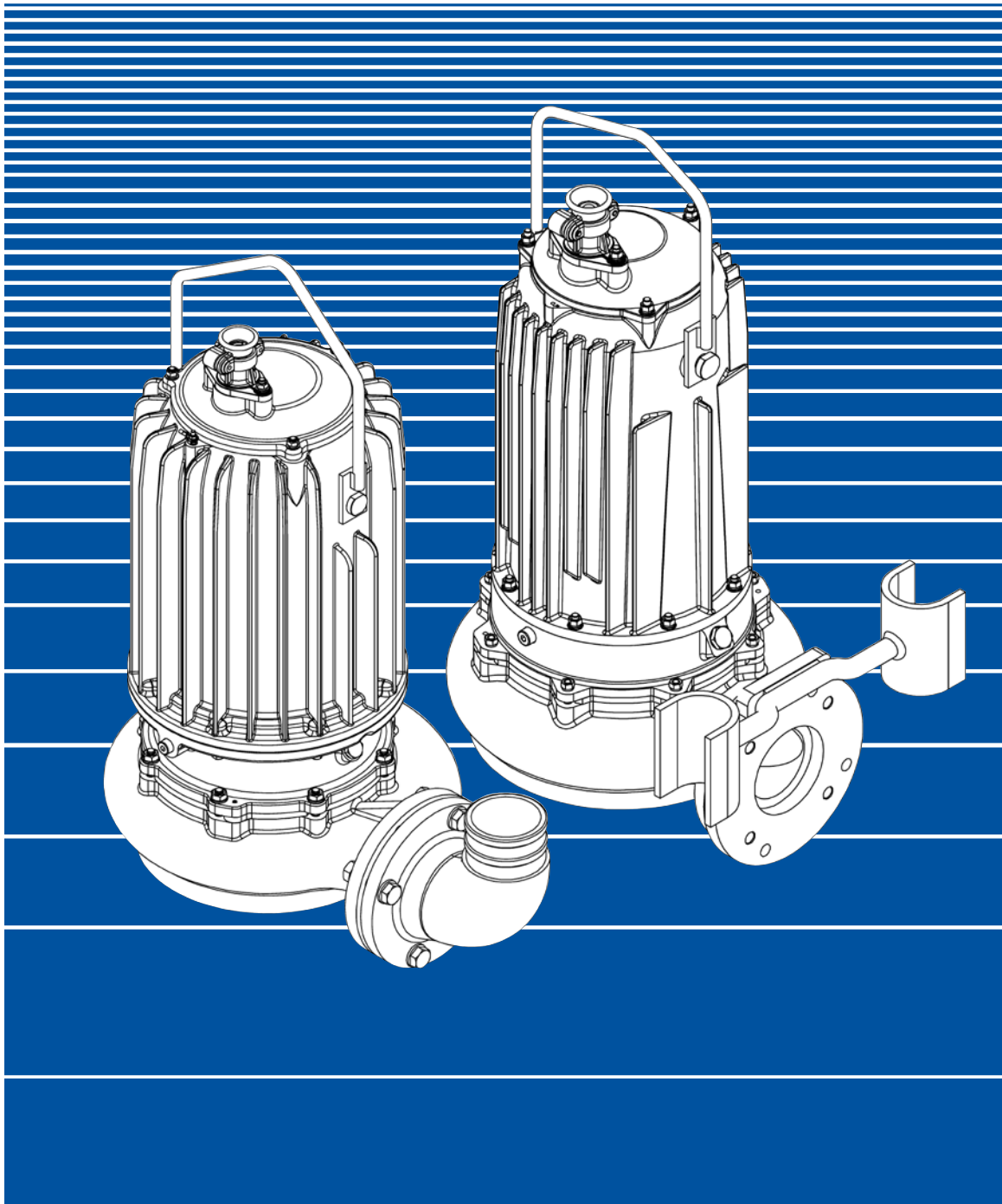




Sewer Sludge Submersible
Pumps

GFHU



Application

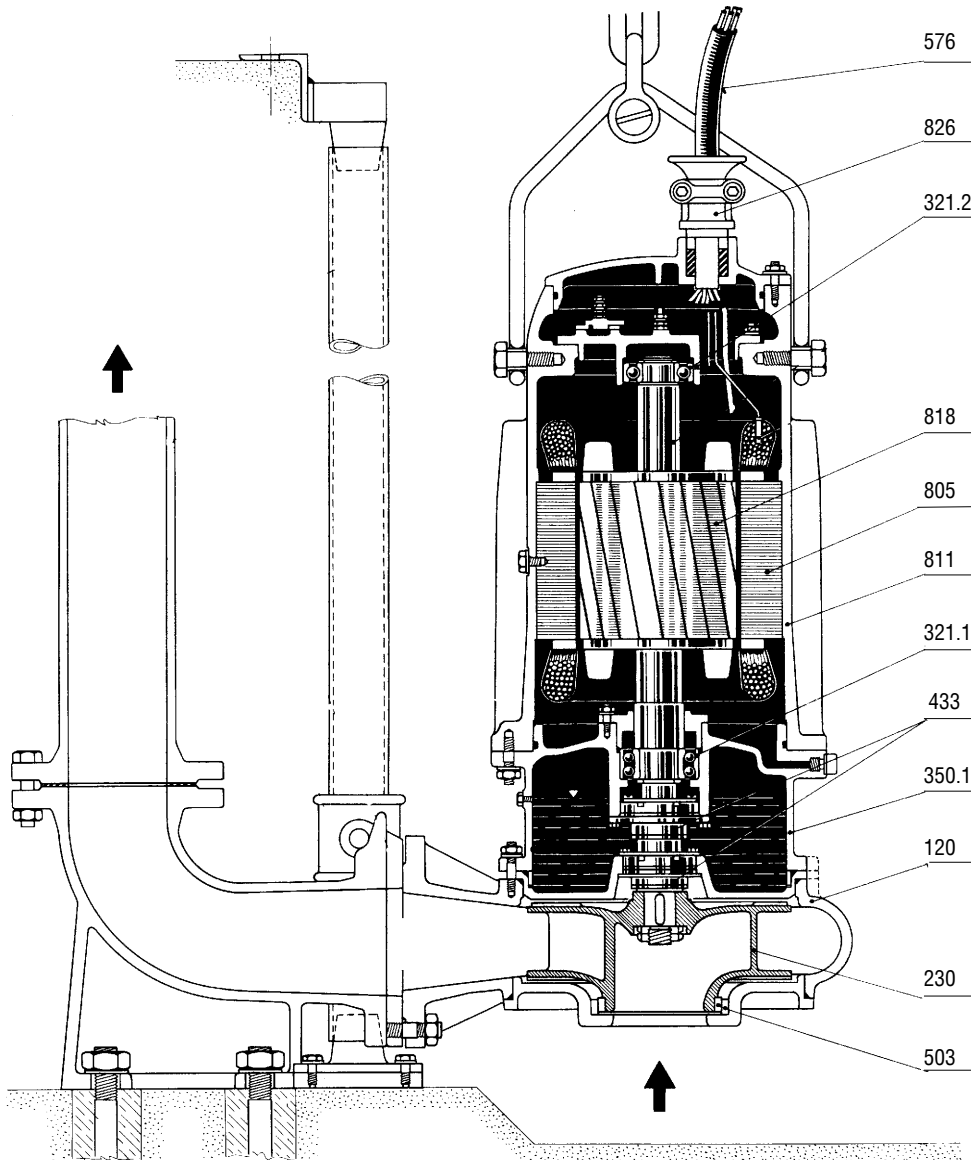
Sewer sludge submersible pumps of the series GFHU are special pumps destined for pumping waste water, faeces and raw, non-treated sludge containing non-abrasive solid small fragmentary and fibrous stuffs as paper, tatters, bandages, leftovers and various street runoffs, or lesser amounts of sand, ash, 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 systems, and/or various water intake structures.

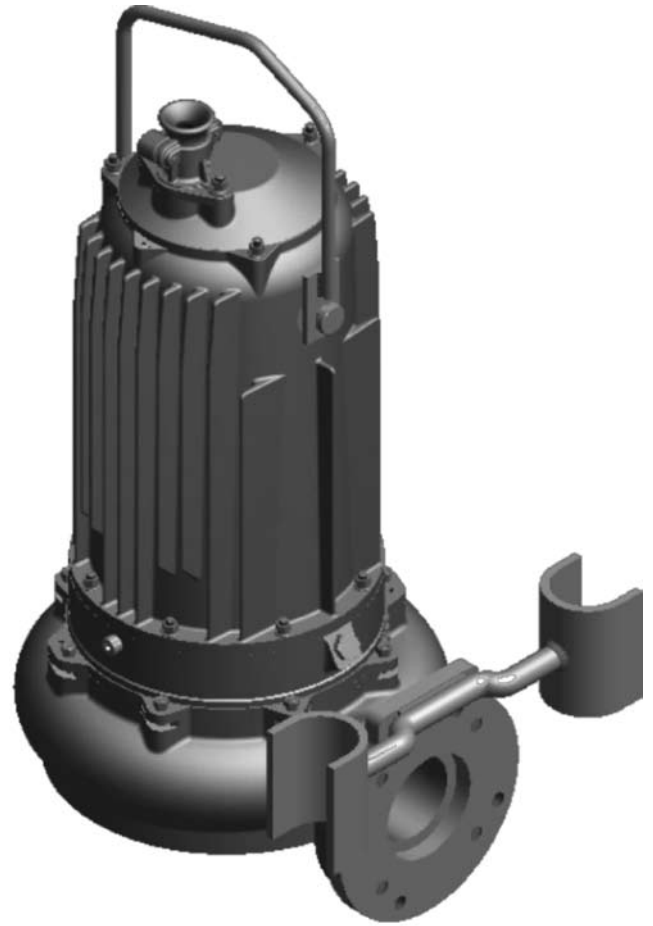
- Max. density of a pumped liquid..... 1,100 kg.m⁻³
- Max. temperature of a pumped liquid 40°C
- Max. temperature of working environment 40°C
- Permissible scope of pH of a pumped liquid 6.5 – 7.5 pH
- Max. submersion in a liquid with density of 1,000 kg.m⁻³ .. 10 m
- Max. inflow on the suction side with the “SJ” version ... 10 m

Lead-in 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 | - Lead-in electric cable | 826 | - Cable entry |



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 throughput rate. Between the hydraulic part and the electric motor there is the oil cup with oil filling 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 is secured by hermetic sealing of a lead-in cable with a special adapted cable entry. 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. Against water penetration from the pump set hydraulic part its electric motor is safely protected by the shaft sealing that consists of a special mechanical seal with wear rings of hardmetal. Mechanical seal is provided with a permanent flameproof enclosure and it is lubricated from an oil cup.

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 (in the "SJ" version) are of grey cast iron.

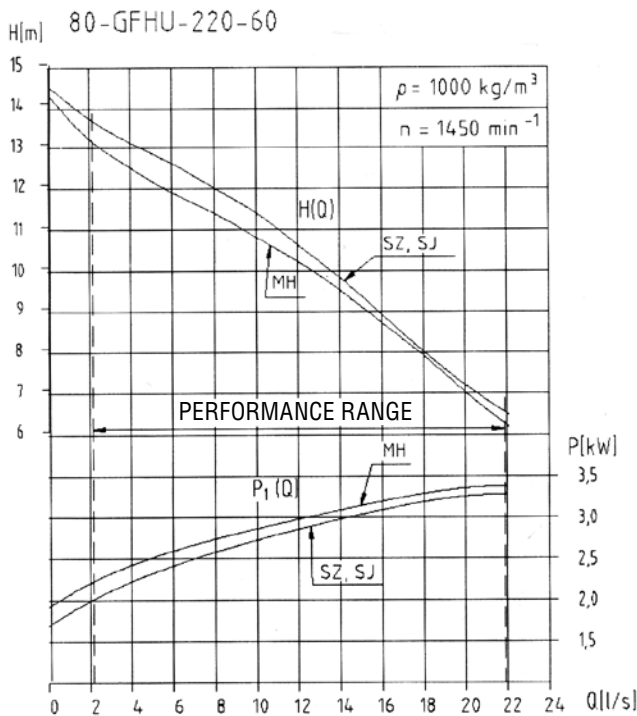
Starting-up

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 with time-current characteristics T1 and T2. And further, it is inevitable to ensure a short circuit protection and connection of thermal bimetallic receptors to the control circuit.

Performance data

80 GFHU

Impeller.....	Ø 220 mm
Impeller throughput rate.....	60x50 mm
Suction branch.....	DN 100 mm
Discharge branch.....	DN 80 mm
Electric motor type.....	definite-purpose
Rated output.....	3 kW
Speed.....	1,450 min ⁻¹
Voltage – as standard.....	400 V
on a special request.....	500 V
Frequency.....	50 Hz
Rated current:	
at voltage 400 V	
“MH” version.....	7.0 A
“SZ”, “SJ” versions.....	6.5 A
at voltage 500 V.....	5.0 A
Motor protection.....	IP 68 ∇ 10 m
Lead-in electric cable.....	H07RN-F6G1.5
Standard lengths of lead-in 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

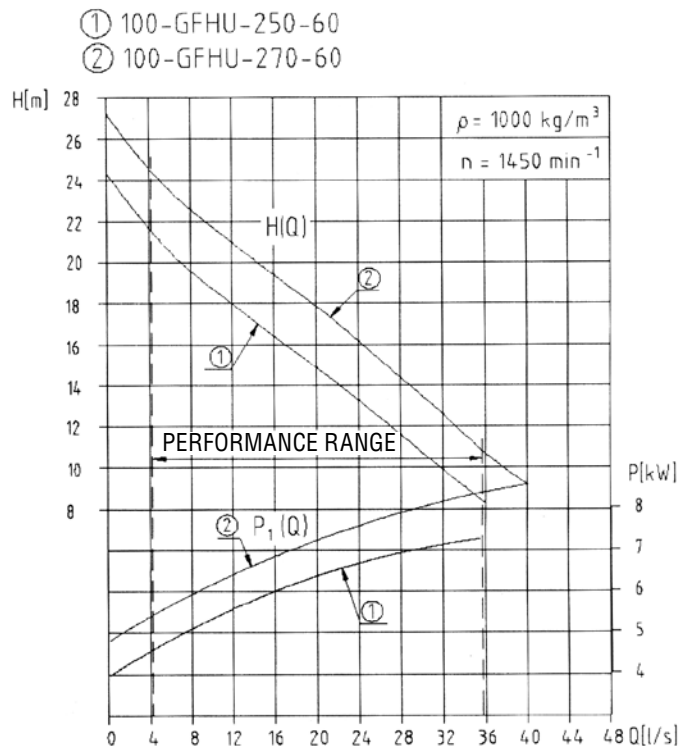


As the smallest model it is destined for small pumping stations in industrial installations, in small waste water treatment plants, and so on.

This pump set is used to advantage, namely in their portable version “MH”, 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 armature shafts, as well as in civil engineering for pumping thick sludge out of excavation pits.

100 GFHU

Impeller.....	Versions “SZ”, “MH” Ø 250 mm or Ø 270 mm
“SJ” version.....	Ø 250 mm
Impeller throughput rate.....	60x70 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 ⁻¹
Voltage – as standard.....	400 V
on a special request.....	500 V
Frequency.....	50 Hz
Rated current:	
at voltage 400 V with Ø 250 mm.....	14 A
at voltage 400 V with Ø 270 mm.....	16 A
at voltage 500 V with Ø 250 mm.....	10.6 A
at voltage 500 V with Ø 270 mm.....	12.8 A
Motor protection.....	IP 68 ∇ 10 m
Lead-in electric cable.....	H07RN-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 for “SZ” and “MH” versions, this pump model can be delivered with impellers of Ø 270 or Ø 250 for various delivery heads H without any changes of other parts of the pump and the motor. So, there is a great possibility of this pump adaptation to given conditions in term of technology or economy of operation. Also a later replacement of the impeller is uncomplicated, easy and practicable, without need of any further changes.

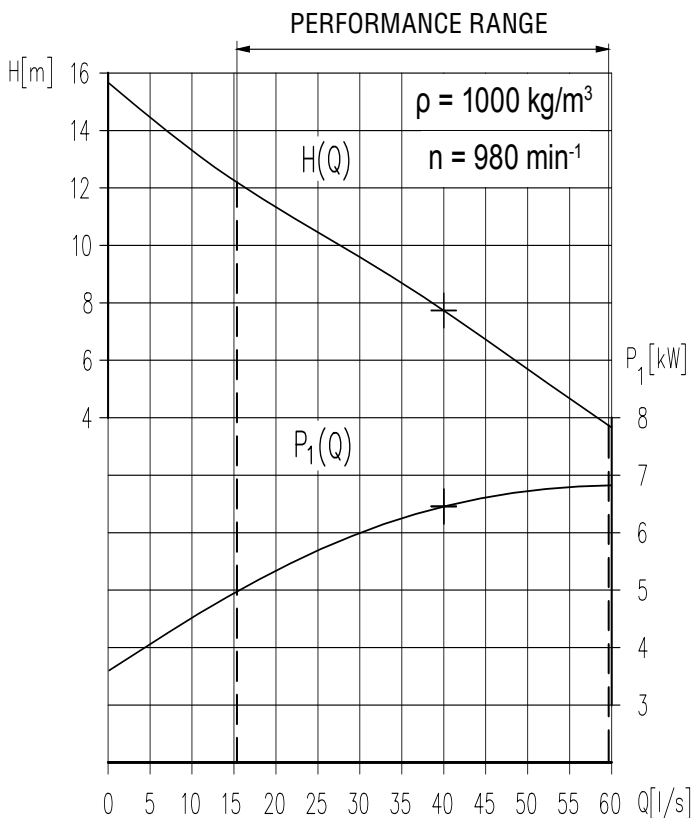
The “SJ” model version can be operated solely with the impeller of Ø 250 mm. The pump is commonly used in middle-sized wastewater treatment stations, whose design concepts can be simplified significantly by using these pumps.

150 GFHU -320

Impeller.....	Ø 320 mm
Impeller throughput rate.....	90x80 mm
Suction branch.....	DN 150 mm
Discharge branch.....	DN 150 mm
Electric motor type.....	definite-purpose
Rated output.....	6.5 kW
Speed.....	980 min ⁻¹
Voltage – as standard.....	400 V
on a special request.....	500 V
Frequency.....	50 Hz
Rated current: at voltage 400 V.....	13.3 A
at voltage 500 V.....	10.0 A
Motor protection.....	IP 68 ∇ 10 m
Lead-in electric cable.....	HO7RN-F6G1.5
Standard lengths of lead-in cables.....	15 m

Pump set weight without a cable and delivery hose:

“SZ” Version.....	~ 248 kg
“SJ” Version.....	~ 296 kg



Thanks to its reduced speed and relative low delivery head H this pump has been predetermined for both long-term and hydro-storage operations. It has proved successful particularly in waste water treatment plants for sludge recirculation in sewage sludge digestion chambers, for pumping-out sludge-collecting tanks in industrial and agricultural plants, for increasing level in lower-located sewerage drain pits up to the level of natural drainage networks in cascade-type systems, and so on.

“SZ” Version

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 lead-in 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 ČSN 45 710 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 pipeline 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 a sump by a chain and/or by a rope for a revision, cleaning, and/or replacement without need of any disassembly interventions.

“MH” Version

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 ČSN 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 that has been 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 namely used 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.

The “MH” version has not been employed with the pump biggest model – 150-GFHU.

“SJ” Version

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

- 1 – Pump itself with a lead-in 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.

Model	80-GFHU			100-GFHU			150-GFHU	
Version	SZ	MH	SJ	SZ	MH	SJ	SZ	SJ
a	775	See the separate dimensional drawing	1125	870	870	1221	980	1340
b	793		-	858	683	-	1105	-
b ₁	-		183	-	-	203	-	270
c	150		150	150	-	155	185	175
Ø d	2"		-	2"	-	-	2"	-
e	160		280	160	10 200	286	255	290
f	min. 120		-	min. 120	min. 120	-	min. 120	-
g	511		-	546	-	-	695	-
h	min. 56		-	min. 56	-	-	min. 56	-
i	11		-	11	-	-	65	-
j	45		-	45	-	-	50	-
~ k	241		-	241	-	-	294	-
l	362		-	362	-	-	480	-
m	-		200	-	-	200	-	265
n	-		225	-	-	260	-	350
Ø o	-		4xØ14	-	-	4xØ14	-	4xØ14
Ø p	-		455	-	-	455	-	455
r	-		20	-	-	20	-	20
Ø s	3xØ18		-	3xØ18	-	-	3xØ18	-
t	92	-	92	-	-	92	-	
u	406	-	406	-	-	463	-	
v	410	-	410	-	-	450	-	
z	200	-	200	-	-	250	-	
D _s	-	DN 100	-	-	DN 100	-	DN 150	
D _v	DN 80	DN 80	DN 100	DN 100	DN 100	DN 150	DN 150	
A	140	-	140	-	-	190	-	
B	155	-	155	-	-	250	-	
E	60/60	-	60/60	-	-	70/70	-	
F	180	200	180	-	200	250	200	
G	180	-	180	-	-	210	-	
Ø H	-	370	-	-	370	-	370	
Ø L	-	4xØ40	-	-	4xØ40	-	4xØ40	
R	min. 600	-	min. 650	-	-	min. 750	-	
S	min. 620	-	min. 700	-	-	min. 900	-	

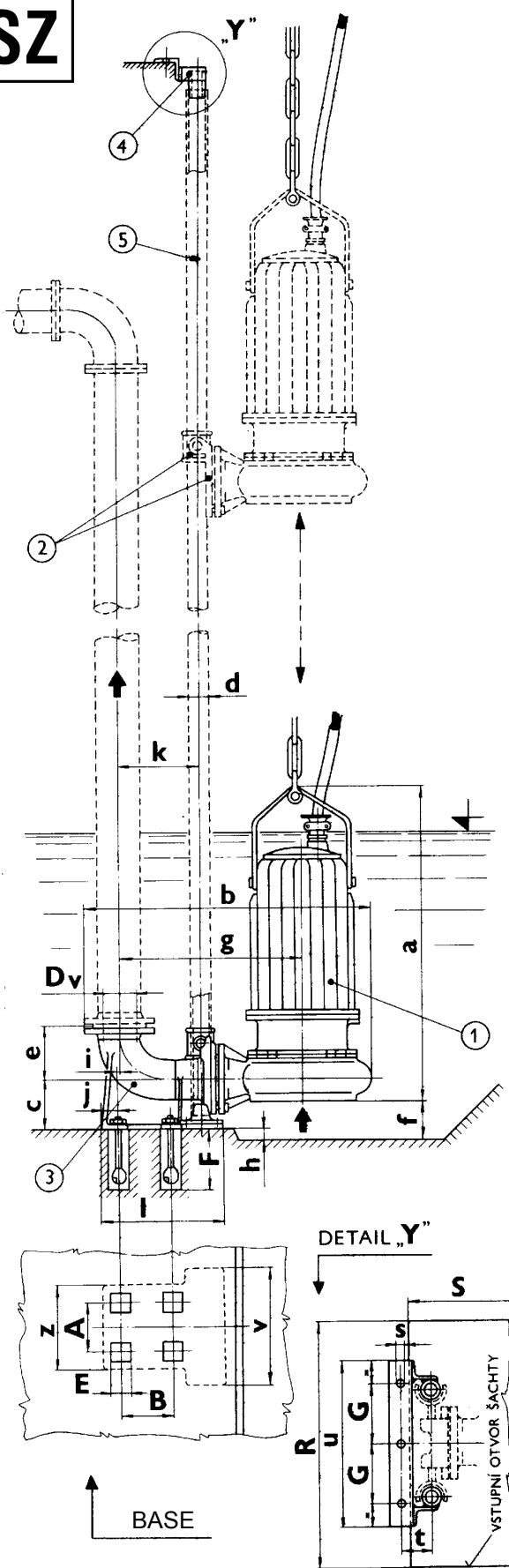
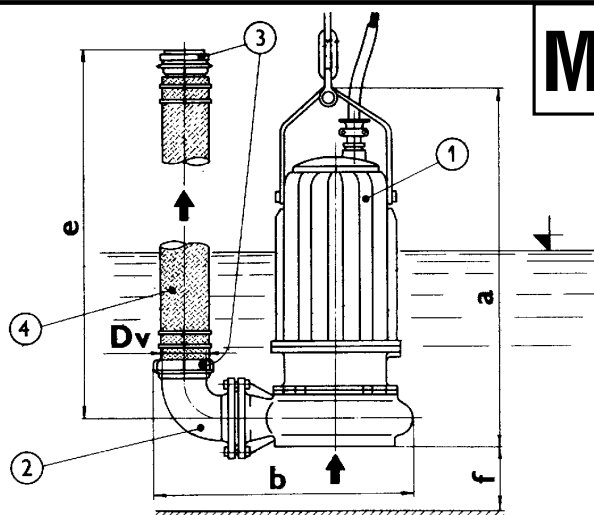
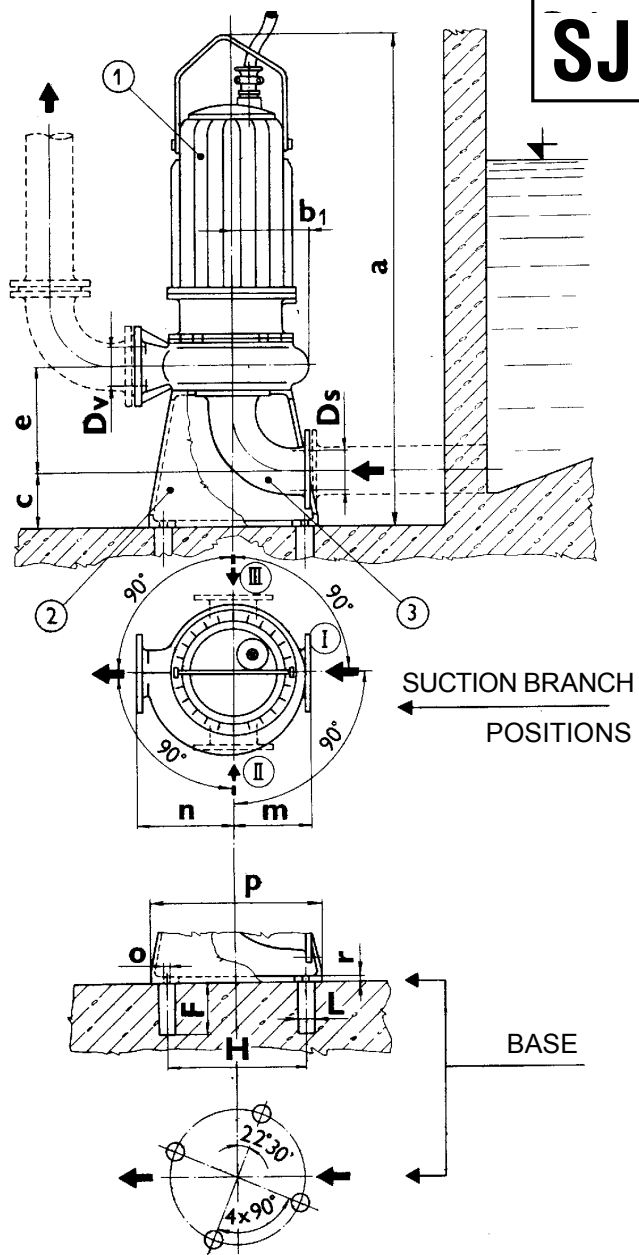
Dimensions are given in mm.

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.

SZ**MH****SJ**

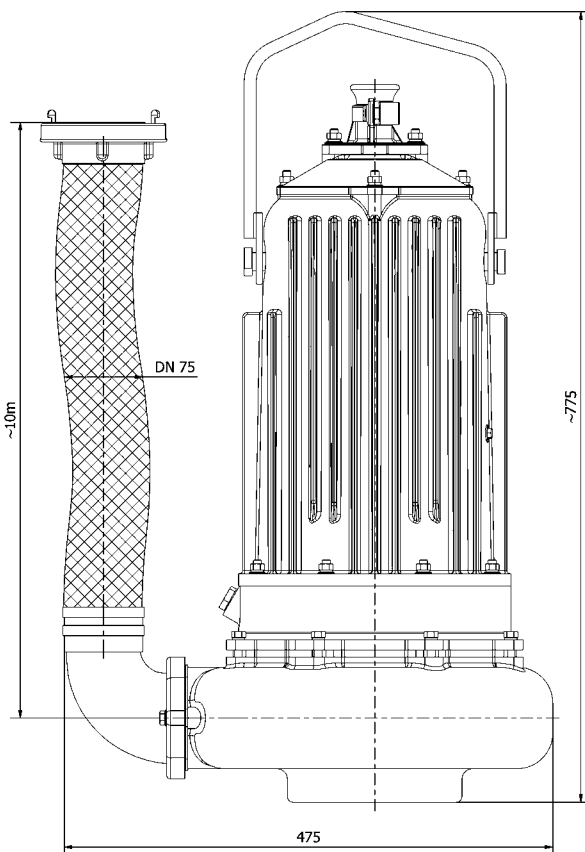
Special Adaptation

80-GFHU

The smallest type of the sewer sludge submersible pump 80-GFHU in its **portable version “MH”** is modified in a special way (see the MH version illustrated 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 port, 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 fire 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 pipeline.



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).