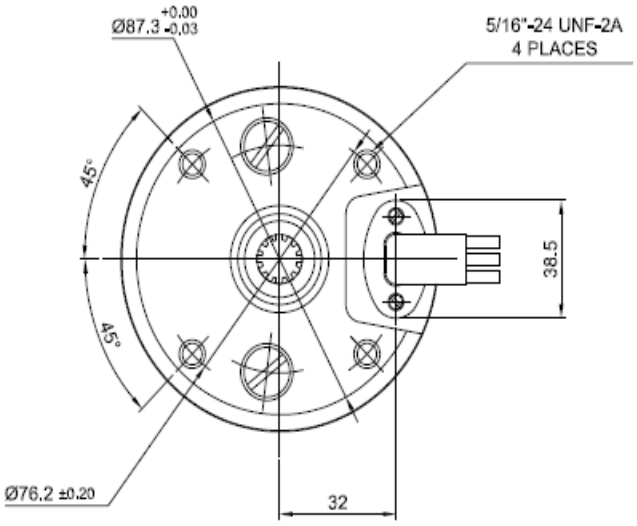
SERIAL NO.	PART NAME	MATERIAL
01	Cable 3 Core/ 4 Core	EPR
02	Mechanical Seal	Ceramic/Carbon
03	Bearing Bush	Carbon
04	Upper Housing	CI (FG-200)/S.S.304
05	Motor Pipe	Stainless Steel
06	Rotor shaft	S.S.420
07	Bearing Bush	Carbon
08	Lower Housing	CI (FG-200)
09	Thrust Bearing set	Carbon/S.S. 420
10	Lower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

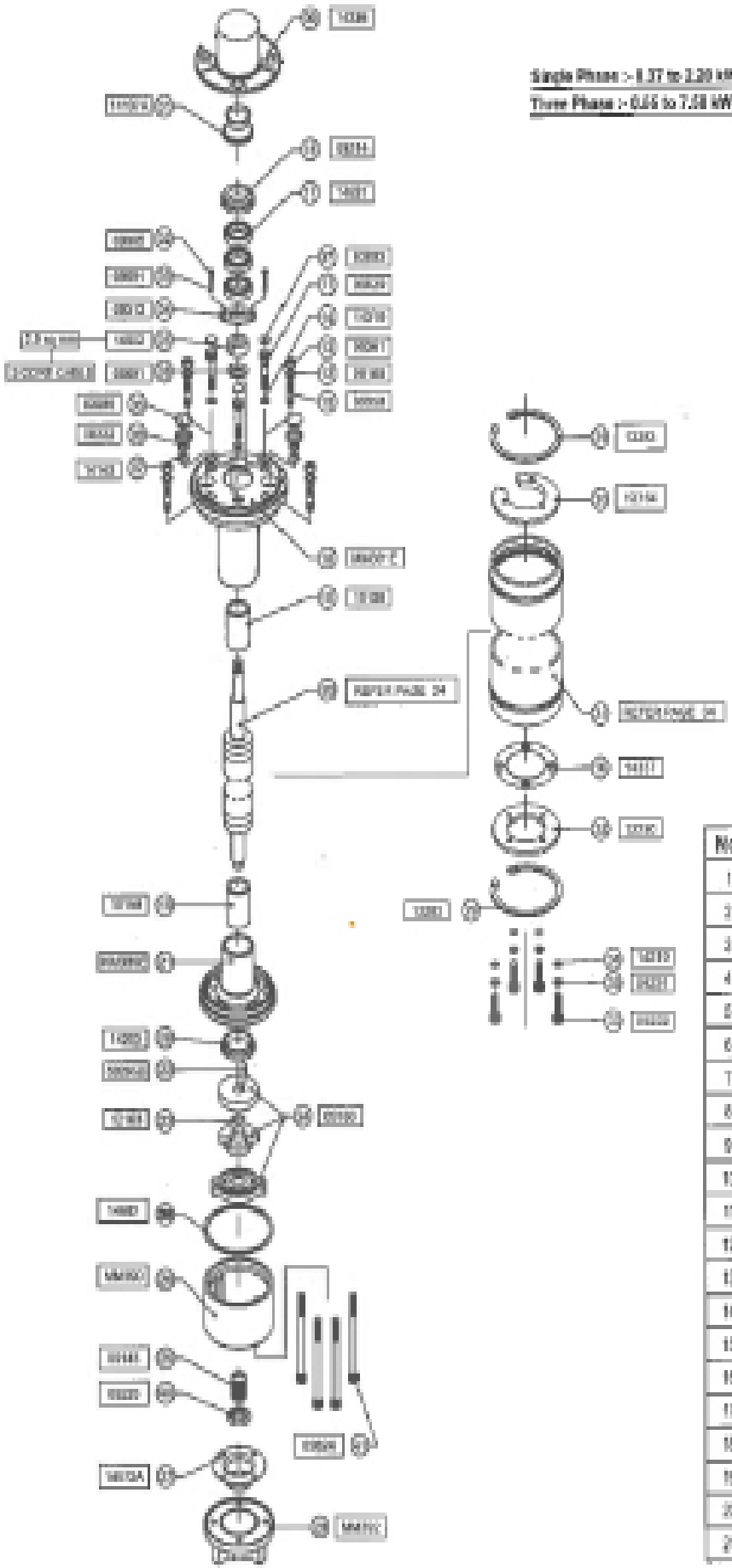


DIMENSIONAL DRAWINGS









No.	PART'S NAME
1	SAND GUARD
2	CABLE CLIP SCREW
3	CABLE WASHER
4	CABLE CLIP
5	CABLE GROMMET
6	DRAIN PLUG
7	DRAIN PLUG "O" RING
8	CABLE WASHER
9	COUPLE CAP
10	WINDING CAP
11	ALLEN BOLT
12	HEX NUT
13	SPRING WASHER
14	ALLEN BOLT "O" RING
15	UPPER STUD
16	OIL SEAL COLLAR
17	OIL SEAL
18	UPPER HOUSING
19	BEARING BUSH
20	MOTOR SHAFT
21	LOWER HOUSING

No.	PART'S NAME
22	KEY
23	CIRCLIP (EXTERNAL)
24	THRUST BEARING PAD SET
25	ROCKER
26	LOWER HOUSING PART 2
27	PRESSURE CUP
28	MOTOR RADE
29	CIRCLIP (INTERNAL)
30	UPPER FLANGE
31	RINGH STATOR BODY
32	LOWER FLANGE
33	ALLEN BOLT
34	STUD "O" RING
35	STUD WASHER
36	DRAIN PLUG CAP
37	ALLEN BOLT CAP
38	C. T. BEARING
39	LOWER GASKET
40	ROCKER PIVOT
41	ALLEN BOLT

NOTES