

# ***HCP PUMPS***

**AF** – sludge pump for extreme loads

**AL** – portable waste-water pumps <sup>®</sup>

**BF** – portable sludge pumps

**SS** – stainless-steel portable pumps for aggressive waste waters

**SF** – stainless-steel portable sludge pumps for aggressive sludge

**AS, AG** – pumps for sandy water

**IC, GD, GDR** – dewatering pumps

**GF** – cutter pumps

**L** – propeller pumps

## **Operation Manual Operation and Assembly Instruction**

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Thank you for purchase of HCP pump and read carefully this Operation Manual before using.

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This Operation and Assembly Manual is valid for submersible pumps of the following type series:

- AF – sludge pumps for extreme loads**
- AL – portable waste-water pumps for light and medium loads**
- BF – portable sludge pumps for light and medium loads**
- SS – stainless-steel portable pumps for aggressive waste waters**
- SF – stainless-steel portable sludge pumps for aggressive sludge**
- AS, AG – pumps for sandy water**
- IC, GD, GDR – dewatering pumps**
- GF – cutter pumps**
- L – propeller pumps**

This manual contains instructions necessary for proper operation, maintenance, safety etc. Disallowed interventions in the pump and failure to observe the given instructions will result in expiry of guarantee. Handle the pump carefully. Check, whether the delivered items correspond to the delivery note and make sure that you have received all parts of the equipment. Make sure that no damage has been caused during the transport. Should you find any defect, record the respective damage immediately with the forwarder.

# 1.0 GENERAL INSTRUCTIONS

## 1.1 USE

<p><b>AF</b></p>	<p>Submersible industrial pumps AF series are designed to pump sludge and water polluted by nonabrasive small solid and fibre particles. When using for pumping wastewater containing abrasive particles, it is necessary to expect an increased wear and tear of the hydraulic part, oil sealing, shaft and mechanical sealing. The maximum content of impurities may be up to 10% of the weight. The maximum temperature of the liquid being pumped is 40°C. The maximum density of the pumped liquid is 1100kg/m<sup>3</sup>. The pump maximum immersion depth is 30 m at liquid density of 1000kg/m<sup>3</sup>. The pumps are used particularly in wastewater treatment plants, building, mining and ore-mining industry, excavation and amelioration works, in removing flood consequences, drainage of tunnels, sewers and reservoirs containing solid parts. pH of the pumped liquid ranges from 6 to 9.</p>
<p><b>AL BF</b></p>	<p>Submersible portable pumps AL and BF series are designed to pump wastewater polluted by nonabrasive small solid and fibre particles. When using for pumping wastewater containing abrasive particles, it is necessary to expect an increased wear and tear of the hydraulic part, oil sealing, shaft and mechanical sealing. The maximum temperature of the pumped liquid is 35°C. The maximum density of the pumped liquid is 1100kg/m<sup>3</sup>. The maximum immersion depth of the pumps is 10 m at liquid density of 1000kg/m<sup>3</sup>. The pumps are used particularly in building industry, excavation and amelioration works, in removing flood consequences, drainage of flooded cellars, basements, septic tanks and wastewater reservoirs etc. pH of the pumped liquid ranges from 6 to 9.</p>
<p><b>SS SF</b></p>	<p>Submersible portable industrial stainless steel pumps SS and SF series are designed for pumping aggressive wastewater polluted with mechanical impurities non-abrasive character. When using for pumping wastewater containing abrasive particles, it is necessary to expect an increased wear and tear of the hydraulic part, oil sealing, shaft and mechanical sealing. The maximum temperature of the pumped liquid is 40°C. The maximum density of the pumped liquid is 1100kg/m<sup>3</sup>. The maximum immersion depth of the pumps is 10 m at liquid density of 1000kg/m<sup>3</sup>. The pumps are used particularly in draining tanks and reservoirs in chemical, pharmaceutical and food-processing industry and wherever it is necessary to pump aggressive and caustic substances or liquids, the nature of which requires the hydraulic parts of the pumps to be made of stainless steel. pH of the pumped liquid ranges from 2 to 14.</p>
<p><b>AS AG</b></p>	<p>Submersible portable industrial pumps AS and AG series are designed to pump wastewater polluted by sand, mud, grit, clay and similar abrasive particles. Pumps of AG series are equipped with a cast iron agitator to create powerful stirring opposite bottom of reservoir and pumping action for slurry. When using for pumping wastewater containing abrasive particles, it is necessary to expect an increased wear and tear of the hydraulic part, oil sealing, shaft and mechanical sealing. The maximum temperature of the liquid being pumped is 40°C. The maximum density of the pumped liquid is 1100kg/m<sup>3</sup>. The maximum content of impurities may be up to 10% of the weight. The pump maximum immersion depth is 30 m at liquid density of 1000kg/m<sup>3</sup>. The pumps are used particularly in building industry, in building construction foundations, pumping of excavations, in accidents of water ducts, in mining and ore-mining industry, in amelioration works, in removing flood consequences, drainage of tunnels, sewers, cellars and reservoirs containing small solid particles. pH of the pumped liquid ranges from 6 to 9.</p>
<p><b>IC</b></p>	<p>Submersible portable pumps IC series are designed to pump wastewater polluted by nonabrasive small solid and fibre particles. When using for pumping wastewater containing abrasive particles, it is necessary to expect an increased wear and tear of the hydraulic part, oil sealing, shaft and mechanical sealing. The maximum temperature of the pumped liquid is 40°C. The maximum density of the pumped liquid is 1100kg/m<sup>3</sup>. The maximum immersion depth of the pumps is 30 m at liquid density of 1000kg/m<sup>3</sup>. The pumps are used particularly in building industry, excavation and amelioration works, in removing flood consequences, drainage of flooded cellars, basements, septic tanks and wastewater reservoirs etc. pH of the pumped liquid ranges from 6 to 9.</p>
<p><b>GD GDR</b></p>	<p>Submersible portable pumps GD and GDR series are designed to pump wastewater polluted by sand, mud, grit, clay and similar abrasive particles. When using for pumping wastewater containing abrasive particles, it is necessary to expect an increased wear and tear of the hydraulic part, oil sealing, shaft and mechanical sealing. Pumps of GDR series allows pumping water down to level about 2 mm. The maximum temperature of the liquid being pumped is 40°C. The maximum density of the pumped liquid is 1100kg/m<sup>3</sup>. The maximum content of impurities may be up to 10% of the weight. The pump maximum immersion depth is 10 m at liquid density of 1000kg/m<sup>3</sup>. The pumps are used particularly in building industry, in building construction foundations, pumping of excavations, in accidents of water ducts, in mining and ore-mining industry, in amelioration works, in removing flood consequences, drainage of tunnels, sewers, cellars and reservoirs containing small solid particles. pH of the pumped liquid ranges from 6 to 9.</p>
<p><b>GF</b></p>	<p>Submersible portable grinder industrial pumps GF series fitted with cutting device are designed for pumping of wastewater containing long-fibre particles and objects as e.g. incontinency and hygienic pads, tampons, plastic bags, textiles and disposable wipes. <b>When using for pumping wastewater containing abrasive particles, radial cutter and cutter ring will be quickly worn-out and pump will be quickly clogged!</b> The maximum temperature of the liquid being pumped is 35°C. The maximum density of the pumped liquid is 1100kg/m<sup>3</sup>. The pump maximum immersion depth is 10 m at liquid density of 1000kg/m<sup>3</sup>. The pumps are used wherever the sanitary sewerage contains objects to be cut by the pump cutter, mainly in commercial facilities, industrial plants, hospitals, apartment buildings, family houses, hotels and leisure facilities, sewerage systems of parks, systems situated under the level of gravitation sewerage and in pressure waste systems. pH of the pumped liquid ranges from 6 to 9.</p>
<p><b>L</b></p>	<p>Submersible industrial pumps L series are designed for pumping of great flow rates of slightly polluted water in small delivery heads. The maximum temperature of the liquid being pumped is 40°C. The maximum density of the pumped liquid is 1050kg/m<sup>3</sup>. The maximum content of impurities may be up to 5% of the weight. The pump maximum immersion depth is 10 m at liquid density of 1000kg/m<sup>3</sup>. The pumps are used particularly in water resources engineering, in supplying water in countryside, in pumping water from rivers, lakes and ponds, for various types of drainage works, regulation of water during floods, pumping wastewater in great volumes. pH of the pumped liquid ranges from 6 to 9. Thanks to very good resistance of the main parts against corrosion the pumps can be placed in seawater for long periods of time.</p>

The real immersion depth is always at least by 1 m shorter than the supply cable length and at the same time it must not exceed the maximum immersion depth.

The pumps are not intended for pumping of flammable fluids, oil products and for installation in potentially explosive conditions.

Maximum number of switch-on/off is from 10 to 12 per hour. The pumps are designed for use in vertical position.

## 1.2 SPECIFICATIONS

### **WARNING**

Read carefully the specifications for the pump model you have bought.

The ambient air temperature within 0 - 40°C.

The pump has a heat protection protecting the motor from overheating as a result of a high temperature or should an inter-phase failure occur during the start-up period or a voltage decrease or should the impeller wheel become clogged. Sizes AL/BF-01, AL/BF-05 and SS/SF-05 1ph/230V is equipped with thermostat. Sizes from AF-615 to AF-1660 is equipped MTP – Miniature Thermal Protection built in stator winding.

### 1.2.1 Noise level:

**AF, AS, AG, IC, GD, GDR, L:** Acoustic pressure layer A emitted by pump not exceed 70 dB while using weight filter A. The highest actual (peak) value of acoustic pressure weighted by function C not exceed 63 Pa (130 dB referred to 20 µPa). Acoustic power layer not exceeds 85 dB value. Measurement of acoustic noise emitted from machinery was in accordance with ČSN EN 809: 1999, ČSN EN 12639: 2000, ČSN EN ISO 3744:1996, ČSN EN ISO 4871: 1998 methods and conditions.

**AL, BF, SS, SF:** The maximum measured level A – of the weighted acoustic pressure for was measured in environment with noisiness of 26.2 db (A) and reached the value of 66.3 db (A).

**GF:** Acoustic pressure layer A emitted by pump not exceed 68 dB while using weight filter A. The highest actual (peak) value of acoustic pressure weighted by function C not exceed 63 Pa (130 dB referred to 20 µPa). Acoustic power layer not exceeds 85 dB value. Measurement of acoustic noise emitted from machinery was in accordance with ČSN EN 809: 1999, ČSN EN 12639: 2000, ČSN EN ISO 3744:1996, ČSN EN ISO 4871: 1998 methods and conditions.

## 2.0 SAFETY

This manual contains the instructions, which have to be observed during the installation, operation and maintenance of the pump. It is necessary that the operating personnel read the text carefully before start of the pump installation and commissioning. It is also necessary that the operation manual is permanently available in the place where the pump is installed. It is necessary to observe not only basic safety instructions but also all the specific safety instructions below. Following instructions are used in operation manual:



- risk of health damage,



- risk of electric shock,

### **WARNING**

- risk of break safe operation and pump damage.

## 2.1 SUMMARY OF IMPORTANT WARNINGS

THAT HAVE TO BE OBSERVED IN HANDLING, OPERATION AND USE OF PUMPS.

### **WARNING**



- 2.1.1 Connection to power supply according to the label information.
- 2.1.2 IN NO CASE MAY the L series pumps BE STARTED UP AND OPERATED INTO A CLOSED DISCHARGE!! RISK OF ACCIDENT!!!
- 2.1.3 The right direction of rotation.
- 2.1.4 In any and all handling, use, connection, maintenance and repairs it is necessary to observe the national rules, standards and regulations in force.
- 2.1.5 Lift or let down the pump using the handle or chain or hanger a not use the supply cable, float switch or WD detector cable.
- 2.1.6 When hanging the pump on a rope or chain it is necessary to avoid rotation or rotating „swinging“ around the vertical axis of the pump. This will prevent from a possible damage of the supply or WD detector cable.
- 2.1.7 When refilling and checking the oil it is necessary to make sure that there is always undamaged sealing under the plugs and that the plugs are properly tightened.
- 2.1.8 All screw joints must be duly tightened and secured against loosening.
- 2.1.9 Before re-commissioning after a few-week operation pause it is necessary to make several turns of the impeller wheel. (series AL, AS, IC, GD, GDR, L and S – must remove strainer)
- 2.1.10 If it is freezing, the pump must not be left in water that could get frozen in the pump if out of operation.
- 2.1.11 A special attention must be paid to the supply cable, float switch and WD detector cable sleeves and if there is any damage found, the sleeve must be replaced immediately.
- 2.1.12 Prior to any manipulation in the electric part of the pump it is necessary to disconnect the pump from the power supply and to prevent from the possibility of accidental reconnection to the power supply. The same applies also in case of maintenance and adjustments of rotating parts.
- 2.1.13 A little pollution of the liquid by the refill oil cannot be excluded (e.g. in case of worn seal).
- 2.1.14 Submersible pump may not be carried if connected to the power supply.
- 2.1.15 Pumps may not be used in swimming pools if there are any people in there.
- 2.1.16 Submersible pumps are not designed for pumping flammable liquids or oil products, and for use in combustion risk areas.
- 2.1.17 During the connecting, checks and inspections it is necessary to observe the national standards and regulations in force.

2.1.18 Pumps with float switch needs elbow-room around for free movement of float switch.

### 3.0 TECHNICAL DATA

AF	Output	Input	Discharge	Voltage – Phase*	Number of poles	Delivery head	Flow rate	Nominal current	Starting current	Dimensions			Weight	Solid passage**
										Length	Width	Height		
	kW	kW	" / mm	m	m <sup>3</sup> /h	A	A	mm	mm	mm	kg	mm		
50AFU20.4(F)	0,4	0,72/0,7	2" / 50	1/3	2	6	9	3,3/1,3	11,5/5,7	236	152	418	19/18	35
50AFU20.4L(F)	0,4	0,72/0,7	2" / 50	1/3	2	4	13,2	3,3/1,3	11,5/5,7	306	163	448	20/19	50
50AFU40.4	0,4	0,6	2" / 50	3	4	3,5	15	1,3	5,0	346	204	516	28	50
50AFU20.8(F)	0,75	1,08/1,05	2" / 50	1/3	2	8	12	5,2/1,9	18,3/9,9	236	152	418	20/19	35
50AFU20.8L(F)	0,75	1,08/1,05	2" / 50	1/3	2	6,5	15	5,2/1,9	18,3/9,9	306	163	448	22/21	50
50AFU40.8	0,75	1,05	2" / 50	3	4	5	18	2	9,1	346	204	516	29	50
50AFU21.5 WD	1,5	2,0	2" / 50	3	2	14	12	3,5	18,7	288	202	477	29	35
50AFU21.5L WD	1,5		2" / 50	3	2			3,4						50
80AFP21.5A WD	1,5	2,0	3" / 80	3	2	7,5	36	3,5	18,7	413	260	525	33	35
80AFP41.5 WD	1,5	2,0	3" / 80	3	4	8	30	3,8	17,4	472	290	567	52	50
80AFU21.5 WD	1,5	2,0	3" / 80	3	2	8,5	24	3,5	18,7	379	202	524	36	50
80AFU21.5L WD	1,5	2,0	3" / 80	3	2	4,5	30	3,5	18,7	402	217	575	39	76
80AFU41.5 WD	1,5	2,0	3" / 80	3	4	5	36	3,8	17,4	443	255	621	52	76
100AFE41.5 WD	1,5		4" / 100	3	4	4	60	3,8	17,4					76
80AFP22.2A WD	2,2	2,95	3" / 80	3	2	11	36	5,0	28,1	413	260	525	35	35
80AFU22.2 WD	2,2	2,95	3" / 80	3	2	12,5	24	5,0	28,1	379	202	524	38	50
80AFU22.2L WD	2,2	2,95	3" / 80	3	2	7	30	5,0	28,1	402	217	575	41	76
80AFP42.2 WD	2,2	2,95	3" / 80	3	4	10	36	5,4	25,3	553	313	623	70	50
80AFU42.2 WD	2,2	2,95	3" / 80	3	4	7	36	5,4	25,3	538	289	675	70	76
80AFP23.7A WD	3,7	4,6	3" / 80	3	2	20,5	36	8,2	27,5	500	290	578	48	32
80AFU23.7A WD	3,7	4,6	3" / 80	3	2	16,5	30	8,2	27,5	481	222	573	46	50
80AFU23.7LA WD	3,7	4,6	3" / 80	3	2	10,5	36	8,2	27,5	481	235	625	48	76
80AFP43.7 WD	3,7	4,7	3" / 80	3	4	14,5	36	8,8	44,2	553	313	643	79	50
80AFU43.7 WD	3,7	4,7	3" / 80	3	4	10	36	8,8	44,2	538	289	695	75	76
80AFP25.5 WD	5,5	6,7	3" / 80	3	2	28	36	11,3	82,7	568	345	689	75	30
100AFP25.5 WD	5,5	6,7	4" / 100	3	2	21,5	60	11,3	82,7	595	345	689	75	30
80AFU25.5 WD	5,5	6,7	3" / 80	3	2	19,5	36	11,3	82,7	504	258	665	68	50
80AFU25.5L WD	5,5	6,7	3" / 80	3	2	13	48	11,3	82,7	509	273	717	70	76
100AFU45.5N WD	5,5	6,8	4" / 100	3	4	11	60	12,3	54,5	615	337	813	96	100
100AFE45.5N WD	5,5	6,8	4" / 100	3	4	14	60	12,3	54,5	653	374	786	110	76
80AFP27.5 WD	7,5	8,8	3" / 80	3	2	34,5	36	14,5	123,5	568	345	689	81	30
100AFP27.5 WD	7,5	8,8	4" / 100	3	2	28	60	14,5	123,5	595	345	689	81	30
80AFU27.5 WD	7,5	8,8	3" / 80	3	2	24	36	14,5	123,5	504	258	665	74	50
80AFU27.5L WD	7,5	8,8	3" / 80	3	2	17,5	48	14,5	123,5	509	273	717	76	76
100AFU47.5N WD	7,5	8,8	4" / 100	3	4	13,5	60	16	82,4	615	337	853	105	100
100AFE47.5N WD	7,5	8,8	4" / 100	3	4	17	60	16	82,4	653	374	826	120	76
150AFE47.5N WD	7,5	8,8	6" / 150	3	4	15	90	16	82,4	713	374	826	120	76
80AFP211 WD	11	12,8	3" / 80	3	2	45	36	21,6	190,4	565	345	729	91	30
100AFP211 WD	11	12,8	4" / 100	3	2	39,5	60	21,6	190,4	596	345	729	91	30
80AFU211 WD	11	12,8	3" / 80	3	2	31,5	60	21,6	190,4	501	258	705	85	50
80AFU211L WD	11	12,8	3" / 80	3	2	24,5	48	21,6	190,4	506	273	757	87	76
150AFE411 WD	11	13,2	6" / 150	3	4	15,5	150	23	190,4	803	447	918	164	76
150AFE415 WD	15	17,2	6" / 150	3	4	21	150	30,4	236,2	803	447	918	176	76
150AFE422 WD	22	25,2	6" / 150	3	4	27,5	150	43	360,5	838	476	979	229	76
150AFE430 WD	30		6" / 150	3	4	33,5	150	55,6						76
AF-610 WD	7,5	8,8	6" / 150	3	4	11	150	15,4	131,1	888	449	870	221	70
AF-615 WD	11	12,4	6" / 150	3	4	15,5	150	22,6	190,4	895	477	1026	260	70
AF-815 WD	11	12,4	8" / 200	3	4	10	270	22,6	190,4	1045	501	1032	270	75
AF-820 WD	15	16,7	8" / 200	3	4	14	270	31	236,2	1045	501	1032	288	75
AF-1030 WD	22	25	10" / 250	3	4	13	360	47,5	360,5	993	541	1092	440	79
AF-1040 WD	30	33,5	10" / 250	3	4	17	420	64,2	449,8	1273	676	1621	765	60
AF-1050 WD	37	41,5	10" / 250	3	4	22	420	76,2	523,3	1273	676	1621	770	60
AF-1430 WD	22	25,5	14" / 350	3	6	6	840	47,8	360,5	1544	813	1764	950	120
AF-1440 WD	30	33,6	14" / 350	3	6	8,5	840	65,1	449,8	1544	813	1764	955	120
AF-1650 WD	37	41,5	16" / 400	3	6	7,5	1200	79,1	523,3	1544	813	1764	965	120
AF-1660 WD	45	50	16" / 400	3	6	9	1200	92,2	657,8	1544	813	1764	970	120

AL BF	Output	Input	Discharge	Voltage – Phase*	Number of poles	Delivery head	Flow rate	Nominal current	Starting current	Dimensions			Weight	Solid passage**
										Length	Width	Height		
	kW	kW	" / mm	m	m <sup>3</sup> /hod	A	A	mm	mm	mm	kg	mm		
AL-01N(F)	0,5	0,6	5/4" /	1	2	7	6	2,8	9,1	209	149	350	13,5	5
AL-05N(F)	0,4	0,6/0,56	2" / 50	1/3	2	8	6	2,8/1,2	8,2/5,7	227	161	349	14/13	8
AL-05LN(F)	0,4	0,72/0,7	2" / 50	1/3	2	7	9	3,3/1,3	11,5/5,7	245	173	430	16/15	8
AL-21N(F)	0,75	1,08/1,05	2" / 50	1/3	2	10	10,8	5,2/1,9	18,3/10,1	245	173	430	17/16	10
AL-21AN(F)	0,75	1,05/1,02	2" / 50	1/3	2	13,5	7,2	5/2		262	187	408	18/17	7
AL-21.5N(F)	1,1	1,42/1,4	2" / 50	1/3	2	15	9,6	6,4/2,4		262	187	428/408	20/18	7
AL-31N(F)	0,75	1,08/1,05	3" / 80	1/3	2	6,5	18	5,2/1,9	18,3/10,1	278	173	457	19/18	10
AL-22N(F)	1,5	2	2" / 50	3	2	18,5	15	3,5		282	207	499/568	27	10
AL-32AN(F)	1,5	2	3" / 80	3	2	10,5	30	3,5		391	208	510(579)	29	10
AL-23AN(F)	2,2	2,95	2" / 50	3	2	23,5	18	5		282	207	499/568	30	10
AL-33AN(F)	2,2	2,95	3" / 80	3	2	15,5	30	5		391	208	510(579)	32	10
AL-43AN(F)	2,2	2,95	4" / 100	3	2	11,5	42	5		389	207	540	32	20
AL-35N	3,7	4,65	3" / 80	3	2	19	36	7,9	49,2	440	207	520(589)	35	20
50AL21.5 WD	1,5	2	2" / 50	3	2	12,5	24	3,5	18,7	279	206	514	32	20
50AL22.2 WD	2,2	2,95	2" / 50	3	2	18	24	5	28,1	279	206	514	35	20
80AL21.5 WD	1,5	2	3" / 80	3	2	8	36	3,5	18,7	385	207	524	37	20
80AL22.2 WD	2,2	2,95	3" / 80	3	2	12	24	5	28,1	385	207	524	40	20
80AL23.7A WD	3,7	4,6	3" / 80	3	2	20,5	36	8,2	27,5	473	242	578	49	20
100AL25.5A WD	5,5	6,7	4" / 100	3	2	21,5	60	11,3	82,7	564	291	689	75	20
100AL27.5A WD	7,5	8,8	4" / 100	3	2	28	60	14,5	123,5	564	291	689	81	20
100AL211 WD	11	12,8	4" / 100	3	2	39,5	60	21,6	190,4	565	291	729	91	20
BF-01UN(F)	0,5	0,6	5/4" /	1	2	5	9	2,8	9,1	214	146	372	14	25
BF-05UN(F)	0,4	0,72/0,7	2" / 50	1/3	2	6	9	3,3/1,3	11,5/5,7	237	154	427	16/15	35
BF-21PN(F)	0,75	1,08/1,05	2" / 50	1/3	2	9	12	5,2/1,9	18,3/10,1	276	235	460	18/17	26
BF-21UN(F)	0,75	1,08/1,05	2" / 50	1/3	2	8	12	5,2/1,9	18,3/10,1	237	154	427	18/17	35
BF-31UN(F)	0,75	1,08/1,05	3" / 80	1/3	2	6,5	18	5,2/1,9	18,3/10,1	278	173	458	19/18	30
BF-22UN(F)	1,5	2	2" / 50	3	2	14	12	3,5		288	202	477(546)	25	35
BF-22ULN(F)	1,5		2" / 50	3	2			3,4						50
BF-32PN(F)	1,5	2	3" / 80	3	2	9	30	3,5	18,1	408	258	530	38	32
BF-32APN(F)	1,5	2	3" / 80	3	2	8,5	36	3,5		417	260	521(590)	30	35
BF-32AUN(F)	1,5	2	3" / 80	3	2	8,5	24	3,5		402	202	519(588)	28	50
BF-33APN(F)	2,2	2,95	3" / 80	3	2	12,5	36	5		417	260	521(590)	32	35
BF-33AUN(F)	2,2	2,95	3" / 80	3	2	12,5	24	5		402	202	519(588)	30	50
BF-35PN	3,7	4,65	3" / 80	3	2	19	36	7,9	49,2	468	260	541	35	35
BF-35UN	3,7	4,65	3" / 80	3	2	16,5	30	7,9	49,2	453	202	539	33	50

GF	Output	Input	Discharge	Voltage – Phase*	Number of poles	Delivery head	Flow rate	Nominal current	Starting current	Dimensions			Weight
										Length	Width	Height	
	kW	kW	" / mm	m	m <sup>3</sup> /hod	A	A	mm	mm	mm	kg		
32GF21.0(F)	1,0	1,4/1,35	1 1/4"/32	1/3	2	17	3,6	6,4/2,4	31,2/13,6	249	177	555/530	28/25
32GF21.2(F)	1,2	1,65/1,6	1 1/4"/32	1/3	2	17	3,6	8,2/2,8	41,9/15,5	285	203	597/546	34/30
32GF21.5	1,5	2,0	1 1/4"/32	3	2	23	3,6	3,5	18,7	285	203	546	33
40GF21.5	1,5	2,0	40/32	3	2	23	3,6	3,5	18,7	255	203	546	32
32GF22.2	2,2	2,95	1 1/4"/32	3	2	29	3,6	5	28,1	285	203	546	35
40GF22.2	2,2	2,95	40/32	3	2	29	3,6	5	28,1	255	203	546	35
50GF22.2	2,2	3,2	2"/50	3	2	19	12,0	5,5	27,5	393	226	616	51
50GF23.7	3,7	4,7	2"/50	3	2	26	12,0	8,2	59,1	393	226	616	53

SS SF	Output	Input	Discharge	Voltage – Phase*	Number of poles	Delivery head	Flow rate	Nominal current	Starting current	Dimensions			Weight	Solid passage**
										Length	Width	Height		
	kW	kW	" / mm	m	m <sup>3</sup> /hod	A	A	mm	mm	mm	kg	mm		
SS-05A(F)	0,4	0,72/0,7	2" / 50	1/3	2	7	7,2	3,3/1,3	11,5/5,7	245	174	439	15/14	10
SS-21A(F)	0,75	1,08/1,05	2" / 50	1/3	2	10	10,2	5,2/1,9	18,3/10,1	245	174	439	17/16	10
SF-05AU(F)	0,4	0,72/0,7	2" / 50	1/3	2	6	9	3,3/1,3	11,5/5,7	237	154	427	15/14	35
SF-21AU(F)	0,75	1,08/1,05	2" / 50	1/3	2	8	12	5,2/1,9	18,3/10,1	237	154	427	16/15	35
80SFP21.5	1,5	2,0	3"/80	3	2	8,5	36	3,5	18,7	417	260	421	28,5	35
80SFU21.5	1,5	2,0	3"/80	3	2	8,5	24	3,5	18,7	402	202	517	26,5	50
80SFP22.2	2,2	2,95	3"/80	3	2	13	36	5	28,1	417	260	421	31,5	35
80SFU22.2	2,2	2,95	3"/80	3	2	13	24	5	28,1	402	202	517	29	50
80SFP23.7	3,7	4,6	3"/80	3	2	20,5	36	8,2	27,5	495	290	568	43	32
80SFU23.7	3,7	4,6	3"/80	3	2	17,5	30	8,2	27,5	476	223	561	40	50
80SFP25.5	5,5	6,7	3"/80	3	2	28	36	11,3	82,7	563	345	684	67	30
100SFP25.5	5,5	6,7	4"/100	3	2	21,5	60	11,3	82,7	591	345	684	67	30
80SFU25.5	5,5	6,7	3"/80	3	2	21	36	11,3	82,7	499	258	657	61	50
80SFP27.5	7,5	8,8	3"/80	3	2	35,5	36	14,5	123,5	563	345	684	73	30
100SFP27.5	7,5	8,8	4"/100	3	2	29	60	14,5	123,5	591	345	684	73	30
80SFU27.5	7,5	8,8	3"/80	3	2	26	36	14,5	123,5	499	258	657	67	50
80SFP211	11	12,8	3"/80	3	2	46	36	21,6	190,4	563	345	724	82	30
100SFP211	11	12,8	4"/100	3	2	39,5	60	21,6	190,4	591	345	724	82	30
80SFU211	11	12,8	3"/80	3	2	33	36	21,6	190,4	499	258	697	76	50

AS AG IC	Output	Input	Discharge	Voltage – Phase*	Number of poles	Delivery head	Flow rate	Nominal current	Starting current	Dimensions			Weight	Solid passage**
										Length	Width	Height		
	kW	kW	Bayonet	m	m <sup>3</sup> /hod	A	A	mm	mm	mm	kg	mm		
50ASH21.1	1,1	1,65/1,6	C 52	1/3	2	13,5	12	8,2/2,8	41,9/15,5		210	496/437	28/24	8
50ASH21.5	1,5	2,0	C 52	3	2	15	15	3,5	18,6		235	530	36	10
50ASH22.2	2,2	2,95	C 52	3	2	19	18	5,1	28,9		235	530	39	10
80ASN21.5	1,5	2	B 75	3	2	10	30	3,5	18,6		235	531	36	10
80ASN22.2	2,2	2,95	B 75	3	2	14	30	5,1	28,9		235	531	39	10
80ASN23.7	3,7	4,7	B 75	3	2	21,5	30	8,3	55,2		235	561	44	10
80ASH25.5	5,5	7	B 75	3	2	28	30	11,6	78,4		286	692	72	10
100ASL23.7	3,7	4,7	A 110	3	2	12,5	60	8,3	55,2	259	235	606	44	10
100ASN25.5	5,5	7	A 110	3	2	19	60	11,6	78,4	297	286	677	75	10
100ASN27.5	7,5	9,2	A 110	3	2	25	60	15,3	108,7	297	286	677	80	10
100ASN211	11	12,8	A 110	3	2	35	60	21,8	190,4		330	785	123	10
150ASL25.5	5,5	7	DN150	3	2	12	90	11,6	78,4		286	724	78	10
150ASL27.5	7,5	9,2	DN150	3	2	17	90	15,3	108,7		286	724	81	10
150ASL215	15	16,9	DN150	3	2	35	90	28,6	236,2		330	819	133	10
80AGN22.2	2,2	2,95	B 75	3	2	13	20	5,1	28,9		260	612	40	10
80AGN23.7	3,7	4,7	B 75	3	2	21	26,5	8,3	55,2		260	642	45	10
80AGH25.5	5,5	7	B 75	3	2	27	37	11,6	78,4		318	766	73	10
100AGN27.5	7,5	9,2	A 110	3	2	24	35	15,3	108,7		318	751	81	10
50ICA21.1	1,1	1,65/1,6	C 52	1/3	2	13,5	12	8,2/2,8	41,9/15,5		210	496/400	28/24	3,5
80ICB21.5	1,5	2	B 75	3	2	10	30	3,5	18,6	236	235	536	36	10
80ICB22.2	2,2	2,95	B 75	3	2	14	30	5,1	28,9	236	235	536	39	10
100ICB23.7	3,7	4,7	A 110	3	2	13	60	8,3	55,2	265	235	589	44	10

GD GDR	Output	Input	Discharge	Voltage – Phase*	Number of poles	Delivery head	Flow rate	Nominal current	Starting current	Dimensions			Weight	Solid passage**
										Length	Width	Height		
	kW	kW	" / mm	m	m <sup>3</sup> /hod	A	A	mm	mm	mm	kg	mm		
GD-400 (F) (FV)	0,4	0,6	2"/50	1	2	8	6	3		***	185	305	10,5(11)	7
GD-750 (F) (FV)	0,75	1,05	2"/50	1	2	11	9,6	5		***	185	327	12,8(13,1)	7
GDR-400	0,4	0,6	1"/25	1	2	8	4,2	3		***	205	305	10,5	1

L	Output	Input	Discharge	Voltage – Phase*	Number of poles	Delivery head	Flow rate	Nominal current	Starting current	Dimensions			Weight	Solid passage**
										Length	Width	Height		
	kW	kW	"/mm	m	m <sup>3</sup> /hod	A	A	mm	mm	mm	kg	mm		
L-41	0,75	1,05	4"/100	3	2	3	42	1,9	9,9	230	225	484	26	10
L-62	1,5	2	6"/150	3	4	2	120	3,8	20,4	-	285	638	51	20
L-63	2,2	2,95	6"/150	3	4	2,5	120	5,4	25,3	-	285	638	52	20
L-200A	5,5	6,8	200	3	4	4	210	12,6	70,4	-	340	923	116	22
L-250A	7,5	8,8	250	3	4	4	330	16	90,4	-	380	1015	157	22
L-300A	11	12,4	300	3	4	4,5	420	22,6	160	-	430	1077	201	23

WD: these types of pumps are equipped with WD (water detector – moisture sensor of leakage) in standard.  
(F) in type marking means pump is equipped with float switch.

\* Voltage-phase : 1F – one-phase – 1 + PE230V ČSN EN 60204-1  
3 F – three-phase – 3 + c PE 400V

\*\* Solid passage: diameter of solid particles that can get through the pump without clogging the impeller.

\*\*\* Depend on used discharge connection and hose.

## 4.0 TECHNICAL DESCRIPTION OF PUMPS

HCP submersible sludge pumps are one-stage pumps designed for various loads and types of operation.

- 4.0.1 **AF** – designed for maximum loads and permanent operation. Four types of impeller wheels are used:  
**P-TYPE IMPELLER:** Single-blade or double-blade semi-open impeller.  
**U-TYPE IMPELLER:** Vortex impeller enables pumping media containing solid particles and long-fibre substances without going through the impeller. The impellers have good resistance against clogging.  
**E-TYPE IMPELLER:** Closed, one-channel two-blade impeller characteristic for great delivery height. Very efficient for pumping waste waters containing solid particles.
- 4.0.2 **AL, BF** - portable sludge pumps with open impellers, either single-blade (P) or multi-blade (U-vortex), depending on type.
- 4.0.3 **SS, SF** – stainless-steel portable one-stage pumps designed for pumping aggressive waste waters. The impellers are open, either single-blade (P) or multi-blade (U-vortex), depending on type.
- 4.0.4 **AS, AG** – portable sludge pumps with multi-blade impeller made from a special alloy with high content of chrome (HCR). Having been heat-processed, this alloy is very hard and resistant against abrasion. Pumps ASH and AGH has open impeller, and pumps ASN, ASL, AGN has closed channel impeller. Pumps AG series is equipped with cast iron agitator fitted on extended shaft to create powerfull stirring oposite botom of reservoir and pumping action for slurry.
- 4.0.5 **IC** – portable one-stage pumps with closed multi-channel impeller. Type 50ICA21.1 impeller is made of bronze, other types from chrome steel.
- 4.0.6 **GD, GDR** – portable one-stage pumps with open, multi-blade impeller. Impeller and casing are made of special rubber with high abrasion resistance. GDR pumps have a special suction pad allowing the drawdown water to the level of 2mm.
- 4.0.7 **GF** – portable one-stage pumps fitted with open, multi-blade impeller and a special cutting device. Radial cutter and cutter ring protects clogging of the pump by matter type incontincy and hygienic pads, tampons, plastic bags, textiles and disposable wipes etc. Cutting device effectively grings-up all these matters and allows continual and long-time operation of the pumps.
- 4.0.8 **L** – industrial pumps fitted with axial or diagonal bronze impeller.

**WD detector** (AF and cast iron AL series - output 1,5kW and more)

WD detector is conductor placed in oil bath of mechanical sealing and insulated from frame of the pump. WD detector has two used wires – one from insulated conductor and second yellow-green coloured on grounding(frame). If water leaks to the oil bath the WD detector may signaling or switch off the pump (depend on protection conected to WD).

Electric motor constitutes a single assembly with the pump. The rotor has an extended shaft for fitting the impeller, eventually radial cutter (GF) or agitator (AG). It is supported on bearings lubricated by grease. The service life of the grease refill of the bearings is identical with the service life of the bearings. The hydraulic part of the pump and the electric motor is separated by double mechanical sealing greased and cooled by oil . The water side of the sealing is fitted with additional gufero sealing. A little pollution of the liquid by the refill oil cannot be excluded (e.g. in case of worn seal).

The supply cable (eventually WD detector cable) terminates from the upper cover area with a cable base sealed in upper cover to avoid penetration of water. The individual cables are sealed in cable base with a special resin to prevent from penetration of water.



The pumps are fitted with a heat protection to protect the motor against overheating as a result of a high temperature or should an inter-phase failure occur during the start-up period, or a voltage decrease, or should the impeller wheel become clogged. Sizes from AF-615 to AF-1660 is equipped with MTP (Miniature Thermal Protection) sensors in stator winding, which protects motor against overheating by activating external protection in control panel. Sizes AL/BF-01, AL/BF-05 and SS/SF-05 1ph/230V is equipped with thermostat.





The pump must be operated with an appropriate control and protective device.

Discharge flanges dimensions of AL, BF, SS, SF, AF, GF series and GRS (Guide Rail Systems) are not in accordance with ČSN/DIN, therefore discharges are always equipped with threaded counterflange or welding-neck flange.

## 4.1 PRODUCTION LABELS

### 4.1.1 Sticker label – sample

00 – pump version  
 f – frequency  
 INSUL. – insulation class  
 I – nominal current  
 U – voltage  
 Q – flow rate  
 H – delivery head  
 Pc – pump input  
 DN – discharge dimension  
 n – speed  
 m – pump weight  
 IP – covering  
 ∇ – max. submersion  
 35°C – max. temperature

 <b>HCP PUMP</b>				
<b>Typ</b>		<b>BF-21PN</b>	<b>00</b> 	
<b>f</b>	<b>50</b>	<b>Hz</b>	<b>INSUL.</b>	<b>B</b>
<b>I</b>	<b>5,2</b>	<b>A</b>	<b>U</b>	<b>230 V~</b>
<b>Q</b>	<b>12</b>	<b>m<sup>3</sup>/hod</b>	<b>H</b>	<b>9,0 m</b>
<b>Pc</b>	<b>1,05</b>	<b>kW</b>	<b>DN</b>	<b>50 mm</b>
<b>n</b>	<b>2850</b>	<b>rpm</b>		
<b>m</b>	<b>18</b>	<b>kg</b>	<b>IP68</b>	<b>10 m</b>
<b>Rotation</b> 			<b>Tmax. 35°C</b>	
<b>Made by: HCP PUMP MFR.CO.,LTD.</b>				

The serial number is printed on separate label.

Sample of labeling:





204 30310

Sequence number

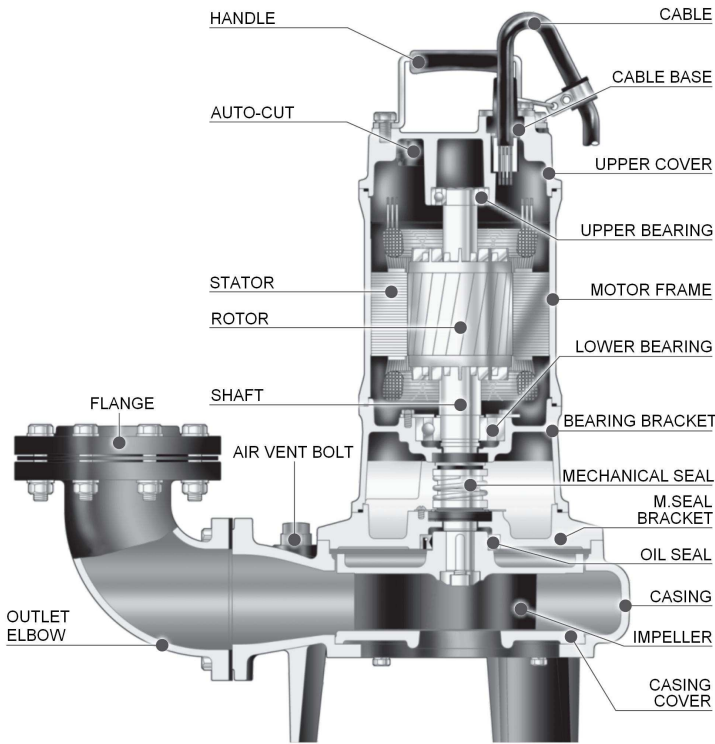
Two last digits of the year of production

### 4.1.2 Metal label – sample

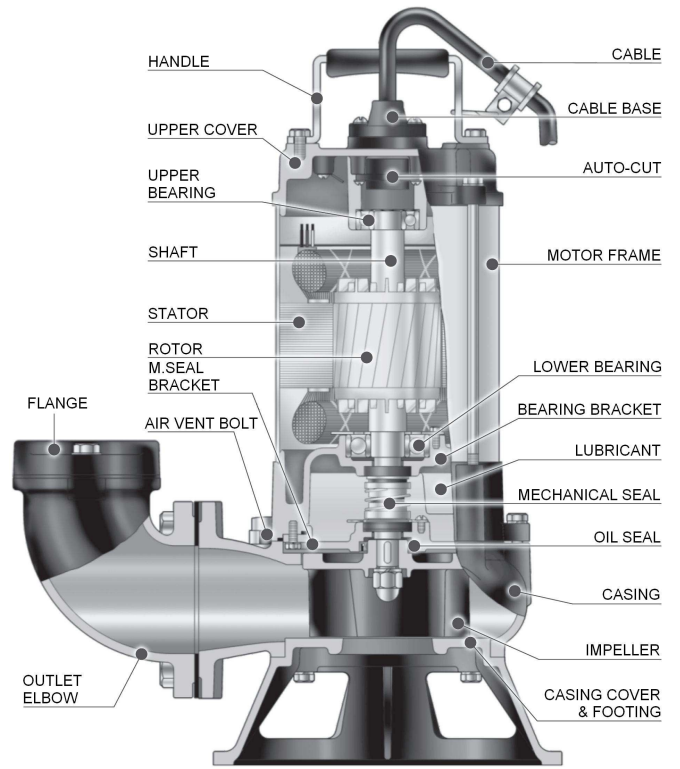
00 – pump version  
 f – frequency  
 INSUL. – insulation class  
 I – nominal current  
 U – voltage  
 Q – flow rate  
 H – delivery head  
 Pc – pump input  
 DN – discharge dimension  
 n – speed  
 m – pump weight  
 IP – covering  
 ∇ – max. submersion  
 S.N. – serial number  
 DAT. – production date

 <b>HCP PUMP</b>					
<b>V.Č. 1301011703</b>			<b>DAT. 2013/11</b>		
<b>○ Typ</b>		<b>32GF21.5</b>	<b>00</b> 		<b>○</b>
<b>f</b>	<b>50</b>	<b>Hz</b>	<b>IZOL</b>	<b>B</b>	<b>IP68</b>
<b>I</b>	<b>3,6</b>	<b>A</b>	<b>U</b>	<b>400</b>	<b>V~</b>
<b>Q</b>	<b>3,6</b>	<b>m<sup>3</sup>/hod</b>	<b>H</b>	<b>23,0</b>	<b>m</b>
<b>Pc</b>	<b>1,95</b>	<b>kW</b>	<b>DN</b>	<b>32</b>	<b>mm</b>
<b>n</b>	<b>2850</b>	<b>ot/min</b>		<b>SMĚR OTÁČENÍ</b>	
<b>m</b>	<b>34</b>	<b>kg</b>	<b>30 m</b>		
<b>Výrobce: HCP PUMP MFR.CO.,LTD.</b>					

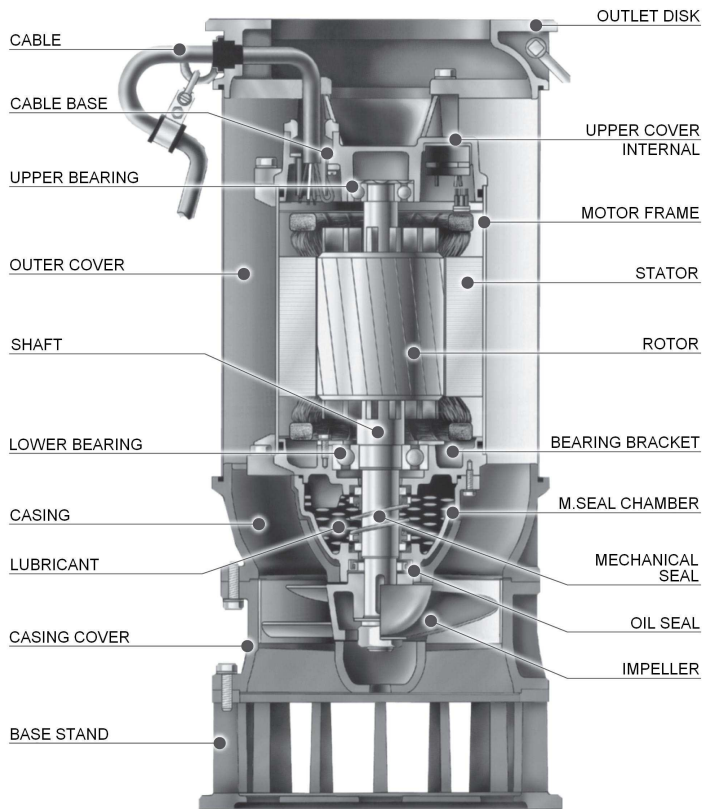
## 4.2 PUMPS SECTIONS



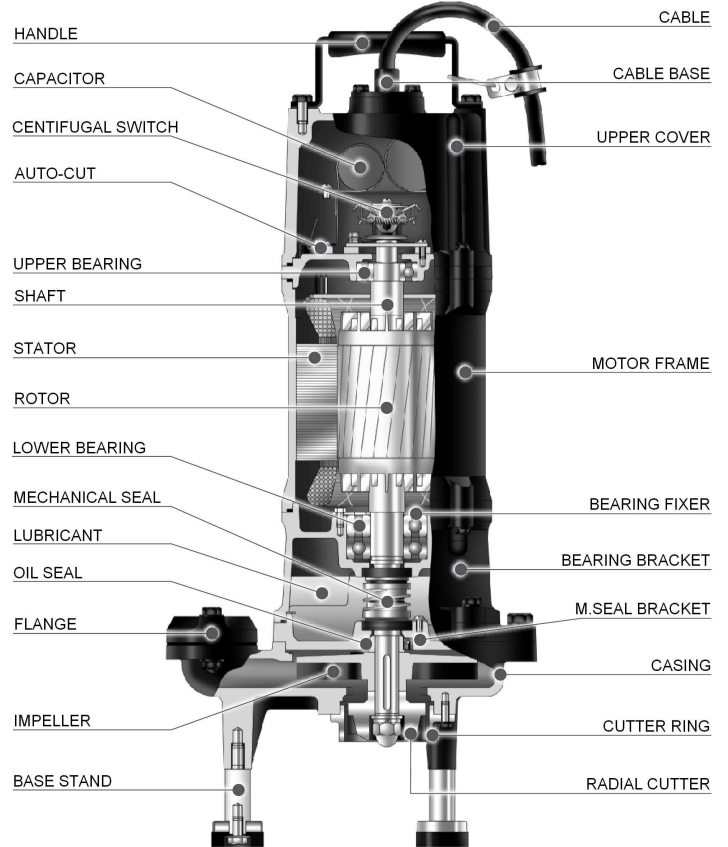
**AF**



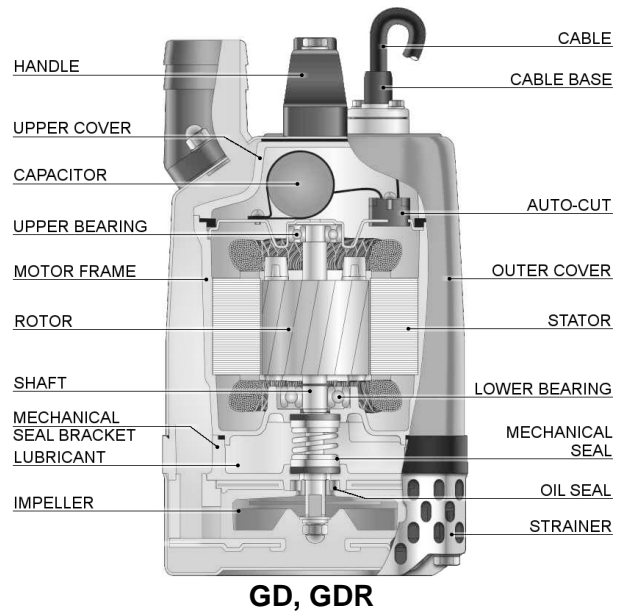
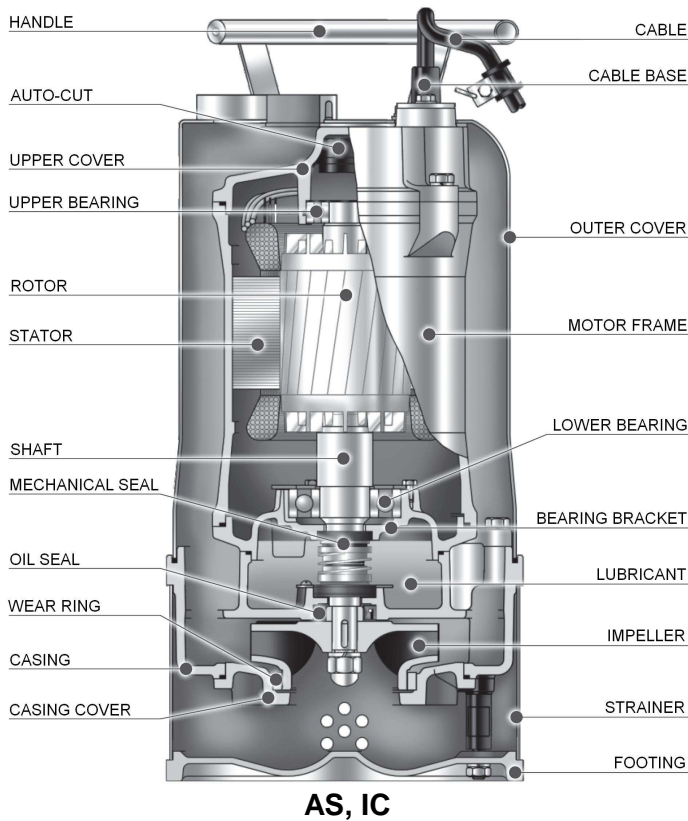
**AL, BF, SS, SF**



**L**



**GF**



### 4.3 TRANSPORT AND STORAGE

**WARNING** The pump can be transported in both vertical and horizontal position. It must be firmly anchored in order not to tip over or roll away.

**!** When handling, hang the pump for the handle only; never stretch the cable by pulling it!! Is possible to use only approved and undamaged hanger with load capacity higher then weight of pump. In consideration of pump weight does not recomend to handle of pump by women. Pumps up to 50kg weight can handle by two men.

**Pumps above 50kg weight hang the pump on hanger with suspension strand and use suitable manipulation device (trolley etc).**

When it is freezing, it is necessary to leave the pump submerged in a non-freezing liquid or to pull the pump out and dry up. Should any left water freeze in the hydraulic enclosure, submerge the pump in a liquid, **never use flame to defrosting.**

During a longer storage or operation pause of the pump it is necessary:

- To make time to time a few revolutions, so that the mechanical seal sealing rings do not get caked (about 1x per 2 months); in storage longer than 6 months this is necessary;
- To place the pump in a dry place.

After a longer storage or operation pause of the pump it is necessary to carry out inspections as if before commissioning.

The pumps can be stored within temperature range from  $-25^{\circ}\text{C}$  to  $+55^{\circ}\text{C}$ . For a short period not exceeding 24 hours the pumps can be stored at temperature up to  $+70^{\circ}\text{C}$ .

Pump and especially cables don't expose to direct sun shining or another sort of damaging radiation for long time. Structure of rubber and plastic parts of pump can be damaged.

## 5.0 CONNECTION TO ELECTRICITY

### 5.1 GENERALLY

**!** Connection to the power supply and inspection of this connection must be carried out by an expert and it must comply with national standards and regulations in force. The pump must be properly and safely grounded. Connection to a switchboard must be equipped with emergency switch!

5.1.1 It is necessary to install following devices for disconnection of power supply:

- Breakdown switch with or without fuse, according to CSN EN 60947-3 standard, class AC-23B.
- No-fuse circuit breaker suitable for disconnection according to CSN EN 60947-2 standard

5.1.2 Protective devices for excess current protection:

If no circuit breaker according to the CSN EN 60947-2 is used as a disconnecting device (see 5.1.1), it is

necessary to install separate fuses or circuit breakers for supply conductors.

**Series AF, AL, BF, AS, AG, IC, GD, GDR, SS, SF, L**

Fuse: fuse nominal current of 100 % - 115 % of the pump nominal current.

Characteristics: gG

Circuit breaker: nominal current 100 % - 115 % of the pump nominal current.

**Series GF**

**WARNING** Input of grinder pump GF is higher than nominal in cutting operation! Current protection setting value must correspond with this!

Fuse: fuse nominal current of 100 % - 140 % of the pump nominal current.

Characteristics: gG

Circuit breaker: nominal current 100 % - 140 % of the pump nominal current.

5.1.3



El.motor of pump is necessary to protect against short connection and overloading by suitable protecting device, which in case of defect switch off all phase conductors. Devices protecting from overload according to CSN EN 60947-4-1 standard or regional standards.

The current setting should be the same as the pump nominal current stated on the label (see 4.1 and 3.0). Is necessary to observe all aforeside requirements, although in el.motor is installed additional thermal protection.

**Explanation:** Additional thermal protection after switch-off can be started in time, when stator (wiring) and motor frame are not enough cooled-down.

Recomended protection device is for example:

- motor starter
- current relay with contactor



5.1.4

**Do not place electric connections under water, as there is a risk of short circuit.**

5.1.5

Pump and Float switch cables must be 100% watertight connected in all length to el.switchbox. Otherwise incorrect evaluation of signals or operation faults may occur.

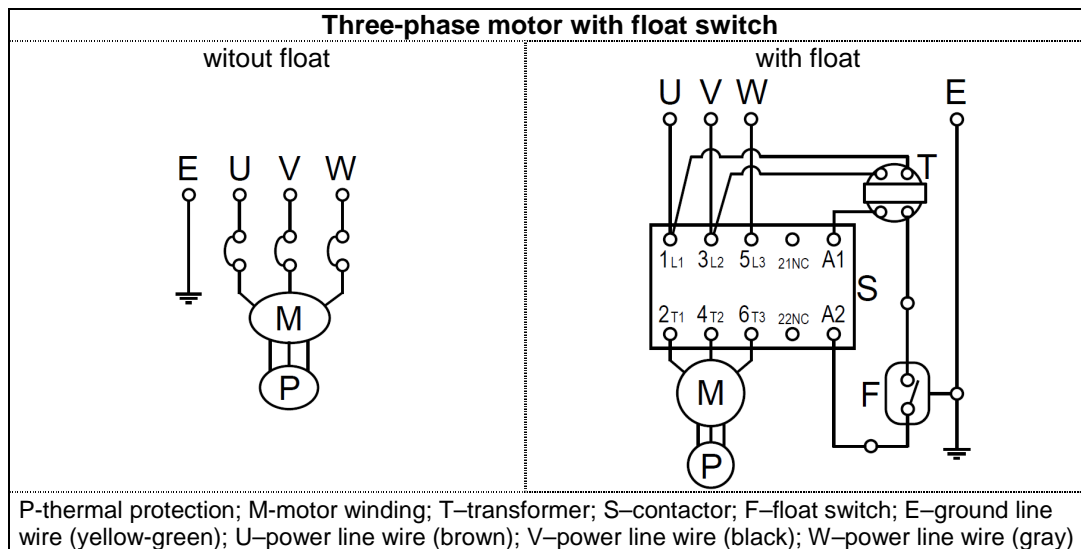
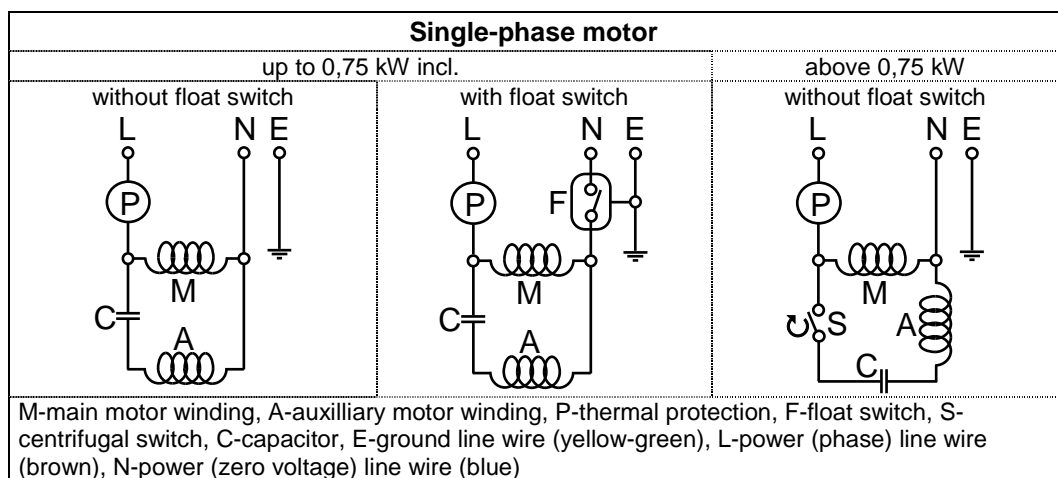
5.1.6

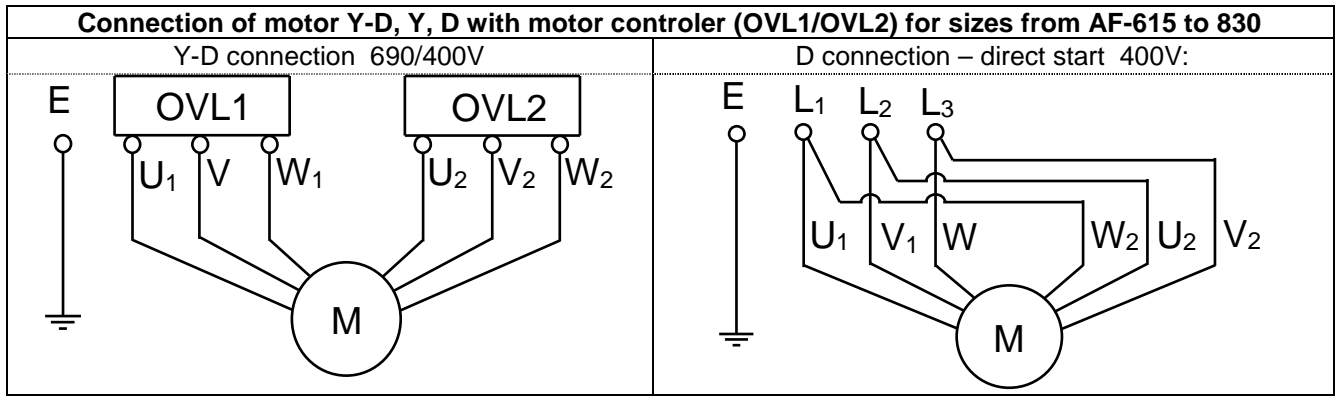
The pumps must not be used in swimming pools if there are any people in water.

5.1.7

In case of using the pump in swimming pool, outside fountains, garden ponds and similar places the pump must be powered via a current protector (RCD), the nominal residual operating current shall not exceed 30 mA.

**5.2 CONNECTING THE PUMP**

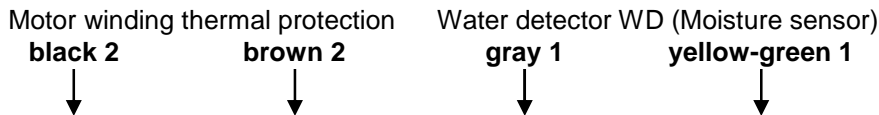




**Y-D connection is recommended by manufacturer.**

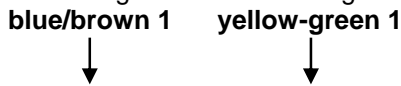
Motor winding thermal protection + Water detector (sizes from AF-615 to 830):

Common signal cable has four line wires. On the end each of line wires has a next labeling:



Water detector (small sizes):

Water detector cable has three line wires. On the cable end sticks out from cable only two line wires, which are connecting to moisture leakage evaluation device.



**WARNING**

**Before cutting short of cable is necessary to transfer labeling of each line wires ends on cable new end.**

**Don't connect signal cable line wires to electric power supply!**

Sections and length of power cables H07RN-F:

Type of pump	Voltage [V]	Section [mm <sup>2</sup> ]	Length [m]
AL-01N,-05N,-05LN,-21(A)N,-31N, BF-01N,-05UN,-21PN,-21UN,-31UN, GD(R)-400,-750, SS-05A,-21A, SF-05AU,-21AU, 50AFU20.4(L)F, 50AFU20.8(L)F	230V	3G 1,0mm <sup>2</sup>	10m
AL-05N,-05LN,-21(A)N,-21.5N,-31N, BF-05UN,-21PN,-21UN,-31UN, SS-05A,-21A, SF-05AU,-21AU, 50AFU20.4, 50AFU20.4L, 50AFU40.4, 50AFU20.8, 50AFU20.8L, 50AFU40.8, L-41, 32GF21.0	400V	4G 1,0mm <sup>2</sup>	10m
50ASH21.1, 50ICA21.1	400V	4G 1,0mm <sup>2</sup>	15m
32GF21.0, 32GF21.2, AL-21.5N	230V	3G 1,5mm <sup>2</sup>	10m
50ASH21.1, 50ASH21.5, 50ICA21.1	230V	3G 1,5mm <sup>2</sup>	15m
AL-22N,-23AN,-32AN,-33AN,-43AN,-35N, 80SFP/U21.5, 80SFP/U22.2, 80SFP/U23.7, BF-22UN,-32(A)PN,-32AUN,-33APN,-33AUN,-35PN,-35UN	400V	4G 1,5mm <sup>2</sup>	10m
32GF21.2, 32GF21.5, 32GF22.2, 50GF22.2, 50GF23.7, L-62,-63			
50AL21.5, 50AL22.2, 80AL21.5, 80AL22.2, 80AL23.7A, 80ICB21.5, 80ICB22.2, 100ICB23.7			
50AFU21.5, 80AFP21.5A, 80AFP41.5, 80AFP22.2A, 80AFP23.7A, 80AFP42.2, 80AFP43.7	400V	4G 1,5mm <sup>2</sup>	15m
80AFU21.5(L), 80AFU41.5, 80AFU22.2(L), 80AFU42.2, 80AFU23.7(L)A, 80AFU43.7, 50ASH21.5, 50ASH22.2, 80ASN21.5, 80ASN22.2, 80ASN23.7, 100ASL23.7, 80AGN22.2, 80AGN23.7, 80(100)SFP25.5, 80SFU25.5, 80(100)SFP27.5, 80SFU27.5, 80(100)SFP211, 80SFU211	400V	4G 2,5mm <sup>2</sup>	10m
100AL25.5A, 100AL27.5A, 100AL211, 80(100)AFP25.5, 80AFU25.5(L), 80(100)AFP27.5, 80(100)AFP211, 80AFU27.5(L), 80AFU211(L), 100AFE/U45.5N, 100AFE/U47.5N, 80ASH25.5, 100ASN25.5, 100ASN27.5, 150ASL25.5, 150ASL27.5, 80AGH25.5, 100AGN27.5	400V	4G 2,5mm <sup>2</sup>	15m
AF-610,-615,-815,-820, L-200A,-250A,-300A	400V	4G 4,0mm <sup>2</sup>	15m



**THE PUMPS CAN NOT BE USED FOR FLAMMABLE AND COMBUSTIBLE LIQUIDS.**



**ALLOWABLE VOLTAGE DECREASE IS 10% OF NOMINAL VOLTAGE**



**THREE-PHASE PUMP MUST RUN CLOCKWISE DIRECTION IF LOOKING FROM THE MOTOR DIRECTION (THE UPPER COVER OR DISCHARGE). IF IT ROTATES OTHERWISE, IT IS NECESSARY TO CHANGE TWO PHASE LINE WIRES IN THE SWITCH BOX OR THE CIRCUIT BREAKER. THE SINGLE-PHASE PUMPS ARE DESIGNED AS CLOCKWISE DIRECTION RUNNING.**



**THE WATER LEVEL MUST ALWAYS BE HIGHER THAN THE PUMP BODY (EXCEPT FOR THE IC, AS, GD, GDR AND L SERIES WHERE THE LIQUID BEING PUMPED FLOWS AROUND THE ELECTRIC MOTOR) – NEVER START AND OPERATE THE PUMP "DRY".**



**MAKE SURE THAT THE VOLTAGE IS IDENTICAL WITH THE DATA ON THE PUMP LABEL**

## 5.3 COMMISSIONING

Before commissioning it is necessary to carry out inspection of the electric part, particularly:

- To check whether the pump supply cable, float switch or water detector cable is not damaged
- To check the correct setting of the current protection
- To check the protection against risky contact voltage

## 5.4 OPERATION AND MAINTENANCE OF ELECTRIC DEVICES



**In any handling of the pump it is necessary to disconnect the pump from the power supply and to make sure that the pump cannot be re-connected accidentally.**

Submersible pump may not be carried if the electric motor is switched on.

**WARNING**

Should a defect of electric equipment or the submersible pump be found during maintenance, the pump must be switched off immediately and the defect must be reported to a person with electro-technical qualification.

## 5.5 MAINTENANCE OF ELECTRIC DEVICES

In more frequent use the electric equipment must be checked at least 1x per month, in occasional use 1x per six months and before any commissioning by a **person having electro-technical qualification according to the national standards and regulations in force.**

It is necessary to check the protection against a risky contact voltage and integrity of supply cable or the pump. Cable replacement and repairs of other parts of the pump where the sealing faces are being loosened must be carried out by a service centre or repair shop as it is necessary to make sure that the sealing parts being disassembled are waterproof tightened again.

**Warning:** Any works on the pump involving disassembly of the cable box enclosure, electric connection, disconnection of the motor and replacement of the cable must be carried out by an expert with an appropriate qualification observing the national standards and regulations on connecting electric connections in force.



The supply cable **MUST NOT** be connected by ignorant and incompetent person.

## 6.0 PUMP OPERATION

### 6.1 GENERAL REQUIREMENTS

Before commissioning the pump it is necessary to make the operating personnel acquainted with the instructions contained herein that are necessary for proper and safe operation. An emphasis is laid on the necessity to observe this requirement as the product works in wet environment, which represents an extra risk regarding the risk of injury by electric current.

### 6.2 PREPARING PUMP FOR COMMISSIONING, ASSEMBLY OF PUMP AND GUIDE RAIL SYSTEM

6.2.1 After having the pump connected to the power supply it is necessary to verify the proper direction of rotation. This can be done by putting a small pump (up to 1.1 kW) on the ground, tilting it a bit on a side (so that the pump stands on the circumference edge of the frame), gripping by the handle and turning the motor on for a moment. If the direction of rotation is wrong, proceed according to chapter 5.0 – electric connection. In case of AL, AS, IC, SS, L pumps is necessary to remove strainer.

6.2.2 In case of big pumps you can check the direction of rotation as follows:

- Hang the pump on a rope or chain and turn the motor on for a moment.

- If the pump jerks **opposite the direction of the "ROTATION" arrow** placed on the pump box, the direction of rotation is correct.

- If the pump jerks in the opposite direction, the direction of rotation is wrong and it is necessary to proceed according to chapter 5.0 – electric connection. **In case of big pumps the jerk can be very powerful.**

6.2.3 Warning – the pump must be installed in vertical position **ONLY**. If the pump is installed in different position, it is not possible to file a claim.

6.2.4 Is necessary to have free space around pump equipped with float switch to ensure that float switch does not catch on the sump surface or another things.

**WARNING**

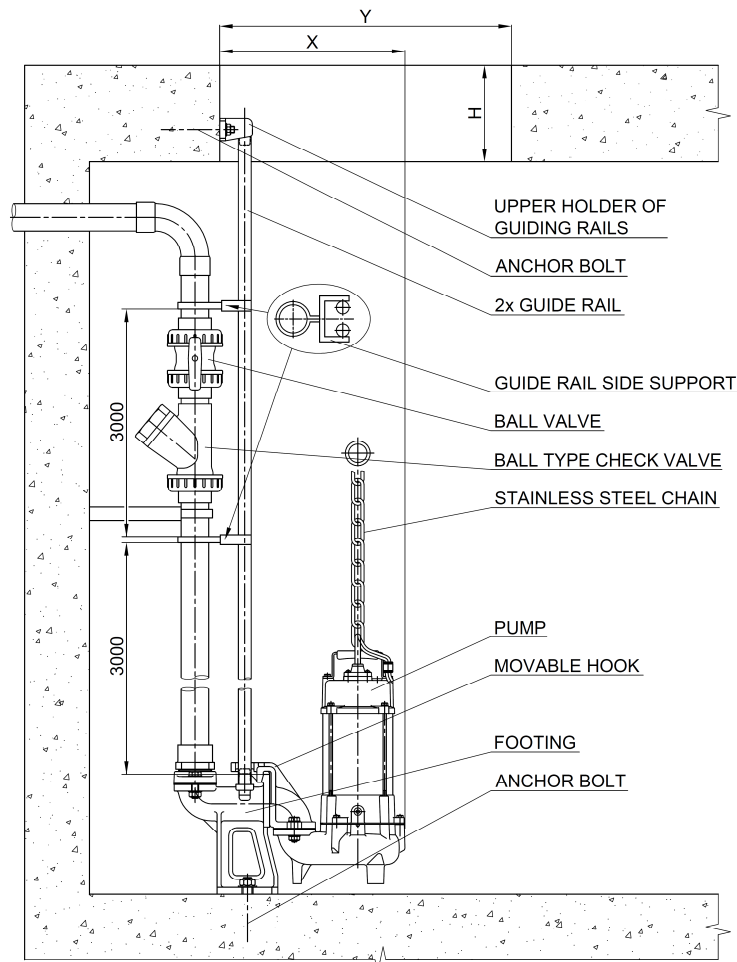
If the sump is small is possible to reduce free length of float switch in fixing point to pump handle. Reduction free length of float switch cable changes switch-on and switch-off level – is necessary to check out. Is necessary to fix the pump in sump against moving or rotating.

<i>Minimal dimensions of sump [mm]:</i>	<i>width</i>	<i>length</i>	<i>height</i>
AL-01NF, BF-01UNF, AL-05NF	600	750	700
AL-05LNF, AL-21NF, AL-31NF BF-05UNF, BF-21UNF, BF-31UNF, BF-21PNF	650	800	750
AL-23ANF, AL-32ANF, AL-33ANF, AL-43ANF	900	1000	900
BF-32AUNF, BF-32APNF, BF-33AUNF, BF-33APNF	800	850	900
32GF21.0F, 32GF21.2F	750	1000	1060
SS-05AF, SS-21AF, SF-05AUF, SF-21AUF	700	900	880

- 6.2.5 Deaerate the sump tank or septic tank in accordance with the local rules and regulations.
- 6.2.6 When pumping from a reservoir where loose materials are sedimented, it is not suitable to put the pump on these sediments as for one the pump will "bury" itself and then the functional surfaces of the hydraulic part will get worn uselessly. In such case it is necessary to place pump on a fixed plate it is not possible to hang the pump.
- 6.2.7 Do not place the pump in mud or sand. Do not allow the pump get clogged. In case of GF pump must not get into the sump any abrasive particles because they quickly blunts the cutting device and the pump becomes blocked.
- 6.2.8 A delivery hose or pipe must be connected to the delivery flange of the pump. The recommended materials the hose should be made of are PVC, rubber etc. The pipe should be made of plastic or steel. The material must always be resistant towards the medium being pumped.
- 6.2.9 Use only hoses and pipes of correct size, otherwise the hydraulic losses can become higher and the flow capacity will be reduced. And in addition to this, the hose or pipe might get clogged.
- 6.2.10 For hanging the pump we recommend to use chain or steel rope. Load capacity of the chain or rope must be chosen with respect to the pump weight (chapter 3.0) and additional load in the maximum immersion depth of the pump in relation to the specific density of the liquid being pumped, so that the safety coefficient  $k > 3$  is observed. Larger pump sizes can not be hanging by handle. Material of the chain or rope must be resistant to the pumped medium.
- 6.2.11 Pumps usually become warm. In order to avoid burns let the pump cool down after switching it off for about 20 minutes before you start to manipulate with it.
- 6.2.12 Do not let the pump run idle. The pump may get overheated and in such case you cannot file a claim.
- 6.2.13 The pipe can not be smaller than the pump discharge. The pipe must be able to convey medium with solid particles. The flow speed in the delivery pipe must be sufficient enough for carrying any solid particles dispersed in the liquid. In order to meet this requirement, the minimum speed of 0.6 m/s is required.

Pipe dimension [mm] / ["]	Minimal flow rate [lpm] / [m <sup>3</sup> ph]
32 / 1 ¼"	29 / 1,8
50 / 2"	84 / 5
80 / 3"	189 / 11,3
100 / 4"	320 / 19,2
150 / 6"	633 / 38
200 / 8"	1206 / 72,3
250 / 10"	1897 / 114
300 / 12"	2681 / 161
350 / 14"	3223 / 194
400 / 16"	4178 / 251

- 6.2.14 Is recommended to install ball-type check valve to discharge pipe to prevent from back flow and reverse rotation of impeller. For type GF, it is necessary, otherwise the backflow would clog the cutting device by the cut pieces.
- 6.2.15 The version fitted with the Guide Rail System consists of the GRS and the pump. The GRS is manufactured by HCP PUMP MFR CO, LTD TAIWAN.



Picture of the BF pump with guide rail system

6.2.16 The Guide rail system consists of the following parts:

- footing
- 2x guide rail (not included in the shipment – provided by customer according to the necessary length)
- movable hook
- upper holder of guide rails
- stainless-steel chain of 4m length

6.2.17 Dimensions of discharge flanges series AL, BF, SS, SF, AF, GF and GRS are not in accordance with ČSN/DIN and therefore are equipped with thread counterflange or welding-neck counterflange.

6.2.18 During installation GRS care about dimension of access hole above the pump  $Y > X$  ! Otherwise is not possible to take out pump from sump.

6.2.19 Fixe the footing to the sump bottom using anchor bolts embedded in concrete. The bolts and nuts must be made of stainless steel. On the footing, there are two benches for seating the guide rails that are attached by the upper holder up in the access hole.

**WARNING**

For the correct placement of pump on footing is necessary to install the footing in a horizontal position!

6.2.20 Upper holder of guide rails fixe near access hole for pump (stainless steel anchor bolts or another construction). If want to drill anchor bolts to concrete care about sufficient height (thickness) of roof. During installation it is necessary to make sure that the guide rails are in vertical position.

6.2.21 If the guide rails are long must be fitted every 3 meters by side bracing (see picture above) as protection against lateral deflection of guide rails. Furthermore it is necessary to anchor the discharge pipe in consideration of its bending resistance.

6.2.22 Remove the base stand (three legs with round rubber pads) and the counter-flange and mount on the movable hook (or hook with bend – depend on type). Let the pump go down in the reservoir using the guide rails. The movable hook will automatically fit in the footing. It is possible to take the pump out for a revision or repair without any need to dismount anything.

6.2.23 In case of 32GF21.0 with GRS T50E must be from oval flange of movable hook on pump side milled or ground off about 3mm material. Otherwise can not be movable hook mounted on the pump. If GRS is not supplied with this modification has to be made additionally.

6.2.24 The cables can not be slack under the pump as they could be sucked in the hydraulic area (We recommend to attach the cable to the stainless steel rope or chain, on which you lower the pump down, cca every 2 m).

**WARNING**

6.2.25 Before switch on the pump the sump must be cleaned of any abrasive and large dirt.


6.2.26 Before switch on the pump it is necessary to check whether the pump is properly seated on the footing before the sump is filled in for the first time.



- 6.2.27 If check valve is installed on discharge pipe pumps AF, AL, BF series is necessary to deaerate pump after the first afloat. Especially in cases where the discharge pipe is equipped with check-valve.
- 6.2.28 Series AL, BF, SS, SF, AF is equipped with air vent bolt or hole in top of pump casing. This bolt/hole allows outflow of gas, which may accumulate in casing when pump rest. When the pump with air vent hole is running flows trickle of water from air vent hole – it is not a defect and air vent hole must be through.

## 6.3 MECHANICAL INSPECTION

Consists in visual inspection of the pump regarding its mechanical conditions.  
Check especially the following:

-  • Integrity of the supply cable and attachment thereof in cable sleeve. Also make sure that the cable sleeve cover is sufficiently tightened so that the supply cable is properly sealed.
- The wear and tear range of parts caused by operation. Especially, pay attention to the impeller, casing cover, casing and mechanical seal, in the GF series also to the radial cutter and cutter ring.

## 7.0 OPERATION, MAINTENANCE AND REPAIRS

### 7.1 GENERALLY

- 7.1.1 During operation the pump does not need any maintenance if the condition according to art. 5.2 is met. Applications with continuous operating or in sump with GRS is necessary to follow Maintenance, revision and control schedule for complete technological complex with regard to this manual requirements. Then it is also necessary to make sure that the delivery hose is not bended – "broken" as this significantly reduces the pump performance, and check whether the hose is not pushed on sharp edges of structures, stones etc.
- 7.1.2 When it is freezing, it is necessary to leave the pump submerged in a non-freezing liquid or take it out, cleanse and dry out. Should ever any water left in the hydraulic area get frozen, submerge the pump in a liquid, never use flame for defrosting.
- 7.1.3 After pumping liquids leaving sediments and soil in the hydraulic part it is necessary to flush the pump immediately after taking it out with clean water. It is recommended to carry out the flushing after every use.
- 7.1.4 In order to prevent from running the pump dry it is recommended to monitor the minimum level. For continuous operation the level of liquid must be at least above the motor area, so that the motor will not get overheated. Series AS, AG, IC and L must have minimum water level 5cm above the top edge of strainer at least.
- 7.1.5 When commissioning a new pump or after a longer operation pause we recommend making a few revolutions by the impeller.

7.1.6 **IN NO CASE MAY the "L" series pumps BE STARTED UP AND OPERATED INTO A CLOSED**

**WARNING DISCHARGE!! RISK OF ACCIDENT!!!**

- 7.1.7 Additional thermal protection against overloading (thermostat in sizes AL/BF-01, AL/BF-05 and SS/SF-05 1ph/230V) protects the motor against burning as a consequence of overheating or overloading. When the motor cools down, the protection against motor overloading is reset and the motor starts up again. Additional thermal protection after switch-off can be started in time, when stator (wiring) and motor frame are not enough cooled-down. If overloading occurs frequently, examine the cause thereof, which may consist in clogged impeller wheel, incorrect – low voltage, incorrect heat breaker or a defect in the motor wiring. Should any defect of electric motor be presumed, replace the stator and the shaft assembly.
- 7.1.8 Lubrication – the motor bearings are filled with permanent grease refill and do not require any additional greasing. The pumps are not fitted with bearing thermostat and sensor for detection of oil refill leakage from the sealing area. Pumps of cast iron series AL and series AF with output 1,5kW and more are equipped with WD detector (moisture sensor) in mechanical seal oil bath.
- 7.1.9 Examine the pump performance by checking the delivery. Make sure that the pump does not vibrate and that it does not make noise.
- 7.1.10 Series AL, BF, SS, SF, AF – check if the air vent bolt or hole are clean and through. If no, it may accumulate gas in casing of the pump and pump may dry-runs!
- 7.1.11 The pumps are not intended for pumping of flammable fluids, oil products and for instalation in potentially explosive conditions. If pumped liquid contains oil products it is danger of damage (swelling, etching etc) cables and sealings in pumps. This damage is not a subject to any warranty claim.

### 7.2 PUMP AND OIL REFILL INSPECTION

The first inspection of the pump, cutting device (GF) and the oil refill is carried out after a month of operation. In case of the L series after a year or 5.000 hours of operation (depending what occurs first). The next inspection should be carried out according to the plan of inspections of the technological facility the pump is part of, however, at least once per year.

Series AF, AL, BF, SS, SF a GF is necessary at least twice per year to inspect the seating surfaces of GRS and guiding rails (if GDS is used). From surfaces must be cleaned of any deposits or incrusts, in order to maintain full functionality of GRS.

If the pump is used for pumping substances with specific properties and influence on the running of the pump (abrasiveness, pH, incrustation, sedimentation etc..) Should control and shorten service intervals as needed.

If the pump is equipped with WD detector and evaluation device is signaling leakage into the mechanical seal oil bath, is necessary to check the mechanical seal condition and eventually change mechanical seal and pour new oil refill into chamber. Although it is not serious defect needs to quick switch off operation, but mechanical seal must be changed as soon as possible, that will not worn-out upper couple of mechanical seal and leaking water into the motor.

At the pumps equipped with WD detector must be routine checked oil refill of mechanical seal chamber, when already small volume of water in oil show on mechanical seal worn-out.

**We recommend entrusting the checking or replacement of the oil refill to a service centre.**

Take the pump out of the sump, clean it and submerge it at least for one hour into a disinfecting solution or neutralizing agent. After that put the pump on a levelled base and check it.

- 7.2.1 The pump – Make sure that the bolts are tightened, check the conditions of the guide rail system (if being part of the pump) and hanger, electric cable, terminal, and wear and tear of the impeller wheel.

When tightening the bolts, the following tightening torques must be applied:

Bolt	M8	M10	M12	M16	M20	M24	M30	M36
Moment [N.m]	12	25	40	90	175	300	500	700

- 7.2.2 Cutting device (GF) – check wear and tear range of the radial cutter and the cutter ring in the GF series. The working edges of radial cutter and cutter ring must be sharp. Otherwise there will be a clogging the pump. If the cutting device is worn, it must be replaced. Inspection or replacement of the cutting equipment should be entrusted to a service center.

- 7.2.3 Lubricant inspection – for pump power:

≤0,75kW every 3000 working hours or 12 months (whichever comes first)

≥1,5kW every 6000 working hours or 12 months (whichever comes first). Loosen the oil plug screw and check the colour of lubricant. If lubricant looks unclear, change mechanical seal and lubricant immediately.

Lubricant change – for pump power:

≤0,75kW ever 4500 working hours or 24 months (whichever comes first)

≥1,5kW every 9000 working hours or 12 months (whichever comes first)

Oil level must reach about 10 mm under low edge of oil plug bore (measured in horizontal pump axis position with oil plug bore in top).

Sealing faces of oil plug and the bore must be clean, and the gasket must be entire. Apply adhesive before re-securing the oil plug screw to strengthen the screw against leakage.

It is recommended to provide oil inspection or change in authorized local HCP service. Used oil – turbine oil ISO WG 32.

- 7.2.4 Mechanical seal inspection – every 24 months. Abrasive wear of ring sealing faces is inspected.

Only qualified mechanics with proper tools and knowledge should be attempting to service this pump or contact authorized local HCP service.

## 7.3 SERVICE, REPAIRS, SPARE PARTS

Any possible repairs and servicing in the guarantee period perform in an authorized service centre only. We recommend entrusting also after-guarantee repairs to service centres.

All the spare parts used for repair must be original parts and any additional spare parts must be approved by the importer.

## 7.4 SERVICE CENTRES

## 7.5 PUMP DISPOSAL



In operation or disposal of the equipment it is necessary to observe the respective national regulations on environment and waste disposal. In case that the equipment will have to be scrapped, it is necessary to proceed in the disposal thereof according to the differentiated waste rules, which means that differences in the materials and their composition must be respected (e.g. metals, plastics, rubber etc.). When applying the rules of the differentiated wastes it is necessary to contact specialized companies dealing with collection of these materials while respecting the local rules and regulations in force.

## 8.0 CONTENT OF SHIPMENT

- Pump assembled with cable and a packaging. Pump AS, AG, IC series with discharge branch (C52, B75, A110) depend on size of pump.
- Pump AS, AG, IC series with cca 10 m fire-hose (C52, B75) depend on pump size (with the exception of pump with A110 discharge branches and hose connections).

- GRS – guide rail system (if having been ordered) consisting of:
  - footing
  - movable hook
  - upper holder of guide rails
  - stainless steel chain

**Warning:** The guide rails are not included in the shipment!!! They are available upon order.

## 9.0 OPERATION FAILURES, THEIR CAUSES AND REMOVAL

FAILURE CHARACTERISTIC	PROBABLE CAUSE	REMEDY
1. After switching on the motor is not running and the pump is not working	1.1 No voltage in the electricity network	Check the power supply*
	1.2 Disconnected cable	Change the cable*
	1.3 Defective connection	Repair, finish connection*
	1.4 Automatic disconnecting during activity	Find cause, remove it
	1.5 Burnt fuse, dropped out breaker	Replace fuse, turn the breaker on*
2. Motor runs (buzzes) yet the pump is not working	2.1 Casing is full of the gas	Deaerate the pump
	2.2 One-phase operation caused by a defect in connection	Repair connection*
	2.3 One-phase operation caused by interruption of one of the cable conductors	Replace the cable*
	2.4 Blocking caused by defective bearing	Replace defective bearing
	2.5 Blocking of the impeller	Check the impeller and clean it
	2.6 Troubles with additional thermal protection	Check and replace if necessary*
	2.7 Voltage decrease	Set the power source*
3. The pump starts running, however the output is low	3.1 Delivery head too big	Replace the pump by more suitable one
	3.2 Opposite direction of rotation of the motor	Change two of three phases*
	3.3 Delivery hose is clogged	Clean it
	3.4 Impeller is heavily worn	Replace for new one
	3.5 Clogged sucking of pump and impeller	Clean it
	3.6 Defective motor wiring	Replace*
4. Additional thermal protection is switching off	4.1 Current breaker set improperly	Set to the motor nominal current*
	4.2 Overloading of motor caused by an object that has blocked the impeller	Dismount and remove the object
	4.3 Overloading caused by high specific density or viscosity of the liquid	Reduce specific density or viscosity
	4.4 Too high temperature of the pumped liquid	Reduce the temperature of the pumped liquid
	4.5 Insufficient cooling of the motor frame caused by clogged delivery or too long "dry" operation	Remove the defects (clean the delivery pipe). Increase the level of the pumped liquid.
5. Big vibrations	5.1 Impeller is worn on one side	Replace the impeller
	5.2 Pump rotates in opposite direction	Change two of three phases and therefore change the direction of rotation of motor*
	5.3 Bearings are worn	Replace by new bearings
6. Series GF – when pump starts cutting, circuit breaker switch off	6.1 Wrong setting of current protection	Set the current protection in accordance with 5.0*
	6.2 Worn cutting device	Replace radial cutter and cutter ring

\* This operations can must be carried out by an expert and it must comply with national standards and regulations in force.

## 10.0 GUARANTEE

The manufacturer provides guarantee in the length of 24 months from delivery performance.

It shall remove for free defects under the following conditions:

- The defect occurs by fault of improper design, manufacturing or use of defective material;
- The pump is operated according to this manual;
- Original spare parts or parts supplied by the pump importer are used;
- Servicing and repairs are carried out by the importer or a contracting service centre

The guarantee shall not cover the defects caused by:

- Improper operation and handling contrary to the safety regulations;
- Defective installation;
- Improper or unauthorized interventions in the pump;
- Natural wear and tear and if pumping liquids except for those recommended in chapter 1.0.

The guarantee shall be limited to the above-mentioned obligations and excludes any damage caused to the health, chattels and property of persons.

The right to change text, technical data and pictures is reserved.

# 11.0 DECLARATION OF CONFORMITY

## EC DECLARATION OF CONFORMITY



Importer/manufacturer's representative in the European Community:

**K+H čerpací technika s.r.o., Dolní Novosadská 55/66  
CZ 779 00 Olomouc, Czech Republic, IČO : 25356933**

Name and address of the person authorized to draw up and keep documentation on behalf of the importer/manufacturer's representative in EC:  
**Ing. Karel Bačuvčík, CEO K+H čerpací technika s.r.o., Dolní Novosadská 55/66, CZ 779 00 Olomouc, Czech Republic**

We declare on our exclusive responsibility that the product:

Title:	<b>Submersible waste water pumps</b>
Series:	<b>AL, BF, AF, SS, SF, AS, AG, IC, GD, GDR, GF, L</b>
Models:	<b>AL:</b> AL-01N(F),-05N(F),-05LN(F),-21(A)N(F),-21.5N(F),-31N(F),-22N(F),-32AN(F),-23AN(F),-33AN(F),-43AN(F),-35N(F), 50AL21.5, 50AL22.2, 80AL21.5, 80AL22.2, 80AL23.7A, 100AL25.5A, 100AL27.5A, 100AL211 <b>BF:</b> BF-01UN(F),-05UN(F),-21UN(F),-21PN(F),-31UN(F),-22U(L)N(F),-32AUN(F),-32(A)PN(F),-33APN(F),-33AUN(F),-35PN(F),-35UN(F) <b>AF:</b> 50AFU20.4(L)(F), 50AFU20.8(L)(F), 50AFU40.8, 50AFU21.5(L), 80AFP21.5A, 80AFP41.5, 80AFU21.5(L), 80AFU41.5, 100AFE41.5, 80AFP22.2A, 80AFP42.2, 80AFU22.2(L), 80AFU42.2, 80AFP23.7A, 80AFU23.7(L)A, 80AFP43.7, 80AFU43.7, 80(100)AFP25.5, 80AFU25.5(L), 100AFE/U45.5N, 80(100)AFP27.5, 80AFU27.5(L), 100(150)AFE/U47.5N, 80(100)AFP211, 80AFU211(L), 150AFE411, 150AFE415, 150AFE422, 150AFE430, AF-610,-615,-815(A),-820(A),-1030,-1040,-1050,1430,-1440,-1650,-1660 <b>SS:</b> SS-05A(F),-21A(F) <b>SF:</b> SF-05AU(F),-21AU(F), 80SFP/U21.5, 80SFP/U22.2, 80SFP/U23.7, 80(100)SFP25.5, 80(100)SFP27.5, 80SFU25.5, 80SFU27.5 <b>AS:</b> 50ASH21.1, 50ASH21.5, 50ASH22.2, 80ASN21.5, 80ASN22.2, 80ASN23.7, 80ASH25.5, 100ASL23.7, 100ASN25.5, 100ASN27.5, 100ASN211, 150ASL25.5, 150ASL27.5, 150ASL215 <b>AG:</b> 80AGN22.2, 80AGN23.7, 80AGH25.5, 100AGN27.5 <b>IC:</b> 50ICA21.1, 80ICB21.5, 80ICB22.2, 100ICB23.7 <b>GD, GDR:</b> GD-400(F)(FV), GD-750(F)(FV), GDR-400 <b>GF:</b> 32GF21.0(F), 32GF21.2(F), 32(40)GF21.5, 32(40)GF22.2, 50GF22.2, 50GF23.7 <b>L:</b> L-41(A),-62,-63,-200A,-250A,-300A
Manufacturer:	HCP PUMP MANUFACTURER Co.Ltd., No.7, Kung Yeh 4th Rd. Ping Tung 900, Taiwan
Description and functions:	Pumps <b>AL, BF</b> series are intended for pumping of chemically neutral waste water polluted with mechanical admixtures of non-abrasive nature. Pumps <b>AF</b> series are intended for pumping of chemically neutral waste water and sludge, polluted with mechanical admixtures of non-abrasive nature. Pumps <b>SS, SF</b> series are intended for pumping of aggressive as well as neutral (acid or alcalic) waste water polluted with mechanical admixtures of non-abrasive nature. Pumps <b>AS, AG</b> series are intended for pumping of chemically neutral water with mechanical admixtures of sand, mud, stone chips, clay and similar materials with abrasive nature. Pumps of the AG series stir around of pumping liquid and prevents from sedimentation admixtures of bottom. Pumps <b>IC</b> series are intended for pumping of chemically neutral waste water polluted with mechanical admixtures of non-abrasive nature. Pumps <b>GD, GDR</b> series are intended for pumping of chemically neutral water with mechanical admixtures of sand, mud, stone chips, clay and similar materials with abrasive nature. GDR pumps have a special suction pad allowing the drawdown water to the level of 2mm. Pumps <b>GF</b> series are intended for pumping of waste water polluted containing long-fibre substances and objects as e.g. incontinency and hygienic pads, tampons, plastic bags, textiles and disposable wipes. Pumps <b>L</b> series are intended for pumping of large flow rates of chemically neutral slightly polluted water with a small delivery head. All series of pumps above are not intended for pumping flammable liquids, oil products and for installation in potentially explosive conditions.

this Declaration relates to complies with and meets all the applicable provisions of the following **Government Regulations of the Czech Republic** and the Directives of the European Parliament and the Council, always as subsequently amended:

**Govt Regulation of the Czech Rep. No.176/2008 Coll.**, the Directive of the Europ.Parliament and the Council No.2006/42/EC;

**Govt Regulation of the Czech Rep. No.118/2016 Coll.**, the Directive of the Europ.Parliament and the Council No.2014/35/EU;

**Govt Regulation of the Czech Rep. No.117/2016 Coll.**, the Directive of the Europ.Parliament and the Council No.2014/30/EU

and especially the following harmonized standards:

ČSN EN ISO 12100 (EN ISO 12100), ČSN EN 809+A1:2010 (EN 809+A1), ČSN EN 60204-1ed.2 (EN 60204-1), ČSN EN ISO 14120, ČSN EN 1037+A1 (EN 1037+A1), ČSN EN 614-1+A1 (EN 614-1), ČSN EN ISO 4871 (EN ISO 4871), ČSN EN 61000-6-4 ed.2+A1 (EN 61000-6-4+A1).

Procedure for compliance assessment:

Pursuant to the Government Regulation of the Czech Republic No.176/2008 Coll., as subsequently amended, Section 5 (2) and Annex No. 8 (the Directive of the European Parliament and the Council No.2006/42/EC, Art.12 para. 2 and Annex VIII.)

The Certification Body TUV SUD Czech, s.r.o., Novodvorská 994, Prague 4, postcode 142 21, Company ID No 63987121, participated in the compliance assessment.

In Olomouc, on 18 April 2017

Place and date of issue

Information on identity of the person authorized to draw up the Declaration on behalf of the importer/representative in the EC and his/her signature:

**Ing. Karel Bačuvčík, CEO  
K+H čerpací technika s.r.o.**