



## Installation and operation instructions



**NDS**

Single stage double suction  
Split casing centrifugal pump

# Approvals

		<b>CB TEST CERTIFICATE</b>	Ref. Certificate No. CH-0876
<b>IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME</b>			
Issued by:	Electrosuisse		
Product:	Horizontal and vertical multistage pumps		
Applicant:	Swiss Pump Company AG	Mosweg 30 CH-3645 Gsell (Thun)	Switzerland
Manufacturer:	Swiss Pump Company AG	Mosweg 30 CH-3645 Gsell (Thun)	Switzerland
Factory:	Swiss Pump Company AG	Mosweg 30 CH-3645 Gsell (Thun)	Switzerland
Rating and principal characteristics:	3 x 300 - 277048 - 480V~, 50/60Hz; 220-230V~, 50/60Hz 137-230-340V~, 60Hz (see I.P.M)		
Trade-mark (if any):	Swiss Pump Company AG (SPCO)		
Model/Type reference:	HM..., GH..., VM..., CD..., ND..., CC..., PG..., MB..., GB..., BMF..., CCP..., SCP..., see appendix type list in test report		
Additional information:	---		
Sample of product tested to be in conformity with IEC:	60335-1ed4jan1and2 60335-2-41ed3jan1and2	National differences: EU Group Differences; EU Special National Conditions; EU A-Deviations	
Test Report Ref. No.:	064G-0218.01 + 02 + 03 + 05.		
The CB Test Certificate is issued by the National Certification Body:			
Electrosuisse Luppenstrasse 1, CH-8320 Fehraltorf			
Signed by:	Erich Christ 2010-07-27	page 1 of 1	



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## Brief Description

### 1. Brief Description

NDS horizontal double-suction split-casing pump is our advanced new product. Pump casing is in nice linearity design with stiffeners. The two bearings are located at a short distance, and the shaft is accordingly shortened. Shaft is fully sealed away from medium, no erosion, and high interchangeability. Closed circulate cooling system is applied to its inner seal housing, which makes NDS pump simple in structure and easy to maintain. NDS split-casing pumps are used far and wide in civil water supply, industry, construction, air-conditioning, irrigation, marine, fire fighting and power station.

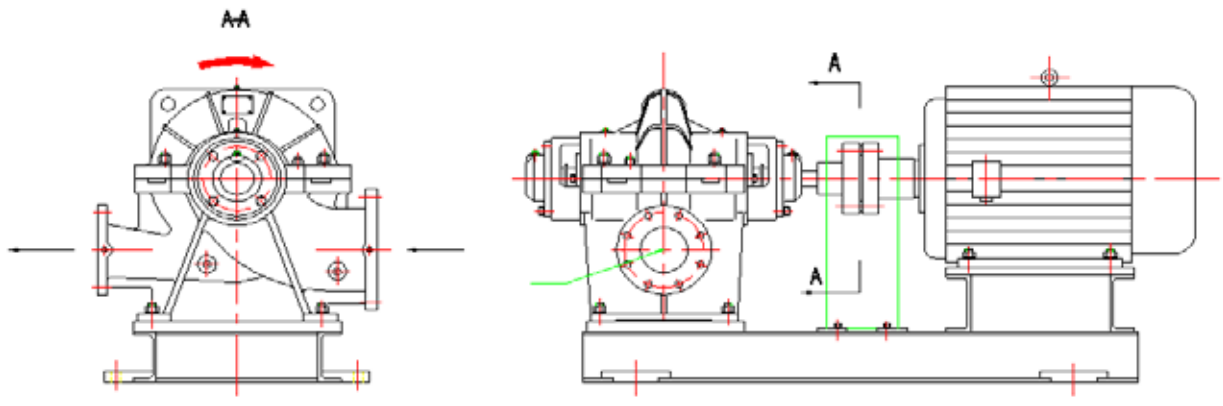
Design	German Standard
Structure	Single-stage, Double-suction, Split-casing, Centrifugal pump
Flange	DIN2501 (ISO7005.2 / GB/T17241.6 PN1.6) standard, ANSI B16.5 Class150lb optional
Rotation	Standard Type: Clockwise viewing from the drive side

### Material

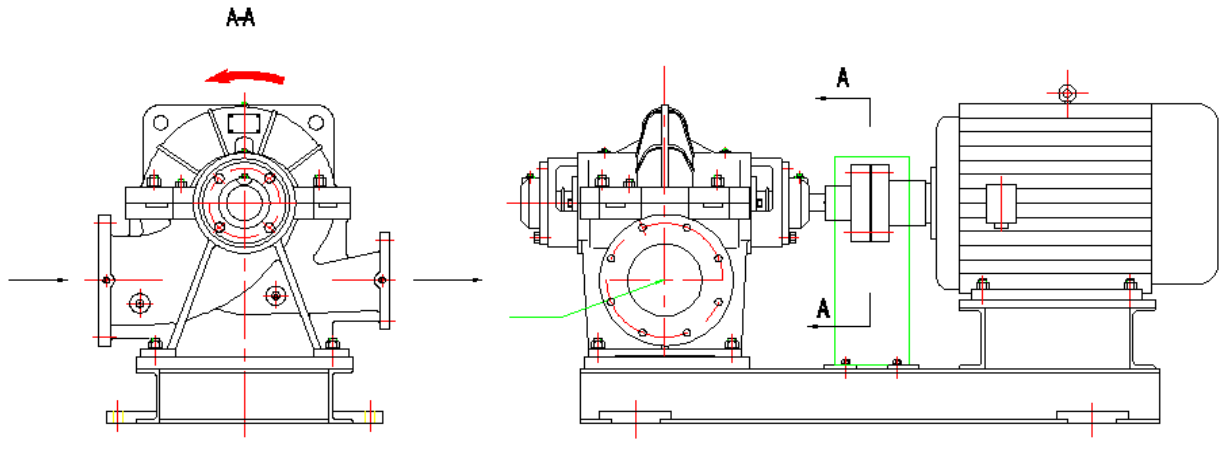
Casing	Cast Iron standard, Ductile Iron, Stainless Steel optional
Impeller	Bronze standard, Cast Iron, Stainless Steel optional
Shaft	ASTM1045 standard, ASTM420, ASTM304, ASTM316 optional
Shaft Seal	Mechanical Seal standard (Carbon-Ceramic/Viton standard, Caron-Sic/Viton optional), Gland Packing optional

### Operating Data

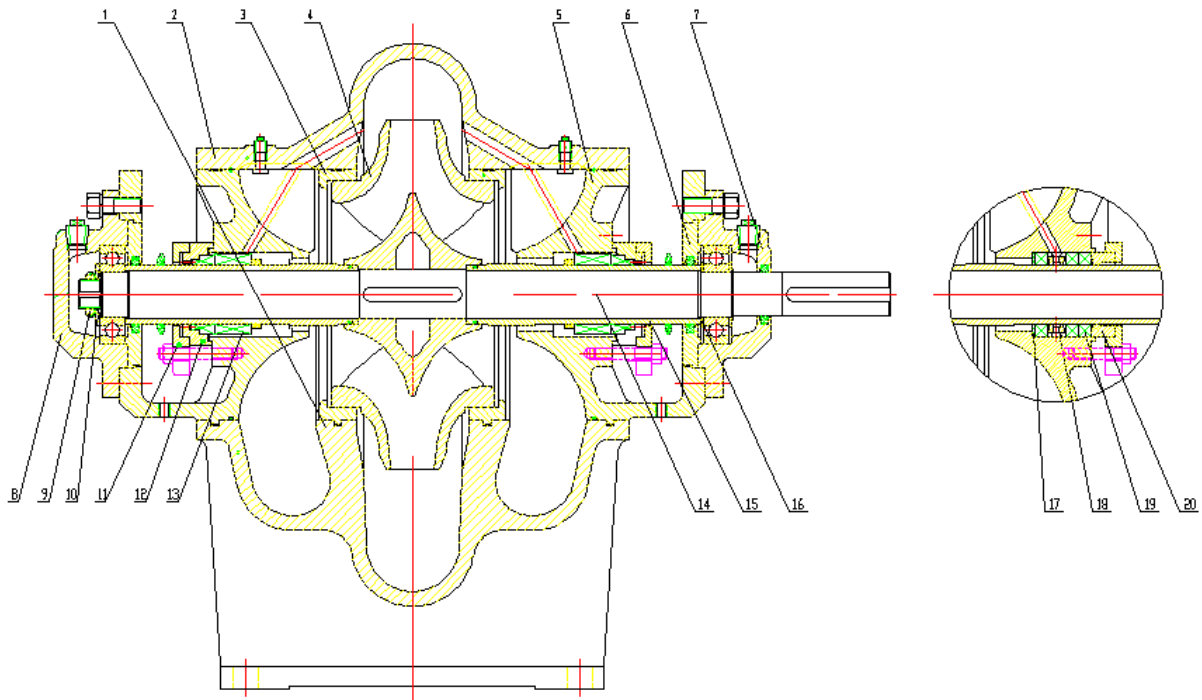
Discharge diameter	80~600mm
Max Capacity	2000 l / s
Max Head	170 m
Max Pressure	16 Bar standard 25 Bar on request
Max Temperature	105°C



Special Type: Counter-clockwise viewing from the drive side



## Structure drawing & Parts Identification



No.	Part Name	No.	Part Name
1	Casing	11	Seal Plate
2	Casing Cover	12	Seal Cover
3	Wear Ring	13	Mechanical Seal
4	Impeller	14	Shaft
5	Seal Housing	15	Shaft Sleeve
6	Bearing Cover	16	Bearing Pressing Ring
7	Drive-end Bearing Housing	17	Packing Pressing Ring
8	Non-Drive-end Bearing Housing	18	Seal Cage
9	Lock Nut	19	Gland Packing
10	Bearing Baffle	20	Gland Cover

### Main Parts Material

No.	Part Name	Material
1	Casing	HT200、HT250、QT400-18
2	Casing Cover	HT200、HT250、QT400-18
3	Wear Ring	HT200、HT250、QT400-18
4	Impeller	HT250、H65、304、316
5	Shaft	45、420、304、316
6	Shaft Sleeve	420、304、316

# Assembly and Disassembly

## 2. Assembly and Disassembly

### 2.1. Rotor assembly

2.1.1) Set each O-ring into seal housing and plug, then screw on plug into seal housing, and then screw on seal housing bolts in advance.

2.1.2) Shape Shaft, impeller and shaft sleeve, knock key in to impeller position, set impeller onto shaft, and then fit wear rings and seal housings on the two ends of impeller.

2.1.3) Set O-ring and seal seat onto shaft sleeve, then screw on the two hexagon socket screws, then put on dynamic ring of mechanical seal, and fix shaft sleeve onto each end of shaft through seal housing. Press static ring of mechanical seal into seal cover, and place paper gasket. String seal covers, seal plates, slingers and bearing covers successively onto shaft through seal housing from the two ends. Fit bearing pressing ring, bearing and the other bearing pressing ring on the drive-end, then fix circlip for shaft, wear on drive-end bearing housing, screw on bolts. Fit bearing on non-drive-end, put on bearing baffle and lock washer, screw on lock nut, wear on non-drive-end bearing housing, screw on bolts, then rotor assembly is now complete.

### 2.2 General assembly

Screw on plugs and bolts on casing, fit rotor assembly on casing by engaging the rounded projections of seal casing and wear ring with their grooves in casing, then on put casing gasket, casing cover, insert dowel pin, screw on bolts and nuts then finish general assembly.

2.3 Disassembly: taking the counterturn of assembly.

## 3. Starting, Checking, Stopping, Running and Maintenance

### 3.1. Starting

1).Check that the direction of the motor rotation corresponds to the direction arrow on the pump casing before joint pump and motor together. Ensure that the pump is running freely without seizure or friction.

2).Turn down discharge valve.

3).Fill the pump with liquid or priming with a vacuum pump.

4).Switch on power, gradually turn up discharge valve after pump operation runs normally to achieve the target performance.

Caution: 3 minutes is the Max. continuous working time for a pump to operate with closed discharge valve.

### 3.2 Checking

- 1). Check direction of pump rotation, which should be clockwise viewing from the drive side.
- 2). Check alignment of the couplings both of pump and motor before using. Over-tolerance will damage flexible elements in a short time, and also cause over standard vibration as well as noise.
- 3). Check leakage of gland packing and tightness of gland cover; make them adequate to the job. If it is fitted with mechanical seal, make sure that the pump is operating with water inside; otherwise the dynamic and stationary rings would be worn out in dry operation
- 4). Check oil level, which should be kept in the specified range by oil gauge. If it is grease, make sure that the bearings are filled with grease.

### 3.3 Stopping

- 1). Turn down discharge valve gradually, switch off the power.
- 2). Drain away water left inside the pump to avoid frost crack while the temperature is below 0°C.
- 3). To keep a pump out of use for a long time, disassemble it into spare parts, store them in an appropriate place after lubrication.

### 3.4 Running and Maintenance

- 1). Readings by the meters are very important in starting and running. Care must be taken to heating, leakage, vibration and noise. Abnormal cases should be handled immediately on discovery.
- 2). Bearings are not allowed to work at the temperature 40°C higher than the temperature around, and the Max. temperature is 80°C.
- 3). In normal cases, a steady drip from the gland should be in a small amount, at about 60 drops per minutes while almost non-leakage from mechanical seal.
- 4). Lubrication should be 4# Calcium Base Grease or SAE20W Oil. Pumps working at 2900 rpm should be replenished with new oil or grease every period of 2500 working hours, 1450 rpm ones should be replenished every 5000 working hours. Ball bearings should be dismantled and replaced by the new ones every 10000 working hours, and also oil cup should be thoroughly cleaned out and filled with fresh lubrication.



# Troubleshooting

## 4. Troubleshooting

Defects	Causes	Solutions
Pump not primed, both the hands of vacuum gauge and manometer switches violently	Not enough water filled in the pump Air leakage in the pipe or meters	Filled with water again Fix the leakage
Pump not primed and high degree vacuum indicated on the vacuum gauge	Foot valve not open or clogged Suction resistance too high or suction lift too high	Check or replace the foot valve Clean or replace the inlet pipe Reduce the suction lift
No water discharged while outlet pressure is pointed by the manometer	Wrong direction of rotation Impeller clogged	Check or shorten the pipe Check the motor rotation Remove the pipe joint and clean the impeller
Lower capacity than specified value	Pump clogged Wear ring worn out	Clean pump and pipes Replace the wear ring
Too much power consumed by pump	Packing too tight Stuffing box too hot Impeller worn out Too large flow that the pump is working in.	Loosen gland packing Replace impeller Turn down discharge valve to reduce flow
Abnormal noise inside the pump Pump not primed	Flow too large Resistance too high in the inlet pipe Suction lift too high Air leakage into the inlet pipe Liquid temperature too high	Turn down discharge valve Reduce flow Fix leakage Lower liquid temperature
Bearings over-heart	Short of lubricant or lubricant too dirty Pump shaft not in alignment to that of the motor Bearing worn out	Filled with clean oil or grease Align coupling centerline Replace bearing
Vibration	Pump shaft not in alignment to that of the motor	Align coupling centerline





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