Electro submersible pumps

# SD, SDF, SDN, SDX, SDS

**ORIGINAL OPERATING INSTRUCTIONS**

## 1. Operating conditions

**Standard construction**

- For clean or slightly dirty water with maximum sand content: 150 g/m³ (50 g/m³ for SDX).
- Water temperature up to 25 °C (35 °C for 4").
- Max starts per hour at regular intervals: 20 for 4" motors, 15 for 6"-8" motors, 10 for 10" motors.

The electric data marked on the label are referred to the nominal power of the motor.

## 2. Installation

Along its entire length the well diameter must be wide enough to allow for passage of the pump with clearance all round.

Handle the pump carefully; don't drop it or let it fall. **The safe movement of the equipment is on the user responsability and any lifting operation must be carried out by a suitably trained and qualified personnel.**

When threaded connections are used, delivery pipes must be tightened to avoid any risk of the pump falling into the well owing to unscrews.

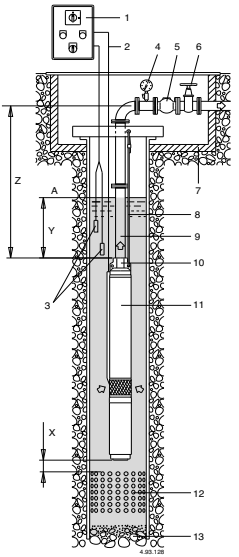
It is advisable to connect the **metal pipes** to the threaded joints with spot welding.

With **plastic pipes** use proper connections.

The **SD, 6SDX**-series pumps have two holes in the delivery casing for anchoring and for raising the pump.

1 control panel
2 power cable
3 level probes system
4 pressure gauge
5 non-return valve
6 delivery gate valve
7 inspection shaft
8 safety cable
9 delivery piping
10 built-in valve
11 pump
12 filter
13 well bottom

A changeable dynamic level.
Z total length of delivery piping; if >100 m install one or more non-return valves.
Y depth of immersion, always >1 m.
X distance between motor and well filter > 1 m.




**A safety rope or chain** of non-perishable material should always be used to secure the pump.

Attach the power supply cables to the delivery pipe with cable clamps placed at intervals of approx 3 m.

Lower the pump into the well, making sure the feed cables are not damaged in any way during the operation.

**Never use the electric power cable to suspend the pump.**

When the pump is operating, the delivery connection must be submersed at least 1 m below the deepest dynamic level of the well; for this purpose, it is advisable to install an automatic control system which will stop operating of the pump when the level of the water falls below this limit.

Position the pump at a distance from the bottom of the well which will be sufficient to avoid accumulation of sand or mud around the motor and to eliminate the risk of overheating.

The following components must be installed in the **delivery pipe:**

- a pressure gauge;
- a check valve at max. 7 m from the pump outlet and more lift-type **check valves** (5), depending on the type of installation (at least one every 50 m in the straight vertical pipe above the pump), to provide protection against water hammering;
- a **gate valve** to regulate delivery, head and absorbed power.

If the submersible pump is to be installed in the **horizontal position**, the following instructions must be followed:

- install the pump with its axis placed at least 0,5 m above the bottom of the sump, tank or container;
- install a supplementary check valve, as the pump valve does not ensure a perfect seal in the horizontal position;
- the plant must allow for easy evacuation of the air when starting.

## 2.1. Motor cooling

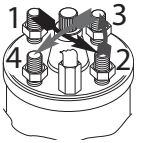
If the well (or tank) has a diameter which is considerably greater than the pump width, it is necessary to install a **cooling flow shroud** (a flow inducer sleeve), that is an external jacket to ensure a sufficient flow and water velocity (v ≥ 0,08 m/s for 4", 0,16 m/s for 6" and 0,2 m/s for 8"-10") **to cool the motor.**

## 3. Assembly of the pumps

The pumps are normally supplied with motor and pump disconnected (except 4SD already assembled).

Connect the coupling and pump-motor suction lantern. Clean the surface to be coupled. Put the suction lantern of the pump in correspondance of the motor studs. Couple the grooved joint of the pump to the motor shaft.

Screw in the nuts to the suction lantern, then fix them crosswise starting from the one opposed to the cable as shown in the figure below. The torque



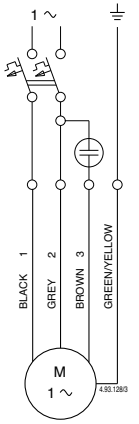
recommended is 10Nm (for 4" motors).
Attach the cable to the pump with the cable guard and place the filter on the suction lantern.
Follow separate operating instructions (if available) of the motor.

## 4. Electrical connection

Electrical connection must be carried out only by a qualified electrician in accordance with local regulations.
**Follow safety standards.**

**The unit must be properly earthed (grounded), also with a non-metallic delivery pipe.**
Make sure the frequency and mains voltage correspond with the name plate data.

The **control panel** must contain:
- a device for disconnection from the mains (switch) with a contact separation of at least 3 mm in all poles;
- an adequate motor protector for the current indicated on the nameplate;
- a capacitor for the **SDM** single-phase pumps, in accordance with the data indicated on the motors themselves.



Electrical diagram single-phase motors

For pumps with power rating above 11 kW, it is advisable to provide the control panel with Y/ Δ or impedance starting.
Install electrodes to protect the pump against dry running.

## 4.1. Connection of cables

Feed cables have to be chosen on the basis of power, distance, voltage drop and temperature.
For connection of cables in the well, use thermoshrinking insulation sheathes or other systems used for submerged cables.
Before lowering the motor into the well, use appropriate instruments to measure continuity between phases and perform an isolation test between each single phase and the earth conductor.

## 4.2. Operation with frequency converter

Adjust the frequency converter so that the limiting values of min. 30 Hz and max. 60 Hz will not be exceeded.

The maximum running up time from 0 to 30 Hz and running down time from 30 to 0 Hz for frequency-converter operation is 1 second.

## 5. Starting

**ATTENTION: never run the pump dry, not even for a short trial run.**

**Start the pump with the gate valve regulated to minimum aperture** and wait until the delivery pipe is completely free of air.

**With a three-phase motor make sure the direction of rotation is correct.**
For this purpose, with the gate valve at half-open aperture position, check the pressure (with the pressure gauge) or flow rate (sight check) after starting. Switch off power, reverse the connections of two phases on the control panel, re-start and check the pressure or flow rate capacity again.
The correct direction of rotation will provide a considerably greater and easily distinguishable pressure and delivery capacity.

Make sure the sand residue present in the water disappeares or is minimal.

**Never start or run the pump when the gate valve has been opened too widely.**
**Make sure the pump operates within its rated limits of performance and that the rated absorbed current is not exceeded.**
Otherwise, regulate the delivery gate valve or the setting of any pressure switches.

**ATTENTION: avoid long periods of operation with closed discharge.**

## 5.1. Generator supply

The switching sequence is of utmost importance. If you do not apply this correctly, both motor and generator may be damaged.
Therefore:
- Always switch the generator on and off without load!

This means:
- Starting: aiways switch the generator ON first - and the motor afterwards!
- Stopping: always switch the motor OFF first - and the generator afterwards!

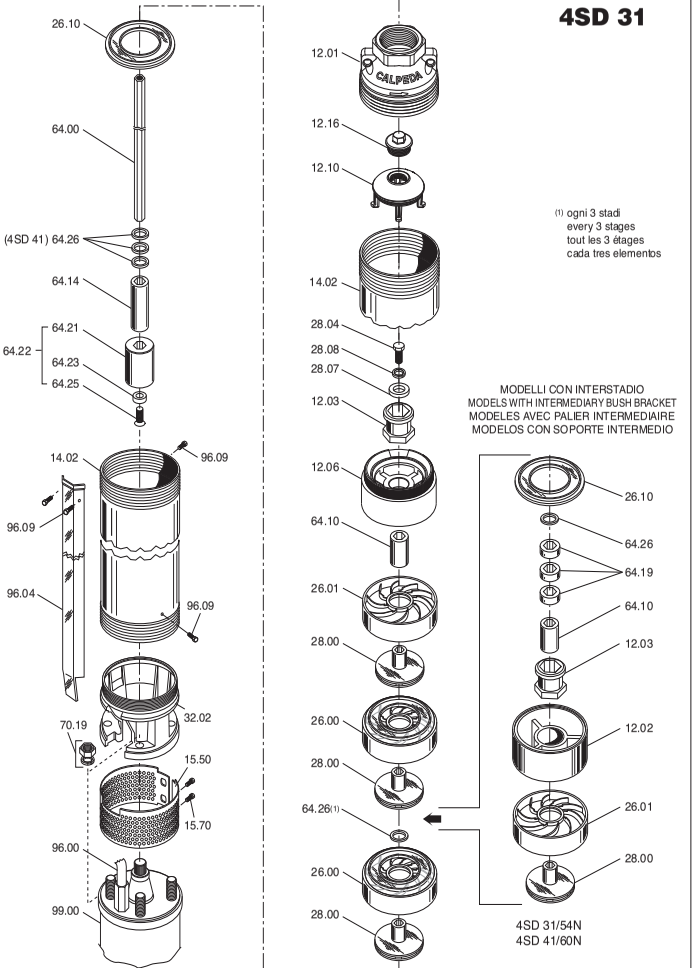
## 6. Maintenance

Under normal operating conditions with clean water the pump will not require maintenance. Absorbed current and head supplied by the pump must be checked at regular intervals.
This procedure should be carried out frequently when water contains considerable quantities of sand. In the case of emergency systems, it is advisable to operate the pumps once a month in order to avoid the risk of blocking and to maintain and verify perfect efficiency.

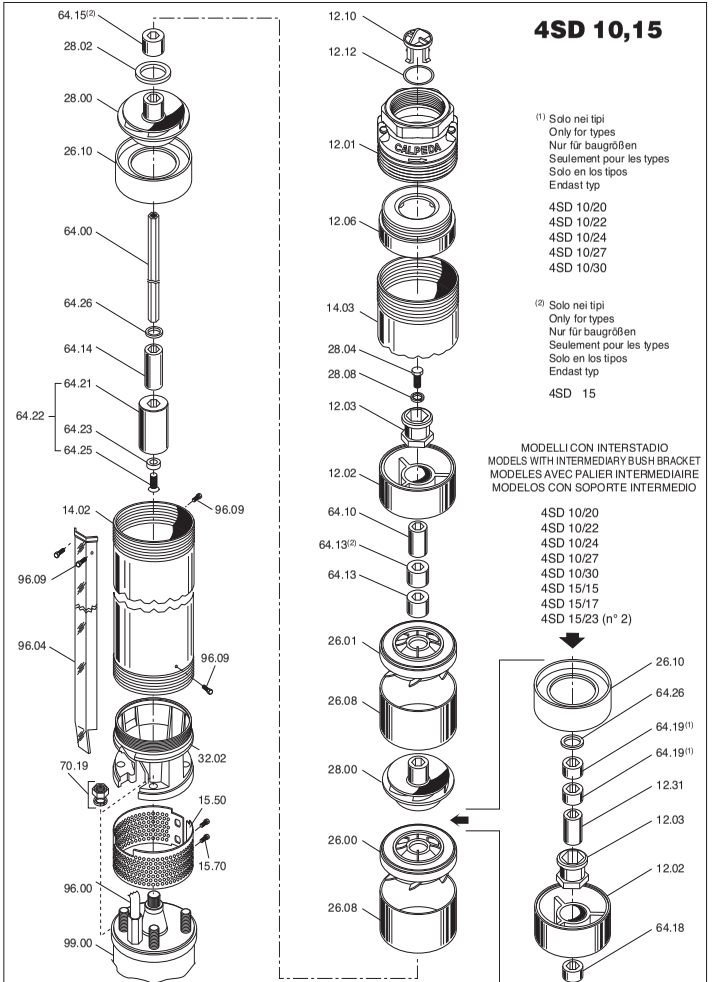
**Disconnect electrical power before any servicing operation.**

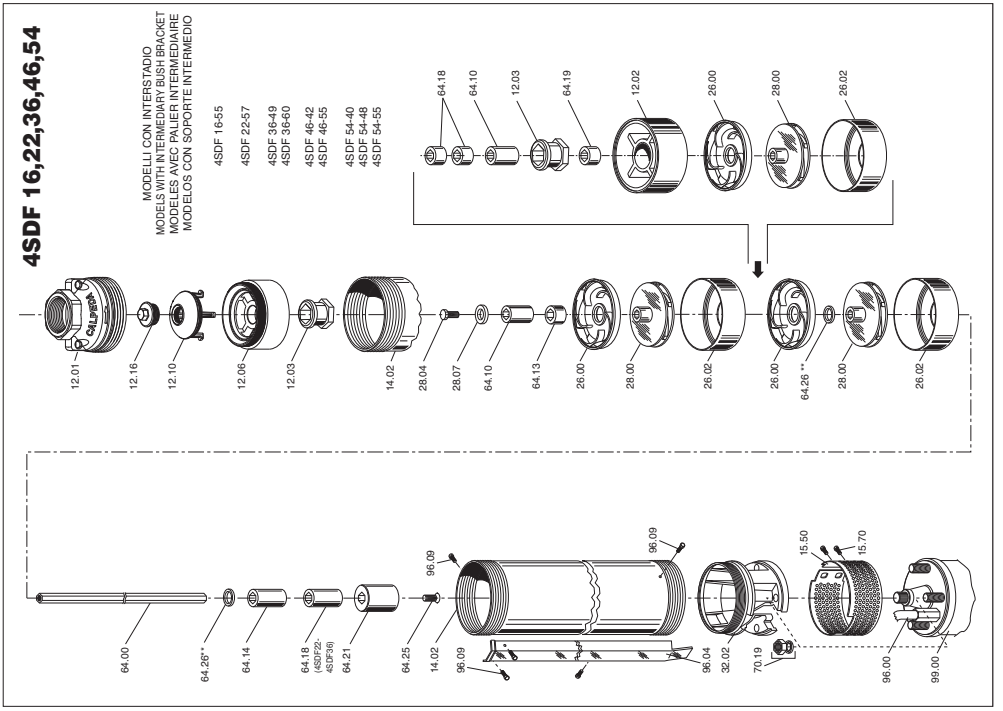
Changes reserved.

## 4SD 31

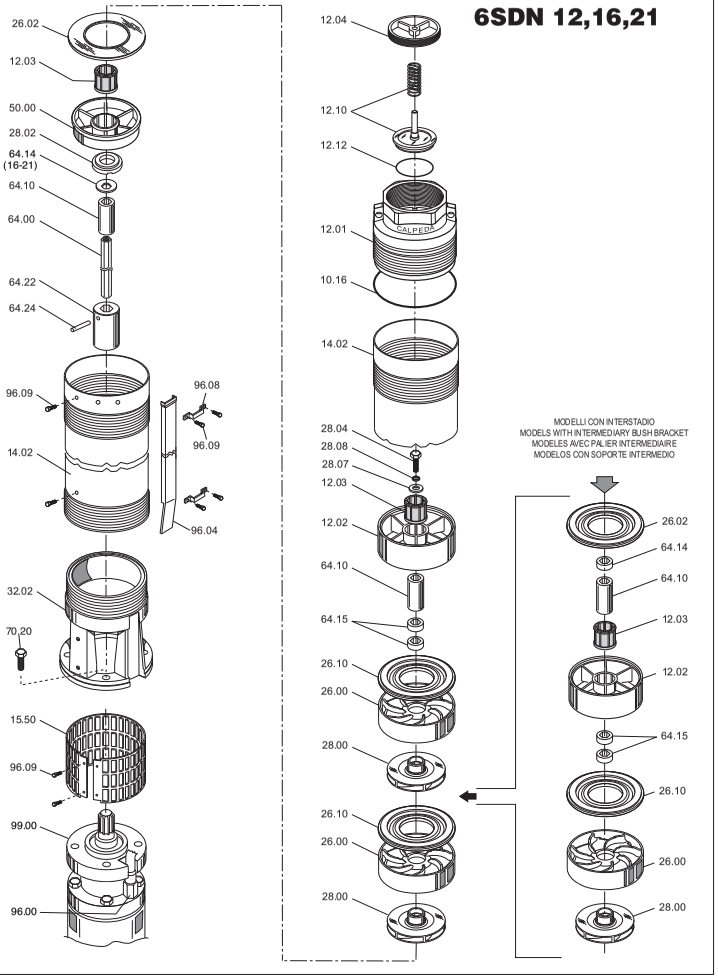



## 4SD 10,15

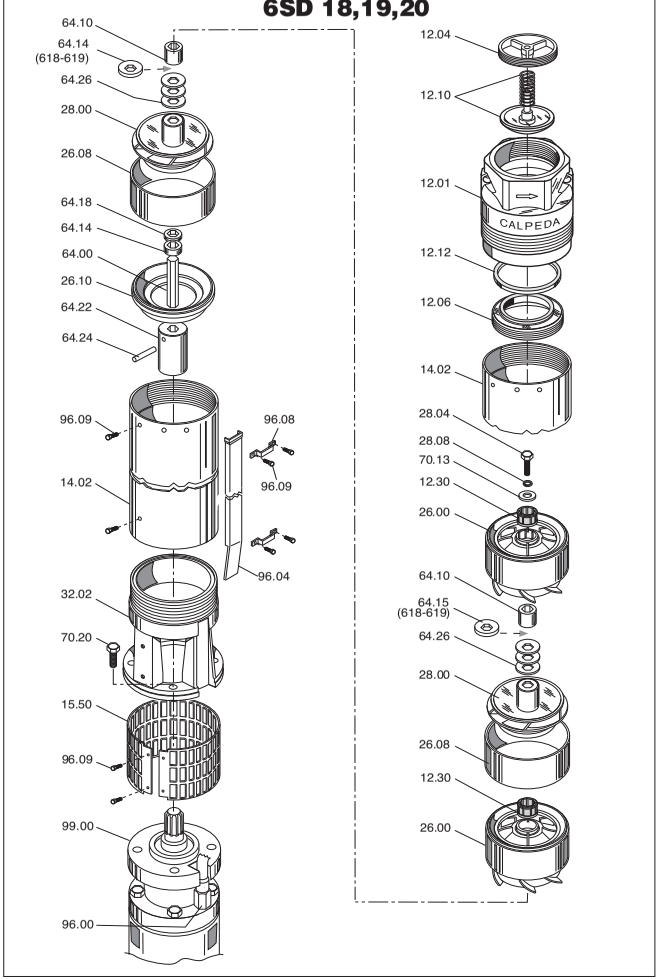



4SDF 16,22,36,46,54
MODELLI CON INTERSTADIO
MODELS WITH INTERMEDIARY BUSH BRACKET
MODELES AVEC PALIER INTERMEDIAIRE
MODELOS CON SOPORTE INTERMEDIO
4SDF 16-55
4SDF 22-57
4SDF 36-49
4SDF 36-60
4SDF 46-42
4SDF 46-55
4SDF 54-40
4SDF 54-48
4SDF 54-55
64.18
64.10
12.03
64.19
12.02
26.00
28.00
26.02
12.01
12.16
12.10
12.06
12.03
14.02
28.04
28.07
64.10
64.13
26.00
28.00
26.02
26.00
64.26 **
28.00
26.02
64.00
64.26**
64.14
64.18 (4SDF22-4SDF36)
64.21
64.25
14.02
96.09
96.09
96.04
32.02
70.19
15.50
15.70
96.00
99.00

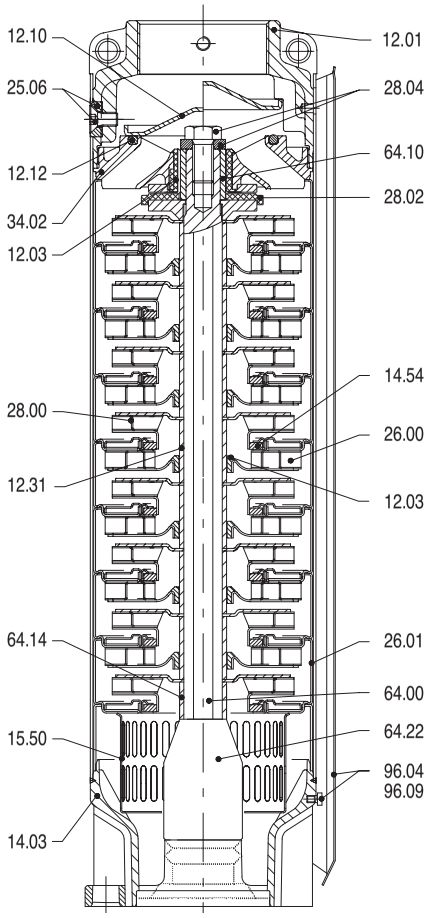
## 6SDN 12,16,21



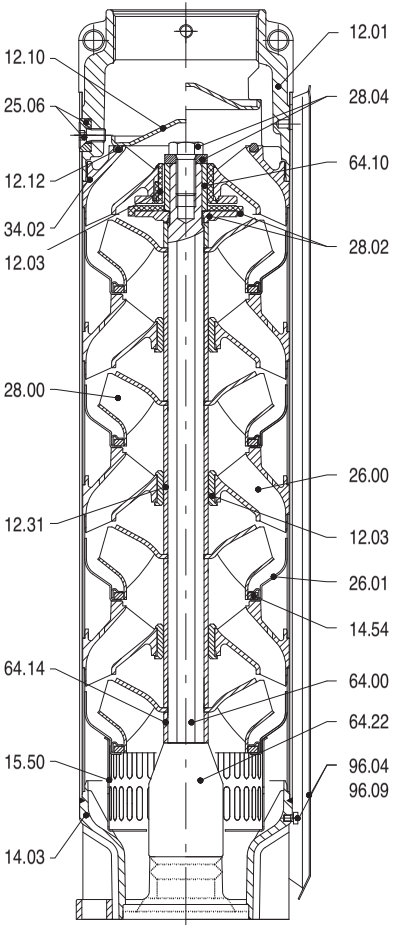

## 6SD 18,19,20



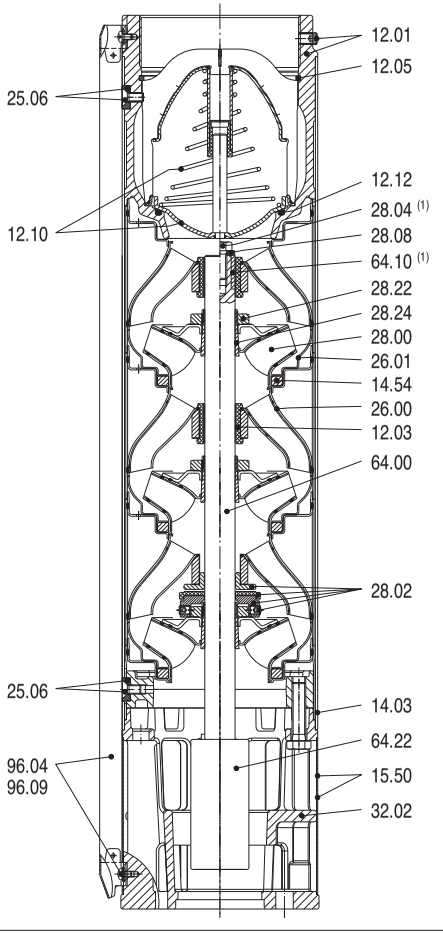
## 6SDX 13,18,27

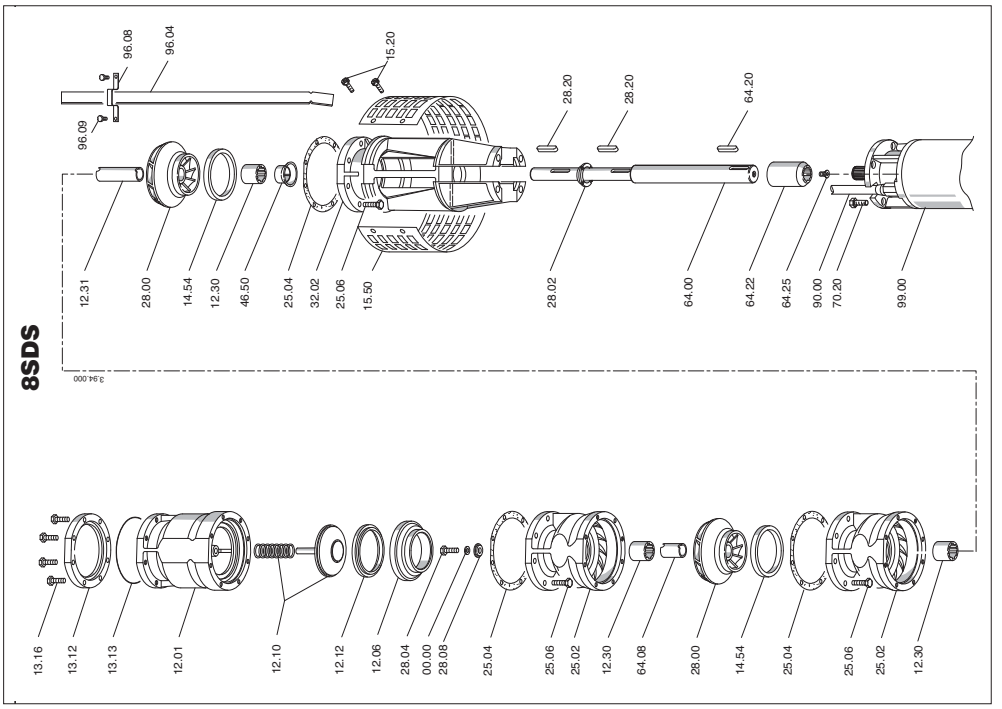


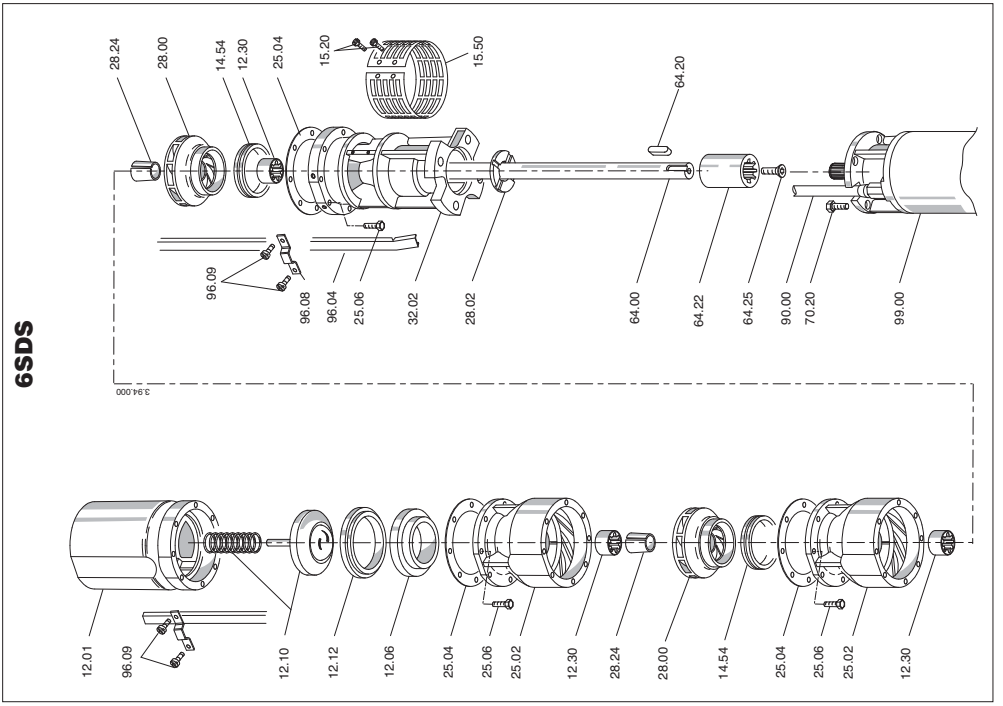

## 6SDX 45,60



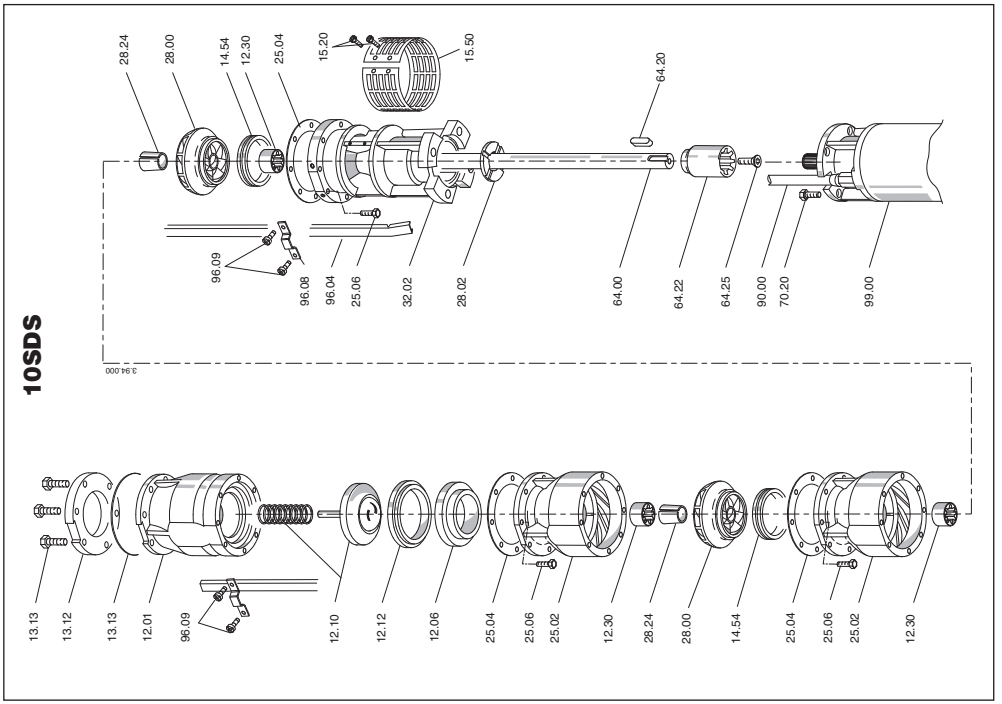

## 8SDX 78,97




8SDS
96.08
96.04
15.20
96.09
28.20
28.20
64.20
12.31
28.00
14.54
12.30
46.50
25.04
32.02
25.06
15.50
28.02
64.00
64.22
64.25
90.00
70.20
99.00
3.94.000
13.16
13.12
13.13
12.01
12.10
12.12
12.06
28.04
00.00
28.08
25.04
25.06
25.02
12.30
64.08
28.00
14.54
25.04
25.06
25.02
12.30


6SDS
28.24
28.00
14.54
12.30
25.04
15.20
15.50
64.20
96.09
96.08
96.04
25.06
32.02
28.02
64.00
64.22
64.25
90.00
70.20
99.00
3.94.000
12.01
96.09
12.10
12.12
12.06
25.04
25.06
25.02
12.30
28.24
28.00
14.54
25.04
25.06
25.02
12.30

## 10SDS


28.24
28.00
14.54
12.30
25.04
15.20
15.50
64.20
96.09
96.08
96.04
25.06
32.02
28.02
64.00
64.22
64.25
90.00
70.20
99.00
3.94.000
13.13
13.12
13.13
12.01
96.09
12.10
12.12
12.06
25.04
25.06
25.02
12.30
28.24
28.00
14.54
25.04
25.06
25.02
12.30

| Italiano<br>Nr. Denominazione | English<br>Nr. Part designation | Deutsch<br>Nr. Teile-Benennung |
|---|---|---|
| 10.16 Guarnizione | 10.16 Gasket | 10.16 Flachdichtung |
| 12.01 Corpo di mandata | 12.01 Delivery casing | 12.01 Druckgehäuse |
| 12.02 Supporto boccola | 12.02 Bush casing | 12.02 Buchsegehäuse |
| 12.03 Cuscinetto a boccola (parte fissa) | 12.03 Bearing sleeve (stationary part) | 12.03 Lagerbuchse |
| 12.04 Guida valvola | 12.04 Valve guide | 12.04 Tellerführung |
| 12.05 Anello di sicurezza | 12.05 Circlip | 12.05 Sicherungsring |
| 12.06 Sede valvola | 12.06 Valve seat | 12.06 Ventilsitz |
| 12.10 Valvola completa | 12.10 Valve set | 12.10 Ventil, komplett |
| 12.12 Guarnizione valvola | 12.12 Valve joint | 12.12 Ventilsitzdichtung |
| 12.16 Tappo | 12.16 Plug | 12.16 Verschlußschraube |
| 12.30 Cuscinetto a boccola stadio | 12.30 Stage bearing sleeve | 12.30 Stufenbüchse |
| 12.31 Bussola del cuscinetto (rotante) | 12.31 Bearing sleeve (rotating part) | 12.31 Lagerhülse |
| 13.12 Controflangia premente | 13.12 Counterflange, delivery side | 13.12 Gegenflansch, druckseitig |
| 13.13 Guarnizione flangia premente | 13.13 Flange gasket, delivery side | 13.13 Flachdichtung, druckseitig |
| 13.16 Vite | 13.16 Screw | 13.16 Schraube |
| 14.02 Camicia esterna | 14.02 External jacket | 14.02 Pumpenmantel |
| 14.54 Anello di tenuta | 14.54 Wear ring | 14.54 Spaltring, saugseitig |
| 15.20 Vite | 15.20 Screw | 15.20 Schraube |
| 15.50 Filtro | 15.50 Strainer | 15.50 Saugsieb |
| 25.02 Corpo stadio | 25.02 Stage casing | 25.02 Stufengehäuse |
| 25.04 Guarnizione piana | 25.04 Gasket | 25.04 Flachdichtung |
| 25.06 Vite | 25.06 Screw | 25.06 Schraube |
| 26.00 Diffusore (pompa) | 26.00 Diffuser (pump) | 26.00 Leitrad |
| 26.02 Parete del diffusore | 26.02 Diffuser plate | 26.02 Leitradwand |
| 26.08 Camicia del diffusore | 26.08 Diffuser sleeve | 26.08 Stufenmantel |
| 26.10 Anello convogliatore | 26.10 Conveyor ring | 26.10 Förderring |
| 28.00 Girante | 28.00 Impeller | 28.00 Laufrad |
| 28.02 Anello di controspinta | 28.02 Counter thrust bearing ring | 28.02 Gegenaxiallagering |
| 28.04 Dado bloccaggio girante (o vite) | 28.04 Impeller nut (or screw) | 28.04 Laufradmutter (oder Schraube) |
| 28.05 Anello di sicurezza | 28.05 Circlip | 28.05 Sicherungsring |
| 28.07 Rondella | 28.07 Washer | 28.07 Scheibe |
| 28.08 Rosetta | 28.08 Washer | 28.08 Scheibe |
| 28.20 Linguetta girante | 28.20 Impeller key | 28.20 Paßfeder für Laufrad |
| 28.24 Bussola conica | 28.24 Locking sleeve | 28.24 Spannhülse |
| 32.02 Lanterna aspirante | 32.02 Suction lantern | 32.02 Sauggehäuse |
| 34.02 Coperchio superiore | 34.02 Upper cover | 34.02 Oberer Deckel |
| 46.50 Parasabbia | 46.50 Sand guard | 46.50 Sandschutzring |
| 64.00 Albero pompa | 64.00 Pump shaft | 64.00 Pumpenwelle |
| 64.08 Camicia di protezione | 64.08 Shaft sleeve | 64.08 Wellenschutzhülse |
| 64.10 Bussola cuscinetto | 64.10 Bearing sleeve | 64.10 Lagerhülse |
| 64.13 Bussola distanziatrice superiore | 64.13 Upper spacer sleeve | 64.13 Abstandshülse, oben |
| 64.14 Bussola distanziatrice inferiore | 64.14 Lower spacer sleeve | 64.14 Abstandshülse, unten |
| 64.15 Bussola distanziatrice | 64.15 Intermediate spacer sleeve | 64.15 Zwischenabstandshülse |
| 64.18 Bussola distanziatrice | 64.18 Spacer sleeve | 64.18 Abstandshülse |
| 64.19 Bussola distanziatrice | 64.19 Spacer sleeve | 64.19 Abstandshülse |
| 64.20 Linguetta per estremità d'albero | 64.20 Key for shaft end | 64.20 Paßfeder für Wellenende |
| 64.21 Giunto | 64.21 Coupling | 64.21 Kupplung |
| 64.22 Giunto completo | 64.22 Coupling, set | 64.22 Kupplung, komplett |
| 64.23 Rondella | 64.23 Washer | 64.23 Scheibe |
| 64.24 Spina elastica | 64.24 Shear pin | 64.24 Paßstift |
| 64.25 Vite | 64.25 Screw | 64.25 Schraube |
| 64.26 Spessore di aggiustaggio | 64.26 Adapter thickness | 64.26 Zwischenlage |
| 70.13 Rondella | 70.13 Washer | 70.13 Scheibe |
| 70.19 Dado | 70.19 Nut | 70.19 Mutter |
| 70.20 Vite | 70.20 Screw | 70.20 Schraube |
| 96.00 Cavo | 96.00 Cable | 96.00 Kabel |
| 96.04 Copricavo | 96.04 Cable guard | 96.04 Kabelschutzleiste |
| 96.08 Staffa | 96.08 Clamp | 96.08 Schelle |
| 96.09 Vite | 96.09 Screw | 96.09 Schraube |
| 99.00 Motore completo | 99.00 Complete motor | 99.00 Motor, komplett |

## (I) DICHIARAZIONE DI CONFORMITÀ

Noi CALPEDA S.p.A. dichiariamo sotto la nostra esclusiva responsabilità che le Pompe SD, SDM, SDN, SDX, SDS, B-SDS, tipo e numero di serie riportati in targa, sono conformi a quanto prescritto dalle Direttive 2004/108/CE, 2006/42/CE, 2006/95/CE e dalle relative norme armonizzate.

## (GB) DECLARATION OF CONFORMITY

We CALPEDA S.p.A. declare that our Pumps SD, SDM, SDN, SDX, SDS, B-SDS, with pump type and serial number as shown on the name plate, are constructed in accordance with Directives 2004/108/EC, 2006/42/EC, 2006/95/EC and assume full responsability for conformity with the standards laid down therein.

## (D) KONFORMITÄTSERKLÄRUNG

Wir, das Unternehmen CALPEDA S.p.A., erklären hiermit verbindlich, daß die Pumpen SD, SDM, SDN, SDX, SDS, B-SDS, Typbezeichnung und Fabrik-Nr. nach Leistungsschild den EG-Vorschriften 2004/108/EG, 2006/42/EG, 2006/95/EG entsprechen.

## (F) DECLARATION DE CONFORMITE

Nous, CALPEDA S.p.A., déclarons que les Pompes SD, SDM, SDN, SDX, SDS, B-SDS, modèle et numero de série marqués sur la plaque signalétique sont conformes aux Directives 2004/108/CE, 2006/42/CE, 2006/95/CE.

## (E) DECLARACION DE CONFORMIDAD

En CALPEDA S.p.A. declaramos bajo nuestra exclusiva responsabilidad que las Bombas SD, SDM, SDN, SDX, SDS, B-SDS, modelo y numero de serie marcados en la placa de caracteristicas son conformes a las disposiciones de las Directivas 2004/108/CE, 2006/42/CE, 2006/95/CE.

## (DK) OVERENSSTEMMELSESERKLÆRING

Vi CALPEDA S.p.A. erklærer hermed at vore pumper SD, SDM, SDN, SDX, SDS, B-SDS, pumpe type og serie nummer vist på typeskiltet er fremstillet i overensstemmelse med bestemmelserne i Direktiv 2004/108/EC, 2006/42/EC, 2006/95/EC og er i overensstemmelse med de heri indeholdte standarder.

## (P) DECLARAÇÃO DE CONFORMIDADE

Nós, CALPEDA S.p.A., declaramos que as nossas Bombas SD, SDM, SDN, SDX, SDS, B-SDS, modelo e número de série indicado na placa identificadora são construìdas de acordo com as Directivas 2004/108/CE, 2006/42/CE, 2006/95/CE e somos inteiramente responsáveis pela conformidade das respectivas normas.

## (NL) CONFORMITEITSVERKLARING

Wij CALPEDA S.p.A. verklaren hiermede dat onze pompen SD, SDM, SDN, SDX, SDS, B-SDS, pomptype en serienummer zoals vermeld op de typeplaat aan de EG-voorschriften 2004/108/EU, 2006/42/EU, 2006/95/EU voldoen.

## (SF) VAKUUTUS

Me CALPEDA S.p.A. vakuutamme että pumppumme SD, SDM, SDN, SDX, SDS, B-SDS, malli ja valmistusnumero tyyppikilvcstä, ovat valmistettu 2004/108/EU, 2006/42/EU, 2006/95/EU direktiivien mukaisesti ja CALPEDA ottaa täyden vastuun siitä, että tuotteet vastaavat näitä standardeja.

## (S) EU NORM CERTIFIKAT

CALPEDA S.p.A. intygar att pumpar SD, SDM, SDN, SDX, SDS, B-SDS, pumptyp och serienummer, visade på namnplåten är konstruerade enligt direktiv 2004/108/EC, 2006/42/EC, 2006/95/EC. Calpeda åtar sig fullt ansvar för överensstämmelse med standard som fastställts i dessa avtal.

## (GR) ΔΗΛΩΣΗ ΣΥΜΦΩΝΙΑΣ

Εμείς ως CALPEDA S.p.A. δηλώνουμε ότι οι αντλίες μας αυτές SD, SDM, SDN, SDX, SDS, B-SDS, με τύπο και αριθμό σειράς κατασκευής όπου αναγράφετε στην πινακίδα της αντλίας, κατασκευάζονται σύμφωνα με τις οδηγίες 2004/108/ΕΟΚ, 2006/42/ΕΟΚ, 2006/95/ΕΟΚ, και αναλαμβάνουμε πλήρη υπευθυνότητα για συμφωνία (συμμόρφωση), με τα στάνταρς των προδιαγραφών αυτών.

## (TR) UYGUNLUK BEYANI

Bizler CALPEDA S.p.A. firması olarak SD, SDM, SDN, SDX, SDS, B-SDS, Pompalarımızın, 2004/108/EC, 2006/42/EC, 2006/95/EC, direktiflerine uygun olarak imal edildiklerini beyan eder ve bu standartlara uygunluğuna dair tüm sorumluluğu üstleniriz.

## (RU) Декларация соответствия

Компания “Calpeda S.p.A.” заявляет с полной ответственностью, что насосы серий SD, SDM, SDN, SDX, SDS, B-SDS, тип и серийный номер которых указывается на заводской табличке соответствуют требованиям нормативов 2004/108/CE, 2006/42/CE, 2006/95/CE.

## (中文) 声明

我们科沛达泵业公司声明我们制造的 SD, SDM, SDF, SDFM, SDN, SDX, SDS, B-SDS, 系列水泵 （在铭牌上标示水泵的型号和序列号）均符合以下标准的相应目录要求：2004/108/CE, 2006/42/CE, 2006/95/CE．本公司遵循其中的标准并承担相应的责任

L’Amministratore Unico

Montorso Vicentino, 01.2010

Licia Mettifogo