



Medium Voltage Switchgear

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# *Diflu*

General Features  
Installation  
Setting to work  
Operation  
Storage

May / 95

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**Instructions Manual**

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## 1. General features

The Diflu circuit-breakers are indoor type equipment, with separated poles construction and SF6 gas breaking medium.

Each pole consists of a single piece in a cast resin enclosure, individually sealed, enclosing the active parts.

The poles are placed on a base structure, which also supports the control mechanism.

The separated poles construction allows utilisation of the same pole in different base structures thus obtaining gear with different distances between phases.

The circuit-breakers are equipped with a spring type energy storing control mechanism, type CLR or CLRM (motorised version).

There are three types of control mechanisms :

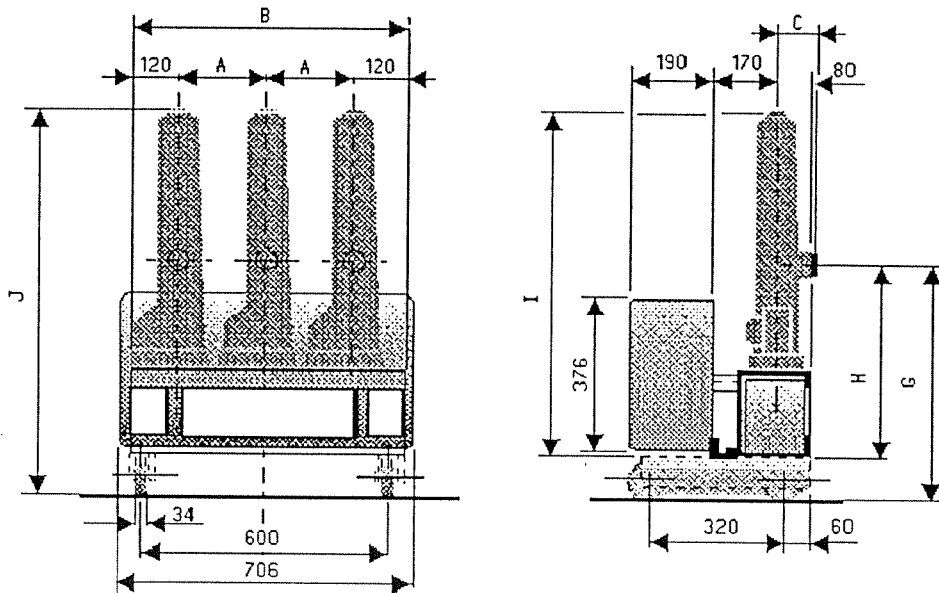
- Front control
- Left longitudinal control
- Right longitudinal control

The basic circuit-breaker supports three poles on the structure without wheels, coupled to the control mechanism.

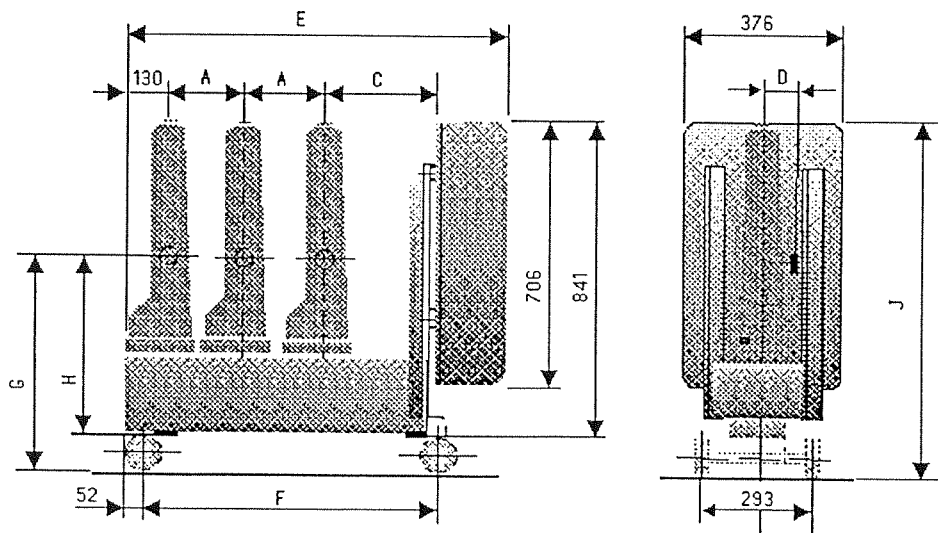
Under request the equipment can be completed with :

- Wheels
- Direct tripping relays
- Connection terminals
- CLR or CLRM electrical accessories (see manual).

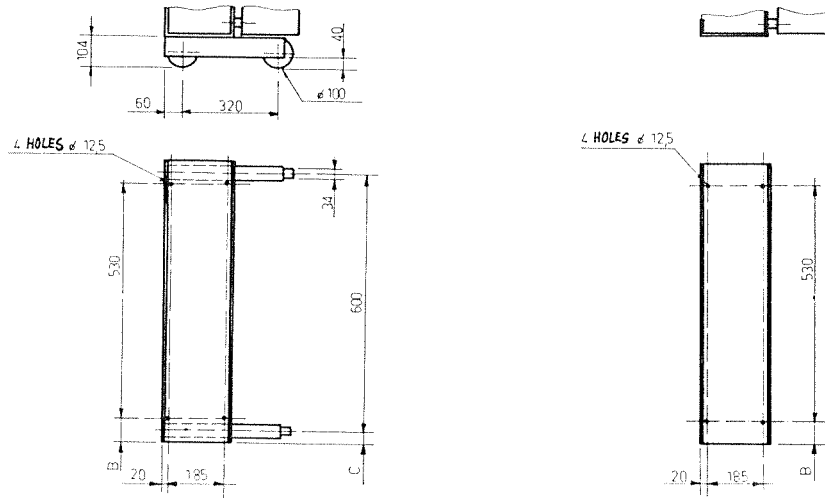
### Frontal Control Mechanism



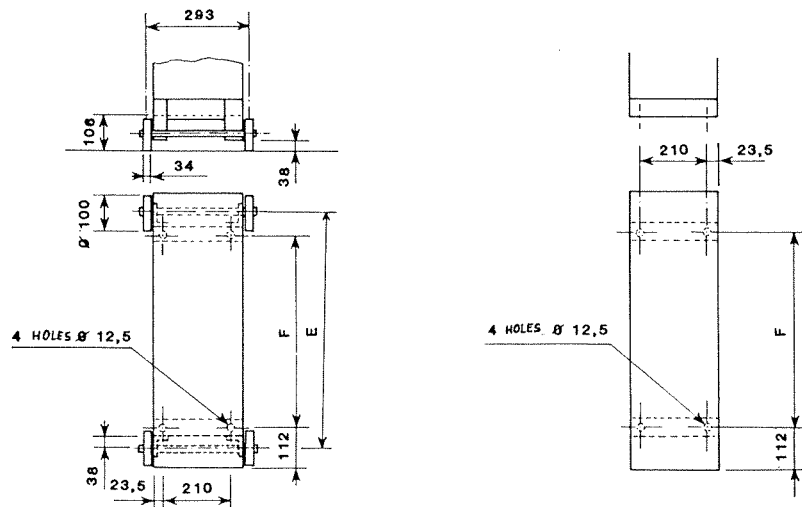
### Longitudinal Control Mechanism



DETAILS OF CLAMPING TO BASE



DETAILS OF CLAMPING TO BASE



Max. service voltage (kV)	Dimensions (mm)												Weight (Kg)					
	A	B	C	D		E	F	G	H	I		J		Front Control		Long. Control		
				(1)	(2)					(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	
7,2 to 12	210	660	300	110	160	1040	710	580	476	841	894	945	999	130	140	140	150	
17,5 to 24	In ≤ 2000 A In = 2500 A	250	740	300	110	160	1120	790	580	476	841	894	945	999	130	140	140	150
		350	940	-	-	160	-	-	580	476	-	894	-	999	-	150	-	-
36		350	940	350	110	160	1370	1040	670	566	931	984	1035	1089	140	150	140	150

(1) In ≤ 1250A

(2) In > 1250 A

## 2. Installation

In every case of usage in cubicles report to the respective cubicle's instruction manual.

### 2.1. Preparatory work

The civil engineering work must be finished, the premises closed, dry and heated if necessary so to avoid humidity, excessive dust and water splashing. The connections can be made after the circuit-breaker is installed.

### 2.2. Handling and unpacking

It is essential that the unpacking is done under cover and preferably in the place of installation.

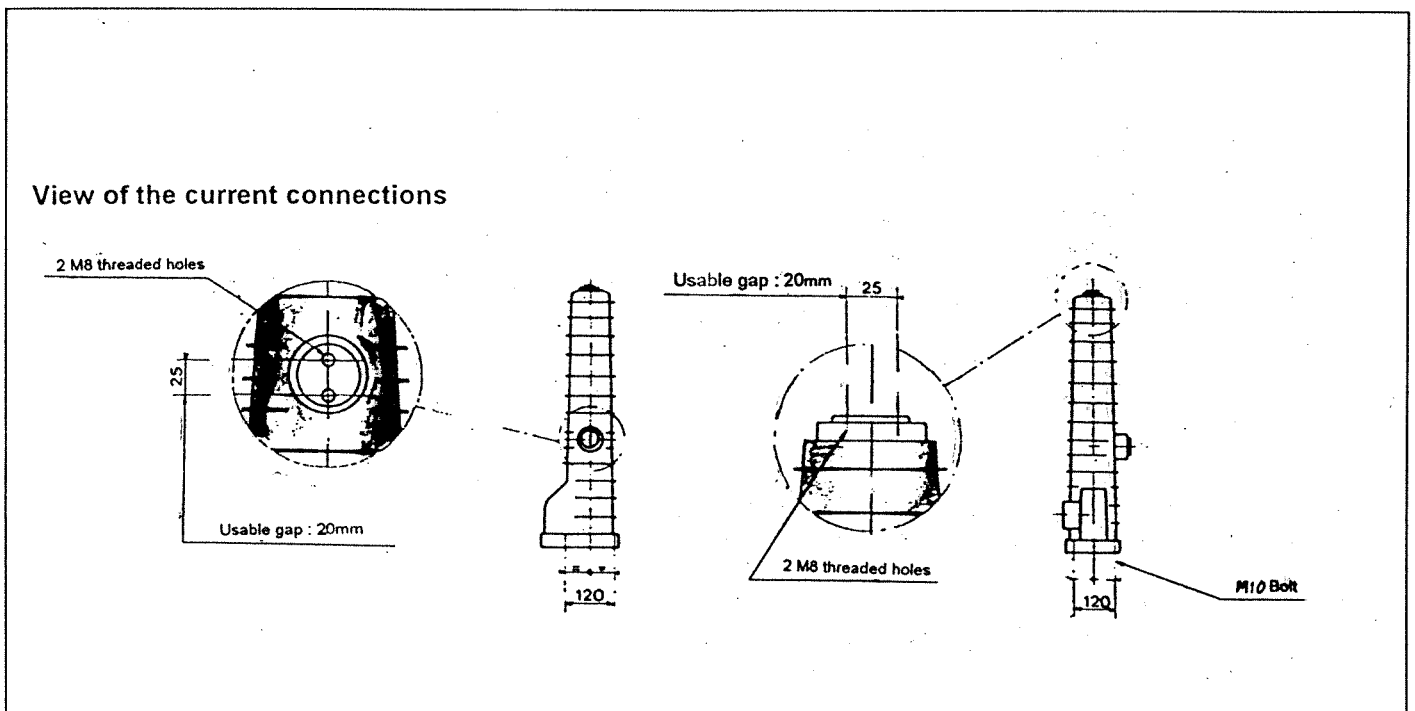
Never use the poles or the control mechanism as a mean of handling the equipment.  
Any force of any considerable magnitude must be applied only to the frame .

Avoid shocks.

The accessories such as wheels are delivered unassembled.

### 2.3. Installation plans

For detailed dimensions, refer to dimensions drawing delivered with each equipment.



### Fitting the running wheels

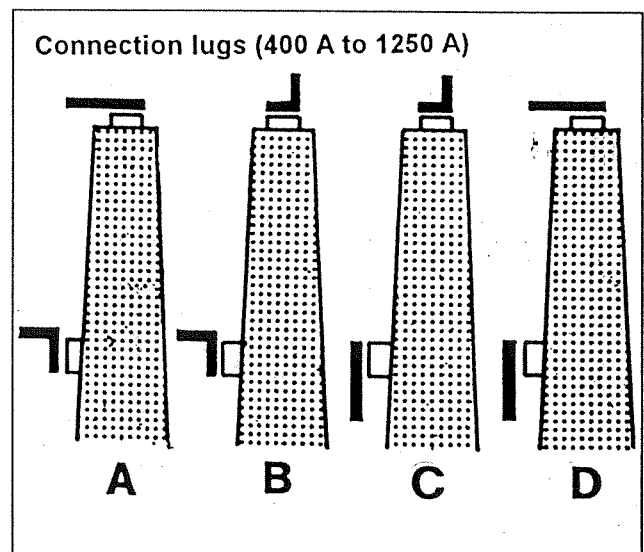
Raise the equipment by the frame. Fit the wheels with screws. See picture.

### Height above ground level

In case of delivery of a bare frame circuit-breaker, the equipment is defined by the installation and is a function of its own restraints.

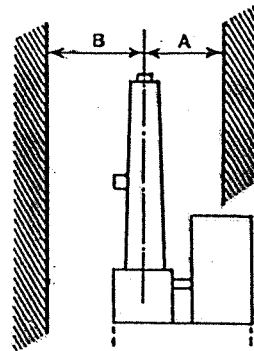
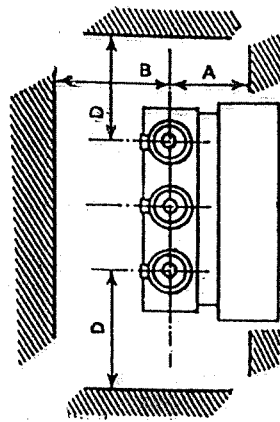
### Connecting lugs

Two types of lugs can be supplied under request : straight lugs or right angle lugs. There are four possible combinations. The C and D arrangements reduce the creepage distance to the non-current carrying parts, cannot be used unless for the impulse withstand voltages of 95 kV peak or 125 kV peak.

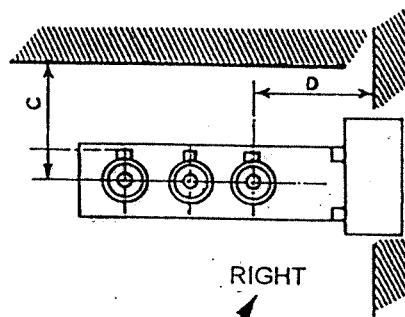


Installation dimensions

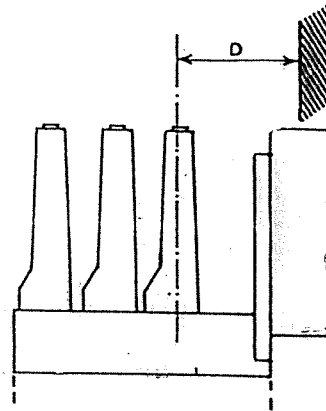
FRONT ARRANGEMENT



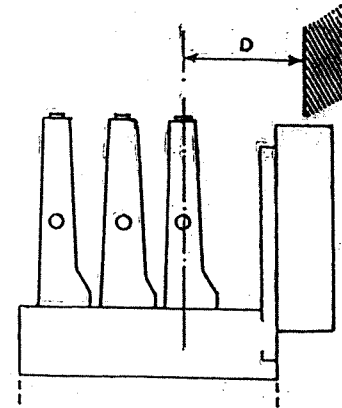
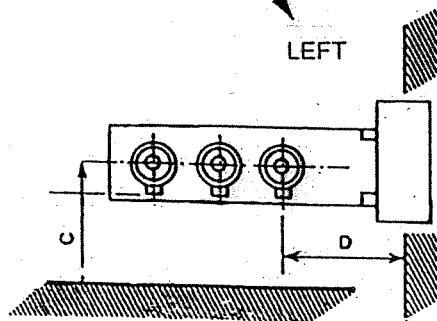
LENGTHWISE ARRANGEMENT



RIGHT



LEFT



Utilisation with direct relays

DIMENSIONS	A	mm	150	190	240	330	240	280	330	420
	B	mm	230	270	320	410	230	270	320	410
	C	mm	230	270	320	410	230	270	320	410
	D	mm	150	190	240	330	170	210'	260	350
Impulse withstand voltage		kVp	75	95	125	170	75	95	125	170

Dimensions B and C do not include the dimensions of the connections which must be added hereto.

## 2.4. Installation process

The successive operations are as follows :

- Unpacking;
- Fixing in normal service position. Check if the dimensions indicated on previous page are respected. Check the verticality of the poles (a slight deviation from the vertical does not affect the operation of the CB but can reveal to be hazardous to the rest of the installation);
- Connection of the power circuits;
- Connection of the LV auxiliary circuits. (see control mechanism instructions manual). Circuits dead;
- After installation put the control mechanism cover in place if it has been removed before making the auxiliary circuits live and before any mechanical operation.
- Clean all dust from the equipment.

## 3. Setting to work and adjustment

### 3.1. Checking before setting to work

- Tightness of the connections.
- Insulation checking of the installation
- Checking of the auxiliary circuits (see control mechanism instructions manual).

### 3.2. Adjustment

The CB is adjusted in the factory. No adjustment is needed during the life of the equipment.

### 3.3. Setting to work

Refer to the control mechanism instructions manual and proceed according to general rules established by the operator.

## 4. Maintenance

### 4.1. Checking and maintenance operations

Periodical checking and maintenance operations in the absence of contrary indications. The possible maintenance operations are those shown in the table on top right side of the page. To perform these operations the equipment must be taken out of service.

Operations	After 2000 mechanical operations or every 2 years	Every 6 years	
Cleaning of the insulators	During an inspection		
Lubrication of the linkage with the control mechanism	X	X	See 4.3
Checking of the opening and closing times		X	
Checking of the control mechanism	See instructions manual		
Checking of the resistance between input and output of each pole		X	
Checking of the pressure		X	See 4.2

All these checking procedures are done without removing the control mechanism.

### 4.2. Checking of pressure or filling up with gas

It should be noted that these operations themselves result in a slight loss of gas varying according to the skill of the operator. For a proper execution of these operations proceed as follows :

Use a 0-5 bar manometer, graded in decibar and a valve connector identical to those for car tyres.

With the CB unplugged measure the pressure at the valve. If the pressure has fallen it is necessary to top it up with a SF6 bottle equipped with a pressure reducing valve designed for an input pressure of 30 bar and an adjustable output pressure of 0 to 5 bar, connected to a flexible two metre long tube terminating in a car tyre type connector. The SF6 gas bottle must be in the vertical position.

After checking the gas pressure or topping it up, fit the valve cap and tighten it carefully.

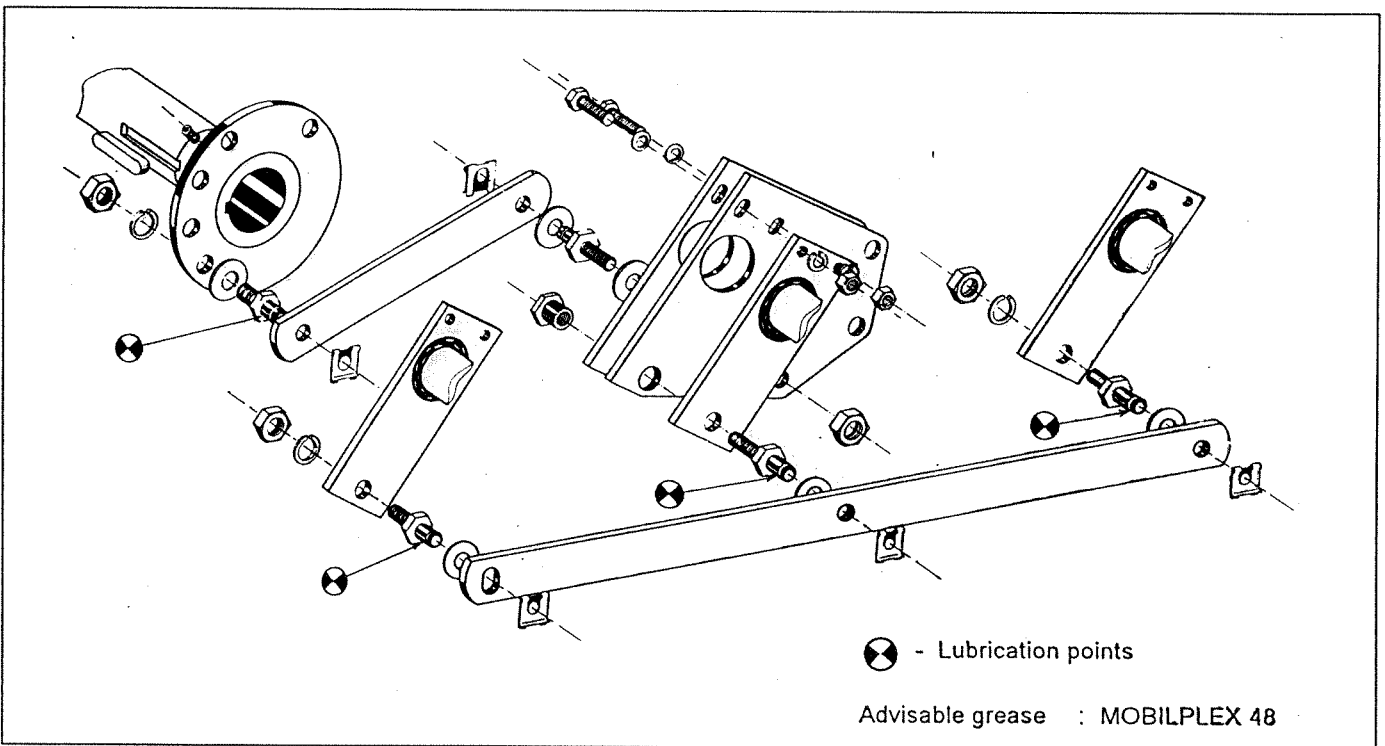
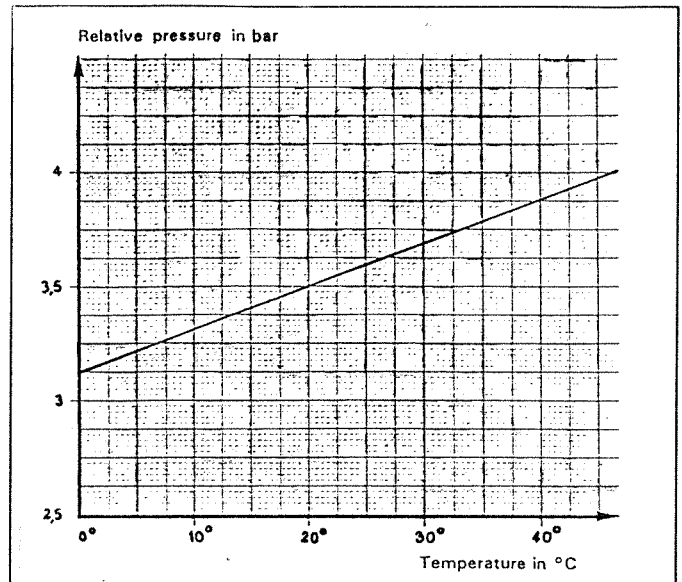
The control of the amount of gas in the bottle is made by weighing it.

#### SF6 filling pressure

When checking the gas pressure in the tank before or after topping up, it is very important to consider the variation of the gas pressure according to the temperature. Use the graph to make the necessary corrections.

#### 4.3. Lubrication of the linkage coupled with the control mechanism

This operation must be executed without uncoupling the control mechanism and after cleaning.



#### 4.4. Replacement parts

No replacement operation is needed for the internal parts of the poles. The replacement unit is the complete chamber, so that the only operations which would have to be undertaken concern parts external to the chamber (linkage, control mechanism...).

For fast and accurate identification of components and repair, send us as much information about the equipment as possible:

- Information on the rating plate (particularly: type, serial number);
- Name and exact description of the desired parts
- Mark and reference number of these pieces referring to the instructions manual.

#### 5. Storage

If a CB is destined to be stored before it is installed, store in dry, well ventilated place and shielded from dust.

Normal storage temperature :  $-5^{\circ}$  à  $+40^{\circ}$ C.  
For other storage conditions, please consult us.