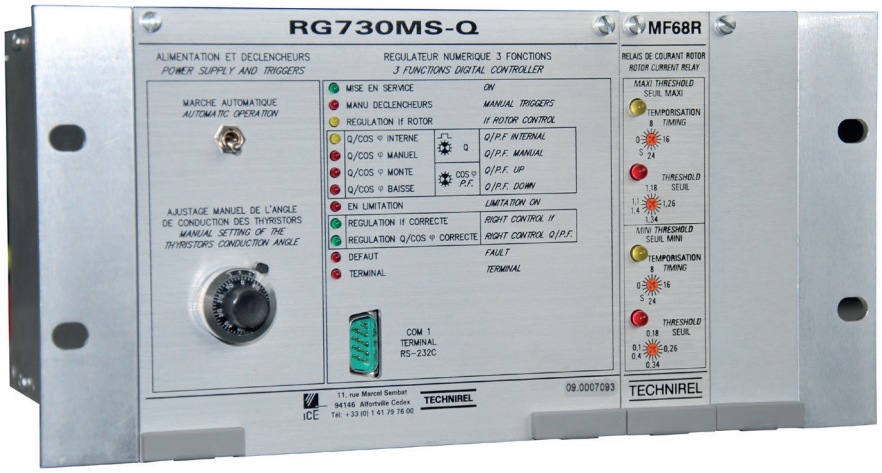
RG730MS-Q

Digital Controller for Synchronous Motors

The digital Automatic Voltage Regulator **RG730MS-Q** is a numerical PID regulator designed to control the excitation of large & medium size synchronous motors.

The digital AVR **RG730MS-Q** belongs to the RG700 series of ICE SAS digital controllers dedicated to the control of synchronous machines.



Regulation purposes

The digital controller RG730MS-Q performs 3 regulation functions and control the bridge rectifier of the synchronous motor in order to:

- maintain the rotor current on its set point during the starting phase,
- maintain the value of the motor power factor on its set point regardless of the load conditions,
- maintain the value of the reactive power on its set point.

Limitation purposes

Rotor current limitation

Thanks to this function the RG730MS-Q controller allows the motor to sustains a sudden & short overload, while minimizing the rotor heating.

Functional description

Basically the RG730MS-Q performs the following control functions:

Regulation functions

- Automatic regulation of the rotor current after detecting the end of the start of the motor in the asynchronous mode and the closing of the excitation contactor
- Automatic regulation of the power factor in all four quadrants after the start of the motor
- Direct regulation of the reactive power
- Manual control with «go up» and «go down» buttons after selecting the manual mode
- Smooth switching between the automatic and the manual regulation.the motor to sustains a sudden & short overload, while minimizing the rotor heating

Limitation

- Limitation of If Rotor

Activation of the regulation and limitation functions

- Regulation & limitation modes are activated by switching on external contacts

Displays

Regulation & limitation modes are displayed by LEDs on the front face of the RG730MS-Q

- Yellow LEDs for regulation modes
- Red LEDs for alarms and manual mode
- Green LEDs for sabilized regulation conditions

Settings

The settings of internal set points, limitation parameters, communication parameters and the PID parameters are performed through the communication port located on the front face by using the PC software.

Measurements

All the measurements are filtered:

- 2 voltages through PT's with 100V or 110V secondary:
  - 1 stator voltage (U12)
  - 1 voltage for thyristors synchronisation (U12)
- 1 current through CT's with 5 Amps secondary:
  - 1 stator current sensing (I3)
- 1 excitation current through an Hall effect sensor.

Regulation & limitation functions activation

Regulation & limitation modes are activated by switching ON external contacts galvanically isolated by the means of optic couplers

Description

The digital controller RG730MS-Q uses 1 microprocessor.

This microprocessor is in charge of:

- Communication management: serial ports 1 & 2
- Binary data input & output management
- Regulation & limitation functions as well as the control of thyristors priming

The RG730MS-Q hardware is made of 3 PCB's fitted in a 9.5 " wide and 3 units high rack suitable for flush mounting.

Safety

The microprocessor has a watchdog equipped with an alarm signalling contact hardwired on terminal.

All parameters used by the regulation are safeguarded in SRAM Memory backed up by a 3V lithium battery having a 1 year autonomy duration when out of supply.

Communication

The RG730MS-Q controller is devoted to control & communication.

Communication function uses 2 serial dedicated ports:

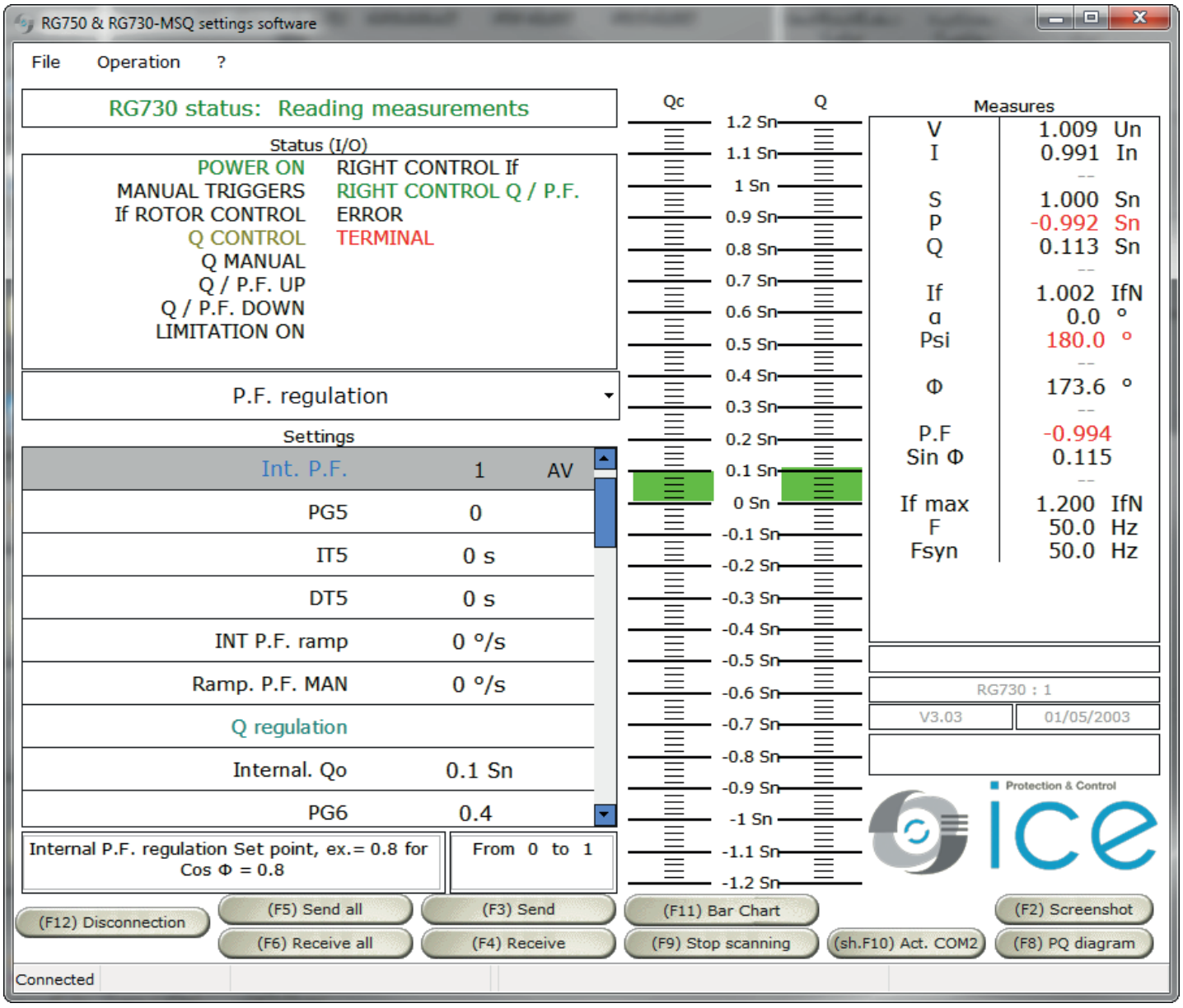
- Port n° 1 characteristics:
  - Dedicated to the man/machine dialogue needed for the commissioning operation
  - Link type: RS232
  - Speed: 9,600 Bauds
  - Protocol: private TECHNIREL ICE SAS property
  - Plug in connexion: on the front panel DB9 plug in type
  - Terminal suitable: PC / Windows (32 / 64 bits)
- Port n° 2 characteristics:
  - Dedicated to communication with the SCADA
  - Link type: Current loop
  - Speed: 300 to 4,800 Bauds
  - Protocol: Modbus / Jbus slave
  - Connection: on rear terminal (screw connection)

HMI - RG730MS-Q configurator

Software functions:

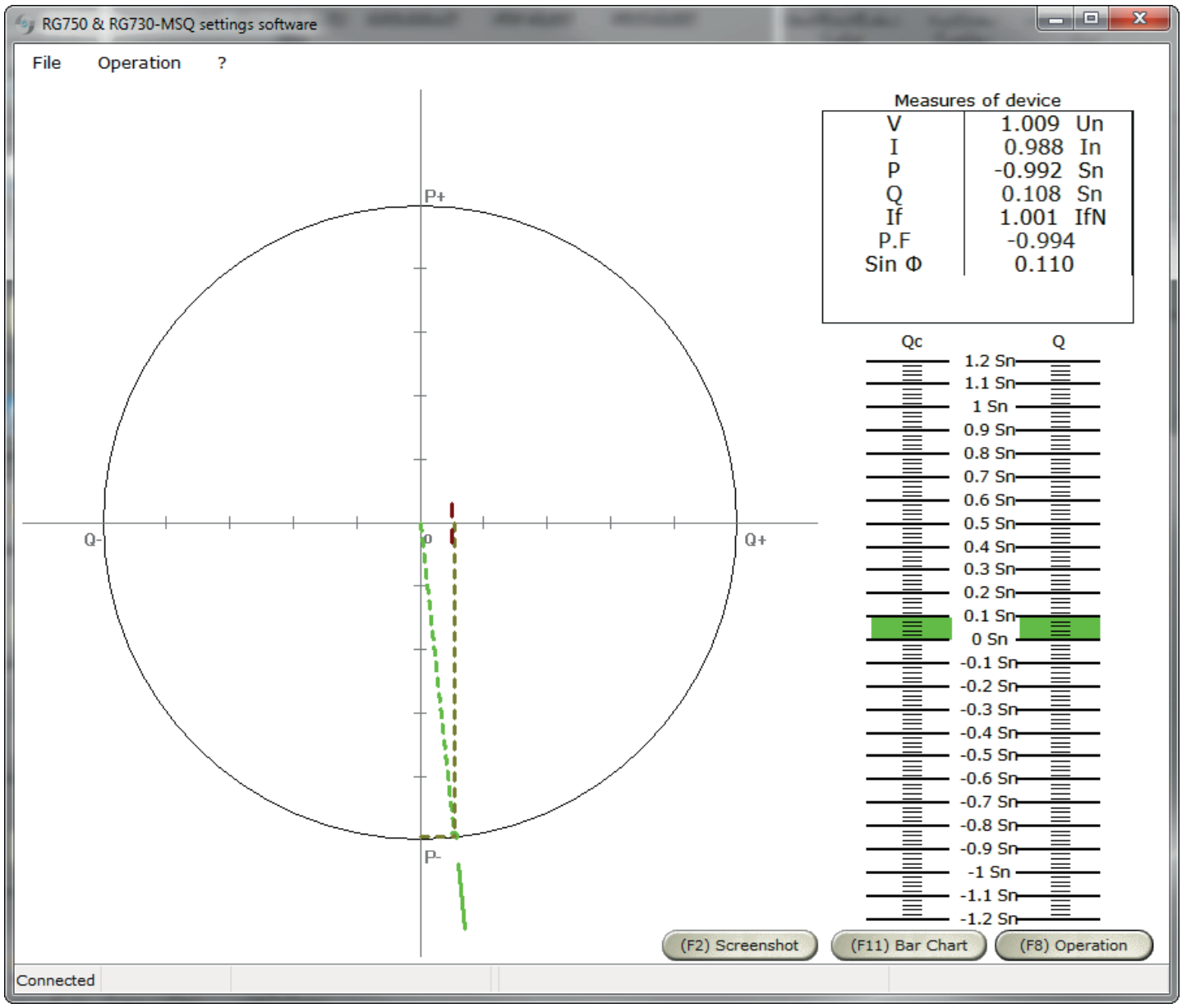
- Display of measurements, set point & parameters adjustements
- Real time motor diagram capability display
- Set points & parameters protected by password
- Status & alarms display

Displays of measurements, set points, & PID gains



RG730MS-Q

Machine capability diagram



Characteristics

Auxiliary supply

- Galvanically insulated
- 24 Vdc
- Power burden: 10 W maxi

Measurement input characteristics

Current input: 5 A – 50 / 60 Hz
- Burden per input: 10 VA
- Insulated

Voltage input: 100 Vac or 110 Vac – 50 / 60 Hz
- Burden per input: 10 VA
- Insulated

Contacts input characteristiscs

- Dry contacts, galvanically isolated

Contacts output characteristics

- Dry contacts

Breaking rate dc currents
30 V / 8 A – 100 V / 0.5 A – 300 V / 0.3 A

Breaking rate ac currents
2,000 VA / 220 V

Performances

- Regulation accuracy: ±1%

Environmental conditions

- Operating temperature: 0° C to + 50° C
- Storage temperature: - 20° C to + 70° C
- Relative humidity: 0 to 92 % without condensation

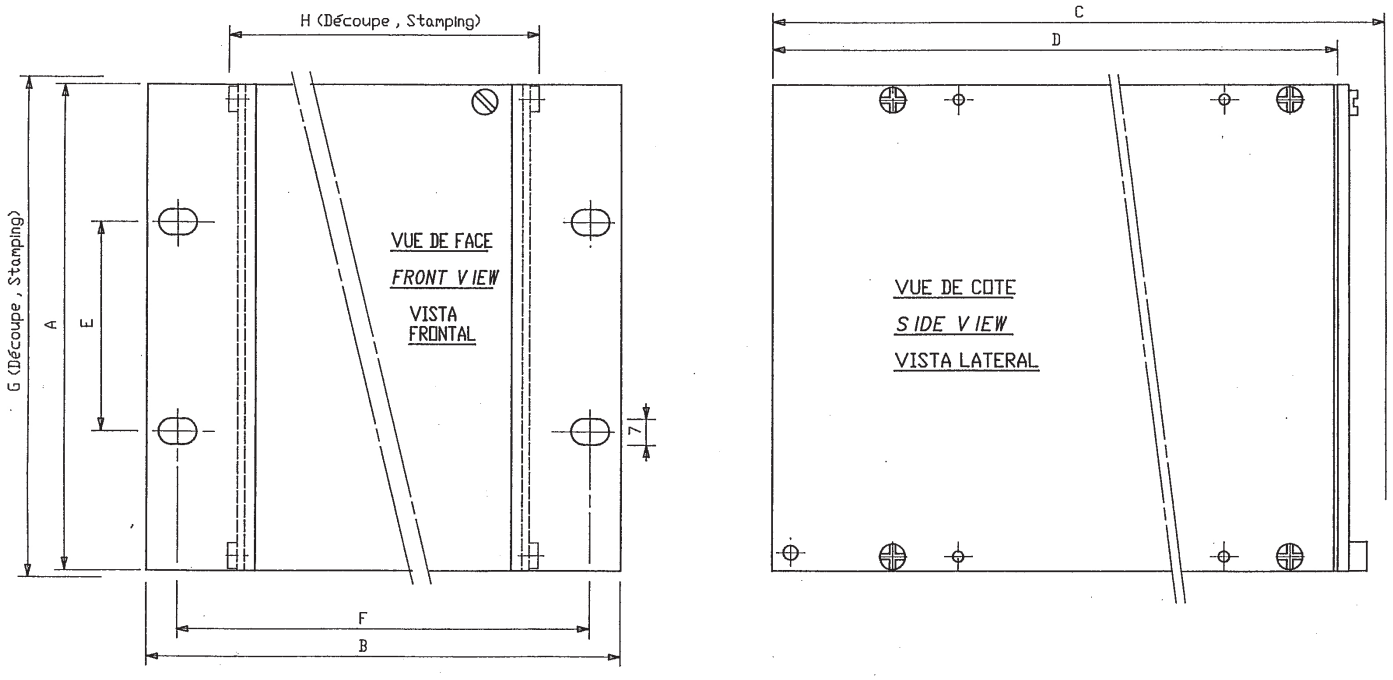
Dimensions

30 T Cases

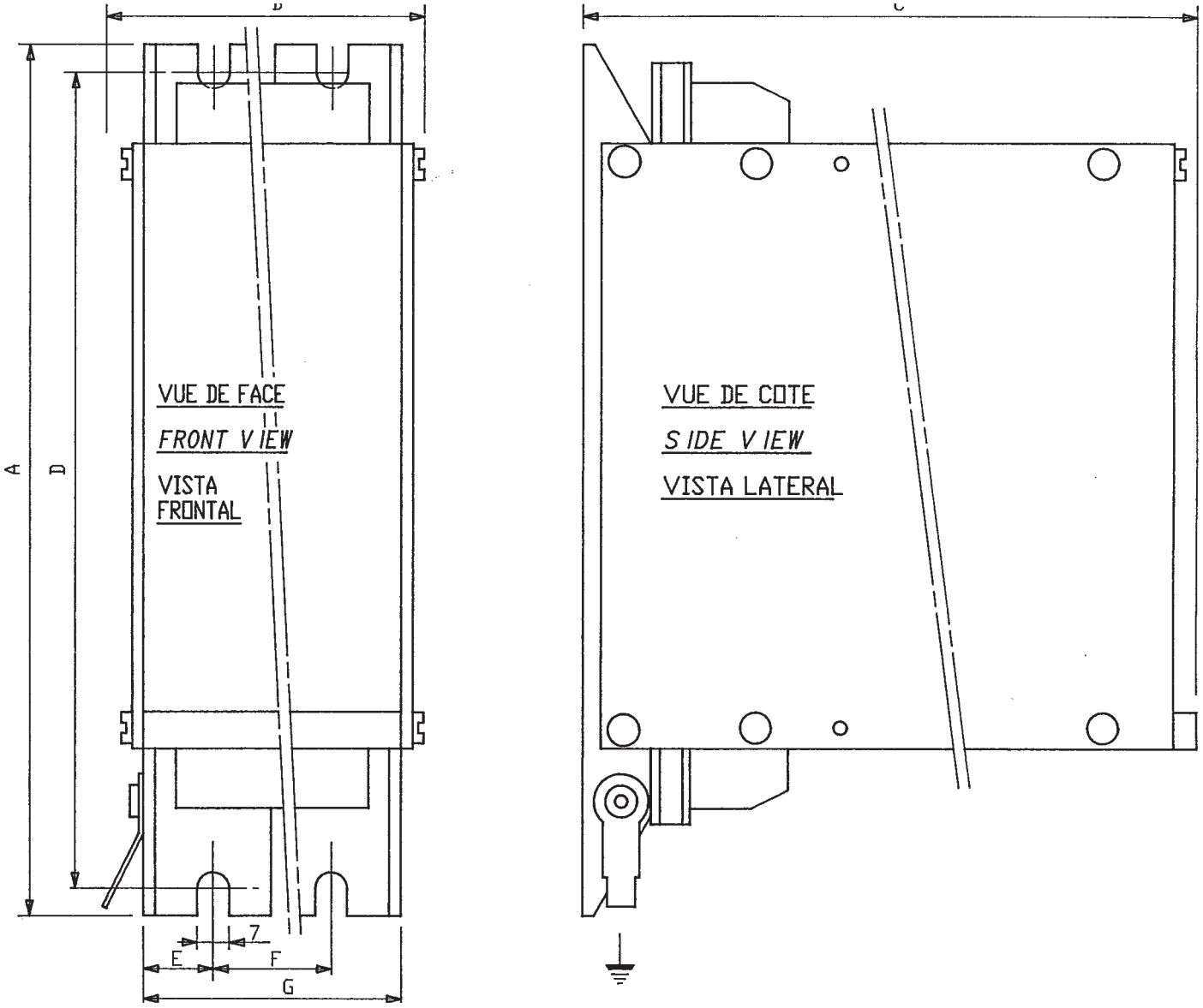
Size	Surface mounting (mm)	Flush mounting (mm)
A	190	132.5
B	166	208.5
C	238	255.0
D	178	225.5
E	16.5	57.1
F	119	191.5
G	152	133.0
H	-	169.0

- Weight: 3.5 Kg
- Connections: Screws terminal with 51 positions

Flush mounting housing



Surface mounting housing



Protection & Control ice
INDUSTRIELLE DE CONTRÔLE ET D'ÉQUIPEMENT - 11 rue Marcel Sembat F-94146 Alfortville cedex
+33 (0)1 41 79 76 00 www.icelec.com contact@icelec.com -
• ISO 19443 : 2018 • ISO 9001 : 2015 • ISO 14001 : 2015 certified •