INTERNATIONAL COUNCIL FOR THE
EXPLORATION OF THE SEA

C.M. 1974/B : 5
Gear and Behaviour Committee

NOTES ON THE FURTHER DEVELOPMENT OF AN ELECTRIFIED SHRIMP TRAWL IN THE NETHERLANDS

by

G.P. Boonstra and S.J. de Groot
(Netherlands Institute for Fishery
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After the promising results in comparative electrical shrimp fishing on inshore research vessels equipped for double rigged beam trawling (3 m. beam) the need was felt to try the system on full scale. For earlier reports see Boonstra and De Groot, 1970, 1974 and De Groot and Boonstra, 1974.
The experiments are now carried out with a commercial shrimp trawler TH 6 based in Colijnsplaat (Scheldt-estuary).
The ship has a length over all of 22.40 m, propulsive power of 248 h.p., equipped with two 8 m beam trawls and a crew of four. The area of investigation is the Scheldt-estuary and the adjacent coastal waters. The depth ranges between 4 - 20 fath. The results reported here cover the period of the 20th of May till the 25th of June 1974. The experiments will be continued till the beginning of October.

In fact the present experiments are closely linked with previous experiments, of which the results were not published. These experiments were carried out with the same vessel and pulse generator in September and October 1973 in the same area.

The pulse generator used, the PG 7317, will be described extensively in a future publication, however, the following characteristics are given. Pulse generator, in watertight container, mounted on the beam, power supply (A.C.) cable linked to the vessel. Pulse form capacitor discharge. Peak voltage maximum 60 V and frequency variable between 1-50 Hz.

Figure I shows the set-up of the experiment. In the experiments described here, the power supply cable is led via a self-tensioning whinch, this whinch is not shown in the figure. The cable used is a four core 4 mm Ø niplas-cable with a breaking strength of 380 KGf. In future a special cable with a greater breaking strength will be used.
Figure II shows the electrode array which was used in the 1973 experiments with the TH 6. The present rigging is slightly different (see also table I). Figure III gives the set-up of the system without the electrode rigging.
The only component giving trouble so far is the power supply connector.

The preliminary results of the experiments are shown in Table I. We consider Experiment E as to be the most representative one. The catch data collected with the electrified gear were compared with the normal gear. On average 33 % more commercial sized shrimp were caught with the electrified beam trawl ($P < 0.001$, Wilcoxon signed rank test). It is difficult to estimate the transparancy of the water. We were unable to prove with the skipper's recordings of the turbidity observed, whether there was a difference in catch in relation to the transparancy. We have to keep in mind that the recordings made by the skipper were based upon what he could see from the deck. The turbidity of the bottom layers in this area is very complex and is dependent of many factors as tides, salinity, sediment type. We are convinced that the great variation in catch performance of the gear, ranging from 5 - 100 % and upwards, originates from the change in behaviour of the shrimp to the fluctuations of the turbidity near the bottom, which can not be observed from the surface.
The main by-catch was plaice, other important species were also caught like sole and eel. However, sole and eel were caught in too small numbers to draw any conclusions from.

Literature

Boonstra, G.P. and Groot, S.J. de, 1970 - Report on the development of an electrified shrimp trawl in the Netherlands. ICES C.M. 1970/B : 5 Gear and Behaviour Committee, 6 pp (mimeo).

Boonstra, G.P. and Groot, S.J. de, 1974 - The development of an electrified shrimp trawl in the Netherlands. J. Cons. Int. Explor. Mer, 35 (2) : 165 - 170.

Groot, S.J. de and Boonstra, G.P., 1974 - Kunnen we elektrisch garnaal en tong vangen? Visserij, 27 (3) : 159 - 173.

/MV

TABLE I - Preliminary data of the electrical fishing experiments with the shrimptrawler TH 6 in the period 20/5 - 25/6 1974.
T = total catch; A = average catch/haul.
Shrimp in litres; plaice in numbers.

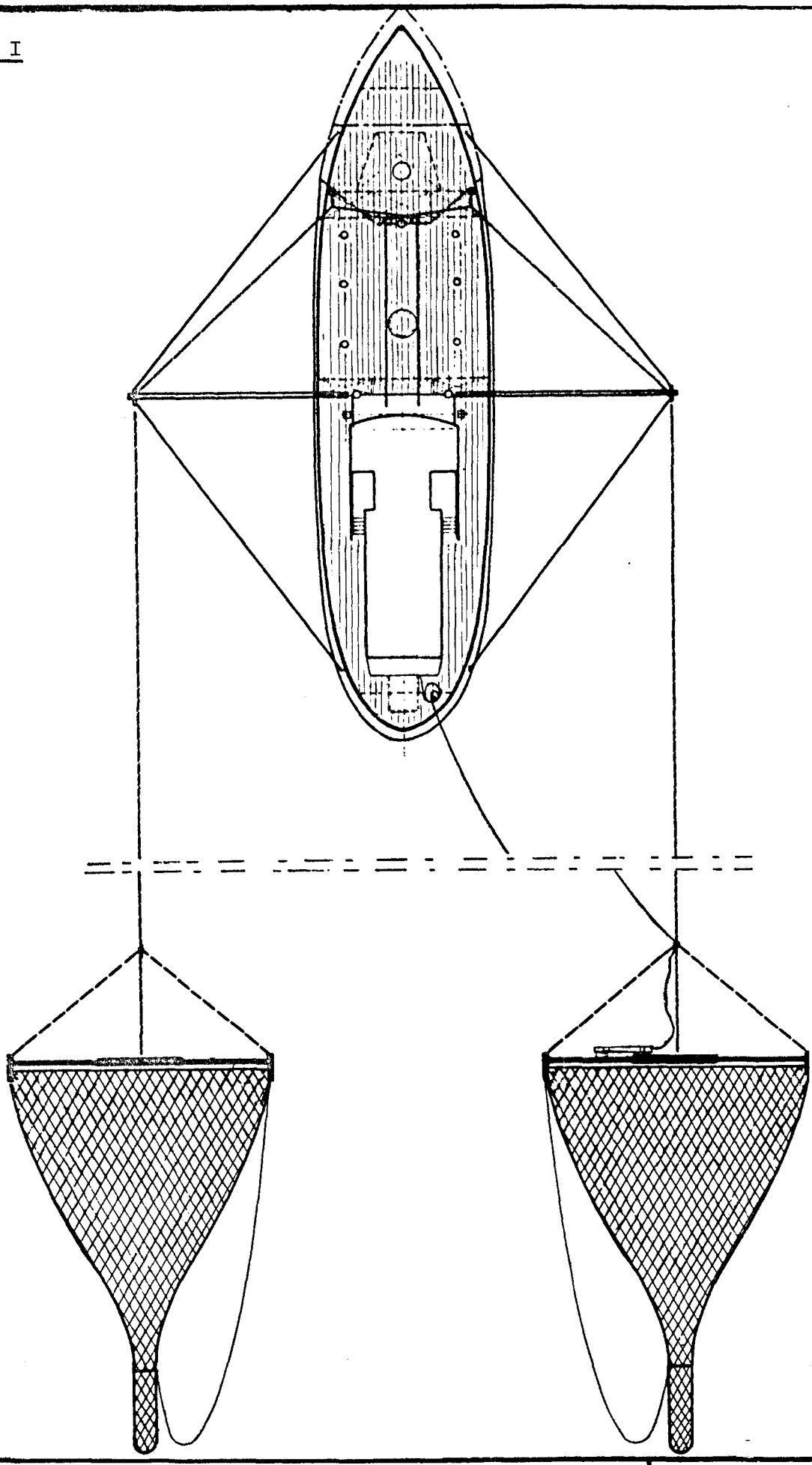
Experiment	Number of hauls	T/A	Electrified beam trawl			Normal beam trawl		
			shrimp undersized(L)	shrimp commercial(L)	plaice >27 cm	shrimp undersized(L)	shrimp commercial(L)	plaice >27 cm
A	51	T	1193	1855	2565	879	1329	1965
		A	23.4	36.4	50.3	17.2	26.1	38.5
B	32	T	463	676	448	437	569	595
		A	14.5	21.1	14.4	13.7	17.8	19.2
C	37	T	694	1115	501	622	970	449
		A	18.8	30.1	17.3	17.9	26.2	15.5
D *	10		-	-	-	-	-	-
			-	-	-	-	-	-
E	68	T	1316	2761	1043	1108	1753	887
		A	19.3	40.6	15.3	16.3	25.8	13.0

Electrical characteristics.

A	Electrodes (7) in towing direction. R = 100 mOhm; f = 30 Hz; Disch.Cap. = 2020 uF. Field Strength = 30 V/m
B	Identical, only change in weight of electrodes.
C	Change in electrode rigging, 2 electrodes parallel to groundrope
D*	----------
E	Electrodes (7) in towing direction. R = 100 m.Ohm; f = 5 Hz; Disch.Cap. = 3500 uF. Field strength = 35 V/m.

* Net was heavily fouled.

FIGURE I

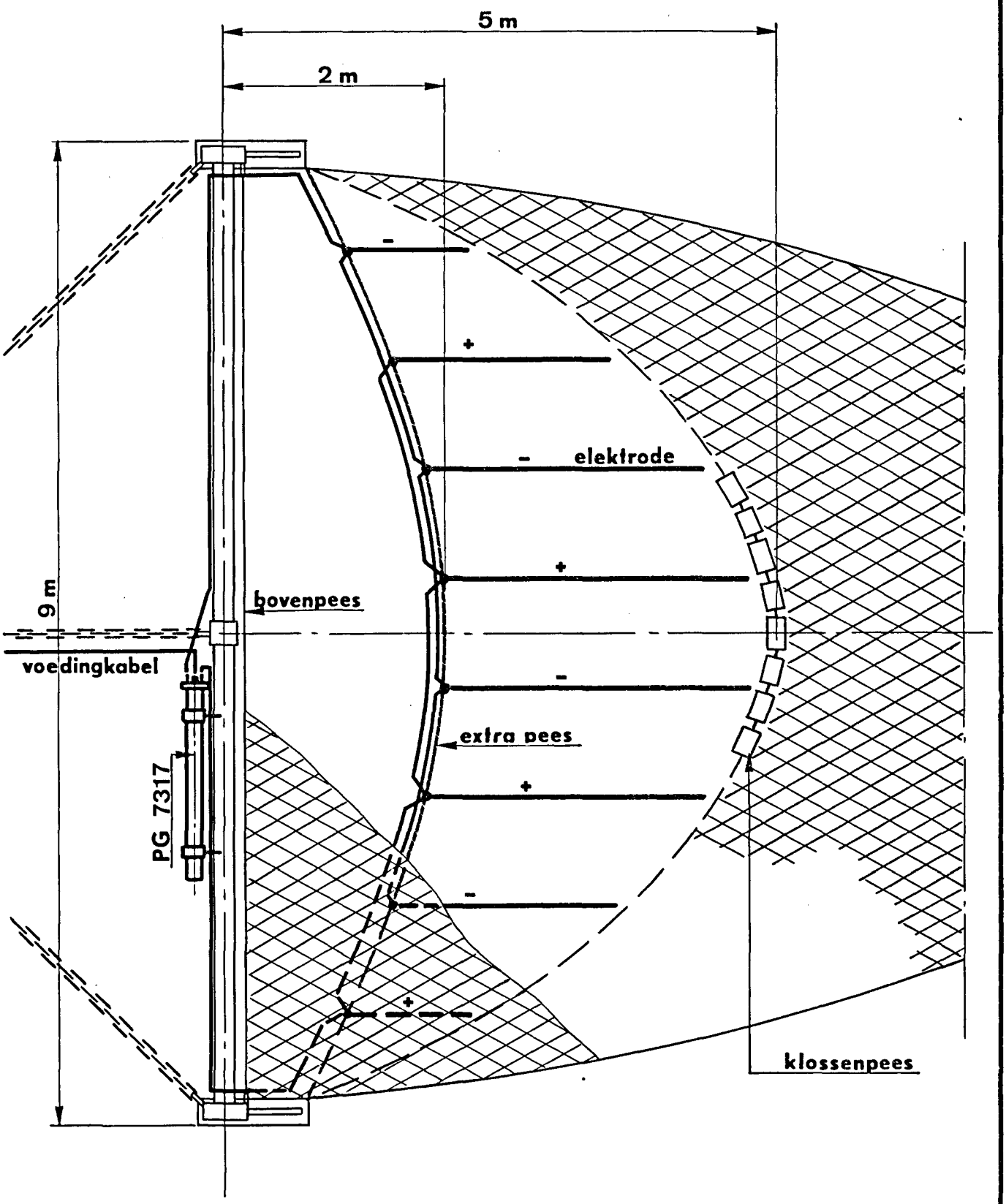


Benaming

vergelijkende electrische visserij

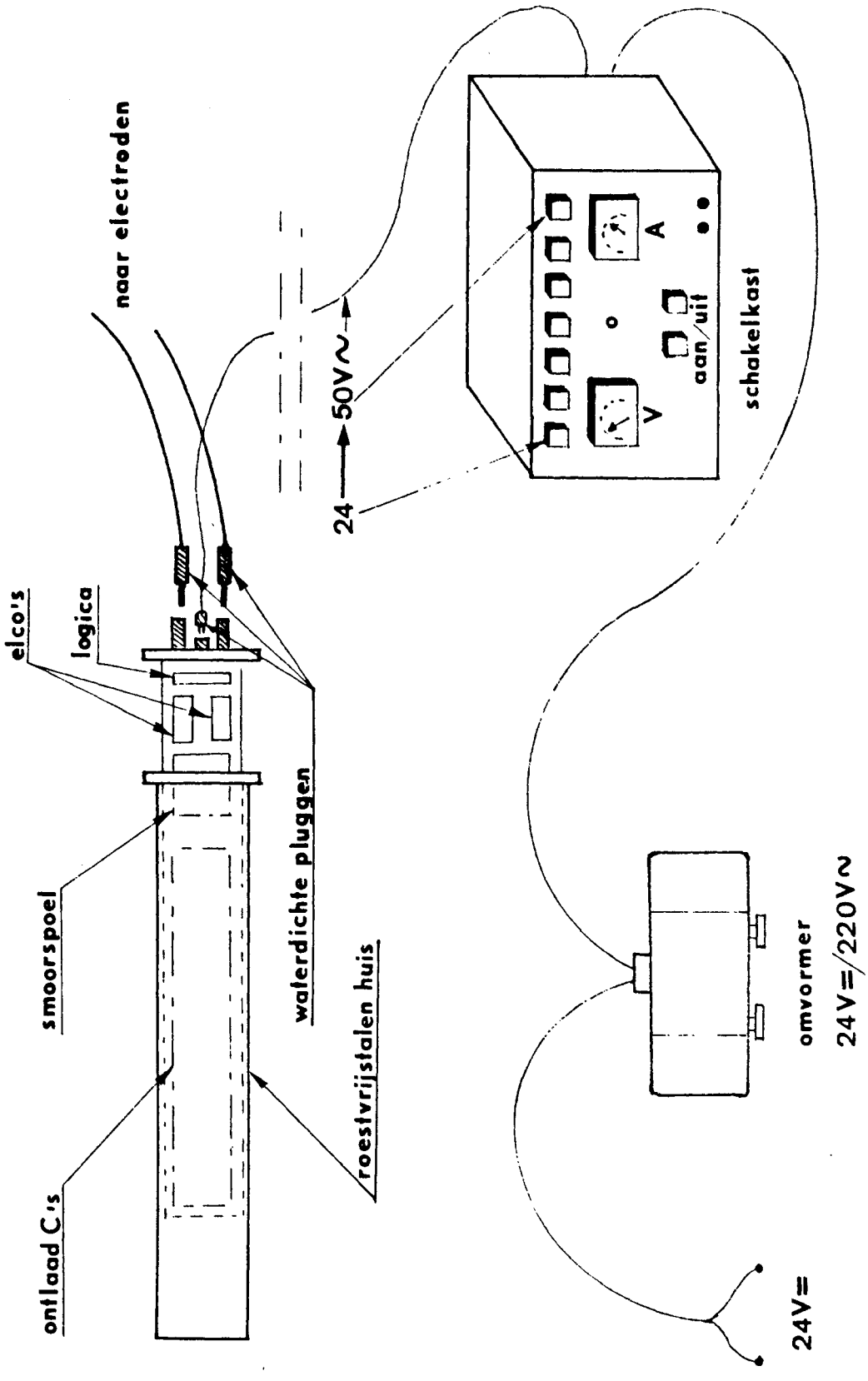
	Schaal	Gecontroleerd	Formaat A4
	Getekend	Gezien	Rangschikmerk

FIGURE II



Benaming: OPTUIGING PULSGENERATOR EN ELEKTRODEN VOOR EEN GARNALENBOOMKOR (TH-6)			Formaat A4
	Schaal	Gecontroleerd	
Auteursrecht voorbehouden volgens de wet	Getekend AV	Gezien	Rangschikmerk

FIGURE III



Benaming			
PULS GENERATOR PG 7317			Formaat A4
	Schaal	Gecontroleerd	
Auteursrecht voorbehouden volgens de wet	Getekend	Gezien	Rangschikmerk