

USE AND INSTALLATION HANDBOOK

DOMINO UP

CONTROL PANEL FOR 1 ELECTRIC PUMP WITH
COS-φ AND CURRENT CONTROL

DOMINO UP



INDEX

- 1. Warnings**
page.....3
- 2. Overview**
page4
- 3. Handling**
page4
- 4. Application and working limits**
page5
- 5. Operation**
page6
- 6. Installation**
page7-8
- 7. Electrical connection**
page9-10
- 8. Regulation and calibration**
page11-14
- 9. Stopping the pump**
page15
- 10. Lights and display**
page15-16
- 11. Maintenance**
page17
- 12. Waste disposal**
page17
- 13. Warranty**
page18
- 14. Spare parts**
page18
- 15. Conformity declaration**
page19
- 16. Connection diagrams**
page.....20

1. WARNINGS

The following symbols, accompanied by the words: “Danger”, “Warning”, indicate the potential hazard resulting from failure to observe the associated warning, as specified below:



DANGER
RISK OF ELECTRIC
SHOCK

Failure to observe this warning may result in electric shock



DANGER

Failure to observe this warning may cause personal injury and/or damage to property



WARNING

Failure to observe this warning may cause damage to the pump, the unit or the system

- **CAUTION:**
Make sure the pumps are fully primed before you start them.
- **CAUTION:**
The control panel must be connected by a qualified electrician in compliance with the electrical regulations in force locally.
- **CAUTION:**
The electric pump or the motor and the panel must be connected to an efficient earthing system in compliance with the electrical regulations in force locally.
- **CAUTION:**
Ensure the unit is properly earthed before carrying out any other operation.
- **CAUTION:**
The electric pump or the motor can start up automatically.
- **CAUTION:**
As a general rule, always disconnect the power supply before carrying out any work on the electrical or mechanical components of the unit or system.

2. OVERVIEW

The purpose of this manual is to provide the necessary information for the proper installation, use and maintenance of DOMINO UP. The user should read this manual before operating the unit. Improper use may cause damage to the machine and lead to forfeiture of the warranty coverage. Always specify the model identification code and the construction number when requesting technical information or spare parts from our Sales and Service department. The instruction and warnings given below concern the standard version; refer to the sale contract documentation for any modifications and special version characteristics. For instructions, situations and events not considered in this manual or in the sale documents, please contact our customer service department.

Our units must be installed in sheltered, well-ventilated, non-hazardous environments and must be used between a maximum temperature of +40°C and minimum of -5°C.

3. HANDLING



DANGER



WARNING

The panel must be handled with care as falls and knocks can cause internal damage without any visible external signs.

If for any reason the unit is not installed and started immediately after it has reached site it must be stored properly in its original packaging together with any separately packed accessories. It must be stored indoors, protected from the weather, especially from freezing temperatures, and from any knocks or falls.

PRELIMINARY INSPECTION: After you have removed the external packaging, visually inspect the control panel to make sure it has suffered no damage during shipping.

If any damage is visible, inform your dealer as soon as possible, no later than five days from the delivery date.

4. APPLICATION AND WORKING LIMITS



**DANGER
RISK OF ELECTRIC
SHOCK**



WARNING

DOMINO UP is suitable for the control of submersible electric pump motors where it is important to control dry running without using level sensors (SINGLE PHASE : DOMINO UP-M or THREE PHASE : DOMINO UP-T). For any other suggested use of DOMINO UP it is advisable to contact our customer service department.

FOURGROUP S.r.l. shall not be liable for any damage caused or suffered by the unit as a result of any unauthorised or improper use.

TECHNICAL FEATURES :

- Electronic control panel;
- Input voltage 1~50/60 Hz 230V $\pm 10\%$ (single-phase model DOMINOUP-M);
- Input voltage 3~50/60 Hz 400V $\pm 10\%$ (three-phase model DOMINOUP-T);
- n°2 very low voltage input for control by pressure switch or float switch with adjustable operating modes;
- Selector for AUTO-OFF-MANUAL motor operation (MANUAL temporary);
- Green led for AUTO operation;
- Green led for motor operating;
- Multifunction display for the visualization of: mains voltage, frequency, motor current and COS ϕ and alarms;
- Push-buttons for protection restoration;
- Push-buttons for adjustments and set up from the display;
- Adjustable electronic protection for motor overload (from keyboard);
- Time for activation of protection: 5";
- Dry running protection adjustable from COS ϕ 0,1÷0,99 (from keyboard);
- Automatic restoration from dry running after 5', 30', 60', 90';
- Internal selector for automatic restoration from dry running every 90';
- Motor protection for wrong phase sequence;
- Clean Output alarm with adjustable intervention mode;
- Reboot Timer 10" to prevent the engine stutters;
- Auxiliary circuits protection fuse;
- Motor protection fuses;
- Main switch with door interlock;
- Single-phase version adapted for the insertion of a capacitor (not included);
- Disconnecter with padlockable handle red and yellow;
- Box in ABS;
- Output with cable holder;
- Protection IP55;
- Ambient temperature: -5/+40 °C;
- Relative humidity 50% at 40 °C (not condensed).

Do not use the product in environments where dust, acids, corrosive and/or flammable gases etc. are present

5. OPERATION



DANGER
RISK OF ELECTRIC
SHOCK



DANGER



WARNING

When the control panel is connected to a power source, the DISPLAY will show a main voltage and frequency value.

Using the buttons



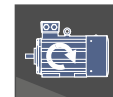
it is possible to make the motor work manually (**manual**) or from an external control (**automatic**).

By pressing the AUT button lights up the LED above the button itself and the picture is ready to receive external signals from sensors and floats.

When closed, an automatic external controls (FLOAT, PRESSURE SWITCHES or any volt free contacts) will permit the motor to work automatically.

Should the external contacts open, the motor will stop immediately and the display will show "**Level Alarm**"

When the motor is operating the green "**Motor on**" light will show



The water level is controlled by verifying the value of the motor's **COS ϕ** (power factor) so does not need level sensors. On detecting a lack of water, for a (fixed) period of **5 seconds**, the motor will be stopped.

The system will then test again after **5, 30, 60, 90 minutes** and show a "**ALLARM! MOTOR DRY RUNNING**" display – if these tests find the **COS ϕ** to have returned within preset values the panel will revert to normal operation.

If the problem persists: secures the system TEST

- with **DIP1** (excluding restart) **ON** in the system locks the test;
- with **DIP1 OFF** tests continue indefinitely every **90 min.**

The system can be connected to pressure switch, float switch, alarm signals, PLC or BMS etc.

After resolving an anomaly can manually restore normal operation by pressing the

button



or by turning the picture by pressing the switch.

This restores all the security features occurring automatically and the system is ready to start in automatic or manual;

GENERAL NOTE:

While calibrating for Over-Load Protection, start the motor 2-3 times to check for correct operation.

We suggest that the operation and functions of the panel are checked periodically to guarantee maximum efficiency.

6a. INSTALLATION



DANGER
RISK OF ELECTRIC
SHOCK



DANGER



WARNING

Power Connection

The unit must be CORRECTLY EARTHED before carrying out any other operation.

The input voltage should correspond to the panel data and marked on the motor.
(**400V** \pm 10% 50/60Hz for **DOMINO UP-T**)
(**230V** \pm 10% 50/60Hz for **DOMINO UP-M**).

Make sure that the power-supply-cable is correctly sized for the nominal current and connect it to the terminals of the control panel main Isolator. (L1 L2 L3)

All exposed cables must be appropriately protected.

The incoming line must be protected with an Earth Leakage Circuit Breaker sized in accordance with local regulations.

Motor Connection

The unit must be CORRECTLY EARTHED before carrying out any other operation.

The input voltage should correspond to that marked on the motor.
(**400V** \pm 10% 50/60Hz **three phase**)
(**230V** \pm 10% 50/60Hz **single phase**).

Before installing the motor run it briefly to check the direction of rotation – usually indicated by an arrow printed on the pump. It is advisable to disconnect the motor from the pump prior to checking rotation or pump could be damaged.

External Control Connection

It is possible to control the motor in "**automatic**" mode using two voltage-free contacts, normally open as floating or pressure switches.

There are power lines but very low voltage lines, however the framework linkage off and with the differential magnetothermic switch off!

6b. INSTALLATION

- USE THE CORRECT SIZED SCREDDRIVER TO FIX THE CABLES IN THEIR TERMINALS TO AVOID DAMAGING THE SCREWS OR SOCKETS.
- FIX THE CONTROL PANEL TO A WALL WITH SCREWS AND WALL PLUGS USING THE HOLES MOULDED IN THE BOX (OR THE FIXING BRACKET IF PRESENT).

AFTER FIXING, REMOVE ANY PLASTIC OR METALLIC DEBRIS (Such as pieces of copper cable or plastic shavings) FROM THE BOX BEFORE CONNECTING POWER.

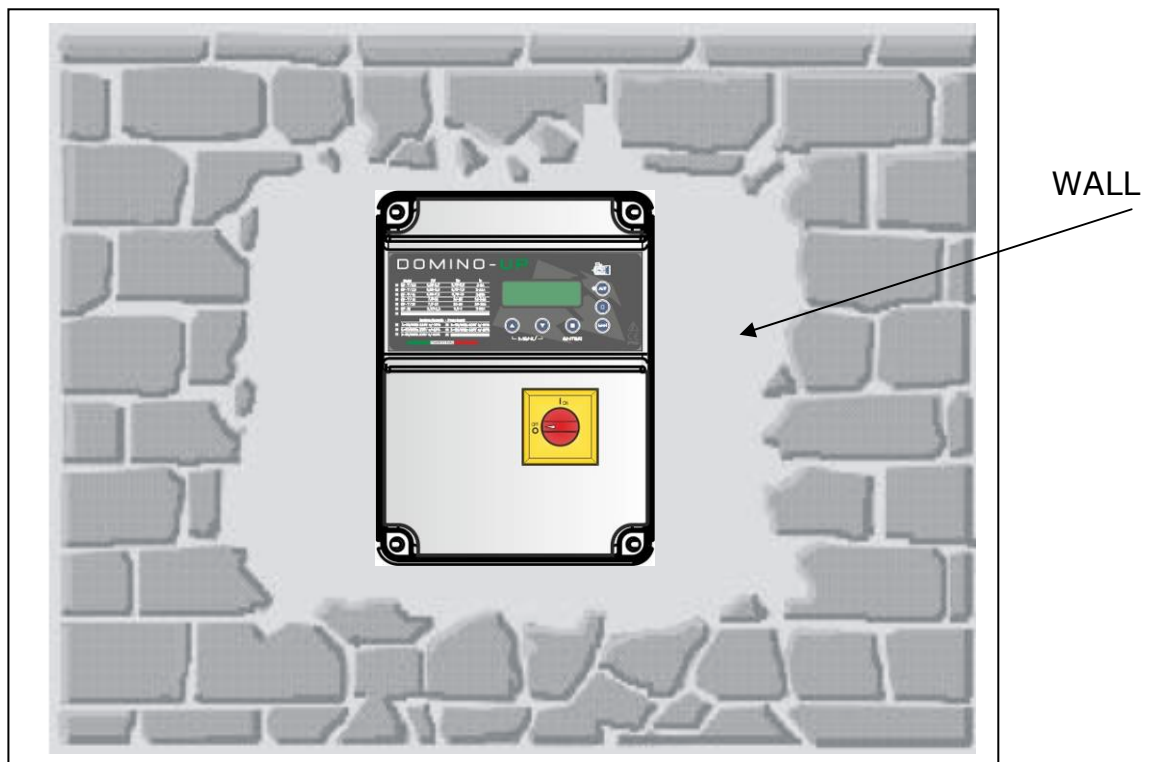


Fig.1

N.B. : DO NOT INSTALL THE CONTROL PANEL CLOSE TO ANY SOURCE OF WATER, FLAMMABLE LIQUIDS OR GASES.

7a. DOMINO UP-T ELECTRICAL CONNECTION



DANGER
RISK OF ELECTRIC
SHOCK



DANGER

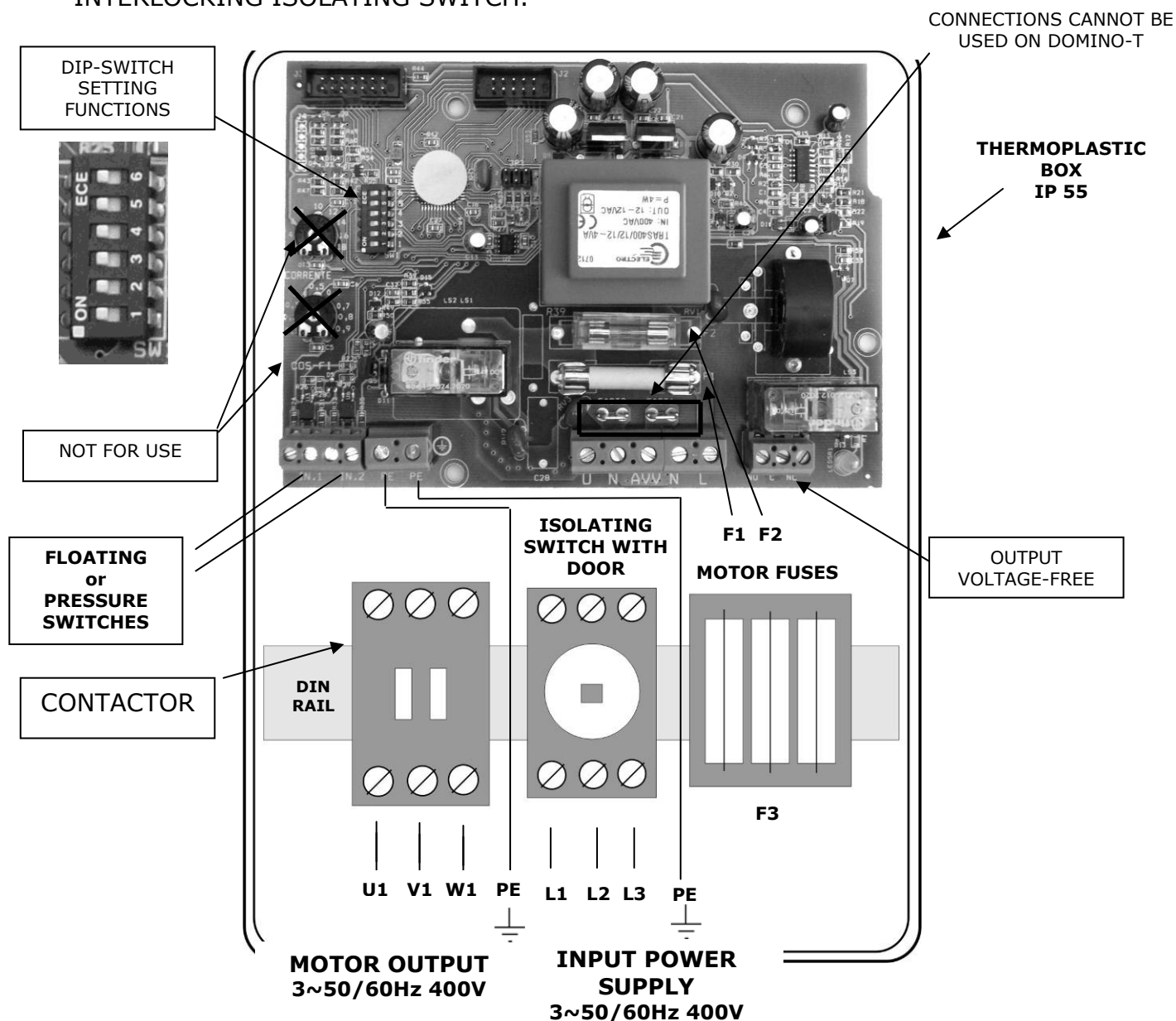


WARNING

Electrical connections and functions of the three phase panel.

Connect the FLOAT/PRESSURE SWITCHES and the MOTOR OUTPUT to the control panel as shown below.

Connect the PANEL POWER SUPPLY cable directly to the terminals of the DOOR INTERLOCKING ISOLATING SWITCH.



FUSES " F1 , F2 , F3 " :

For protection from short circuits on the panel, on the panel-motor cable and on the motor

F1 : **PRIMARY** circuit protection fuse;

F2 : **AUXILIARY** circuit protection fuse; [See page 11 for fuse ratings & sizes]

F3 : Three **MOTOR** protection fuses ;

7b. DOMINO UP-M ELECTRICAL CONNECTION



DANGER
RISK OF ELECTRIC
SHOCK



DANGER

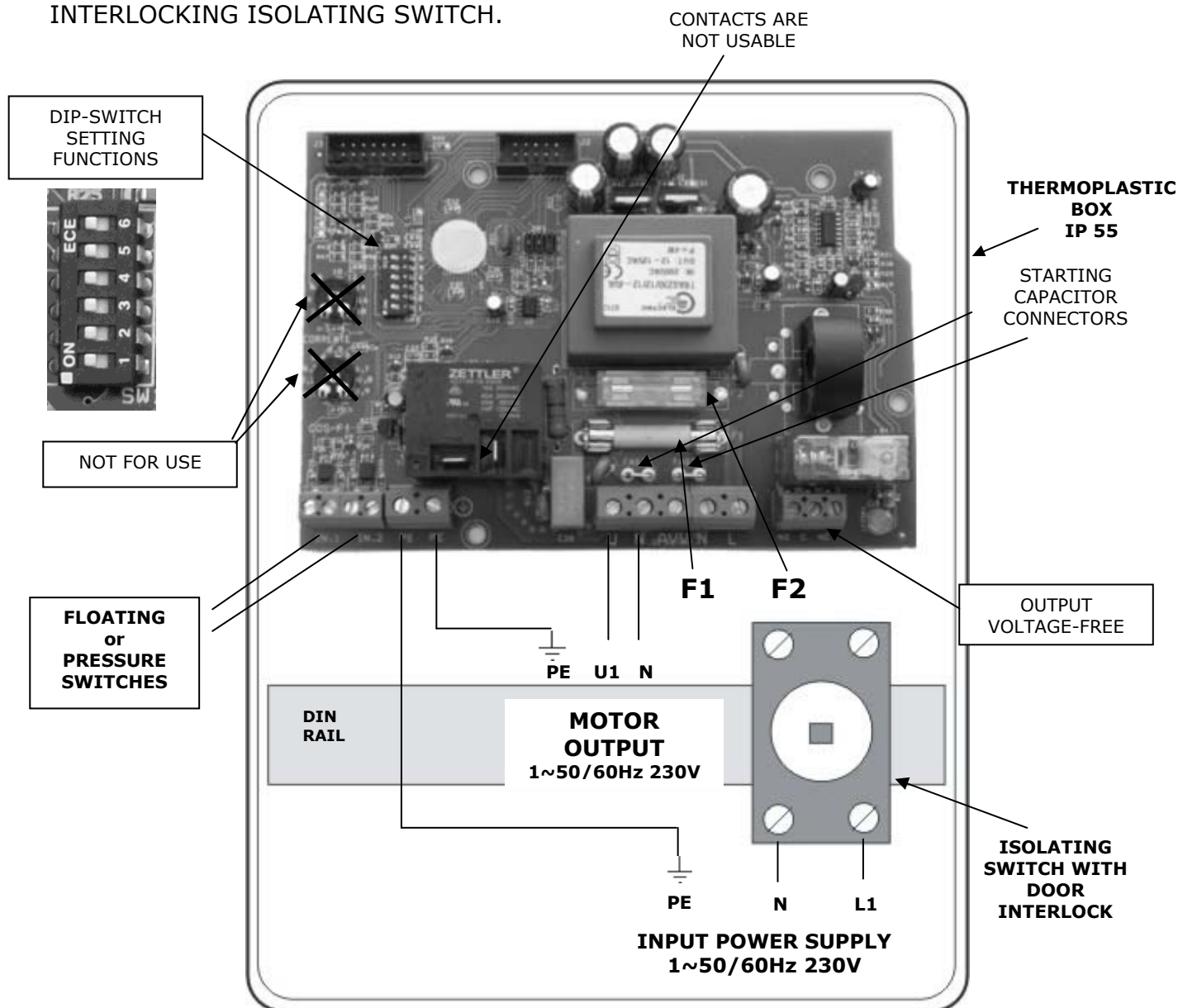


WARNING

Electrical connections and functions of the single phase panel.

Connect the FLOAT/PRESSURE SWITCHES and the MOTOR OUTPUT to the control panel as shown below.

Connect the PANEL POWER SUPPLY cable directly to the terminals of the DOOR INTERLOCKING ISOLATING SWITCH.



FUSES " F1 , F2 " :

For protection from short circuits on the panel, on the panel-motor cable and on the motor

F1 : **MOTOR** protection fuse;

F2 : **AUXILIARY** circuit protection fuse; [See page 11 for fuse ratings & sizes]

8a. REGULATION AND CALIBRATION

SETTING CONTROL PARAMETERS

It's possible to set the main protections via the buttons and the DISPLAY as follows:

- Press and hold the 2 buttons simultaneously
or until the word "SETUP";



for at least 7 seconds

their release will display the parameter:

MAX MOTOR
CURRENT : A

Using the same keys (UP & DOWN), increase or decrease the value of Max Current of the Motor to be used; then confirm the value by pressing the "ENTER" key.



you will see the parameter:

MIN COS-PHI
MOTOR :

Using the same keys (UP & DOWN), increase or decrease the value of Min Cos-Fi of the Motor to be used; then confirm the value by pressing the "ENTER" key.



you will see the parameter:

ALARM VOLTAGE
ENABLE:

Using the same keys (UP & DOWN), increase or decrease the value from 0 to 1 to select the function:
0 = Alarm function for voltage out of range OFF;
1 = Alarm function for voltage out of range ON.
then confirm the value by pressing the "ENTER" key.



Please note that the operating range considered acceptable by Domino is $\pm 15\%$ Vn.

you will see the parameter:



Using the same keys (UP & DOWN), increase or decrease the value from 1 to 2 to select the function:

1 = The alarm appears when Input IN1; with closed input alarm display disappears and the engine starts and stops with the opening and closing of entrance IN2.

2 = The alarm never appears; the motor starts and stops with 2 inputs IN1 and IN2 with IN1 as STOP and IN2 as START with self retainer.

then confirm the value by pressing the "ENTER" key



you will see the parameter:



Using the same keys (UP & DOWN), increase or decrease the value from 1 to 4 to select the language

1 = ITALIAN

2 = ENGLISH

3 = SPANISH

4 = FRENCH

then confirm the value by pressing the "ENTER" key



This will return to the display of voltage and frequency, the DOMINO UP is now ready for normal operation;



8b. REGULATION AND CALIBRATION

Before operation you must calibrate **the System Overload Motor Protection** by setting **the Tripping Current Protection**:

First read on the display the current absorbed by the motor operating in manual mode (press and hold the MANUAL button for about 10 seconds and read the value on the display "Motor Current....A").

Increase this value of **20%**, and set the value in the "Maximum Motor Current".

Suppose we want to set the overload protection for a three-phase motor by 5,5kW (7,5Hp) whose Nominal Absorption is about **12 A**.

CALIBRATION STEPS:

After performing a correct installation of the system, having complied with the direction of rotation of the pump, press and hold the Manual button for about ten seconds and read the value on the display of current absorbed by the motor (then worth approximately near 12A).

8c. REGULATION AND CALIBRATION

Following PROTECTION SETTING instruction (on the previous page) set parameter " **Max Motor Current : A** " to a value **20%** above the motor absorbed current ($12 + 20\% = 14,4A$)



MAX MOTOR
CURRENT: 14.4A

At this point the protection is set.

NOTE : Protection is delayed by **5 seconds** .

THE SAME PROCEDURE IS VALID FOR ALL MODELS IS 3-PHASE SINGLE-PHASE; BASED ON CURRENT CONSUMPTION SIMPLY ADJUST THE PARAMETER "MAXIMUM MOTOR CURRENT" 20% MORE FOR THE PROTECTION OF THE CONNECTED LOAD;
(eg. ABSORPTION **4A** = ADJUSTMENT TO **4,8A**).

EXAMPLE OF COS- ϕ CALIBRATION

Set a value under that the protection had to stop the motor for dry running;
To view the real value of **COS- ϕ** turn on the motor (ONLY WITH WATER PRESENT)
and press "**ENTER**" until you see the following message on the DISPLAY.

Ex.



Then set PARAMETER "MIN COS-Phi MOTOR" to 10-15% below this value.

Ex.



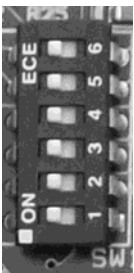
LOW COS- ϕ : " ALARM! MOTOR DRY RUNNING "

8d. REGULATION AND CALIBRATION

DIP-SWITCH SETTING

Is it possible to set some operating options using the dip-switches on the board.

Whereas the relative function is active when the switch is moved to the left, one has:



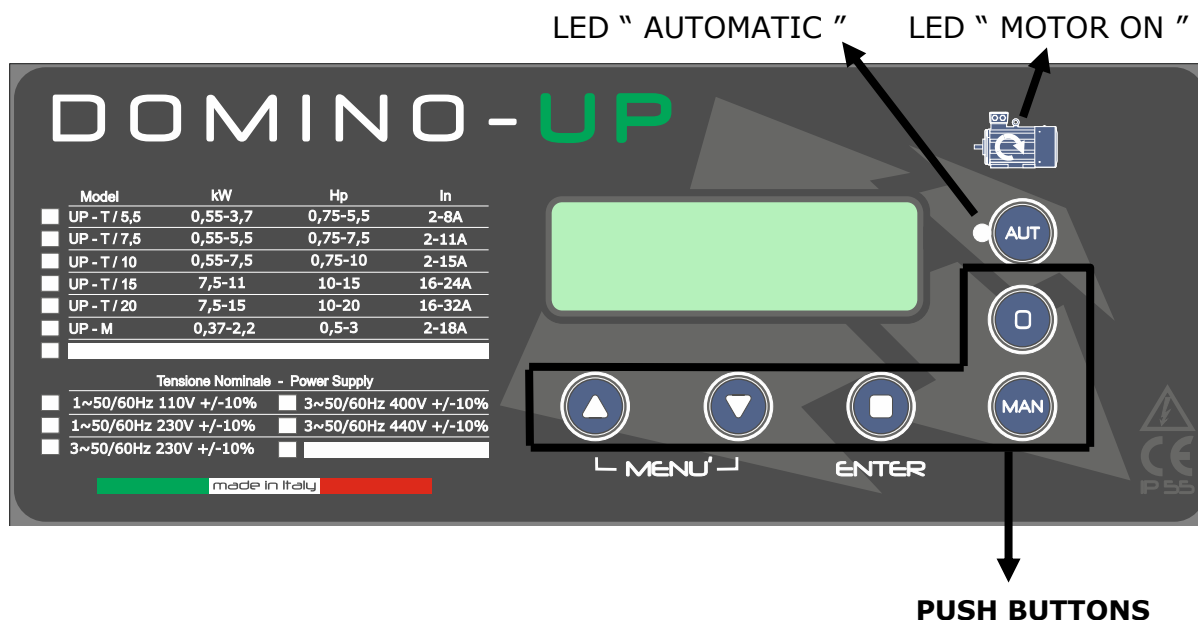
- DIP6 = Alarm relay ignition on overcurrent tripping;**
- DIP5 = Alarm relay ignition on intervention for dry running;**
- DIP4 = NOT IN USE;**
- DIP3 = Alarm relay switching on input IN1 opening;**
- DIP2 = NOT IN USE;**
- DIP1 = No reboot for dry running after the first 4 attempts.**

9. STOPPING THE PUMP

The MOTOR can be switched off in the following ways:

- In **manual** operation: release the "MAN" push button.
 - In **automatic** operation pushing the "0" button or when the input IN1 and IN2 no longer give consent.
 - Turning the door interlocking general switch to "OFF" position. (Panel will revert to its previous MANUAL or AUTOMATIC state when switched back on).
- The MOTOR will switch off AUTOMATICALLY when the external switch is opened OR a protection status is activated. (OVER-UNDERVOLTAGE, OVERLOAD, NO WATER ALARM or LEVEL ALARM)

10a. MESSAGES AND LIGHTS ON DISPLAY



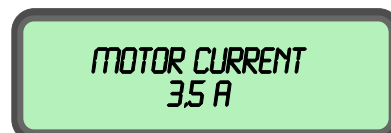
INDICATES NORMAL AND CORRECT FUNCTION :



PUSH " ENTER " BUTTON



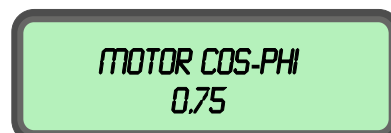
TO SHOW ACTUAL MOTOR CURRENT :



PUSH " ENTER " BUTTON



SHOW ACTUAL MOTOR COS- ϕ :



10b. MESSAGES AND LIGHTS ON DISPLAY

PUSH "ENTER" BUTTON AGAIN TO
"MAIN VOLTAGE"



RETURN TO THE FIRST PARAMETER

ALL ACTIVE ALARMS ARE INDICATED ON DISPLAY UNTIL IS PUSHED
SWITCH IS TURNED "OFF "



OR THE MASTER



PUSH AUTOMATIC BUTTON TO SELECT THE AUTOMATIC OPERATION OF
THE MOTOR BY EXTERNAL CONTACTS ; THIS FUNCTION IS INDICATED
WHEN GREEN LED IS LIT ; WHEN THE EXTERNAL CONTACTS IS OPEN
THE MOTOR IS TURNED-OFF AND THE DISPLAY INDICATES "**LEVEL
ALARM**" ;

IT IS POSSIBLE TO TURN OFF THE MOTOR AT ANY TIME BY PUSHING THE
BUTTON



WHILST THE "MAN" BUTTON IS KEPT DEPRESSED THE MOTOR WILL RUN
IN MANUAL MODE ; WHEN RELEASED THE MOTOR IS TURNED-OFF. IN
MANUAL MODE ALL PROTECTIVE SYSTEMS ARE SUSPENDED.

ALARM INDICATIONS :

- OPENING INPUT IN1 WITH
MODE LEVEL ALARM SET TO "1":
- NO WATER (DRY RUNNING) :
- MOTOR OVERLOAD :



11. MAINTENANCE



**DANGER
RISK OF ELECTRIC
SHOCK**



DANGER



WARNING

DOMINO UP does not require any routine maintenance provided that working limits are observed. Any maintenance operations must be performed by qualified and experienced personnel, in compliance with the safety regulations in force.

DANGER!

Make sure Domino UP is disconnected from the power supply before performing any maintenance operations.

12. WASTE DISPOSAL

After the control panel has been installed and started, the customer must provide for appropriate removal & disposal of any waste materials according to legislation locally in force.

If the control panel or parts of it are taken out of service and dismantled, local regulations regarding sorted waste disposal must be followed. Refer to the appropriate recycling authorities.

CAUTION: Contamination of the environment with hazardous substances such as battery acid, fuel, oil, plastic, copper, etc., may cause serious damage to the environment and endanger people's health.

13. WARRANTY

Our products are guaranteed for a year from the date of commissioning; this applies only to products purchased from our offices or from our authorised retailers. The warranty does not extend beyond 15 months from the date of shipping. If the shipping documentation is missing, the date of manufacture is given in the code on the nameplate or fused into the interior of the terminal box. The warranty covers all manufacturing defects of material manufactured by us; it covers replacement and repair only, at our premises and by our staff, of the defective panel or part. The warranty does not provide for any claims by the customer. The warranty does not cover damage caused by faulty electrical connections, lack of adequate protection, incorrect assembly, incorrect use or any negligence in installing and operating the plant.

The WARRANTY is also void in the following circumstances:

- damage due to corrosion or abrasion of any type or nature;
- malfunction due to improper installation;
- repair, disassembly or tampering by unauthorised persons;
- failure by the customer to pay due amounts.

The defective product must be returned to our factory carriage paid. We reserve the sole right to determine the cause of the defect and whether it is covered by the warranty or not. After the repair, the goods will be returned to the Customer carriage forward.

WE DECLINE all liability for damages and injury caused by our products.

Fourgroup S.r.l. reserves the right to modify its products without notifications. Any controversy arising from the terms of this warranty shall be resolved in the Padua Court, even if payment is agreed by bank's draft.

For any further information, refer to the sales contract.

14. SPARE PARTS

Always state the exact model identification number and construction number when requesting technical information or spare parts from our sales and service centre.



Use only genuine new spare parts when replacing any faulty components.



The use of unsuitable spare parts can cause malfunctions, personal injury and damage to property.

15. CONFORMITY DECLARATION

FOURGROUP S.r.l. , based in Polverara Via Enrico Fermi 8 – Padova – Italy,
declare that the products

DOMINO UP-M , DOMINO UP-T

are in compliance with the following European directives and with the national
directives of actuation :

- Machine 2006/42/CE
- European directive 2006/95/CE
- Electromagnetic compatibility 2004/108/CE and following changes in compliance with the following technical rules:
- EN 60439-1, EN 55014-1, EN 55014-2, EN 61000-3-2, EN 61000-3-3

Polverara – Italy, 05/08/2010

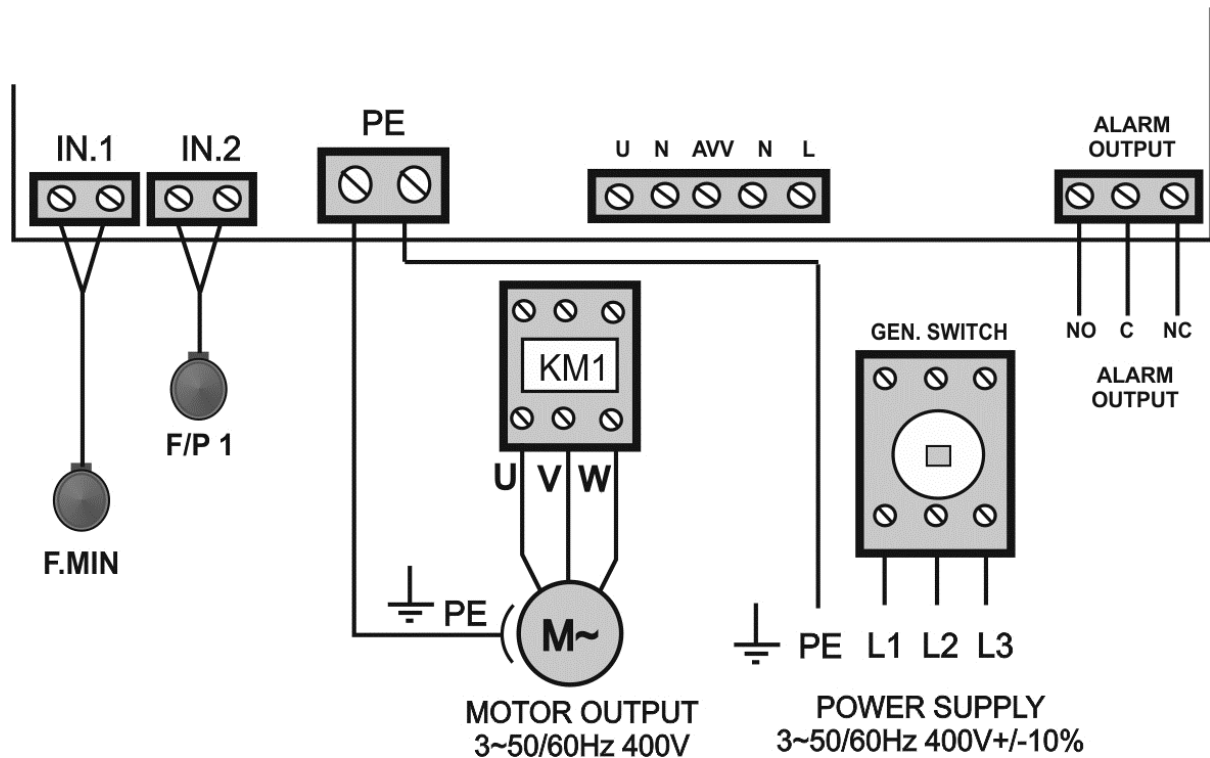
TECHNICAL MANAGER

(Grigoletto Per. Ind. Walter)



16a. CONNECTION DIAGRAM DOMINO UP-T

CONNECTION DIAGRAM



16b. CONNECTION DIAGRAM DOMINO UP-M

CONNECTION DIAGRAM

