FLUID SOLAR

4" high efficiency submersible solar pumps

Clean water
(Maximum
sand content 150 g/m³)

Domestic use

Agricultural use

PERFORMANCE RANGE

- Flow rate up to **180 l/min** (10.8 m³/h)
- Head up to **180 m**

APPLICATION LIMITS

- Maximum liquid temperature **+35 °C**
- Maximum sand content **150 g/m³**
- Maximum immersion depth of **40 m** with a sufficiently long power cable
- Installation:
  – vertical
  – horizontal

CONSTRUCTION AND SAFETY STANDARDS

EN 60335-1
IEC 60335-1
CEI 61-150

EN 60034-1
IEC 60034-1
CEI 2-3

CE

EU REGULATION N. 547/2012

CERTIFICATIONS

Company with management system certified DNV
ISO 9001: QUALITY

EAC

TECHNICAL CHARACTERISTICS

- 4" multi-stage submersible solar pumps
- High performance motor with permanent magnets
- High efficiency photovoltaic panels
  PANASONIC mod. VBHN240SJ25
- Electronic control incorporated in the motor

INSTALLATION AND USE

The **FLUID SOLAR** pumps have been developed to pump clean water from a well utilising energy obtained from photovoltaic panels. The electronic control incorporated into the high performance motor converts the exit voltage from the panels and regulates the velocity of rotation of the motor in order to utilise the available energy most efficiently at any one time: **on a sunny day there will be a high velocity of rotation with a raised performance of the pump, and on a cloudy day the velocity and the performance will be reduced**.

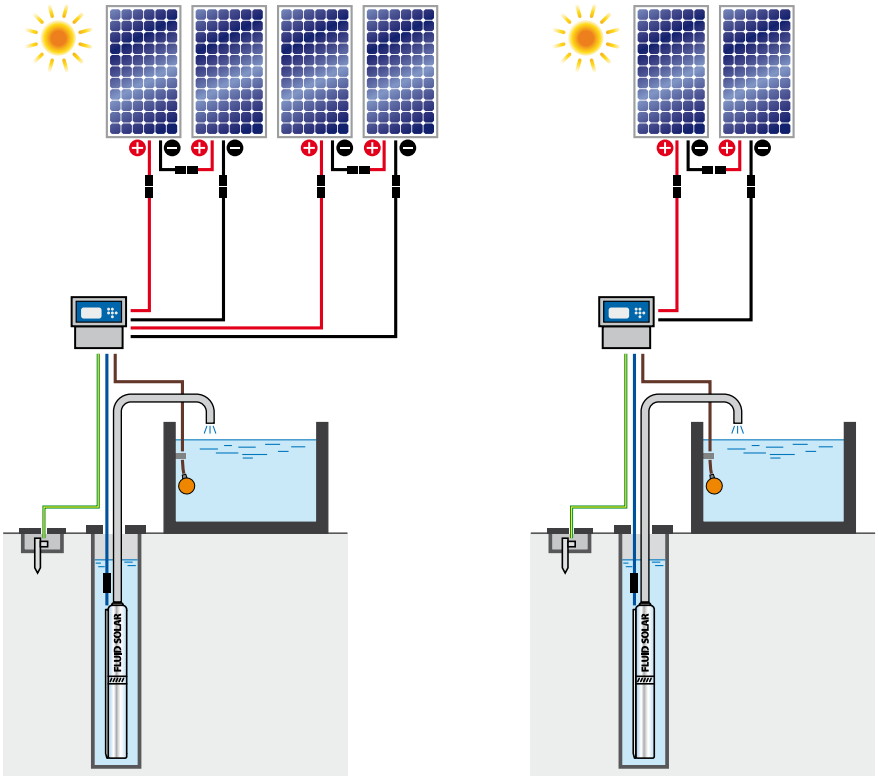
PATENTS - TRADE MARKS

- Patent n. 0001413386, EP2419642
- Patent n. EP2300717
- FLUID SOLAR® Registered Trade Mark n. 0001516301

Installation examples for electric water pump as P1=750 W

FLUID SOLAR 1/10 - 2/6 - 4/4 - 6/3

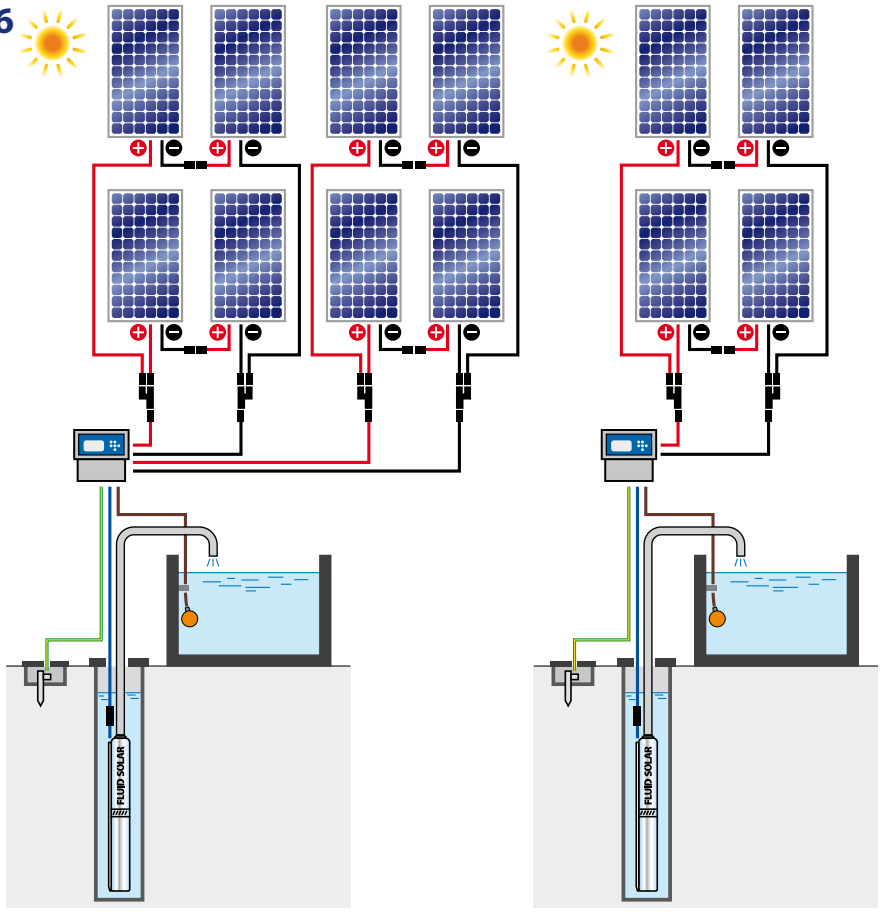
- To get the nominal maximum performances waterpump has to be powered by **n. 4 photovoltaic modules** with a nominal total power of **980 Wp** at least.
- Waterpump can be powered even by only **2 photovoltaic modules**: in this case performances are lower than maximum nominal performances that can be achieved with 4 modules.
- Empty tension for any single module has to range between **35** to **50 VDC**.



Installation examples for electric water pump as P1=1500 W

FLUID SOLAR 1/20 - 2/14 - 4/8 - 6/6

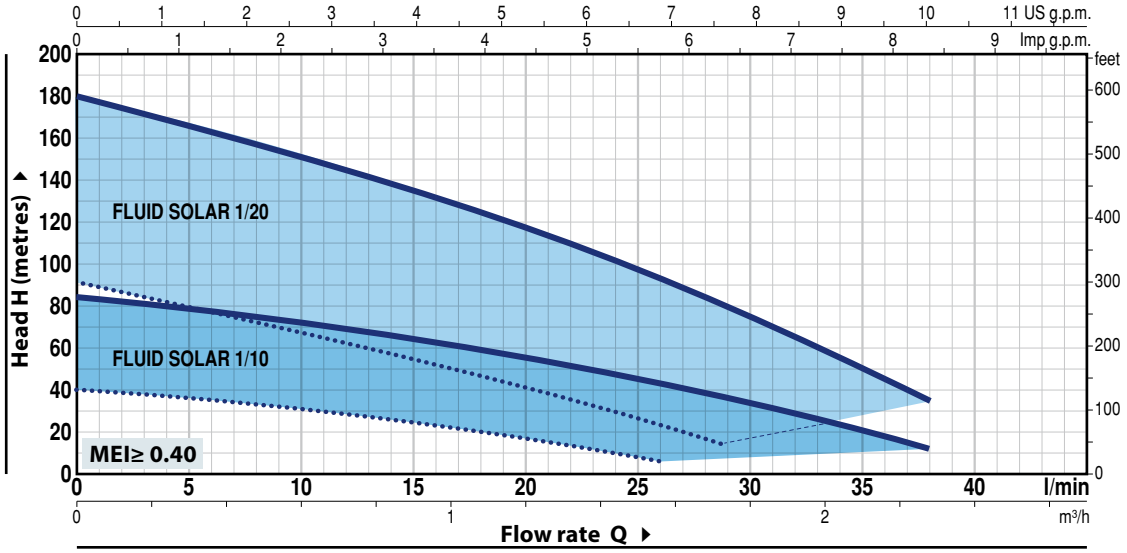
- To get the nominal maximum performances waterpump has to be powered by **n. 8 photovoltaic modules** with a nominal total power of **1960 Wp** at least.
- Waterpump can be powered even by only **4 photovoltaic modules**: in this case performances are lower than maximum nominal performances that can be achieved with 8 modules.
- Empty tension for any single module has to range between **35** to **50 VDC**.



FLUID SOLAR

CHARACTERISTIC CURVES AND PERFORMANCE DATA

Tolerance of characteristic curves in compliance with EN ISO 9906 Grade 3B



FLUID SOLAR 1/10

ABSORBED POWER P1 **750 W**

Performance with **4 photovoltaic panels** with a total rated power of 980 Wp

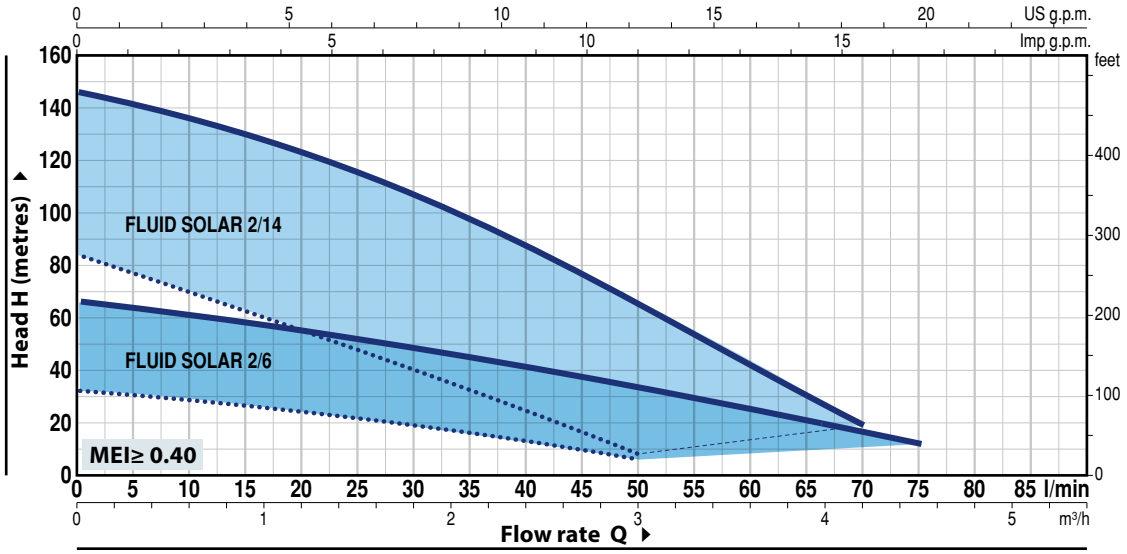
Q	m³/h	0	0.3	0.6	1.2	1.6	1.8	2.3
	l/min	**0**	**5**	**10**	**20**	**26**	**30**	**38**
H metres	▬	84	79	72	56	42	33	12
	••••	40	36	31	17	6		

FLUID SOLAR 1/20

ABSORBED POWER P1 **1500 W**

Performance with **8 photovoltaic panels** with a total rated power of 1960 Wp

Q	m³/h	0	0.3	0.6	1.2	1.6	1.74	1.8	2.3
	l/min	**0**	**5**	**10**	**20**	**26**	**29**	**30**	**38**
H metres	▬	180	165	150	118	92	79	75	35
	••••	90	80	67	41	22	13		



FLUID SOLAR 2/6

ABSORBED POWER P1 **750 W**

Performance with **4 photovoltaic panels** with a total rated power of 980 Wp

Q	m³/h	0	0.3	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.5
	l/min	**0**	**5**	**10**	**20**	**30**	**40**	**50**	**60**	**70**	**75**
H metres	▬	66	64	61	55	48	41	33	25	16	12
	••••	32	31	28	24	19	13	6			

FLUID SOLAR 2/14

ABSORBED POWER P1 **1500 W**

Performance with **8 photovoltaic panels** with a total rated power of 1960 Wp

Q	m³/h	0	0.3	0.6	1.2	1.8	2.4	3.0	3.6	4.2
	l/min	**0**	**5**	**10**	**20**	**30**	**40**	**50**	**60**	**70**
H metres	▬	146	140	136	123	107	87	65	42	20
	••••	82	77	70	55	40	24	8		

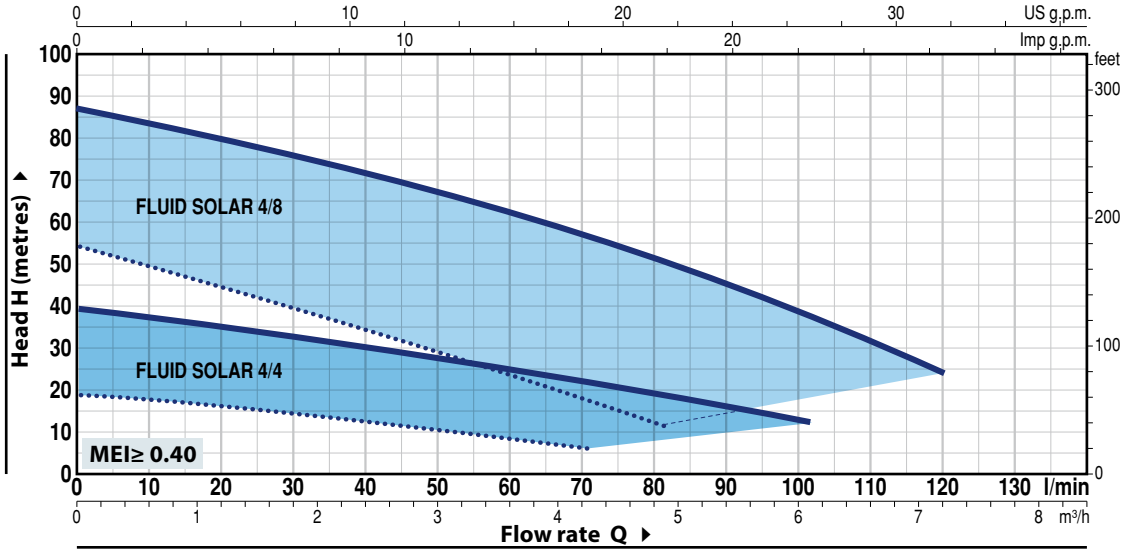
▬ **Performance with a solar radiation of 1000 W/m² and with an available voltage of the photovoltaic panels of 100 VDC**

•••• **Performance with a solar radiation of 300 W/m² and with an available voltage of the photovoltaic panels of 70 VDC**

The performance curves illustrated above are obtained with the photovoltaic panels facing SOUTH (facing NORTH for installations in the southern hemisphere) and optimising the angle of inclination in relation to the horizon in compliance with the latitude of the installation site

CHARACTERISTIC CURVES AND PERFORMANCE DATA

Tolerance of characteristic curves in compliance with EN ISO 9906 Grade 3B



FLUID SOLAR 4/4

ABSORBED POWER P1 **750 W**

Performance with **4 photovoltaic panels** with a total rated power of 980 Wp

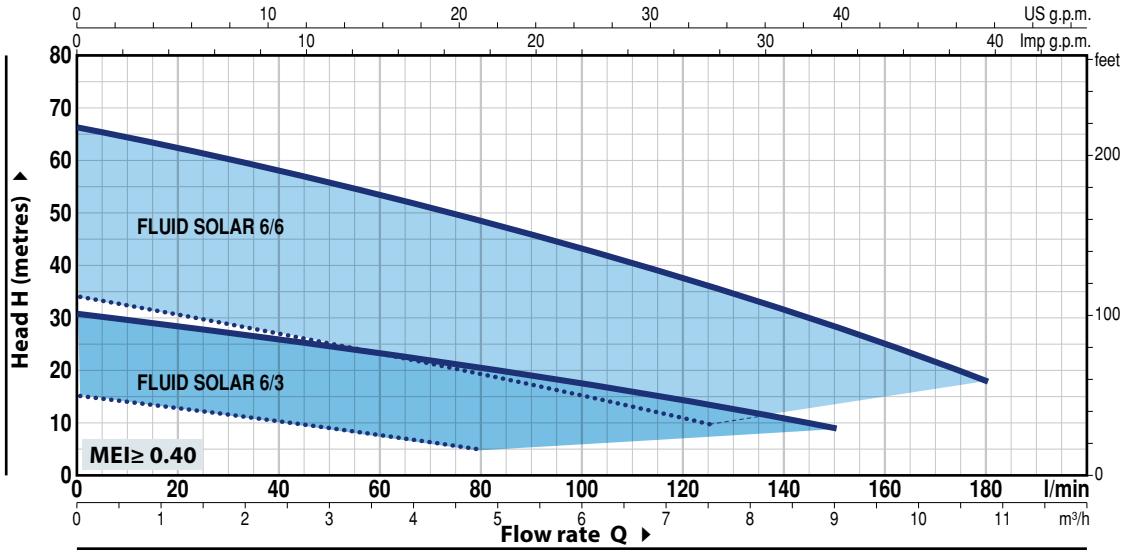
Q	m³/h	0	0.3	0.6	1.2	1.8	3.0	3.6	4.3	4.5	4.8	5.7	6.1
	l/min	**0**	**5**	**10**	**20**	**30**	**50**	**60**	**71**	**75**	**80**	**95**	**102**
H metres	▬	39	38.5	37	35	32.5	27	25	22	21	18	14	12
	••••	19	18.5	17.5	16	14	10	8	6				

FLUID SOLAR 4/8

ABSORBED POWER P1 **1500 W**

Performance with **8 photovoltaic panels** with a total rated power of 1960 Wp

Q	m³/h	0	0.3	0.6	1.2	2.4	3.6	4.9	6.0	7.2
	l/min	**0**	**5**	**10**	**20**	**40**	**60**	**82**	**100**	**120**
H metres	▬	87	85	83	80	71	62	50	39	24
	••••	54	52	49	45	34	23	11		



FLUID SOLAR 6/3

ABSORBED POWER P1 **750 W**

Performance with **4 photovoltaic panels** with a total rated power of 980 Wp

Q	m³/h	0	0.3	1.8	3.6	4.8	5.4	7.2	9.0
	l/min	**0**	**5**	**30**	**60**	**80**	**90**	**120**	**150**
H metres	▬	31	30	27	23	20	19	14	9
	••••	15	14	11	8	5			

FLUID SOLAR 6/6

ABSORBED POWER P1 **1500 W**

Performance with **8 photovoltaic panels** with a total rated power of 1960 Wp

Q	m³/h	0	0.3	1.8	3.6	5.4	7.2	7.5	9.0	10.8
	l/min	**0**	**5**	**30**	**60**	**90**	**120**	**125**	**150**	**180**
H metres	▬	66	65	60	53	46	37	36	28	18
	••••	34	33	29	23	17	11	10		

▬ **Performance with a solar radiation of 1000 W/m² and with an available voltage of the photovoltaic panels of 100 VDC**

•••• **Performance with a solar radiation of 300 W/m² and with an available voltage of the photovoltaic panels of 70 VDC**

The performance curves illustrated above are obtained with the photovoltaic panels facing SOUTH (facing NORTH for installations in the southern hemisphere) and optimising the angle of inclination in relation to the horizon in compliance with the latitude of the installation site

FLUID SOLAR P1 = 750 W

POS.	COMPONENT	CONSTRUCTION CHARACTERISTICS
1	**DELIVERY BODY AND EXTERNAL SLEEVE**	Stainless steel AISI 304 complete with threaded delivery port in compliance with ISO 228/1.
2	**IMPELLERS**	Lexan 141-R for FLUID SOLAR 1/10, 4/4, 6/3 Delrin for FLUID SOLAR 2/6
3	**DIFFUSERS**	Noryl FE1520PW
4	**STAGE BOXES / STAGE LIDS**	Stainless steel AISI 304
5	**CABLE COVER**	Stainless steel AISI 304
6	**PUMP SHAFT**	Stainless steel AISI 304 for FLUID SOLAR 1/10, 4/4, 4/8, 6/3
7	**DRIVE COUPLING**	Stainless steel AISI 316L for FLUID SOLAR 1/10, 4/4, 4/8, 6/3
8	**MOTOR SHAFT**	Stainless steel AISI 431
9	**MOTOR SLEEVE**	Stainless steel AISI 304
10	**TWO MECHANICAL SEALS SEPARATED BY AN OIL CHAMBER**	

Seal Model	*Shaft Diameter*	*Position*	*Materials* Stationary ring	Rotational ring	Elastomer
STA-17	**Ø 17** mm	Motor side	Silicon carbide	Graphite	NBR
ST1-16	**Ø 16** mm	Pump side	Silicon carbide	Graphite	NBR

11	**BEARINGS**	**6203 2RS - C3E / 6203 ZZ - C3E**
12	**INVERTER**	
13	**ELECTRIC MOTOR**	

– Submersible motor, suitable for continuous duty (with dry, rewindable stator).
– High performance motor with permanent magnets
– Insulation: class F
– Protection: IP X8

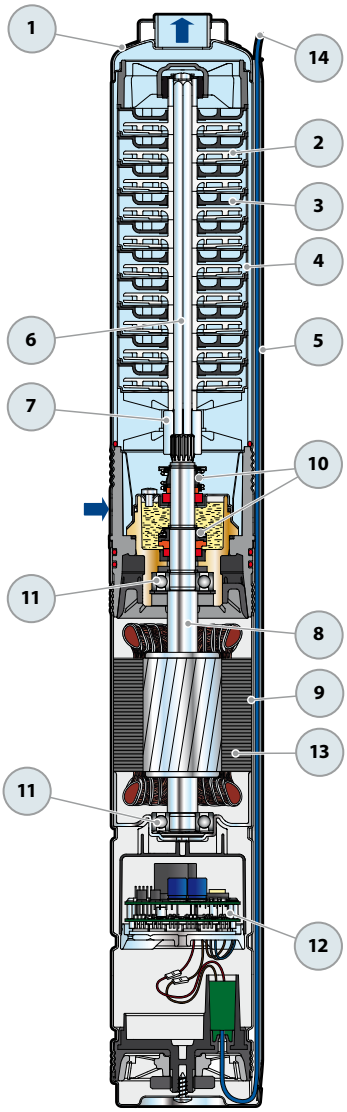
14 POWER CABLE

➠ **PBS-P type**
approved for use in drinking water by "ACS"
in compliance with BS 6920, approval n. 04 ACCLI 201
Standard length 2 metres

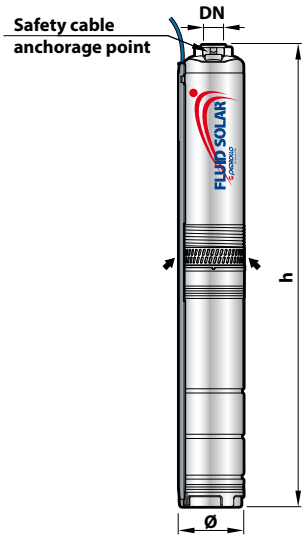
Equipment supplied: connection kit for RPS2 cables

15	**CONTROL BOX**	
16	**CONNECTORS**	

– 2 SMK male connectors
– 2 SMK female connectors



Equipment supplied



DIMENSIONS AND WEIGHT

MODEL	PORT DN	N. STAGES	DIMENSIONS mm Ø	h	kg *
FLUID SOLAR 1/10	**1"**	10	100	710	12.3
FLUID SOLAR 2/6		6		587	11.4
FLUID SOLAR 4/4		4		614	11.0
FLUID SOLAR 6/3	**1¼"**	3		616	11.0

(* weight of the pump with control box)

FLUID SOLAR P1 = 1500 W

POS.	COMPONENT	CONSTRUCTION CHARACTERISTICS
1	**DELIVERY BODY AND EXTERNAL SLEEVE**	Stainless steel AISI 304, complete with threaded delivery port in compliance with ISO 228/1.
2	**IMPELLERS**	Lexan 141-R
3	**DIFFUSERS**	Noryl FE1520PW
4	**STAGE BOXES / STAGE LIDS**	Stainless steel AISI 304
5	**CABLE COVER**	Stainless steel AISI 304
6	**PUMP SHAFT**	Stainless steel AISI 304
7	**DRIVE COUPLING**	Stainless steel AISI 316L
8	**MOTOR SHAFT**	Stainless steel AISI 431
9	**MOTOR SLEEVE**	Stainless steel AISI 304
10	**TWO MECHANICAL SEALS SEPARATED BY AN OIL CHAMBER**	

Seal	*Shaft*	*Position*	*Materials*		
Model	***Diameter***		*Stationary ring*	*Rotational ring*	*Elastomer*
STA-17	**Ø 17** mm	Motor side	Silicon carbide	Graphite	NBR
ST1-16	**Ø 16** mm	Pump side	Silicon carbide	Graphite	NBR

11	**BEARINGS**	**3203 B 2RS - C3E / 6203 ZZ - C3E**
12	**INVERTER**	

13 ELECTRIC MOTOR

- Submersible motor, suitable for continuous duty (with dry, rewindable stator).
- High performance motor with permanent magnets
- Insulation: class F
- Protection: IP X8

14 POWER CABLE

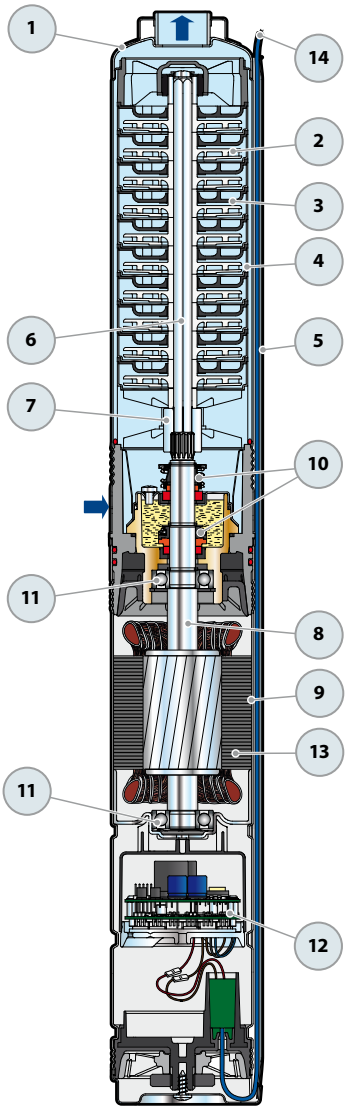
➠ **PBS-P type**
approved for use in drinking water by "ACS"
in compliance with BS 6920, approval n. 04 ACCLI 201
Standard length 2 metres

Equipment supplied: connection kit for RPS2 cables

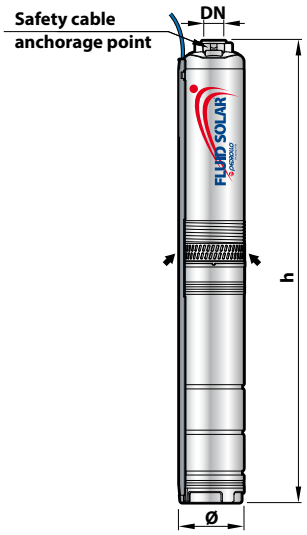
15 CONTROL BOX

16 CONNECTORS

N. 2 SMK male connectors
N. 2 SMK female connectors
N. 2 Y female/male-male connectors type MC4
N. 2 Y male/female-female connectors type MC4



Equipment supplied



DIMENSIONS AND WEIGHT

MODEL	PORT DN	N. STAGES	DIMENSIONS mm Ø	DIMENSIONS mm h	kg *
FLUID SOLAR 1/20	**1"**	20	100	990	13.9
FLUID SOLAR 2/14		14		855	13.8
FLUID SOLAR 4/8		8		772	13.7
FLUID SOLAR 6/6	**1¼"**	6		776	13.7

(* weight of the pump with control box)