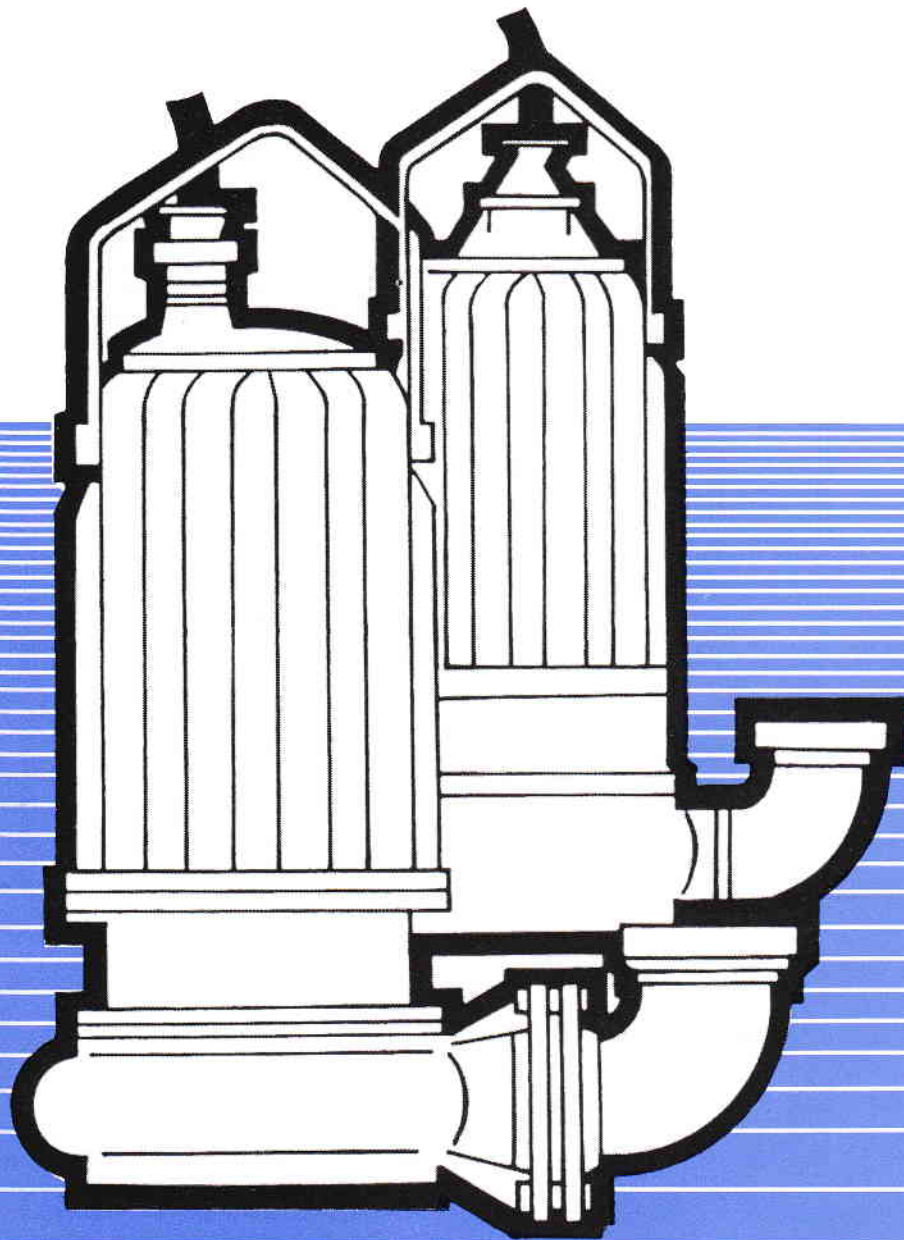




Submersible sewerage pumps

# GFHU

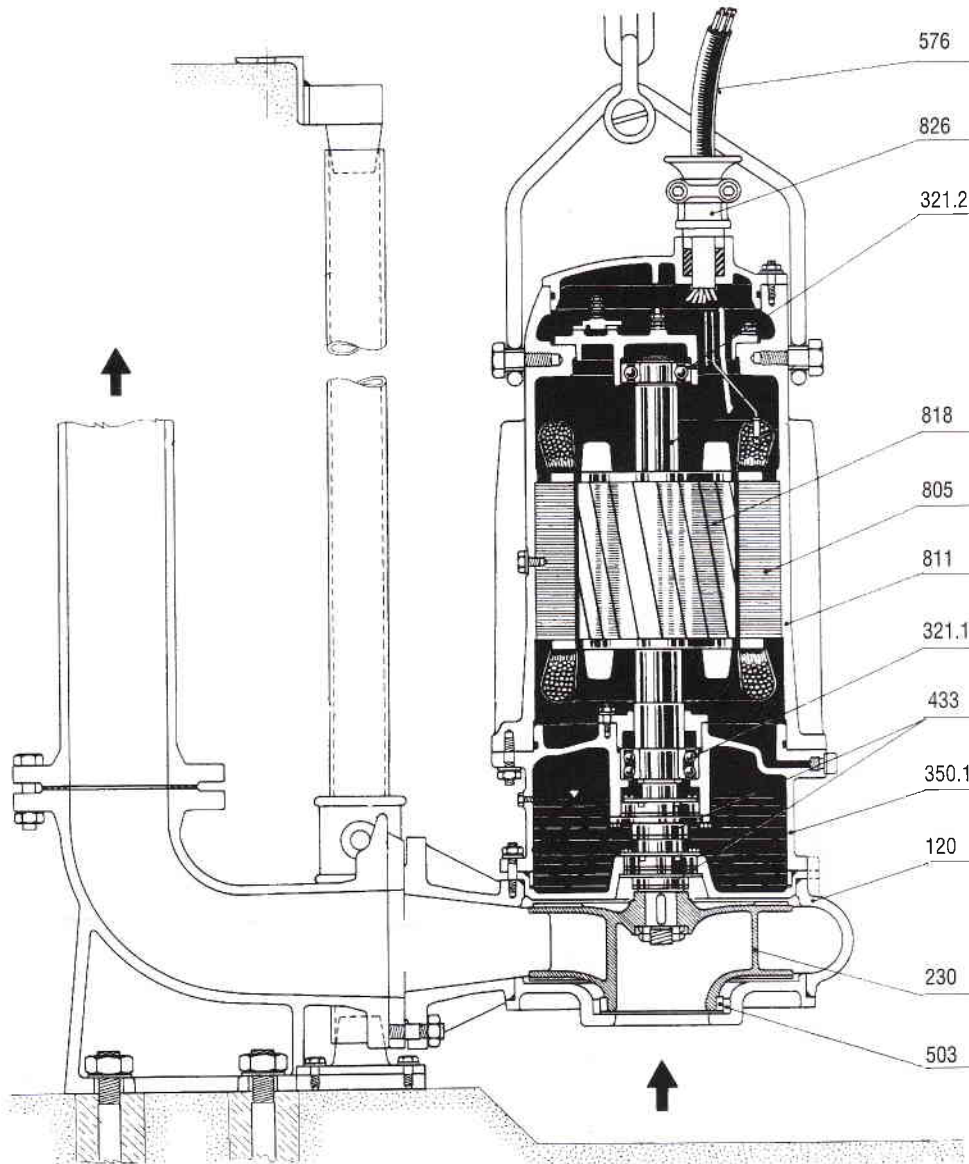


# Application

Submersible sludge & sewage pumps of the series GFHU are special pumps destined for pumping waste water, faeces and raw, non-treated sludge containing non-abrasive small fragmentary and fibrous stuffs as paper, tatters, bandages, leftovers and various street washoffs, or a lesser amount of sand, ash, gravel, pieces of wood and other stuffs coming into sewer systems. They are particularly useful and advantageous in many sewer systems, wastewater treatment plants, industrial installations, sewer networks, and/or various water intake structures.

Max. density of a pumped liquid ..... 1,100 kg.m<sup>-3</sup>  
 Max. temperature of a pumped liquid ..... 40°C  
 Max. temperature of working environment ..... 40°C  
 Permissible scope of pH of a pumped liquid ..... 6.5 – 7.5 pH  
 Max. submersion in a liquid with density of 1,000 kg.m<sup>-3</sup> ..... 10 m  
 Max. inflow on the suction side with the "SJ" version ..... 10 m  
 Supply electric cable cannot come in contact with water containing oils and hydrocarbons.

**These pumps are not destined for work in explosion hazard environments.**



- |       |                 |       |                          |     |                        |
|-------|-----------------|-------|--------------------------|-----|------------------------|
| 120   | - Volute casing | 350.1 | - Lower bearing housing  | 805 | - Motor stator         |
| 230   | - Impeller      | 433   | - Double mechanical seal | 811 | - Stator body          |
| 321.1 | - Lower bearing | 503   | - Wear rings             | 818 | - Electric motor rotor |
| 321.2 | - Upper bearing | 576   | - Supply electric cable  | 826 | - Cable outlet         |



## Design

Submersible sludge & sewage pumps of the GFHU series are of centrifugal, single-stage, volute casing type, with a shrouded single vane impeller of large clearness/throughput rate. Between the hydraulic part and the electric motor there is the oil pan that is sealed with a special double mechanical seal.

**Three-phase asynchronous AC electric motor** is watertight, so perfectly fitted for work under water. Water-tightness provides hermetic sealing of a supply cable in a special adapted outlet. In the motor winding there are thermal sensors that open the contactor control circuit and protect the motor from damage. The rotor is supported on grease-lubricated rolling-contact bearings.

**The pumps are not destined for operation in explosion hazard environments.**

**Stuffing box.** From water penetration from the pump set hydraulic part its electric motor is safely protected by the shaft sealing that is formed of a special mechanical seal with wear rings of hardmetal/cemented carbide. Mechanical seal is provided with a permanent flameproof enclosure and it is lubricated from an oil pan.

Material is chosen in consideration of properties of a pumped stuff, favourable weight and service life of this pump set. Body of the motor stator is of aluminium-silicon alloy. The shaft and important connection screws coming to contact with a pumped liquid are of stainless steel. The impeller is of rust- and abrasion-resistant steel. Pump volute and the base with a suction elbow ("SJ" version) are of grey cast iron.



## Starting-up

To ensure a trouble-free switching and protection of the pump electric motor it is necessary to provide it with suitable electrical switching and protection devices. From overcurrent the pump must be protected with a device of the release classes 10, 20. And further, it is necessary to ensure a short circuit protection and connect thermal bimetallic receptors to the control circuit.

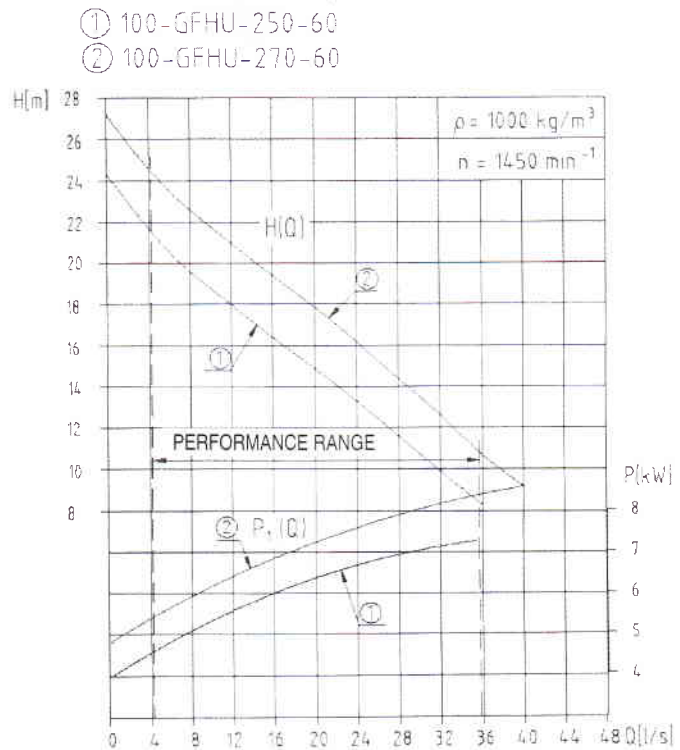
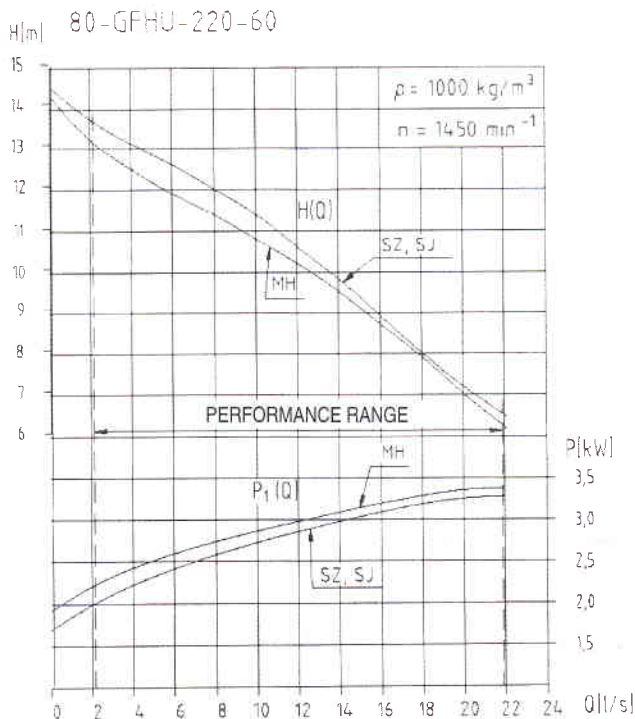
# Performance data

## 80 GFHU

Impeller .....	∅ 220 mm
Impeller clearness / throughput rate .....	60 x 50 mm
Suction branch .....	DN 100 mm
Discharge branch .....	DN 80 mm
Electric motor type .....	definite-purpose
Rated output .....	3 kW
Speed .....	1,455 min <sup>-1</sup>
Voltage - standard .....	400 V
- on a special request .....	500 V
Frequency .....	50 Hz
Rated current:	
at voltage 400 V .....	
"MT" version .....	7.0 A
"SZ", "SJ" versions .....	6.5 A
at voltage 500 V .....	5.0 A
Motor protection .....	IP 68 $\nabla$ 10 m
Supply electric cable .....	HO7RN-F6G1,5
Standard lengths of supply cables .....	15 m
(on a special request it is possible to deliver even another cable length)	
Pump set weight without a cable and delivery hose:	
"SZ" version .....	~ 95 kg
"MH" version .....	~ 91 kg
"SJ" version .....	~ 138 kg

## 100 GFHU

Impeller .....	Versions "SZ", "MH" ∅ 250 mm or ∅ 270 mm
"SJ" version .....	∅ 250 mm
Impeller clearness / throughput rate .....	60 x 70 mm
Suction branch .....	DN 100 mm
Discharge branch .....	DN 100 mm
Electric motor type .....	definite-purpose
Rated output .....	6.5 kW
Speed .....	1,450 min <sup>-1</sup>
Voltage - as standard .....	400 V
- on a special request .....	500 V
Frequency .....	50 Hz
Rated current	
at voltage 400 V with ∅ 250 mm .....	14 A
at voltage 400 V with ∅ 270 mm .....	16 A
at voltage 500 V with ∅ 250 mm .....	10.6 A
at voltage 500 V with ∅ 270 mm .....	12.8 A
Motor protection .....	IP 68 $\nabla$ 10 m
Supply electric cable .....	HO7RN-F6G1,5
Standard lengths of supply cables .....	15 m
(on a special request it is possible to deliver even another cable length)	
Pump set weight without a cable and delivery hose:	
"SZ" version .....	~ 146 kg
"MH" version .....	~ 152 kg
"SJ" version .....	~ 193 kg



As the smallest model it is destined for small pumping stations in industrial installations, in small waste water pumping plants, and so on. This pump set is used to advantage, namely in their portable version "MT", as a mobile pump set for cleaning secondary settlement tanks and sedimentation tanks, rain water delay units and flood-water wells, further with re-pumping leakage water out of valve chambers and shafts, as well as in building industries for pumping thick sludge out of excavation pits.

As for "SZ" and "MH" versions, this pump model can be delivered with impellers of  $\varnothing 270$  or  $\varnothing 250$  for various delivery heads  $H$  without any changes of the pump and other parts of its motor. So, there is a great possibility of this pump adaptation to given conditions whether in term of technology, or economy of operation. Even later replacement is simply and practicable, without any further changes. The "SJ" model can be operated solely with the impeller of  $\varnothing 250$  mm. The pump is commonly used in middle-sized wastewater pumping stations, whose design concepts can be simplified thanks to it.

## Workmanship Version "SZ"

Destined for wet installation into sumps, being provided with a lowering gear, and with the parts being delivered as given thereafter:

- 1 – Pump itself with a supply electric cable
- 2 – Flange of a lowering gear with a guide sleeve on the pump
- 3 – Discharge elbow, including holding-down anchor bolts
- 4 – Clamp of guide pipes, without fixing bolts.

(As for the pump piping, galvanized pipes DN 2" according to the CSN 45 710 and in length depending on the sump depth are convenient (Position 5), however they are not an integral part of the Pump Producer's delivery).

Submersible stationary version is very advantageous, because the pump in its "SZ" version is lowered straight down into the wet sump along the pipe-line until it sits down with its flange on the counter-flange of the duck-foot elbow being attached to the sump bottom. Specially modified flanged joint is tightened with the pump own dead weight without need of any mounting. And in a similar way it is possible to lift the pump out of sump by a chain and/or by a rope for a revision, cleaning, and/or replacement without need of any disassembly interventions.

## Workmanship Version "MH"

Portable, destined for wet installation into sumps, with the following parts being delivered, as a standard:

- 1 – Pump itself with a supply electric cable
- 2 – Discharge elbow with connection thread Rd 130 (with the model 100-GFHU)
- 3 – Complete suction hose screw joint 110, according to the CSN 389 409 (with the model 100-GFHU)
- 4 – Discharge hose DN 110 of polyamide fibre, and inner rubber liner in the standard length of 10 m (with the model 100-GFHU). Discharge hose ending with a suction hose socket with the thread Rd 130 allows possible further additional extension of the 100-GFHU pump discharge.

At the smallest type 80-GFHU being specially modified for narrow spaces the scope and structure of accessories for its discharge side (positions 2, 3, 4) are given separately – see the special modification of the 80-GFHU model.

Submersible portable version is destined namely as a mobile pump set for occasional and / or temporary pumping out of sumps, with auxiliary and emergency interventions, as well as for using in numerous working places. Within the operation the pump is suspended on a rope and/or a chain.

## Workmanship Version "SJ"

Destined for dry installation into sumps, with the following parts being delivered, as a standard:

- 1 – Pump itself with a supply electric cable
- 2 – Base destined for rigid fixing of the pump set on the foundation, attached to the pump, including holding-down anchor bolts
- 3 – Suction flanged elbow being attached to the pump.

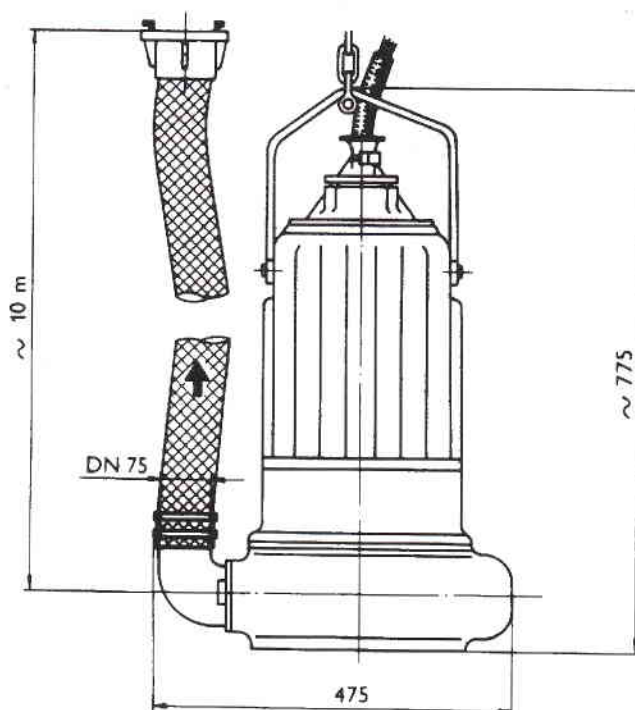
Stationary version for dry installation into sumps usually comes into question everywhere any existing dry sumps are to be fitted. Besides basic positions of the suction branch (I) further possible positions of the suction branch (II, III) against the discharge branch attainable by turning the suction elbow through the angle of 90° are indicated with dashed lines in the dimensional drawing.

## Special Adaptation 80-GFHU

The smallest type of the submersible pump 80-GFHU in its portable version "MH" is modified in a special way (see the illustration below), considering the smallest dimensions so that it would be possible to use it in small and namely very narrow spaces. This special modification may be also considered to be the standard version of this pump model destined for general purposes.

This mobile pump set using is advantageous and practical namely for cleaning various types of sumps and wells in sewerage systems with minimum dimensions of inlet ports, that is, from the diameter of 500 mm.

Putting into operation, manipulation and transport of this model is easy and quick thanks to a very light delivery hose of polyamide fibre with inner rubber liner that is delivered together with this pump in its standard length of 10 m. The delivery hose is ended with a half of a fire quick-acting coupling of the size DN 75 /CSN 38 9454), so it is possible to offer additional elongation of delivery pipe line.



## Cascade Connexion

Utilization of the "GFHU" pumps may be extended thanks to a possibility of series connexion of two pumps for so called "cascade pumping", that is in combination of versions SJ + SJ or SZ + SJ. These are situations if one pump is not sufficient for overcoming a higher delivery head. So, under certain circumstances it is desirable to connect two pumps of the same type, whereby it is possible to gain considerable higher delivery head values – nearly double at given capacity (rate of flow).

Model	80 - GFHU			100- GFHU		
Version	SZ	MH	SJ	SZ	MH	SJ
a	775	See the dimensional drawing	1 125	870	870	1.221
b	793		-	858	683	-
b <sub>1</sub>	-		183	-	-	203
c	150		150	150	-	155
∅ d	2"		-	2"	-	-
e	160		280	160	10.200	286
f	min.120		-	min. 120	min. 120	-
g	511		-	546	-	-
h	min. 56		-	min. 56	-	-
i	11		-	11	-	-
j	45		-	45	-	-
~k	241		-	241	-	-
l	362		-	362	-	-
m	-		200	-	-	200
n	-		225	-	-	260
∅ o	-		4x ∅ 14	-	-	4x∅14
∅ p	-		455	-	-	455
r	-		20	-	-	20
s	3x ∅ 18		-	3x ∅ 18	-	-
t	94		-	94	-	-
u	406	-	406	-	-	
v	410	-	410	-	-	
z	200	-	200	-	-	
Ds	-	DN 100	-	-	DN 100	
Dv	DN 80	DN 80	DN 100	DN 100	DN 100	
A	140	-	140	-	-	
B	155	-	155	-	-	
E	60/60	-	60/60	-	-	
F	180	200	180	-	200	
G	180	-	180	-	-	
∅ H	-	370	-	-	370	
∅ L	-	4x ∅ 40	-	-	4x∅40	
R	min.600	-	min 650	-	-	
S	min.620	-	min 700	-	-	

Dimensions are given in mm.

With the "SJ" version this pump suction branch is provided with a flange for PN 6 and with a raised face, according to the CSN 13 1201.

With the "SZ" version this pump discharge branch is provided with a flange for PN 16 and with a raised face, according to the CSN 13 1201. With the "SJ" version it is provided with a flange for PN 10 and with a raised face, according to the CSN 13 1202 (with exception of the 80-GFHU model that is provided with a flange for PN 16, according to the CSN 13 1203).

Dimension "d" – pipe 2", galvanized - according to the CSN 425 710.

Dimensions "v" and "z" refer to the base of the foot-type discharge elbow; the base ground-plan is indicated with dashed lines.



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