SI/Note MAE/70-4
24.4.1970

INTERLOCK SYSTEM FOR R-B, R-Q, R-M and T-D

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1. Ring magnets R-B and quadrupoles R-Q

The following interlock system is proposed :

All temperature contacts, as well as all water flow contacts of each bending magnet or quadrupole are series connected. Each magnet and quadrupole has thus one sum indication (lamp) for the thermo-switches and one for the waterflowmeters, mounted on the interlock module installed on each magnet and quadrupole.

The interlocks of the elements of all periods (P1 ... 16) are grouped together, such that water and temperature are indicated separately for the whole system in the PSB Central Electronic Room (CER). Here connection is made with the main power supply and indications for water and for temperature of the whole system are transmitted to the MCR (fig. 1).

Reset can be made on each individual element and from the CER and from the MCR.

2. Multipoles

The monitor contacts are grouped such that all lenses connected to one power supply have one interlock circuit. The interlock modules for each unit are placed in the CER.

The same modules as for the main magnets will be used

giving for sextupoles and octupoles separate indication for water and temperature. The quadrupoles have only a temperature indication. The total number of interlock modules in the CER is 47 to 49.

3. Transfer dipoles

The dipoles T-DH3, V7, V8 are indirectly water-cooled. Their interlock modules, which are of the same type as used for the main magnets, are placed in the CER.

4. Technical lay-out

4.1 Each main magnet has an interlock module as shown in figs. 2 and 4. For the indication and the interlock in the CER the same module (slightly modified) is used.

In the tunnel of the PSB a 6-core ring-cable connects the individual elements. Only one 6-core cable is needed for the connection of the ring-cable with the interlock module installed in a rack of the main power supply in the CER.

In the MCR magnet indication (w, t) and reset is integrated in the main power supply panel.

4.2 For the multipole modules connection is made through multicore cables between the individual units in the ring and the interlock system in the CER (16 16-core cables and 5 28-core cables).

The signal cables o, t, w, reset and the 24 V power supply cables (+, -) should be connected in the interlock module by Burndy contacts. Also for the multipoles and T-D the connection should be made by plug contacts.

4.3 Number of modules :

on ring elements		R-B	32 + 1
		R-Q	48
			80 + 1
in CER	R-B and R-Q		1
	Multipoles		49
	Transfer		3
			53
Total			134
=====			===

About 10 spare units are foreseen.

4.4 In the CER the modules are placed in 19" racks. One chassis contains 12 modules, so we need for

- 1 main magnet module and power supply : half a chassis with main power supply rack
- multipole ring elements : 4-5 chassis.

In addition one patch panel as terminal for the multipoles is foreseen.

Distribution :

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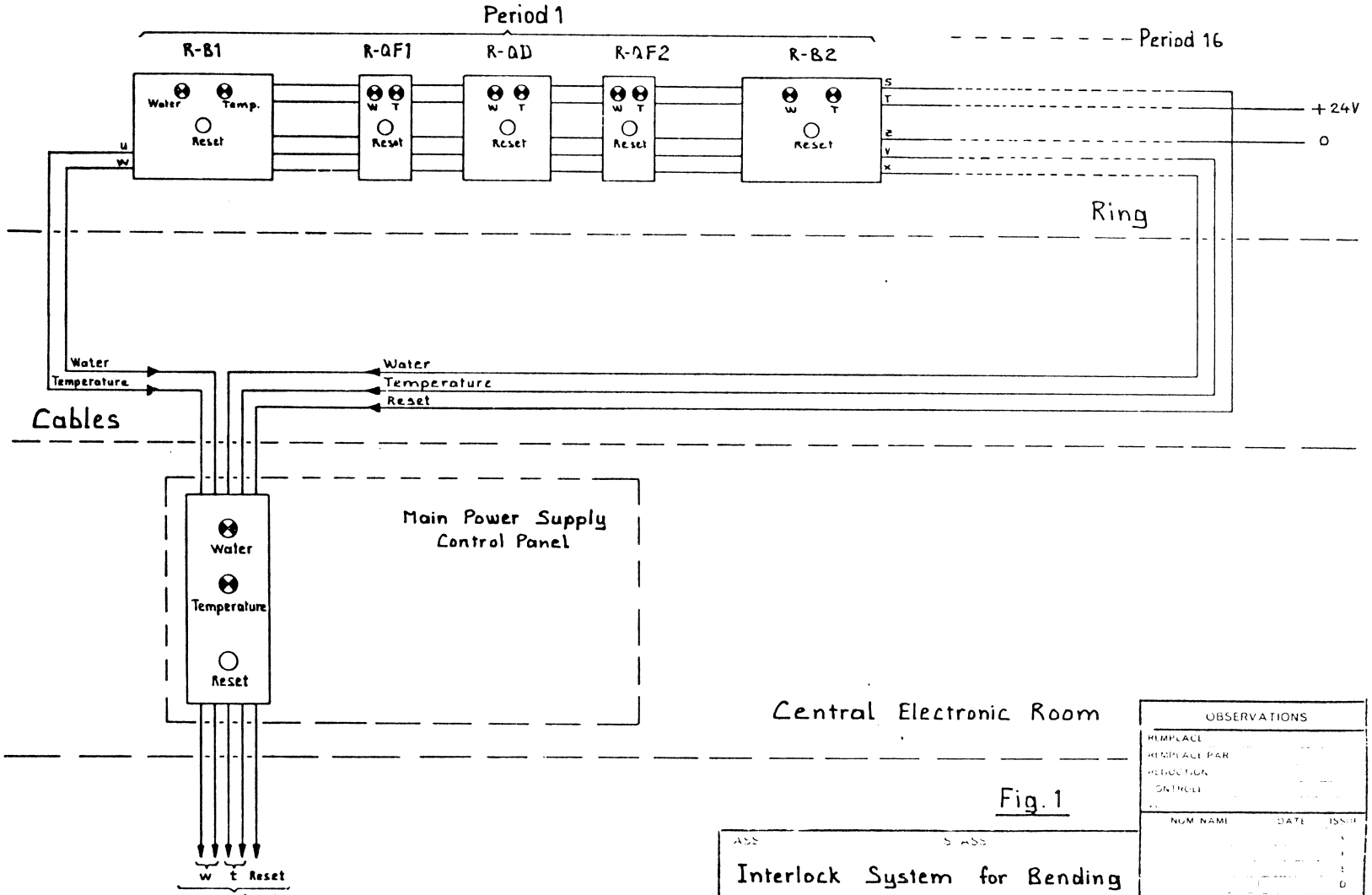

Fig. 1

Interlock System for Bending Magnets and Quadrupoles
Information Flow

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OBSERVATIONS

NUM NAME DATE

13.4.70

SI 1 04 1000 3

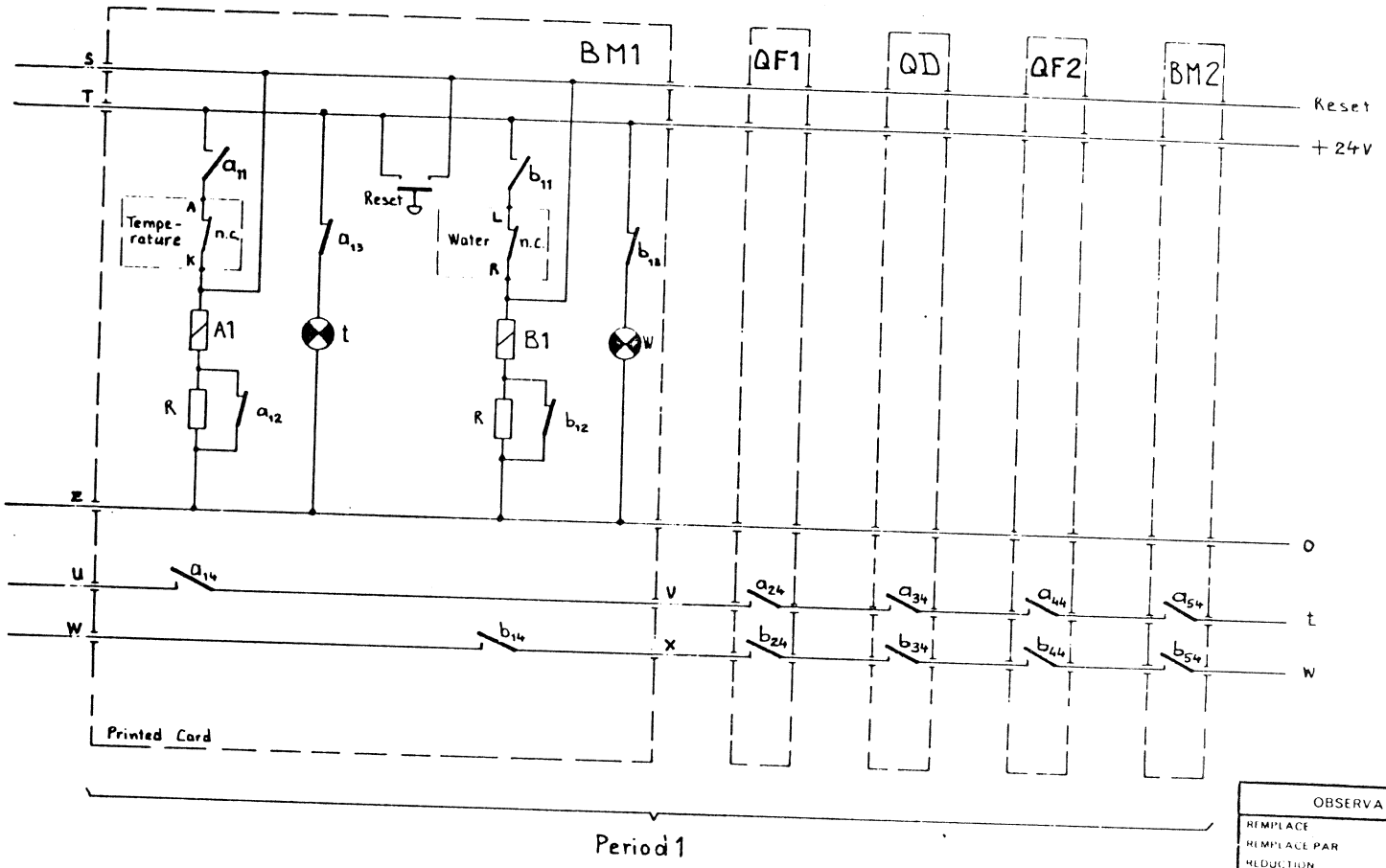

Fig. 2

OBSERVATIONS			
REMPLACE			
REMPLACE PAR			
REDUCTION			
CONTROLE			
VU			
NOM NAME	DATE	ISSUE	
		G	
		F	
		E	
		D	
		C	
		B	
	13.4.70	A	

ASS S ASS	
Diagram of Connections on the Bending Magnets and Quadrupoles	
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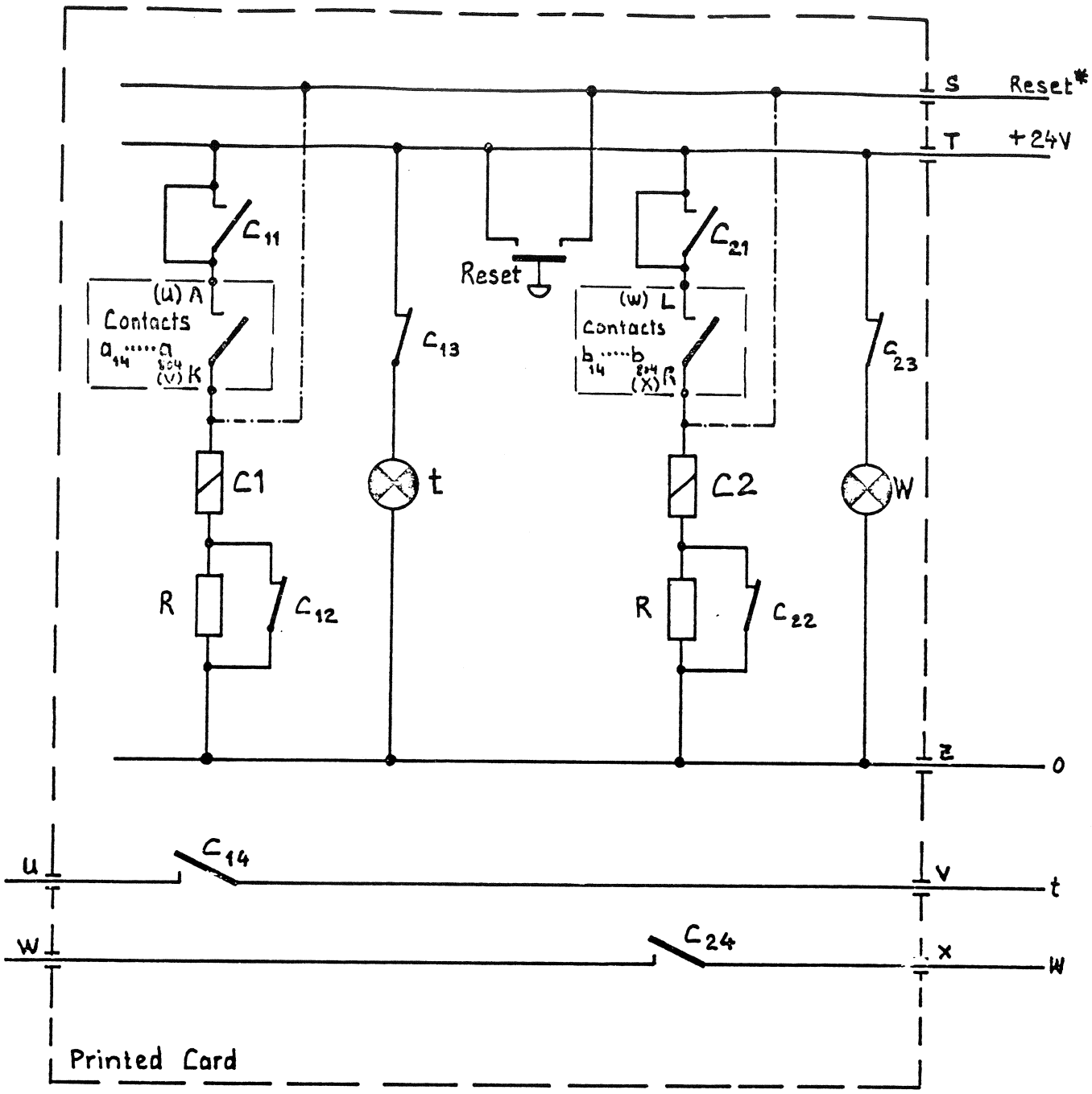

*From the ring o-t-w To Main Power Supply (resp. u-v-w-x-z)

Bridge to be suppressed. C_{11} (C_{21}) Bridge to be added.

Fig. 3

NO/UNITE

Rugosité VSM 10321 Roughness									
Groupe	▽	▽▽			▽▽▽			▽▽▽▽	
Classe	N 10	N 9	N 8	N 7	N 6	N 5	N 4	N 3	N 2
μm.	12,5	6,3	3,2	1,6	0,8	0,7	0,2	0,1	0,05
Abréviations								VSM 10319	
Symboles usinage, traitement								VSM 10320	
Symboles de formes								VSM 10324	

Tolérances	
0 - 10	± 0,1
10 - 80	± 0,2
80 - 360	± 0,3
360 - 750	± 0,4
.....	.....
.....	.....

REMPLACE		
REMPLACE PAR		
REDUCTION		
CONTROLE		
VU		

NOM NAME	DATE	ISSUE
		G
		F
		E
		D
		C
		B
CG	28.4.70	A

ASS. | S/ASS.

Diagram of Connections in the P.S.B. Central Electronic Room

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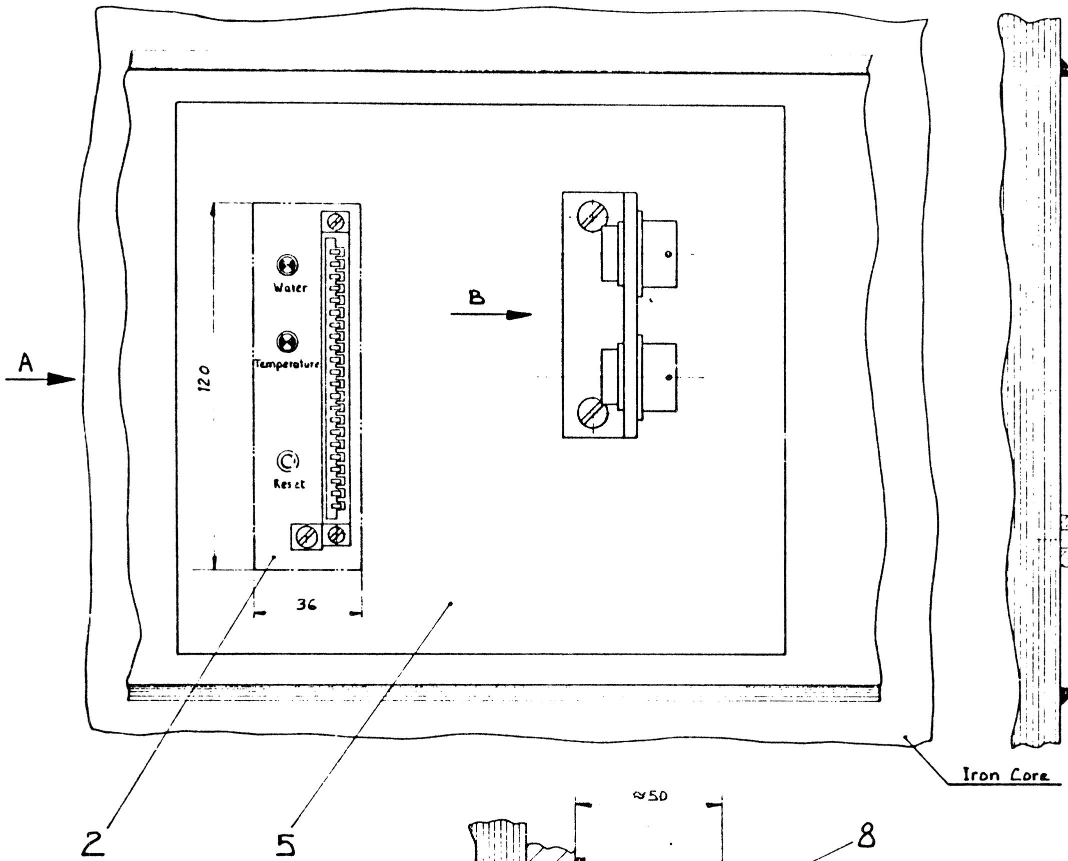
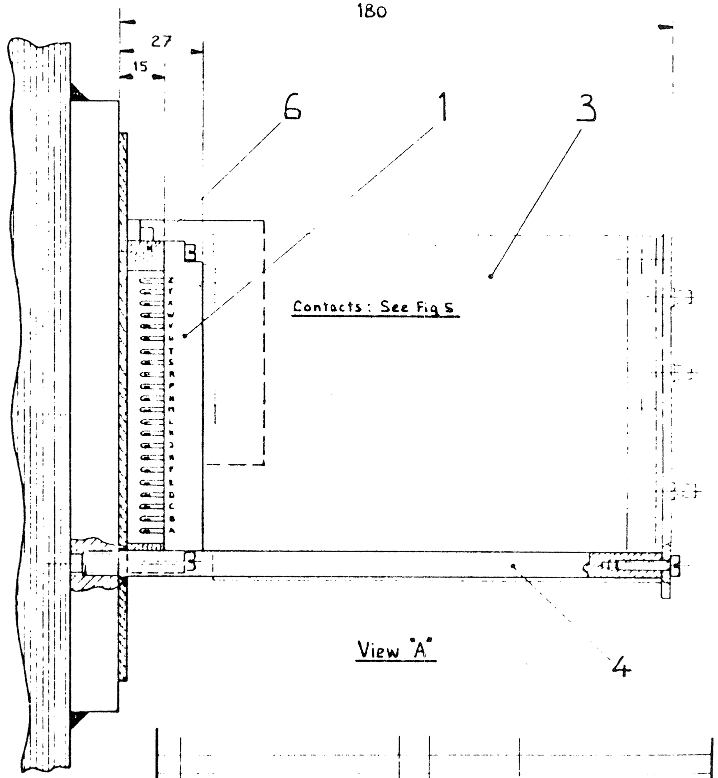
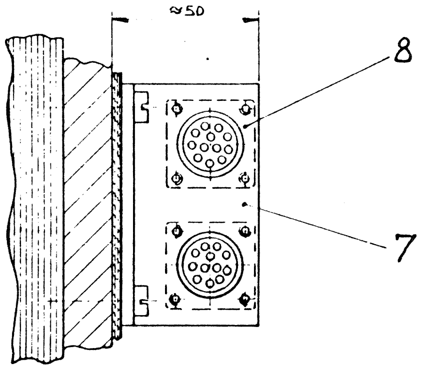




View "A"



View "B"

Fig. 4

Bending

NO UNITE	DESCRIPTION	POS	MAT	OBSERVATIONS
2	Burndy Socket	8		12 Contacts (Male)
1	Supporting Device	7	St. Plate	Thickness 4mm
2	Vetronite	6		12×10×10 mm
1	Vetronite Plate	5		Thickness 3mm
1	Supporting Device	4		M8×15 + M3×20; lg=190
1	Printed Card	3		
1	Front Panel	2		
1	Amphenol Terminal	1		Type 8600-22

Tolérances

0 - 10	0.1
10 - 80	0.2
80 - 360	0.3
360 - 750	0.4

REMPLACE
REMPLACE PAR
REDUCTION
CONTROLE
VU

NOM NAME	DATE	ISSUE
		G
		F
		E
		D
		C
		B
[signature]	14.4.70	A

ASS. S/ASS.

Interlock Model tobe used in the P.S.B.-Ring and the CER.

Echelle Scale 1:1

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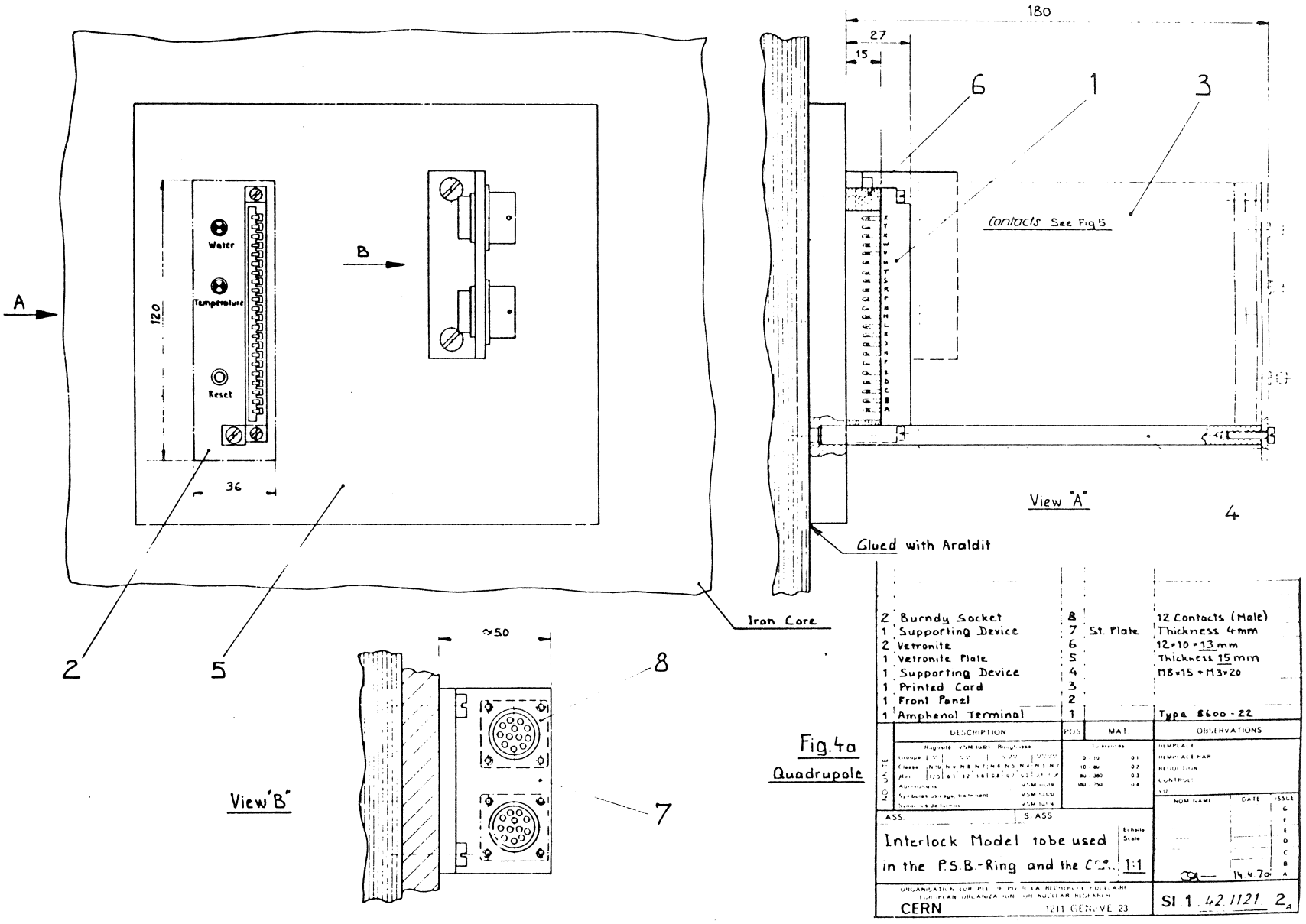

2	Burndy Socket	8		12 Contacts (Male)
1	Supporting Device	7	St. Plate	Thickness 4mm
2	Vetronite	6		12×10×13mm
1	Vetronite Plate	5		Thickness 15mm
1	Supporting Device	4		M8×15 + M3×20
1	Printed Card	3		
1	Front Panel	2		
1	Amphenol Terminal	1		Type 8600-22

DESCRIPTION	POS	MAT	OBSERVATIONS

ASS. | S. ASS

Interlock Model tobe used in the P.S.B.-Ring and the CPS

Echelle / Scale 1:1

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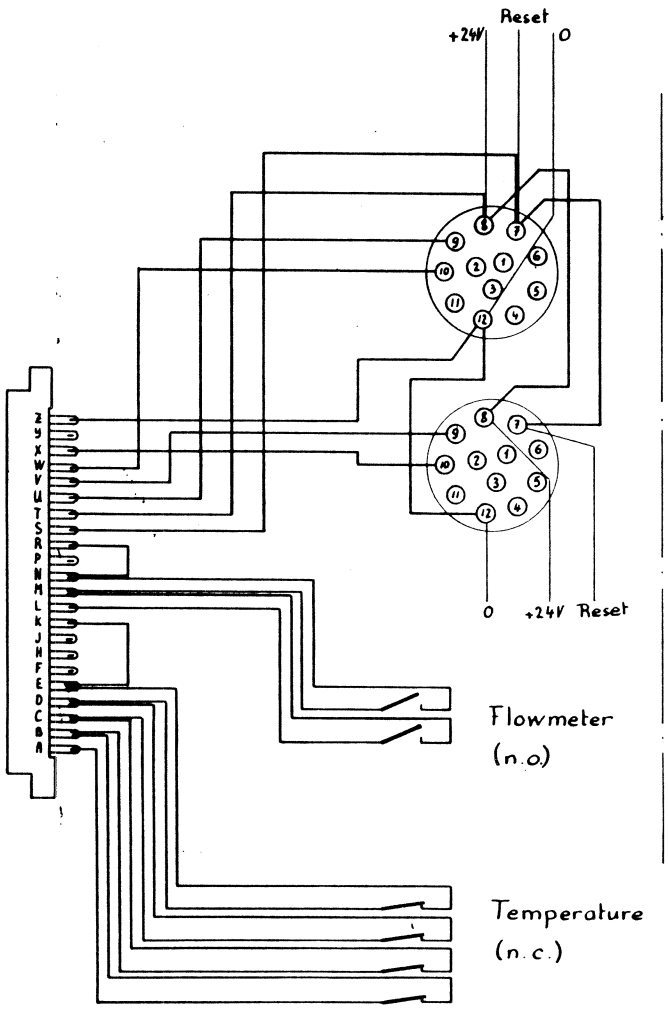
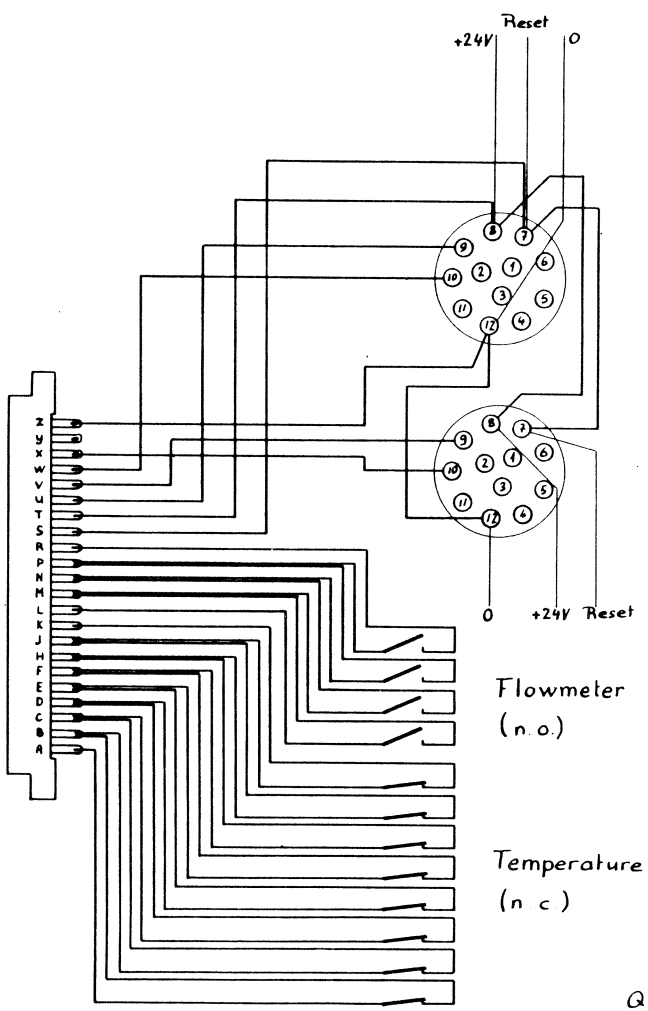
SI.1.42.1121 2A

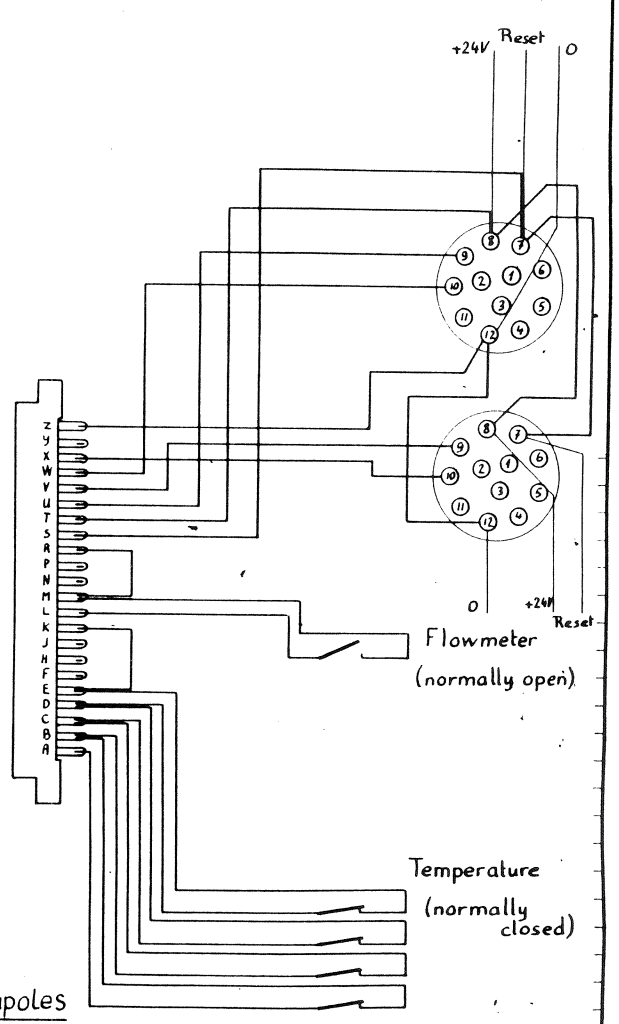
Fig.4a
Quadrupole



B.M. Normal Coils



B.M. Special Coils



Quadrupoles

Fig.5

NOMBRE DE PIÈCES	DÉSIGNATION	POS.	MATIÈRE	OBSERVATIONS
	Connections on the Bending Magnet (Normal, special coils) Quadrupole			

DESSINÉ	B.Jim	15.70
CONTROLÉ		
VU		
REMPLACE		
REMPLACÉ PAR		
RÉDUCTION		

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SI.1.04.1004.2