From February 1st, 2017 SAMES Technologies SAS becomes SAMES KREMLIN SAS
A partir du 1/02/17, SAMES Technologies SAS devient SAMES KREMLIN SAS

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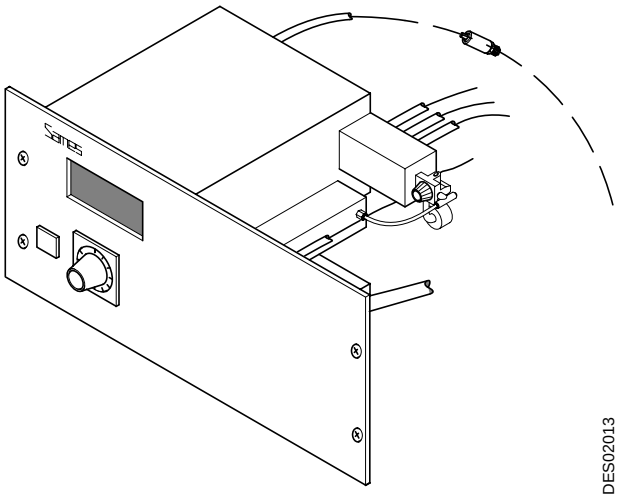

DES02013

User manual

TN 5077
Turbine-speed reading and control module

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WARNING : Sames Technologies is registered as a "Training Center" approved by the "Ministry of Employment".
Training courses in use and maintenance of your equipment can be organised throughout the the year.
A catalog is available on request. Among the different training programmes proposed, you will be able to find the training which best corresponds to your needs and production requirements. These training courses can be organised on your premises or in our training center at our headquarters in Meylan.

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TN 5077

Turbine-speed reading and control module

WARNING : This document contains links to the following user manuals:
For the microphone user manual see RT Nr 6190

1. Warning

1.1. Safety Regulations

This equipment may be dangerous if it is not used in compliance with the security regulations specified in this manual.

- The turbine speed reading and control module must never be installed in locations where there is a risk of explosion.
- The electrostatic paint spraying equipment must only be used by qualified personnel fully informed of rules no.° 1 to 10 as follows:

1 A warning notice written in a language understood by the operator, summarizing safety regulations nos.° 2 to ° 8, section 1.1 of this manual, must be placed in a clearly visible position close to the powder-spraying booth.

2 Shoes intended for operator use must be anti-static and comply with the ISO 2251 publication. If gloves are used, only anti-static gloves or gloves ensuring grounding of the operator may be worn.

3 The floor in the area in which the operator works must be anti-static (ordinary bare concrete floors are anti-static).

4 Powder spraying must be carried out in front of a ventilated booth designed for the purpose. Start-up of the **TN 5077** must be interlocked with operation of the ventilation system.

5 All conducting structures such as floors, walls of powder-spraying booths, ceilings, barriers, parts to be painted, powder distribution tank, etc., that are inside or near the work station and the earth terminal on the electro-pneumatic control module must be electrically connected to the ground system protecting the electrical power supply.

6 Parts to be painted must have a resistance in relation to the ground system that is less than or equal to 1 MΩ.

7 Powder-spraying equipment must be maintained regularly according to the manufacturer's instructions. Repairs must be carried out in strict compliance with these instructions.

8 Check that the current-return measurement cable for each Tribo spray gun is correctly connected before starting up the system.

9 Only **SAMES** original spare parts ensure operating safety of the equipment.

10 Ambient temperature must not exceed 45 °C.

1.2. Standards and Certification

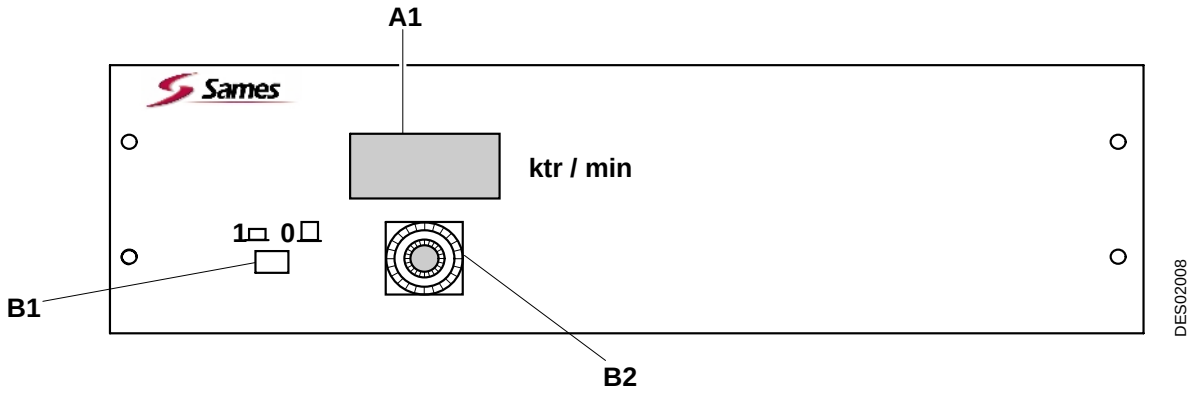
The **TN 5077** must be used in compliance with the specifications indicated in European standard EN 50053-2.

2. General

Module TN 5077 is designed to read and control the rotation speed of the turbine used for powder-paint spraying. Turbine rotation speed can be read at all times on the numerical display located on the front panel (see figure below).

3. Description

The turbine-speed reading and control module is delivered in rack form and has a length of 19 inches, a height of 3U and a depth of 270 mm. The rack is designed to be fitted horizontally in a cabinet.



A1	Numerical display of turbine rotation speed.
B1	TN 5077 module start-up switch.
B2	Setting button for powder spray gun turbine rotation speed.

The TN 5077 is equipped with:

- a ground cable.
- a bridged plug for local control.
- a connection cable to connect it to electro-pneumatic control module CRN 117B.
- a microphone sensor to measure turbine rotation speed (see RT Nr 6190).

4. Characteristics

4.1. Electrical characteristics

Power-supply voltage	230 +/- 20V (115 +/- 10V as an option)
Power consumption	40 VA
Frequency	50/60 Hz

4.2. Pneumatic characteristics

Maximum supply pressure	10 bar
Minimum supply pressure	4 bar
Spray gun air supply flow rate	0 to 3 m_0^3/h according to spray gun rotation speed
Microphone air supply flow rate	1.9 m_0^3/h
Pneumatic seal air supply flow rate	2.4 m_0^3/h
Counter-electrode cleaning air supply flow rate	1.9 m_0^3/h

m_0^3/h^3: values given for a temperature of 20° C at an atmospheric pressure of 1,013 mbar

WARNING : The length of pneumatic hoses supplying microphone, pneumatic seal and counter-electrode cleaning air must not exceed 10 m. The length of the microphone air supply hose must not exceed 10 m but the microphone air return hose must never be longer than 3 to 5 m.

5. Operation

The equipment is started up by pressing the pushbutton on the front panel.

The turbine-speed reading and control module supplies the air necessary to start rotation of the powder spray gun bell. Turbine rotation speed settings can be adjusted between 2,000 and 10,000 rpm. This adjustment is made via the external link (PLC) or the setting turn button located on the front panel of the module in the case of local control.

This module also supplies air:

- for cleaning the counter-electrode.
- to the microphone sensor measuring turbine rotation speed.
- to the pneumatic seal.

Microphone, pneumatic seal and counter-electrode cleaning air flow rates are controlled by means of restrictors and a regulator.
This principle gives identical spray gun operation regardless of pneumatic hose lengths (limited to a maximum length of 10 metres).

The lead connecting the equipment to the CRN 117B electro-pneumatic control module allows locking of spraying if there is not enough air in the pneumatic seal in order to protect the spray gun. Thus, it is necessary to control the spray gun (trigger at least) via the TN 5077 module.

6. Startup

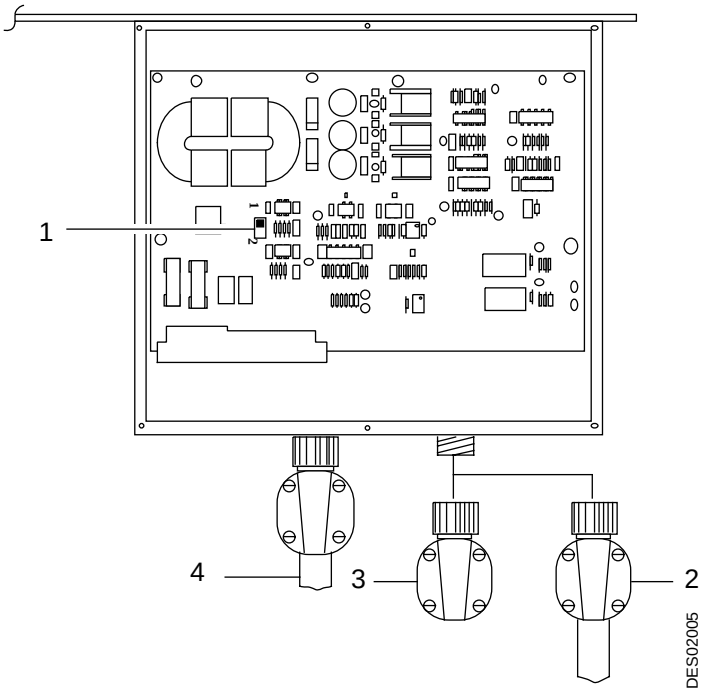
The TN 5077 module must first of all be in a cabinet designed for the purpose.
The TN 5077 module can be controlled in two different ways:

- either directly on the front panel of the console.
- or by a PLC.

6.1. Local control

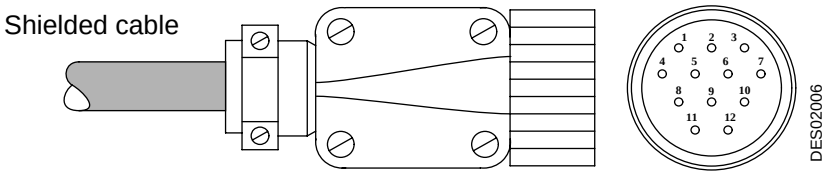
In local control mode, the jumper strap on the TN 5077 module's main electronic board is in position 1 and the bridged plug is connected to the back of the turbine-speed reading and control module.

1	Jumper strap
2	Plug for remote control cable
3	Bridged plug
4	Electro-pneumatic control module connection cable



6.2. Remote control

- Disconnect the bridged plug (item 3).
- Place the jumper strap (item 1) in position 2 on the TN 5077 module's main electronic board.
- Prepare the remote control cable (item 2) according to the diagram below and connect it in place of the plug installed on the back of the module.



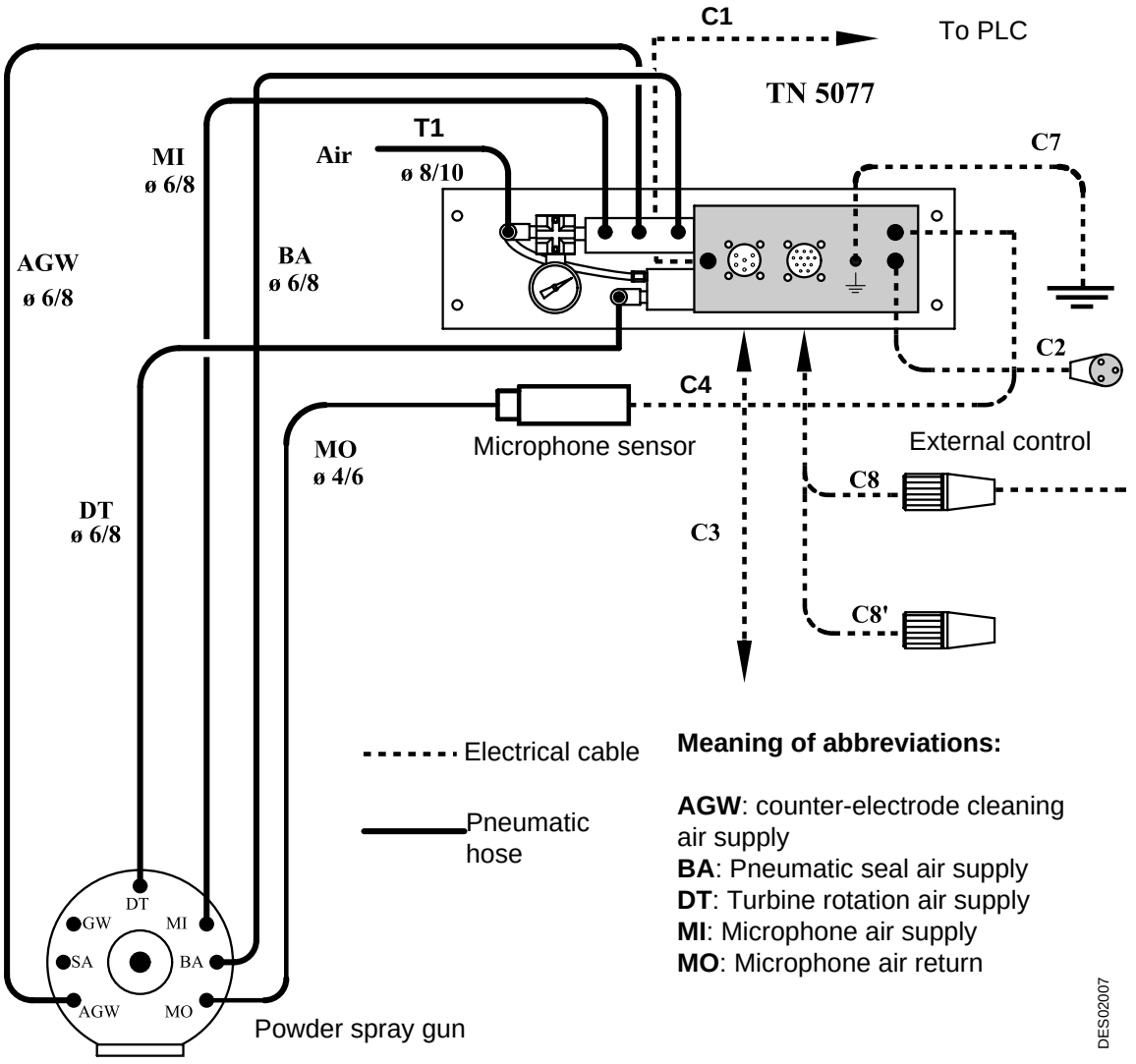
Plug connections:

1	0V	**7**	Rotation setpoint (0/5V)
2	HV setpoint	**8**	Default rotation (NC)
3	Default HV (NO)	**9**	Common default rotation
4	Default HV (NC)	**10**	0V
5	Default HV	**11**	Default rotation (NO)
6	HV trigger	**12**	Rotation trigger

6.3. Component connection

The following elements must be connected:

- Compressed air network air supply hose T1 (dia. 8/10) to TN 5077 module.
- Powder spray gun turbine air supply hose DT (dia. 6/8) to TN 5077 module.
- Powder spray gun counter-electrode cleaning air supply hose AGW (dia. 6/8) to TN 5077 module.
  Note: Place a plug on this outlet if the powder spray gun is used without a counter-electrode.
- Powder spray gun pneumatic seal air supply hose BA (dia. 6/8) to TN 5077 module.
- Spray gun microphone air supply hose MI (dia. 6/8) to TN 5077 module.
- Microphone return signal hose MO (dia. 4/6) from spray gun to microphone.
- Inter-module connection cable C3
- Ground cable C7 connecting TN 5077 module to ground system protecting electrical power supply.
- External control cable plug C8 or bridged plug C8' on back of TN 5077 module.
- Cable C1 from TN 5077 module to PLC for copying turbine speed reading (01V)
  This cable does not exist on standard versions of the TN 5077 module.
- Cable C4 from microphone sensor to TN 5077 module (via a terminal box).
- TN 5077 control module plug C2, mains power supply.

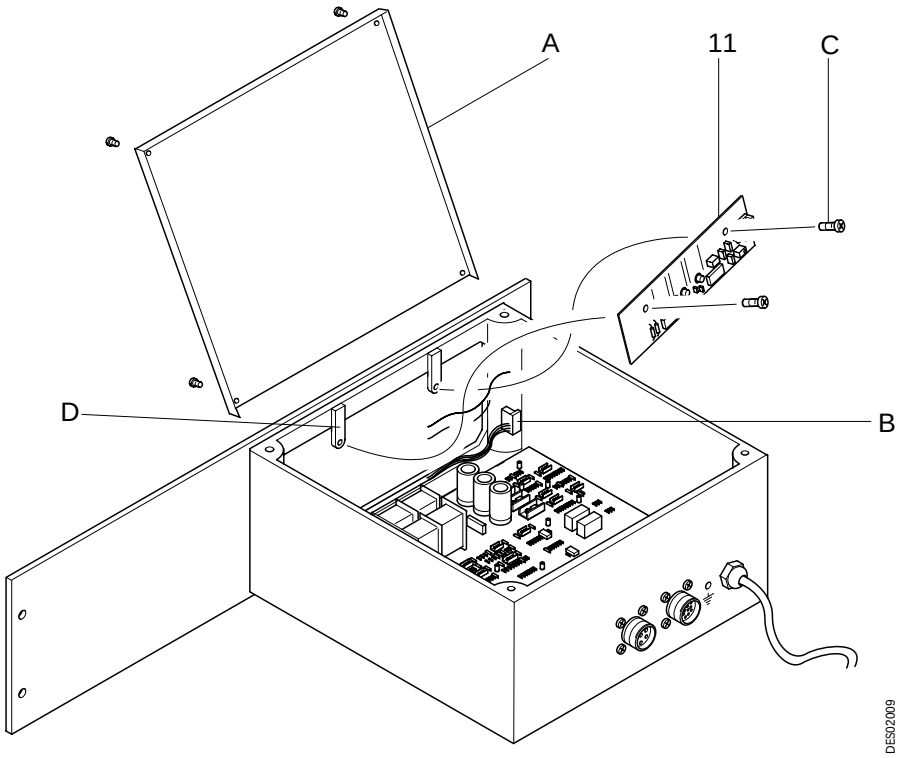


7. Maintenance

7.1. Disassembly/Reassembly of the voltmeter board

7.1.1. Disassembly

- **Step 1**: Disconnect the power supply from the TN 5077 module.
- **Step 2**: Unscrew the 4 screws (Chc M 4 x 6 steel) securing the cover (item A) and remove it.
- **Step 3**: Disconnect the connector (item B).
- **Step 4**: Unscrew the 2 screws (CHc M 6 x 10 steel) (item C) securing the voltmeter board and remove it.



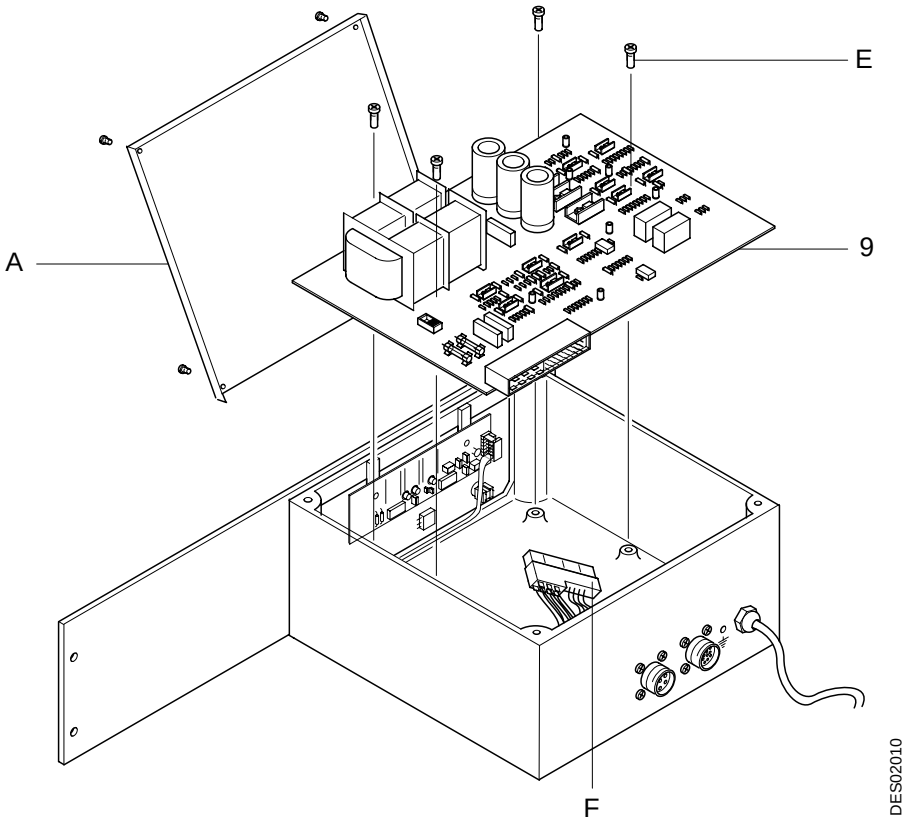
7.1.2. Reassembly

- **Step 1**: Position the voltmeter board on its fixing cramps (item D) and fix it in place with the 2 screws (CHc M 6 x 10 steel), (item C).
- **Step 2**: Reconnect the connector (item B).
- **Step 3**: Refit the cover (item A) and fix it in place with the 4 screws (Chc M 4 x 6 steel).
- **Step 4**: Reconnect the power supply to the module.

7.2. Disassembly/Reassembly of the main electronic board

7.2.1. Disassembly

- **Step 1**: Disconnect the power supply from the module.
- **Step 2**: Unscrew the 4 screws (Chc M 4 x 6 steel) securing the cover (item A) and remove it.
- **Step 3**: Disconnect the connector (item F).
- **Step 4**: Unscrew the 4 fixing screws (M 4 x 10) (item E) and remove the main board (item 9).



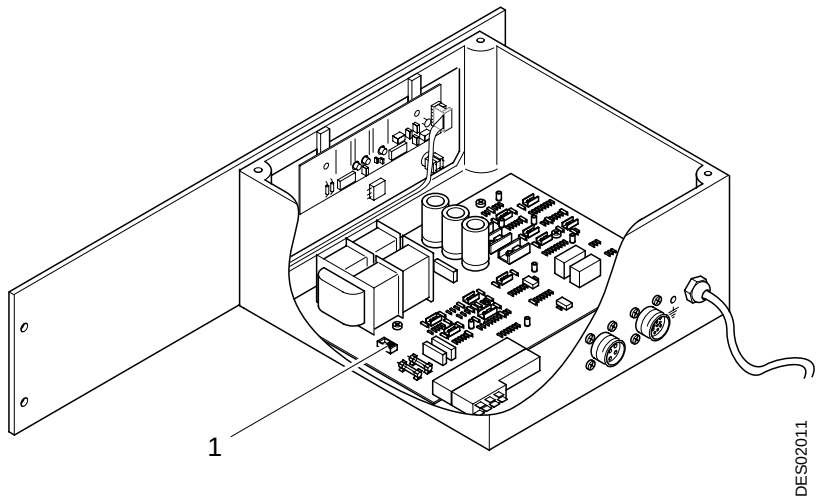
7.2.2. Reassembly

- **Step 1**: Position the main electronic board on its fixing cramps and fix it in place with the 4 screws (M 4 x 10), (item E).
- **Step 2**: Reconnect the connector (item F).
- **Step 3**: Refit the cover (item A) and fix it in place with the 4 screws (Chc M 4 x 6 steel).
- **Step 4**: Reconnect the power supply to the module.

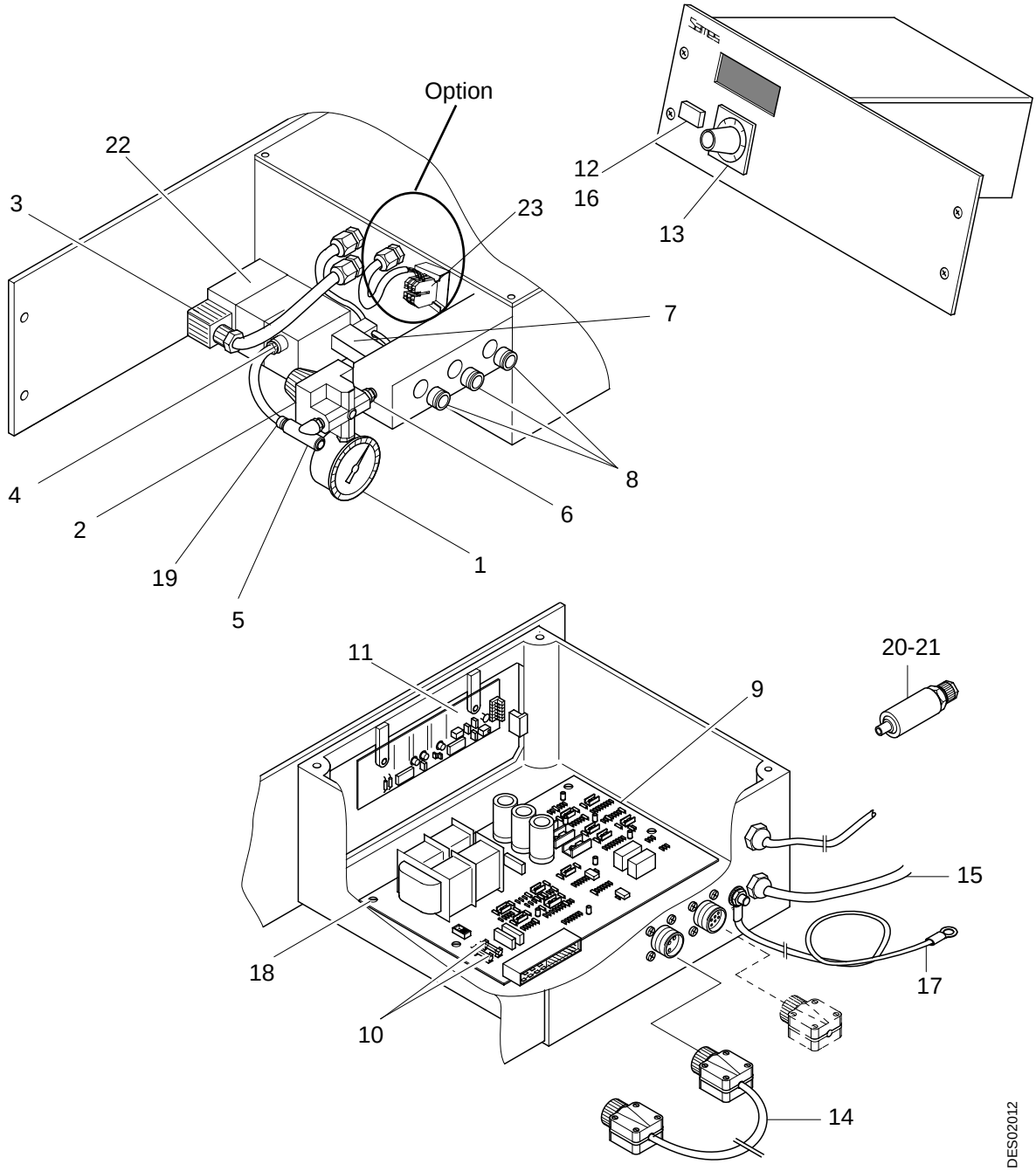
7.3. Modification of module 115/230V power supply voltage.

Switch from 230V to 115V:

- **Step 1**: Remove the cover as previously described.
- **Step 2**: Switch the rocker switch (item 1) on the main electronic board to the 110V position.
- **Step 3**: Replace the cover.



8. Spare Parts



Item	Part number	Description	Qty	Unit of sale
	851668	**Turbine-speed reading and control module**	**1**	**1**
1	R7MCAD054	Manometer dia. 40 - 4 bar	1	1
2	R4DREG029	Pressure regulator, 0 to 4 bar	1	1
3	F6RLCS393	Elbow union, dia. 8 mm -1/4”	1	1
4	F6RLUS199	Straight union, dia. 8 mm -1/4” male	1	1
5	F6RLTS414	Male tapping T, dia. 10 mm - 1/4”	1	1
6	F6RLHC214	Male-male nipple	1	1
7	R2PBPR048	Pressure switch, 2.1 - 2.4 bar	1	1
8	F6RLUC138	“Pneumatic union” cartridge, dia. 8 mm	3	1
9	851665	Main electronic board	1	1
10	E6FCFN039	Fuse cartridge 5 x 20 - 1A	2	10
11	851657	Voltmeter board (for display)	1	1
12	E8VHTV091	White cover	1	1
13	E5FBCE080	HV setting button	1	1
14	852208	Equipped connecting cable	1	1
15	757215	Equipped mains power cable	1	1
16	E5NUPB070	Push button body	1	1
17	842635	Ground cable equipped with terminals	1	1
18	X2BVKB118	FB/90 board fixing screw M 4 x 10 steel	4	10
19	F6RPRR150	Reducer, 10/8	1	1
20	851488	Microphone sensor (see RT Nr 6190)	1	1
21	E4PTFS195	Male plug, 3-pin	1	1
22	R3VVPR229	Proportional valve	1	1
23	E4BVDS147	Terminal M 4 x 6 (**option**)	3	1
	E4BVDS150	Stop equipping terminals (**option**)	2	1
	U1CBBS001	Air supply hose, dia. 4/6 mm		m
	U1CBBS003	Air supply hose, dia. 6/8 mm		m